N60087_003902
BRUNSWICK_NAS
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-42924-1, NAS BRUNSWICK ME

09/20/2018

TESTAMERICA LABORATORIES INC

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-42924-1

Job Description: TT: PFAS, Brunswick, Discharge

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

Attention: Jeff Orient

Approved for release.
David R Alltucker
Project Manager I
9/20/2018 4:15 PM

David R Alltucker, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4383
david.alltucker@testamericainc.com
09/20/2018

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Qualifiers

LCMS

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

Glossary

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

Job Narrative
320-42924-1

Receipt
The samples were received on 9/7/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 8.4º C.

Receipt Exceptions
The following samples were received at the laboratory outside the required temperature criteria: TP-PFC-033-TPI (320-42924-1), TP-PFC-033-MID CARBON (320-42924-2), TP-PFC-033-TPE (320-42924-3) and TP-PFC-033-TPE-D (320-42924-4). The client was contacted regarding this issue, and the laboratory was instructed to proceed with/cancel analysis. Received at 8.4'C and ice was melted with delivery for Thursday and received Friday.

LCMS
Method(s) 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 concentration of several analytes associated with the following samples exceeded the instrument calibration range: TP-PFC-033-TPI (320-42924-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): Results for sample TP-PFC-033-TPI (320-42924-1) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

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

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-245574.

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

Detection Summary

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

TestAmerica Job ID: 320-42924-1

Client Sample ID: TP-PFC-033-TPI — Lab Sample ID: 320-42924-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	74	M	1.7	0.49	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	210	M	1.7	0.36	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	370	E	1.7	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	82		1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1100	E	1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	3.0	M	1.7	0.43	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	1.0	J	1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	55	M	1.7	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	400	E	1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	8.0	M	1.7	0.31	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	360	E	3.3	0.91	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	78	D M	17	4.9	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	220	D	17	3.6	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	390	D	17	3.9	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	82	D	17	5.1	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1700	D	17	4.5	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	63	D	17	3.8	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	430	D	17	3.2	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	9.3	J D M	17	3.1	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	350	D	33	9.1	ng/L	10		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-033-MID CARBON — Lab Sample ID: 320-42924-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	110		1.7	0.49	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	290	M	1.7	0.36	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	270		1.7	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.2		1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	72	M	1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	13	M	1.7	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	5.1	M	1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-033-TPE — Lab Sample ID: 320-42924-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	120		1.6	0.48	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	260		1.6	0.35	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	170	M	1.6	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.2	J M	1.6	0.50	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	9.1	M	1.6	0.44	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	4.8		1.6	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.66	J M	1.6	0.31	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-033-TPE-D — Lab Sample ID: 320-42924-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.6	0.48	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-033-TPE-D (Continued)

Lab Sample ID: 320-42924-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	280		1.6	0.35	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	170	M	1.6	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.4	J M	1.6	0.50	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	9.2	M	1.6	0.44	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	4.5		1.6	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.65	J M	1.6	0.31	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-033-TPI

Date Collected: 09/06/18 09:10
Date Received: 09/07/18 09:15

Lab Sample ID: 320-42924-1

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	0.49	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluoropentanoic acid (PFPeA)	**210**	**M**	1.7	0.36	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorohexanoic acid (PFHxA)	**370**	**E**	1.7	0.39	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluoroheptanoic acid (PFHpA)	**82**		1.7	0.51	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorooctanoic acid (PFOA)	**1100**	**E**	1.7	0.45	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorononanoic acid (PFNA)	**3.0**	**M**	1.7	0.43	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorodecanoic acid (PFDA)	**1.0**	**J**	1.7	0.40	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.7	0.60	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorododecanoic acid (PFDoA)	1.2	U	1.7	0.43	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	0.63	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	0.69	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorobutanesulfonic acid (PFBS)	**55**	**M**	1.7	0.38	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorohexanesulfonic acid (PFHxS)	**400**	**E**	1.7	0.32	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluoroheptanesulfonic Acid (PFHpS)	**8.0**	**M**	1.7	0.31	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorooctanesulfonic acid (PFOS)	**360**	**E**	3.3	0.91	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.7	0.46	ng/L		09/14/18 08:21	09/16/18 15:31	1
Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	1.1	ng/L		09/14/18 08:21	09/16/18 15:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*91*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C4 PFBA	*81*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C5 PFPeA	*96*	*M*	*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C2 PFHxA	*89*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C4-PFHpA	*97*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C4 PFOA	*91*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C5 PFNA	*99*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C2 PFDA	*98*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C2 PFUnA	*96*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C2 PFDoA	*92*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
18O2 PFHxS	*97*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C2-PFTeDA	*90*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C4 PFOS	*93*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*1*
13C3-PFBS	*95*	*M*	*50 - 150*	*09/14/18 08:21*	*09/16/18 15:31*	*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)	**78**	**D M**	17	4.9	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluoropentanoic acid (PFPeA)	**220**	**D**	17	3.6	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorohexanoic acid (PFHxA)	**390**	**D**	17	3.9	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluoroheptanoic acid (PFHpA)	**82**	**D**	17	5.1	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorooctanoic acid (PFOA)	**1700**	**D**	17	4.5	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorononanoic acid (PFNA)	12	U M	17	4.3	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorodecanoic acid (PFDA)	8.3	U	17	4.0	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluoroundecanoic acid (PFUnA)	12	U	17	6.0	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorododecanoic acid (PFDoA)	12	U	17	4.3	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorotridecanoic Acid (PFTriA)	25	U	33	6.3	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorotetradecanoic acid (PFTeA)	25	U	33	6.9	ng/L		09/14/18 08:21	09/18/18 00:10	10

Client Sample ID: TP-PFC-033-TPI — Lab Sample ID: 320-42924-1

Date Collected: 09/06/18 09:10 — **Matrix: Water**
Date Received: 09/07/18 09:15

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)	**63**	**D**	17	3.8	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorohexanesulfonic acid (PFHxS)	**430**	**D**	17	3.2	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluoroheptanesulfonic Acid (PFHpS)	**9.3**	**J D M**	17	3.1	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorooctanesulfonic acid (PFOS)	**350**	**D**	33	9.1	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorodecanesulfonic acid (PFDS)	12	U	17	4.6	ng/L		09/14/18 08:21	09/18/18 00:10	10
Perfluorooctane Sulfonamide (FOSA)	25	U	33	11	ng/L		09/14/18 08:21	09/18/18 00:10	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*75*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C4 PFBA	*75*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C5 PFPeA	*78*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C2 PFHxA	*77*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C4-PFHpA	*79*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C4 PFOA	*87*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C5 PFNA	*84*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C2 PFDA	*86*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C2 PFUnA	*84*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C2 PFDoA	*76*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
18O2 PFHxS	*79*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C2-PFTeDA	*74*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C4 PFOS	*78*		*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*
13C3-PFBS	*70*	*M*	*50 - 150*	*09/14/18 08:21*	*09/18/18 00:10*	*10*

Client Sample ID: TP-PFC-033-MID CARBON — Lab Sample ID: 320-42924-2

Date Collected: 09/06/18 09:15 — **Matrix: Water**
Date Received: 09/07/18 09:15

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)	**110**		1.7	0.49	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluoropentanoic acid (PFPeA)	**290**	**M**	1.7	0.36	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorohexanoic acid (PFHxA)	**270**		1.7	0.39	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluoroheptanoic acid (PFHpA)	**7.2**		1.7	0.51	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorooctanoic acid (PFOA)	**72**	**M**	1.7	0.45	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorononanoic acid (PFNA)	1.3	U M	1.7	0.43	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.40	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	0.60	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.43	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U M	3.3	0.63	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	0.69	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorobutanesulfonic acid (PFBS)	**13**	**M**	1.7	0.38	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorohexanesulfonic acid (PFHxS)	**5.1**	**M**	1.7	0.32	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.31	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorooctanesulfonic acid (PFOS)	2.5	U M	3.3	0.92	ng/L		09/14/18 08:21	09/16/18 15:39	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.47	ng/L		09/14/18 08:21	09/16/18 15:39	1

Client Sample ID: TP-PFC-033-MID CARBON — Lab Sample ID: 320-42924-2

Date Collected: 09/06/18 09:15 **Matrix: Water**
Date Received: 09/07/18 09:15

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)	2.5	U	3.3	1.1	ng/L		09/14/18 08:21	09/16/18 15:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*88*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C4 PFBA	*79*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C5 PFPeA	*87*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C2 PFHxA	*87*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C4-PFHpA	*94*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C4 PFOA	*93*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C5 PFNA	*87*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C2 PFDA	*94*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C2 PFUnA	*91*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C2 PFDoA	*83*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
18O2 PFHxS	*92*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C2-PFTeDA	*79*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C4 PFOS	*88*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*
13C3-PFBS	*86*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:39*	*1*

Client Sample ID: TP-PFC-033-TPE — Lab Sample ID: 320-42924-3

Date Collected: 09/06/18 09:20 **Matrix: Water**
Date Received: 09/07/18 09:15

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)	**120**		1.6	0.48	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluoropentanoic acid (PFPeA)	**260**		1.6	0.35	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorohexanoic acid (PFHxA)	**170**	**M**	1.6	0.38	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluoroheptanoic acid (PFHpA)	**1.2**	**J M**	1.6	0.50	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorooctanoic acid (PFOA)	**9.1**	**M**	1.6	0.44	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorononanoic acid (PFNA)	1.2	U M	1.6	0.43	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorodecanoic acid (PFDA)	0.82	U	1.6	0.39	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.6	0.59	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	0.43	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U M	3.3	0.62	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	0.68	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorobutanesulfonic acid (PFBS)	**4.8**		1.6	0.38	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorohexanesulfonic acid (PFHxS)	**0.66**	**J M**	1.6	0.31	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.82	U	1.6	0.30	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorooctanesulfonic acid (PFOS)	2.5	U M	3.3	0.90	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	0.46	ng/L		09/14/18 08:21	09/16/18 15:46	1
Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	1.1	ng/L		09/14/18 08:21	09/16/18 15:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*90*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C4 PFBA	*80*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C5 PFPeA	*90*	*M*	*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C2 PFHxA	*88*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C4-PFHpA	*94*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C4 PFOA	*91*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*

Client Sample ID: TP-PFC-033-TPE — Lab Sample ID: 320-42924-3

Date Collected: 09/06/18 09:20 **Matrix: Water**
Date Received: 09/07/18 09:15

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

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFNA	*91*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C2 PFDA	*96*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C2 PFUnA	*93*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C2 PFDoA	*83*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
18O2 PFHxS	*90*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C2-PFTeDA	*84*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C4 PFOS	*90*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*
13C3-PFBS	*88*	*M*	*50 - 150*	*09/14/18 08:21*	*09/16/18 15:46*	*1*

Client Sample ID: TP-PFC-033-TPE-D — Lab Sample ID: 320-42924-4

Date Collected: 09/06/18 00:00 **Matrix: Water**
Date Received: 09/07/18 09:15

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**		1.6	0.48	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluoropentanoic acid (PFPeA)	**280**		1.6	0.35	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorohexanoic acid (PFHxA)	**170**	**M**	1.6	0.38	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluoroheptanoic acid (PFHpA)	**1.4**	**J M**	1.6	0.50	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorooctanoic acid (PFOA)	**9.2**	**M**	1.6	0.44	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorononanoic acid (PFNA)	1.2	U M	1.6	0.42	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorodecanoic acid (PFDA)	0.81	U	1.6	0.39	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.6	0.59	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	0.42	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorotridecanoic Acid (PFTriA)	2.4	U M	3.3	0.62	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorotetradecanoic acid (PFTeA)	2.4	U	3.3	0.68	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorobutanesulfonic acid (PFBS)	**4.5**		1.6	0.37	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorohexanesulfonic acid (PFHxS)	**0.65**	**J M**	1.6	0.31	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.81	U	1.6	0.30	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorooctanesulfonic acid (PFOS)	2.4	U M	3.3	0.90	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	0.46	ng/L		09/14/18 08:21	09/16/18 15:54	1
Perfluorooctane Sulfonamide (FOSA)	2.4	U	3.3	1.1	ng/L		09/14/18 08:21	09/16/18 15:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*86*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C4 PFBA	*75*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C5 PFPeA	*83*	*M*	*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C2 PFHxA	*83*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C4-PFHpA	*87*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C4 PFOA	*88*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C5 PFNA	*87*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C2 PFDA	*92*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C2 PFUnA	*86*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C2 PFDoA	*84*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
18O2 PFHxS	*87*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C2-PFTeDA	*79*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C4 PFOS	*89*		*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*
13C3-PFBS	*89*	*M*	*50 - 150*	*09/14/18 08:21*	*09/16/18 15:54*	*1*

Default Detection Limits

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

TestAmerica Job ID: 320-42924-1

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: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-42924-1

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

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFOSA	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA
Lab Sample ID	Client Sample ID	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)
320-42924-1	TP-PFC-033-TPI	91	81	96 M	89	97	91	99	98
320-42924-1 - DL	TP-PFC-033-TPI	75	75	78	77	79	87	84	86
320-42924-2	TP-PFC-033-MID CARBON	88	79	87	87	94	93	87	94
320-42924-3	TP-PFC-033-TPE	90	80	90 M	88	94	91	91	96
320-42924-4	TP-PFC-033-TPE-D	86	75	83 M	83	87	88	87	92
LCS 320-245574/2-A	Lab Control Sample	79	84	90	92	91	92	92	98
LCSD 320-245574/3-A	Lab Control Sample Dup	84	79	87 M	87	93	96	93	90
MB 320-245574/1-A	Method Blank	88	84	87	87	94	96	89	86

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFUnA	PFDoA	PFHxS	PFTDA	PFOS	3C3-PFBS		
Lab Sample ID	Client Sample ID	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)		
320-42924-1	TP-PFC-033-TPI	96	92	97	90	93	95 M		
320-42924-1 - DL	TP-PFC-033-TPI	84	76	79	74	78	70 M		
320-42924-2	TP-PFC-033-MID CARBON	91	83	92	79	88	86		
320-42924-3	TP-PFC-033-TPE	93	83	90	84	90	88 M		
320-42924-4	TP-PFC-033-TPE-D	86	84	87	79	89	89 M		
LCS 320-245574/2-A	Lab Control Sample	91	87	91	80	92	91		
LCSD 320-245574/3-A	Lab Control Sample Dup	88	87	88	79	90	85 M		
MB 320-245574/1-A	Method Blank	90	87	97	79	88	86 M		

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 320-245574/1-A
Matrix: Water
Analysis Batch: 245887

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 245574

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		09/12/18 08:12	09/16/18 15:01	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.43	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorohexanoic acid (PFHxA)	1.0	U M	2.0	0.47	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	0.61	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorooctanoic acid (PFOA)	1.5	U M	2.0	0.54	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorononanoic acid (PFNA)	1.5	U M	2.0	0.52	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.48	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluoroundecanoic acid (PFUnA)	1.5	U M	2.0	0.72	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorododecanoic acid (PFDoA)	1.5	U M	2.0	0.52	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	0.76	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	0.83	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.46	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.38	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.37	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U M	4.0	1.1	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	0.56	ng/L		09/12/18 08:12	09/16/18 15:01	1
Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	1.3	ng/L		09/12/18 08:12	09/16/18 15:01	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*88*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C4 PFBA	*84*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C5 PFPeA	*87*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C2 PFHxA	*87*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C4-PFHpA	*94*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C4 PFOA	*96*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C5 PFNA	*89*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C2 PFDA	*86*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C2 PFUnA	*90*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C2 PFDoA	*87*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
18O2 PFHxS	*97*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C2-PFTeDA	*79*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C4 PFOS	*88*		*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*
13C3-PFBS	*86*	*M*	*50 - 150*	*09/12/18 08:12*	*09/16/18 15:01*	*1*

Lab Sample ID: LCS 320-245574/2-A
Matrix: Water
Analysis Batch: 245887

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 245574

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	41.0	M	ng/L		102	83 - 118
Perfluoropentanoic acid (PFPeA)	40.0	40.1		ng/L		100	83 - 108
Perfluorohexanoic acid (PFHxA)	40.0	38.4		ng/L		96	83 - 109
Perfluoroheptanoic acid (PFHpA)	40.0	44.5		ng/L		111	80 - 113
Perfluorooctanoic acid (PFOA)	40.0	39.4		ng/L		98	80 - 107
Perfluorononanoic acid (PFNA)	40.0	44.7		ng/L		112	83 - 113
Perfluorodecanoic acid (PFDA)	40.0	39.3		ng/L		98	85 - 113
Perfluoroundecanoic acid (PFUnA)	40.0	41.9		ng/L		105	76 - 105

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

Lab Sample ID: LCS 320-245574/2-A
Matrix: Water
Analysis Batch: 245887

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 245574

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	40.0	41.3		ng/L		103	87 - 116
Perfluorotridecanoic Acid (PFTriA)	40.0	36.0		ng/L		90	75 - 129
Perfluorotetradecanoic acid (PFTeA)	40.0	38.1		ng/L		95	82 - 115
Perfluorobutanesulfonic acid (PFBS)	35.4	35.6		ng/L		101	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.5		ng/L		98	81 - 106
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.1		ng/L		105	80 - 117
Perfluorooctanesulfonic acid (PFOS)	37.1	35.4		ng/L		95	82 - 112
Perfluorodecanesulfonic acid (PFDS)	38.6	40.8		ng/L		106	81 - 114
Perfluorooctane Sulfonamide (FOSA)	40.0	44.4		ng/L		111	85 - 114

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*79*		*50 - 150*
13C4 PFBA	*84*		*50 - 150*
13C5 PFPeA	*90*		*50 - 150*
13C2 PFHxA	*92*		*50 - 150*
13C4-PFHpA	*91*		*50 - 150*
13C4 PFOA	*92*		*50 - 150*
13C5 PFNA	*92*		*50 - 150*
13C2 PFDA	*98*		*50 - 150*
13C2 PFUnA	*91*		*50 - 150*
13C2 PFDoA	*87*		*50 - 150*
18O2 PFHxS	*91*		*50 - 150*
13C2-PFTeDA	*80*		*50 - 150*
13C4 PFOS	*92*		*50 - 150*
13C3-PFBS	*91*		*50 - 150*

Lab Sample ID: LCSD 320-245574/3-A
Matrix: Water
Analysis Batch: 245887

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 245574

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	39.3	M	ng/L		98	83 - 118	4	30
Perfluoropentanoic acid (PFPeA)	40.0	38.5	M	ng/L		96	83 - 108	4	30
Perfluorohexanoic acid (PFHxA)	40.0	38.1		ng/L		95	83 - 109	1	30
Perfluoroheptanoic acid (PFHpA)	40.0	40.8		ng/L		102	80 - 113	9	30
Perfluorooctanoic acid (PFOA)	40.0	37.9		ng/L		95	80 - 107	4	30
Perfluorononanoic acid (PFNA)	40.0	40.6		ng/L		102	83 - 113	10	30
Perfluorodecanoic acid (PFDA)	40.0	42.7		ng/L		107	85 - 113	8	30
Perfluoroundecanoic acid (PFUnA)	40.0	41.5		ng/L		104	76 - 105	1	30
Perfluorododecanoic acid (PFDoA)	40.0	40.3		ng/L		101	87 - 116	3	30

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

Lab Sample ID: LCSD 320-245574/3-A
Matrix: Water
Analysis Batch: 245887

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 245574

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic Acid (PFTriA)			40.0	36.9		ng/L		92	75 - 129	2	30
Perfluorotetradecanoic acid (PFTeA)			40.0	40.7		ng/L		102	82 - 115	7	30
Perfluorobutanesulfonic acid (PFBS)			35.4	35.1	M	ng/L		99	87 - 120	1	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	34.5		ng/L		95	81 - 106	3	30
Perfluoroheptanesulfonic Acid (PFHpS)			38.1	41.6		ng/L		109	80 - 117	4	30
Perfluorooctanesulfonic acid (PFOS)			37.1	36.7		ng/L		99	82 - 112	4	30
Perfluorodecanesulfonic acid (PFDS)			38.6	43.5		ng/L		113	81 - 114	6	30
Perfluorooctane Sulfonamide (FOSA)			40.0	40.5		ng/L		101	85 - 114	9	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*84*		*50 - 150*
13C4 PFBA	*79*		*50 - 150*
13C5 PFPeA	*87*	*M*	*50 - 150*
13C2 PFHxA	*87*		*50 - 150*
13C4-PFHpA	*93*		*50 - 150*
13C4 PFOA	*96*		*50 - 150*
13C5 PFNA	*93*		*50 - 150*
13C2 PFDA	*90*		*50 - 150*
13C2 PFUnA	*88*		*50 - 150*
13C2 PFDoA	*87*		*50 - 150*
18O2 PFHxS	*88*		*50 - 150*
13C2-PFTeDA	*79*		*50 - 150*
13C4 PFOS	*90*		*50 - 150*
13C3-PFBS	*85*	*M*	*50 - 150*

LCMS

Prep Batch: 245574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-42924-1	TP-PFC-033-TPI	Total/NA	Water	3535	
320-42924-1 - DL	TP-PFC-033-TPI	Total/NA	Water	3535	
320-42924-2	TP-PFC-033-MID CARBON	Total/NA	Water	3535	
320-42924-3	TP-PFC-033-TPE	Total/NA	Water	3535	
320-42924-4	TP-PFC-033-TPE-D	Total/NA	Water	3535	
MB 320-245574/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-245574/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-245574/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 245887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-42924-1	TP-PFC-033-TPI	Total/NA	Water	EPA 537 (Mod)	245574
320-42924-2	TP-PFC-033-MID CARBON	Total/NA	Water	EPA 537 (Mod)	245574
320-42924-3	TP-PFC-033-TPE	Total/NA	Water	EPA 537 (Mod)	245574
320-42924-4	TP-PFC-033-TPE-D	Total/NA	Water	EPA 537 (Mod)	245574
MB 320-245574/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	245574
LCS 320-245574/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	245574
LCSD 320-245574/3-A	Lab Control Sample Dup	Total/NA	Water	EPA 537 (Mod)	245574

Analysis Batch: 246405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-42924-1 - DL	TP-PFC-033-TPI	Total/NA	Water	EPA 537 (Mod)	245574

Lab Chronicle

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

TestAmerica Job ID: 320-42924-1

Client Sample ID: TP-PFC-033-TPI
Lab Sample ID: 320-42924-1
Date Collected: 09/06/18 09:10
Matrix: Water
Date Received: 09/07/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			245574	09/14/18 08:21	MNV	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	245887	09/16/18 15:31	S1M	TAL SAC
Total/NA	Prep	3535	DL		245574	09/14/18 08:21	MNV	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	246405	09/18/18 00:10	S1M	TAL SAC

Client Sample ID: TP-PFC-033-MID CARBON
Lab Sample ID: 320-42924-2
Date Collected: 09/06/18 09:15
Matrix: Water
Date Received: 09/07/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			245574	09/14/18 08:21	MNV	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	245887	09/16/18 15:39	S1M	TAL SAC

Client Sample ID: TP-PFC-033-TPE
Lab Sample ID: 320-42924-3
Date Collected: 09/06/18 09:20
Matrix: Water
Date Received: 09/07/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			245574	09/14/18 08:21	MNV	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	245887	09/16/18 15:46	S1M	TAL SAC

Client Sample ID: TP-PFC-033-TPE-D
Lab Sample ID: 320-42924-4
Date Collected: 09/06/18 00:00
Matrix: Water
Date Received: 09/07/18 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			245574	09/14/18 08:21	MNV	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	245887	09/16/18 15:54	S1M	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: 320-42924-1
Project/Site: TT: PFAS, Brunswick, Discharge

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: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-42924-1

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: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-42924-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-42924-1	TP-PFC-033-TPI	Water	09/06/18 09:10	09/07/18 09:15
320-42924-2	TP-PFC-033-MID CARBON	Water	09/06/18 09:15	09/07/18 09:15
320-42924-3	TP-PFC-033-TPE	Water	09/06/18 09:20	09/07/18 09:15
320-42924-4	TP-PFC-033-TPE-D	Water	09/06/18 00:00	09/07/18 09:15

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 242499

Lab Sample ID: IC 320-242499/2 Client Sample ID:

Date Analyzed: 08/28/18 10:20 Lab File ID: 2018.08.28LLICALA_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	2.05	Baseline	roycea	08/28/18 10:55
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.83	Isomers	roycea	08/28/18 10:55
Perfluorododecanoic acid (PFDoA)	4.13	Baseline	roycea	08/28/18 10:56

Lab Sample ID: IC 320-242499/3 Client Sample ID:

Date Analyzed: 08/28/18 10:28 Lab File ID: 2018.08.28LLICALA_006.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Baseline	roycea	08/28/18 11:55
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.83	Baseline	roycea	08/28/18 10:58

Lab Sample ID: ICB 320-242499/9 Client Sample ID:

Date Analyzed: 08/28/18 11:13 Lab File ID: 2018.08.28LLICALA_012.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)		Invalid Compound ID	roycea	08/28/18 12:21

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 245884

Lab Sample ID: CCB 320-245884/2 Client Sample ID:

Date Analyzed: 09/16/18 13:53 Lab File ID: 2018.09.16_LLA_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	2.08	Wrong peak	mongkols	09/17/18 10:33
Perfluorohexanesulfonic acid (PFHxS)	2.44	Baseline	mongkols	09/17/18 10:33
Perfluorononanoic acid (PFNA)	3.15	Baseline	mongkols	09/17/18 10:34
Perfluorooctanesulfonic acid (PFOS)	3.19	Baseline	mongkols	09/17/18 10:33
Perfluorotetradecanoic acid (PFTeA)	4.71	Baseline	mongkols	09/17/18 10:34
Perfluorobutanoic acid (PFBA)		Invalid Compound ID	mongkols	09/17/18 10:33

Lab Sample ID: CCVL 320-245884/3 Client Sample ID:

Date Analyzed: 09/16/18 14:01 Lab File ID: 2018.09.16_LLA_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.50	Baseline	mongkols	09/17/18 10:36
Perfluorohexanoic acid (PFHxA)	2.08	Baseline	mongkols	09/17/18 10:36
Perfluorohexanesulfonic acid (PFHxS)	2.44	Baseline	mongkols	09/17/18 10:36
Perfluorooctanesulfonic acid (PFOS)	3.18	Baseline	mongkols	09/17/18 10:36
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.87	Baseline	mongkols	09/17/18 10:36
Perfluorotridecanoic Acid (PFTriA)	4.45	Baseline	mongkols	09/17/18 10:37

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 245887

Lab Sample ID: MB 320-245574/1-A Client Sample ID:

Date Analyzed: 09/16/18 15:01 Lab File ID: 2018.09.16_LLA_013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.81	Incomplete Integration	mongkols	09/17/18 15:54
Perfluorohexanoic acid (PFHxA)	2.06	Baseline	mongkols	09/17/18 15:54
Perfluorooctanoic acid (PFOA)	2.77	Baseline	mongkols	09/17/18 15:55
Perfluorononanoic acid (PFNA)	3.15	Baseline	mongkols	09/17/18 15:55
Perfluorooctanesulfonic acid (PFOS)	3.15	Baseline	mongkols	09/17/18 15:55
Perfluoroundecanoic acid (PFUnA)	3.84	Wrong peak	mongkols	09/17/18 15:56
Perfluorododecanoic acid (PFDoA)	4.12	Baseline	mongkols	09/17/18 15:56

Lab Sample ID: LCS 320-245574/2-A Client Sample ID:

Date Analyzed: 09/16/18 15:08 Lab File ID: 2018.09.16_LLA_014.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.49	Baseline	mongkols	09/17/18 15:57

Lab Sample ID: LCSD 320-245574/3-A Client Sample ID:

Date Analyzed: 09/16/18 15:16 Lab File ID: 2018.09.16_LLA_015.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.49	Incomplete Integration	mongkols	09/17/18 15:58
13C5 PFPeA	1.77	Incomplete Integration	mongkols	09/17/18 15:58
Perfluoropentanoic acid (PFPeA)	1.77	Incomplete Integration	mongkols	09/17/18 15:58
13C3-PFBS	1.81	Incomplete Integration	mongkols	09/17/18 15:58
Perfluorobutanesulfonic acid (PFBS)	1.81	Incomplete Integration	mongkols	09/17/18 15:58

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 245887

Lab Sample ID: 320-42924-1 Client Sample ID: TP-PFC-033-TPI

Date Analyzed: 09/16/18 15:31 Lab File ID: 2018.09.16_LLA_017.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.49	Baseline	mongkols	09/17/18 16:00
13C5 PFPeA	1.77	Incomplete Integration	mongkols	09/17/18 16:00
Perfluoropentanoic acid (PFPeA)	1.77	Baseline	mongkols	09/17/18 16:01
13C3-PFBS	1.81	Incomplete Integration	mongkols	09/17/18 16:00
Perfluorobutanesulfonic acid (PFBS)	1.81	Baseline	mongkols	09/17/18 16:01
Perfluoroheptanesulfonic Acid (PFHpS)	2.76	Split Peak	mongkols	09/17/18 16:01
Perfluorononanoic acid (PFNA)	3.13	Split Peak	mongkols	09/17/18 16:01
Perfluoroundecanoic acid (PFUnA)	3.82	Split Peak	mongkols	09/17/18 16:02

Lab Sample ID: 320-42924-2 Client Sample ID: TP-PFC-033-MID CARBON

Date Analyzed: 09/16/18 15:39 Lab File ID: 2018.09.16_LLA_018.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.77	Baseline	mongkols	09/17/18 16:02
Perfluorobutanesulfonic acid (PFBS)	1.81	Baseline	mongkols	09/17/18 16:02
Perfluorohexanesulfonic acid (PFHxS)	2.35	Baseline	mongkols	09/17/18 16:02
Perfluorooctanoic acid (PFOA)	2.75	Baseline	mongkols	09/17/18 16:02
Perfluorooctanesulfonic acid (PFOS)	3.01	Baseline	mongkols	09/17/18 16:03
Perfluorononanoic acid (PFNA)	3.13	Split Peak	mongkols	09/17/18 16:03
Perfluoroundecanoic acid (PFUnA)	3.84	Split Peak	mongkols	09/17/18 16:03
Perfluorotridecanoic Acid (PFTriA)	4.40	Split Peak	mongkols	09/17/18 16:03

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 245887

Lab Sample ID: 320-42924-3 Client Sample ID: TP-PFC-033-TPE

Date Analyzed: 09/16/18 15:46 Lab File ID: 2018.09.16_LLA_019.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C5 PFPeA	1.76	Incomplete Integration	mongkols	09/17/18 16:05
13C3-PFBS	1.81	Incomplete Integration	mongkols	09/17/18 16:05
Perfluorohexanoic acid (PFHxA)	2.06	Split Peak	mongkols	09/17/18 16:06
Perfluorohexanesulfonic acid (PFHxS)	2.35	Baseline	mongkols	09/17/18 16:06
Perfluoroheptanoic acid (PFHpA)	2.37	Split Peak	mongkols	09/17/18 16:06
Perfluorooctanoic acid (PFOA)	2.67	Baseline	mongkols	09/17/18 16:07
Perfluorooctanesulfonic acid (PFOS)	3.14	Baseline	mongkols	09/17/18 16:07
Perfluorononanoic acid (PFNA)	3.17	Baseline	mongkols	09/17/18 16:07
Perfluoroundecanoic acid (PFUnA)	3.82	Baseline	mongkols	09/17/18 16:07
Perfluorotridecanoic Acid (PFTriA)	4.39	Baseline	mongkols	09/17/18 16:07

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 245887

Lab Sample ID: 320-42924-4 Client Sample ID: TP-PFC-033-TPE-D

Date Analyzed: 09/16/18 15:54 Lab File ID: 2018.09.16_LLA_020.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C5 PFPeA	1.76	Incomplete Integration	mongkols	09/17/18 16:09
13C3-PFBS	1.81	Incomplete Integration	mongkols	09/17/18 16:09
Perfluorohexanoic acid (PFHxA)	2.05	Incomplete Integration	mongkols	09/17/18 16:09
Perfluoroheptanoic acid (PFHpA)	2.36	Split Peak	mongkols	09/17/18 16:10
Perfluorohexanesulfonic acid (PFHxS)	2.40	Baseline	mongkols	09/17/18 16:10
Perfluorooctanoic acid (PFOA)	2.66	Baseline	mongkols	09/17/18 16:10
Perfluorooctanesulfonic acid (PFOS)	3.14	Baseline	mongkols	09/17/18 16:10
Perfluoroundecanoic acid (PFUnA)	3.82	Baseline	mongkols	09/17/18 16:10
Perfluorononanoic acid (PFNA)		Invalid Compound ID	mongkols	09/17/18 16:10
Perfluorotridecanoic Acid (PFTriA)		Invalid Compound ID	mongkols	09/17/18 16:11

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 246099

Lab Sample ID: CCB 320-246099/2 Client Sample ID:

Date Analyzed: 09/17/18 18:09 Lab File ID: 2018.09.17_LLB_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.40	Baseline	mongkols	09/18/18 15:00
Perfluorooctanoic acid (PFOA)	2.73	Baseline	mongkols	09/18/18 15:00
Perfluorooctanesulfonic acid (PFOS)	3.12	Baseline	mongkols	09/18/18 15:00
Perfluorodecanoic acid (PFDA)	3.47	Baseline	mongkols	09/18/18 15:01
Perfluorooctane Sulfonamide (FOSA)	3.48	Baseline	mongkols	09/18/18 15:00
Perfluoroundecanoic acid (PFUnA)	3.79	Baseline	mongkols	09/18/18 15:01
Perfluorobutanoic acid (PFBA)		Invalid Compound ID	mongkols	09/18/18 15:00
Perfluoropentanoic acid (PFPeA)		Invalid Compound ID	mongkols	09/18/18 15:00

Lab Sample ID: CCVL 320-246099/3 Client Sample ID:

Date Analyzed: 09/17/18 18:17 Lab File ID: 2018.09.17_LLB_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
6:2 FTS	2.70	Baseline	mongkols	09/18/18 15:02
Perfluorooctanesulfonic acid (PFOS)	3.10	Baseline	mongkols	09/18/18 15:02

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 246405

Lab Sample ID: 320-42924-1 DL Client Sample ID: TP-PFC-033-TPI DL

Date Analyzed: 09/18/18 00:10 Lab File ID: 2018.09.17_LLB_052.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.48	Baseline	mongkols	09/20/18 09:01
13C3-PFBS	1.80	Incomplete Integration	mongkols	09/20/18 09:01
Perfluoroheptanesulfonic Acid (PFHpS)	2.73	Split Peak	mongkols	09/20/18 09:01
Perfluorononanoic acid (PFNA)	3.10	Split Peak	mongkols	09/20/18 09:02

Lab Sample ID: CCV 320-246405/4 Client Sample ID:

Date Analyzed: 09/18/18 00:25 Lab File ID: 2018.09.17_LLB_054.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.48	Incomplete Integration	mongkols	09/20/18 09:06

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00103	02/28/19	08/28/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM3HFPO-DA_00004	200 uL	13C3 HFPO-DA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM3HFPO-DA_00004	05/18/21	WELLINGTON, Lot M3HFPODA0518			(Purchased Reagent)		13C3 HFPO-DA	50 ug/mL
.LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-IS_00082	02/20/19	08/28/18	Methanol, Lot Fisher 168632	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_00008	01/25/19	07/25/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ICALSU_00001	10 mL	13C2-PFOA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_00008	01/25/19	07/25/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ICALSU_00001	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_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL1_00010	01/16/19	07/25/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ICALSU_00001	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_00174	0.25 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.02335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0237 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (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
							Perfluorodecanoic acid (PFDA)	0.025 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
							Perfluorooctanoic acid (PFOA)	0.025025 ng/mL
							Perfluorononanesulfonic acid	0.024 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_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00174	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 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
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 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
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(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_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(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_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL2_00009	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	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_00174	0.5 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.0467 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0474 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (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
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05005 ng/mL
							Perfluorononanesulfonic acid	0.048 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_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00174	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 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
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 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
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(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_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(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_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(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_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL3_00009	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	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

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00174	2.5 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.2335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.237 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (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
							Perfluorooctanoic acid (PFOA)	0.25025 ng/mL
							Perfluorononanesulfonic acid	0.24 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.25 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.25 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00174	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 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
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23		WELLINGTON, Lot brNEtFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(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_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(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_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(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_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL4_00009	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	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

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00174	10 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.934 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.948 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (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
							Perfluorooctanoic acid (PFOA)	1.001 ng/mL
							Perfluorononanesulfonic acid	0.96 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
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00174	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 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
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 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
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(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_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(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_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(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_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL5_00009	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	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_00174	25 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	2.335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	2.37 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1H,1H,2H,2H-perfluorodecanesulfonic acid (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
							Perfluorooctanoic acid (PFOA)	2.5025 ng/mL
							Perfluorononanesulfonic acid	2.4 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_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00174	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 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
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 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
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(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_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(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_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(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_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL6_00010	01/16/19	07/25/18	MeOH/H2O, Lot 090285	30 mL	LCMPFC_ICALSU_00001	1.5 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_00174	7.5 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	4.67 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	4.74 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (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

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
							Perfluorooctanoic acid (PFOA)	5.005 ng/mL
							Perfluorononanesulfonic acid	4.8 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_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00174	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 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
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 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
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(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_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(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_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL7_00009	01/16/19	07/25/18	MeOH/H2O, Lot 090285	30 mL	LCMPFC_ICALSU_00001	1.5 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_00174	15 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	9.34 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	9.48 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10.01 ng/mL
							Perfluorononanesulfonic acid	9.6 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_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00174	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 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
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 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
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(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_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(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_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(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_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFCIC_FULL_00016	01/25/19	07/31/18	MeOH/H2O, Lot 09285	100 mL	LCMPFC_ICALSU_00001	5 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFCIC_FULL_00016	01/25/19	07/31/18	MeOH/H2O, Lot 09285	100 mL	LCMPFC_ICALSU_00001	5 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00002	125 uL	Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.4125 ng/mL
							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_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23	Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFAC-24PAR_00002	04/18/23	Wellington Laboratories, Lot PFAC24PAR0418			(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

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	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_00181	02/11/19	08/11/18	Methanol, Lot 090285	250 mL	LC10:2FTS_00001	100 uL	1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2)	0.01928 ug/mL
					LC11ClPF3OUdS_00002	100 uL	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	0.01884 ug/mL
					LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LC9Cl-PF3ONS_00002	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_00006	100 uL	DONA	0.01884 ug/mL
					LCHFPO-DA_00002	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDoS_00004	100 uL	Perfluorododecanesulfonic acid (PFDoS)	0.01936 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00010	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFODA_00010	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.LC10:2FTS_00001	11/18/19	WELLINGTON, Lot 102FTS1116			(Purchased Reagent)		1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2)	48.2 ug/mL
.LC11CIPF3OUdS_00002	09/30/21	Wellington Labs, Lot 11CIPF3OUdS0916			(Purchased Reagent)		11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	47.1 ug/mL
.LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
.LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
.LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
.LC9CI-PF3ONS_00002	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_00006	03/26/23	WELLINGTON, Lot NADONA0318			(Purchased Reagent)		DONA	47.1 ug/mL
.LCHFPO-DA_00002	03/26/21	WELLINGTON, Lot HFPODA0318			(Purchased Reagent)		Perfluoro(2-propoxypropanoic) acid	50 ug/mL
.LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDoS_00004	09/30/21	Wellington Laboratories, Lot LPFDoS0916			(Purchased Reagent)		Perfluorododecanesulfonic acid (PFDoS)	48.4 ug/mL
.LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(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_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA_00010	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
.LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
.LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00010	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(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_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
.LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC10:2FTS_00001

1307747
ID: LC10:2FTS_00001
Exp:11/18/19 Prpd:CBW Opn:07/19/18
6:2FTS

R: 7/19/18 CBW

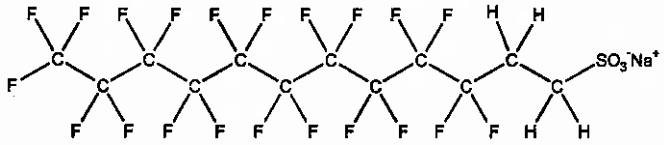
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 10:2FTS **LOT NUMBER:** 102FTS1116

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{12}H_4F_{21}SO_3Na$		**MOLECULAR WEIGHT:**	650.18
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	48.2 ± 2.4 µg/ml	(10:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	11/18/2016			
EXPIRY DATE: (mm/dd/yyyy)	11/18/2019			
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:** 12/07/2016 (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:

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

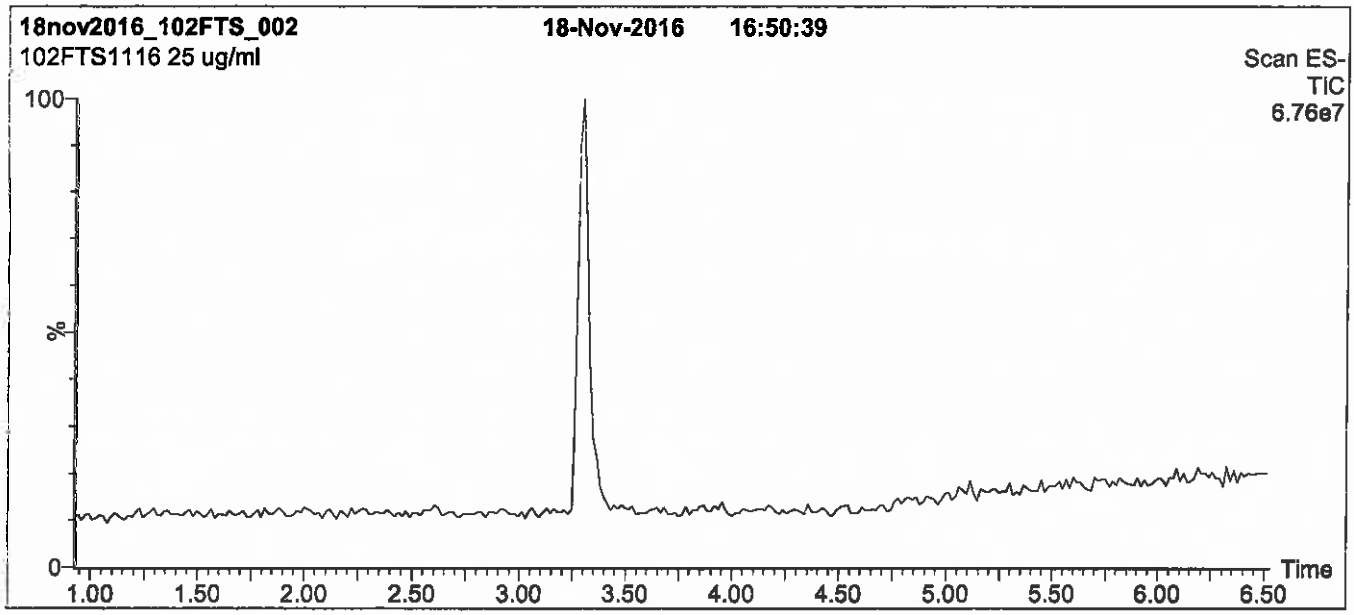
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

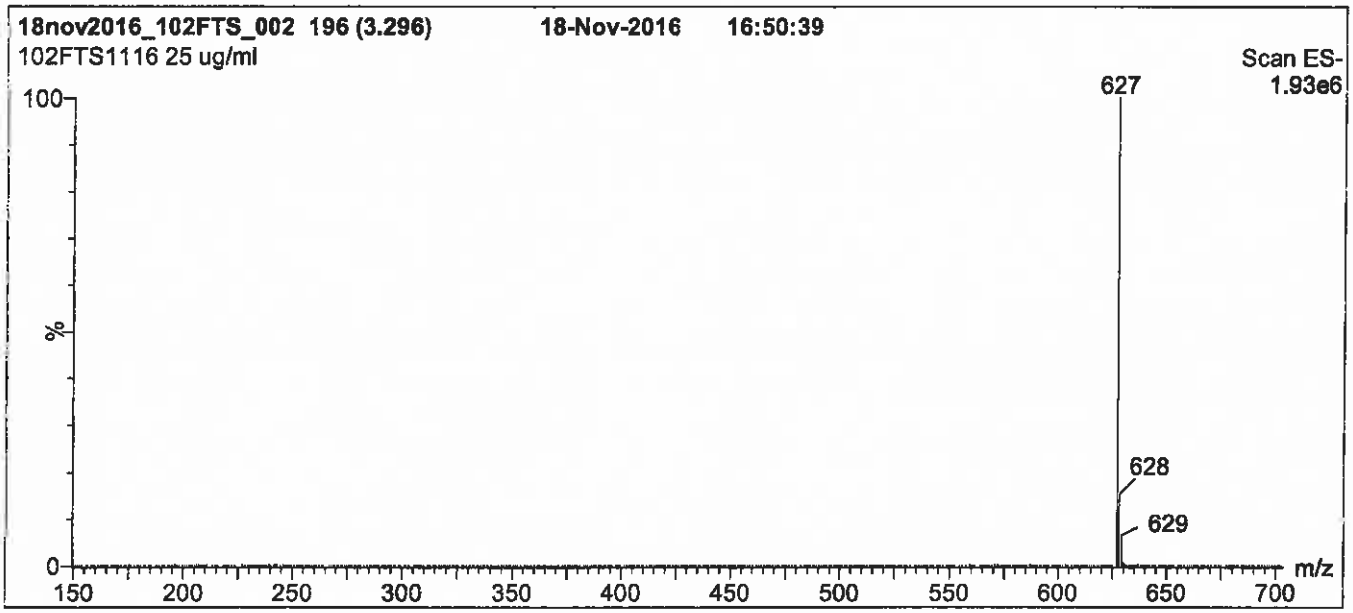
CALA

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: **10:2FTS; 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: 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

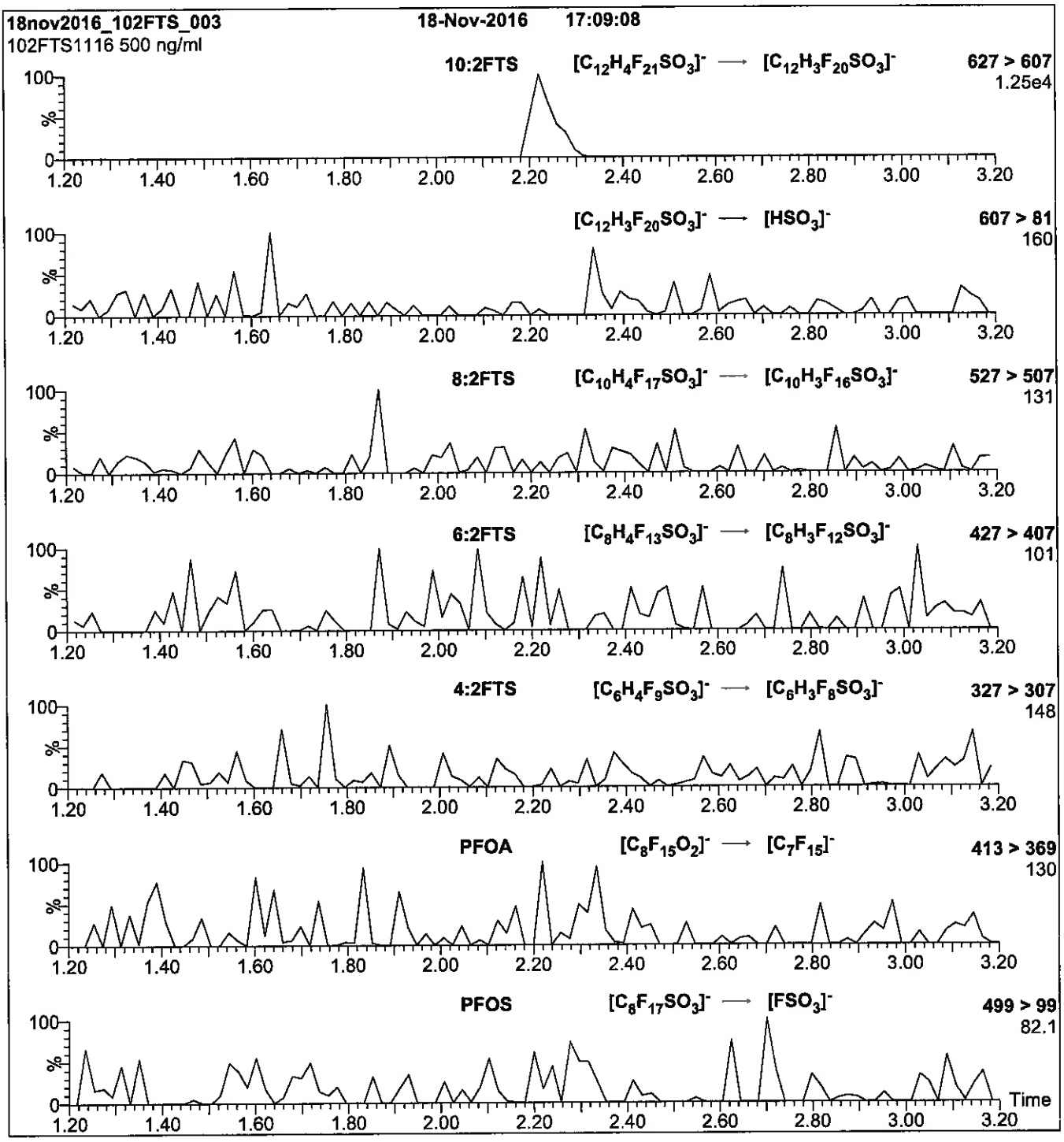
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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: **10:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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) = 25

Reagent

LC11CIPF3OUdS_00002

h: 4/16/18 SKJ

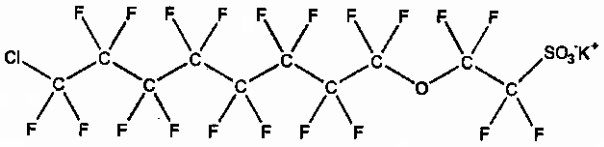
WELLINGTON LABORATORIES

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:

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SYNTHESIS / CHARACTERIZATION:

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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:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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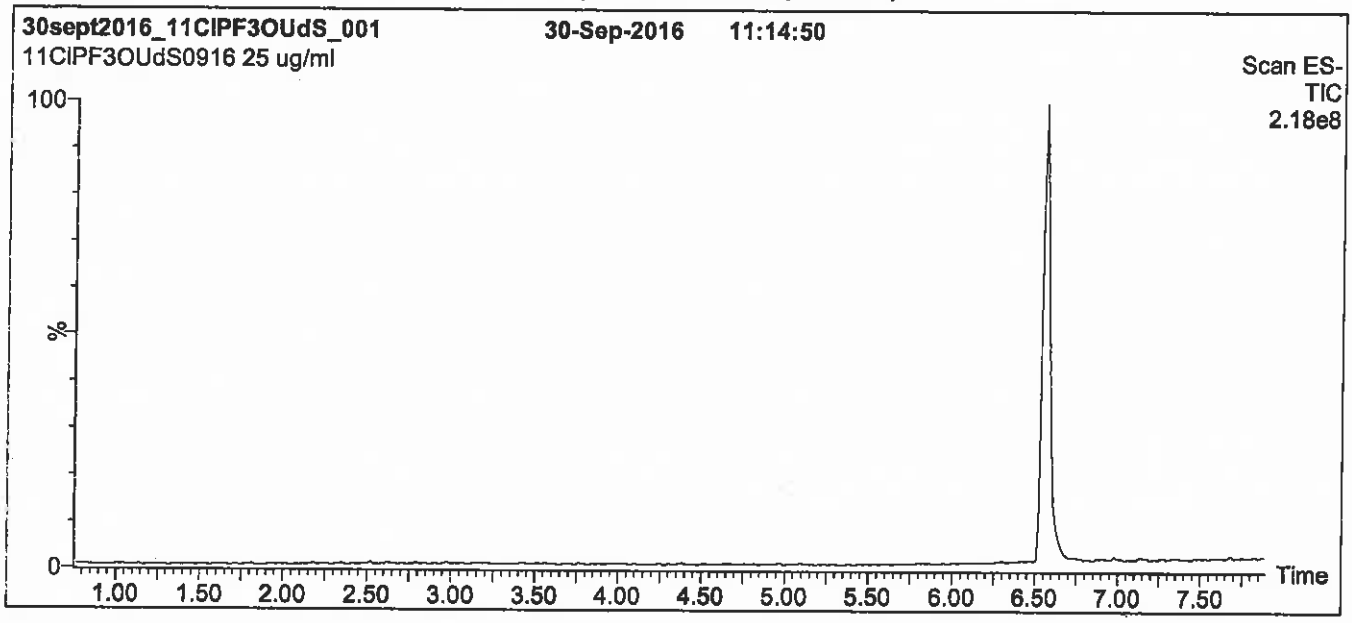
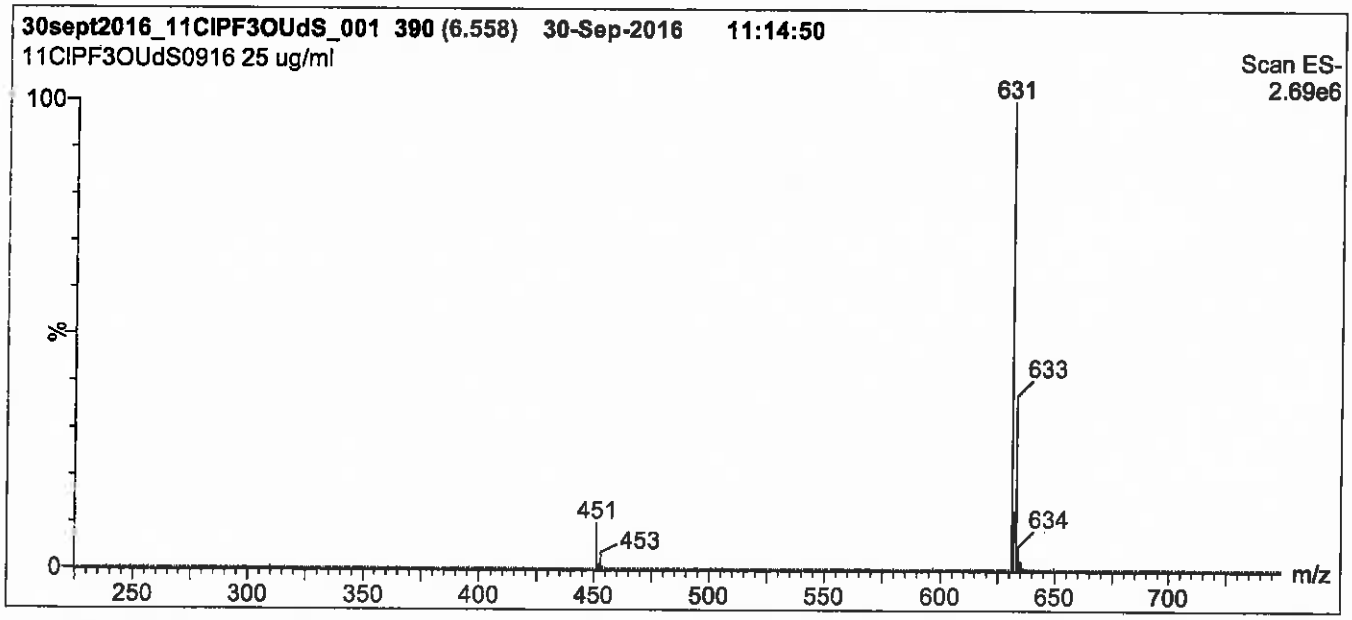
Figure 1: **11Cl-PF3OUdS; LC/MS Data (TIC and Mass Spectrum)**





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

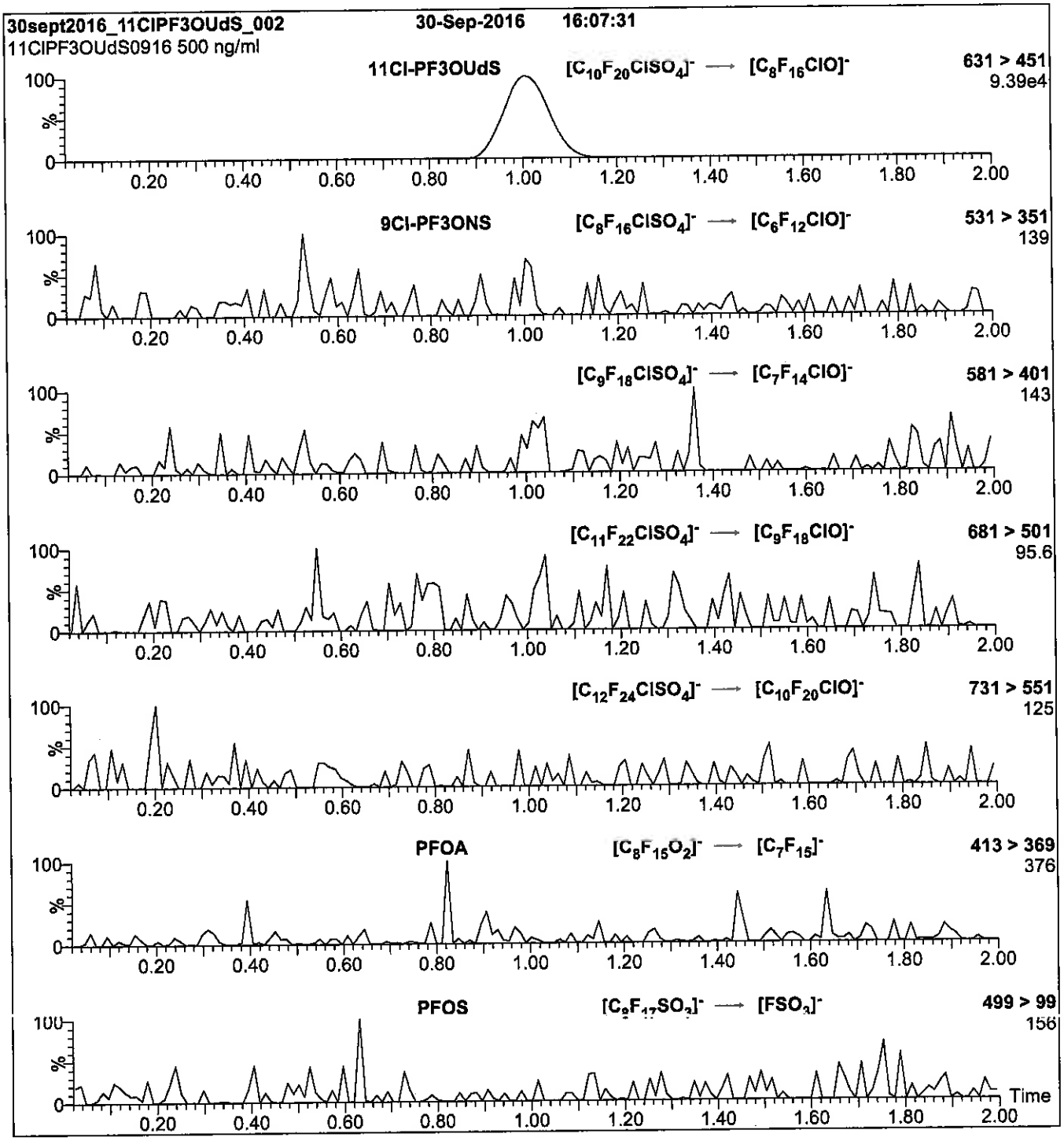
Flow: 300 µl/min

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_00005

r: 9/21/17 SKV

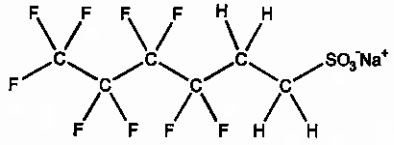
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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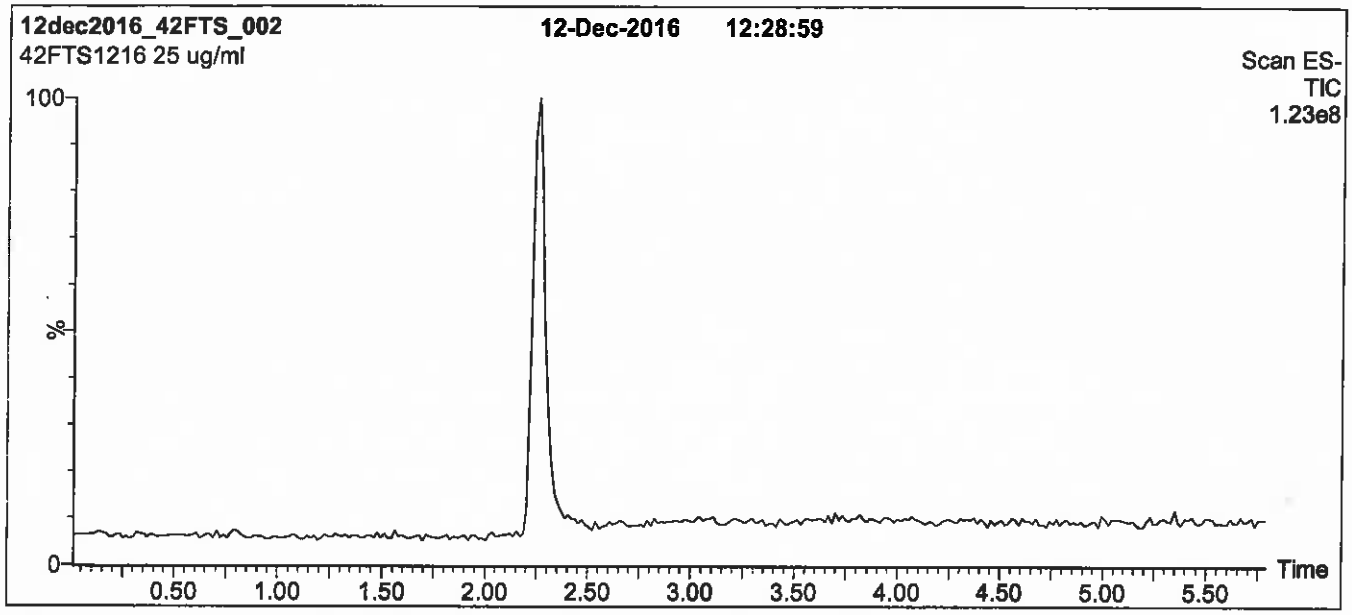
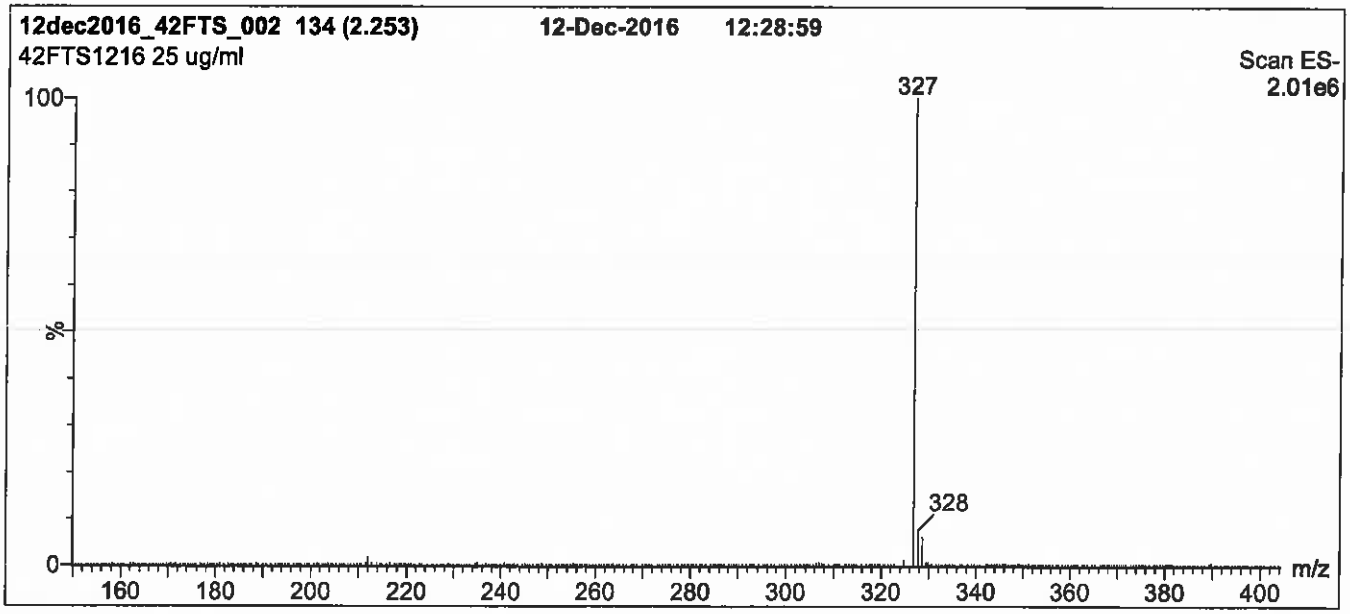
Figure 1: **4:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

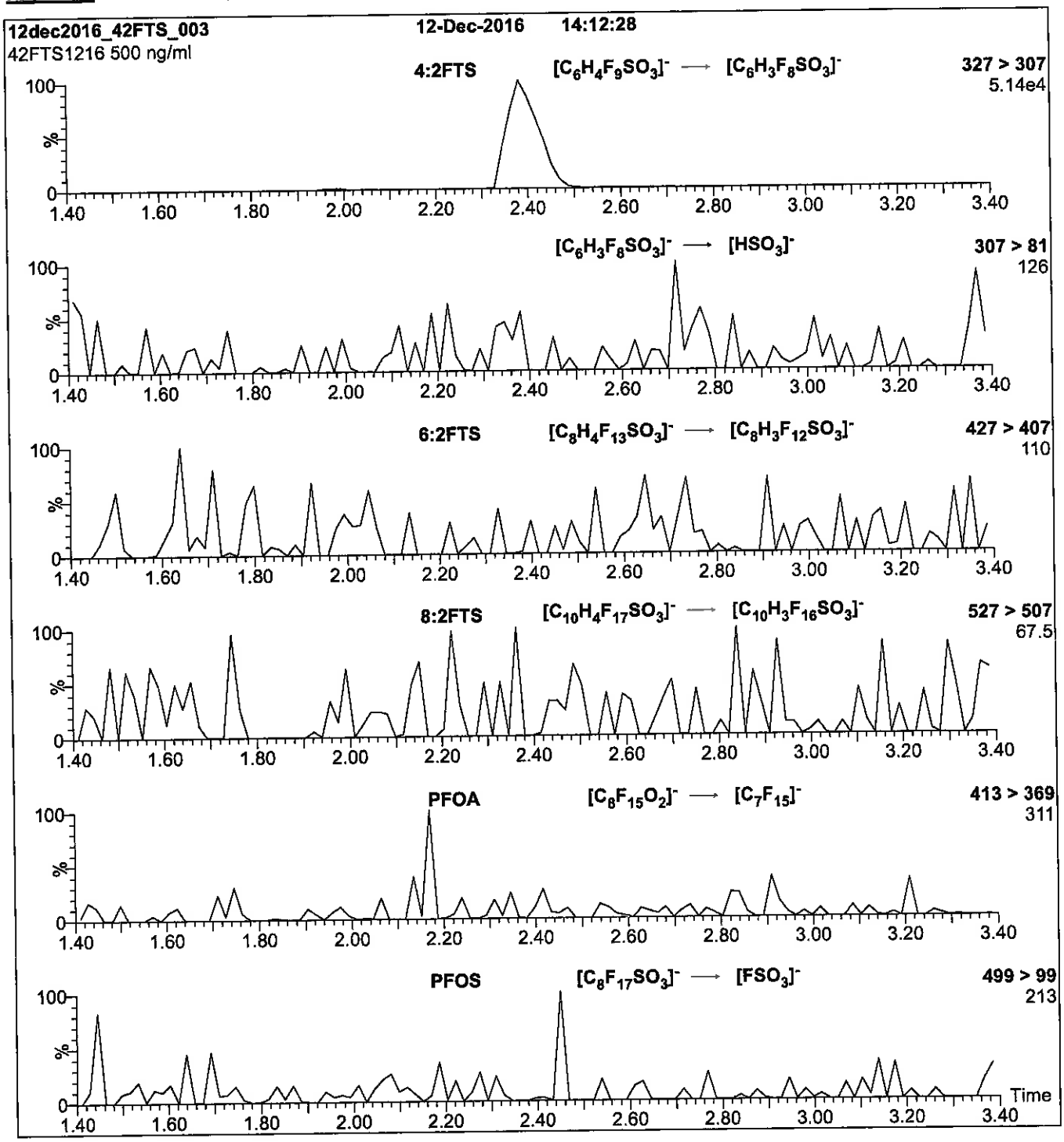
Flow: 300 µl/min

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_00007

r: 9/21/17 SRV

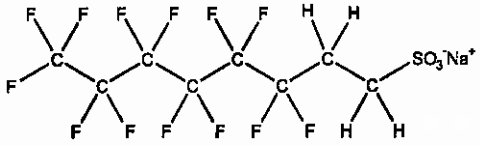
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS0417

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)	04/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/20/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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:

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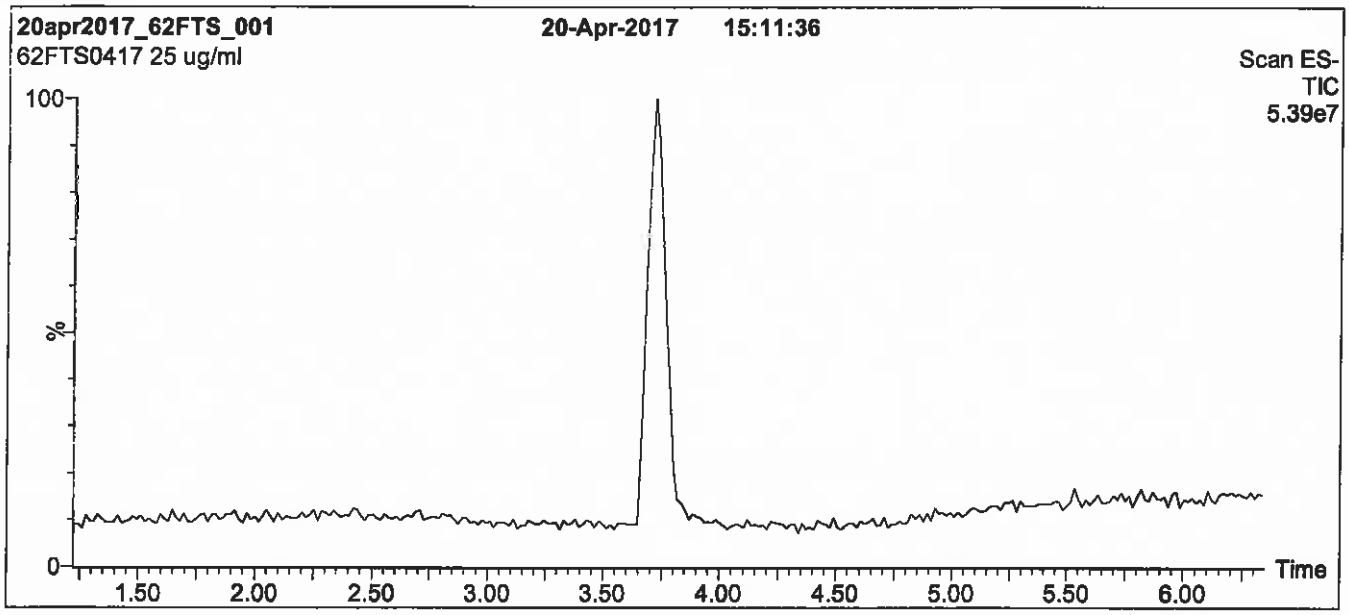
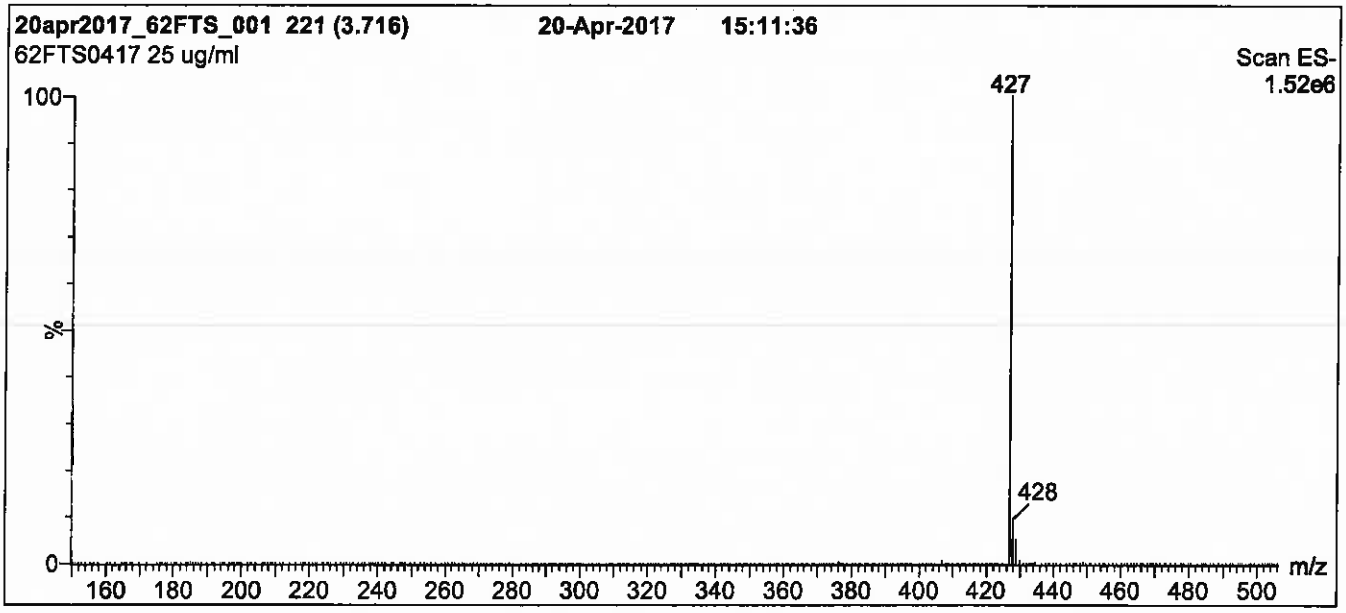
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

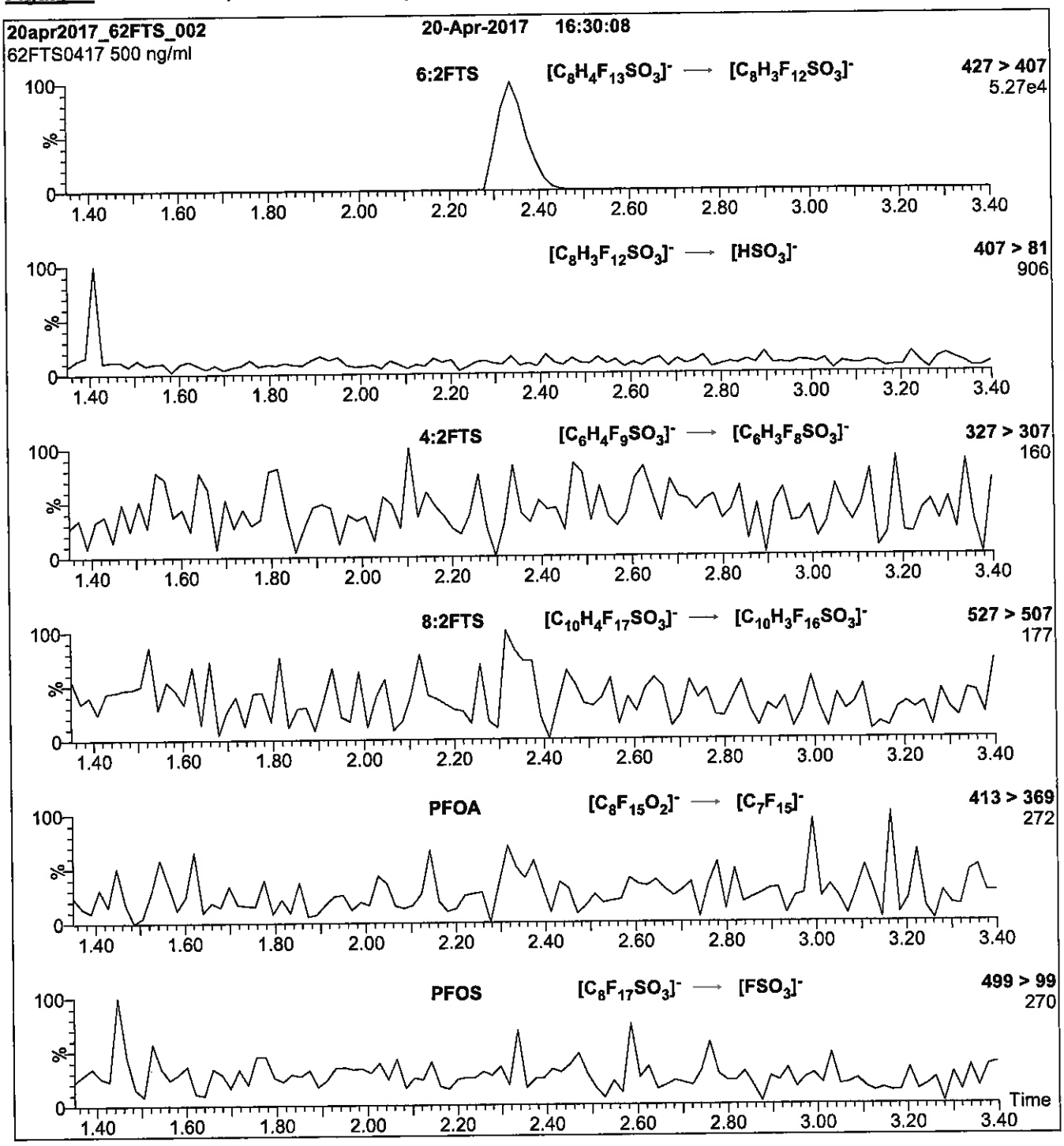
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.35e-3
Collision Energy (eV) = 25

Reagent

LC8:2FTS_00007

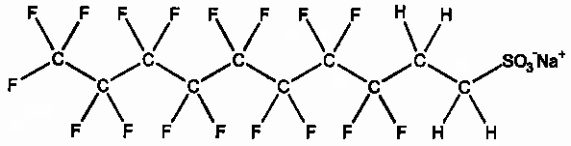
n: 9/21/17-SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS1216
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)	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:

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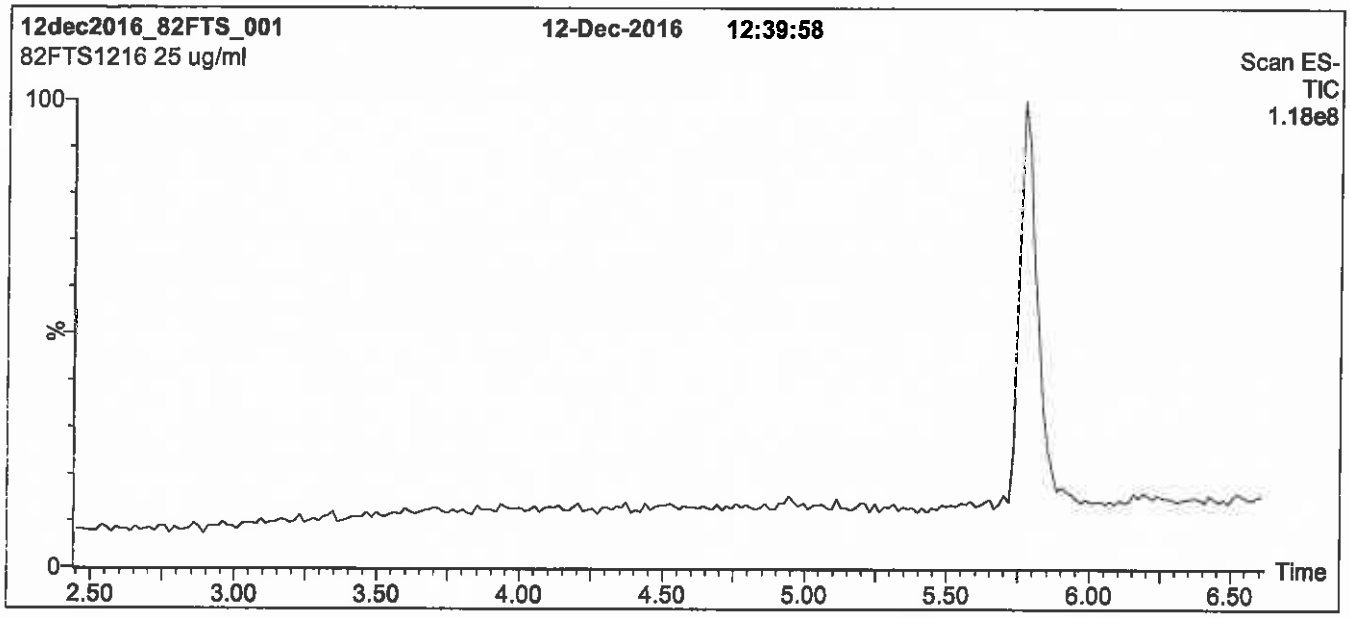
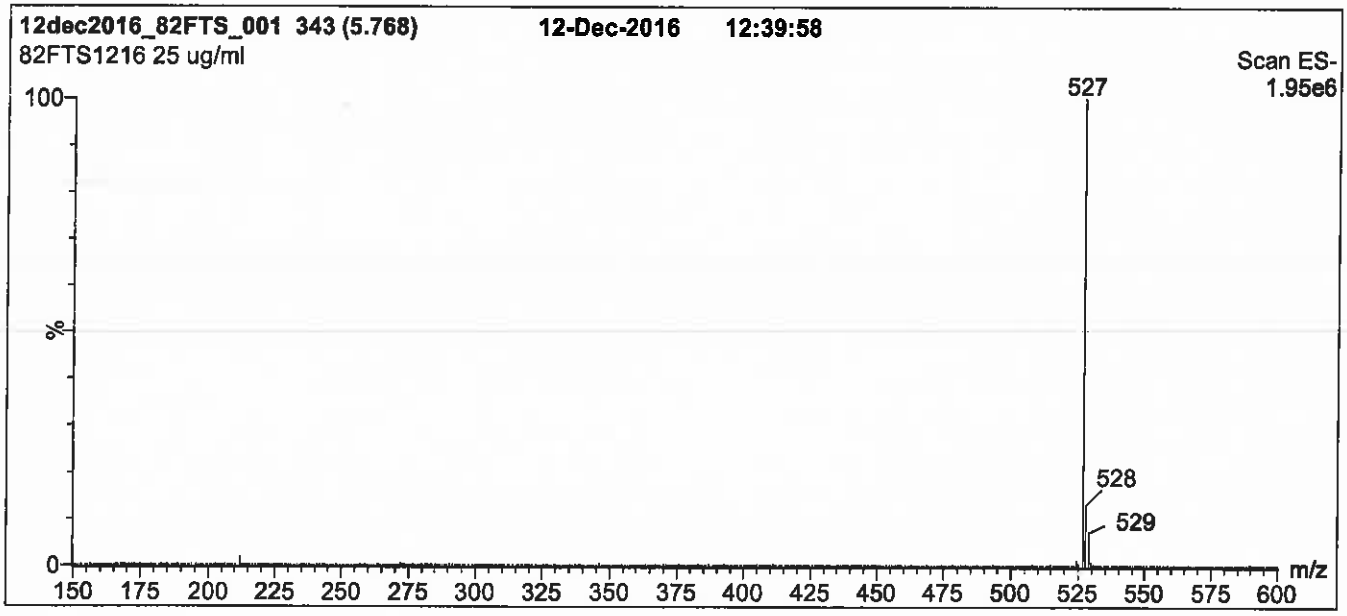
Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

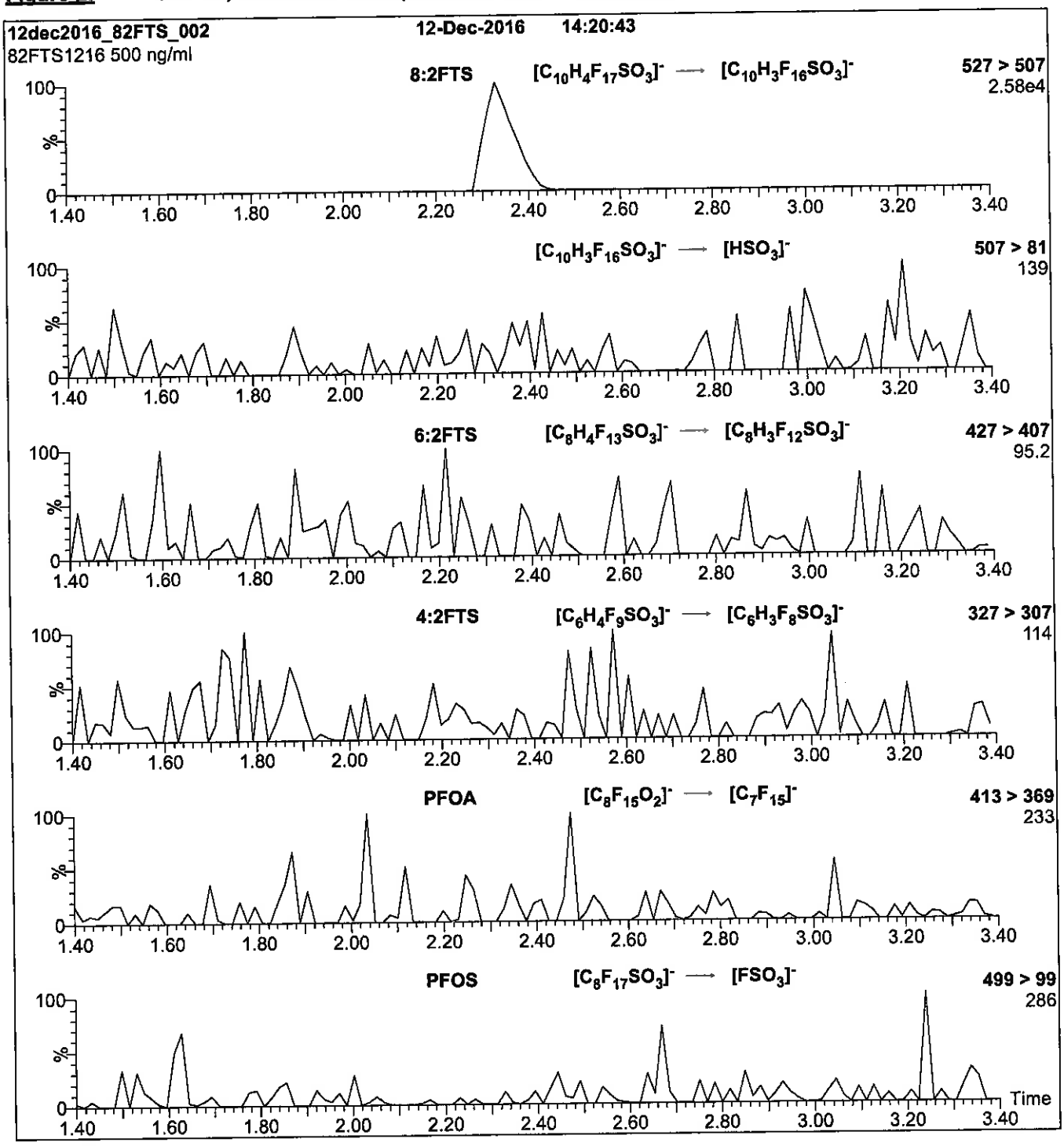
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.28e-3
Collision Energy (eV) = 30

Reagent

LC9CI-PF3ONS_00002

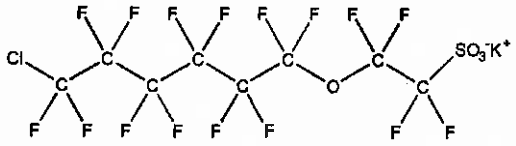
P: 4/25/18 SKV

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: $C_8F_{15}ClSO_4K$
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.

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:

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

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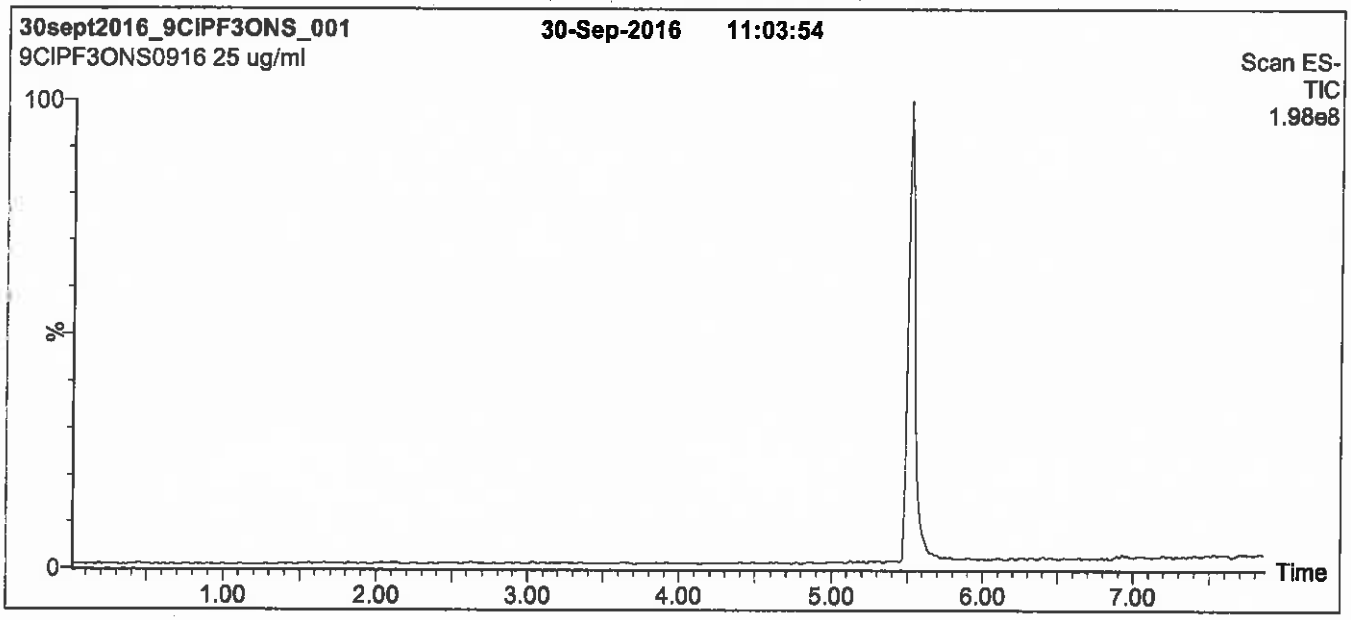
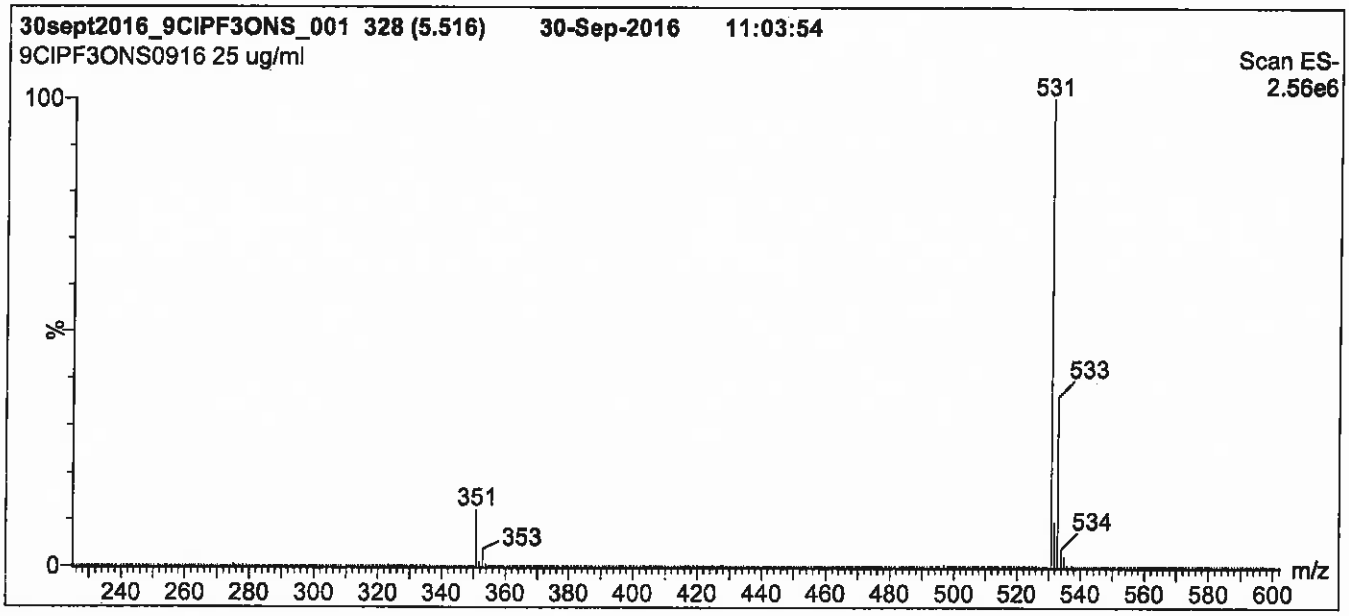
Figure 1: **9Cl-PF3ONS; LC/MS Data (TIC and Mass Spectrum)**





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

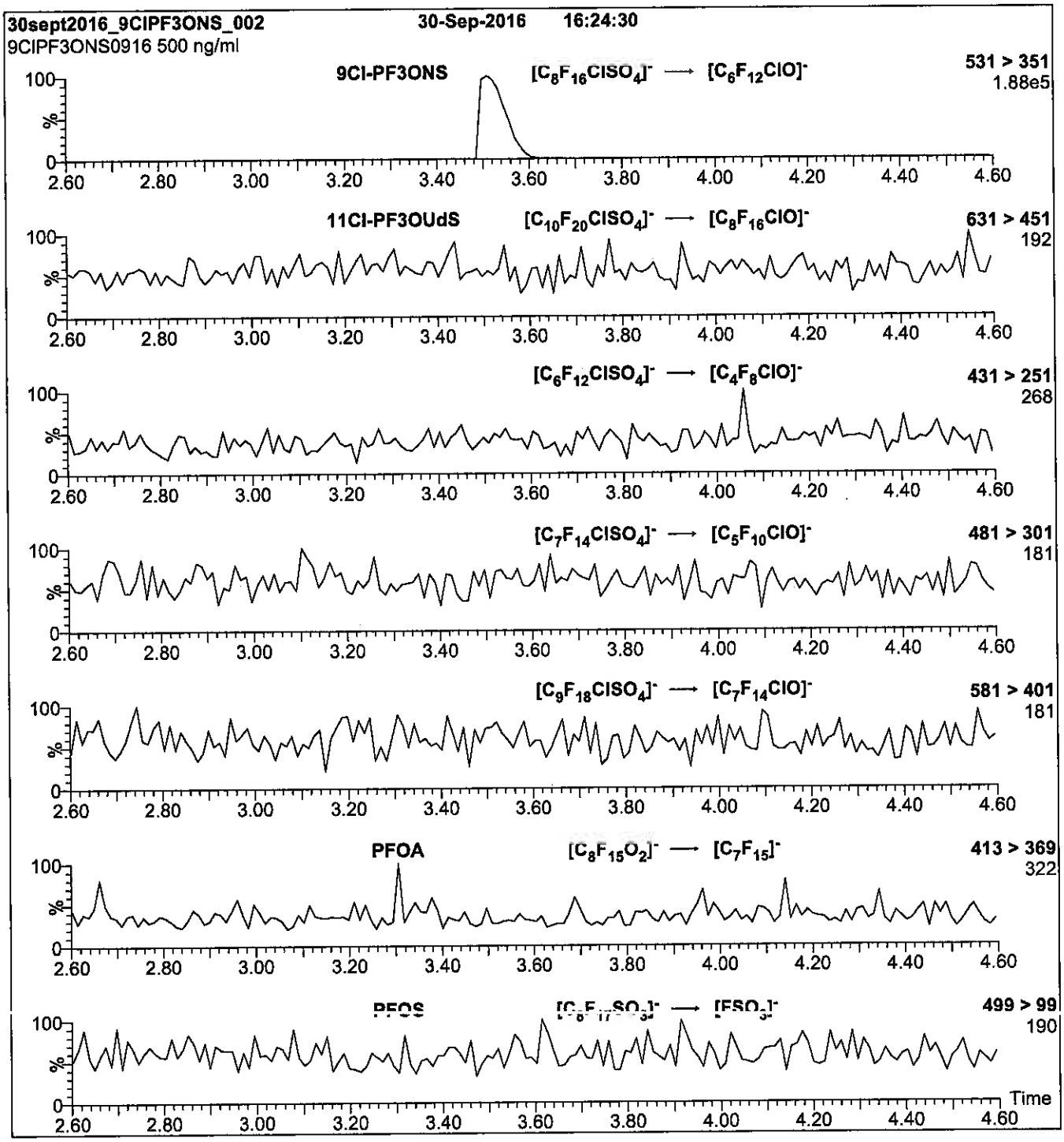
Flow: 300 µl/min

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.

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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, 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

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

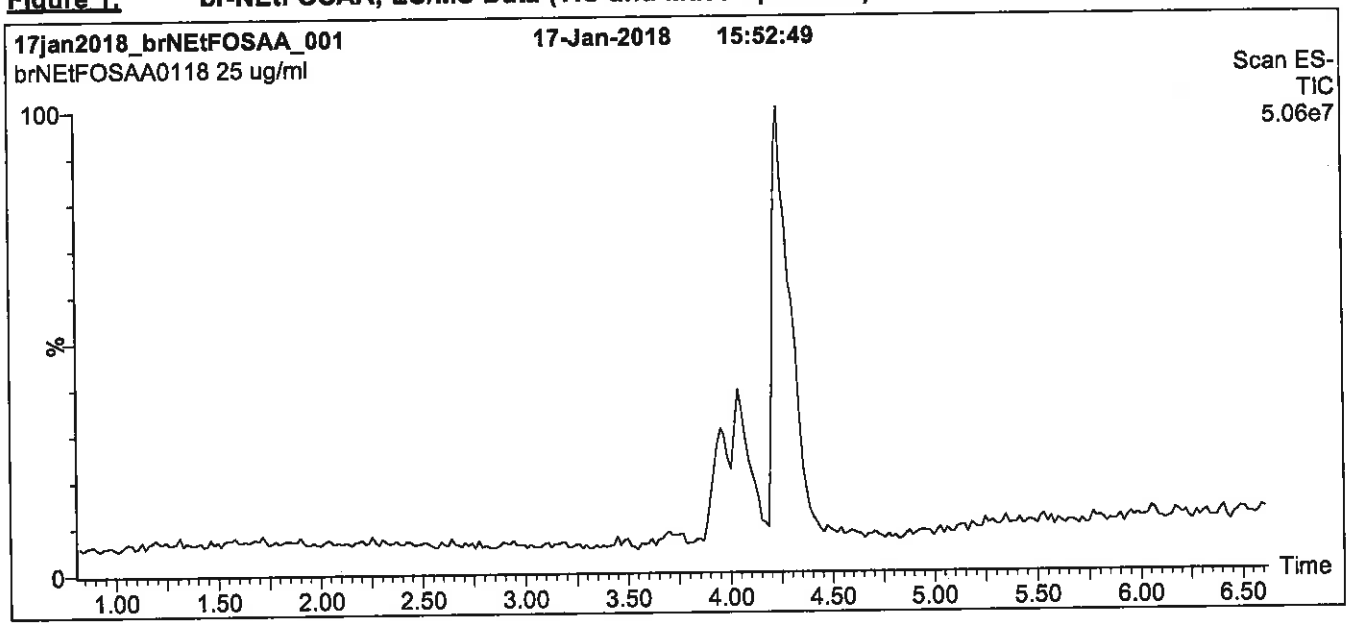
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(C_2H_5)CH_2CO_2H$	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	2.3
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic 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

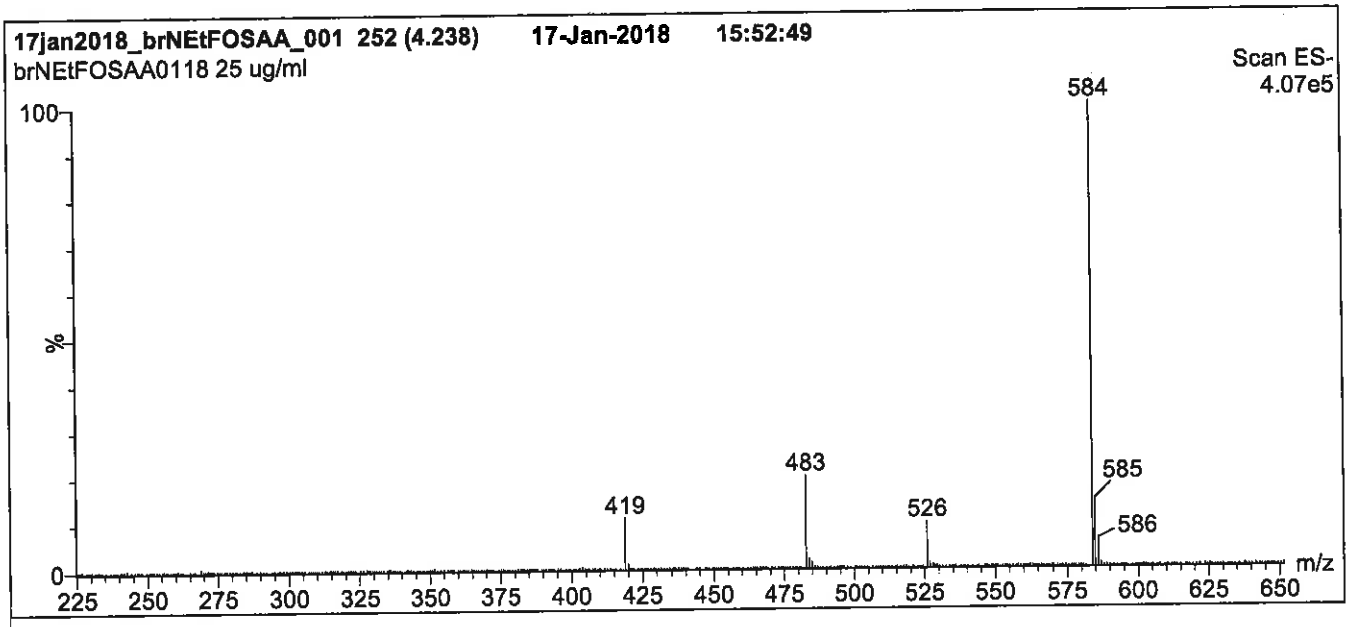
* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

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

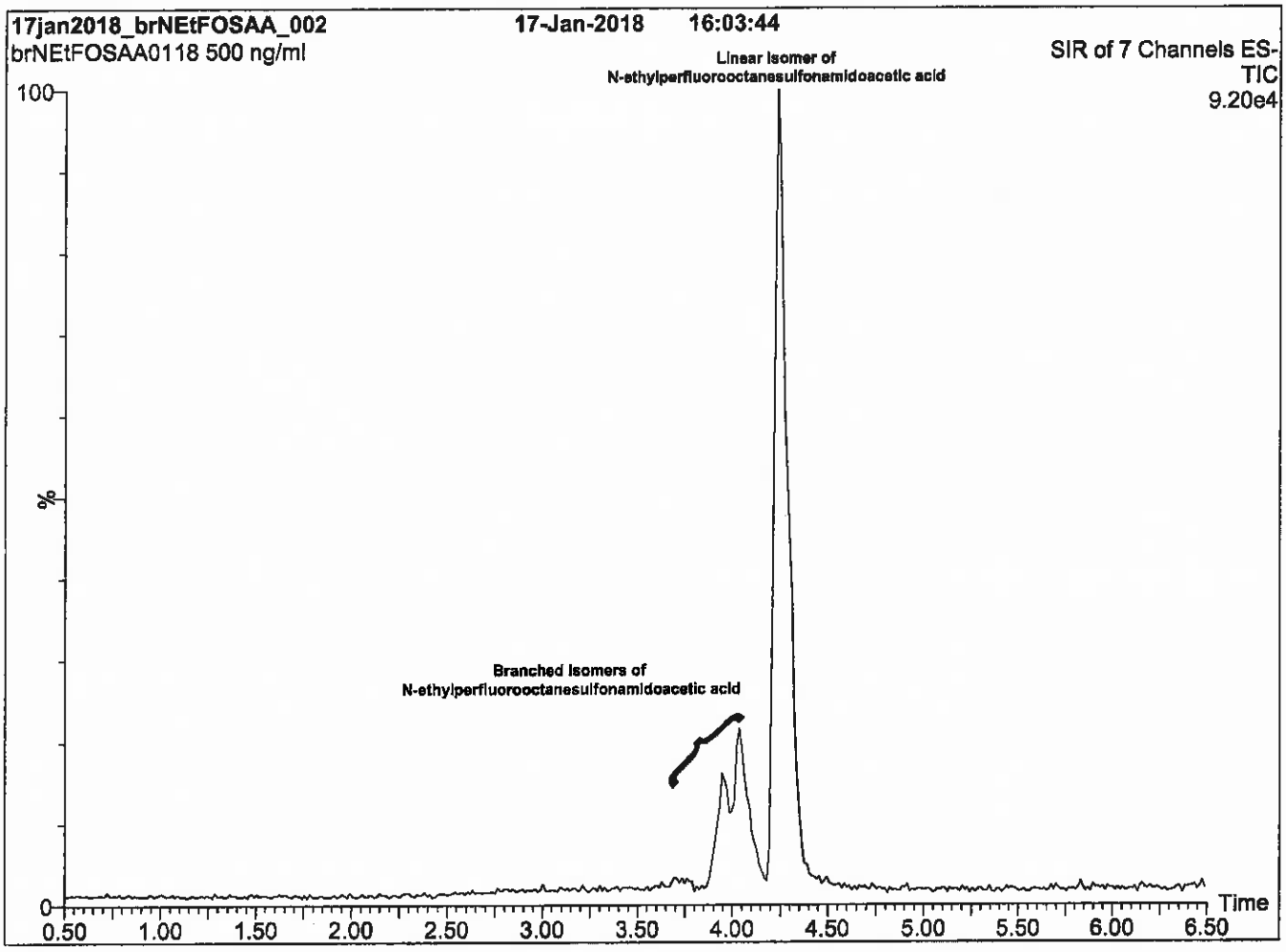
Flow: 300 µl/min

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

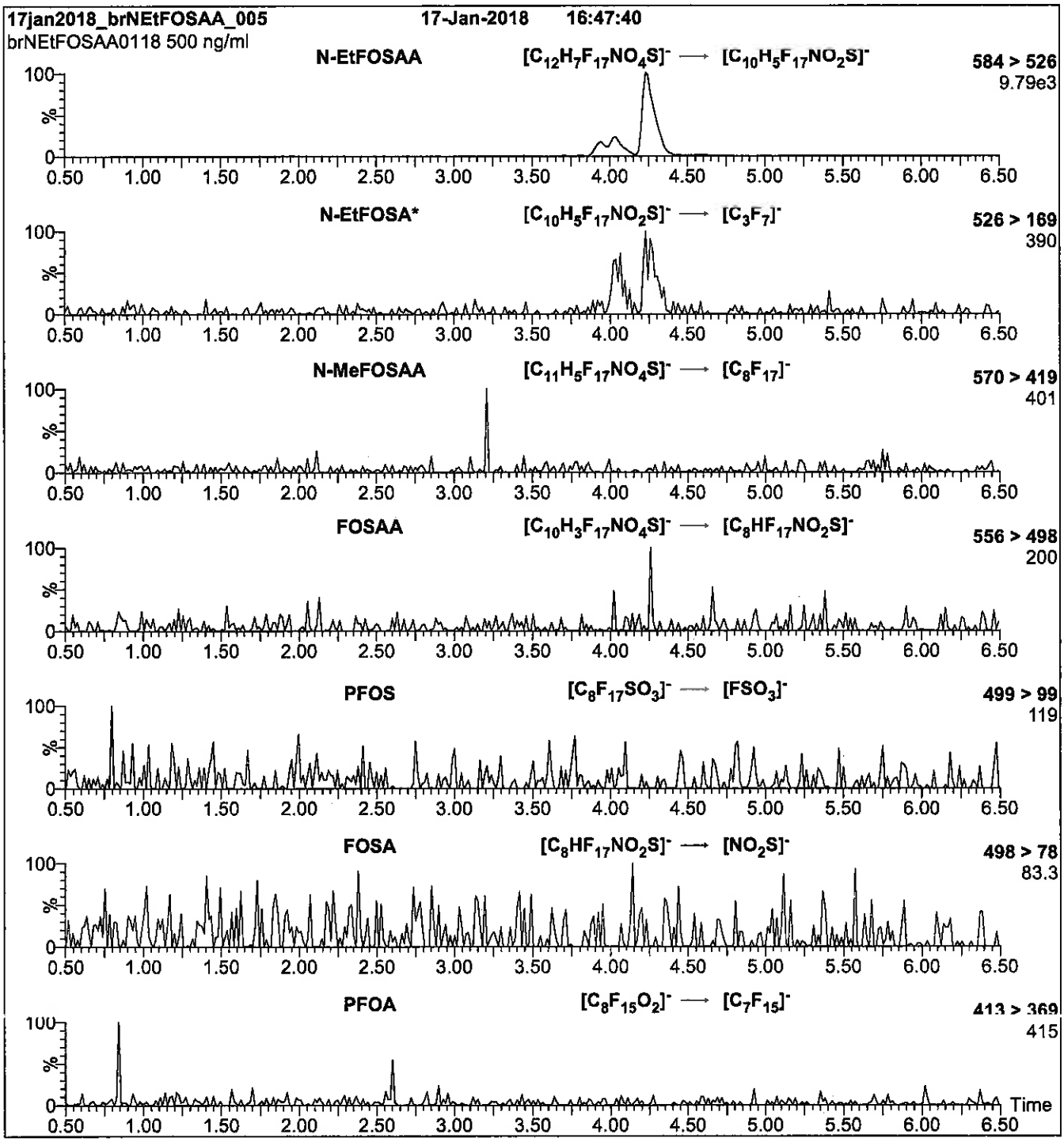
Flow: 300 µl/min

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:

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.

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

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

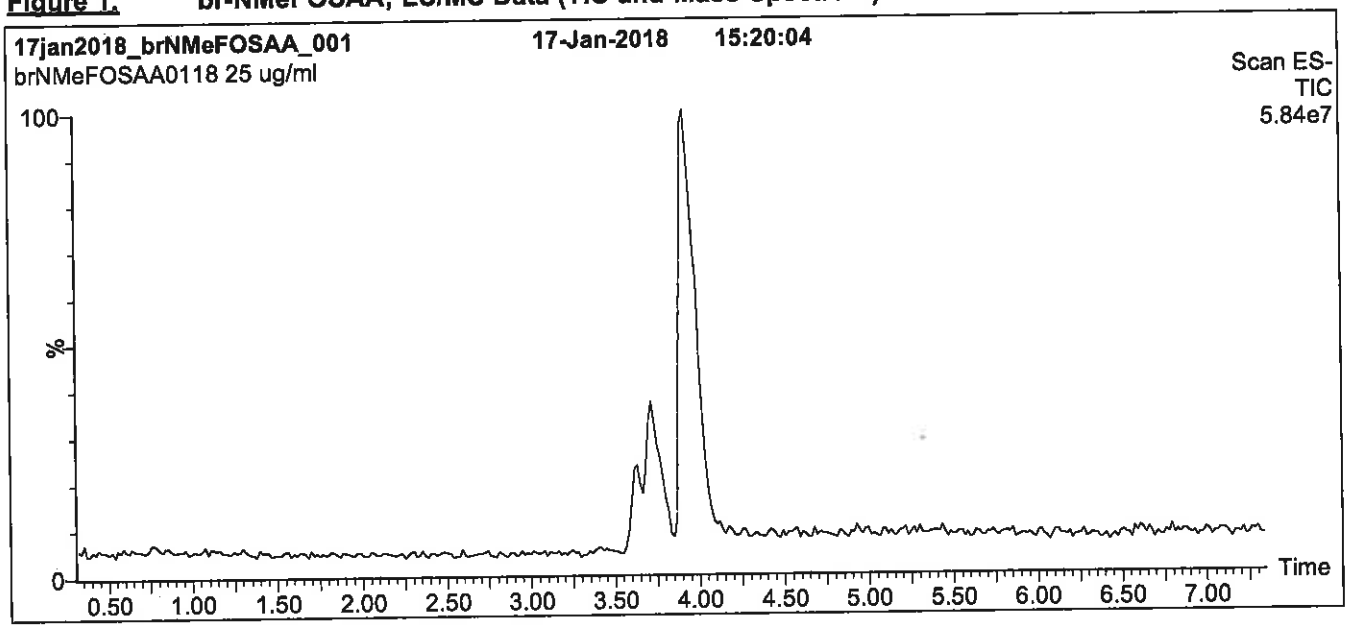
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(CH_3)CH_2CO_2H$	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(CH_3)CH_2CO_2H$	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic 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

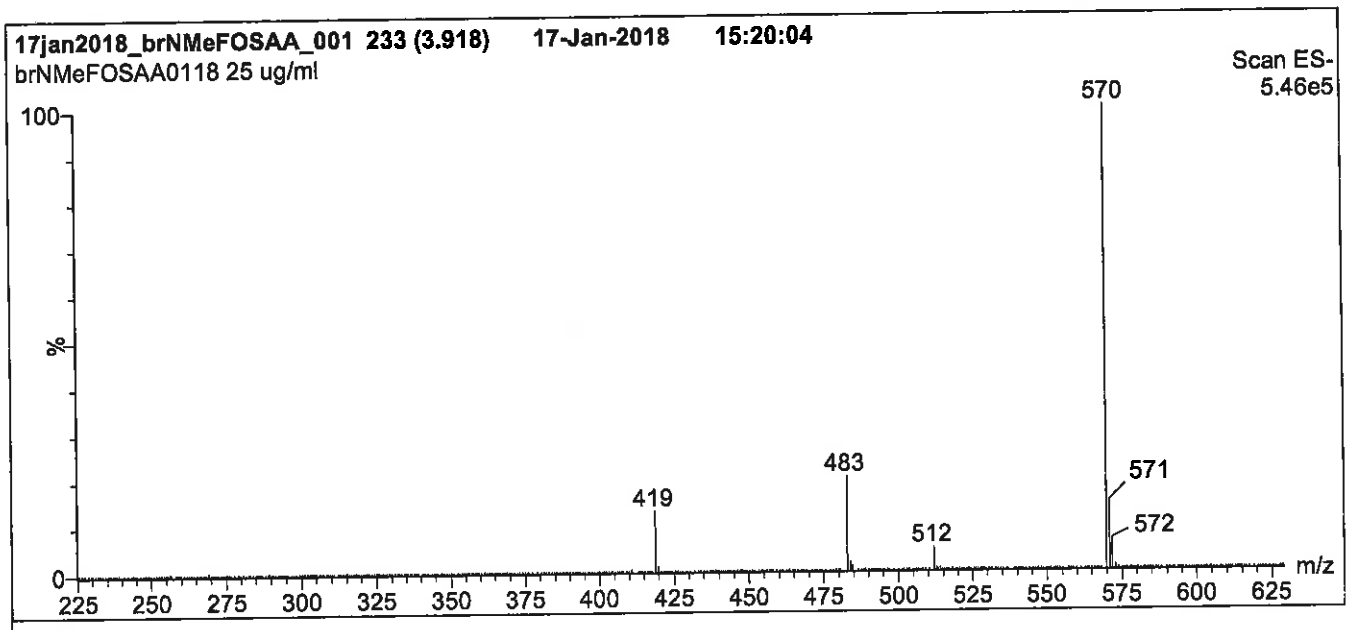
* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

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

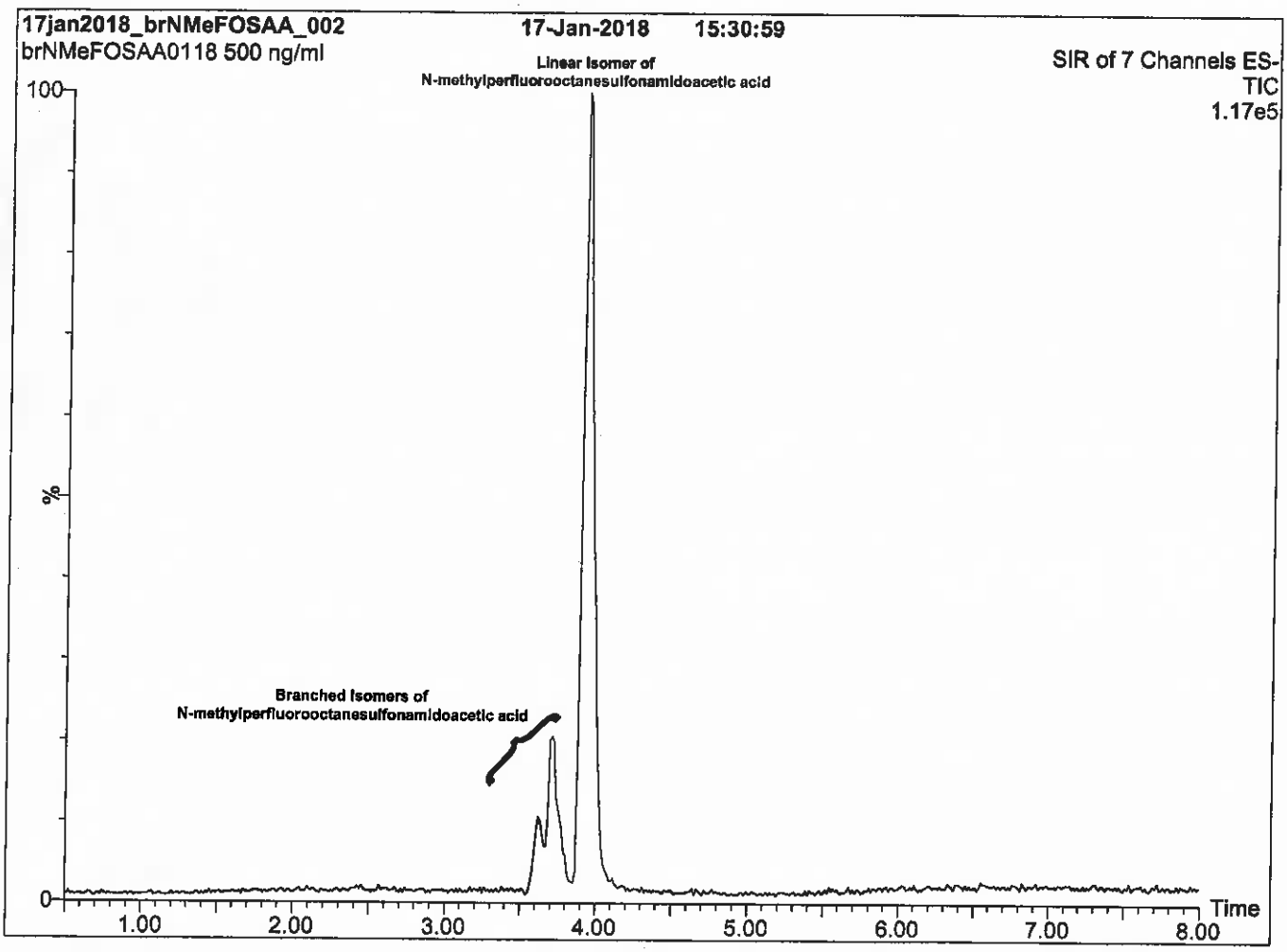
Flow: 300 µl/min

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

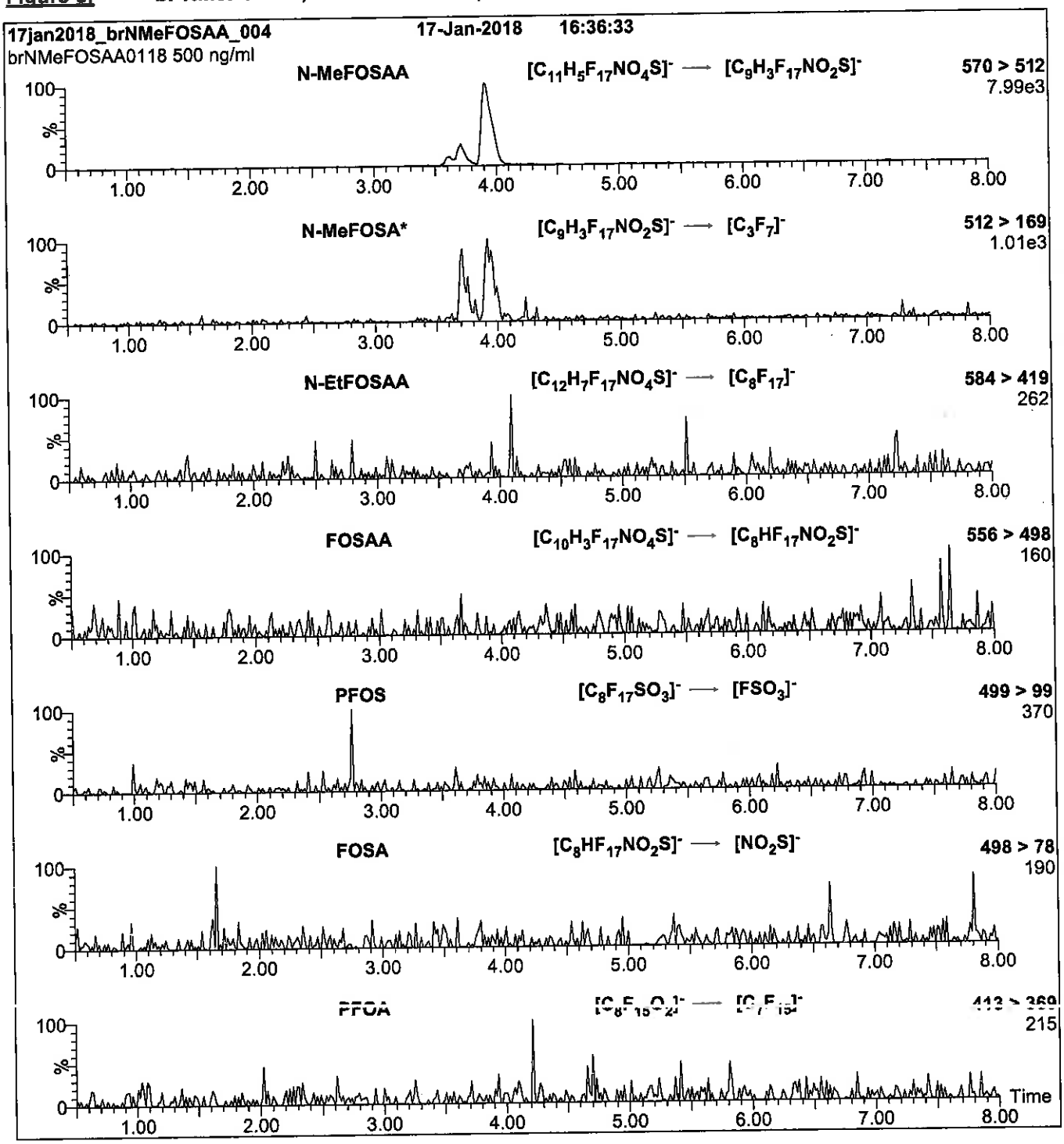
Flow: 300 µl/min

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_00009

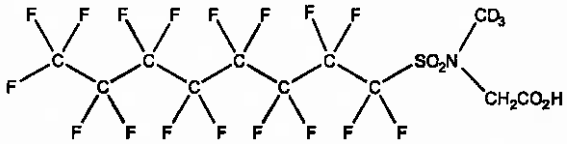
1287340
ID: LCd3-NMeFOSAA_00009
Exp:11/08/22 Prpd:CBW Opn:06/26/18
d3-N-MeFOSAA

R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	d3-N-MeFOSAA	**LOT NUMBER:**	d3NMeFOSAA1117
COMPOUND:	N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	11/08/2017		
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 moiety 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

INTENDED USE:

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HAZARDS:

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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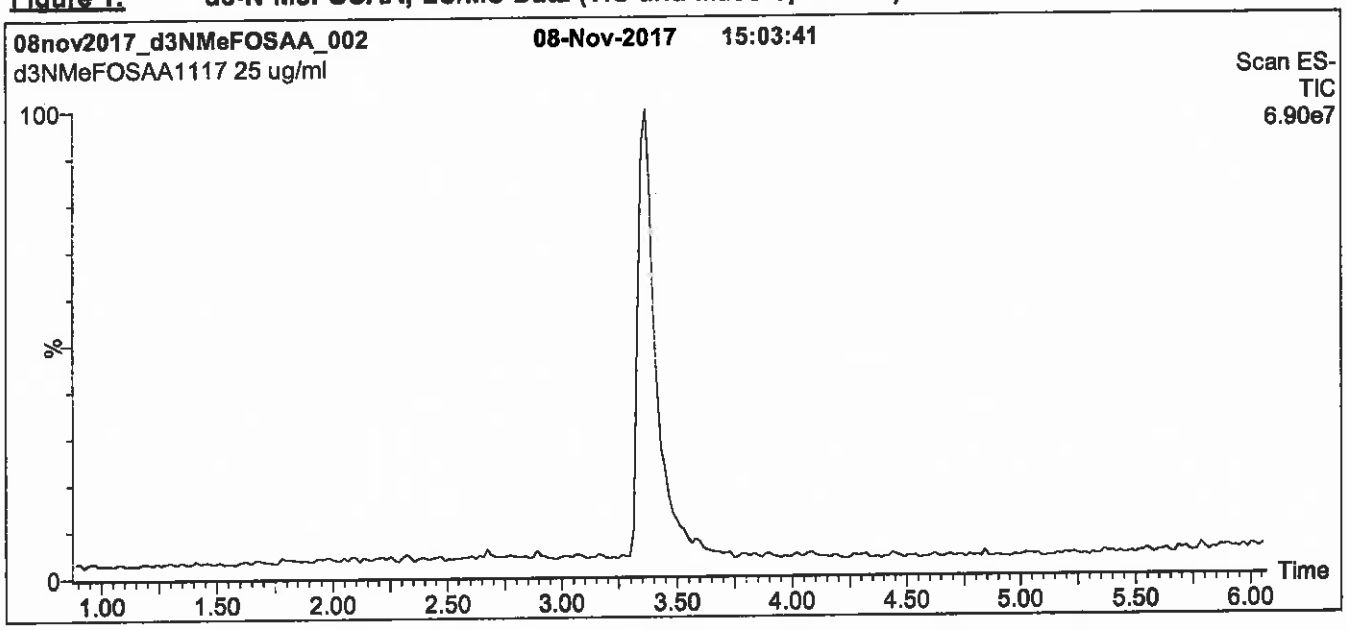
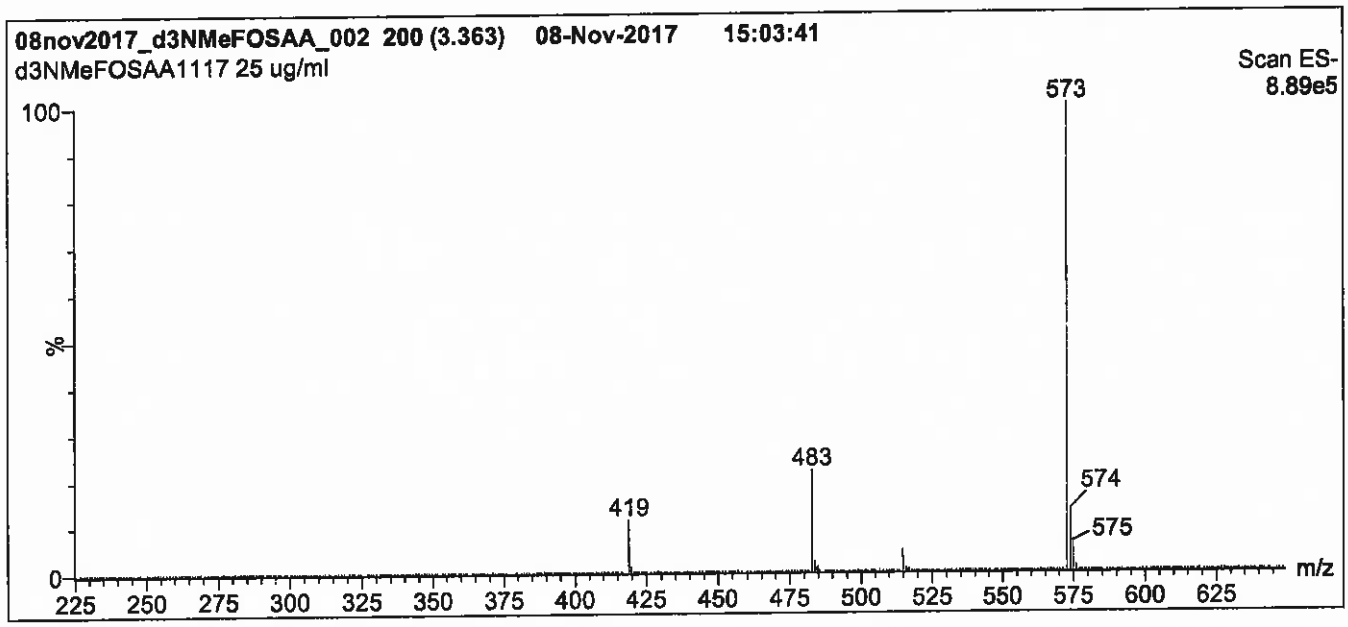
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

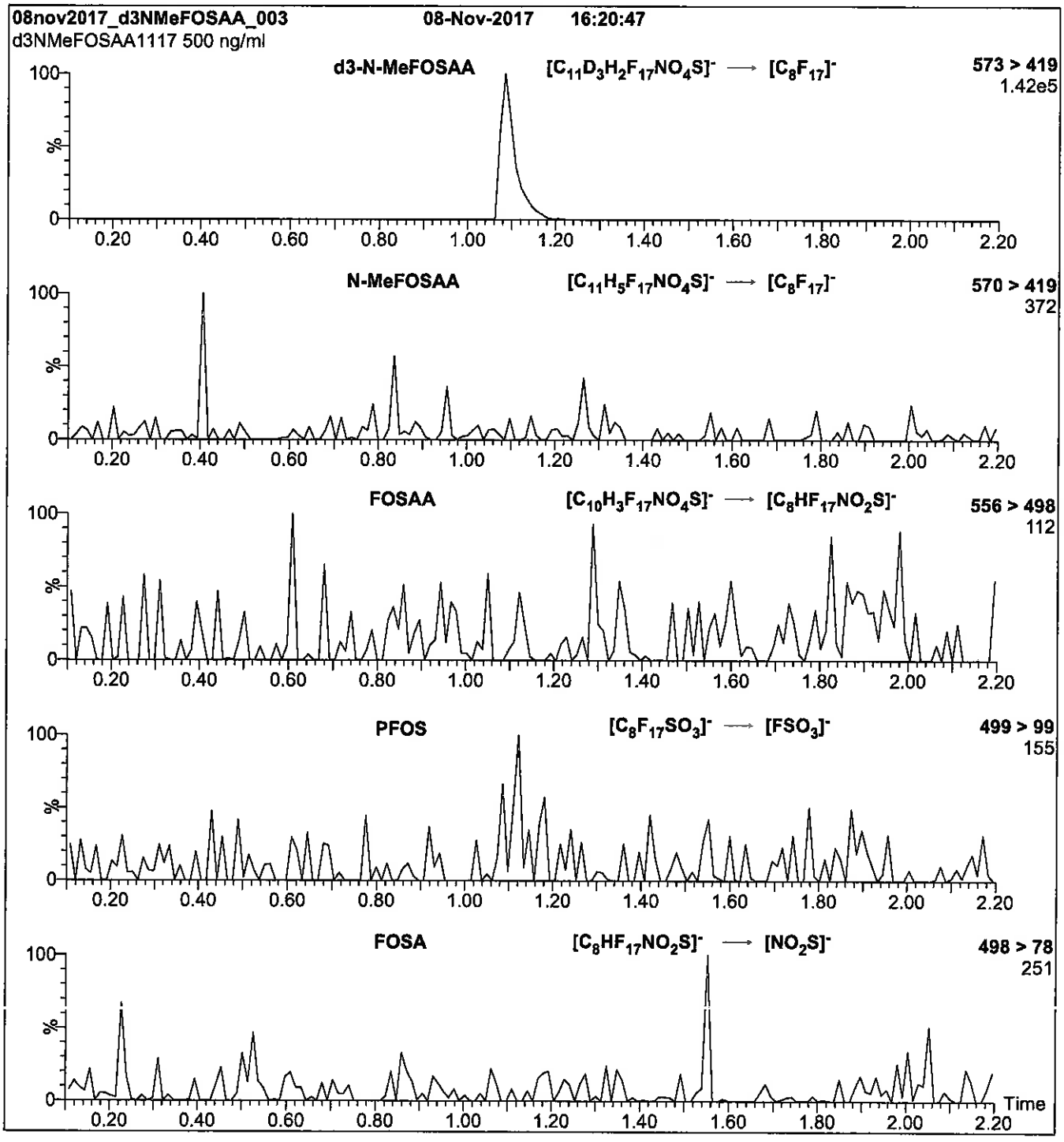
Flow: 300 µl/min

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

Reagent

LCd5-NEtFOSAA_00009

1287349
ID: LCd5-NEtFOSAA_00009
Exp:11/08/22 Prpd:CBW Opn:05/26/18
d5-N-EtFOSAA

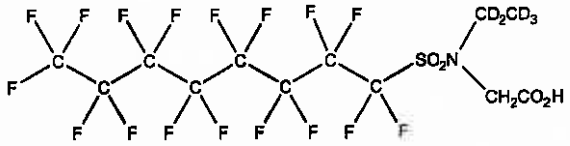
R: 6/26/18 CBW

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 moiety 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

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 $x_1, x_2,...x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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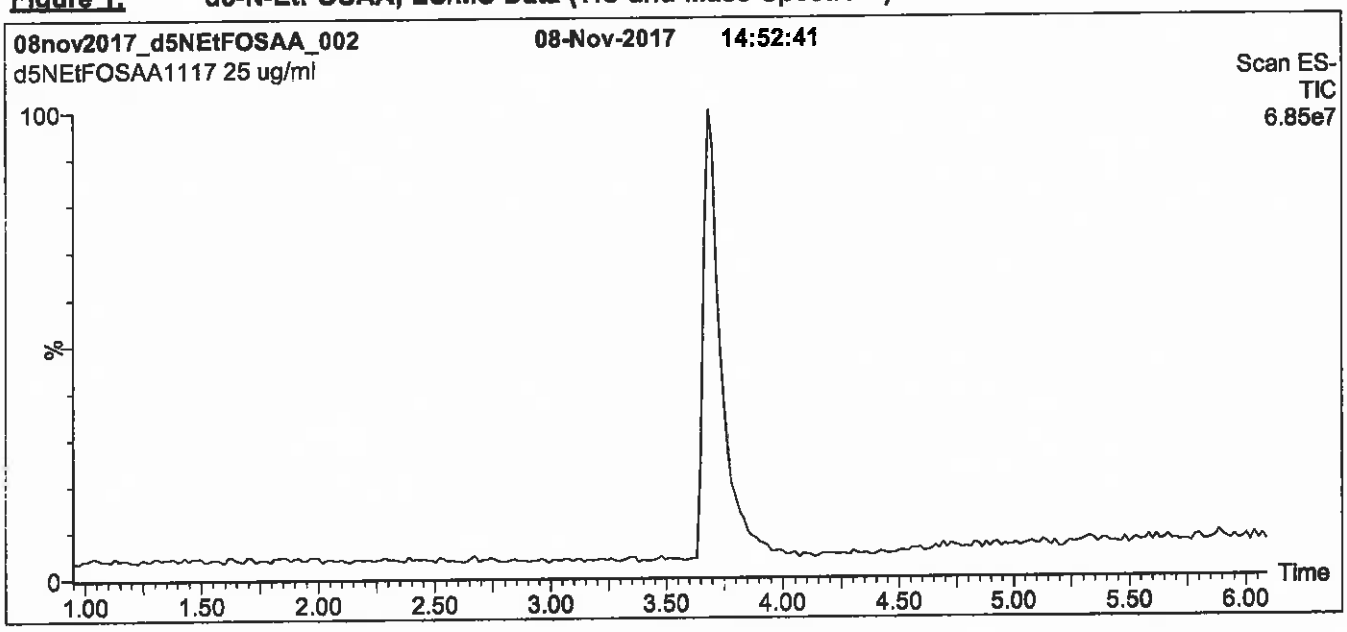
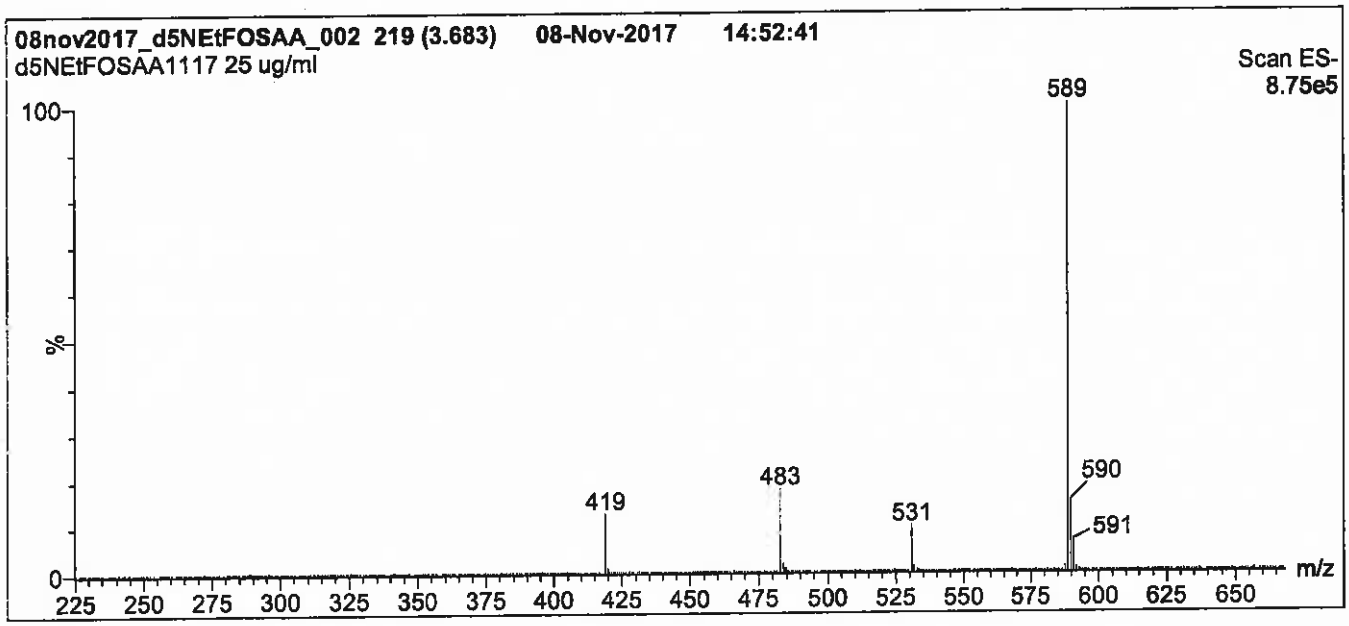
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

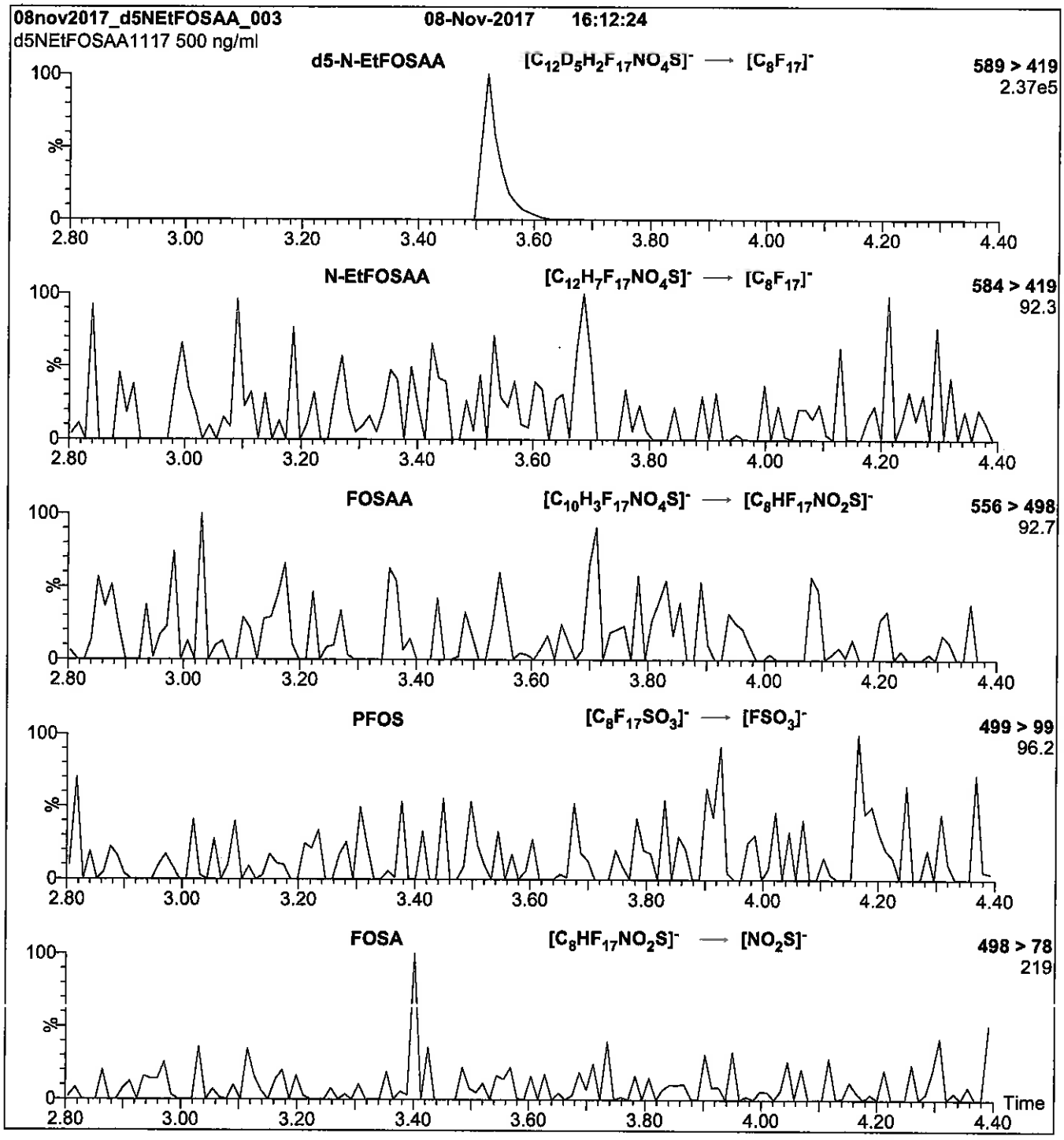
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

LCHFPO-DA_00002

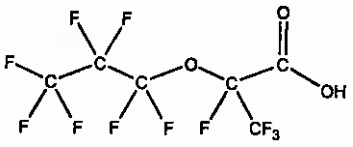
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: HFPO-DA **LOT NUMBER:** HFPODA0318

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)	03/26/2018		
EXPIRY DATE: (mm/dd/yyyy)	03/26/2021		
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.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/28/2018 (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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HOMOGENEITY:

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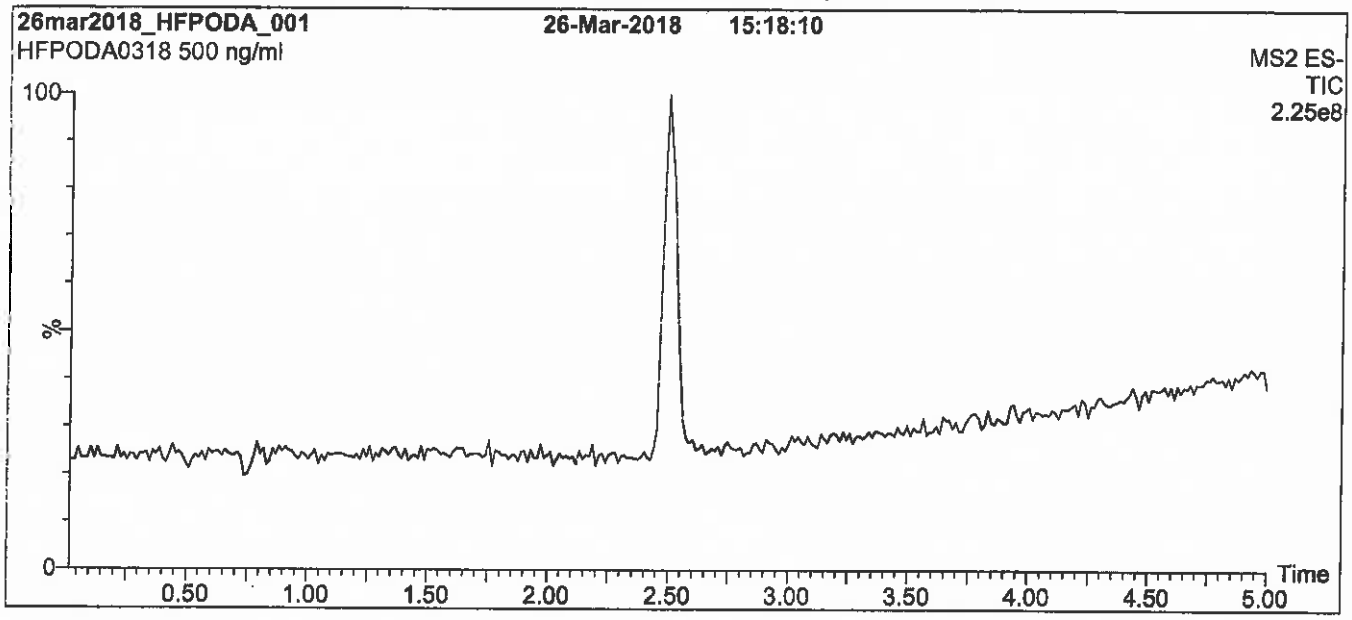
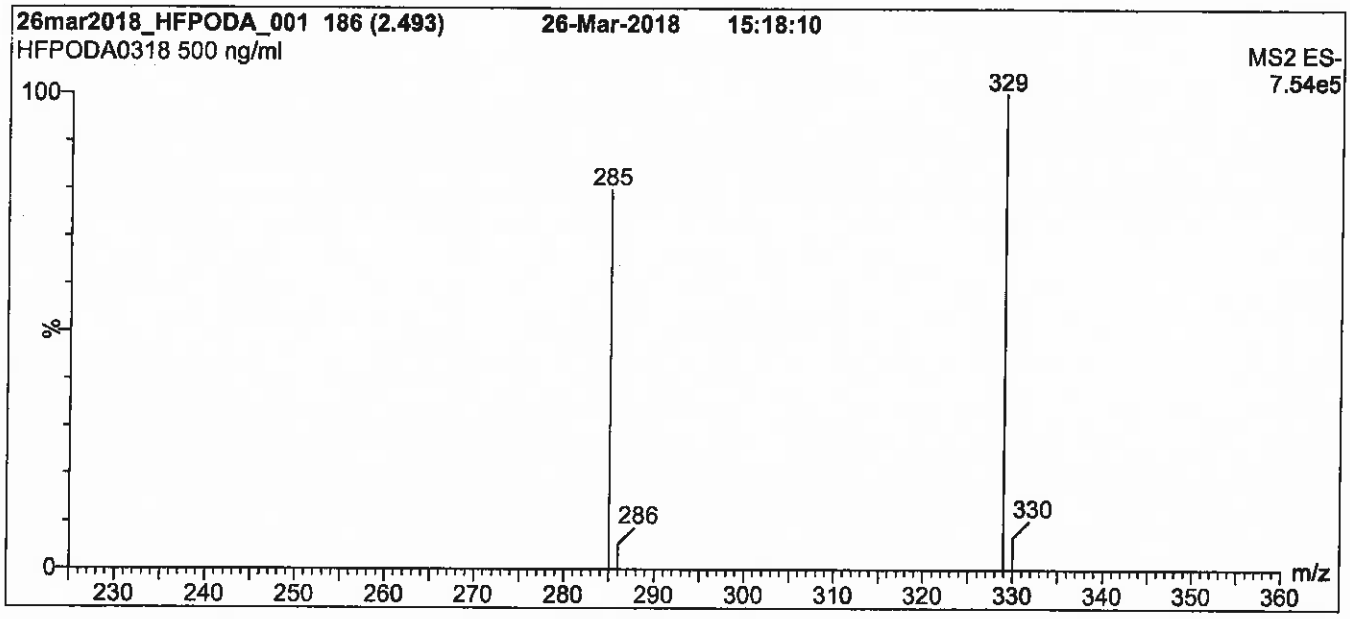
Figure 1: **HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro 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 80% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

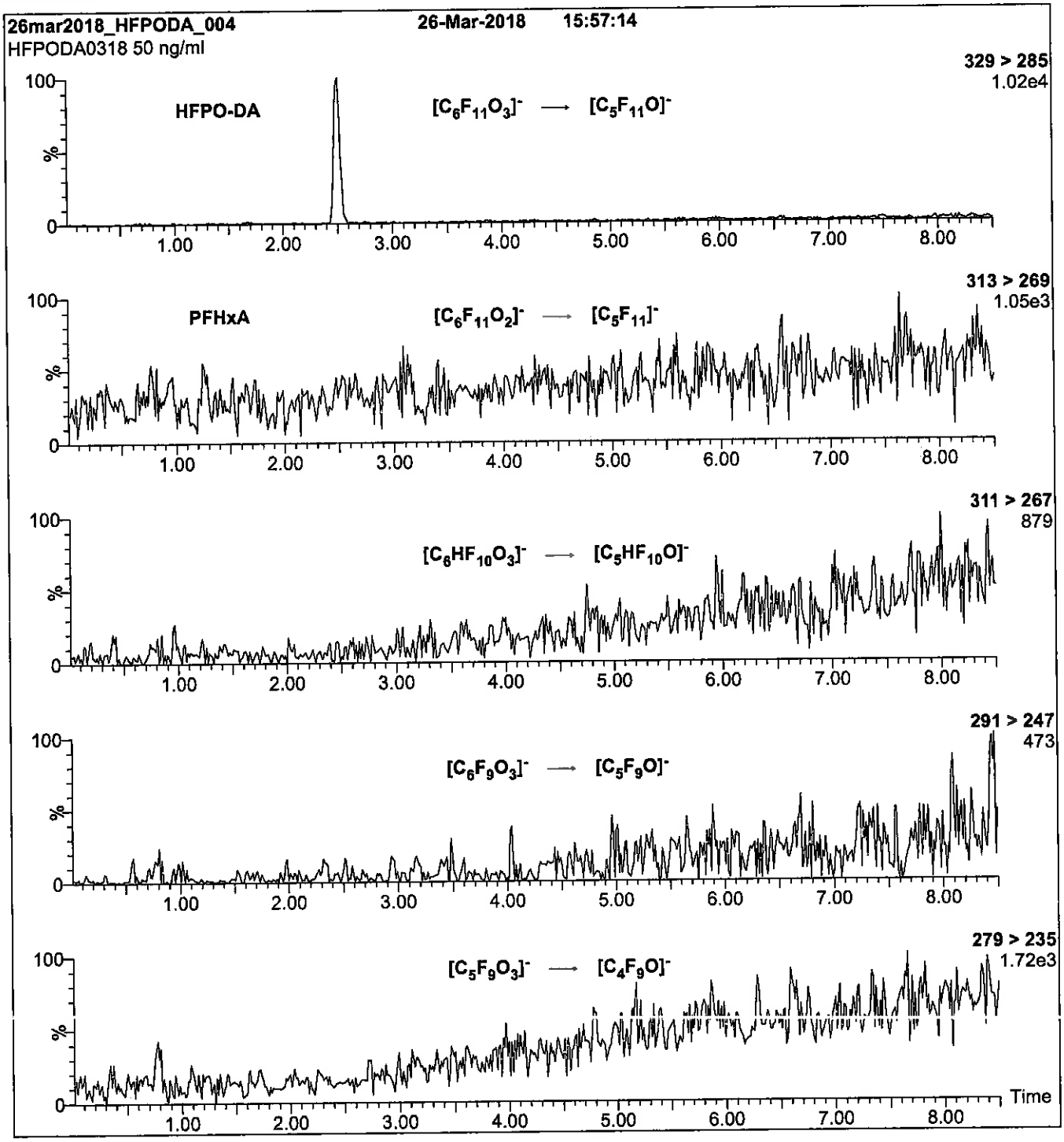
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.10
Cone Voltage (V) = 7.50
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.69e-3
Collision Energy (eV) = 6

Reagent

LCM2-6:FTS_00009

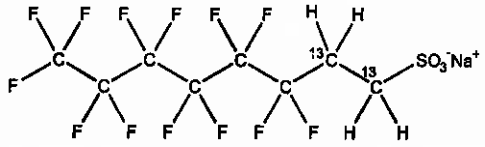
1287352
ID: LCM2-6:FTS_00009
Exp:02/16/23 Prpd:CBW Opn:06/26/18
M2-6:2FTS

R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2-6:2FTS	**LOT NUMBER:**	M262FTS0218
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)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
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: _____ **Date:** 03/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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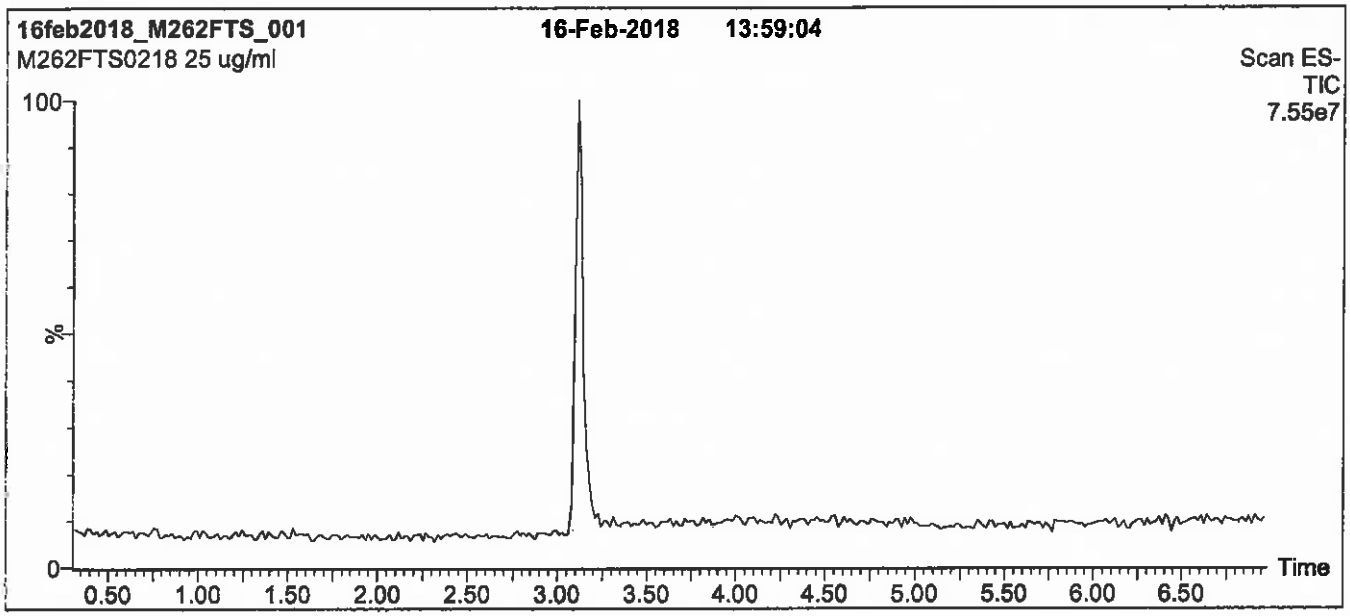
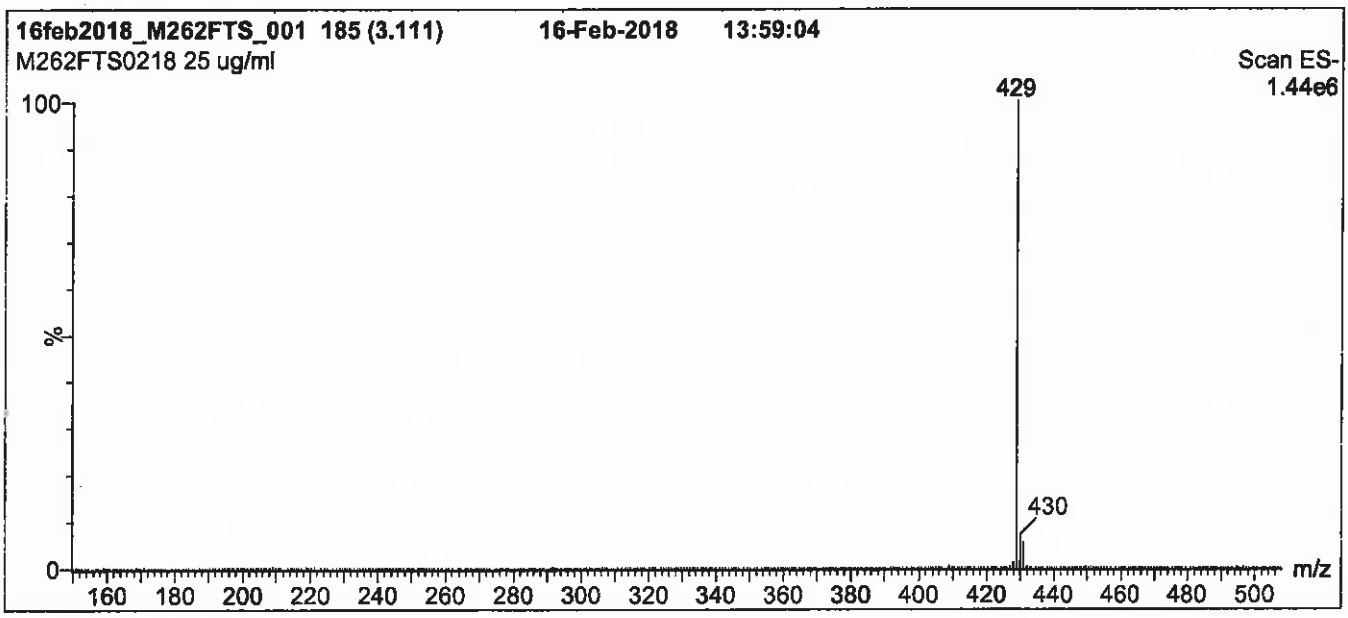
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

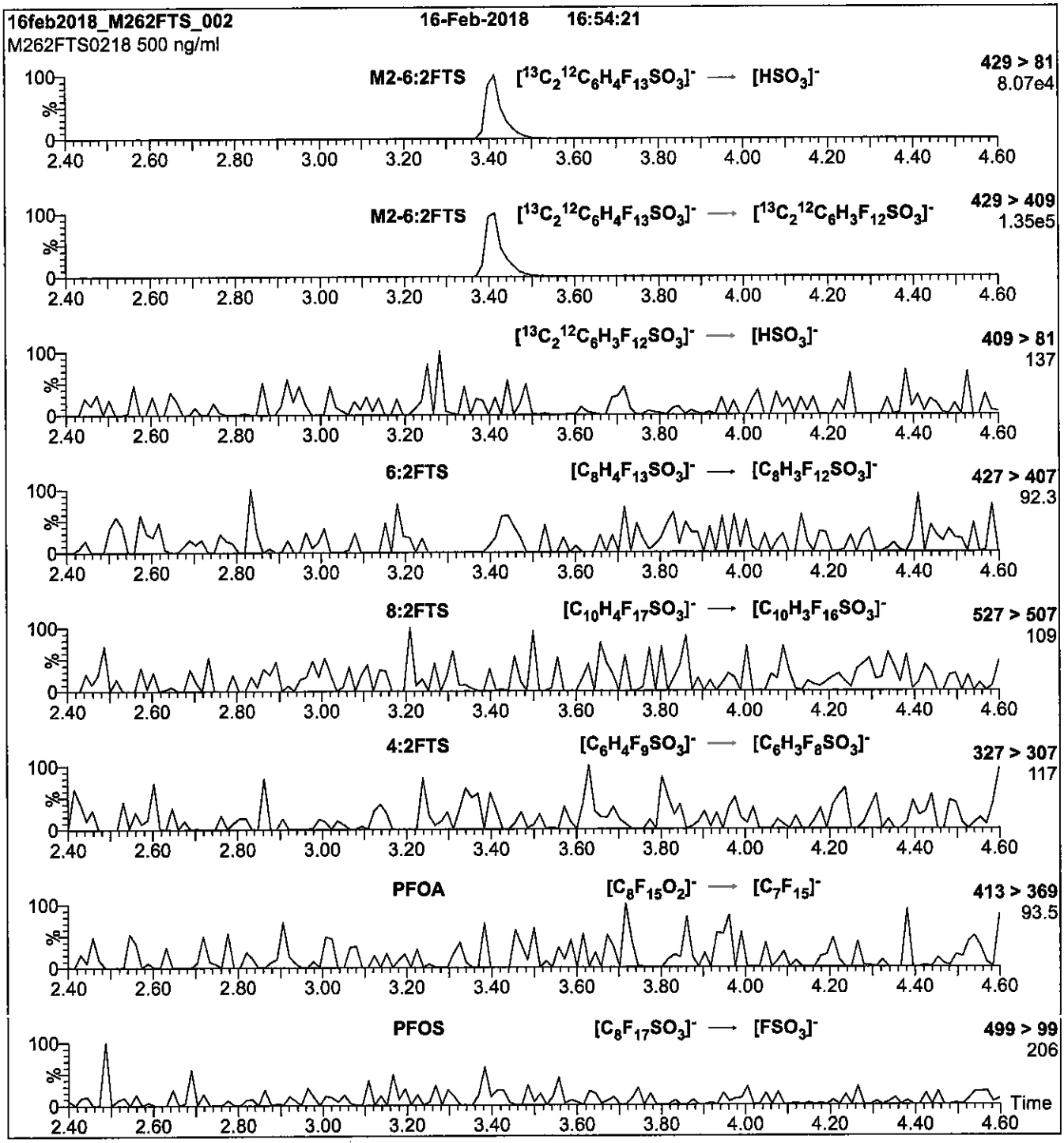
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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_00011

1287355
ID: LCM2-8:2FTS_03011
Exp:01/24/23 Prpd:CBW Opn:06/26/18
M2-8:2FTS

R: 6/26/18 CBW

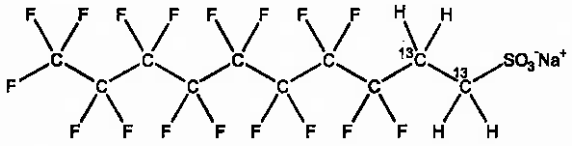
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0118

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/24/2018		
EXPIRY DATE: (mm/dd/yyyy)	01/24/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/26/2018 (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.

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.

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly 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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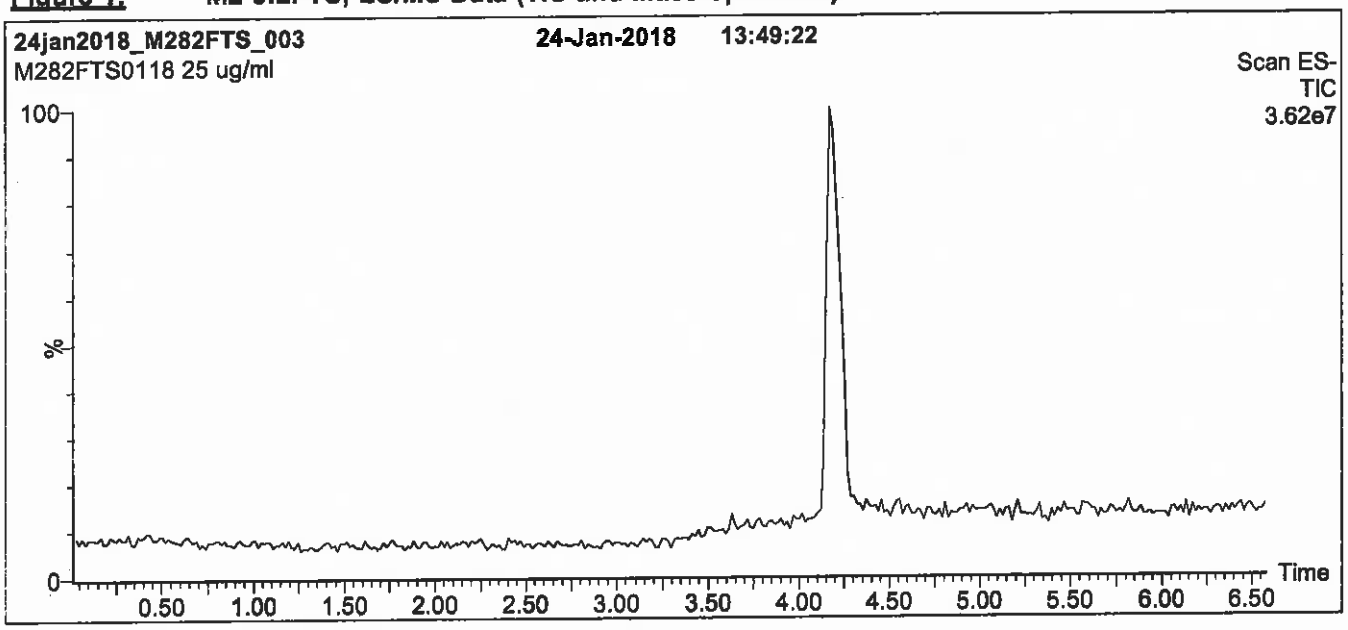
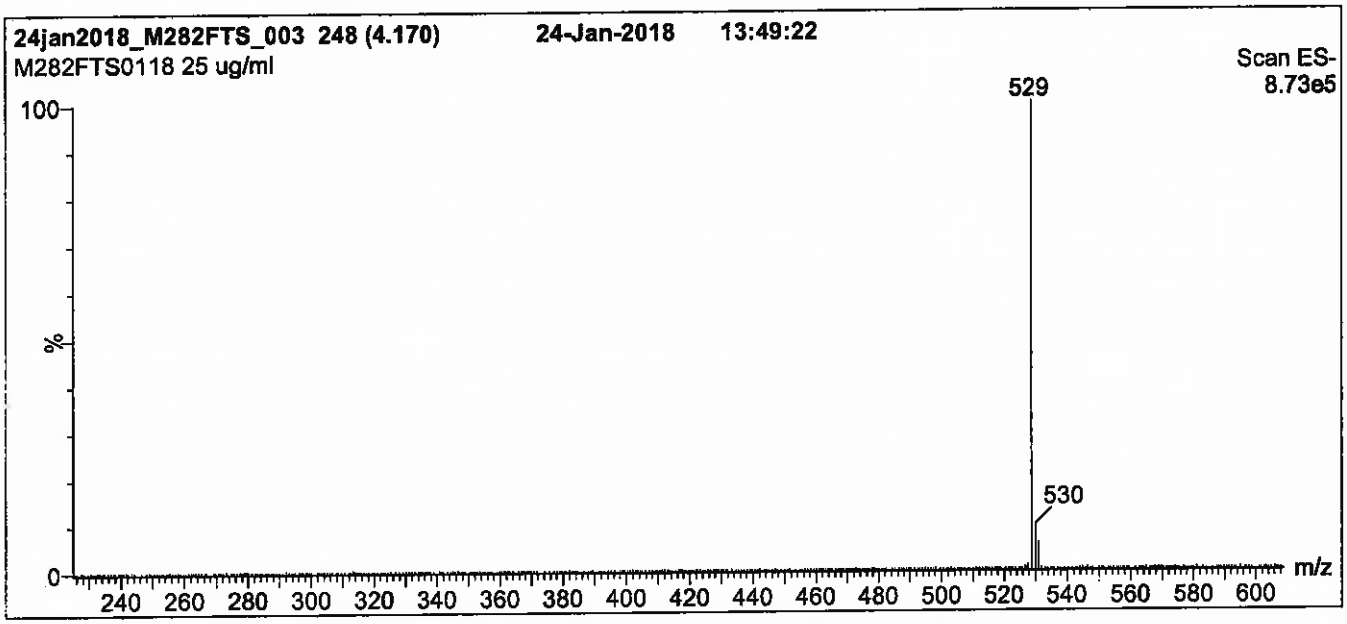
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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: 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

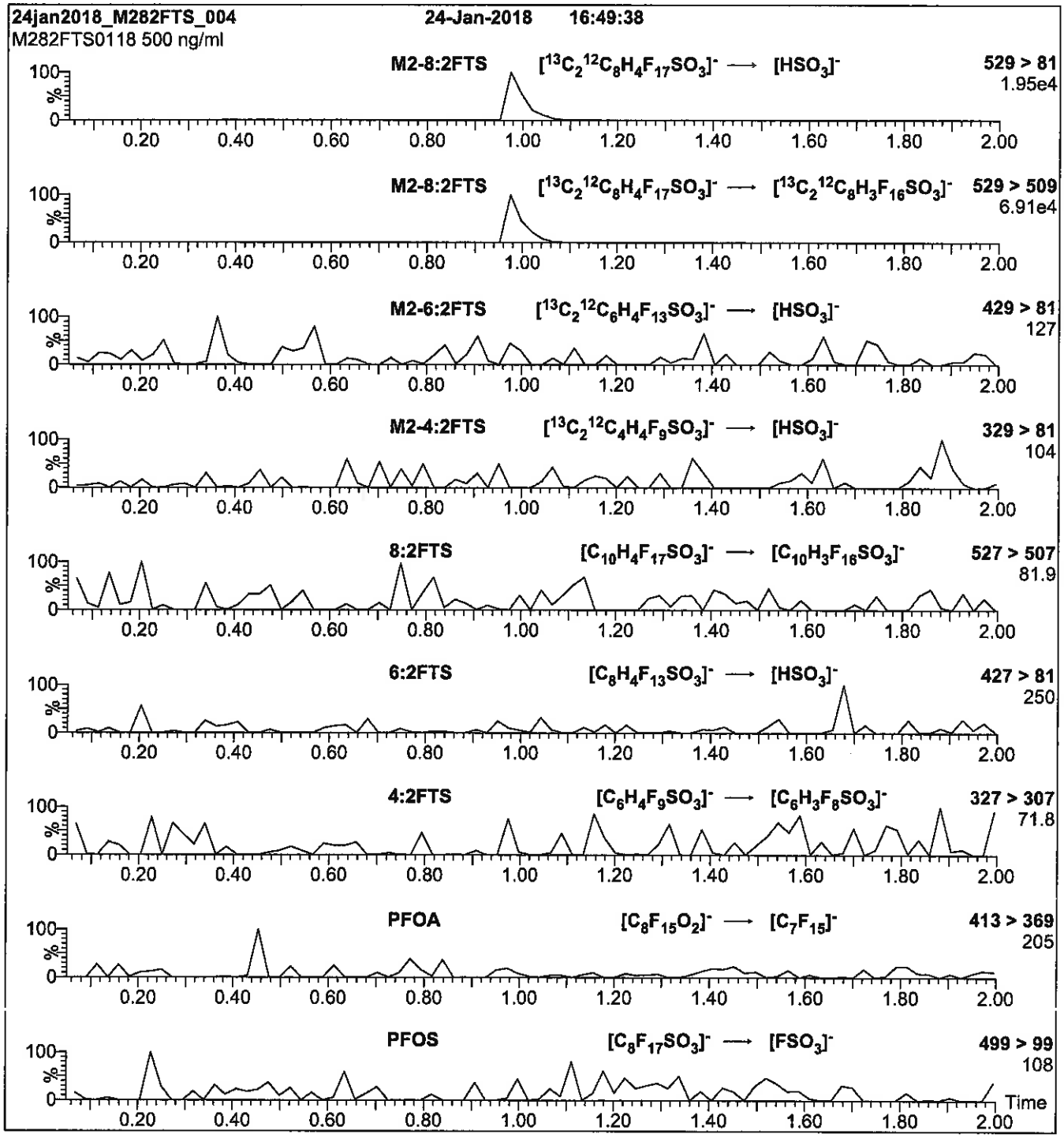
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.43e-3
Collision Energy (eV) = 25

Reagent

LCM2PFHxDA_00017

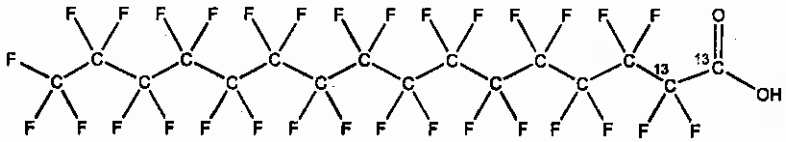
1287278
ID: LCM2PFHxDA_00017
Exp:07/13/22 Prpd:CBW Opn:06/26/18
13C2-PFHxDA at 50ug/mL.

R: 6/26/18 CBW

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 ($1,2\text{-}^{13}C_2$)
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 ~ 0.3% 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

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.

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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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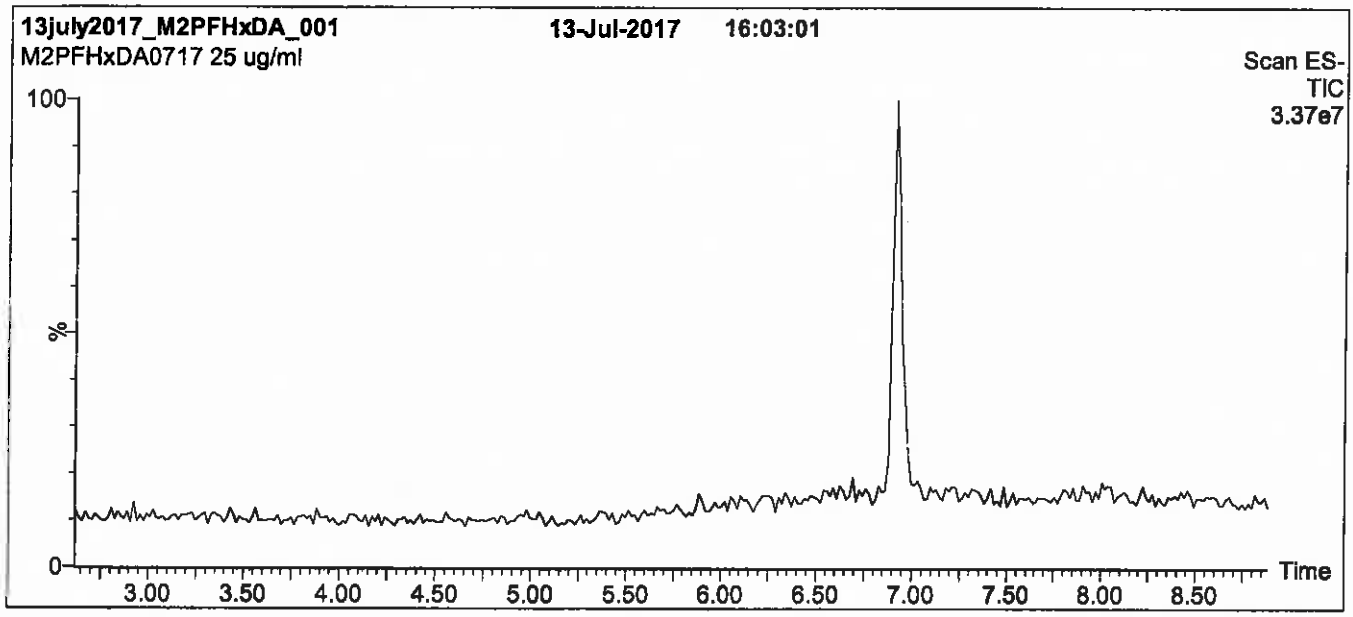
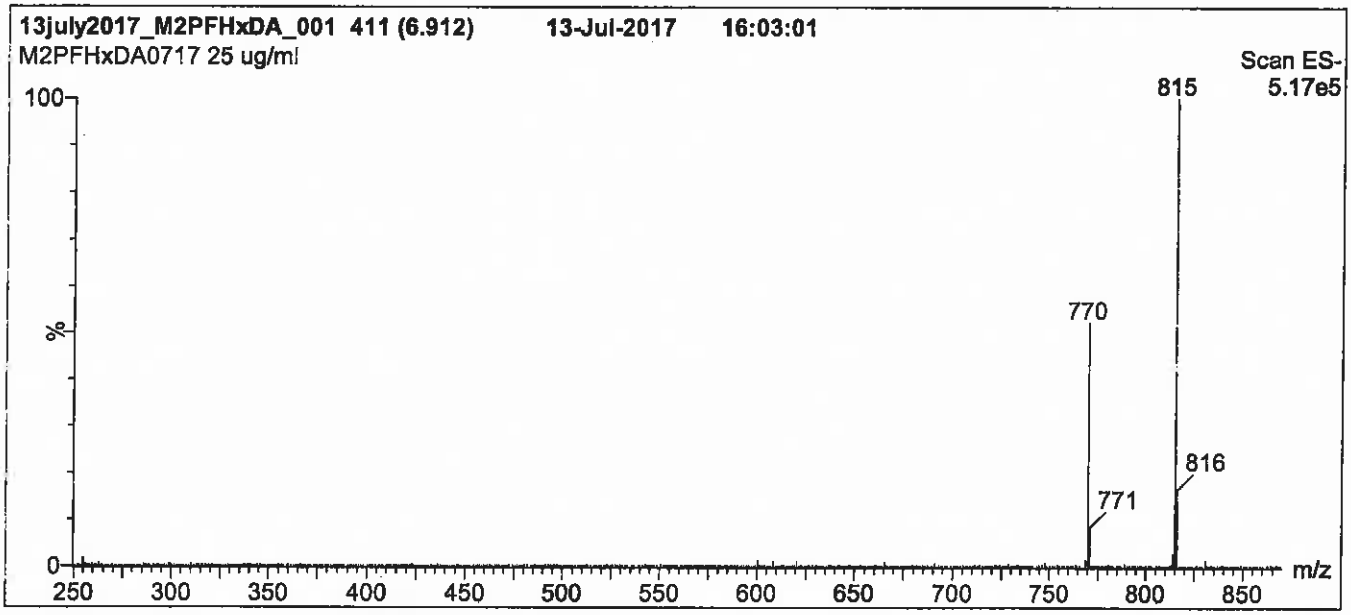
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





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

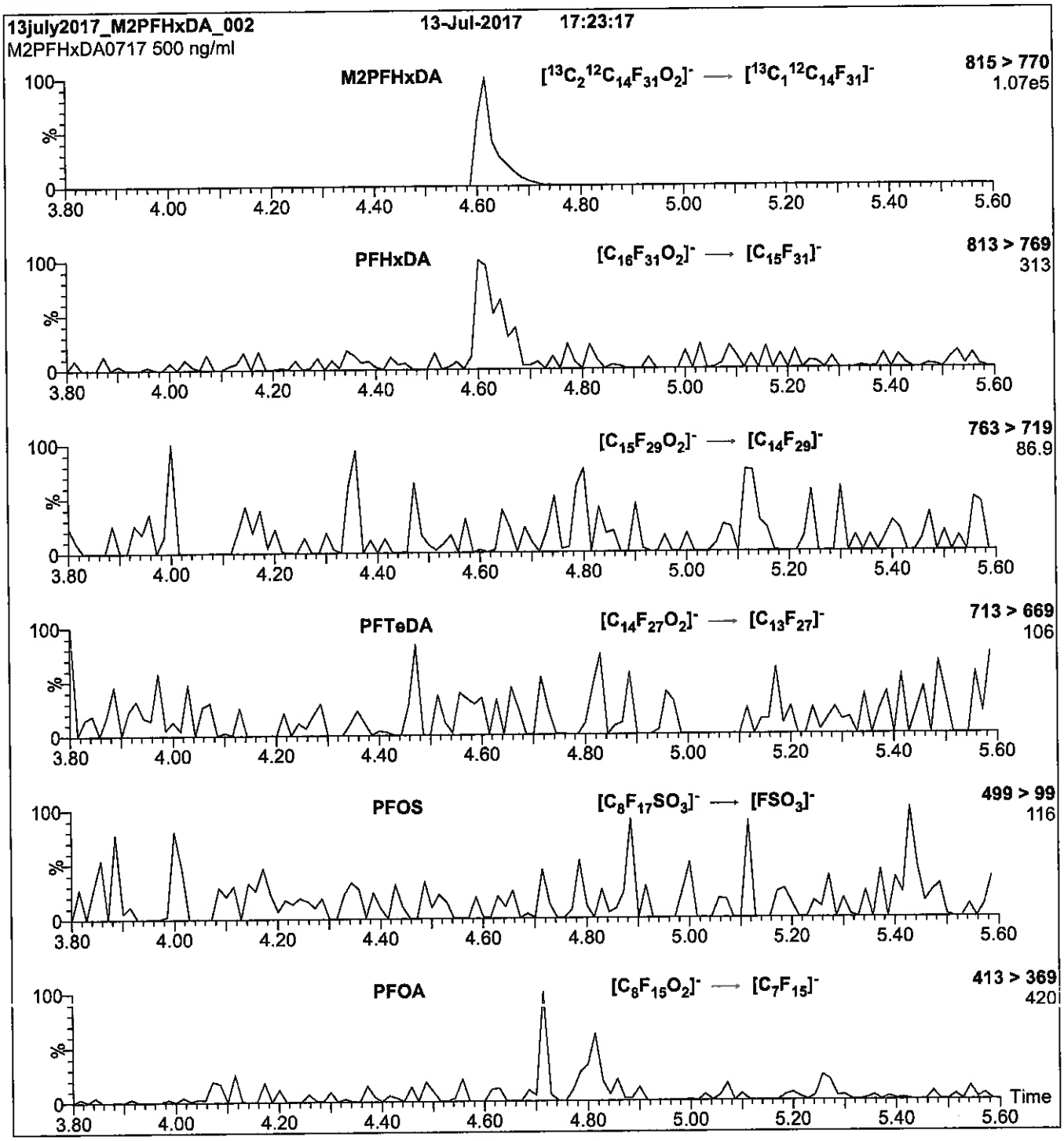
Flow: 300 µl/min

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

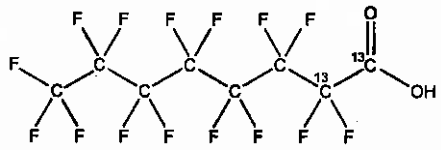
LCM2PFOA_00008

Y. 5/8/17 SKV

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)

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CALA

ANAB

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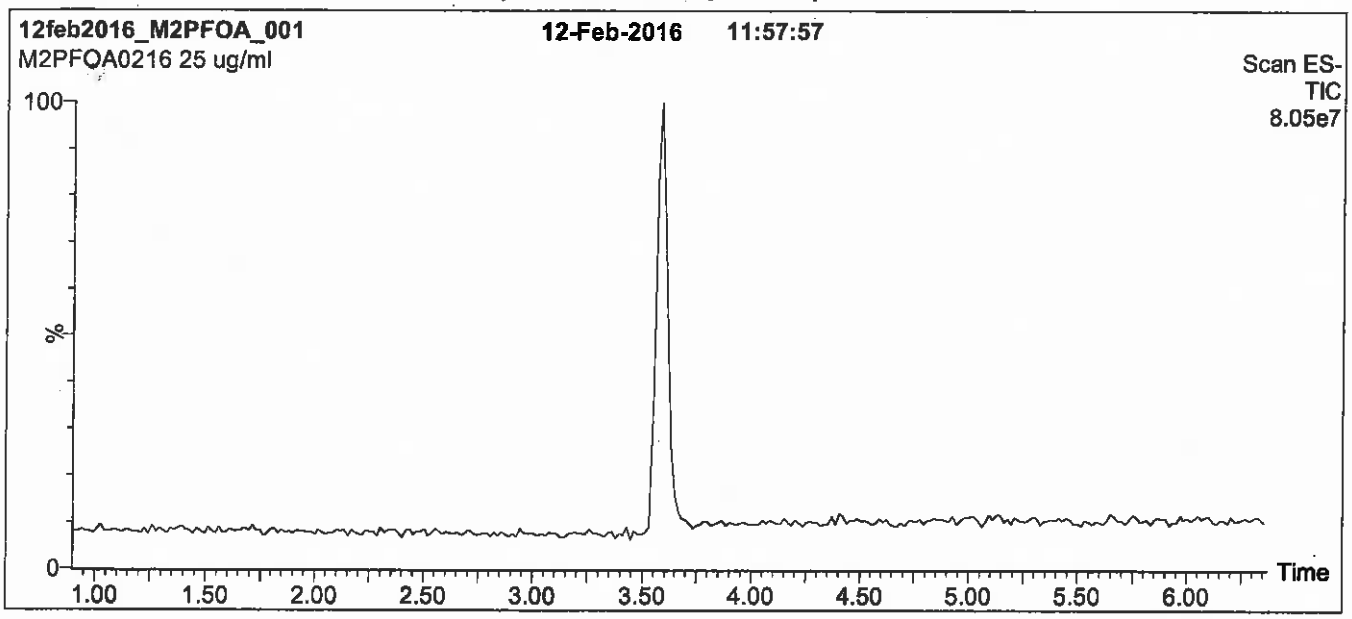
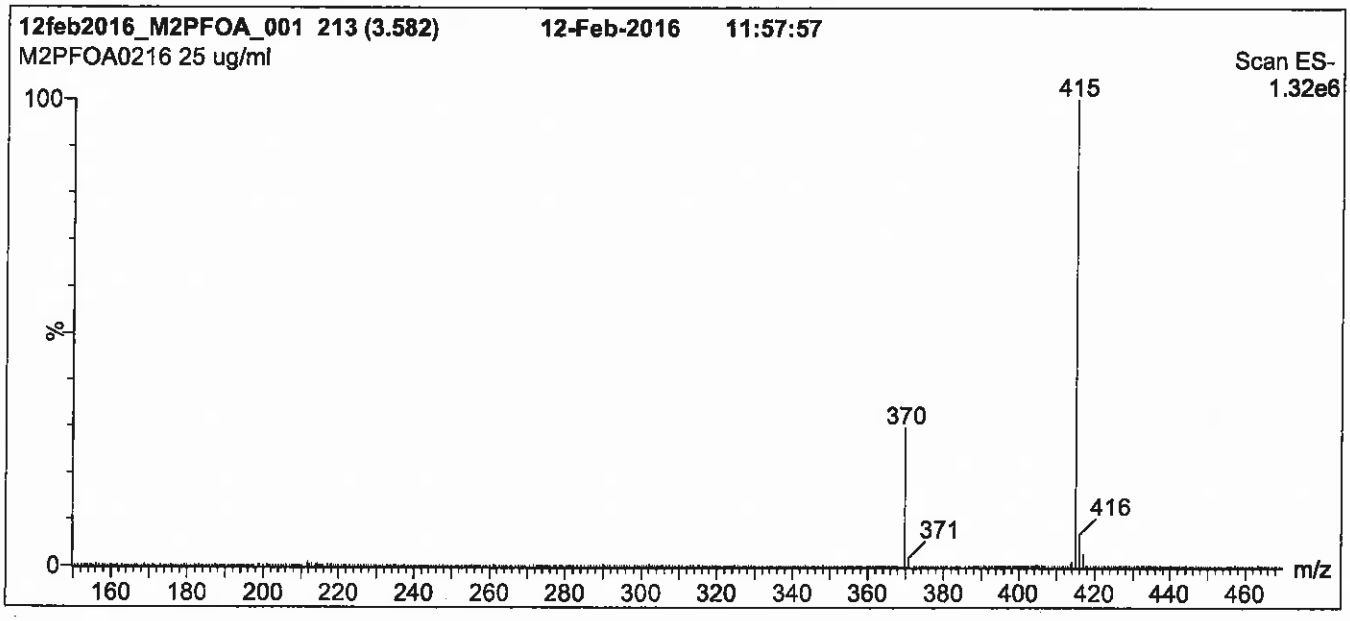
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

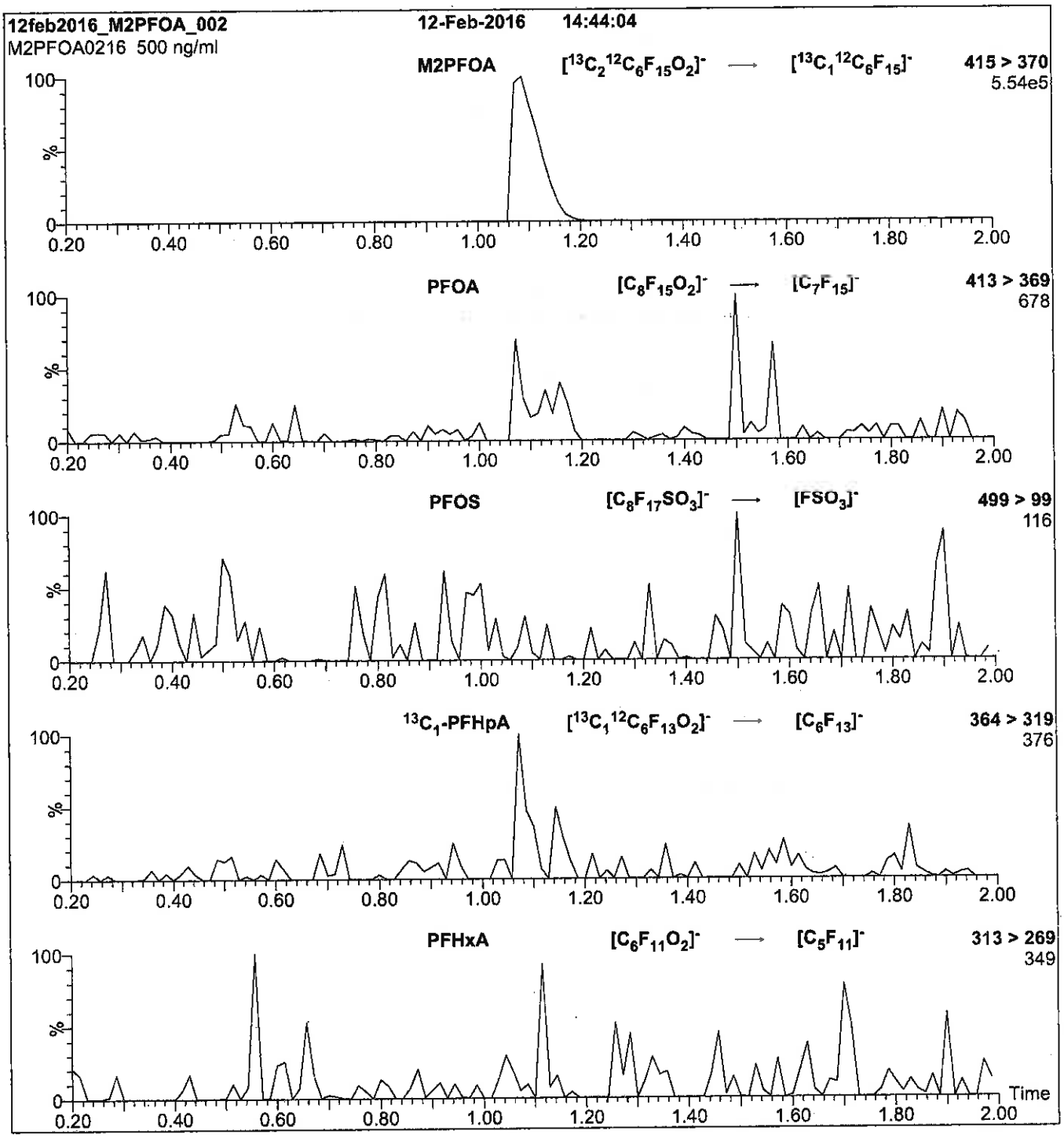
Flow: 300 µl/min

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

LCM2PFOA_00012

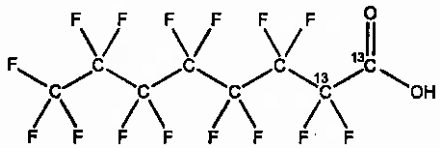
1287307
ID: LCM2PFOA_00012
Exp:10/26/22 Prpd:CBW Opn:06/26/18
13C2-PFOA Stock 50ug/mL

R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA1017
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/26/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/26/2022		
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:** 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

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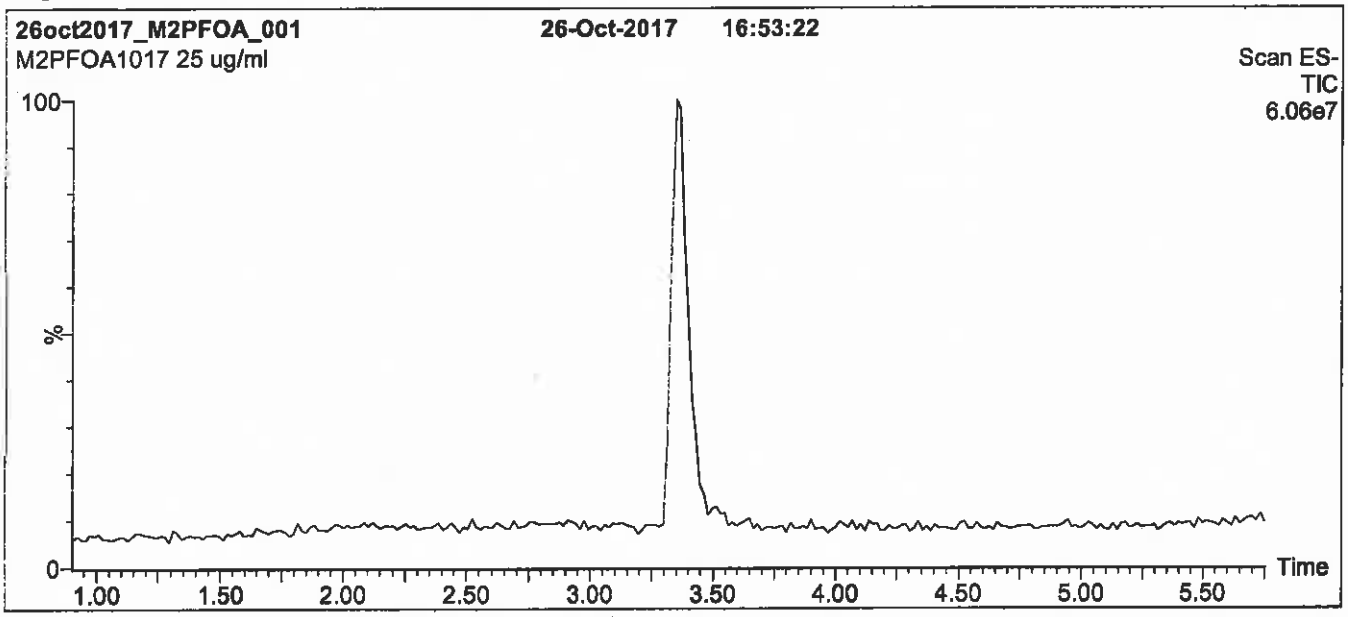
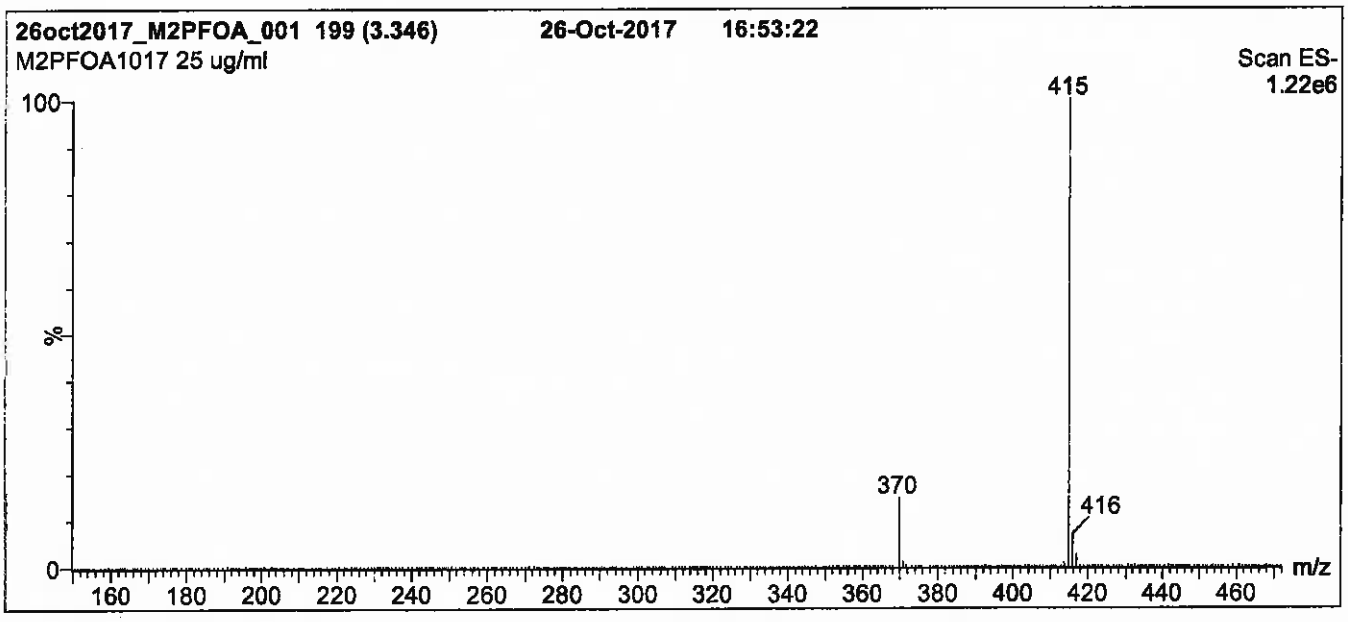
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

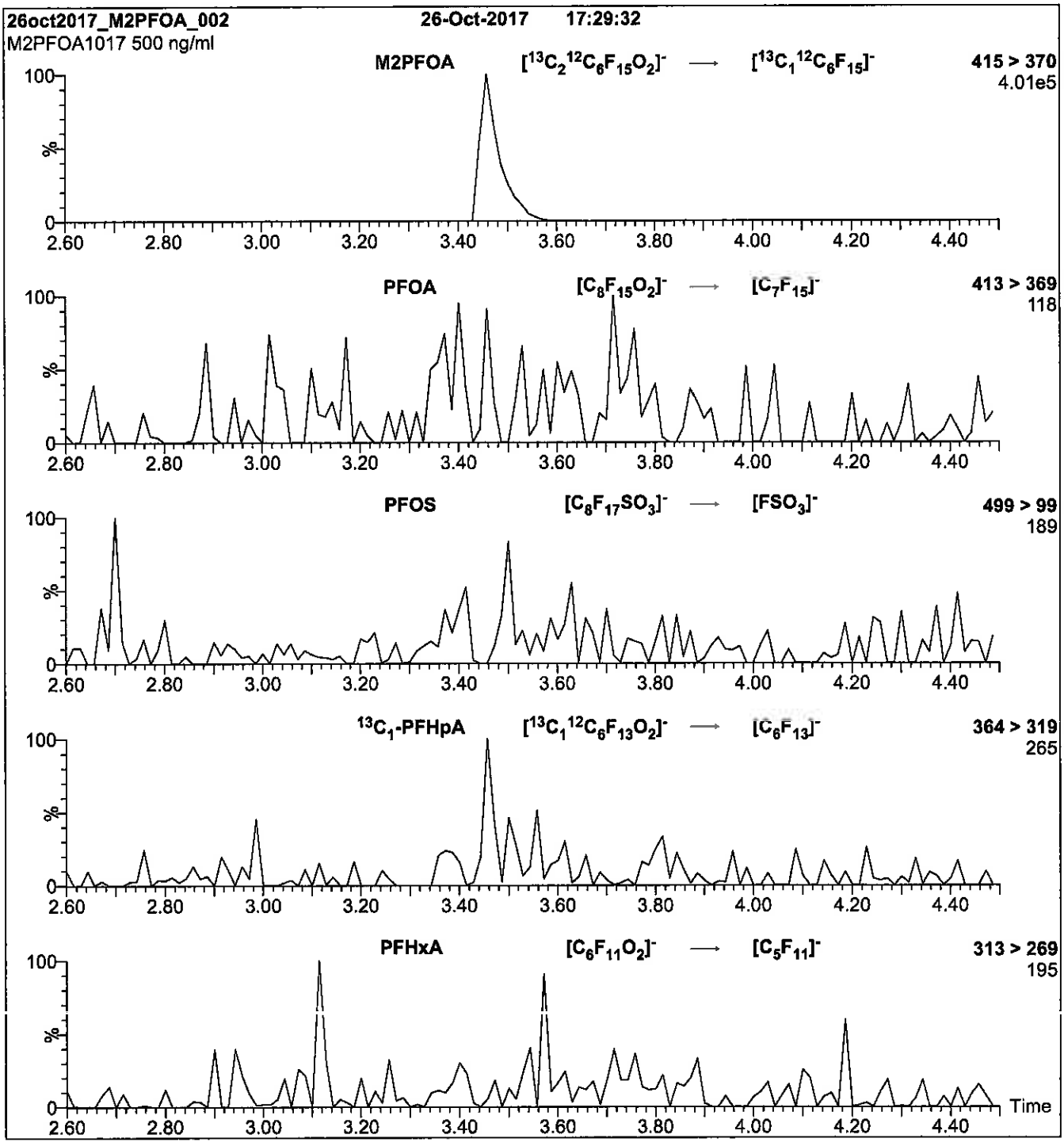
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 10

Reagent

LCM2PFTeDA_00015

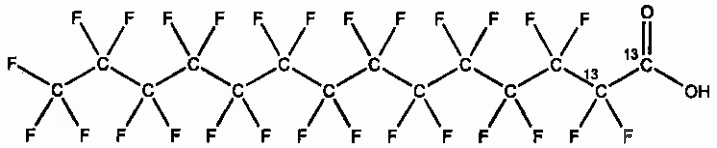
1287281
ID: LCM2PFTeDA_03015
Exp:11/30/22 Prpd:CBW Opn:06/26/18
13C2-PFTeDA at 50ug/mL

R: 6/26/18 CBW

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
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)	11/30/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/30/2022		
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:** 12/01/2017 (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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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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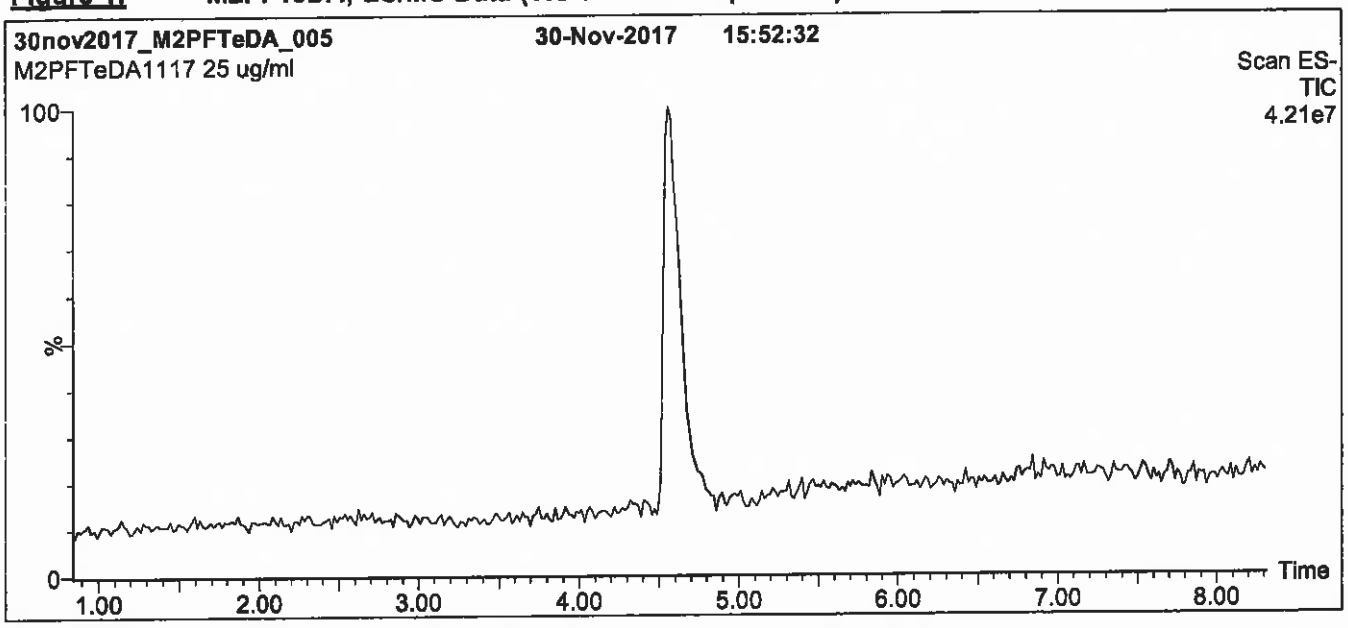
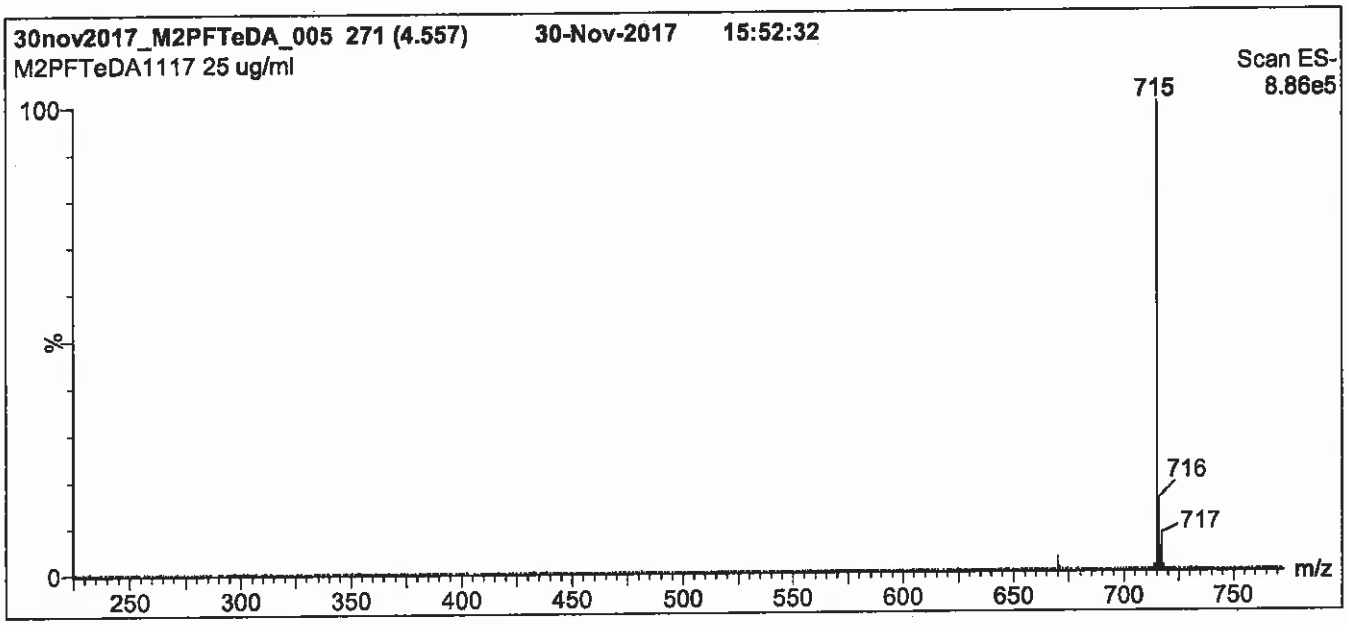
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

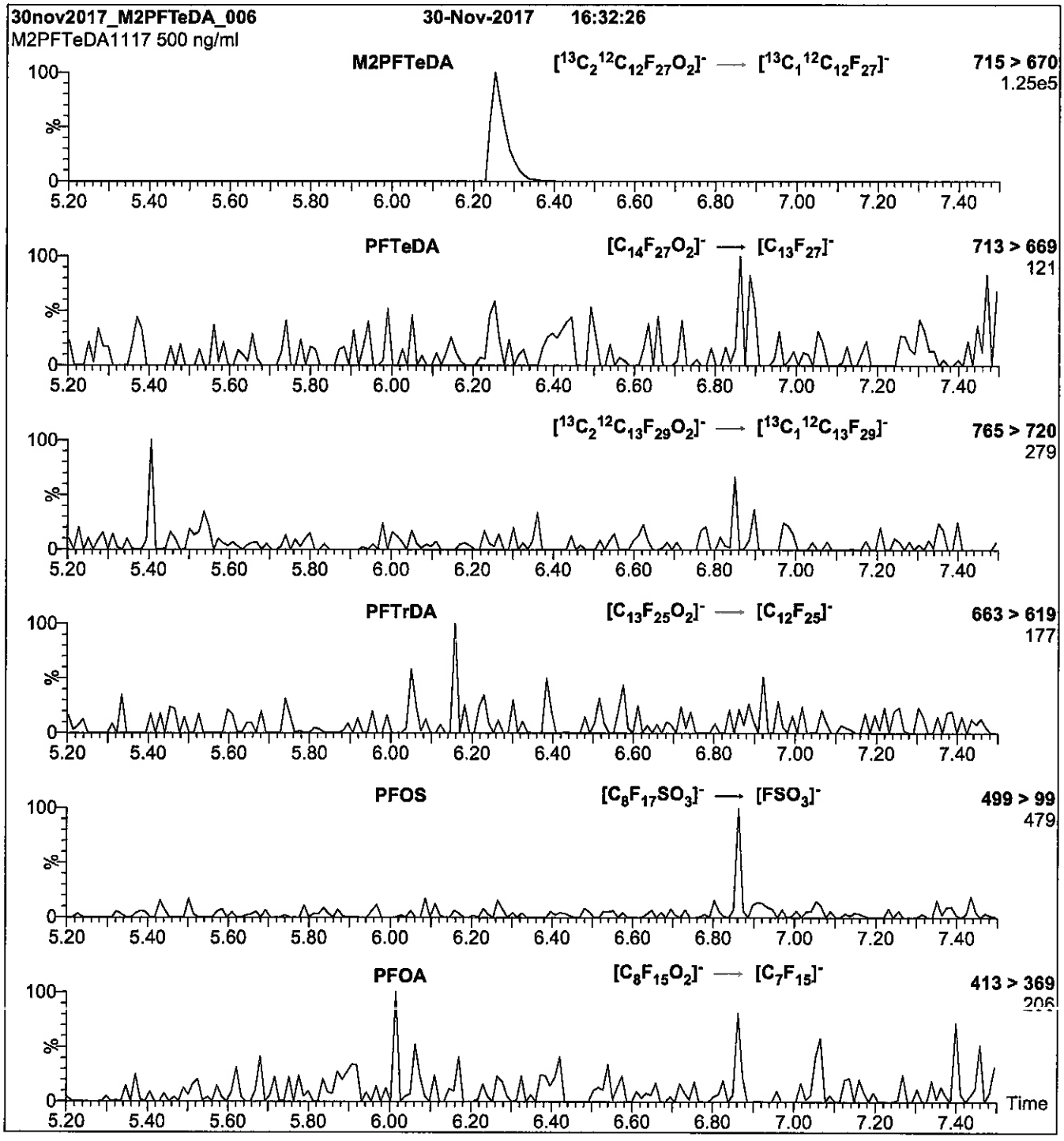
Flow: 300 µl/min

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_00004

1287358
ID: LCM3HFPO-DA_00004
Exp:05/18/21 Prpd:CBW Opn:05/25/18
M3HFPO-DA

R: 6/26/18 CBW

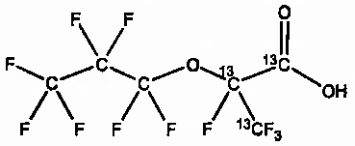
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3HFPO-DA **LOT NUMBER:** M3HFPODA0518

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)	05/18/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/18/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 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:** 05/25/2018 (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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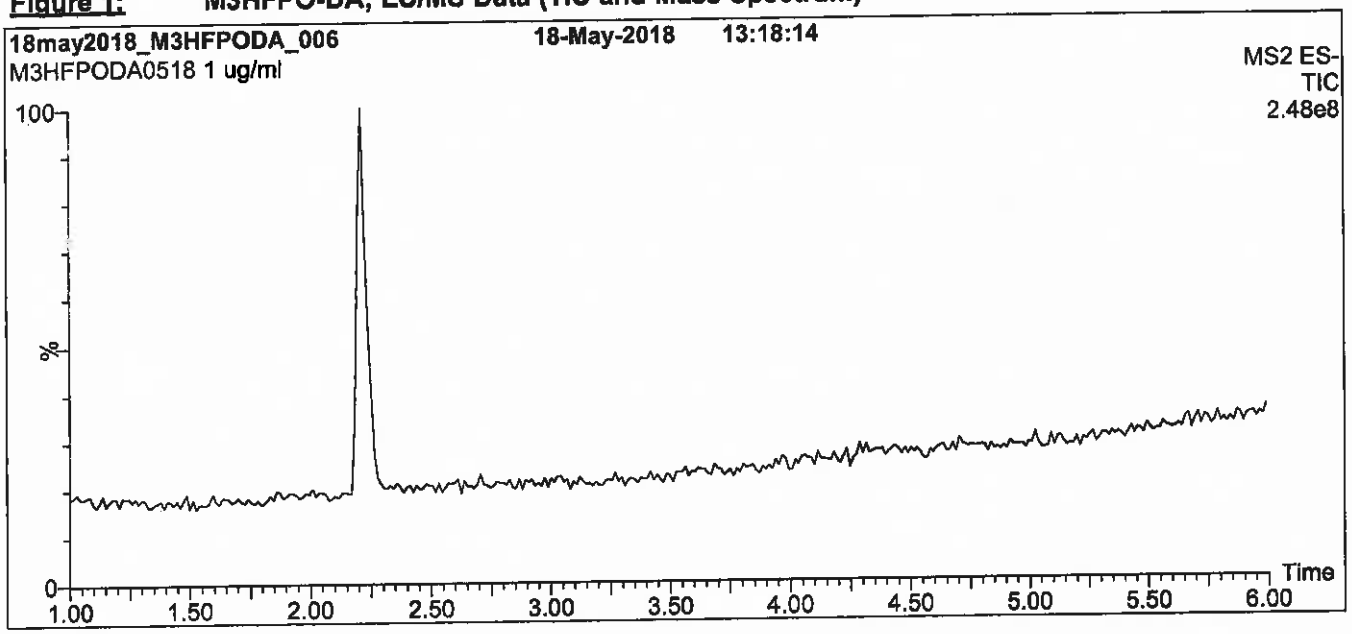
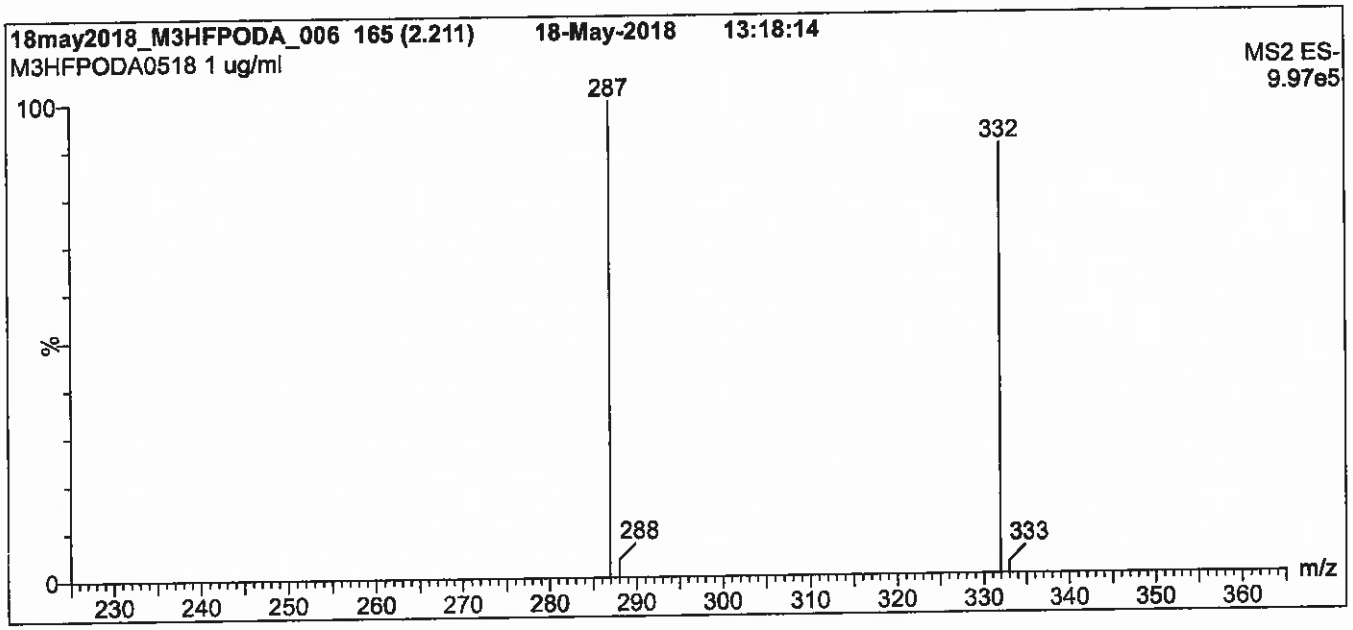
Figure 1: **M3HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro 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 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

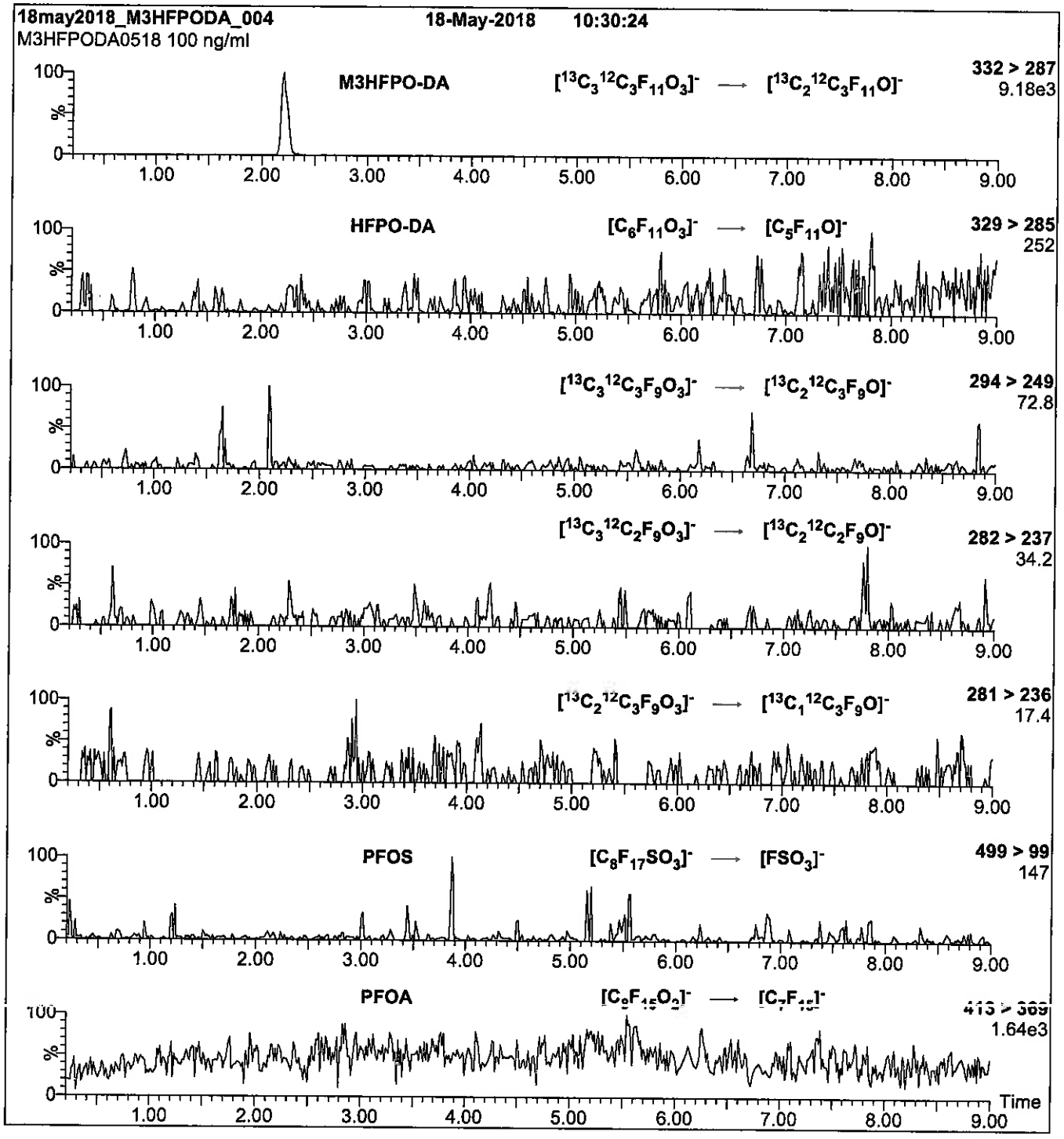
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.10
Cone Voltage (V) = 7.50
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (M3HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 6

Reagent

LCM4PFHPA_00015

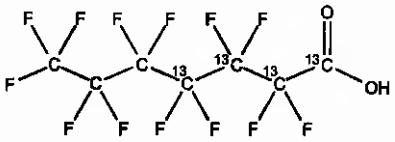
1287287
ID: LCM4PFHPA_00015
Exp:05/03/22 Prpd:CBW Opn:06/26/18
13C4-Perfluoroheptanoic a

R 6/26/18 CBW

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

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:

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.

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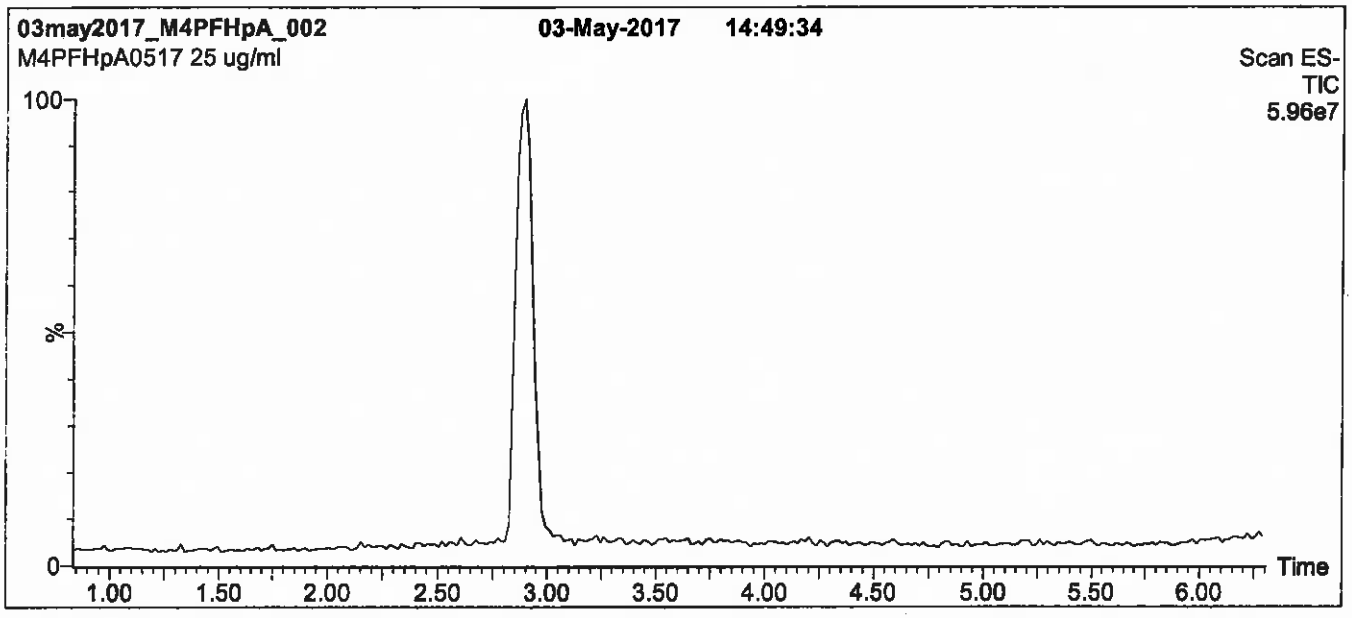
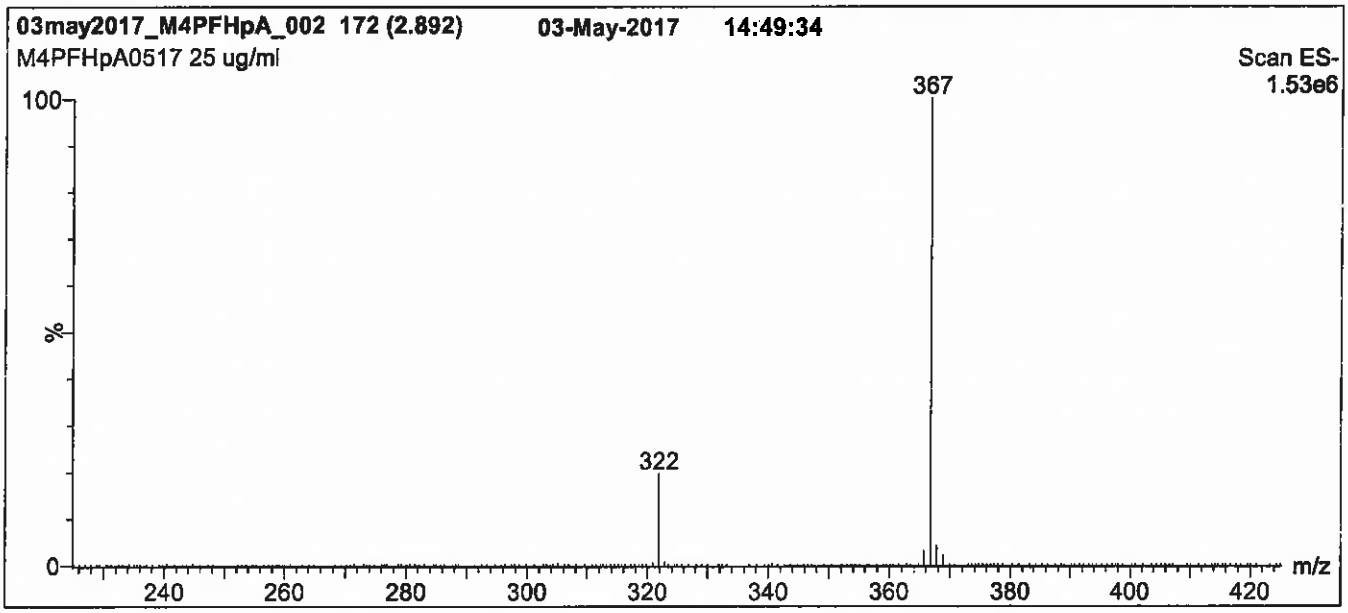
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





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

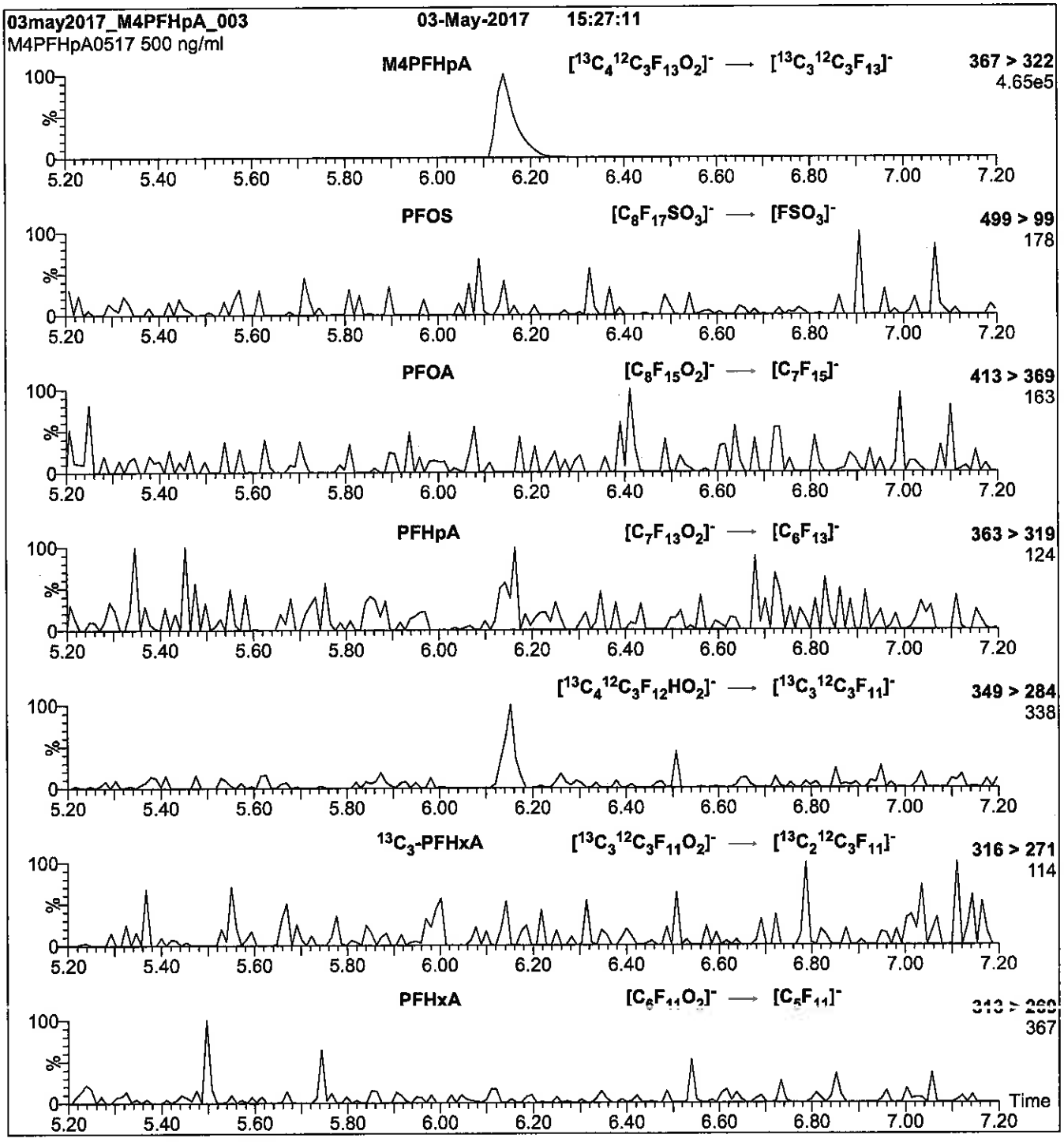
Flow: 300 µl/min

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_00016

R- 6/26/18 CBW

WELLINGTON LABORATORIES

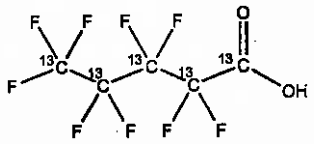
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: M5PFPeA0717

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_6HF_8O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_6$)
LAST TESTED: (mm/dd/yyyy)	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

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

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

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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 REFERENCE MATERIAL PRODUCER

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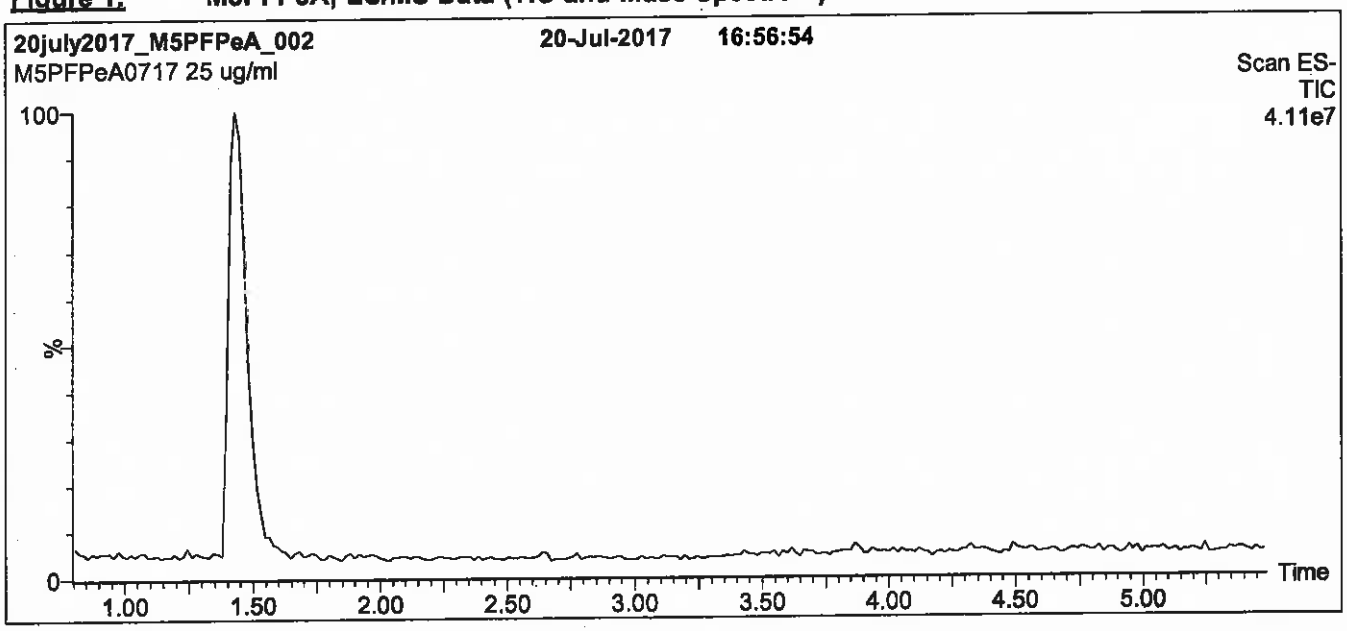
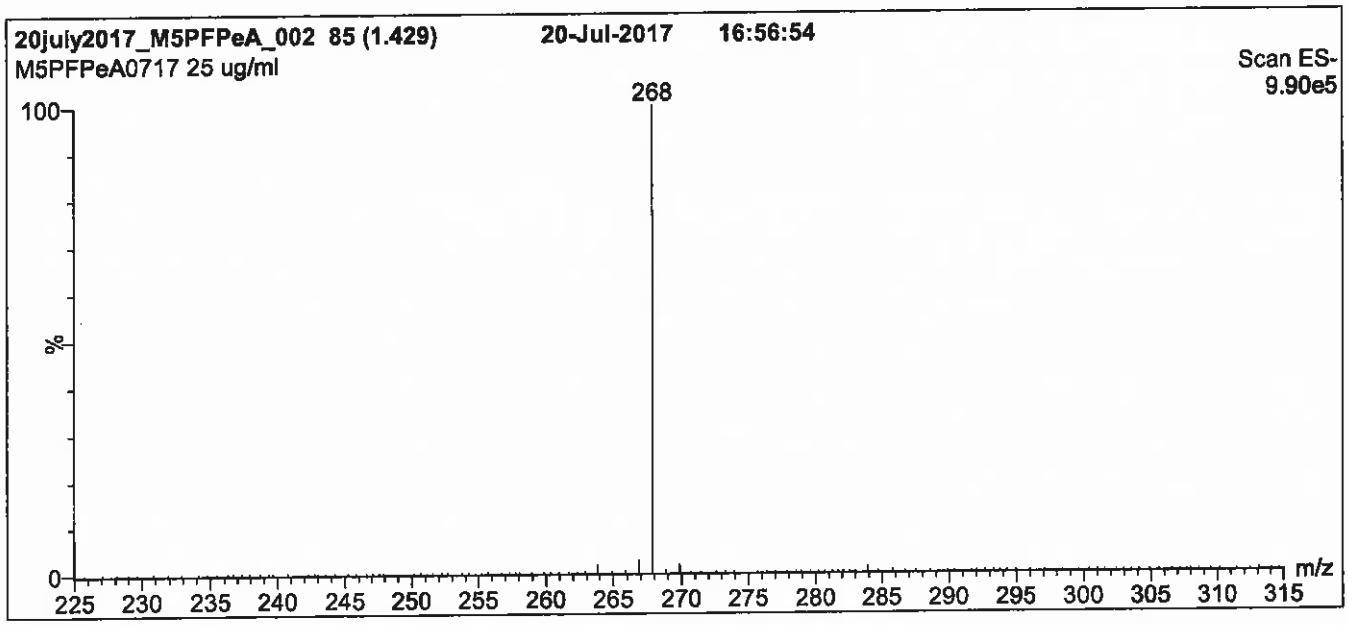
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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

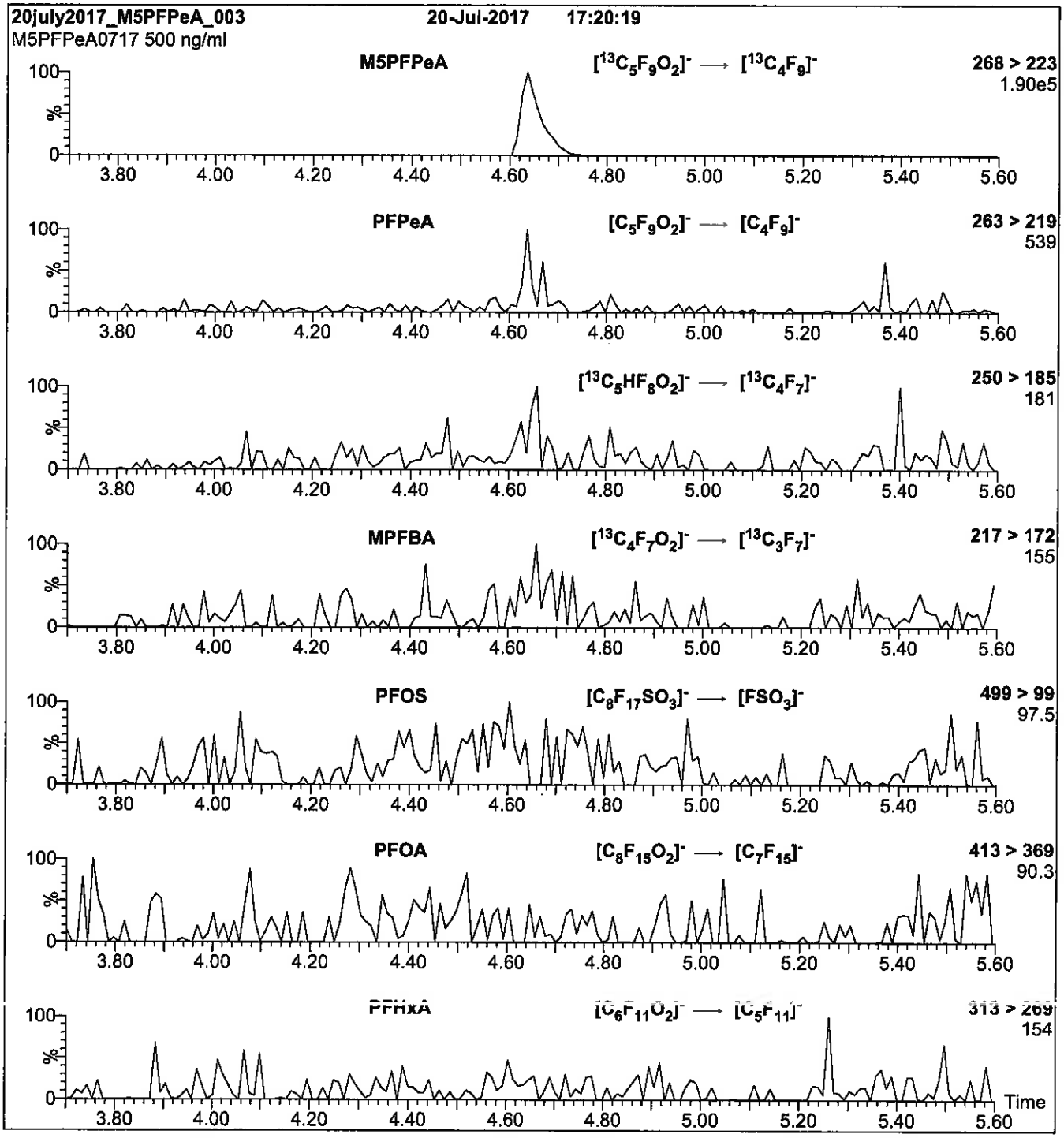
Flow: 300 µl/min

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_00020

1287296
ID: LCM8FOSA_00020
Exp:10/11/22 Prpd:CBW Opn:06/26/18
13C8-Perfluorooctanesulfo

R: 6/26/18 CBW

WELLINGTON LABORATORIES

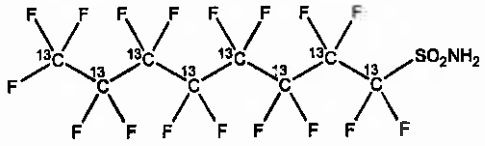
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1017I

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

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CALA

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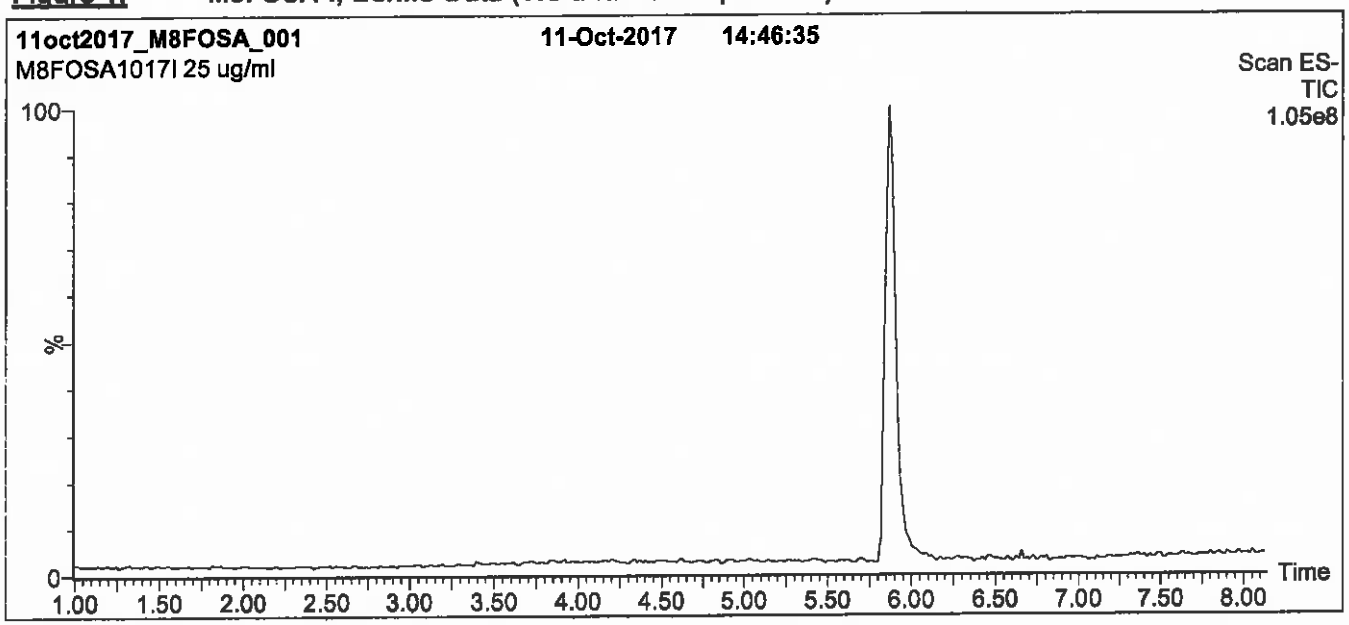
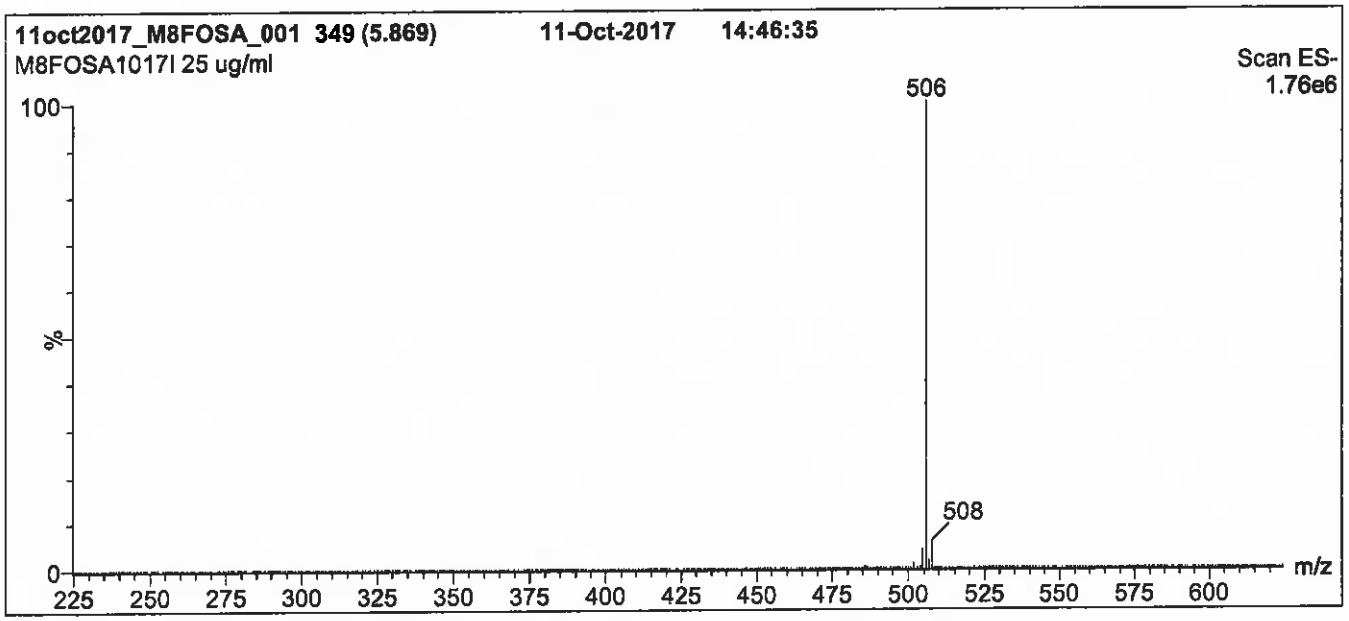
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





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

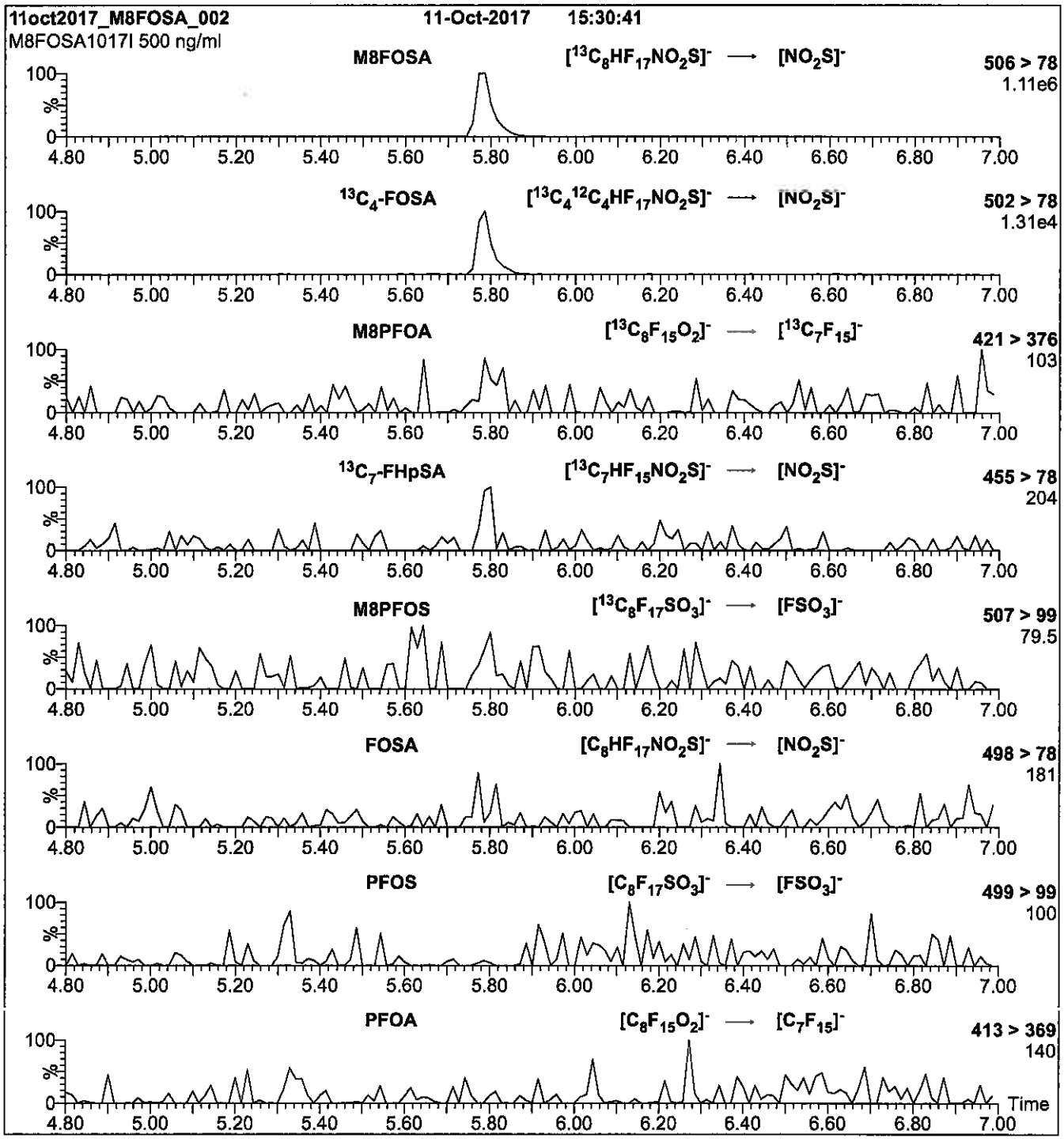
Flow: 300 µl/min

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_00016

1287299
ID: LCMPFBA_00015
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorobutanoic ac

R: 6/26/18 CBW

WELLINGTON LABORATORIES

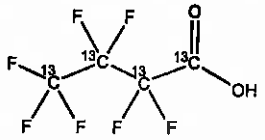
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFBA0218

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) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
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:** 02/22/2018 (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.

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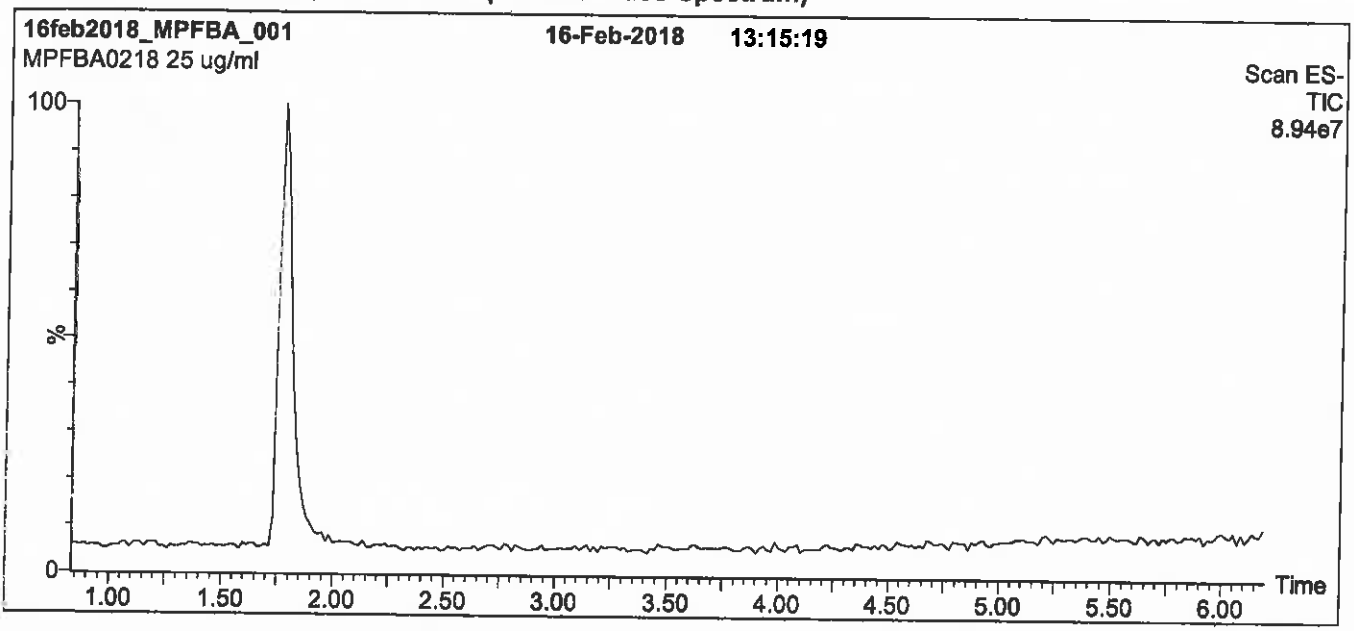
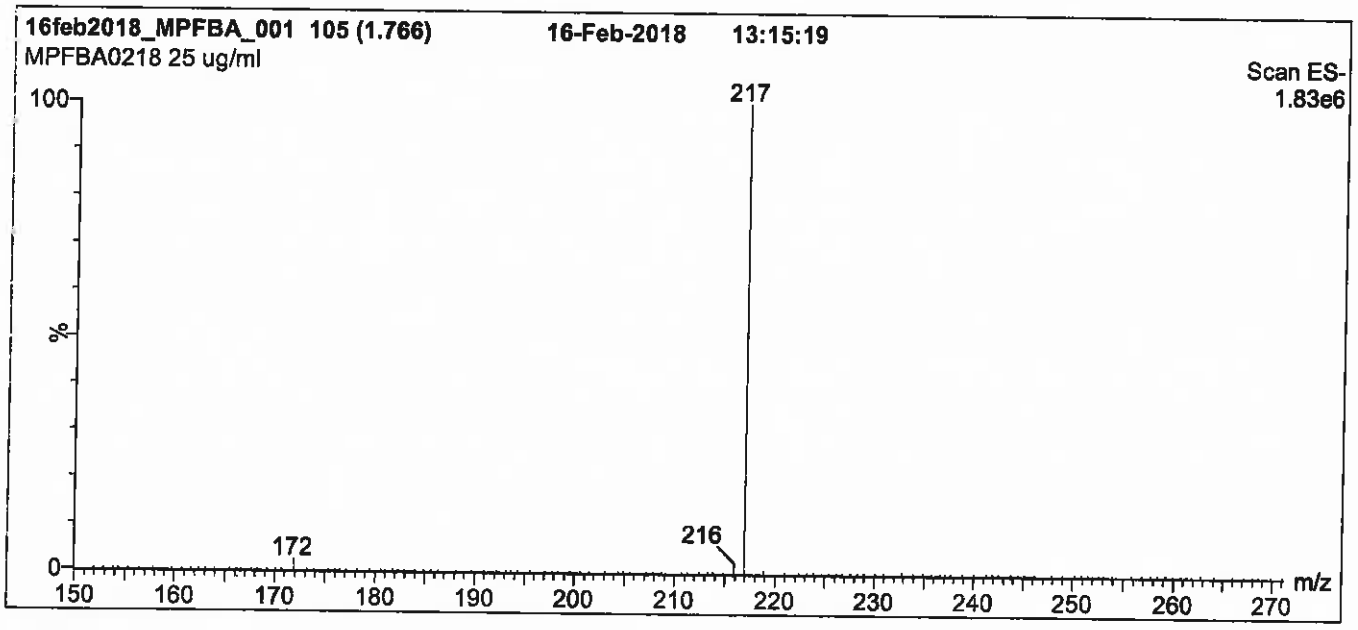
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





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

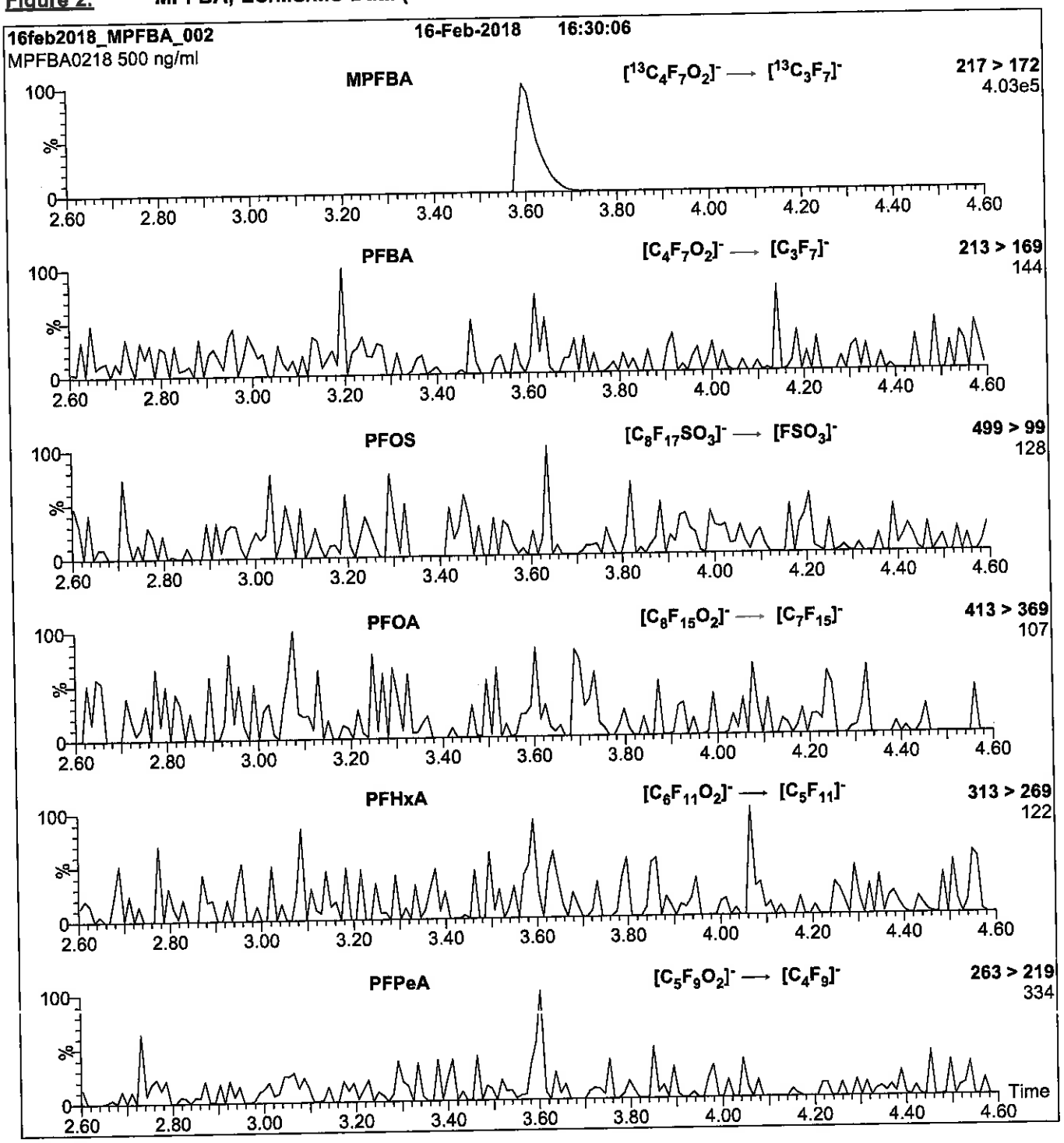
Flow: 300 µl/min

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) = 3.31e-3
Collision Energy (eV) = 10

Reagent

LCMPFBS_00009

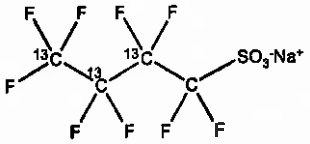
R-C/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3PFBS
LOT NUMBER: M3PFBS0218
COMPOUND: Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate

STRUCTURE:



CAS #: Not available

MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_9SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.5 ± 2.3 µg/ml (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	02/15/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/15/2023		
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:** 02/16/2018 (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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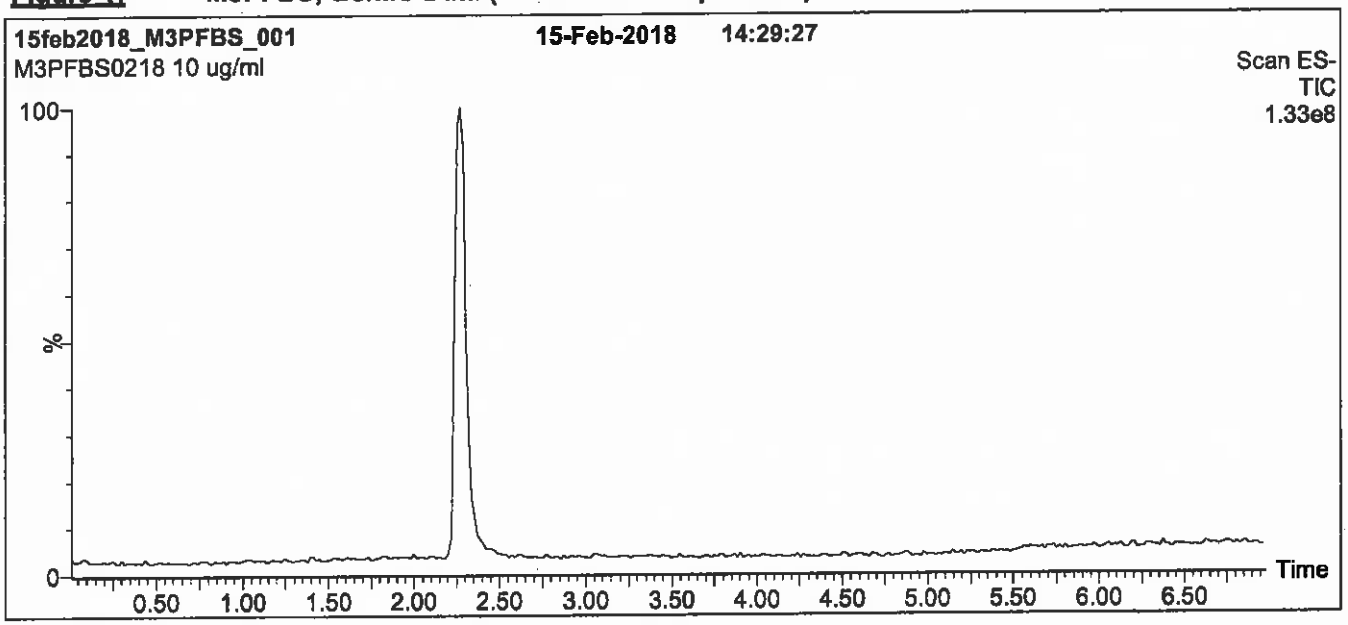
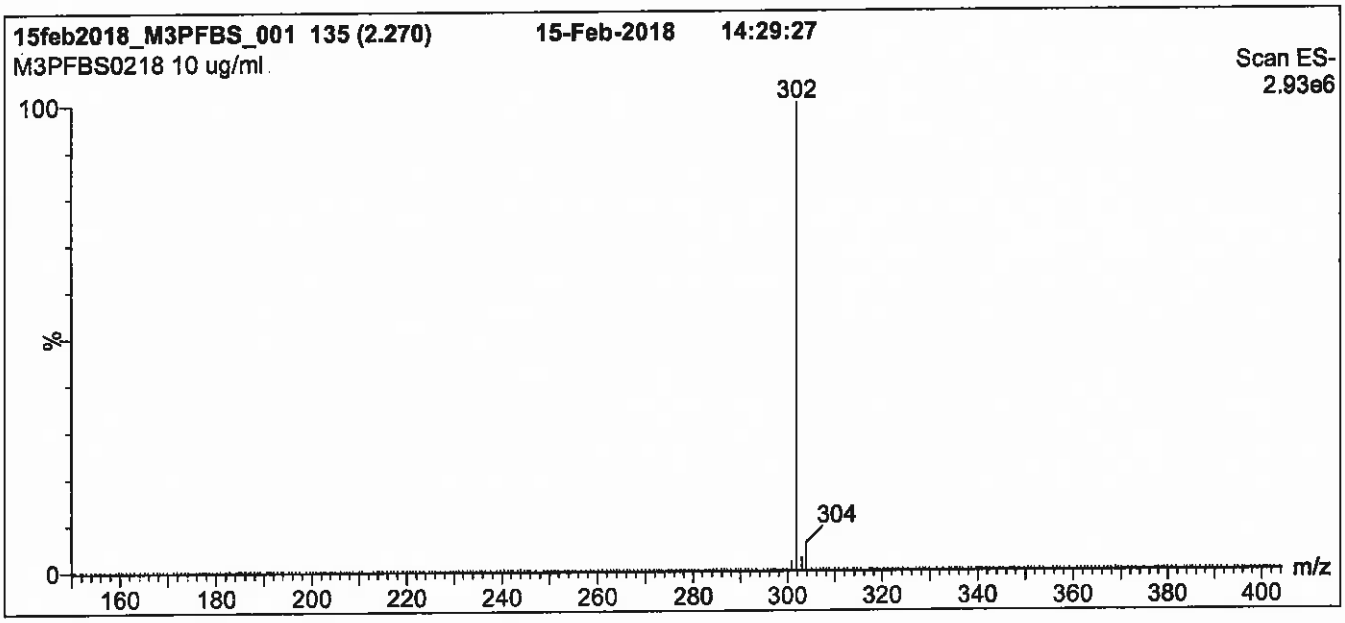
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





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

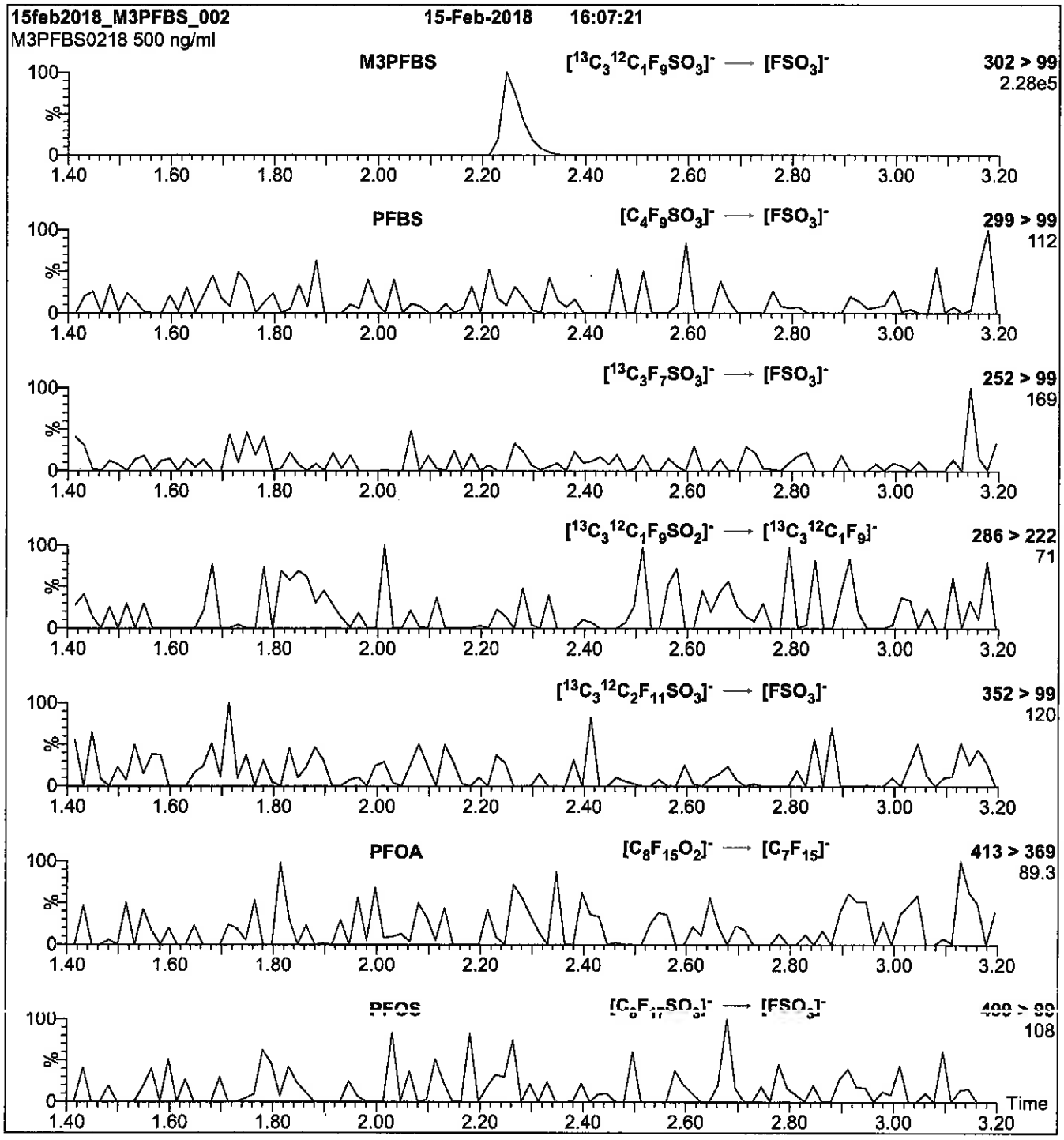
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
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) = 3.17e-3
Collision Energy (eV) = 25

Reagent

LCMPFDA_00021

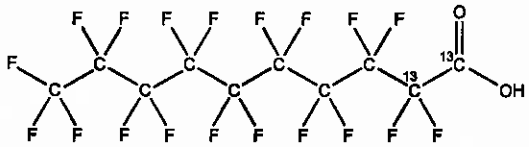
1287334
ID: LCMPFDA_00021
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C2-Perfluorodecanoic a

R=6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0218
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/07/2018 (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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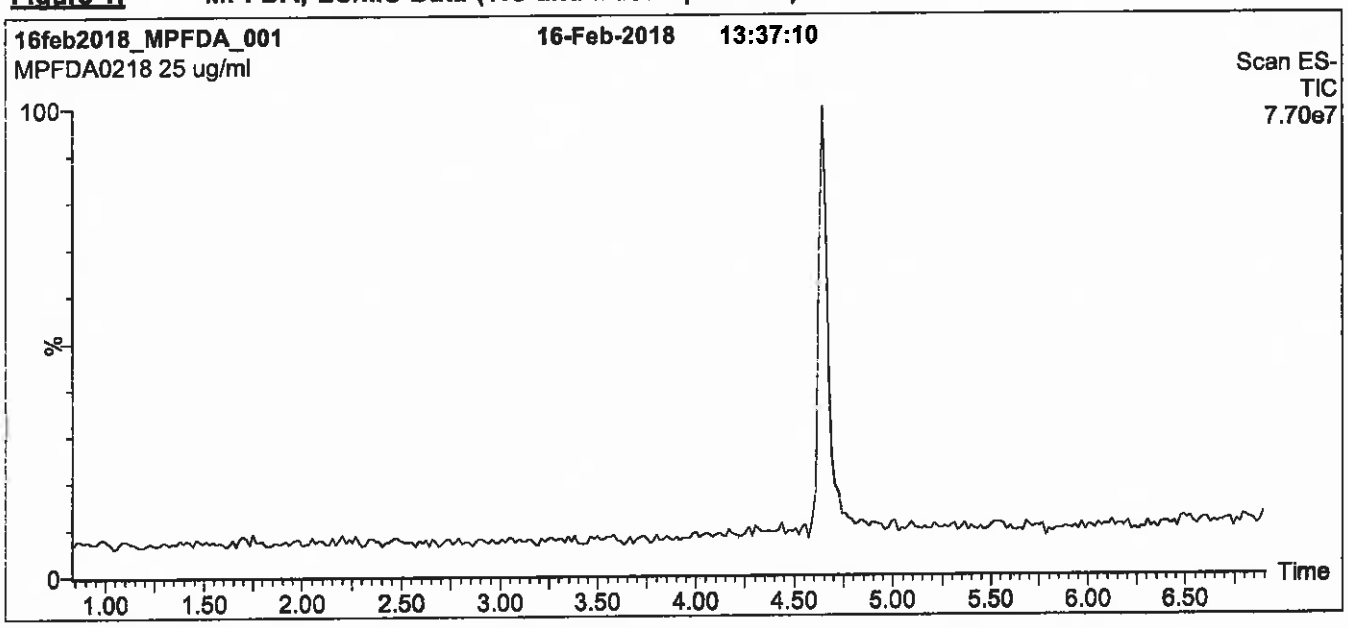

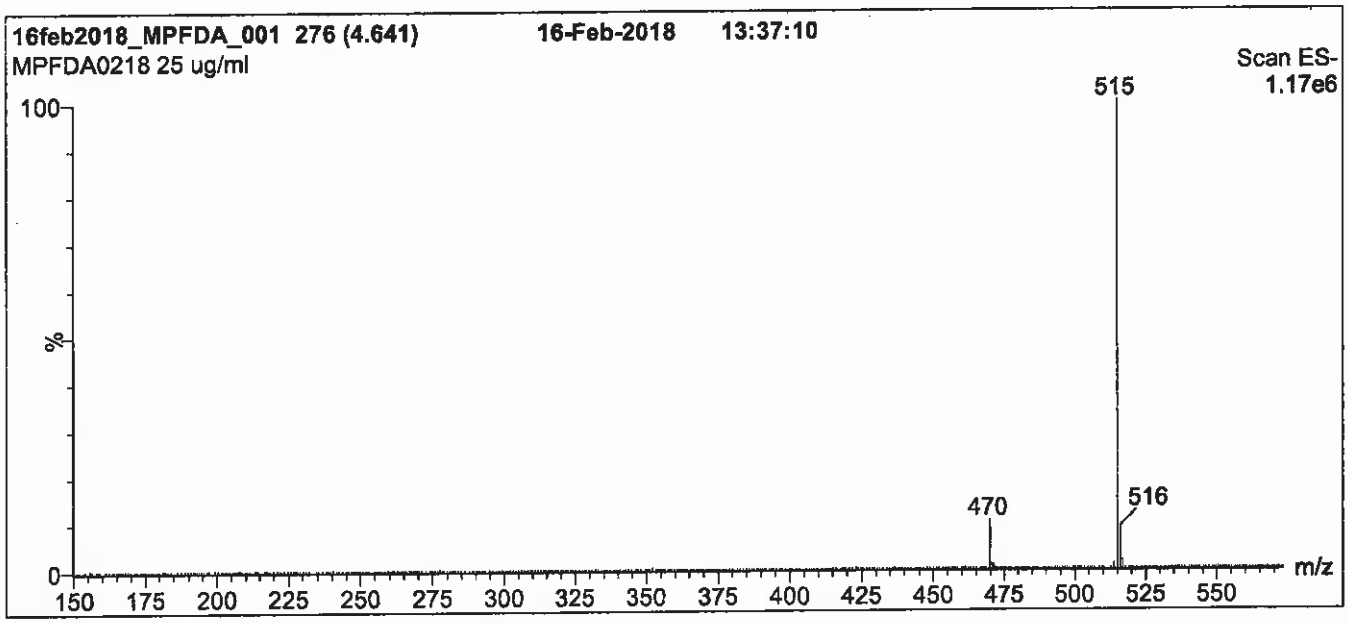

Conditions for Figure 1:

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

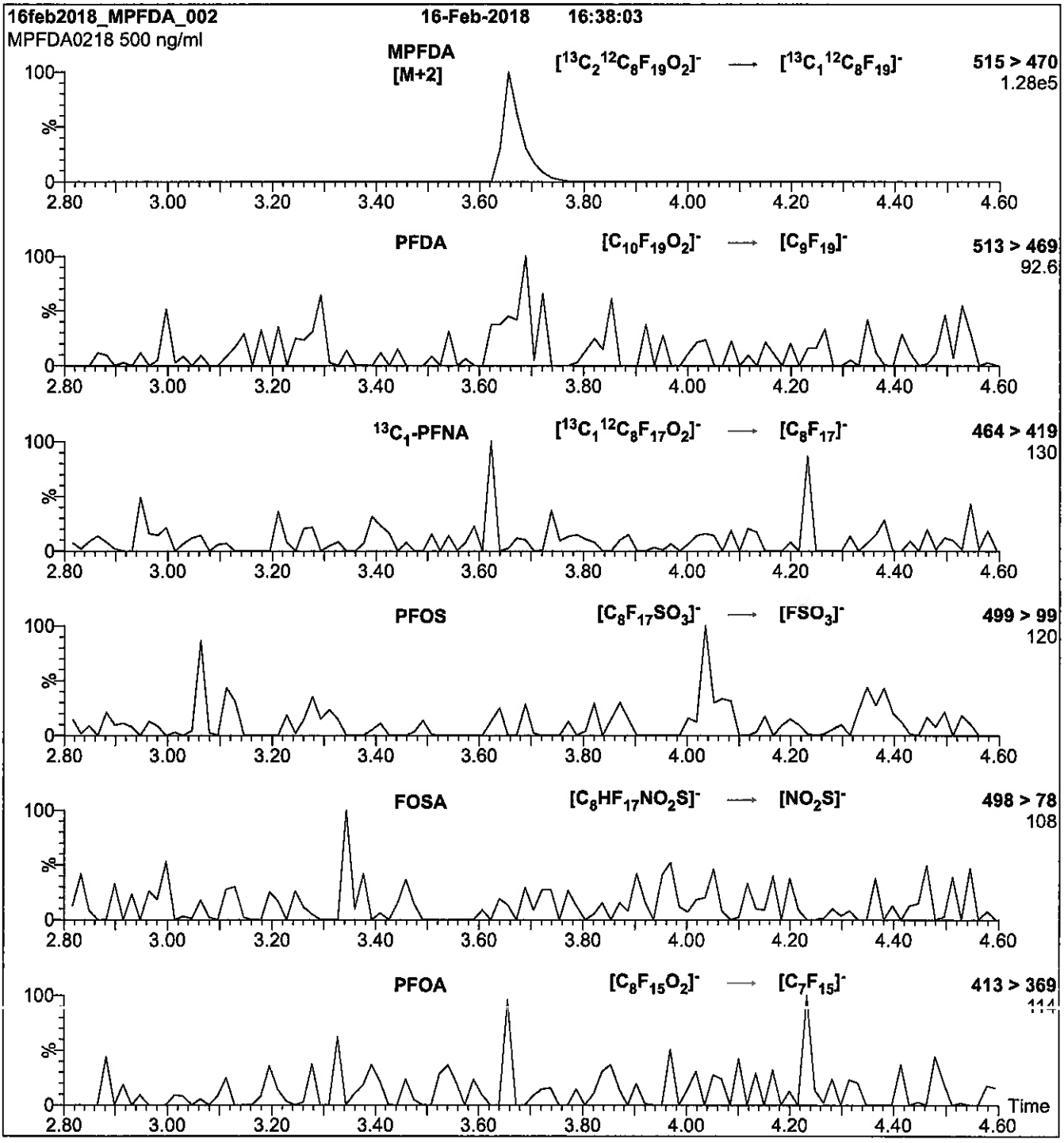
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 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) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00016

6/26/18 CBW

WELLINGTON LABORATORIES

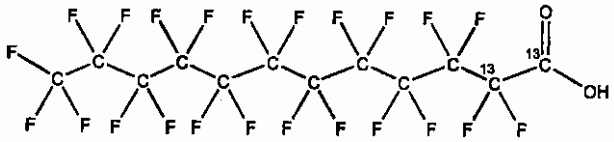
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFDoA0218

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
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Certified By: _____ **Date:** 02/23/2018 (mm/dd/yyyy)
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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 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 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:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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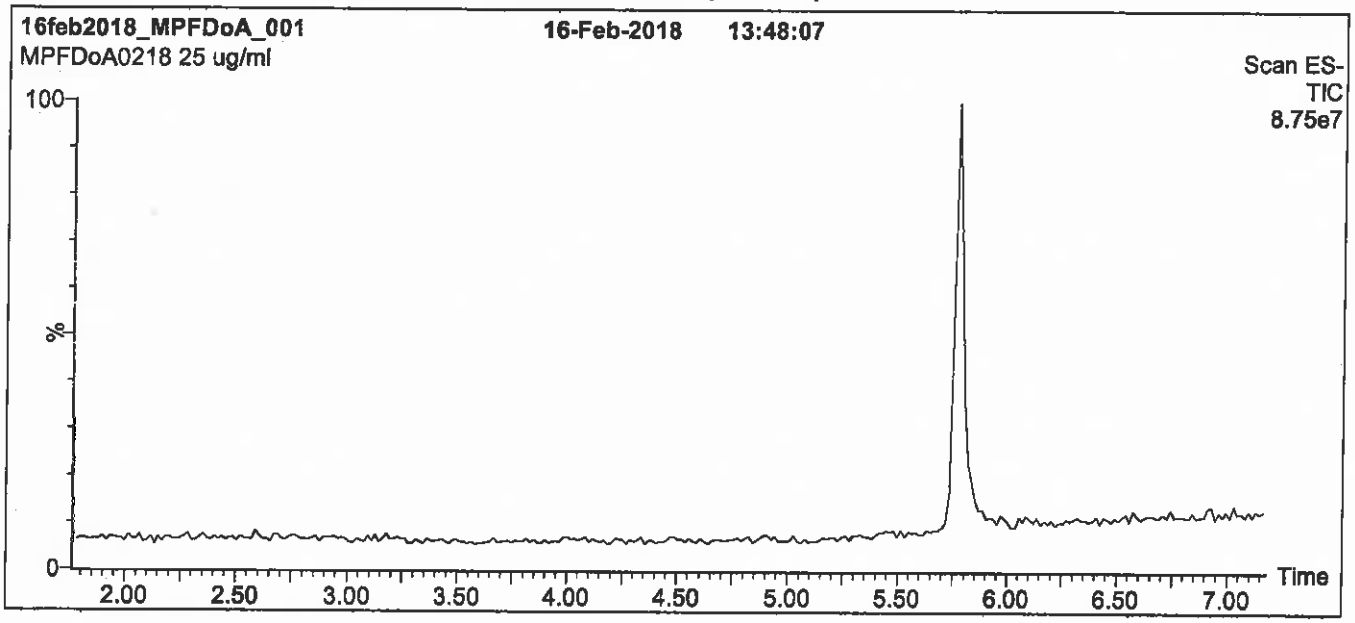
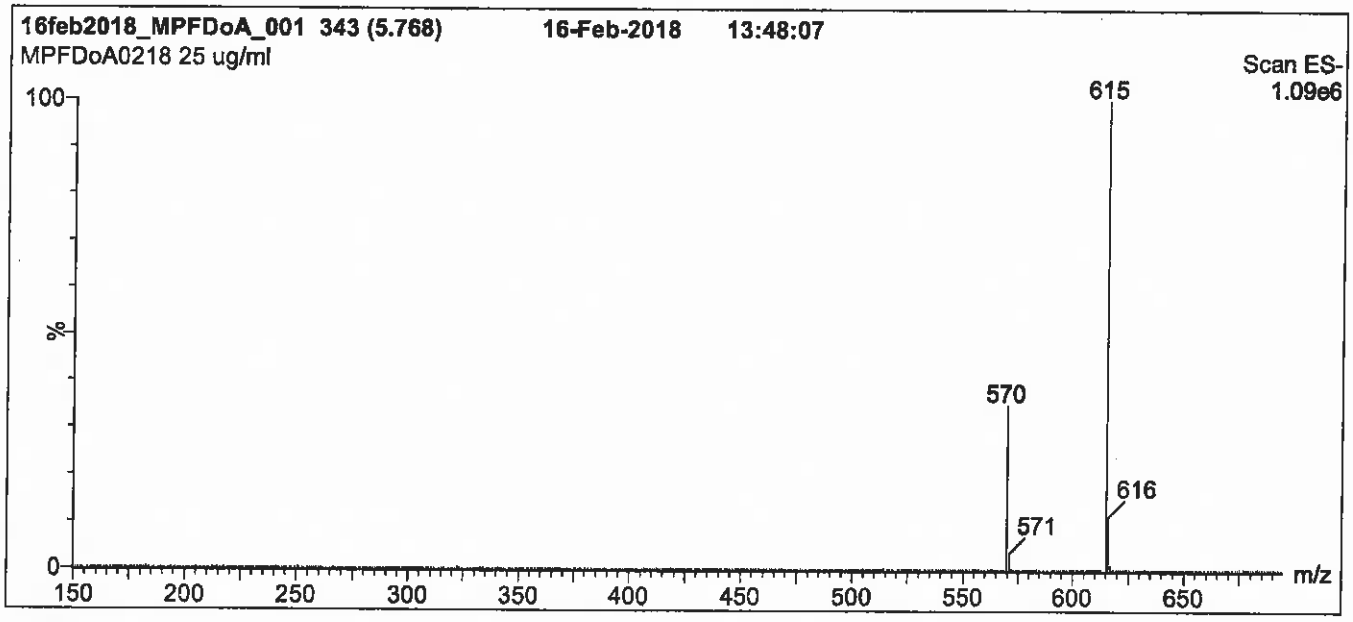
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





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

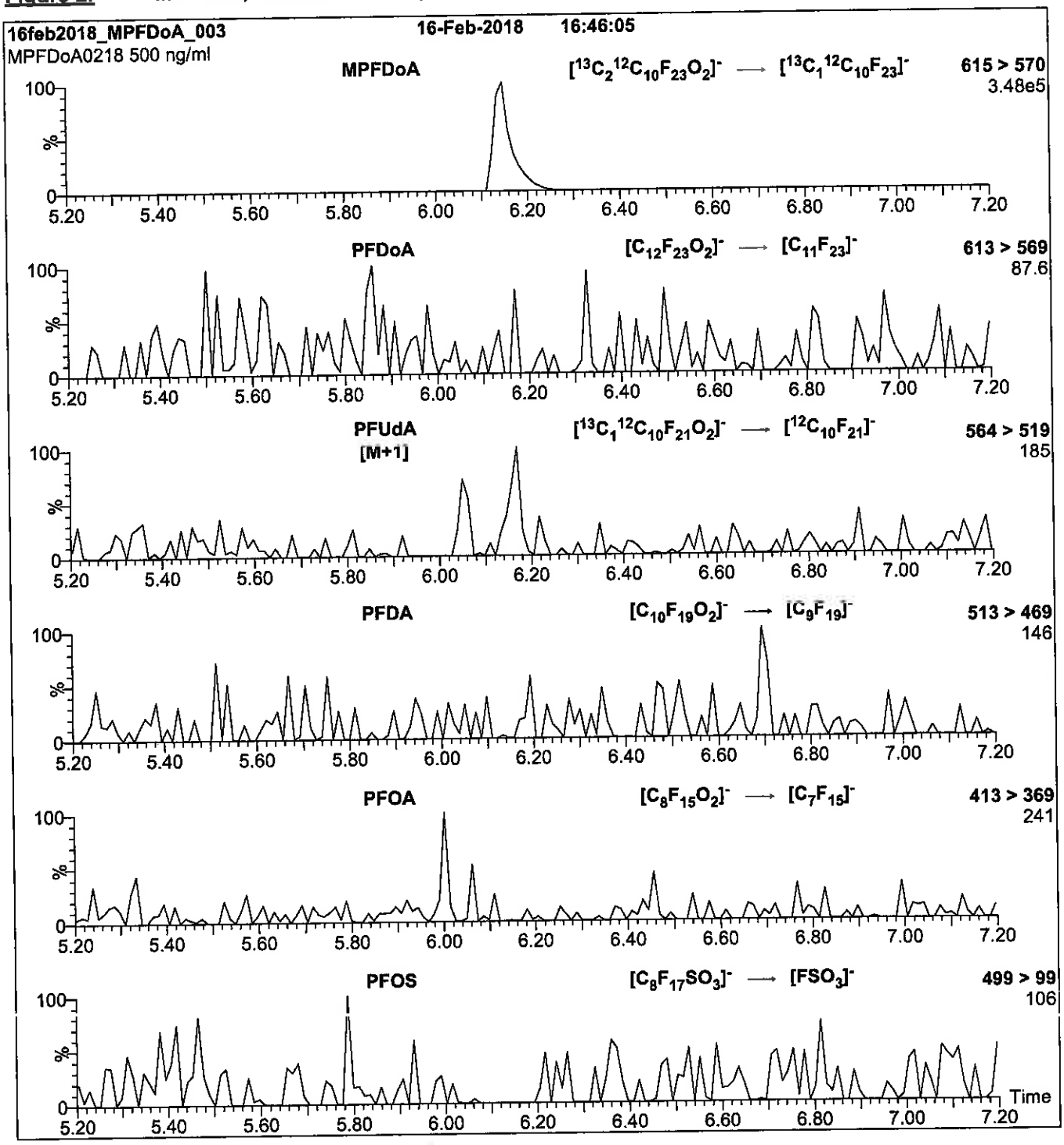
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 50
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) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00023

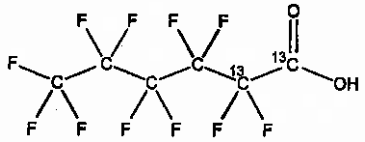
1287337
ID: LCMPFHxA_00023
Exp:10/27/22 Prpd:CBW Opn:06/26/18
13C2-Perfluorohexanoic ac

R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA1017
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid		
STRUCTURE:		**CAS #:**	Not available



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

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.

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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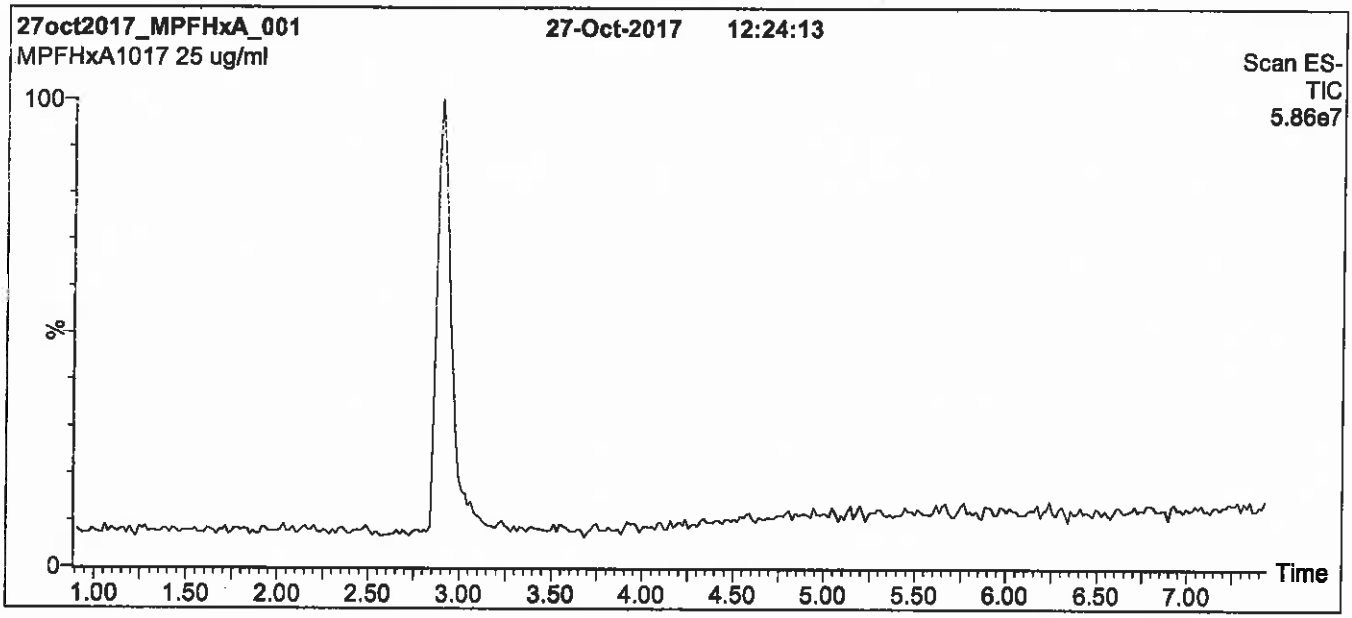
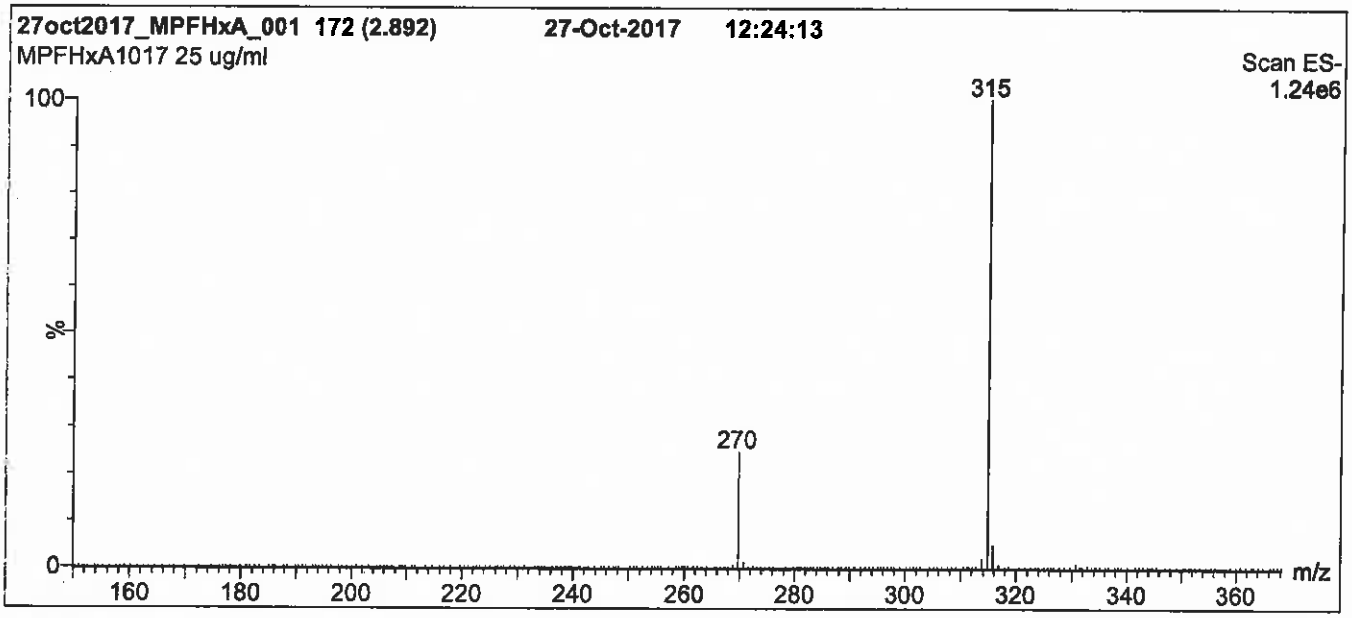
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





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

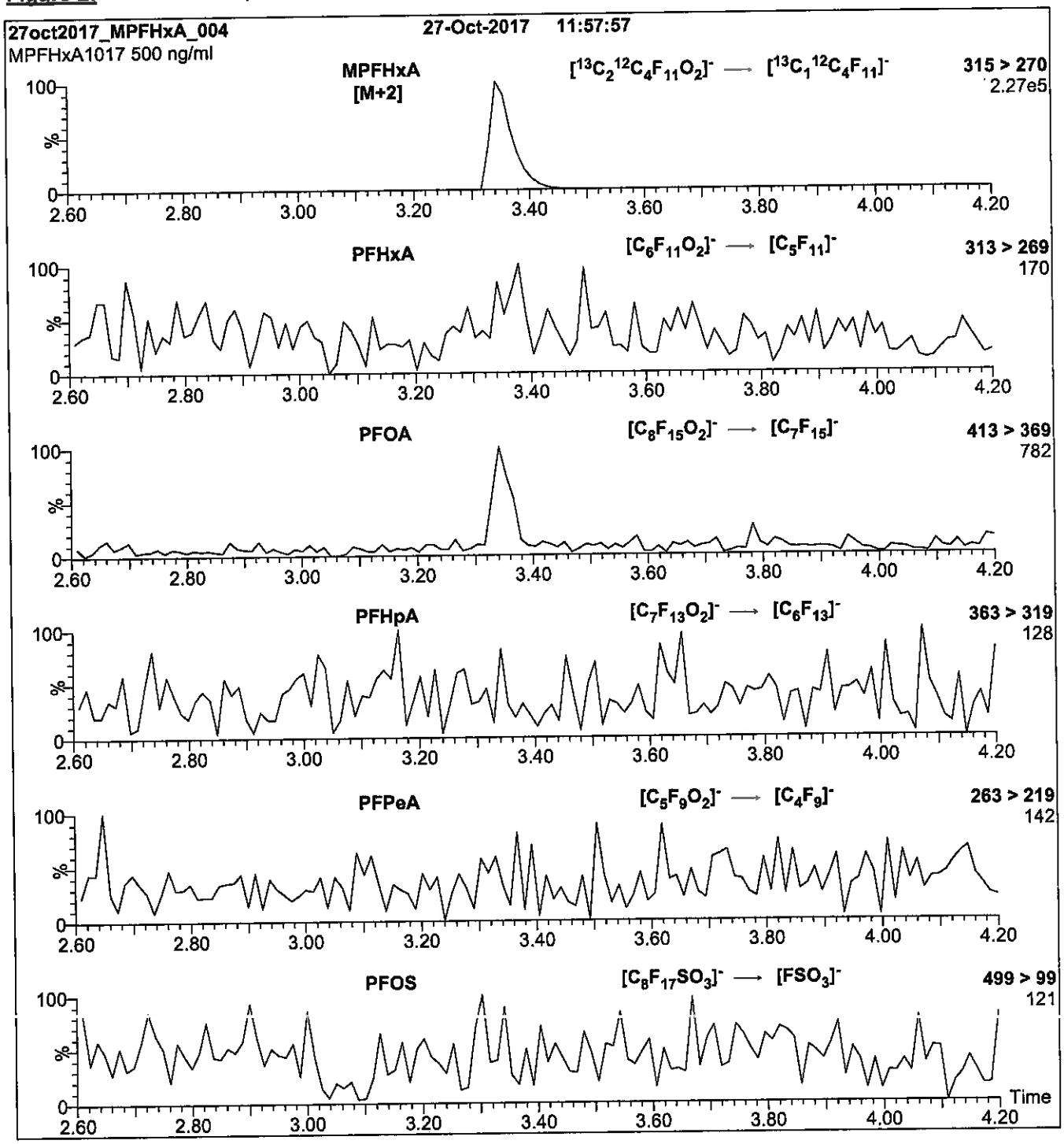
Flow: 300 µl/min

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_00016

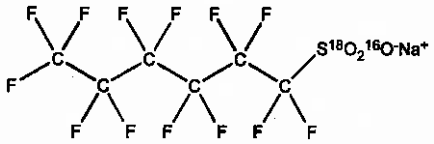
1287304
ID: LCMPFHxS_00016
Exp:03/22/23 Prpd:CBW Opn:06/26/18
18O2-Perfluorohexanesulfo

R: 6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0318
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	1585941-14-5



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (MPFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	03/22/2018		
EXPIRY DATE: (mm/dd/yyyy)	03/22/2023		
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) and ~ 0.3% of sodium perfluoro-1-heptane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFHpS).
- 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: _____ **Date:** 06/07/2018 (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 REFERENCE MATERIAL PRODUCER

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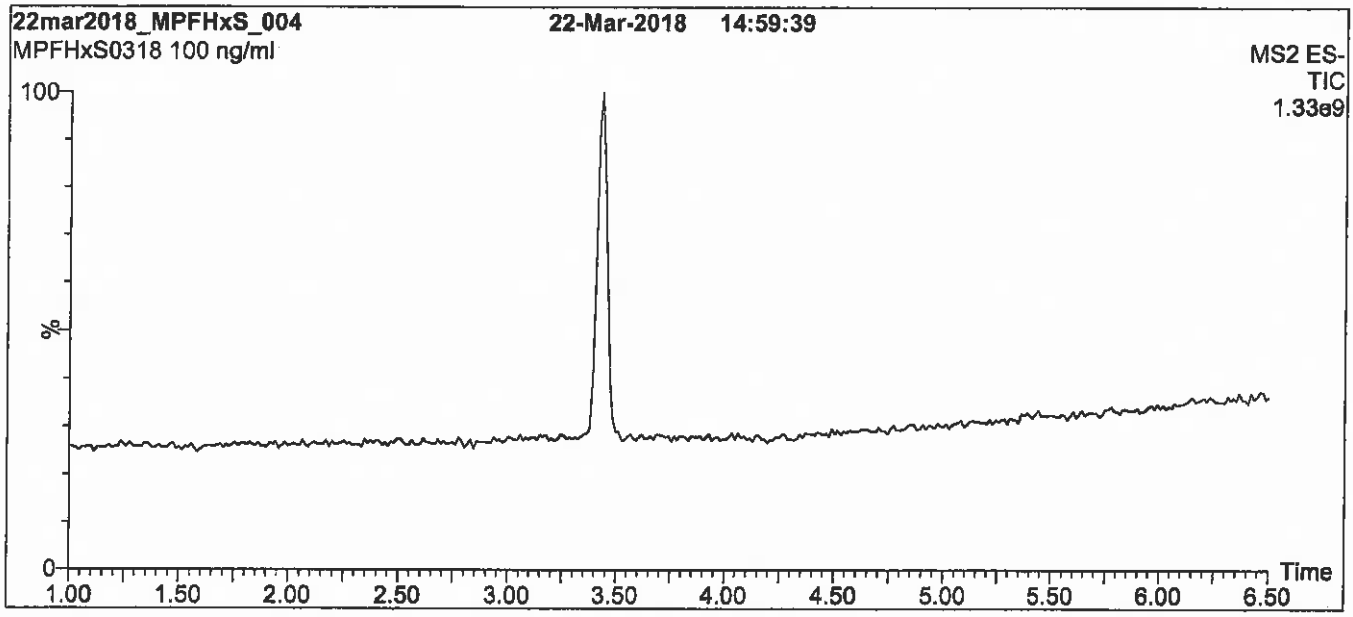
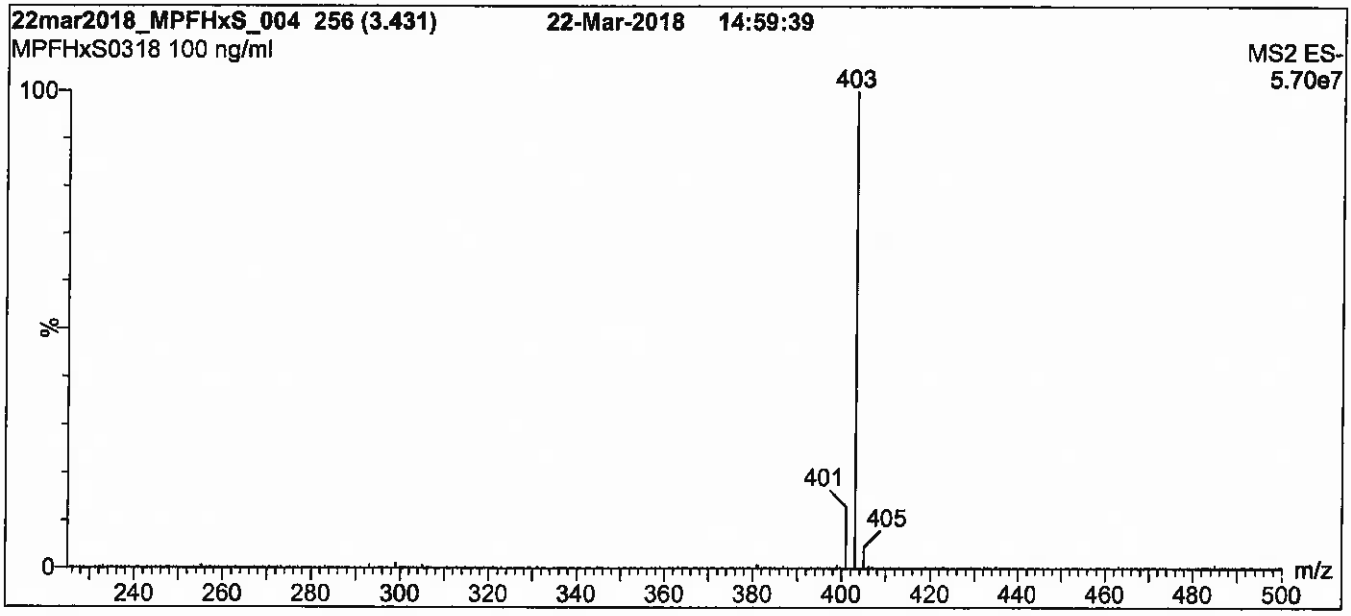
Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro 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 80% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

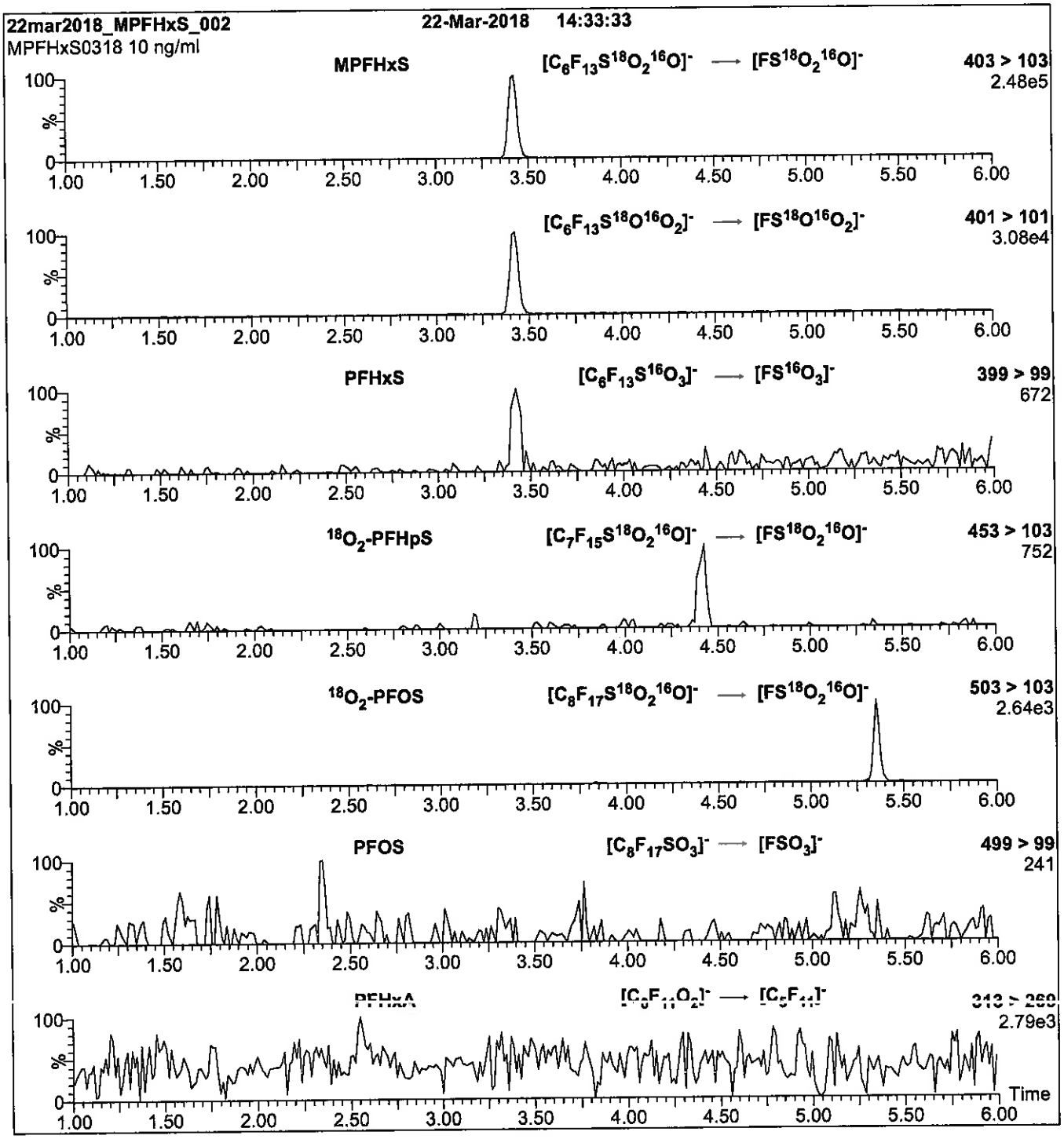
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (MPFHxS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.64e-3
Collision Energy (eV) = 32

Reagent

LCMPFNA_00016

1287293
ID: LCMPFNA_00016
Exp:12/14/22 Prpd:CBW Opn:06/26/18
13C5-Perfluorononanoic aci

R: 6/26/18 CBW

WELLINGTON LABORATORIES

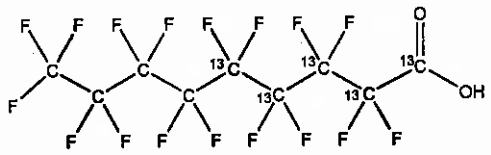
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFNA1217

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) 12/14/2017
EXPIRY DATE: (mm/dd/yyyy) 12/14/2022
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: _____ **Date:** 12/19/2017 (m:m/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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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:

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CALA

ANAB ACCREDITED

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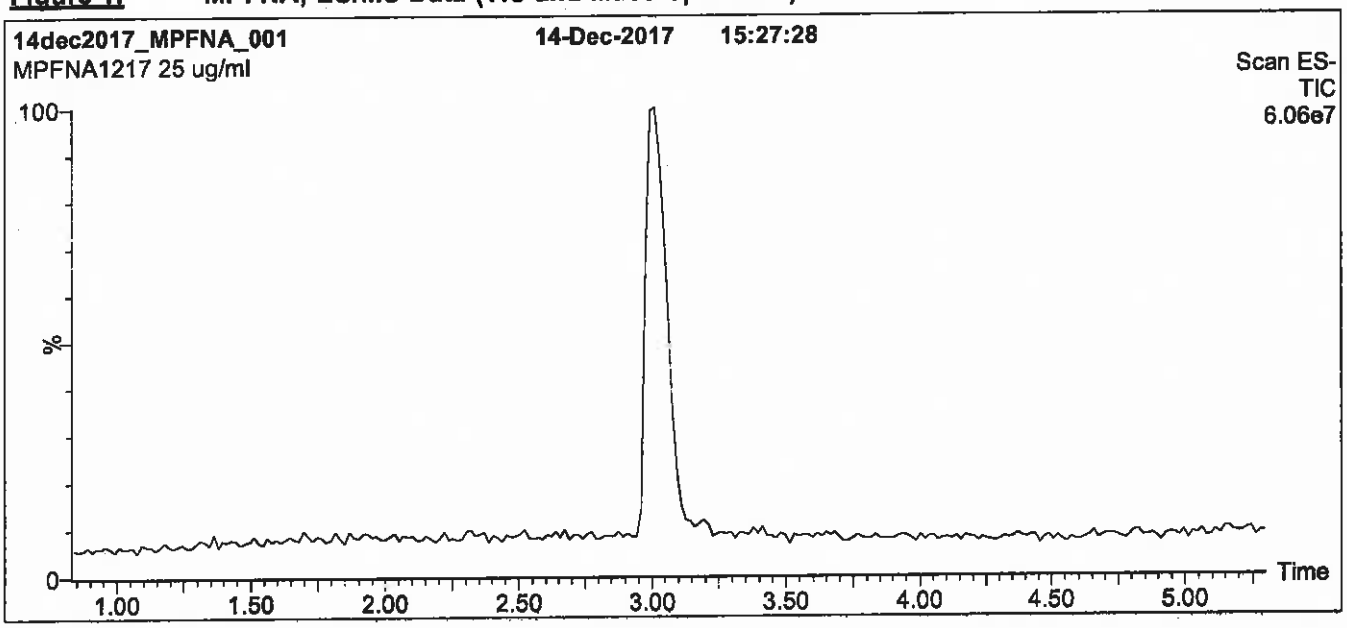
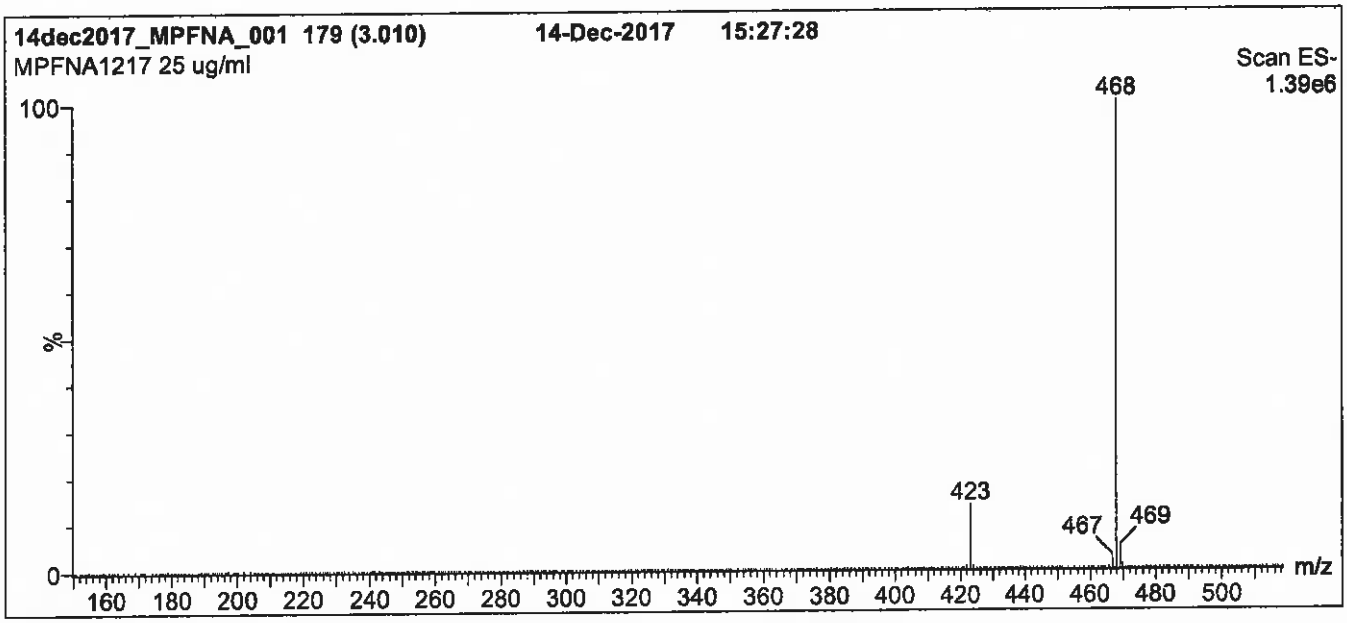
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

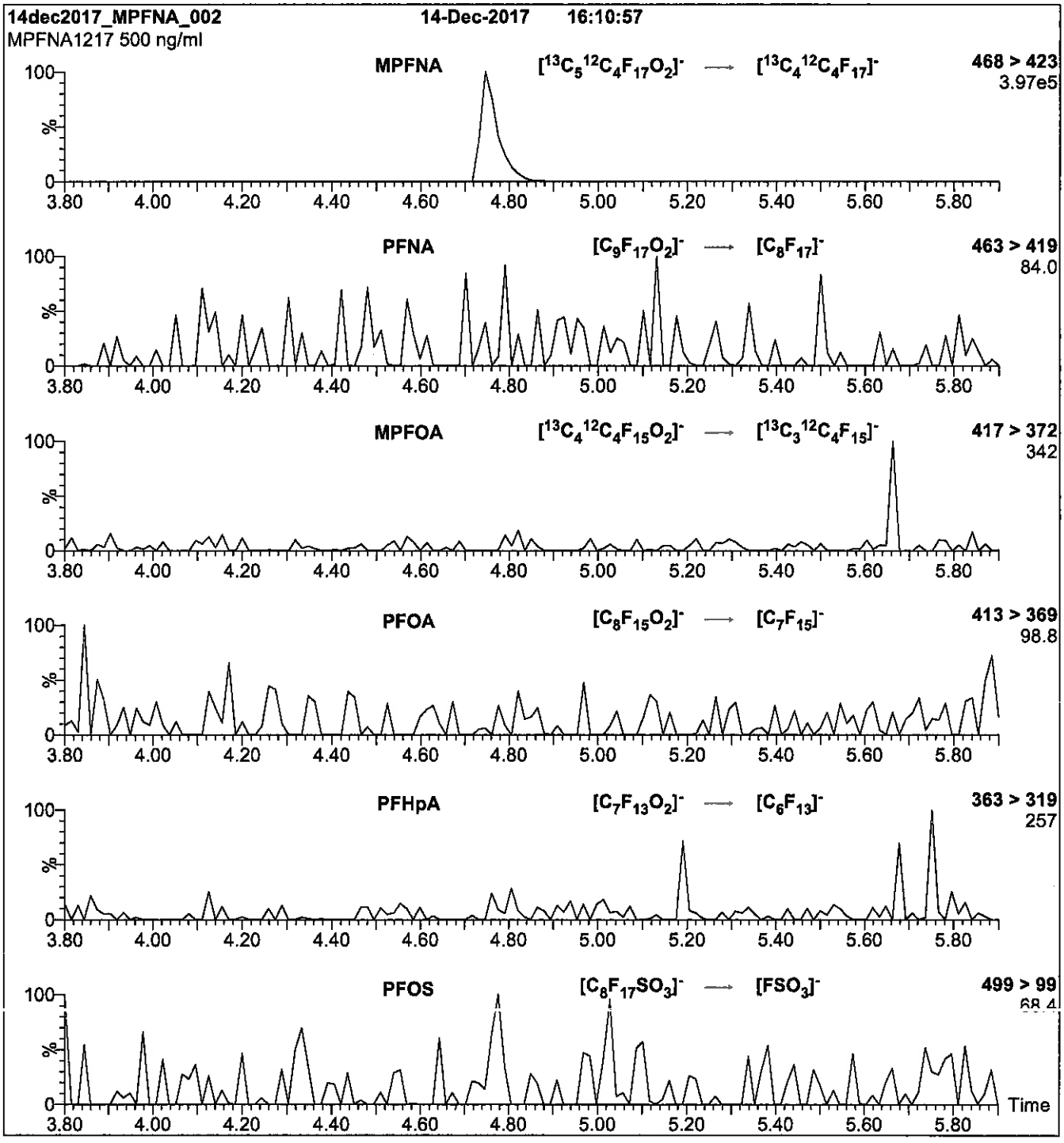
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **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) = 3.43e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00020

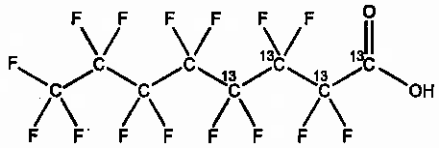
1287275
ID: LCMPFOA_00020
Exp:05/04/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorooctanoic ac

Q: CBW 6/26/18

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFOA	**LOT NUMBER:**	MPFOA0418
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid		
STRUCTURE:		**CAS #:**	960315-48-4



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{15}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/04/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/04/2023		
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:** 06/13/2018 (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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HANDLING:

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TRACEABILITY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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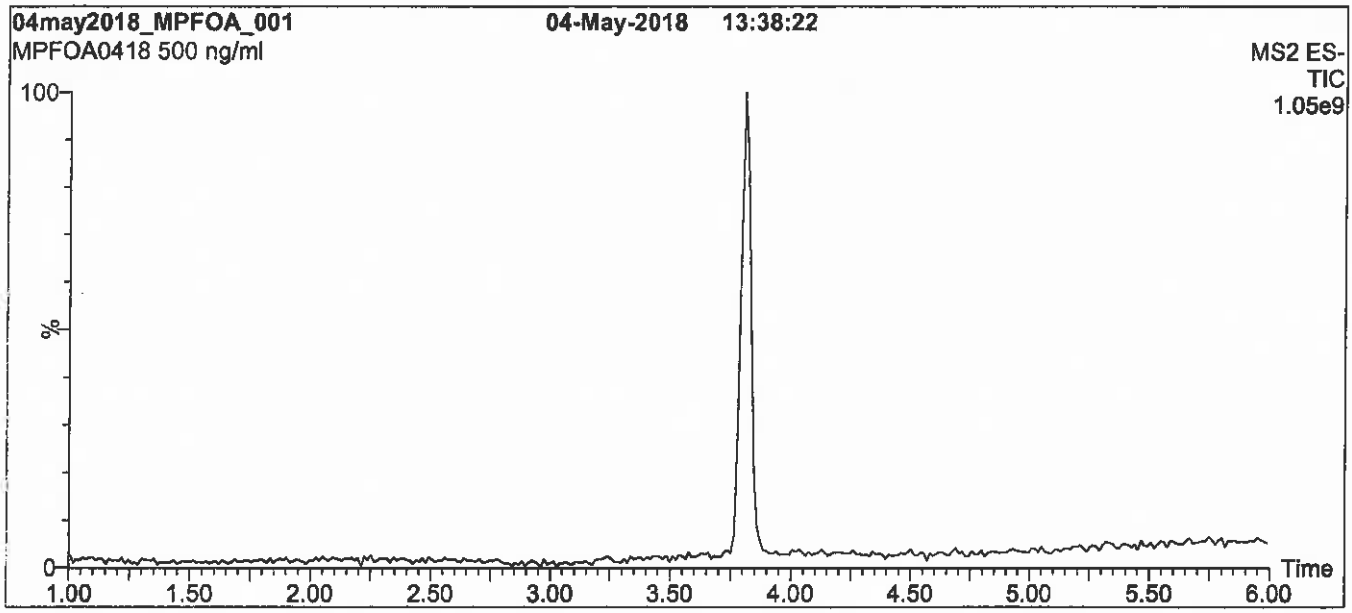
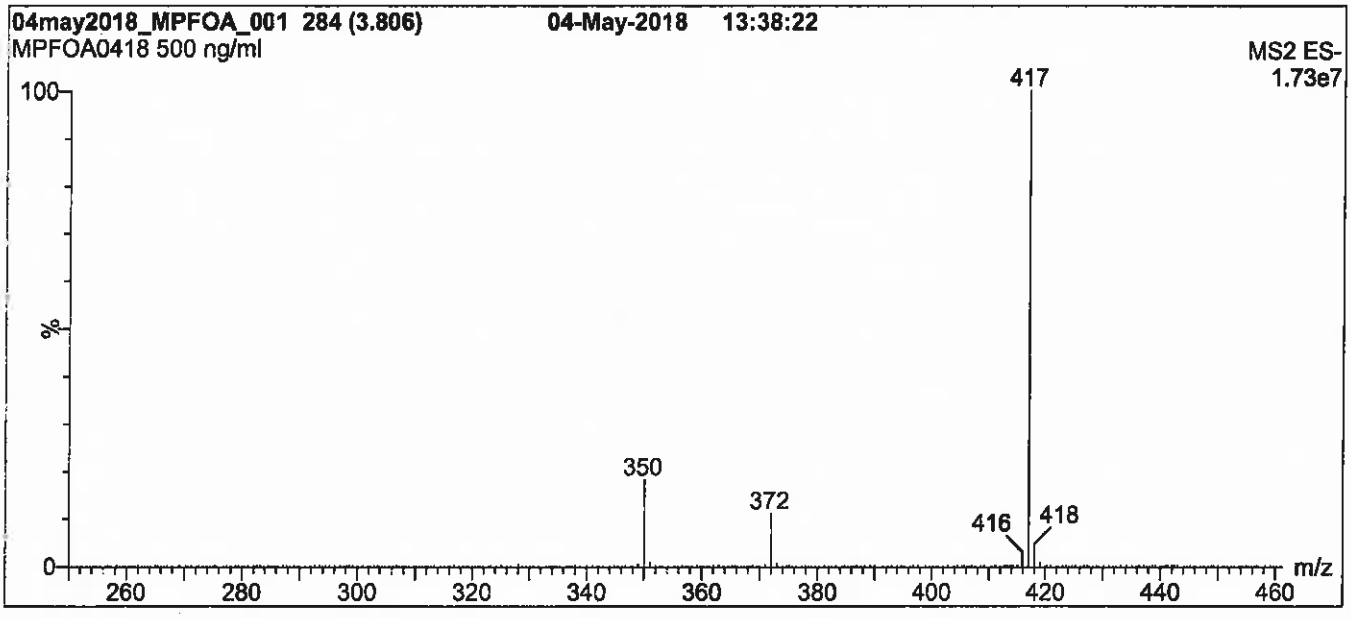
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro 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 80% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

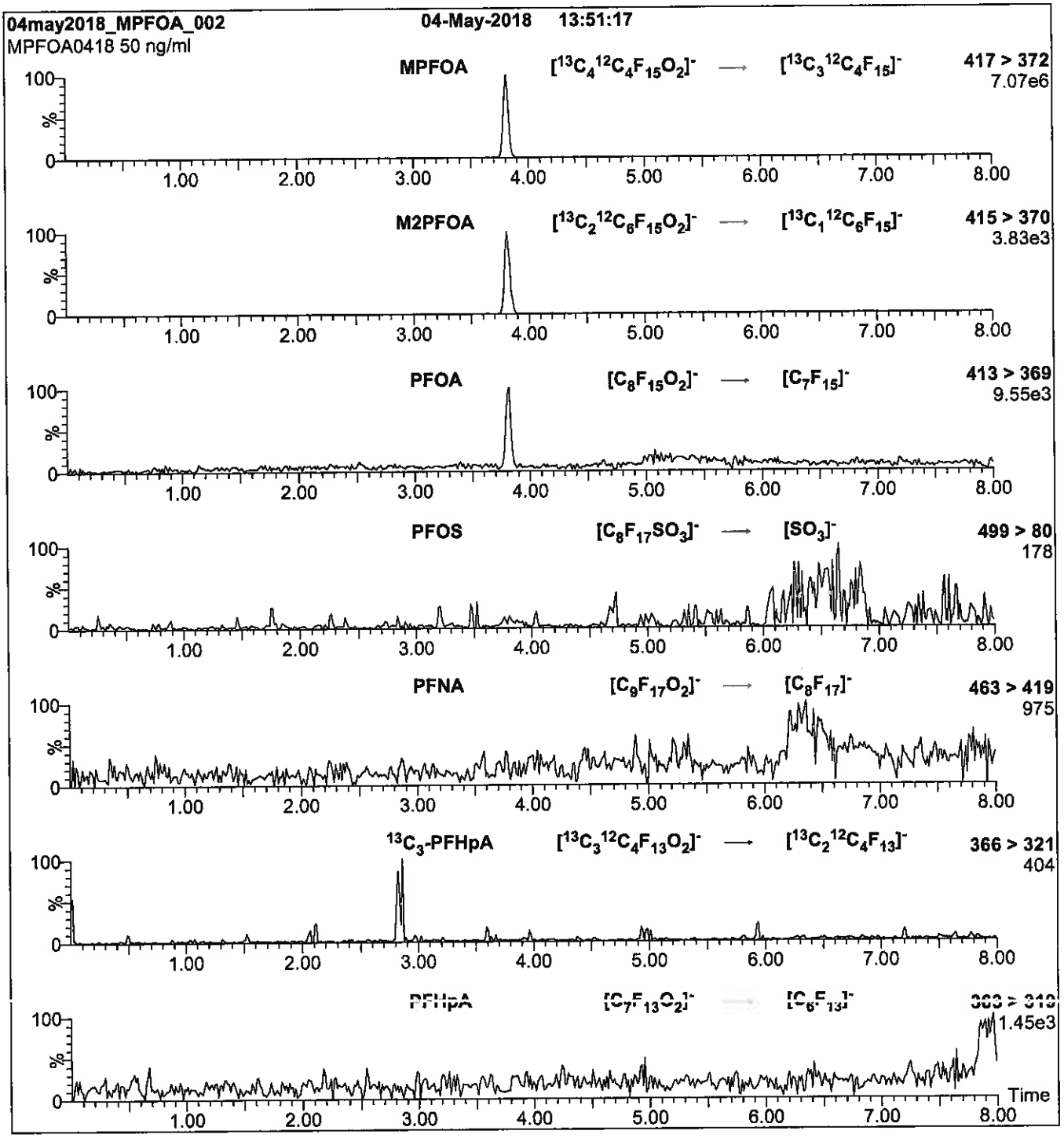
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (MPFOA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 8

Reagent

LCMPFOS_00028

1287343
ID: LCMPFOS_00028
Exp:06/15/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorooctanesulfo

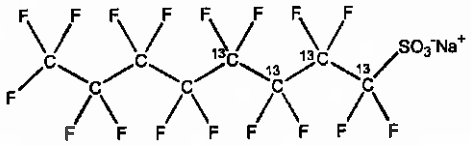
R=6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS
LOT NUMBER: MPFOS0618
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)	06/15/2018		
EXPIRY DATE: (mm/dd/yyyy)	06/15/2023		
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% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/18/2018 (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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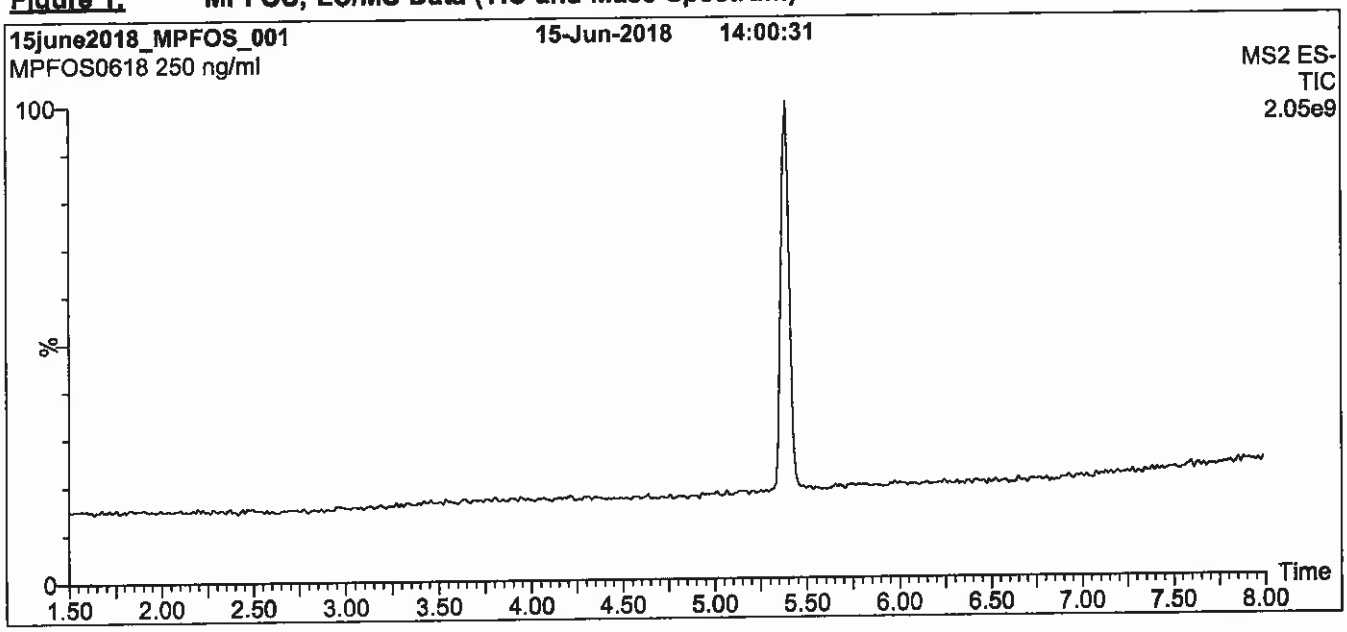
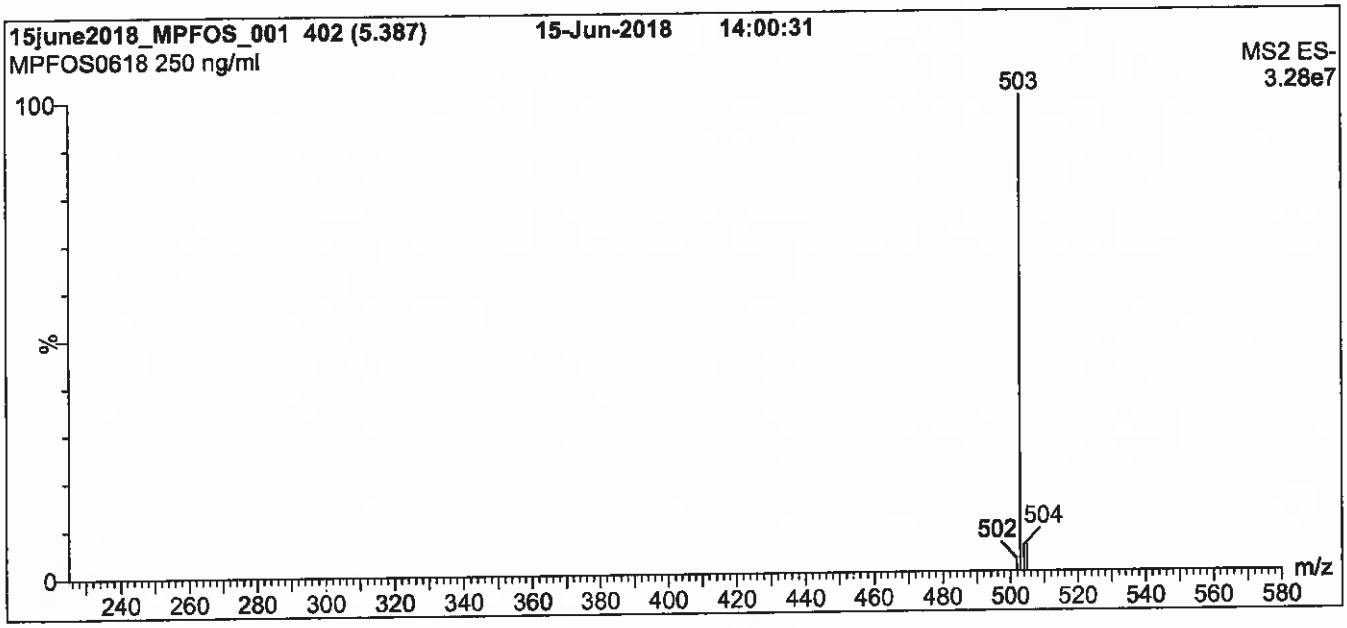




Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro 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 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

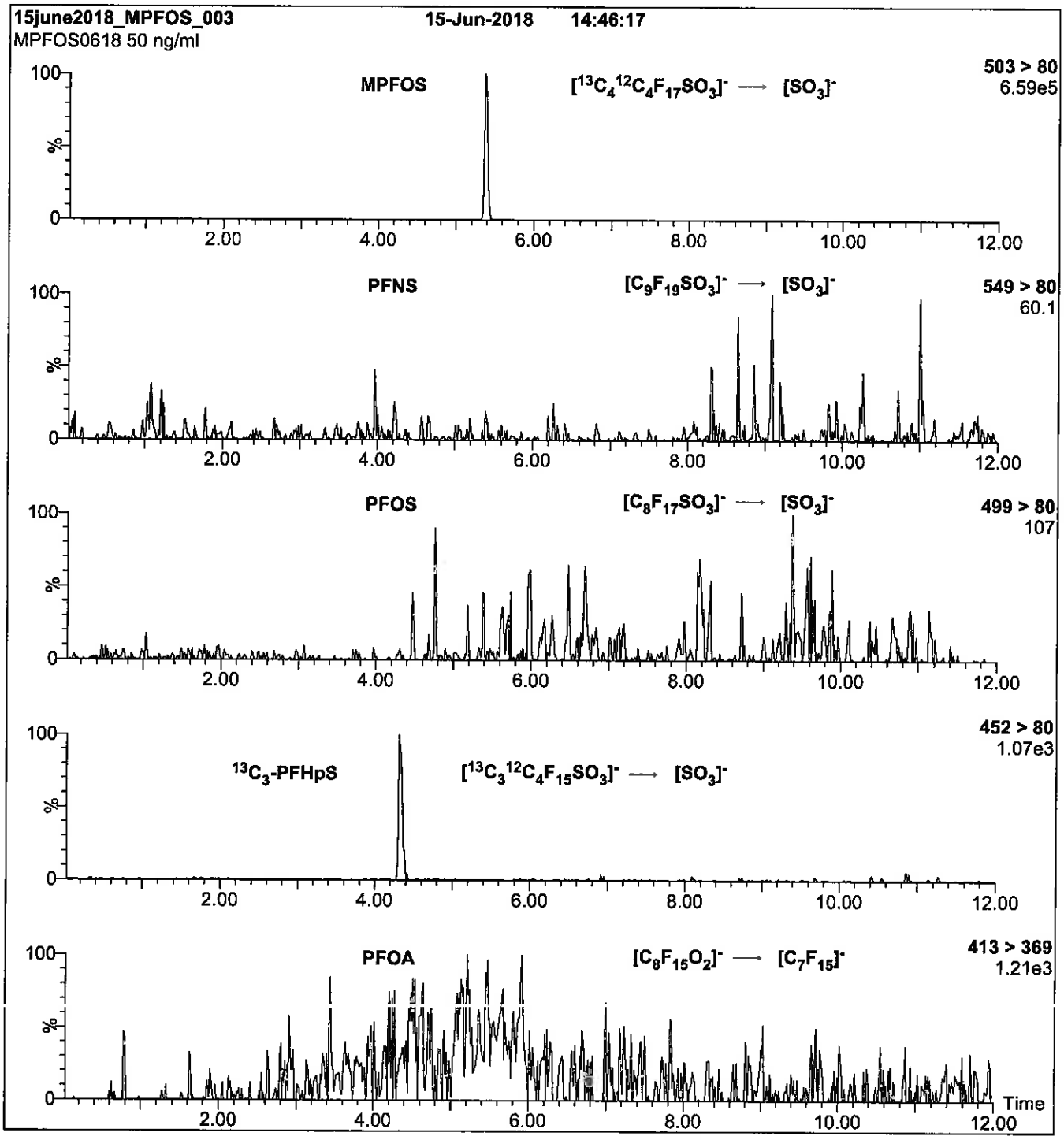
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection:	On-column (MPFOS)
Mobile phase:	Same as Figure 1
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.41e-3
Collision Energy (eV) = 42

Reagent

LCMPFUdA_00018

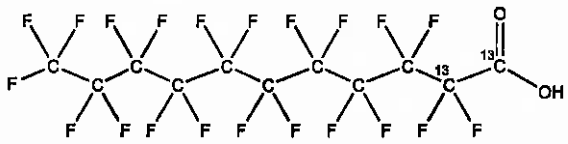
1287321
ID: LCMPFUdA_00018
Exp:05/11/23 Prpd:CBW Opn:06/26/18
13C2-Perfluoroundecanoic

R:6/26/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFUdA	**LOT NUMBER:**	MPFUdA0518
COMPOUND:	Perfluoro-*n*-[1,2-$^{13}C_2$]undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	05/11/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/11/2023		
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: _____ **Date:** 05/25/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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

UNCERTAINTY:

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

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

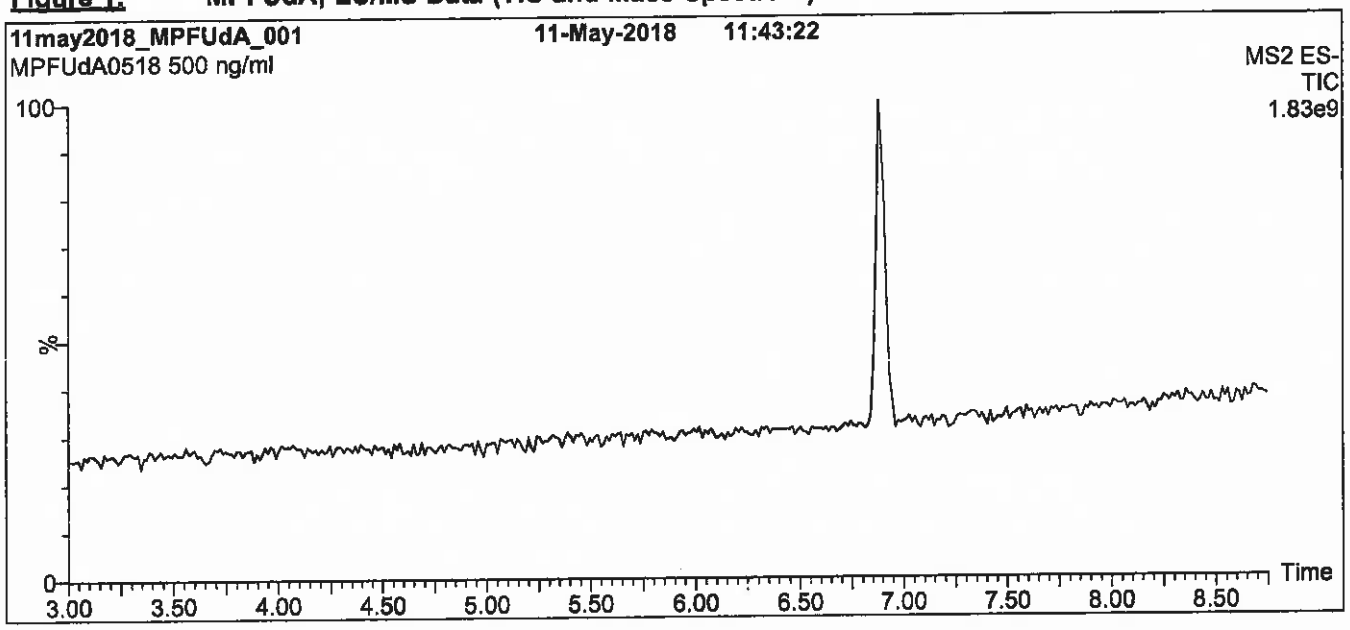
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

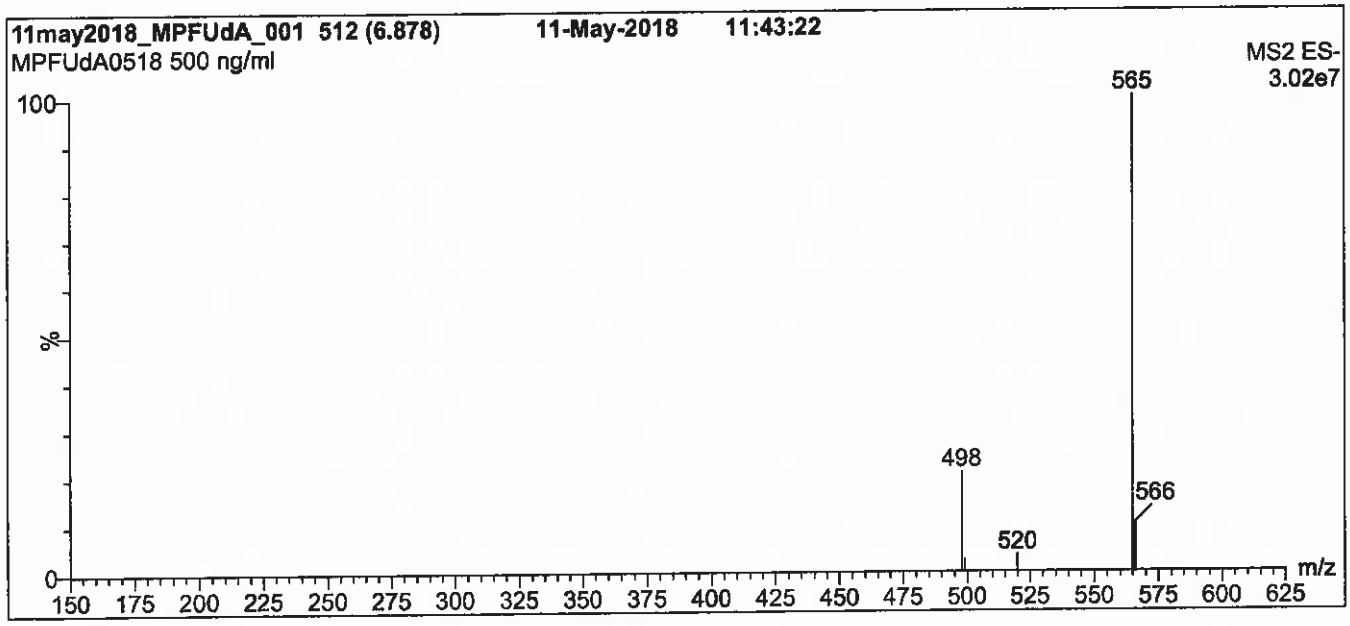
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro 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 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

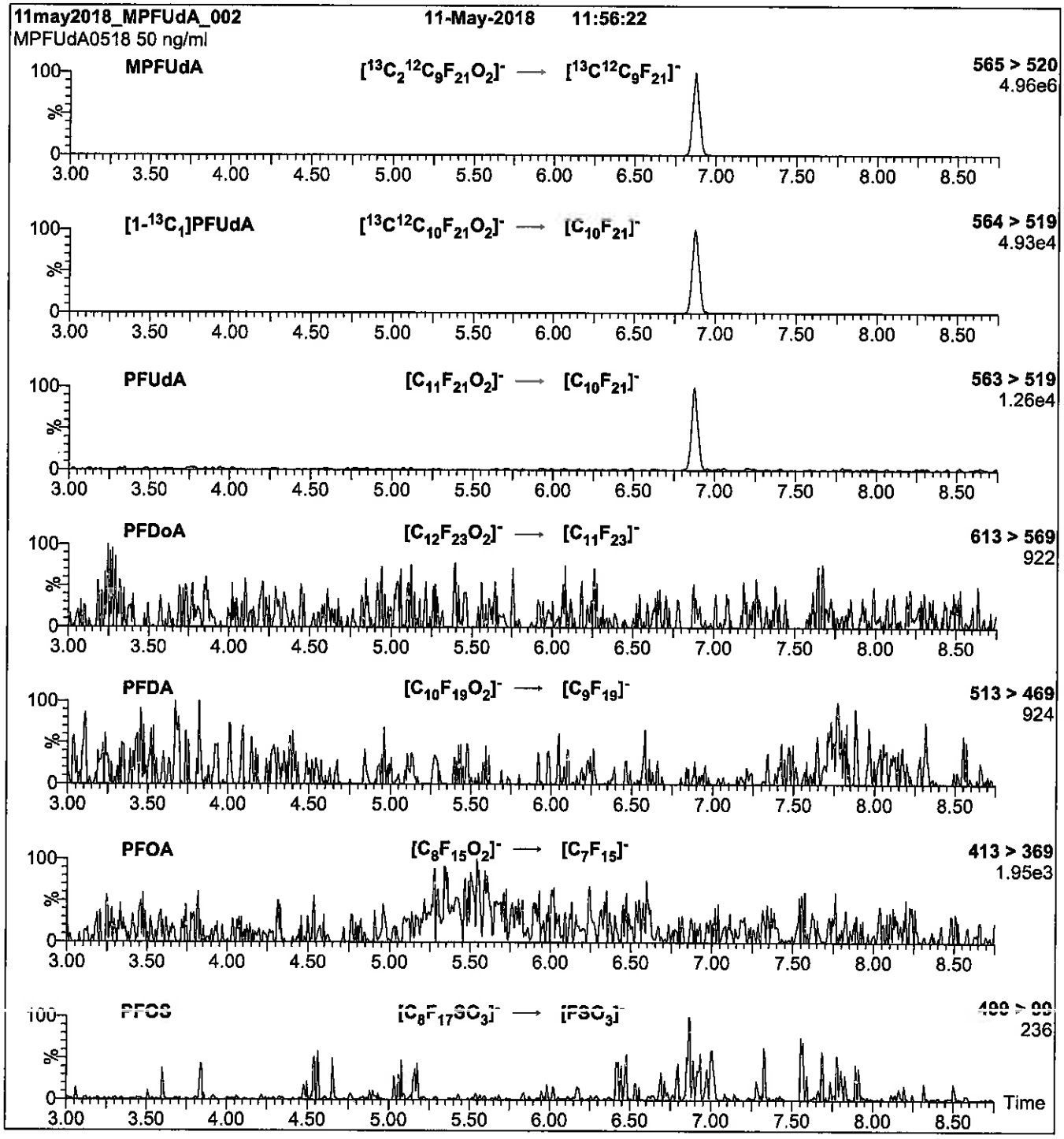
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (MPFUdA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.51e-3
Collision Energy (eV) = 12

Reagent

LCPFAC-24PAR_00002

1310191
ID: LCPFAC-24PAR_00002
Exp:04/18/23 Prpd:TTP Opn:07/24/18
PFAC/PFAS Mix

Rec: 7/24/18 TP
Opn: 7/24/18 TP
Exp: 4/18/23

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:	PFAC24PAR0418
SOLVENT(S):	Methanol / Isopropanol (4%) / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	04/09/2018
LAST TESTED: (mm/dd/yyyy)	04/18/2018
EXPIRY DATE: (mm/dd/yyyy)	04/18/2023
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.

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:

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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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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.
*** Concentrations have been rounded to three significant figures.

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	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2	
7	Other Unidentified Isomers		0.5	

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

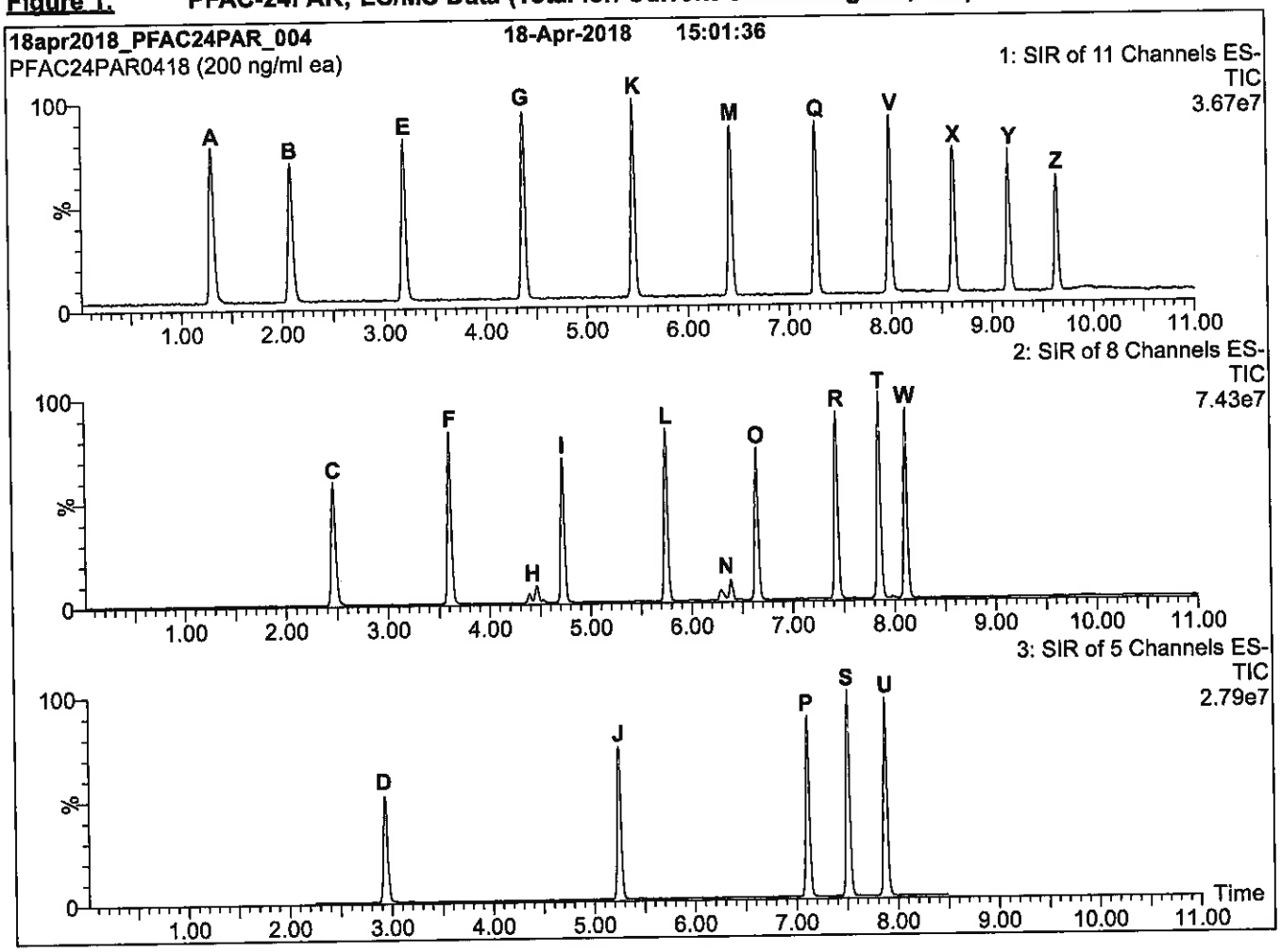
Table C: **PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

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:** 04/24/2018
(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: **Waters Xevo TQ-S micro 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 10 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 15 min

Flow: 300 µl/min

MS Parameters

Experiment: SIR

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = variable (2-38)
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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

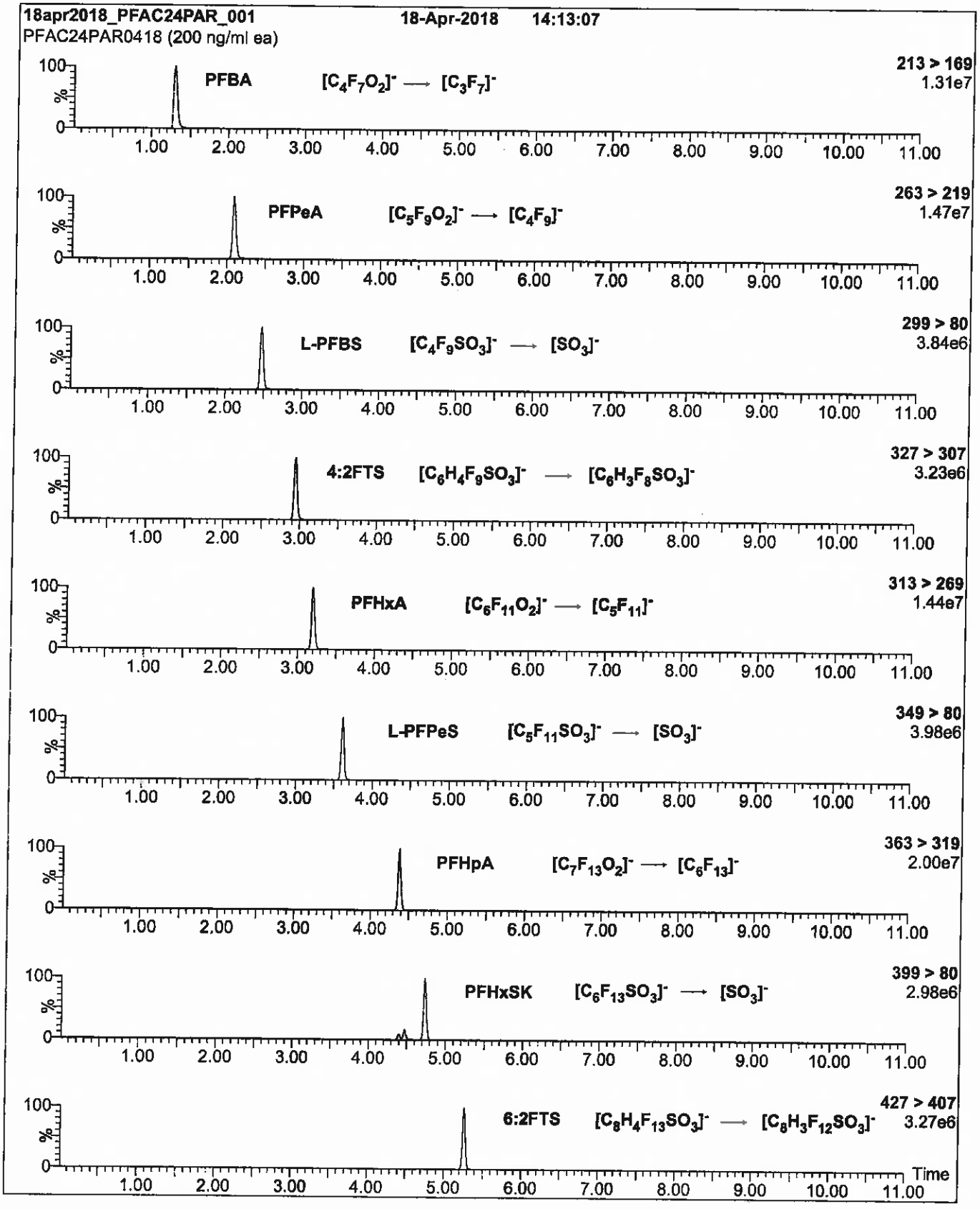


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**

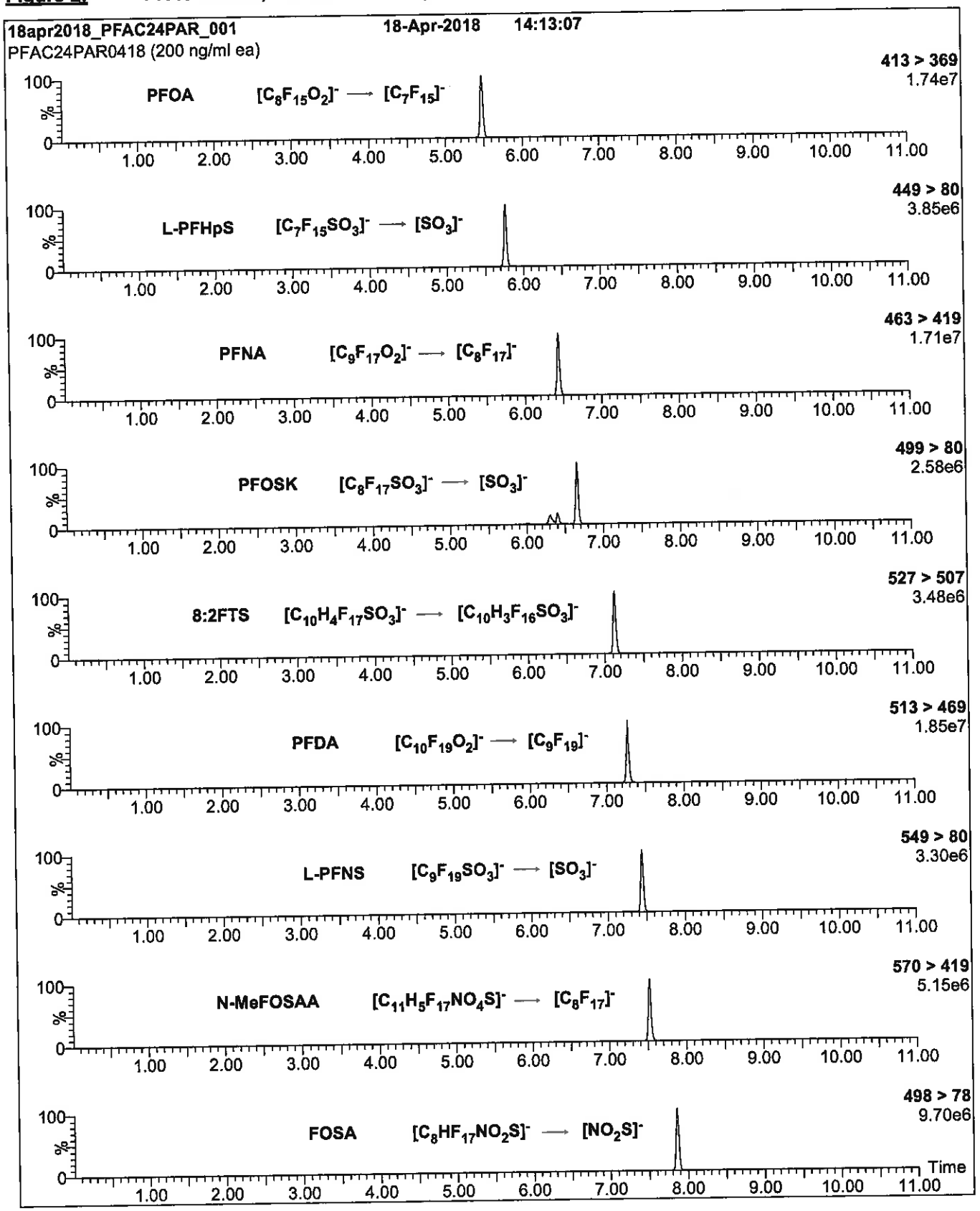
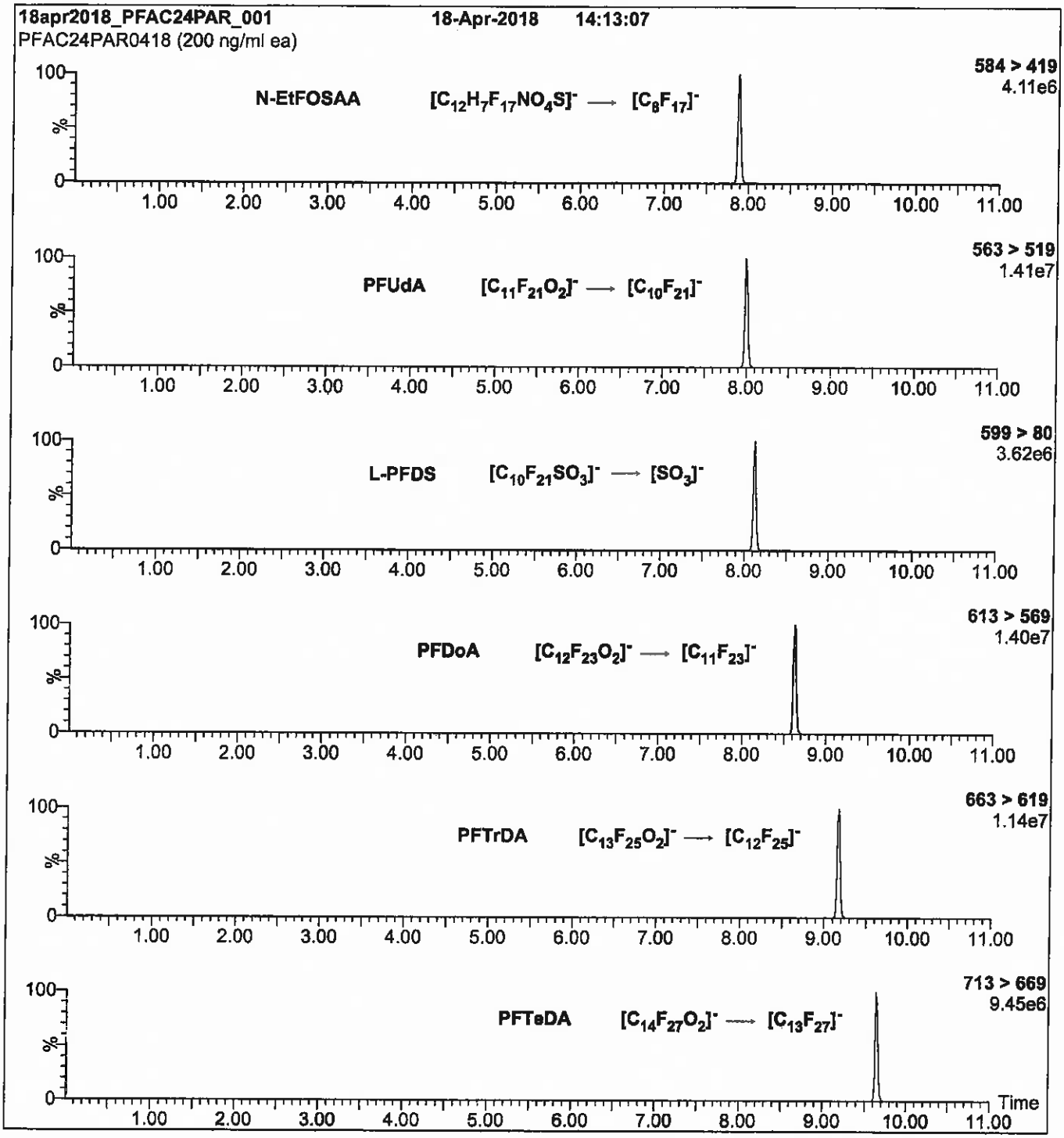


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFAC-24PAR)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.47e-3

Collision Energy (eV) = 8-64 (variable)

Reagent

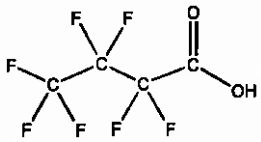
LCPFBA_00008

P: 9/21/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFBA	**LOT NUMBER:**	PFBA0517
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)	05/29/2017		
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:

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HAZARDS:

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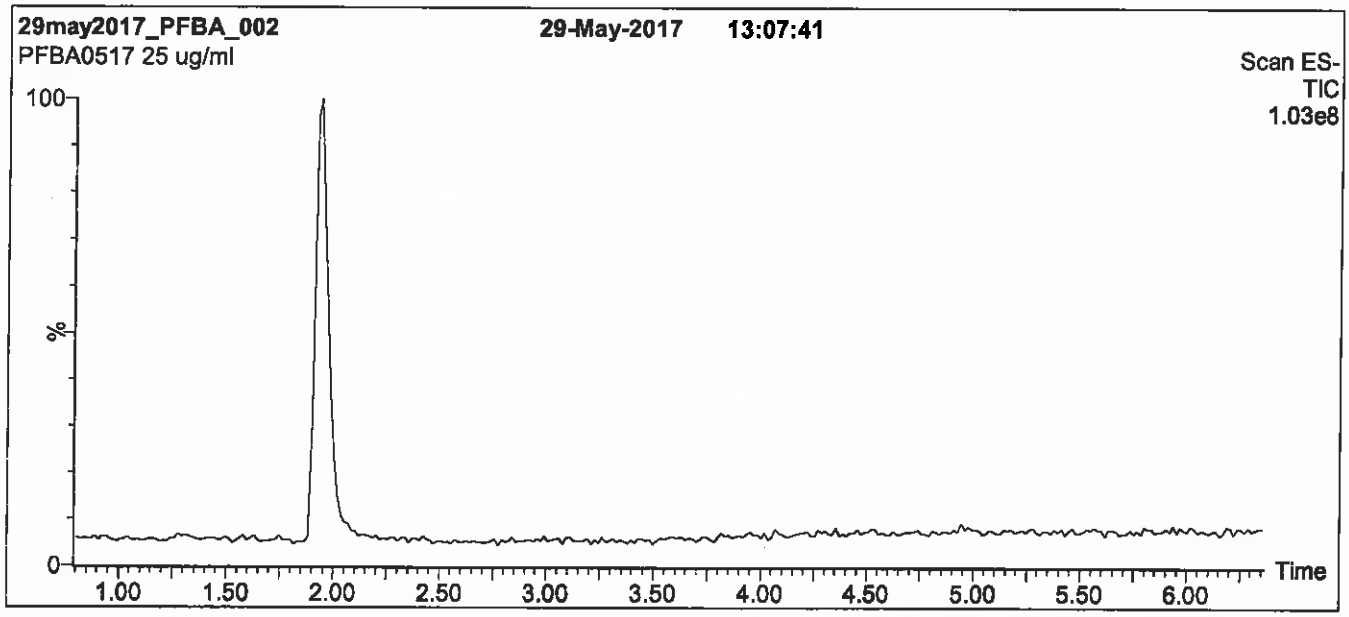
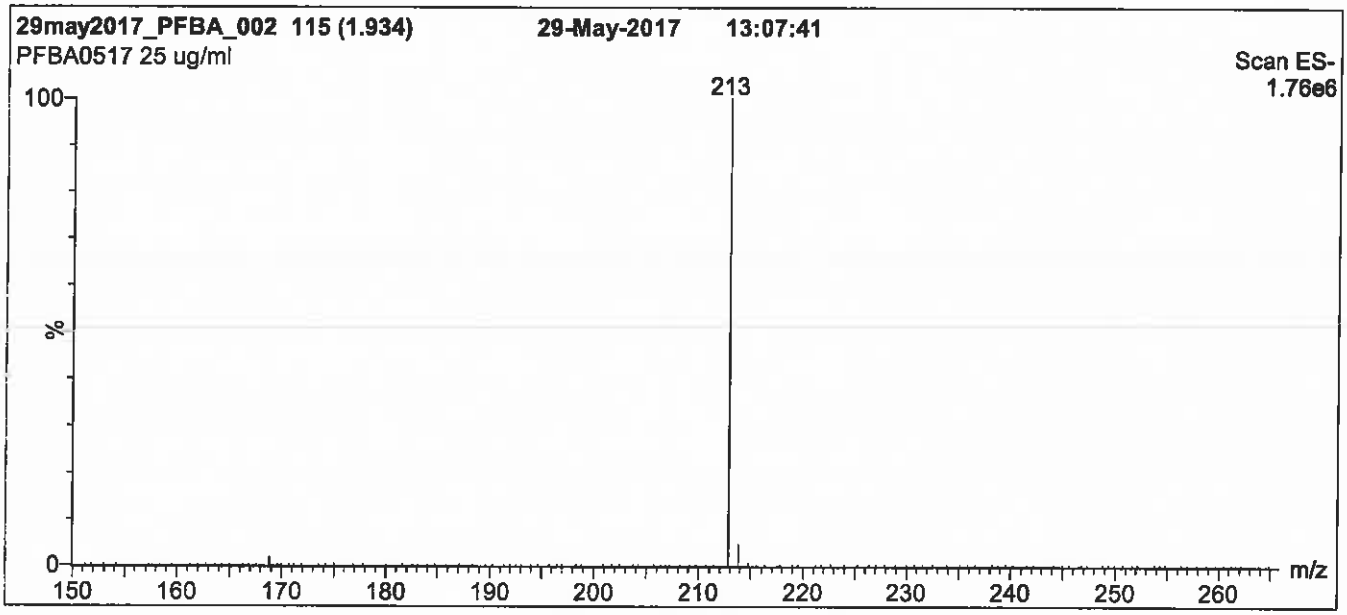
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





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

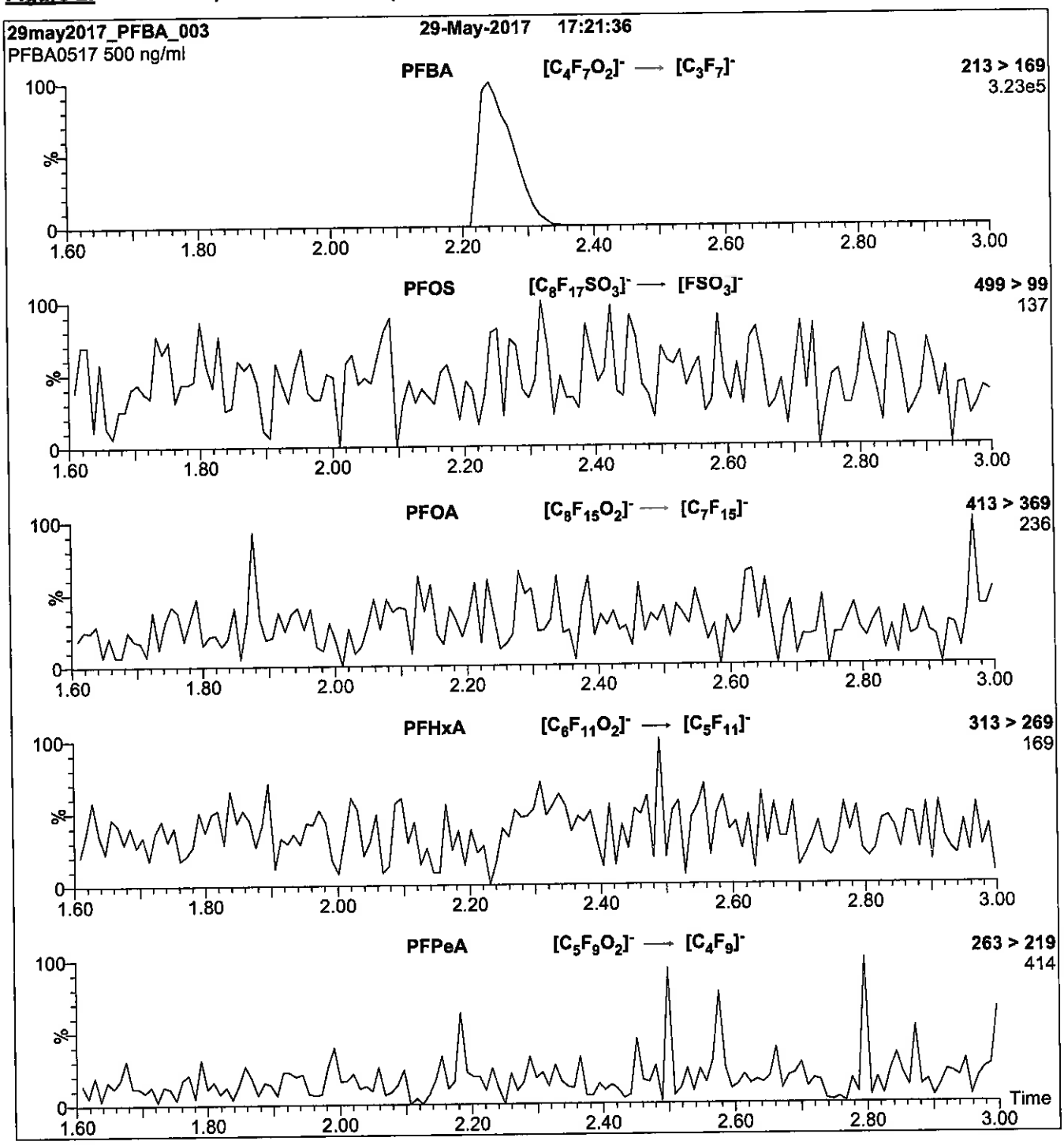
Flow: 300 µl/min

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

Reagent

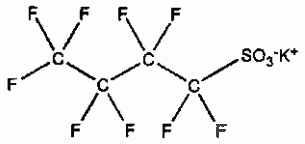
LCPFBS_00009

D: 2/16/18 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFBS	**LOT NUMBER:**	LPFBS0917
COMPOUND:	Potassium perfluoro-1-butanesulfonate		
STRUCTURE:		**CAS #:**	29420-49-3



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**MOLECULAR WEIGHT:**	338.19
CONCENTRATION:	50.0 ± 2.5 µg/ml (K salt) 44.2 ± 2.2 µg/ml (PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/21/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/21/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 09/22/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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

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

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CALA

ANAB ACCREDITED

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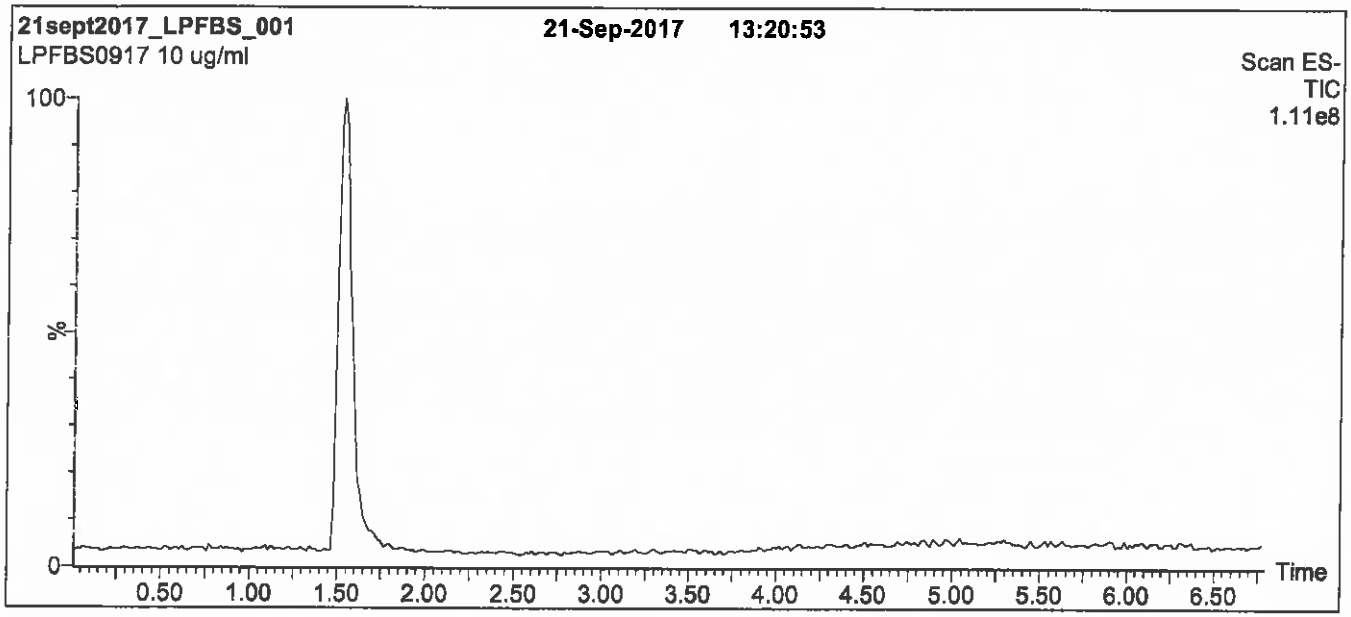
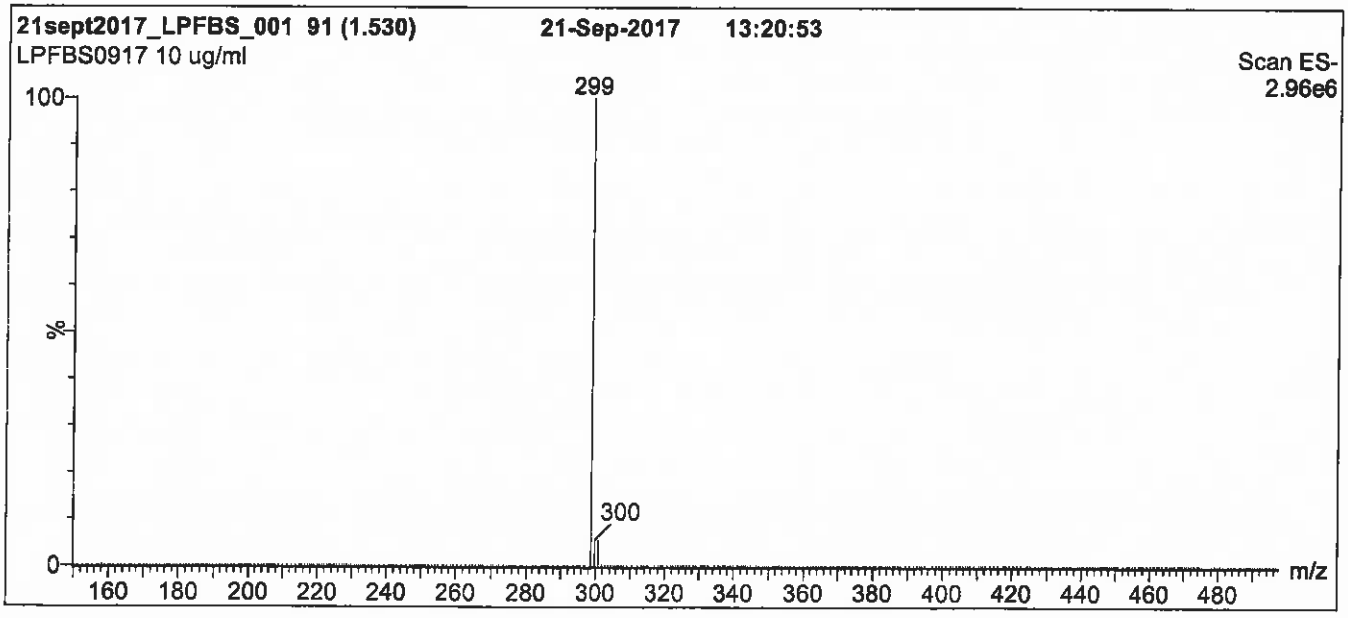




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

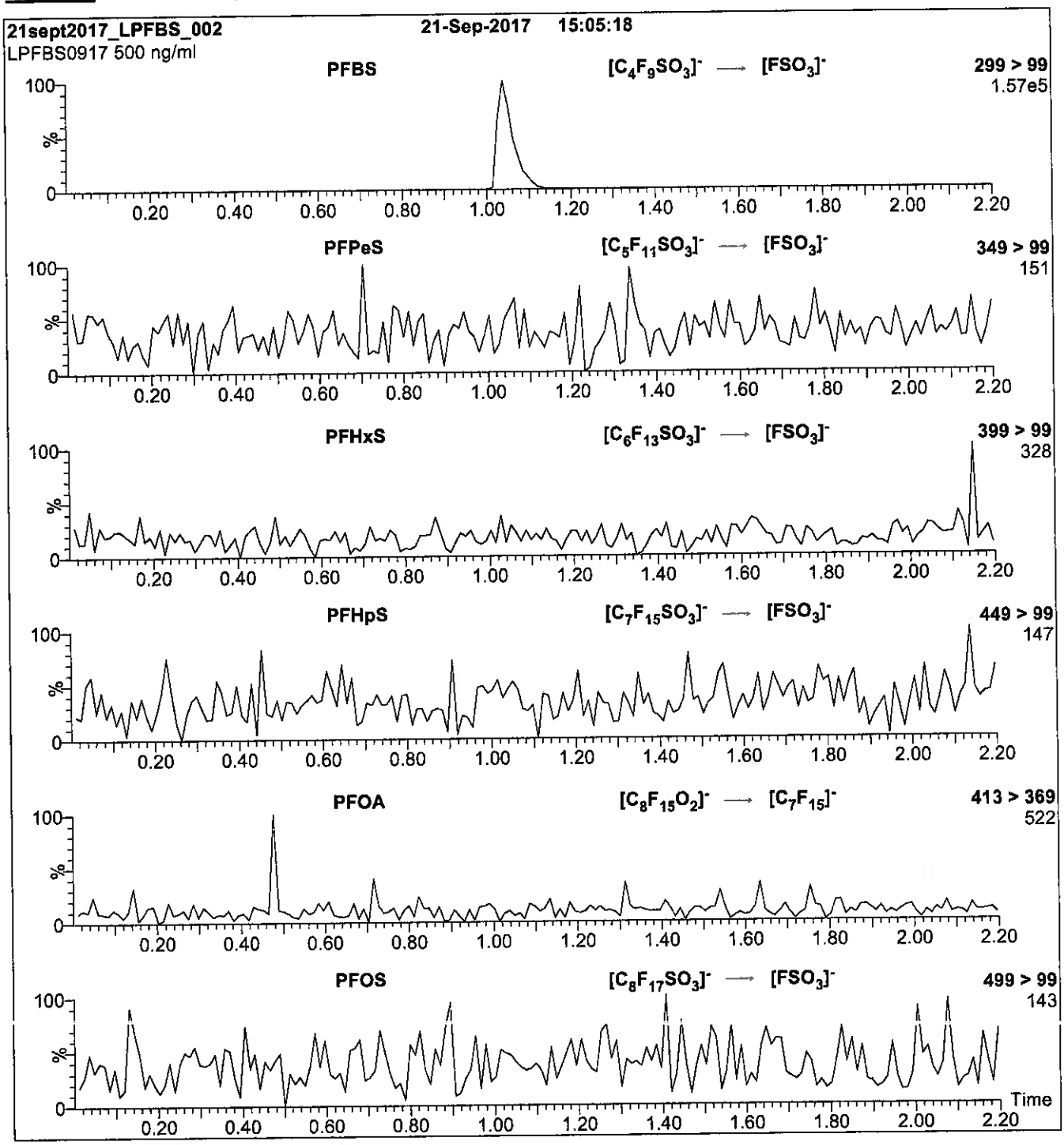
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00008

R: 9/21/17 SKJ

WELLINGTON LABORATORIES

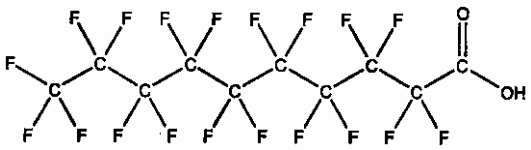
CERTIFICATE OF ANALYSIS DOCUMENTATION

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).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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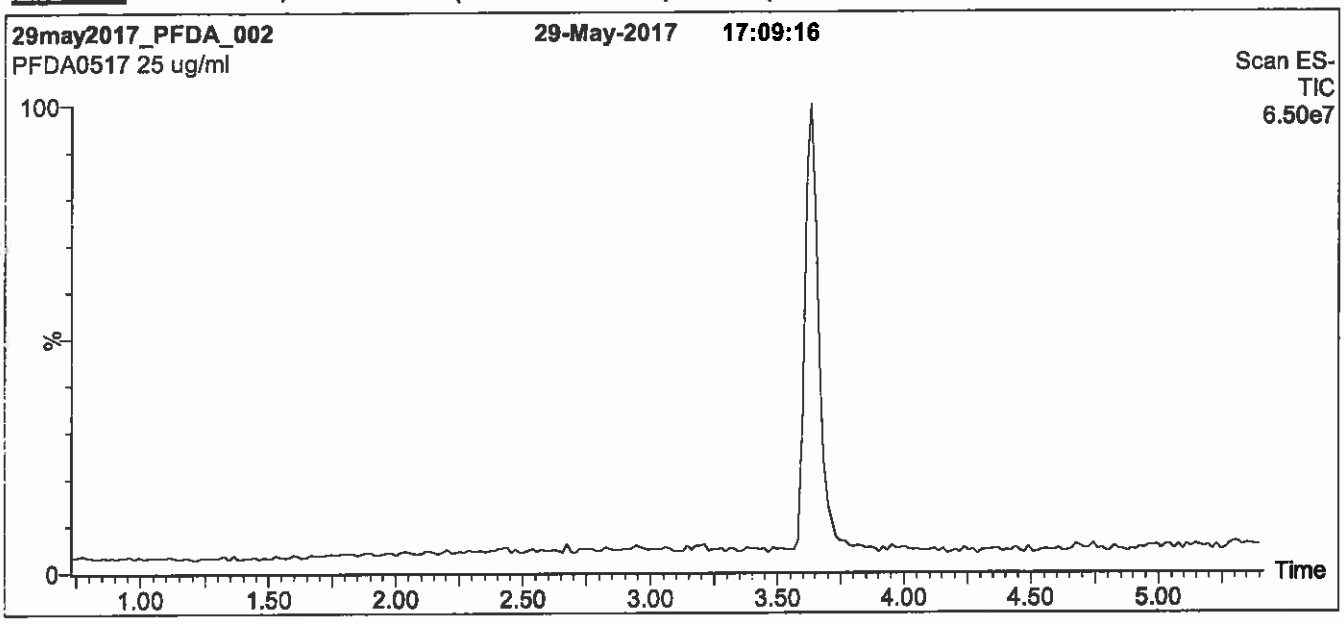
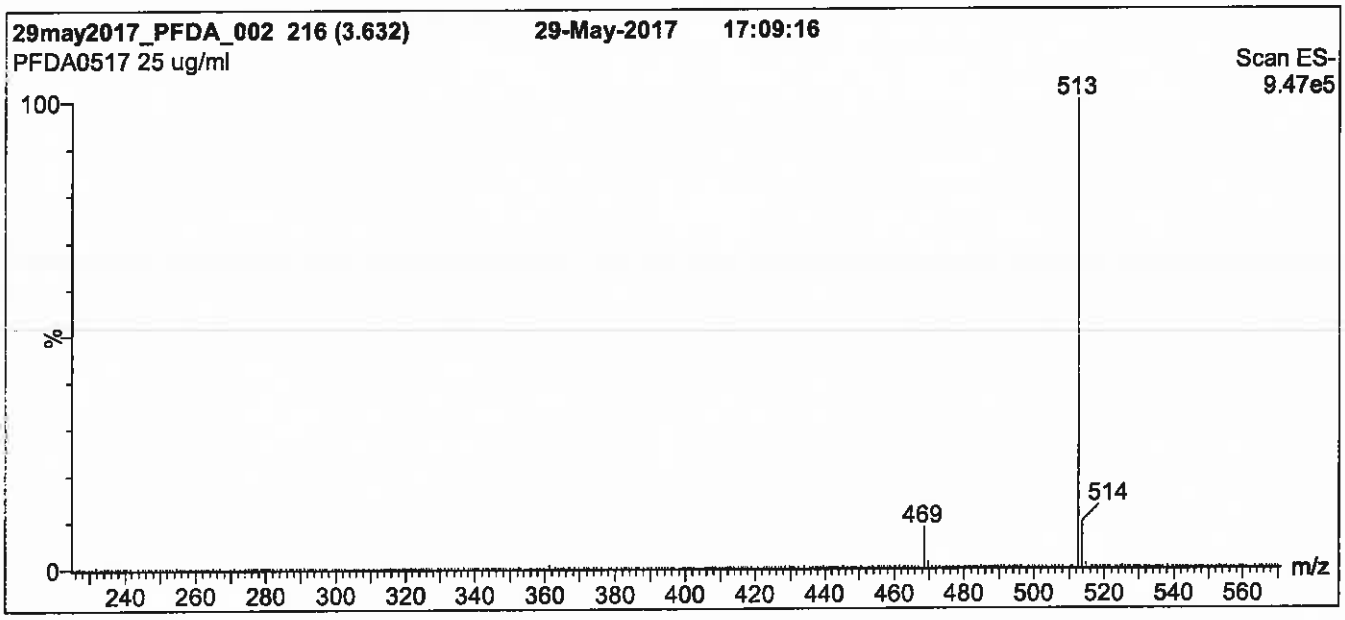
Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

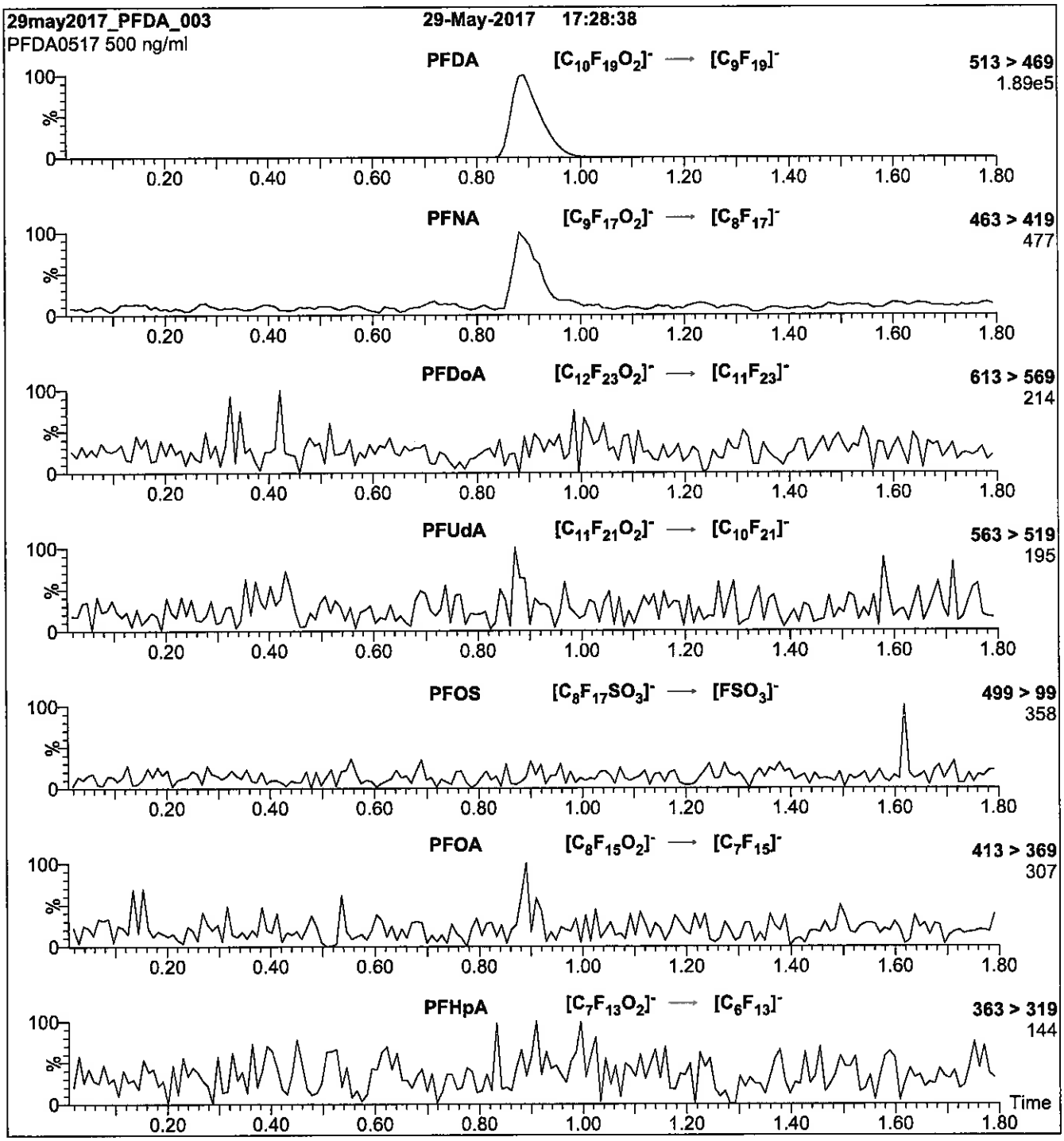
Flow: 300 µl/min

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

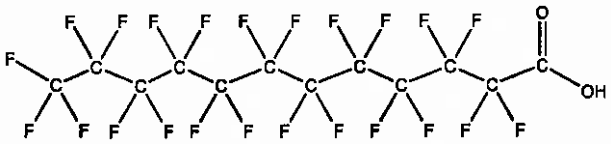
LCPFDoA_00008

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		

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

- See page 2 for further details.
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CALA

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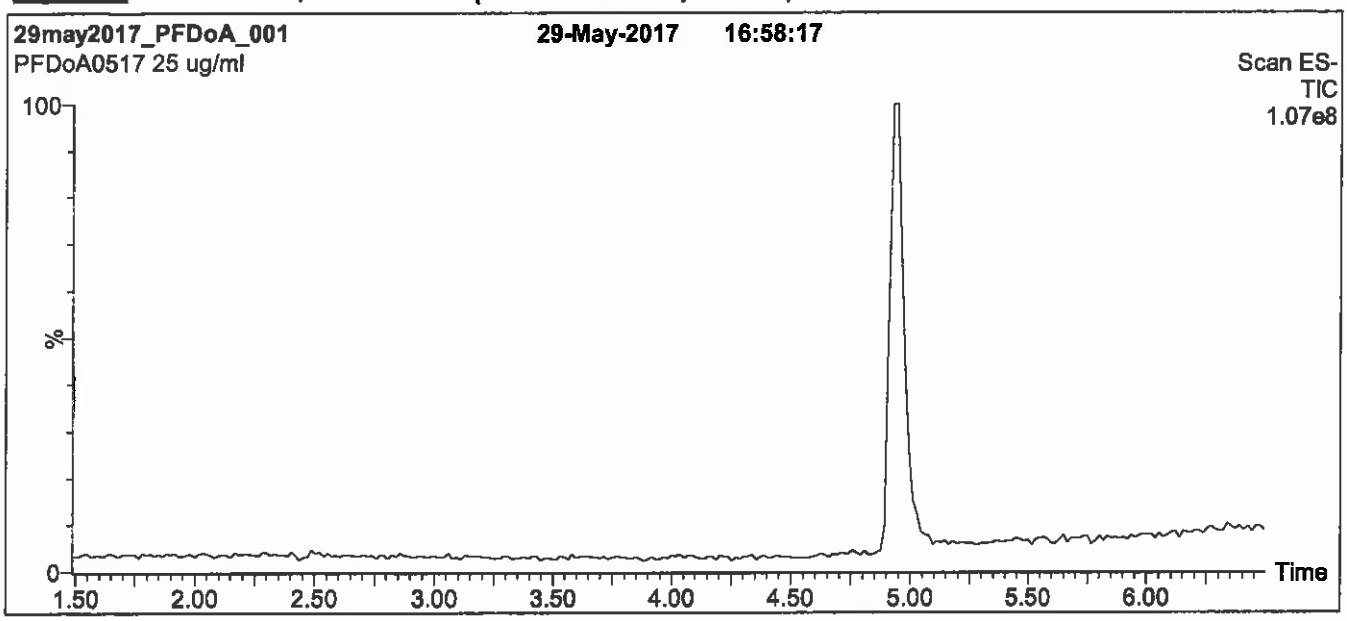

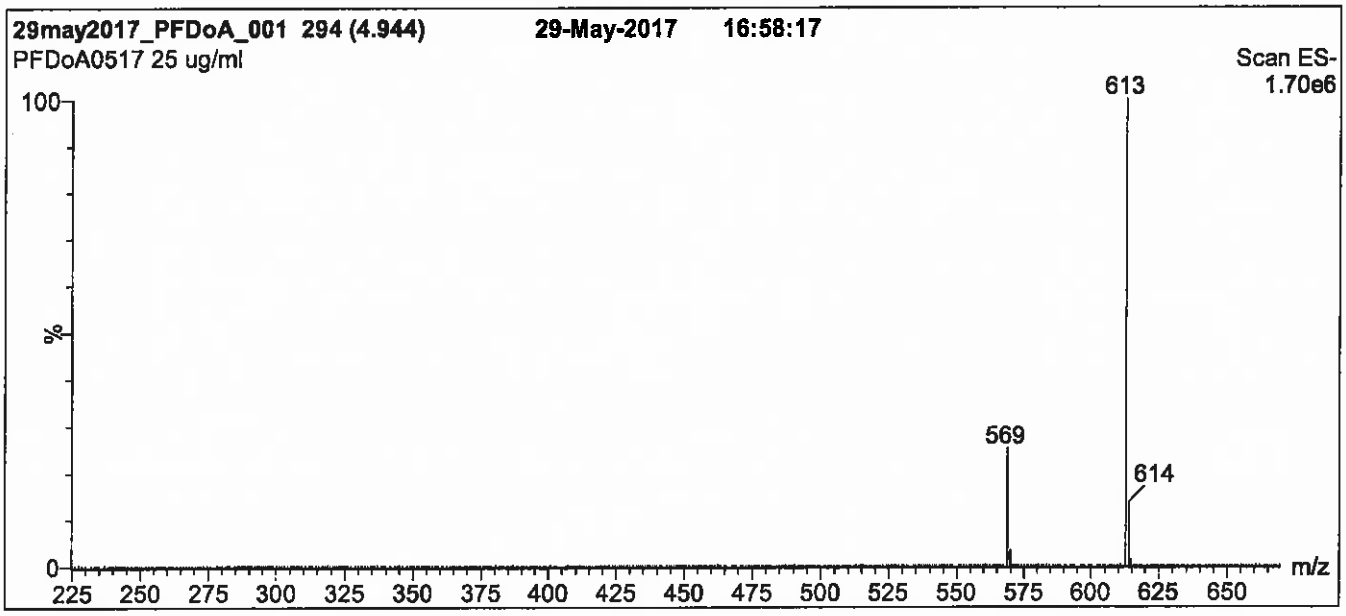

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Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
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Flow: 300 µl/min

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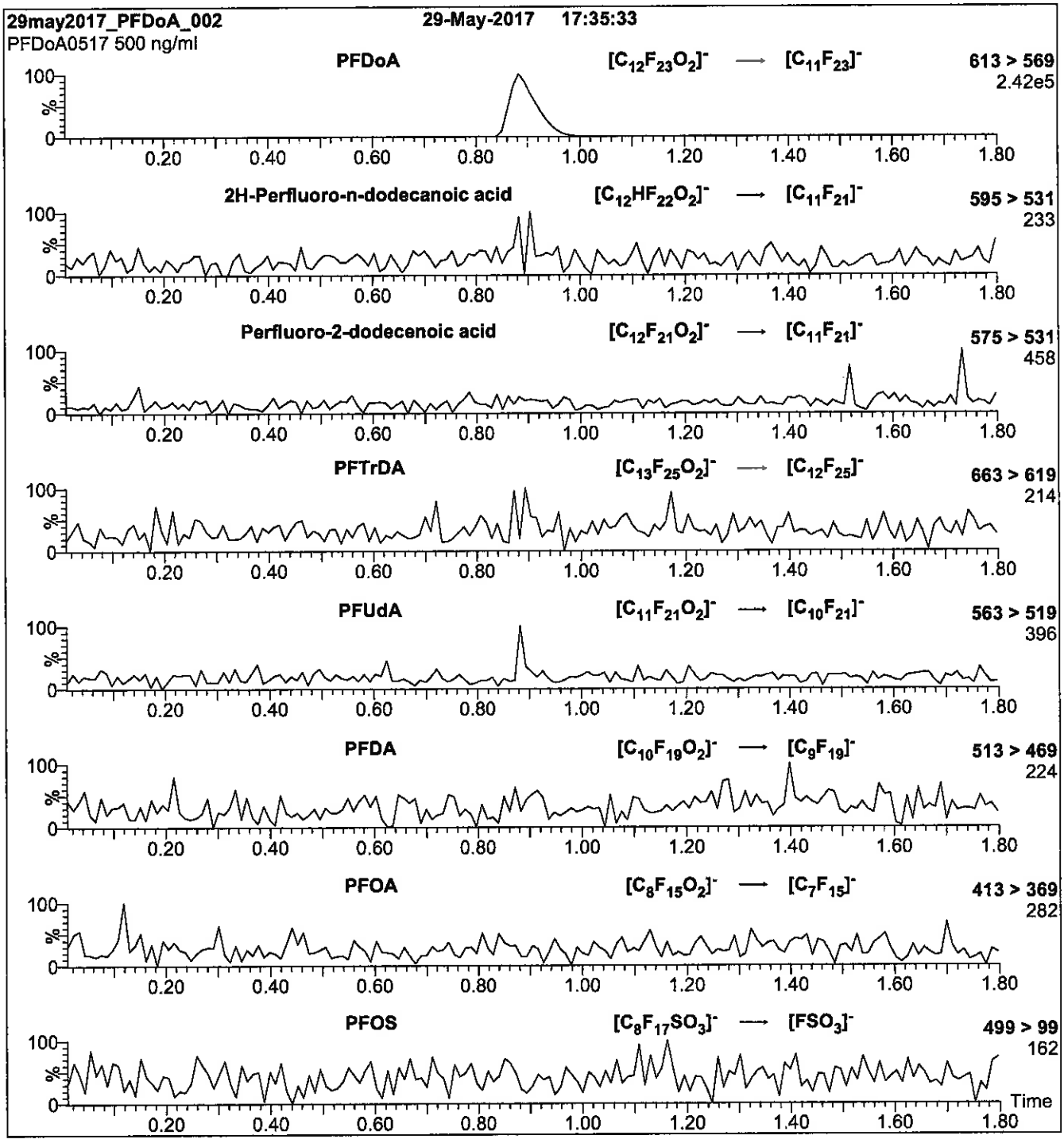
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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

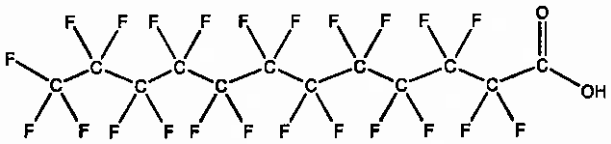
LCPFDoA_00010

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:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. 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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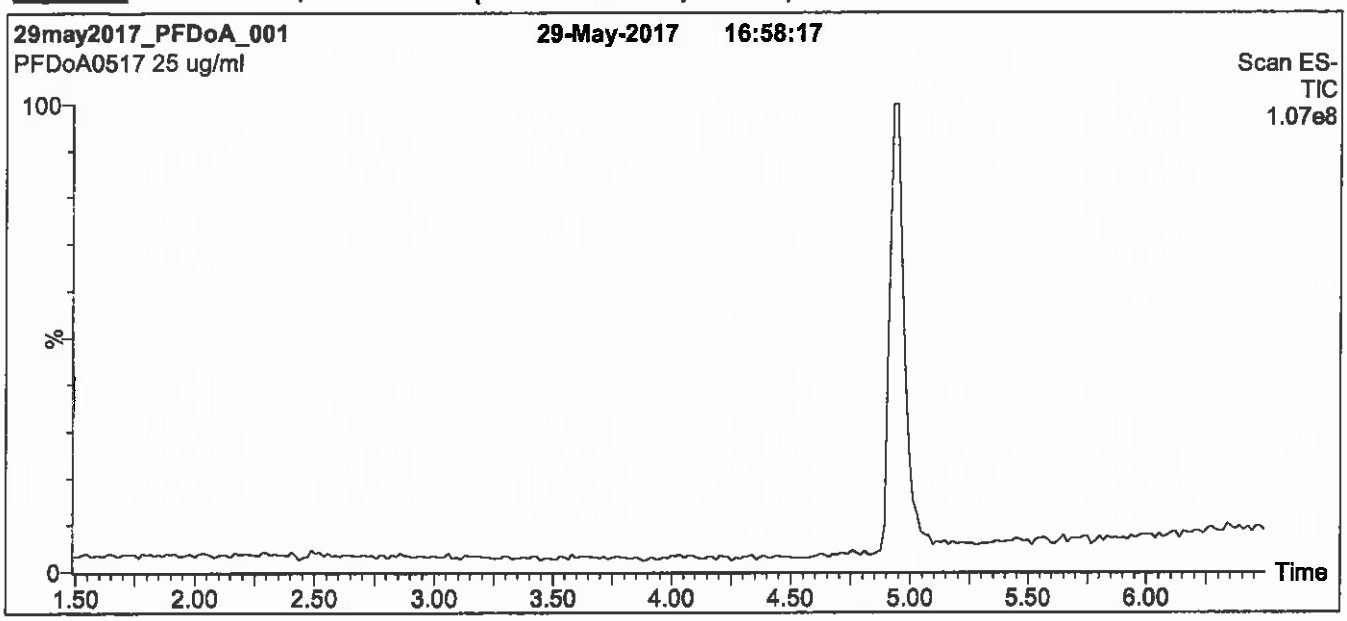
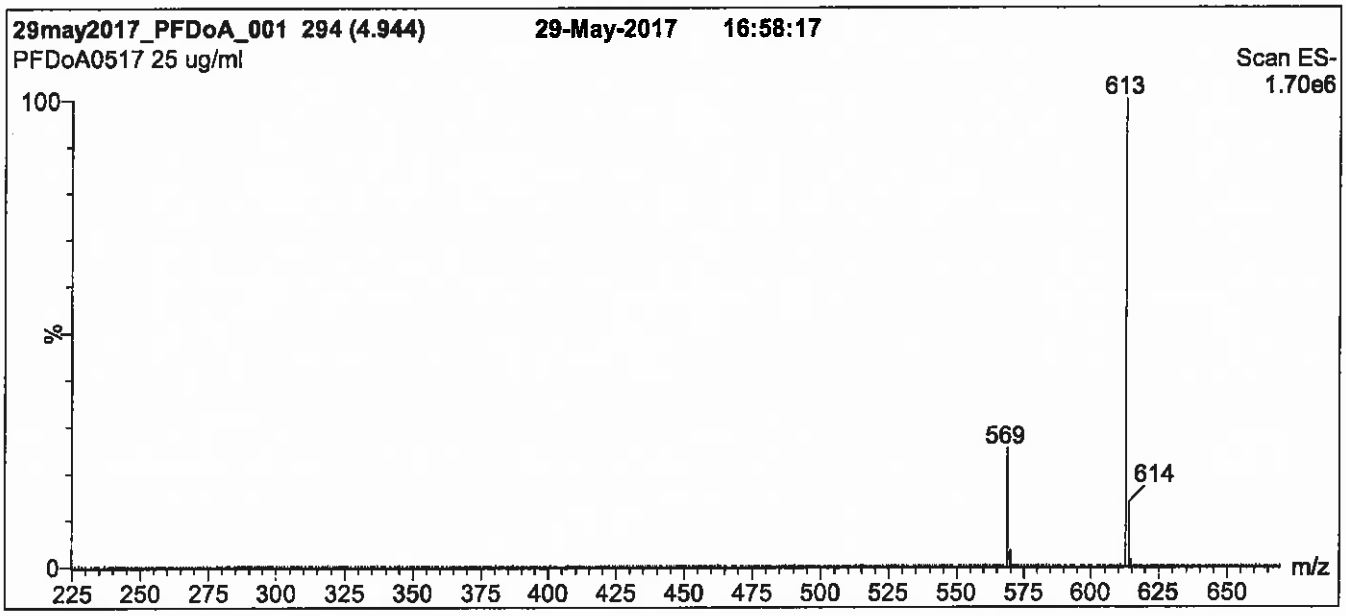
Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





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

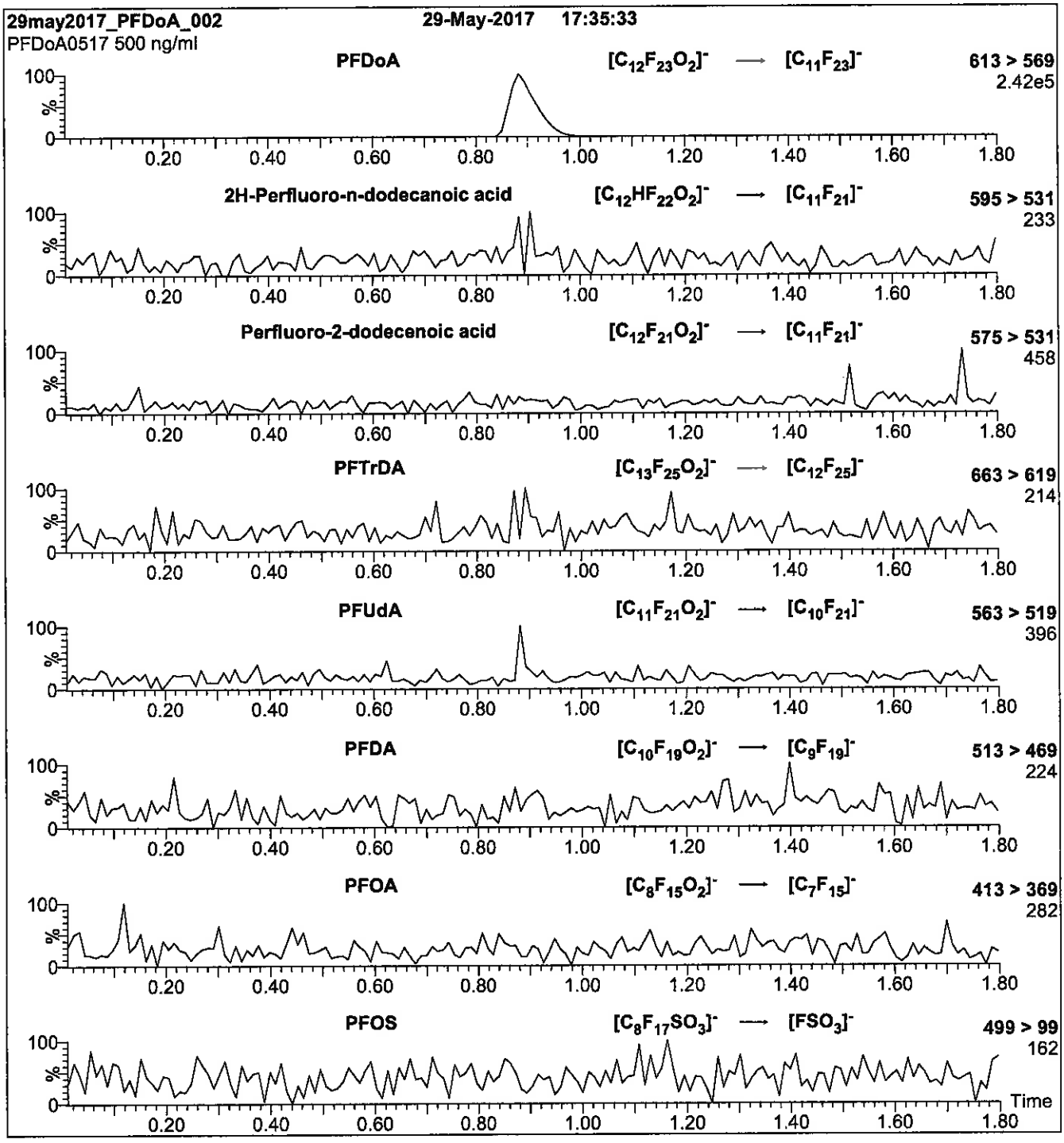
Flow: 300 µl/min

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

LCPFDoS_00004

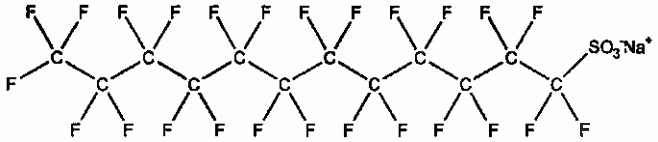
1307130
ID: LCPFDoS_00004
Exp:09/30/21 Prpd:CBW Opn:07/19/18
L-PFDoS at 48.4ug/mL

R: 7/19/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFDoS	**LOT NUMBER:**	LPFDoS0916
COMPOUND:	Sodium perfluoro-1-dodecanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_{12}F_{25}SO_3Na$	**MOLECULAR WEIGHT:**	722.14
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	48.4 ± 2.4 µg/ml (PFDoS 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.
- Contains ~ 0.7% of sodium perfluoro-1-tetradecanesulfonate and ~ 0.7% of perfluoro-n-dodecanoic acid (PFDoA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/17/2016 (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:

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

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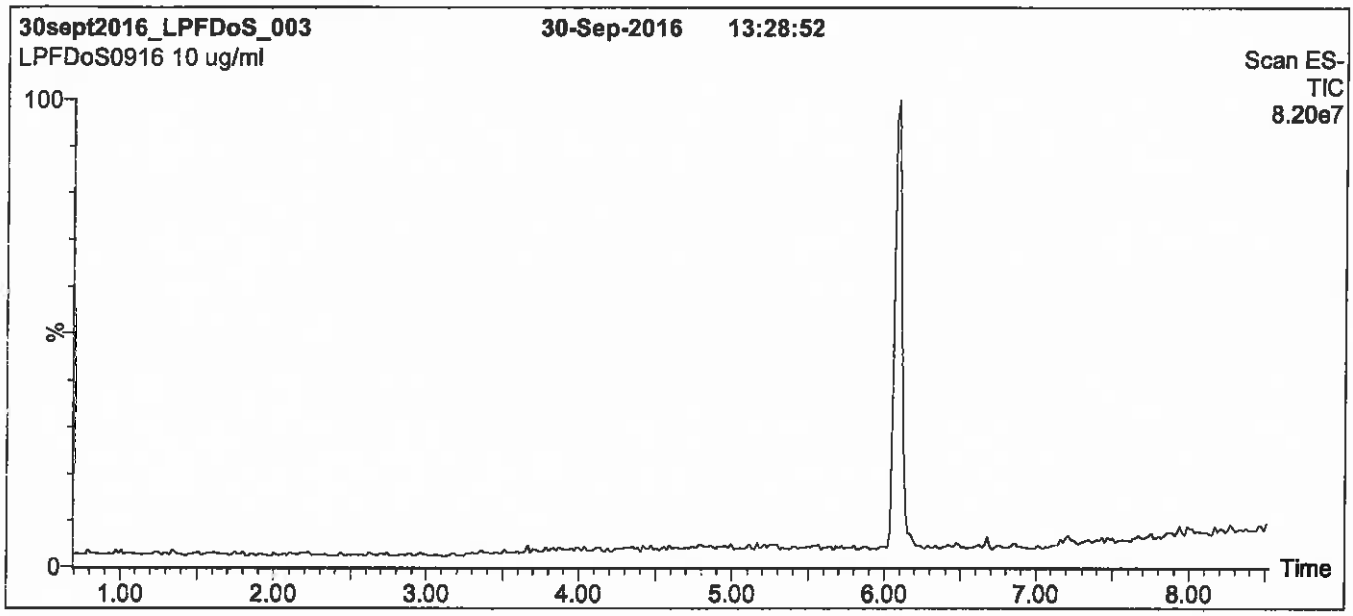
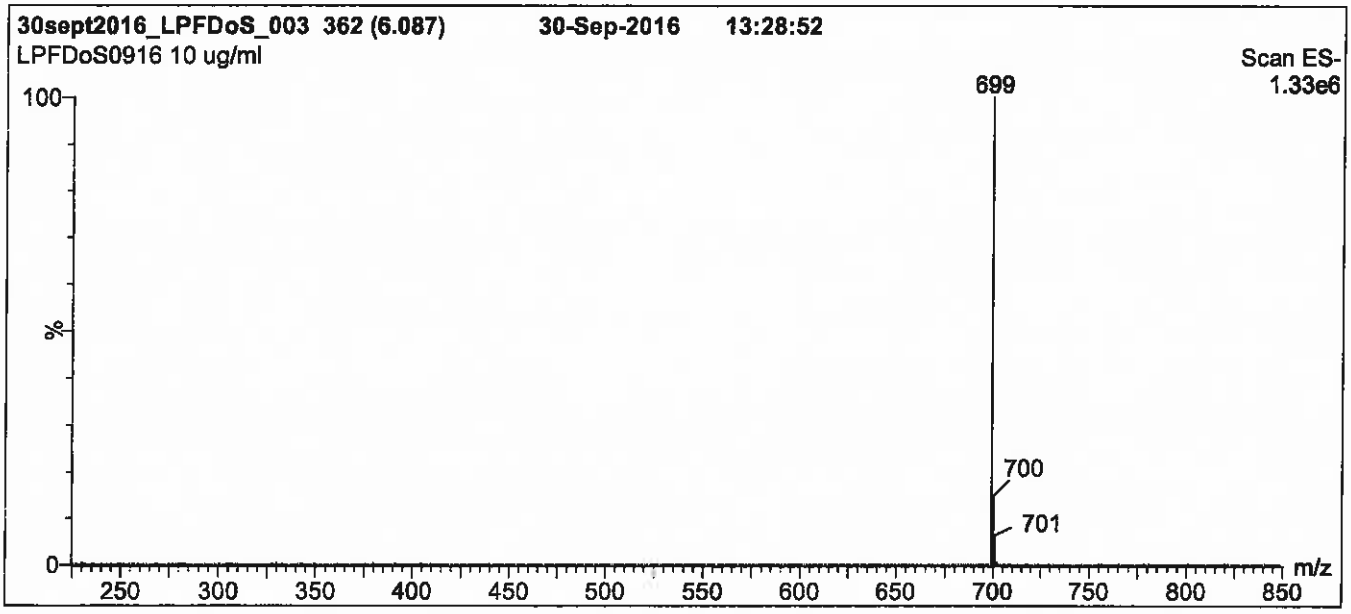
Figure 1: **L-PFDoS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

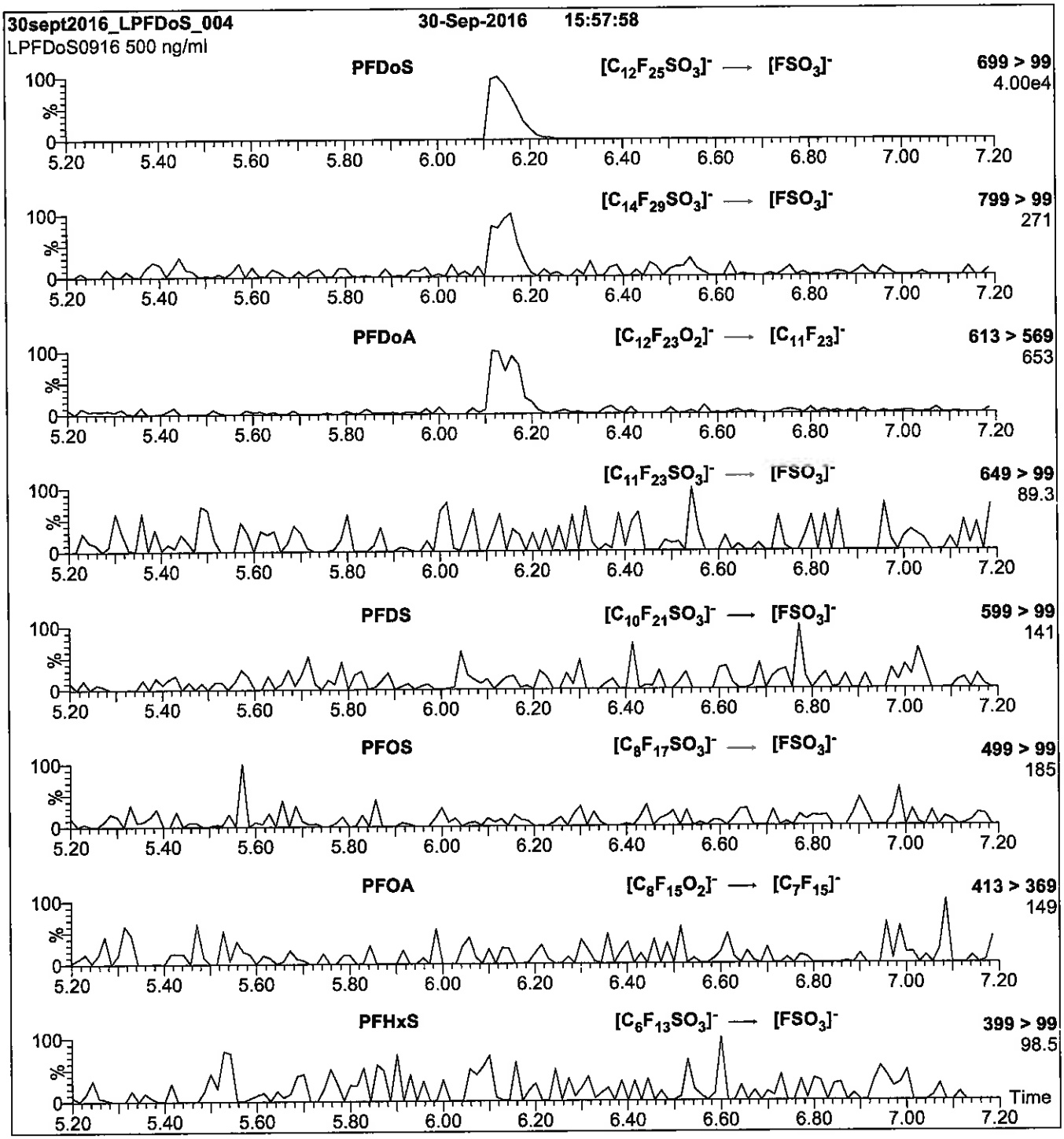
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFDoS)
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) = 50

Reagent

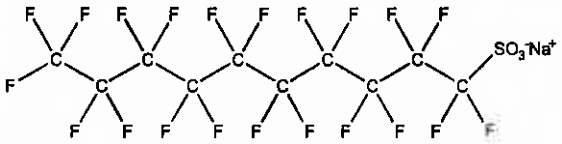
LCPFDS_00008

P: 2/16/18 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFDS	**LOT NUMBER:**	LPFDS1117
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)	**SOLVENT(S):**	Methanol
	48.2 ± 2.4 µg/ml (PFDS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
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 ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

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
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CALA

ANAB ACCREDITED

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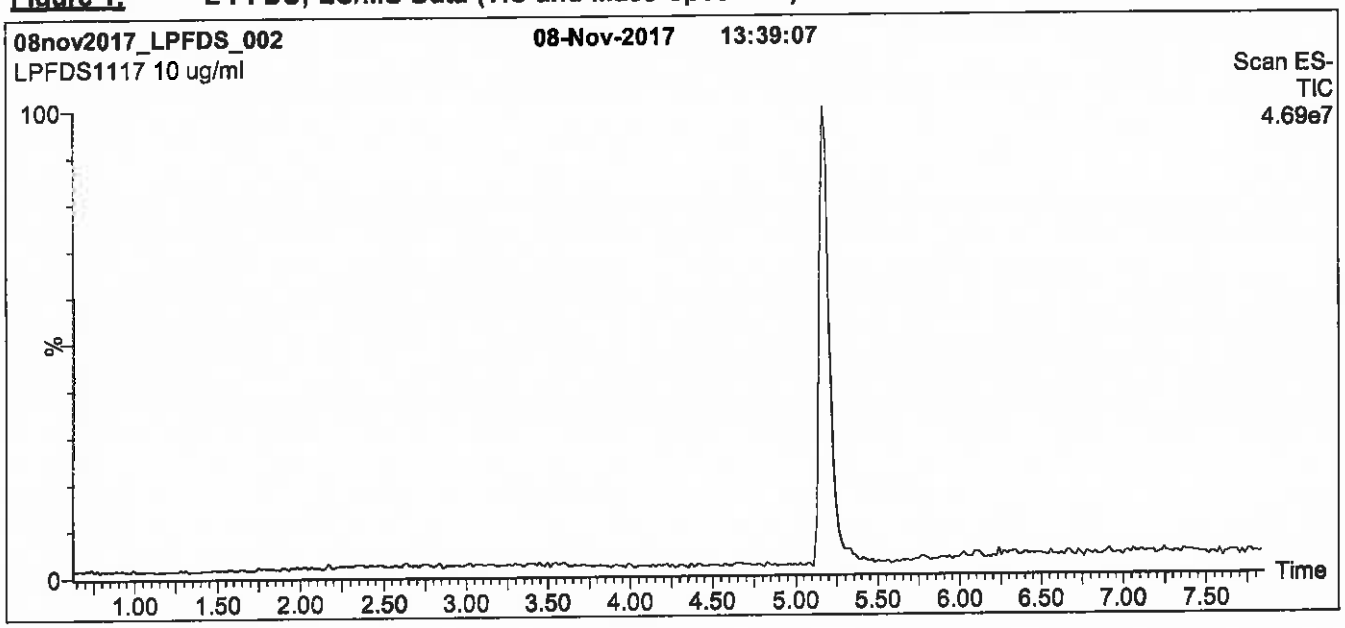
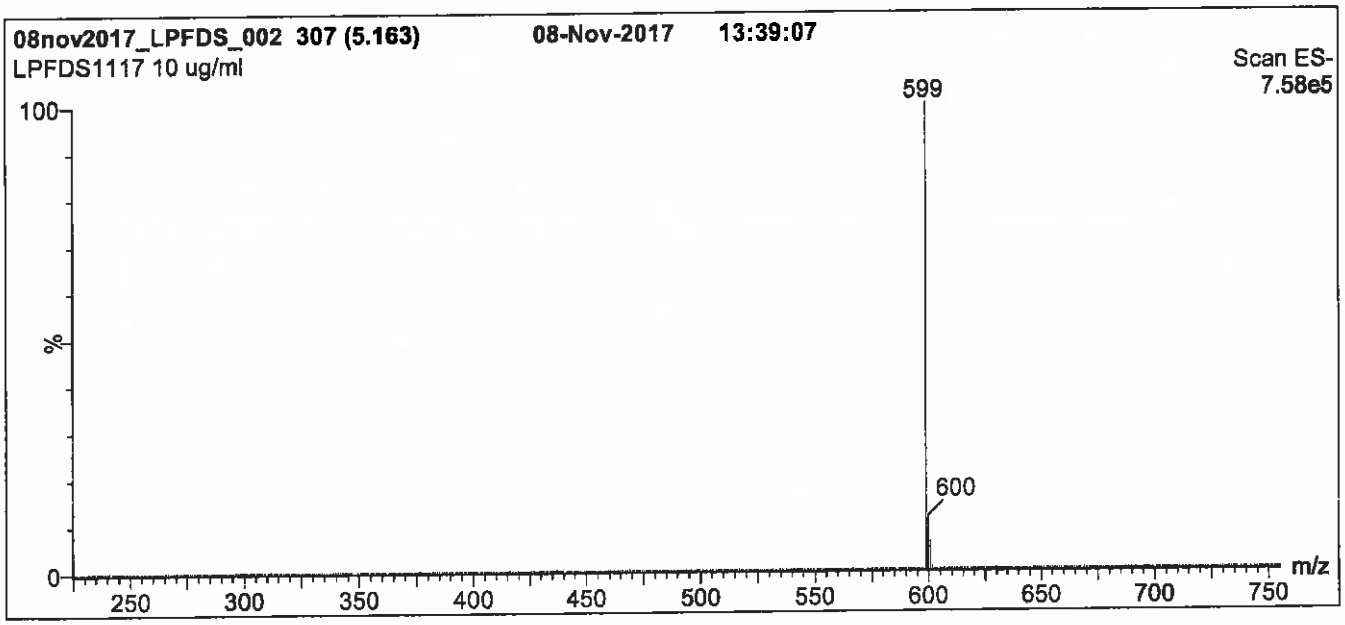
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

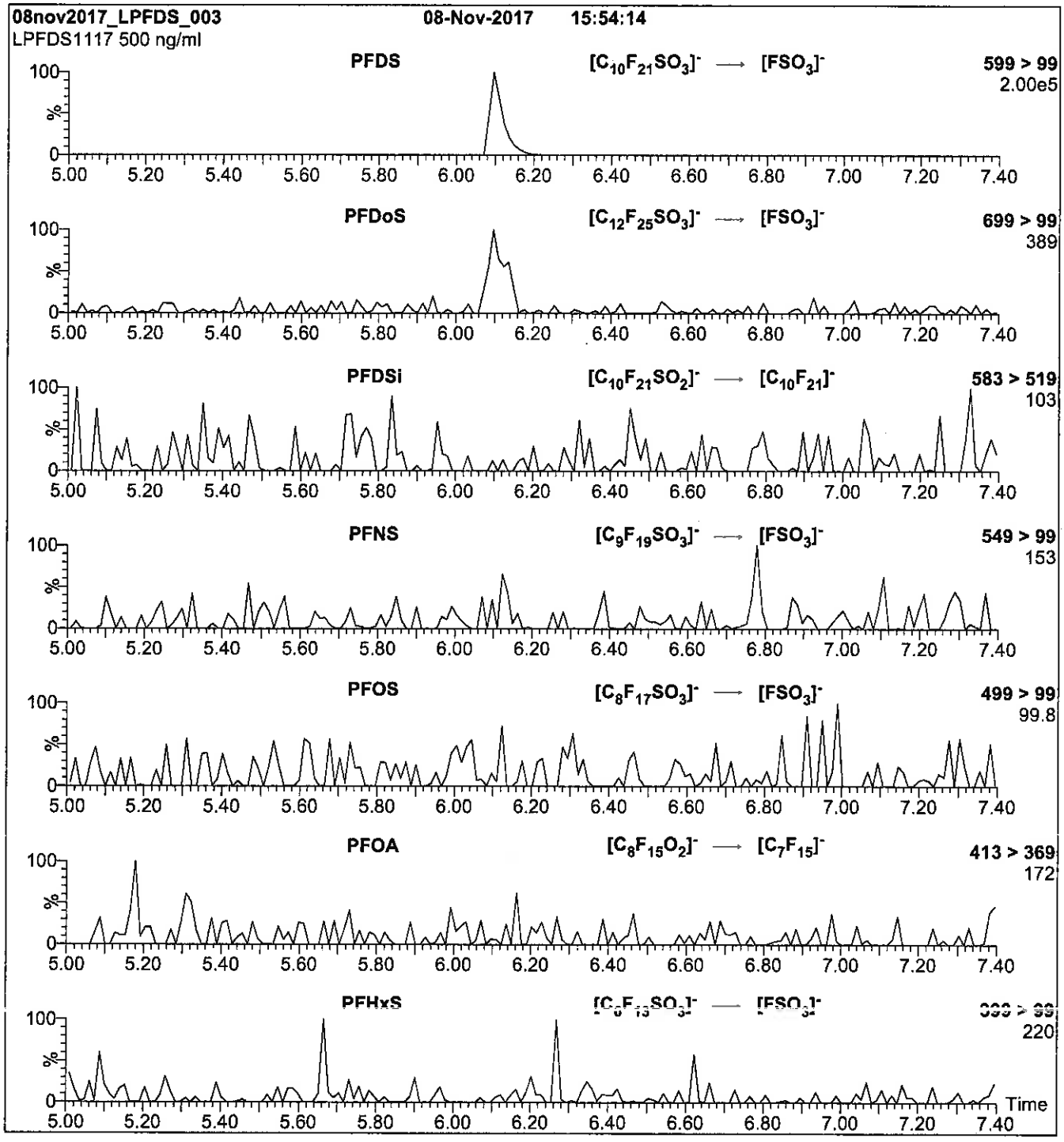
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.46e-3
Collision Energy (eV) = 50

Reagent

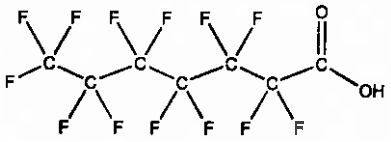
LCPFHpA_00011

P > 2/16/18 SCV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHpA	**LOT NUMBER:**	PFHpA0917
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)	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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/29/2017 (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:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

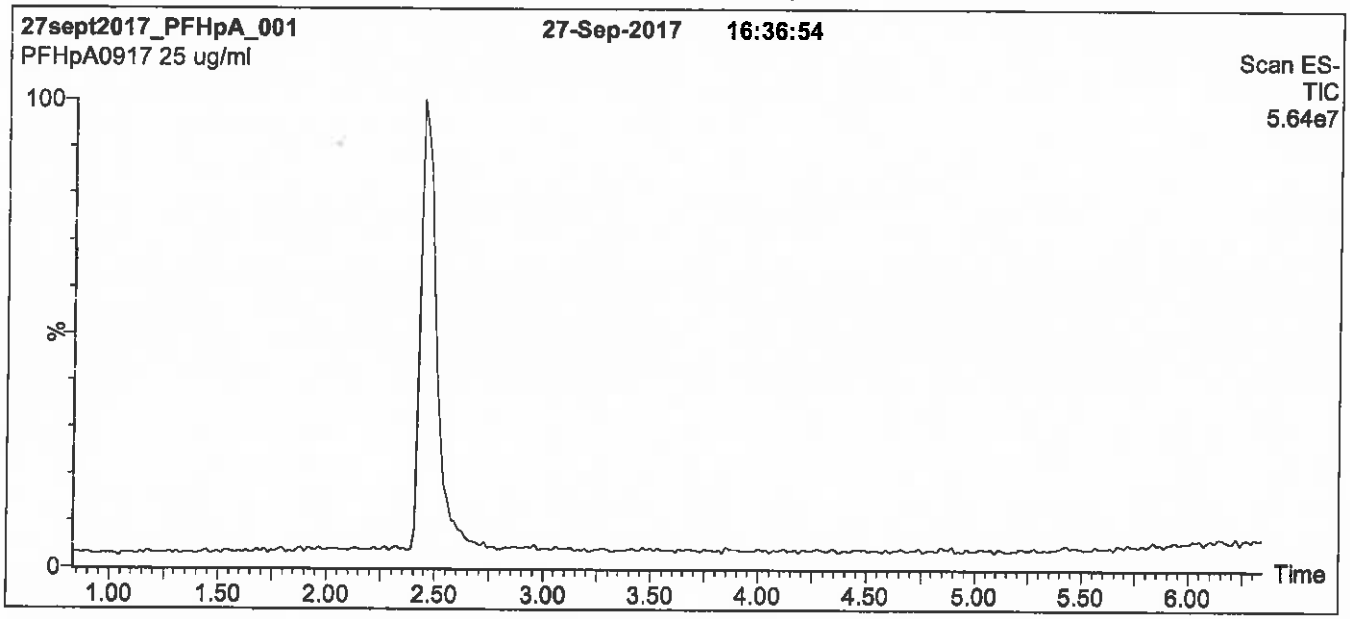
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

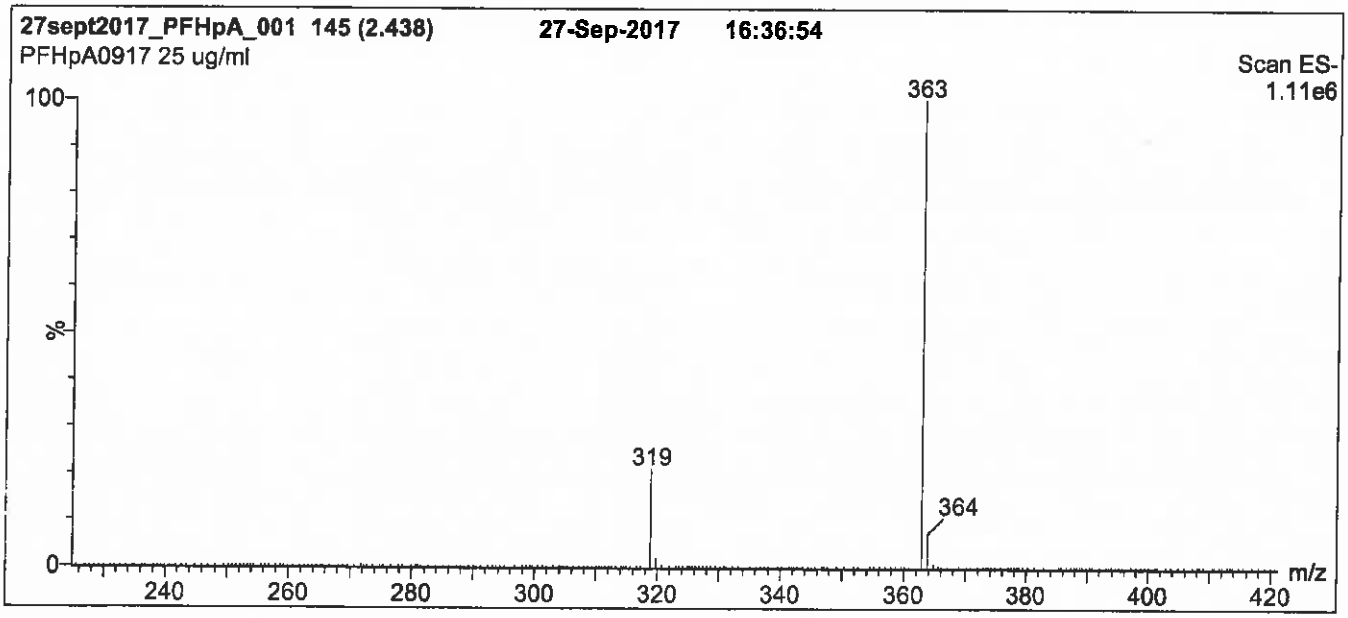
CALA

ANAB ACCREDITED

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

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

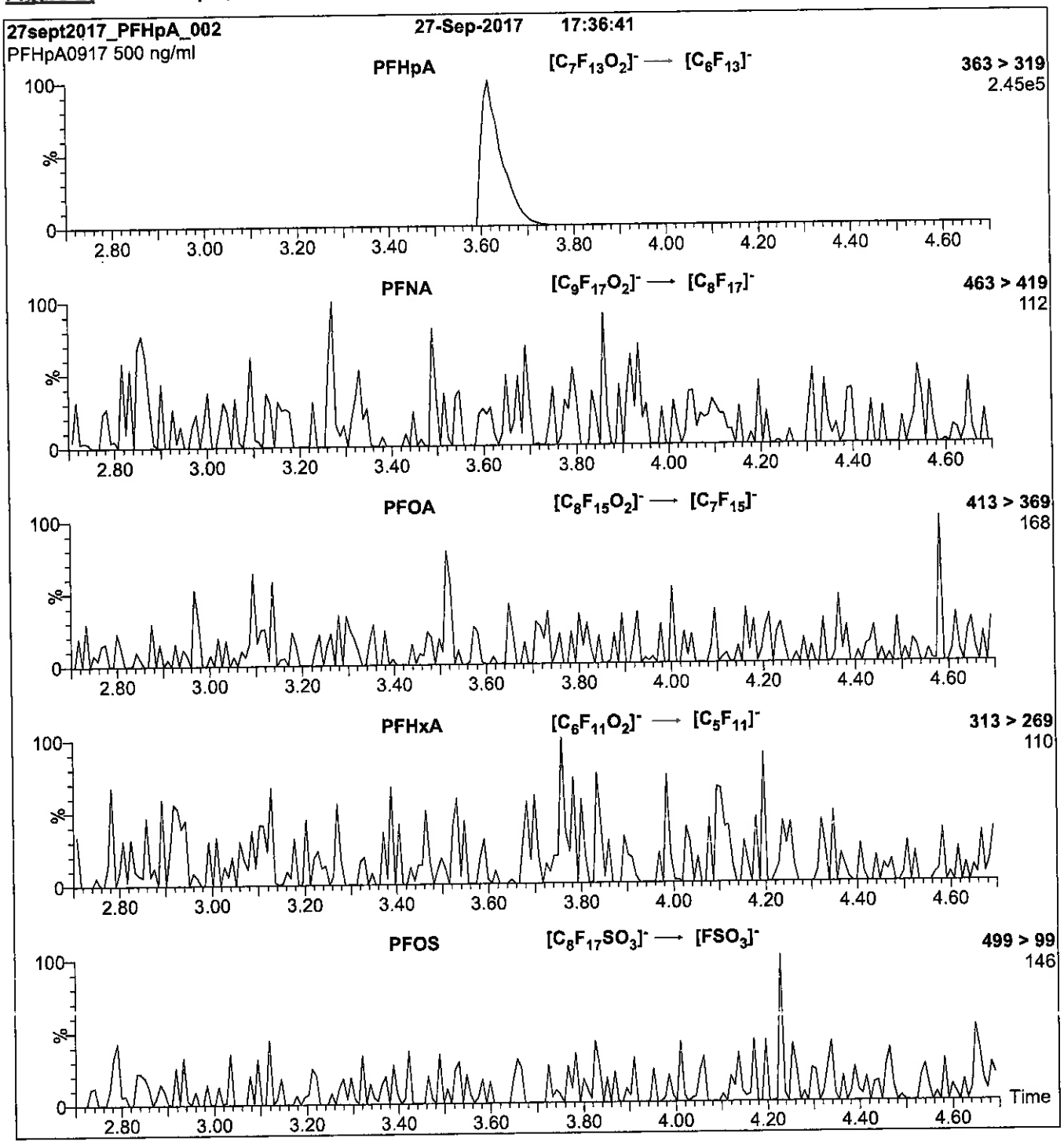
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 11

Reagent

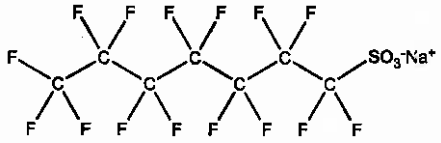
LCPFHpSA_00003

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)	**SOLVENT(S):**	Methanol
	47.6 ± 2.4 µg/ml (PFHpS anion)		
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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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:

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

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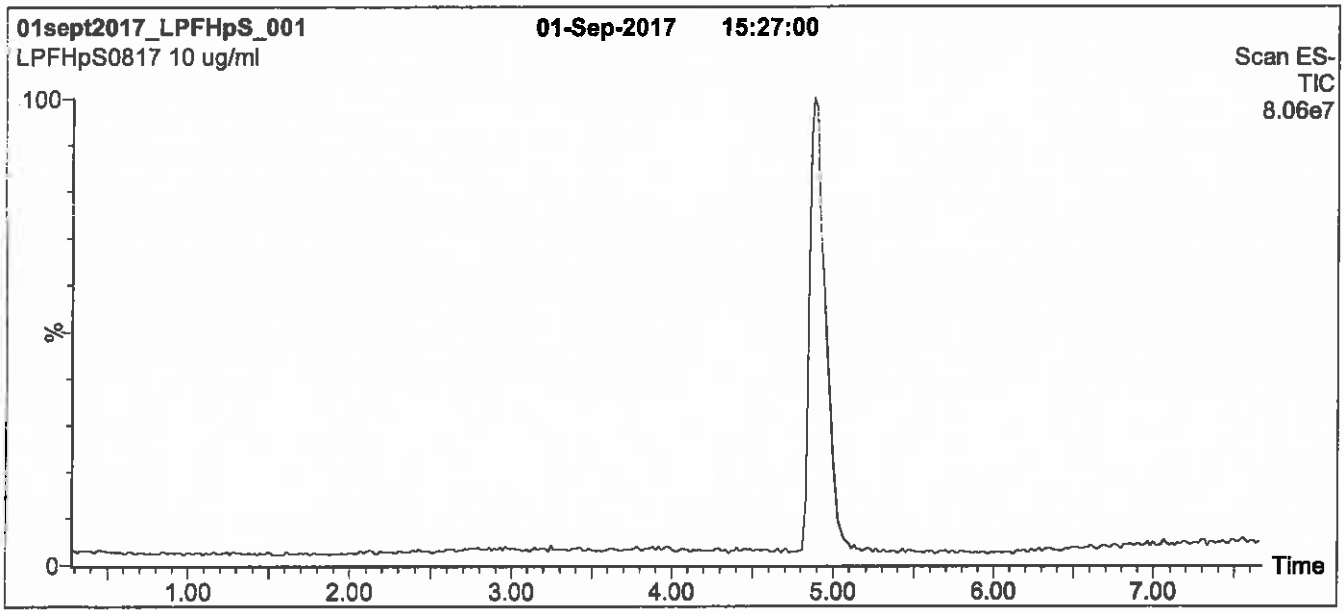
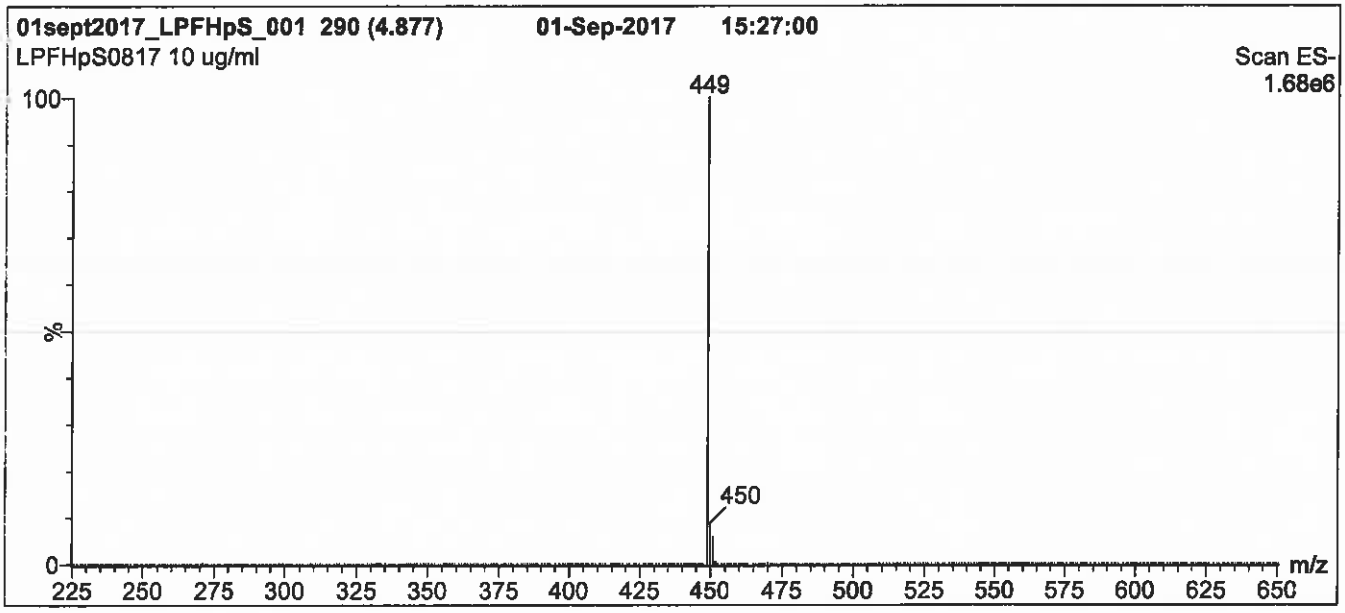
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

Figure 1: **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

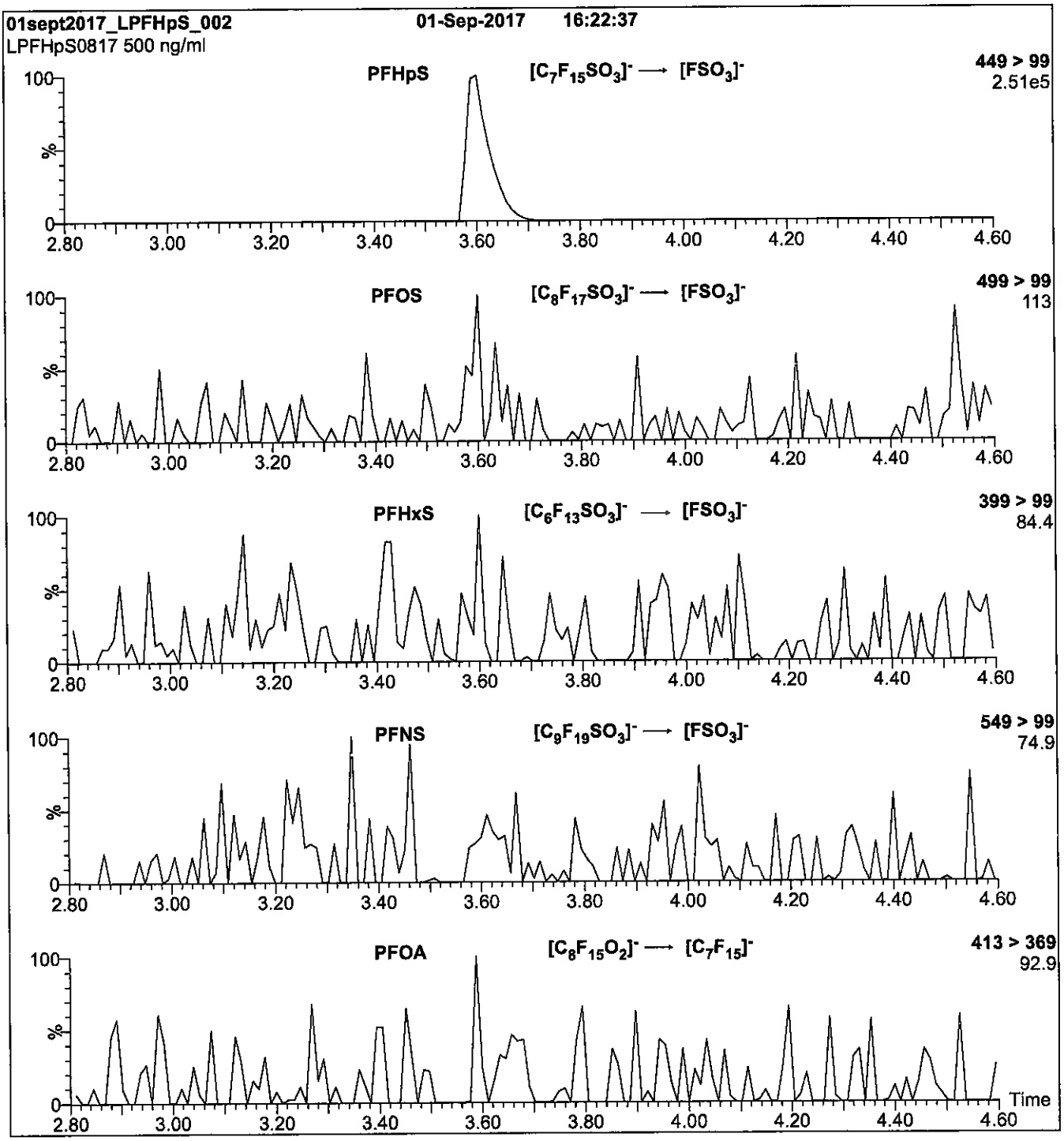
Flow: 300 µl/min

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_00010

r: 2/16/18 SK

WELLINGTON LABORATORIES

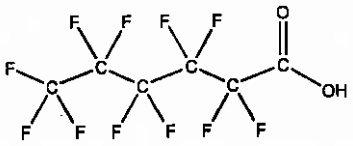
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFHxA0917

STRUCTURE:

CAS #: 307-24-4



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 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.
- Contains ~ 1.0% of branched isomers.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/01/2017 (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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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED

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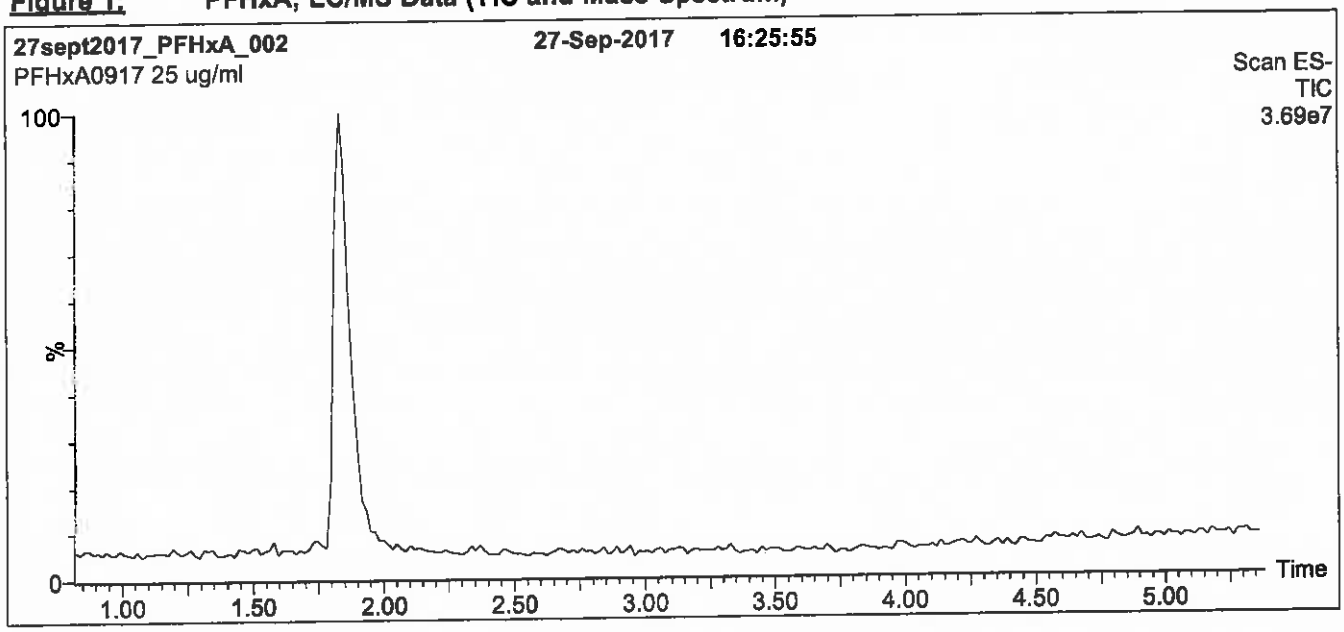
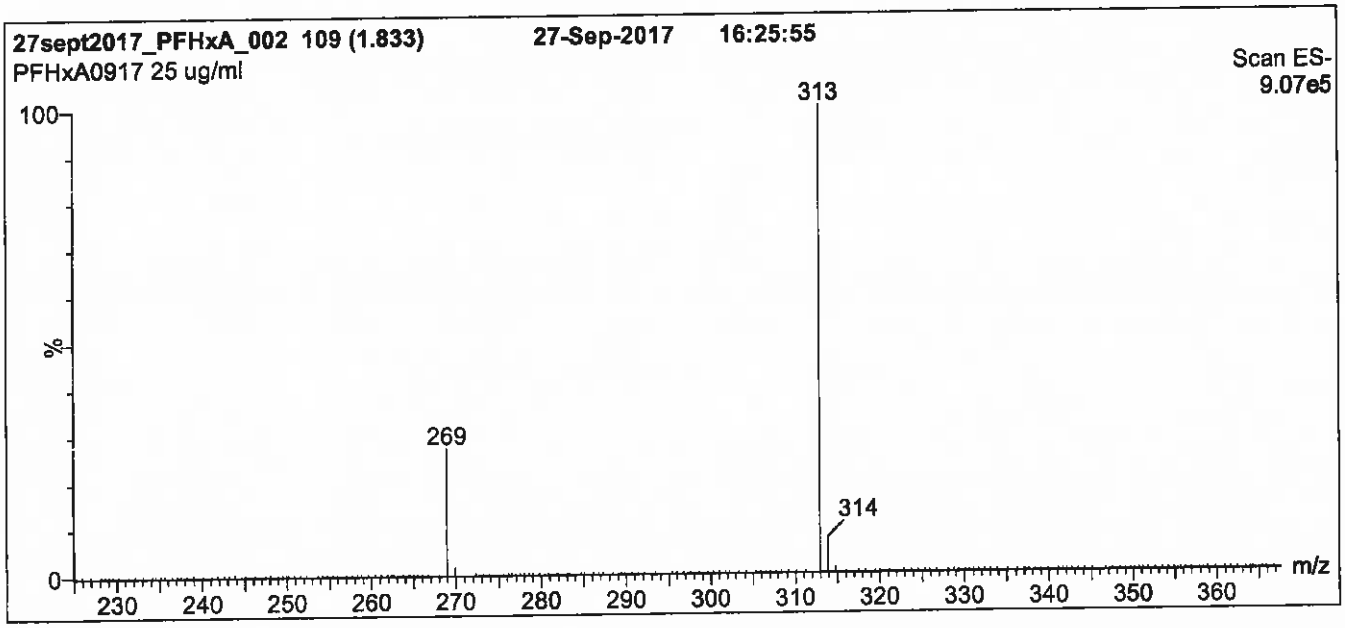
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

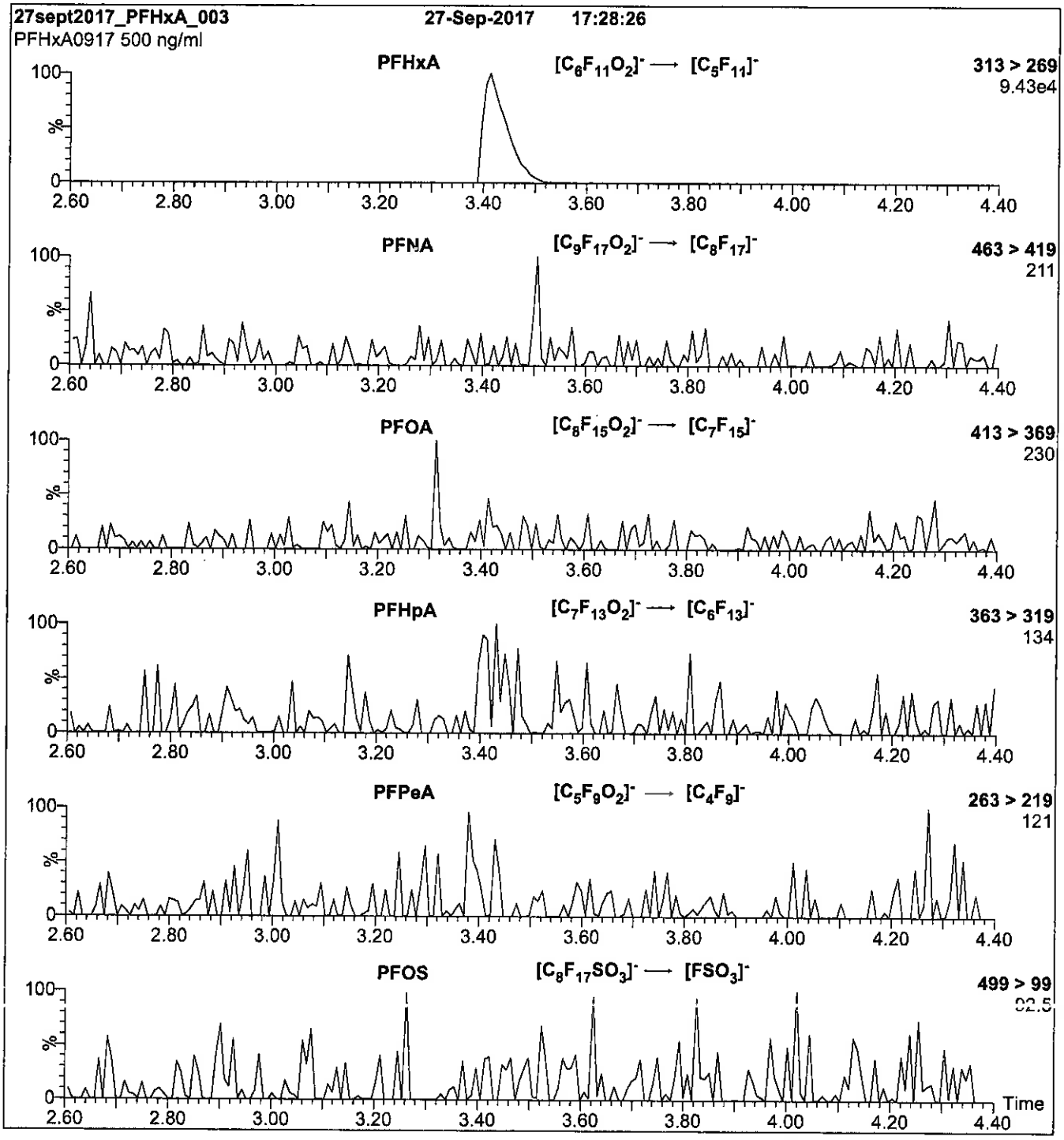
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **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) = 3.46e-3
Collision Energy (eV) = 10

Reagent

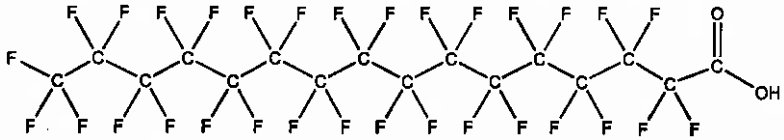
LCPFHxDA_00010

r: 9/21/17 sw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxDA	**LOT NUMBER:**	PFHxDA0717
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)	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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/04/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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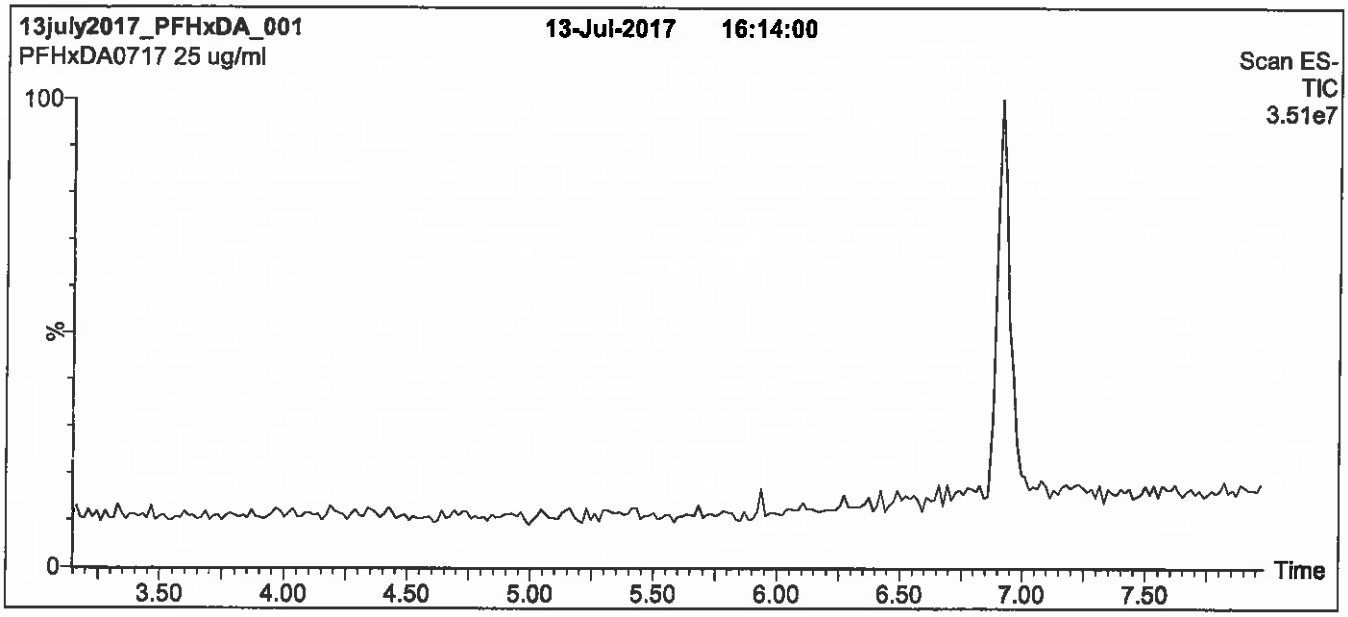
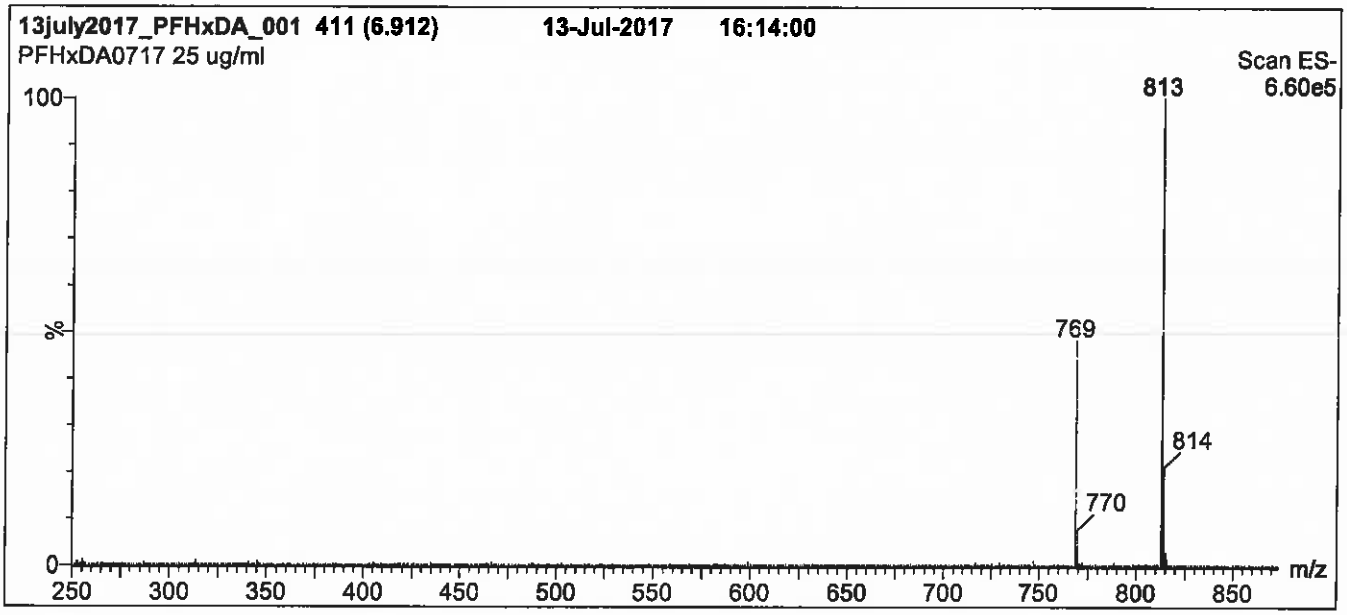
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

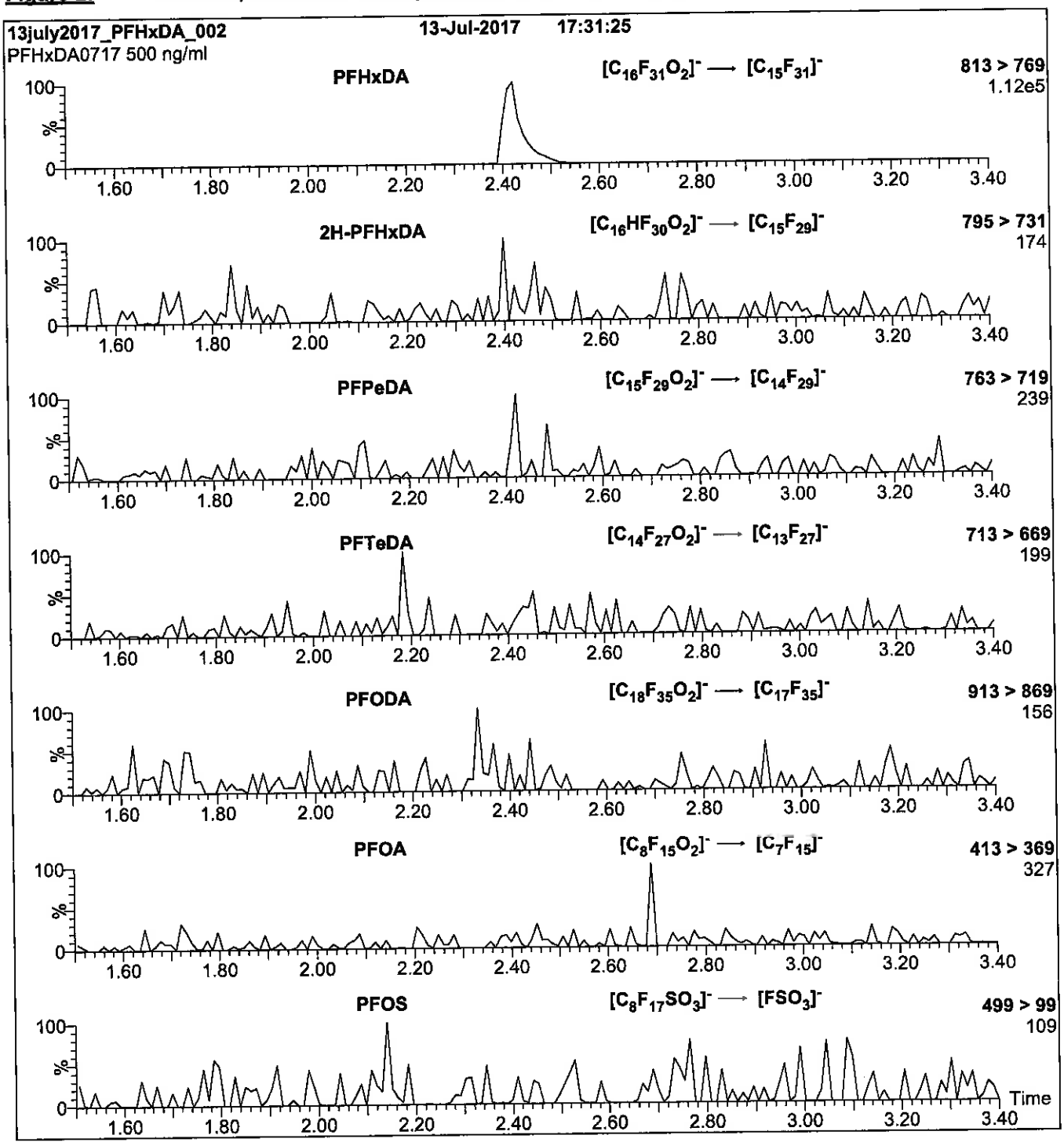
Flow: 300 µl/min

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: **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) = 3.13e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00006

P: 10/20 A SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate
Solution/Mixture of Linear and
Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0117
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)	01/03/2017
LAST TESTED: (mm/dd/yyyy)	01/04/2017
EXPIRY DATE: (mm/dd/yyyy)	01/04/2022
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 (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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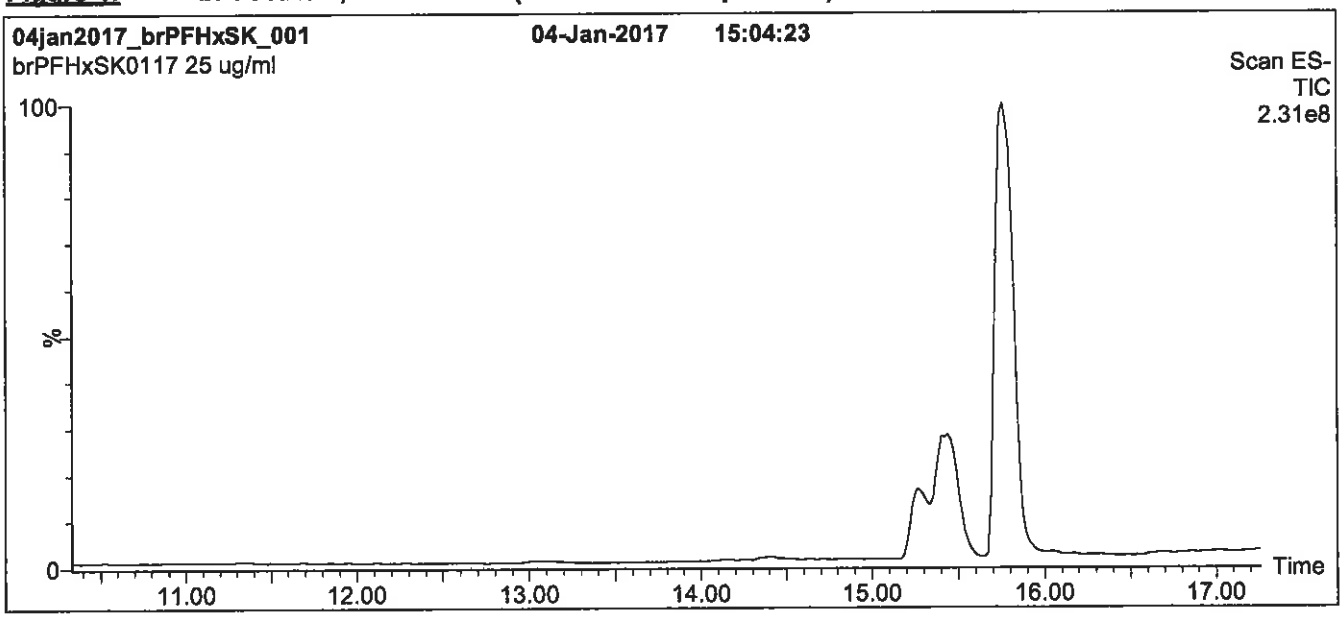
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

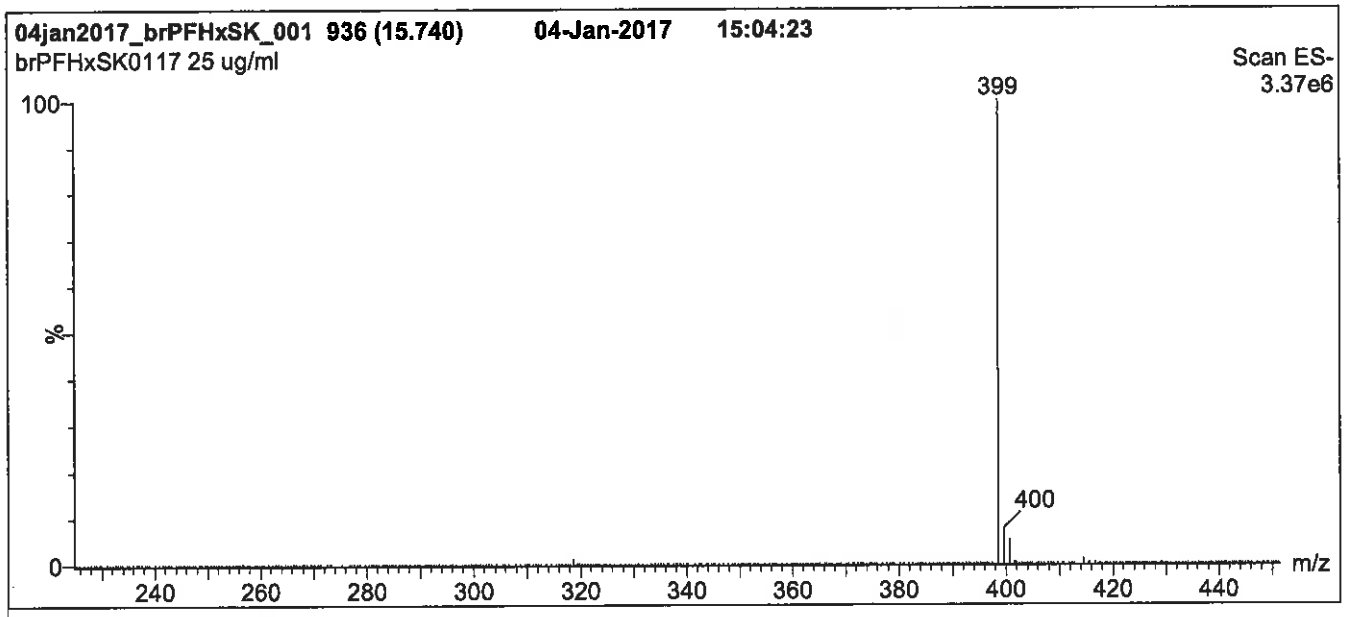
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	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:** 01/20/2017 (mm/dd/yyyy)
B.G. Chittim

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

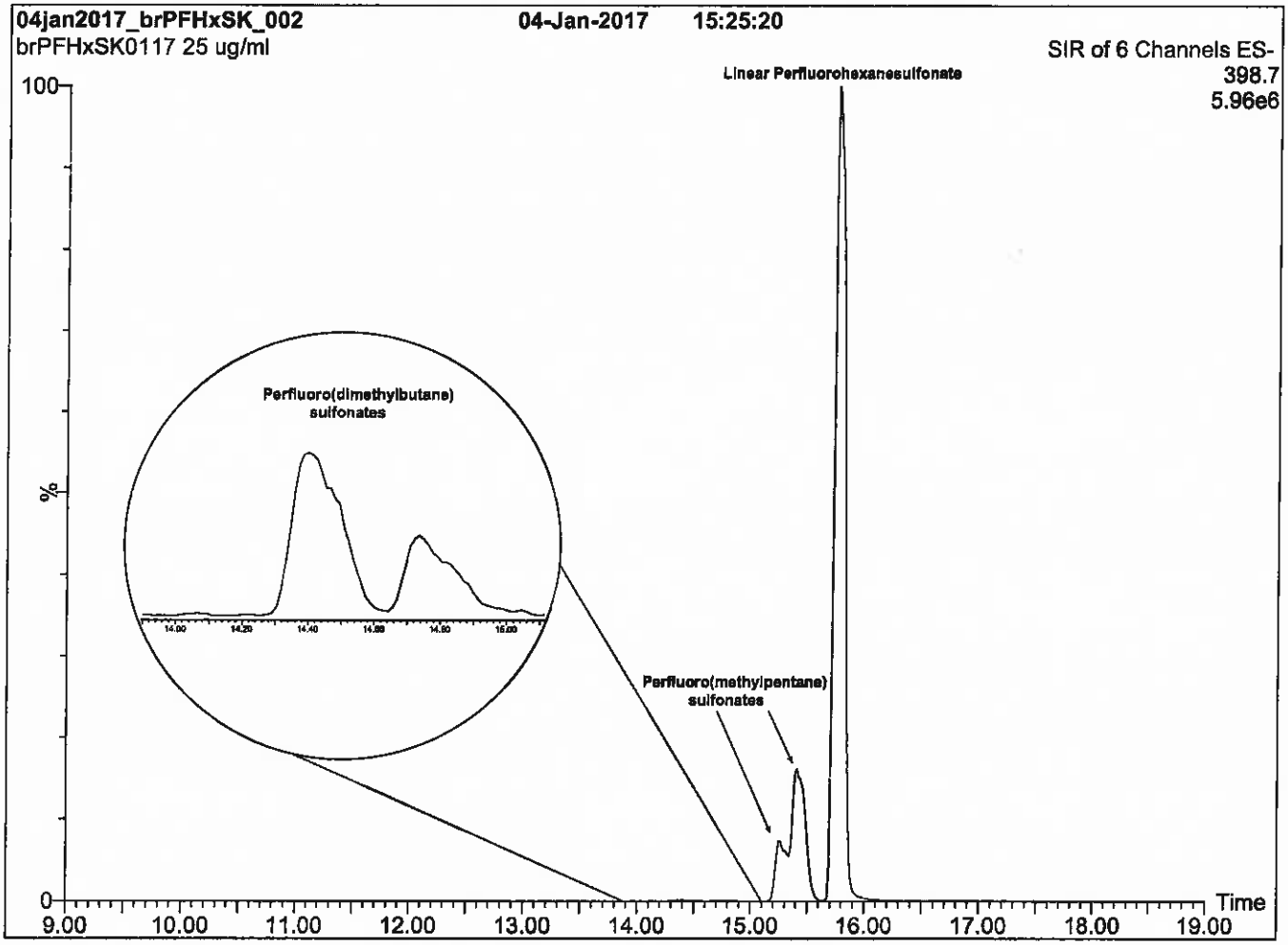
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **br-PFHxSK; 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: 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

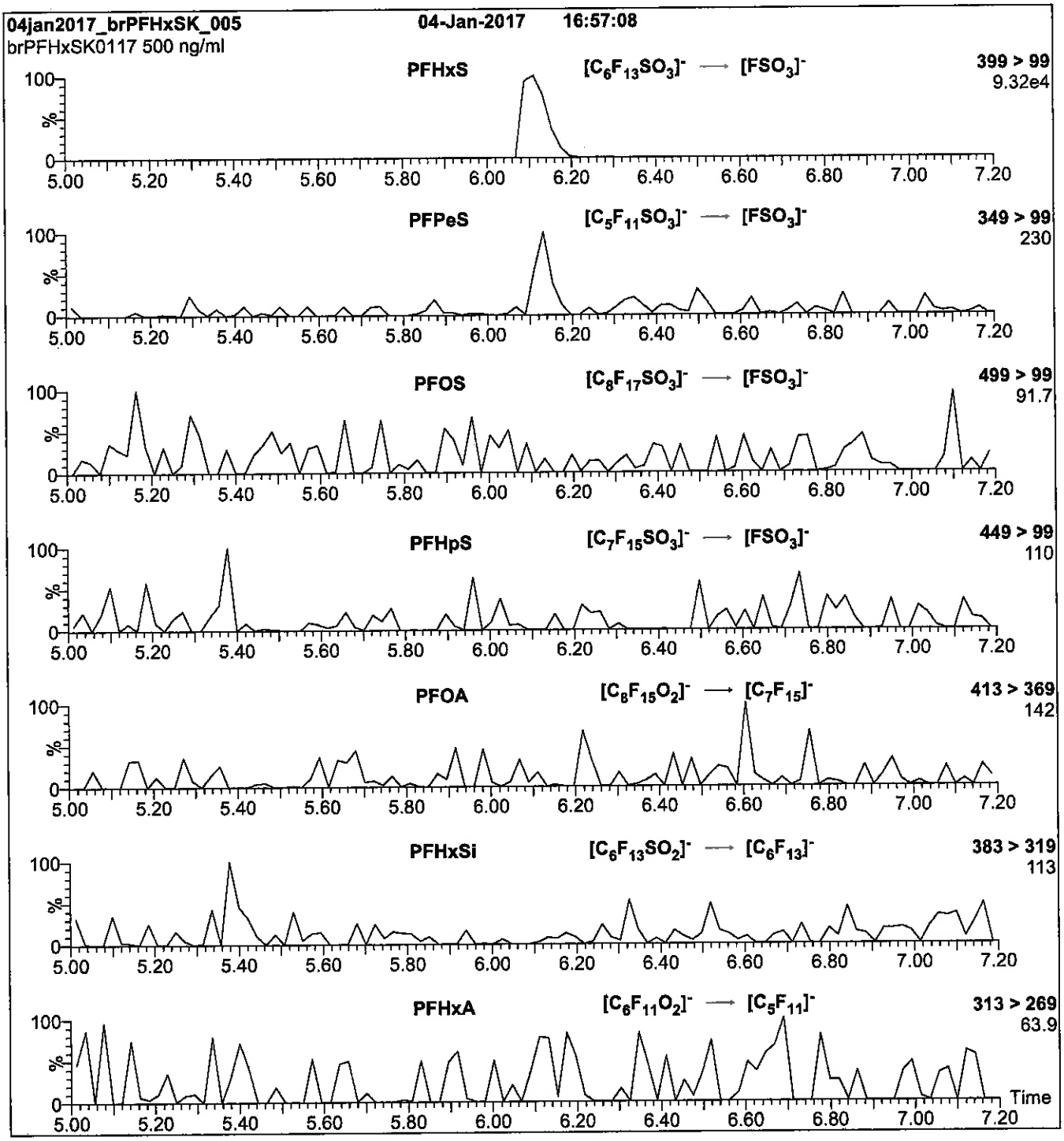
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (15-62)
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) = 3.35e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00010

r: 2/16/18 SKJ

WELLINGTON LABORATORIES

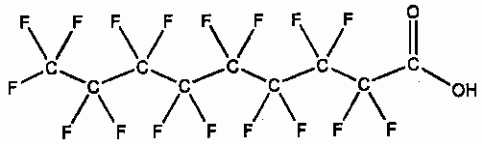
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFNA0717

STRUCTURE:

CAS #: 375-95-1



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 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).

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Certified By: _____ **Date:** 07/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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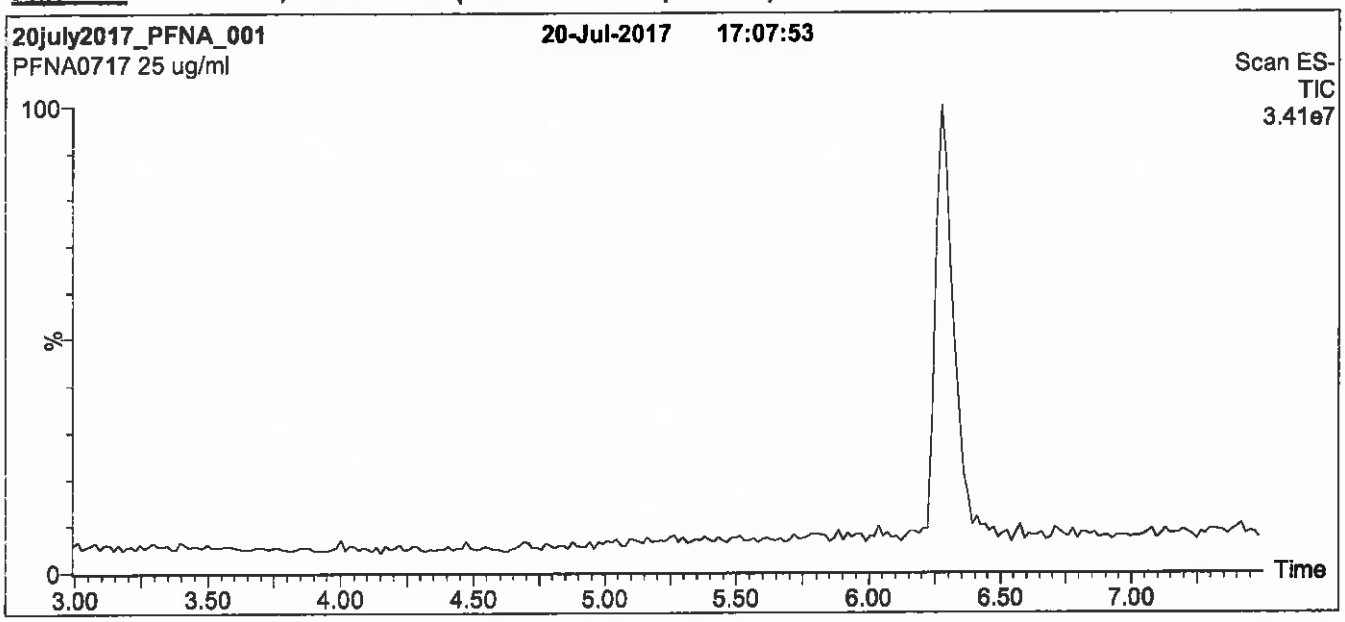

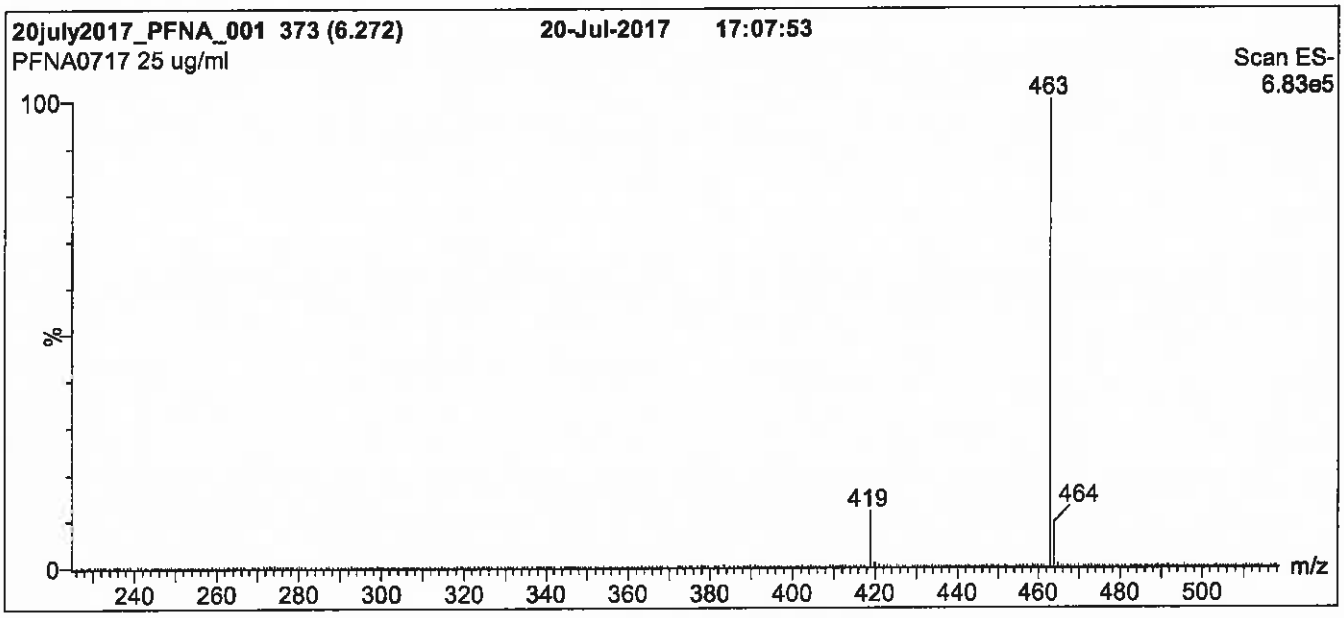

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1.7 µm, 2.1 x 100 mm

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

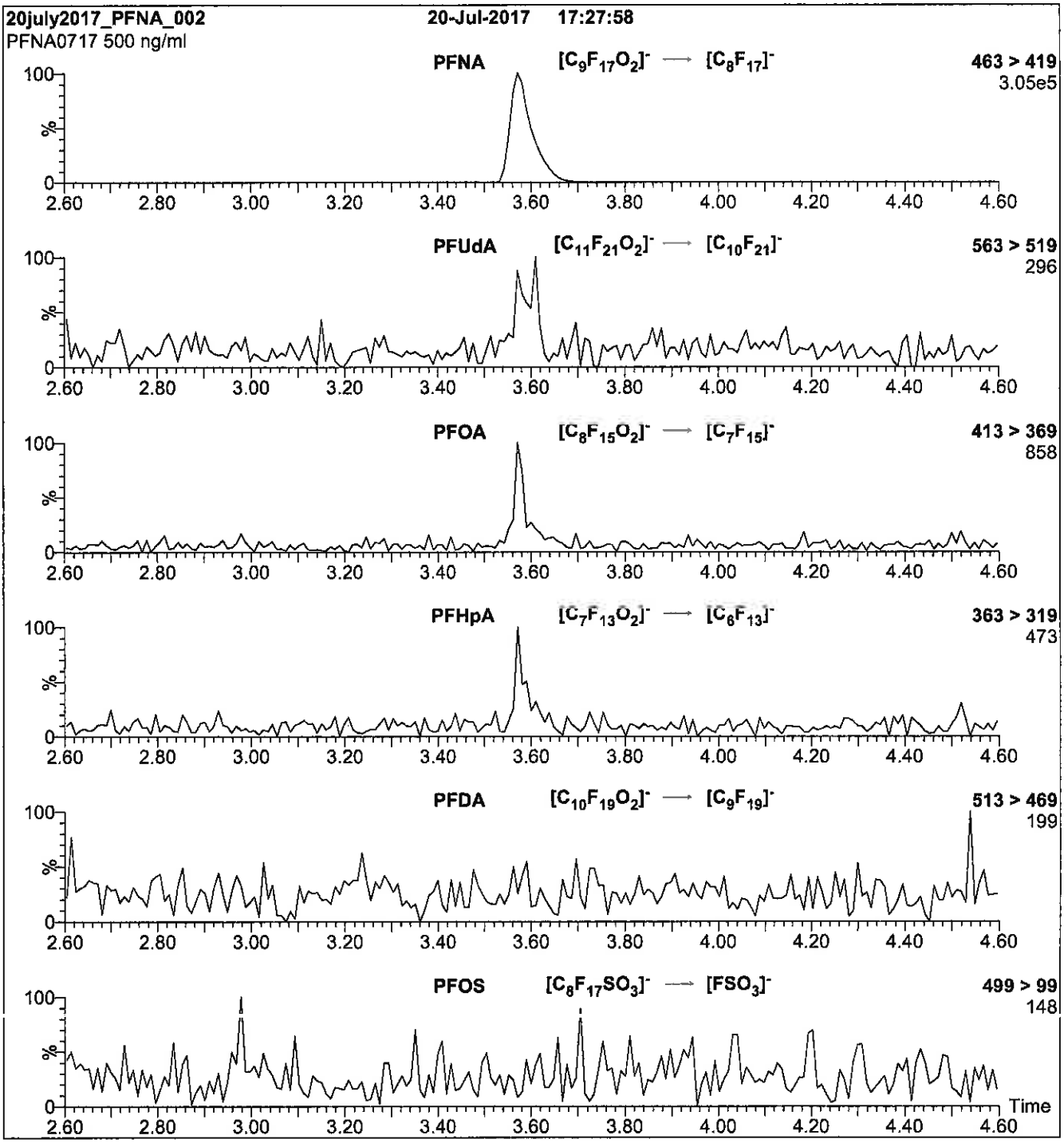
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFNS_00003

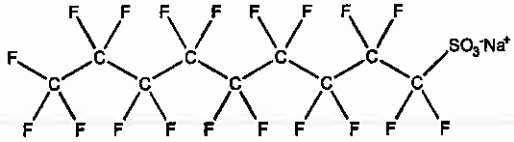
1106804
ID: LCPFNS_00003
Exp: 09/27/22 Prpd: SKV
L-PFNS at 48.0ug/mL

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		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: 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:** 09/28/2017 (mm/dd/yyyy)

B.G. Chittim, General Manager

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

INTENDED USE:

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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:

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CALA

ANAB ACCREDITED

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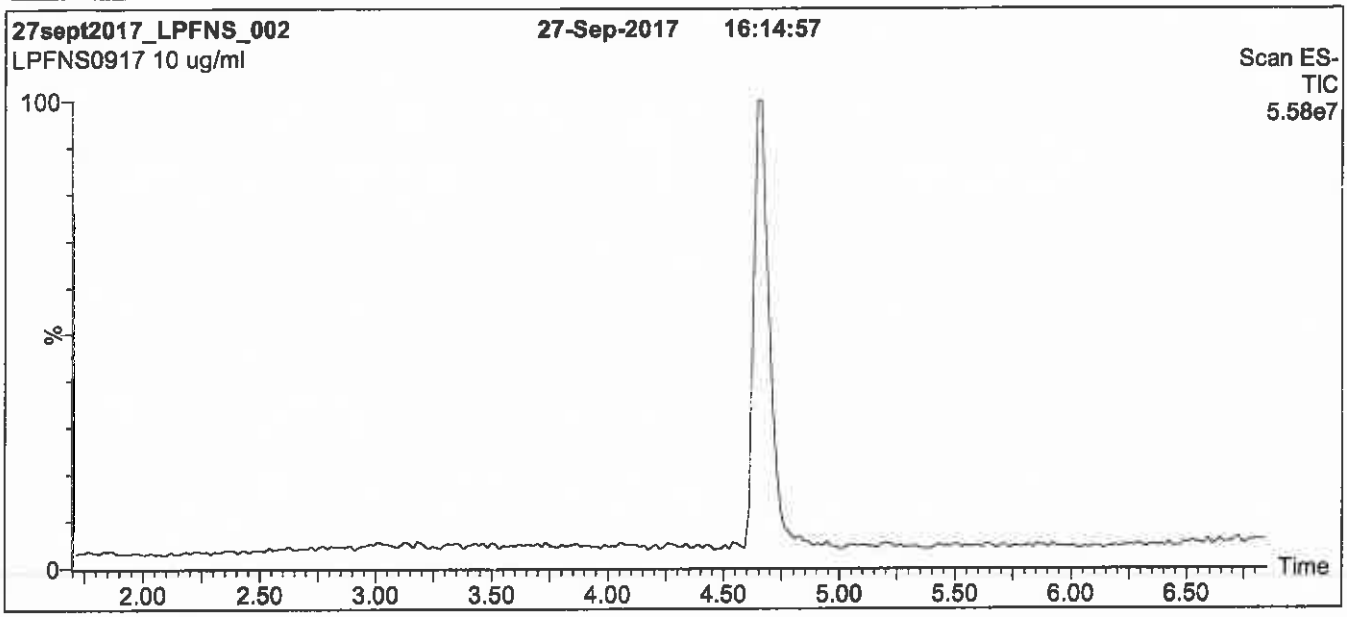
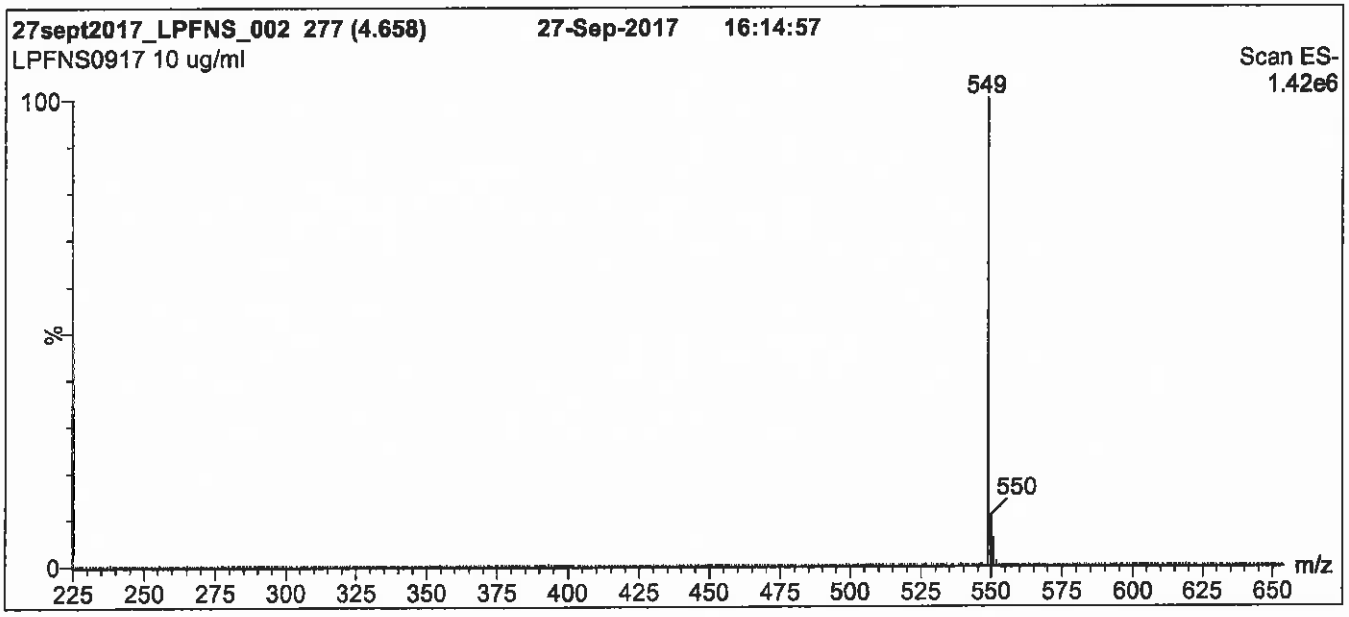
Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

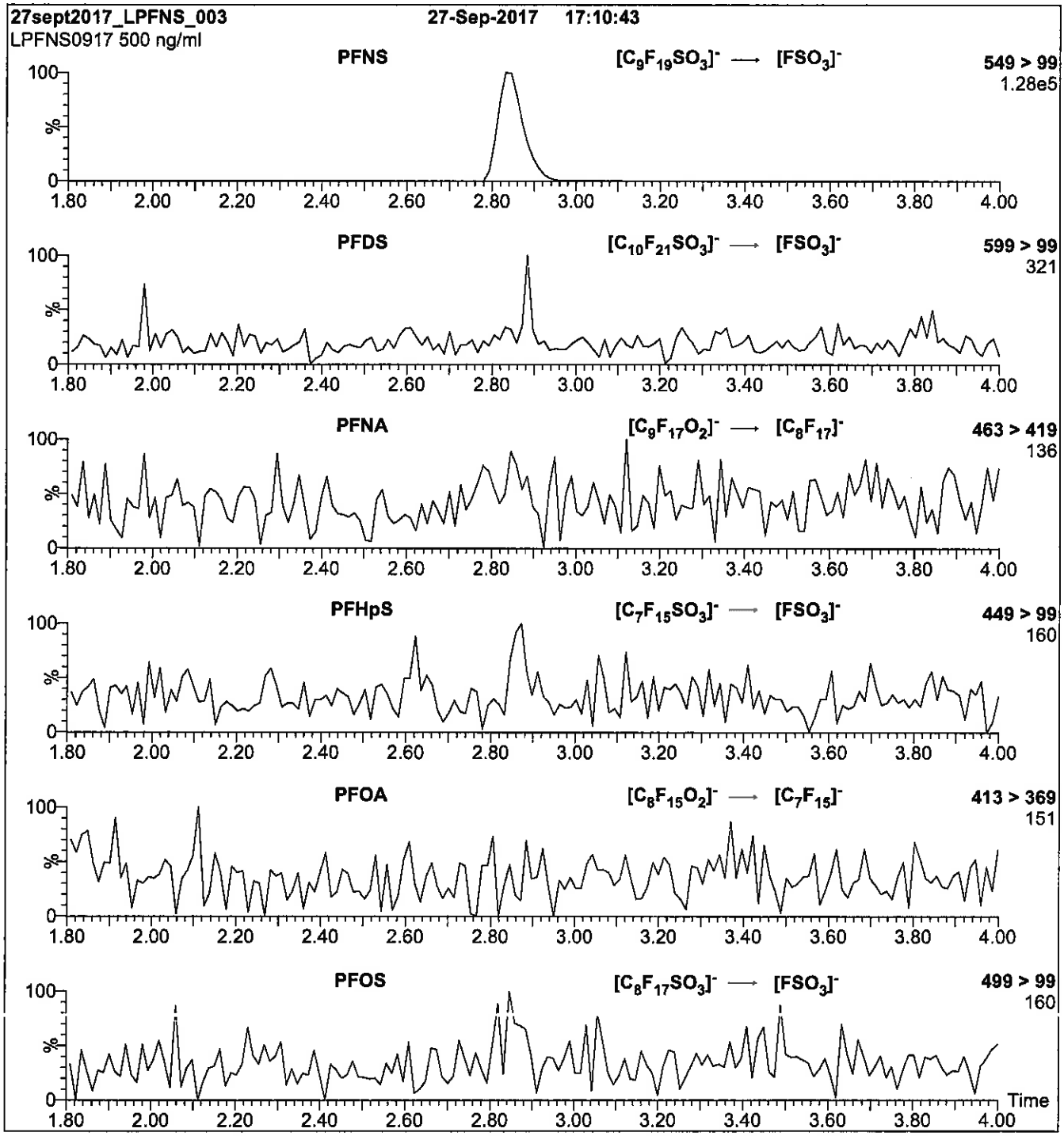
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

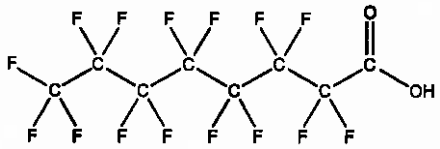
LCPFOA_00011

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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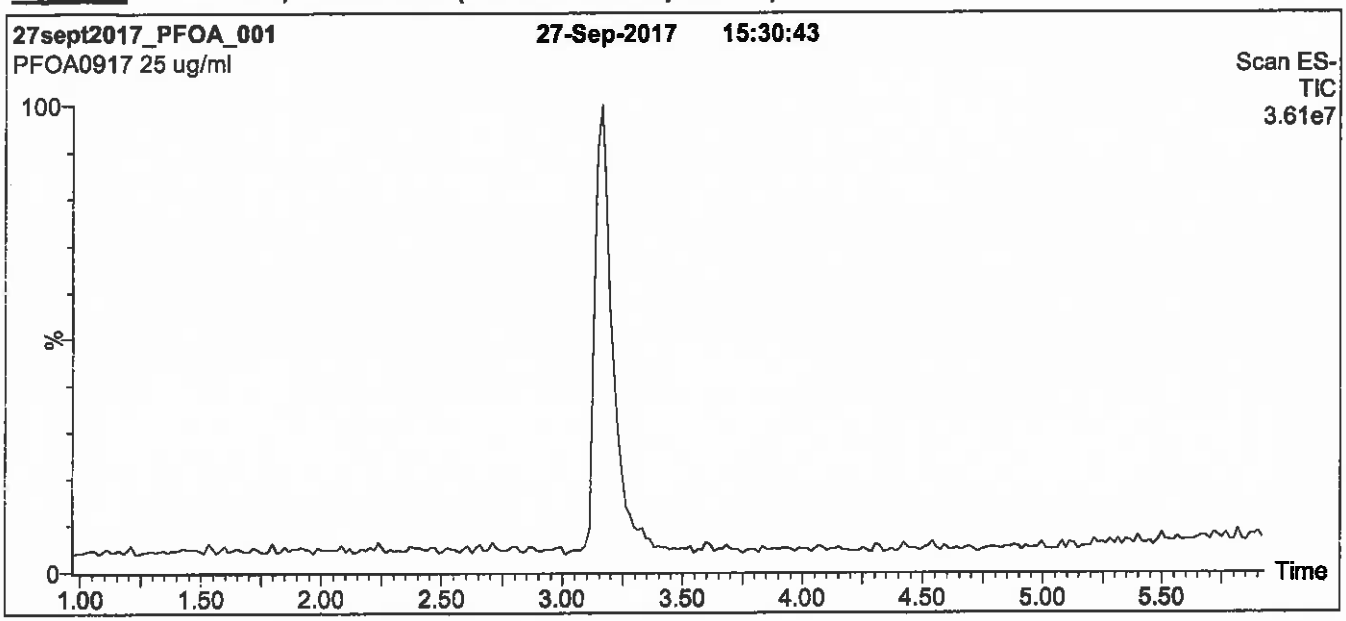
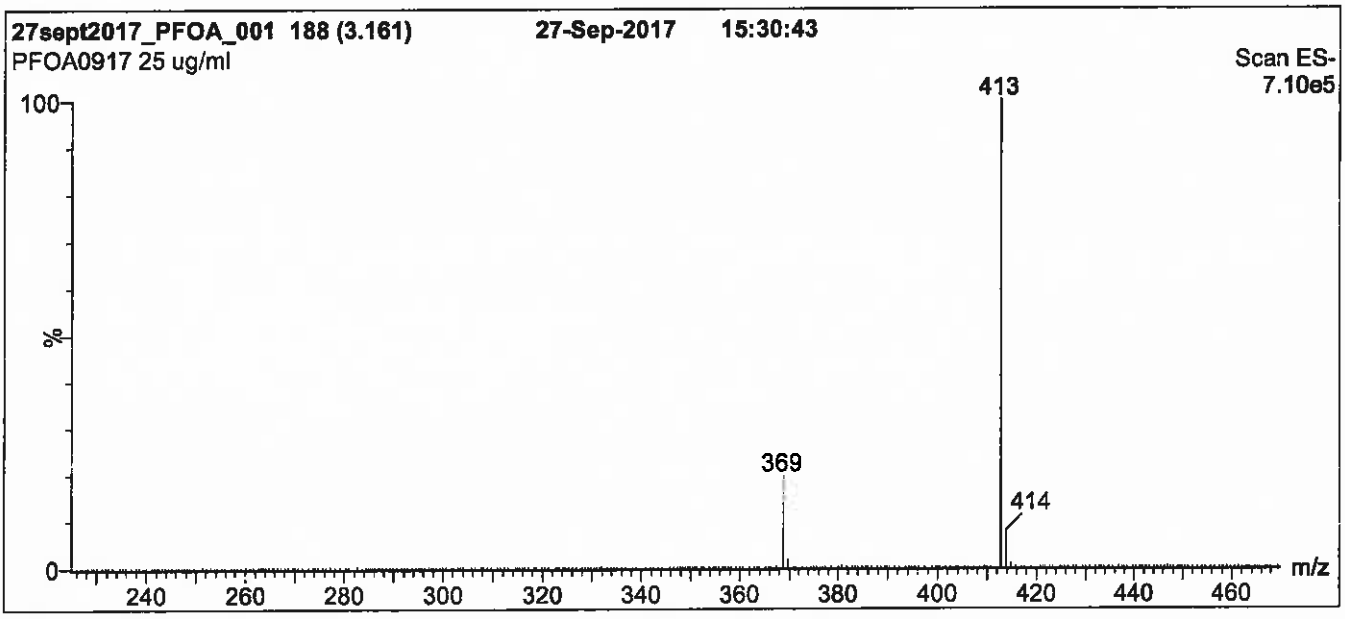
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





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

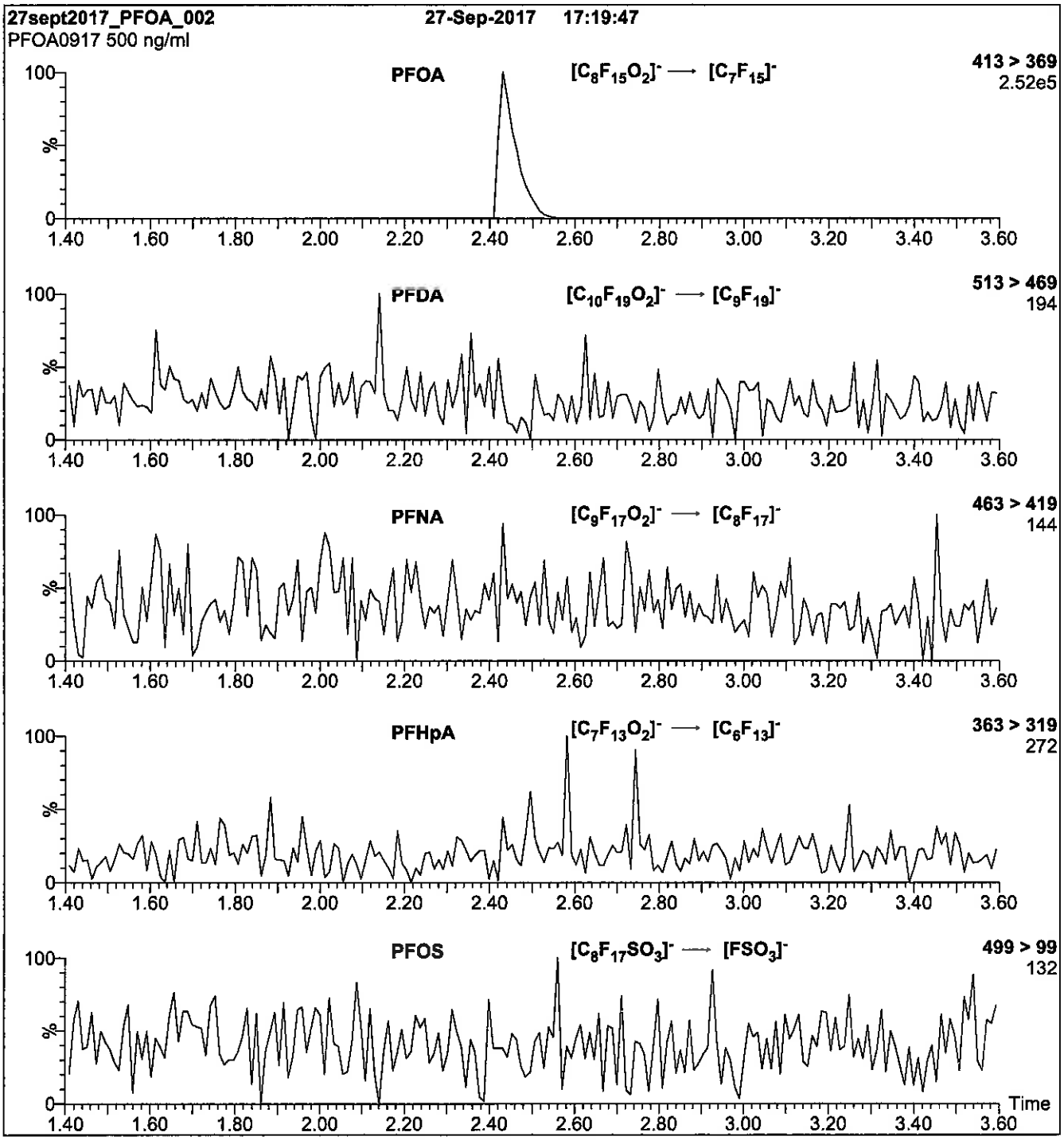
Flow: 300 µl/min

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

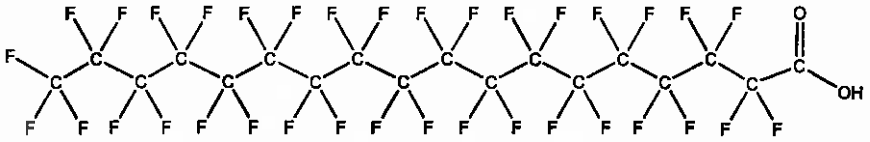
LCPFODA_00010

r: 9/2/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFODA	**LOT NUMBER:**	PFODA0717
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)	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.

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

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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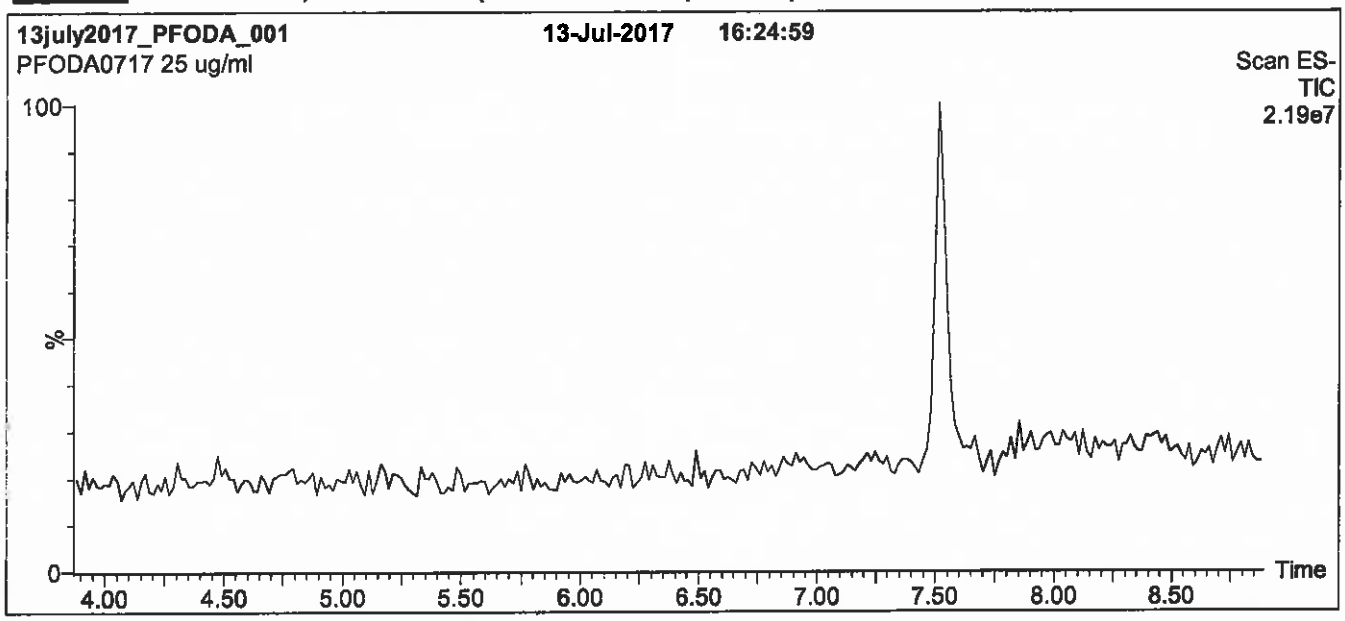
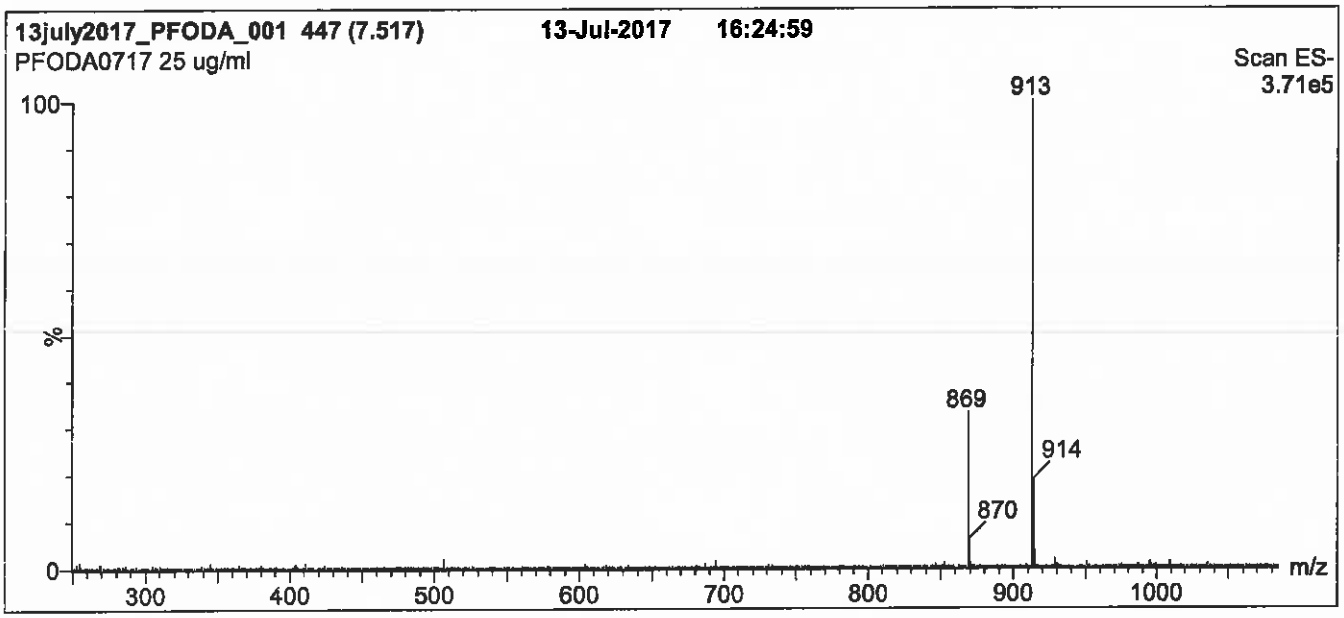
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

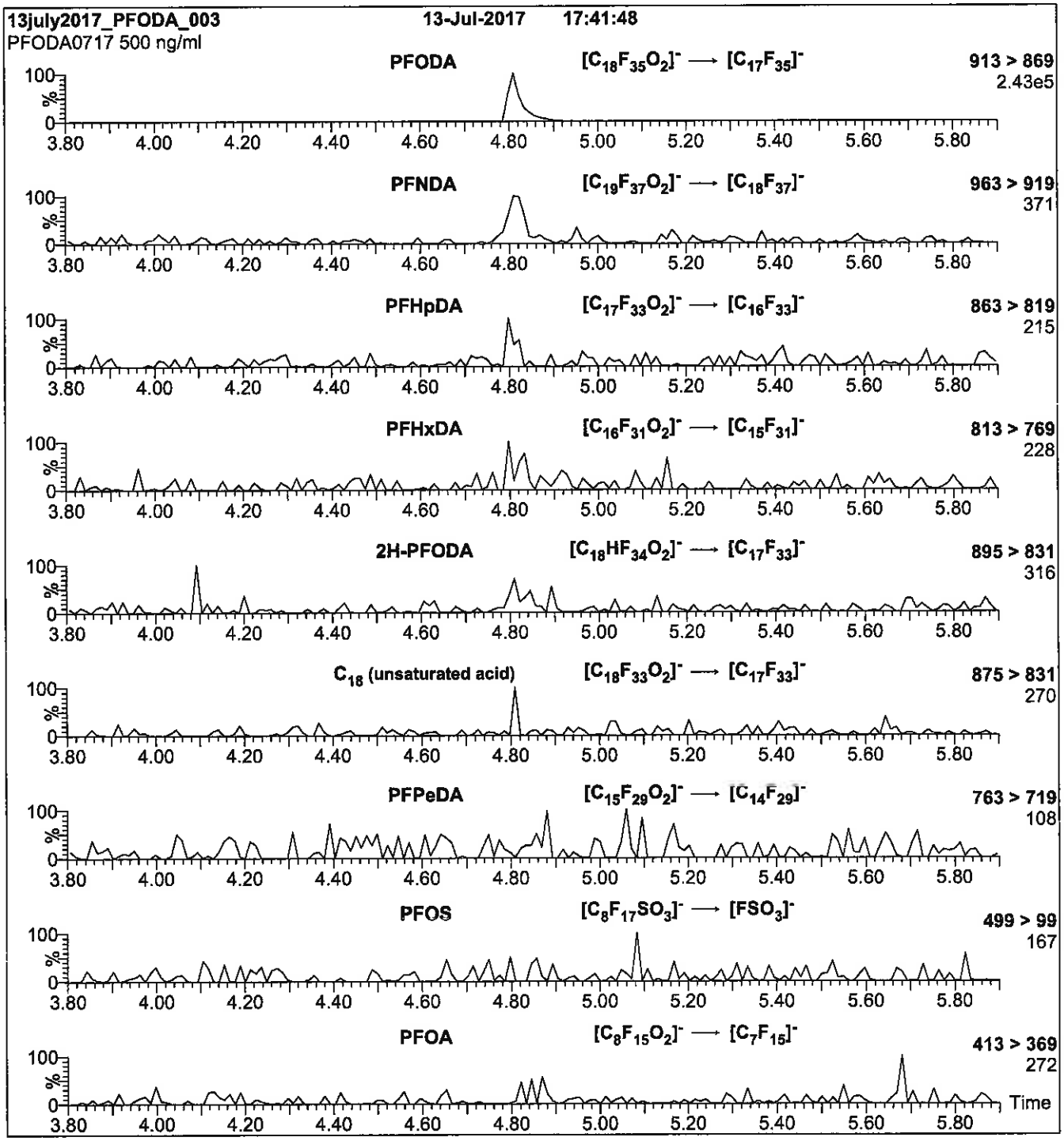
Flow: 300 µl/min

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) = 100
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 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) = 15

Reagent

LCPFOS-br_00007

P: 10/2017 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK0117
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)	01/09/2017
LAST TESTED: (mm/dd/yyyy)	01/12/2017
EXPIRY DATE: (mm/dd/yyyy)	01/12/2022
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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UNCERTAINTY:

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

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

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

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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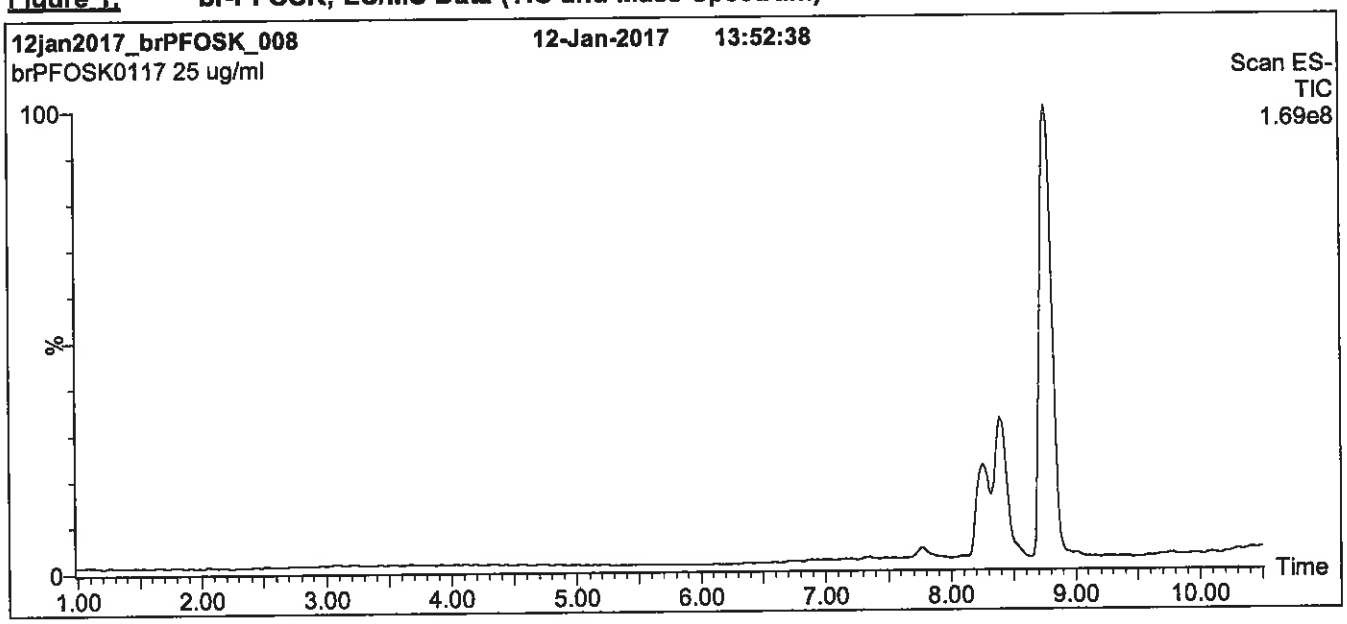
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

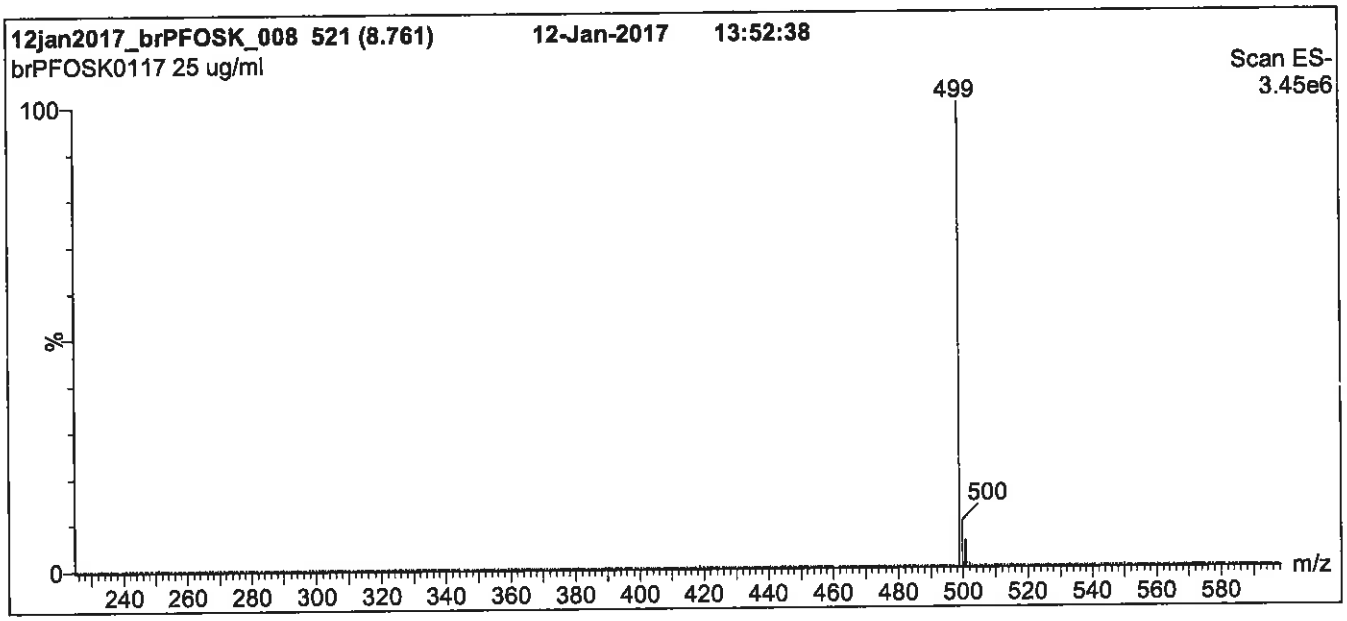
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	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	$CF_3C(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	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	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2SO_3^-K^+$	0.07

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

Certified By: B.G. Chittim **Date:** 01/20/2017 (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

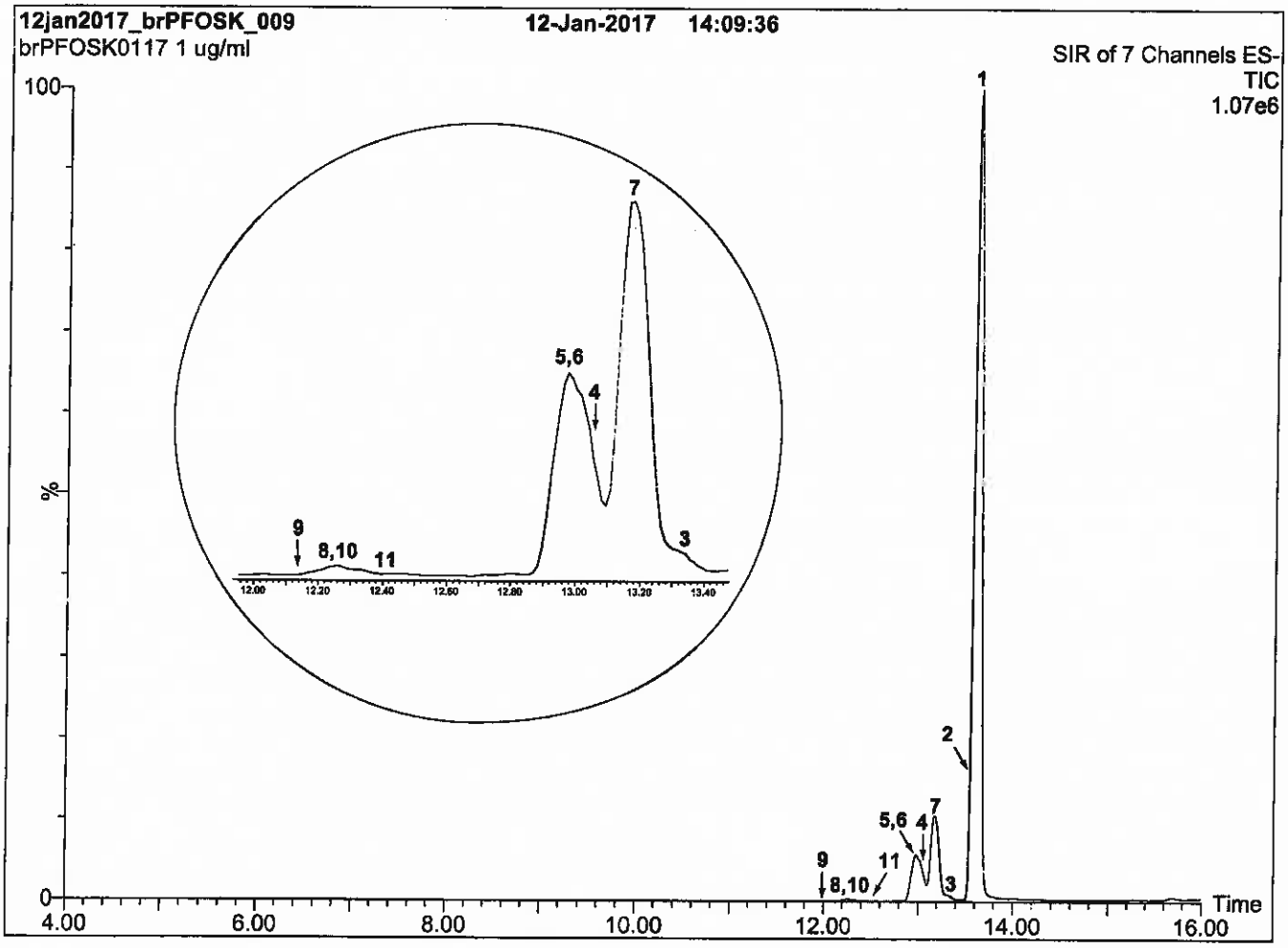
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **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

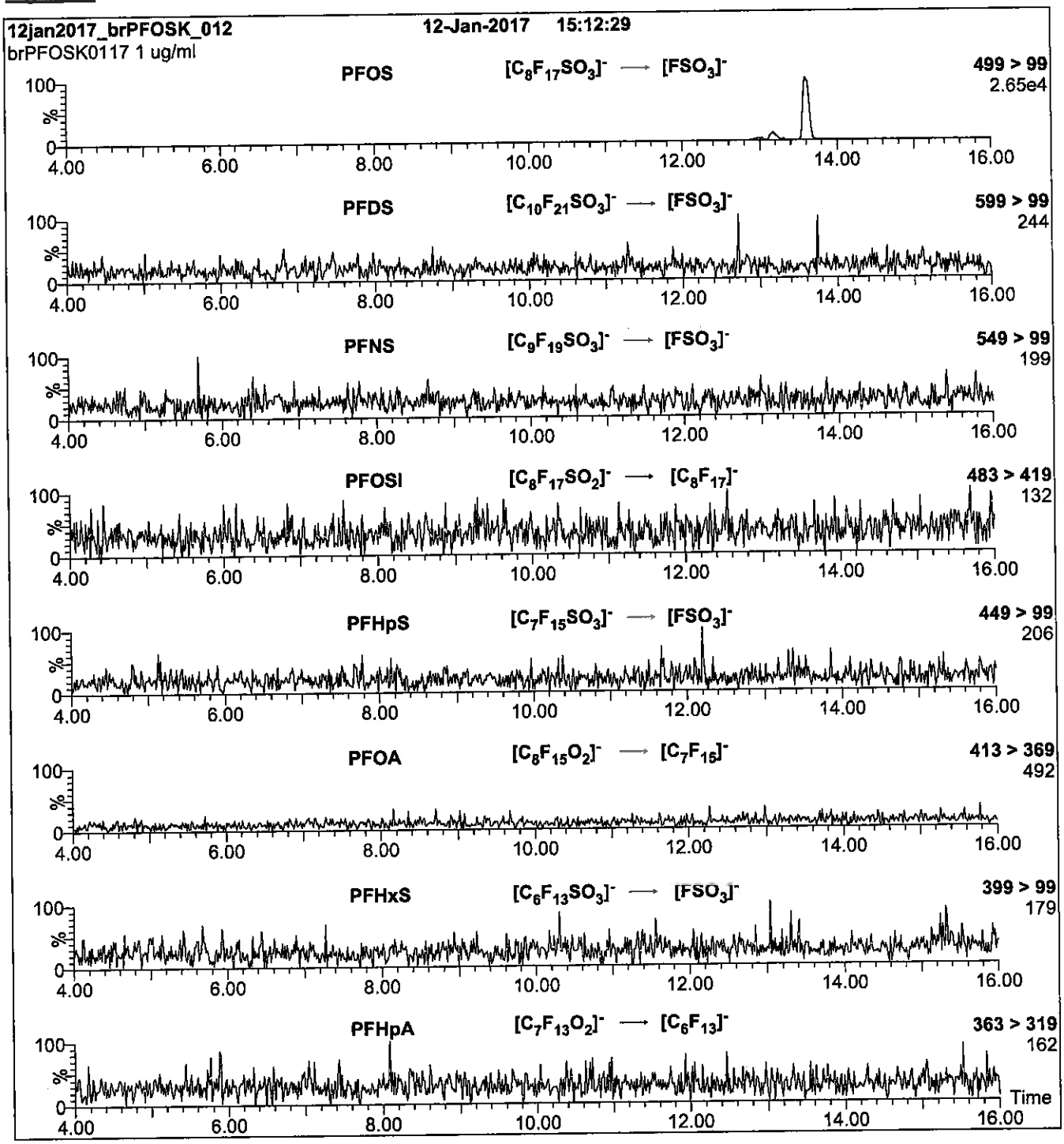
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

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) = 3.31e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

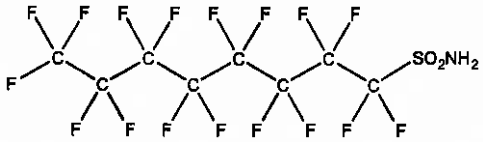
LCPFOSA_00013

R: 2/6/16 SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0817I
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)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/14/2017 (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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CALA

ANAB ACCREDITED

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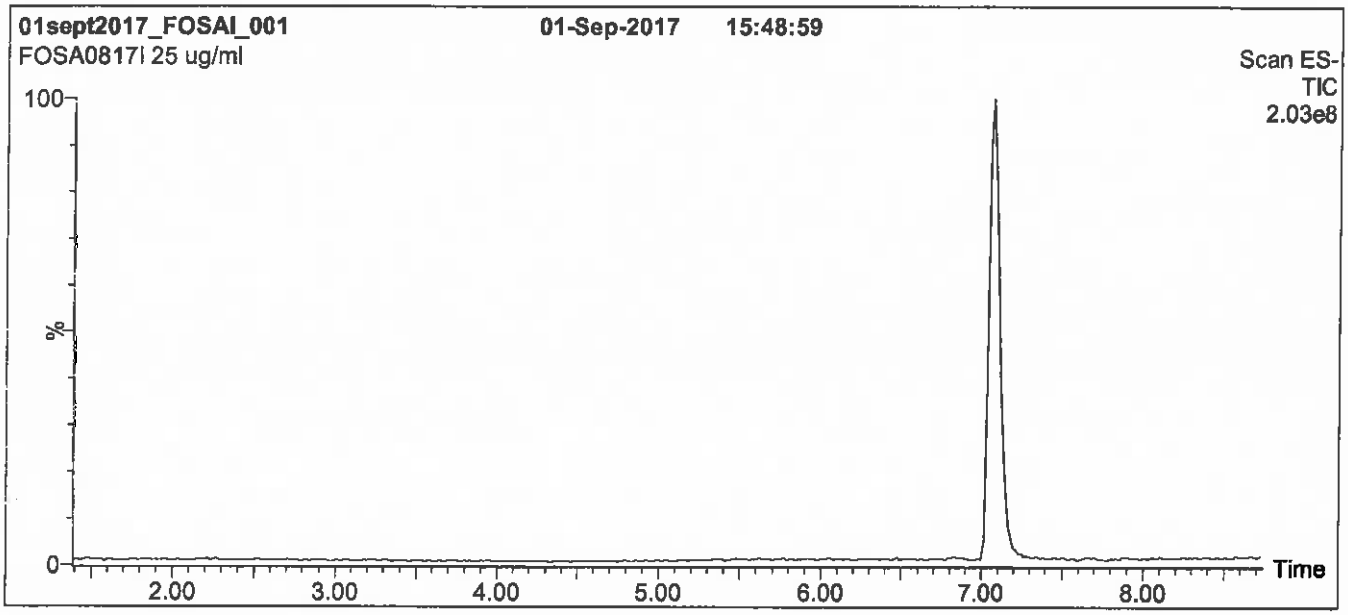
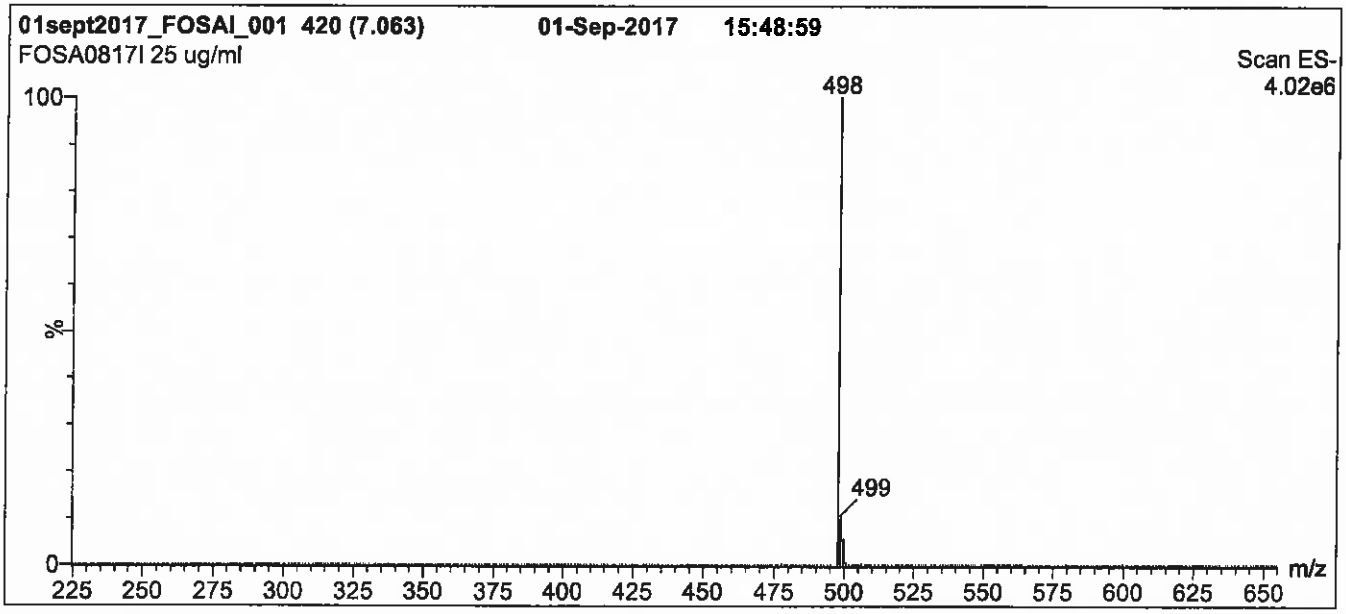
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

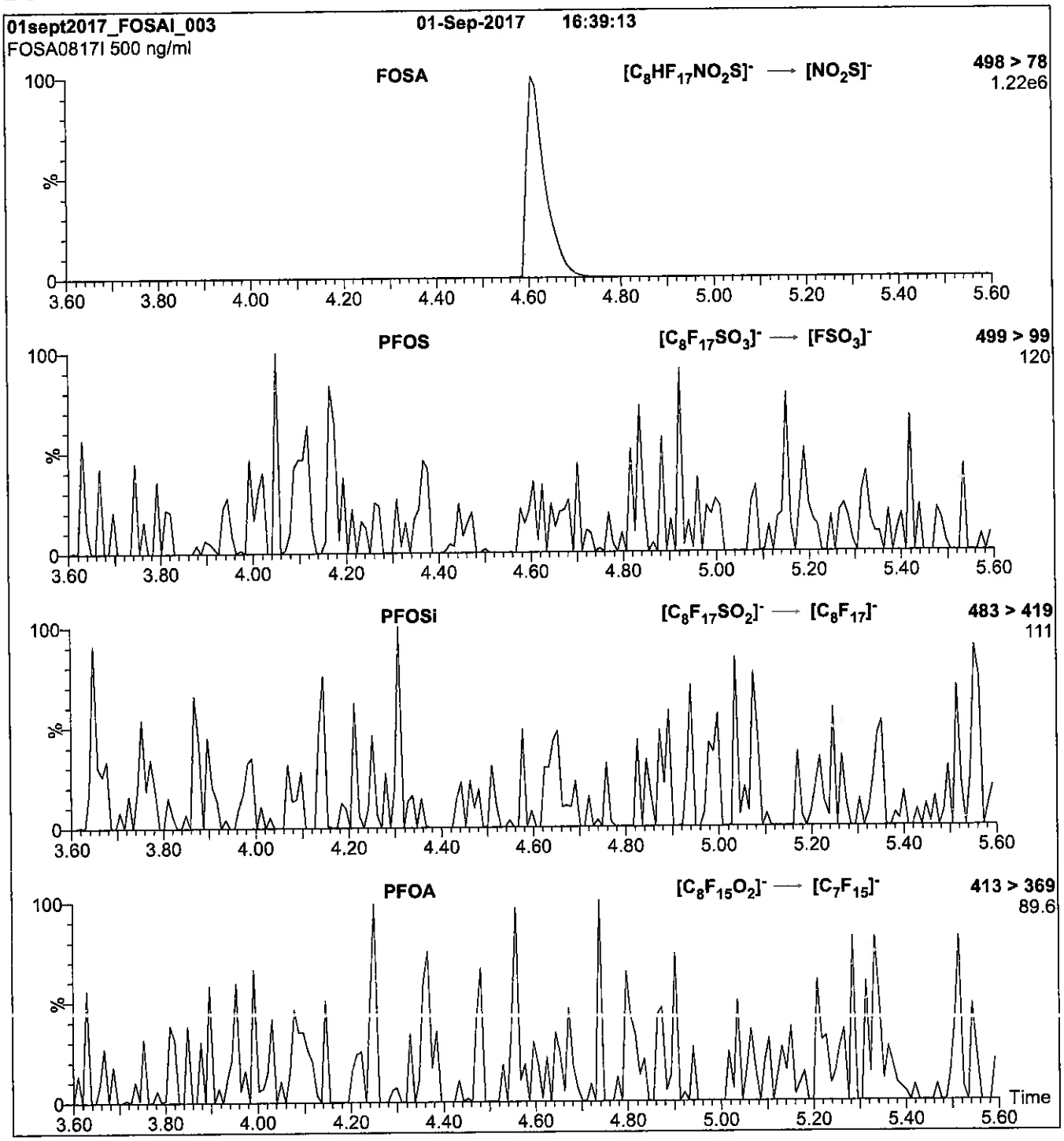
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

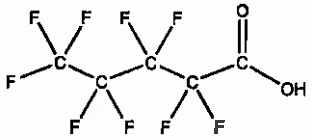
LCPFPeA_00008

r: 6/20/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0617
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_9O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	06/14/2022		
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 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: _____ **Date:** 06/16/2017 (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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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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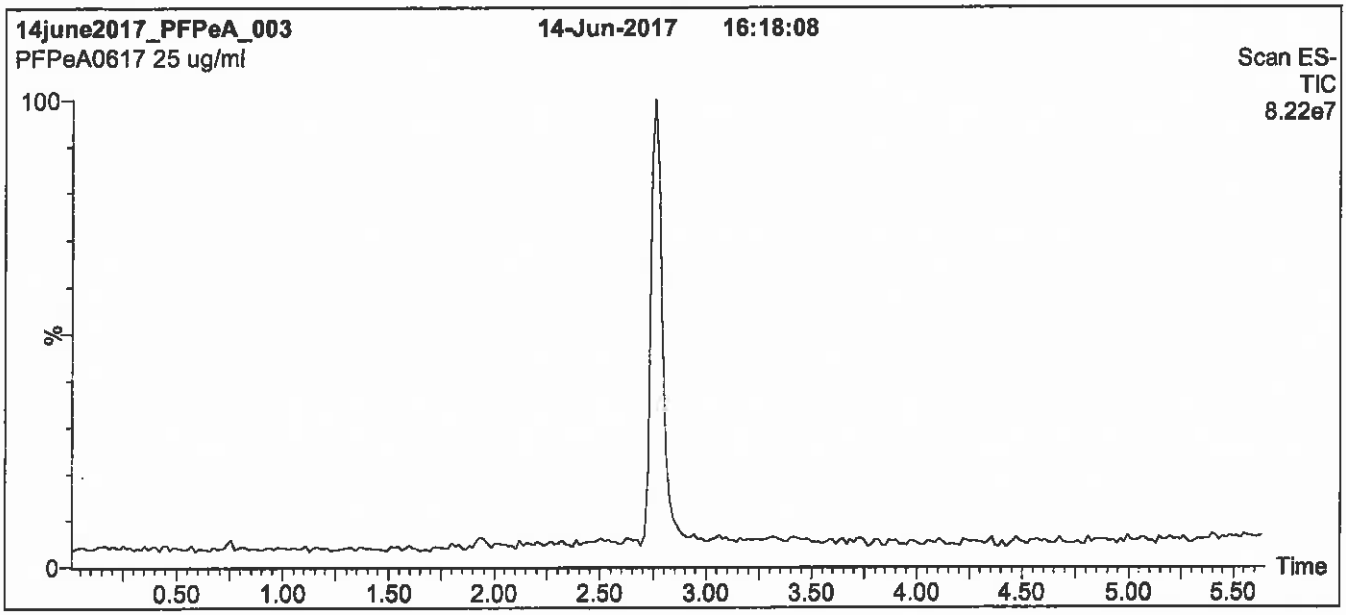
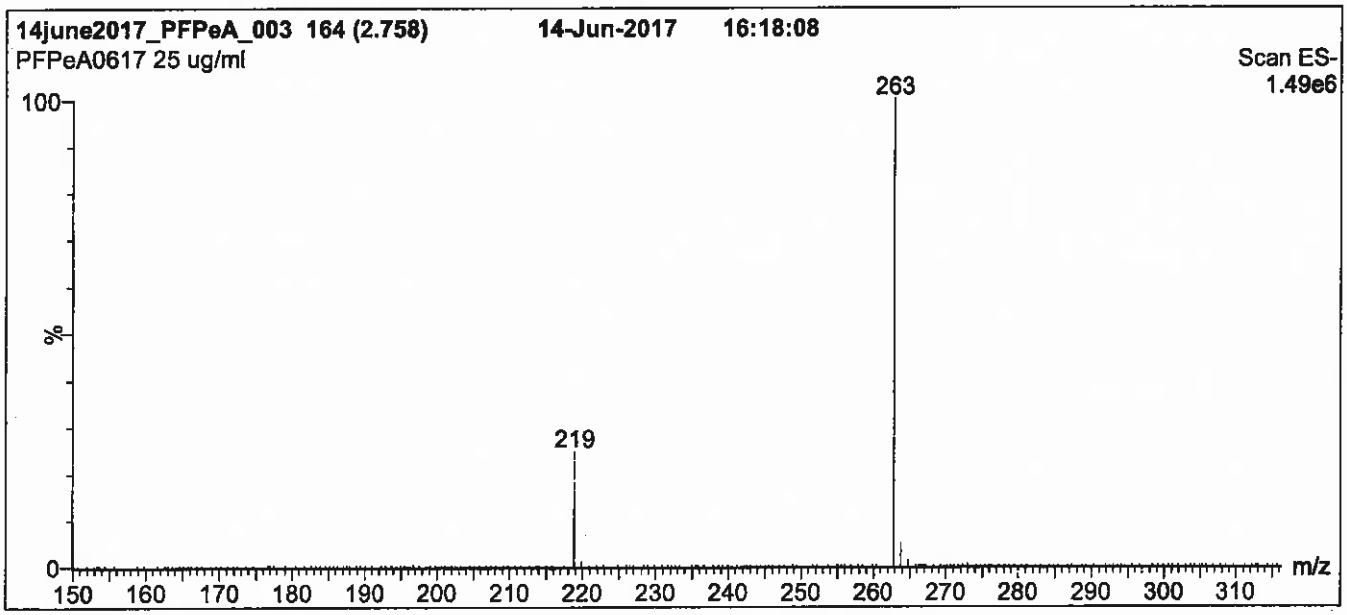
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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

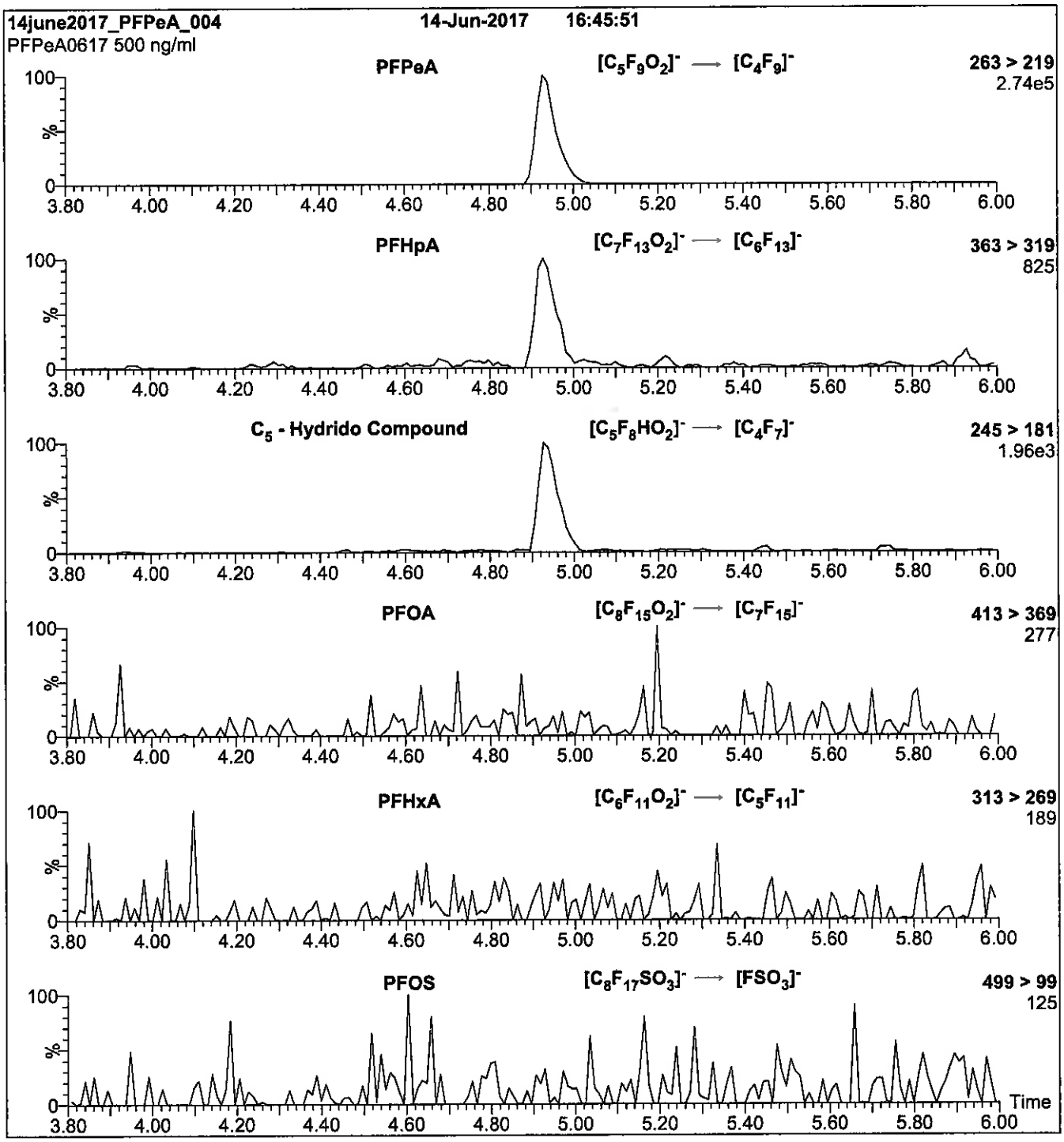
Flow: 300 µl/min

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) = 3.62e-3
Collision Energy (eV) = 9

Reagent

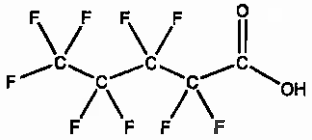
LCPFPeA_00010

P: 9/20/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0617
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_9O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	06/14/2022		
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 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: _____ **Date:** 06/16/2017 (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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ 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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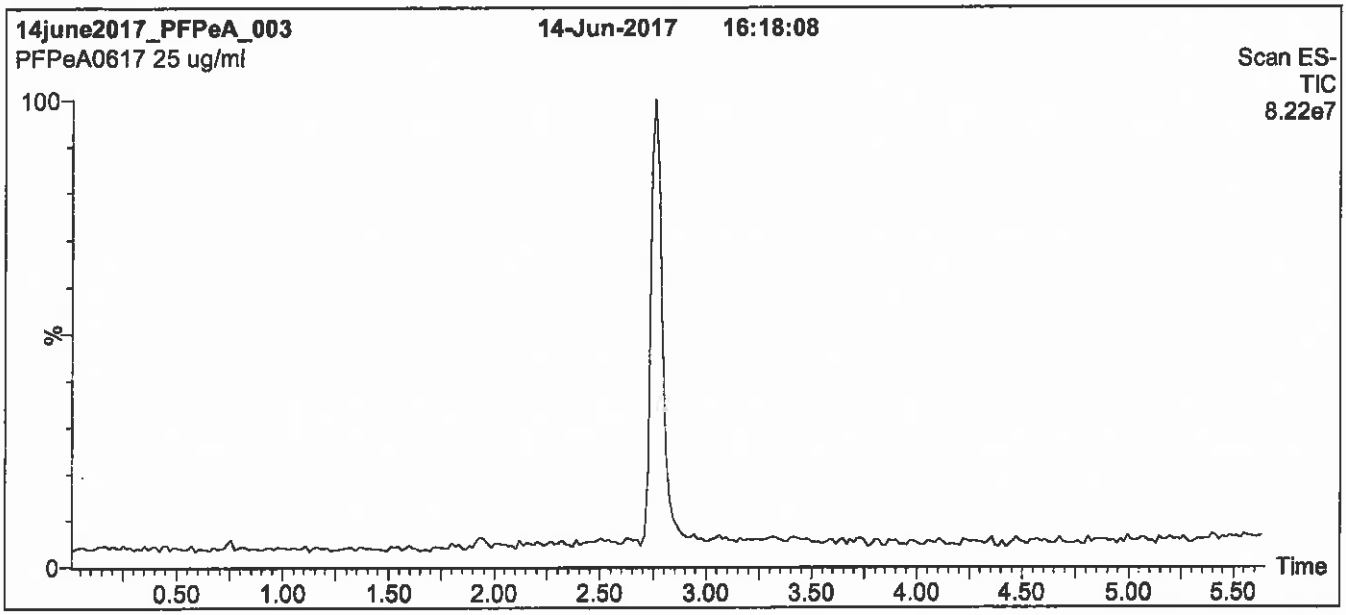
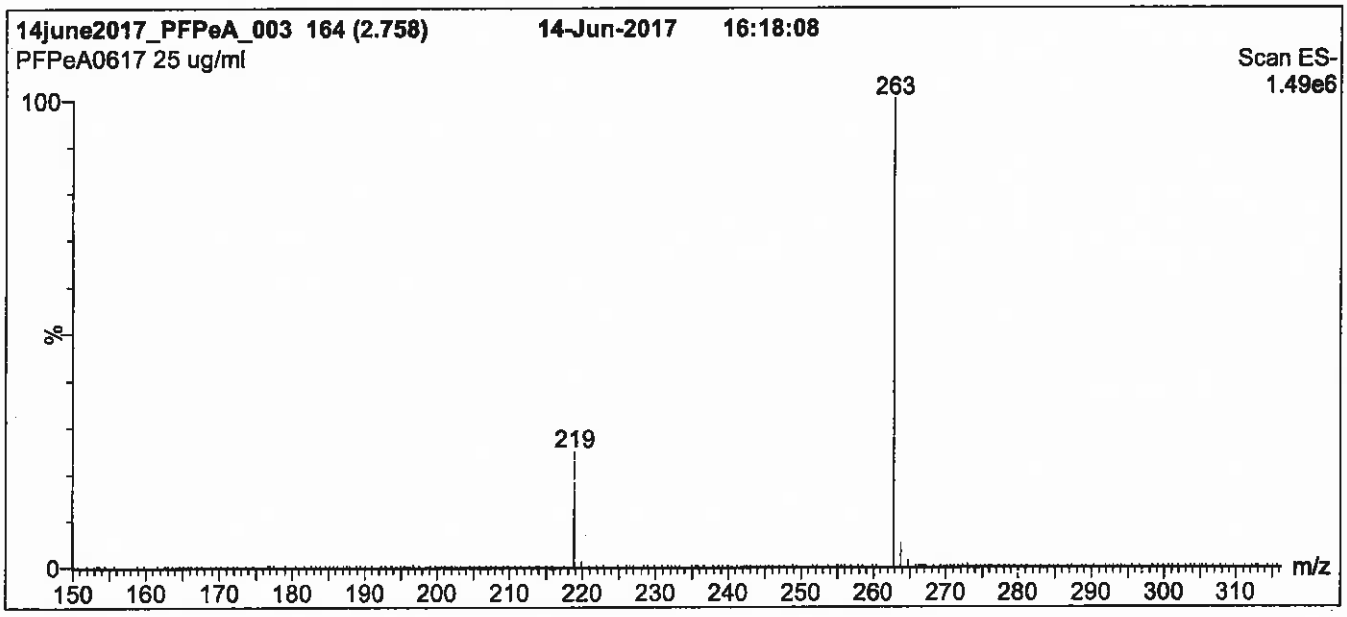
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





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

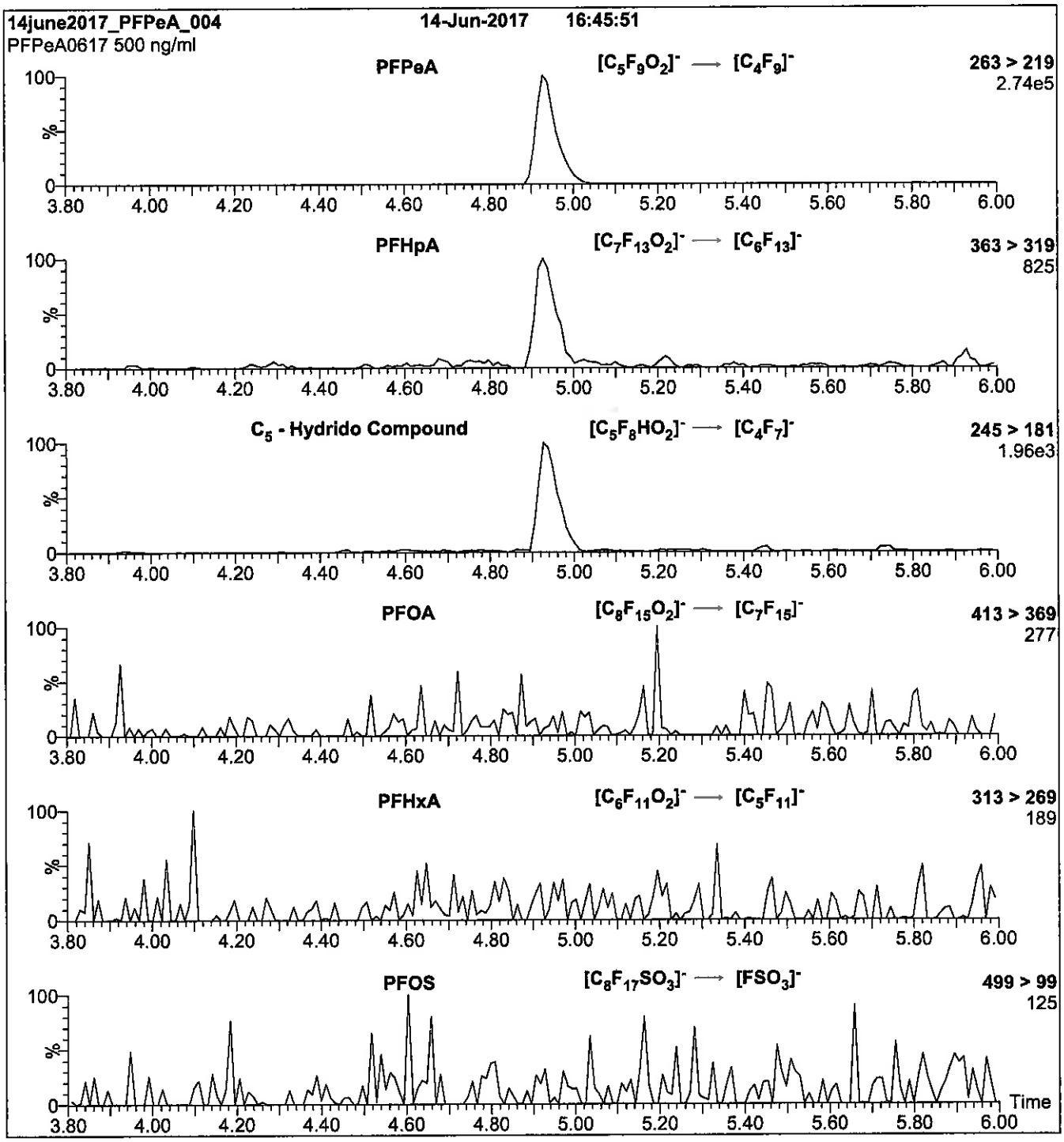
Flow: 300 µl/min

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) = 3.62e-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

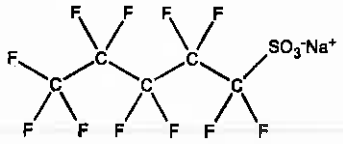
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: LPFPeS0117

STRUCTURE:

CAS #: 630402-22-1



MOLECULAR FORMULA: $C_5F_{11}SO_3Na$
MOLECULAR WEIGHT: 372.09
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
46.9 ± 2.3 µg/ml (PFPeS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/11/2017
EXPIRY DATE: (mm/dd/yyyy) 01/11/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 09/06/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

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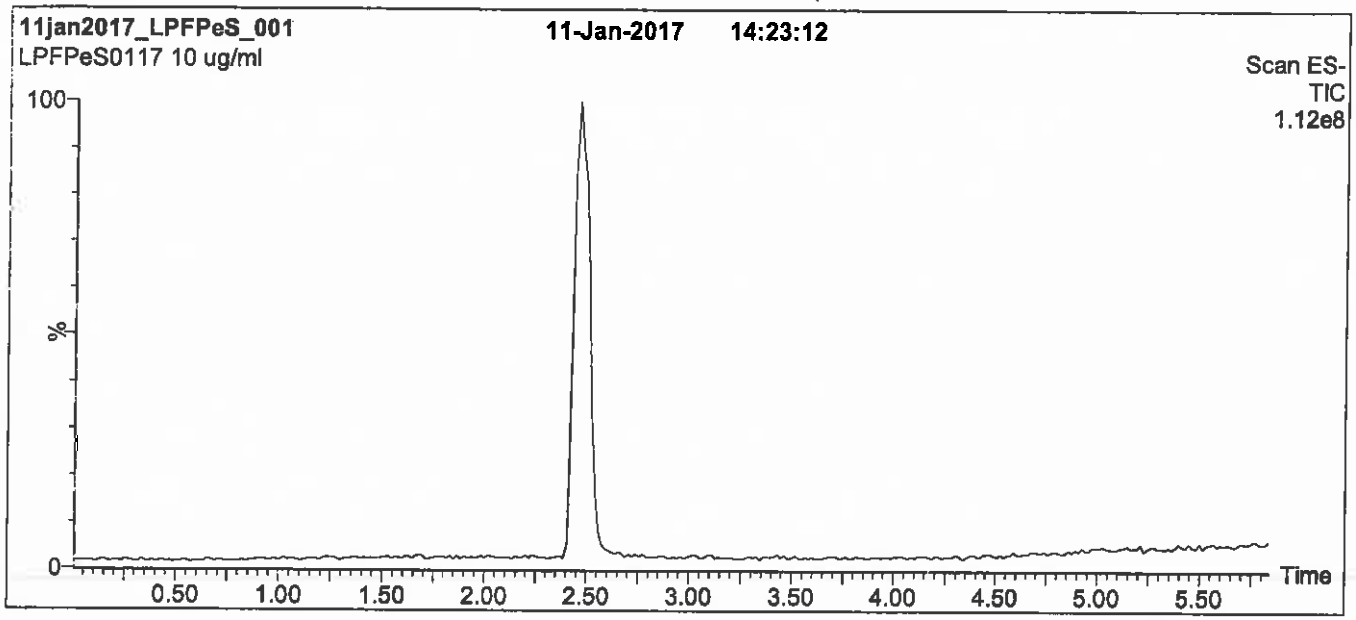
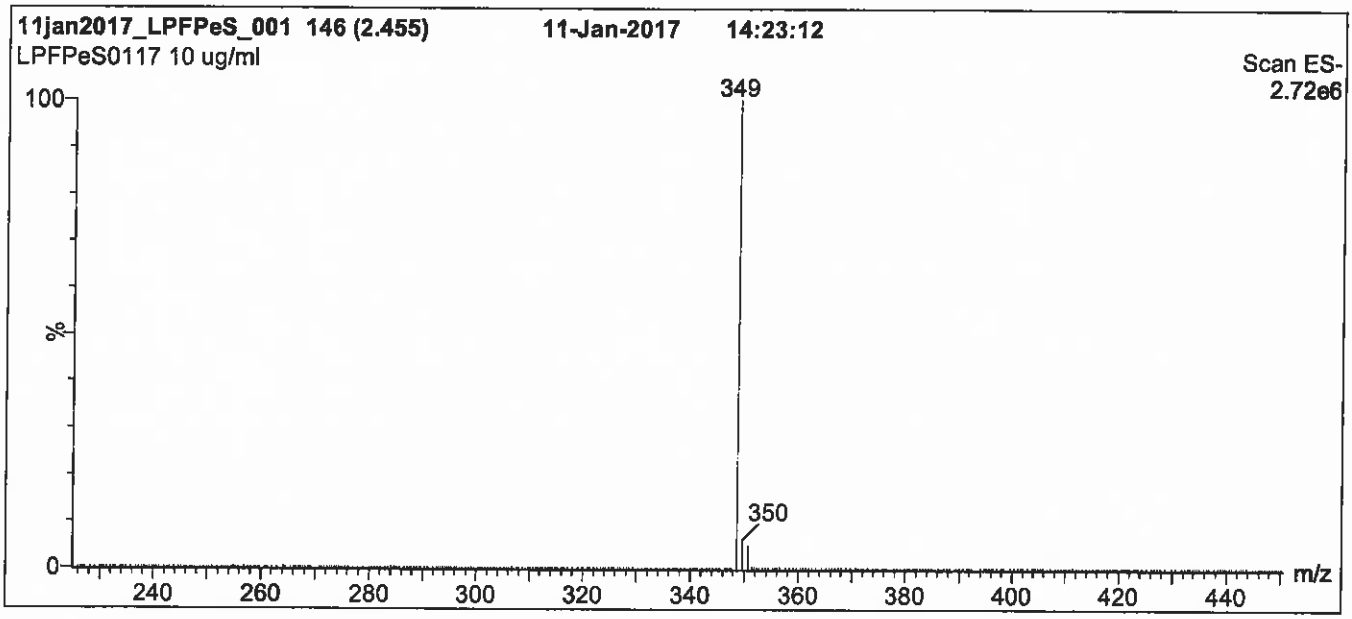
Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





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

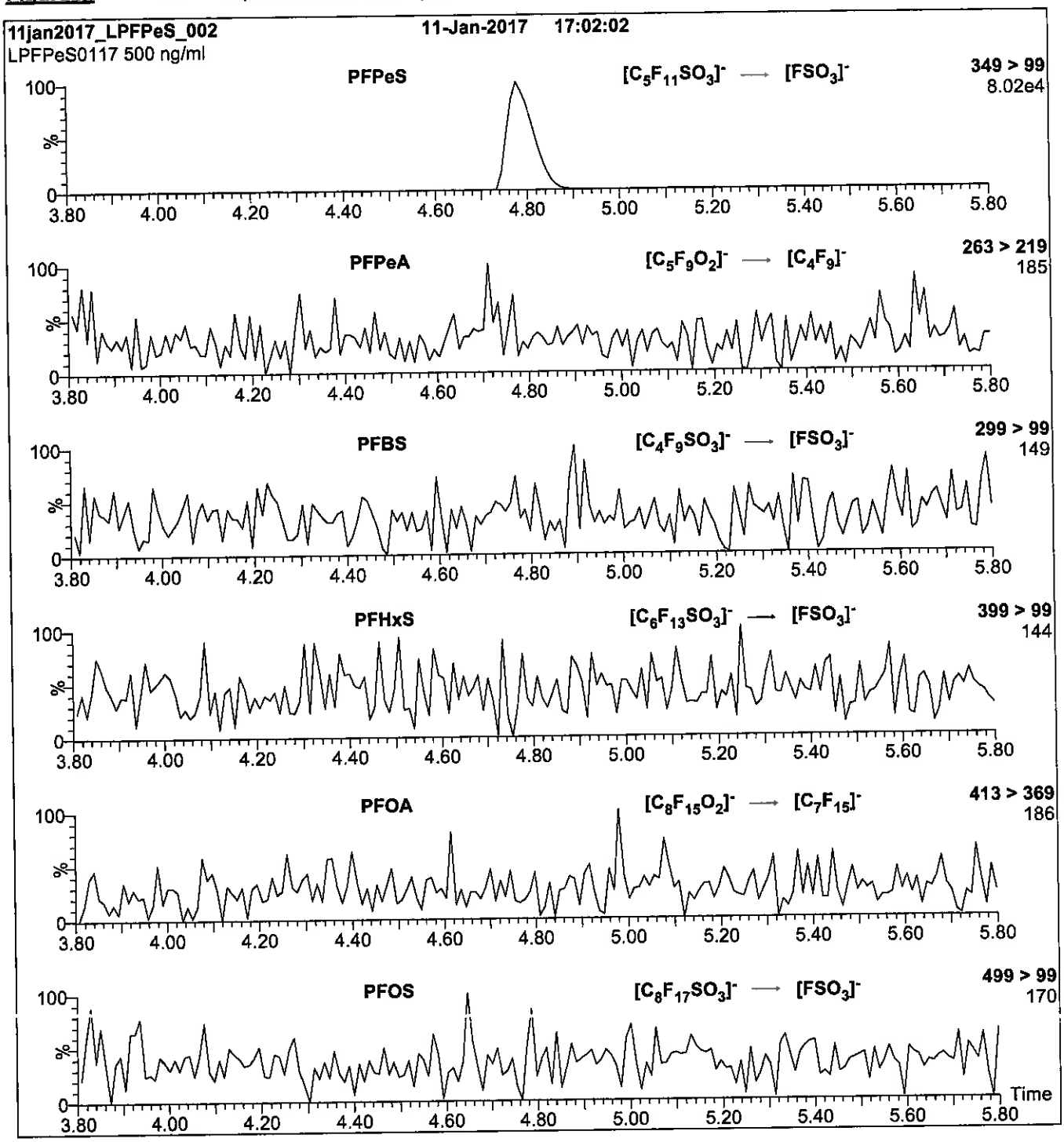
Flow: 300 µl/min

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

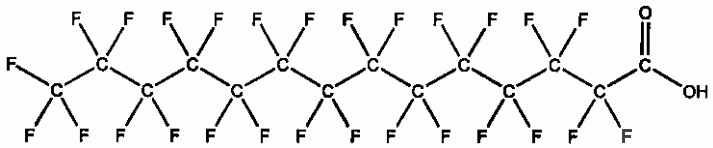
LCPFTeDA_00008

P: 9/21/17 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFTeDA	**LOT NUMBER:**	PFTeDA0916
COMPOUND:	Perfluoro-n-tetradecanoic acid		
STRUCTURE:		**CAS #:**	376-06-7



MOLECULAR FORMULA:	$C_{14}HF_{27}O_2$	**MOLECULAR WEIGHT:**	714.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 10/05/2016 (mm/dd/yyyy)

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

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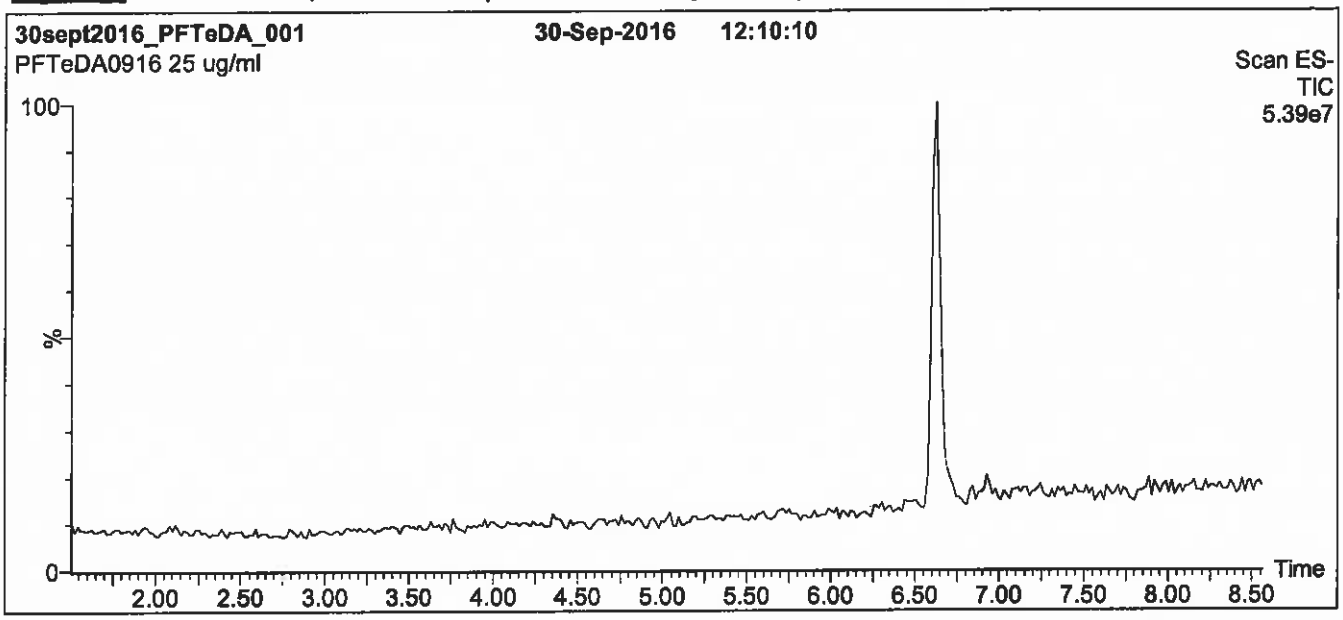
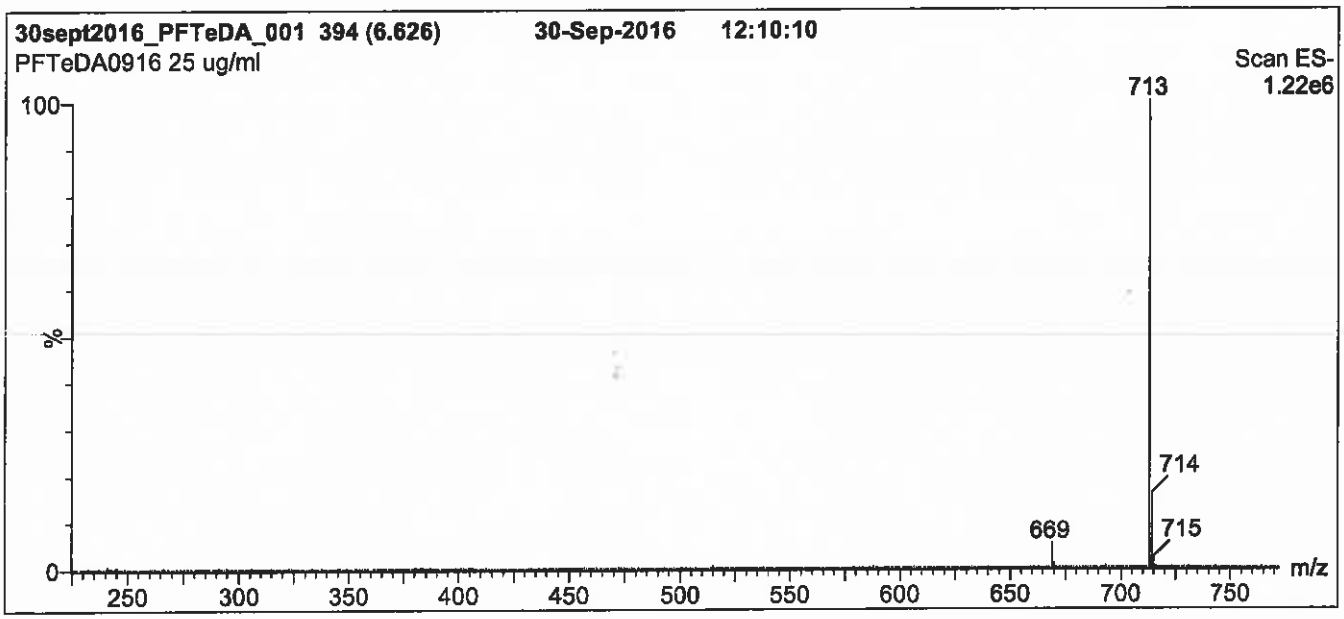
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





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

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

Mobile phase: Gradient
Start: 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

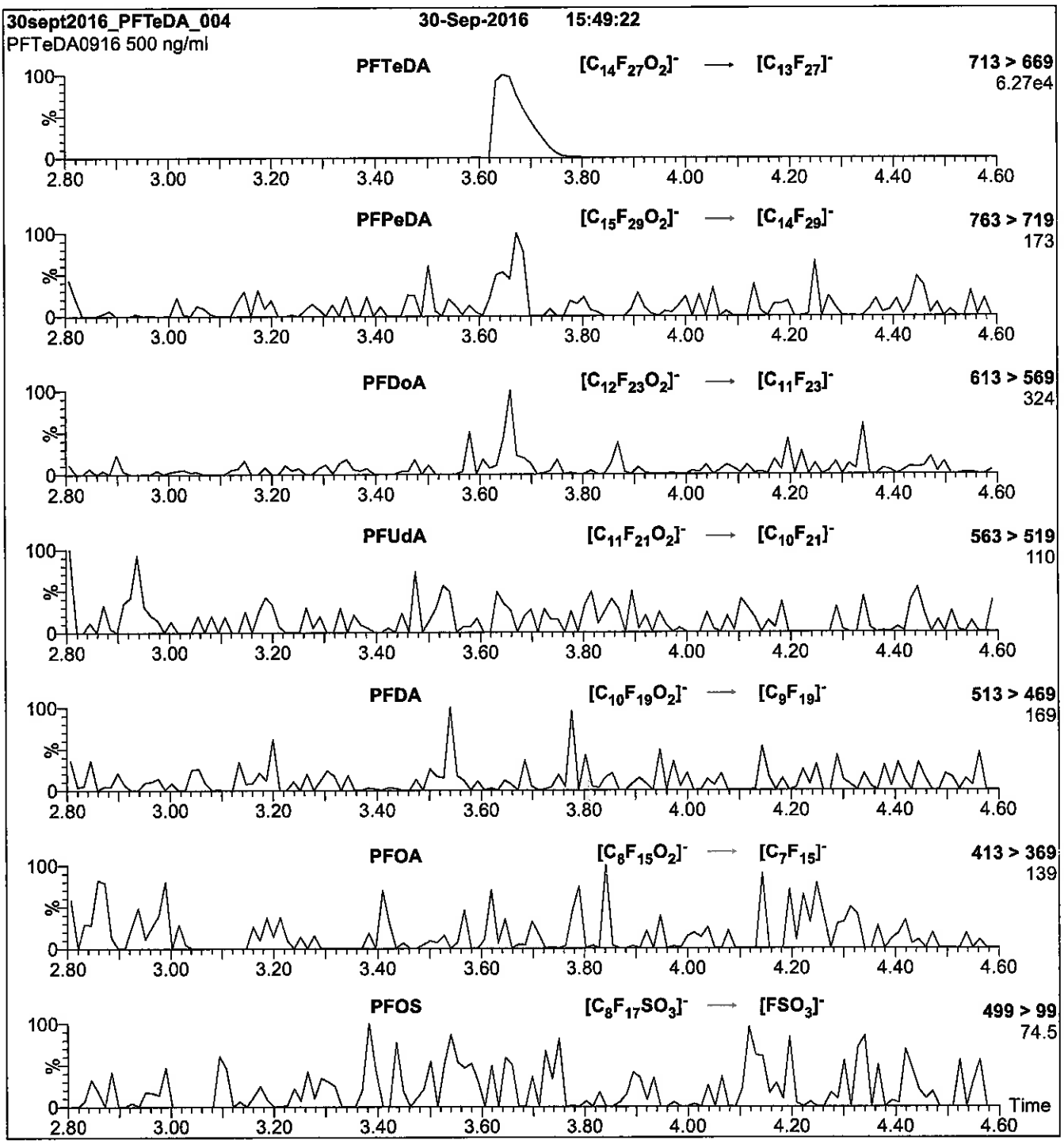
Flow: 300 µl/min

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

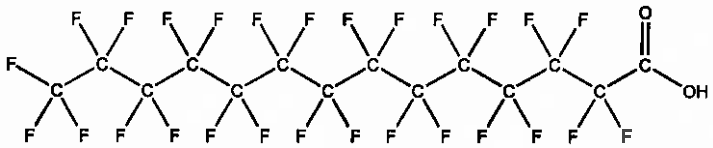
LCPFTeDA_00009

P: 9/21/17 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFTeDA	**LOT NUMBER:**	PFTeDA0916
COMPOUND:	Perfluoro-n-tetradecanoic acid		
STRUCTURE:		**CAS #:**	376-06-7



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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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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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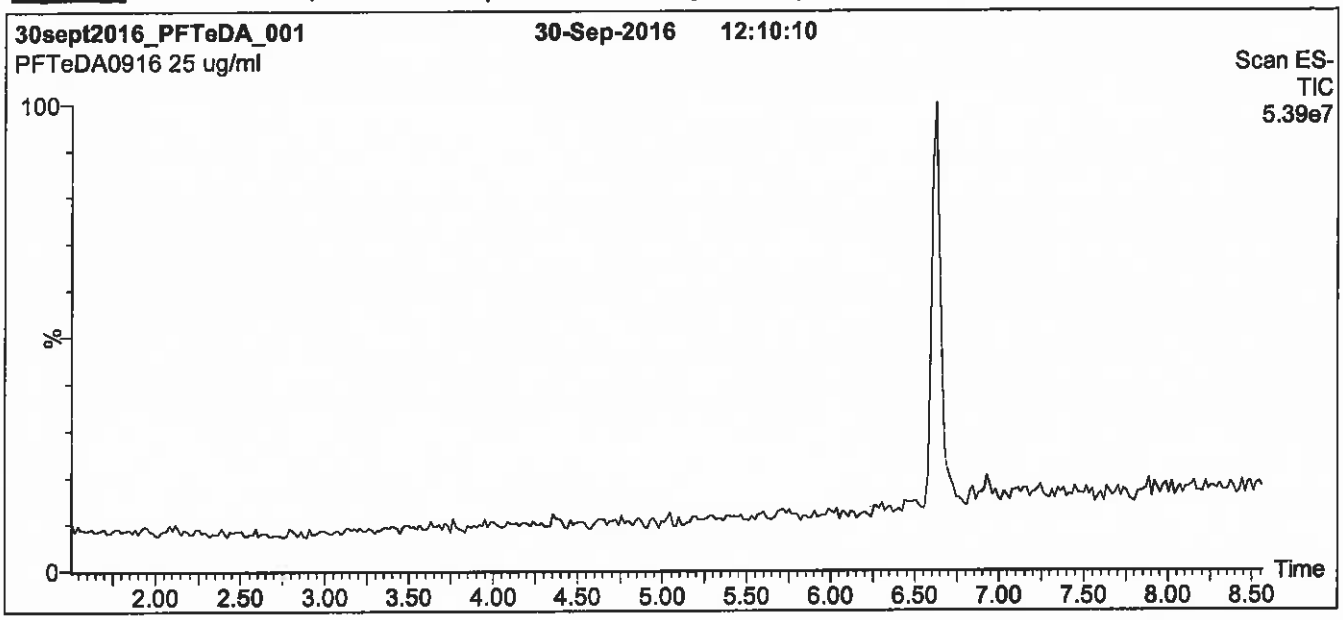
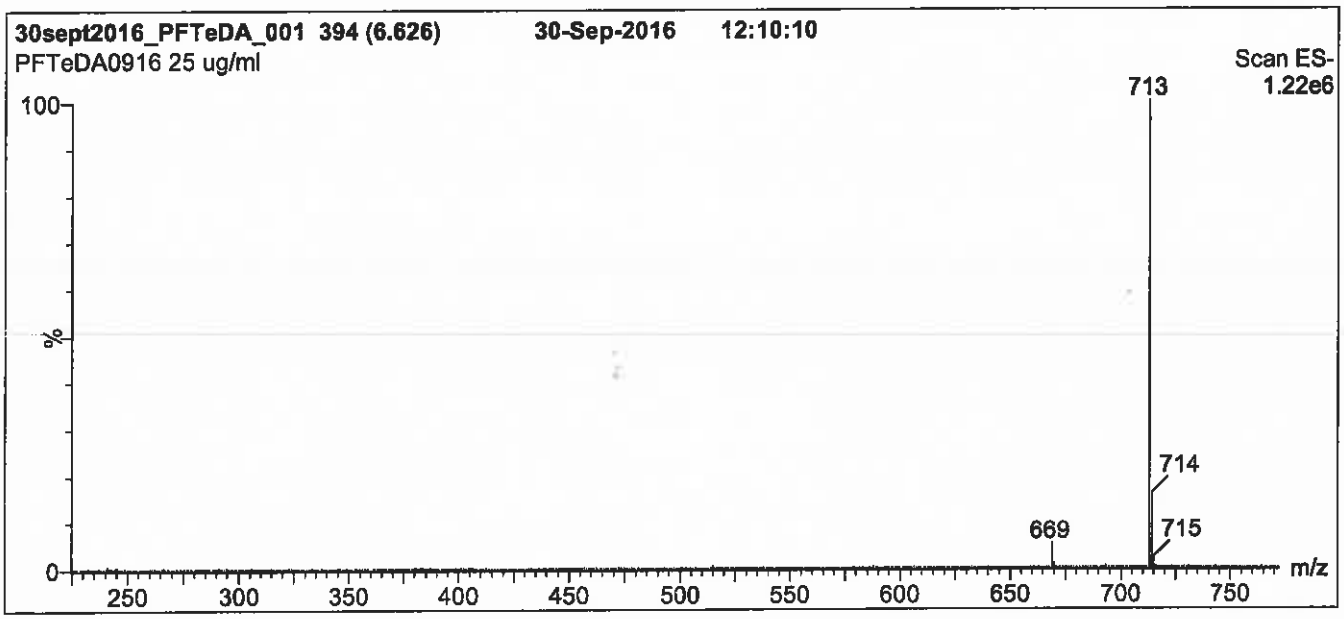
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





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

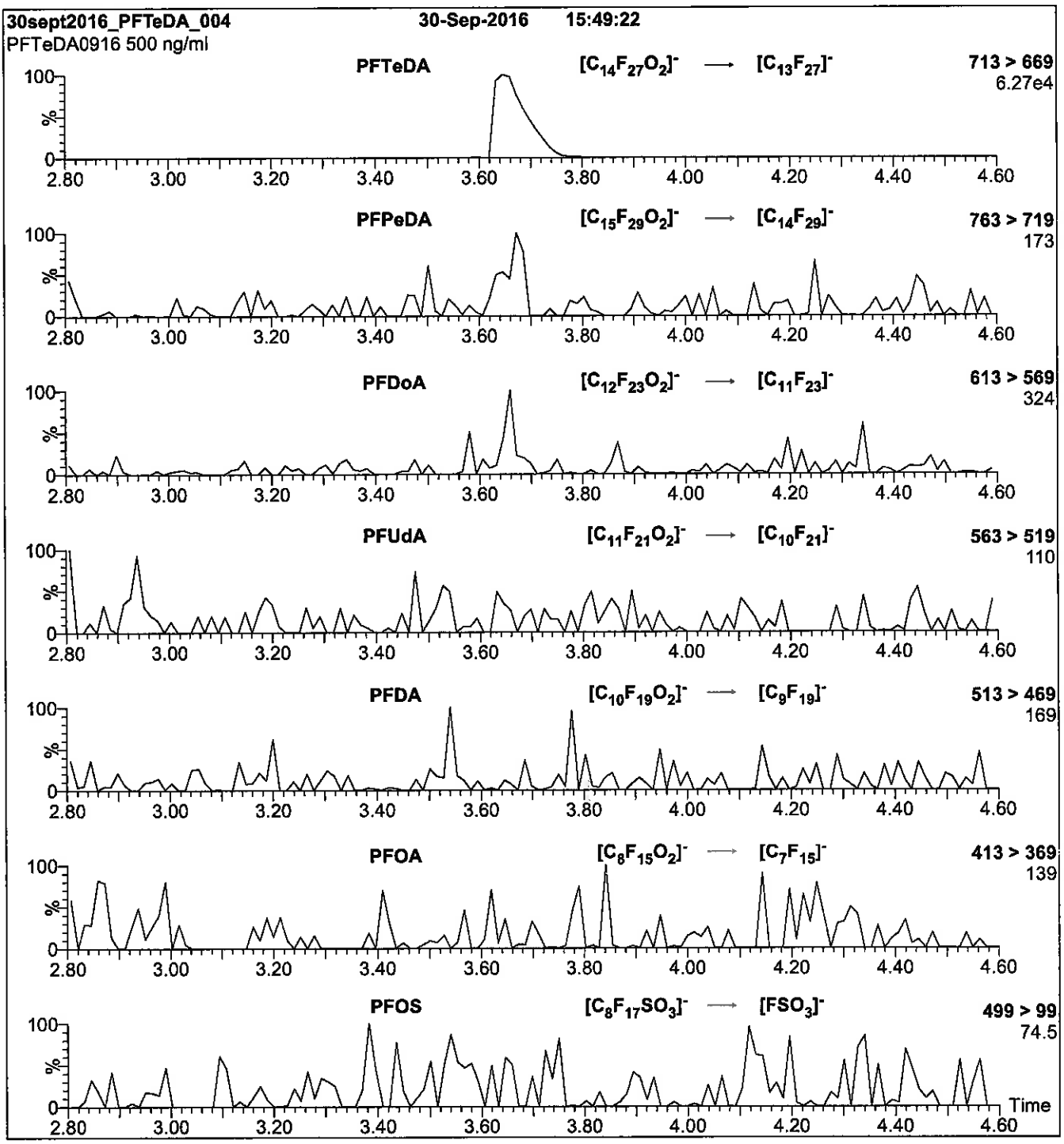
Flow: 300 µl/min

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

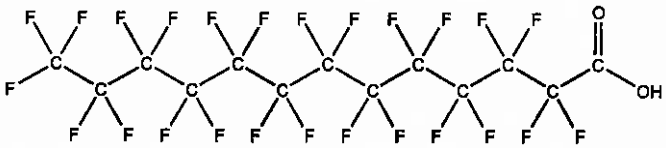
LCPFTrDA_00008

R: 9/21/17 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFTrDA	**LOT NUMBER:**	PFTrDA0517
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)	05/02/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/02/2022		
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 PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

ANAB ACCREDITED

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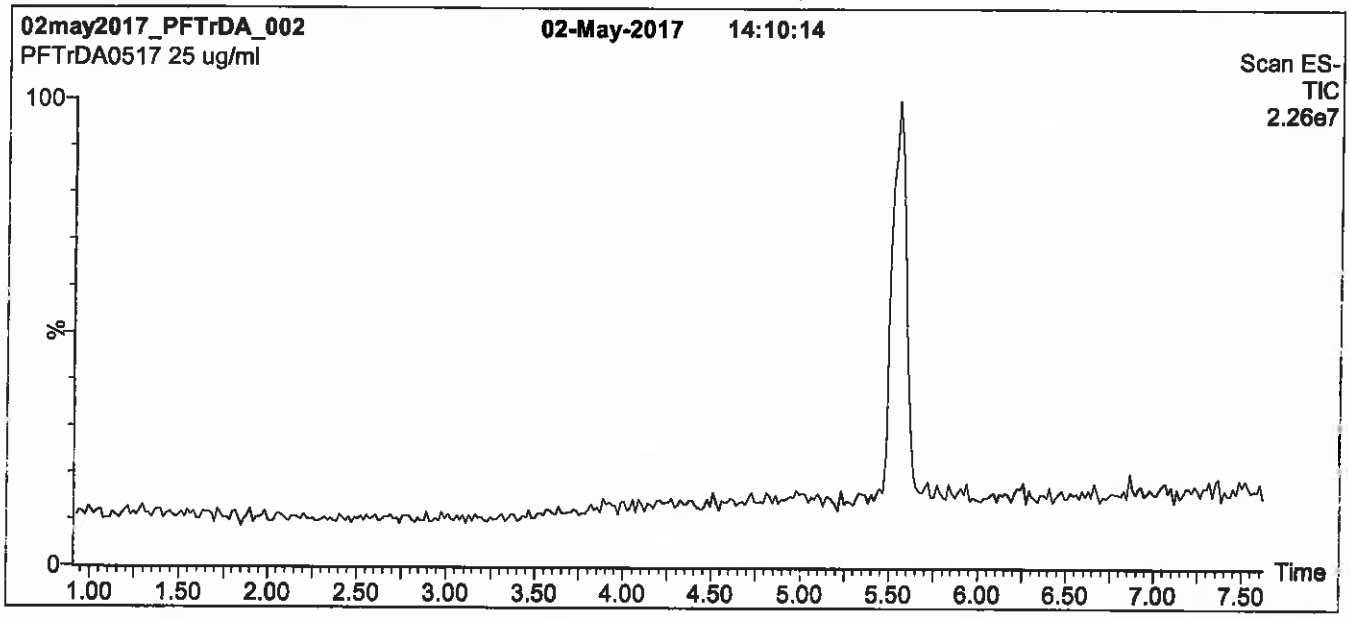
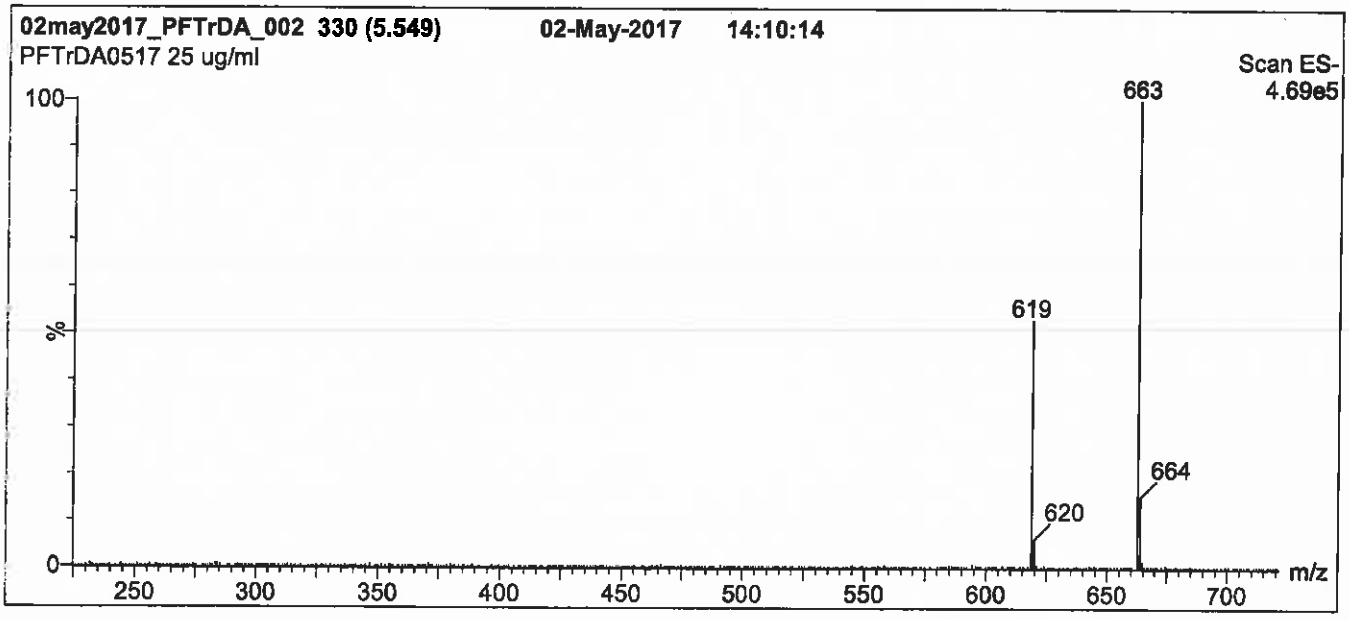




Conditions for Figure 1:

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

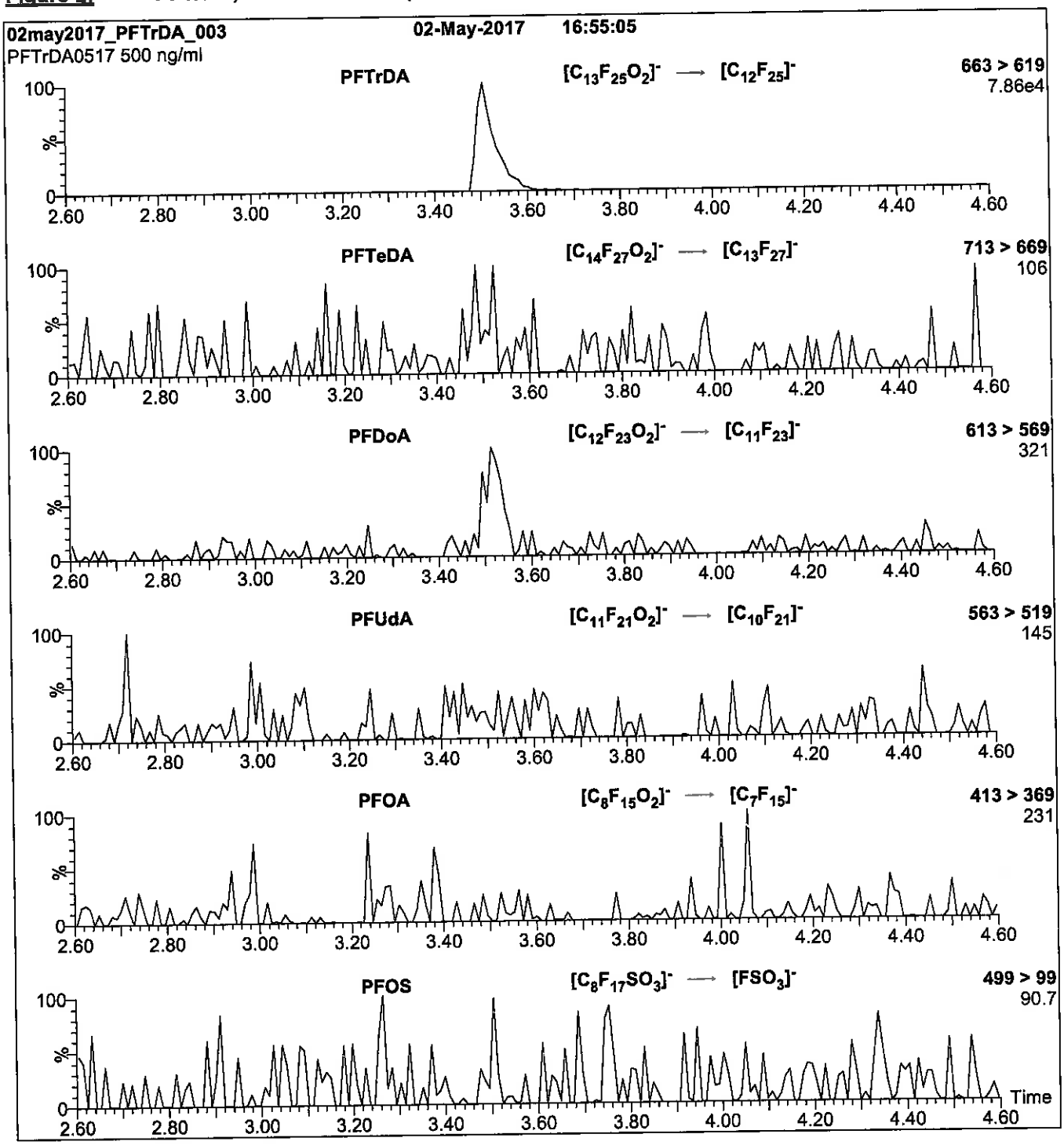
Flow: 300 µl/min .

MS Parameters

Experiment: Full Scan (225 - 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% (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) = 15

Reagent

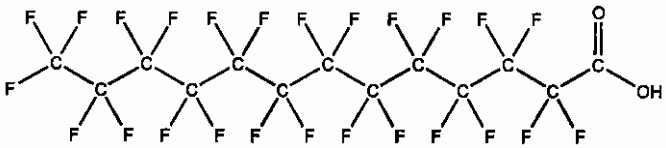
LCPFTrDA_00009

R: 9/21/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFTrDA	**LOT NUMBER:**	PFTrDA0517
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)	05/02/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/02/2022		
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ADDITIONAL INFORMATION:

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B.G. Chittim, General Manager

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CALA

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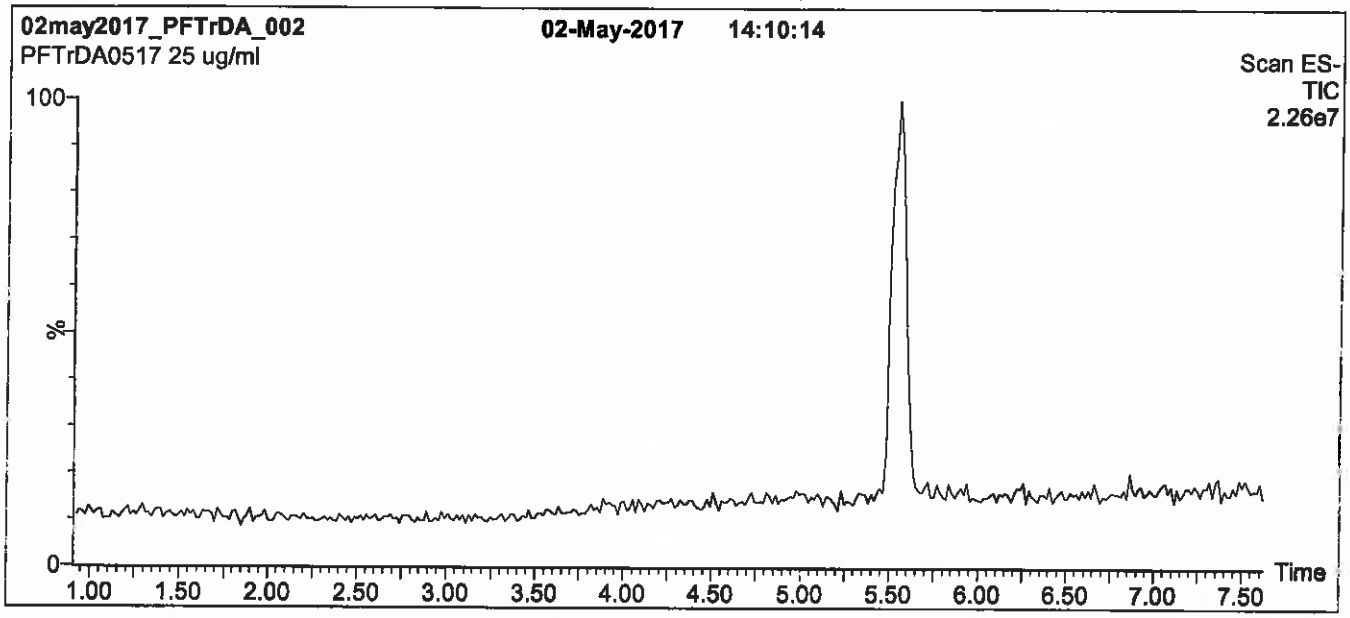

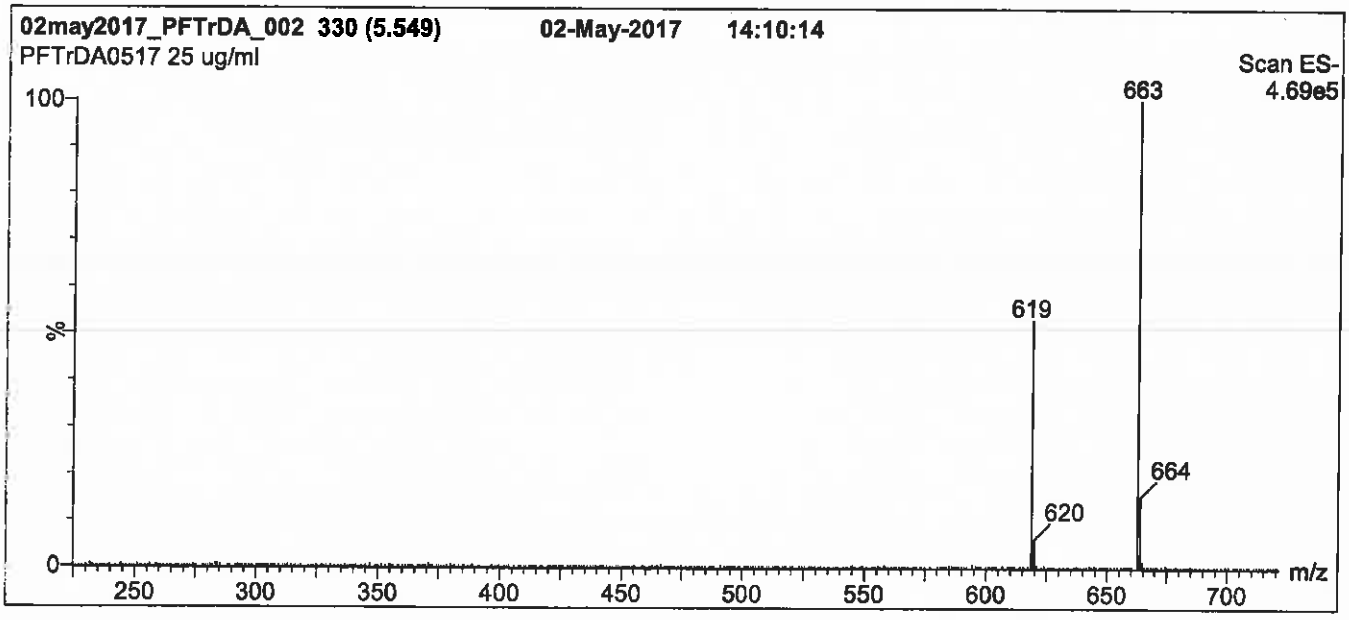

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Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min .

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
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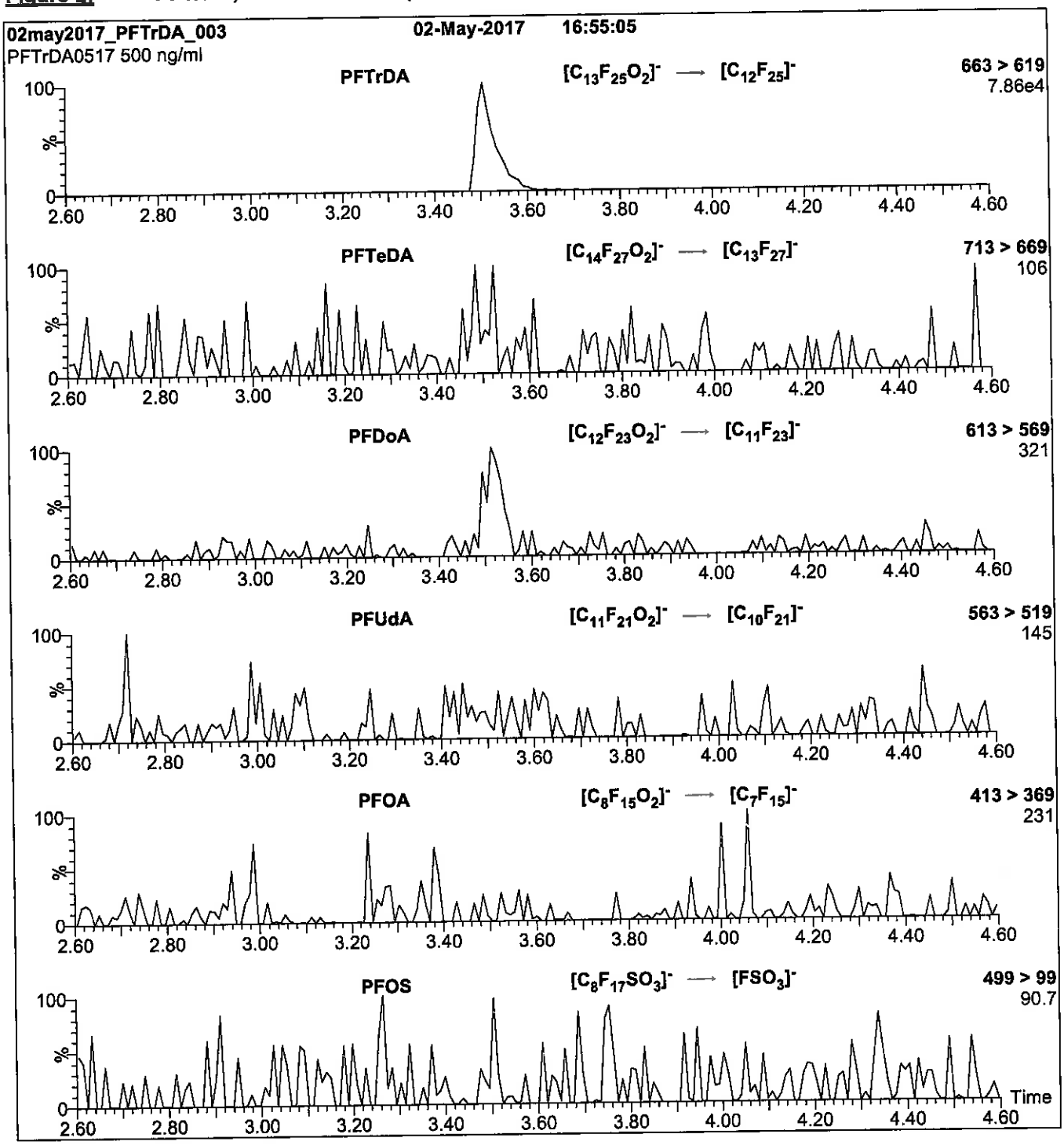
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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



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MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 15

Reagent

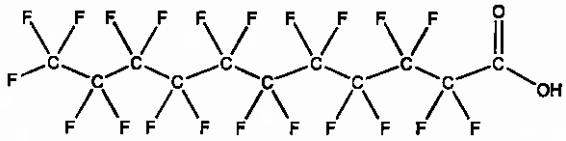
LCPFUdA_00008

r: 9/2/17 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		
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Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

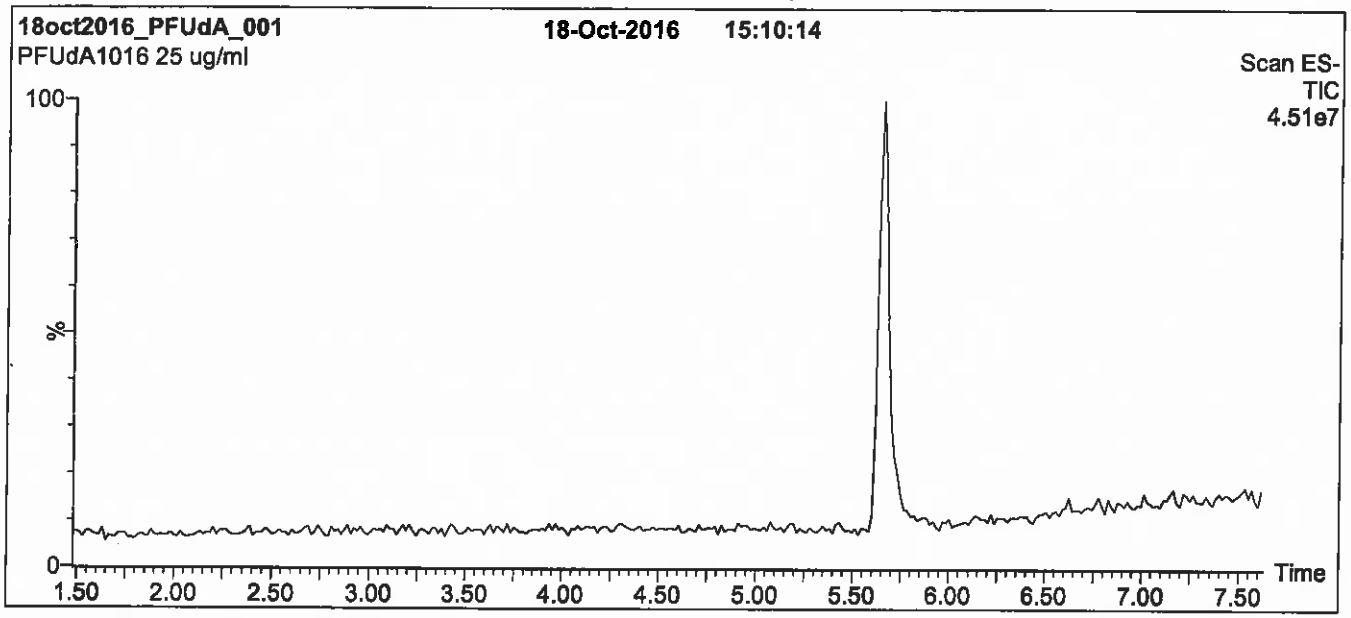
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

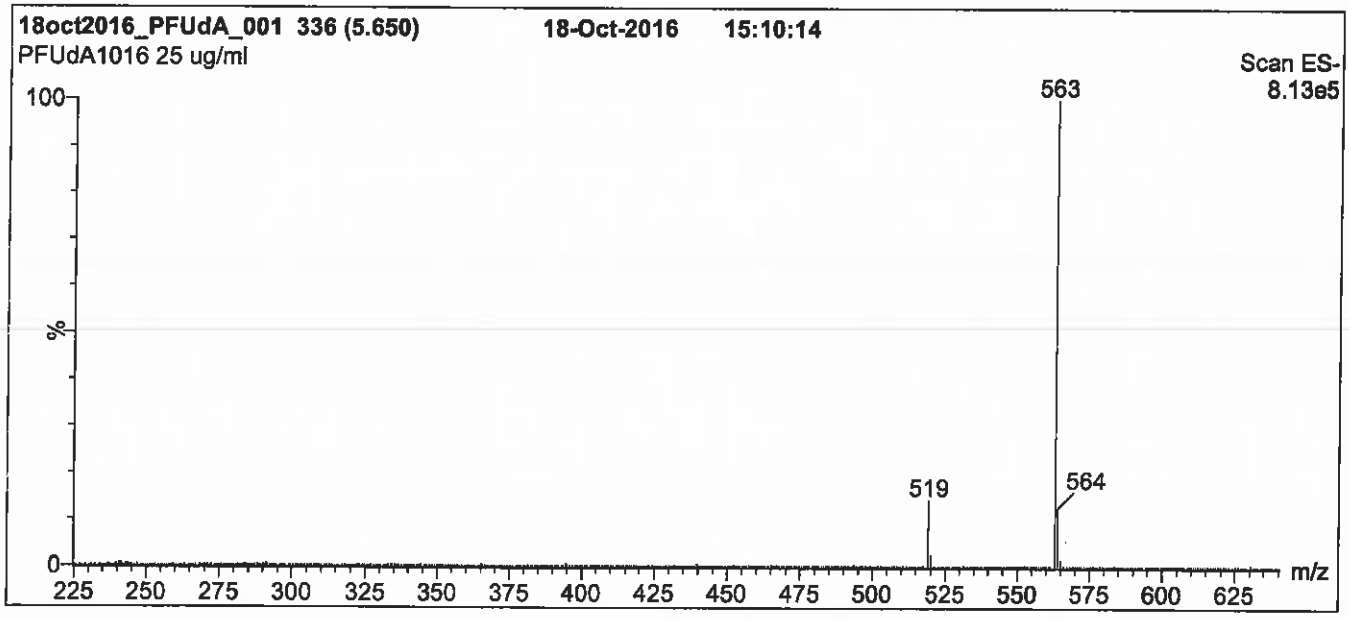
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

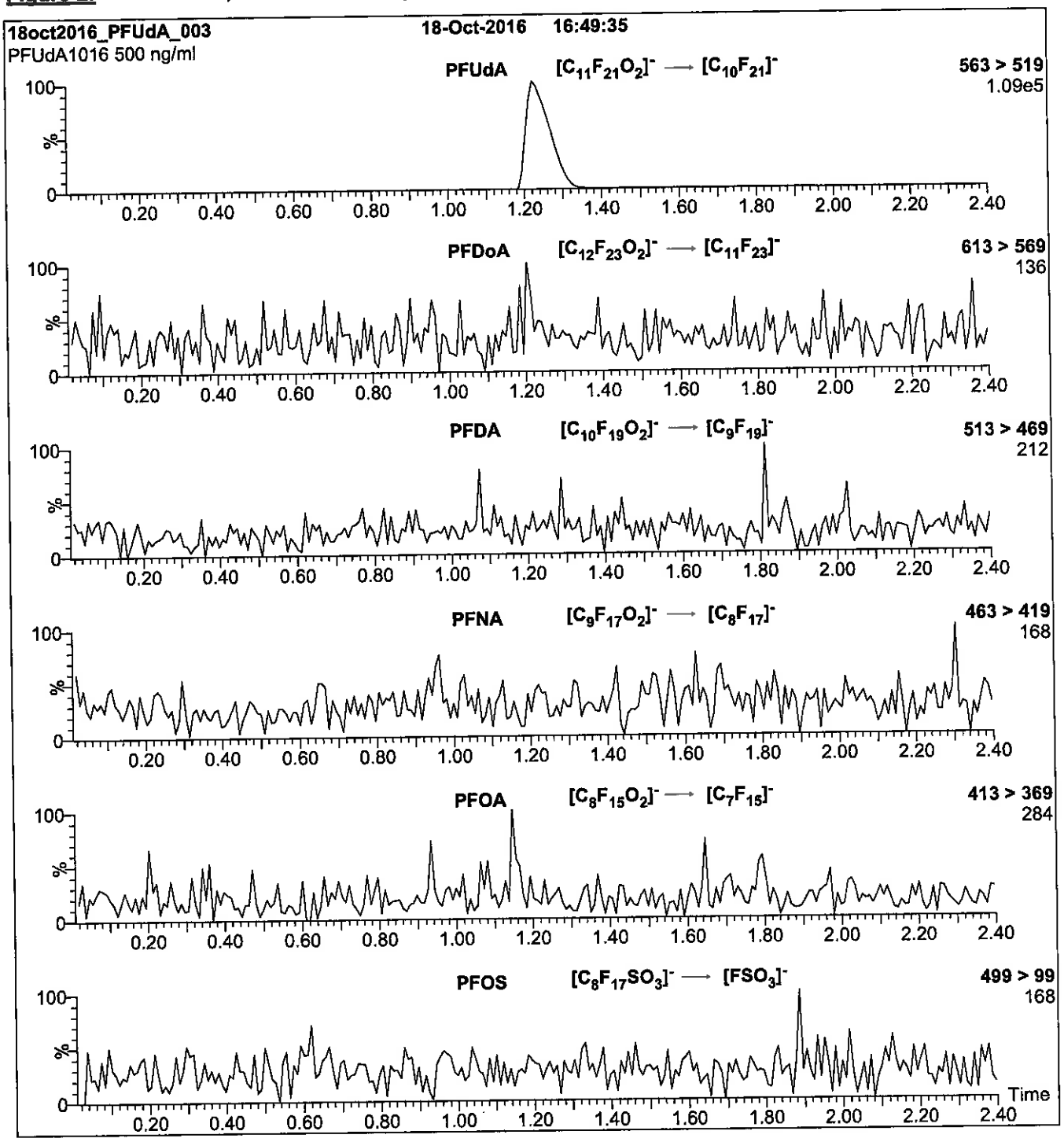
Flow: 300 µl/min

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.: 320-42924-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-033-TPI	320-42924-1	81	96 M	95 M	89	97	97	91	99
TP-PFC-033-TPI DL	320-42924-1 DL	75	78	70 M	77	79	79	87	84
TP-PFC-033-MID CARBON	320-42924-2	79	87	86	87	94	92	93	87
TP-PFC-033-TPE	320-42924-3	80	90 M	88 M	88	94	90	91	91
TP-PFC-033-TPE-D	320-42924-4	75	83 M	89 M	83	87	87	88	87
	MB 320-245574/1-A	84	87	86 M	87	94	97	96	89
	LCS 320-245574/2-A	84	90	91	92	91	91	92	92
	LCSD 320-245574/3-A	79	87 M	85 M	87	93	88	96	93

	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.: 320-42924-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-033-TPI	320-42924-1	93	91	98	96	92	90
TP-PFC-033-TPI DL	320-42924-1 DL	78	75	86	84	76	74
TP-PFC-033-MID CARBON	320-42924-2	88	88	94	91	83	79
TP-PFC-033-TPE	320-42924-3	90	90	96	93	83	84
TP-PFC-033-TPE-D	320-42924-4	89	86	92	86	84	79
	MB 320-245574/1-A	88	88	86	90	87	79
	LCS 320-245574/2-A	92	79	98	91	87	80
	LCSD 320-245574/3-A	90	84	90	88	87	79

	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.: 320-42924-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.09.16_LLA_014.d

Lab ID: LCS 320-245574/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	41.0	102	83-118	M
Perfluoropentanoic acid (PFPeA)	40.0	40.1	100	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	38.4	96	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	44.5	111	80-113	
Perfluorooctanoic acid (PFOA)	40.0	39.4	98	80-107	
Perfluorononanoic acid (PFNA)	40.0	44.7	112	83-113	
Perfluorodecanoic acid (PFDA)	40.0	39.3	98	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	41.9	105	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	41.3	103	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	36.0	90	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	38.1	95	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	35.6	101	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.5	98	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.1	105	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	35.4	95	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	40.8	106	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	44.4	111	85-114	
13C8 FOSA	100	78.7	79	50-150	
13C4 PFBA	100	84.1	84	50-150	
13C5 PFPeA	100	89.7	90	50-150	
13C2 PFHxA	100	92.0	92	50-150	
13C4-PFHpA	100	91.5	91	50-150	
13C4 PFOA	100	91.7	92	50-150	
13C5 PFNA	100	91.7	92	50-150	
13C2 PFDA	100	97.7	98	50-150	
13C2 PFUnA	100	91.0	91	50-150	
13C2 PFDoA	100	87.5	87	50-150	
18O2 PFHxS	94.6	86.5	91	50-150	
13C2-PFTeDA	100	80.1	80	50-150	
13C4 PFOS	95.6	87.7	92	50-150	
13C3-PFBS	93.0	84.6	91	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.09.16_LLA_015.d

Lab ID: LCSD 320-245574/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	39.3	98	4	30	83-118	M
Perfluoropentanoic acid (PFPeA)	40.0	38.5	96	4	30	83-108	M
Perfluorohexanoic acid (PFHxA)	40.0	38.1	95	1	30	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	40.8	102	9	30	80-113	
Perfluorooctanoic acid (PFOA)	40.0	37.9	95	4	30	80-107	
Perfluorononanoic acid (PFNA)	40.0	40.6	102	10	30	83-113	
Perfluorodecanoic acid (PFDA)	40.0	42.7	107	8	30	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	41.5	104	1	30	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	40.3	101	3	30	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	36.9	92	2	30	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7	102	7	30	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	35.1	99	1	30	87-120	M
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.5	95	3	30	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	41.6	109	4	30	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.7	99	4	30	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	43.5	113	6	30	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	40.5	101	9	30	85-114	
13C8 FOSA	100	84.3	84			50-150	
13C4 PFBA	100	78.7	79			50-150	
13C5 PFPeA	100	86.5	87			50-150	M
13C2 PFHxA	100	86.6	87			50-150	
13C4-PFHpA	100	92.5	93			50-150	
13C4 PFOA	100	95.6	96			50-150	
13C5 PFNA	100	92.7	93			50-150	
13C2 PFDA	100	89.5	90			50-150	
13C2 PFUnA	100	87.8	88			50-150	
13C2 PFDoA	100	87.3	87			50-150	
18O2 PFHxS	94.6	83.7	88			50-150	
13C2-PFTeDA	100	78.7	79			50-150	
13C4 PFOS	95.6	86.0	90			50-150	
13C3-PFBS	93.0	78.9	85			50-150	M

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.: 320-42924-1

SDG No.:

Lab File ID: 2018.09.16_LLA_013.d Lab Sample ID: MB 320-245574/1-A

Matrix: Water Date Extracted: 09/12/2018 08:12

Instrument ID: A9 Date Analyzed: 09/16/2018 15:01

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-245574/2-A	2018.09.16_LLA_014.d	09/16/2018 15:08
	LCSD 320-245574/3-A	2018.09.16_LLA_015.d	09/16/2018 15:16
TP-PFC-033-TPI	320-42924-1	2018.09.16_LLA_017.d	09/16/2018 15:31
TP-PFC-033-MID CARBON	320-42924-2	2018.09.16_LLA_018.d	09/16/2018 15:39
TP-PFC-033-TPE	320-42924-3	2018.09.16_LLA_019.d	09/16/2018 15:46
TP-PFC-033-TPE-D	320-42924-4	2018.09.16_LLA_020.d	09/16/2018 15:54
TP-PFC-033-TPI DL	320-42924-1 DL	2018.09.17_LLB_052.d	09/18/2018 00:10

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Sample No.: IC 320-242499/5 Date Analyzed: 08/28/2018 10:43

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.08.28LLICALA_0 Heated Purge: (Y/N) N

Calibration ID: 40823

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		8409228	2.75				
UPPER LIMIT		12613842	2.95				
LOWER LIMIT		4204614	2.55				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-242499/9		8678444	2.75				
ICV 320-242499/10		8272454	2.75				
CCV 320-245884/4 CCVIS		8014697	2.78				
CCV 320-246099/4 CCVIS		8238197	2.73				

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.: 320-42924-1

SDG No.:

Sample No.: CCV 320-245884/4 Date Analyzed: 09/16/2018 14:08

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.09.16_LLA_006. Heated Purge: (Y/N) N

Calibration ID: 40823

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		8014697	2.78				
UPPER LIMIT		12022046	2.98				
LOWER LIMIT		4007349	2.58				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-245884/2		8612340	2.80				
CCVL 320-245884/3		8111538	2.79				
CCV 320-245887/1		8080760	2.77				
MB 320-245574/1-A		8471882	2.77				
LCS 320-245574/2-A		8026611	2.77				
LCSD 320-245574/3-A		8409709	2.77				
320-42924-1	TP-PFC-033-TPI	7282148	2.76				
320-42924-2	TP-PFC-033-MID CARBON	8316580	2.75				
320-42924-3	TP-PFC-033-TPE	8293025	2.75				
320-42924-4	TP-PFC-033-TPE-D	8629172	2.75				
CCV 320-245887/12		8549947	2.75				

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.: 320-42924-1

SDG No.:

Sample No.: CCV 320-246099/4 Date Analyzed: 09/17/2018 18:24

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.09.17_LLB_006. Heated Purge: (Y/N) N

Calibration ID: 40823

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		8238197	2.73				
UPPER LIMIT		12357296	2.93				
LOWER LIMIT		4119099	2.53				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-246099/2		8382047	2.73				
CCVL 320-246099/3		8211716	2.73				
CCV 320-246405/1		8500955	2.73				
320-42924-1 DL	TP-PFC-033-TPI DL	922488Q	2.72				
CCV 320-246405/4		8309242	2.73				

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.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPI | Lab Sample ID: 320-42924-1

Matrix: Water | Lab File ID: 2018.09.16_LLA_017.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:10

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 301.4(mL) | Date Analyzed: 09/16/2018 15:31

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74	M	1.7	1.2	0.49
2706-90-3	Perfluoropentanoic acid (PFPeA)	210	M	1.7	0.83	0.36
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*370*	*E*	*1.7*	0.83	*0.39*
375-85-9	Perfluoroheptanoic acid (PFHpA)	82		1.7	1.2	0.51
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1100*	*E*	*1.7*	1.2	*0.45*
375-95-1	Perfluorononanoic acid (PFNA)	3.0	M	1.7	1.2	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	J	1.7	0.83	0.40
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.7	1.2	0.60
307-55-1	Perfluorododecanoic acid (PFDoA)	1.2	U	1.7	1.2	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	0.63
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.69
375-73-5	Perfluorobutanesulfonic acid (PFBS)	55	M	1.7	0.83	0.38
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*400*	*E*	*1.7*	0.83	*0.32*
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	8.0	M	1.7	0.83	0.31
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*360*	*E*	*3.3*	2.5	*0.91*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.7	1.2	0.46
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPI Lab Sample ID: 320-42924-1

Matrix: Water Lab File ID: 2018.09.16_LLA_017.d

Analysis Method: EPA 537 (Mod) Date Collected: 09/06/2018 09:10

Extraction Method: 3535 Date Extracted: 09/14/2018 08:21

Sample wt/vol: 301.4(mL) Date Analyzed: 09/16/2018 15:31

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		50-150
STL00992	13C4 PFBA	81		50-150
STL01893	13C5 PFPeA	96	M	50-150
STL00993	13C2 PFHxA	89		50-150
STL01892	13C4-PFHpA	97		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	99		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	96		50-150
STL00998	13C2 PFDoA	92		50-150
STL00994	18O2 PFHxS	97		50-150
STL02116	13C2-PFTeDA	90		50-150
STL00991	13C4 PFOS	93		50-150
STL02337	13C3-PFBS	95	M	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d
Lims ID: 320-42924-A-1-A
Client ID: TP-PFC-033-TPI
Sample Type: Client
Inject. Date: 16-Sep-2018 15:31:28 ALS Bottle#: 9 Worklist Smp#: 6
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-42924-a-1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 16:08:13 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 16:02:08

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	1.488	1.494	-0.006	1.000	4645812	2.23			237	M
D 1 13C4 PFBA										
217.00 > 172.00	1.488	1.494	-0.006	0.539	5700041	2.03		81.3	11507	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.772	1.772	0.0	1.000	15466949	6.35			315	M
D 3 13C5-PFPeA										M
267.90 > 223.00	1.772	1.772	0.0	0.642	6008478	2.40		96.1	3422	M
D 47 13C3-PFBS										M
301.90 > 83.00	1.805	1.814	-0.009	0.654	72695	2.21		95.3	216	M
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.814	1.814	0.0	1.005	5465121	1.66			712	M
298.90 > 99.00	1.805	1.814	-0.009	1.000	1915958		2.85(1.35-4.05)		341	M
D 7 13C2 PFHxA										
315.00 > 270.00	2.066	2.068	-0.002	0.748	5892091	2.23		89.2	5584	
6 Perfluorohexanoic acid										E
313.00 > 269.00	2.066	2.068	-0.002	1.000	23706994	11.0			809	E
313.00 > 119.00	2.066	2.068	-0.002	1.000	1638206		14.47(6.96-20.87)		1370	
D 9 13C4-PFHpA										
367.00 > 322.00	2.395	2.399	-0.004	0.868	7635824	2.42		96.9	8503	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.395	2.400	-0.005	1.000	7655649	2.46			375	
363.00 > 169.00	2.395	2.400	-0.005	1.000	1668982		4.59(2.17-6.52)		1521	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.408	2.413	-0.005	1.000	27907244	12.0			6733	E
399.00 > 99.00	2.408	2.413	-0.005	1.000	8035746		3.47(1.90-5.70)		4510	
D 11 18O2 PFHxS										
403.00 > 84.00	2.408	2.426	-0.018	0.872	4463039	2.30		97.3	5209	

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	2.761	2.766	-0.005	1.000	6700046	2.28		91.3	10702	
* 62 13C2-PFOA										
415.00 > 370.00	2.761	2.766	-0.005		7282148	2.50			10181	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.745	2.766	-0.021	0.994	91563387	31.7			2546	E
413.00 > 169.00	2.761	2.766	-0.005	1.000	53413795		1.71(1.36-4.08)		10447	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.761	2.782	-0.021	0.883	460798	0.2424			29.2	
449.00 > 99.00	2.761	2.782	-0.021	0.883	150542		3.06(1.84-5.53)		82.5	M
D 19 13C5 PFNA										
468.00 > 423.00	3.128	3.153	-0.025	1.133	6783531	2.47		98.7	9885	
D 18 13C4 PFOS										
503.00 > 80.00	3.128	3.153	-0.025	1.133	4614813	2.22		92.7	2784	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.128	3.153	-0.025	1.000	22124394	10.9			6718	E
499.00 > 99.00	3.128	3.153	-0.025	1.000	4920506		4.50(2.04-6.12)		2853	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.128	3.153	-0.025	1.000	241804	0.0911			18.1	M
463.00 > 169.00	3.128	3.153	-0.025	1.000	40079		6.03(2.68-8.03)		24.8	
D 21 13C8 FOSA										
506.00 > 78.00	3.460	3.465	-0.005	1.253	2509001	2.28		91.1	3212	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.460	3.465	-0.005	1.000	15393	0.005175			6.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.508	3.512	-0.004	1.271	6752908	2.46		98.4	7408	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.508	3.512	-0.004	1.000	95805	0.0312			14.2	
513.00 > 169.00	3.491	3.512	-0.021	0.995	6067		15.79(7.12-21.35)		8.9	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.818	3.839	-0.021	0.996	13746	0.006836			2.9	M
563.00 > 169.00	3.818	3.839	-0.021	0.996	1395		9.85(5.24-15.72)		2.3	M
D 30 13C2 PFUnA										
565.00 > 520.00	3.834	3.854	-0.020	1.389	5603484	2.40		95.9	8902	
D 36 13C2 PFDoA										
615.00 > 570.00	4.117	4.139	-0.022	1.491	6561036	2.31		92.3	10014	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.639	4.660	-0.021	1.680	5121898	2.26		90.5	13026	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 17-Sep-2018 16:08:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d

Injection Date: 16-Sep-2018 15:31:28 Instrument ID: A9

Lims ID: 320-42924-A-1-A Lab Sample ID: 320-42924-1

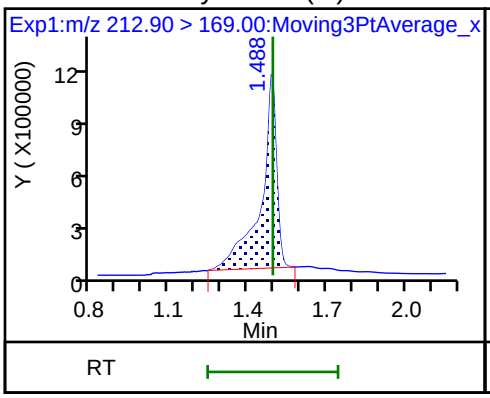
Client ID: TP-PFC-033-TPI

Operator ID: A9\Administrator ALS Bottle#: 9 Worklist Smp#: 6

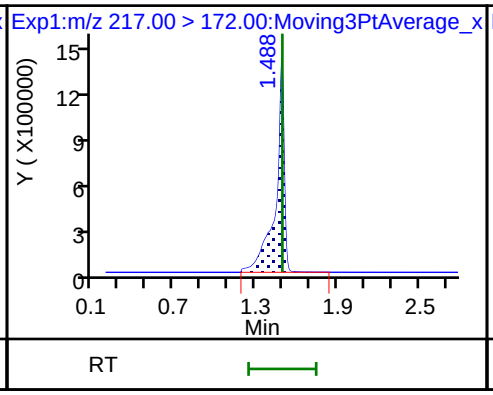
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

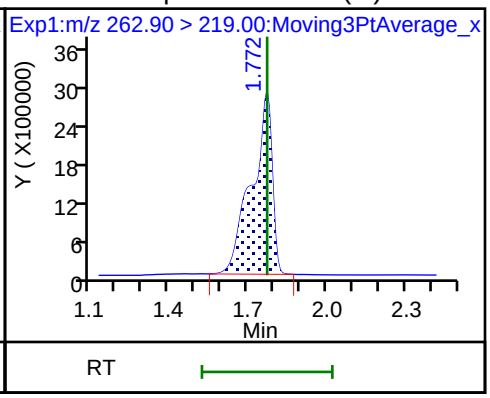
2 Perfluorobutyric acid (M)



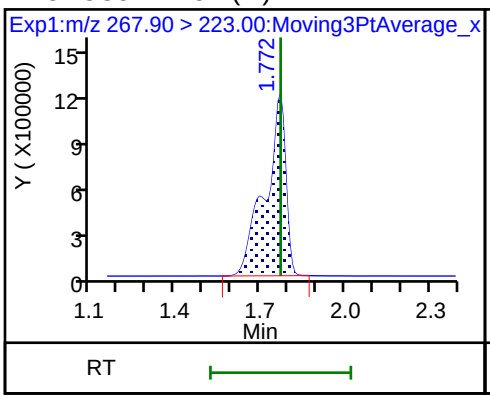
D 1 13C4 PFBA



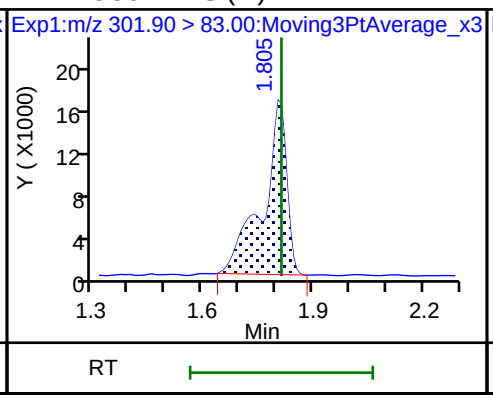
4 Perfluoropentanoic acid (M)



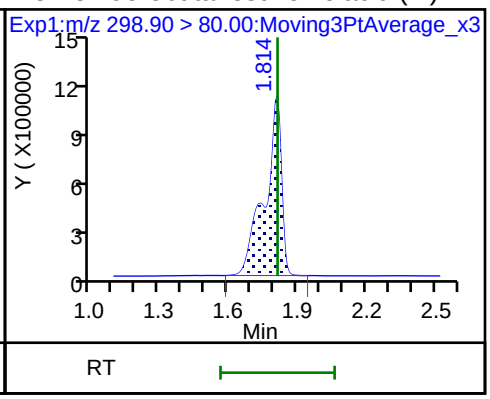
D 3 13C5-PFPeA (M)



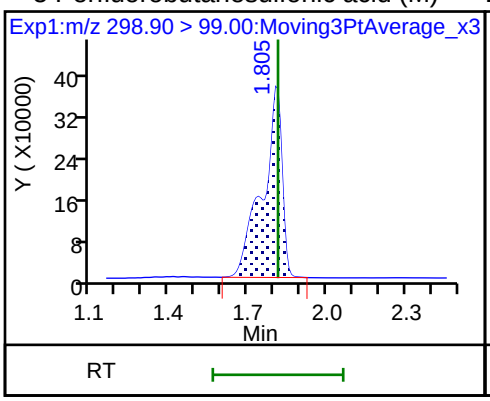
D 47 13C3-PFBS (M)



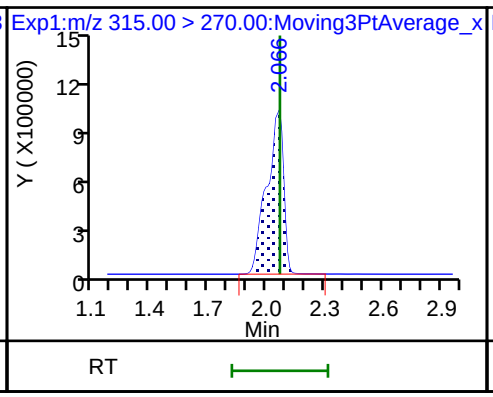
5 Perfluorobutanesulfonic acid (M)



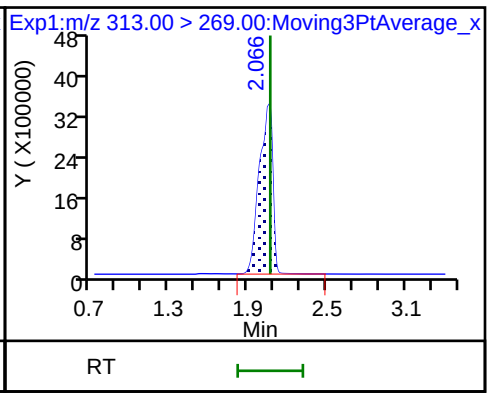
5 Perfluorobutanesulfonic acid (M)



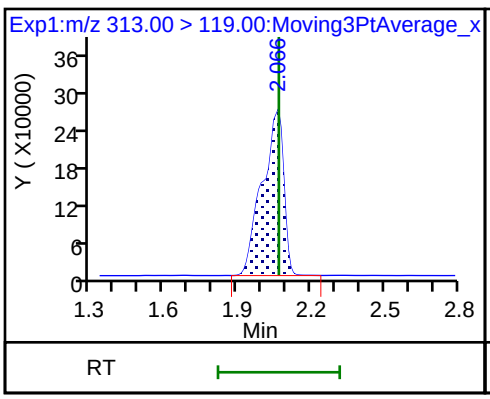
D 7 13C2 PFHxA



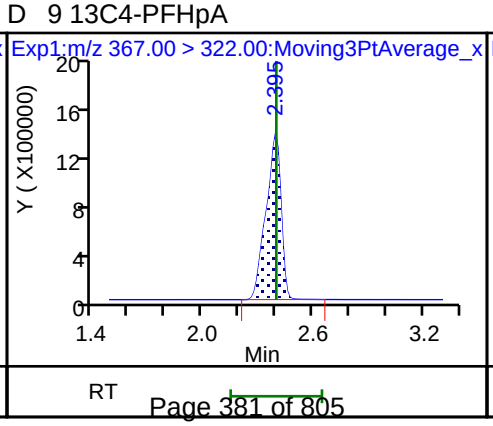
6 Perfluorohexanoic acid



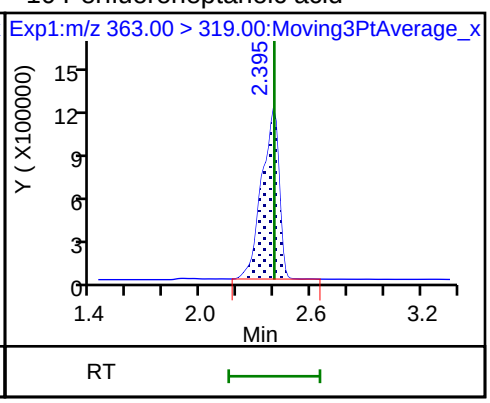
6 Perfluorohexanoic acid



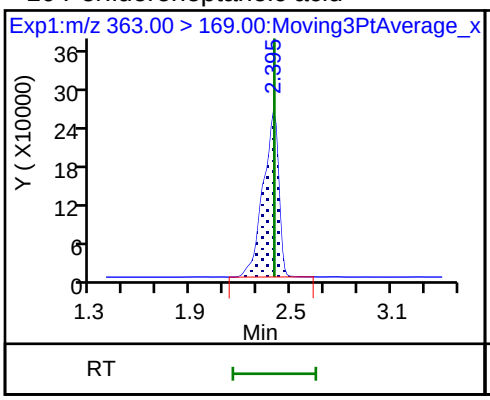
D 9 13C4-PFHpA



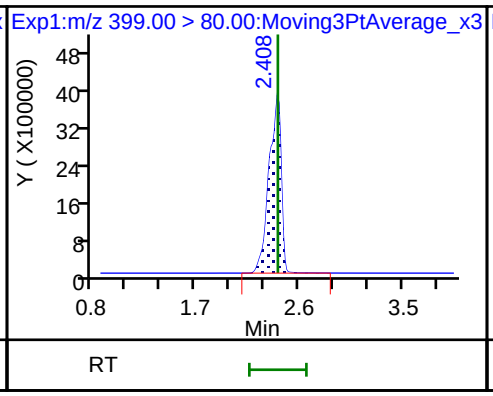
10 Perfluoroheptanoic acid



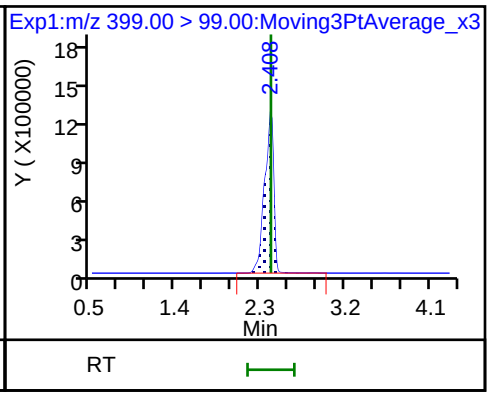
10 Perfluoroheptanoic acid



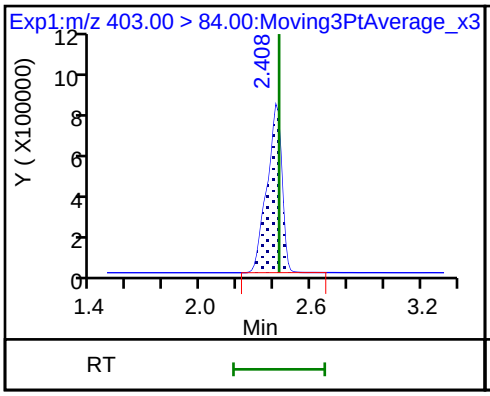
8 Perfluorohexanesulfonic acid



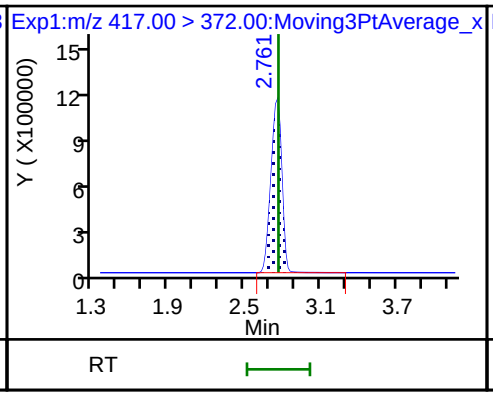
8 Perfluorohexanesulfonic acid



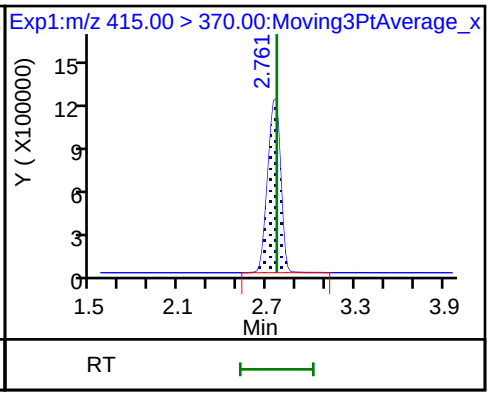
D 11 18O2 PFHxS



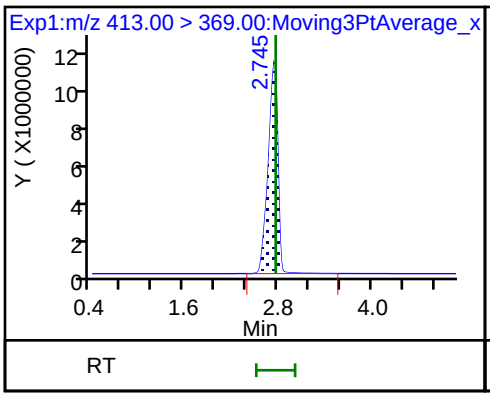
D 14 13C4 PFOA



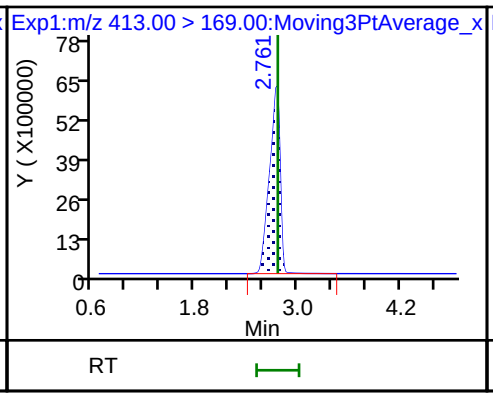
* 62 13C2-PFOA



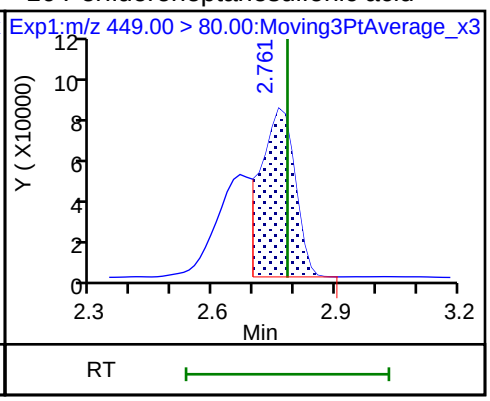
15 Perfluorooctanoic acid



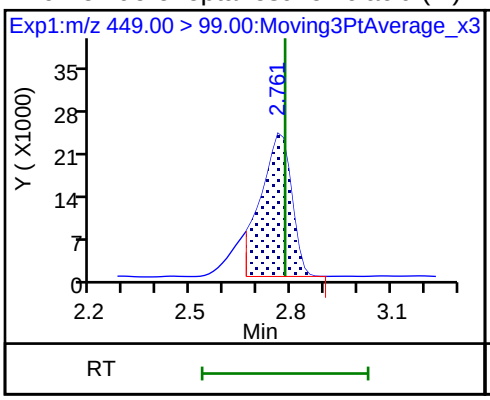
15 Perfluorooctanoic acid



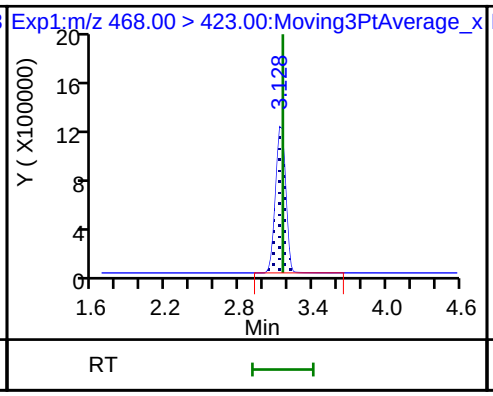
16 Perfluoroheptanesulfonic acid



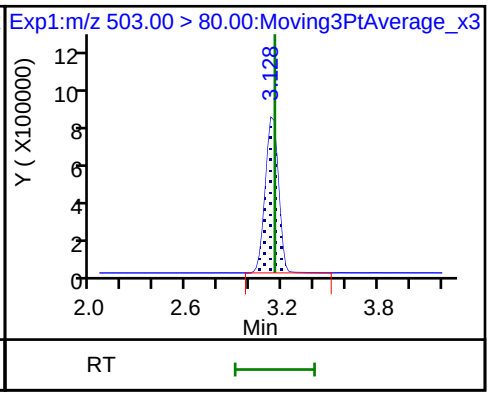
16 Perfluoroheptanesulfonic acid (M)



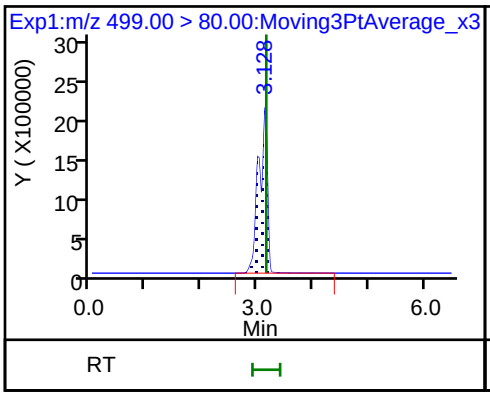
D 19 13C5 PFNA



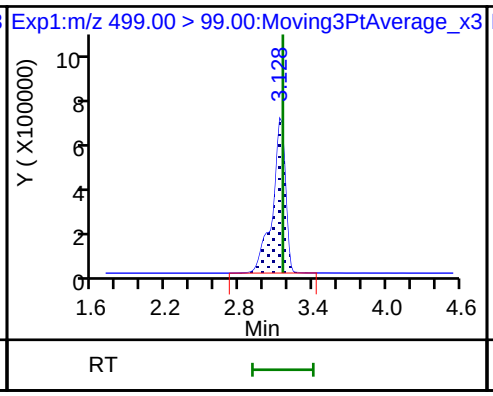
D 18 13C4 PFOS



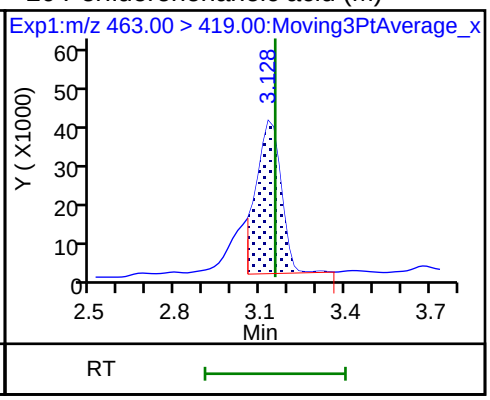
17 Perfluorooctane sulfonic acid



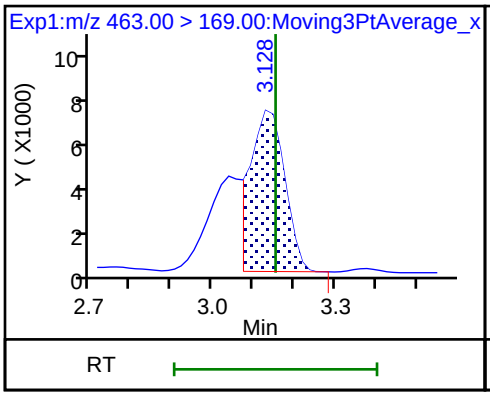
17 Perfluorooctane sulfonic acid



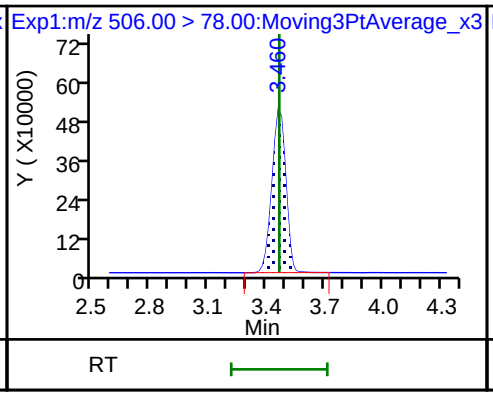
20 Perfluorononanoic acid (M)



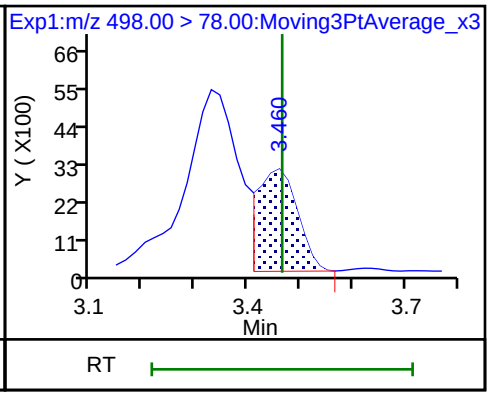
20 Perfluorononanoic acid



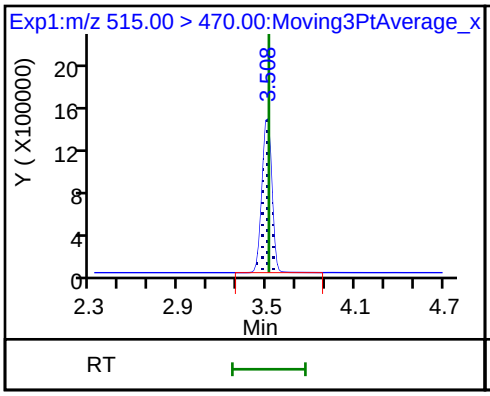
D 21 13C8 FOSA



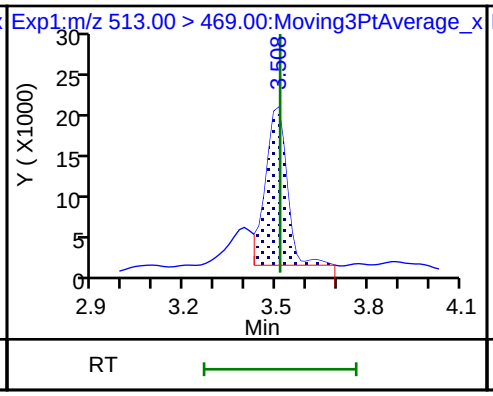
22 Perfluorooctane Sulfonamide



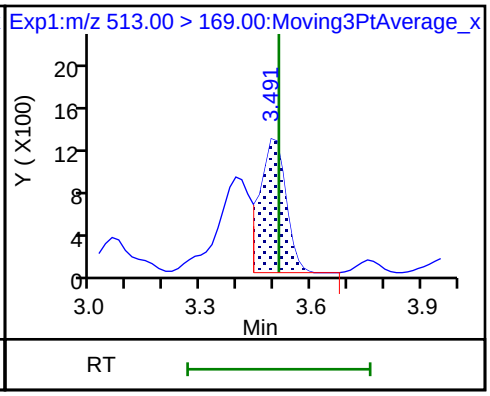
D 23 13C2 PFDA



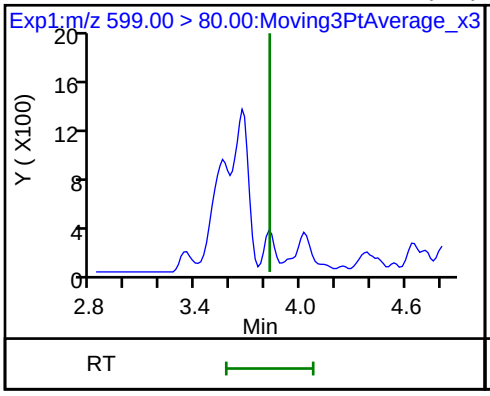
24 Perfluorodecanoic acid



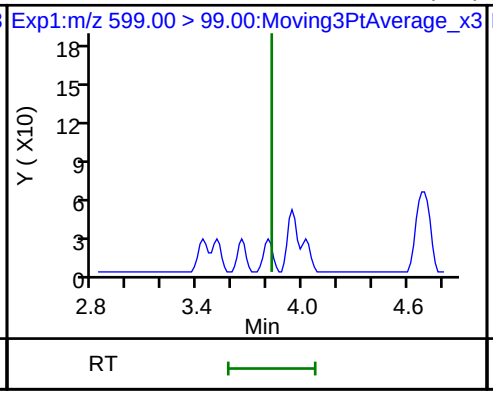
24 Perfluorodecanoic acid



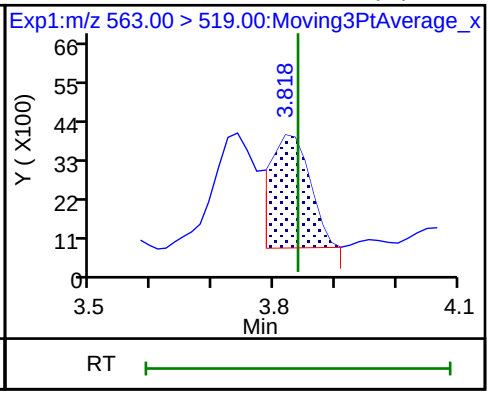
29 Perfluorodecane Sulfonic acid (ND)



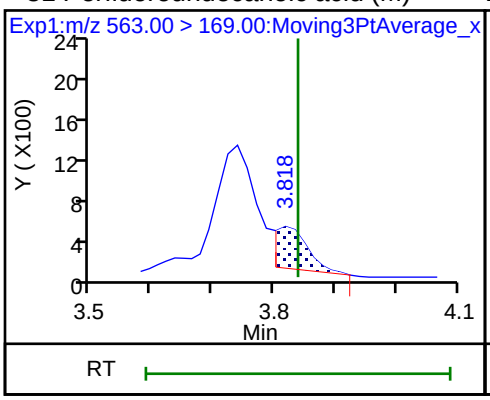
29 Perfluorodecane Sulfonic acid (ND)



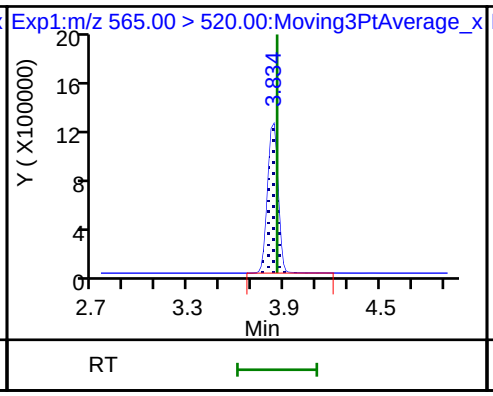
31 Perfluoroundecanoic acid (M)



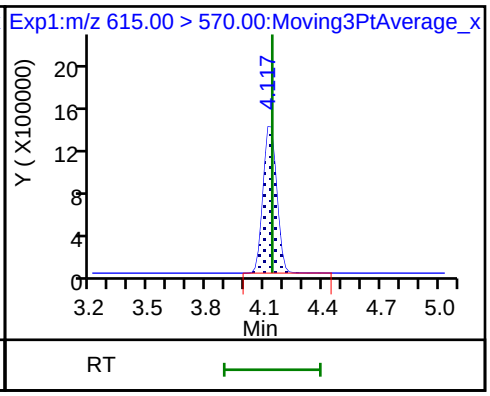
31 Perfluoroundecanoic acid (M)



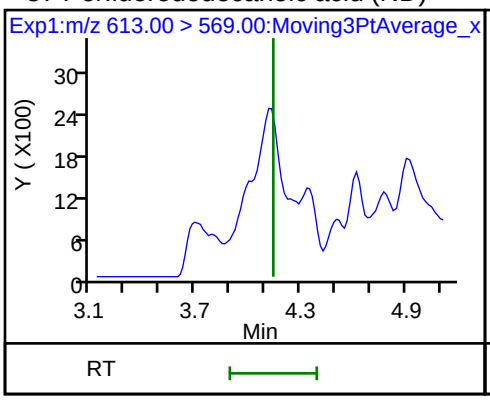
D 30 13C2 PFUnA



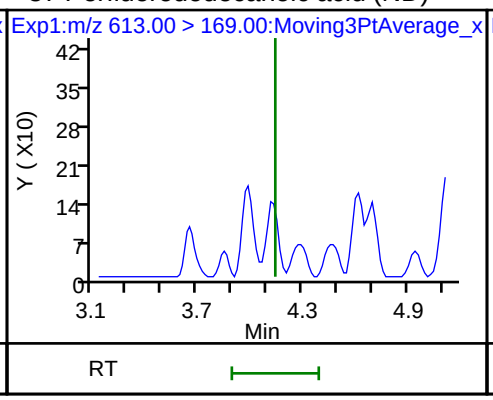
D 36 13C2 PFDoA



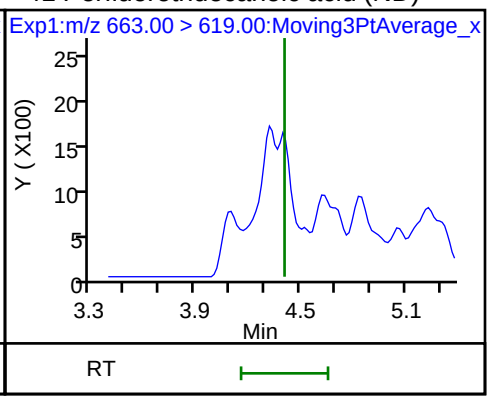
37 Perfluorododecanoic acid (ND)



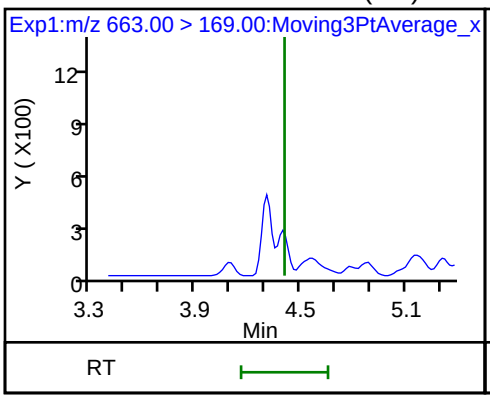
37 Perfluorododecanoic acid (ND)



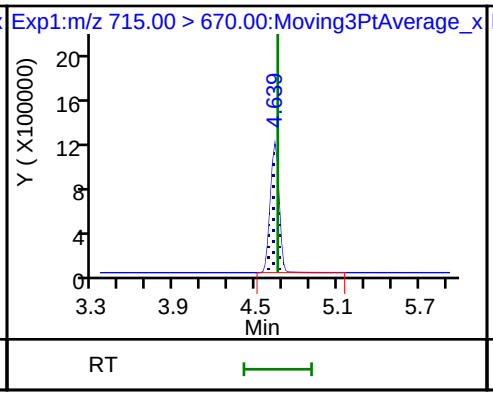
41 Perfluorotridecanoic acid (ND)



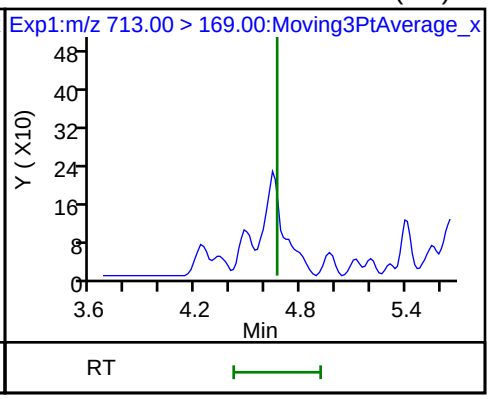
41 Perfluorotridecanoic acid (ND)



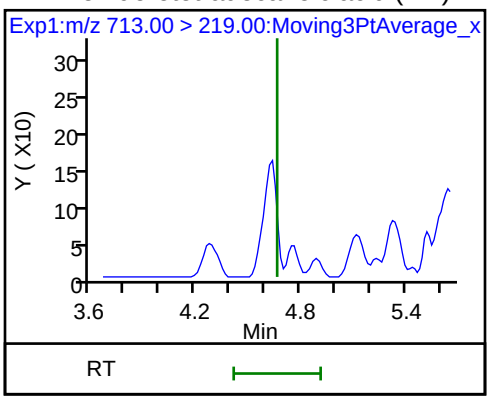
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

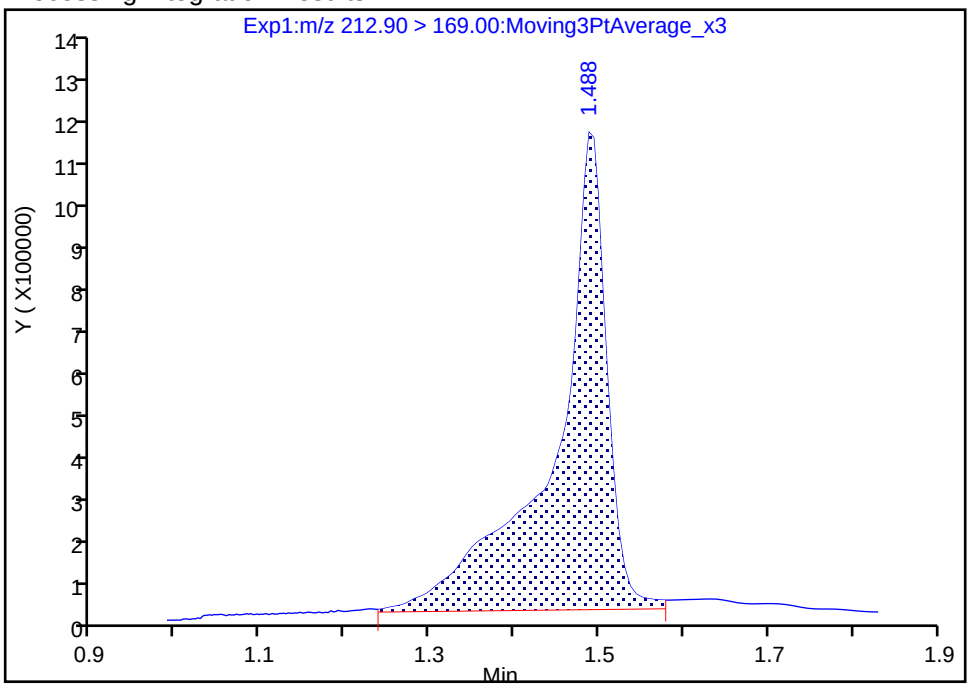
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

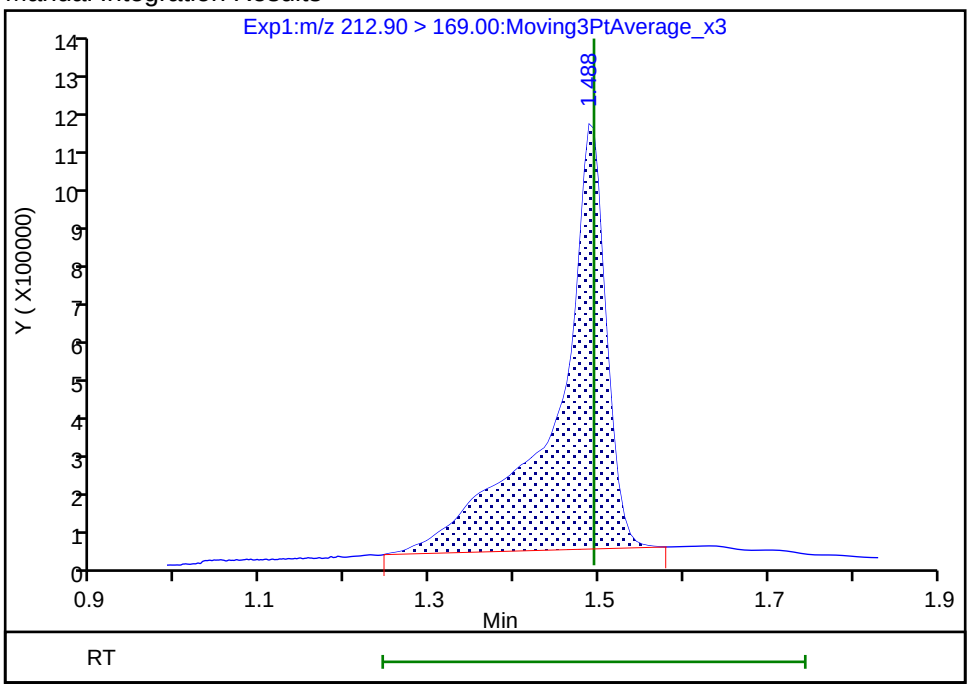
Processing Integration Results

RT: 1.49
Area: 4937107
Amount: 2.372189
Amount Units: ng/ml



Manual Integration Results

RT: 1.49
Area: 4645812
Amount: 2.232227
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:00:58

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

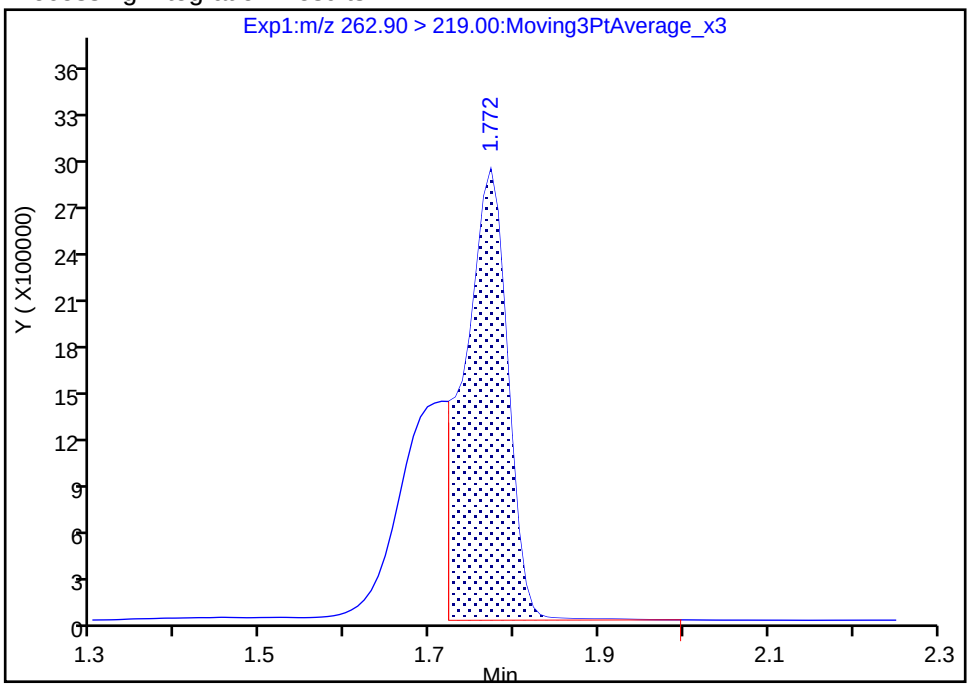
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

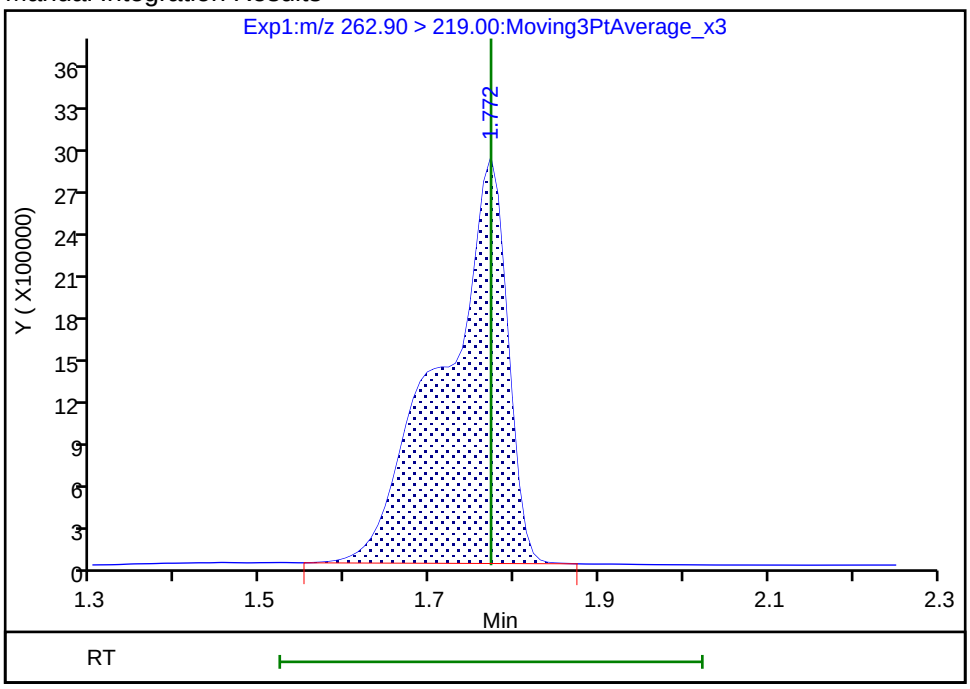
Processing Integration Results

RT: 1.77
Area: 10173228
Amount: 4.173428
Amount Units: ng/ml



Manual Integration Results

RT: 1.77
Area: 15466949
Amount: 6.345105
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:01:03
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

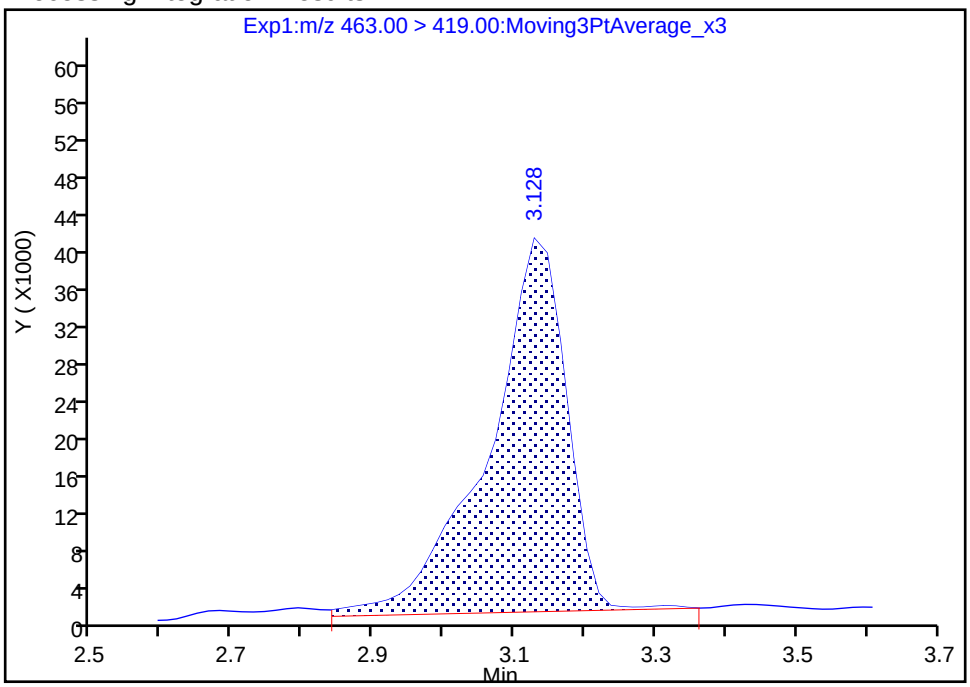
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

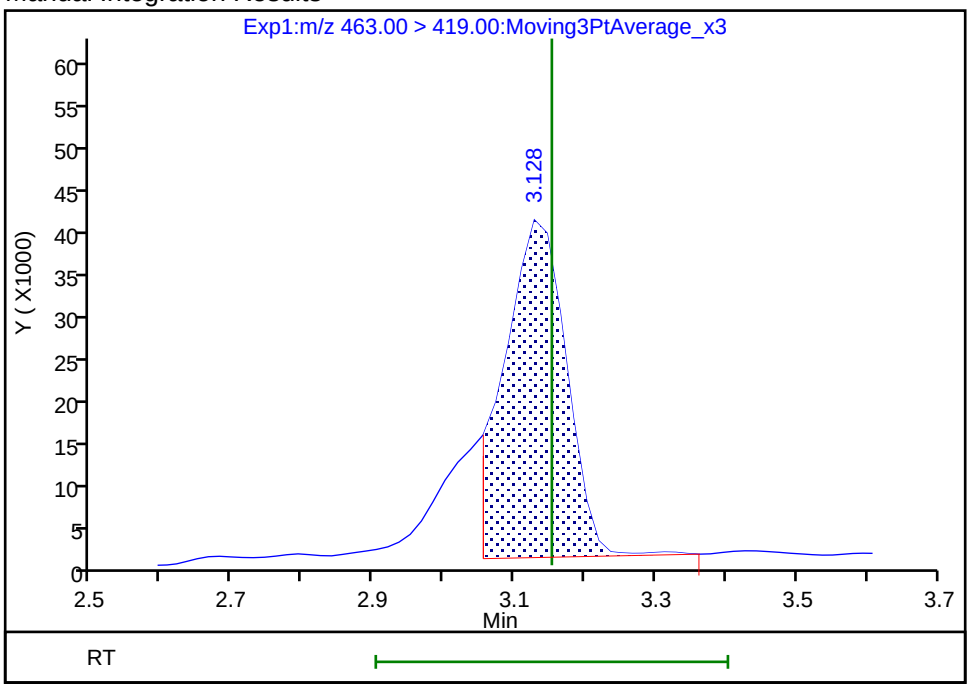
Processing Integration Results

RT: 3.13
Area: 308624
Amount: 0.116311
Amount Units: ng/ml



Manual Integration Results

RT: 3.13
Area: 241804
Amount: 0.091129
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:01:41

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

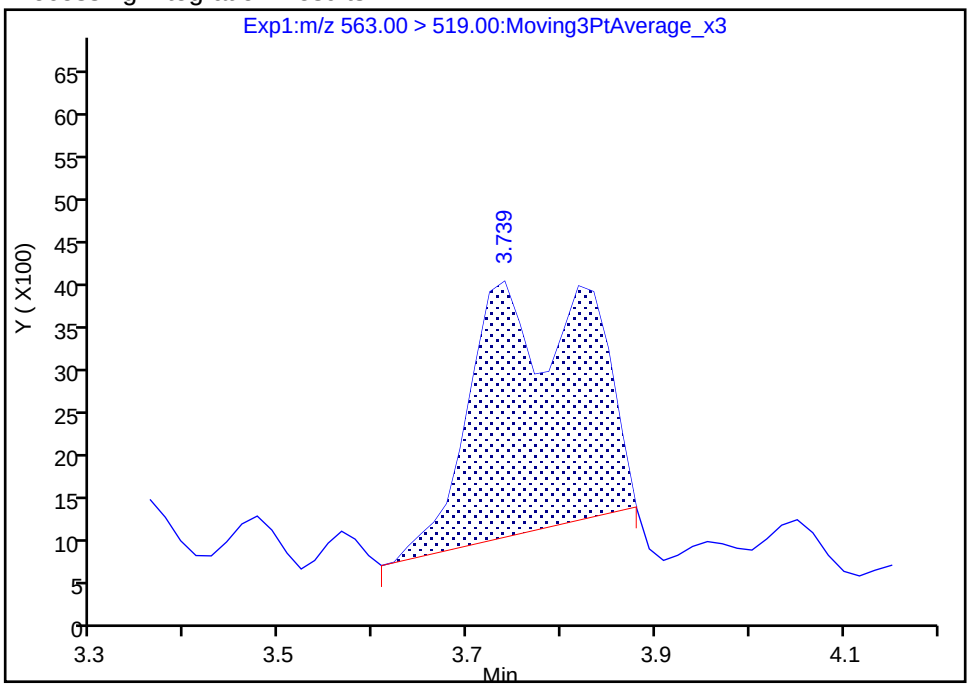
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

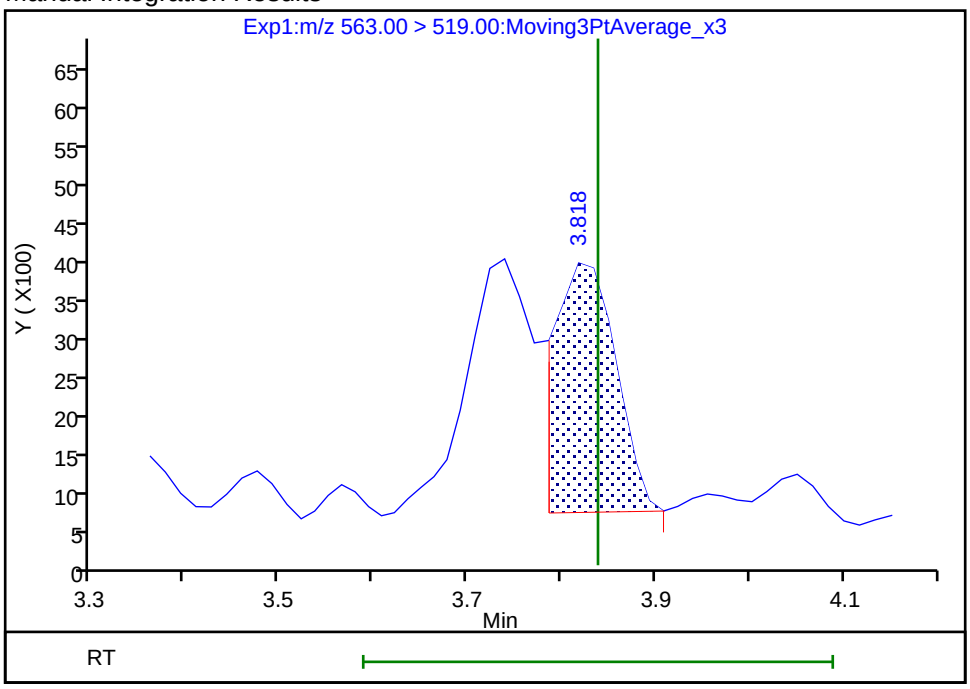
Processing Integration Results

RT: 3.74
Area: 24891
Amount: 0.012378
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 13746
Amount: 0.006836
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:02:00

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

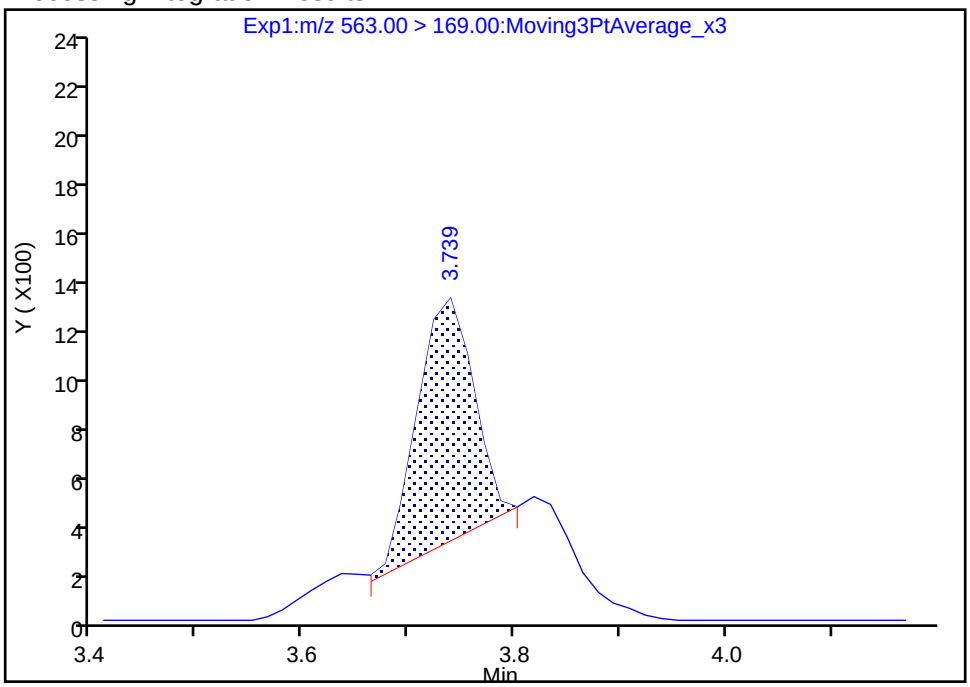
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

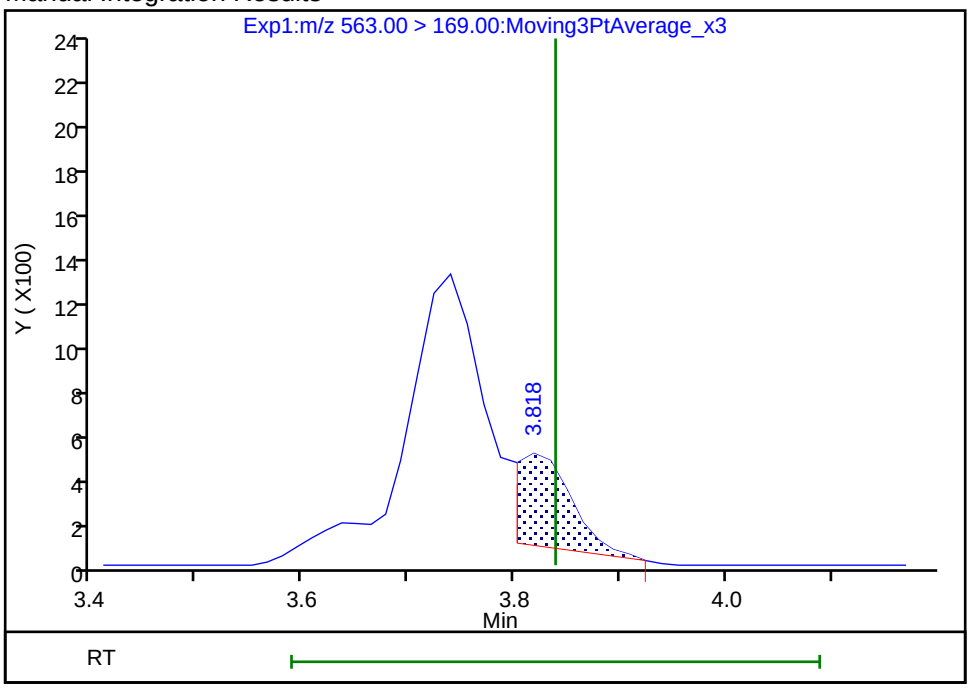
Processing Integration Results

RT: 3.74
Area: 3703
Amount: 0.012378
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 1395
Amount: 0.006836
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:02:03

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

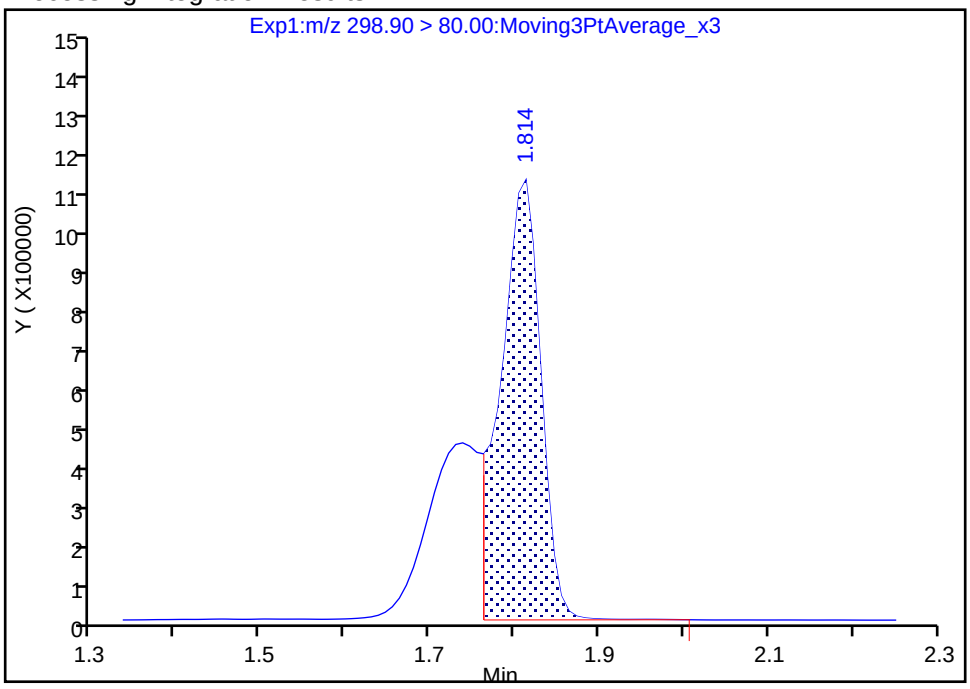
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

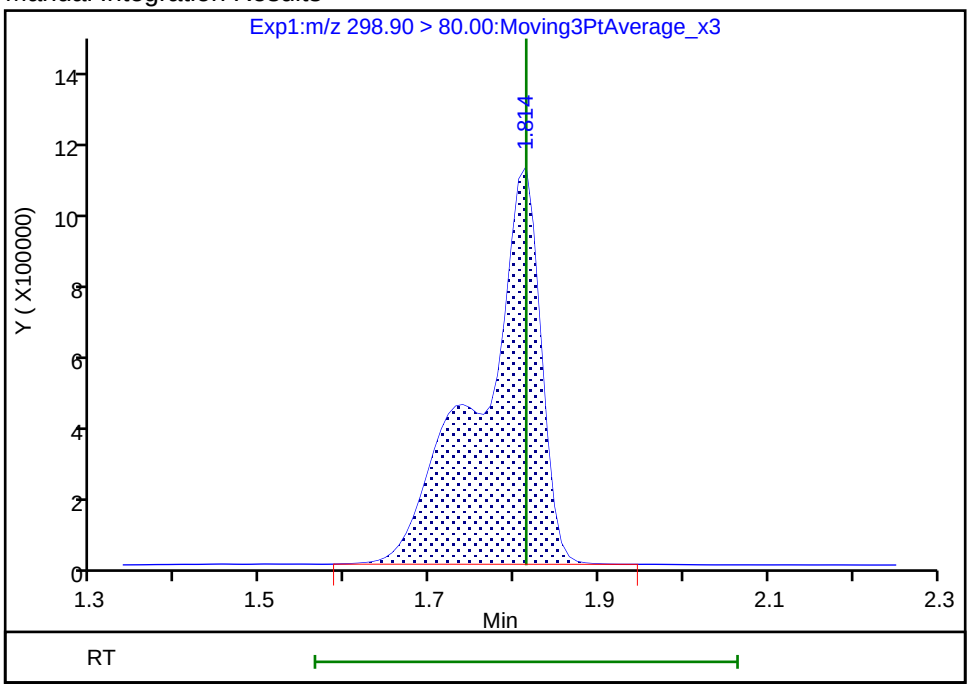
Processing Integration Results

RT: 1.81
Area: 3575899
Amount: 1.088550
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 5465121
Amount: 1.663654
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:01:08

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

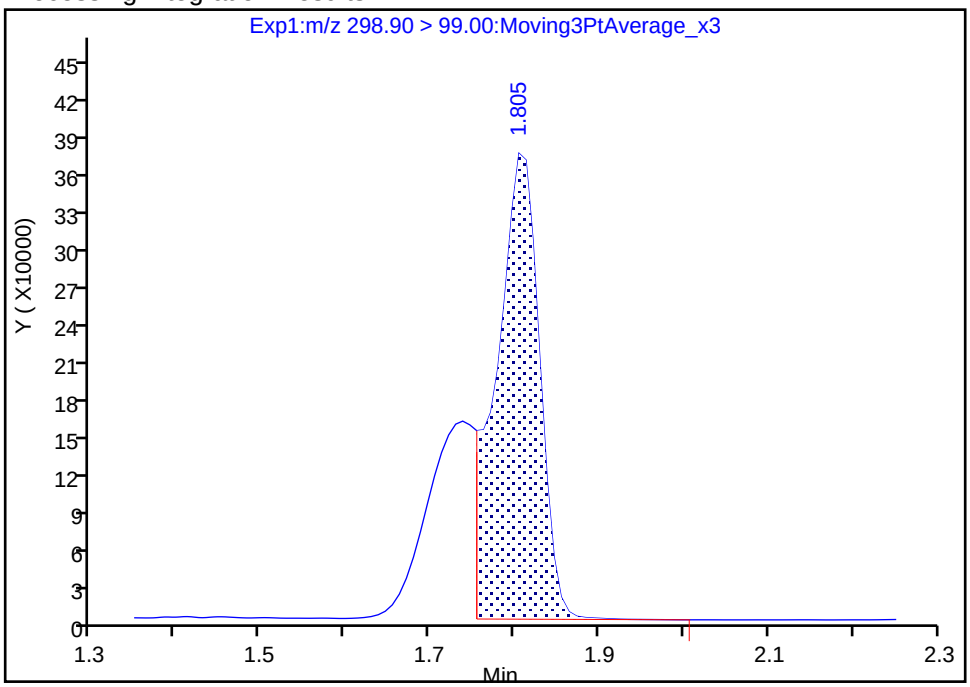
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

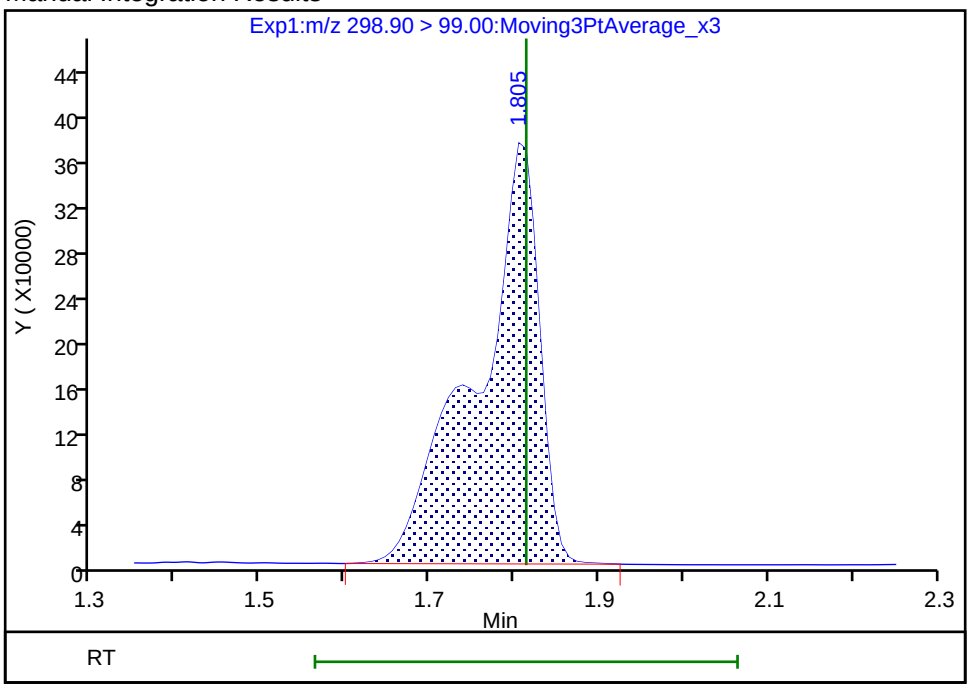
Processing Integration Results

RT: 1.81
Area: 1308020
Amount: 1.088550
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 1915958
Amount: 1.663654
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:01:10
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

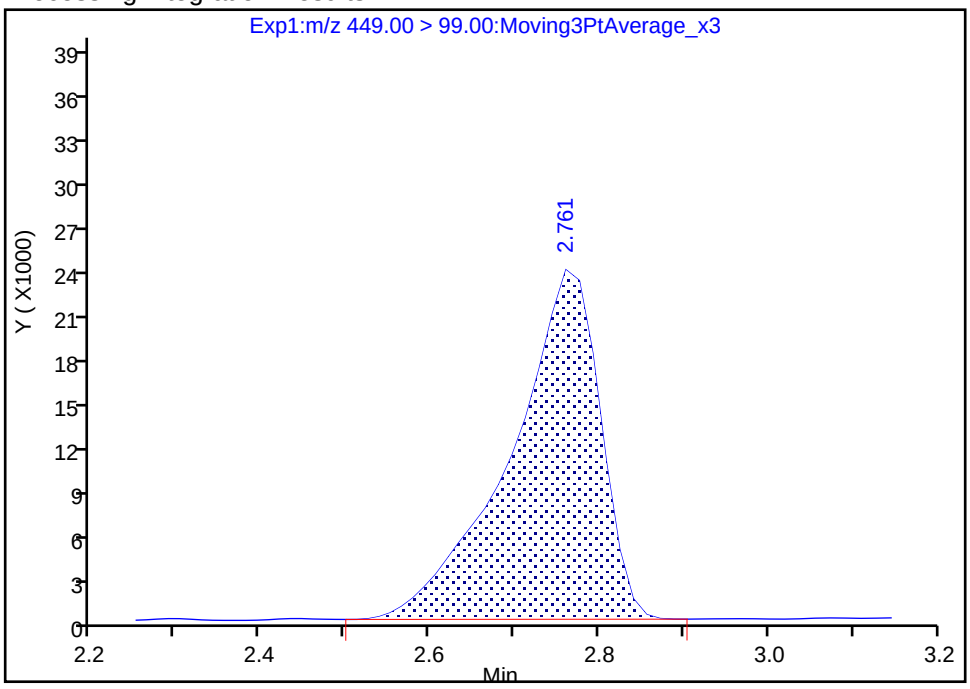
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

16 Perfluoroheptanesulfonic acid, CAS: 375-92-8

Signal: 2

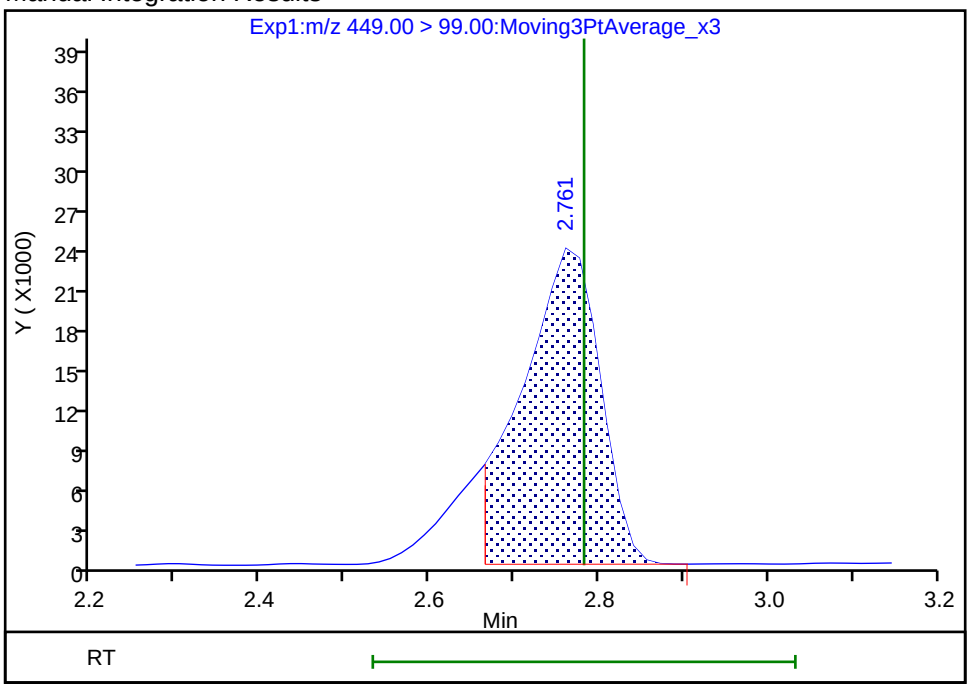
Processing Integration Results

RT: 2.76
Area: 174720
Amount: 0.242375
Amount Units: ng/ml



Manual Integration Results

RT: 2.76
Area: 150542
Amount: 0.242375
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:01:33

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

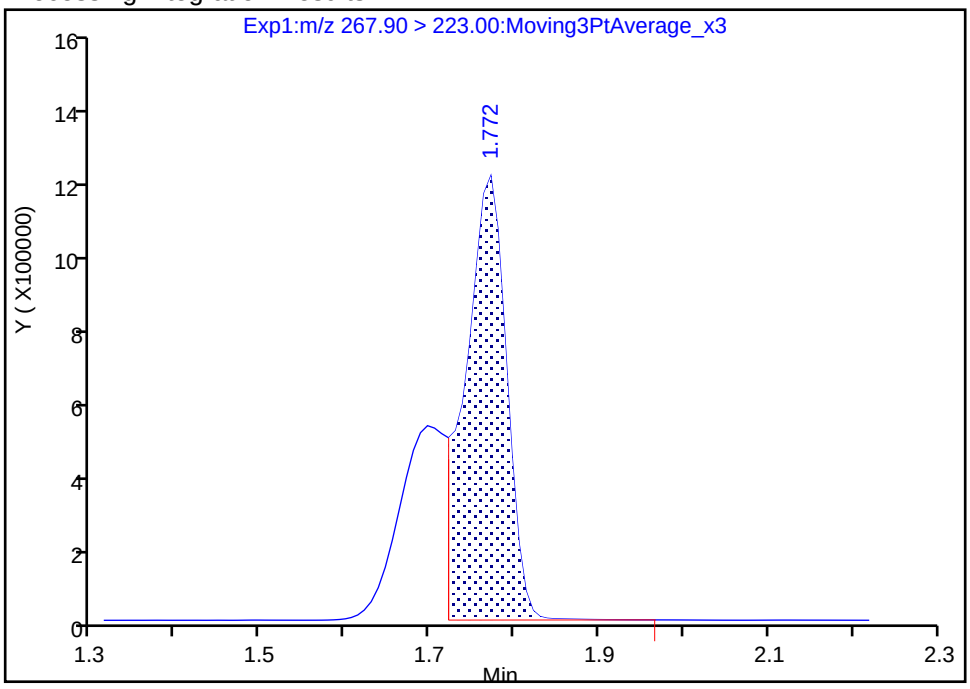
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 3 13C5-PFPeA, CAS: STL01893

Signal: 1

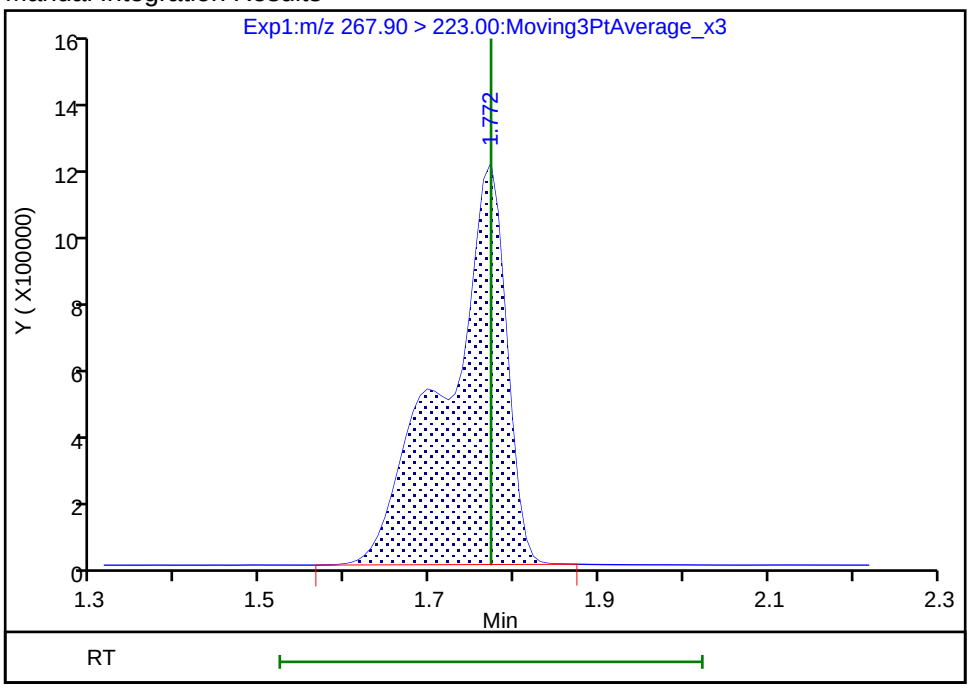
Processing Integration Results

RT: 1.77
Area: 4024621
Amount: 1.609605
Amount Units: ng/ml



Manual Integration Results

RT: 1.77
Area: 6008478
Amount: 2.403027
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:00:40

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

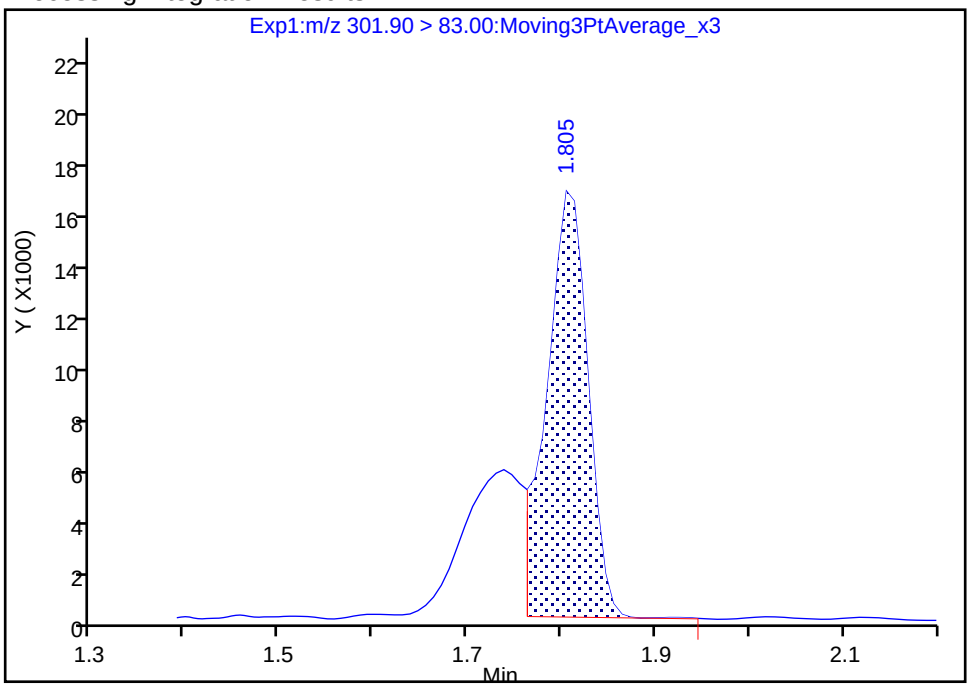
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_017.d				
Injection Date:	16-Sep-2018 15:31:28	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

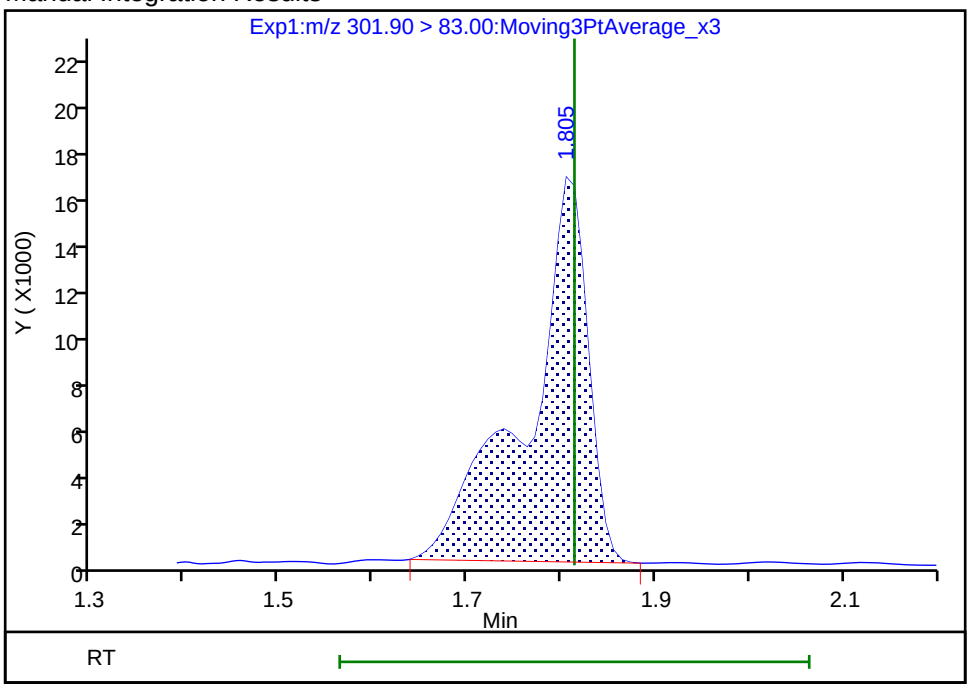
Processing Integration Results

RT: 1.81
Area: 49018
Amount: 1.493379
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 72695
Amount: 2.214721
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:00:45

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPI DL | Lab Sample ID: 320-42924-1 DL

Matrix: Water | Lab File ID: 2018.09.17_LLB_052.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:10

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 301.4(mL) | Date Analyzed: 09/18/2018 00:10

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 246405 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*78*	*D M*	*17*	12	*4.9*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*220*	*D*	*17*	8.3	*3.6*
307-24-4	Perfluorohexanoic acid (PFHxA)	390	D	17	8.3	3.9
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*82*	*D*	*17*	12	*5.1*
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D	17	12	4.5
375-95-1	*Perfluorononanoic acid (PFNA)*	*12*	*U M*	*17*	12	*4.3*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*8.3*	*U*	*17*	8.3	*4.0*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*12*	*U*	*17*	12	*6.0*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*12*	*U*	*17*	12	*4.3*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*25*	*U*	*33*	25	*6.3*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*25*	*U*	*33*	25	*6.9*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*63*	*D*	*17*	8.3	*3.8*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	430	D	17	8.3	3.2
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*9.3*	*J D M*	*17*	8.3	*3.1*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	350	D	33	25	9.1
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*12*	*U*	*17*	12	*4.6*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*25*	*U*	*33*	25	*11*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPI DL Lab Sample ID: 320-42924-1 DL

Matrix: Water Lab File ID: 2018.09.17_LLB_052.d

Analysis Method: EPA 537 (Mod) Date Collected: 09/06/2018 09:10

Extraction Method: 3535 Date Extracted: 09/14/2018 08:21

Sample wt/vol: 301.4(mL) Date Analyzed: 09/18/2018 00:10

Con. Extract Vol.: 10.00(mL) Dilution Factor: 10

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 246405 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	75		50-150
STL00992	13C4 PFBA	75		50-150
STL01893	13C5 PFPeA	78		50-150
STL00993	13C2 PFHxA	77		50-150
STL01892	13C4-PFHpA	79		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	84		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	84		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	18O2 PFHxS	79		50-150
STL02116	13C2-PFTeDA	74		50-150
STL00991	13C4 PFOS	78		50-150
STL02337	13C3-PFBS	70	M	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d
Lims ID: 320-42924-A-1-A
Client ID: TP-PFC-033-TPI
Sample Type: Client
Inject. Date: 18-Sep-2018 00:10:06 ALS Bottle#: 35 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 10.0000
Sample Info: 320-42924-a-1-a 10X (#245574)
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 20-Sep-2018 09:02:10 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 20-Sep-2018 09:02:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.478	1.479	0.0	0.544	663841	0.1869		74.8	2077	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.483	1.488	-0.005	1.004	566303	0.2336			76.6	M
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.755	0.0	1.000	1631135	0.6549			92.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.756	-0.001	0.646	613881	0.1938		77.5	1130	
D 47 13C3-PFBS										M
301.90 > 83.00	1.797	1.789	0.008	0.661	6737	0.1620		69.7	38.9	M
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	581217	0.1909			176	
298.90 > 99.00	1.797	1.797	0.0	1.000	200911		2.89(1.35-4.05)		114	
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.038	-0.001	0.749	645003	0.1926		77.0	2270	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.037	2.048	-0.011	1.000	2793759	1.19			354	
313.00 > 119.00	2.037	2.048	-0.011	1.000	173379		16.11(6.96-20.87)		285	
D 9 13C4-PFHpA										
367.00 > 322.00	2.360	2.360	0.0	0.868	791105	0.1981		79.2	2669	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.373	2.373	0.0	1.006	801894	0.2485			83.6	
363.00 > 169.00	2.373	2.373	0.0	1.006	166411		4.82(2.17-6.52)		238	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.386	2.386	0.0	1.000	3069820	1.28			2392	
399.00 > 99.00	2.386	2.386	0.0	1.000	822940		3.73(1.90-5.70)		1033	
D 11 18O2 PFHxS										
403.00 > 84.00	2.386	2.387	-0.001	0.878	456698	0.1860		78.6	3088	

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	2.718	2.719	-0.001	1.000	806777	0.2170		86.8	1989	
* 62 13C2-PFOA										
415.00 > 370.00	2.718	2.734	-0.016		922488	0.2500			3809	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.718	2.734	-0.016	1.000	18007814	5.18			755	
413.00 > 169.00	2.718	2.734	-0.016	1.000	7768513		2.32(1.36-4.08)		7356	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.734	2.734	0.0	0.882	56355	0.0279			30.1	
449.00 > 99.00	2.734	2.734	0.0	0.882	13171		4.28(1.84-5.53)		34.2	M
20 Perfluorononanoic acid										M
463.00 > 419.00	3.098	3.098	0.0	1.000	31769	0.0111			2.9	
463.00 > 169.00	3.098	3.098	0.0	1.000	4001		7.94(2.68-8.03)		10.6	M
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.098	3.098	0.0	1.000	2300180	1.06			865	
499.00 > 99.00	3.098	3.098	0.0	1.000	504237		4.56(2.04-6.12)		1187	
D 19 13C5 PFNA										
468.00 > 423.00	3.098	3.099	-0.001	1.140	731320	0.2100		84.0	2234	
D 18 13C4 PFOS										
503.00 > 80.00	3.098	3.099	-0.001	1.140	489533	0.1855		77.6	198	
D 21 13C8 FOSA										
506.00 > 78.00	3.448	3.449	-0.001	1.269	262312	0.1879		75.2	923	
D 23 13C2 PFDA										
515.00 > 470.00	3.448	3.449	-0.001	1.269	746135	0.2145		85.8	3321	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.448	3.465	-0.017	1.000	3040	0.000978			7.5	
D 30 13C2 PFUnA										
565.00 > 520.00	3.775	3.776	-0.001	1.389	623390	0.2106		84.2	2821	
D 36 13C2 PFDoA										
615.00 > 570.00	4.072	4.073	-0.001	1.498	686127	0.1905		76.2	1841	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.573	4.573	-0.001	1.682	527587	0.1839		73.6	2414	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 20-Sep-2018 09:02:11 Chrom Revision: 2.3 18-Sep-2018 21:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d

Injection Date: 18-Sep-2018 00:10:06 Instrument ID: A9

Lims ID: 320-42924-A-1-A Lab Sample ID: 320-42924-1

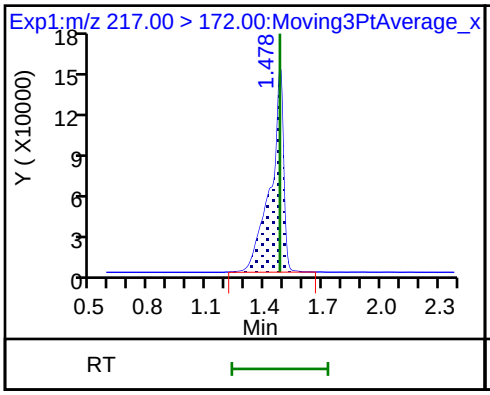
Client ID: TP-PFC-033-TPI

Operator ID: A9\Administrator ALS Bottle#: 35 Worklist Smp#: 2

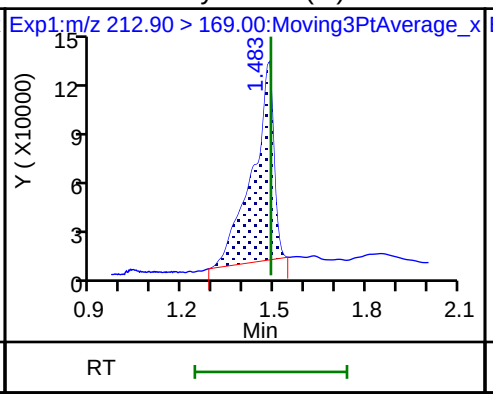
Injection Vol: 20.0 ul Dil. Factor: 10.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

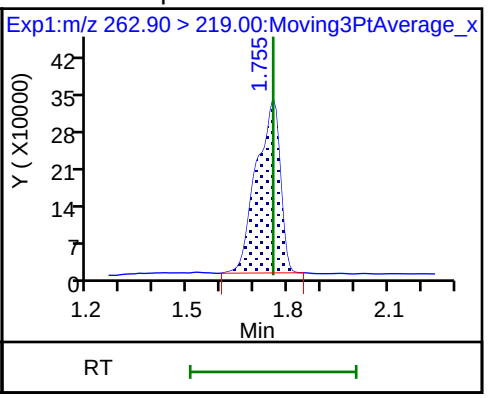
D 1 13C4 PFBA



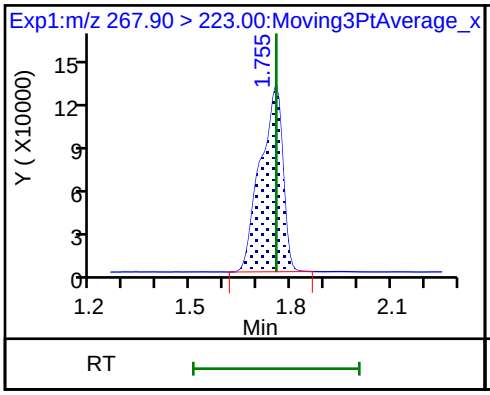
2 Perfluorobutyric acid (M)



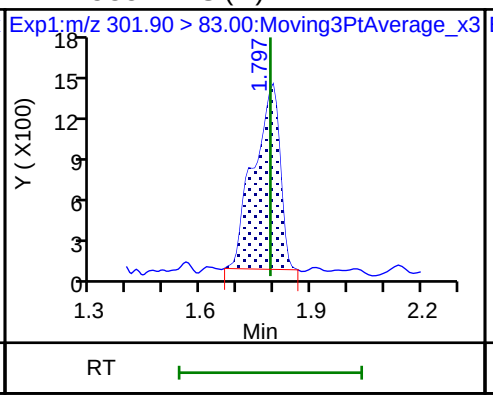
4 Perfluoropentanoic acid



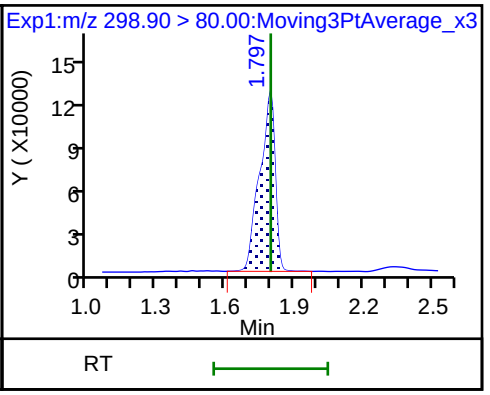
D 3 13C5-PFPeA



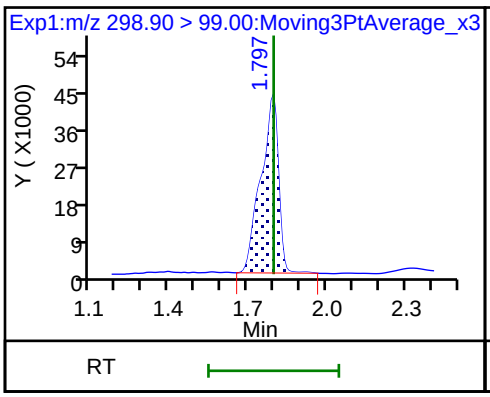
D 47 13C3-PFBS (M)



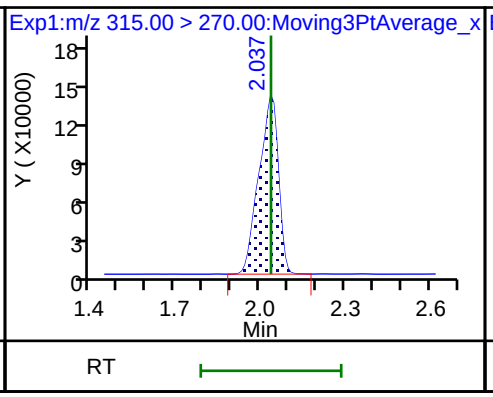
5 Perfluorobutanesulfonic acid



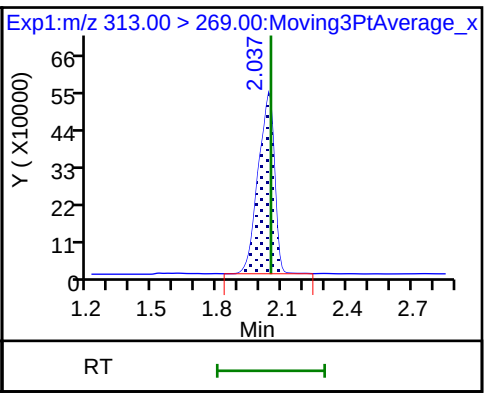
5 Perfluorobutanesulfonic acid



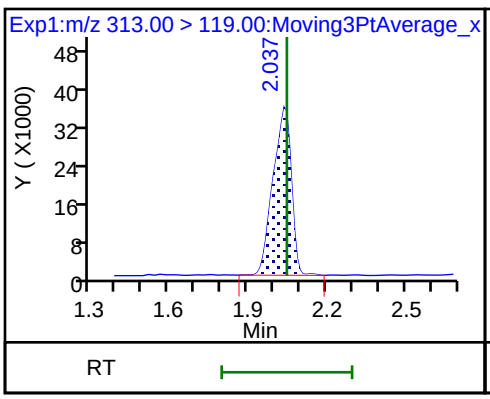
D 7 13C2 PFHxA



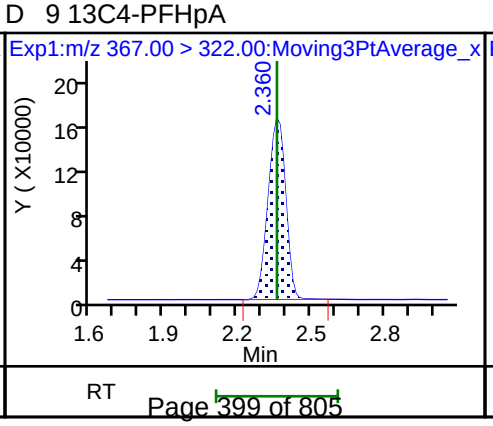
6 Perfluorohexanoic acid



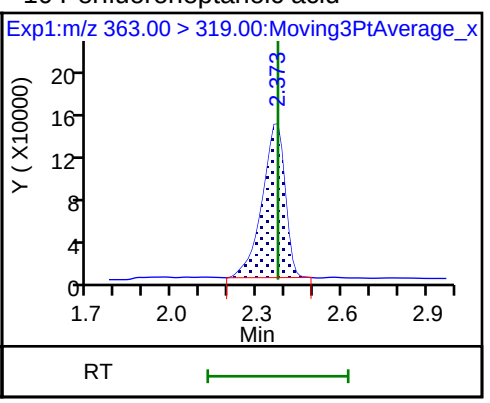
6 Perfluorohexanoic acid



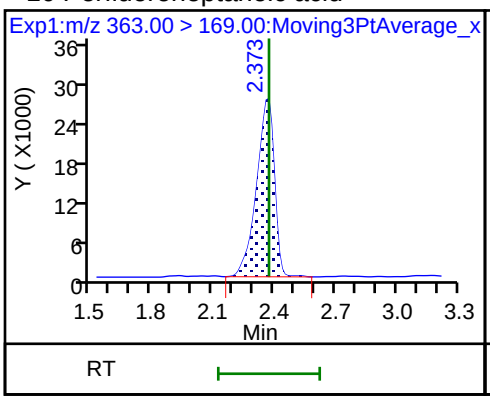
D 9 13C4-PFHpA



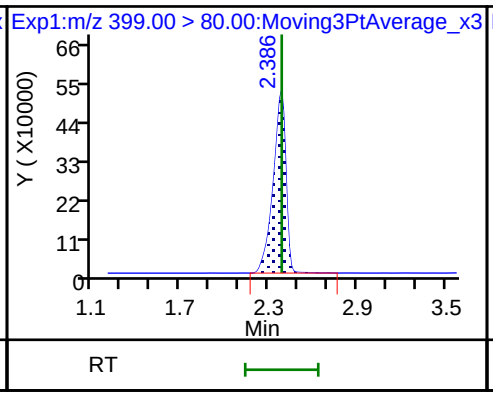
10 Perfluoroheptanoic acid



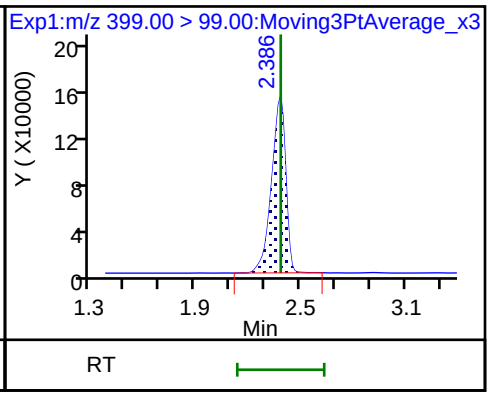
10 Perfluoroheptanoic acid



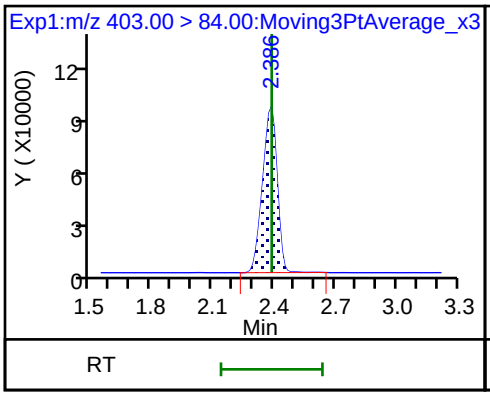
8 Perfluorohexanesulfonic acid



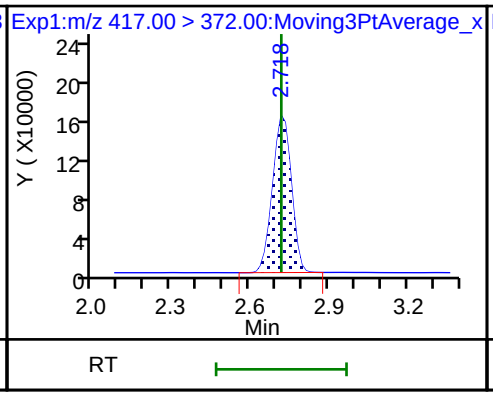
8 Perfluorohexanesulfonic acid



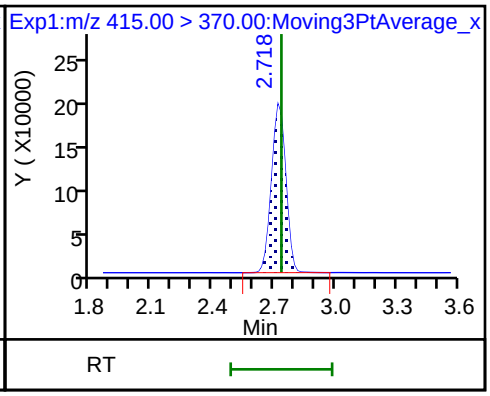
D 11 18O2 PFHxS



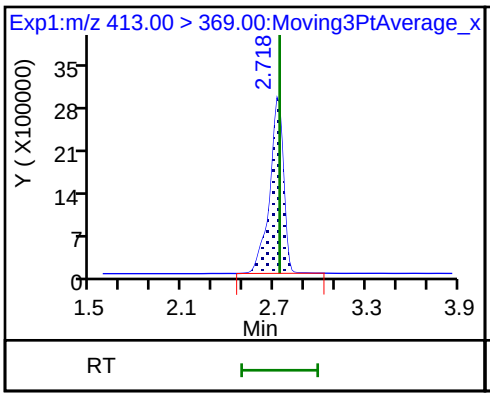
D 14 13C4 PFOA



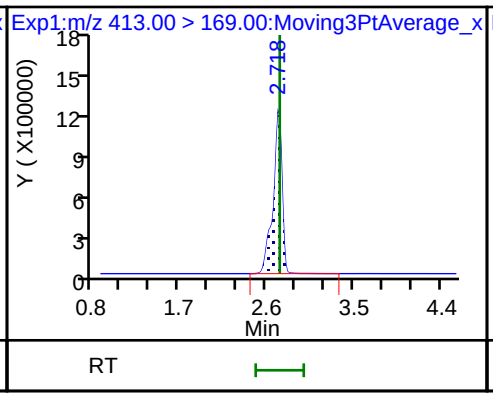
* 62 13C2-PFOA



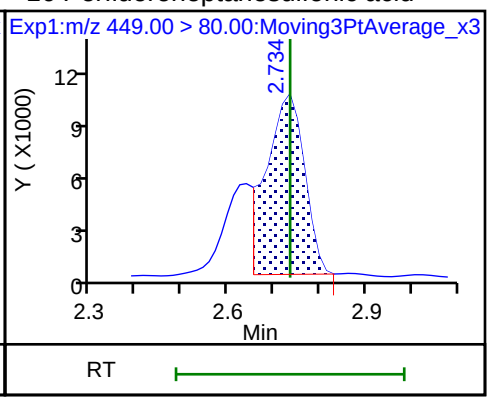
15 Perfluorooctanoic acid



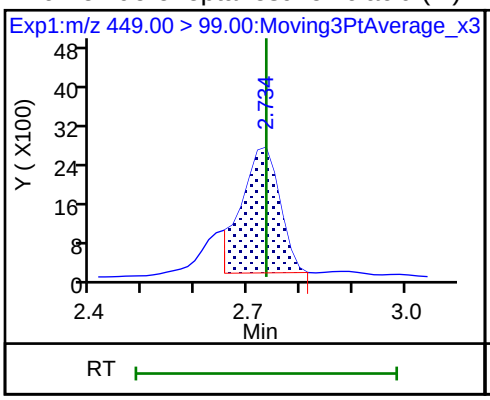
15 Perfluorooctanoic acid



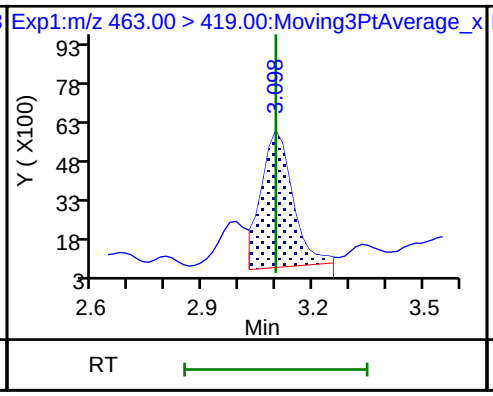
16 Perfluoroheptanesulfonic acid



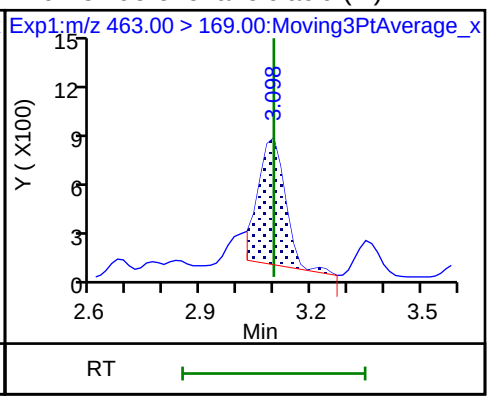
16 Perfluoroheptanesulfonic acid (M)



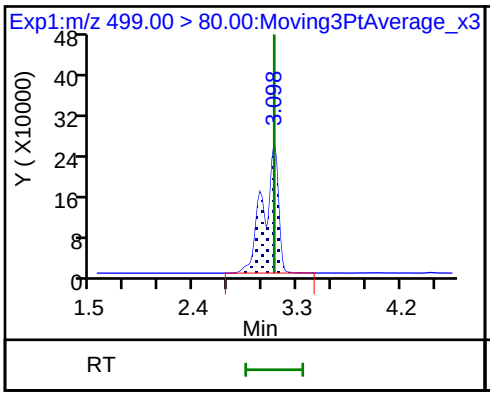
20 Perfluorononanoic acid



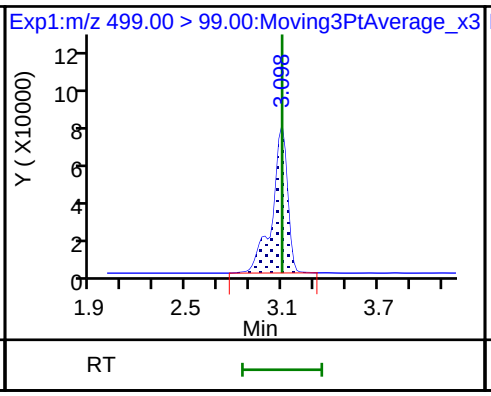
20 Perfluorononanoic acid (M)



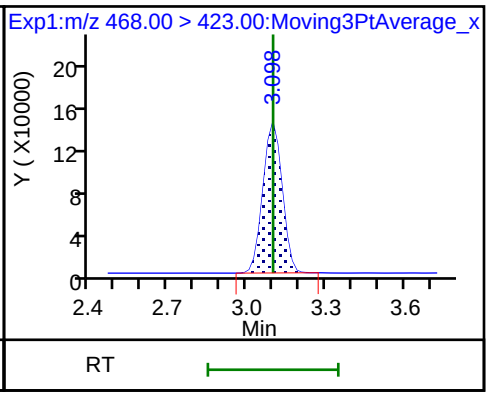
17 Perfluorooctane sulfonic acid



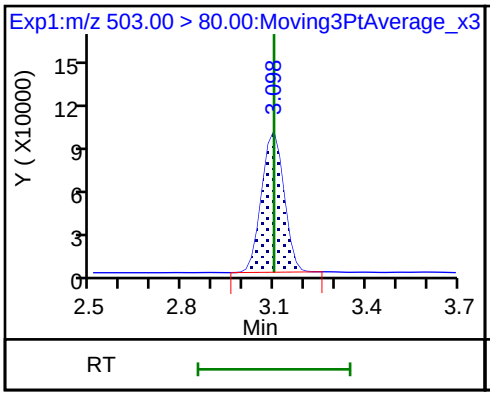
17 Perfluorooctane sulfonic acid



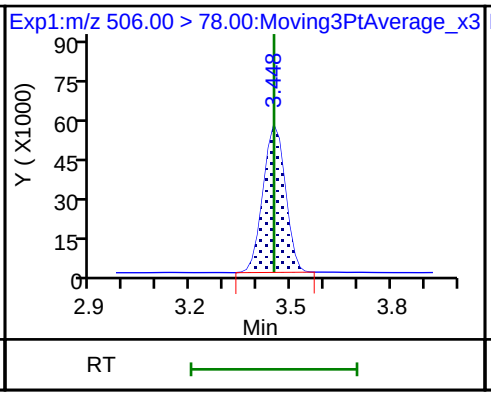
D 19 13C5 PFNA



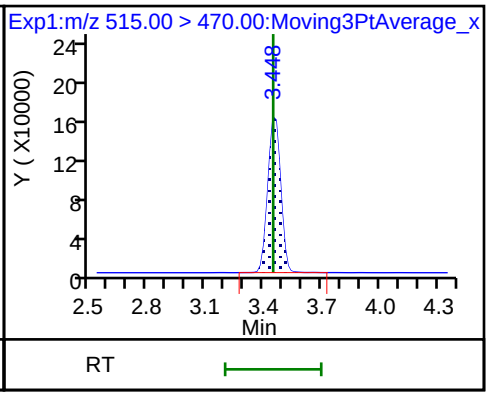
D 18 13C4 PFOS



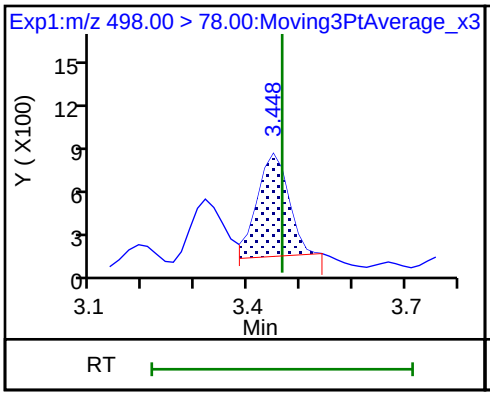
D 21 13C8 FOSA



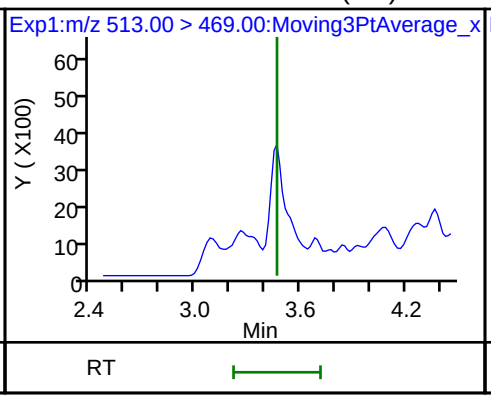
D 23 13C2 PFDA



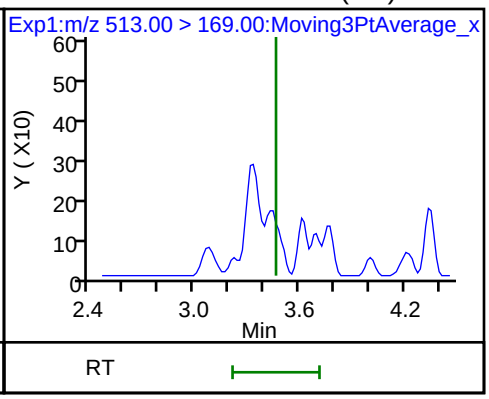
22 Perfluorooctane Sulfonamide



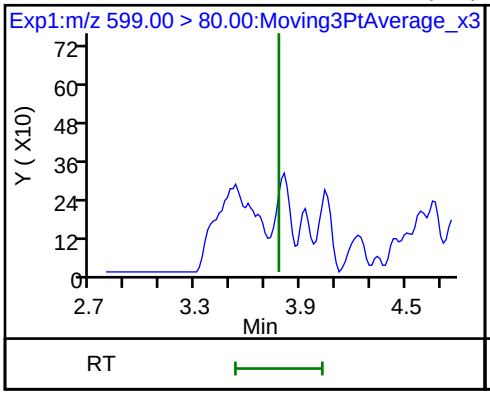
24 Perfluorodecanoic acid (ND)



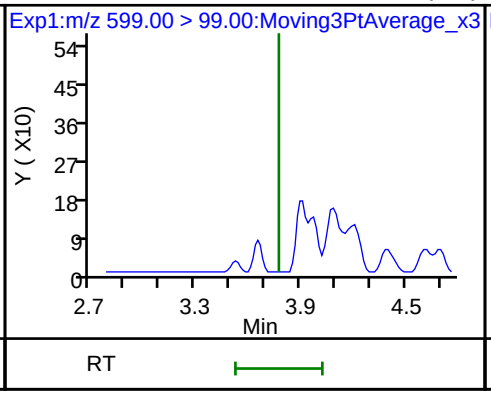
24 Perfluorodecanoic acid (ND)



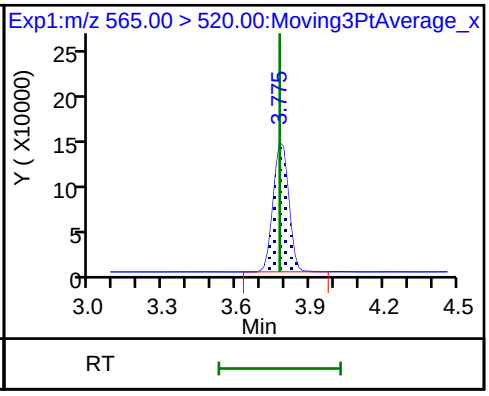
29 Perfluorodecane Sulfonic acid (ND)



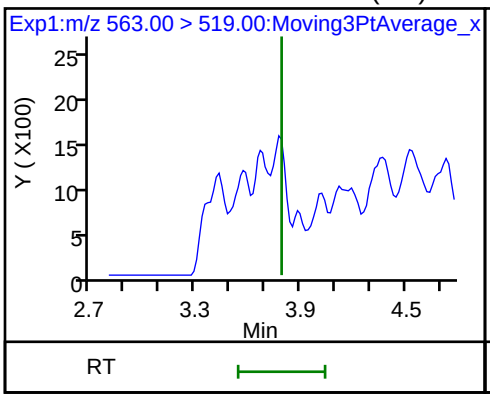
29 Perfluorodecane Sulfonic acid (ND)



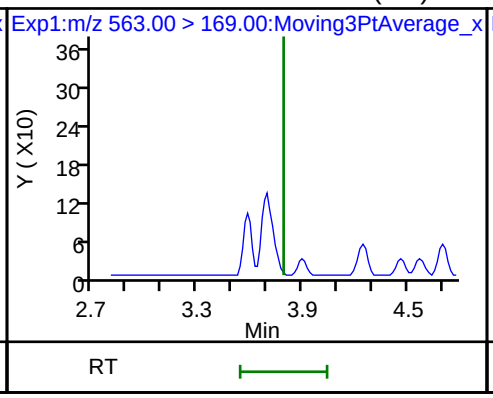
D 30 13C2 PFUnA



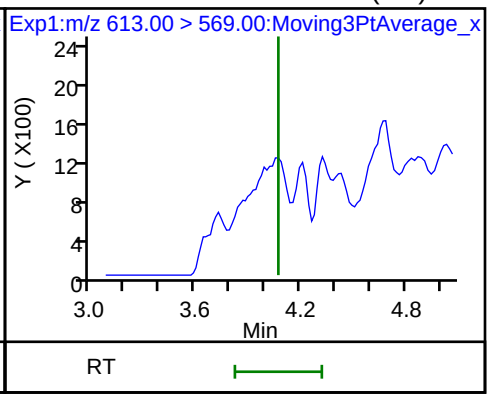
31 Perfluoroundecanoic acid (ND)



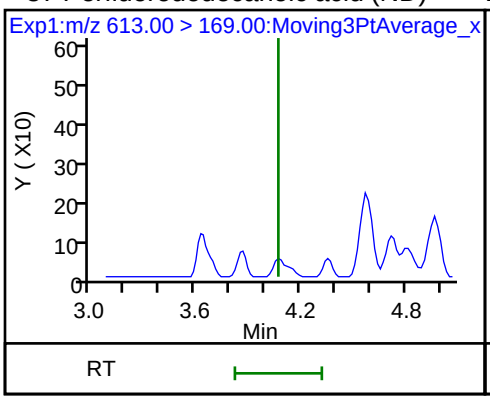
31 Perfluoroundecanoic acid (ND)



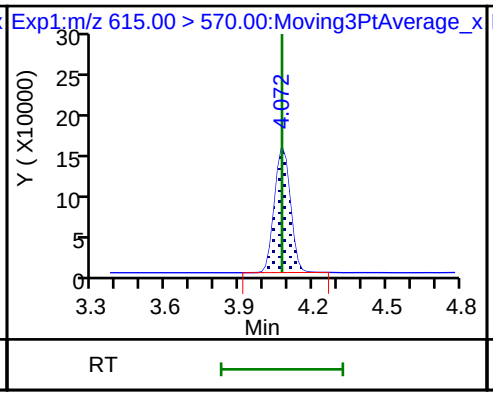
37 Perfluorododecanoic acid (ND)



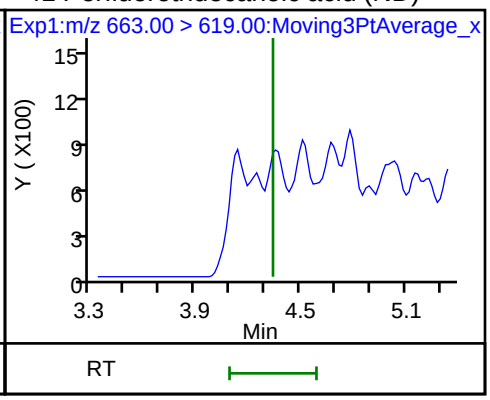
37 Perfluorododecanoic acid (ND)



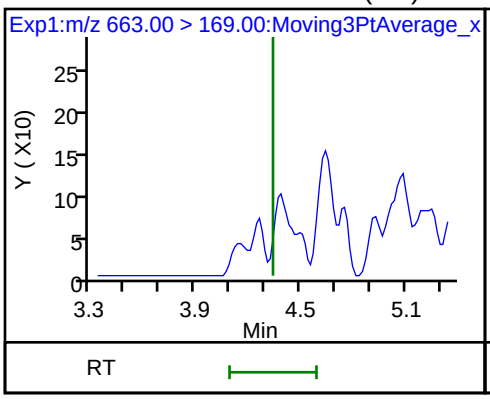
D 36 13C2 PFDoA



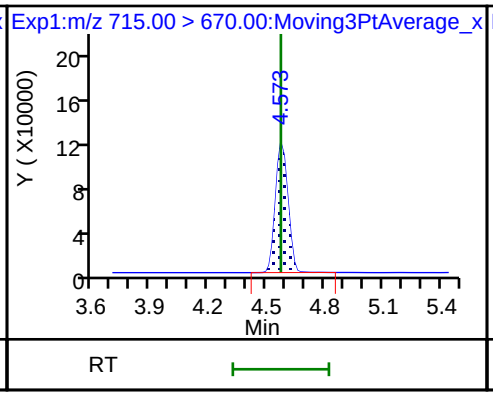
41 Perfluorotridecanoic acid (ND)



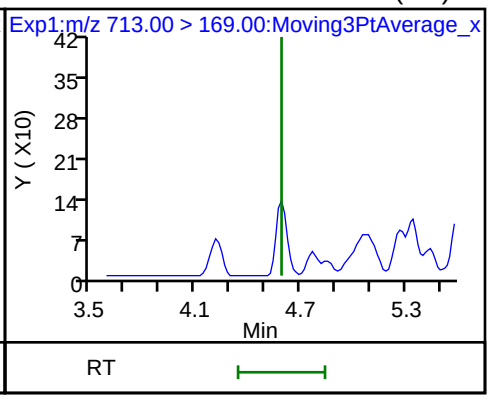
41 Perfluorotridecanoic acid (ND)



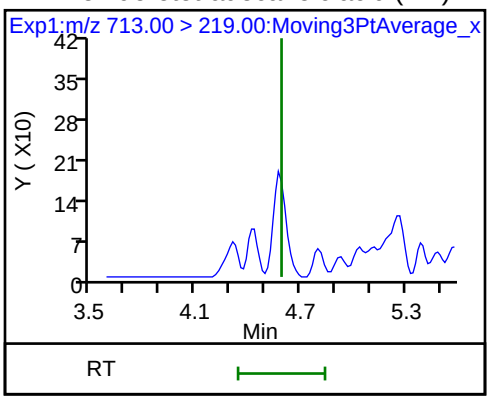
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

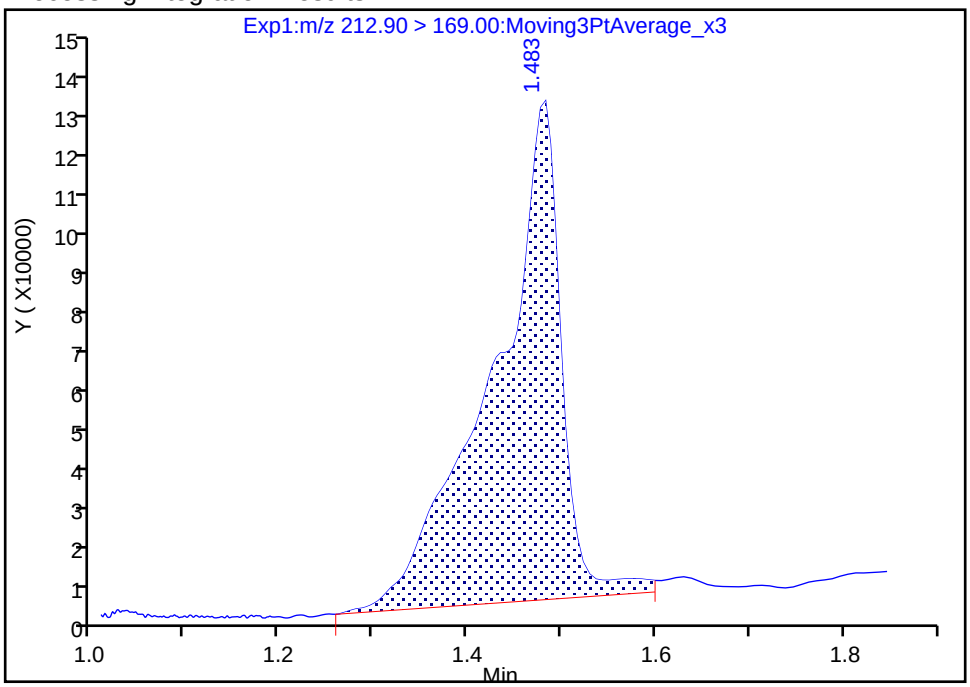
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d				
Injection Date:	18-Sep-2018 00:10:06	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	35	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

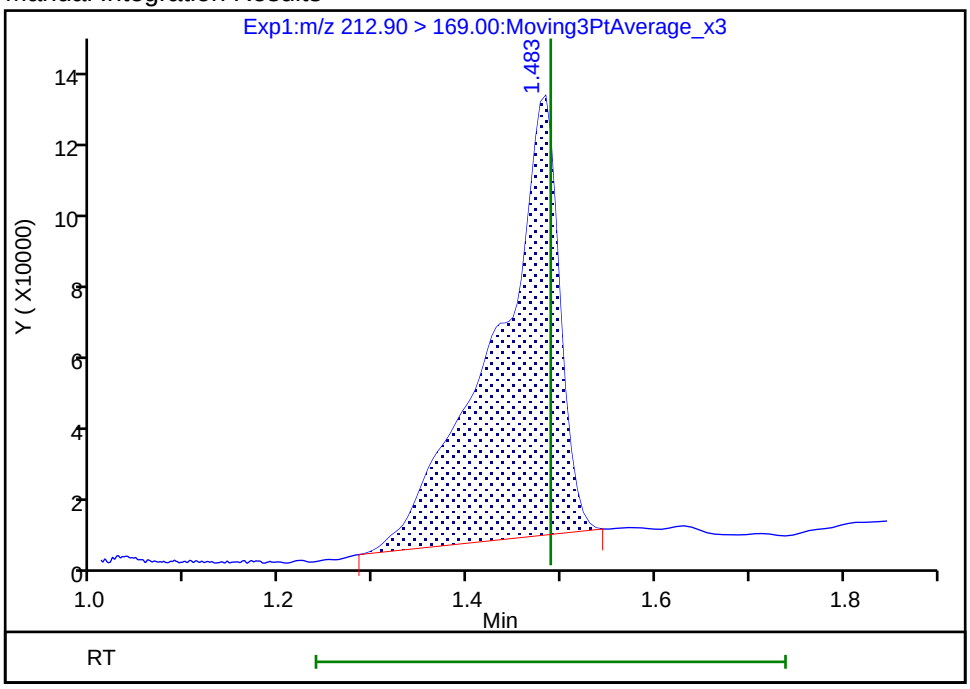
Processing Integration Results

RT: 1.48
Area: 615638
Amount: 0.253990
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 566303
Amount: 0.233636
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:01:33

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

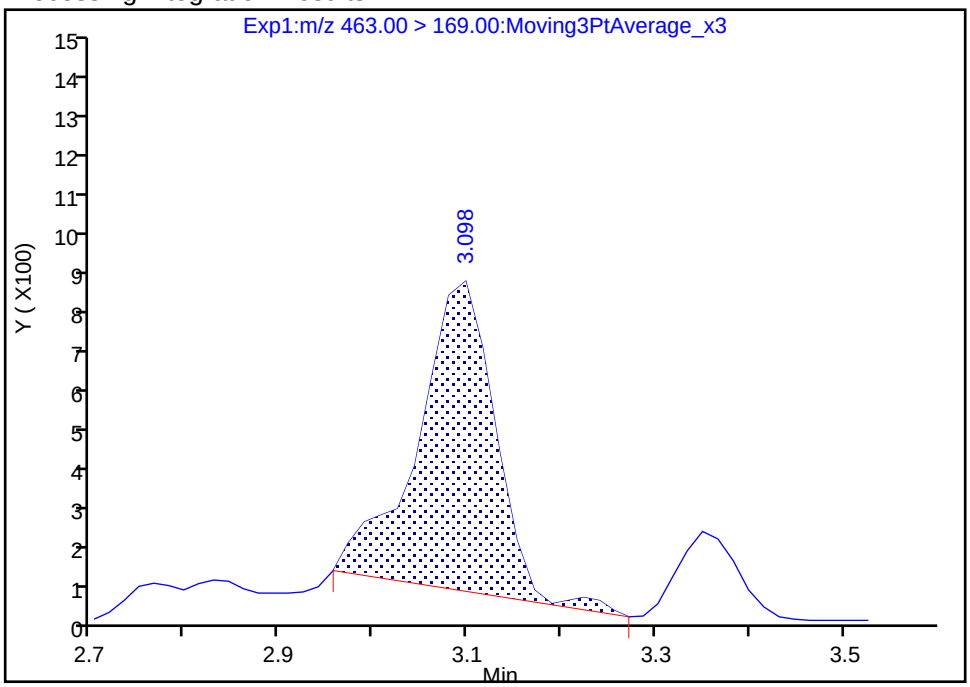
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d				
Injection Date:	18-Sep-2018 00:10:06	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	35	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

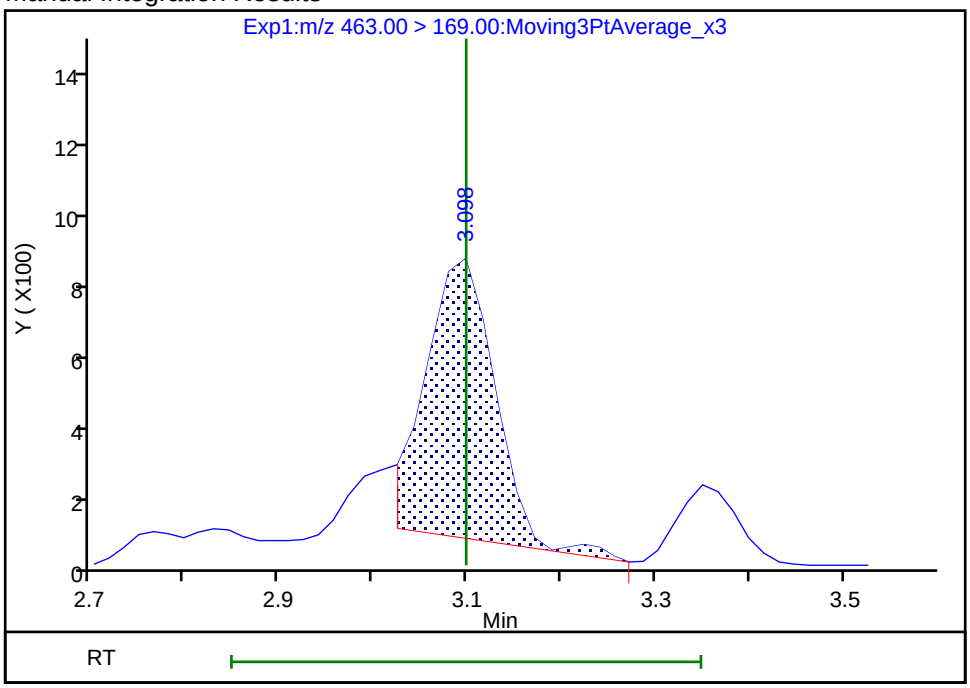
Processing Integration Results

RT: 3.10
Area: 4502
Amount: 0.011106
Amount Units: ng/ml



Manual Integration Results

RT: 3.10
Area: 4001
Amount: 0.011106
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:02:00

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

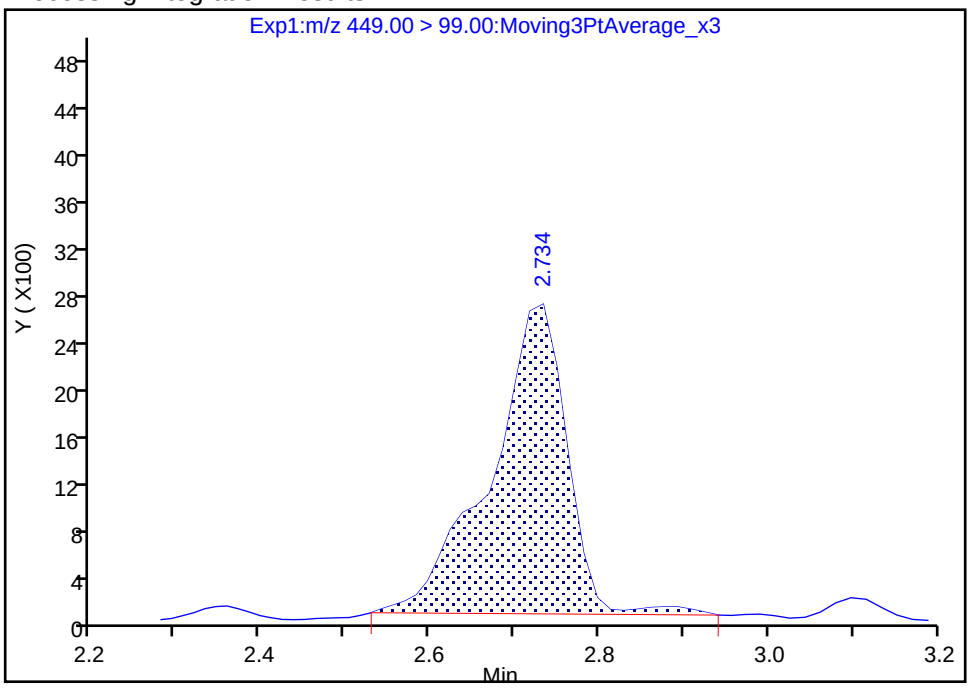
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d				
Injection Date:	18-Sep-2018 00:10:06	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	35	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

16 Perfluoroheptanesulfonic acid, CAS: 375-92-8

Signal: 2

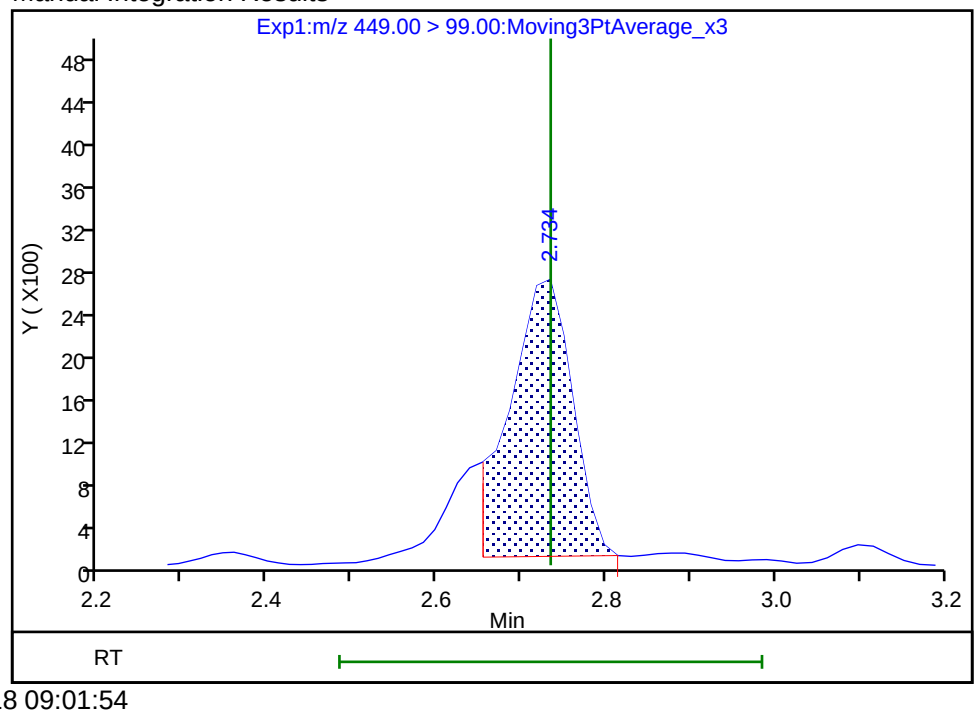
Processing Integration Results

RT: 2.73
Area: 16484
Amount: 0.027944
Amount Units: ng/ml



Manual Integration Results

RT: 2.73
Area: 13171
Amount: 0.027944
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:01:54

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

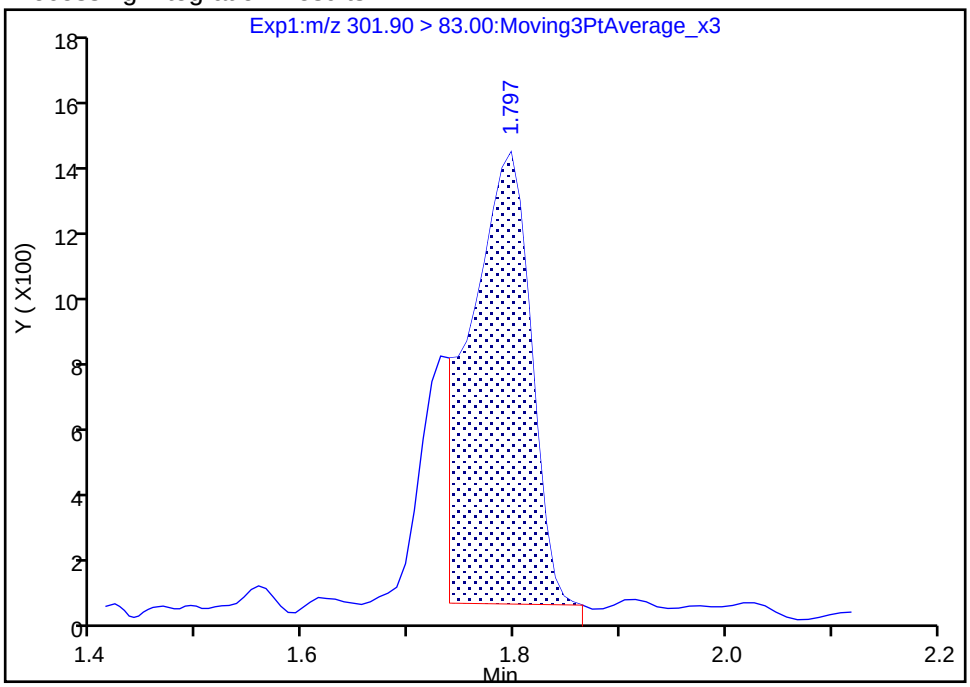
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d				
Injection Date:	18-Sep-2018 00:10:06	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	35	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

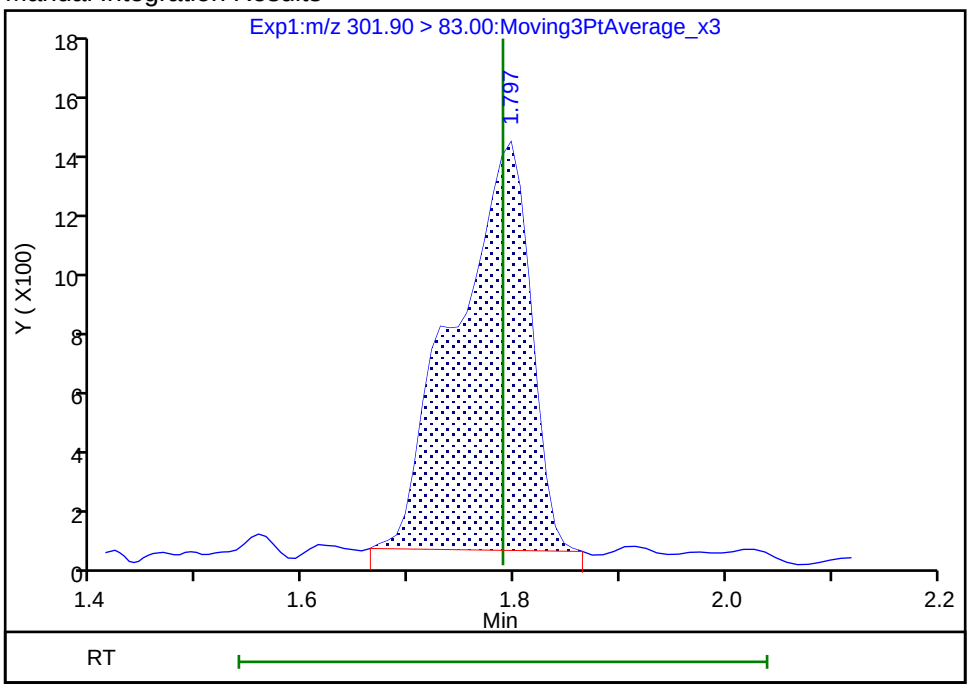
Processing Integration Results

RT: 1.80
Area: 5363
Amount: 0.128980
Amount Units: ng/ml



Manual Integration Results

RT: 1.80
Area: 6737
Amount: 0.162024
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:01:19

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-MID CARBON | Lab Sample ID: 320-42924-2

Matrix: Water | Lab File ID: 2018.09.16_LLA_018.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:15

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 299.7(mL) | Date Analyzed: 09/16/2018 15:39

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.7	1.3	0.49
2706-90-3	Perfluoropentanoic acid (PFPeA)	290	M	1.7	0.83	0.36
307-24-4	Perfluorohexanoic acid (PFHxA)	270		1.7	0.83	0.39
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.2		1.7	1.3	0.51
335-67-1	Perfluorooctanoic acid (PFOA)	72	M	1.7	1.3	0.45
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U M	1.7	1.3	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.83	0.40
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	1.3	0.60
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U M	3.3	2.5	0.63
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.69
375-73-5	Perfluorobutanesulfonic acid (PFBS)	13	M	1.7	0.83	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.1	M	1.7	0.83	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.83	0.31
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U M	3.3	2.5	0.92
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.47
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-MID CARBON Lab Sample ID: 320-42924-2

Matrix: Water Lab File ID: 2018.09.16_LLA_018.d

Analysis Method: EPA 537 (Mod) Date Collected: 09/06/2018 09:15

Extraction Method: 3535 Date Extracted: 09/14/2018 08:21

Sample wt/vol: 299.7(mL) Date Analyzed: 09/16/2018 15:39

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	88		50-150
STL00992	13C4 PFBA	79		50-150
STL01893	13C5 PFPeA	87		50-150
STL00993	13C2 PFHxA	87		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	87		50-150
STL00996	13C2 PFDA	94		50-150
STL00997	13C2 PFUnA	91		50-150
STL00998	13C2 PFDoA	83		50-150
STL00994	18O2 PFHxS	92		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	88		50-150
STL02337	13C3-PFBS	86		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d
Lims ID: 320-42924-A-2-A
Client ID: TP-PFC-033-MID CARBON
Sample Type: Client
Inject. Date: 16-Sep-2018 15:39:00 ALS Bottle#: 10 Worklist Smp#: 7
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-42924-a-2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 16:08:13 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 16:03:58

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	1.494	1.494	0.0	1.000	7743973	3.35			485	
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.494	0.0	0.543	6331158	1.98		79.1	11299	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.772	1.772	0.0	1.000	22182492	8.81			1240	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.772	0.0	0.644	6203409	2.17		86.9	7591	
D 47 13C3-PFBS										
301.90 > 83.00	1.813	1.814	-0.001	0.659	74933	2.00		86.0	363	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.813	1.814	-0.001	1.000	1368833	0.4042			732	M
298.90 > 99.00	1.813	1.814	-0.001	1.000	548441		2.50(1.35-4.05)		285	
D 7 13C2 PFHxA										
315.00 > 270.00	2.057	2.068	-0.011	0.748	6592990	2.18		87.4	9168	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.057	2.068	-0.011	1.000	19742942	8.22			1958	
313.00 > 119.00	2.068	2.068	0.0	1.005	1216256		16.23(6.96-20.87)		2179	
D 9 13C4-PFHpA										
367.00 > 322.00	2.399	2.399	0.0	0.872	8498829	2.36		94.4	10531	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.399	2.400	-0.001	1.000	743574	0.2145			23.9	
363.00 > 169.00	2.399	2.400	-0.001	1.000	165769		4.49(2.17-6.52)		29.3	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.347	2.413	-0.066	0.973	387124	0.1543			268	M
399.00 > 99.00	2.412	2.413	-0.001	1.000	102470		3.78(1.90-5.70)		80.4	
D 11 18O2 PFHxS										
403.00 > 84.00	2.412	2.426	-0.014	0.877	4793952	2.17		91.6	9879	

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	2.750	2.766	-0.016	1.000	7820799	2.33		93.3	9014	
* 62 13C2-PFOA										
415.00 > 370.00	2.750	2.766	-0.016		8316580	2.50			8261	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.750	2.766	-0.016	1.000	7248545	2.15			239	
413.00 > 169.00	2.750	2.766	-0.016	1.000	3209855		2.26(1.36-4.08)		1198	M
D 19 13C5 PFNA										
468.00 > 423.00	3.134	3.153	-0.019	1.140	6863738	2.19		87.5	6095	
D 18 13C4 PFOS										
503.00 > 80.00	3.134	3.153	-0.019	1.140	5012644	2.11		88.2	4958	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.007	3.153	-0.146	0.960	52954	0.0239			22.9	M
499.00 > 99.00	3.025	3.153	-0.128	0.965	9347		5.67(2.04-6.12)		18.3	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.134	3.153	-0.019	1.000	6103	0.002273			0.6	M
463.00 > 169.00	3.116	3.153	-0.037	0.994	1254		4.87(2.68-8.03)		3.0	M
D 21 13C8 FOSA										
506.00 > 78.00	3.464	3.465	-0.001	1.260	2756423	2.19		87.6	4244	
D 23 13C2 PFDA										
515.00 > 470.00	3.496	3.512	-0.016	1.271	7362972	2.35		93.9	11627	
31 Perfluoroundecanoic acid										RMa
563.00 > 519.00	3.838	3.839	-0.001	1.000	12724	0.005852			2.6	Ra
563.00 > 169.00	3.838	3.839	-0.001	1.000	720		17.67(5.24-15.72)		2.4	
D 30 13C2 PFUnA										
565.00 > 520.00	3.838	3.854	-0.016	1.396	6058770	2.27		90.8	11073	
D 36 13C2 PFDoA										
615.00 > 570.00	4.122	4.139	-0.017	1.499	6749754	2.08		83.2	6752	
41 Perfluorotridecanoic acid										RM
663.00 > 619.00	4.403	4.408	-0.005	1.068	3462	0.001598			1.2	RM
663.00 > 169.00	4.388	4.408	-0.020	1.064	311		11.13(3.09-9.27)		1.6	M
D 43 13C2-PFTeDA										
715.00 > 670.00	4.644	4.660	-0.016	1.689	5124872	1.98		79.3	8705	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

a - User Assigned ID

Report Date: 17-Sep-2018 16:08:32 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d

Injection Date: 16-Sep-2018 15:39:00 Instrument ID: A9

Lims ID: 320-42924-A-2-A Lab Sample ID: 320-42924-2

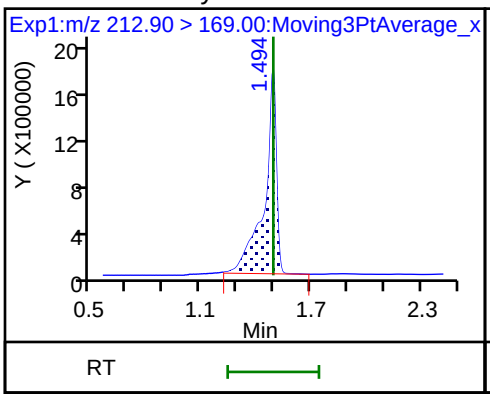
Client ID: TP-PFC-033-MID CARBON

Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 7

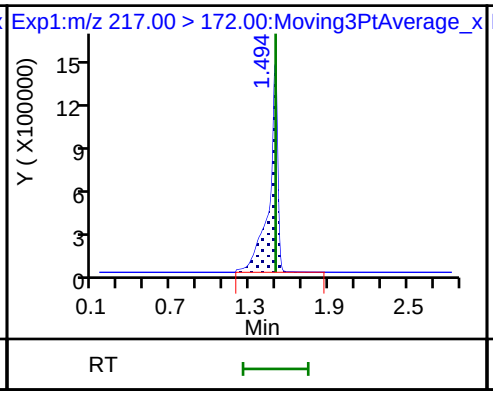
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

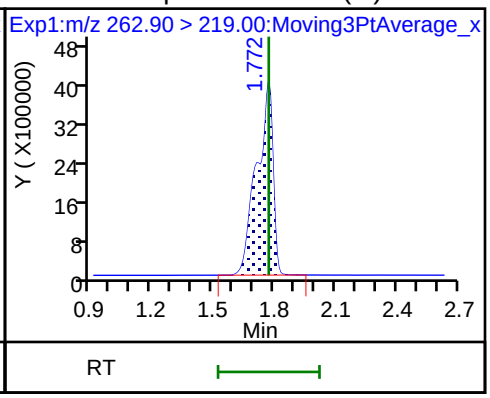
2 Perfluorobutyric acid



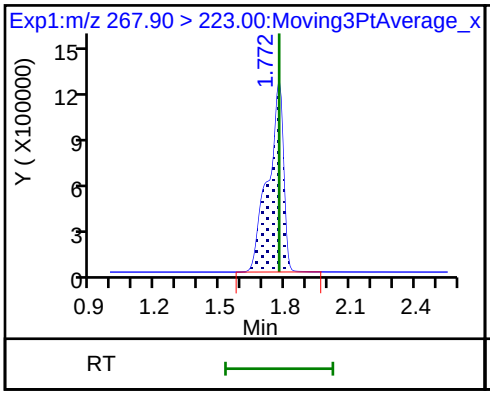
D 1 13C4 PFBA



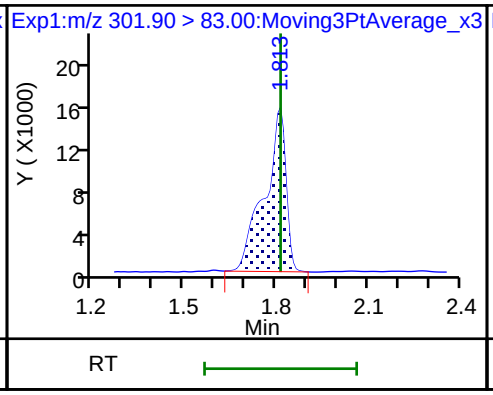
4 Perfluoropentanoic acid (M)



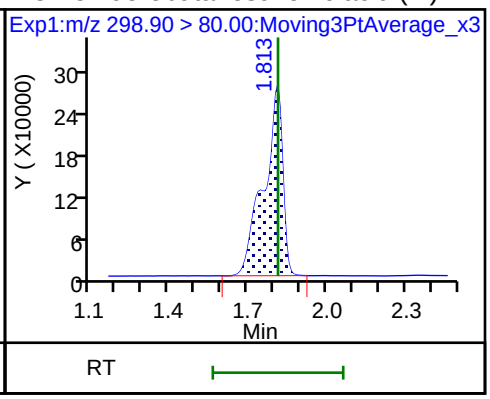
D 3 13C5-PFPeA



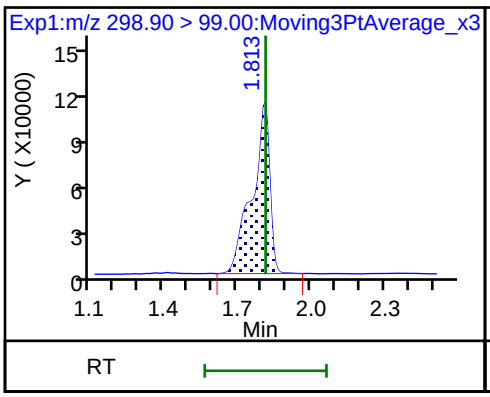
D 47 13C3-PFBS



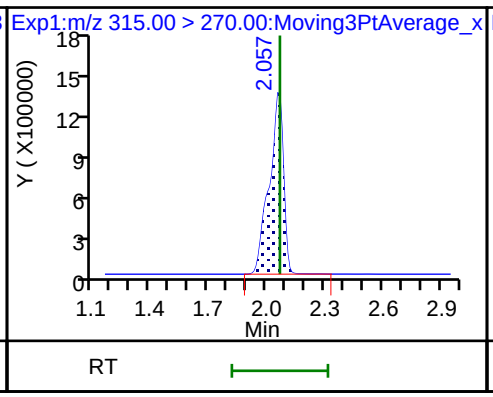
5 Perfluorobutanesulfonic acid (M)



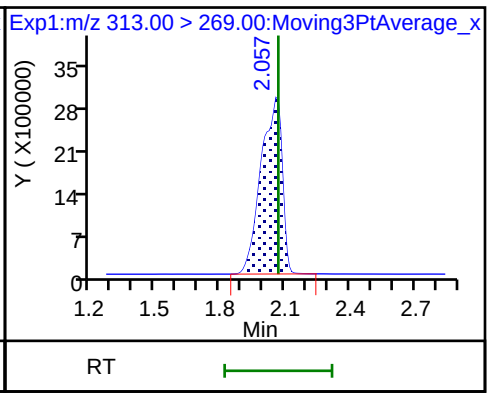
5 Perfluorobutanesulfonic acid



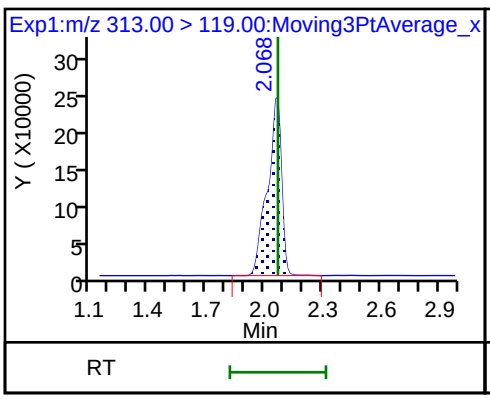
D 7 13C2 PFHxA



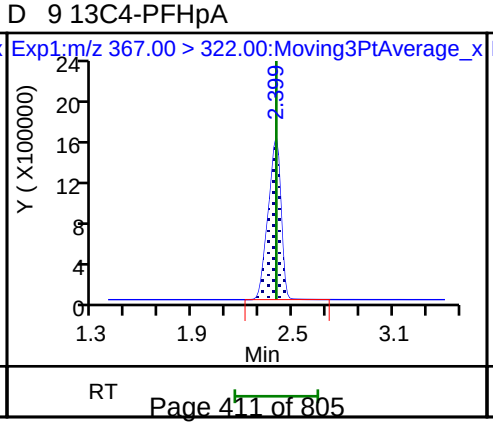
6 Perfluorohexanoic acid



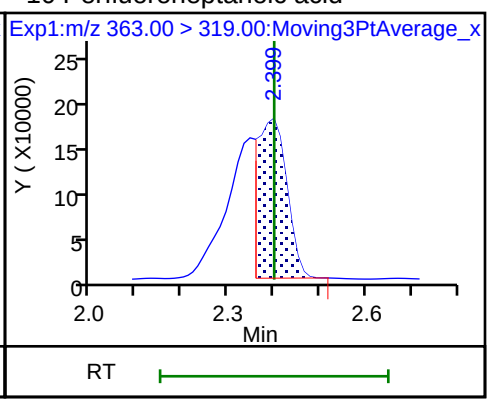
6 Perfluorohexanoic acid



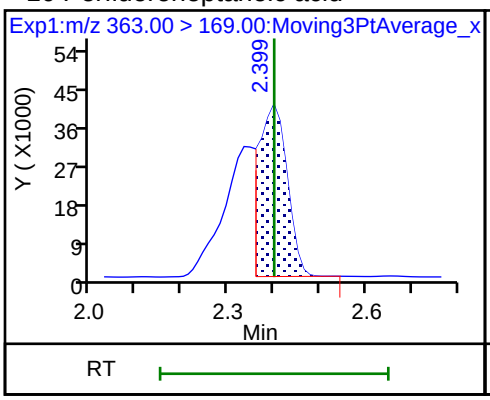
D 9 13C4-PFHpA



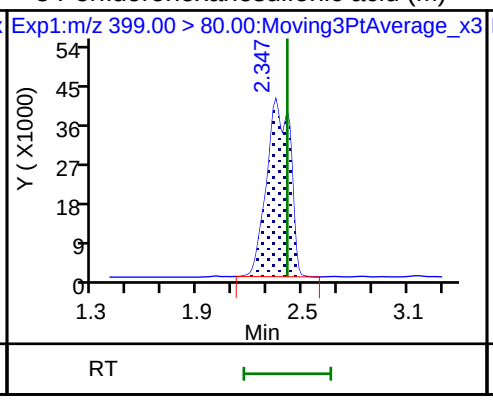
10 Perfluoroheptanoic acid



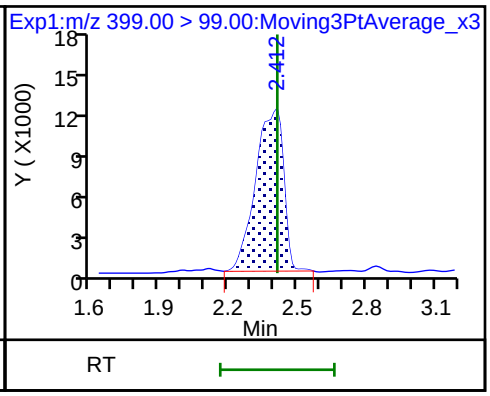
10 Perfluoroheptanoic acid



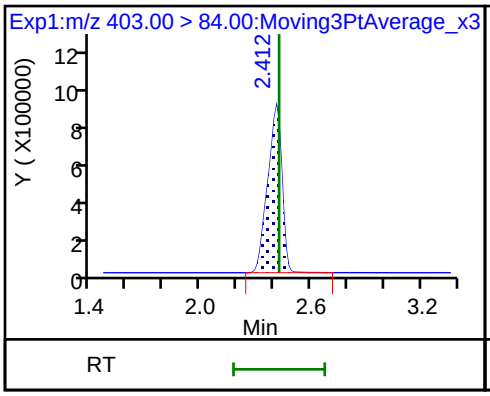
8 Perfluorohexanesulfonic acid (M)



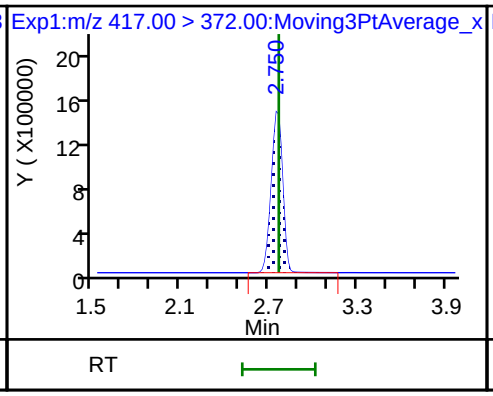
8 Perfluorohexanesulfonic acid



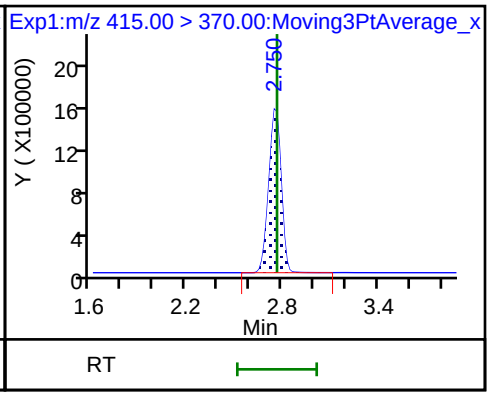
D 11 18O2 PFHxS



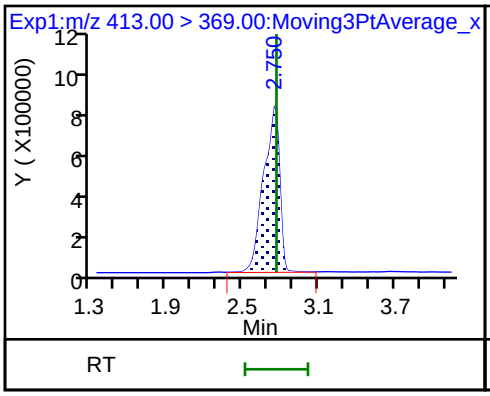
D 14 13C4 PFOA



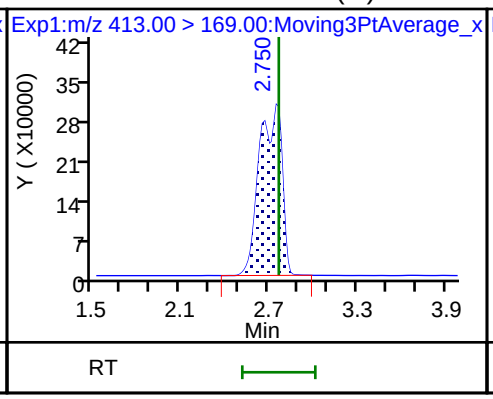
* 62 13C2-PFOA



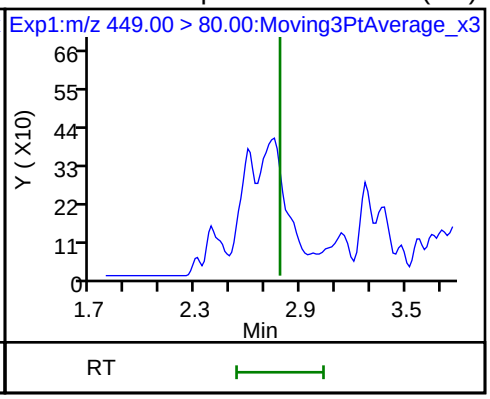
15 Perfluorooctanoic acid



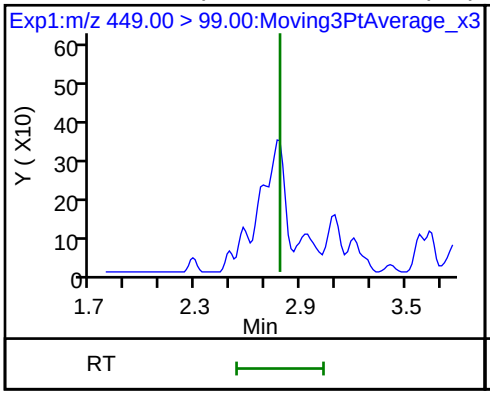
15 Perfluorooctanoic acid (M)



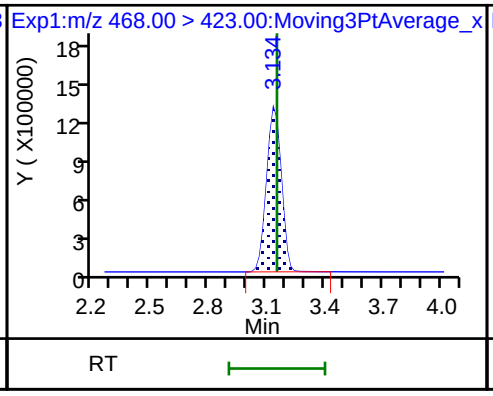
16 Perfluoroheptanesulfonic acid (ND)



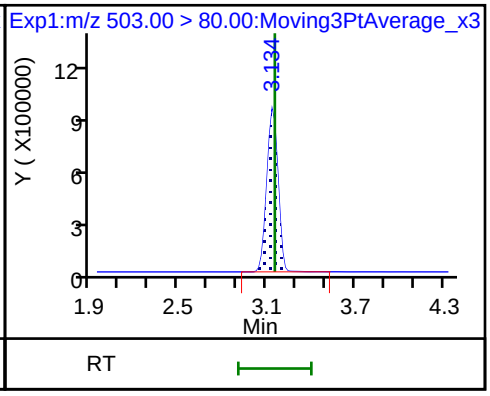
16 Perfluoroheptanesulfonic acid (ND)



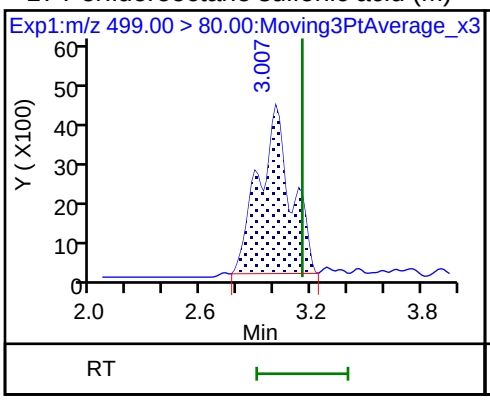
D 19 13C5 PFNA



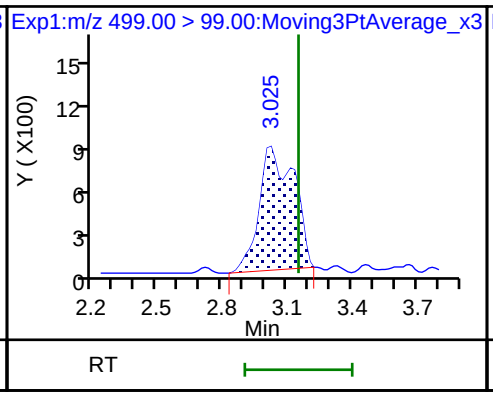
D 18 13C4 PFOS



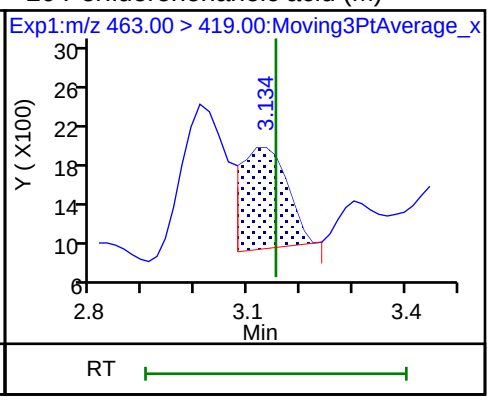
17 Perfluorooctane sulfonic acid (M)



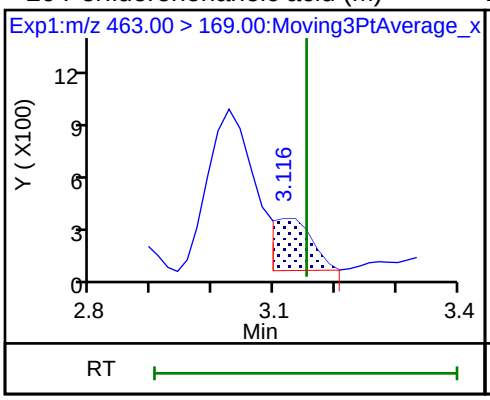
17 Perfluorooctane sulfonic acid



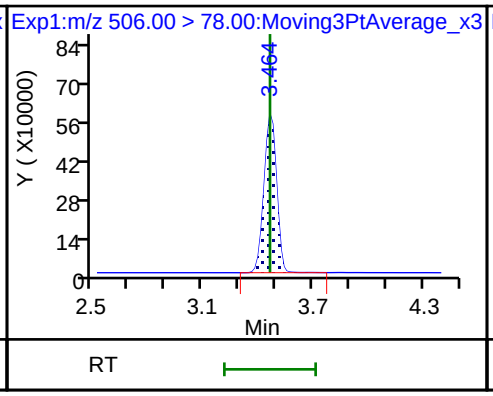
20 Perfluorononanoic acid (M)



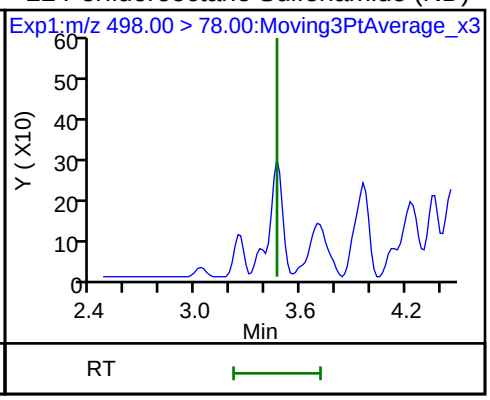
20 Perfluorononanoic acid (M)



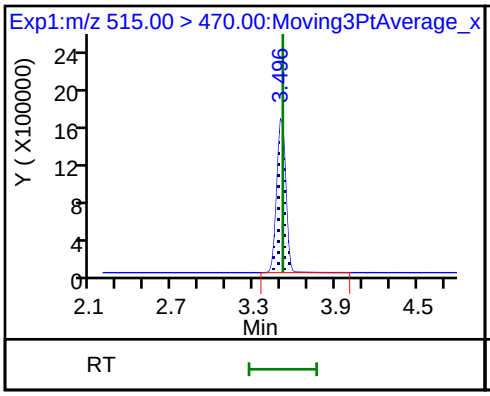
D 21 13C8 FOSA



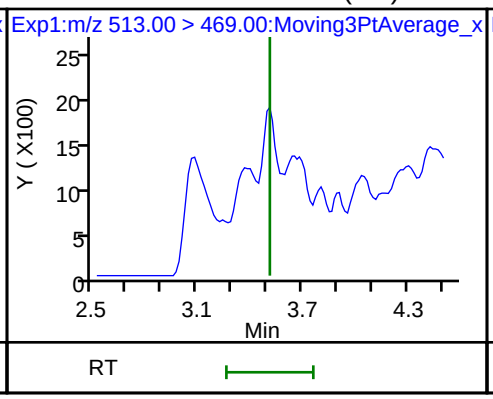
22 Perfluorooctane Sulfonamide (ND)



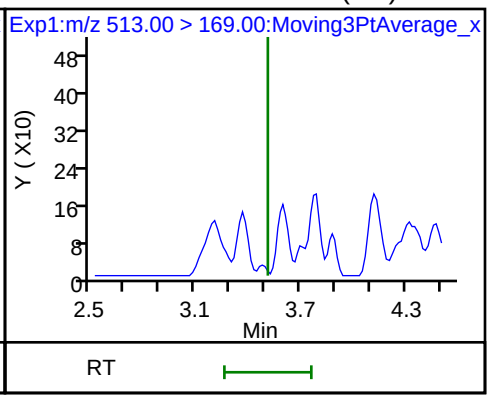
D 23 13C2 PFDA



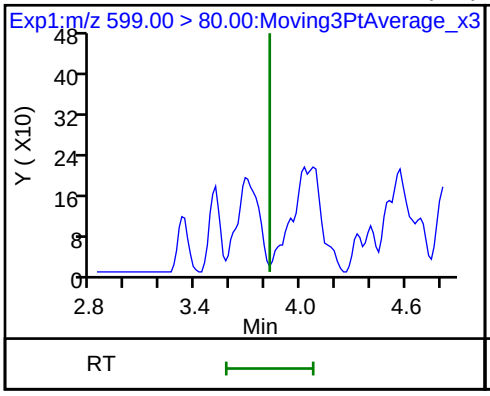
24 Perfluorodecanoic acid (ND)



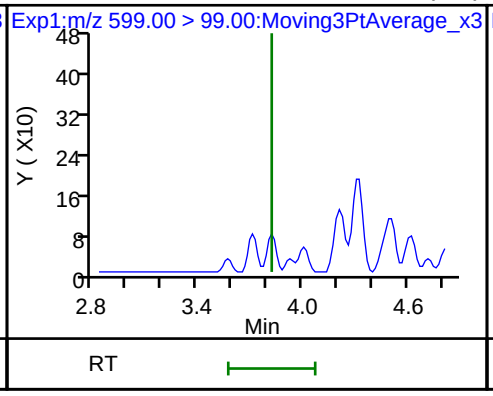
24 Perfluorodecanoic acid (ND)



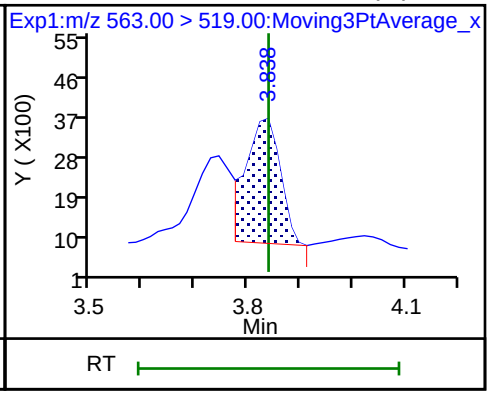
29 Perfluorodecane Sulfonic acid (ND)



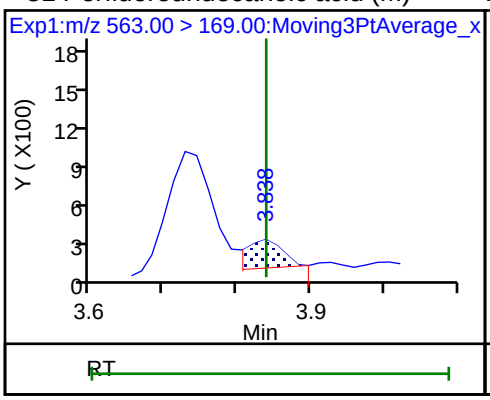
29 Perfluorodecane Sulfonic acid (ND)



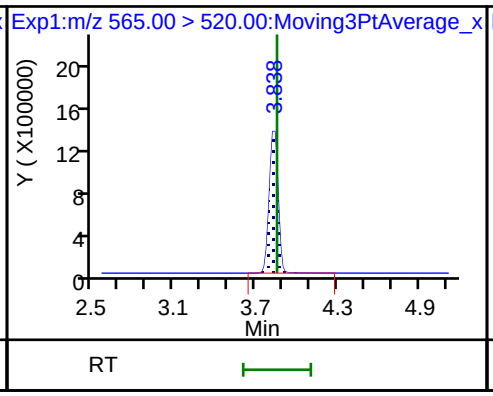
31 Perfluoroundecanoic acid (M)



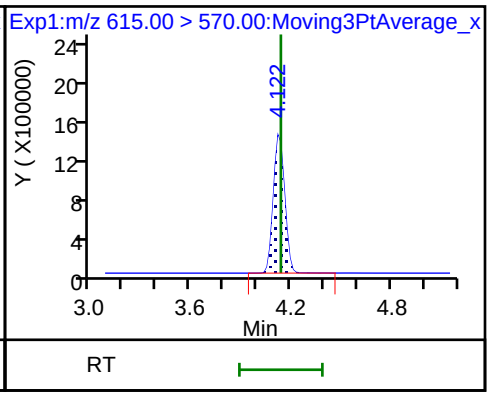
31 Perfluoroundecanoic acid (M)



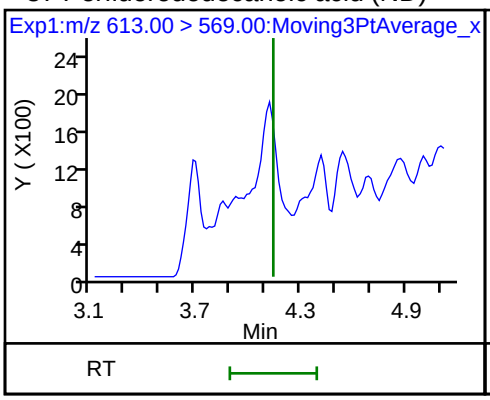
D 30 13C2 PFUnA



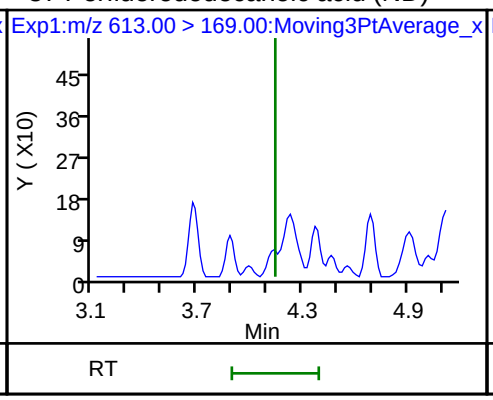
D 36 13C2 PFDoA



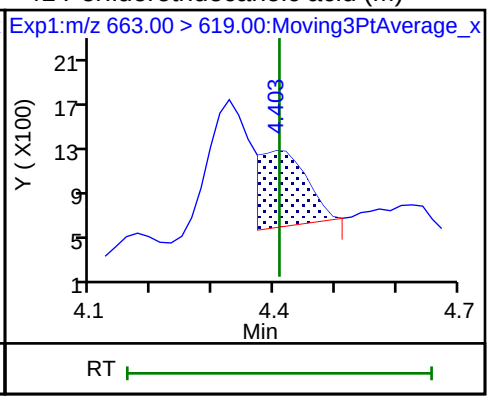
37 Perfluorododecanoic acid (ND)



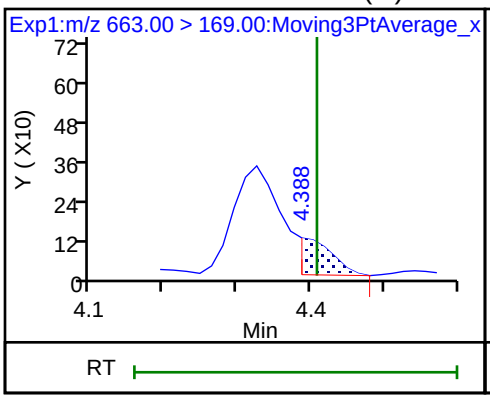
37 Perfluorododecanoic acid (ND)



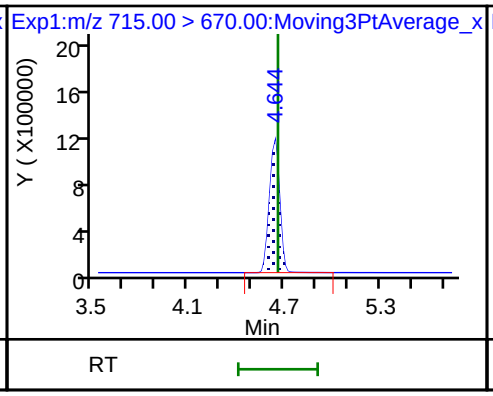
41 Perfluorotridecanoic acid (M)



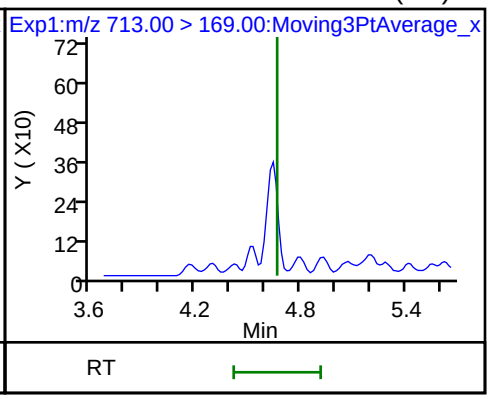
41 Perfluorotridecanoic acid (M)



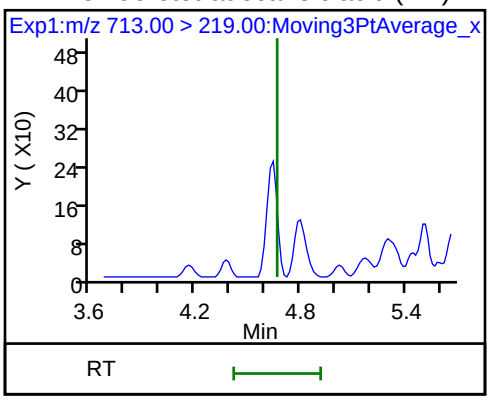
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

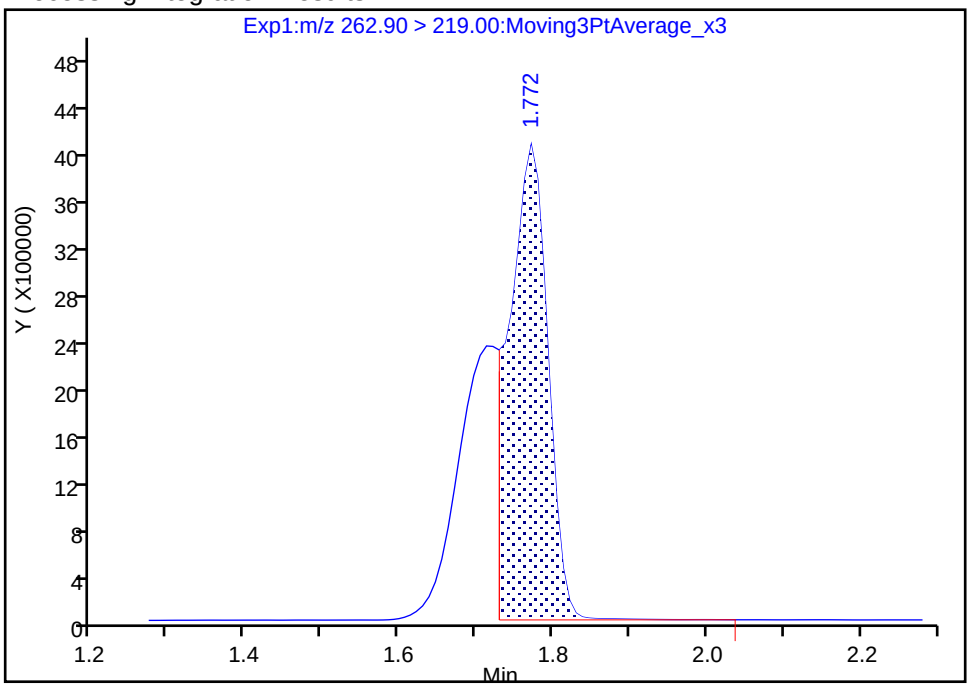
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

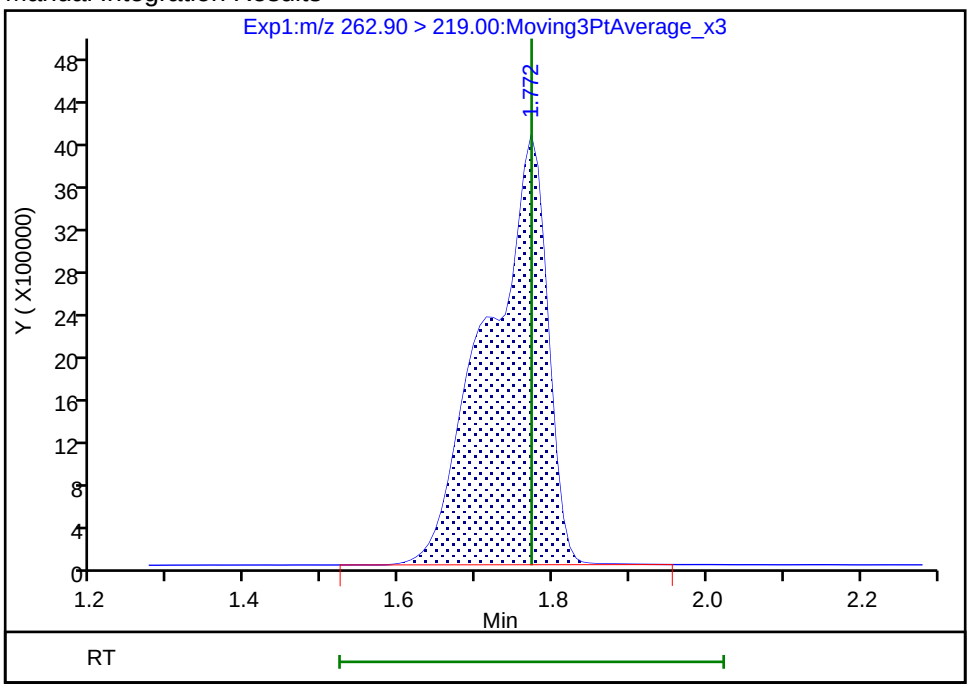
Processing Integration Results

RT: 1.77
Area: 13837014
Amount: 5.498074
Amount Units: ng/ml



Manual Integration Results

RT: 1.77
Area: 22182492
Amount: 8.814112
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:02:41

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

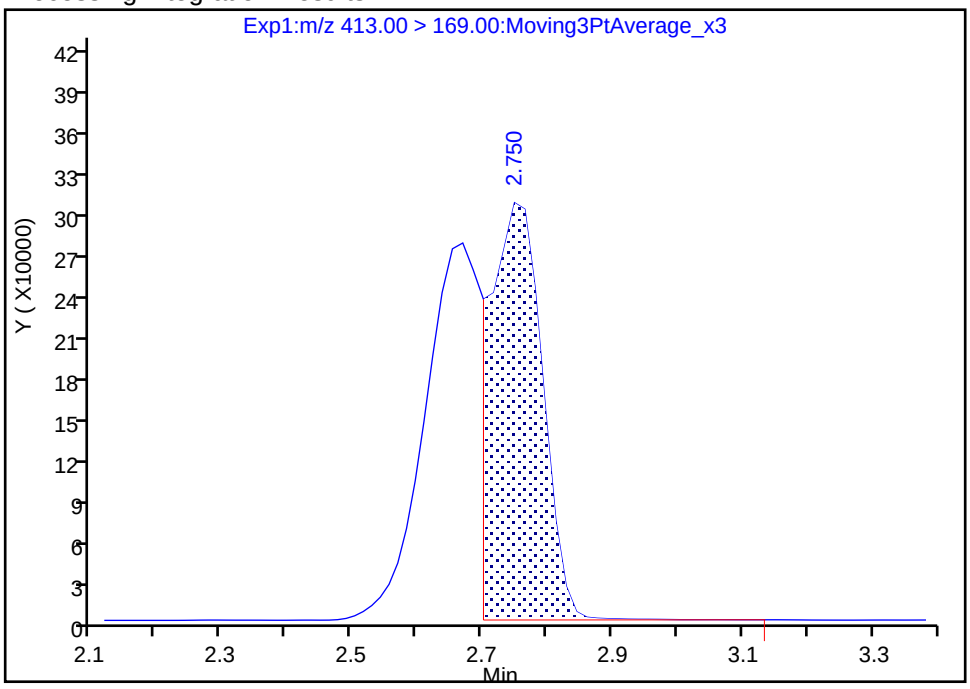
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

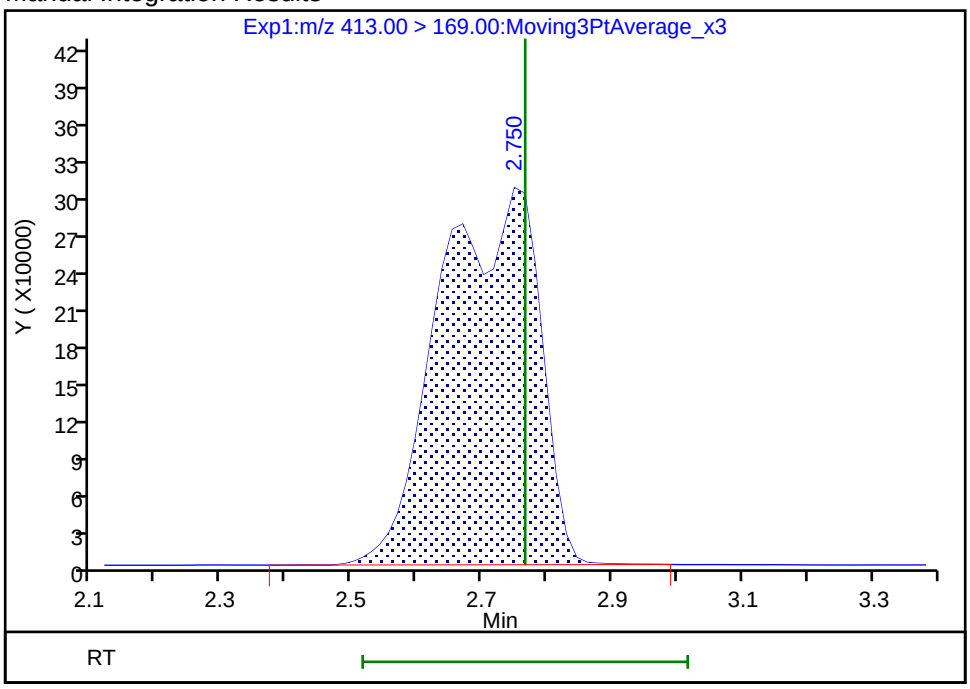
Processing Integration Results

RT: 2.75
Area: 1639830
Amount: 2.152929
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 3209855
Amount: 2.152929
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:02:56

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

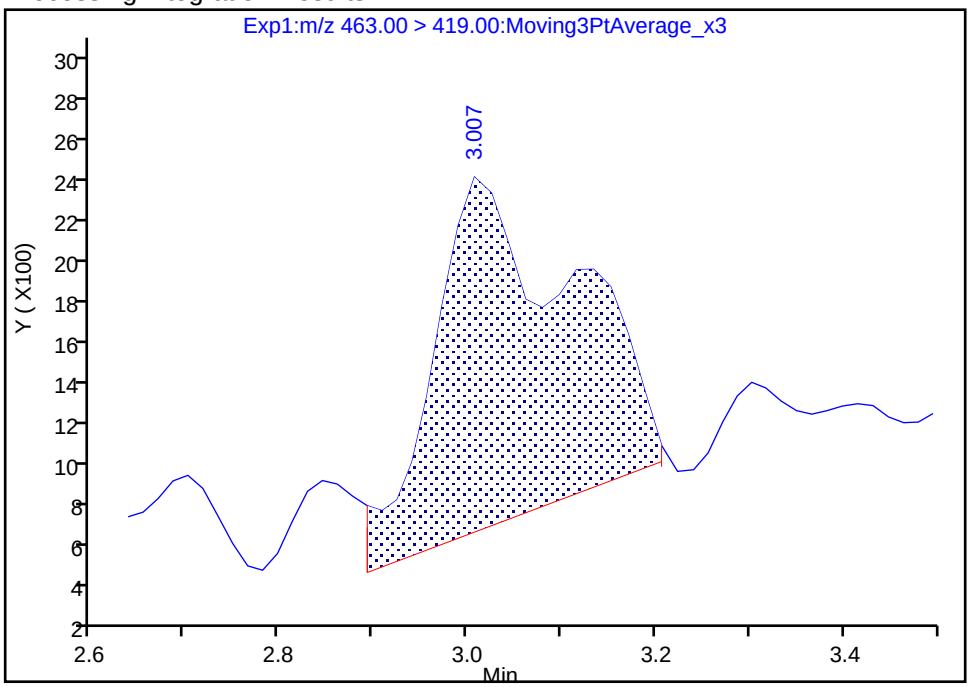
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

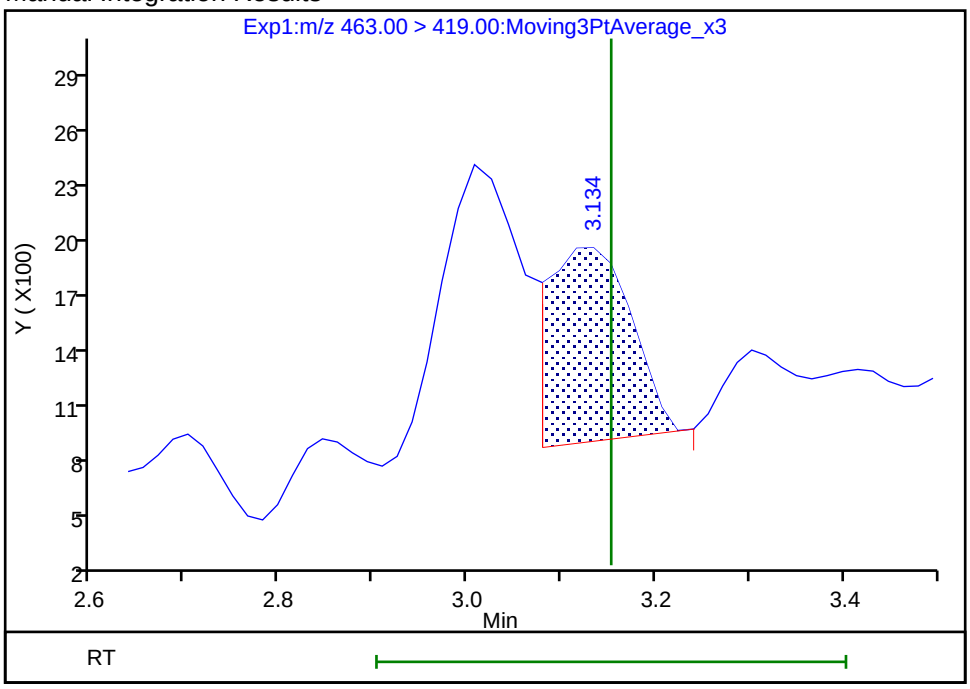
Processing Integration Results

RT: 3.01
Area: 17264
Amount: 0.006430
Amount Units: ng/ml



Manual Integration Results

RT: 3.13
Area: 6103
Amount: 0.002273
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:03:13

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

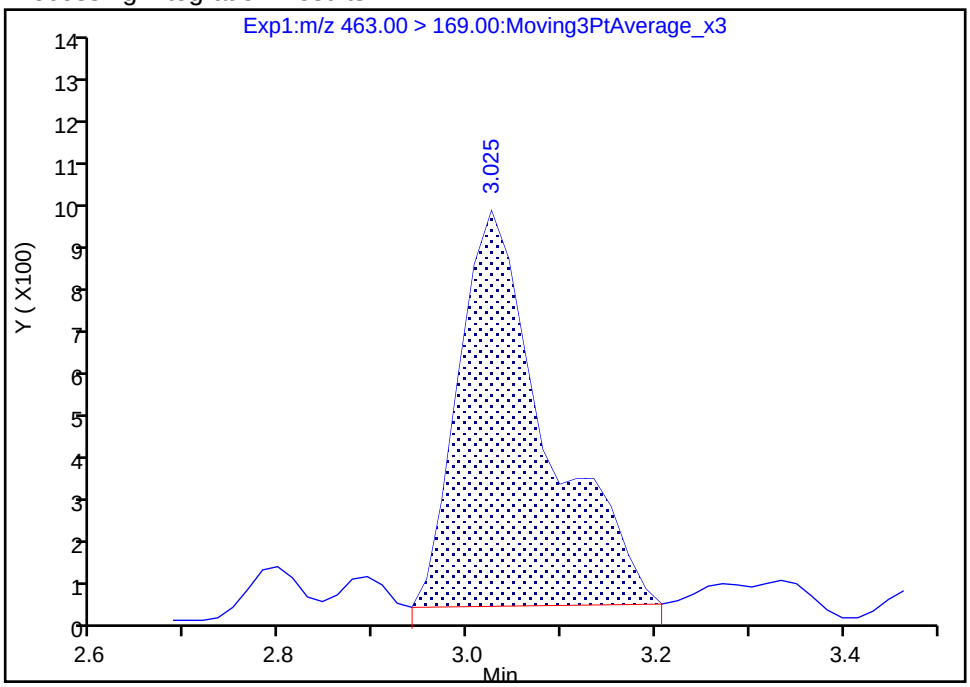
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

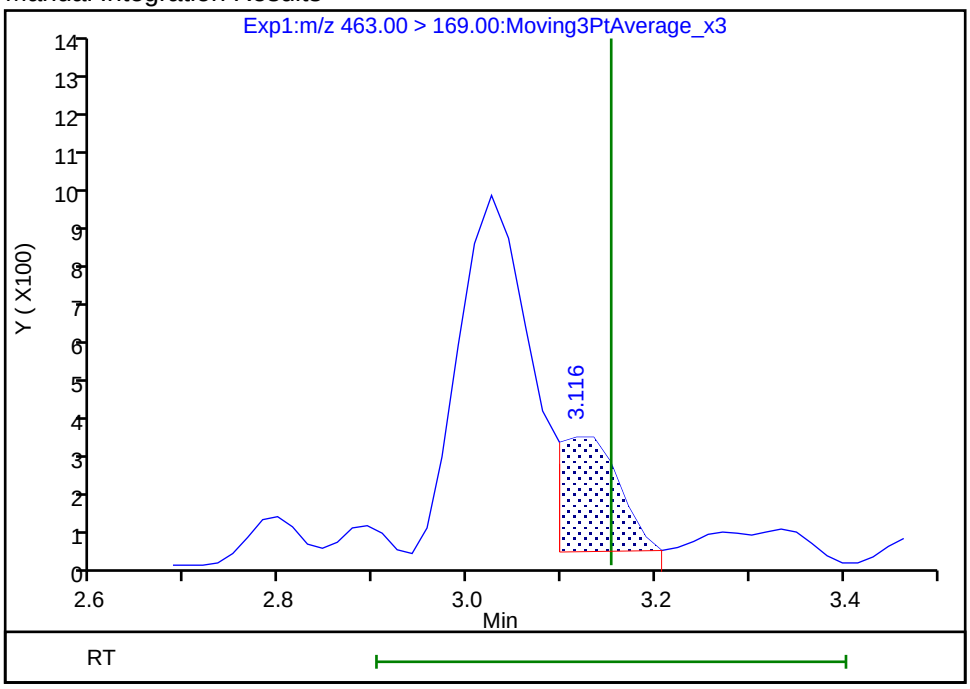
Processing Integration Results

RT: 3.03
Area: 6178
Amount: 0.006430
Amount Units: ng/ml



Manual Integration Results

RT: 3.12
Area: 1254
Amount: 0.002273
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:03:15
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

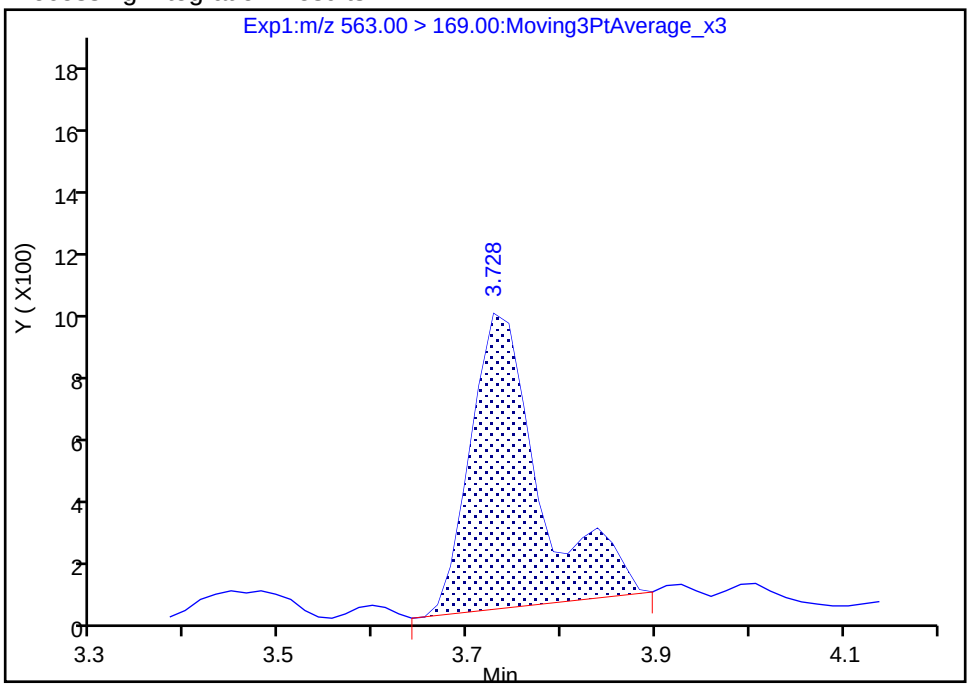
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

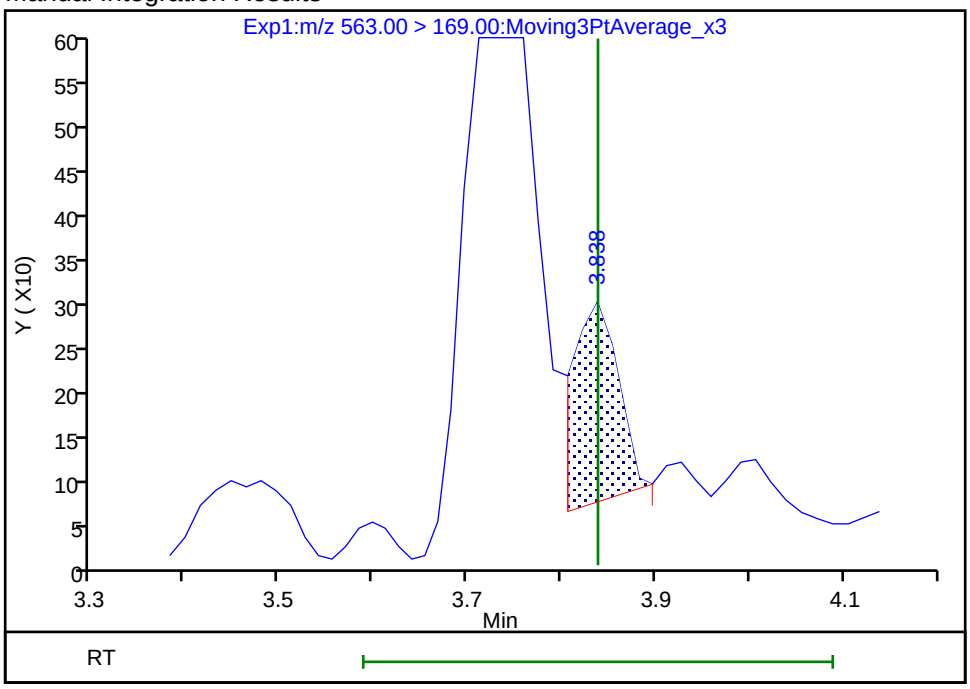
Processing Integration Results

RT: 3.73
Area: 4875
Amount: 0.004285
Amount Units: ng/ml



Manual Integration Results

RT: 3.84
Area: 720
Amount: 0.005852
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:03:34

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

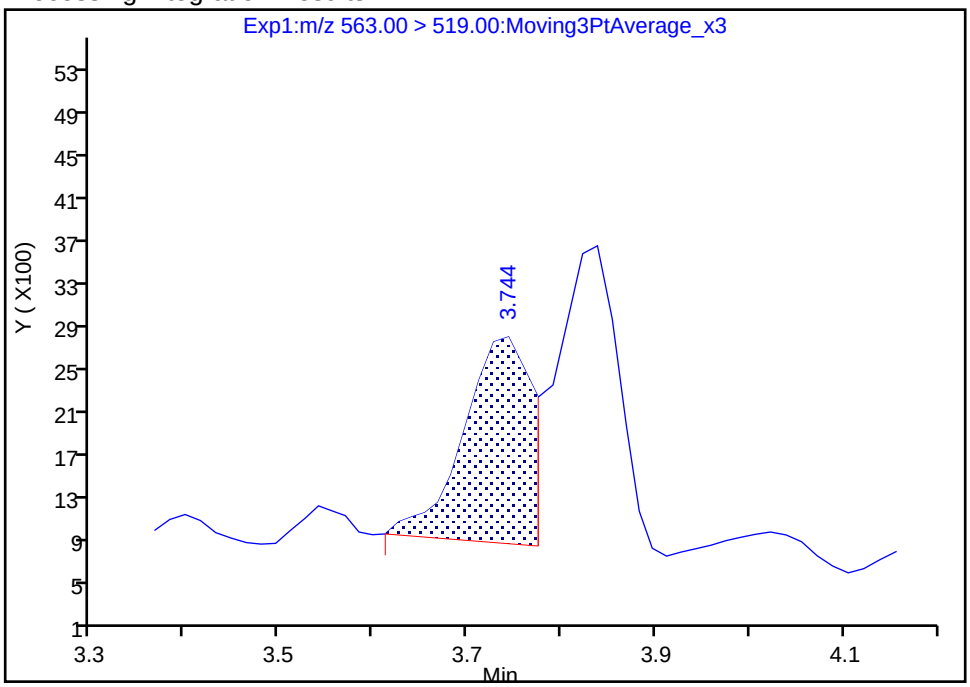
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

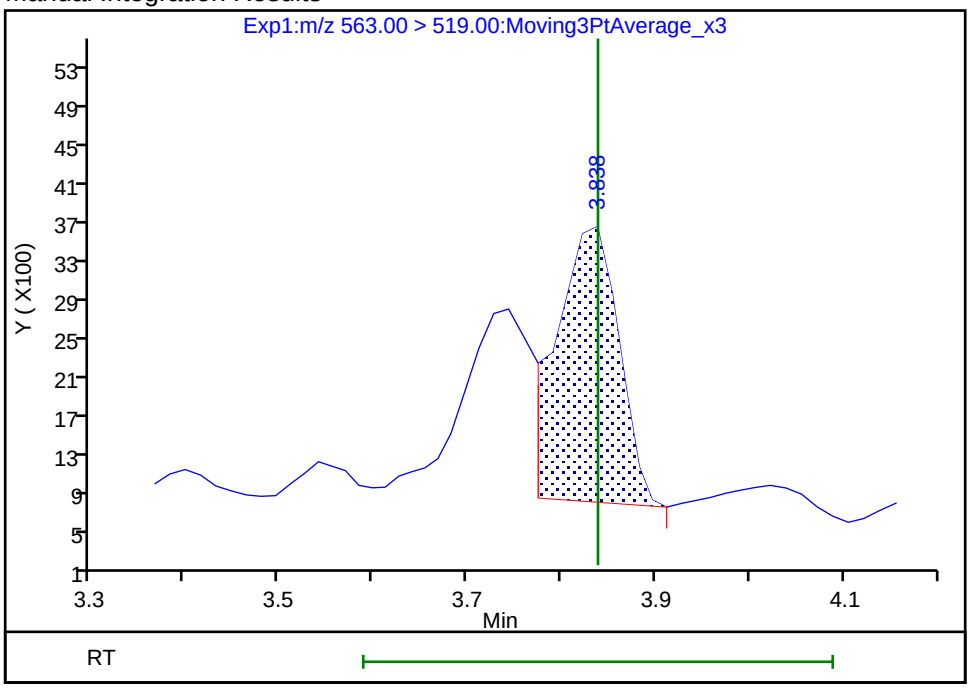
Processing Integration Results

RT: 3.74
Area: 9317
Amount: 0.004285
Amount Units: ng/ml



Manual Integration Results

RT: 3.84
Area: 12724
Amount: 0.005852
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:03:38
Audit Action: Manually Integrated/Assigned Compound ID Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

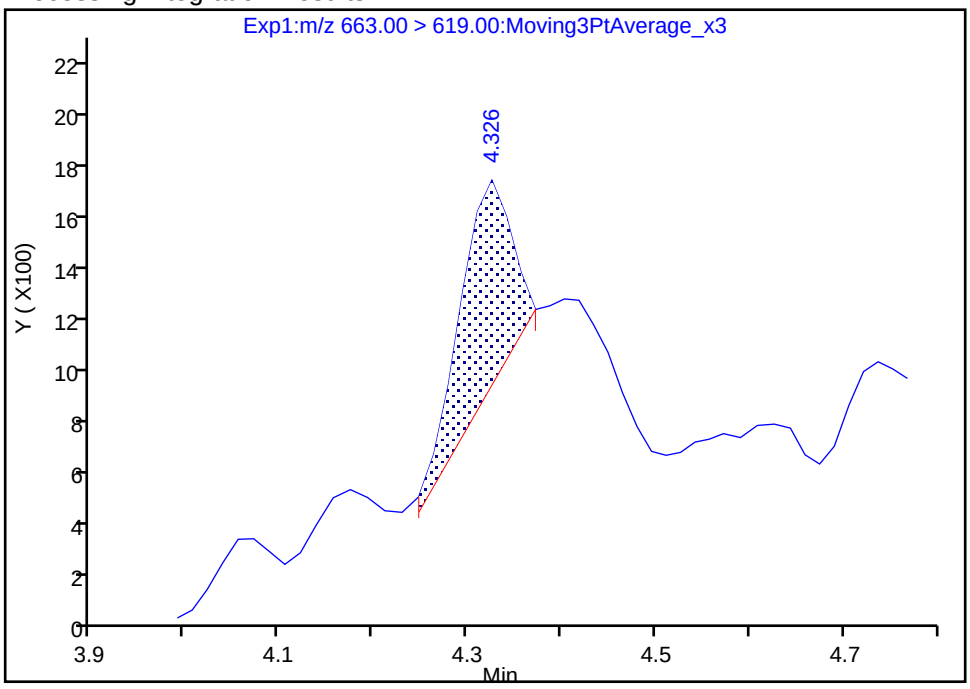
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

41 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 1

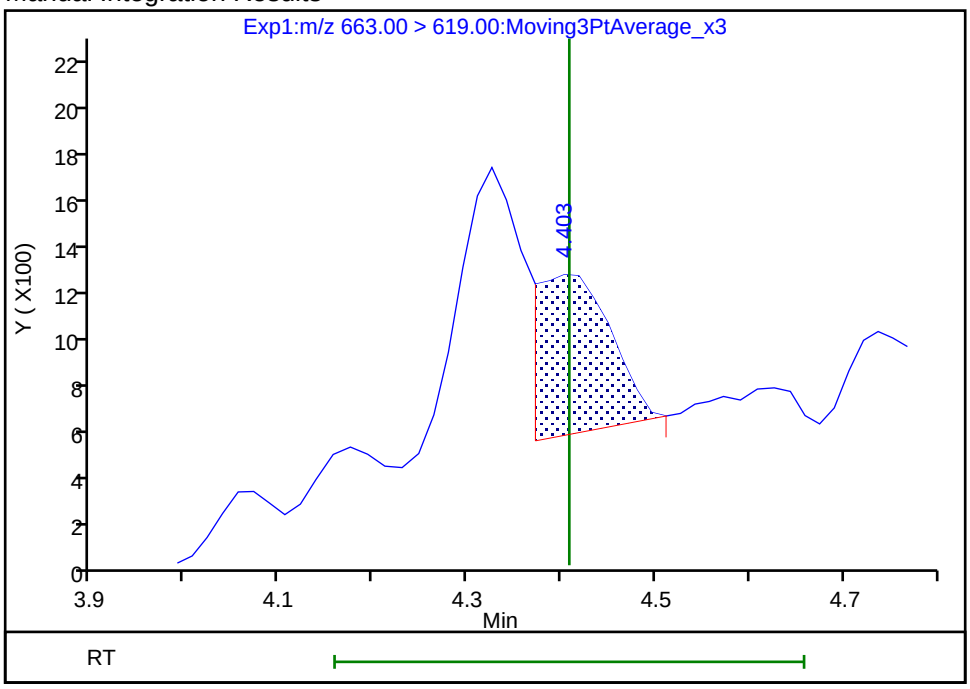
Processing Integration Results

RT: 4.33
Area: 3060
Amount: 0.001413
Amount Units: ng/ml



Manual Integration Results

RT: 4.40
Area: 3462
Amount: 0.001598
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:03:51

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

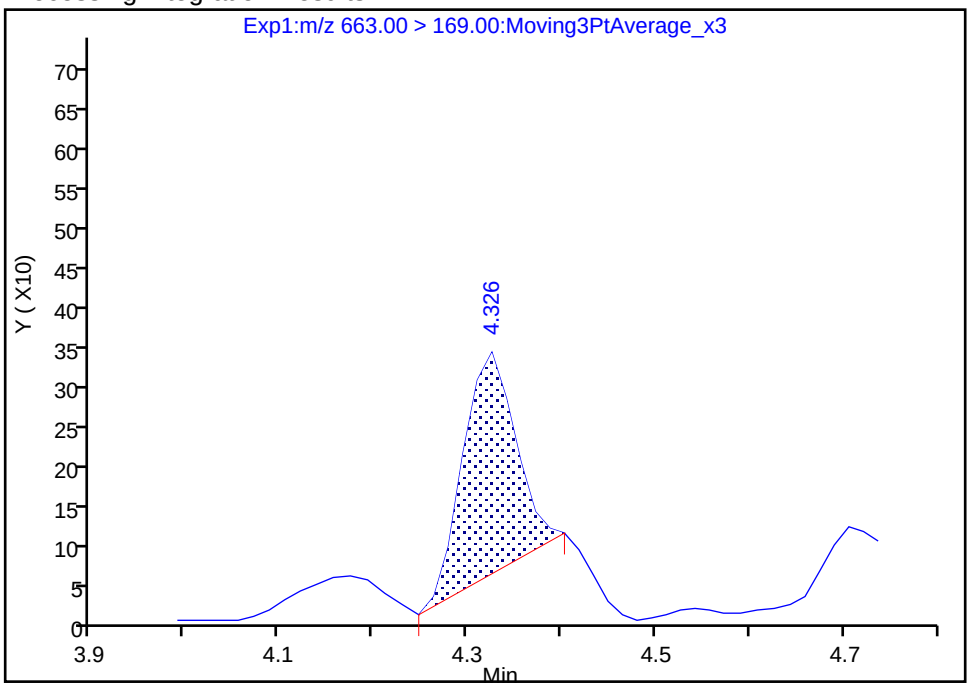
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

41 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 2

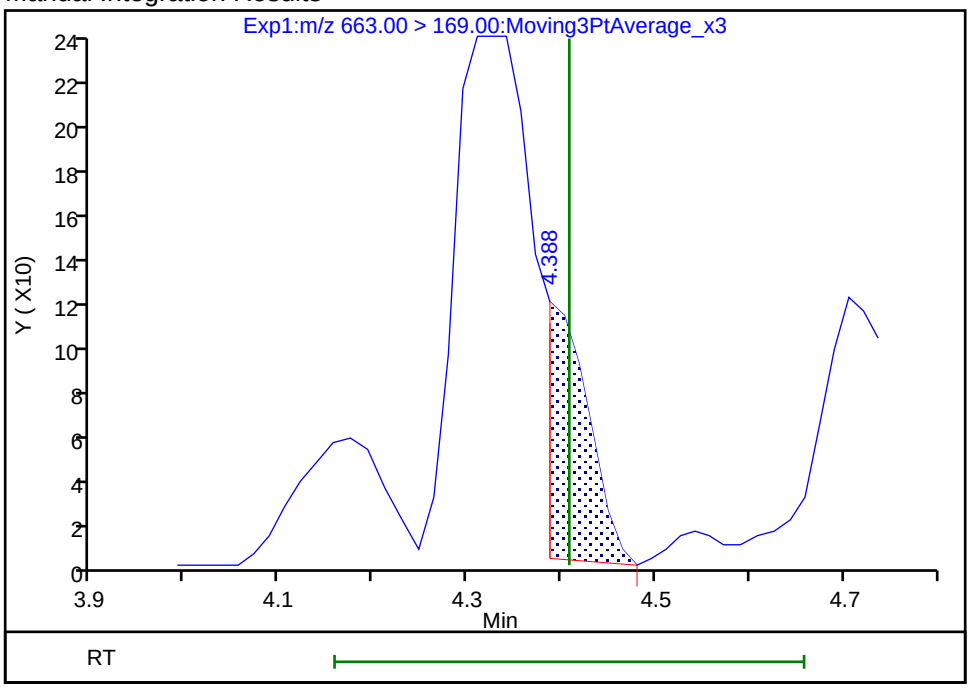
Processing Integration Results

RT: 4.33
Area: 1092
Amount: 0.001413
Amount Units: ng/ml



Manual Integration Results

RT: 4.39
Area: 311
Amount: 0.001598
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:03:54

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

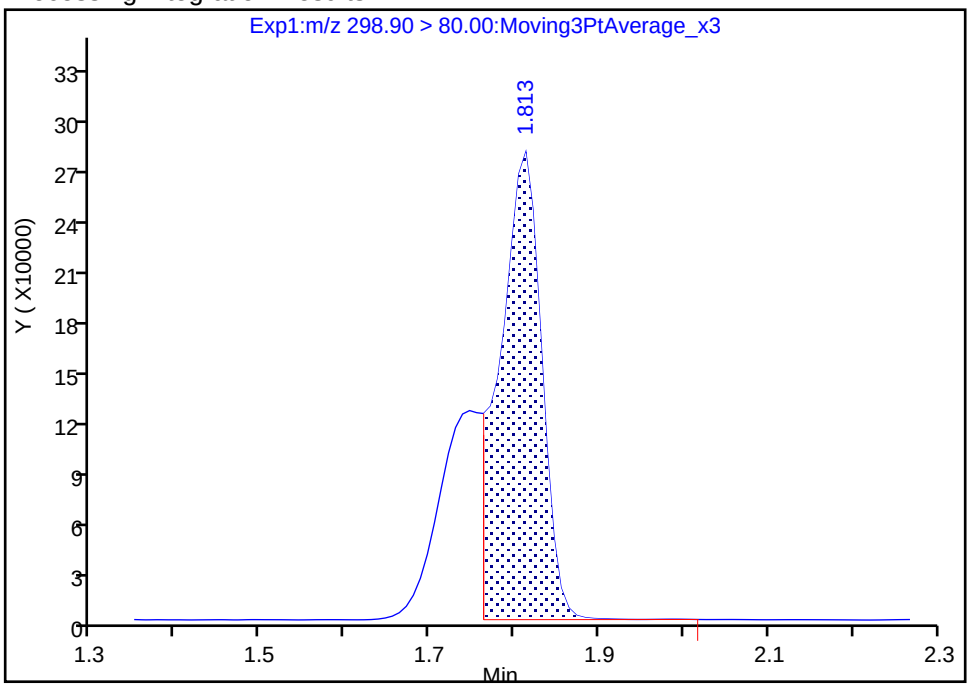
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

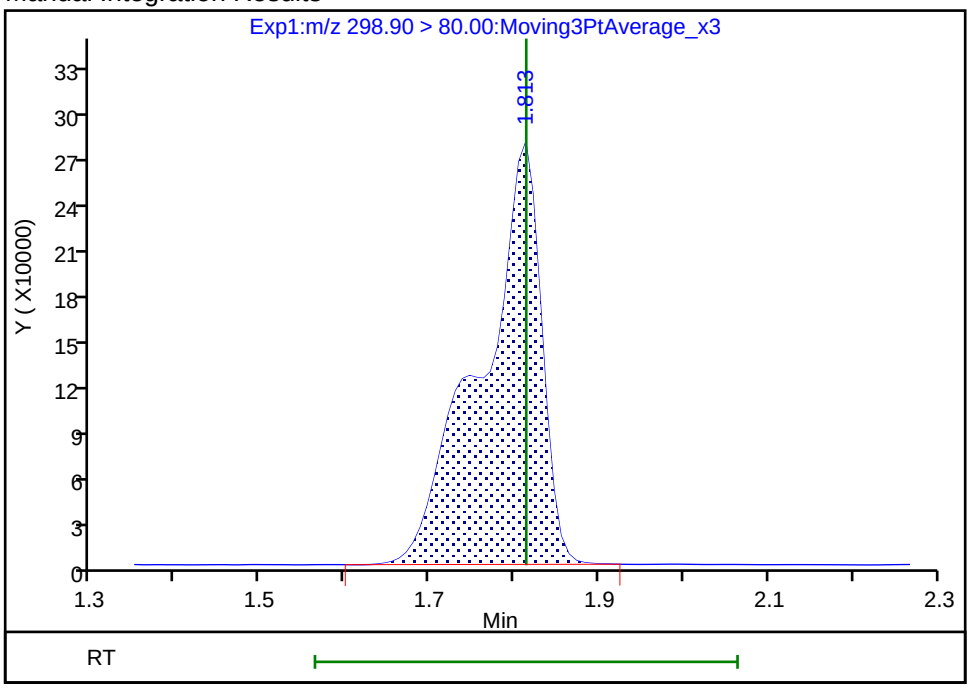
Processing Integration Results

RT: 1.81
Area: 936514
Amount: 0.276572
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 1368833
Amount: 0.404245
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:02:45

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

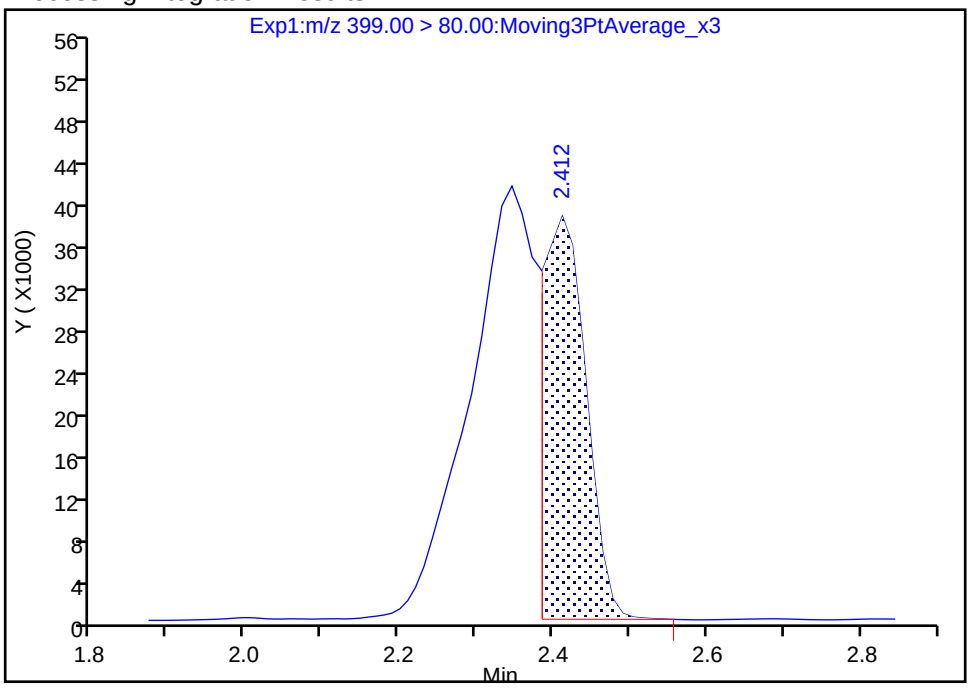
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

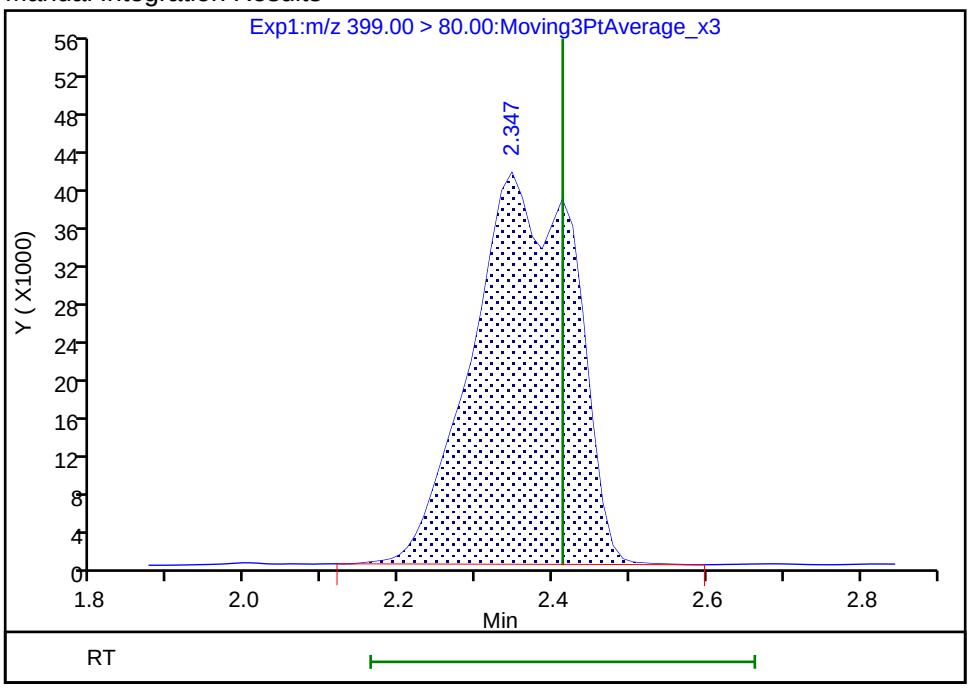
Processing Integration Results

RT: 2.41
Area: 140670
Amount: 0.056083
Amount Units: ng/ml



Manual Integration Results

RT: 2.35
Area: 387124
Amount: 0.154340
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:02:52

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

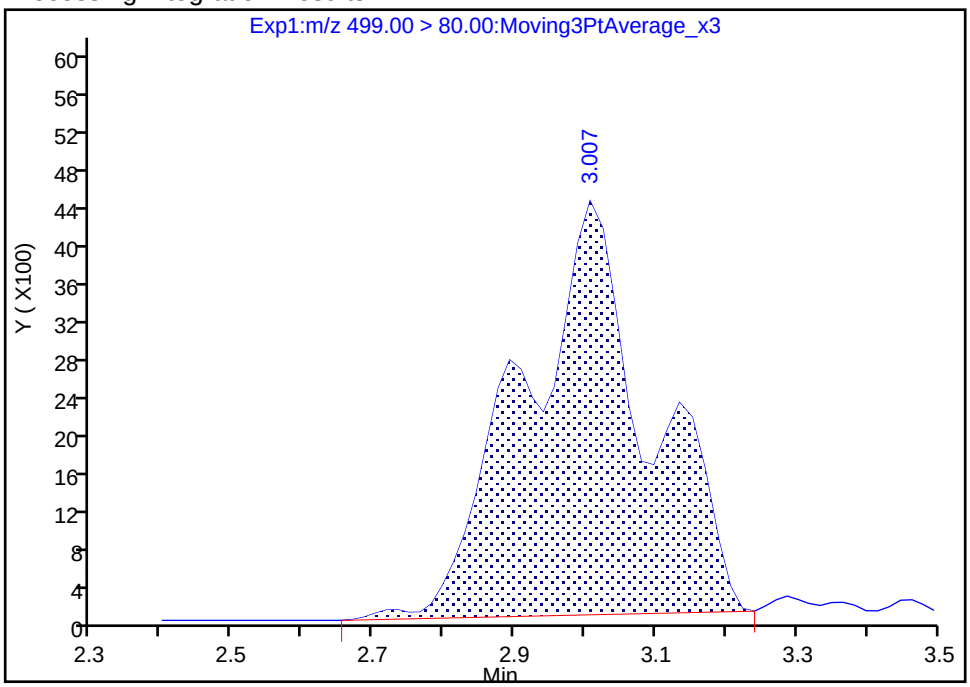
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_018.d				
Injection Date:	16-Sep-2018 15:39:00	Instrument ID:	A9		
Lims ID:	320-42924-A-2-A	Lab Sample ID:	320-42924-2		
Client ID:	TP-PFC-033-MID CARBON				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

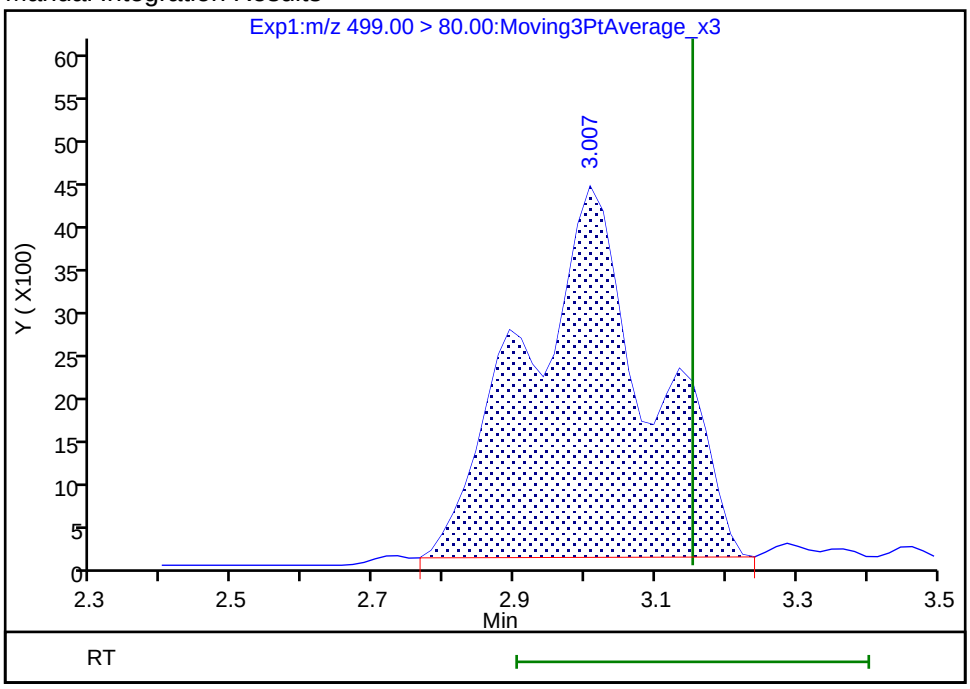
Processing Integration Results

RT: 3.01
Area: 54296
Amount: 0.024535
Amount Units: ng/ml



Manual Integration Results

RT: 3.01
Area: 52954
Amount: 0.023929
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:03:03

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPE | Lab Sample ID: 320-42924-3

Matrix: Water | Lab File ID: 2018.09.16_LLA_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:20

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 305.8(mL) | Date Analyzed: 09/16/2018 15:46

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		1.6	1.2	0.48
2706-90-3	Perfluoropentanoic acid (PFPeA)	260		1.6	0.82	0.35
307-24-4	Perfluorohexanoic acid (PFHxA)	170	M	1.6	0.82	0.38
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.2	J M	1.6	1.2	0.50
335-67-1	Perfluorooctanoic acid (PFOA)	9.1	M	1.6	1.2	0.44
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U M	1.6	1.2	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	0.82	U	1.6	0.82	0.39
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.6	1.2	0.59
307-55-1	Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	1.2	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U M	3.3	2.5	0.62
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.68
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.8		1.6	0.82	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.66	J M	1.6	0.82	0.31
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.82	U	1.6	0.82	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U M	3.3	2.5	0.90
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	1.2	0.46
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPE | Lab Sample ID: 320-42924-3

Matrix: Water | Lab File ID: 2018.09.16_LLA_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:20

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 305.8(mL) | Date Analyzed: 09/16/2018 15:46

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	90		50-150
STL00992	13C4 PFBA	80		50-150
STL01893	13C5 PFPeA	90	M	50-150
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	96		50-150
STL00997	13C2 PFUnA	93		50-150
STL00998	13C2 PFDoA	83		50-150
STL00994	18O2 PFHxS	90		50-150
STL02116	13C2-PFTeDA	84		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	88	M	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d
Lims ID: 320-42924-A-3-A
Client ID: TP-PFC-033-TPE
Sample Type: Client
Inject. Date: 16-Sep-2018 15:46:30 ALS Bottle#: 11 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-42924-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 16:08:13 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 16:08:12

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	1.489	1.494	-0.005	1.000	8778181	3.75			476	
D 1 13C4 PFBA										
217.00 > 172.00	1.489	1.494	-0.005	0.541	6404757	2.01		80.3	616	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.772	0.0	1.005	21092187	8.09			1100	
D 3 13C5-PFPeA										M
267.90 > 223.00	1.764	1.772	-0.008	0.641	6427414	2.26		90.3	7939	M
D 47 13C3-PFBS										M
301.90 > 83.00	1.805	1.814	-0.009	0.656	76367	2.04		87.9	403	M
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.805	1.814	-0.009	1.000	503014	0.1458			255	
298.90 > 99.00	1.805	1.814	-0.009	1.000	214719		2.34(1.35-4.05)		103	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.068	-0.010	0.748	6657575	2.21		88.5	8020	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.058	2.068	-0.010	1.000	12727082	5.25			1314	M
313.00 > 119.00	2.058	2.068	-0.010	1.000	648754		19.62(6.96-20.87)		1196	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.399	-0.013	0.868	8400855	2.34		93.6	9803	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.373	2.400	-0.027	0.995	120582	0.0352			9.1	M
363.00 > 169.00	2.400	2.400	0.0	1.006	27797		4.34(2.17-6.52)		11.7	M
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.347	2.413	-0.066	0.973	49681	0.0203			43.0	M
399.00 > 99.00	2.413	2.413	0.0	1.000	11425		4.35(1.90-5.70)		9.8	M
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.426	-0.013	0.877	4688733	2.12		89.8	4728	

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	2.750	2.766	-0.016	1.000	7606306	2.28		91.0	10441	
* 62 13C2-PFOA										
415.00 > 370.00	2.750	2.766	-0.016		8293025	2.50			5374	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.671	2.766	-0.095	0.971	915298	0.2795			26.5	M
413.00 > 169.00	2.655	2.766	-0.111	0.965	450282		2.03(1.36-4.08)		223	
D 19 13C5 PFNA										
468.00 > 423.00	3.135	3.153	-0.018	1.140	7090019	2.26		90.6	6947	
D 18 13C4 PFOS										
503.00 > 80.00	3.135	3.153	-0.018	1.140	5112758	2.16		90.2	4066	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.135	3.153	-0.018	1.000	7617	0.003375			2.5	M
499.00 > 99.00	3.117	3.153	-0.036	0.994	1433		5.32(2.04-6.12)		4.5	M
20 Perfluorononanoic acid										RM
463.00 > 419.00	3.172	3.153	0.019	1.012	971	0.000350			0.2	RM
463.00 > 169.00	3.207	3.153	0.054	1.023	1140		0.85(2.68-8.03)		2.0	M
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.465	0.0	1.260	2832866	2.26		90.3	7191	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.481	3.465	0.016	1.004	4148	0.001235			9.2	
D 23 13C2 PFDA										
515.00 > 470.00	3.496	3.512	-0.016	1.271	7525936	2.41		96.3	6509	
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.823	3.839	-0.016	1.000	18867	0.008528			4.3	M
563.00 > 169.00	3.823	3.839	-0.016	1.000	1675		11.26(5.24-15.72)		4.8	M
D 30 13C2 PFUnA										
565.00 > 520.00	3.823	3.854	-0.031	1.390	6164900	2.32		92.7	7236	
D 36 13C2 PFDoA										
615.00 > 570.00	4.123	4.139	-0.017	1.499	6732619	2.08		83.2	9293	
41 Perfluorotridecanoic acid										RM
663.00 > 619.00	4.388	4.408	-0.020	1.064	8491	0.003930			3.8	RM
663.00 > 169.00	4.326	4.408	-0.082	1.049	3265		2.60(3.09-9.27)		5.9	M
D 43 13C2-PFTeDA										
715.00 > 670.00	4.627	4.660	-0.033	1.682	5404185	2.10		83.8	6366	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 17-Sep-2018 16:09:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d

Injection Date: 16-Sep-2018 15:46:30 Instrument ID: A9

Lims ID: 320-42924-A-3-A Lab Sample ID: 320-42924-3

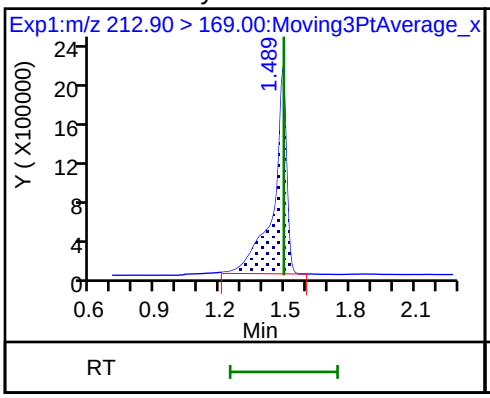
Client ID: TP-PFC-033-TPE

Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 8

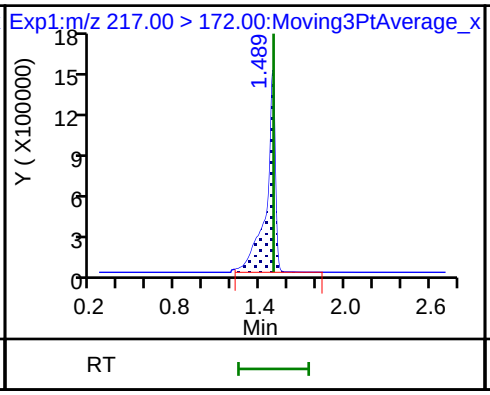
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

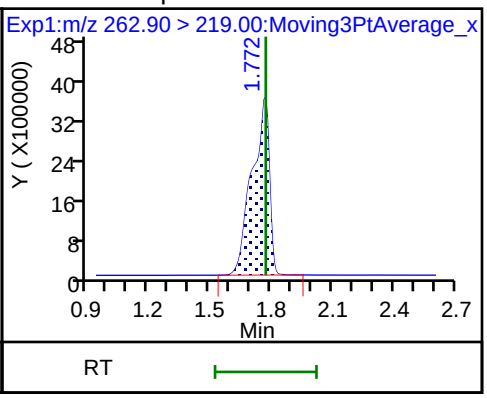
2 Perfluorobutyric acid



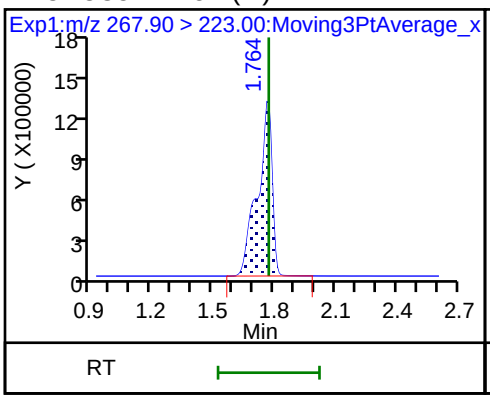
D 1 13C4 PFBA



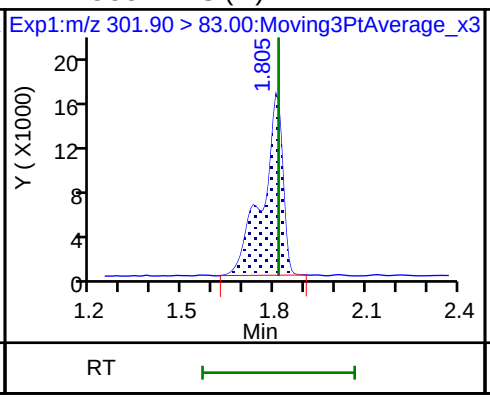
4 Perfluoropentanoic acid



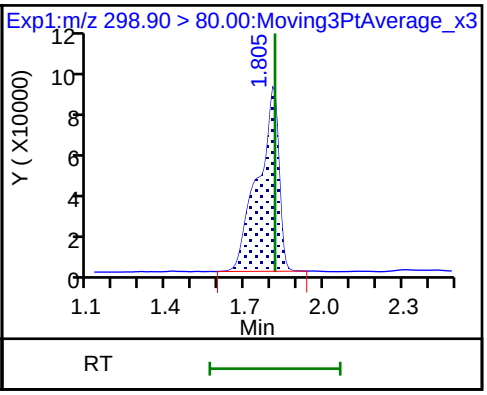
D 3 13C5-PFPeA (M)



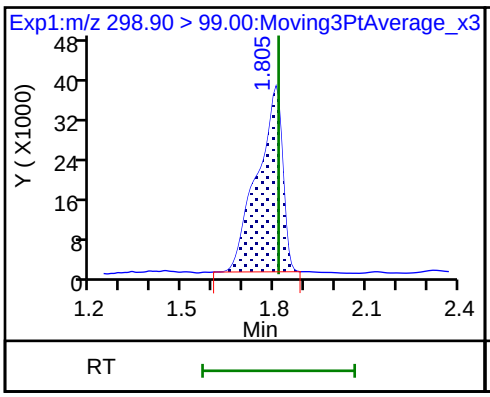
D 47 13C3-PFBS (M)



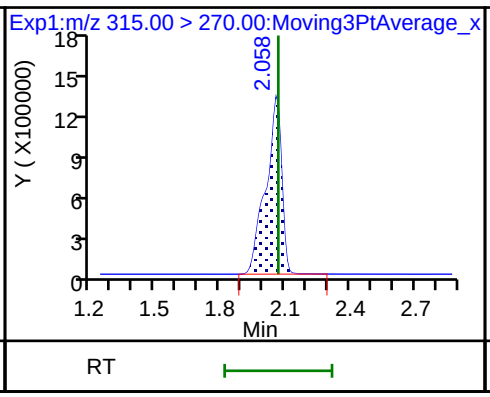
5 Perfluorobutanesulfonic acid



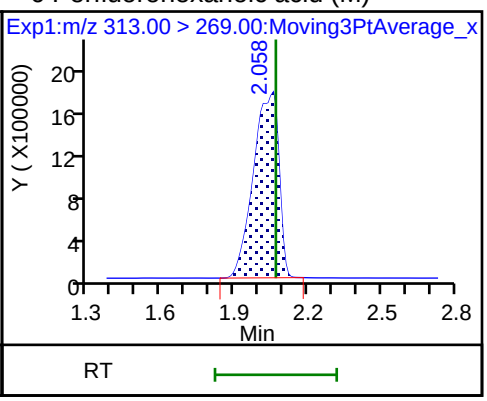
5 Perfluorobutanesulfonic acid



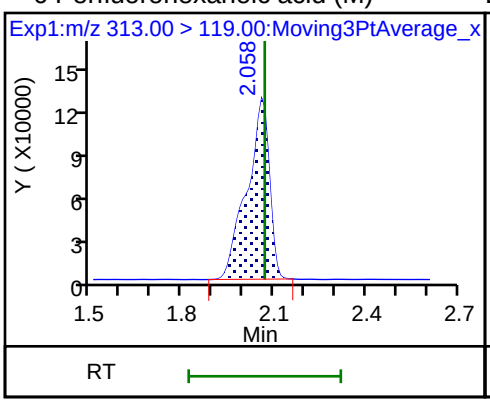
D 7 13C2 PFHxA



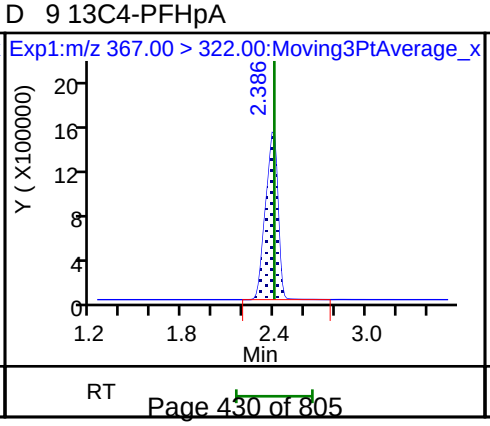
6 Perfluorohexanoic acid (M)



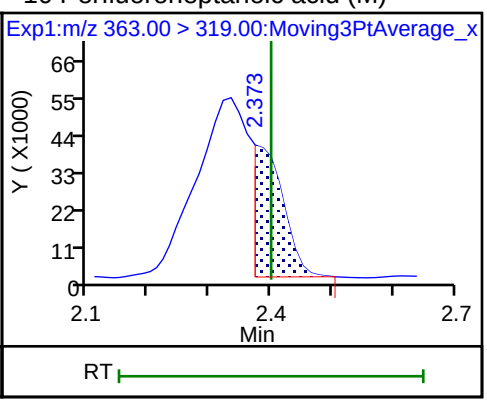
6 Perfluorohexanoic acid (M)



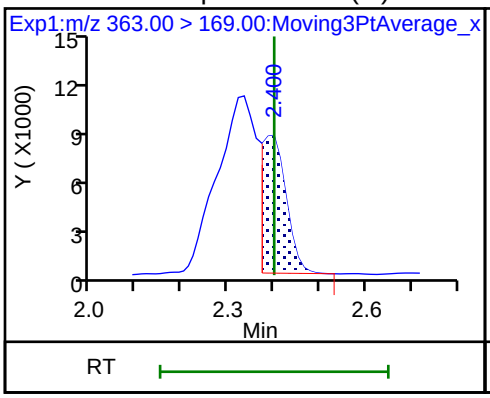
D 9 13C4-PFHpA



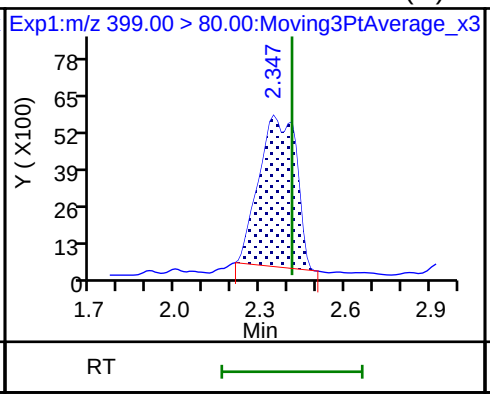
10 Perfluoroheptanoic acid (M)



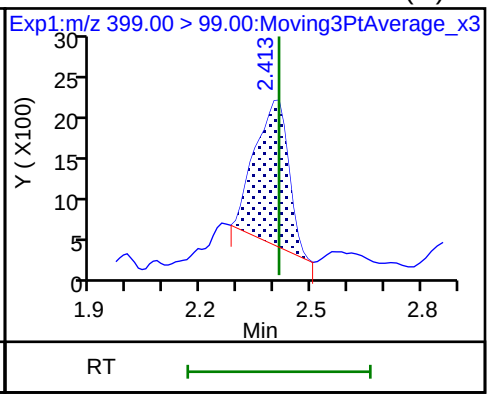
10 Perfluoroheptanoic acid (M)



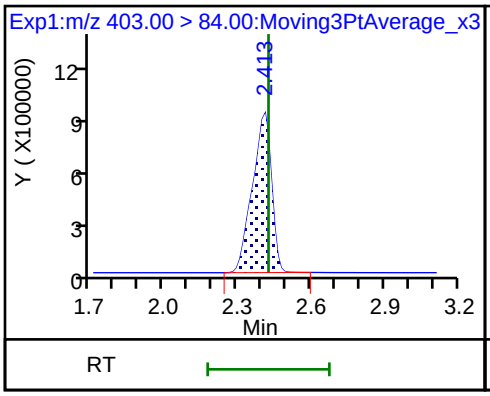
8 Perfluorohexanesulfonic acid (M)



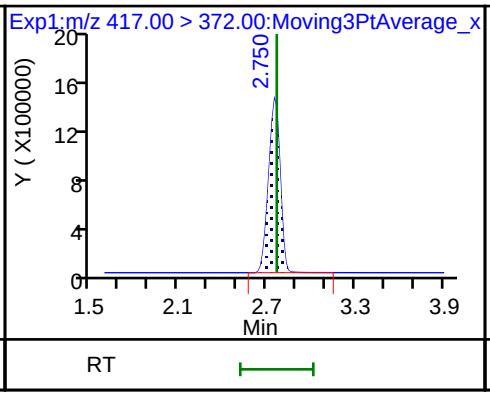
8 Perfluorohexanesulfonic acid (M)



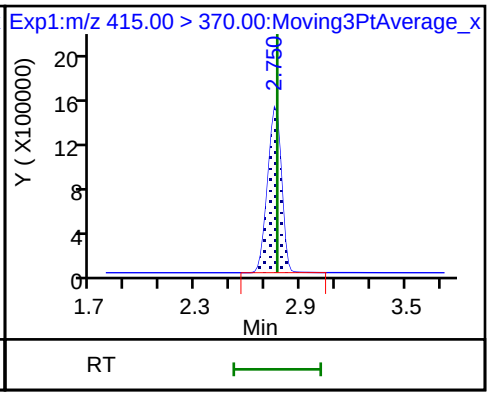
D 11 18O2 PFHxS



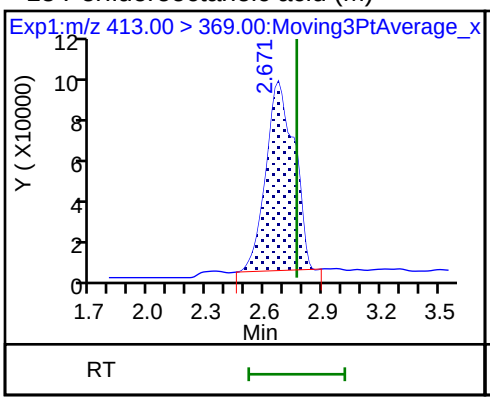
D 14 13C4 PFOA



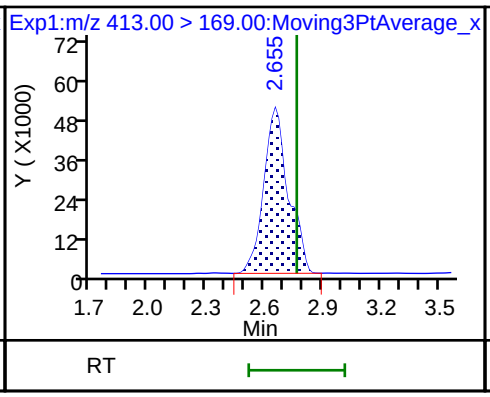
* 62 13C2-PFOA



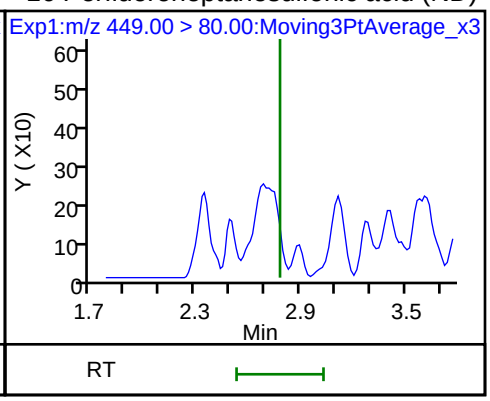
15 Perfluorooctanoic acid (M)



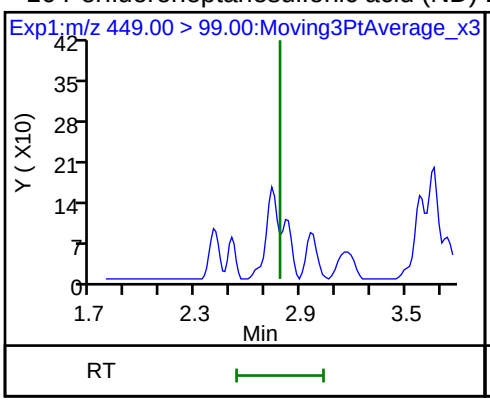
15 Perfluorooctanoic acid



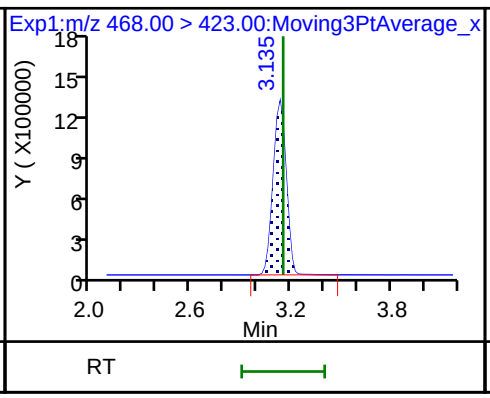
16 Perfluoroheptanesulfonic acid (ND)



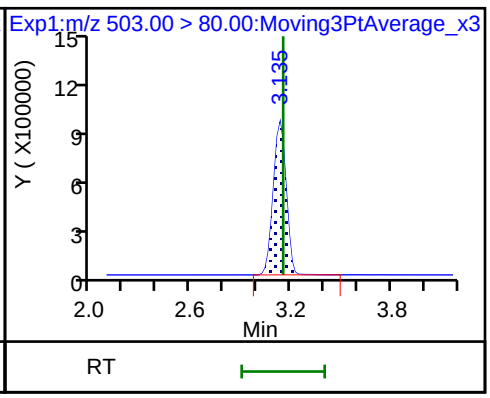
16 Perfluoroheptanesulfonic acid (ND)



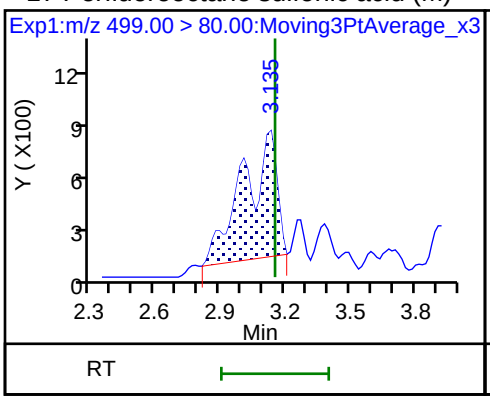
D 19 13C5 PFNA



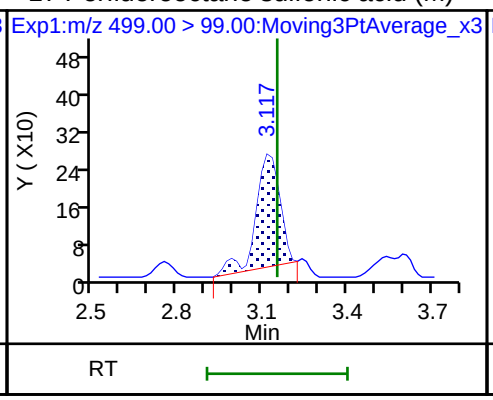
D 18 13C4 PFOS



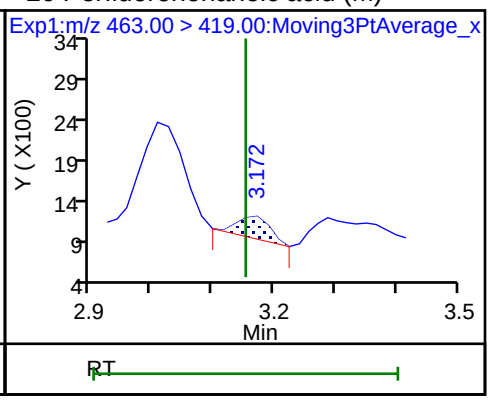
17 Perfluorooctane sulfonic acid (M)



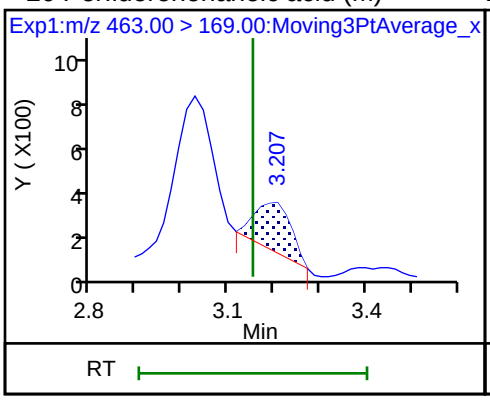
17 Perfluorooctane sulfonic acid (M)



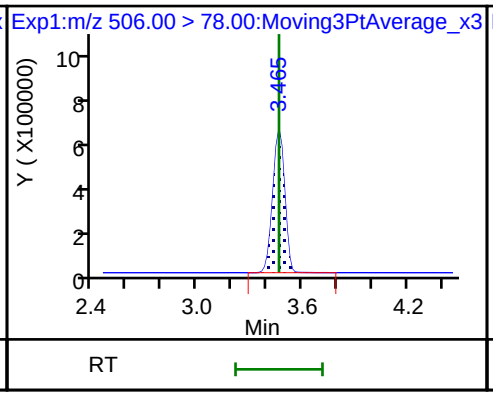
20 Perfluorononanoic acid (M)



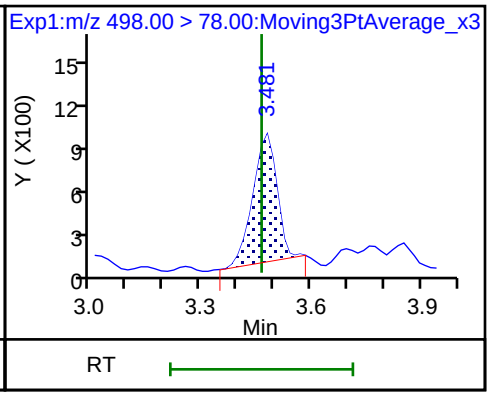
20 Perfluorononanoic acid (M)



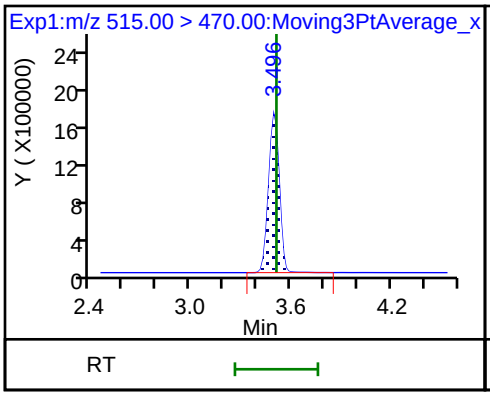
D 21 13C8 FOSA



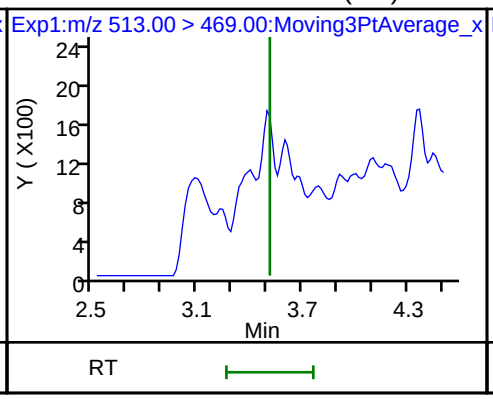
22 Perfluorooctane Sulfonamide



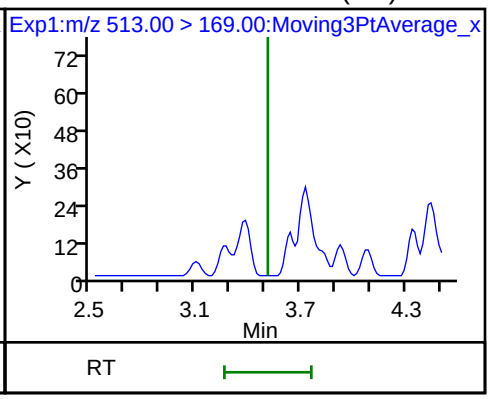
D 23 13C2 PFDA



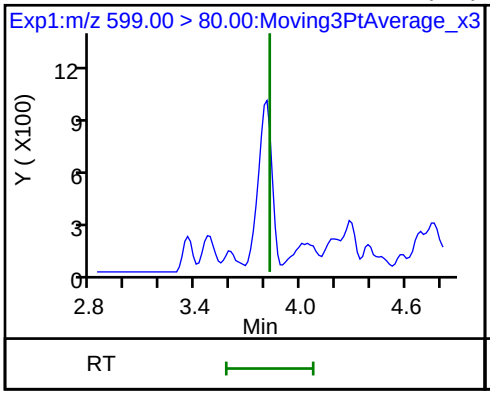
24 Perfluorodecanoic acid (ND)



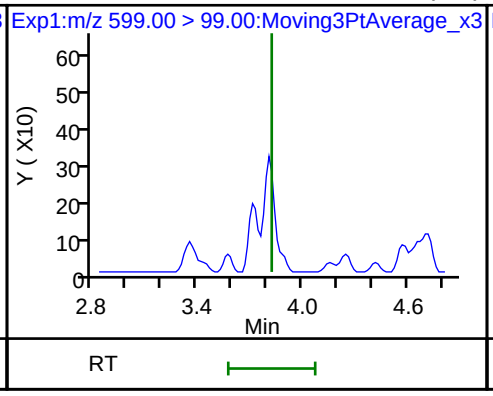
24 Perfluorodecanoic acid (ND)



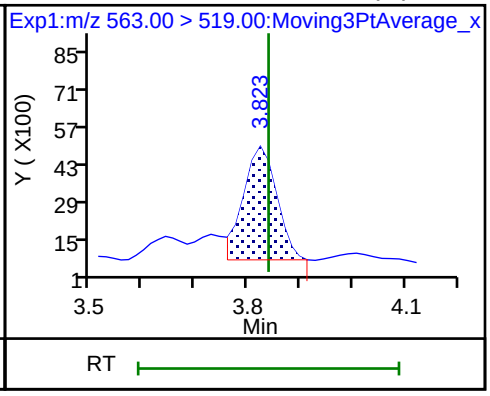
29 Perfluorodecane Sulfonic acid (ND)



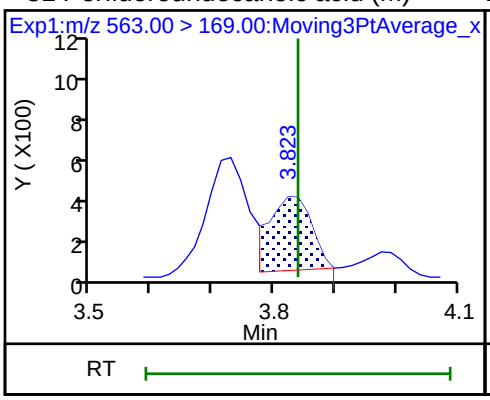
29 Perfluorodecane Sulfonic acid (ND)



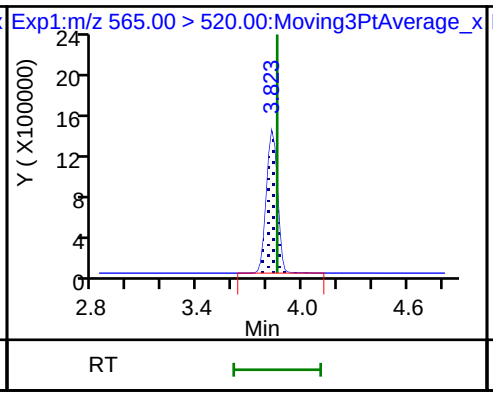
31 Perfluoroundecanoic acid (M)



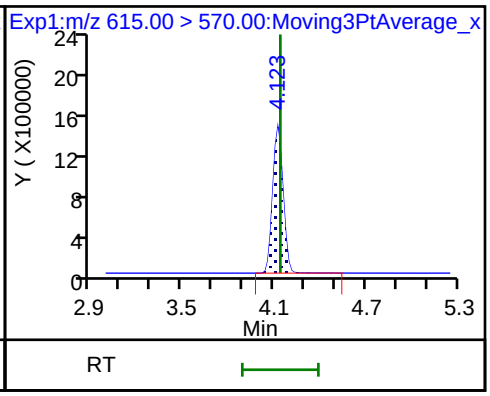
31 Perfluoroundecanoic acid (M)



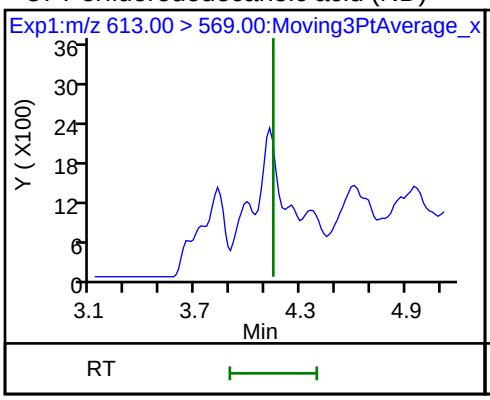
D 30 13C2 PFUnA



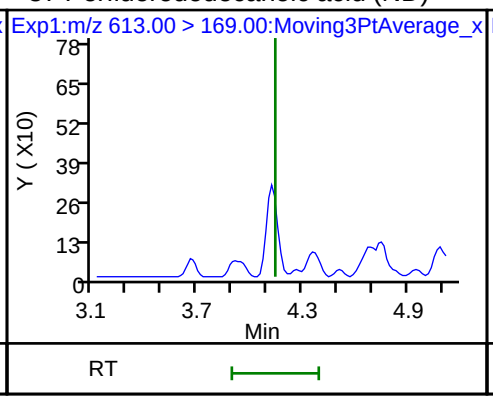
D 36 13C2 PFDoA



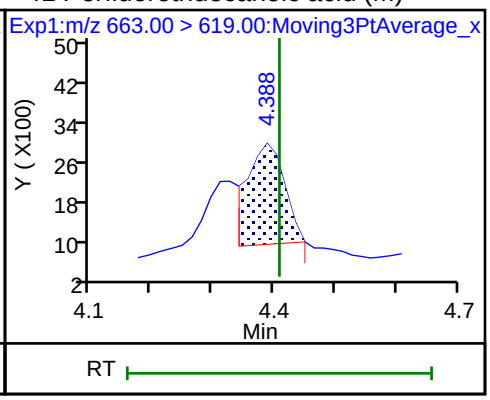
37 Perfluorododecanoic acid (ND)



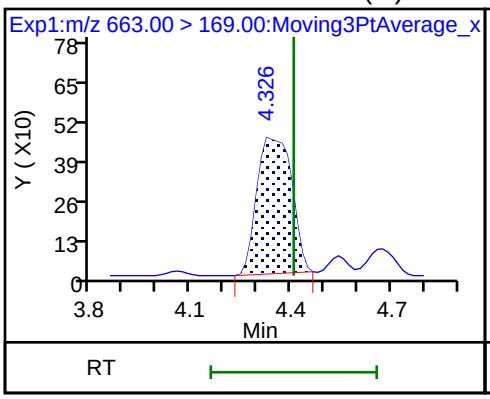
37 Perfluorododecanoic acid (ND)



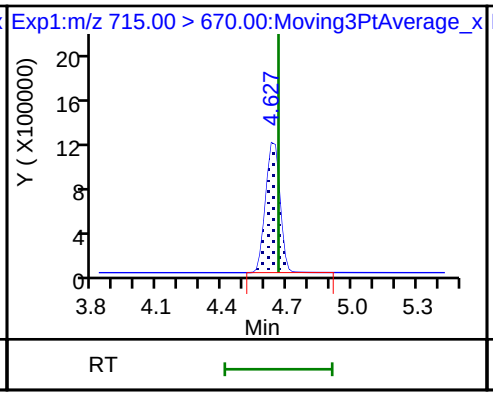
41 Perfluorotridecanoic acid (M)



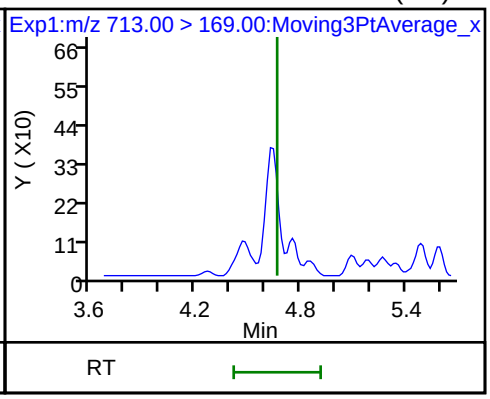
41 Perfluorotridecanoic acid (M)



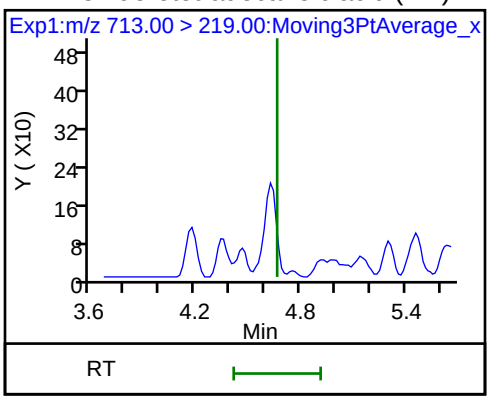
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

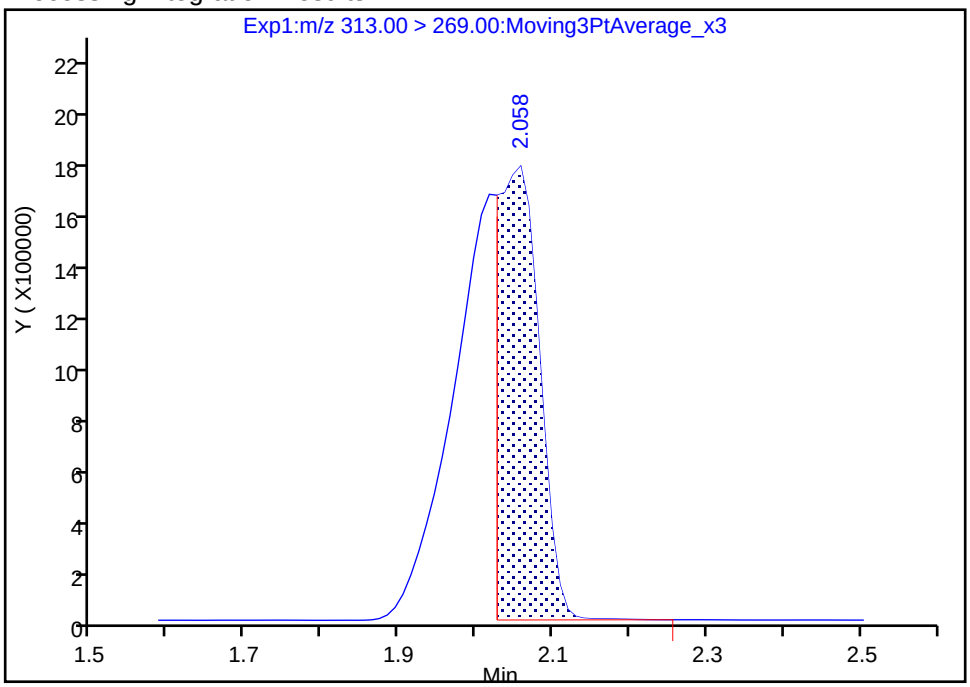
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

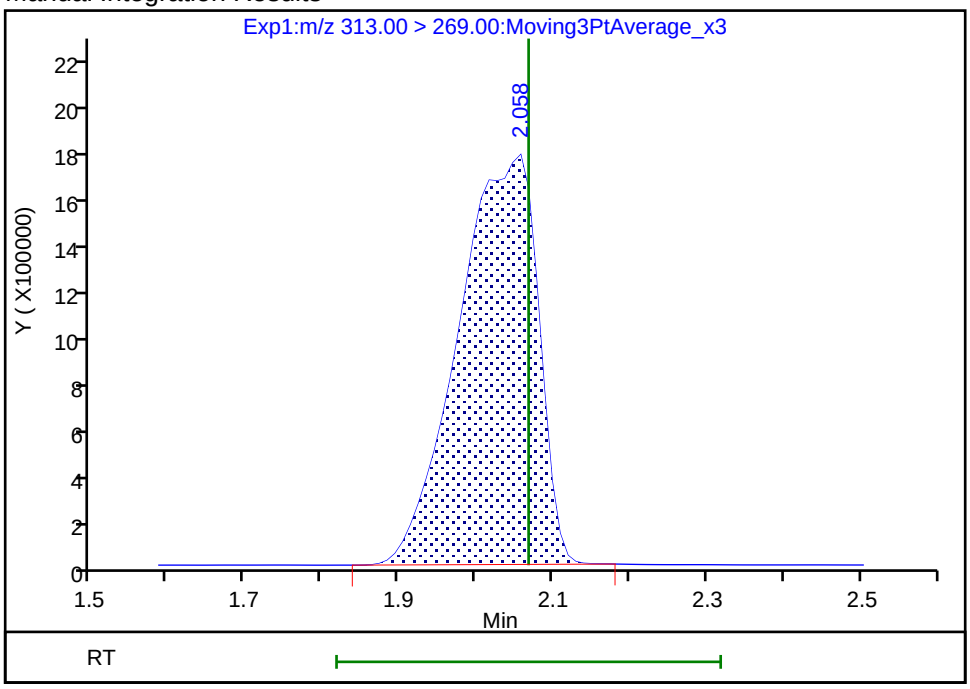
Processing Integration Results

RT: 2.06
Area: 6261196
Amount: 2.581811
Amount Units: ng/ml



Manual Integration Results

RT: 2.06
Area: 12727082
Amount: 5.248026
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:06:06

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

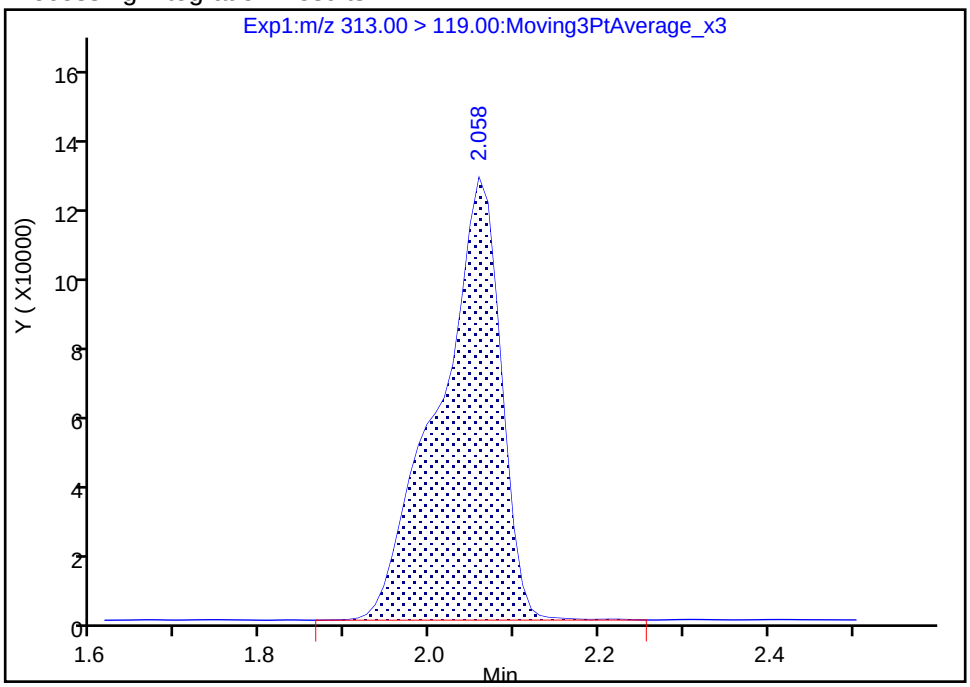
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d
Injection Date: 16-Sep-2018 15:46:30 Instrument ID: A9
Lims ID: 320-42924-A-3-A Lab Sample ID: 320-42924-3
Client ID: TP-PFC-033-TPE
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

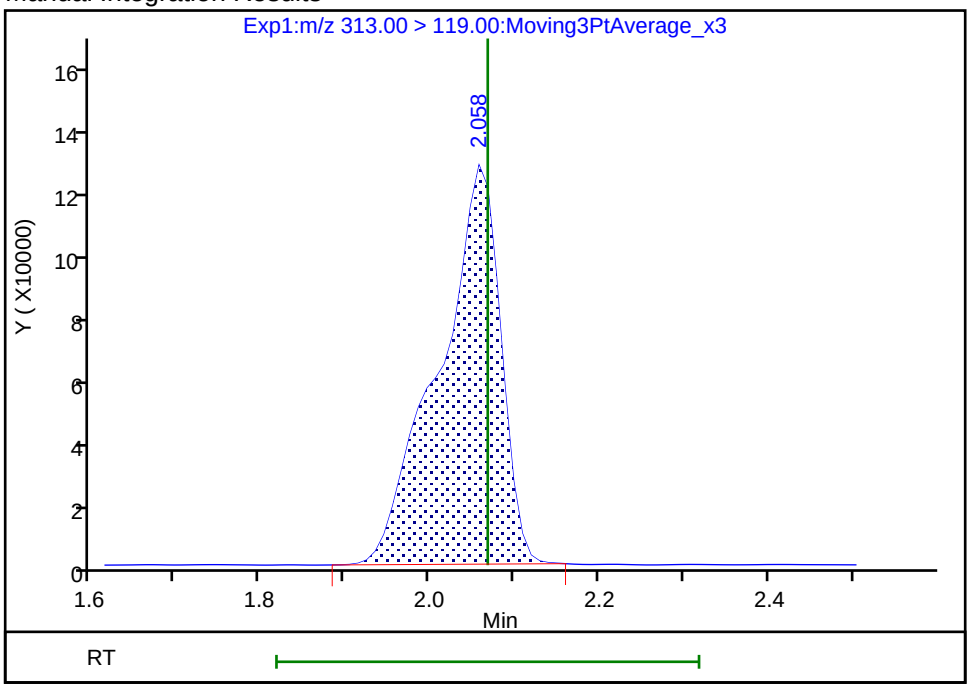
Processing Integration Results

RT: 2.06
Area: 653570
Amount: 2.581811
Amount Units: ng/ml



Manual Integration Results

RT: 2.06
Area: 648754
Amount: 5.248026
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:06:08
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

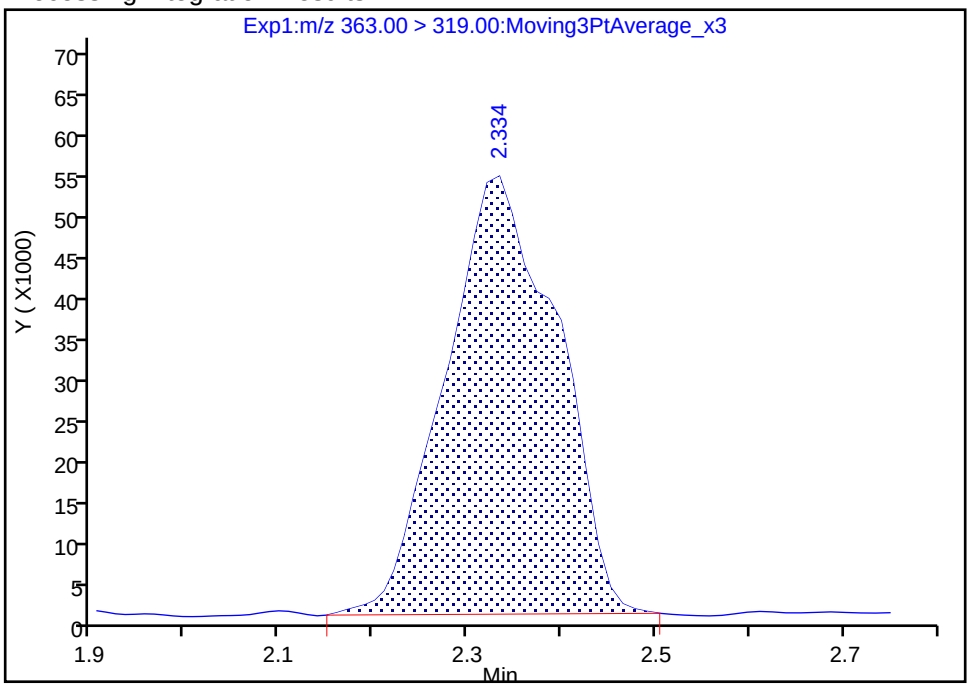
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

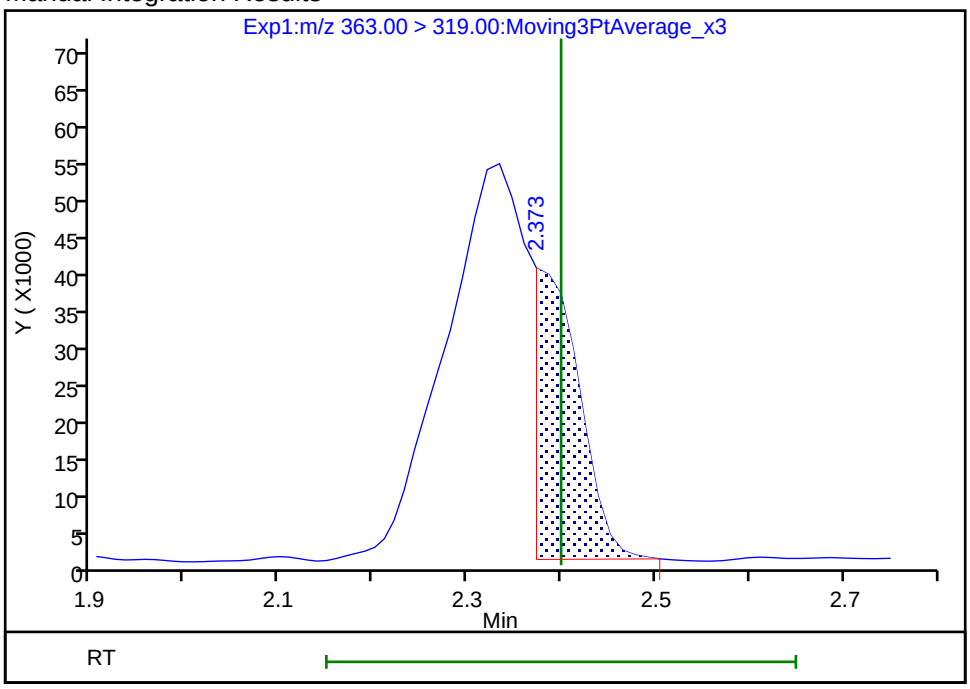
Processing Integration Results

RT: 2.33
Area: 440890
Amount: 0.128667
Amount Units: ng/ml



Manual Integration Results

RT: 2.37
Area: 120582
Amount: 0.035190
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:06:25

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

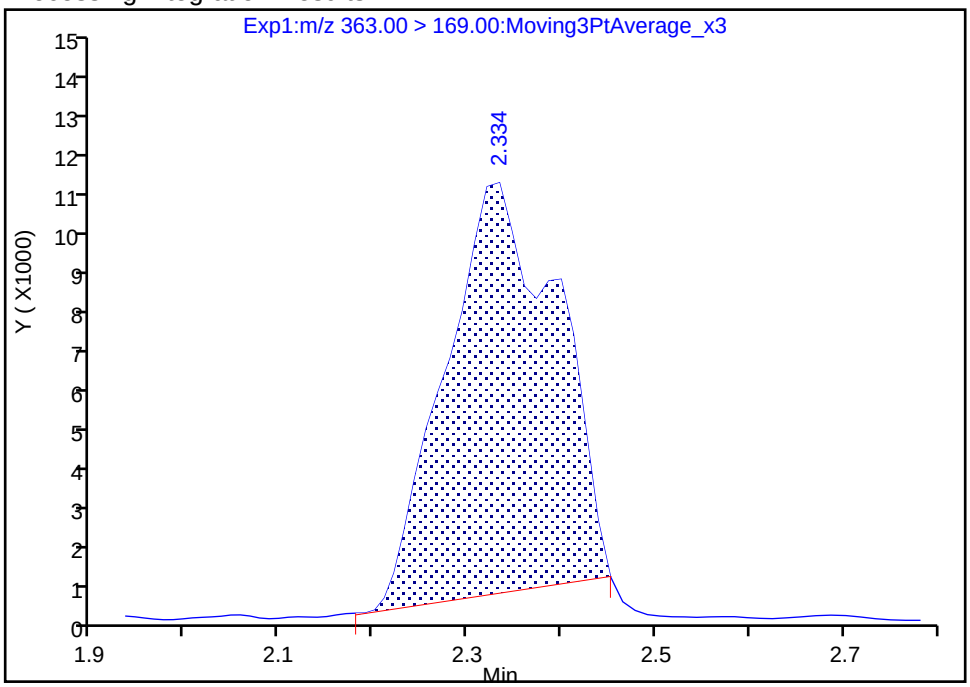
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d
Injection Date: 16-Sep-2018 15:46:30 Instrument ID: A9
Lims ID: 320-42924-A-3-A Lab Sample ID: 320-42924-3
Client ID: TP-PFC-033-TPE
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 2

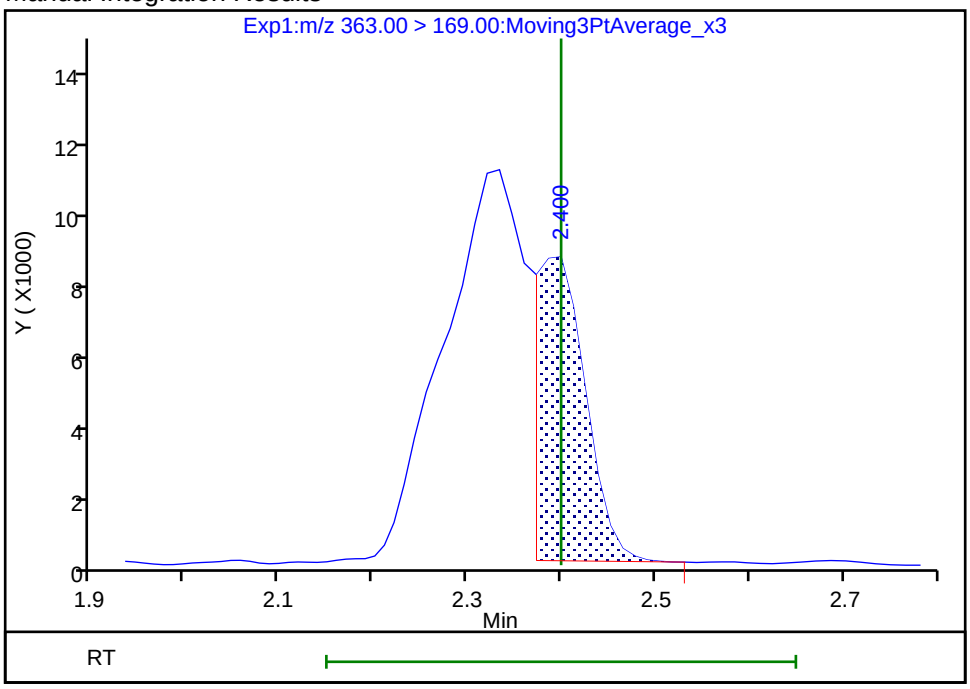
Processing Integration Results

RT: 2.33
Area: 82395
Amount: 0.128667
Amount Units: ng/ml



Manual Integration Results

RT: 2.40
Area: 27797
Amount: 0.035190
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:06:28
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

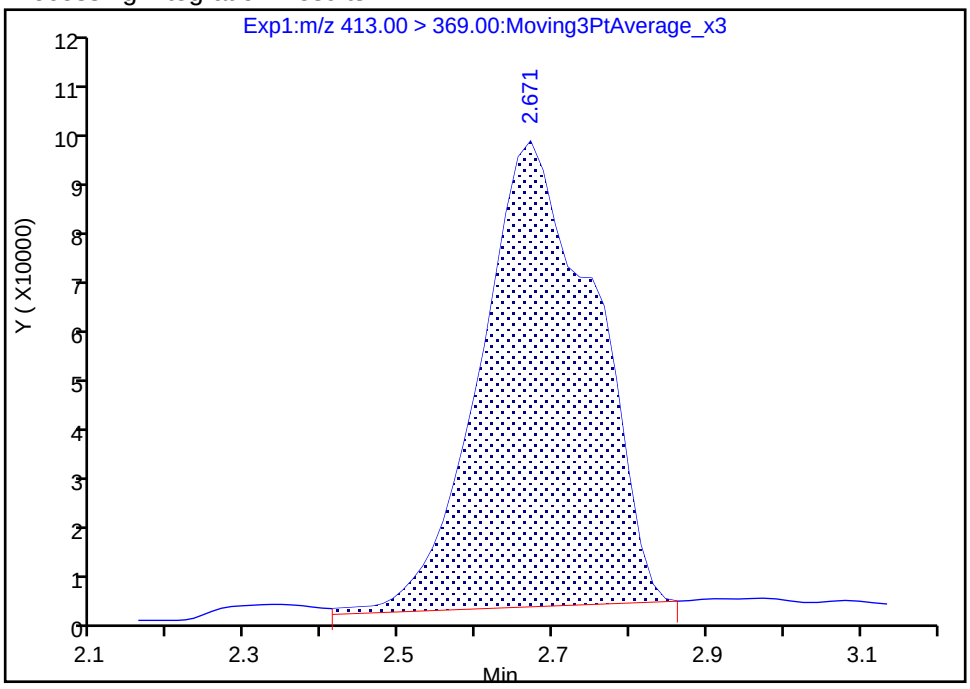
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

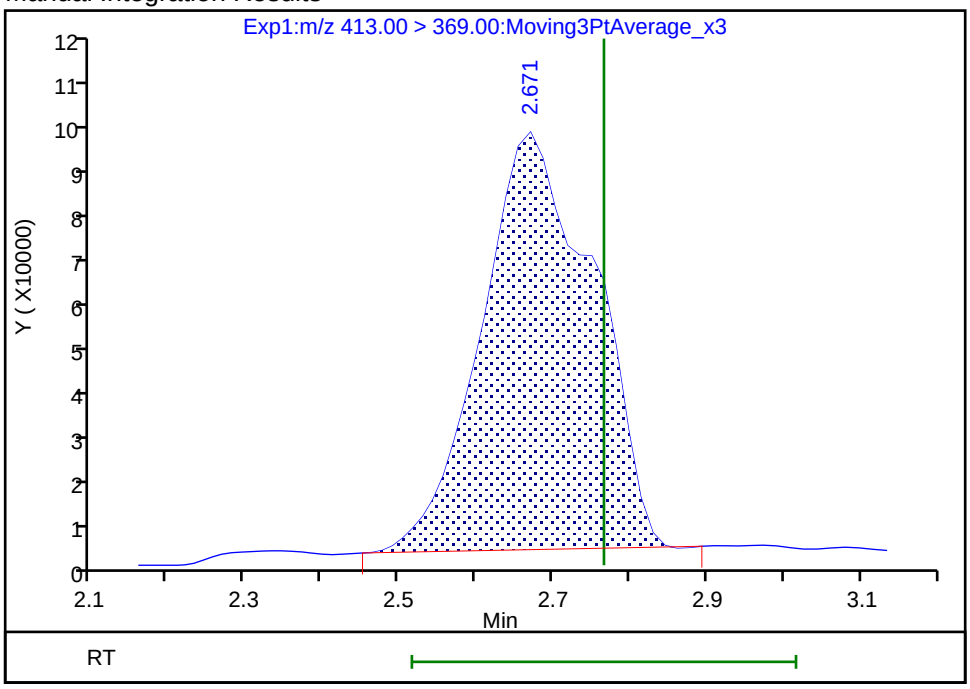
Processing Integration Results

RT: 2.67
Area: 937084
Amount: 0.286177
Amount Units: ng/ml



Manual Integration Results

RT: 2.67
Area: 915298
Amount: 0.279524
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:07

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

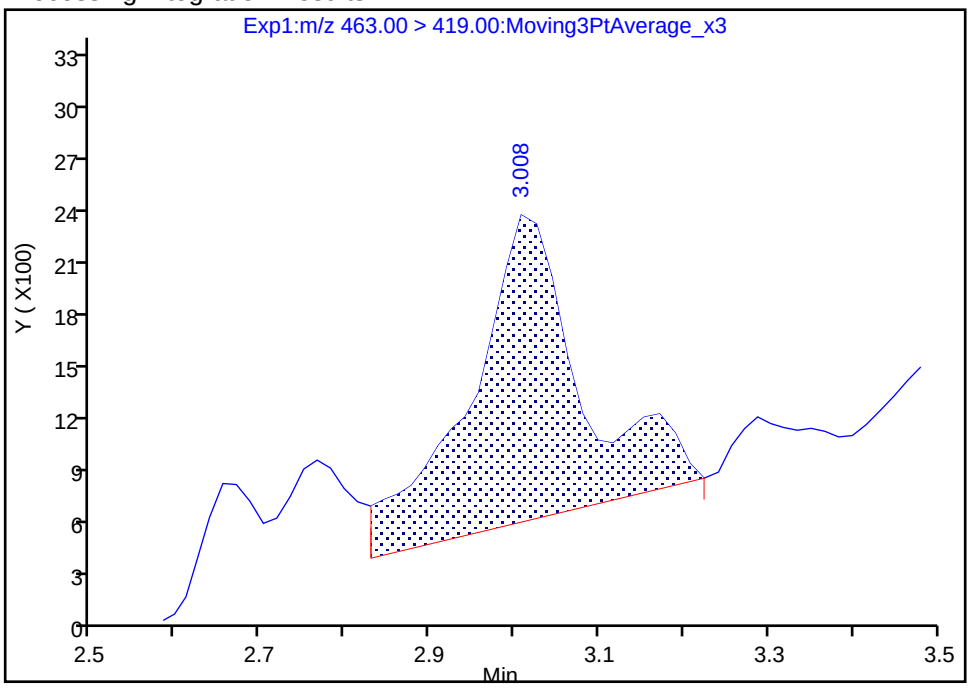
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

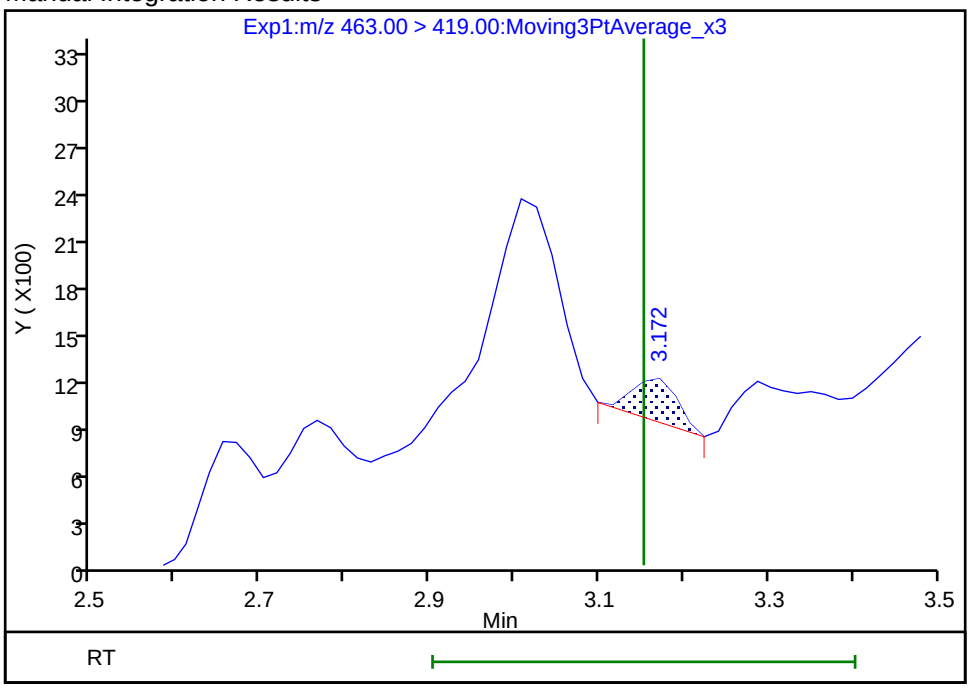
Processing Integration Results

RT: 3.01
Area: 15899
Amount: 0.005733
Amount Units: ng/ml



Manual Integration Results

RT: 3.17
Area: 971
Amount: 0.000350
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:25

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

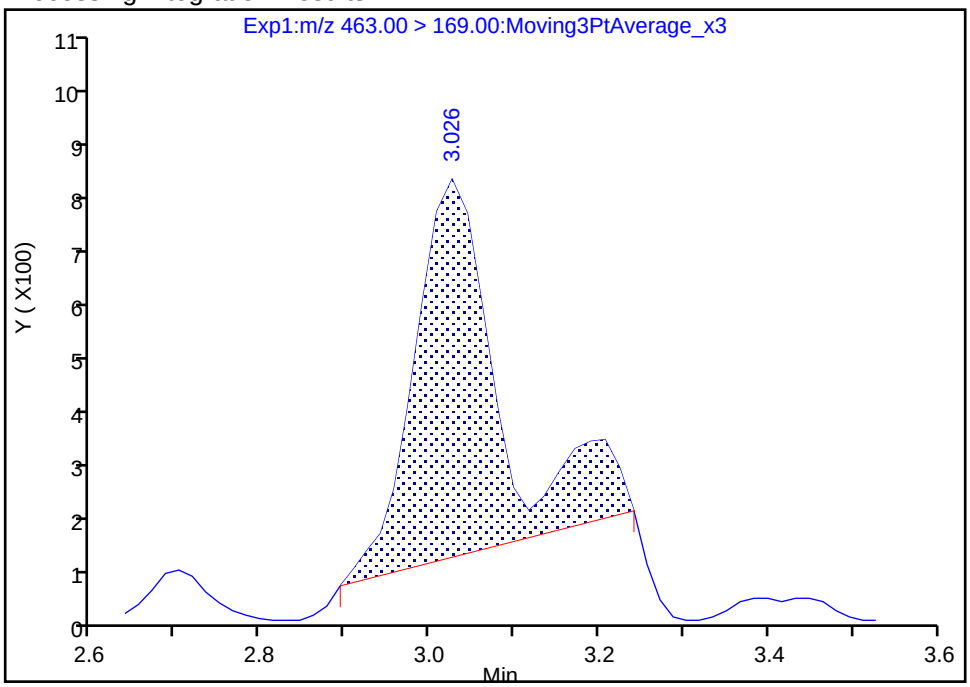
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

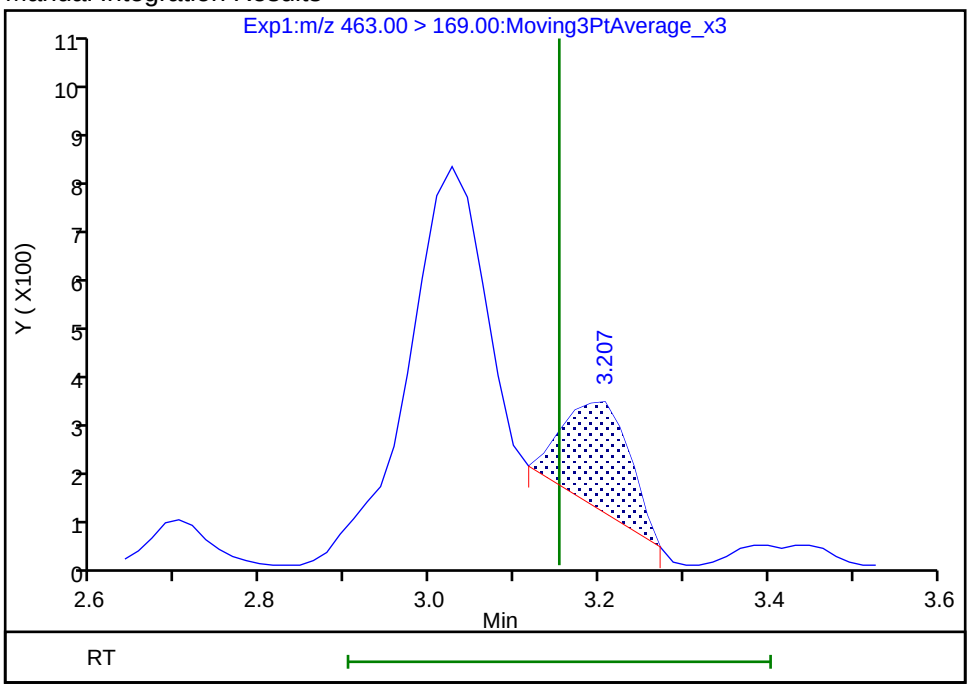
Processing Integration Results

RT: 3.03
Area: 4686
Amount: 0.005733
Amount Units: ng/ml



Manual Integration Results

RT: 3.21
Area: 1140
Amount: 0.000350
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:27
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

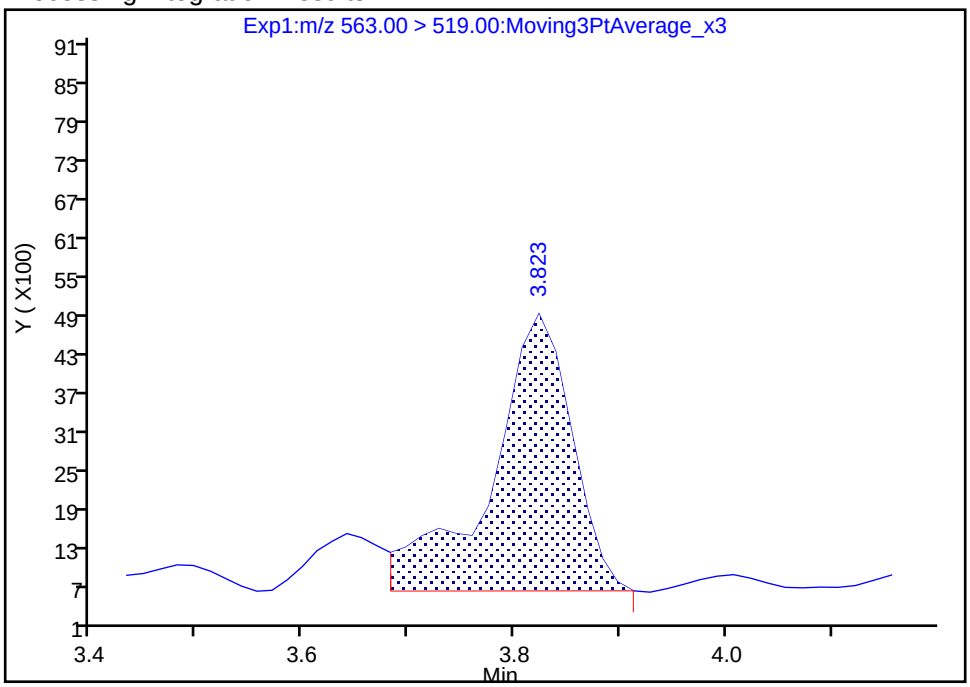
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

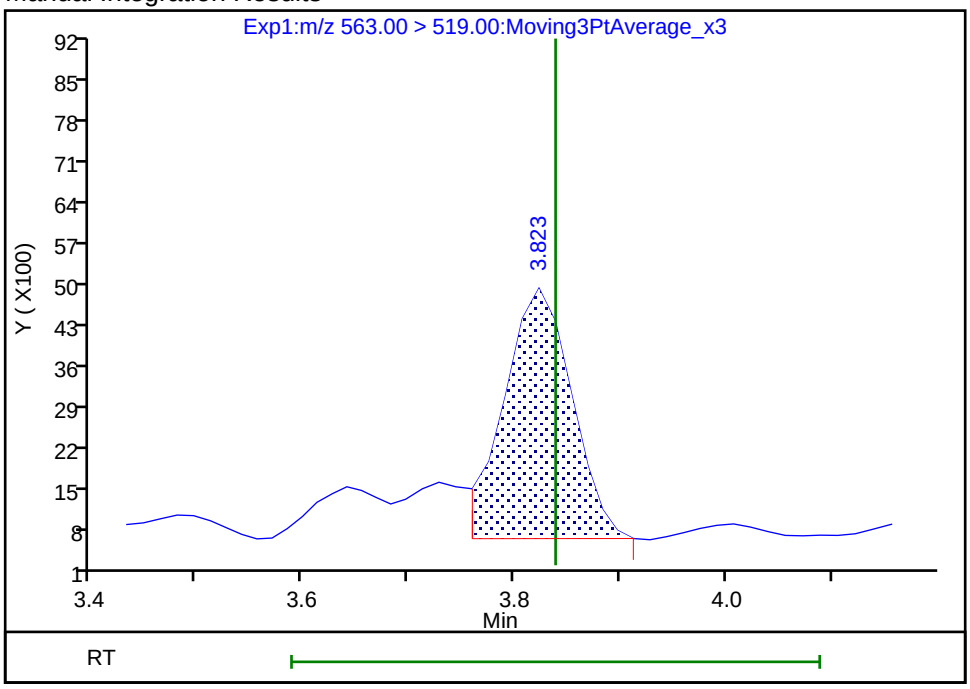
Processing Integration Results

RT: 3.82
Area: 22679
Amount: 0.010251
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 18867
Amount: 0.008528
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:35

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

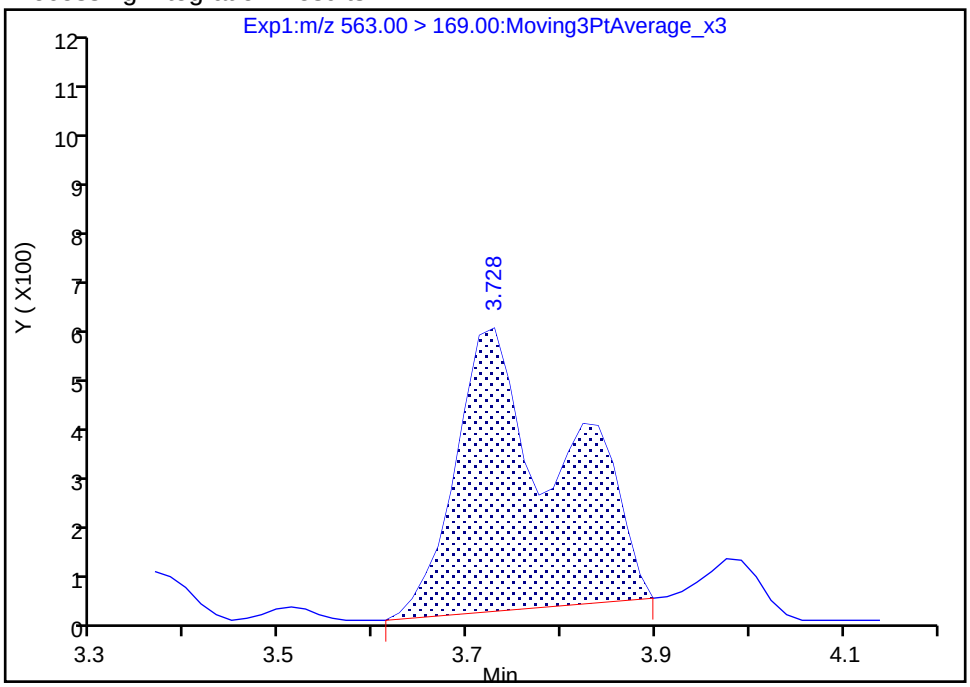
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

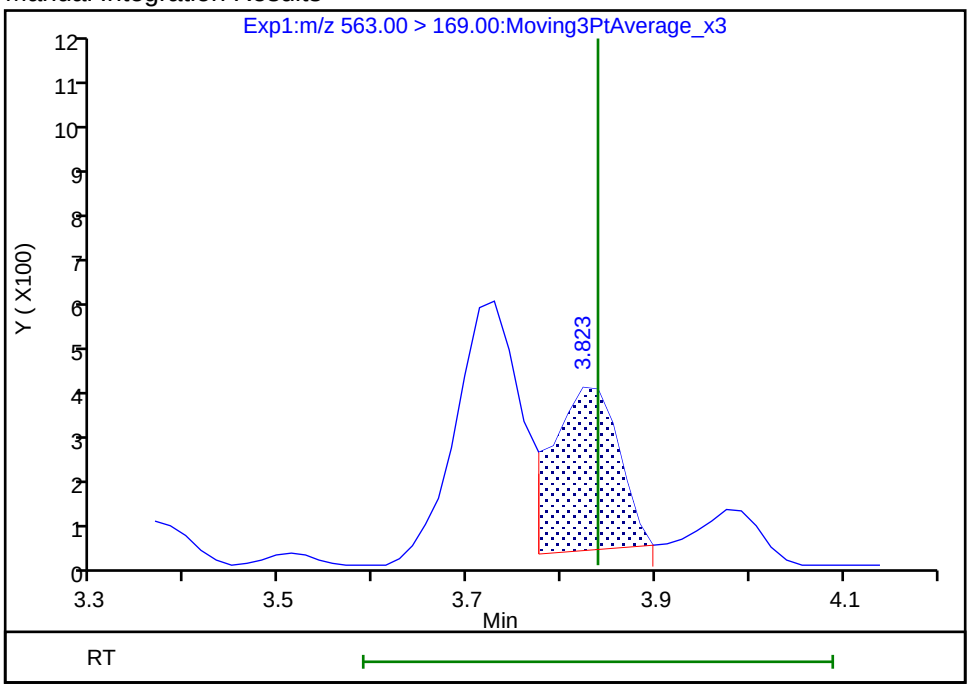
Processing Integration Results

RT: 3.73
Area: 4282
Amount: 0.010251
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 1675
Amount: 0.008528
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:38
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

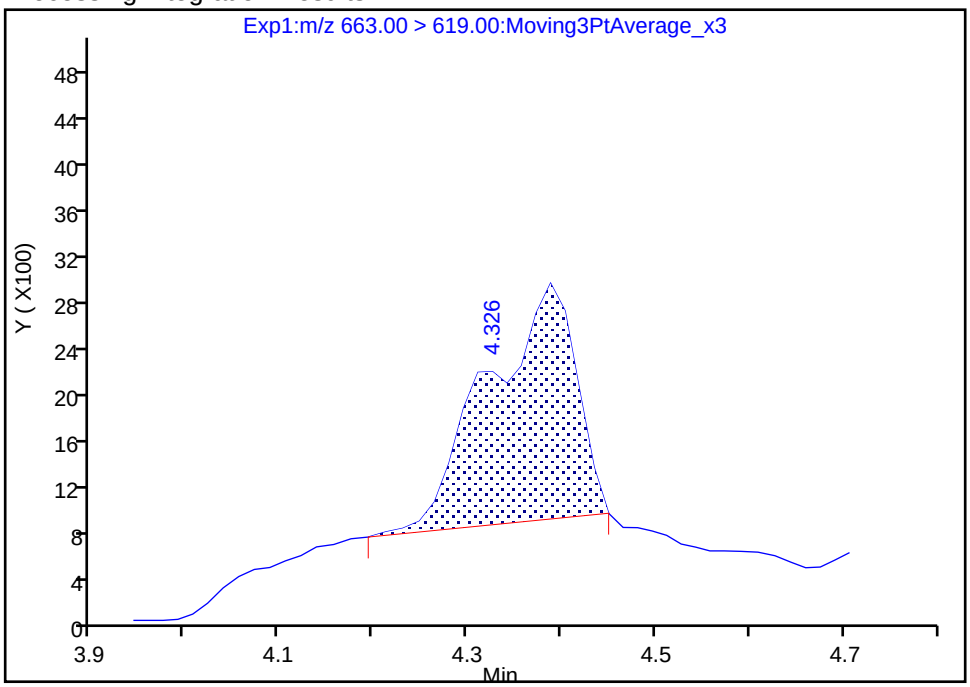
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

41 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 1

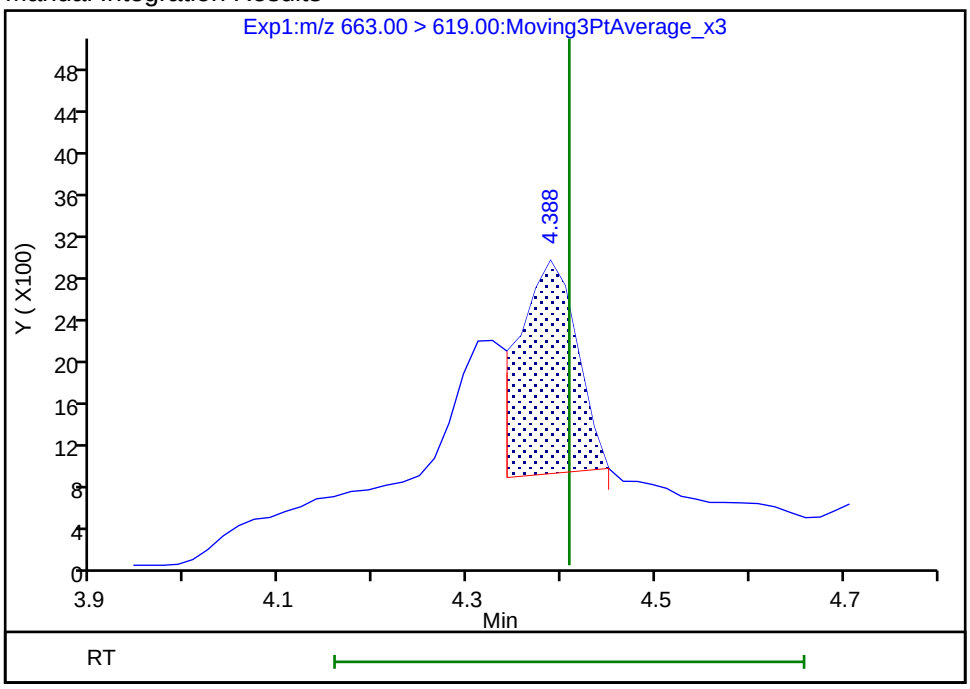
Processing Integration Results

RT: 4.33
Area: 13454
Amount: 0.006227
Amount Units: ng/ml



Manual Integration Results

RT: 4.39
Area: 8491
Amount: 0.003930
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:48

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

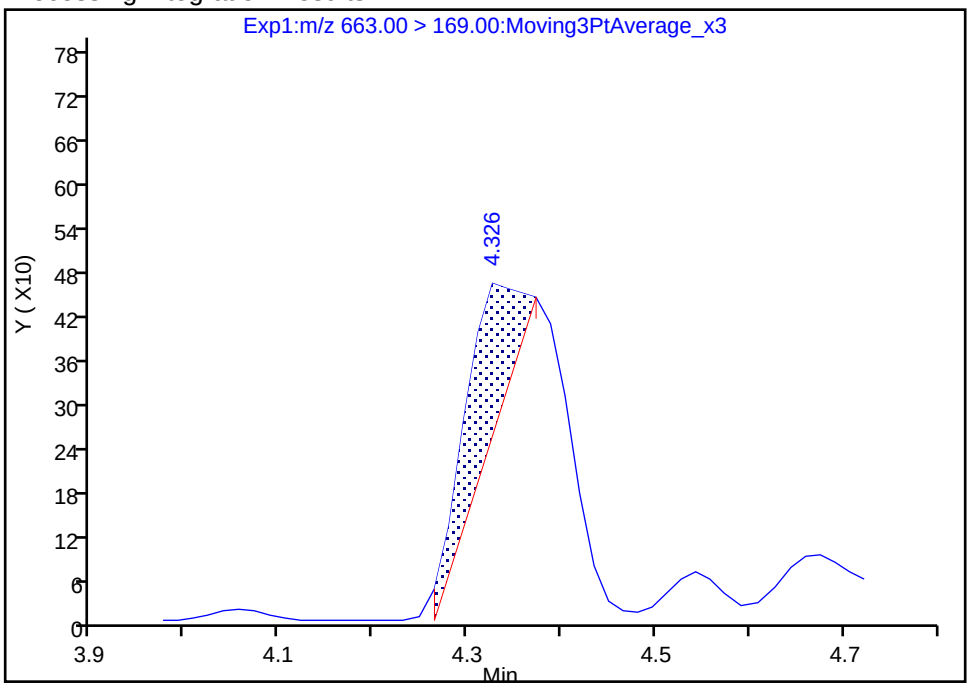
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

41 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 2

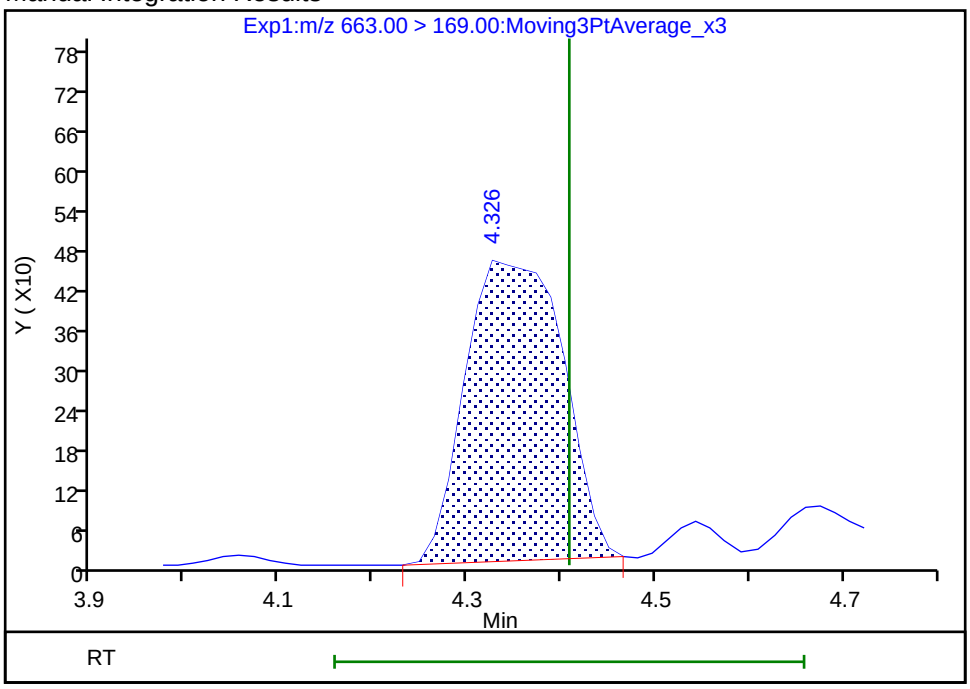
Processing Integration Results

RT: 4.33
Area: 787
Amount: 0.006227
Amount Units: ng/ml



Manual Integration Results

RT: 4.33
Area: 3265
Amount: 0.003930
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:48

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

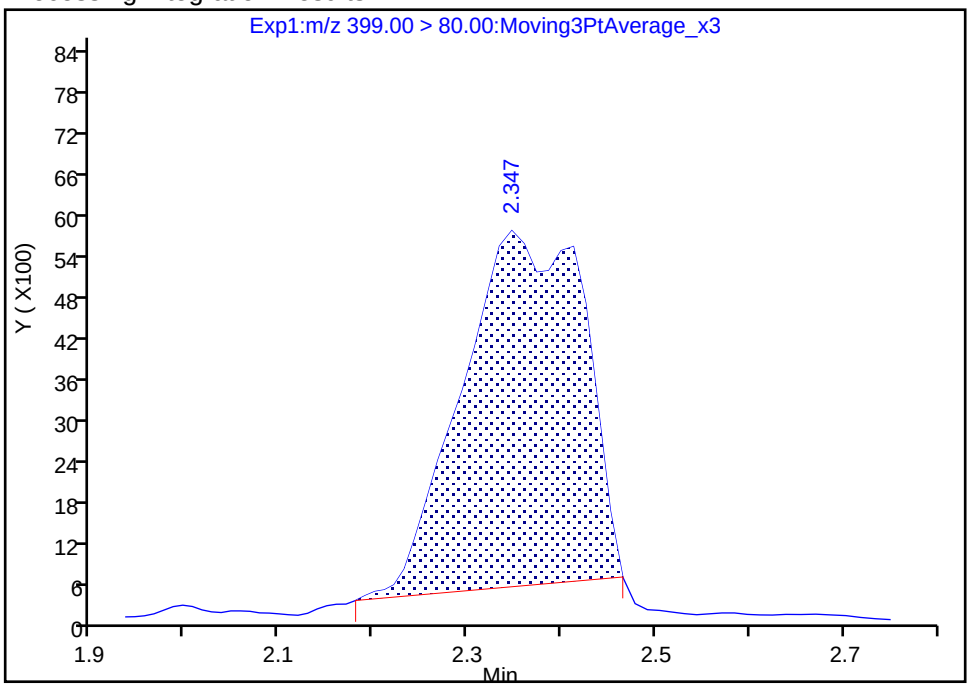
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

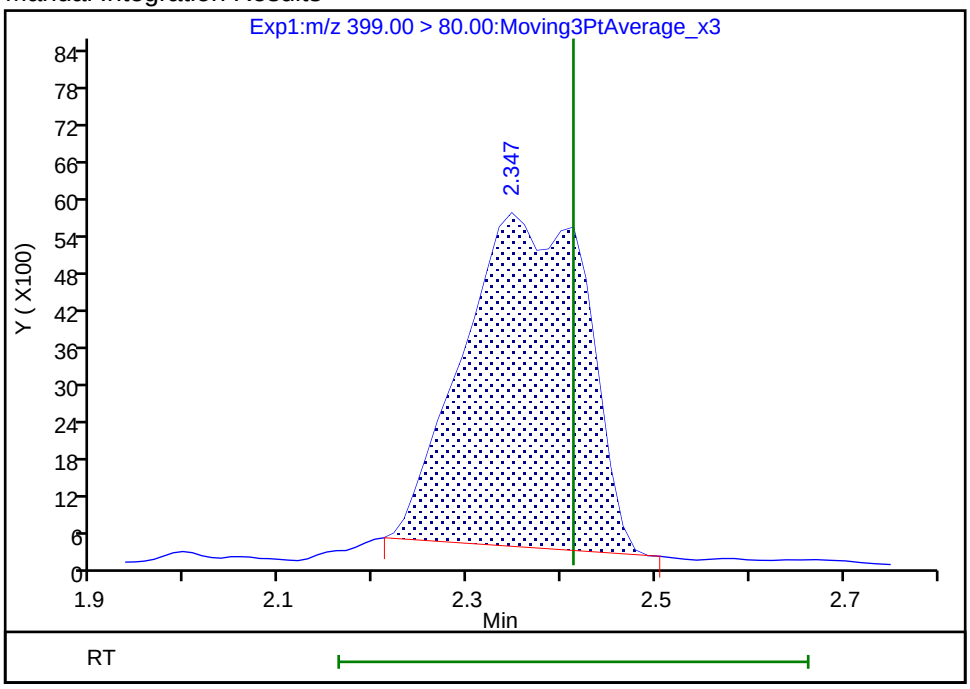
Processing Integration Results

RT: 2.35
Area: 47052
Amount: 0.019180
Amount Units: ng/ml



Manual Integration Results

RT: 2.35
Area: 49681
Amount: 0.020252
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:06:57

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

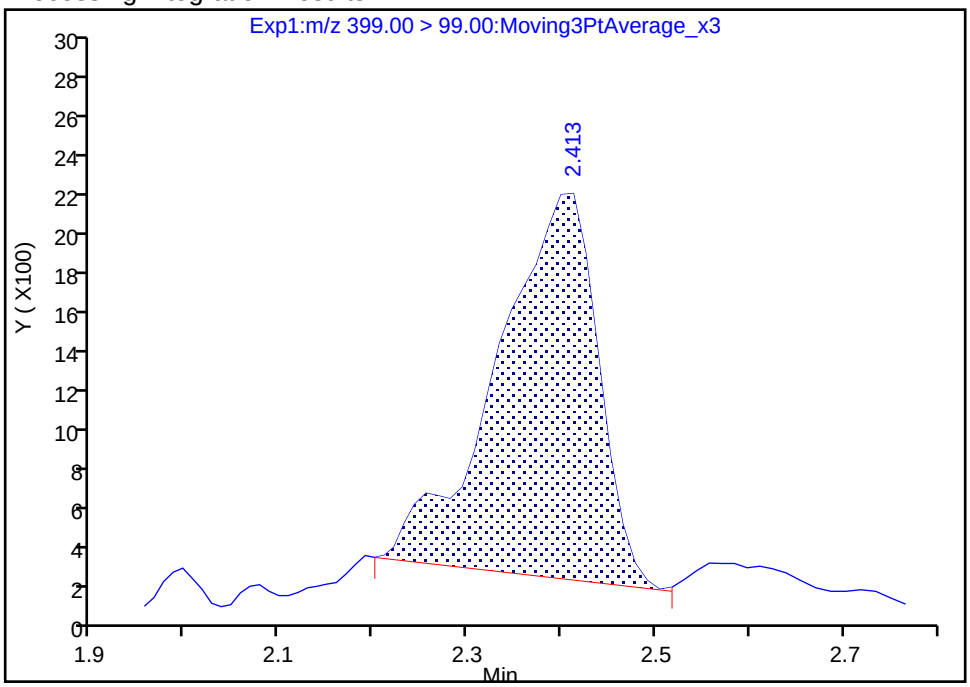
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

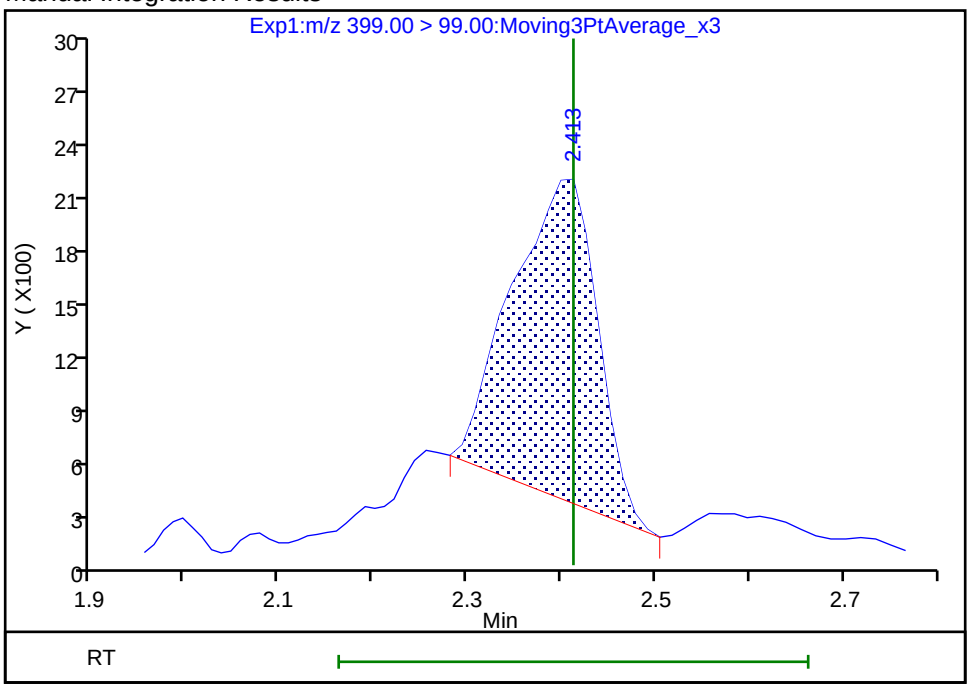
Processing Integration Results

RT: 2.41
Area: 14823
Amount: 0.019180
Amount Units: ng/ml



Manual Integration Results

RT: 2.41
Area: 11425
Amount: 0.020252
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:00
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

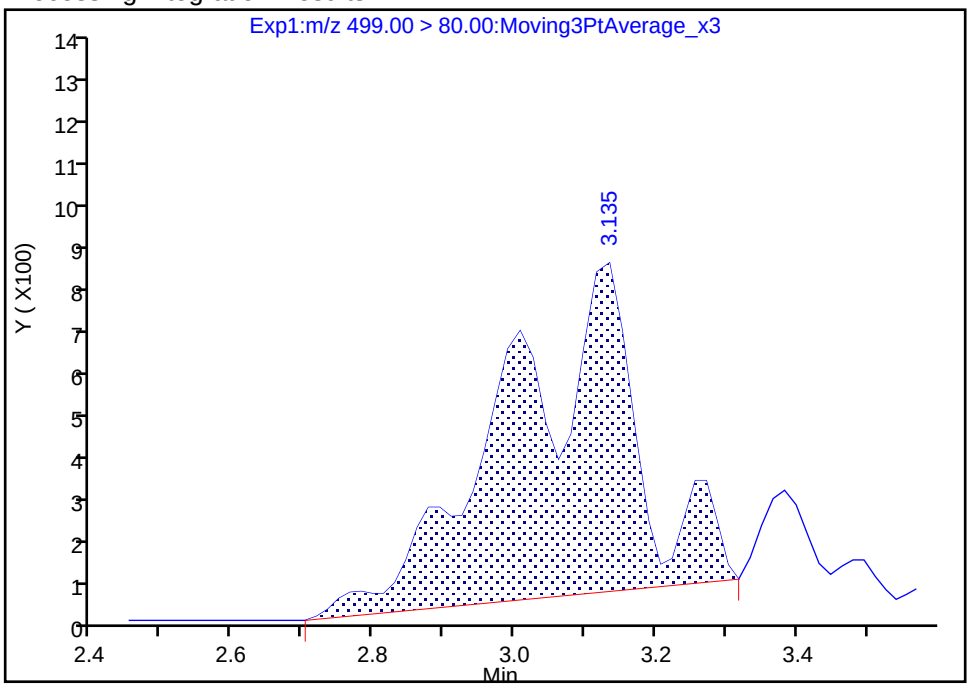
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

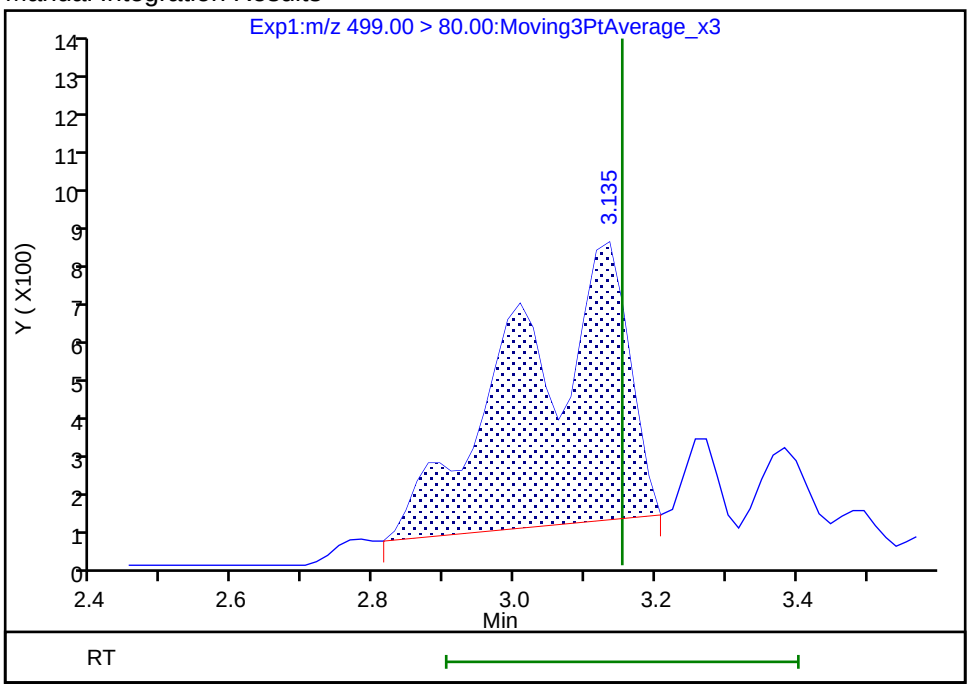
Processing Integration Results

RT: 3.13
Area: 9788
Amount: 0.004336
Amount Units: ng/ml



Manual Integration Results

RT: 3.13
Area: 7617
Amount: 0.003375
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:15

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

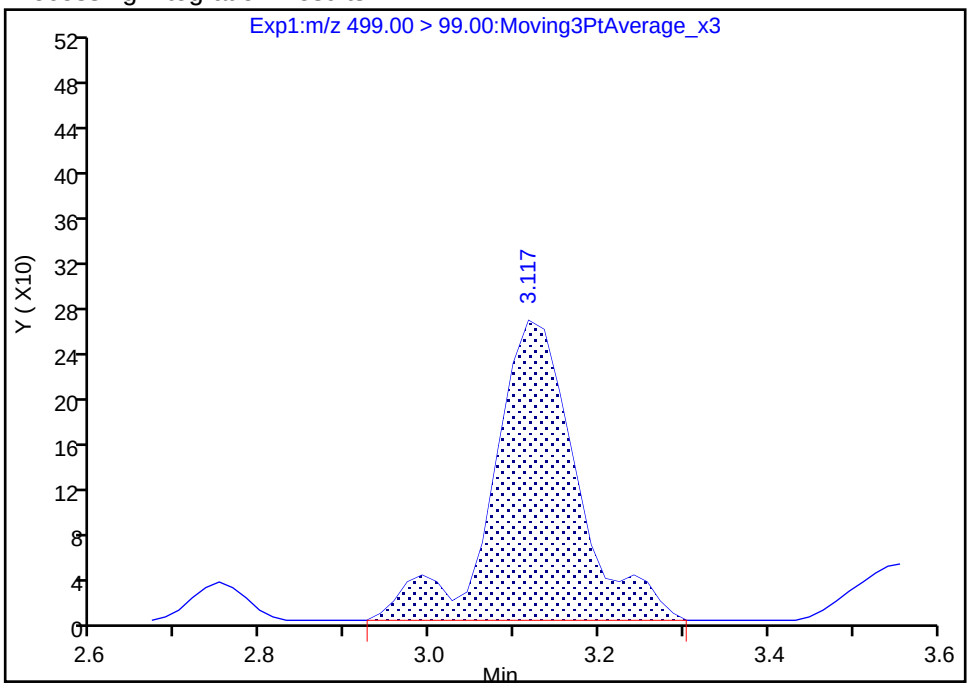
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

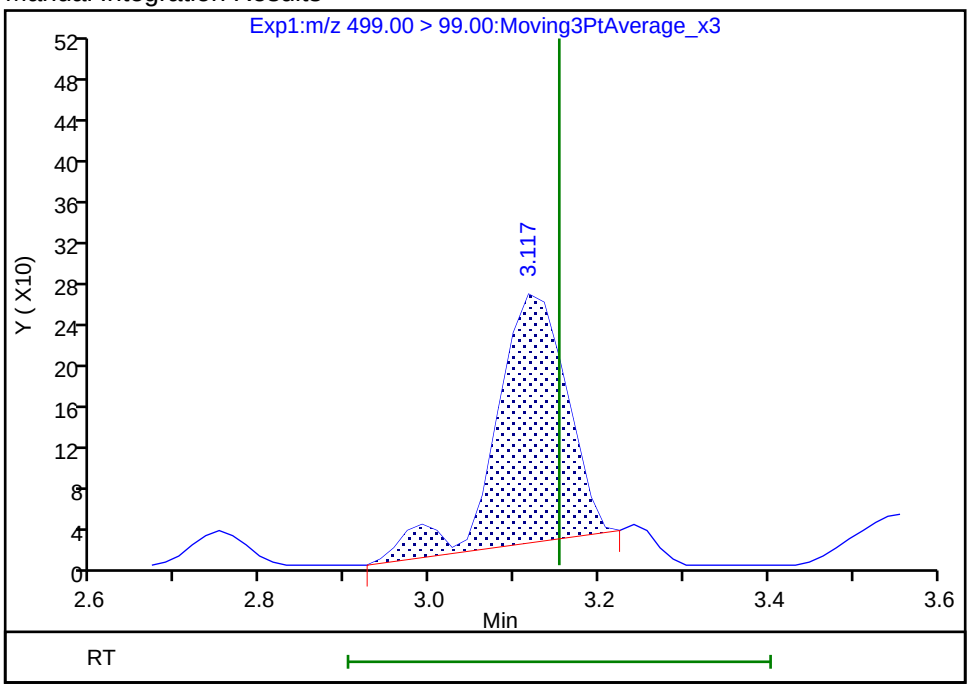
Processing Integration Results

RT: 3.12
Area: 1847
Amount: 0.004336
Amount Units: ng/ml



Manual Integration Results

RT: 3.12
Area: 1433
Amount: 0.003375
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:07:19

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

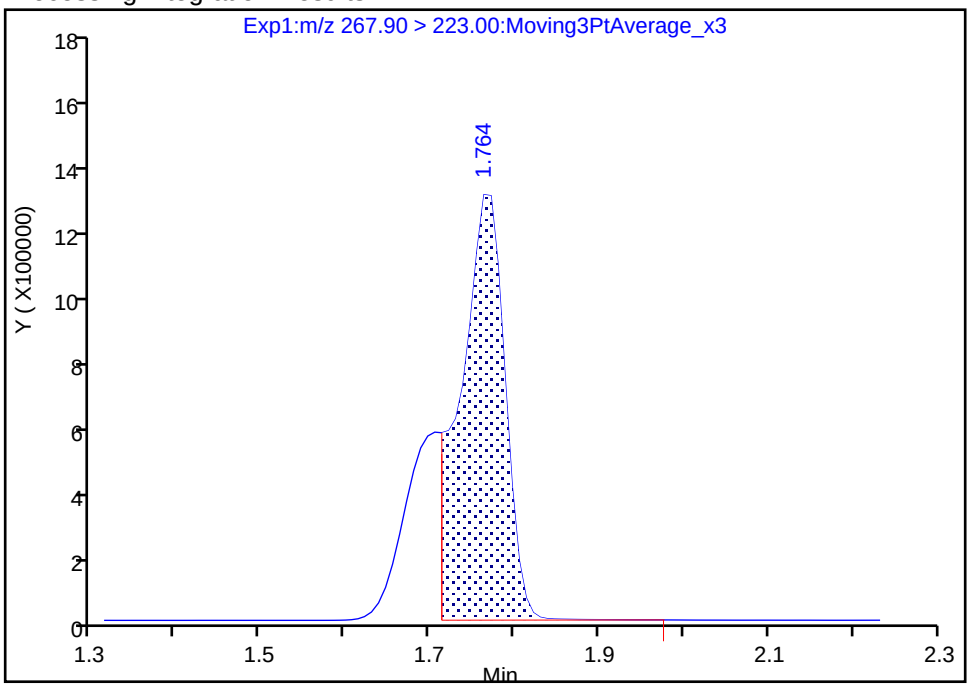
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d
Injection Date: 16-Sep-2018 15:46:30 Instrument ID: A9
Lims ID: 320-42924-A-3-A Lab Sample ID: 320-42924-3
Client ID: TP-PFC-033-TPE
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

D 3 13C5-PFPeA, CAS: STL01893

Signal: 1

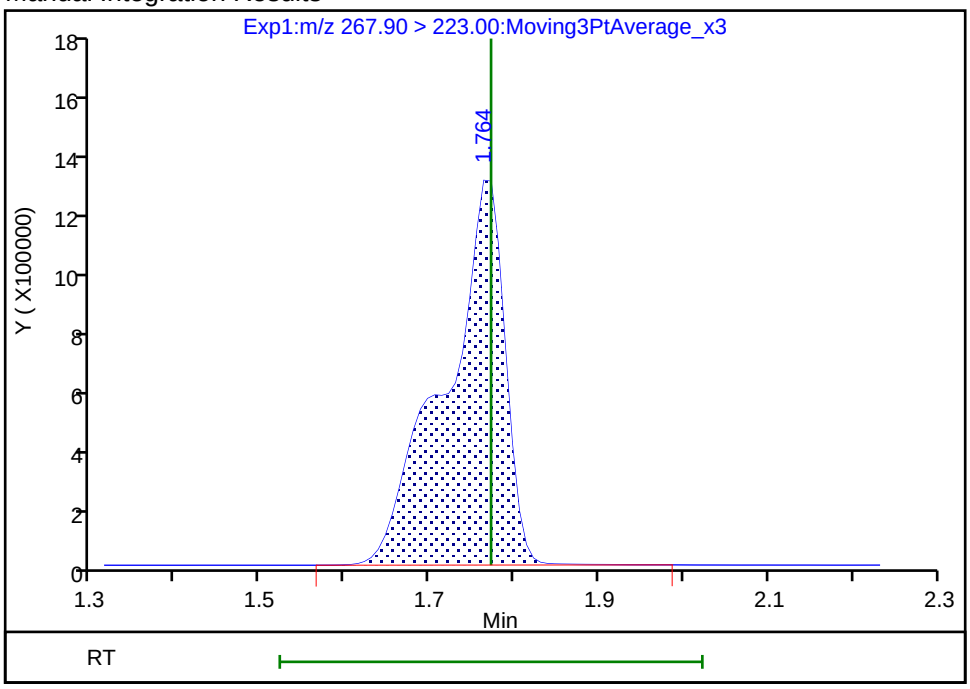
Processing Integration Results

RT: 1.76
Area: 4714302
Amount: 1.655610
Amount Units: ng/ml



Manual Integration Results

RT: 1.76
Area: 6427414
Amount: 2.257236
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:05:31
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

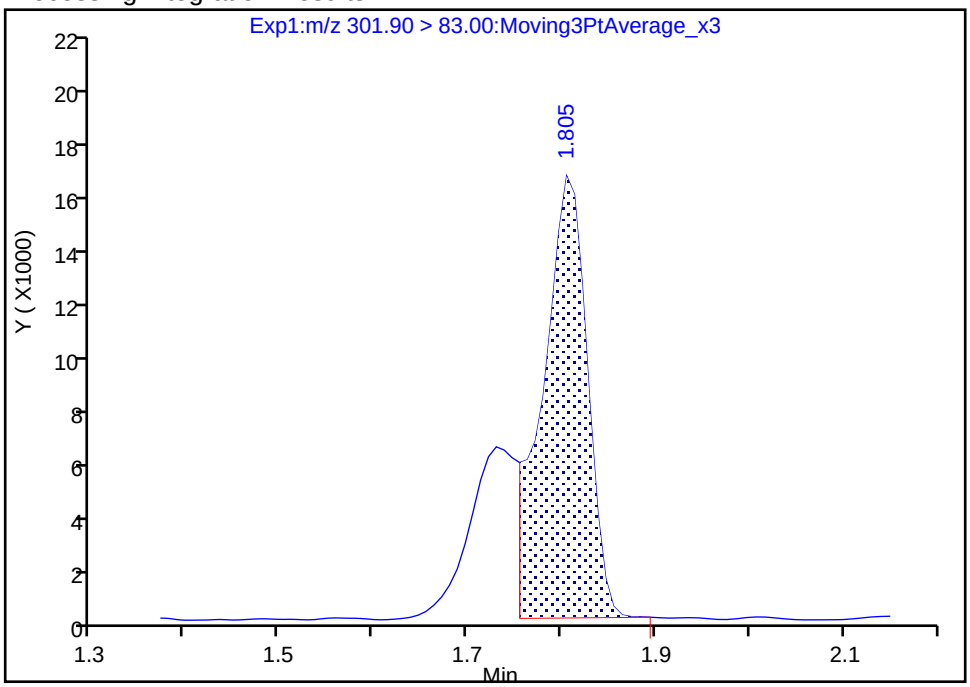
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_019.d				
Injection Date:	16-Sep-2018 15:46:30	Instrument ID:	A9		
Lims ID:	320-42924-A-3-A	Lab Sample ID:	320-42924-3		
Client ID:	TP-PFC-033-TPE				
Operator ID:	A9\Administrator	ALS Bottle#:	11	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

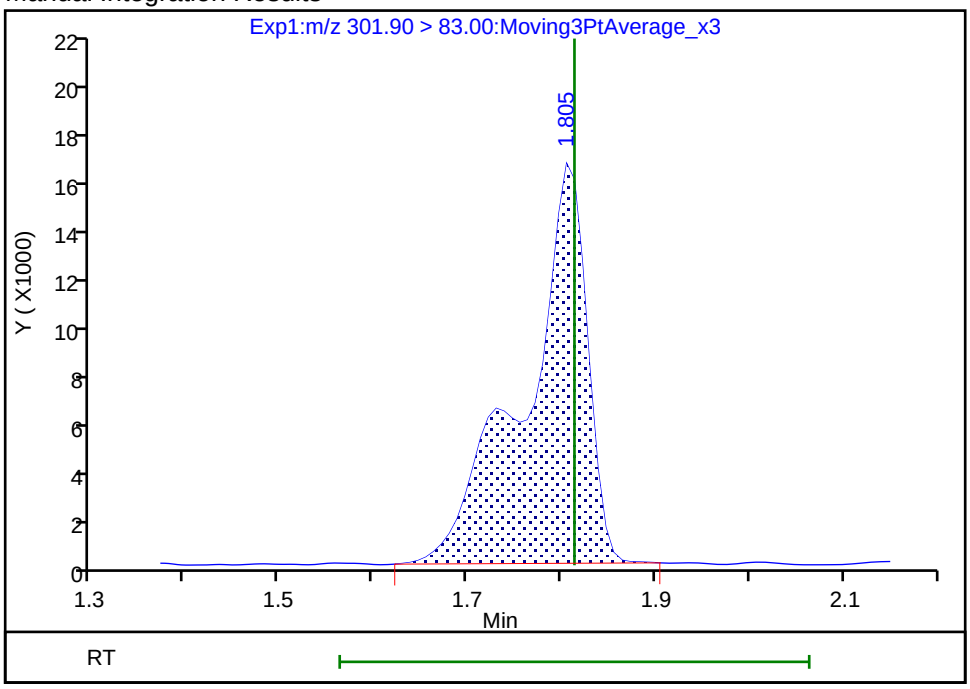
Processing Integration Results

RT: 1.81
Area: 53991
Amount: 1.444383
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 76367
Amount: 2.042993
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:05:40

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPE-D | Lab Sample ID: 320-42924-4

Matrix: Water | Lab File ID: 2018.09.16_LLA_020.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 00:00

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 307.1(mL) | Date Analyzed: 09/16/2018 15:54

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.6	1.2	0.48
2706-90-3	Perfluoropentanoic acid (PFPeA)	280		1.6	0.81	0.35
307-24-4	Perfluorohexanoic acid (PFHxA)	170	M	1.6	0.81	0.38
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.4	J M	1.6	1.2	0.50
335-67-1	Perfluorooctanoic acid (PFOA)	9.2	M	1.6	1.2	0.44
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U M	1.6	1.2	0.42
335-76-2	Perfluorodecanoic acid (PFDA)	0.81	U	1.6	0.81	0.39
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.6	1.2	0.59
307-55-1	Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	1.2	0.42
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.4	U M	3.3	2.4	0.62
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.4	U	3.3	2.4	0.68
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.5		1.6	0.81	0.37
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.65	J M	1.6	0.81	0.31
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.81	U	1.6	0.81	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.4	U M	3.3	2.4	0.90
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	1.2	0.46
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.4	U	3.3	2.4	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPE-D Lab Sample ID: 320-42924-4

Matrix: Water Lab File ID: 2018.09.16_LLA_020.d

Analysis Method: EPA 537 (Mod) Date Collected: 09/06/2018 00:00

Extraction Method: 3535 Date Extracted: 09/14/2018 08:21

Sample wt/vol: 307.1(mL) Date Analyzed: 09/16/2018 15:54

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	86		50-150
STL00992	13C4 PFBA	75		50-150
STL01893	13C5 PFPeA	83	M	50-150
STL00993	13C2 PFHxA	83		50-150
STL01892	13C4-PFHpA	87		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	87		50-150
STL00996	13C2 PFDA	92		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	84		50-150
STL00994	18O2 PFHxS	87		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	89		50-150
STL02337	13C3-PFBS	89	M	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d
Lims ID: 320-42924-A-4-A
Client ID: TP-PFC-033-TPE-D
Sample Type: Client
Inject. Date: 16-Sep-2018 15:54:01 ALS Bottle#: 12 Worklist Smp#: 9
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-42924-a-4-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 16:11:12 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 16:11:12

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	1.484	1.494	-0.010	1.000	9017693	3.94			487	
D 1 13C4 PFBA										
217.00 > 172.00	1.484	1.494	-0.010	0.539	6261097	1.88		75.4	833	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.772	-0.008	1.000	21032620	8.45			1149	
D 3 13C5-PFPeA										M
267.90 > 223.00	1.764	1.772	-0.008	0.641	6138371	2.07		82.9	6876	M
D 47 13C3-PFBS										M
301.90 > 83.00	1.806	1.814	-0.008	0.656	80790	2.08		89.3	468	M
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.806	1.814	-0.008	1.000	507207	0.1389			277	
298.90 > 99.00	1.797	1.814	-0.017	0.995	215075		2.36(1.35-4.05)		103	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.068	-0.010	0.748	6514719	2.08		83.2	8897	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.048	2.068	-0.020	0.995	12528545	5.28			1376	M
313.00 > 119.00	2.058	2.068	-0.010	1.000	640991		19.55(6.96-20.87)		946	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.399	-0.013	0.868	8161388	2.18		87.4	9260	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.360	2.400	-0.040	0.989	142693	0.0429			10.1	M
363.00 > 169.00	2.386	2.400	-0.014	1.000	32864		4.34(2.17-6.52)		13.2	M
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.400	2.413	-0.013	1.000	49645	0.0200			45.2	M
399.00 > 99.00	2.400	2.413	-0.013	1.000	15158		3.28(1.90-5.70)		12.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.426	-0.026	0.872	4741792	2.06		87.3	10662	

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	2.750	2.766	-0.016	1.000	7671037	2.21		88.2	10925	
* 62 13C2-PFOA										
415.00 > 370.00	2.750	2.766	-0.016		8629172	2.50			17033	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.655	2.766	-0.111	0.965	935709	0.2833			28.1	
413.00 > 169.00	2.655	2.766	-0.111	0.965	438788		2.13(1.36-4.08)		264	M
D 19 13C5 PFNA										
468.00 > 423.00	3.135	3.153	-0.018	1.140	7103105	2.18		87.2	4551	
D 18 13C4 PFOS										
503.00 > 80.00	3.135	3.153	-0.018	1.140	5275838	2.14		89.4	4183	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.135	3.153	-0.018	1.000	9590	0.004117			4.4	M
499.00 > 99.00	3.117	3.153	-0.036	0.994	1233		7.78(2.04-6.12)		5.0	
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.465	0.0	1.260	2796180	2.14		85.7	3977	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.465	3.465	0.0	1.000	3756	0.001133			9.0	
D 23 13C2 PFDA										
515.00 > 470.00	3.496	3.512	-0.016	1.271	7459725	2.29		91.7	13173	
31 Perfluoroundecanoic acid										RMa
563.00 > 519.00	3.823	3.839	-0.016	1.000	18036	0.008463			3.8	Ra
563.00 > 169.00	3.823	3.839	-0.016	1.000	863		20.90(5.24-15.72)		2.8	
D 30 13C2 PFUnA										
565.00 > 520.00	3.823	3.854	-0.031	1.390	5938624	2.14		85.8	4434	
D 36 13C2 PFDoA										
615.00 > 570.00	4.106	4.139	-0.033	1.493	7073357	2.10		84.0	7798	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.627	4.660	-0.033	1.682	5308147	1.98		79.1	7162	

QC Flag Legend

Processing Flags
R - Failed Signal Ratio Test
Review Flags
M - Manually Integrated
a - User Assigned ID

Report Date: 17-Sep-2018 16:11:12 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d

Injection Date: 16-Sep-2018 15:54:01 Instrument ID: A9

Lims ID: 320-42924-A-4-A Lab Sample ID: 320-42924-4

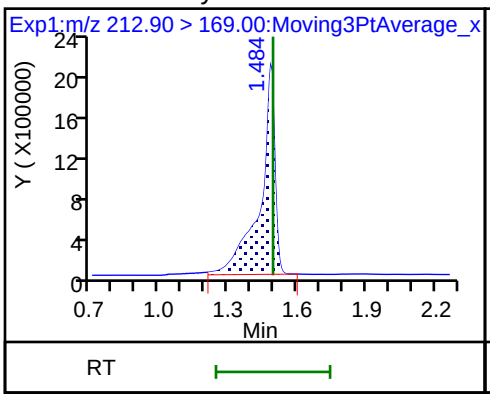
Client ID: TP-PFC-033-TPE-D

Operator ID: A9\Administrator ALS Bottle#: 12 Worklist Smp#: 9

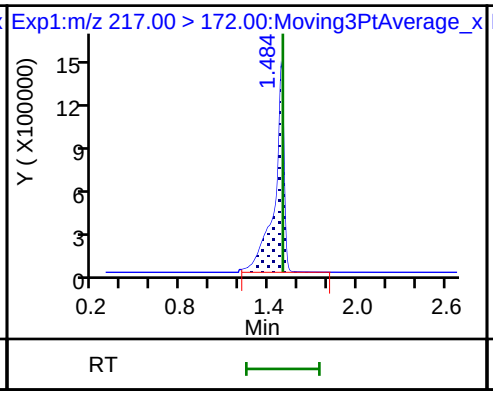
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

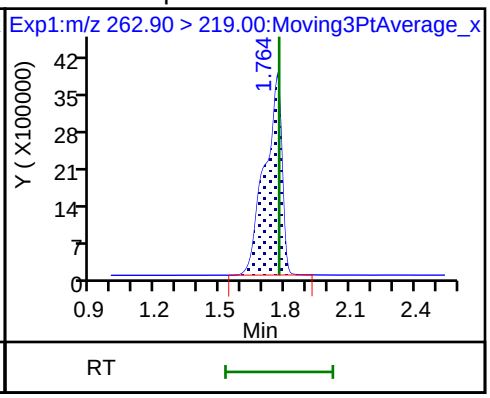
2 Perfluorobutyric acid



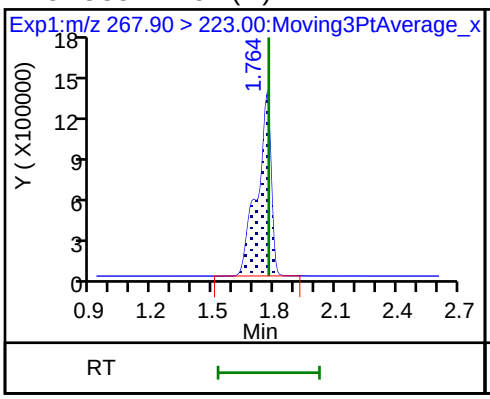
D 1 13C4 PFBA



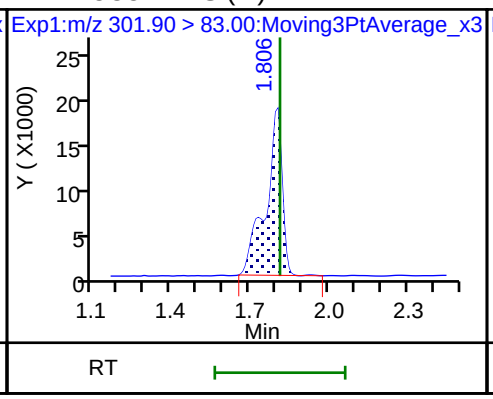
4 Perfluoropentanoic acid



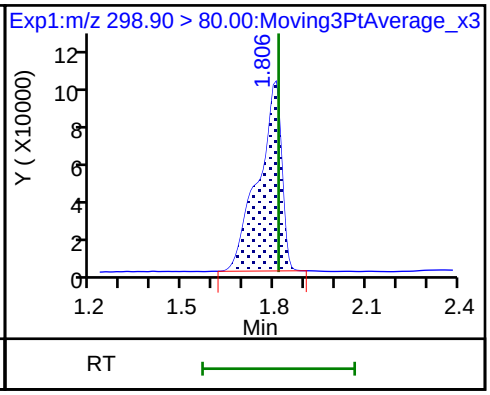
D 3 13C5-PFPeA (M)



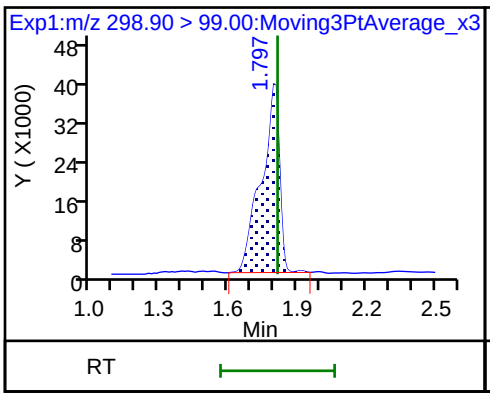
D 47 13C3-PFBS (M)



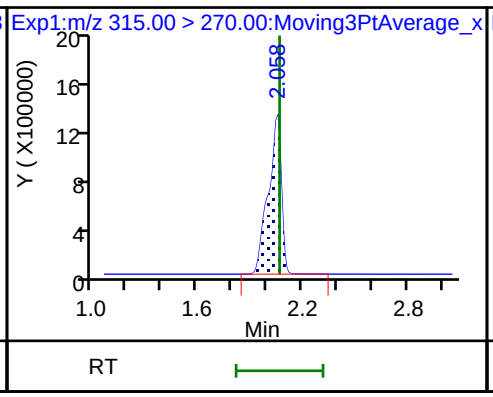
5 Perfluorobutanesulfonic acid



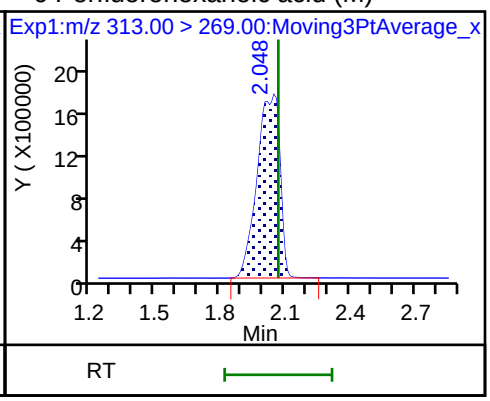
5 Perfluorobutanesulfonic acid



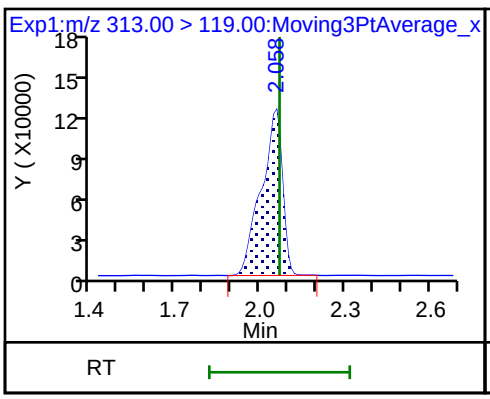
D 7 13C2 PFHxA



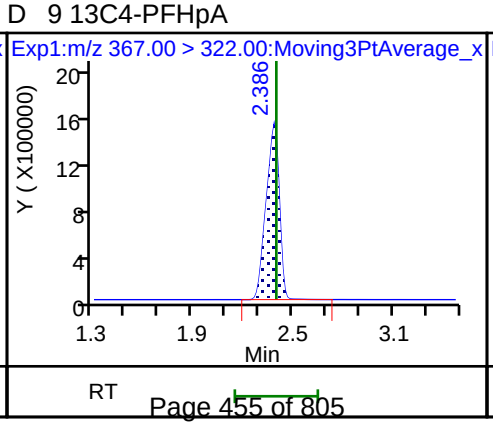
6 Perfluorohexanoic acid (M)



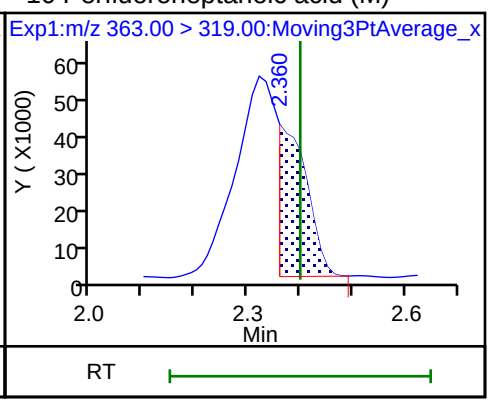
6 Perfluorohexanoic acid



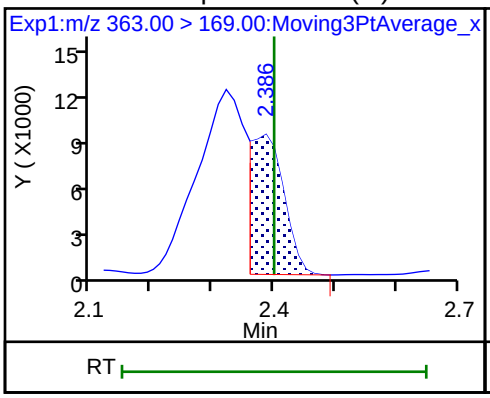
D 9 13C4-PFHpA



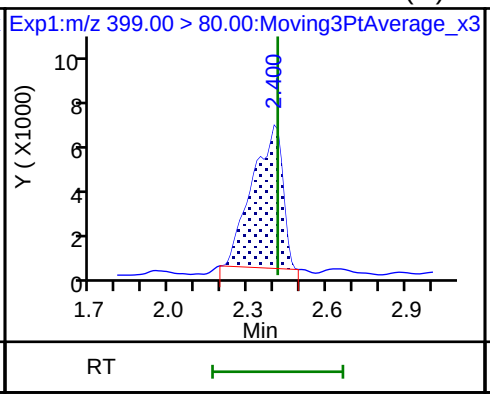
10 Perfluoroheptanoic acid (M)



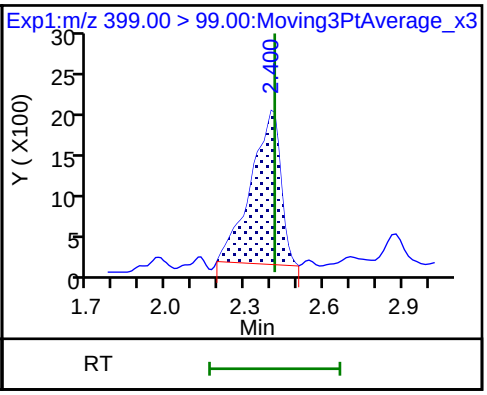
10 Perfluoroheptanoic acid (M)



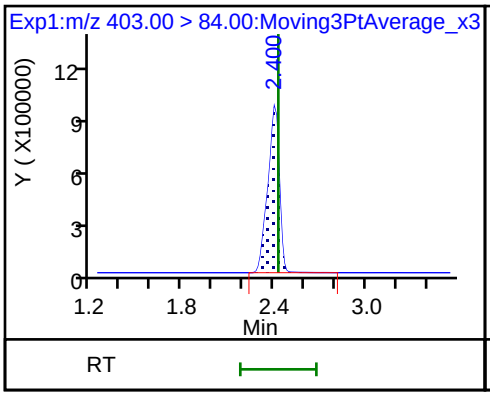
8 Perfluorohexanesulfonic acid (M)



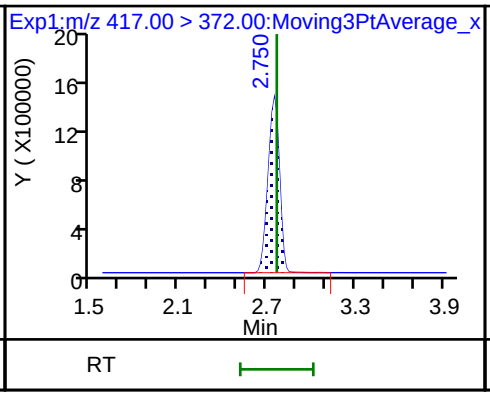
8 Perfluorohexanesulfonic acid



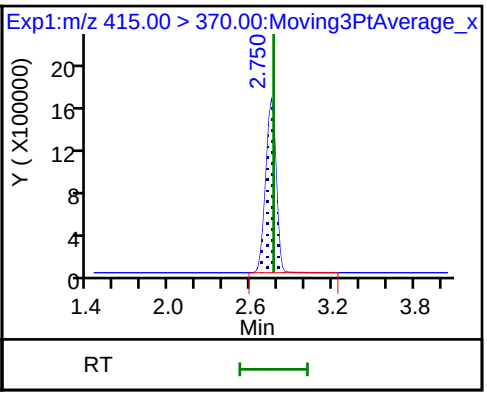
D 11 18O2 PFHxS



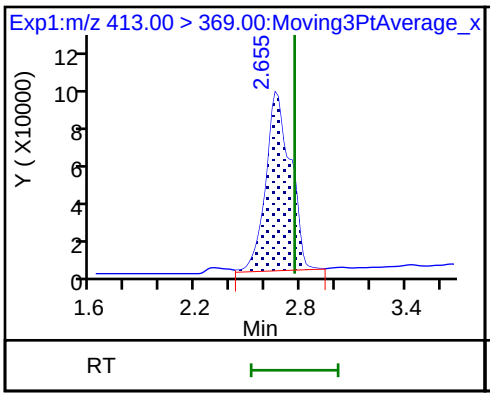
D 14 13C4 PFOA



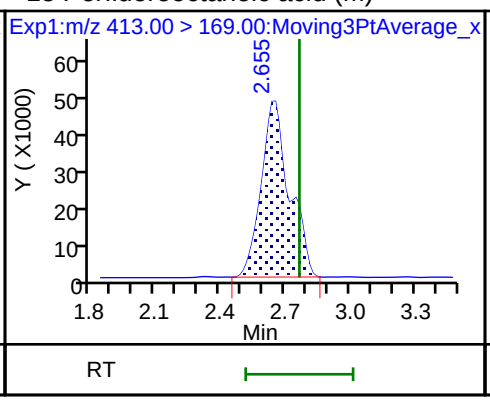
* 62 13C2-PFOA



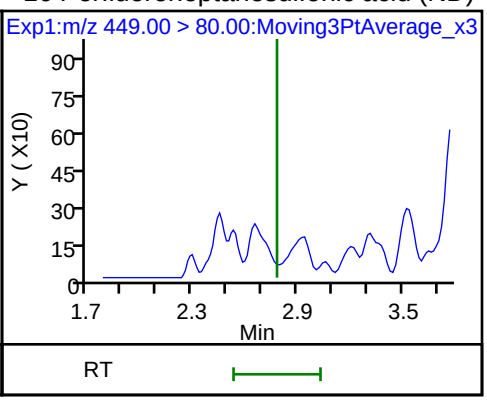
15 Perfluorooctanoic acid



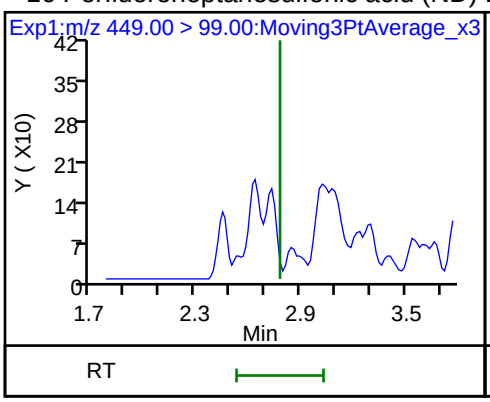
15 Perfluorooctanoic acid (M)



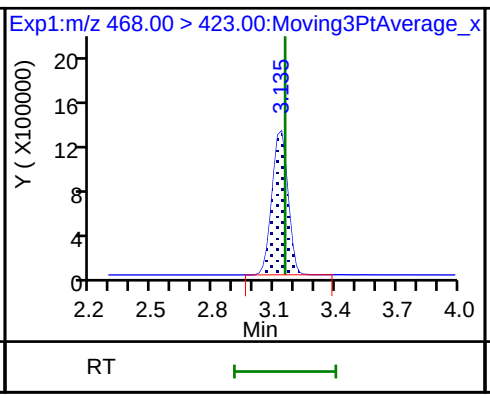
16 Perfluoroheptanesulfonic acid (ND)



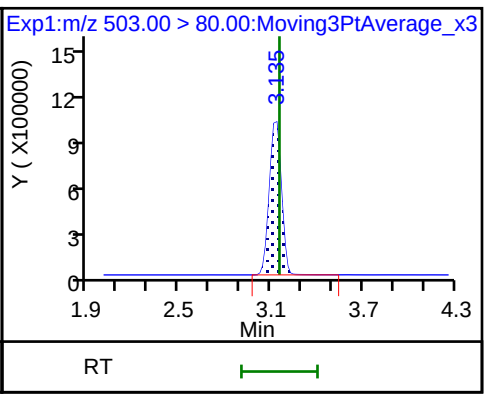
16 Perfluoroheptanesulfonic acid (ND)



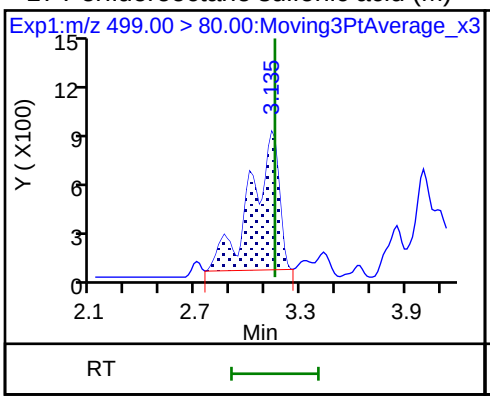
D 19 13C5 PFNA



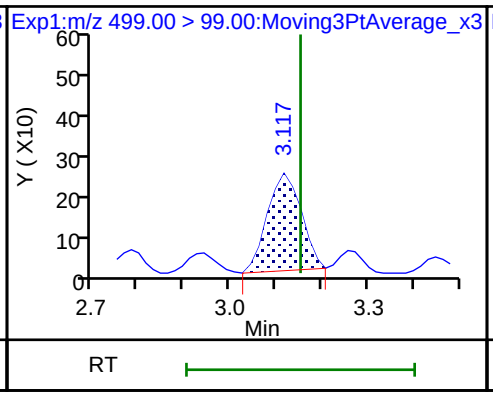
D 18 13C4 PFOS



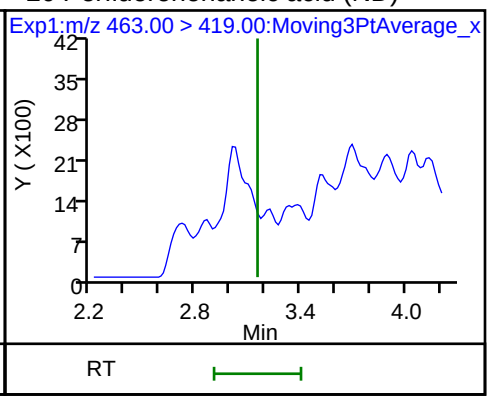
17 Perfluorooctane sulfonic acid (M)



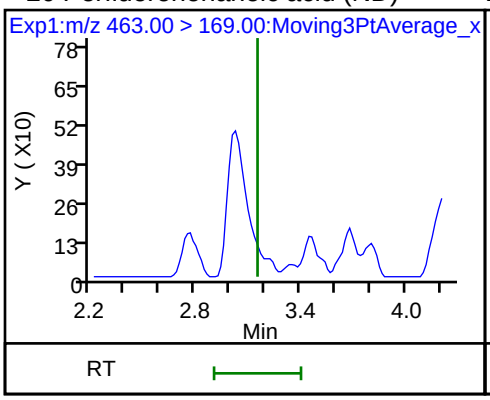
17 Perfluorooctane sulfonic acid



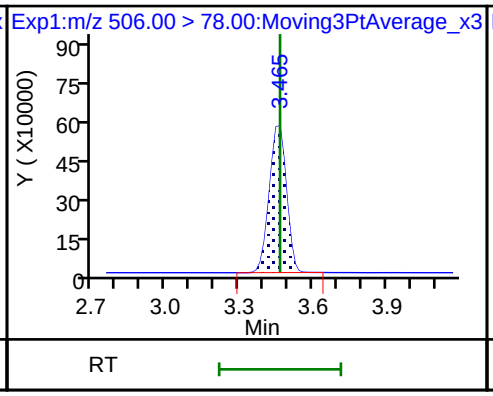
20 Perfluorononanoic acid (ND)



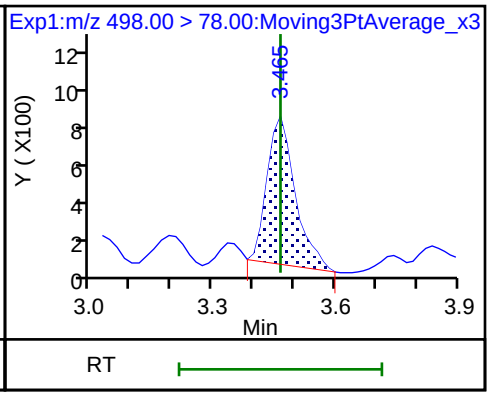
20 Perfluorononanoic acid (ND)



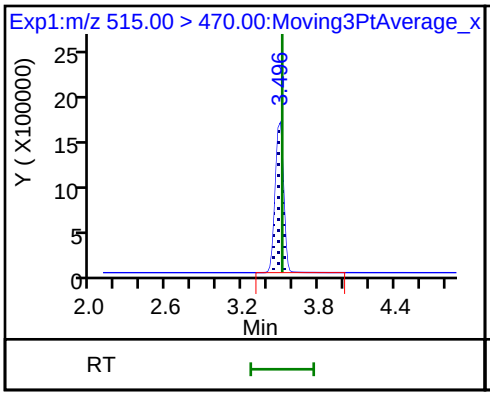
D 21 13C8 FOSA



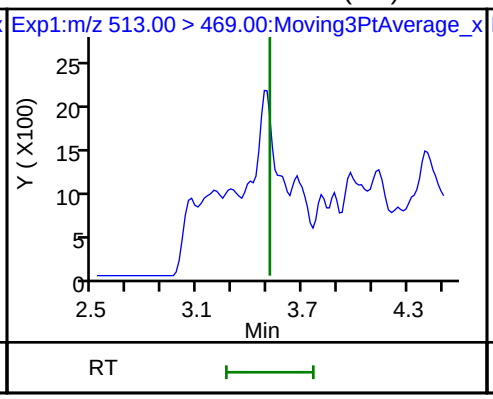
22 Perfluorooctane Sulfonamide



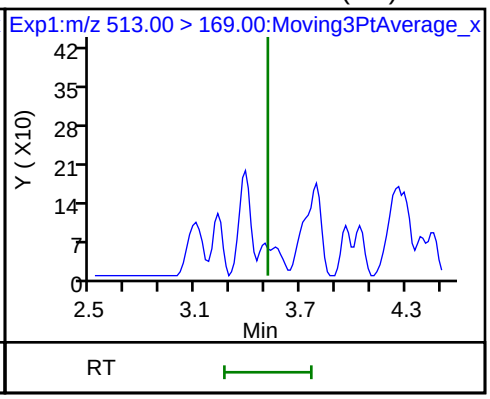
D 23 13C2 PFDA



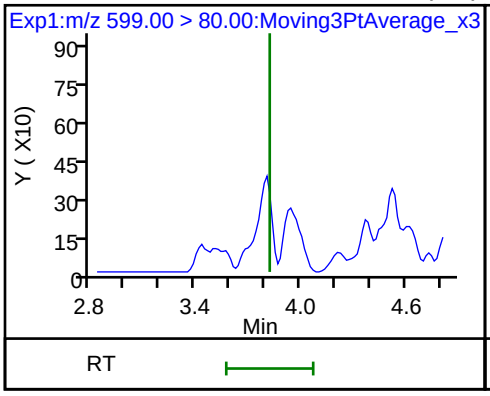
24 Perfluorodecanoic acid (ND)



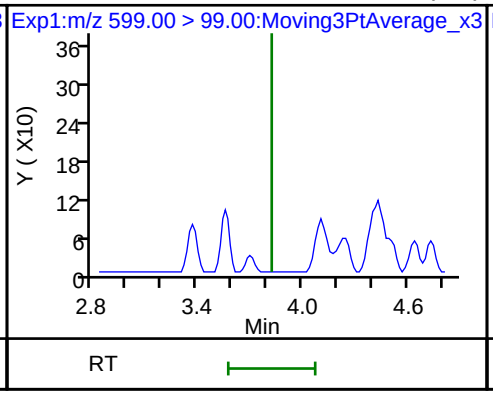
24 Perfluorodecanoic acid (ND)



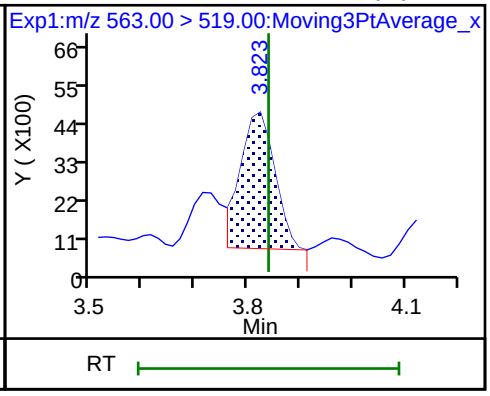
29 Perfluorodecane Sulfonic acid (ND)



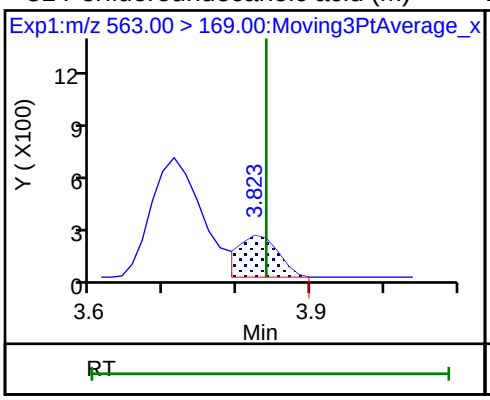
29 Perfluorodecane Sulfonic acid (ND)



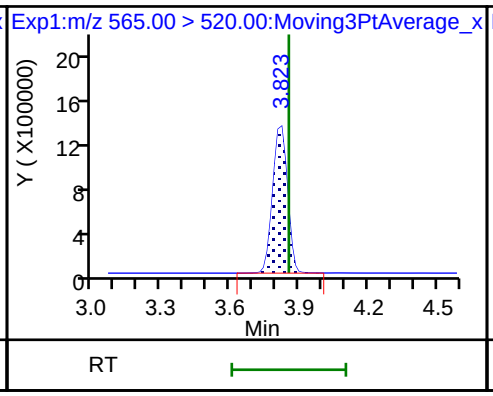
31 Perfluoroundecanoic acid (M)



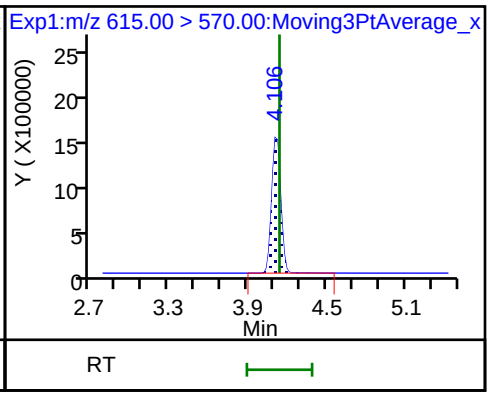
31 Perfluoroundecanoic acid (M)



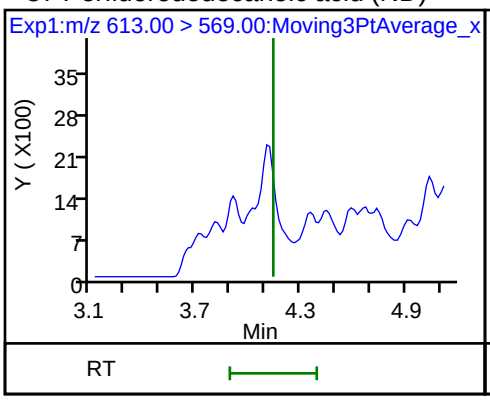
D 30 13C2 PFUnA



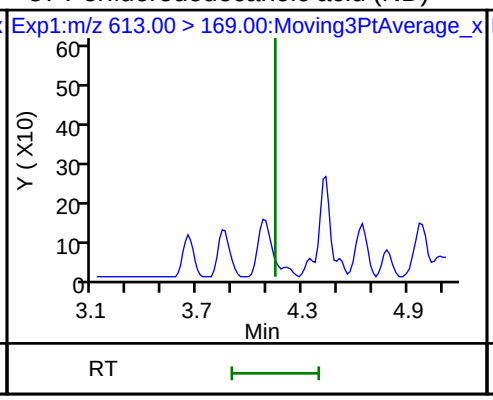
D 36 13C2 PFDoA



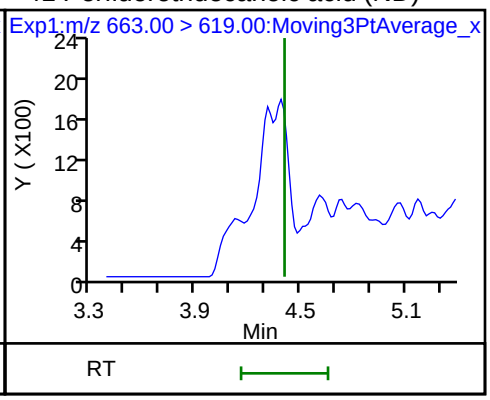
37 Perfluorododecanoic acid (ND)



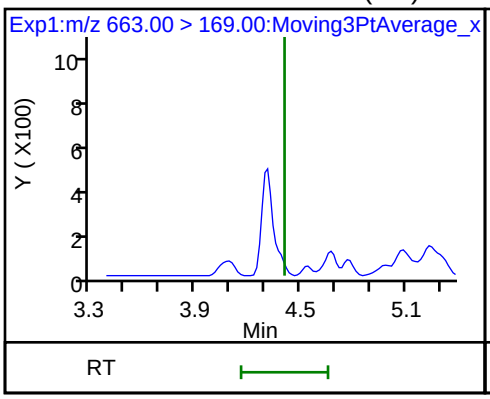
37 Perfluorododecanoic acid (ND)



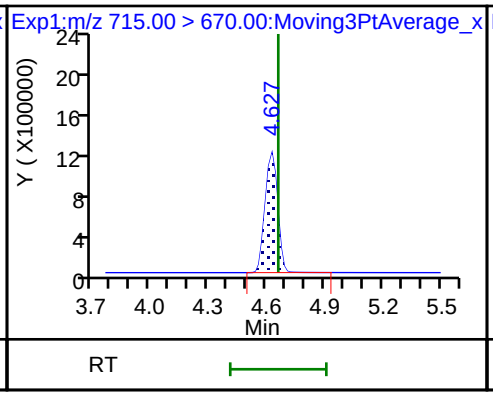
41 Perfluorotridecanoic acid (ND)



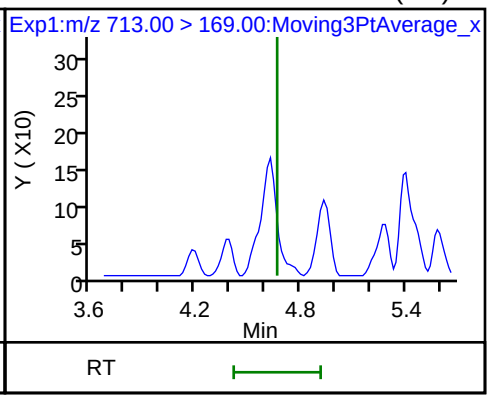
41 Perfluorotridecanoic acid (ND)



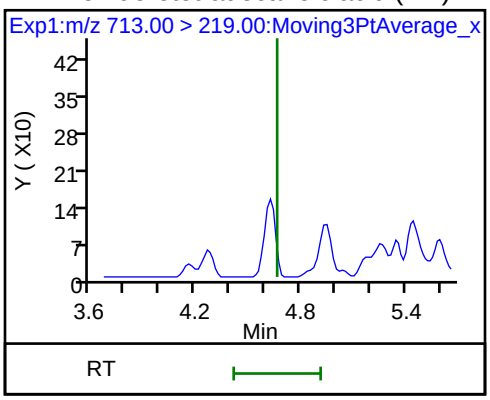
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

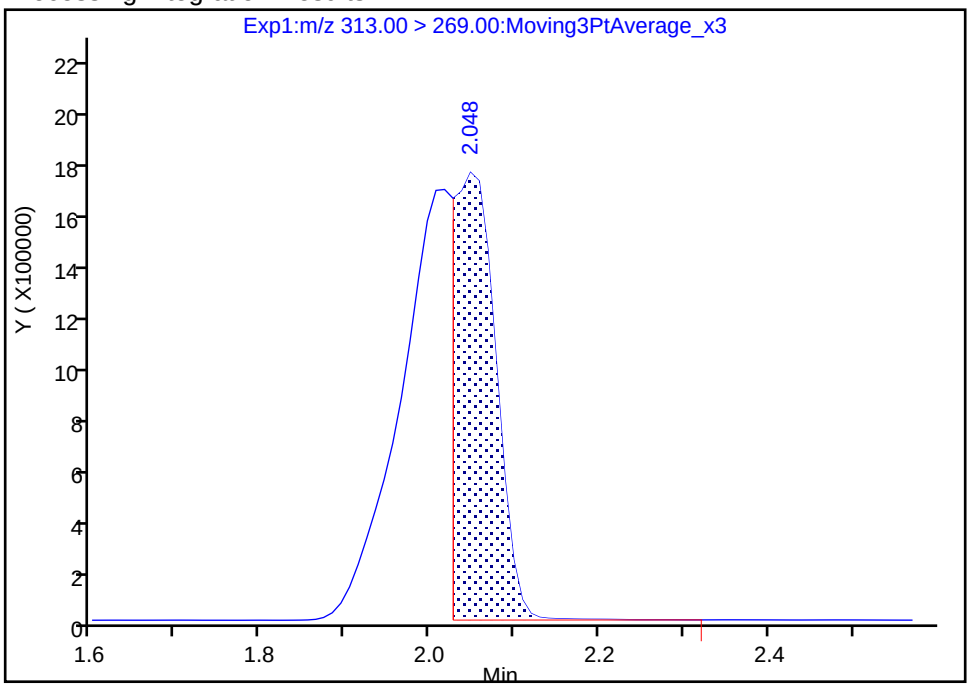
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

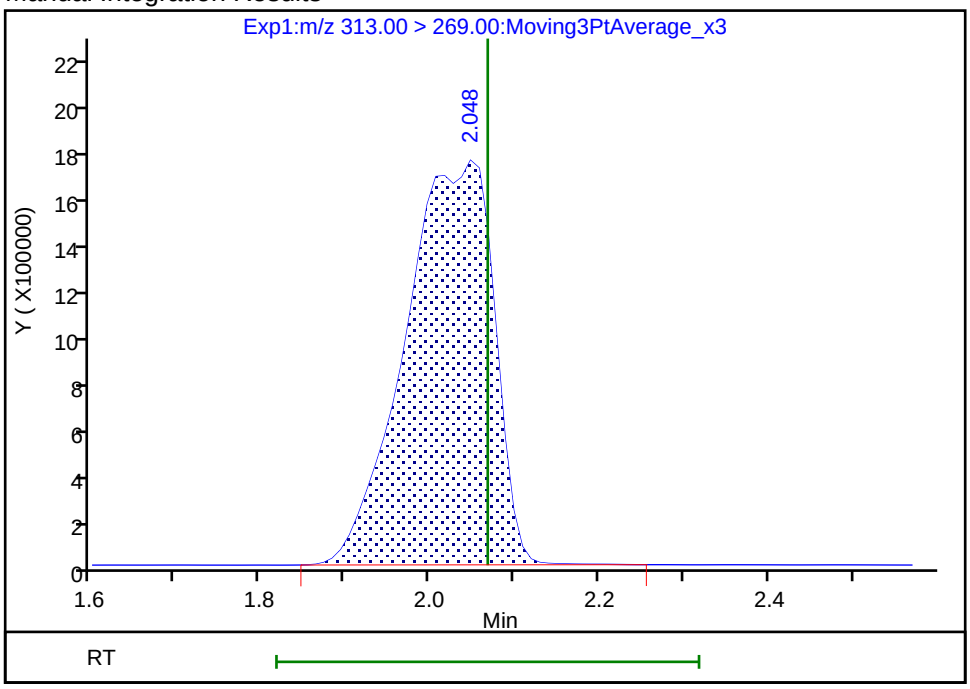
Processing Integration Results

RT: 2.05
Area: 5629289
Amount: 2.372144
Amount Units: ng/ml



Manual Integration Results

RT: 2.05
Area: 12528545
Amount: 5.279443
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:09:55

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

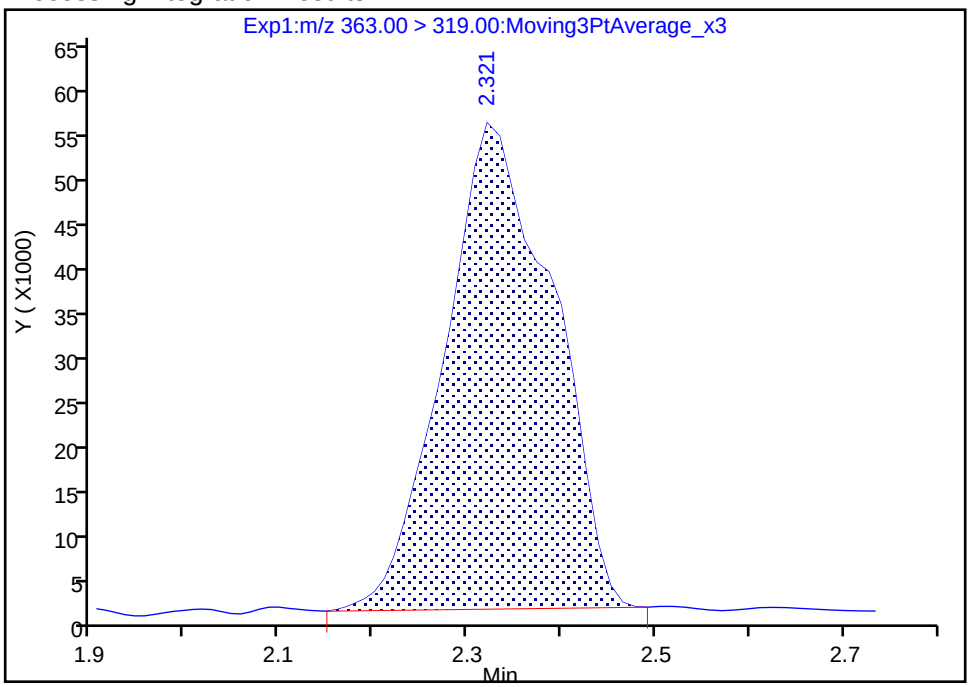
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

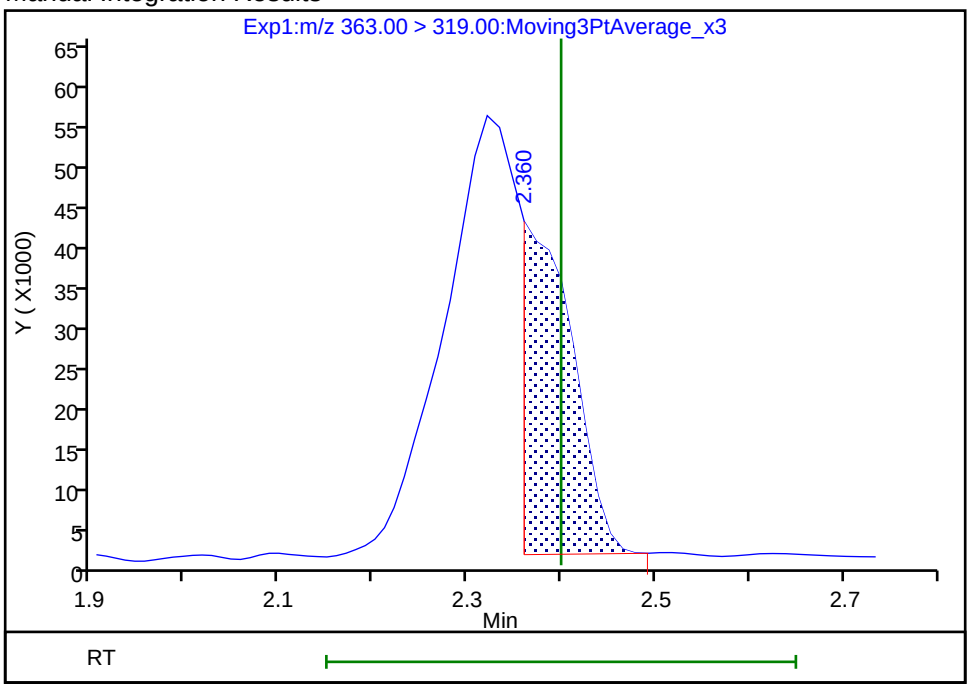
Processing Integration Results

RT: 2.32
Area: 432923
Amount: 0.130049
Amount Units: ng/ml



Manual Integration Results

RT: 2.36
Area: 142693
Amount: 0.042865
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:10:13

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

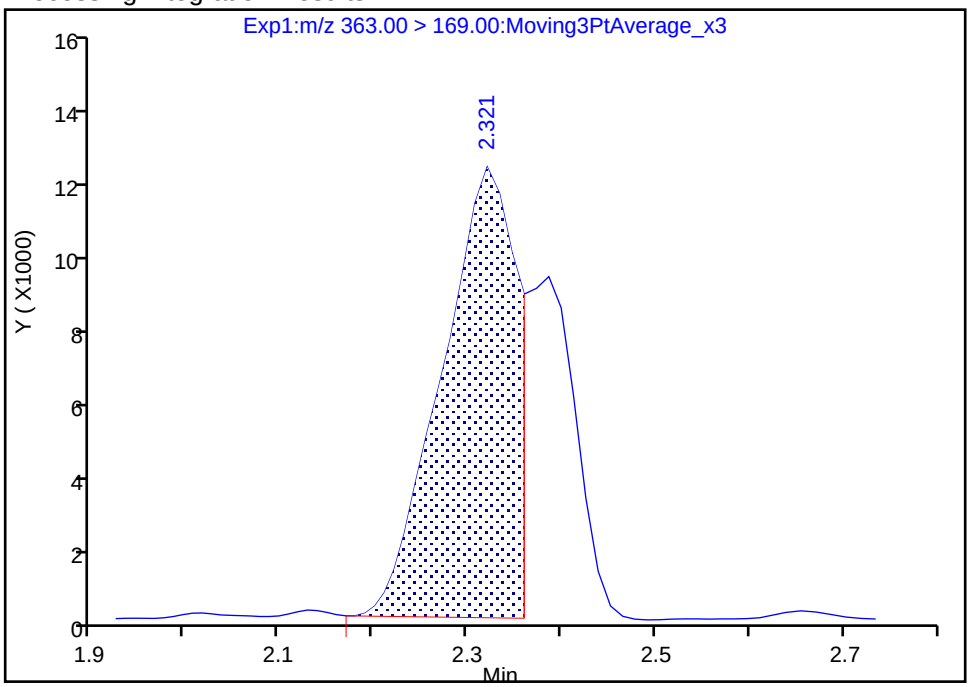
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d
Injection Date: 16-Sep-2018 15:54:01 Instrument ID: A9
Lims ID: 320-42924-A-4-A Lab Sample ID: 320-42924-4
Client ID: TP-PFC-033-TPE-D
Operator ID: A9\Administrator ALS Bottle#: 12 Worklist Smp#: 9
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 2

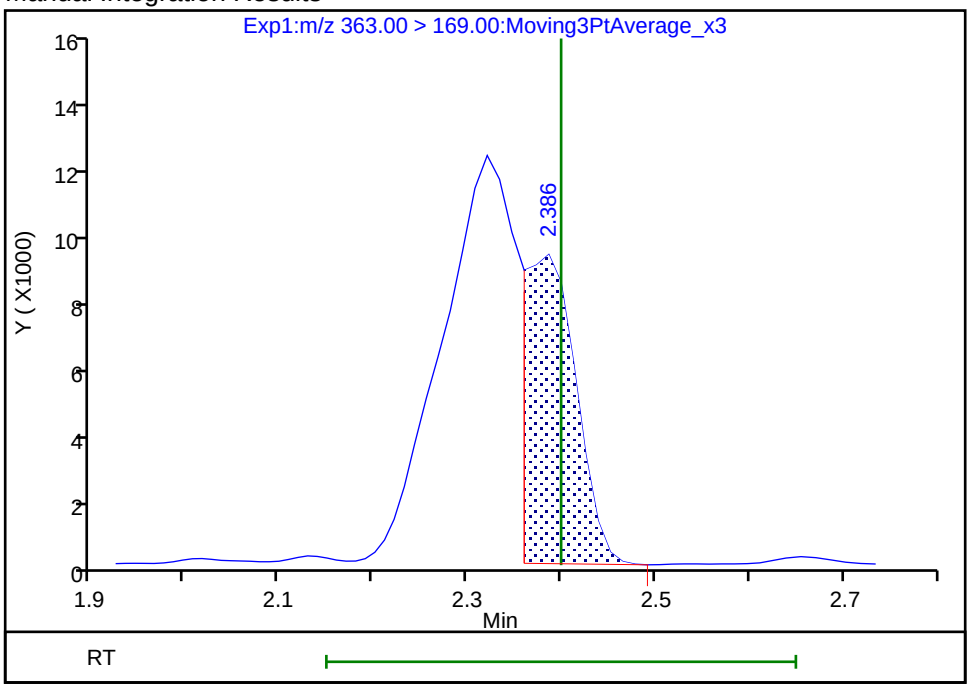
Processing Integration Results

RT: 2.32
Area: 65214
Amount: 0.130049
Amount Units: ng/ml



Manual Integration Results

RT: 2.39
Area: 32864
Amount: 0.042865
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:10:15
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

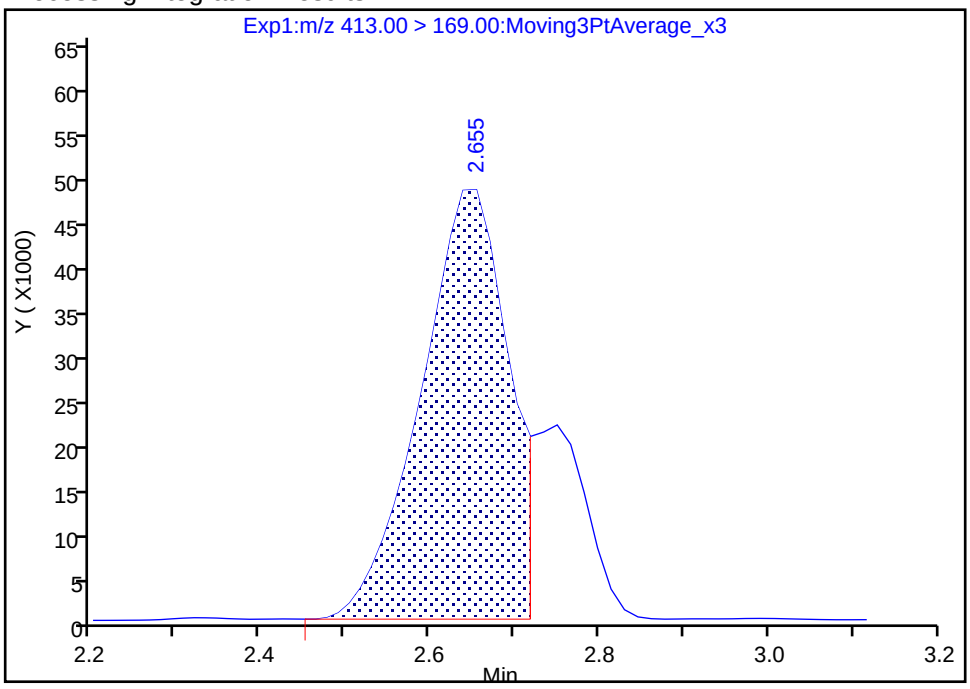
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

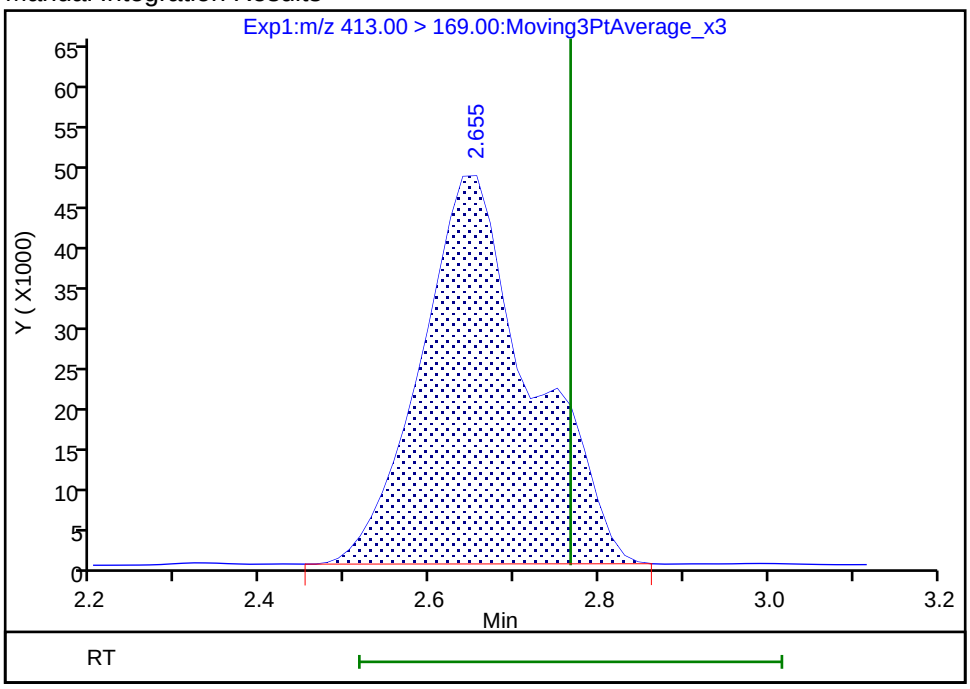
Processing Integration Results

RT: 2.65
Area: 343848
Amount: 0.283346
Amount Units: ng/ml



Manual Integration Results

RT: 2.65
Area: 438788
Amount: 0.283346
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:10:30

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

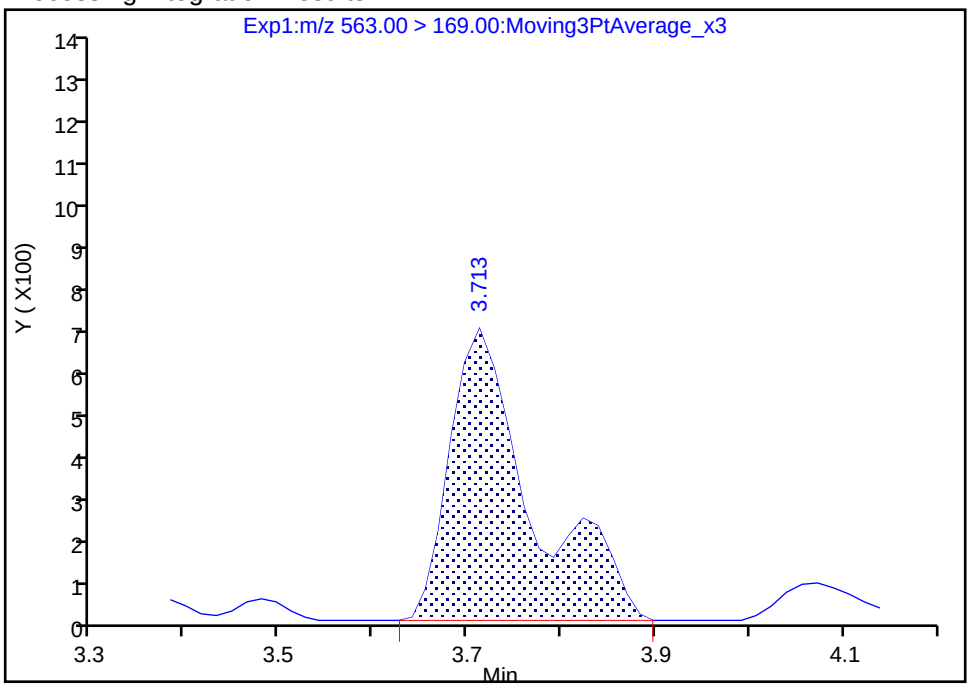
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

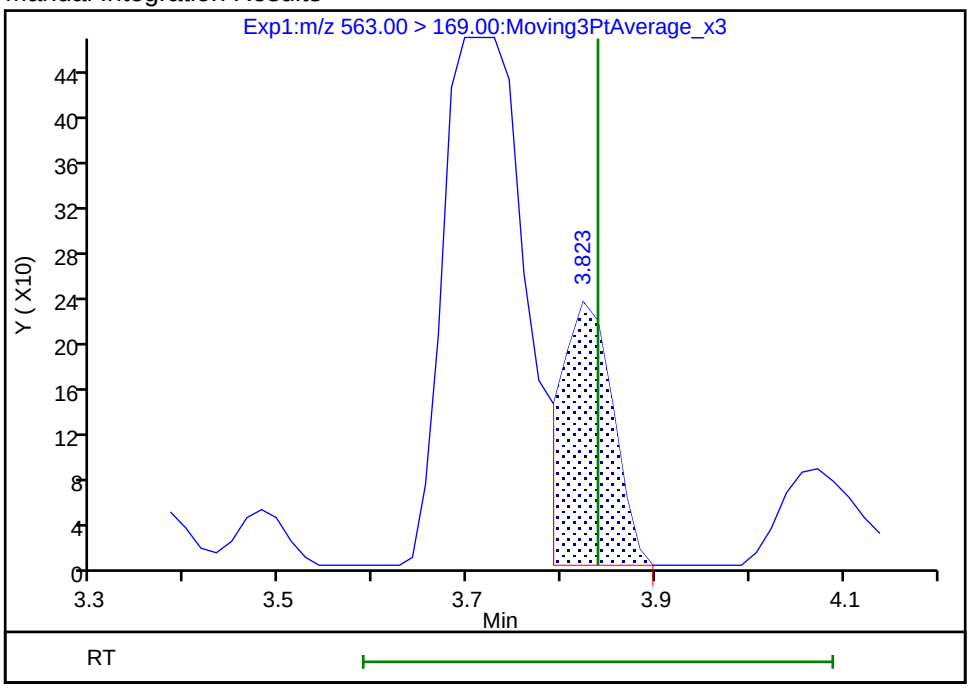
Processing Integration Results

RT: 3.71
Area: 4015
Amount: 0.003076
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 863
Amount: 0.008463
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:10:55
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

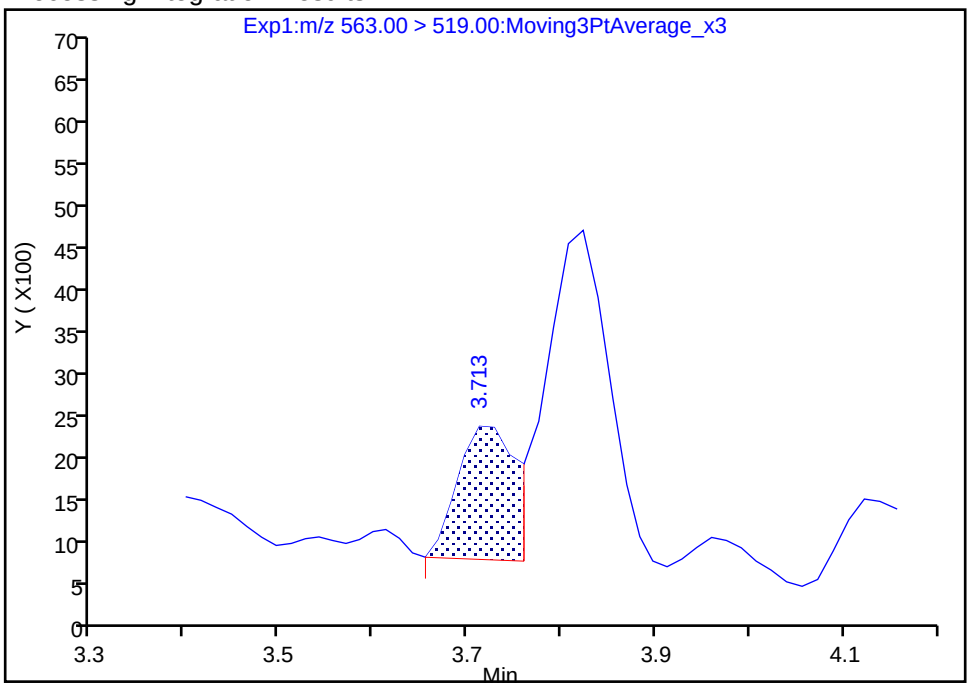
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

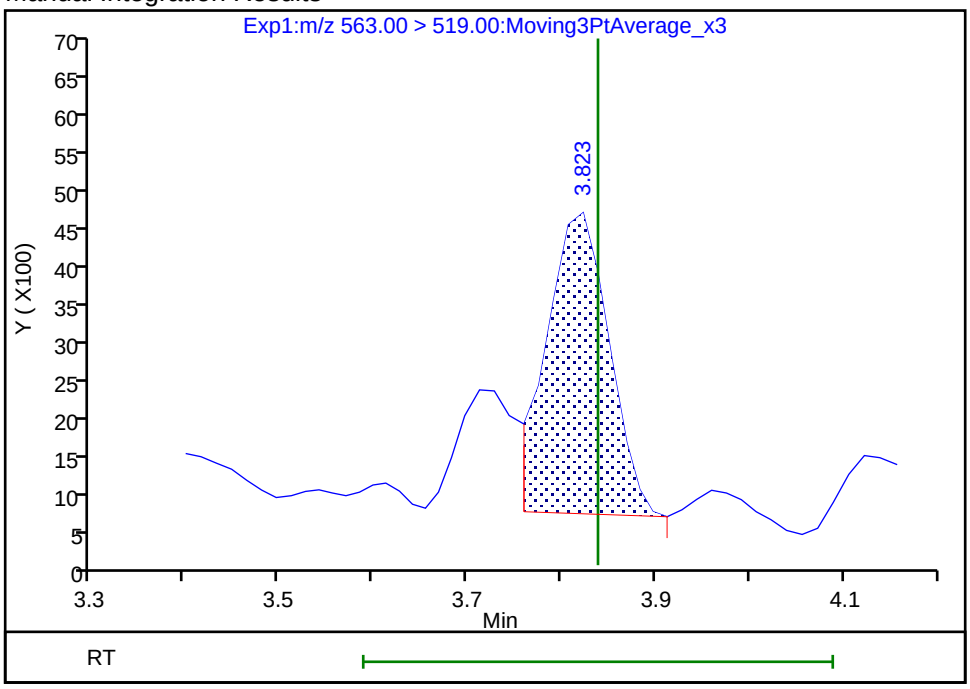
Processing Integration Results

RT: 3.71
Area: 6556
Amount: 0.003076
Amount Units: ng/ml



Manual Integration Results

RT: 3.82
Area: 18036
Amount: 0.008463
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:10:57
Audit Action: Manually Integrated/Assigned Compound ID Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

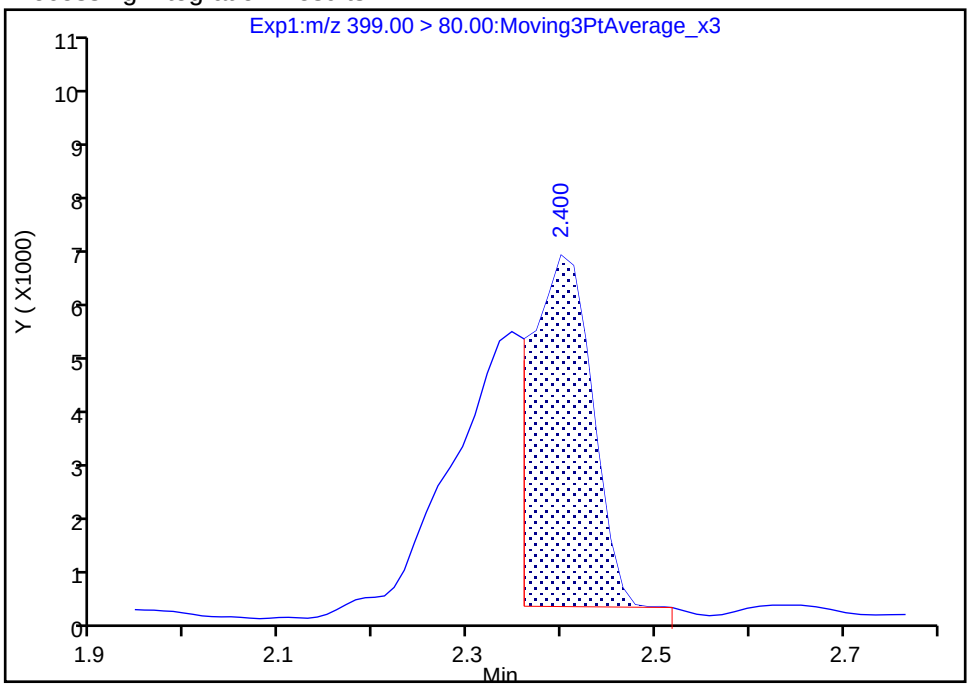
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

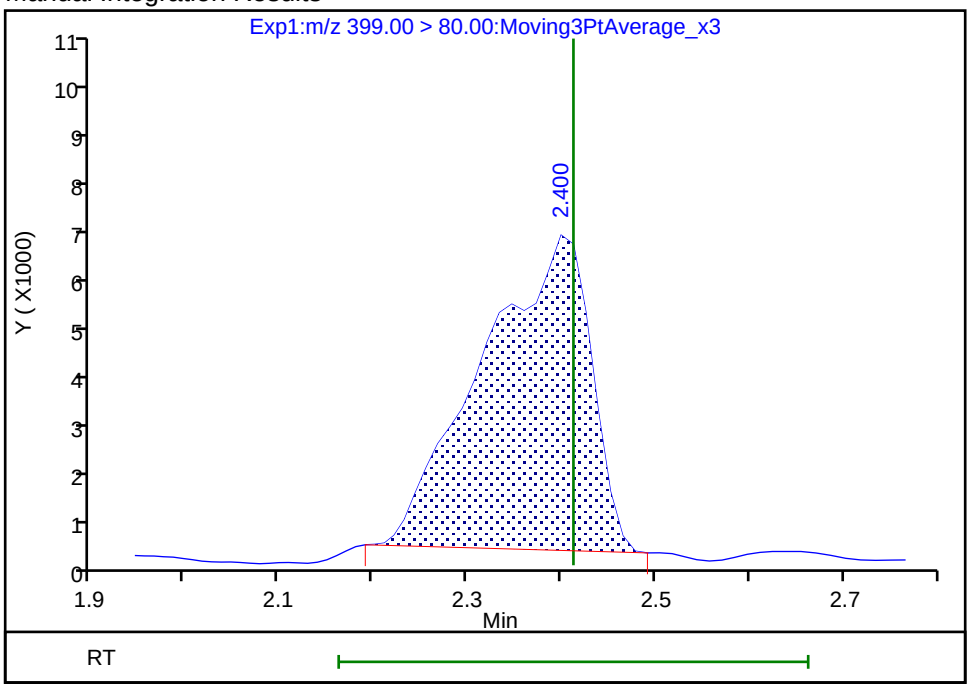
Processing Integration Results

RT: 2.40
Area: 26949
Amount: 0.010862
Amount Units: ng/ml



Manual Integration Results

RT: 2.40
Area: 49645
Amount: 0.020010
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:10:24

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

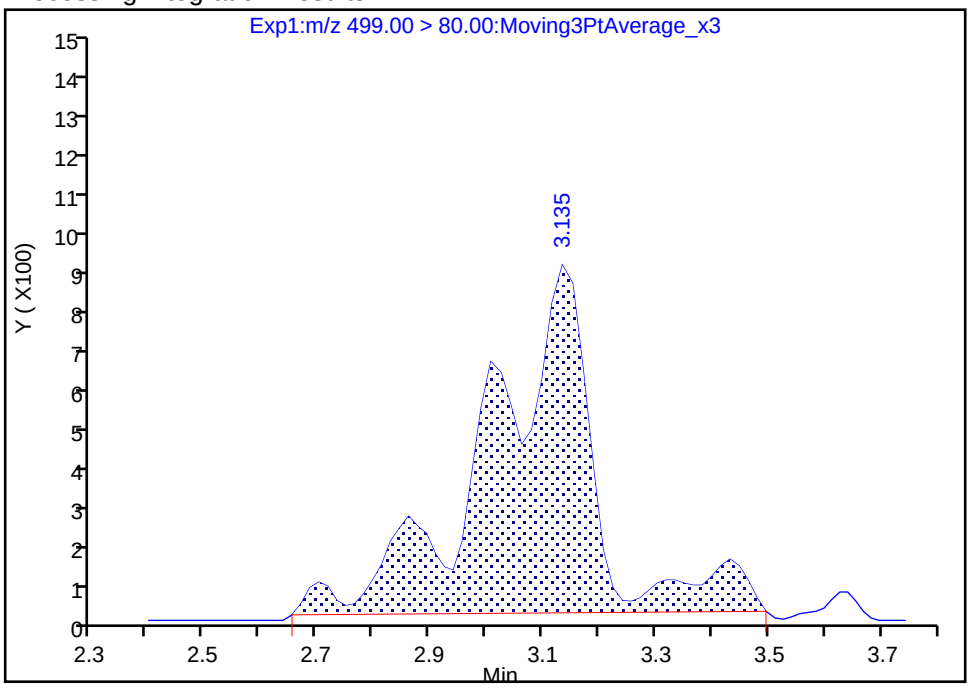
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

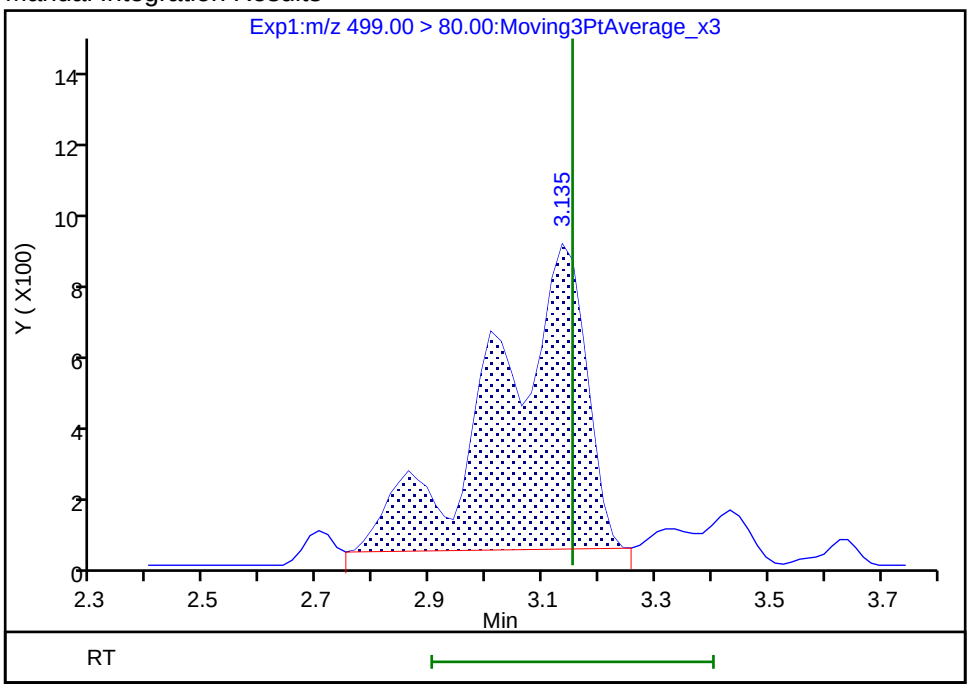
Processing Integration Results

RT: 3.13
Area: 11695
Amount: 0.005021
Amount Units: ng/ml



Manual Integration Results

RT: 3.13
Area: 9590
Amount: 0.004117
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:10:38

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

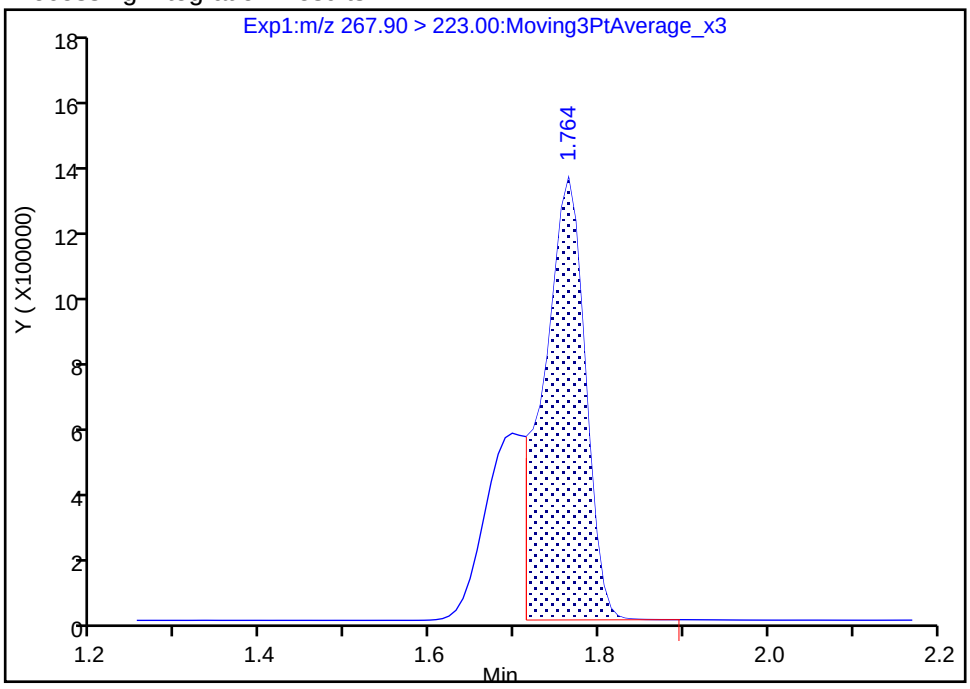
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 3 13C5-PFPeA, CAS: STL01893

Signal: 1

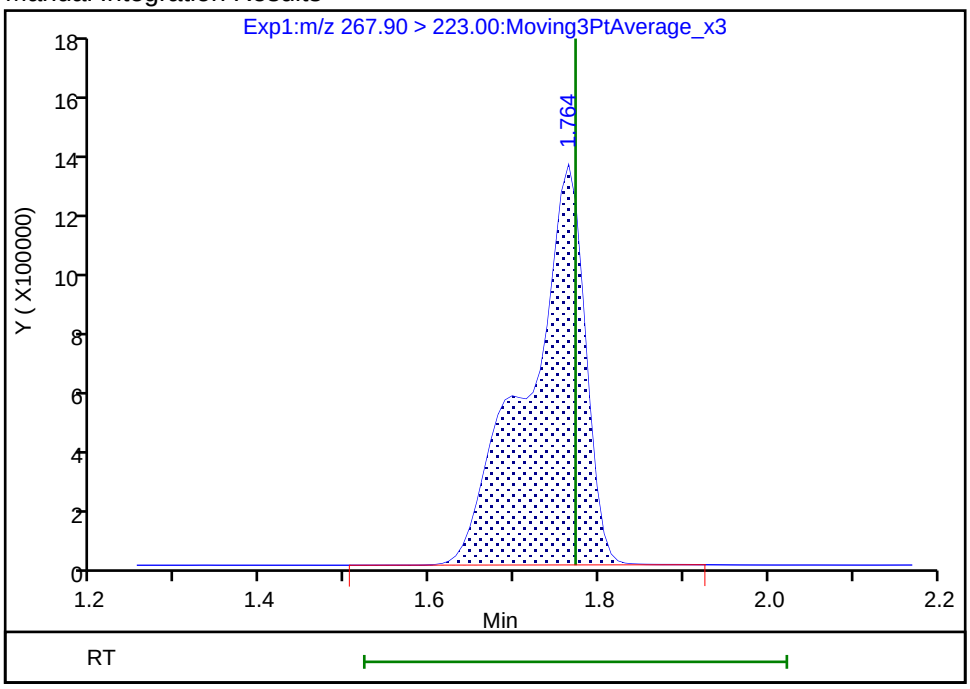
Processing Integration Results

RT: 1.76
Area: 4367023
Amount: 1.473907
Amount Units: ng/ml



Manual Integration Results

RT: 1.76
Area: 6138371
Amount: 2.071752
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:09:40

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

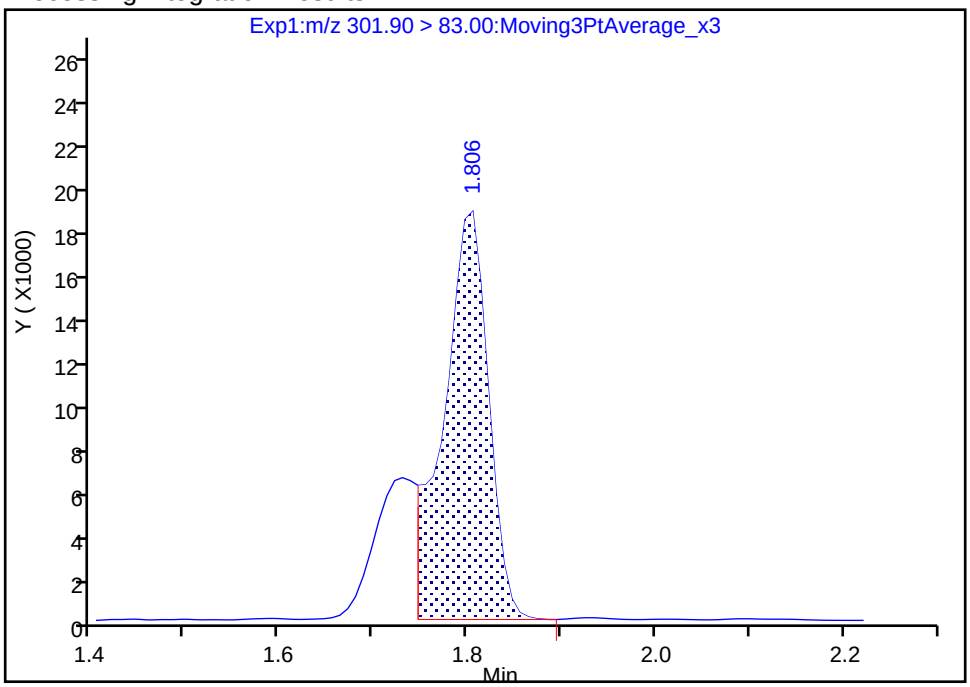
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_020.d				
Injection Date:	16-Sep-2018 15:54:01	Instrument ID:	A9		
Lims ID:	320-42924-A-4-A	Lab Sample ID:	320-42924-4		
Client ID:	TP-PFC-033-TPE-D				
Operator ID:	A9\Administrator	ALS Bottle#:	12	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

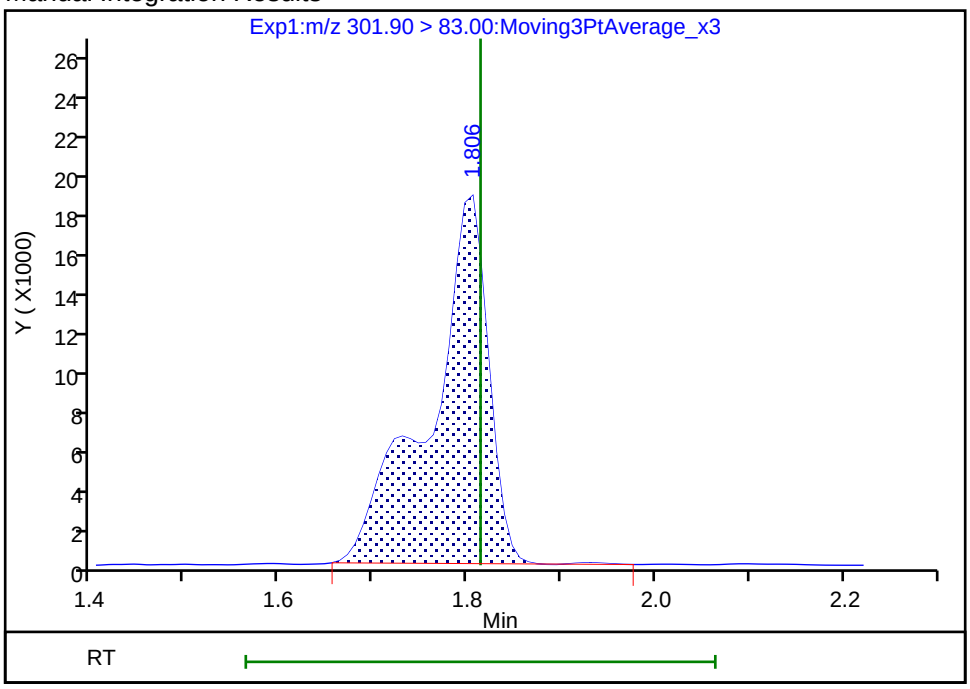
Processing Integration Results

RT: 1.81
Area: 61584
Amount: 1.583335
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 80790
Amount: 2.077124
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 16:09:44

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

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

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-242499/2	2018.08.28LLICALA_005.d
Level 2	IC 320-242499/3	2018.08.28LLICALA_006.d
Level 3	IC 320-242499/4	2018.08.28LLICALA_007.d
Level 4	IC 320-242499/5	2018.08.28LLICALA_008.d
Level 5	IC 320-242499/6	2018.08.28LLICALA_009.d
Level 6	IC 320-242499/7	2018.08.28LLICALA_010.d
Level 7	IC 320-242499/8	2018.08.28LLICALA_011.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)	0.8927 0.9116	0.8954 0.8679	0.9443	0.9529	0.9250	AveID		0.9128				3.3		20.0			
Perfluoropentanoic acid (PFPeA)	1.0749 0.9802	1.1009 0.9016	1.0098	1.0241	1.0081	AveID		1.0142				6.4		20.0			
Perfluorobutanesulfonic acid (PFBS)	107.38 104.12	107.86 86.752	107.68	107.88	113.78	AveID		105.06				8.2		20.0			
4:2 FTS	22.077 21.958	24.055 19.139	20.776	21.704	21.556	AveID		21.609				6.8		20.0			
Perfluorohexanoic acid (PFHxA)	1.0587 0.8313	0.9607 0.7919	0.8893	0.9289	0.9138	AveID		0.9107				9.6		20.0			
Perfluoropentanesulfonic acid	52.424 51.169	50.750 43.829	49.787	48.669	52.488	AveID		49.874				6.0		20.0			
Perfluoroheptanoic acid (PFHpA)	1.0818 0.9815	1.0173 0.8823	1.0810	1.0765	1.0176	AveID		1.0197				7.1		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3769 1.2002	1.4155 1.1259	1.1598	1.1188	1.2648	AveID		1.2374				9.7		20.0			
6:2 FTS	2.3795 2.1598	1.9035 2.0910	2.1061	2.2987	2.0425	AveID		2.1401				7.4		20.0			
Perfluorooctanoic acid (PFOA)	1.2591 0.9395	1.2418 0.8788	1.1012	1.1239	0.9894	AveID		1.0762				13.6		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	0.9739 0.9937	1.0074 0.9395	0.9316	1.0199	1.0262	AveID		0.9846				3.8		20.0			
Perfluorononanoic acid (PFNA)	0.9784 0.9314	0.9989 0.8380	1.0334	1.0251	1.0400	AveID		0.9779				7.4		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.0369 1.0829	1.1378 1.0313	0.9847	1.0387	1.0737	AveID		1.0551				4.6		20.0			
Perfluorooctane Sulfonamide (FOSA)	2.9240 2.8542	3.1961 2.4575	3.1668	3.1126	3.0350	AveID		2.9638				8.6		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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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	0.6306 0.6719	0.7244 0.6076	0.5845	0.6733	0.6287	AveID		0.6458				7.3		20.0			
8:2 FTS	16.922 14.257	16.064 14.985	14.493	13.879	15.370	AveID		15.139				7.1		20.0			
Perfluorodecanoic acid (PFDA)	1.0698 1.0175	1.3625 0.9134	1.2465	1.1597	1.1991	AveID		1.1384				13.2		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.0006 1.0203	1.0031 0.9147	1.0172	1.0286	0.9722	AveID		0.9938				4.0		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6624 0.8237	0.9114 0.8004	0.7860	0.8637	0.8457	AveID		0.8133				9.7		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.1494 0.9525	0.8021 0.9059	0.9226	0.8817	0.8950	AveID		0.9299				11.5		20.0			
Perfluoroundecanoic acid (PFUnA)	1.1176 0.8386	0.9636 0.7797	0.8634	0.8880	0.8291	AveID		0.8971				12.6		20.0			
Perfluorododecanoic acid (PFDoA)	1.0185 0.9775	1.1442 0.7672	1.0634	1.0760	1.0082	AveID		1.0079				11.8		20.0			
Perfluorotridecanoic Acid (PFTriA)	0.9028 0.7663	0.8711 0.6019	0.8424	0.8131	0.8186	AveID		0.8023				12.3		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.1638 0.1615	0.1607 0.1547	0.1708	0.1595	0.1591	AveID		0.1614				3.1		20.0			
13C4 PFBA	0.9405 1.0096	0.9644 0.9619	0.9327	0.9807	0.9467	Ave		0.9623				2.7		20.0			
13C5 PFPeA	0.8460 0.8928	0.8591 0.8383	0.8447	0.8853	0.8424	Ave		0.8584				2.6		20.0			
13C3-PFBS	0.0108 0.0116	0.0113 0.0119	0.0109	0.0119	0.0105	Ave		0.0113				4.9		20.0			
13C2 PFHxA	0.8705 0.9435	0.9268 0.8949	0.9126	0.9125	0.8918	Ave		0.9075				2.7		20.0			
13C4-PFHpA	1.0624 1.0891	1.1339 1.0454	1.0894	1.0940	1.0613	Ave		1.0822				2.7		20.0			
18O2 PFHxS	0.6471 0.6934	0.6840 0.6372	0.6680	0.7016	0.6274	Ave		0.6655				4.3		20.0			
M2-6:2FTS	0.1058 0.1069	0.1096 0.0989	0.1068	0.1114	0.1050	Ave		0.1063				3.7		20.0			
13C4 PFOA	1.0772 1.0353	0.9932 0.9391	0.9888	1.0020	1.0174	Ave		1.0076				4.2		20.0			
13C4 PFOS	0.7090 0.7233	0.7126 0.6669	0.7361	0.7341	0.7237	Ave		0.7151				3.3		20.0			
13C5 PFNA	0.9204 0.9719	0.9572 0.9051	0.9819	0.9602	0.9095	Ave		0.9437				3.3		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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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	0.3749 0.3702	0.3999 0.3657	0.3716	0.3987	0.3672	Ave		0.3783				3.9		20.0			
M2-8:2FTS	0.0168 0.0154	0.0159 0.0130	0.0161	0.0173	0.0150	Ave		0.0156				9.0		20.0			
13C2 PFDA	0.9701 0.9577	0.9673 0.8828	0.9334	0.9650	0.9217	Ave		0.9426				3.4		20.0			
d3-NMeFOSAA	0.4114 0.4319	0.4324 0.4231	0.4248	0.4150	0.4355	Ave		0.4249				2.2		20.0			
d5-NEtFOSAA	0.3232 0.3152	0.3634 0.3012	0.3465	0.3544	0.3357	Ave		0.3342				6.7		20.0			
13C2 PFUnA	0.7731 0.8292	0.8518 0.7395	0.8015	0.8134	0.8075	Ave		0.8023				4.6		20.0			
13C2 PFDoA	0.9715 0.9794	0.9938 0.9968	0.9290	0.9689	0.9919	Ave		0.9759				2.4		20.0			
13C2-PFTeDA	0.7780 0.7753	0.8260 0.7640	0.7336	0.7602	0.8050	Ave		0.7774				3.9		20.0			
13C2-PFHxDA	0.8072 0.8373	0.8184 0.8172	0.7701	0.6493	0.8177	Ave		0.7882				8.2		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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-242499/2	2018.08.28LLICALA_005.d
Level 2	IC 320-242499/3	2018.08.28LLICALA_006.d
Level 3	IC 320-242499/4	2018.08.28LLICALA_007.d
Level 4	IC 320-242499/5	2018.08.28LLICALA_008.d
Level 5	IC 320-242499/6	2018.08.28LLICALA_009.d
Level 6	IC 320-242499/7	2018.08.28LLICALA_010.d
Level 7	IC 320-242499/8	2018.08.28LLICALA_011.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	71445 14983771	148472 27502138	771594	3143317	7216590	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	77378 14249697	162630 24900282	747283	3049788	6999092	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	86842 17343386	185053 30003262	910651	3828010	8735294	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	18865 3864378	43604 6993719	185640	813711	1748471	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	78425 12770869	153085 23347053	710995	2851130	6716098	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	44988 9043779	92389 16084327	446776	1832484	4275802	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	97799 17404274	198338 30385284	1031715	3961330	8899700	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	69000 12331061	151487 21506619	617641	2402576	5950574	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	20316 3562961	33995 6460415	186850	816302	1675863	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	115524 15852050	212266 27214840	954853	3792013	8304297	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	55943 11141173	117514 19649006	571922	2397620	5826744	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	76629 14738364	164410 24988022	888927	3310854	7795005	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	58058 11834862	129377 21024940	589276	2380254	5942729	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorooctane Sulfonamide (FOSA)		AveID	93280 17204061	219730 29608945	1031117	4174038	9183356	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorononanesulfonic acid		AveID	36528 7596364	85204 12812955	361865	1596059	3599772	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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
8:2 FTS		AveID	23158 3415181	42130 6151127	196079	773601	1820247	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	88314 15866006	226611 26563468	1019290	3764333	9108633	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	35030 7175328	74575 12749037	378563	1435862	3489405	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	38530 9351668	107648 16951122	488613	2056125	4862491	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	31607 4889294	50114 8988864	280096	1051106	2476305	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	73524 11321464	141127 18994666	606238	2429610	5517545	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	84200 15587157	195509 25191162	865534	3507055	8241309	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	74635 12220220	148840 19763356	685651	2650027	6691746	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	10843 2038535	22816 3893936	109761	407853	1055743	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	8002830 8218830	8291131 7921655	8171064	8247082	7801898	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	7198766 7268510	7385908 6904215	7400409	7445050	6942787	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	85084 87618	90247 90962	88972	93328	80767	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	7407564 7681141	7967390 7370188	7995321	7673418	7349652	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	9040528 8866287	9747881 8609256	9544033	9199599	8746068	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5209326 5340279	5562863 4964565	5536160	5581192	4891052	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	855608 826593	894847 774049	889043	889676	822215	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	9166204 8428311	8538141 7734289	8662621	8426167	8384516	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	5768085 5629385	5856894 5250354	6165020	5901987	5701715	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	7831909 7912109	8229151 7454345	8602003	8074769	7495131	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	3190191 3013781	3437498 3012041	3255994	3352554	3025791	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	136855 119770	131131 102619	135294	139344	118425	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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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	8255368 7796459	8316028 7270400	8177178	8114874	7596034	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	3501055 3516347	3717380 3484339	3721760	3489761	3589091	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	2749959 2566441	3123931 2480748	3035794	2980380	2766889	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	6578448 6750273	7323152 6090404	7021910	6840404	6654794	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	8266827 7973084	8543283 8209254	8139014	8148044	8174334	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	6620523 6312069	7100968 6291947	6427054	6392553	6634077	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6868821 6816429	7035360 6730496	6746927	5459924	6738965	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-242499/2	2018.08.28LLICALA_005.d
Level 2	IC 320-242499/3	2018.08.28LLICALA_006.d
Level 3	IC 320-242499/4	2018.08.28LLICALA_007.d
Level 4	IC 320-242499/5	2018.08.28LLICALA_008.d
Level 5	IC 320-242499/6	2018.08.28LLICALA_009.d
Level 6	IC 320-242499/7	2018.08.28LLICALA_010.d
Level 7	IC 320-242499/8	2018.08.28LLICALA_011.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)	-2.2 -4.9	-1.9	3.4	4.4	1.3	-0.1	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	6.0 -11.1	8.5	-0.4	1.0	-0.6	-3.4	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	2.2 -17.4	2.7	2.5	2.7	8.3	-0.9	30 30	30	30	30	30	30
4:2 FTS	2.2 -11.4	11.3	-3.9	0.4	-0.2	1.6	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	16.3 -13.0	5.5	-2.3	2.0	0.3	-8.7	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	5.1 -12.1	1.8	-0.2	-2.4	5.2	2.6	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	6.1 -13.5	-0.2	6.0	5.6	-0.2	-3.7	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	11.3 -9.0	14.4	-6.3	-9.6	2.2	-3.0	30 30	30	30	30	30	30
6:2 FTS	11.2 -2.3	-11.1	-1.6	7.4	-4.6	0.9	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	17.0 -18.3	15.4	2.3	4.4	-8.1	-12.7	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-1.1 -4.6	2.3	-5.4	3.6	4.2	0.9	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	0.1 -14.3	2.2	5.7	4.8	6.4	-4.8	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-1.7 -2.3	7.8	-6.7	-1.6	1.8	2.6	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-1.3 -17.1	7.8	6.9	5.0	2.4	-3.7	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-2.4 -5.9	12.2	-9.5	4.2	-2.7	4.0	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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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
8:2 FTS	11.8 -1.0	6.1	-4.3	-8.3	1.5	-5.8	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	-6.0 -19.8	19.7	9.5	1.9	5.3	-10.6	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.7 -8.0	0.9	2.4	3.5	-2.2	2.7	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-18.6 -1.6	12.1	-3.4	6.2	4.0	1.3	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	23.6 -2.6	-13.7	-0.8	-5.2	-3.8	2.4	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	24.6 -13.1	7.4	-3.8	-1.0	-7.6	-6.5	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	1.1 -23.9	13.5	5.5	6.8	0.0	-3.0	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	12.5 -25.0	8.6	5.0	1.3	2.0	-4.5	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	1.5 -4.2	-0.5	5.8	-1.2	-1.4	0.0	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_005.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 28-Aug-2018 10:20:47 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: IC PFC STD1
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 13:27:18 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 10:56:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.484	1.485	-0.001	0.539	8002830	2.44		97.7	27886	
2 Perfluorobutyric acid										
212.90 > 169.00	1.489	1.486	0.003	1.004	71445	0.0245		97.8	12.0	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.758	-0.002	0.638	7198766	2.46		98.6	14481	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.756	1.759	-0.003	1.000	77378	0.0265		106	10.6	
D 47 13C3-PFBS										
301.90 > 83.00	1.798	1.796	0.002	0.653	85084	2.22		95.4	655	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.798	1.797	0.001	1.000	86842	0.0226		102	67.1	
298.90 > 99.00	1.798	1.797	0.001	1.000	30121		2.88(1.35-4.05)	102	41.8	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.018	2.012	0.006	1.122	18865	0.0239		102	175	
D 60 M2-4:2FTS										
329.00 > 81.00	2.018	2.013	0.005	0.733	759048	NC			913	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.745	7407564	2.40		95.9	6826	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.048	2.048	0.0	1.000	78425	0.0291		116	24.7	
313.00 > 119.00	2.059	2.048	0.011	1.005	5659		13.86(6.96-20.87)	116	10.4	M
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.079	2.071	0.008	1.157	44988	0.0246		105	158	
349.00 > 99.00	2.079	2.071	0.008	1.157	22028		2.04(1.15-3.45)	105	65.6	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.151	2.149	0.002	1.000	16040	NC			10.1	

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	2.151	2.150	0.001	0.782	897253	NC			2826	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	9040528	2.45		98.2	12366	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	97799	0.0265		106	18.3	
363.00 > 169.00	2.387	2.387	0.0	1.000	24009		4.07(2.17-6.52)	106	59.9	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	69000	0.0253		111	106	
399.00 > 99.00	2.400	2.400	0.0	1.000	27099		2.55(1.90-5.70)	111	46.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5209326	2.30		97.2	9109	
76 DONA										
377.00 > 251.00	2.440	2.432	0.008	0.778	149099	NC			252	
377.00 > 85.00	2.427	2.432	-0.005	0.774	60160		2.48(1.13-3.39)		27.6	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.728	0.007	1.000	20316	0.0264		111	19.6	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.728	0.007	0.994	855608	2.36		99.5	1608	
D 73 13C8 PFOA										
421.00 > 376.00	2.751	2.744	0.007		7221591	NC			12573	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	9166204	2.67		107	11780	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8509573	2.50			16014	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	115524	0.0293		117	10.4	
413.00 > 169.00	2.751	2.751	0.0	1.000	37560		3.08(1.36-4.08)	117	76.6	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.760	0.007	0.882	55943	0.0235		98.9	107	
449.00 > 99.00	2.767	2.760	0.007	0.882	15538		3.60(1.84-5.53)	98.9	82.0	
D 72 13C8 PFOS										
507.00 > 99.00	3.137	3.129	0.008		1203481	NC			3010	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.137	3.136	0.001	1.000	58058	0.0228		98.3	72.1	
499.00 > 99.00	3.137	3.136	0.001	1.000	17541		3.31(2.04-6.12)	98.3	65.7	
D 19 13C5 PFNA										
468.00 > 423.00	3.137	3.136	0.001	1.140	7831909	2.44		97.5	7738	
20 Perfluorononanoic acid										
463.00 > 419.00	3.137	3.136	0.001	1.000	76629	0.0250		100	10.7	
463.00 > 169.00	3.137	3.136	0.001	1.000	12902		5.94(2.68-8.03)	100	41.7	
D 18 13C4 PFOS										
503.00 > 80.00	3.137	3.136	0.001	1.140	5768085	2.37		99.2	3864	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.353	3.346	0.007	1.069	67563	NC			176	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	93280	0.0247		98.7	228	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3190191	2.48		99.1	5962	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.483	3.483	0.0	1.110	36528	0.0234		97.6	114	
549.00 > 99.00	3.483	3.483	0.0	1.110	4232		8.63(3.02-9.05)	97.6	31.4	
D 26 M2-8:2FTS										
529.00 > 81.00	3.499	3.485	0.014	1.272	136855	2.57		107	714	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.499	3.485	0.014	1.000	23158	0.0268		112	85.1	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.499	3.498	0.001	1.000	88314	0.0235		94.0	15.0	R
513.00 > 169.00	3.499	3.498	0.001	1.000	4025		21.94(7.12-21.35)	94.0	11.6	
D 23 13C2 PFDA										
515.00 > 470.00	3.499	3.498	0.001	1.272	8255368	2.57		103	5162	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.658	3.651	0.007	1.329	3501055	2.42		96.8	4446	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.658	3.653	0.005	1.000	35030	0.0252		101	12.3	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.810	3.807	0.003	1.215	38530	0.0196		81.4	54.3	
599.00 > 99.00	3.810	3.807	0.003	1.215	11643		3.31(2.14-6.43)	81.4	67.2	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.819	0.007	1.391	2749959	2.42		96.7	2024	
D 30 13C2 PFUnA										
565.00 > 520.00	3.826	3.825	0.001	1.391	6578448	2.41		96.4	5245	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.826	3.825	0.001	1.000	31607	0.0309		124	74.2	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.826	3.825	0.001	1.000	73524	0.0311		125	16.3	
563.00 > 169.00	3.826	3.825	0.001	1.000	7359		9.99(5.24-15.72)	125	36.6	
35 MeFOSA										
512.00 > 169.00	3.947	3.949	-0.002		19919	NC			79.1	
66 11-Chloroeicosafluoro-3-oxaundecan										M
631.00 > 451.00	3.995	3.983	0.012	1.273	68328	NC			239	M
37 Perfluorododecanoic acid										M
613.00 > 569.00	4.126	4.118	0.008	1.000	84200	0.0253		101	18.4	M
613.00 > 169.00	4.126	4.118	0.008	1.000	7805		10.79(4.68-14.05)	101	21.4	
D 36 13C2 PFDoA										
615.00 > 570.00	4.126	4.118	0.008	1.500	8266827	2.49		99.5	8398	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.126	4.120	0.006	1.179	14462	NC			46.4	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.142	4.142	0.0		17783	NC			58.6	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.360	4.360	0.0	1.390	6838	NC			15.1	
699.00 > 99.00	4.360	4.360	0.0	1.390	11677		0.59(0.28-0.83)		55.2	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.391	4.384	0.007	1.064	74635	0.0281		113	26.6	
663.00 > 169.00	4.391	4.384	0.007	1.064	9832		7.59(3.09-9.27)	113	30.5	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.633	4.628	0.005	1.684	6620523	2.50		100	8521	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.633	4.631	0.002	1.000	10843	0.0254		101	56.5	
713.00 > 219.00	4.633	4.631	0.002	1.000	7242		1.50(0.70-2.09)	101	46.8	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.062	5.053	0.009	1.000	116904	NC			26.4	
813.00 > 169.00	5.062	5.053	0.009	1.000	21077		5.55(2.77-8.32)		81.2	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.062	5.053	0.009	1.840	6868821	2.56		102	6421	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.436	5.416	0.020	1.074	43928	NC			14.8	
913.00 > 169.00	5.422	5.416	0.006	1.071	7329		5.99(2.55-7.64)		65.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00010 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 13:27:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_005.d

Injection Date: 28-Aug-2018 10:20:47 Instrument ID: A9

Lims ID: IC L1 Full

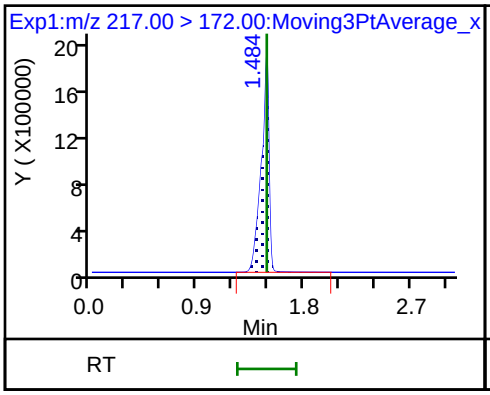
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2

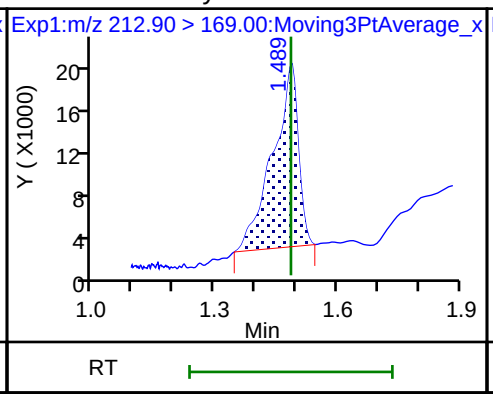
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

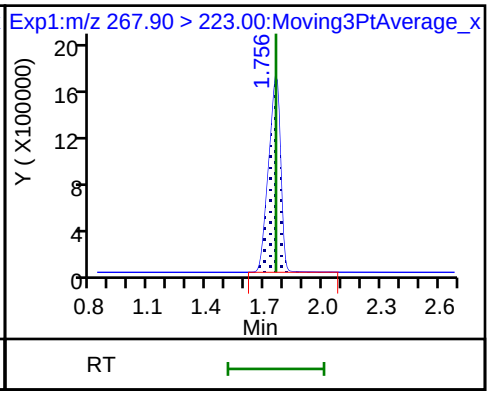
D 1 13C4 PFBA



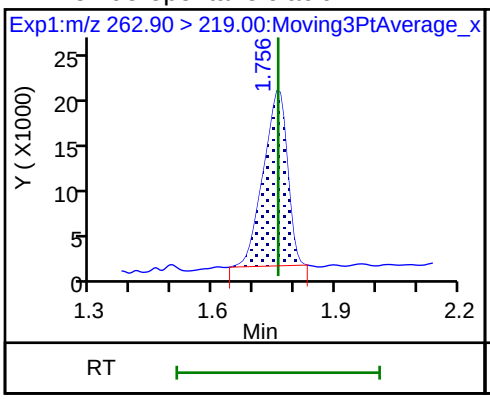
2 Perfluorobutyric acid



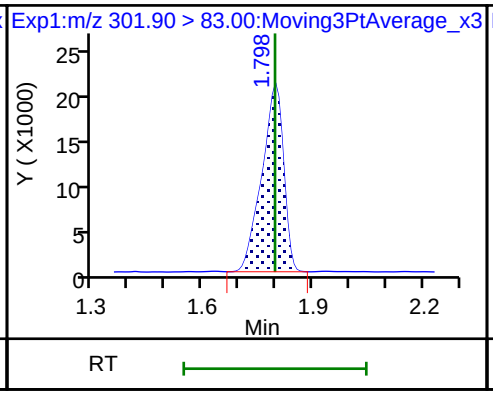
D 3 13C5-PFPeA



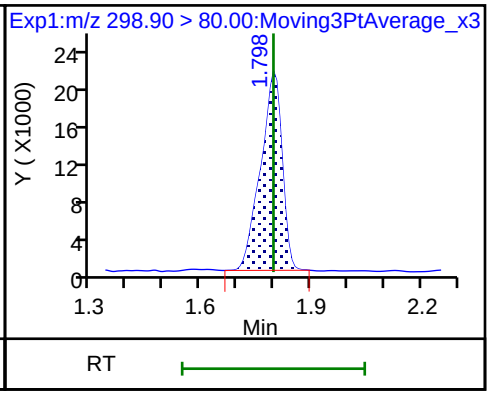
4 Perfluoropentanoic acid



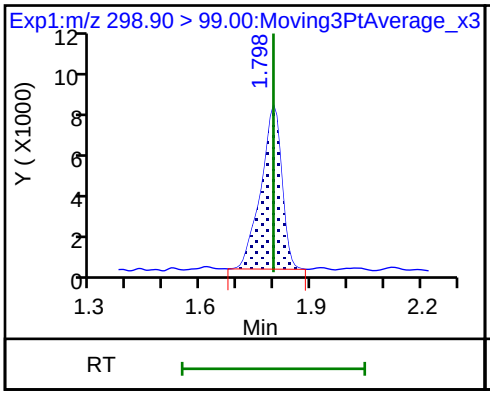
D 47 13C3-PFBS



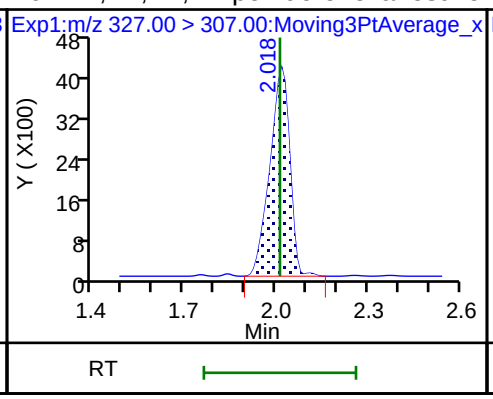
5 Perfluorobutanesulfonic acid



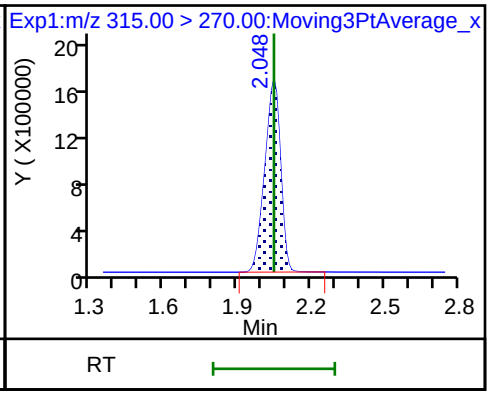
5 Perfluorobutanesulfonic acid



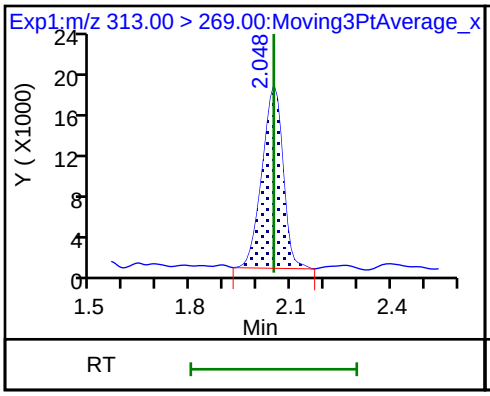
61 1H,1H,2H,2H-perfluorohexanesulfon



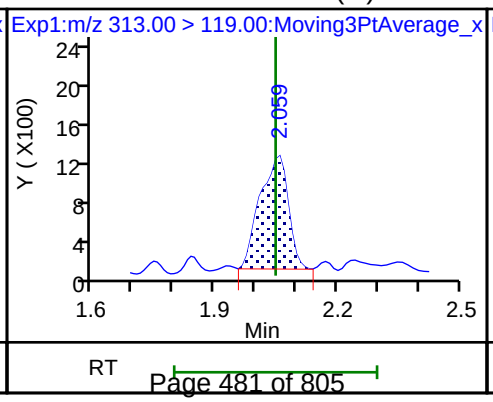
D 7 13C2 PFHxA



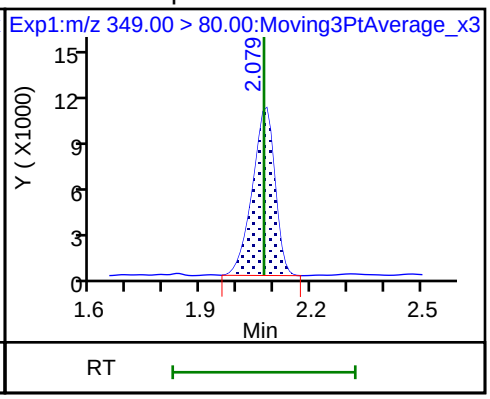
6 Perfluorohexanoic acid



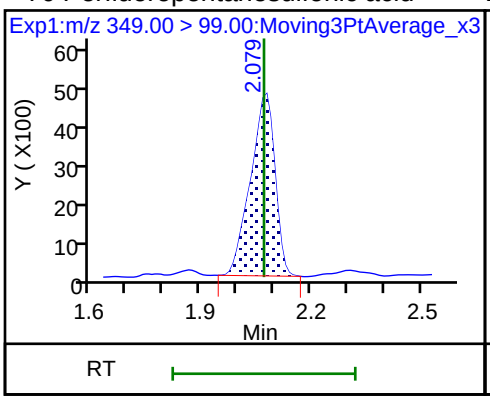
6 Perfluorohexanoic acid (M)



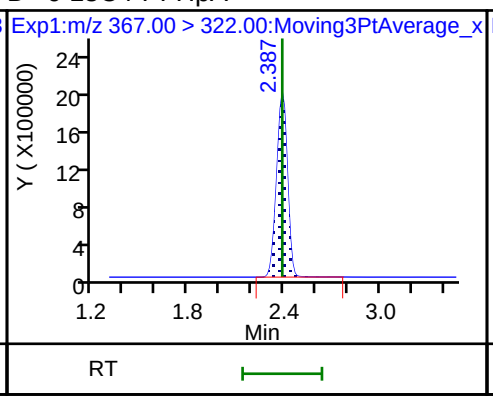
70 Perfluoropentanesulfonic acid



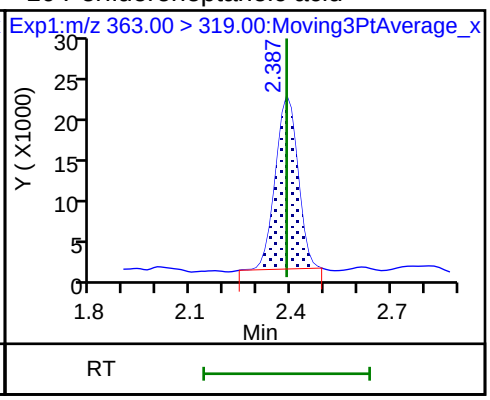
70 Perfluoropentanesulfonic acid



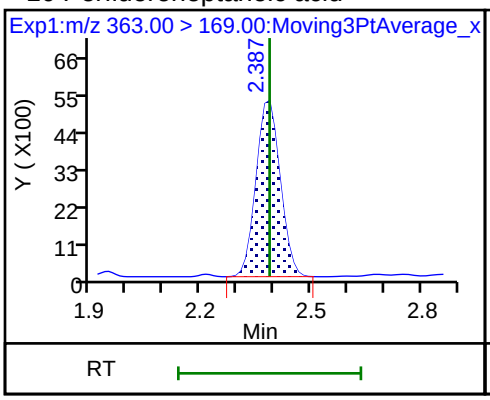
D 9 13C4-PFHpA



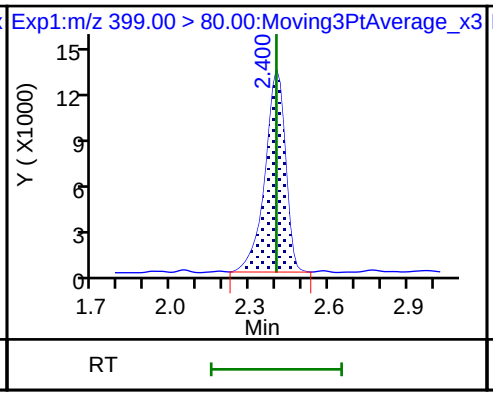
10 Perfluoroheptanoic acid



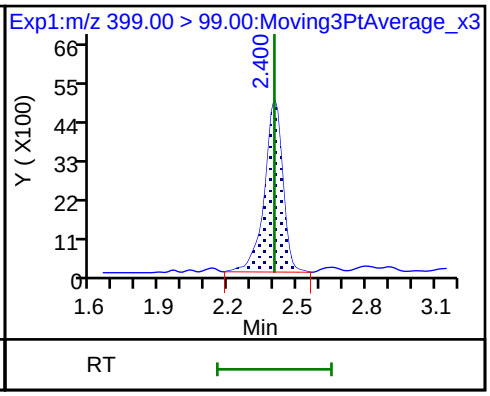
10 Perfluoroheptanoic acid



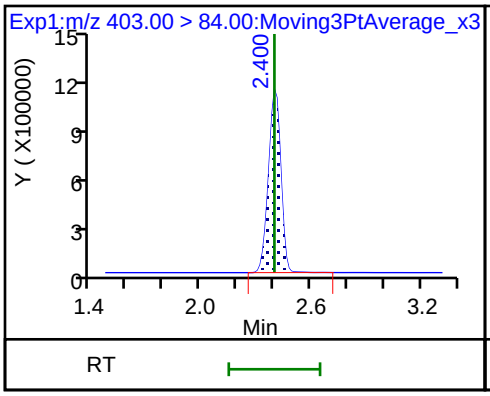
8 Perfluorohexanesulfonic acid



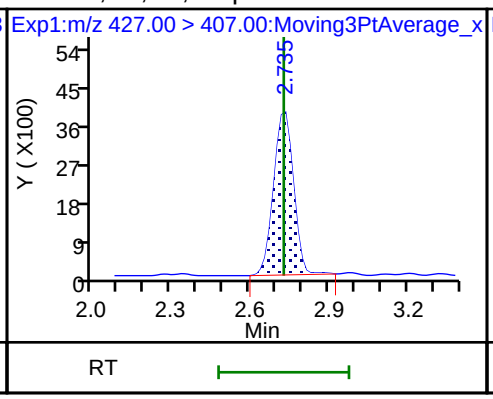
8 Perfluorohexanesulfonic acid



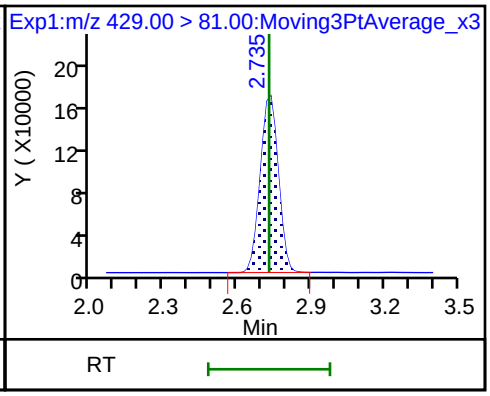
D 11 18O2 PFHxS



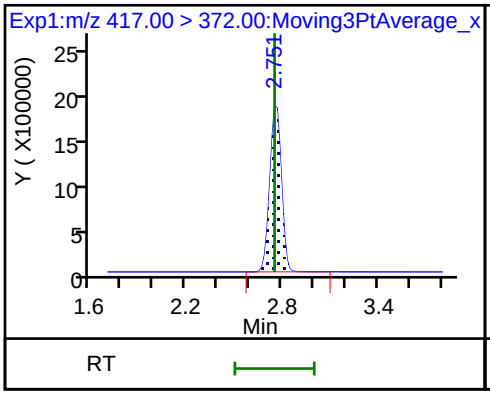
13 1H,1H,2H,2H-perfluorooctanesulfon



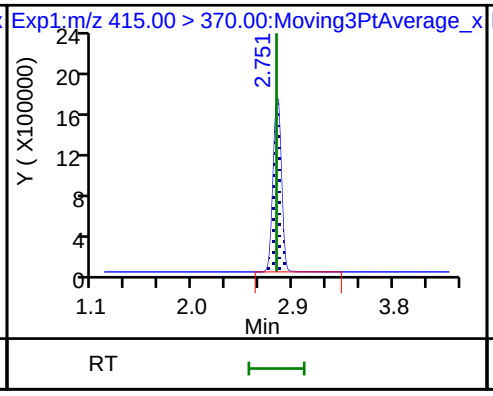
D 12 M2-6:2FTS



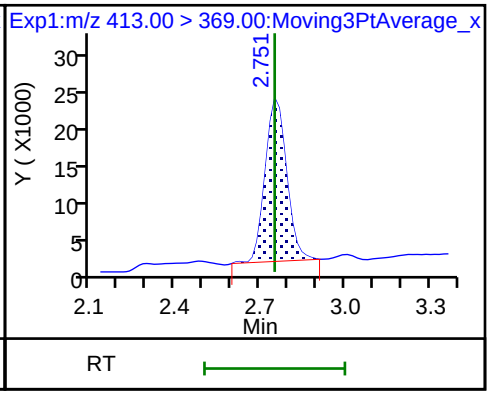
D 14 13C4 PFOA



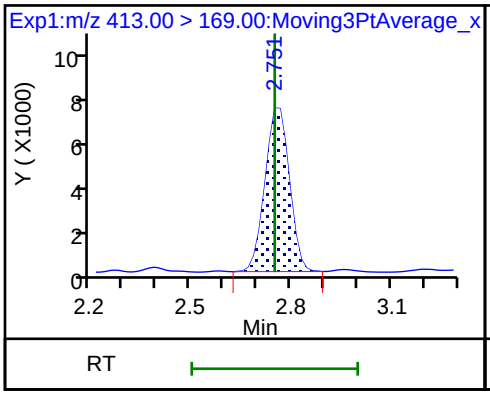
* 62 13C2-PFOA



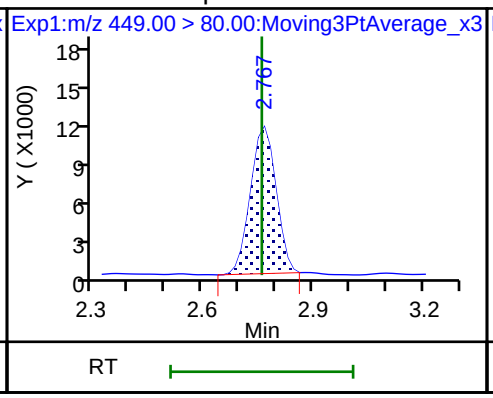
15 Perfluorooctanoic acid



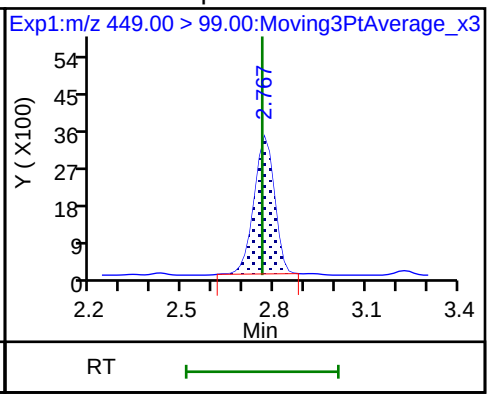
15 Perfluorooctanoic acid



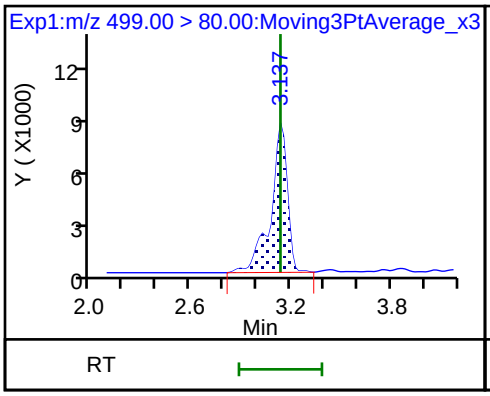
16 Perfluoroheptanesulfonic acid



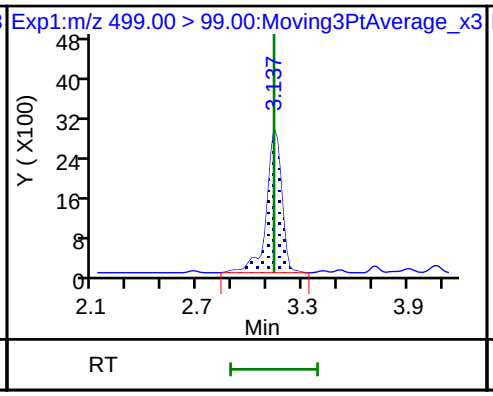
16 Perfluoroheptanesulfonic acid



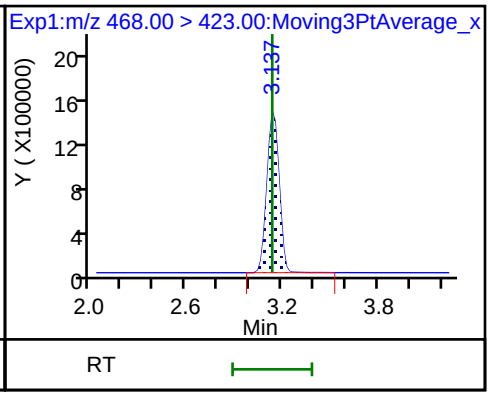
17 Perfluorooctane sulfonic acid



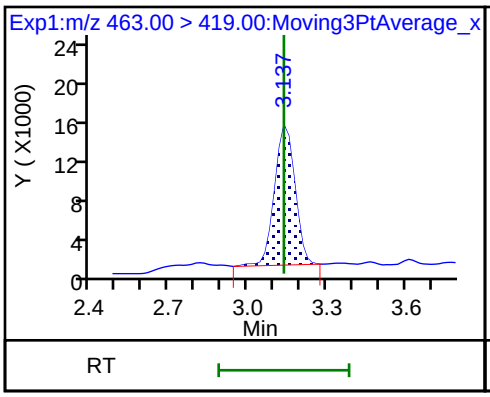
17 Perfluorooctane sulfonic acid



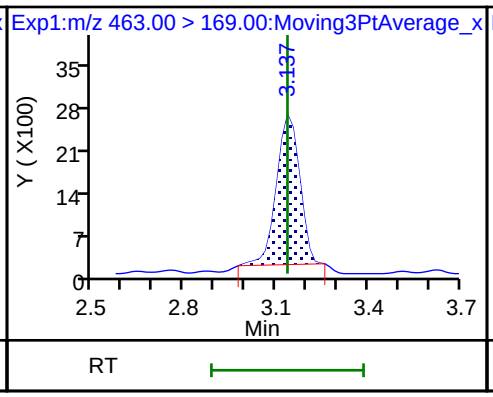
D 19 13C5 PFNA



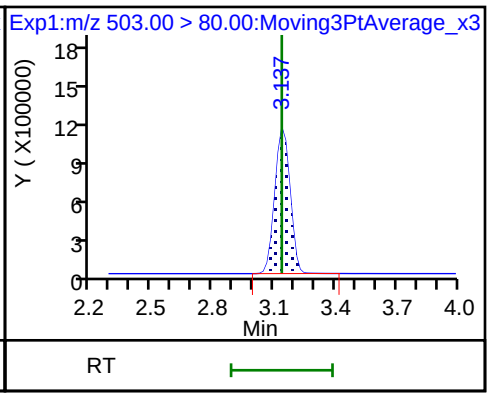
20 Perfluorononanoic acid



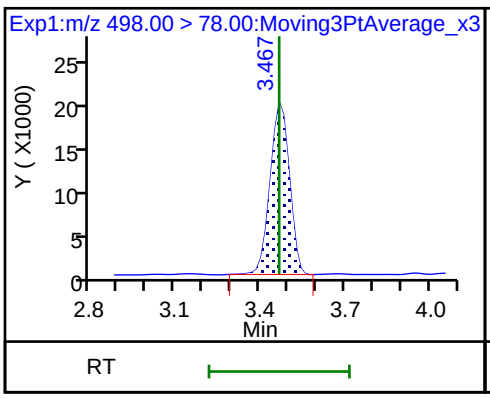
20 Perfluorononanoic acid



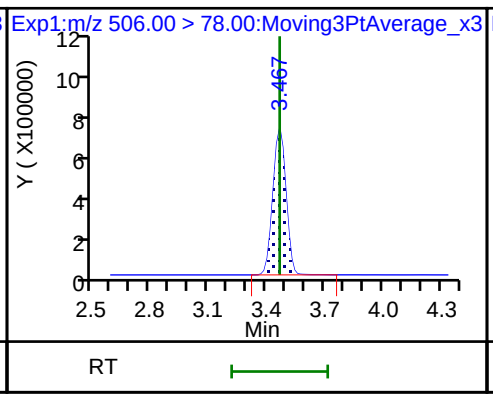
D 18 13C4 PFOS



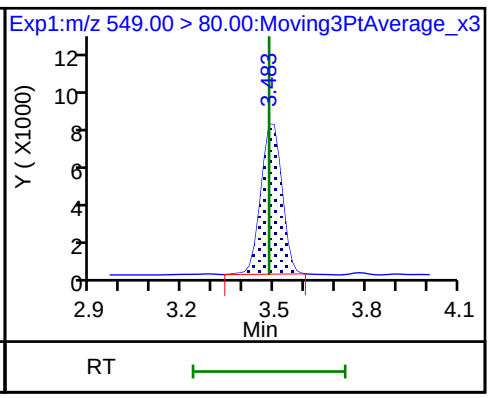
22 Perfluorooctane Sulfonamide



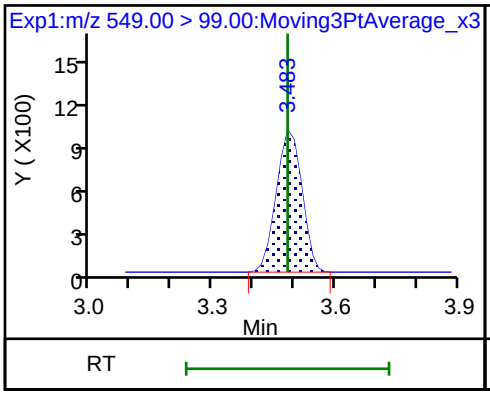
D 21 13C8 FOSA



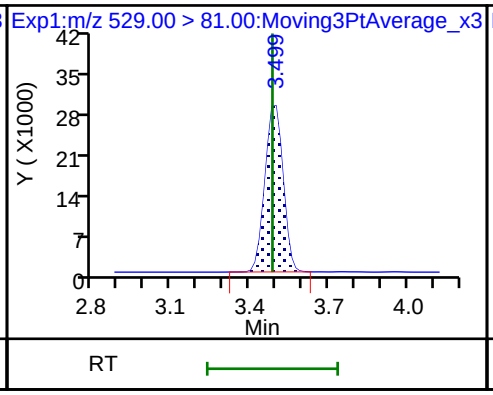
68 Perfluorononanesulfonic acid



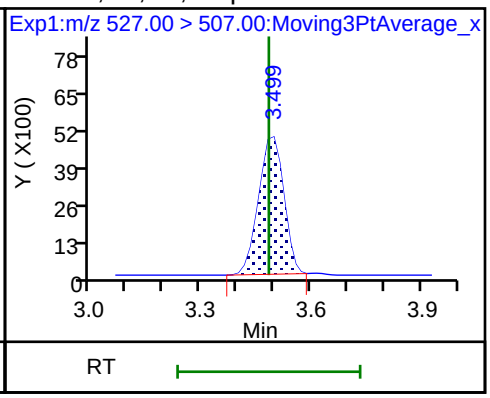
68 Perfluorononanesulfonic acid



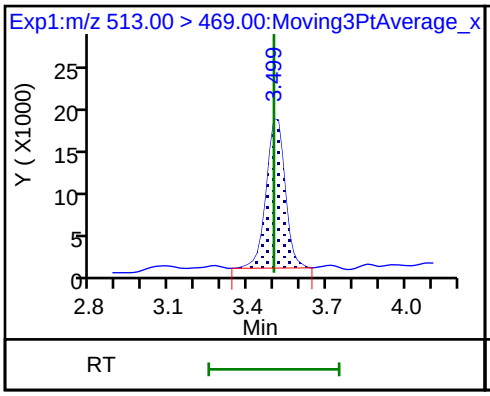
D 26 M2-8:2FTS



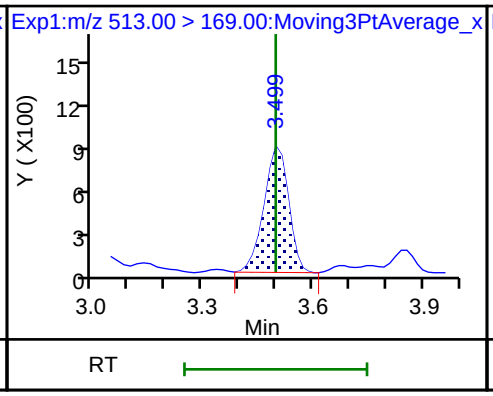
25 1H,1H,2H,2H-perfluorodecanesulfoni



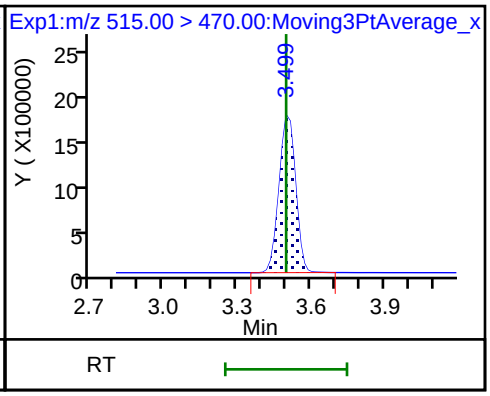
24 Perfluorodecanoic acid



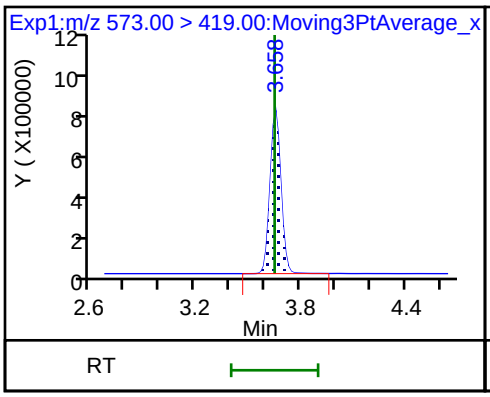
24 Perfluorodecanoic acid



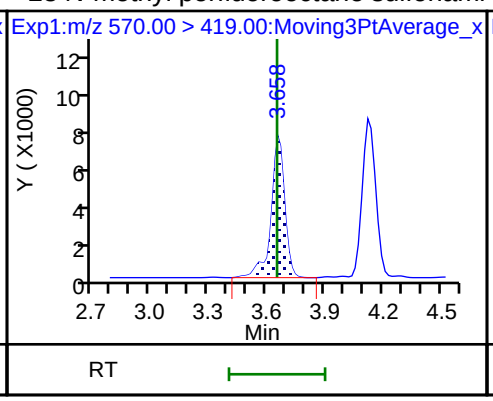
D 23 13C2 PFDA



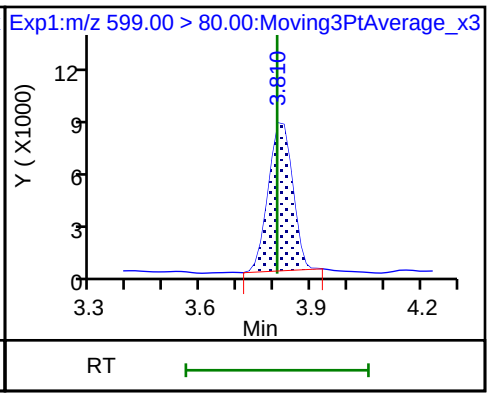
D 27 d3-NMeFOSAA



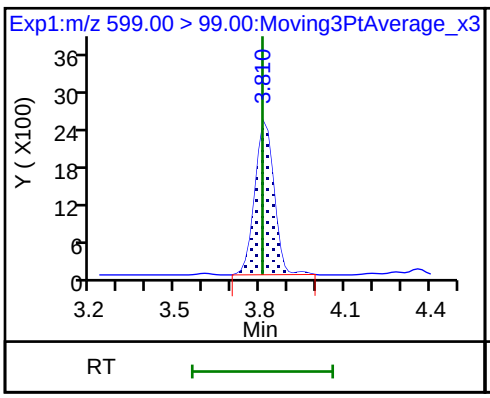
28 N-methyl perfluorooctane sulfonami



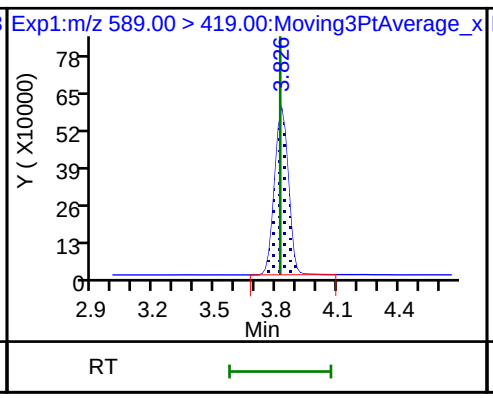
29 Perfluorodecane Sulfonic acid



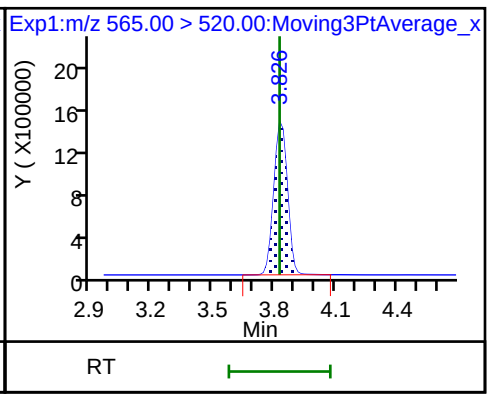
29 Perfluorodecane Sulfonic acid



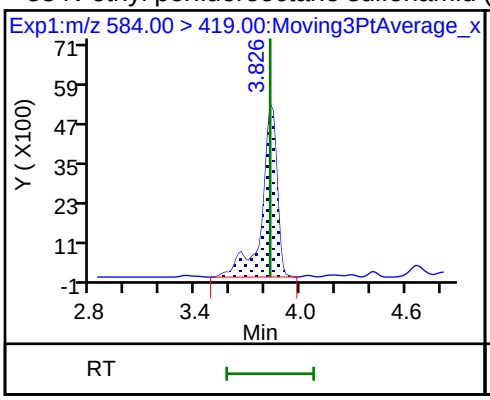
D 32 d5-NEtFOSAA



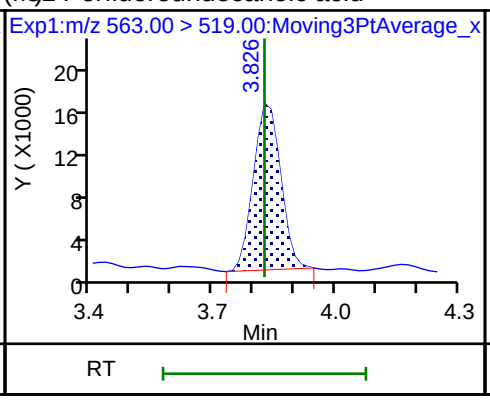
D 30 13C2 PFUnA



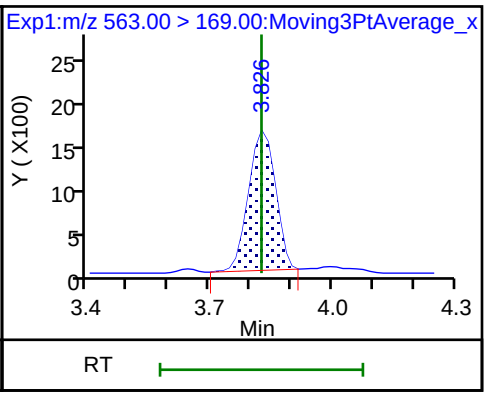
33 N-ethyl perfluorooctane sulfonamid (M)



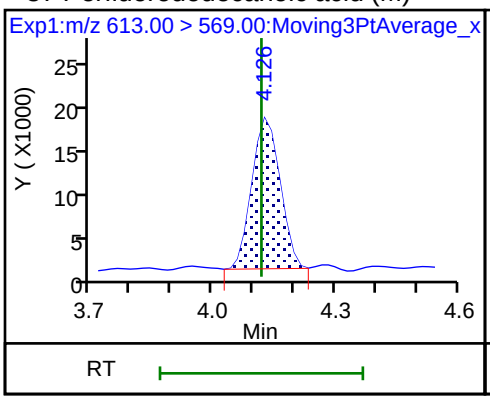
31 Perfluoroundecanoic acid



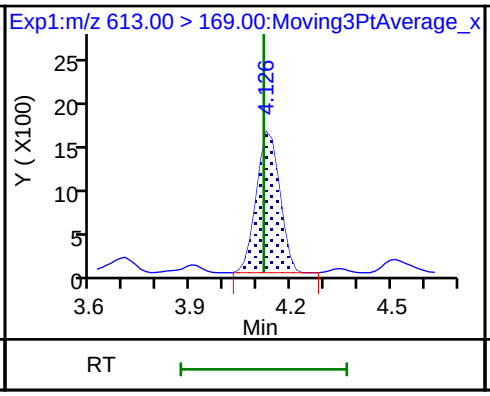
31 Perfluoroundecanoic acid



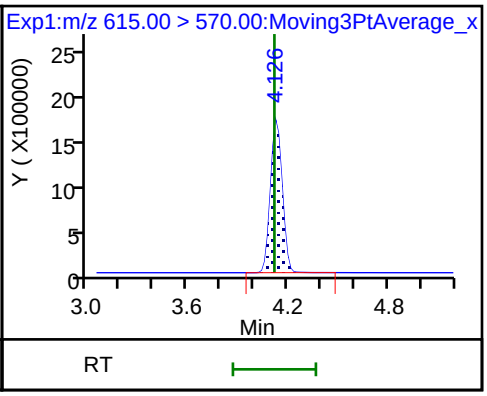
37 Perfluorododecanoic acid (M)



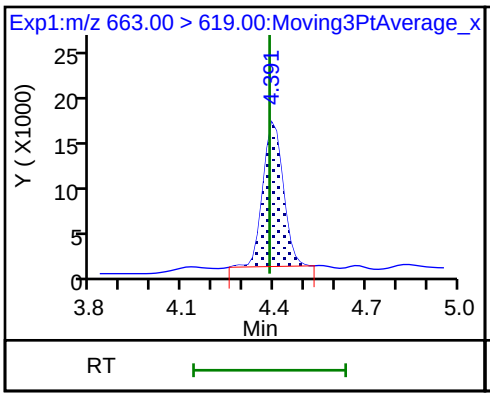
37 Perfluorododecanoic acid



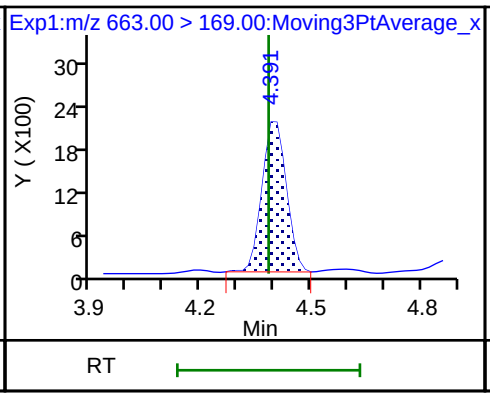
D 36 13C2 PFDoA



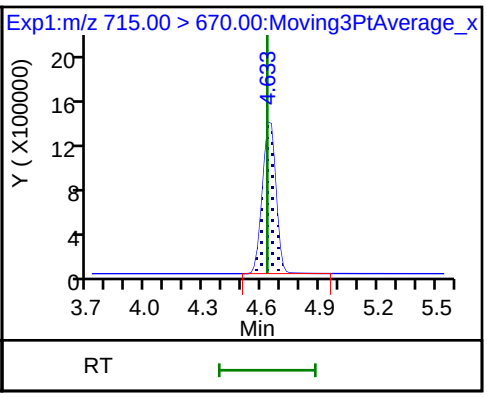
41 Perfluorotridecanoic acid



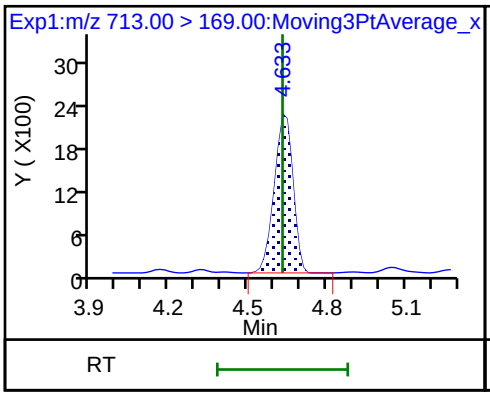
41 Perfluorotridecanoic acid



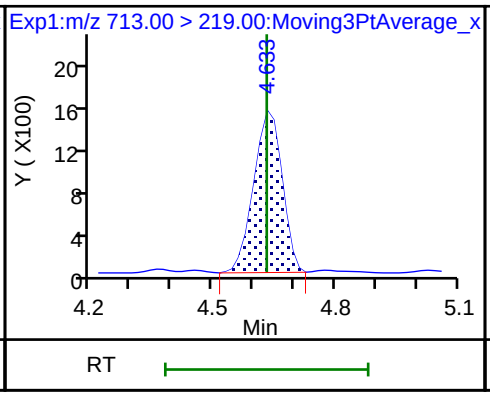
D 43 13C2-PFTeDA



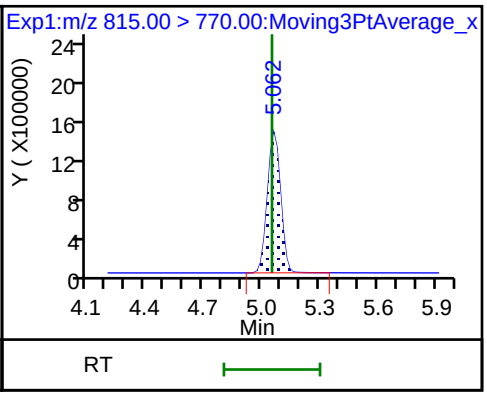
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

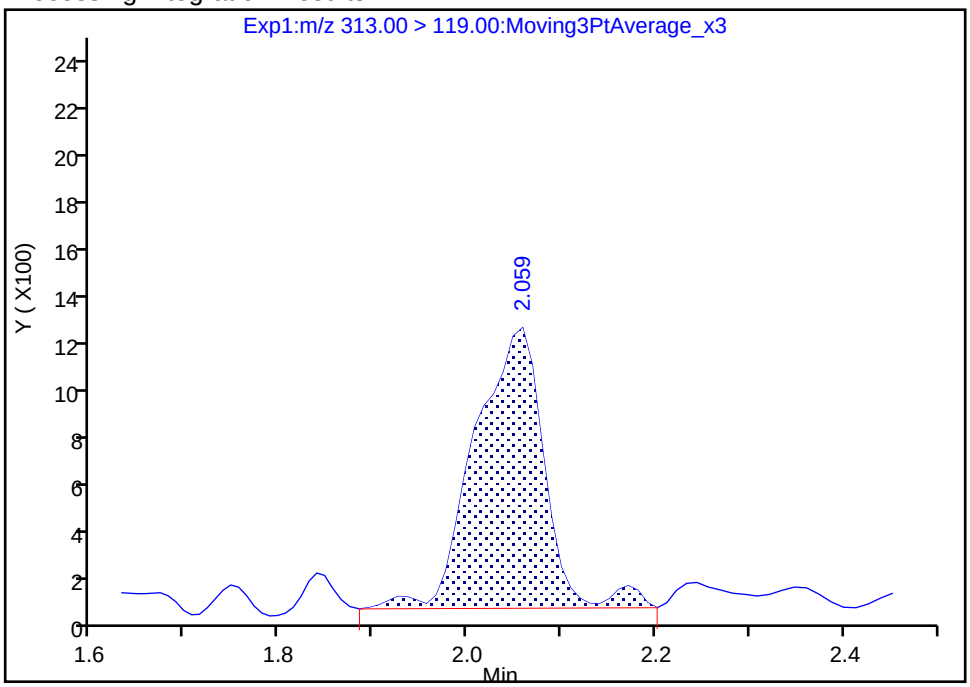
Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_005.d
Injection Date: 28-Aug-2018 10:20:47 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

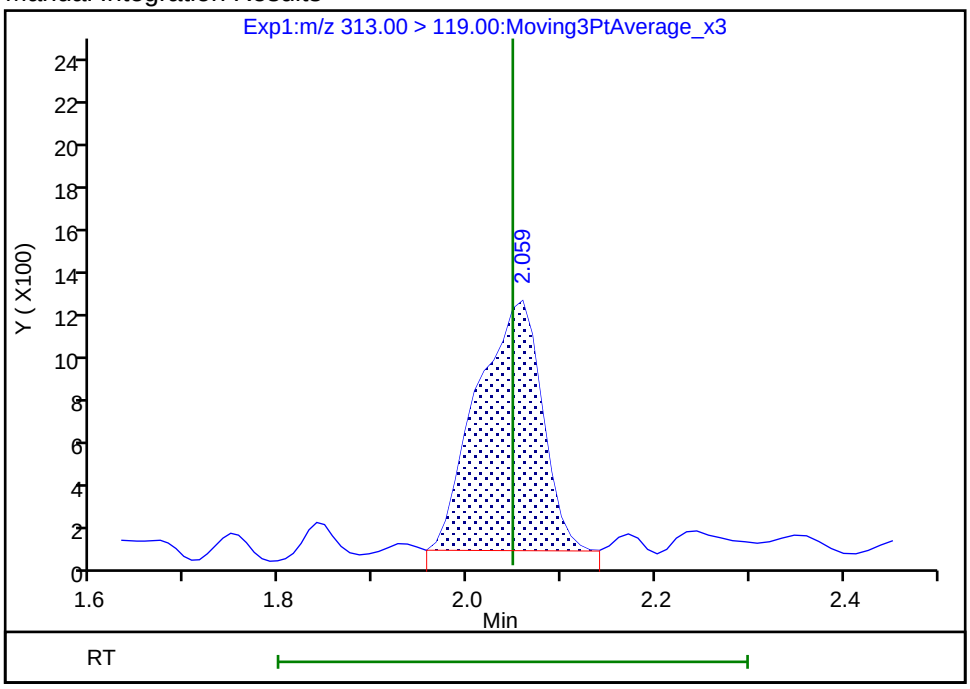
Processing Integration Results

RT: 2.06
Area: 6169
Amount: 0.027588
Amount Units: ng/ml



Manual Integration Results

RT: 2.06
Area: 5659
Amount: 0.029064
Amount Units: ng/ml



Reviewer: roycea, 28-Aug-2018 10:55:31
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

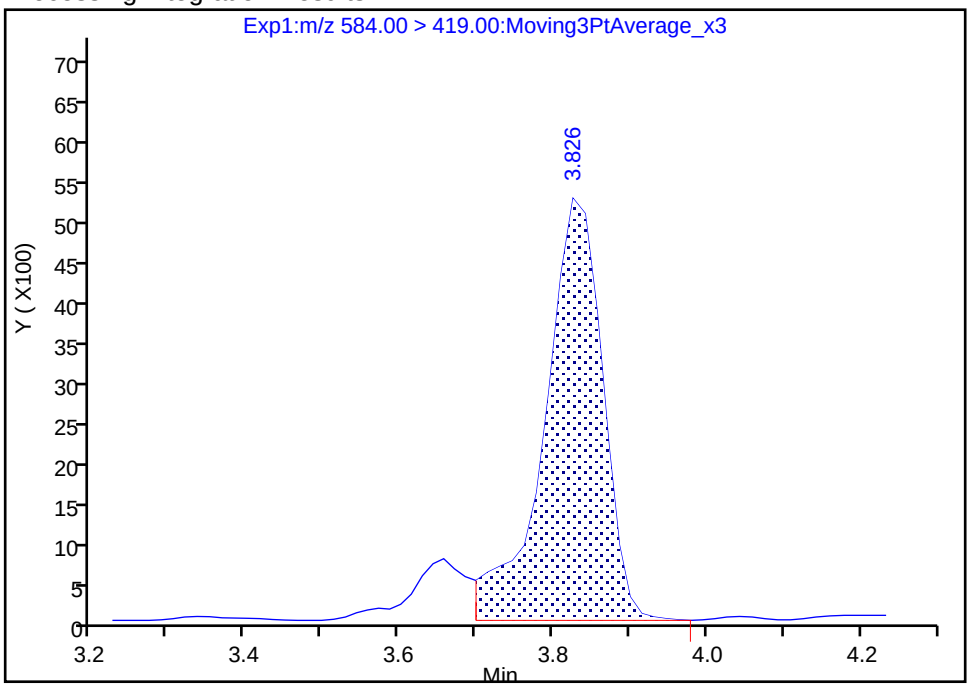
Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_005.d
Injection Date: 28-Aug-2018 10:20:47 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

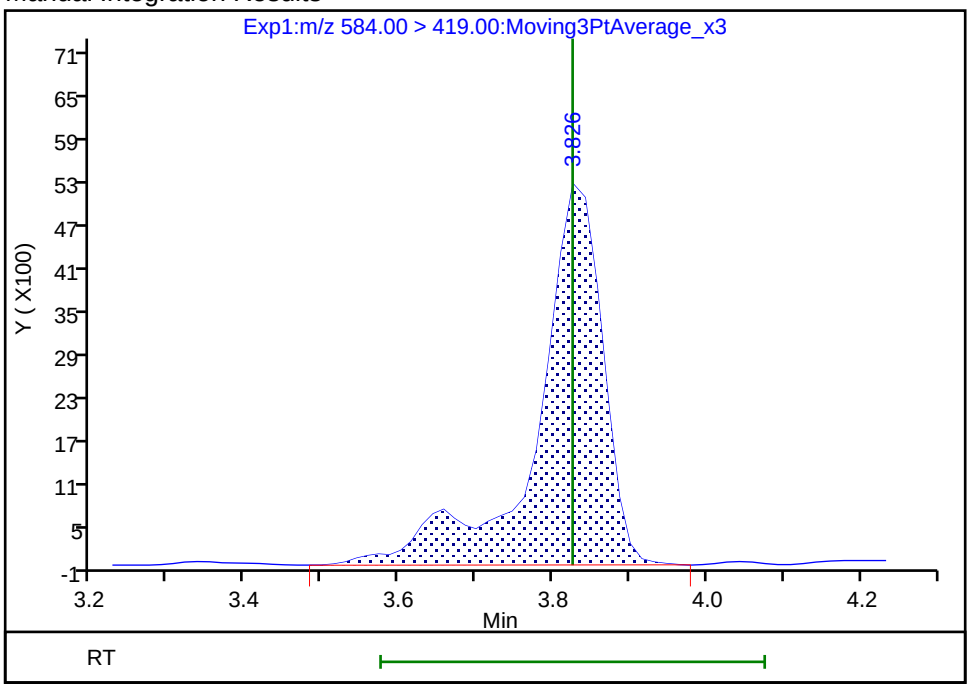
Processing Integration Results

RT: 3.83
Area: 27761
Amount: 0.027628
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 31607
Amount: 0.030901
Amount Units: ng/ml



Reviewer: roycea, 28-Aug-2018 10:55:56
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

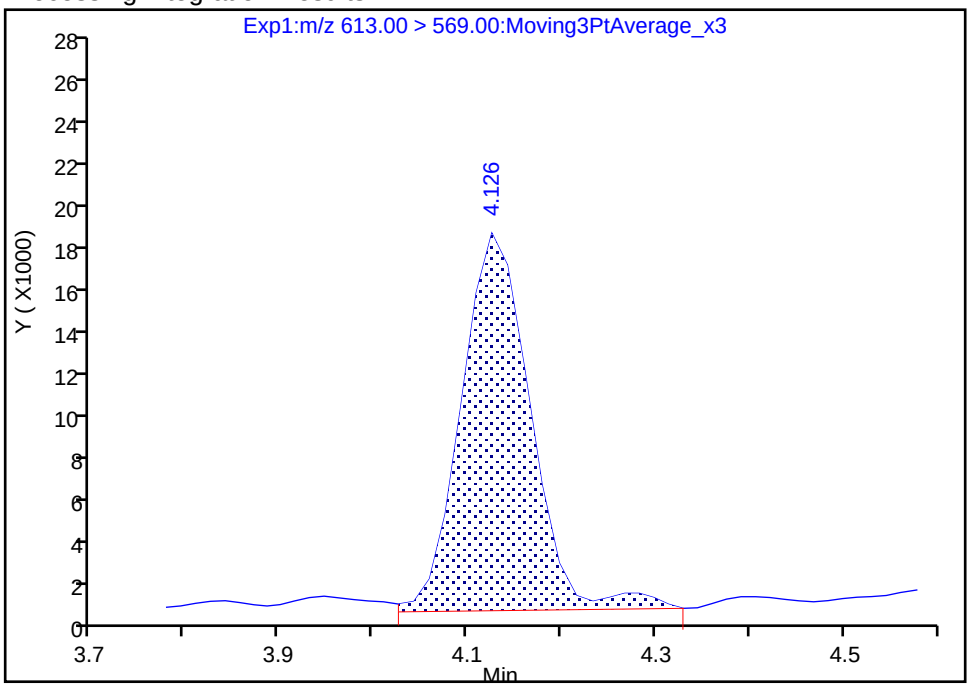
Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_005.d
Injection Date: 28-Aug-2018 10:20:47 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

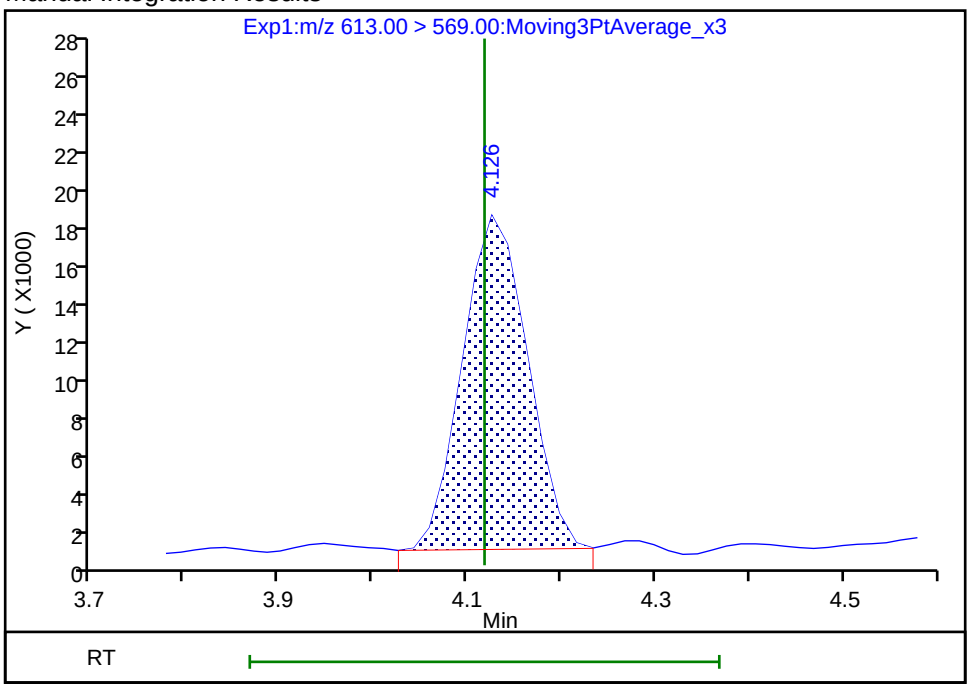
Processing Integration Results

RT: 4.13
Area: 91648
Amount: 0.025240
Amount Units: ng/ml



Manual Integration Results

RT: 4.13
Area: 84200
Amount: 0.025264
Amount Units: ng/ml



Reviewer: roycea, 28-Aug-2018 10:56:10
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_006.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 28-Aug-2018 10:28:16 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: IC PFC STD2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 13:27:28 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 10:56:48

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	1.489	1.485	0.004	0.541	8291131	2.51		100	17018	
2 Perfluorobutyric acid										
212.90 > 169.00	1.489	1.486	0.003	1.000	148472	0.0490		98.1	24.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.758	0.006	0.641	7385908	2.50		100	12498	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.759	0.005	1.000	162630	0.0543		109	21.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.796	0.001	0.653	90247	2.33		100	738	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	185053	0.0454		103	127	
298.90 > 99.00	1.797	1.797	0.0	1.000	59365		3.12(1.35-4.05)	103	75.1	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.012	0.005	1.122	43604	0.0520		111	319	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.013	0.004	0.733	824589	NC			1107	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.744	7967390	2.55		102	8699	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	153085	0.0527		105	49.7	
313.00 > 119.00	2.048	2.048	0.0	1.000	12880		11.89(6.96-20.87)	105	25.0	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.071	-0.003	1.151	92389	0.0477		102	247	
349.00 > 99.00	2.079	2.071	0.008	1.157	39375		2.35(1.15-3.45)	102	138	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.149	0.001	1.000	30149	NC			18.6	

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	2.150	2.150	0.0	0.782	803202	NC			2151	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	9747881	2.62		105	10893	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	198338	0.0499		99.8	44.3	
363.00 > 169.00	2.387	2.387	0.0	1.000	47456		4.18(2.17-6.52)	99.8	134	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	151487	0.0520		114	188	
399.00 > 99.00	2.400	2.400	0.0	1.000	41006		3.69(1.90-5.70)	114	82.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5562863	2.43		103	15845	
76 DONA										
377.00 > 251.00	2.439	2.432	0.007	0.778	328200	NC			467	
377.00 > 85.00	2.439	2.432	0.007	0.778	140412		2.34(1.13-3.39)		73.8	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.728	0.007	1.000	33995	0.0422		88.9	28.5	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.728	0.007	0.994	894847	2.45		103	1405	
D 73 13C8 PFOA										
421.00 > 376.00	2.751	2.744	0.007		7443899	NC			11202	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	8538141	2.46		98.6	11358	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8596922	2.50			15510	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.751	2.751	0.0	1.000	212266	0.0577		115	19.6	M
413.00 > 169.00	2.751	2.751	0.0	1.000	74449		2.85(1.36-4.08)	115	188	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.760	0.007	0.882	117514	0.0487		102	156	
449.00 > 99.00	2.767	2.760	0.007	0.882	28009		4.20(1.84-5.53)	102	132	
D 72 13C8 PFOS										
507.00 > 99.00	3.136	3.129	0.007		1300205	NC			3048	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	129377	0.0500		108	110	
499.00 > 99.00	3.136	3.136	0.0	1.000	29738		4.35(2.04-6.12)	108	90.4	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.136	0.0	1.140	8229151	2.54		101	7676	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	164410	0.0511		102	22.1	
463.00 > 169.00	3.136	3.136	0.0	1.000	32541		5.05(2.68-8.03)	102	81.4	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.136	0.0	1.140	5856894	2.38		99.7	4285	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.352	3.346	0.006	1.069	147444	NC			367	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	219730	0.0539		108	534	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3437498	2.64		106	7407	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.482	3.483	-0.001	1.110	85204	0.0538		112	211	
549.00 > 99.00	3.482	3.483	-0.001	1.110	13283		6.41(3.02-9.05)	112	104	
D 26 M2-8:2FTS										
529.00 > 81.00	3.482	3.485	-0.003	1.266	131131	2.44		102	650	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.482	3.485	-0.003	1.000	42130	0.0508		106	174	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.498	0.0	1.000	226611	0.0598		120	42.4	
513.00 > 169.00	3.498	3.498	0.0	1.000	14709		15.41(7.12-21.35)	120	48.6	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.498	0.0	1.272	8316028	2.57		103	8587	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.651	0.006	1.329	3717380	2.54		102	4722	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.653	0.004	1.000	74575	0.0505		101	25.5	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.810	3.807	0.003	1.215	107648	0.0540		112	140	
599.00 > 99.00	3.810	3.807	0.003	1.215	23332		4.61(2.14-6.43)	112	166	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.825	3.819	0.006	1.391	3123931	2.72		109	2483	
D 30 13C2 PFUnA										
565.00 > 520.00	3.825	3.825	0.0	1.391	7323152	2.65		106	14284	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.825	3.825	0.0	1.000	50114	0.0431		86.3	101	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.825	3.825	0.0	1.000	141127	0.0537		107	32.6	
563.00 > 169.00	3.825	3.825	0.0	1.000	14526		9.72(5.24-15.72)	107	96.3	
35 MeFOSA										
512.00 > 169.00	3.946	3.949	-0.003		33986	NC			157	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.978	3.983	-0.005	1.268	152144	NC			708	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.125	4.118	0.007	1.000	195509	0.0568		114	42.0	
613.00 > 169.00	4.125	4.118	0.007	1.000	19225		10.17(4.68-14.05)	114	68.2	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.118	0.007	1.500	8543283	2.55		102	6868	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.125	4.120	0.005	1.185	28306	NC			77.4	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.142	4.142	0.0		35989	NC			98.7	
75 Perfluorododecanesulfonic acid (PF										M
699.00 > 80.00	4.359	4.360	-0.001	1.390	8877	NC			19.6	M
699.00 > 99.00	4.359	4.360	-0.001	1.390	19034		0.47(0.28-0.83)		97.4	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.390	4.384	0.006	1.064	148840	0.0543		109	55.5	
663.00 > 169.00	4.390	4.384	0.006	1.064	24969		5.96(3.09-9.27)	109	88.8	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.629	4.628	0.001	1.683	7100968	2.66		106	10774	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.629	4.631	-0.002	1.000	22816	0.0498		99.5	134	
713.00 > 219.00	4.629	4.631	-0.002	1.000	16839		1.35(0.70-2.09)	99.5	107	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.053	0.005	1.000	199686	NC			46.7	
813.00 > 169.00	5.058	5.053	0.005	1.000	31573		6.32(2.77-8.32)		143	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.058	5.053	0.005	1.839	7035360	2.60		104	12129	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.420	5.416	0.004	1.071	92487	NC			26.2	
913.00 > 169.00	5.420	5.416	0.004	1.071	16340		5.66(2.55-7.64)		183	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00009 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 13:27:32 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_006.d

Injection Date: 28-Aug-2018 10:28:16 Instrument ID: A9

Lims ID: IC L2 Full

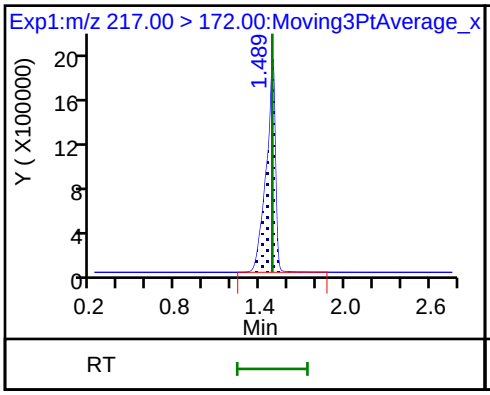
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3

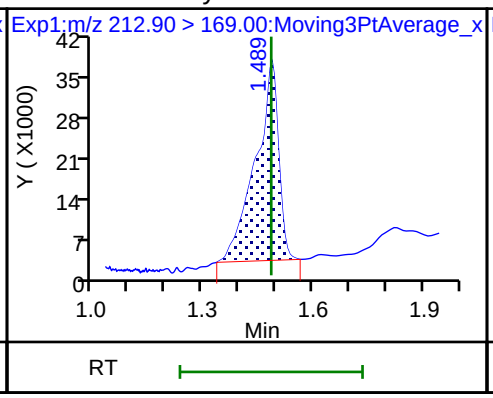
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

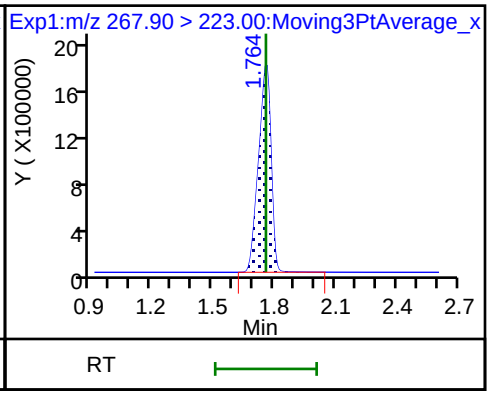
D 1 13C4 PFBA



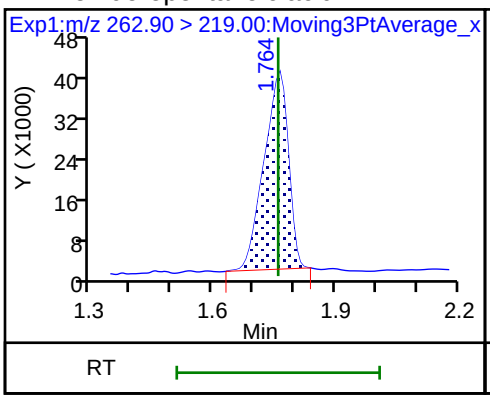
2 Perfluorobutyric acid



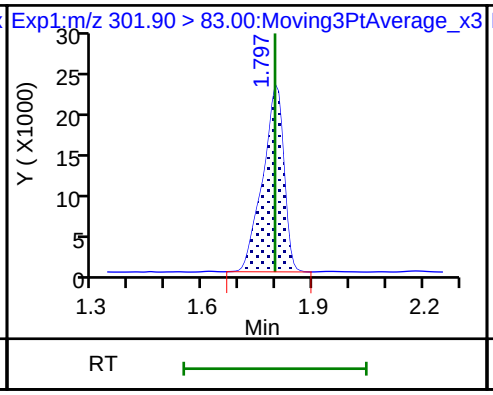
D 3 13C5-PFPeA



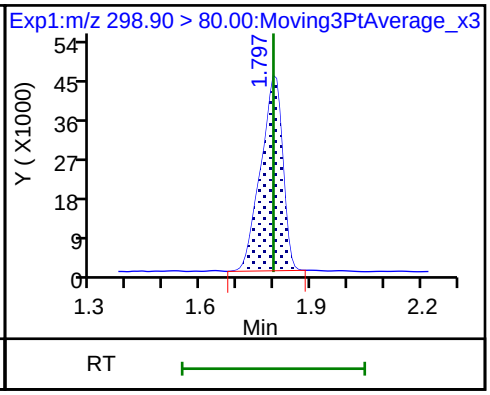
4 Perfluoropentanoic acid



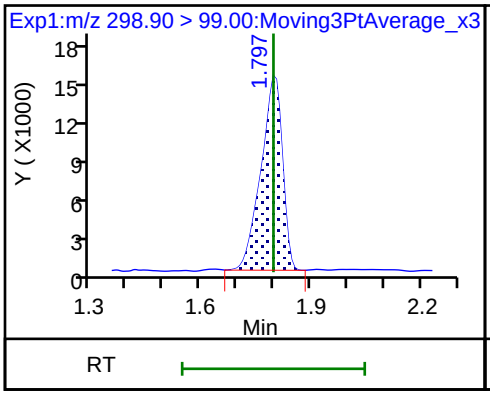
D 47 13C3-PFBS



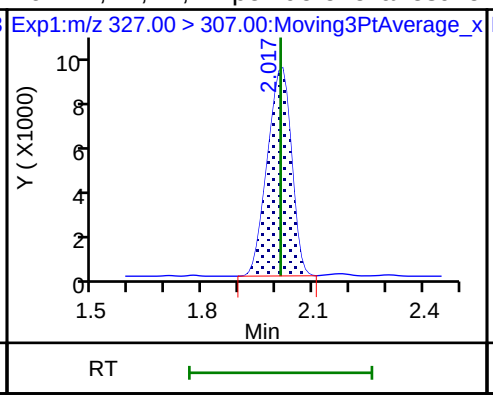
5 Perfluorobutanesulfonic acid



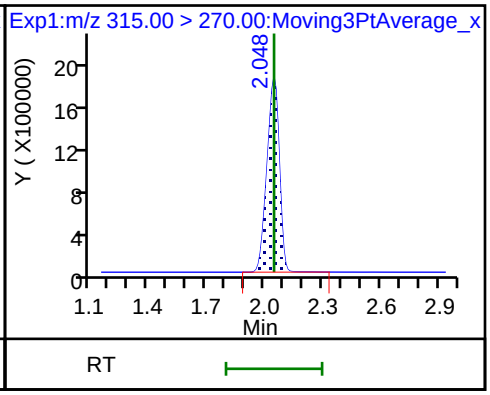
5 Perfluorobutanesulfonic acid



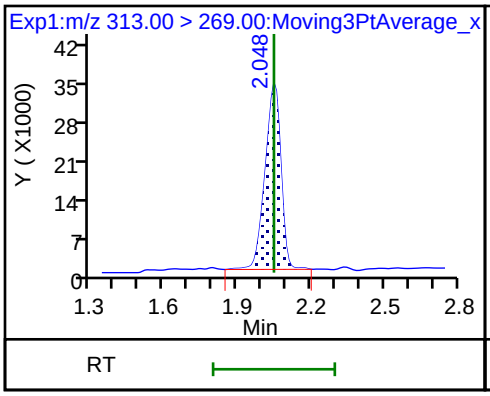
61 1H,1H,2H,2H-perfluorohexanesulfon



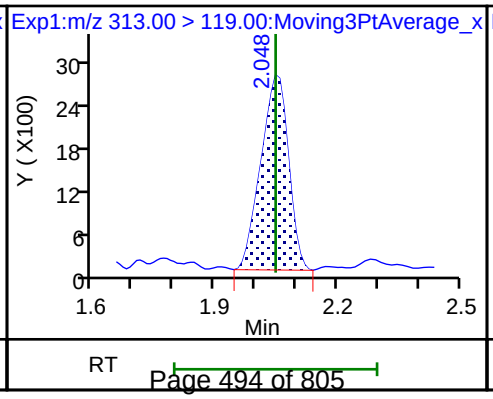
D 7 13C2 PFHxA



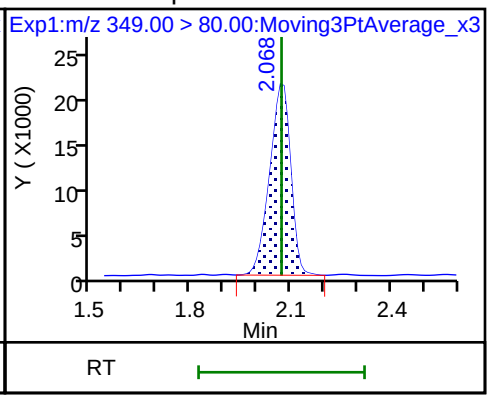
6 Perfluorohexanoic acid



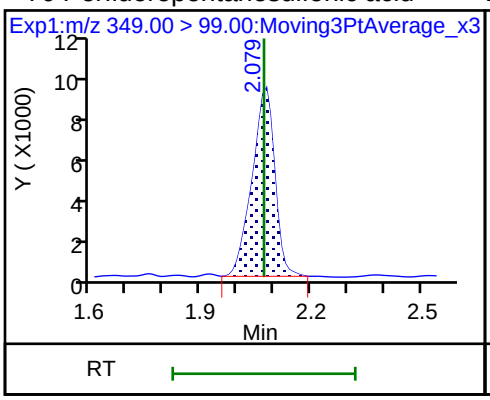
6 Perfluorohexanoic acid



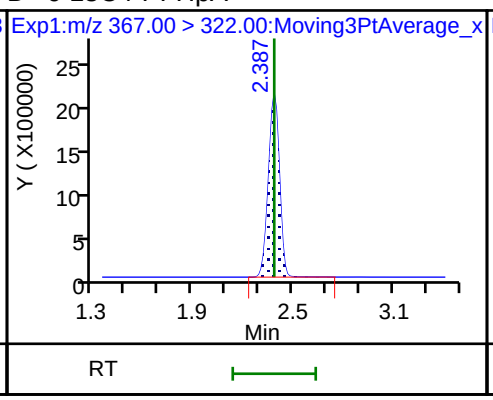
70 Perfluoropentanesulfonic acid



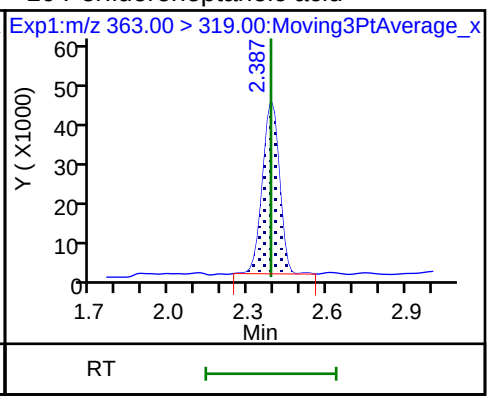
70 Perfluoropentanesulfonic acid



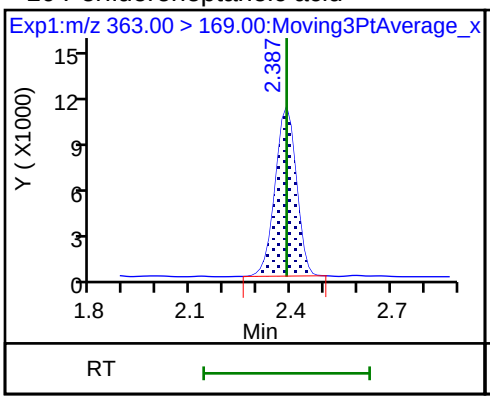
D 9 13C4-PFHpA



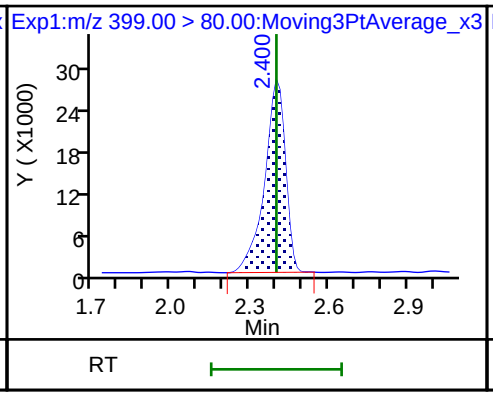
10 Perfluoroheptanoic acid



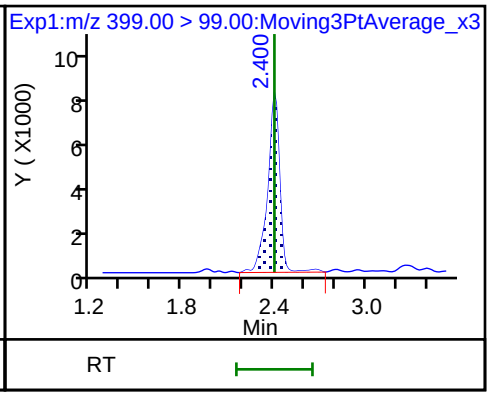
10 Perfluoroheptanoic acid



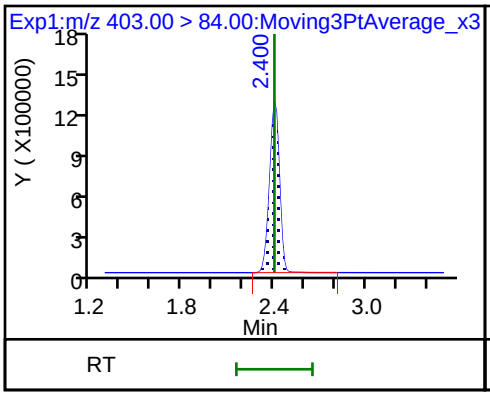
8 Perfluorohexanesulfonic acid



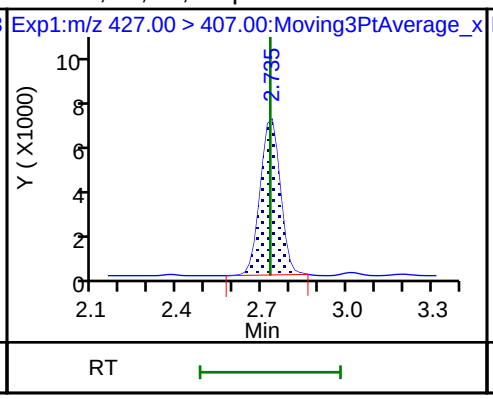
8 Perfluorohexanesulfonic acid



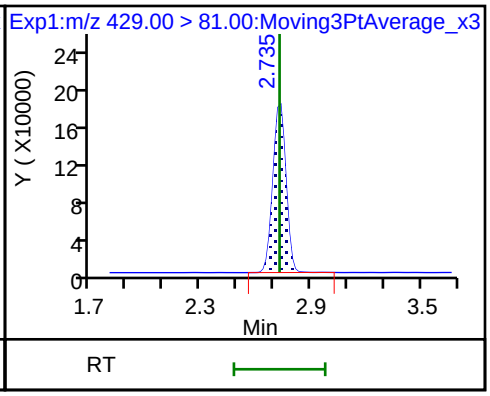
D 11 18O2 PFHxS



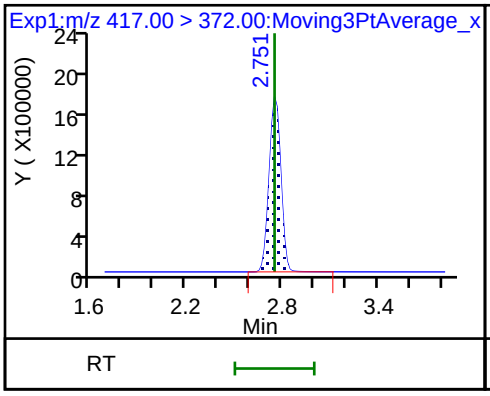
13 1H,1H,2H,2H-perfluorooctanesulfon



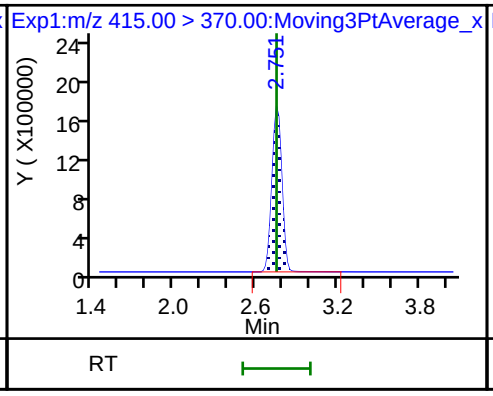
D 12 M2-6:2FTS



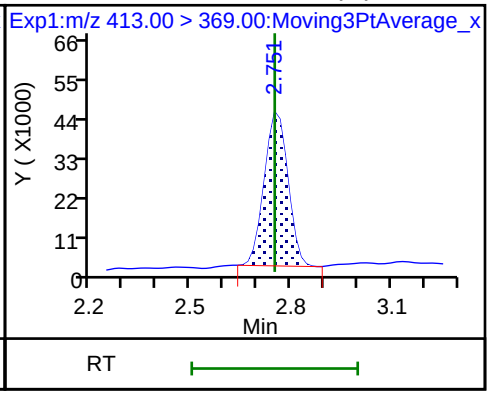
D 14 13C4 PFOA



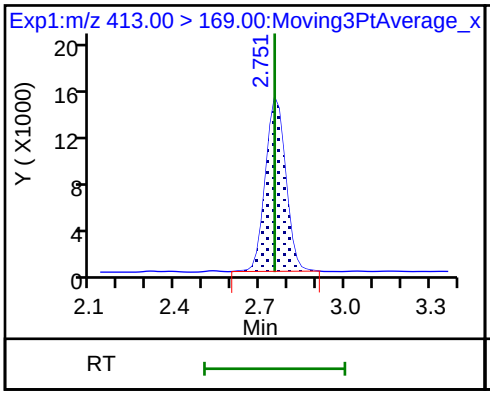
* 62 13C2-PFOA



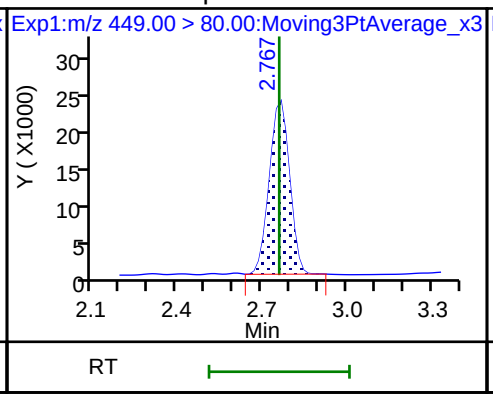
15 Perfluorooctanoic acid (M)



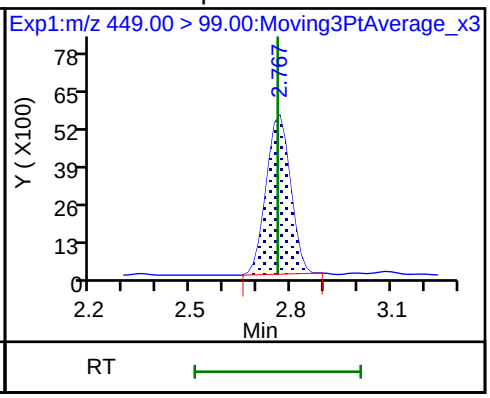
15 Perfluorooctanoic acid



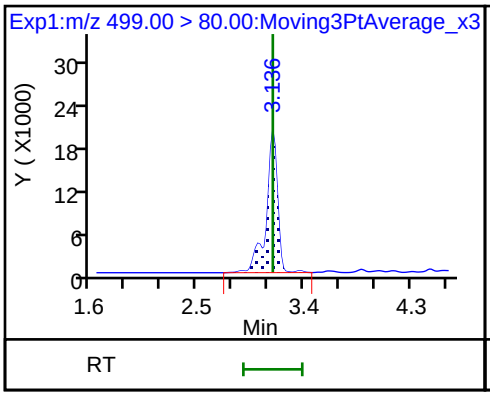
16 Perfluoroheptanesulfonic acid



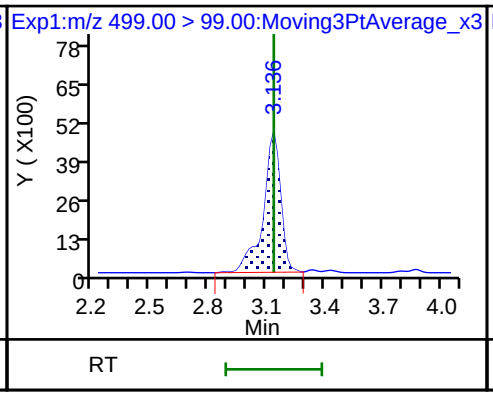
16 Perfluoroheptanesulfonic acid



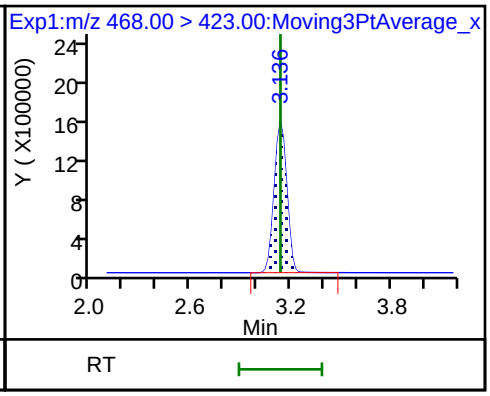
17 Perfluorooctane sulfonic acid



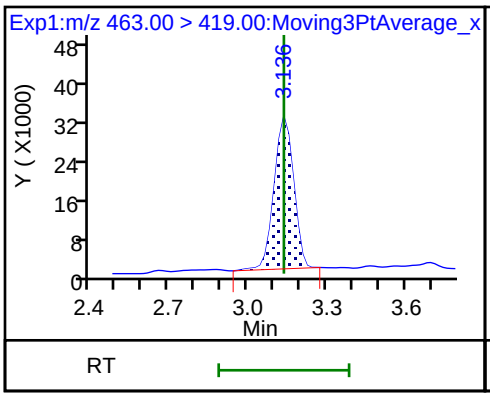
17 Perfluorooctane sulfonic acid



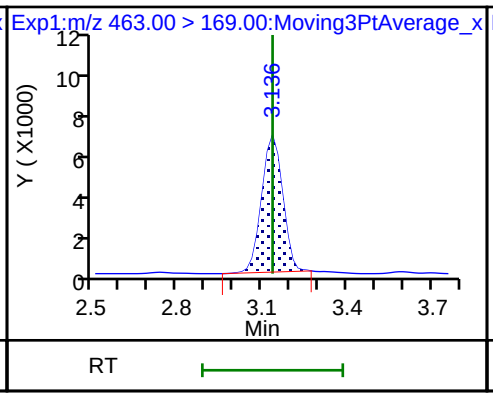
D 19 13C5 PFNA



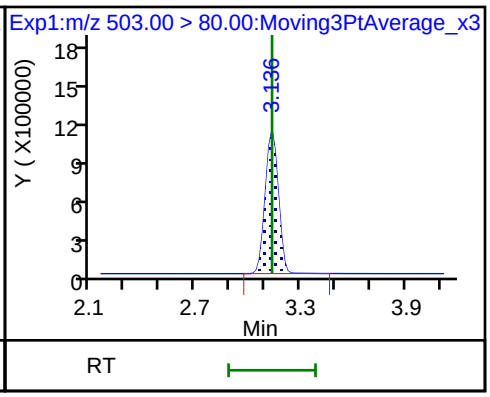
20 Perfluorononanoic acid



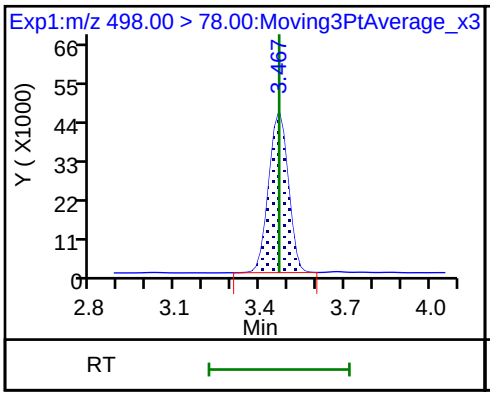
20 Perfluorononanoic acid



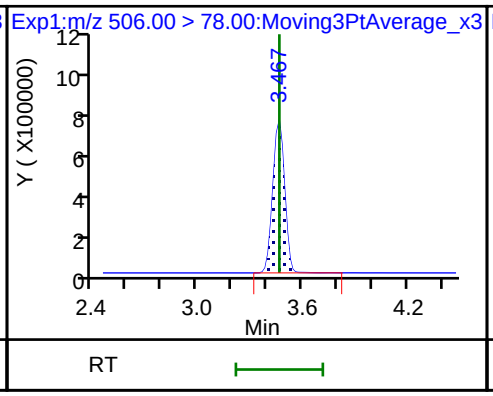
D 18 13C4 PFOS



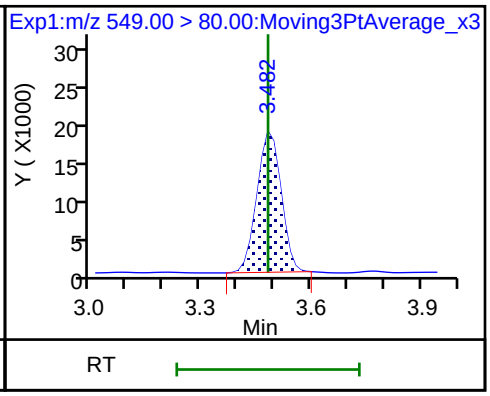
22 Perfluorooctane Sulfonamide



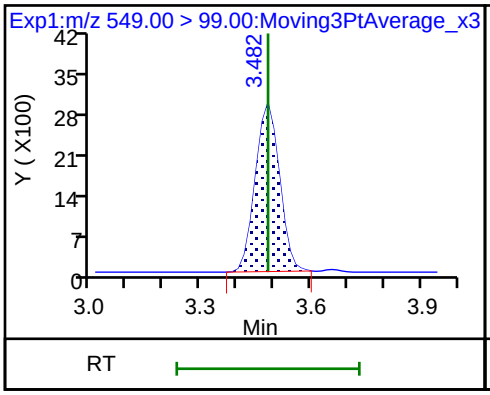
D 21 13C8 FOSA



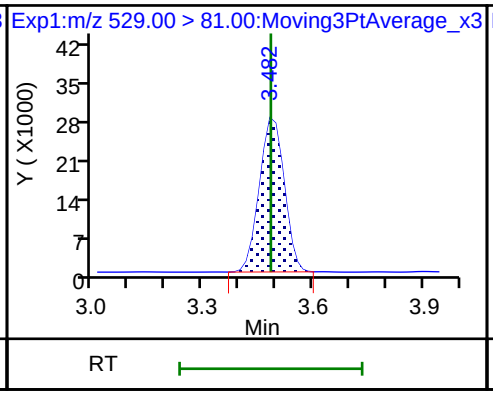
68 Perfluorononanesulfonic acid



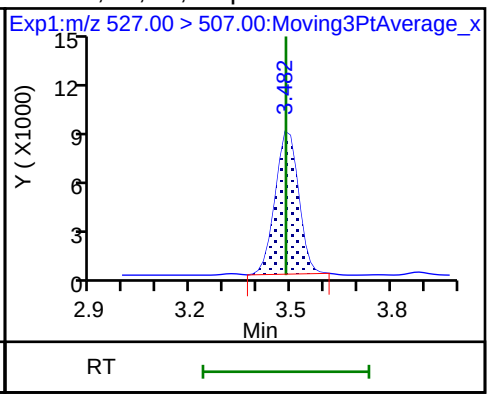
68 Perfluorononanesulfonic acid



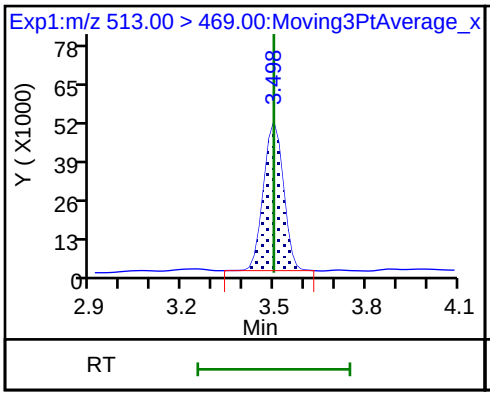
D 26 M2-8:2FTS



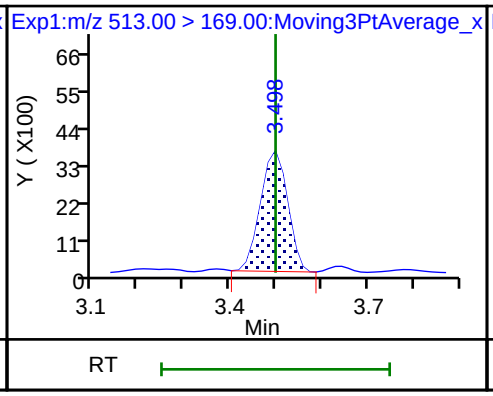
25 1H,1H,2H,2H-perfluorodecanesulfoni



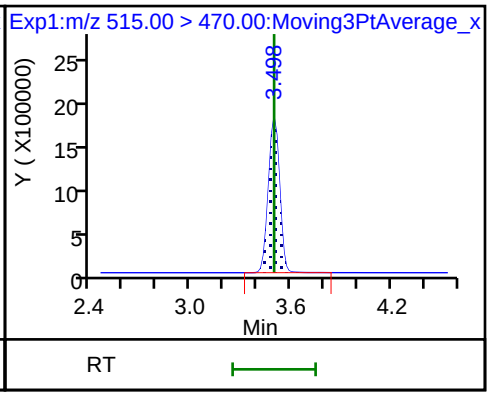
24 Perfluorodecanoic acid



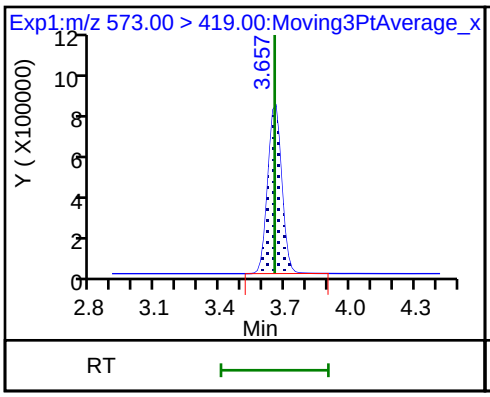
24 Perfluorodecanoic acid



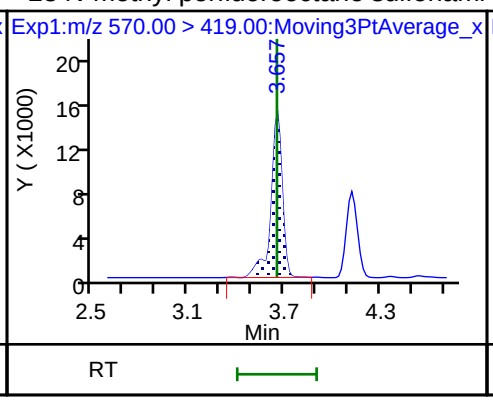
D 23 13C2 PFDA



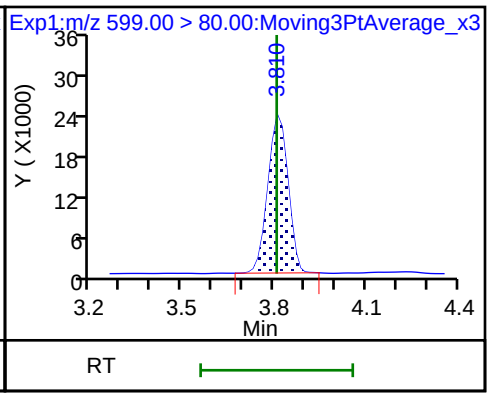
D 27 d3-NMeFOSAA



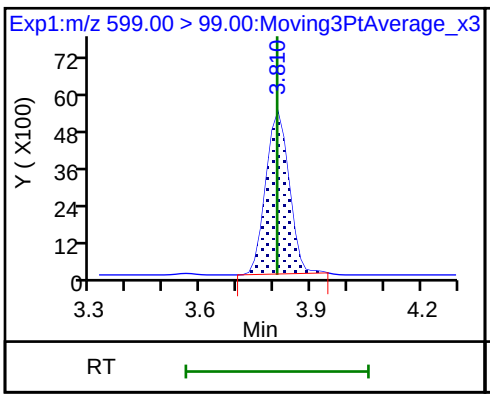
28 N-methyl perfluorooctane sulfonami



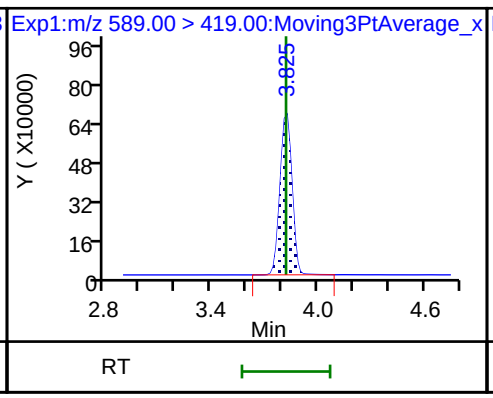
29 Perfluorodecane Sulfonic acid



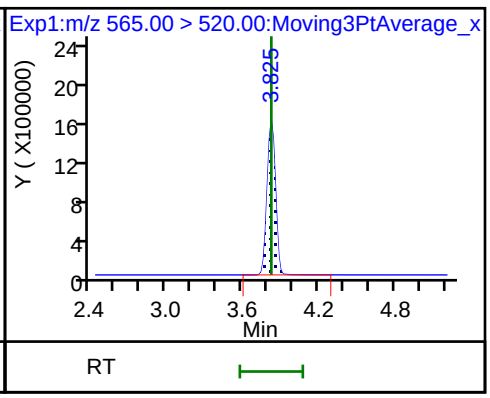
29 Perfluorodecane Sulfonic acid



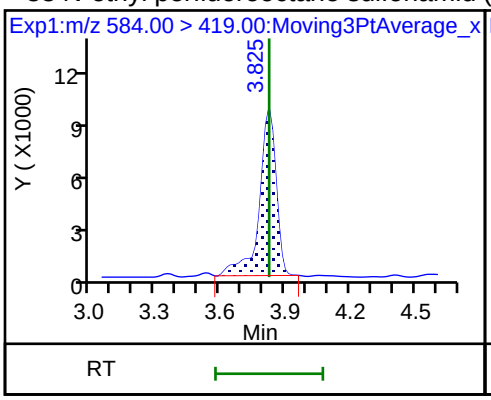
D 32 d5-NEtFOSAA



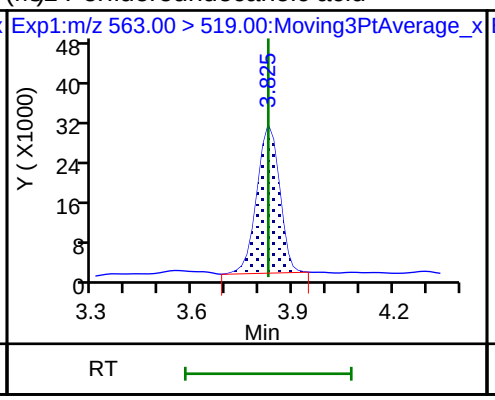
D 30 13C2 PFUnA



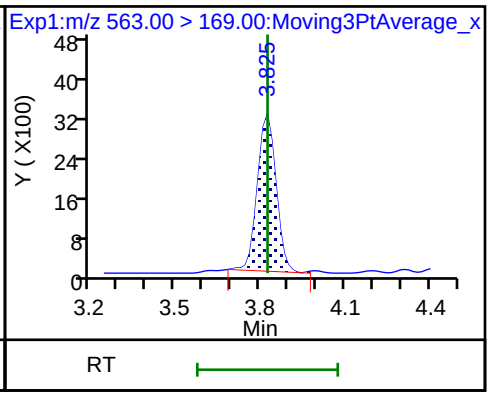
33 N-ethyl perfluorooctane sulfonamid (M)



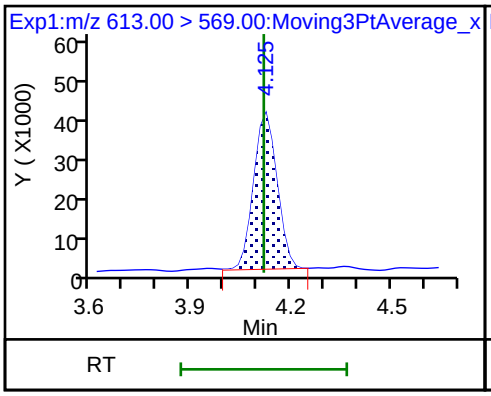
31 Perfluoroundecanoic acid



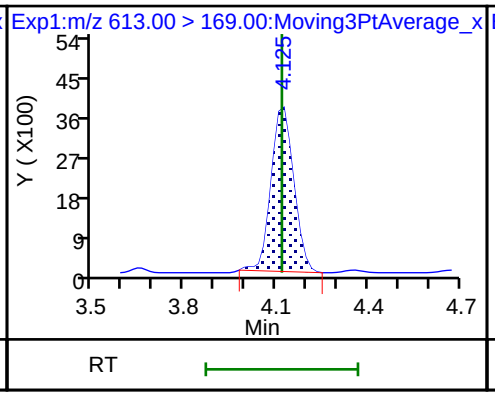
31 Perfluoroundecanoic acid



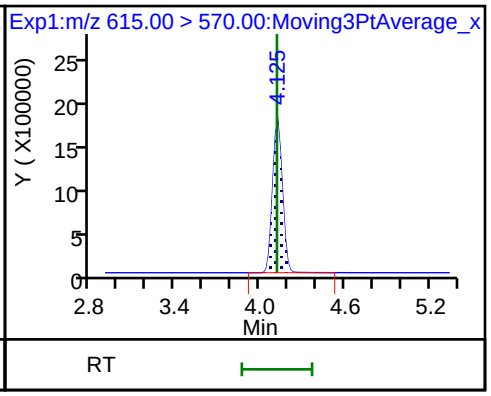
37 Perfluorododecanoic acid



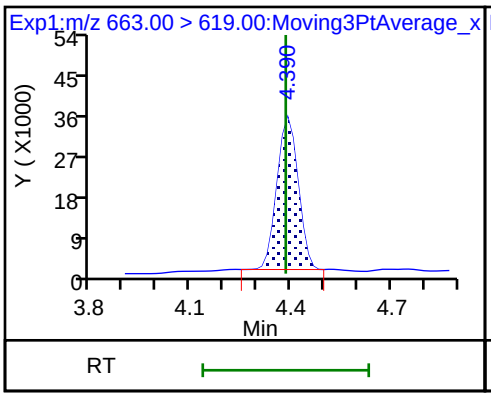
37 Perfluorododecanoic acid



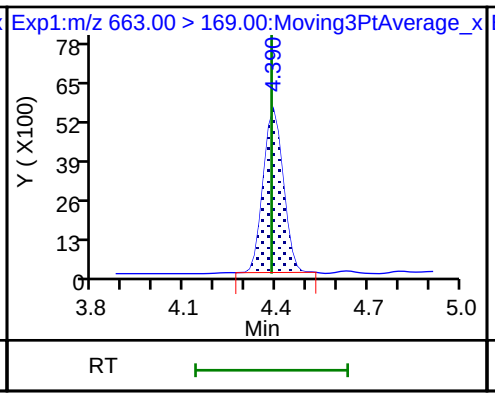
D 36 13C2 PFDoA



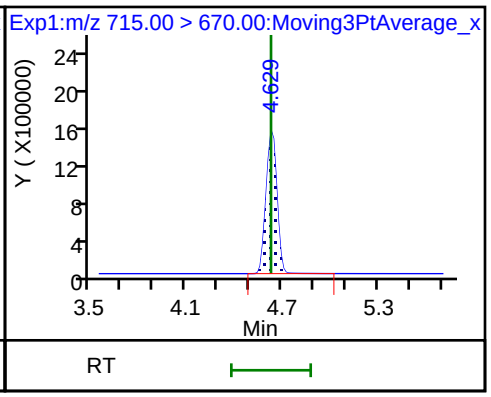
41 Perfluorotridecanoic acid



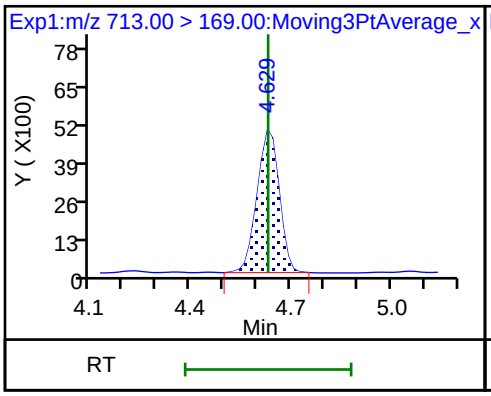
41 Perfluorotridecanoic acid



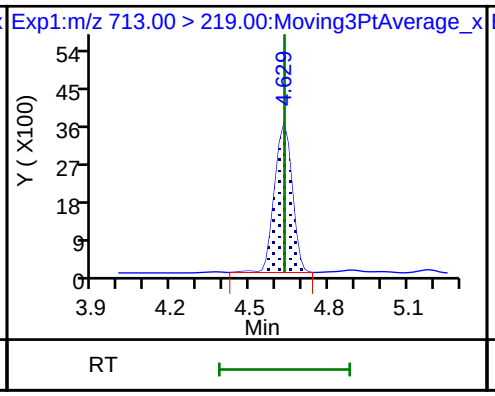
D 43 13C2-PFTeDA



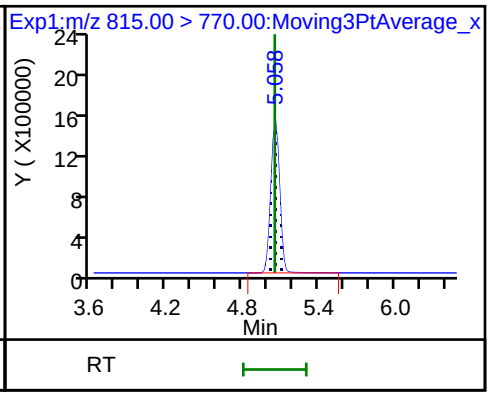
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

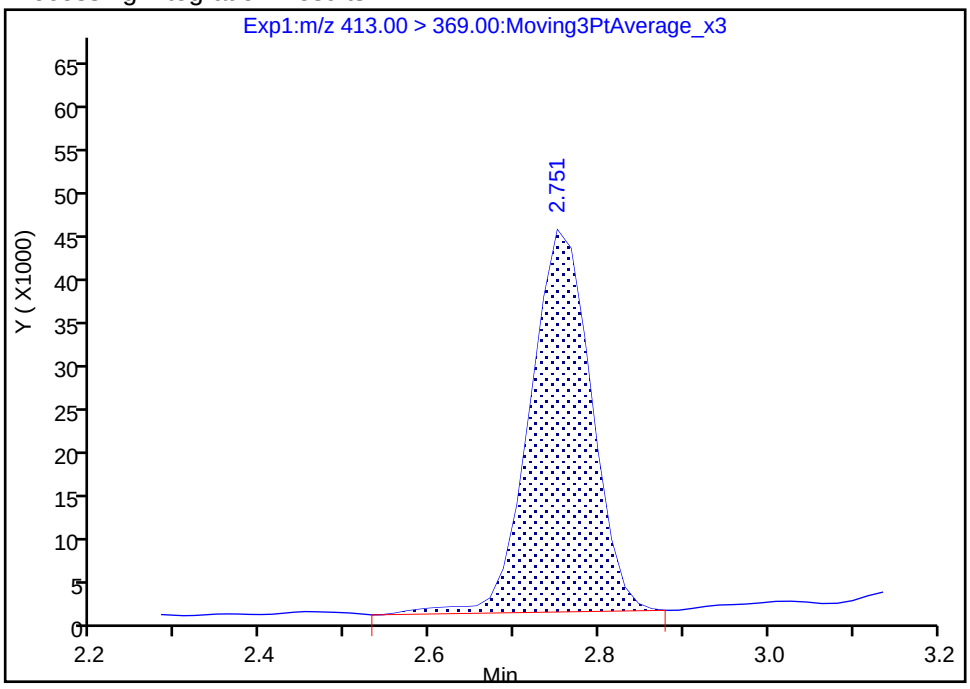
Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_006.d
Injection Date: 28-Aug-2018 10:28:16 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

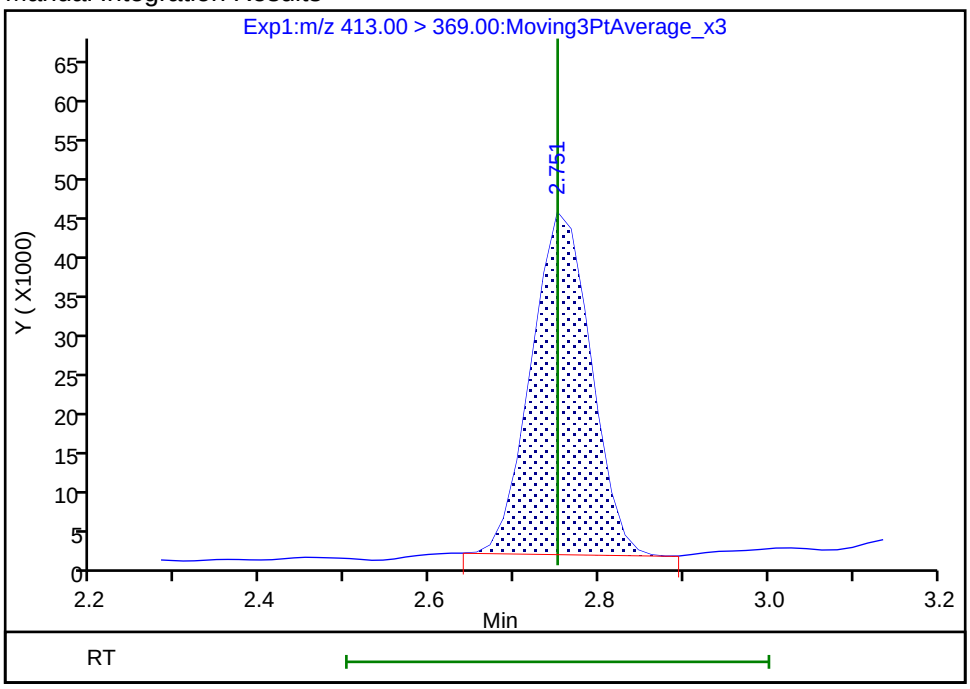
Processing Integration Results

RT: 2.75
Area: 220267
Amount: 0.059556
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 212266
Amount: 0.057749
Amount Units: ng/ml



Reviewer: roycea, 28-Aug-2018 11:55:22
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

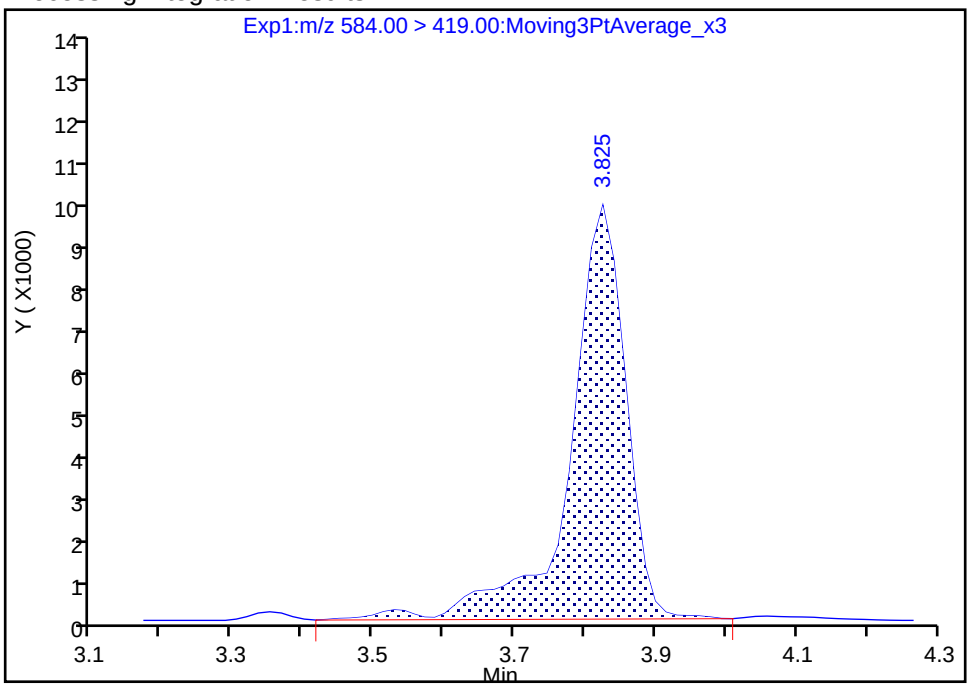
Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_006.d
Injection Date: 28-Aug-2018 10:28:16 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

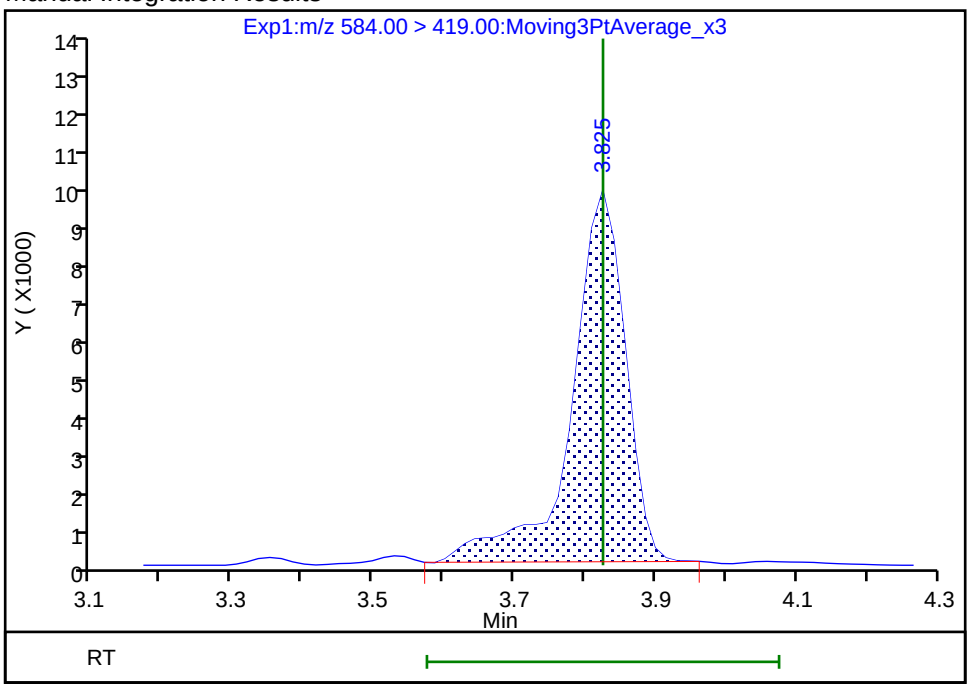
Processing Integration Results

RT: 3.83
Area: 52485
Amount: 0.044286
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 50114
Amount: 0.043129
Amount Units: ng/ml



Reviewer: roycea, 28-Aug-2018 10:58:28
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_007.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 28-Aug-2018 10:35:45 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: IC PFC STD3
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 13:27:36 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 10:59:59

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	1.483	1.485	-0.002	0.539	8171064	2.42		96.9	11309	
2 Perfluorobutyric acid										
212.90 > 169.00	1.483	1.486	-0.003	1.000	771594	0.2586		103	131	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.758	-0.002	0.638	7400409	2.46		98.4	10119	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.759	0.005	1.005	747283	0.2489		99.6	92.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.796	0.001	0.653	88972	2.25		96.9	731	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	910651	0.2265		102	566	
298.90 > 99.00	1.797	1.797	0.0	1.000	310492		2.93(1.35-4.05)	102	355	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.012	-0.005	1.117	185640	0.2245		96.1	1079	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.013	0.004	0.733	764687	NC			818	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.744	7995321	2.51		101	8594	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	710995	0.2441		97.7	197	
313.00 > 119.00	2.048	2.048	0.0	1.000	45947		15.47(6.96-20.87)	97.7	94.2	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.071	-0.003	1.151	446776	0.2341		99.8	1060	
349.00 > 99.00	2.068	2.071	-0.003	1.151	209041		2.14(1.15-3.45)	99.8	535	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.149	0.001	1.000	144461	NC			84.8	

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	2.150	2.150	0.0	0.782	872697	NC			2722	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	9544033	2.52		101	14205	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	1031715	0.2650		106	185	
363.00 > 169.00	2.387	2.387	0.0	1.000	233468		4.42(2.17-6.52)	106	691	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	617641	0.2132		93.7	774	
399.00 > 99.00	2.400	2.400	0.0	1.000	181791		3.40(1.90-5.70)	93.7	382	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5536160	2.37		100	9871	
76 DONA										
377.00 > 251.00	2.426	2.432	-0.006	0.774	1650815	NC			2552	
377.00 > 85.00	2.426	2.432	-0.006	0.774	708641		2.33(1.13-3.39)		336	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.728	0.007	1.000	186850	0.2332		98.4	228	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.728	0.007	0.994	889043	2.39		100	1268	
D 73 13C8 PFOA										
421.00 > 376.00	2.751	2.744	0.007		7129395	NC			12737	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	8662621	2.45		98.1	13367	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8760981	2.50			7465	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	954853	0.2560		102	81.1	
413.00 > 169.00	2.751	2.751	0.0	1.000	329107		2.90(1.36-4.08)	102	562	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.760	0.007	0.882	571922	0.2252		94.6	593	
449.00 > 99.00	2.767	2.760	0.007	0.882	146227		3.91(1.84-5.53)	94.6	515	
D 72 13C8 PFOS										
507.00 > 99.00	3.136	3.129	0.007		1260760	NC			2898	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	589276	0.2165		93.3	586	
499.00 > 99.00	3.136	3.136	0.0	1.000	150858		3.91(2.04-6.12)	93.3	453	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.136	0.0	1.140	8602003	2.60		104	15584	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	888927	0.2642		106	113	
463.00 > 169.00	3.136	3.136	0.0	1.000	144935		6.13(2.68-8.03)	106	450	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.136	0.0	1.140	6165020	2.46		103	4347	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.353	3.346	0.007	1.069	662154	NC			1155	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	1031117	0.2671		107	1921	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3255994	2.46		98.2	8042	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.482	3.483	-0.001	1.110	361865	0.2172		90.5	913	
549.00 > 99.00	3.482	3.483	-0.001	1.110	67871		5.33(3.02-9.05)	90.5	777	
D 26 M2-8:2FTS										
529.00 > 81.00	3.482	3.485	-0.003	1.266	135294	2.47		103	554	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.482	3.485	-0.003	1.000	196079	0.2293		95.7	772	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.498	0.0	1.000	1019290	0.2737		109	173	
513.00 > 169.00	3.498	3.498	0.0	1.000	63973		15.93(7.12-21.35)	109	150	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.498	0.0	1.272	8177178	2.48		99.0	13184	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.651	0.006	1.329	3721760	2.50		100.0	3977	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.653	0.004	1.000	378563	0.2559		102	113	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.810	3.807	0.003	1.215	488613	0.2329		96.6	620	
599.00 > 99.00	3.810	3.807	0.003	1.215	110745		4.41(2.14-6.43)	96.6	411	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.825	3.819	0.006	1.391	3035794	2.59		104	2983	
D 30 13C2 PFUnA										
565.00 > 520.00	3.825	3.825	0.0	1.391	7021910	2.50		99.9	5964	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.825	3.825	0.0	1.000	280096	0.2481		99.2	476	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.825	3.825	0.0	1.000	606238	0.2406		96.2	127	
563.00 > 169.00	3.825	3.825	0.0	1.000	63827		9.50(5.24-15.72)	96.2	356	
35 MeFOSA										
512.00 > 169.00	3.947	3.949	-0.002		173308	NC			517	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.978	3.983	-0.005	1.268	794765	NC			2363	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.125	4.118	0.007	1.000	865534	0.2638		106	212	
613.00 > 169.00	4.125	4.118	0.007	1.000	93241		9.28(4.68-14.05)	106	301	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.118	0.007	1.500	8139014	2.38		95.2	10321	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.125	4.120	0.005	1.185	134692	NC			403	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.142	4.142	0.0		184078	NC			308	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.360	4.360	0.0	1.390	53596	NC			130	
699.00 > 99.00	4.360	4.360	0.0	1.390	90934		0.59(0.28-0.83)		431	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.391	4.384	0.007	1.064	685651	0.2625		105	253	
663.00 > 169.00	4.391	4.384	0.007	1.064	121775		5.63(3.09-9.27)	105	473	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.630	4.628	0.002	1.683	6427054	2.36		94.4	10600	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.630	4.631	-0.001	1.000	109761	0.2645		106	657	
713.00 > 219.00	4.630	4.631	-0.001	1.000	73919		1.48(0.70-2.09)	106	496	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.053	0.006	1.000	692910	NC			153	
813.00 > 169.00	5.059	5.053	0.006	1.000	125880		5.50(2.77-8.32)		500	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.059	5.053	0.006	1.839	6746927	2.44		97.7	10418	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.419	5.416	0.003	1.071	442803	NC			130	
913.00 > 169.00	5.419	5.416	0.003	1.071	84799		5.22(2.55-7.64)		717	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00009 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 13:27:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_007.d

Injection Date: 28-Aug-2018 10:35:45 Instrument ID: A9

Lims ID: IC L3 Full

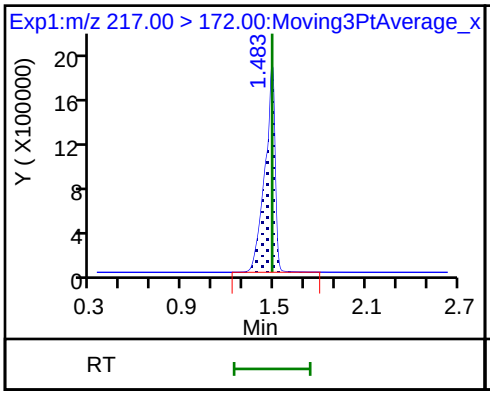
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 12 Worklist Smp#: 4

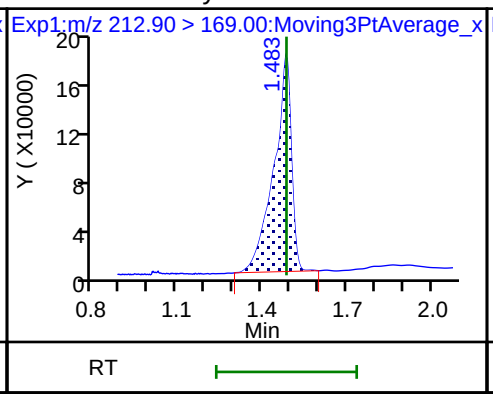
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

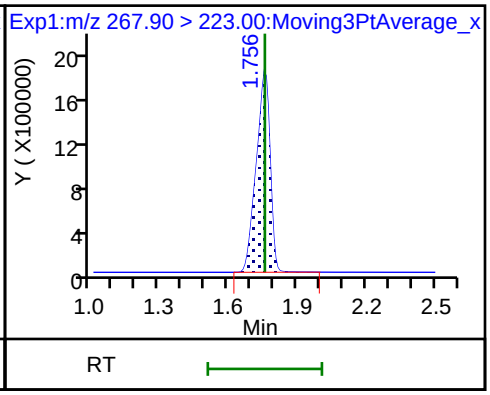
D 1 13C4 PFBA



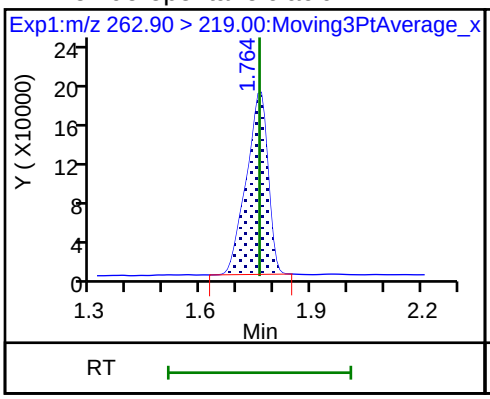
2 Perfluorobutyric acid



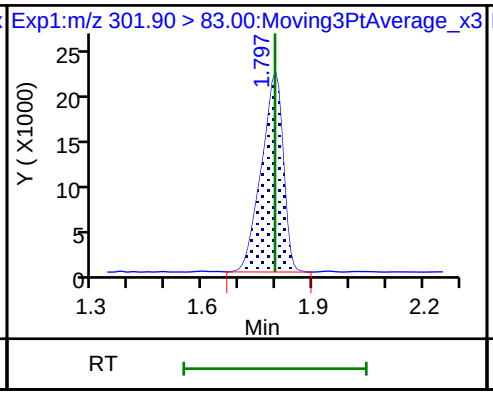
D 3 13C5-PFPeA



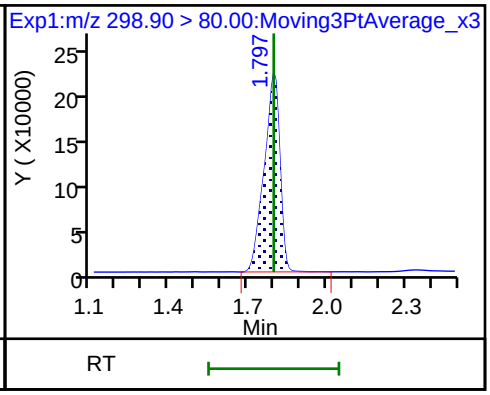
4 Perfluoropentanoic acid



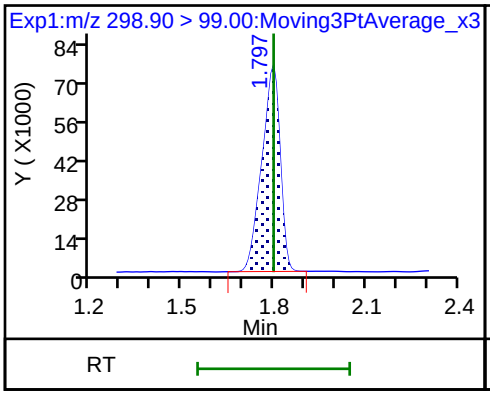
D 47 13C3-PFBS



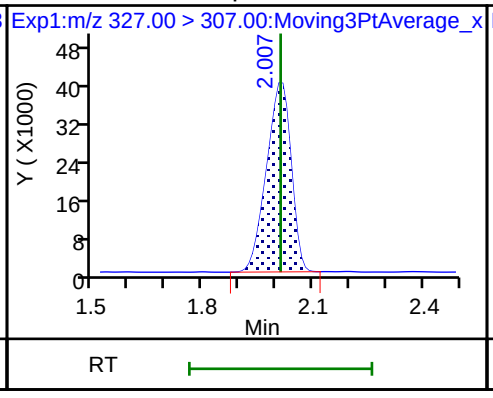
5 Perfluorobutanesulfonic acid



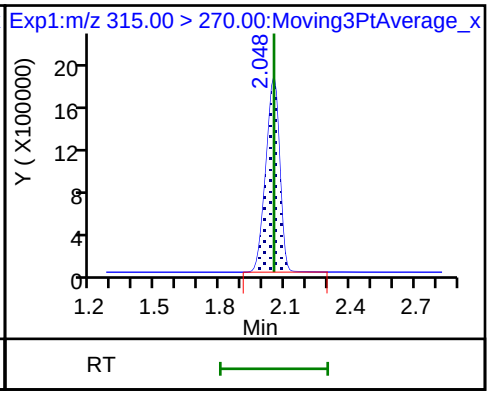
5 Perfluorobutanesulfonic acid



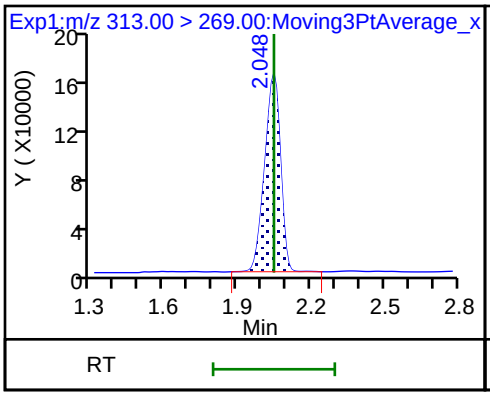
61 1H,1H,2H,2H-perfluorohexanesulfon



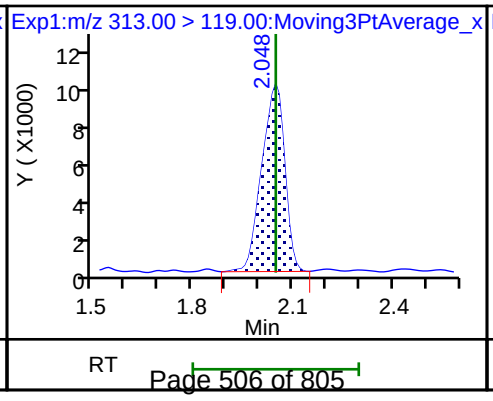
D 7 13C2 PFHxA



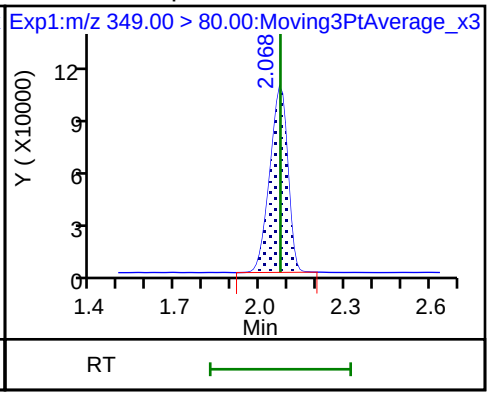
6 Perfluorohexanoic acid



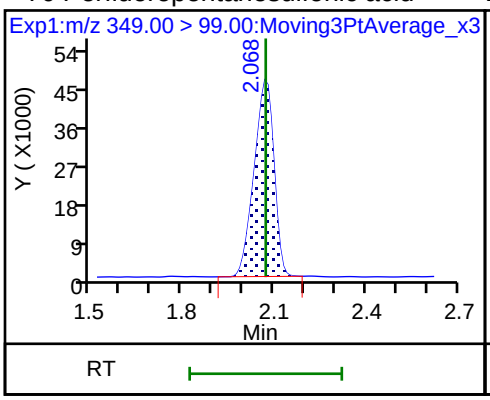
6 Perfluorohexanoic acid



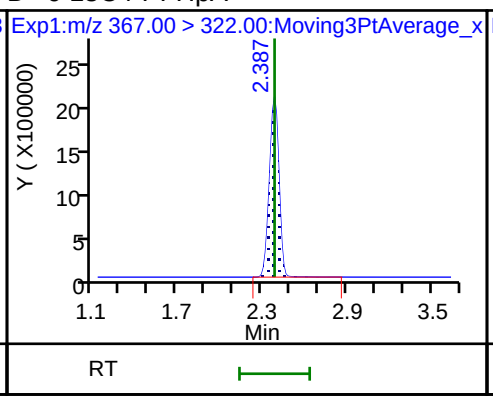
70 Perfluoropentanesulfonic acid



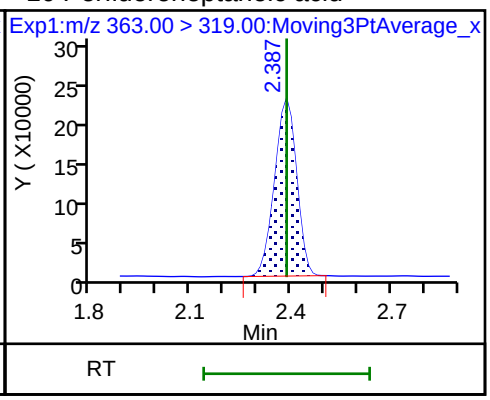
70 Perfluoropentanesulfonic acid



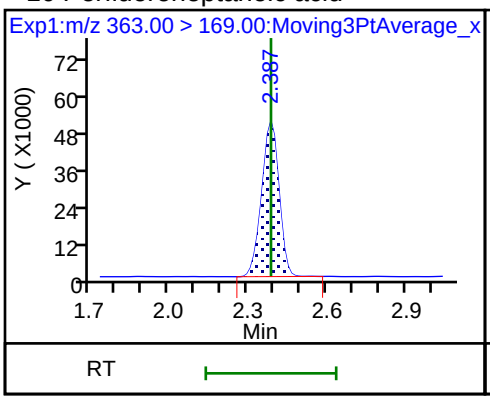
D 9 13C4-PFHpA



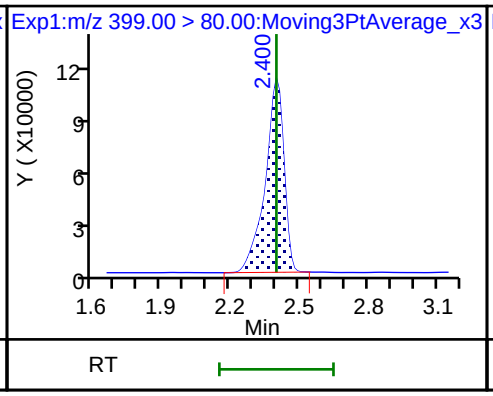
10 Perfluoroheptanoic acid



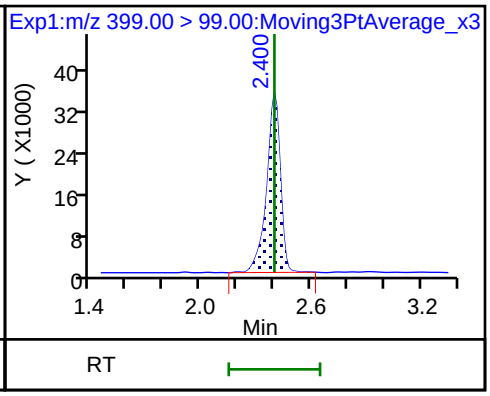
10 Perfluoroheptanoic acid



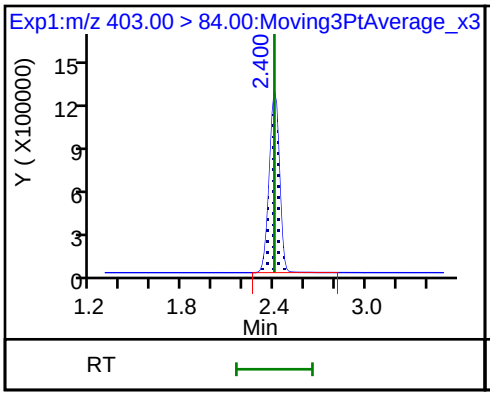
8 Perfluorohexanesulfonic acid



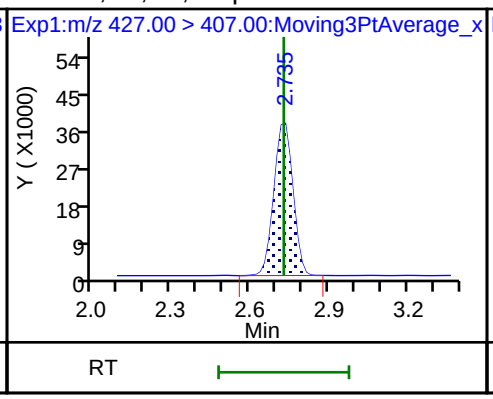
8 Perfluorohexanesulfonic acid



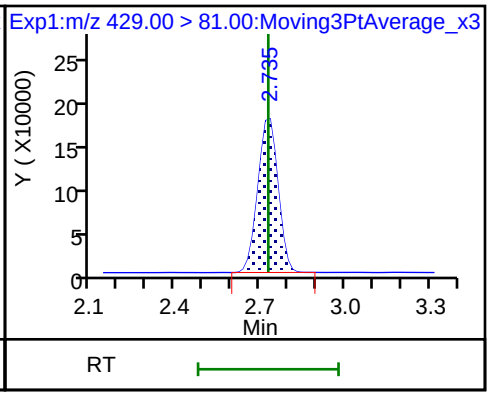
D 11 18O2 PFHxS



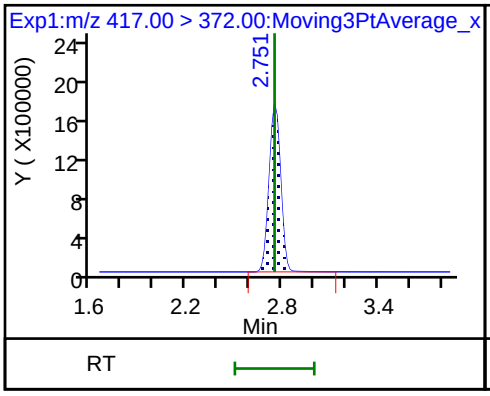
13 1H,1H,2H,2H-perfluorooctanesulfon



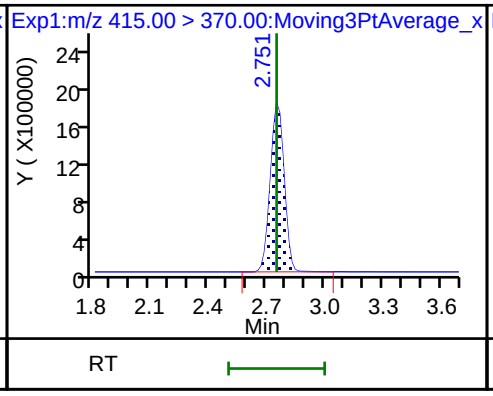
D 12 M2-6:2FTS



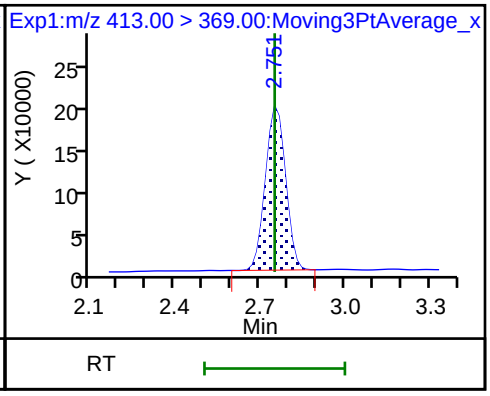
D 14 13C4 PFOA



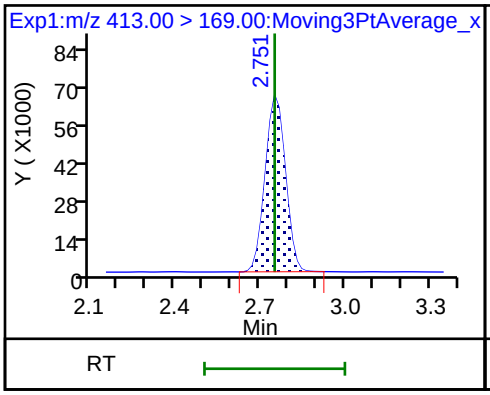
* 62 13C2-PFOA



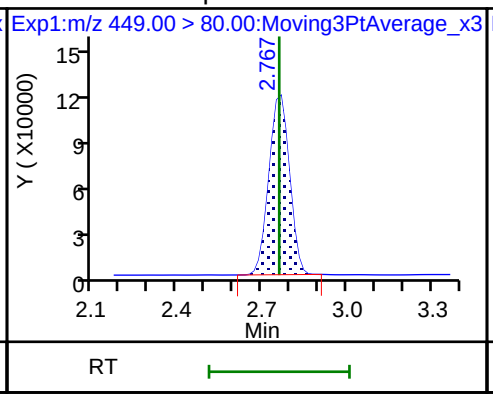
15 Perfluorooctanoic acid



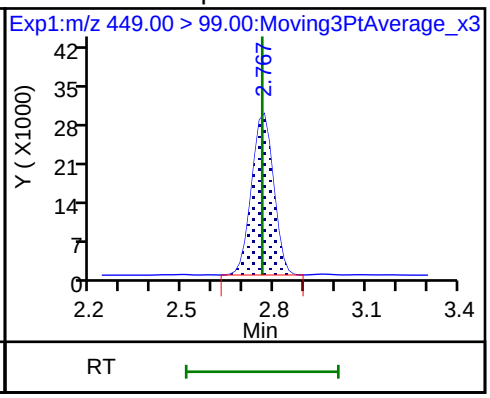
15 Perfluorooctanoic acid



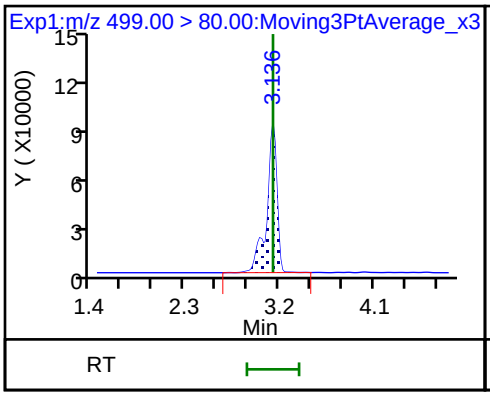
16 Perfluoroheptanesulfonic acid



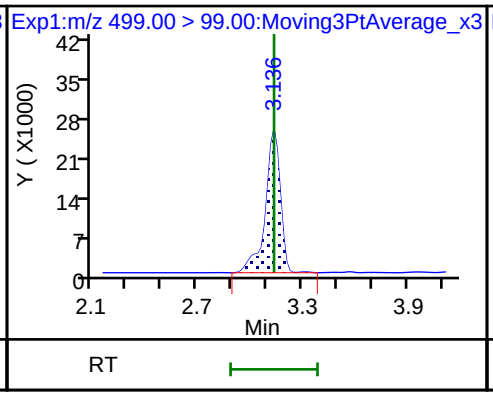
16 Perfluoroheptanesulfonic acid



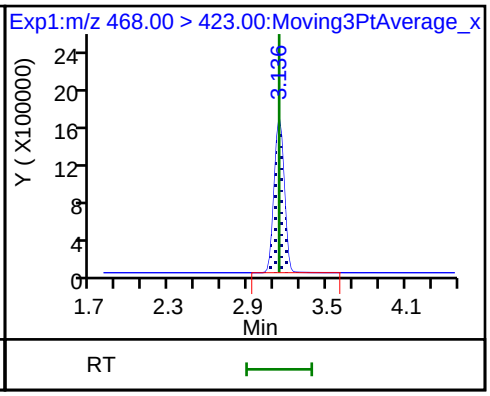
17 Perfluorooctane sulfonic acid



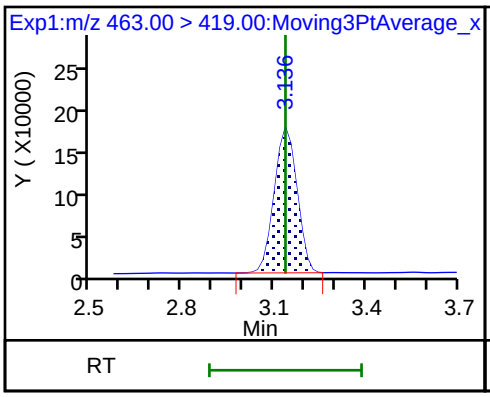
17 Perfluorooctane sulfonic acid



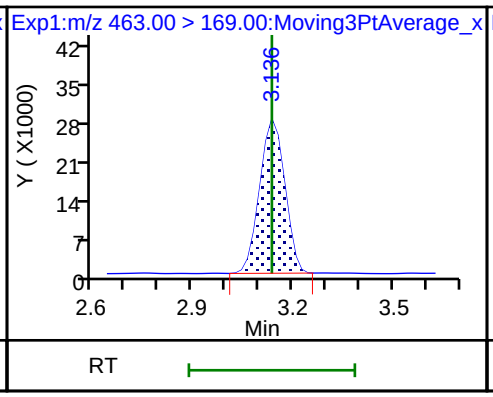
D 19 13C5 PFNA



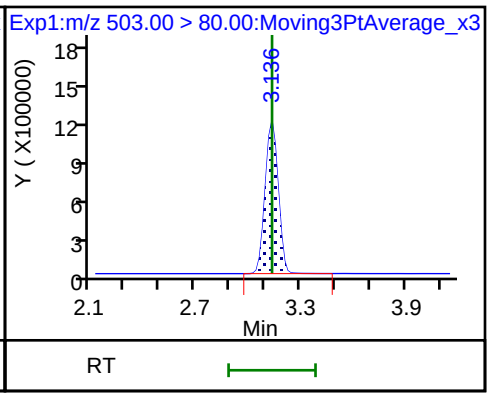
20 Perfluorononanoic acid



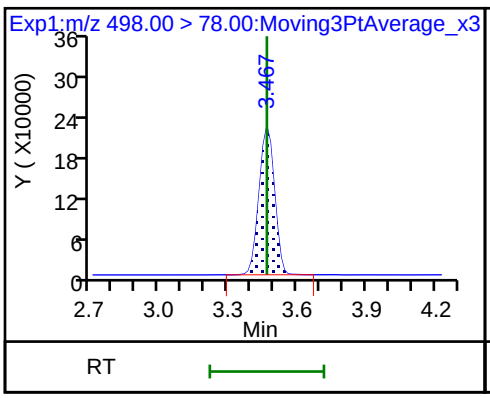
20 Perfluorononanoic acid



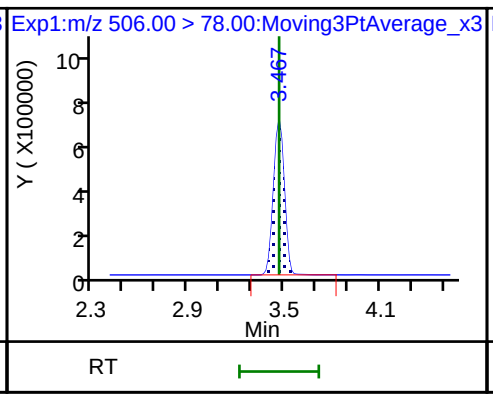
D 18 13C4 PFOS



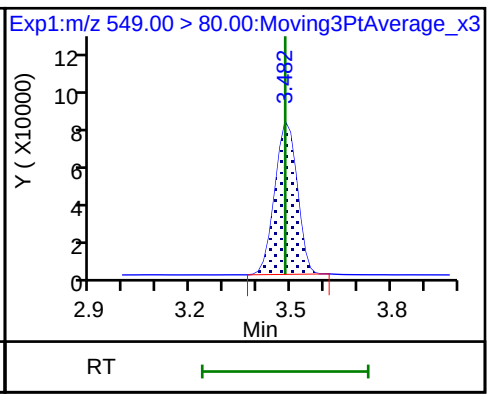
22 Perfluorooctane Sulfonamide



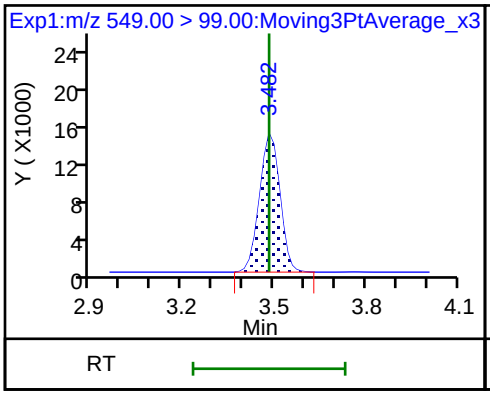
D 21 13C8 FOSA



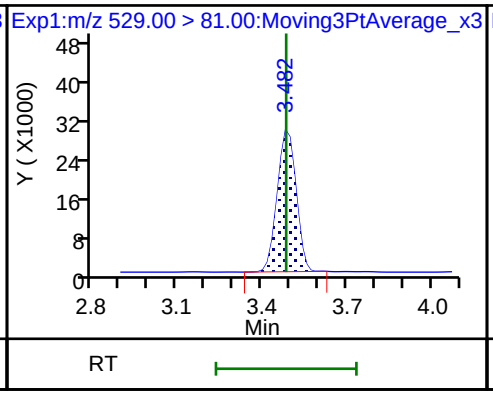
68 Perfluorononanesulfonic acid



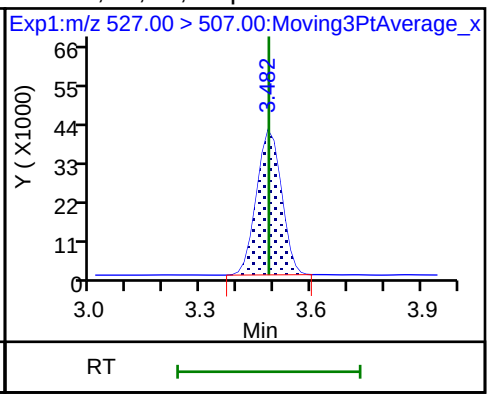
68 Perfluorononanesulfonic acid



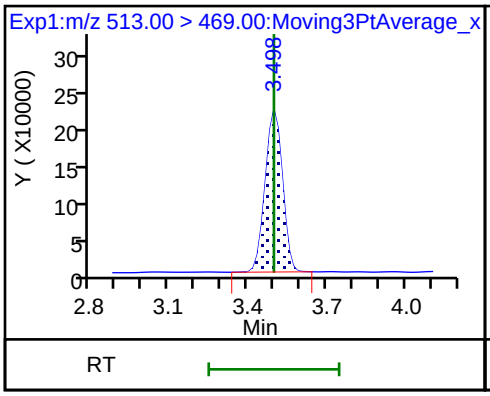
D 26 M2-8:2FTS



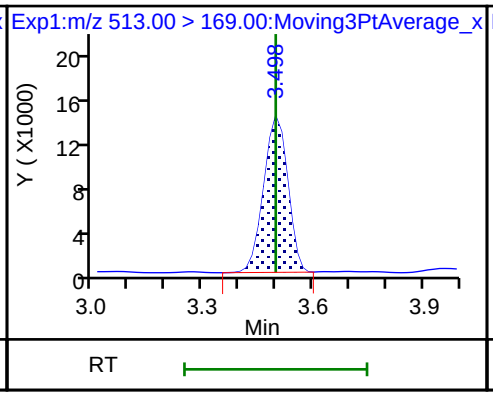
25 1H,1H,2H,2H-perfluorodecanesulfoni



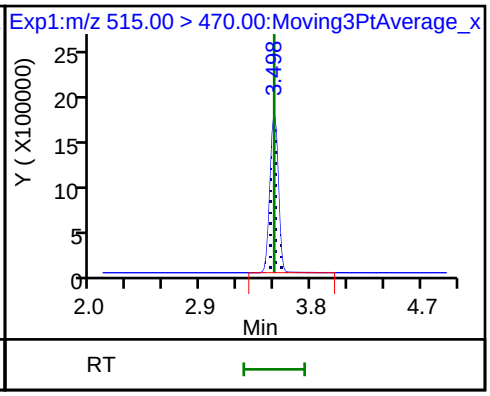
24 Perfluorodecanoic acid



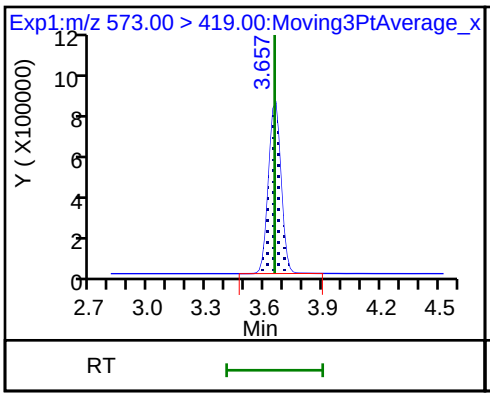
24 Perfluorodecanoic acid



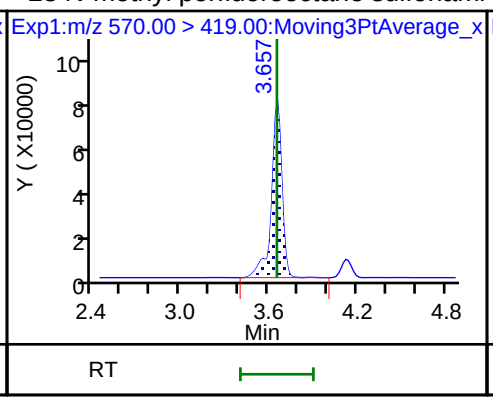
D 23 13C2 PFDA



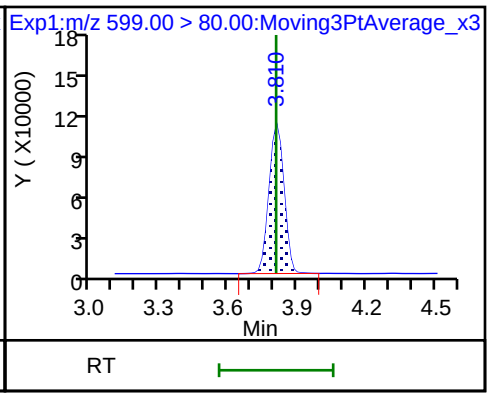
D 27 d3-NMeFOSAA



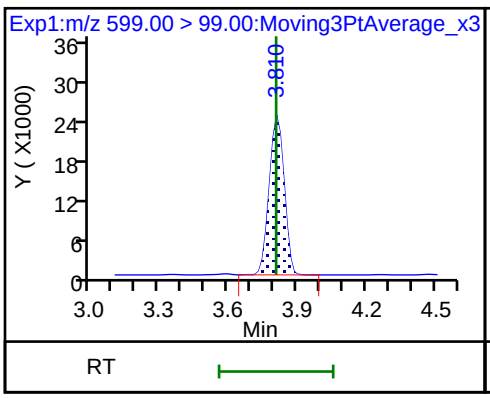
28 N-methyl perfluorooctane sulfonami



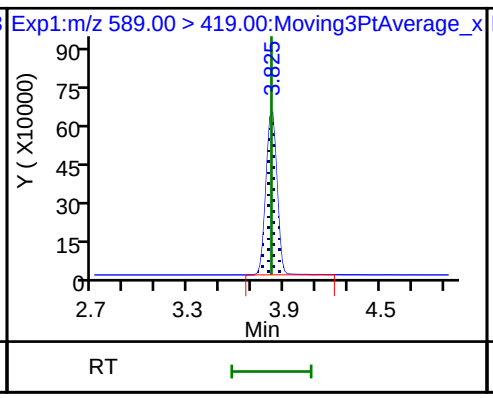
29 Perfluorodecane Sulfonic acid



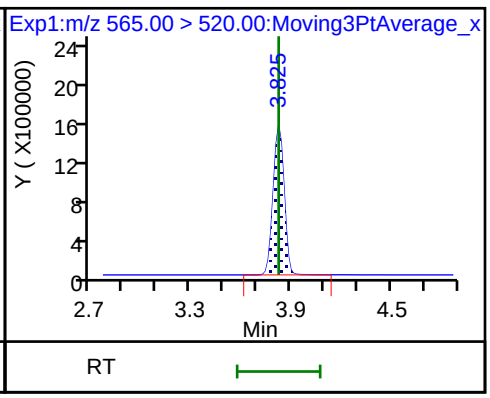
29 Perfluorodecane Sulfonic acid



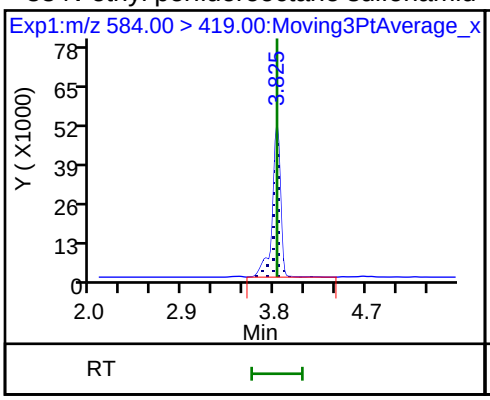
D 32 d5-NEtFOSAA



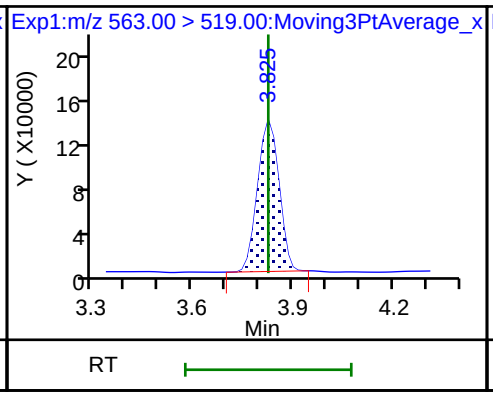
D 30 13C2 PFUnA



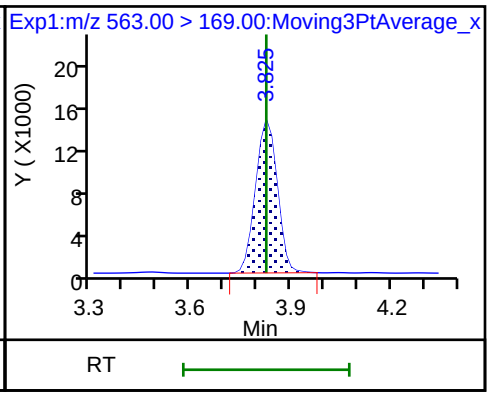
33 N-ethyl perfluorooctane sulfonamid



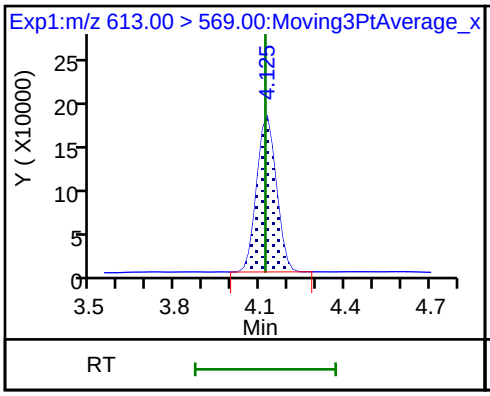
31 Perfluoroundecanoic acid



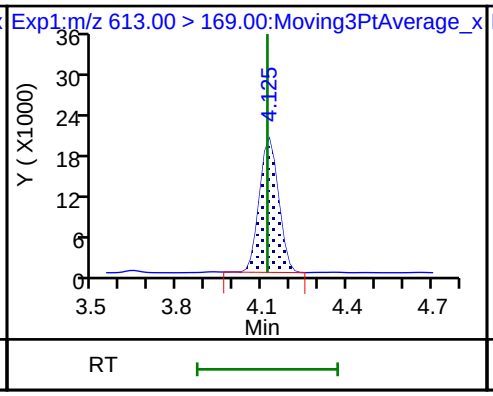
31 Perfluoroundecanoic acid



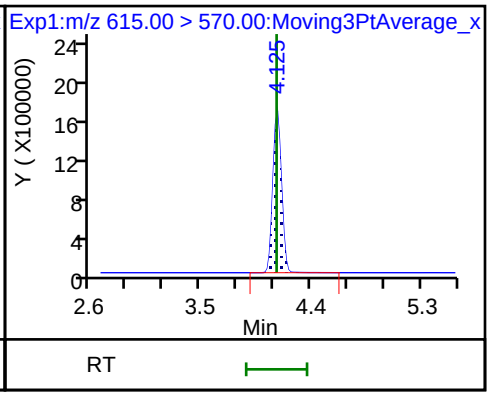
37 Perfluorododecanoic acid



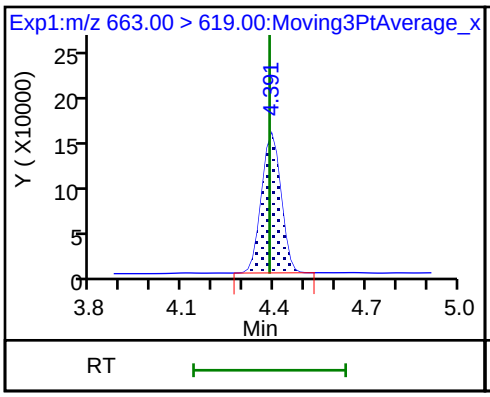
37 Perfluorododecanoic acid



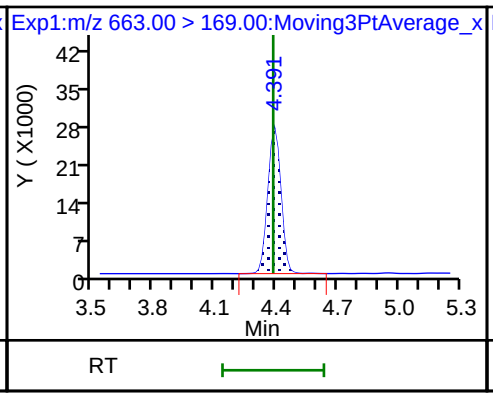
D 36 13C2 PFDoA



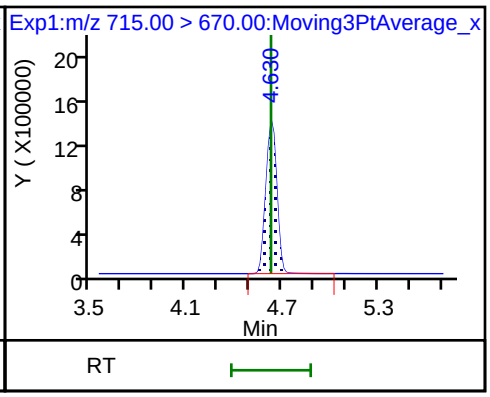
41 Perfluorotridecanoic acid



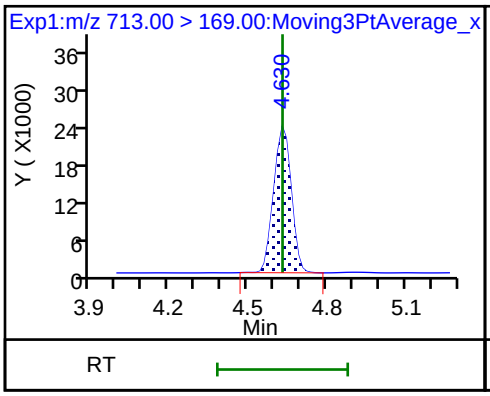
41 Perfluorotridecanoic acid



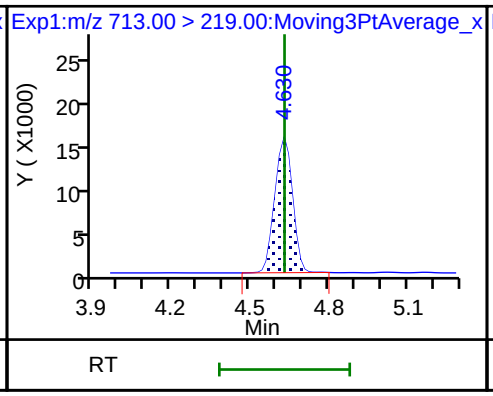
D 43 13C2-PFTeDA



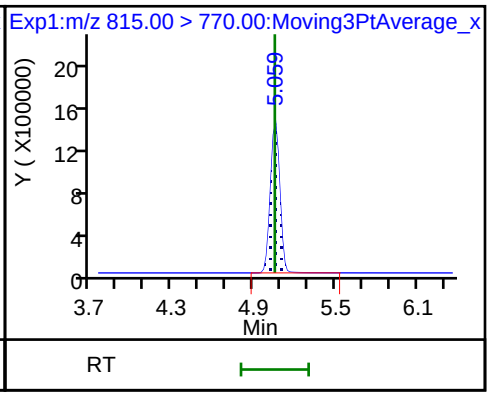
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_008.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 28-Aug-2018 10:43:17 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: IC PFC STD4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 13:27:08 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 13:27:08

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	1.489	1.485	0.004	0.541	8247082	2.55		102	14262	
2 Perfluorobutyric acid										
212.90 > 169.00	1.489	1.486	0.003	1.000	3143317	1.04		104	508	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.758	0.006	0.641	7445050	2.58		103	14769	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.759	0.005	1.000	3049788	1.01		101	354	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.796	0.001	0.653	93328	2.46		106	737	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	3828010	0.9077		103	2017	
298.90 > 99.00	1.797	1.797	0.0	1.000	1261899		3.03(1.35-4.05)	103	1200	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.012	0.005	1.122	813711	0.9381		100	4350	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.013	0.004	0.733	788951	NC			926	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.745	7673418	2.51		101	14087	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	2851130	1.02		102	863	
313.00 > 119.00	2.048	2.048	0.0	1.000	214904		13.27(6.96-20.87)	102	502	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.079	2.071	0.008	1.157	1832484	0.9153		97.6	3435	
349.00 > 99.00	2.068	2.071	-0.003	1.151	842217		2.18(1.15-3.45)	97.6	2116	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.149	0.001	1.000	552949	NC			312	

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	2.150	2.150	0.0	0.782	795942	NC			2978	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	9199599	2.53		101	9411	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	3961330	1.06		106	681	
363.00 > 169.00	2.387	2.387	0.0	1.000	852861		4.64(2.17-6.52)	106	1600	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	2402576	0.8228		90.4	2203	
399.00 > 99.00	2.400	2.400	0.0	1.000	683800		3.51(1.90-5.70)	90.4	909	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5581192	2.49		105	5455	
76 DONA										
377.00 > 251.00	2.439	2.432	0.007	0.778	6494207	NC			6414	
377.00 > 85.00	2.439	2.432	0.007	0.778	2756257		2.36(1.13-3.39)		1249	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.728	0.007	1.000	816302	1.02		107	622	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.728	0.007	0.994	889676	2.49		105	1290	
D 73 13C8 PFOA										
421.00 > 376.00	2.751	2.744	0.007		7103435	NC			8511	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	8426167	2.49		99.4	10249	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8409228	2.50			10679	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	3792013	1.05		104	301	
413.00 > 169.00	2.751	2.751	0.0	1.000	1323195		2.87(1.36-4.08)	104	2123	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.760	0.007	0.882	2397620	0.9861		104	2422	
449.00 > 99.00	2.767	2.760	0.007	0.882	582972		4.11(1.84-5.53)	104	2833	
D 72 13C8 PFOS										
507.00 > 99.00	3.136	3.129	0.007		1220672	NC			4374	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	2380254	0.9135		98.4	1209	
499.00 > 99.00	3.136	3.136	0.0	1.000	577528		4.12(2.04-6.12)	98.4	1576	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.136	0.0	1.140	8074769	2.54		102	12278	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	3310854	1.05		105	402	
463.00 > 169.00	3.136	3.136	0.0	1.000	602945		5.49(2.68-8.03)	105	1032	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.136	0.0	1.140	5901987	2.45		103	4328	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.352	3.346	0.006	1.069	2658307	NC			2232	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	4174038	1.05		105	3615	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3352554	2.63		105	5672	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.482	3.483	-0.001	1.110	1596059	1.00		104	2091	
549.00 > 99.00	3.482	3.483	-0.001	1.110	257104		6.21(3.02-9.05)	104	1491	
D 26 M2-8:2FTS										
529.00 > 81.00	3.482	3.485	-0.003	1.266	139344	2.65		111	904	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.482	3.485	-0.003	1.000	773601	0.8783		91.7	2550	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.498	0.0	1.000	3764333	1.02		102	615	
513.00 > 169.00	3.498	3.498	0.0	1.000	236839		15.89(7.12-21.35)	102	323	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.498	0.0	1.272	8114874	2.56		102	5791	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.651	0.006	1.329	3489761	2.44		97.7	6524	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.653	0.004	1.000	1435862	1.04		104	382	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.809	3.807	0.002	1.215	2056125	1.02		106	1878	
599.00 > 99.00	3.809	3.807	0.002	1.215	422265		4.87(2.14-6.43)	106	1411	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.825	3.819	0.006	1.391	2980380	2.65		106	2984	
D 30 13C2 PFUnA										
565.00 > 520.00	3.825	3.825	0.0	1.391	6840404	2.53		101	11625	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.825	3.825	0.0	1.000	1051106	0.9482		94.8	1290	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.825	3.825	0.0	1.000	2429610	0.9898		99.0	487	
563.00 > 169.00	3.825	3.825	0.0	1.000	232635		10.44(5.24-15.72)	99.0	805	
35 MeFOSA										
512.00 > 169.00	3.962	3.949	0.013		680757	NC			636	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.993	3.983	0.010	1.273	3129936	NC			6133	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.125	4.118	0.007	1.000	3507055	1.07		107	776	
613.00 > 169.00	4.125	4.118	0.007	1.000	361062		9.71(4.68-14.05)	107	1205	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.118	0.007	1.499	8148044	2.48		99.3	9374	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.125	4.120	0.005	1.184	512179	NC			1206	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.141	4.142	-0.001		692795	NC			436	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.360	4.360	0.0	1.390	215153	NC			513	
699.00 > 99.00	4.360	4.360	0.0	1.390	382083		0.56(0.28-0.83)		1236	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.390	4.384	0.006	1.064	2650027	1.01		101	899	
663.00 > 169.00	4.390	4.384	0.006	1.064	436267		6.07(3.09-9.27)	101	1370	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.629	4.628	0.001	1.683	6392553	2.44		97.8	14581	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.629	4.631	-0.002	1.000	407853	0.9880		98.8	1746	
713.00 > 219.00	4.629	4.631	-0.002	1.000	305947		1.33(0.70-2.09)	98.8	2146	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.053	0.005	1.000	2078803	NC			472	
813.00 > 169.00	5.058	5.053	0.005	1.000	355463		5.85(2.77-8.32)		1098	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.058	5.053	0.005	1.839	5459924	2.06		82.4	5959	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.418	5.416	0.002	1.071	1334498	NC			412	
913.00 > 169.00	5.418	5.416	0.002	1.071	238751		5.59(2.55-7.64)		1653	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00009 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 13:27:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_008.d

Injection Date: 28-Aug-2018 10:43:17 Instrument ID: A9

Lims ID: IC L4 Full

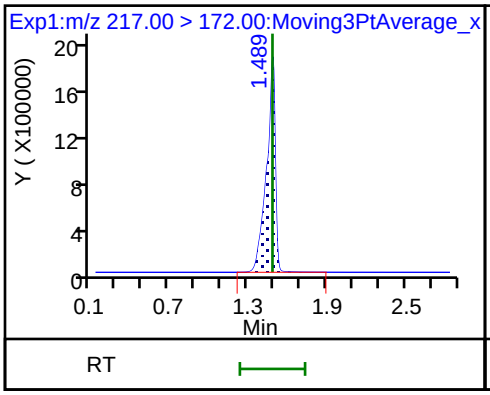
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 5

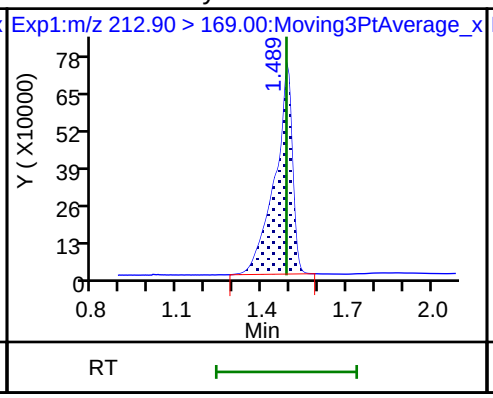
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

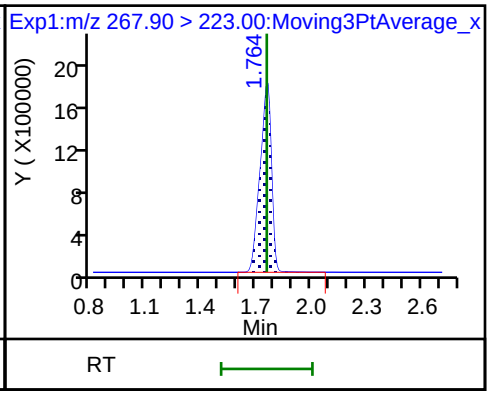
D 1 13C4 PFBA



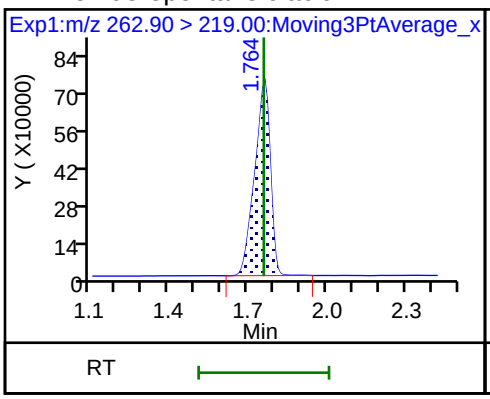
2 Perfluorobutyric acid



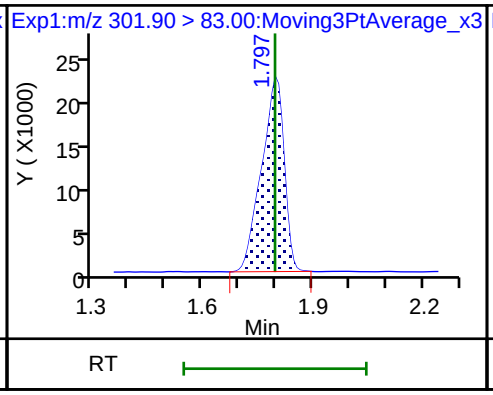
D 3 13C5-PFPeA



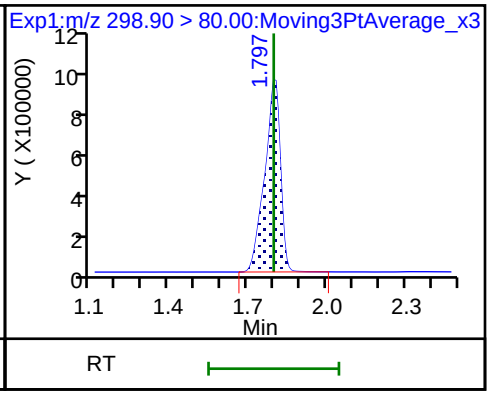
4 Perfluoropentanoic acid



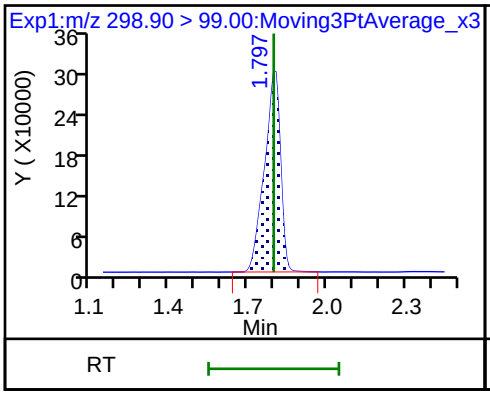
D 47 13C3-PFBS



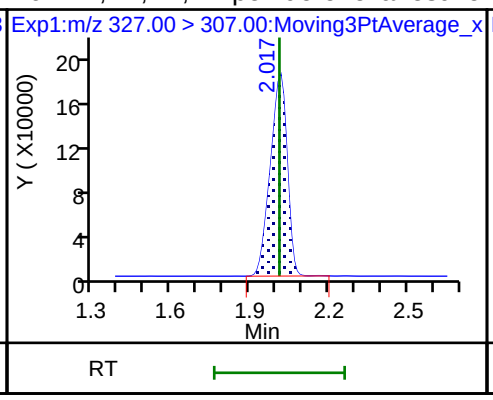
5 Perfluorobutanesulfonic acid



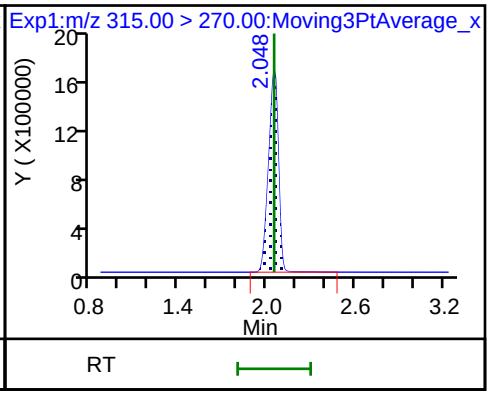
5 Perfluorobutanesulfonic acid



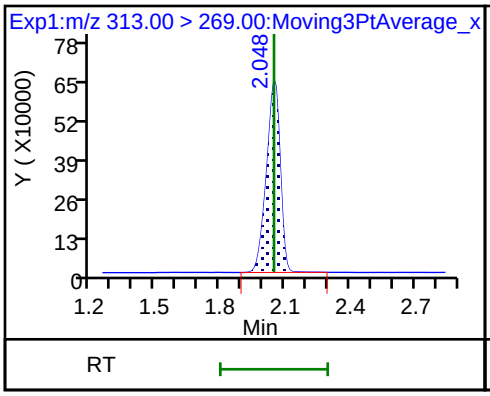
61 1H,1H,2H,2H-perfluorohexanesulfon



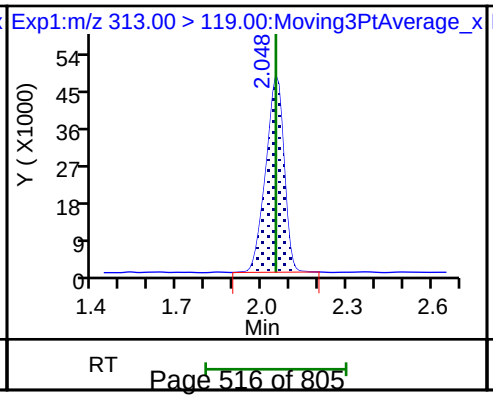
D 7 13C2 PFHxA



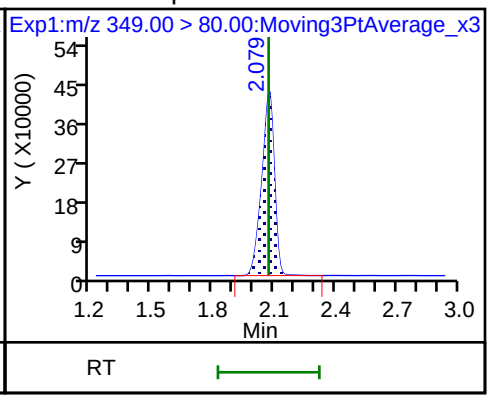
6 Perfluorohexanoic acid



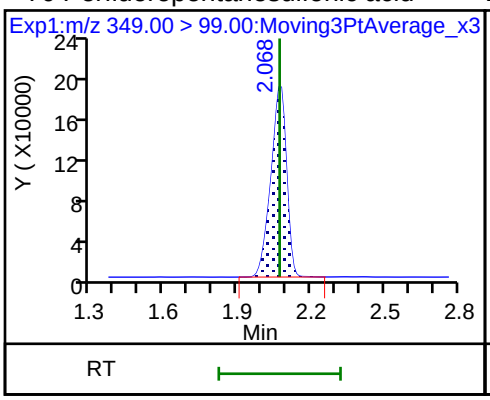
6 Perfluorohexanoic acid



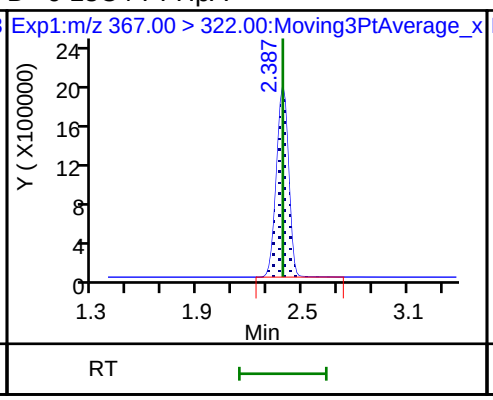
70 Perfluoropentanesulfonic acid



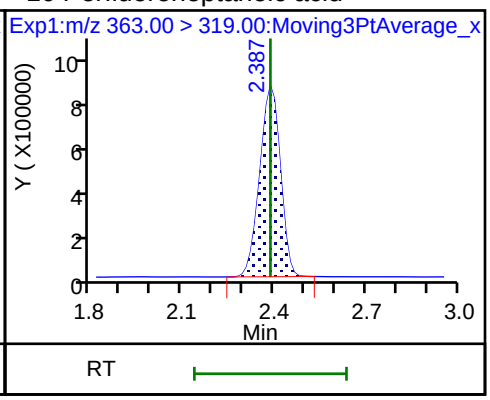
70 Perfluoropentanesulfonic acid



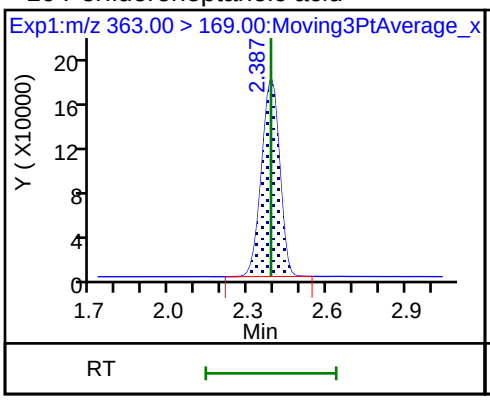
D 9 13C4-PFHpA



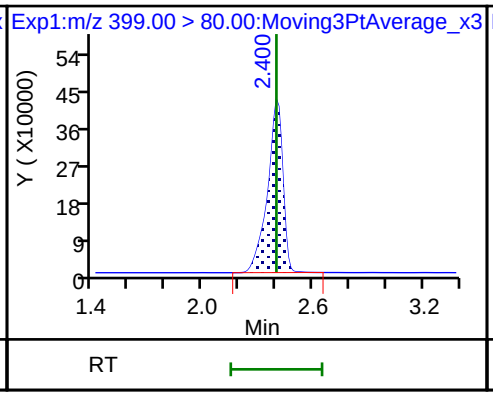
10 Perfluoroheptanoic acid



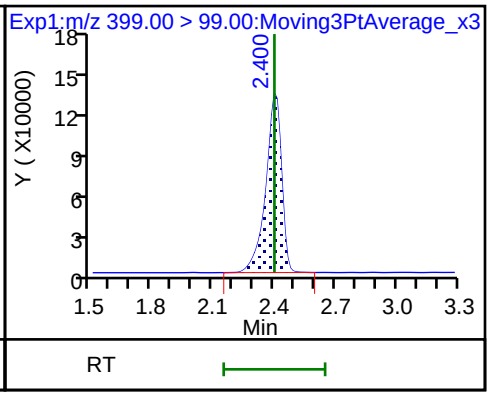
10 Perfluoroheptanoic acid



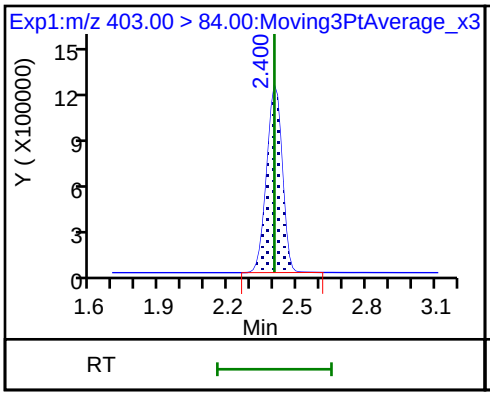
8 Perfluorohexanesulfonic acid



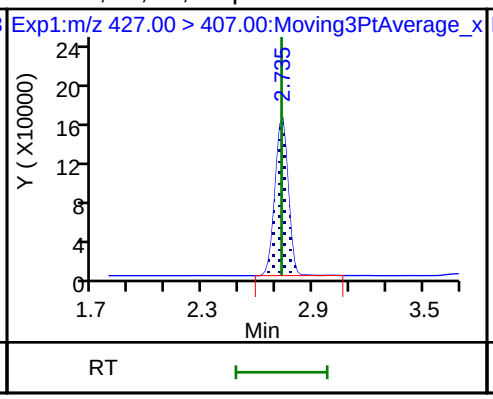
8 Perfluorohexanesulfonic acid



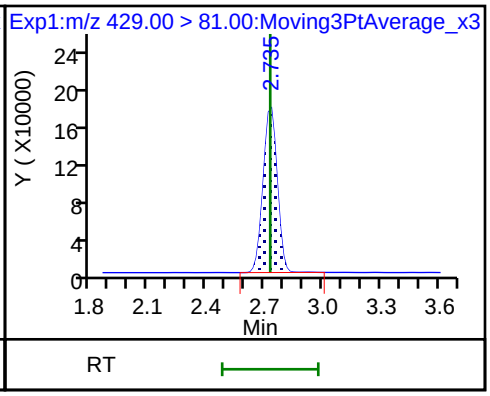
D 11 18O2 PFHxS



13 1H,1H,2H,2H-perfluorooctanesulfon



D 12 M2-6:2FTS



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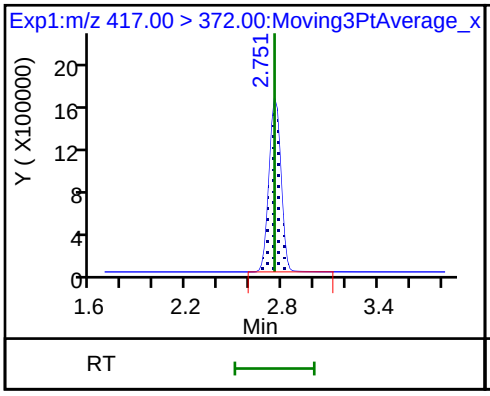
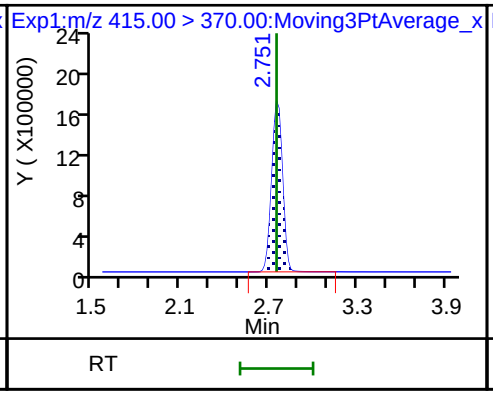
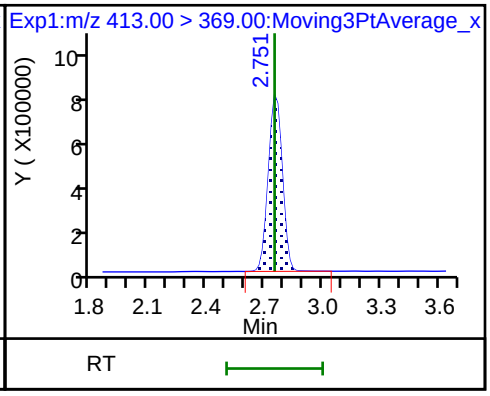


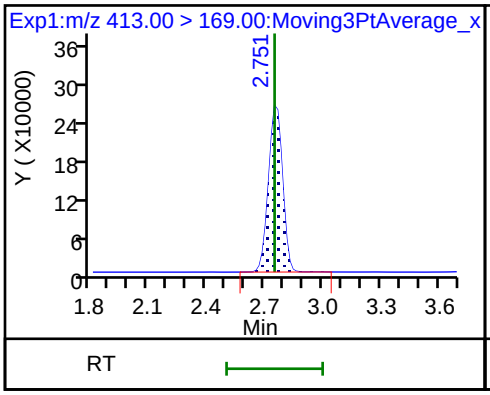
* 62 13C2-PFOA



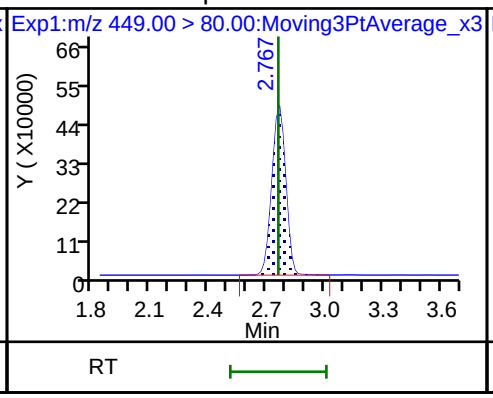
15 Perfluorooctanoic acid



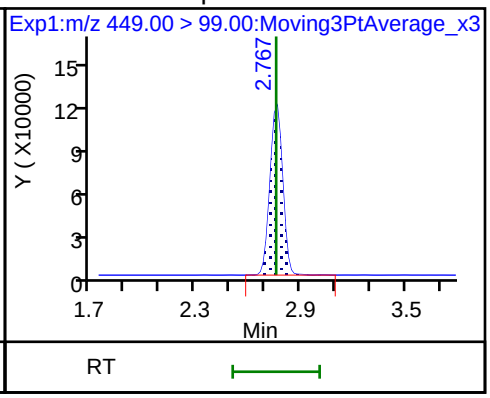
15 Perfluorooctanoic acid



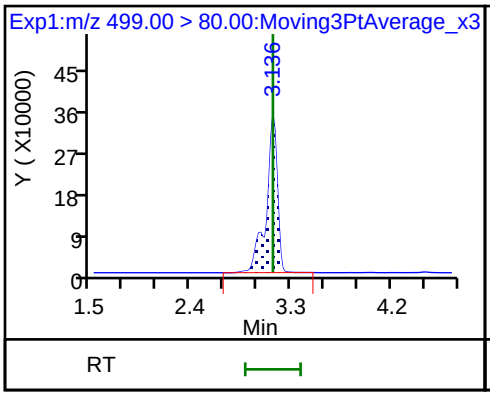
16 Perfluoroheptanesulfonic acid



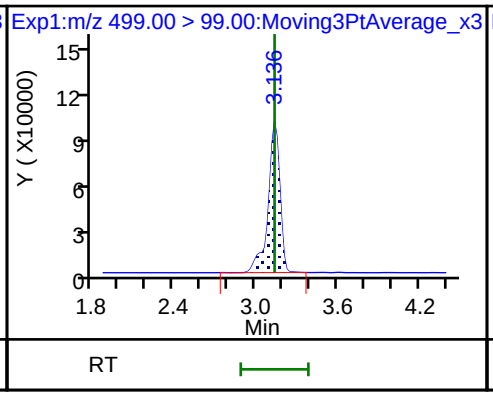
16 Perfluoroheptanesulfonic acid



17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



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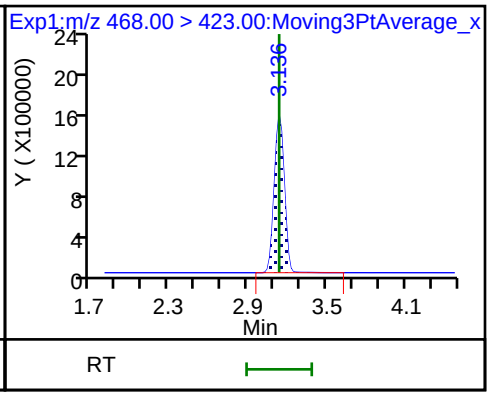
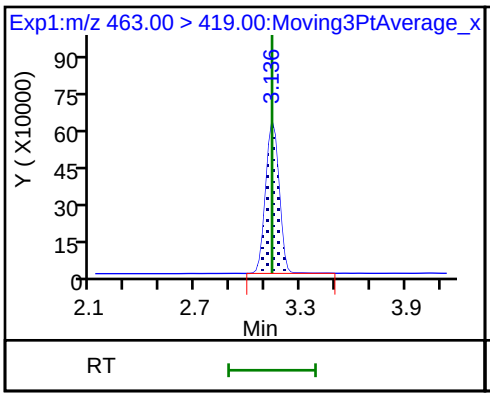
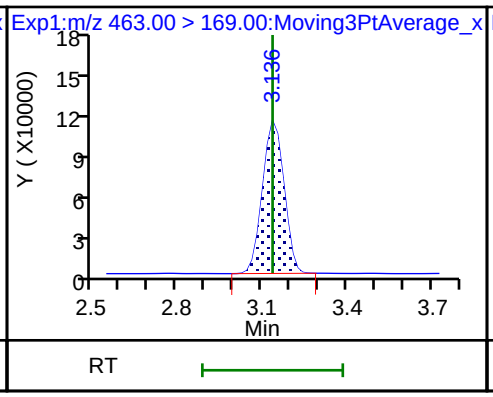


20 Perfluorononanoic acid



20 Perfluorononanoic acid



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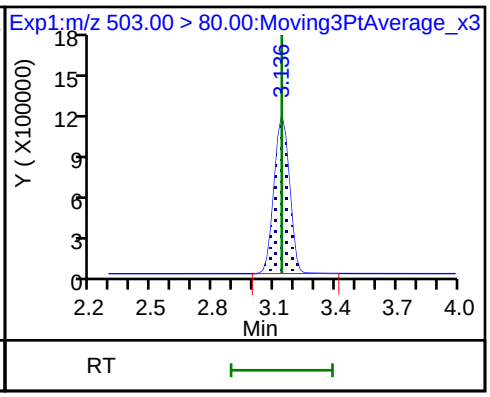
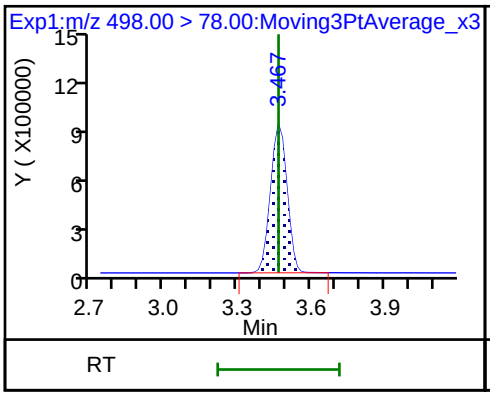


22 Perfluorooctane Sulfonamide



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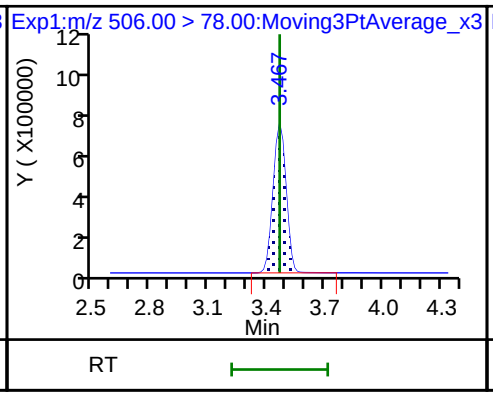
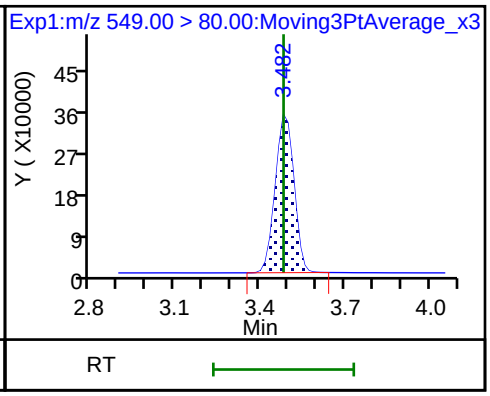
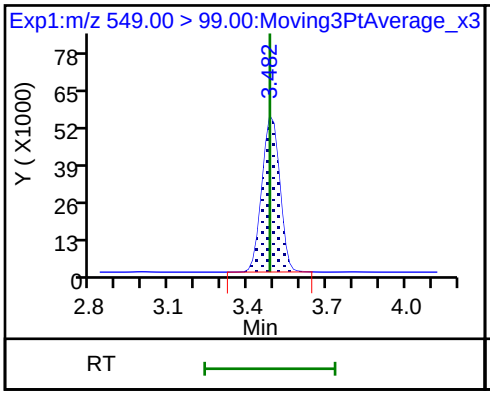


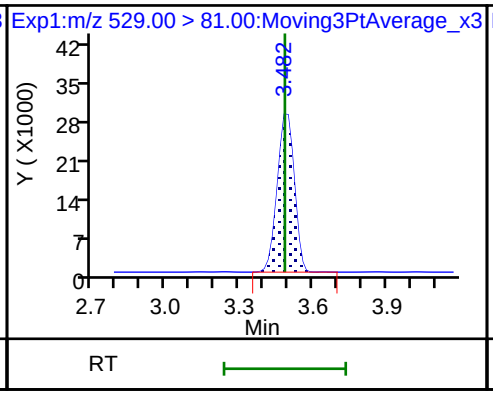
68 Perfluorononanesulfonic acid



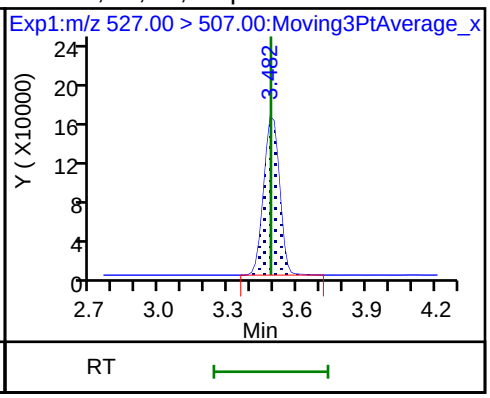
68 Perfluorononanesulfonic acid



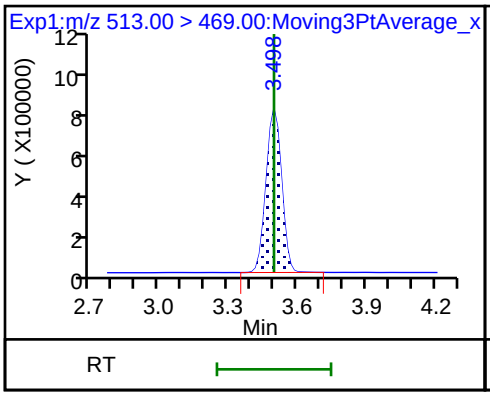
D 26 M2-8:2FTS



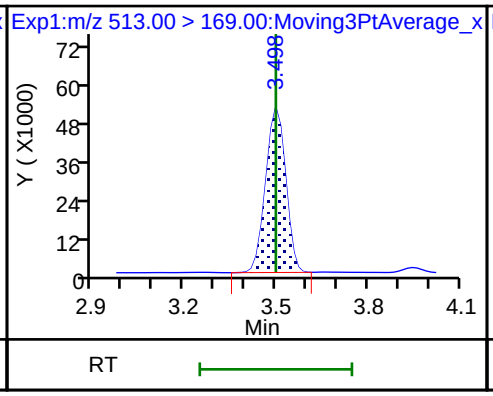
25 1H,1H,2H,2H-perfluorodecanesulfoni



24 Perfluorodecanoic acid



24 Perfluorodecanoic acid



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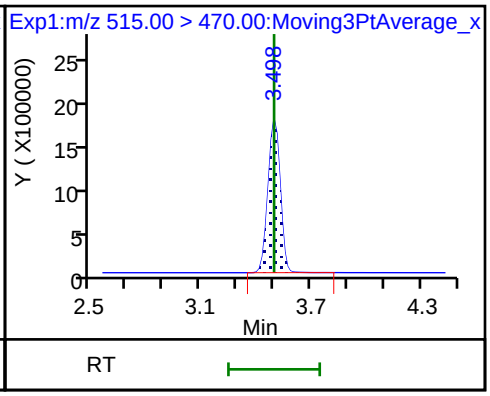
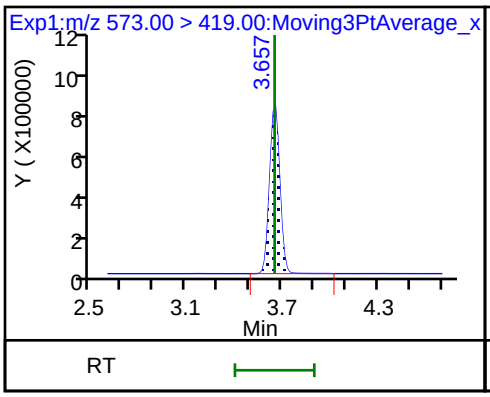
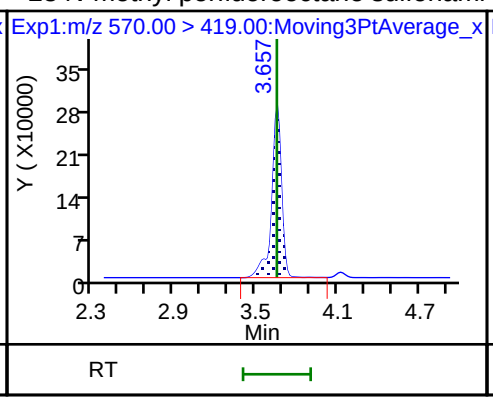


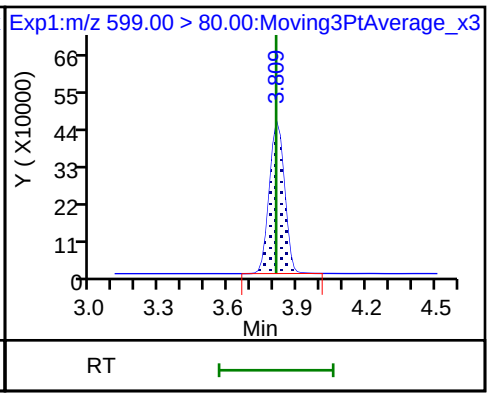
D 27 d3-NMeFOSAA



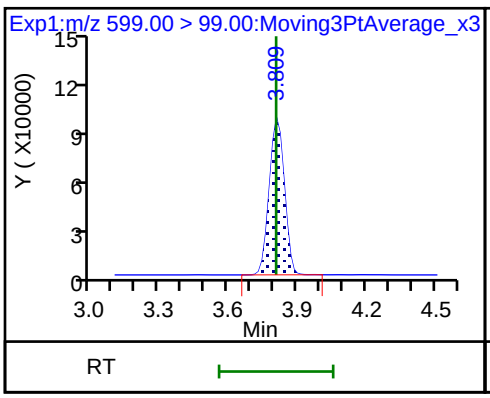
28 N-methyl perfluorooctane sulfonami



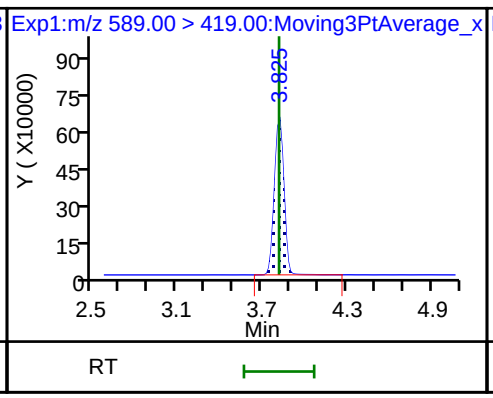
29 Perfluorodecane Sulfonic acid



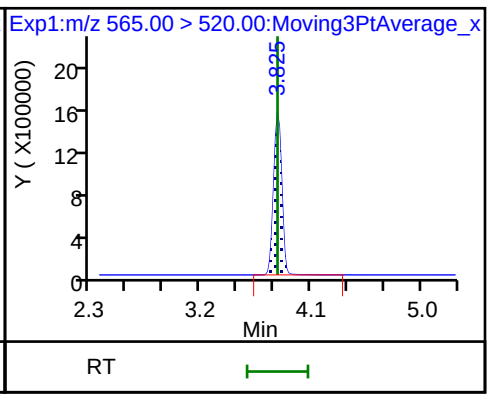
29 Perfluorodecane Sulfonic acid



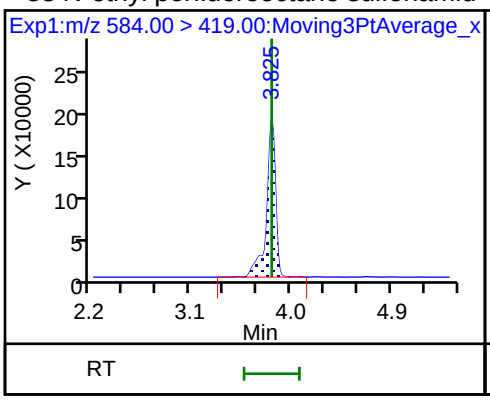
D 32 d5-NEtFOSAA



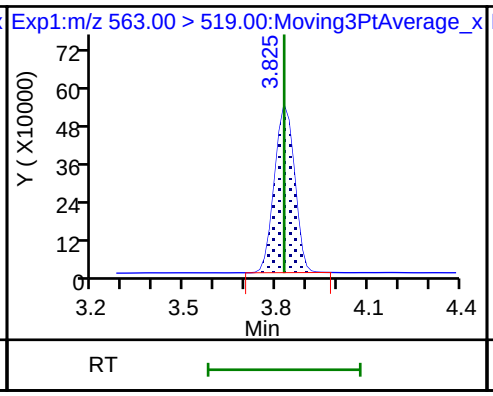
D 30 13C2 PFUnA



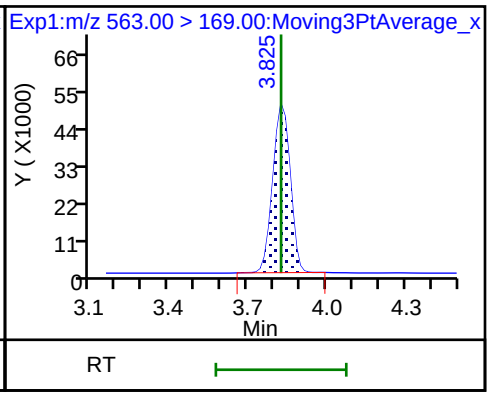
33 N-ethyl perfluorooctane sulfonamid



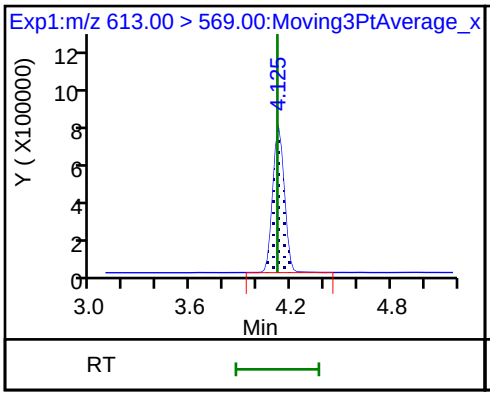
31 Perfluoroundecanoic acid



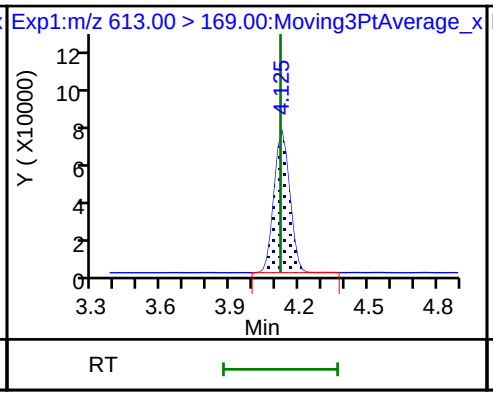
31 Perfluoroundecanoic acid



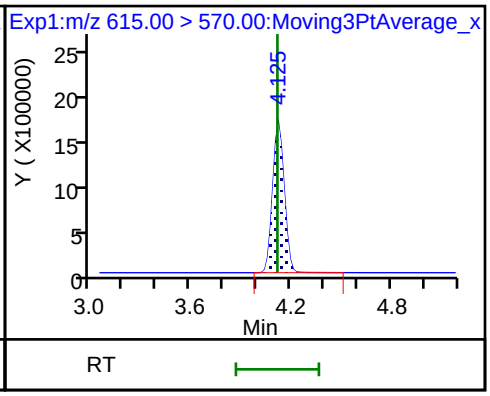
37 Perfluorododecanoic acid



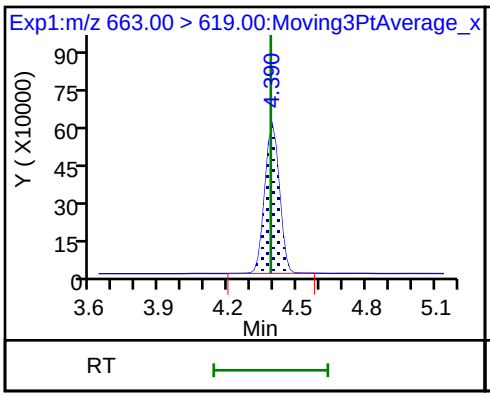
37 Perfluorododecanoic acid



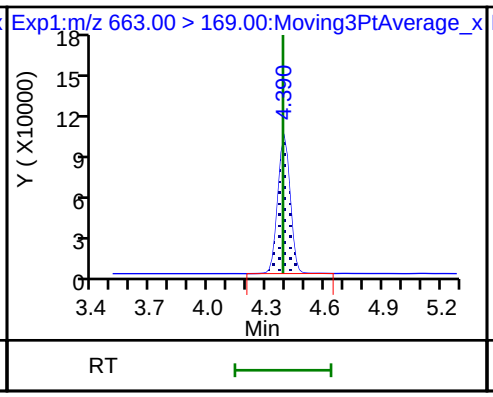
D 36 13C2 PFDoA



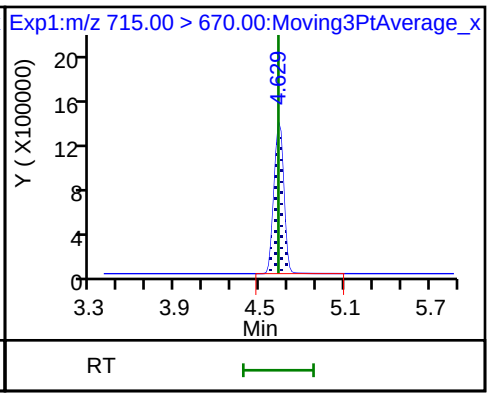
41 Perfluorotridecanoic acid



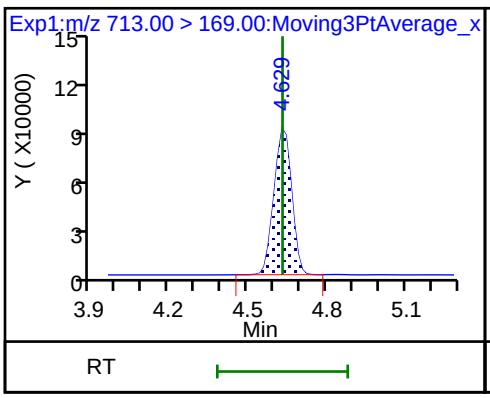
41 Perfluorotridecanoic acid



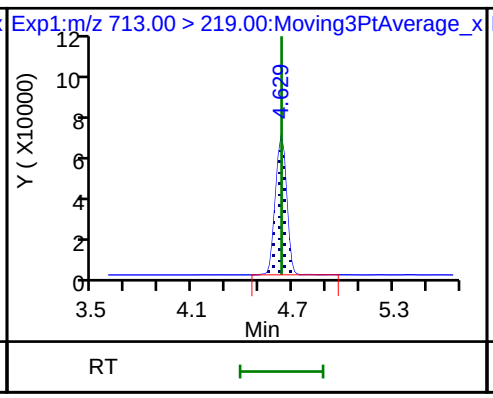
D 43 13C2-PFTeDA



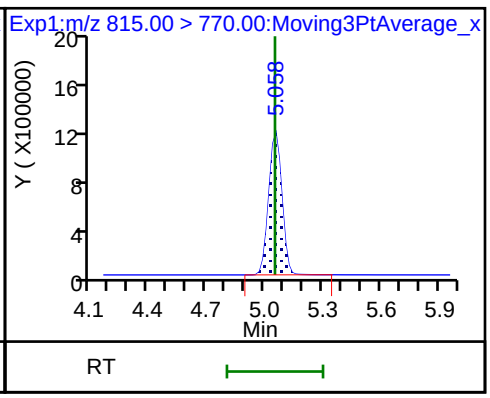
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_009.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 28-Aug-2018 10:50:48 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: IC PFC STD5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 13:27:44 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 11:04:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.484	1.485	-0.001	0.539	7801898	2.46		98.4	18666	
2 Perfluorobutyric acid										
212.90 > 169.00	1.484	1.486	-0.002	1.000	7216590	2.53		101	1140	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.758	-0.002	0.638	6942787	2.45		98.1	16427	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.756	1.759	-0.003	1.000	6999092	2.48		99.4	691	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.796	0.001	0.653	80767	2.17		93.5	646	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	8735294	2.39		108	4242	
298.90 > 99.00	1.797	1.797	0.0	1.000	3068462		2.85(1.35-4.05)	108	2904	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.012	-0.005	1.117	1748471	2.33		99.8	3708	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.013	-0.006	0.730	723431	NC			910	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.745	7349652	2.46		98.3	10194	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	6716098	2.51		100	1652	
313.00 > 119.00	2.048	2.048	0.0	1.000	503877		13.33(6.96-20.87)	100	1268	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.069	2.071	-0.002	1.151	4275802	2.47		105	5365	
349.00 > 99.00	2.069	2.071	-0.002	1.151	1917757		2.23(1.15-3.45)	105	2640	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.149	0.001	1.000	1350318	NC			650	

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	2.150	2.150	0.0	0.782	746274	NC			2256	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	8746068	2.45		98.1	16769	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	8899700	2.49		99.8	1307	
363.00 > 169.00	2.387	2.387	0.0	1.000	2107597		4.22(2.17-6.52)	99.8	3167	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	5950574	2.33		102	4987	
399.00 > 99.00	2.400	2.400	0.0	1.000	1601819		3.71(1.90-5.70)	102	2349	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	4891052	2.23		94.3	8820	
76 DONA										
377.00 > 251.00	2.426	2.432	-0.006	0.774	14294164	NC			12126	
377.00 > 85.00	2.426	2.432	-0.006	0.774	6467909		2.21(1.13-3.39)		2969	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.728	-0.009	1.000	1675863	2.26		95.4	1561	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.728	-0.009	0.988	822215	2.35		98.8	1068	
D 73 13C8 PFOA										
421.00 > 376.00	2.735	2.744	-0.009		6848148	NC			8473	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	8384516	2.52		101	11662	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8241249	2.50			16980	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	8304297	2.30		91.9	652	
413.00 > 169.00	2.751	2.751	0.0	1.000	3002795		2.77(1.36-4.08)	91.9	3394	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.751	2.760	-0.009	0.877	5826744	2.48		104	4770	
449.00 > 99.00	2.751	2.760	-0.009	0.877	1330852		4.38(1.84-5.53)	104	2565	
D 72 13C8 PFOS										
507.00 > 99.00	3.118	3.129	-0.011		1231916	NC			2727	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	5942729	2.36		102	3927	
499.00 > 99.00	3.136	3.136	0.0	1.000	1389335		4.28(2.04-6.12)	102	2540	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.136	0.0	1.140	7495131	2.41		96.4	11913	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	7795005	2.66		106	869	
463.00 > 169.00	3.136	3.136	0.0	1.000	1466662		5.31(2.68-8.03)	106	2225	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.136	0.0	1.140	5701715	2.42		101	3867	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.336	3.346	-0.010	1.064	6342999	NC			4324	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	9183356	2.56		102	5598	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3025791	2.43		97.1	6566	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.483	3.483	0.0	1.110	3599772	2.34		97.3	2924	
549.00 > 99.00	3.483	3.483	0.0	1.110	614110		5.86(3.02-9.05)	97.3	2016	
D 26 M2-8:2FTS										
529.00 > 81.00	3.483	3.485	-0.002	1.266	118425	2.30		95.9	567	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.483	3.485	-0.002	1.000	1820247	2.43		102	4524	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.498	0.0	1.000	9108633	2.63		105	1313	
513.00 > 169.00	3.498	3.498	0.0	1.000	586175		15.54(7.12-21.35)	105	396	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.498	0.0	1.272	7596034	2.44		97.8	7658	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.643	3.651	-0.008	1.324	3589091	2.56		103	5068	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.653	0.004	1.004	3489405	2.45		97.8	7066	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.810	3.807	0.003	1.215	4862491	2.51		104	3918	
599.00 > 99.00	3.810	3.807	0.003	1.215	1024799		4.74(2.14-6.43)	104	2304	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.810	3.819	-0.009	1.385	2766889	2.51		100	2664	
D 30 13C2 PFUnA										
565.00 > 520.00	3.826	3.825	0.001	1.391	6654794	2.52		101	11815	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.826	3.825	0.001	1.004	2476305	2.41		96.2	3349	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.826	3.825	0.001	1.000	5517545	2.31		92.4	995	
563.00 > 169.00	3.826	3.825	0.001	1.000	583713		9.45(5.24-15.72)	92.4	2553	
35 MeFOSA										
512.00 > 169.00	3.947	3.949	-0.002		1701939	NC			858	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.978	3.983	-0.005	1.268	7485003	NC			18945	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.109	4.118	-0.009	1.000	8241309	2.50		100	1590	
613.00 > 169.00	4.109	4.118	-0.009	1.000	887808		9.28(4.68-14.05)	100	2045	
D 36 13C2 PFDoA										
615.00 > 570.00	4.109	4.118	-0.009	1.494	8174334	2.54		102	7239	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.125	4.120	0.005	1.184	1273893	NC			3906	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.142	4.142	0.0		1807818	NC			607	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.360	4.360	0.0	1.390	512801	NC			1050	
699.00 > 99.00	4.360	4.360	0.0	1.390	868748		0.59(0.28-0.83)		2069	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.376	4.384	-0.008	1.065	6691746	2.55		102	2032	
663.00 > 169.00	4.391	4.384	0.007	1.069	1100551		6.08(3.09-9.27)	102	2566	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.633	4.628	0.005	1.684	6634077	2.59		104	11939	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.633	4.631	0.002	1.000	1055743	2.46		98.6	3023	
713.00 > 219.00	4.615	4.631	-0.016	0.996	701865		1.50(0.70-2.09)	98.6	2079	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.045	5.053	-0.008	1.000	6310009	NC			1196	
813.00 > 169.00	5.045	5.053	-0.008	1.000	1065933		5.92(2.77-8.32)		2433	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.045	5.053	-0.008	1.834	6738965	2.59		104	10290	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.408	5.416	-0.008	1.072	4453206	NC			951	
913.00 > 169.00	5.408	5.416	-0.008	1.072	791459		5.63(2.55-7.64)		2660	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00009 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 13:27:47 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_009.d

Injection Date: 28-Aug-2018 10:50:48 Instrument ID: A9

Lims ID: IC L5 Full

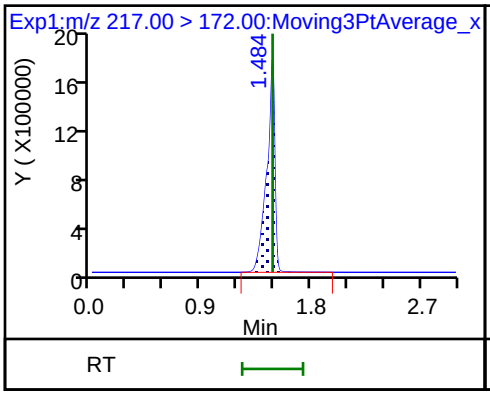
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 6

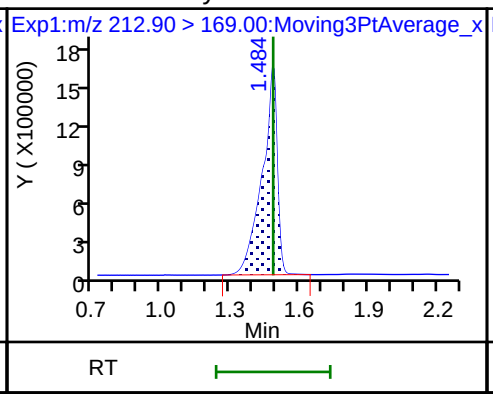
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

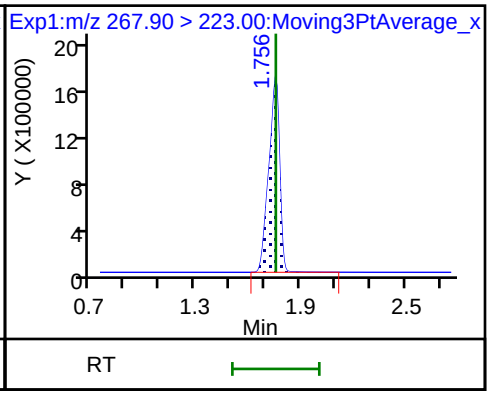
D 1 13C4 PFBA



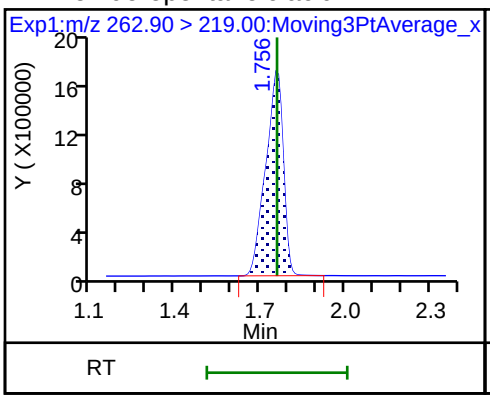
2 Perfluorobutyric acid



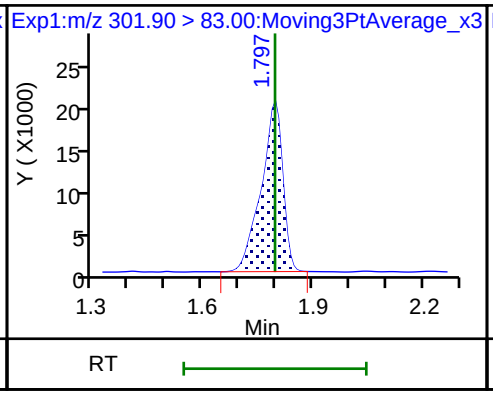
D 3 13C5-PFPeA



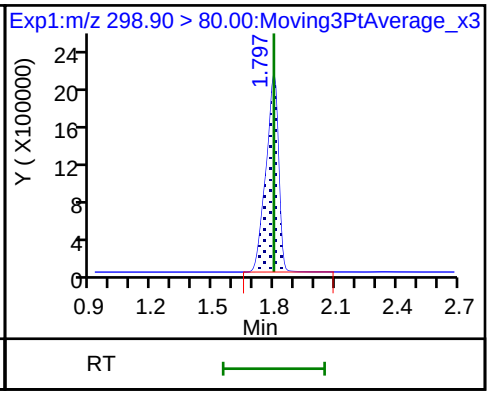
4 Perfluoropentanoic acid



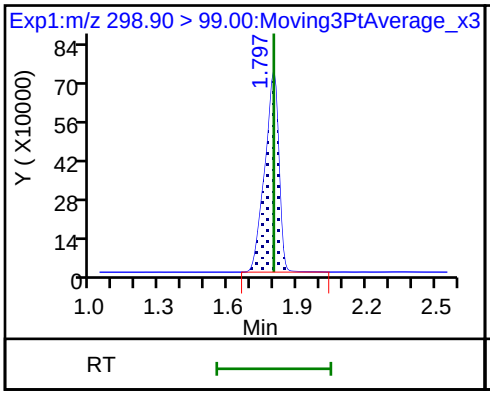
D 47 13C3-PFBS



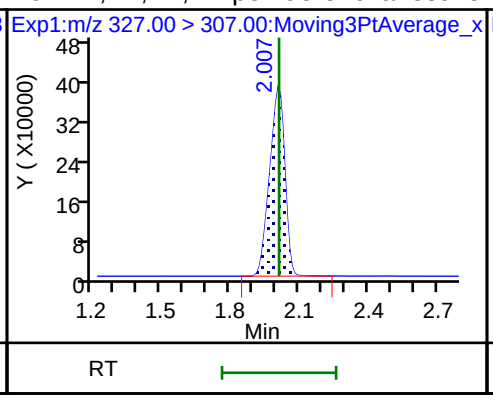
5 Perfluorobutanesulfonic acid



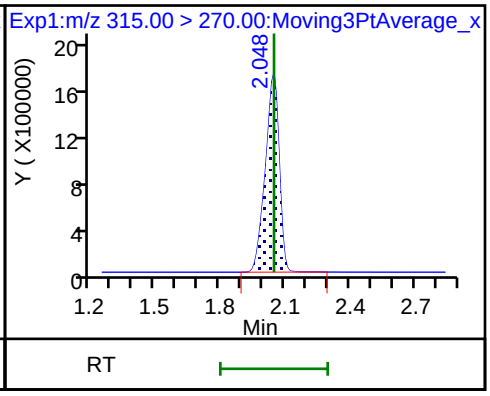
5 Perfluorobutanesulfonic acid



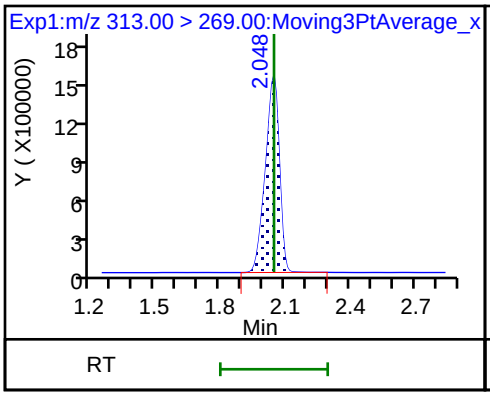
61 1H,1H,2H,2H-perfluorohexanesulfon



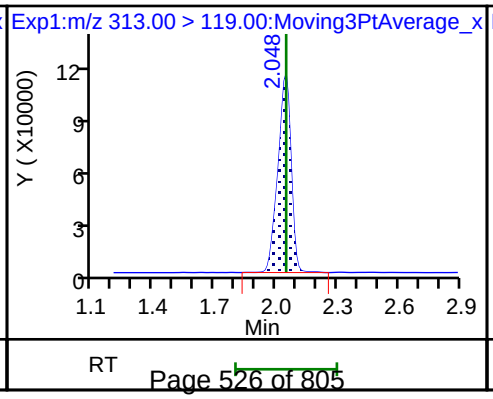
D 7 13C2 PFHxA



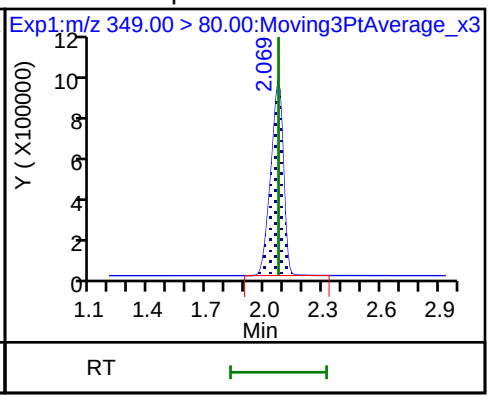
6 Perfluorohexanoic acid



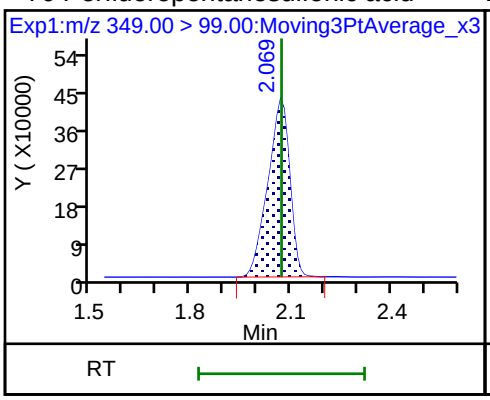
6 Perfluorohexanoic acid



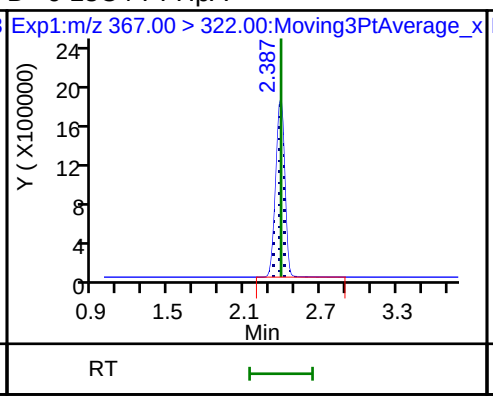
70 Perfluoropentanesulfonic acid



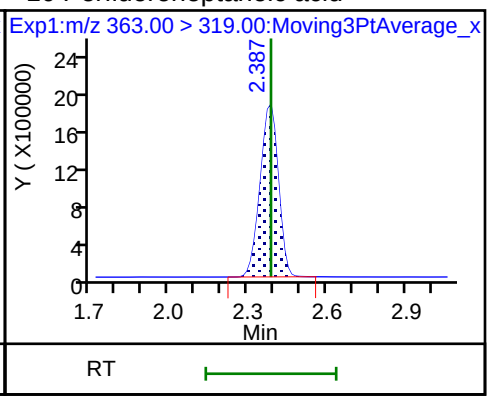
70 Perfluoropentanesulfonic acid



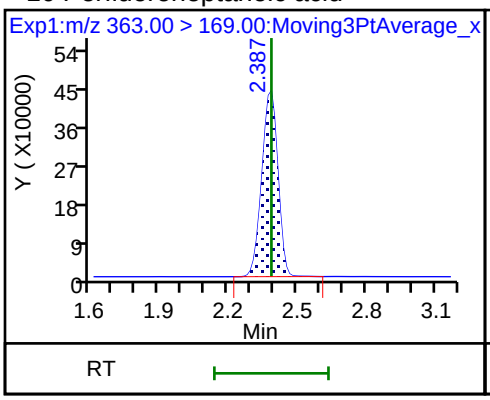
D 9 13C4-PFHpA



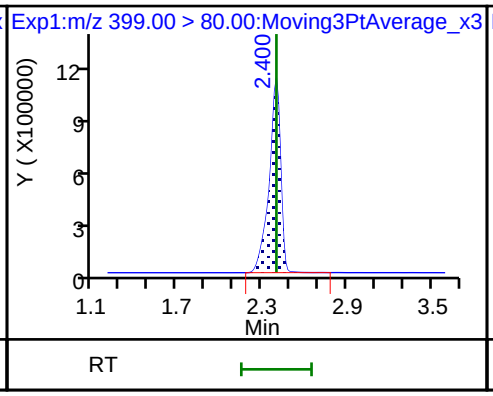
10 Perfluoroheptanoic acid



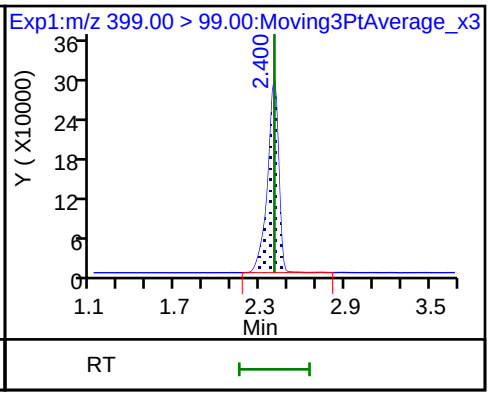
10 Perfluoroheptanoic acid



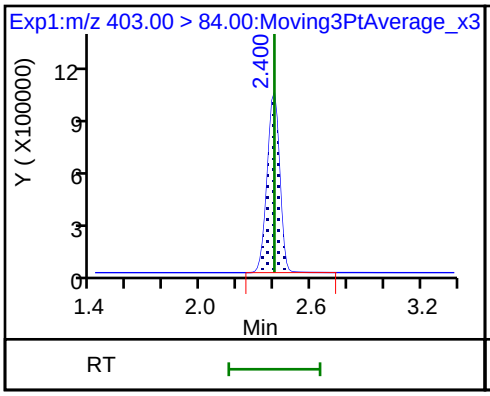
8 Perfluorohexanesulfonic acid



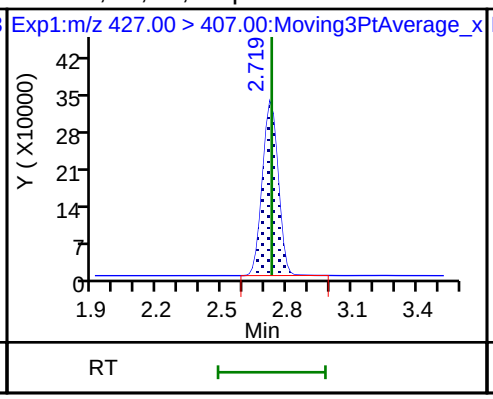
8 Perfluorohexanesulfonic acid



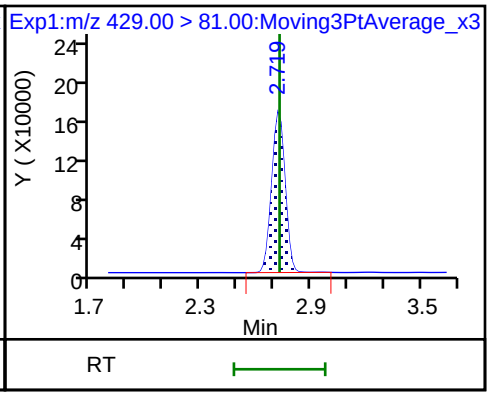
D 11 18O2 PFHxS



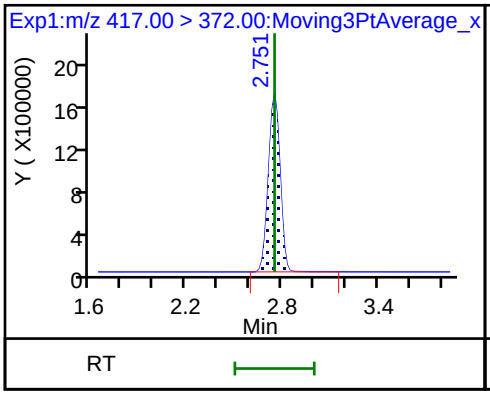
13 1H,1H,2H,2H-perfluorooctanesulfon



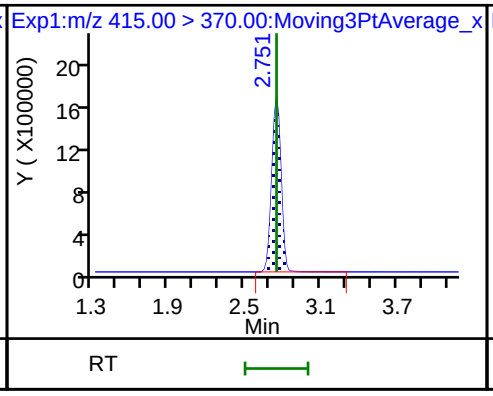
D 12 M2-6:2FTS



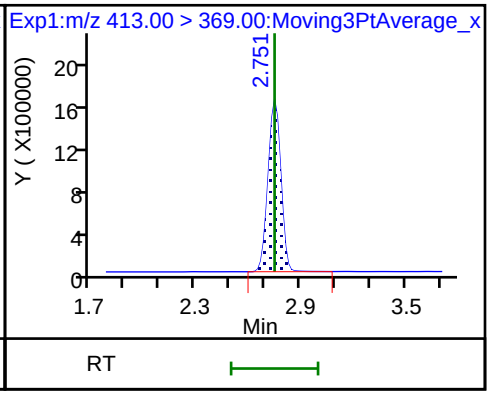
D 14 13C4 PFOA



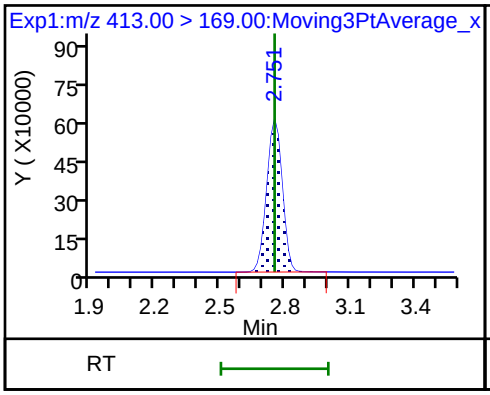
* 62 13C2-PFOA



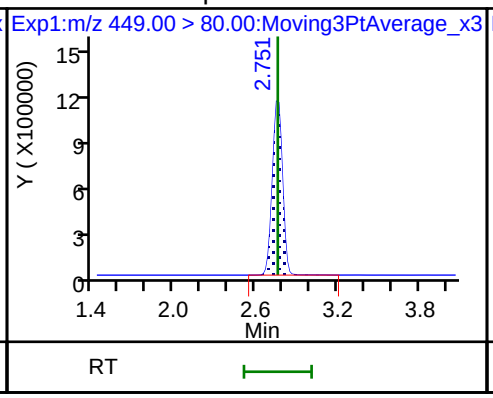
15 Perfluorooctanoic acid



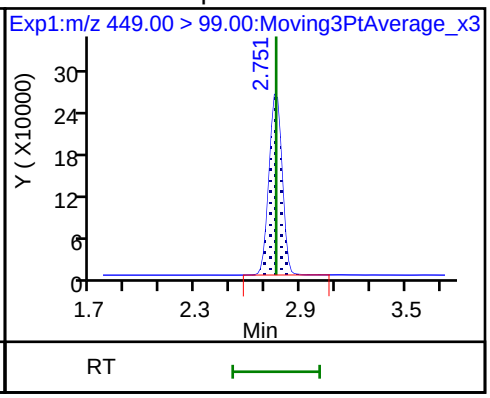
15 Perfluorooctanoic acid



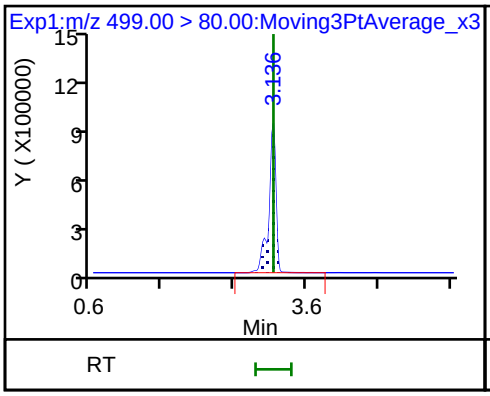
16 Perfluoroheptanesulfonic acid



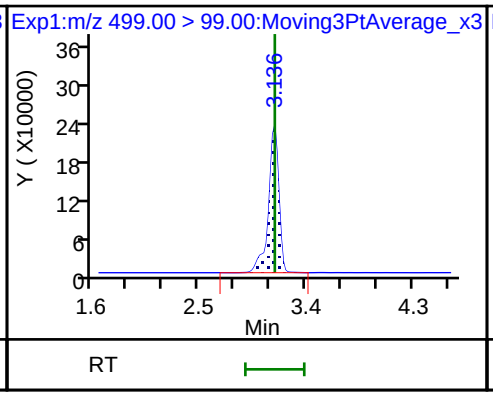
16 Perfluoroheptanesulfonic acid



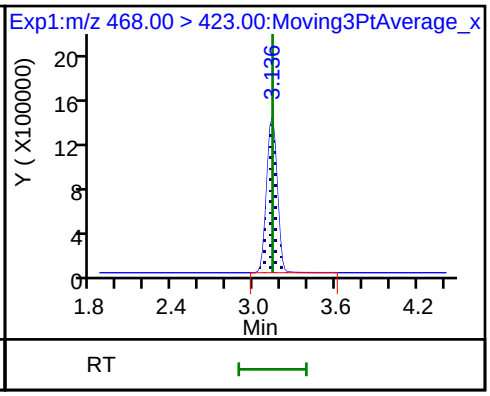
17 Perfluorooctane sulfonic acid



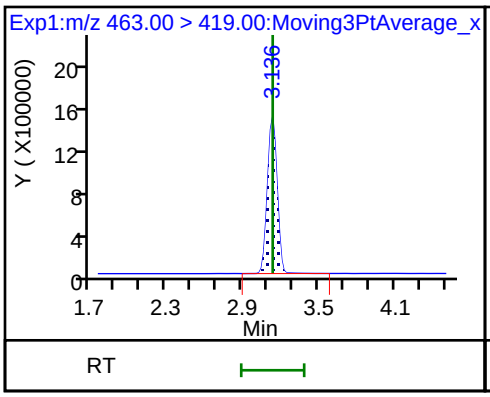
17 Perfluorooctane sulfonic acid



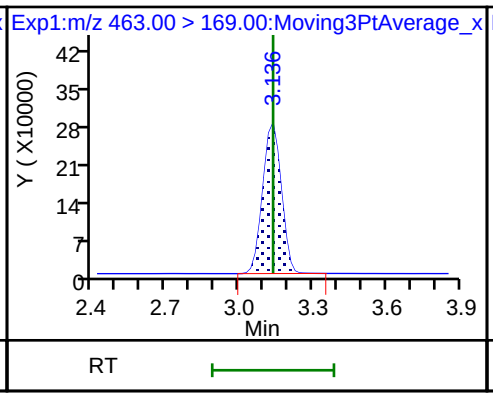
D 19 13C5 PFNA



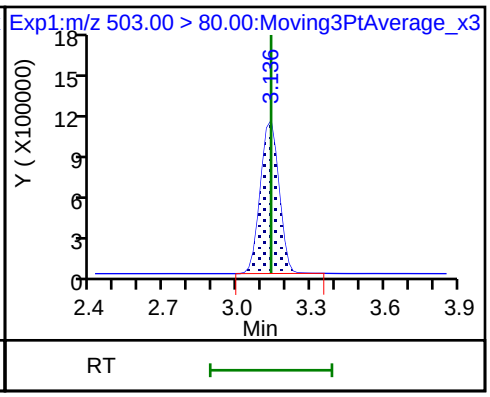
20 Perfluorononanoic acid



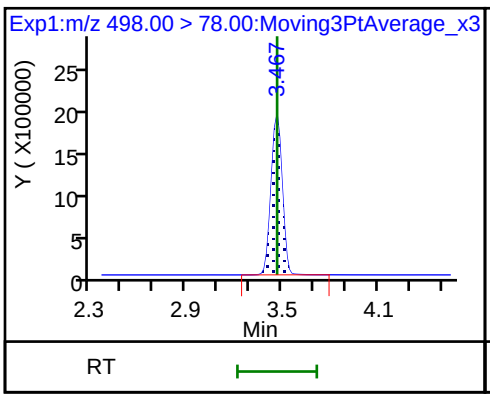
20 Perfluorononanoic acid



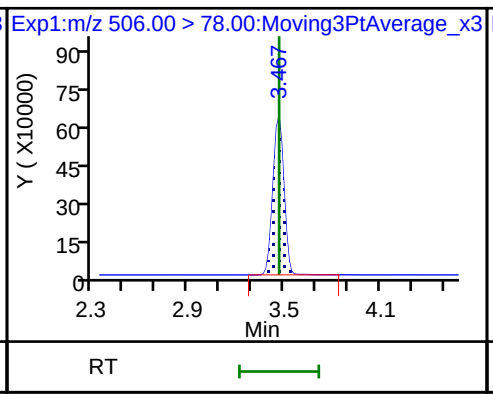
D 18 13C4 PFOS



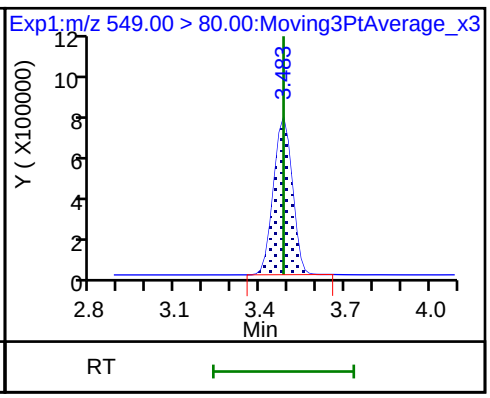
22 Perfluorooctane Sulfonamide



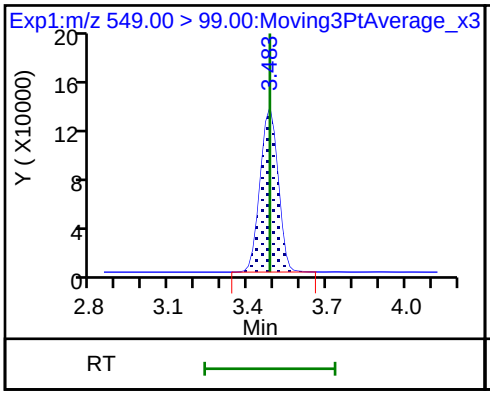
D 21 13C8 FOSA



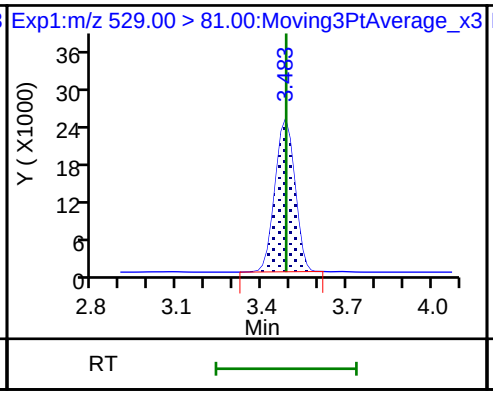
68 Perfluorononanesulfonic acid



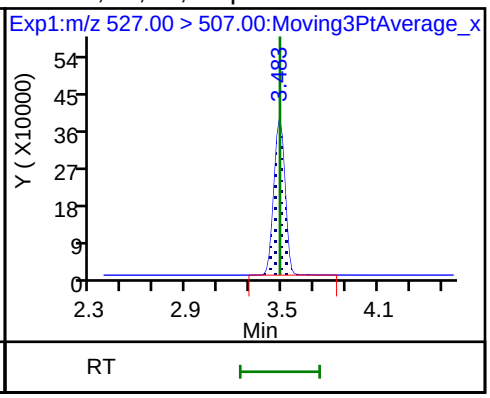
68 Perfluorononanesulfonic acid



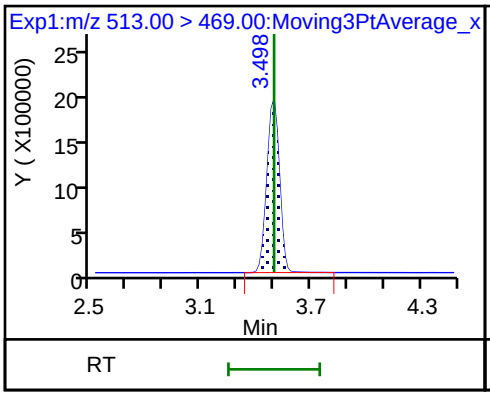
D 26 M2-8:2FTS



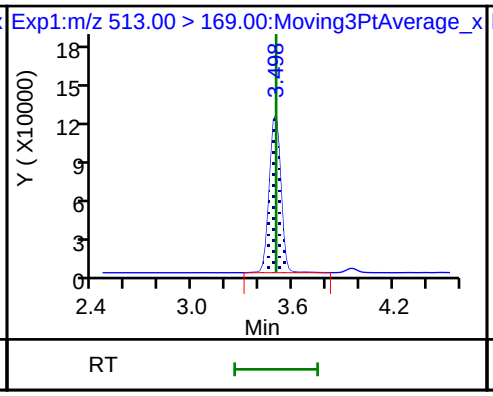
25 1H,1H,2H,2H-perfluorodecanesulfoni



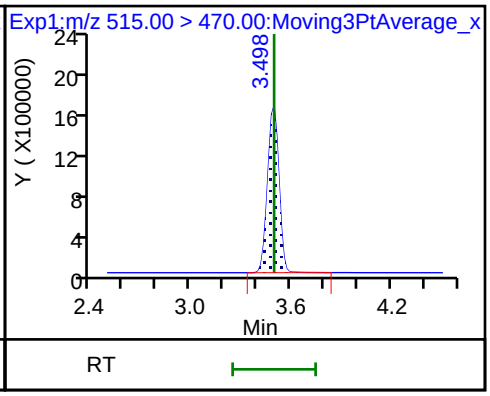
24 Perfluorodecanoic acid



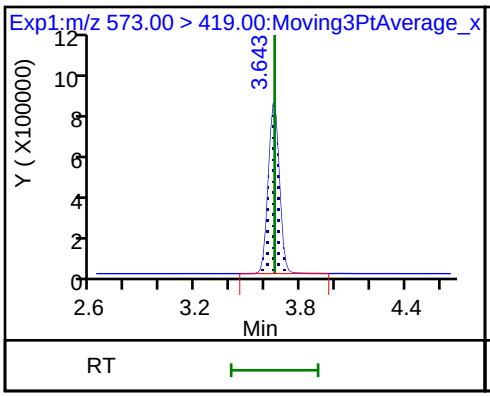
24 Perfluorodecanoic acid



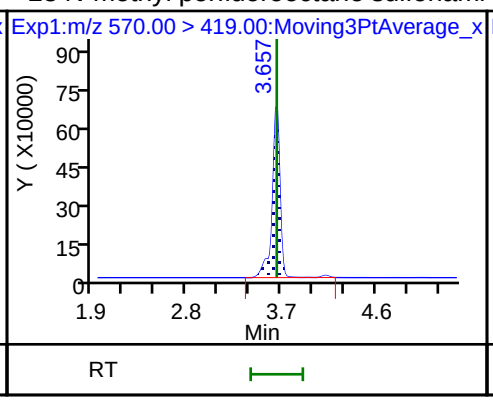
D 23 13C2 PFDA



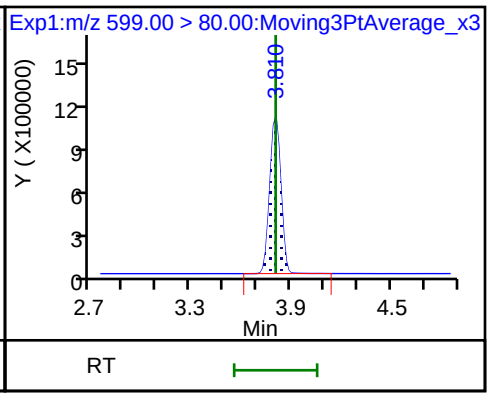
D 27 d3-NMeFOSAA



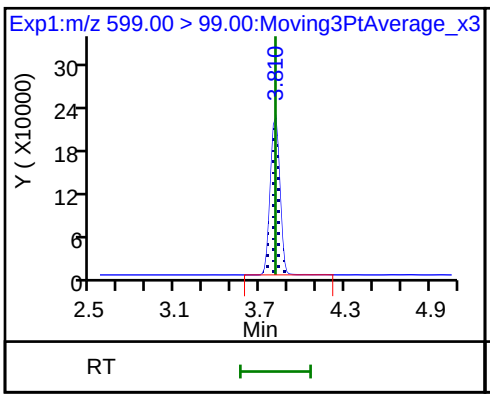
28 N-methyl perfluorooctane sulfonami



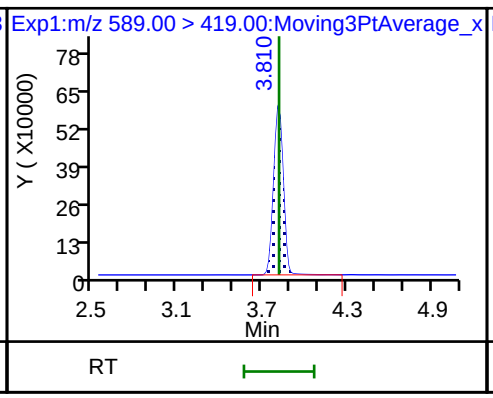
29 Perfluorodecane Sulfonic acid



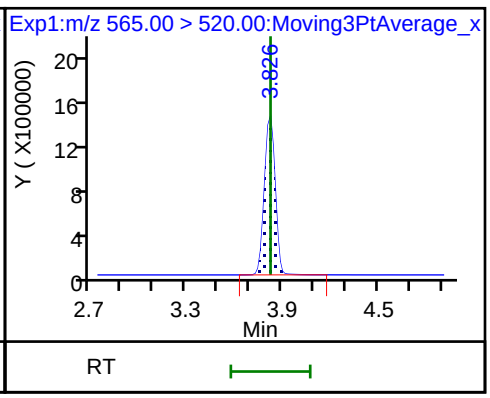
29 Perfluorodecane Sulfonic acid



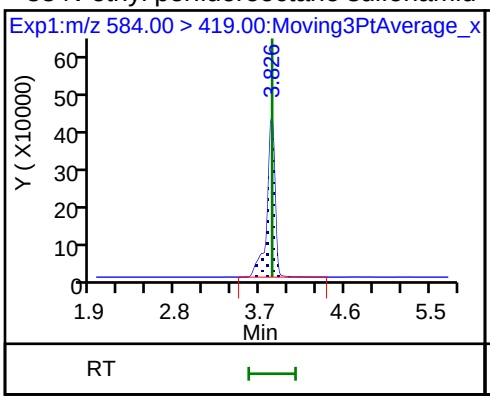
D 32 d5-NEtFOSAA



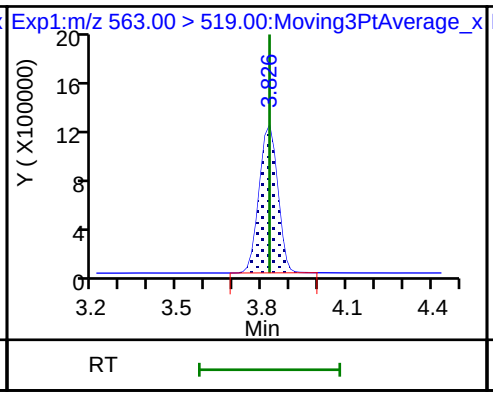
D 30 13C2 PFUnA



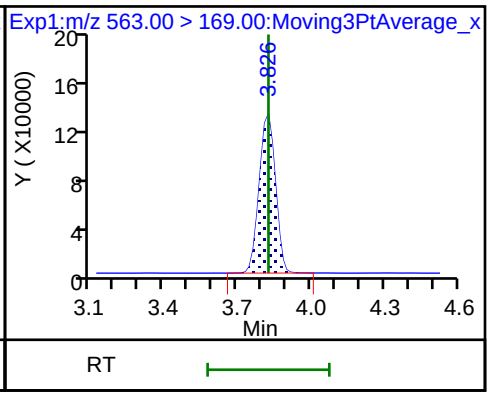
33 N-ethyl perfluorooctane sulfonamid



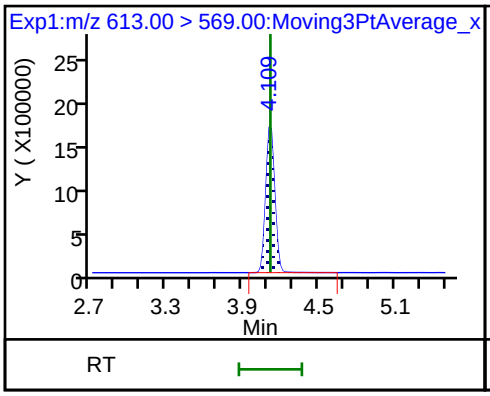
31 Perfluoroundecanoic acid



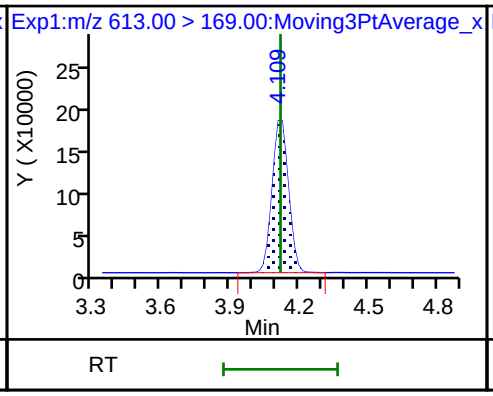
31 Perfluoroundecanoic acid



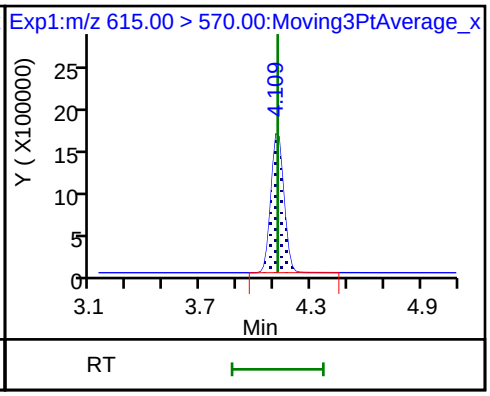
37 Perfluorododecanoic acid



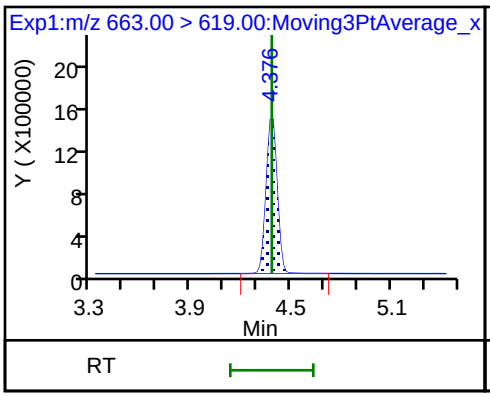
37 Perfluorododecanoic acid



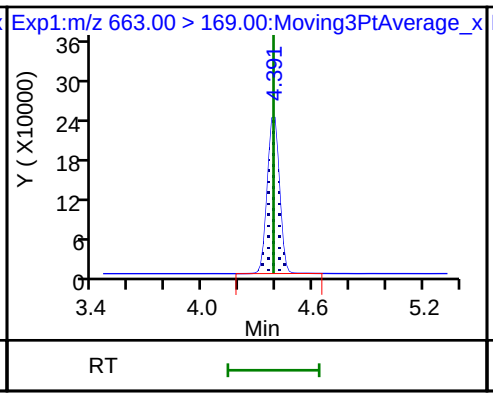
D 36 13C2 PFDoA



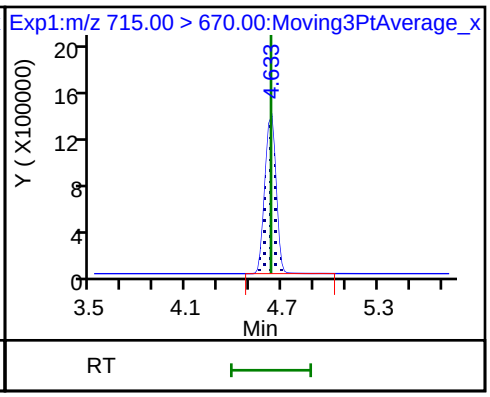
41 Perfluorotridecanoic acid



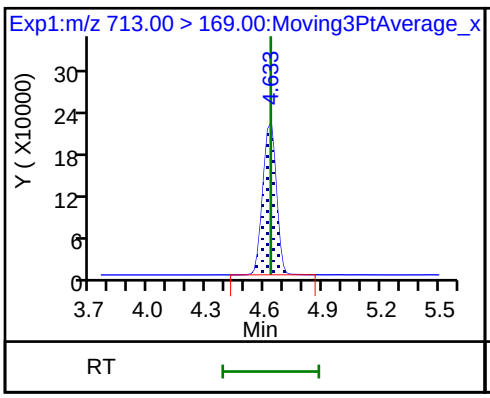
41 Perfluorotridecanoic acid



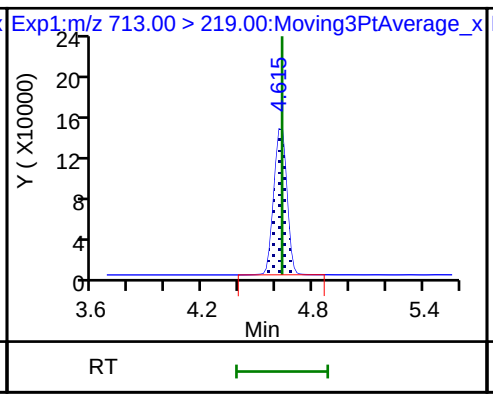
D 43 13C2-PFTeDA



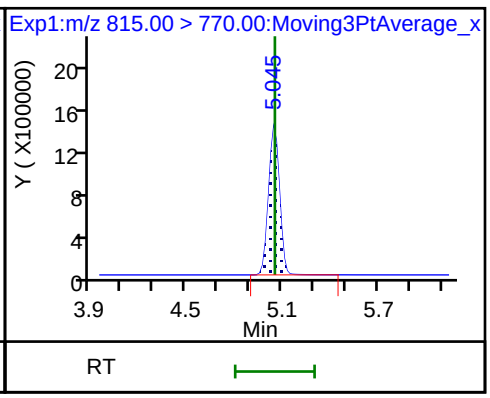
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_010.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 28-Aug-2018 10:58:17 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: IC PFC STD6
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 13:27:51 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 11:52:17

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	1.484	1.485	-0.001	0.539	8218830	2.62		105	17599	
2 Perfluorobutyric acid										
212.90 > 169.00	1.484	1.486	-0.002	1.000	14983771	4.99		99.9	2252	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.758	-0.002	0.638	7268510	2.60		104	8870	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.756	1.759	-0.003	1.000	14249697	4.83		96.6	1340	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.796	-0.007	0.650	87618	2.39		103	721	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.798	1.797	0.001	1.005	17343386	4.38		99.1	5896	
298.90 > 99.00	1.798	1.797	0.001	1.005	6371973		2.72(1.35-4.05)	99.1	4834	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.012	-0.005	1.122	3864378	4.75		102	7205	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.013	-0.006	0.730	751690	NC			847	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.745	7681141	2.60		104	10055	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	12770869	4.56		91.3	3746	
313.00 > 119.00	2.048	2.048	0.0	1.000	1043036		12.24(6.96-20.87)	91.3	1987	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.069	2.071	-0.002	1.156	9043779	4.81		103	6585	
349.00 > 99.00	2.069	2.071	-0.002	1.156	4185432		2.16(1.15-3.45)	103	5118	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.140	2.149	-0.009	0.995	2900205	NC			1520	

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	2.150	2.150	0.0	0.782	800298	NC			2144	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	8866287	2.52		101	16373	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	17404274	4.81		96.3	2120	
363.00 > 169.00	2.374	2.387	-0.013	0.994	4380290		3.97(2.17-6.52)	96.3	6187	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	12331061	4.41		97.0	6758	
399.00 > 99.00	2.400	2.400	0.0	1.000	3392384		3.63(1.90-5.70)	97.0	3348	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5340279	2.46		104	7426	
76 DONA										
377.00 > 251.00	2.426	2.432	-0.006	0.774	27199824	NC			29562	
377.00 > 85.00	2.426	2.432	-0.006	0.774	12945040		2.10(1.13-3.39)		5136	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.728	-0.009	1.000	3562961	4.78		101	2295	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.728	-0.009	0.988	826593	2.39		101	1559	
D 73 13C8 PFOA										
421.00 > 376.00	2.735	2.744	-0.009		6917205	NC			12216	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	8428311	2.57		103	26044	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8140987	2.50			11219	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	15852050	4.37		87.3	1067	
413.00 > 169.00	2.751	2.751	0.0	1.000	6237187		2.54(1.36-4.08)	87.3	5619	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.751	2.760	-0.009	0.877	11141173	4.80		101	8318	
449.00 > 99.00	2.751	2.760	-0.009	0.877	3002246		3.71(1.84-5.53)	101	5881	
D 72 13C8 PFOS										
507.00 > 99.00	3.118	3.129	-0.011		1179245	NC			2256	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	11834862	4.76		103	8163	
499.00 > 99.00	3.136	3.136	0.0	1.000	2971407		3.98(2.04-6.12)	103	4295	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.136	0.0	1.140	7912109	2.57		103	9263	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	14738364	4.76		95.2	1376	
463.00 > 169.00	3.136	3.136	0.0	1.000	3075245		4.79(2.68-8.03)	95.2	5412	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.136	0.0	1.140	5629385	2.42		101	4231	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.336	3.346	-0.010	1.064	12670914	NC			4984	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	17204061	4.82		96.3	11085	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3013781	2.45		97.9	8034	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.483	3.483	0.0	1.110	7596364	4.99		104	5401	
549.00 > 99.00	3.483	3.483	0.0	1.110	1326799		5.73(3.02-9.05)	104	5081	
D 26 M2-8:2FTS										
529.00 > 81.00	3.483	3.485	-0.002	1.266	119770	2.35		98.2	691	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.483	3.485	-0.002	1.000	3415181	4.51		94.2	5065	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.498	0.0	1.000	15866006	4.47		89.4	1851	
513.00 > 169.00	3.498	3.498	0.0	1.000	1237796		12.82(7.12-21.35)	89.4	482	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.498	0.0	1.272	7796459	2.54		102	15345	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.643	3.651	-0.008	1.324	3516347	2.54		102	3859	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.643	3.653	-0.010	1.000	7175328	5.13		103	1579	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.794	3.807	-0.013	1.210	9351668	4.88		101	6004	
599.00 > 99.00	3.794	3.807	-0.013	1.210	2156718		4.34(2.14-6.43)	101	4361	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.810	3.819	-0.009	1.385	2566441	2.36		94.3	2260	
D 30 13C2 PFUnA										
565.00 > 520.00	3.826	3.825	0.001	1.391	6750273	2.58		103	6772	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.826	3.825	0.001	1.004	4889294	5.12		102	4140	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.826	3.825	0.001	1.000	11321464	4.67		93.5	2040	
563.00 > 169.00	3.810	3.825	-0.015	0.996	1095584		10.33(5.24-15.72)	93.5	2374	
35 MeFOSA										
512.00 > 169.00	3.947	3.949	-0.002		3556841	NC			885	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.978	3.983	-0.005	1.268	13855585	NC			9941	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.109	4.118	-0.009	1.000	15587157	4.85		97.0	2717	
613.00 > 169.00	4.109	4.118	-0.009	1.000	1741310		8.95(4.68-14.05)	97.0	3431	
D 36 13C2 PFDoA										
615.00 > 570.00	4.109	4.118	-0.009	1.493	7973084	2.51		100	6036	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.109	4.120	-0.011	1.180	2405218	NC			4137	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.142	4.142	0.0		3791367	NC			562	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.360	4.360	0.0	1.390	1083101	NC			2115	
699.00 > 99.00	4.360	4.360	0.0	1.390	1929696		0.56(0.28-0.83)		2482	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.375	4.384	-0.009	1.065	12220220	4.78		95.5	3514	
663.00 > 169.00	4.375	4.384	-0.009	1.065	2368145		5.16(3.09-9.27)	95.5	5433	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.630	4.628	0.002	1.683	6312069	2.49		99.7	12716	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.630	4.631	-0.001	1.000	2038535	5.00		100	4974	
713.00 > 219.00	4.630	4.631	-0.001	1.000	1470914		1.39(0.70-2.09)	100	5164	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.042	5.053	-0.011	1.000	12115938	NC			1902	
813.00 > 169.00	5.042	5.053	-0.011	1.000	2271869		5.33(2.77-8.32)		4129	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.042	5.053	-0.011	1.833	6816429	2.66		106	7012	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.406	5.416	-0.010	1.072	8788349	NC			1634	
913.00 > 169.00	5.406	5.416	-0.010	1.072	1633197		5.38(2.55-7.64)		3518	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00010 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 13:27:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_010.d

Injection Date: 28-Aug-2018 10:58:17 Instrument ID: A9

Lims ID: IC L6 Full

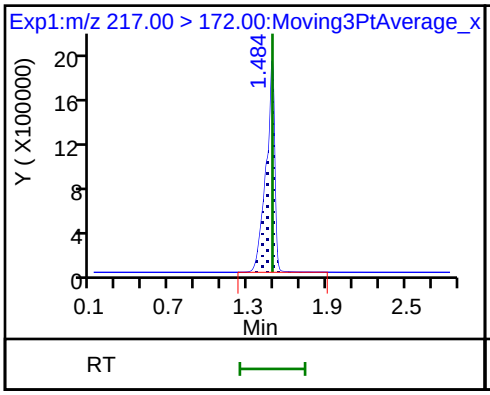
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 15 Worklist Smp#: 7

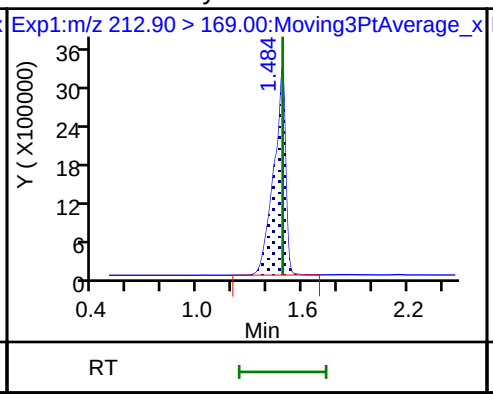
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

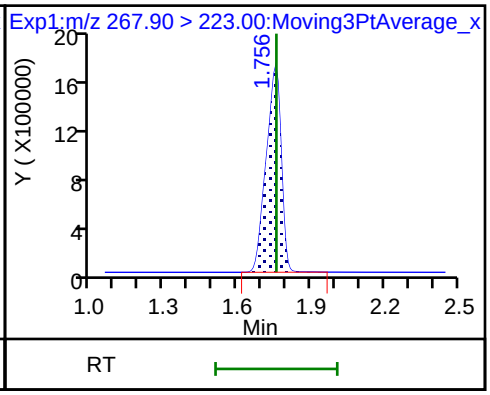
D 1 13C4 PFBA



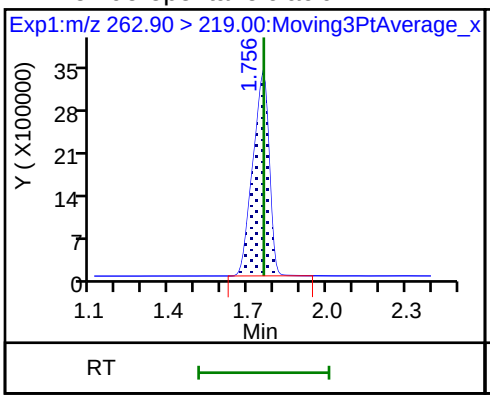
2 Perfluorobutyric acid



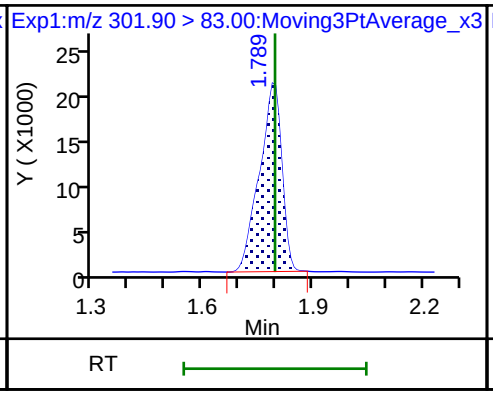
D 3 13C5-PFPeA



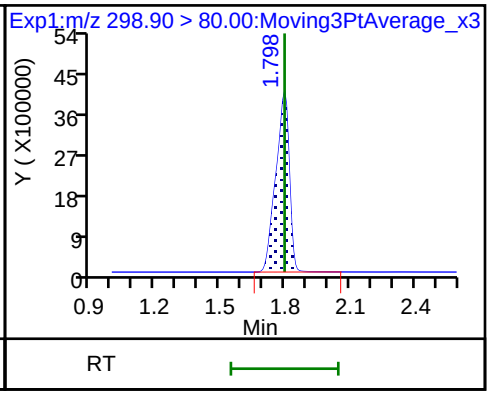
4 Perfluoropentanoic acid



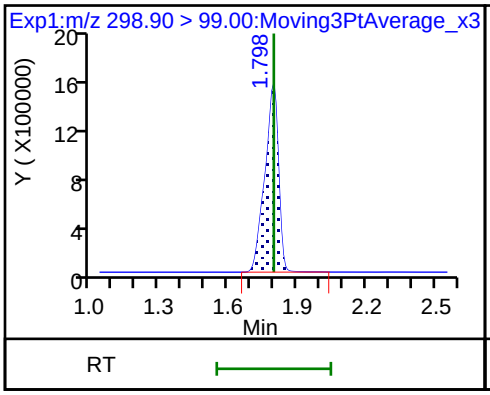
D 47 13C3-PFBS



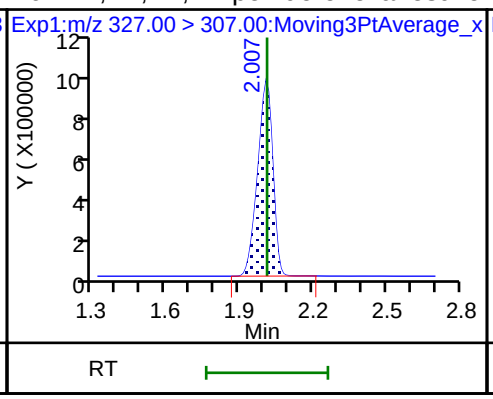
5 Perfluorobutanesulfonic acid



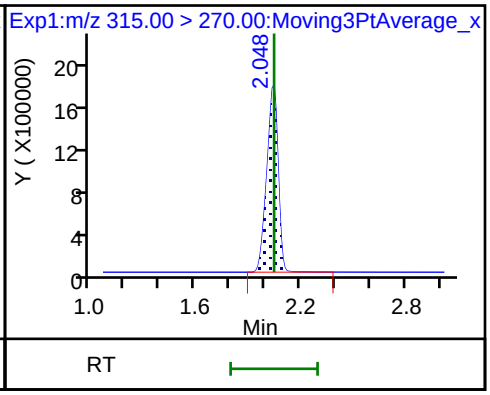
5 Perfluorobutanesulfonic acid



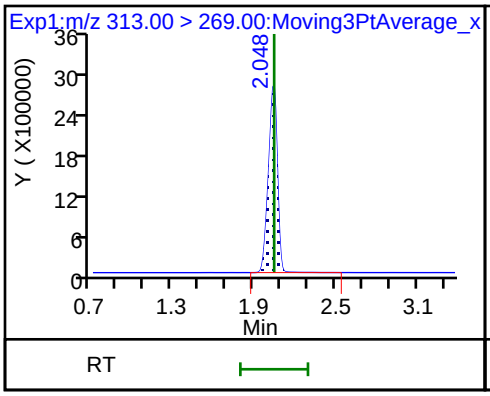
61 1H,1H,2H,2H-perfluorohexanesulfon



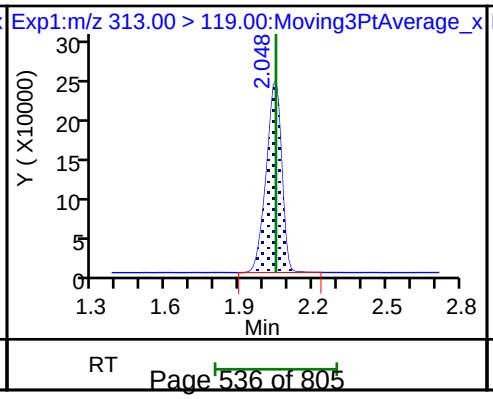
D 7 13C2 PFHxA



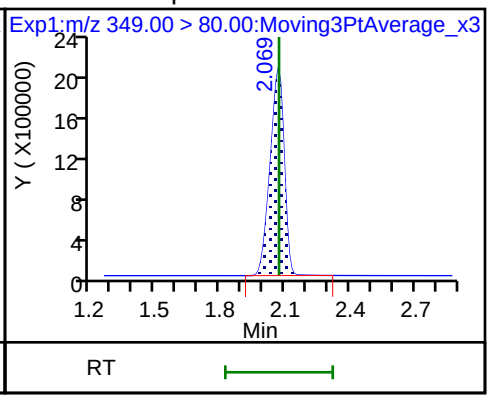
6 Perfluorohexanoic acid



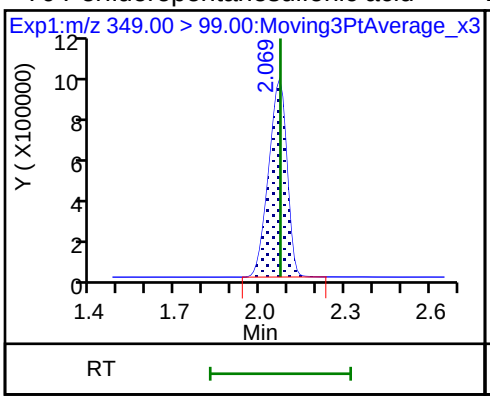
6 Perfluorohexanoic acid



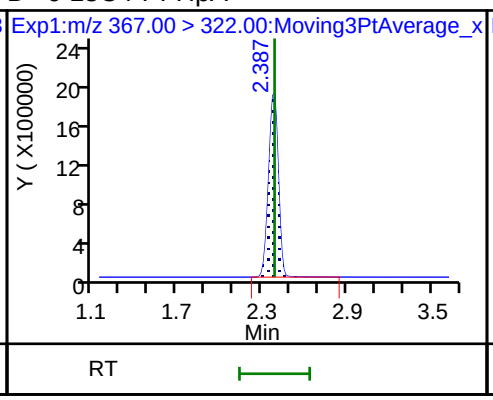
70 Perfluoropentanesulfonic acid



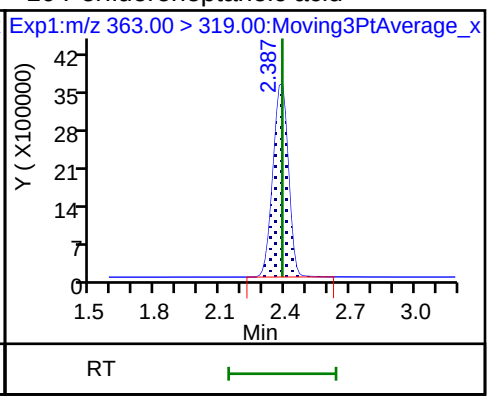
70 Perfluoropentanesulfonic acid



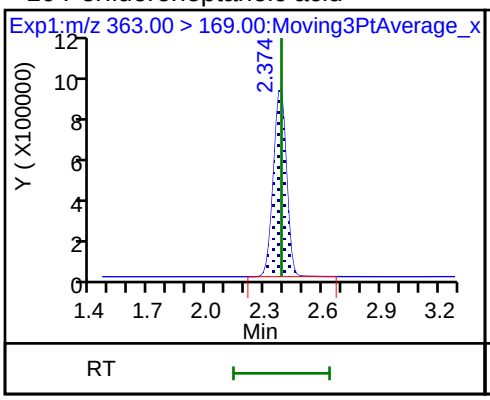
D 9 13C4-PFHpA



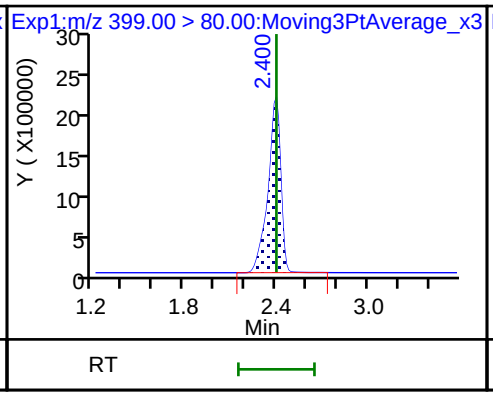
10 Perfluoroheptanoic acid



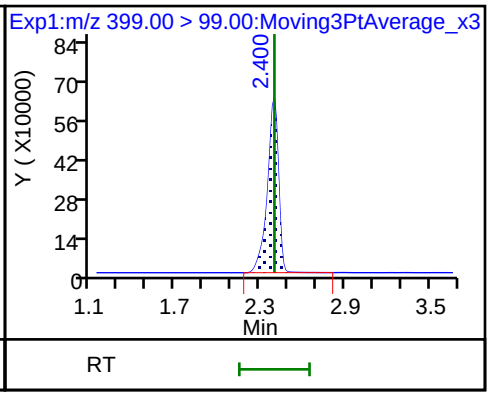
10 Perfluoroheptanoic acid



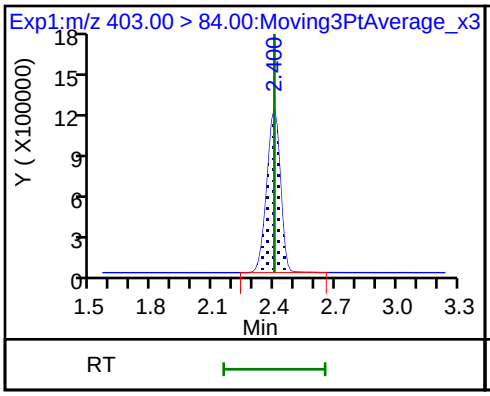
8 Perfluorohexanesulfonic acid



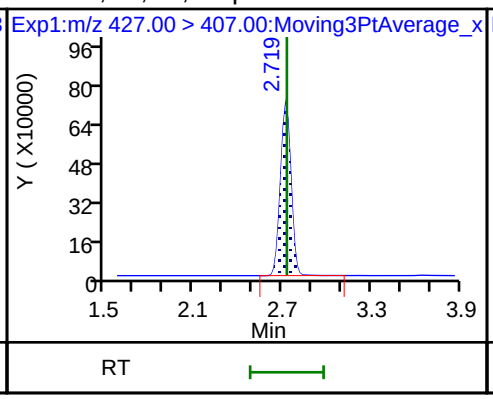
8 Perfluorohexanesulfonic acid



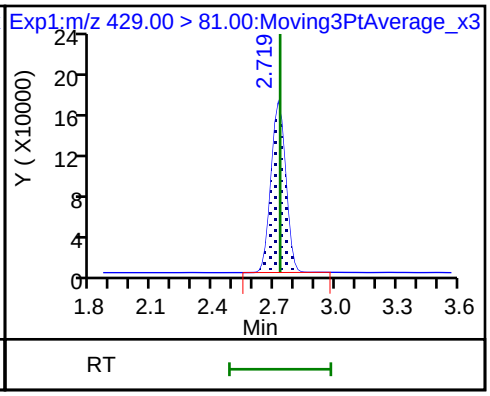
D 11 18O2 PFHxS



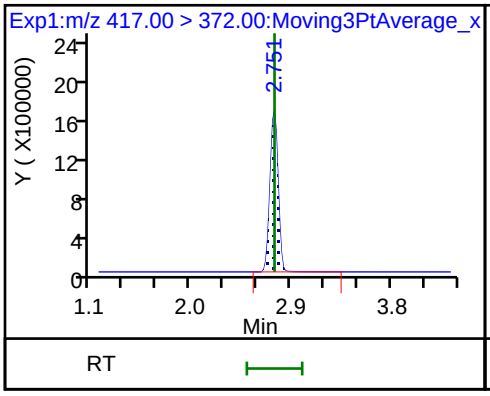
13 1H,1H,2H,2H-perfluorooctanesulfon



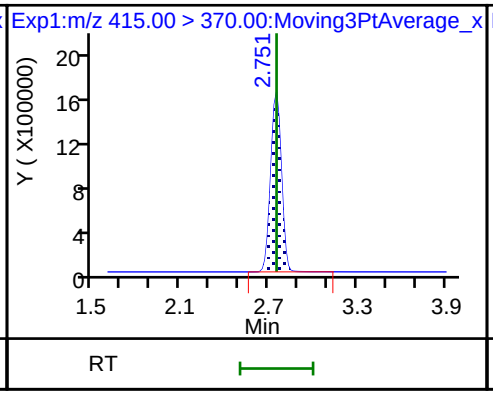
D 12 M2-6:2FTS



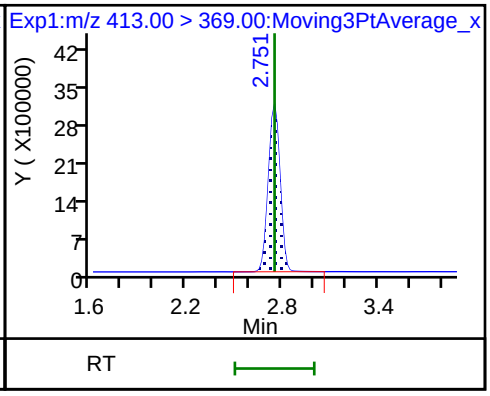
D 14 13C4 PFOA



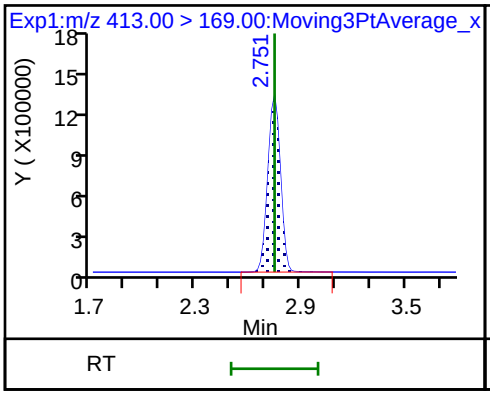
* 62 13C2-PFOA



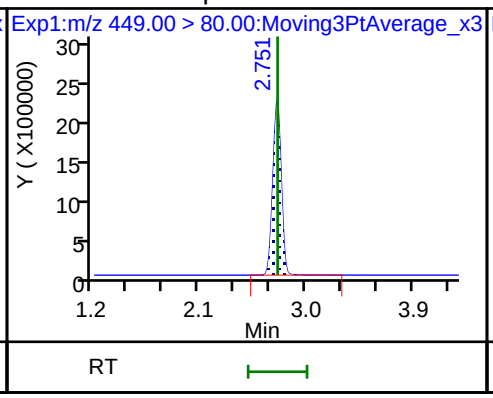
15 Perfluorooctanoic acid



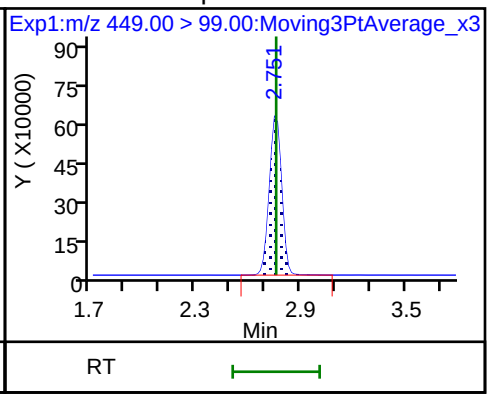
15 Perfluorooctanoic acid



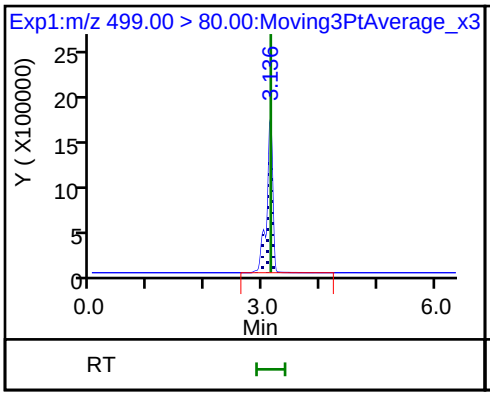
16 Perfluoroheptanesulfonic acid



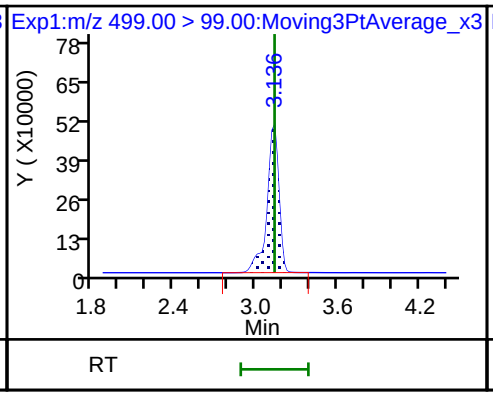
16 Perfluoroheptanesulfonic acid



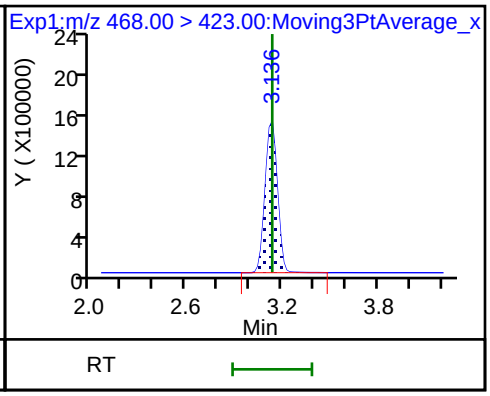
17 Perfluorooctane sulfonic acid



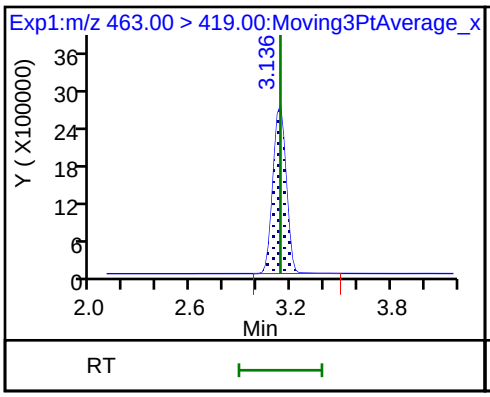
17 Perfluorooctane sulfonic acid



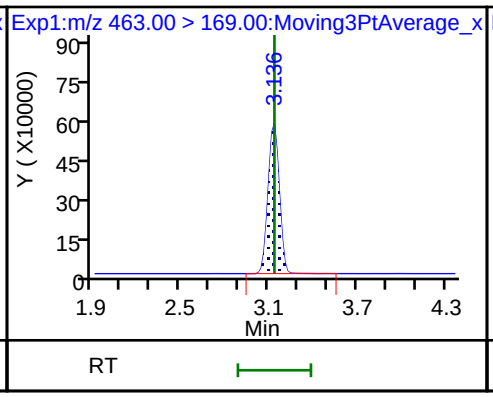
D 19 13C5 PFNA



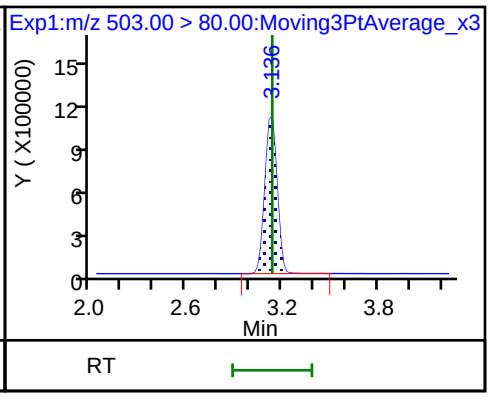
20 Perfluorononanoic acid



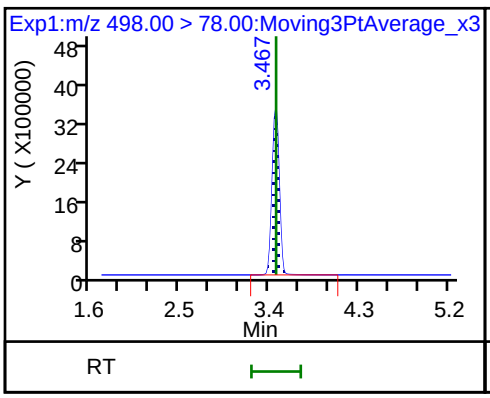
20 Perfluorononanoic acid



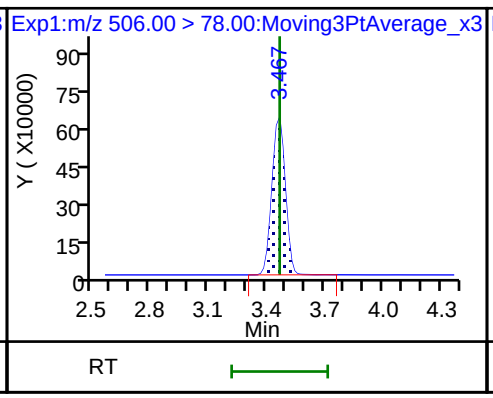
D 18 13C4 PFOS



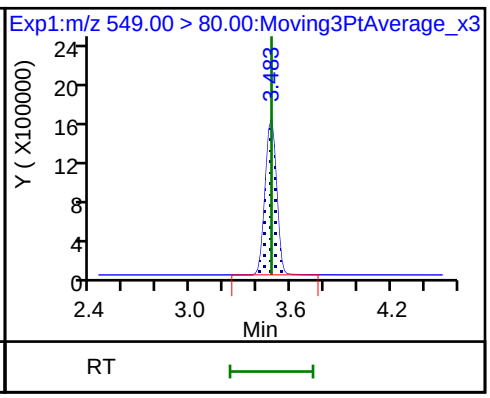
22 Perfluorooctane Sulfonamide



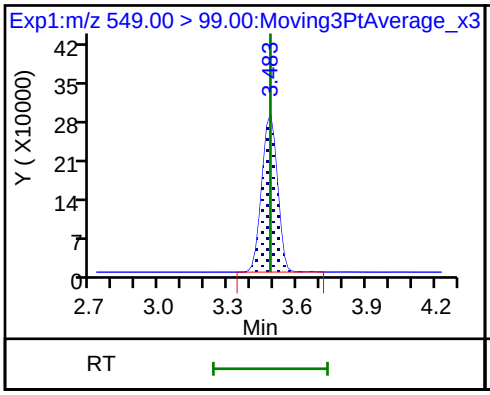
D 21 13C8 FOSA



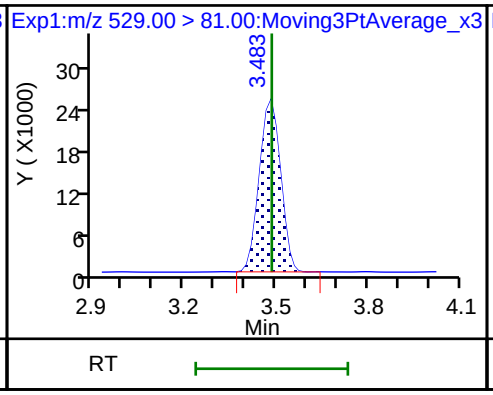
68 Perfluorononanesulfonic acid



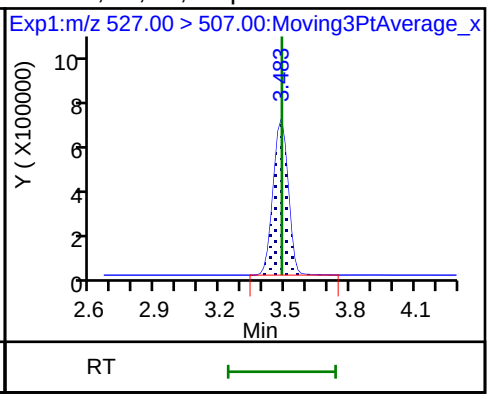
68 Perfluorononanesulfonic acid



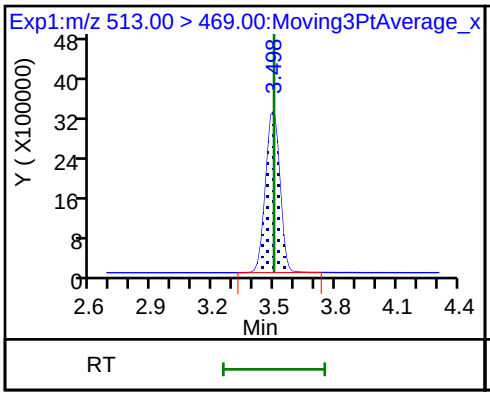
D 26 M2-8:2FTS



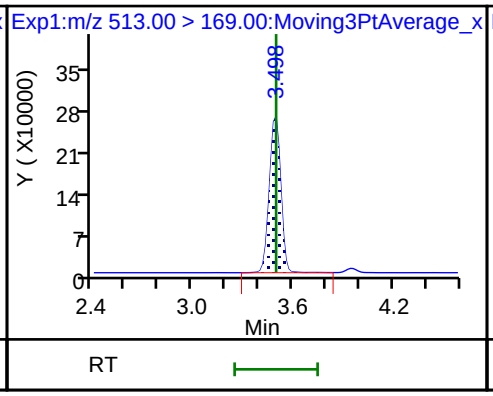
25 1H,1H,2H,2H-perfluorodecanesulfoni



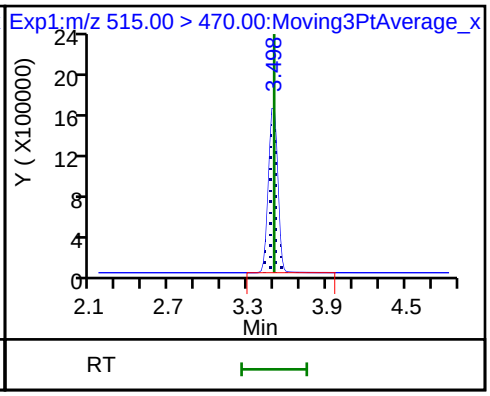
24 Perfluorodecanoic acid



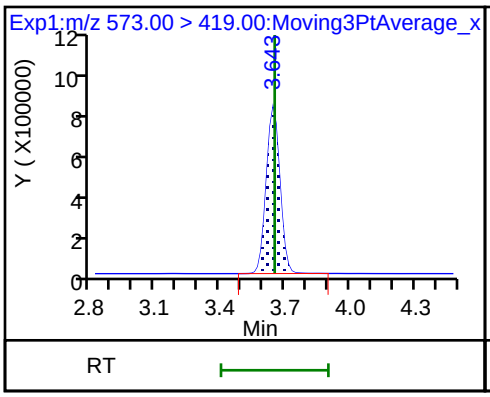
24 Perfluorodecanoic acid



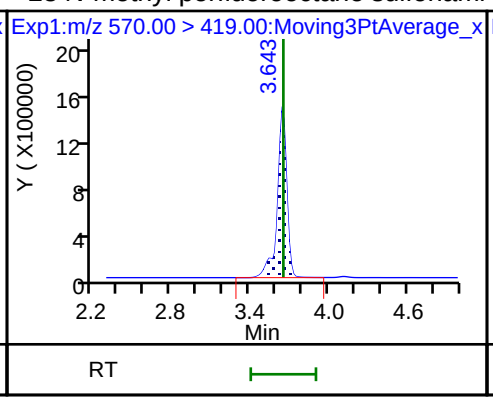
D 23 13C2 PFDA



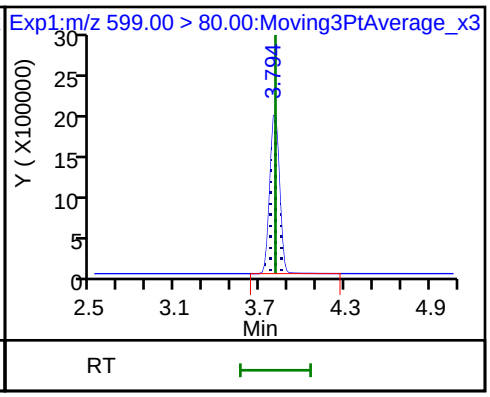
D 27 d3-NMeFOSAA



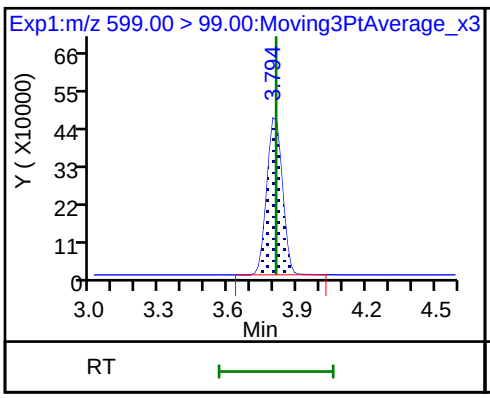
28 N-methyl perfluorooctane sulfonami



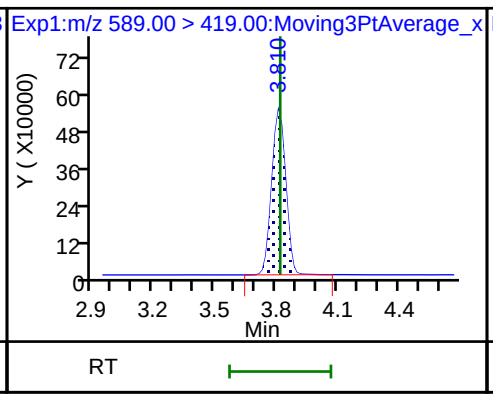
29 Perfluorodecane Sulfonic acid



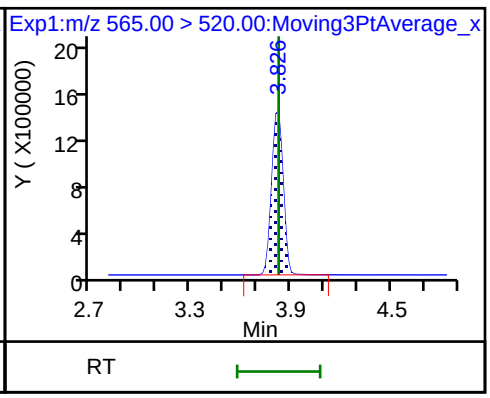
29 Perfluorodecane Sulfonic acid



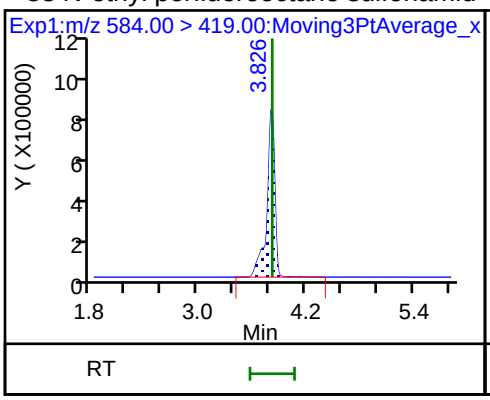
D 32 d5-NEtFOSAA



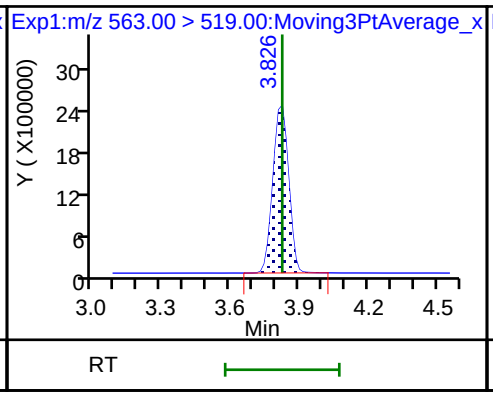
D 30 13C2 PFUnA



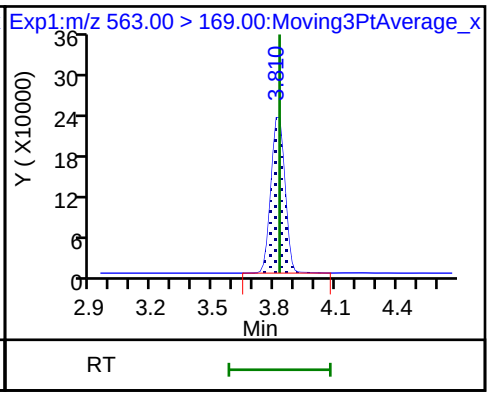
33 N-ethyl perfluorooctane sulfonamid



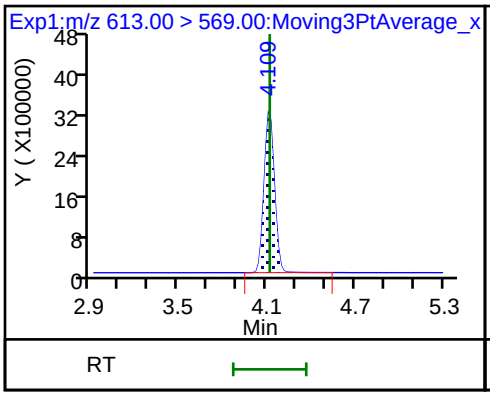
31 Perfluoroundecanoic acid



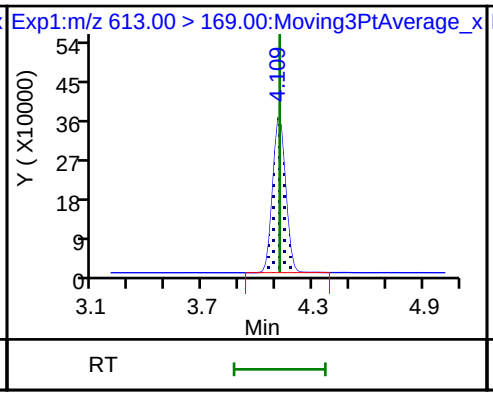
31 Perfluoroundecanoic acid



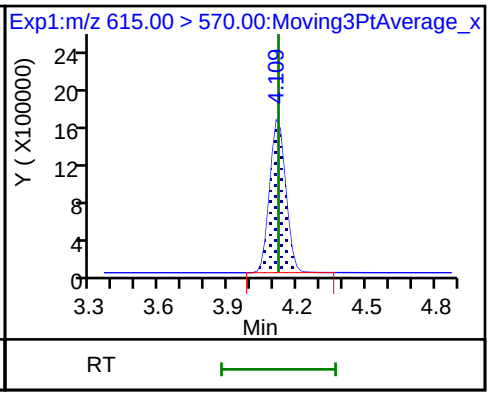
37 Perfluorododecanoic acid



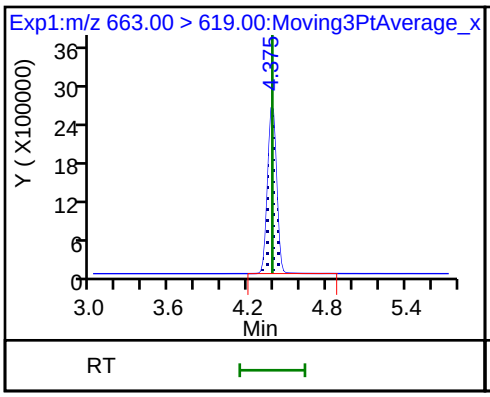
37 Perfluorododecanoic acid



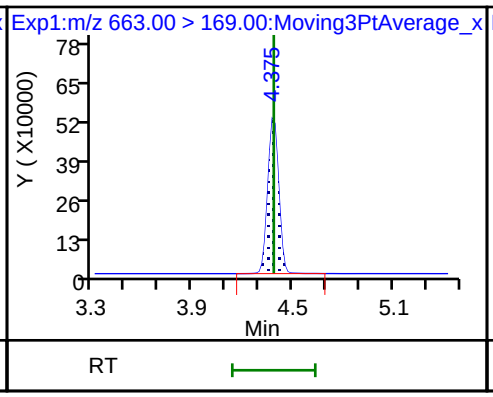
D 36 13C2 PFDoA



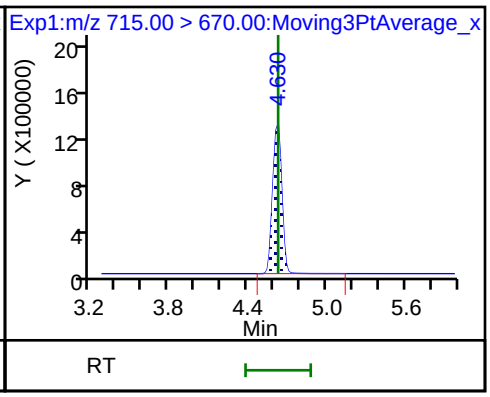
41 Perfluorotridecanoic acid



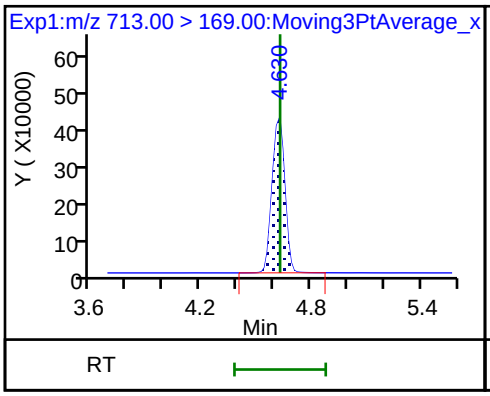
41 Perfluorotridecanoic acid



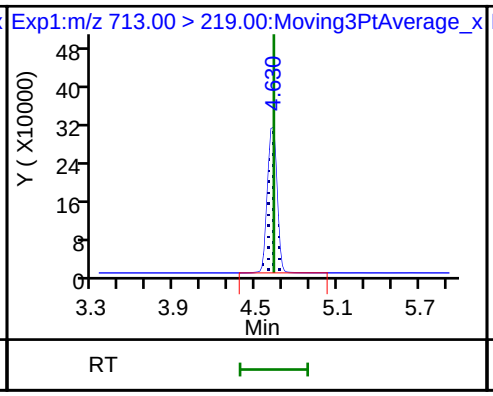
D 43 13C2-PFTeDA



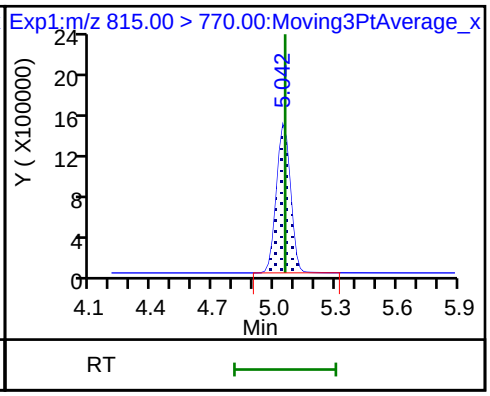
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 28-Aug-2018 11:05:49 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: IC PFC STD7
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 13:27:59 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 11:52:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.484	1.485	-0.001	0.539	7921655	2.50		100.0	22603	
2 Perfluorobutyric acid										
212.90 > 169.00	1.484	1.486	-0.002	1.000	27502138	9.51		95.1	3546	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.758	-0.002	0.638	6904215	2.44		97.7	13178	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.756	1.759	-0.003	1.000	24900282	8.89		88.9	1970	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.796	0.001	0.653	90962	2.45		105	714	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	30003262	7.30		82.6	7809	
298.90 > 99.00	1.797	1.797	0.0	1.000	11679987		2.57(1.35-4.05)	82.6	7679	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.012	-0.005	1.117	6993719	8.27		88.6	13060	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.013	-0.006	0.730	715177	NC			885	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.744	7370188	2.47		98.6	8834	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	23347053	8.70		87.0	4894	
313.00 > 119.00	2.048	2.048	0.0	1.000	1998176		11.68(6.96-20.87)	87.0	2639	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.071	-0.003	1.151	16084327	8.24		87.9	10331	
349.00 > 99.00	2.068	2.071	-0.003	1.151	7994692		2.01(1.15-3.45)	87.9	7155	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.149	0.001	1.000	5979686	NC			2598	

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	2.150	2.150	0.0	0.782	879762	NC			3273	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	8609256	2.41		96.6	6540	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	30385284	8.65		86.5	3237	
363.00 > 169.00	2.387	2.387	0.0	1.000	8190734		3.71(2.17-6.52)	86.5	8403	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	21506619	8.28		91.0	13127	
399.00 > 99.00	2.400	2.400	0.0	1.000	6436519		3.34(1.90-5.70)	91.0	7077	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	4964565	2.26		95.7	4642	
76 DONA										
377.00 > 251.00	2.426	2.432	-0.006	0.774	43974663	NC			12427	
377.00 > 85.00	2.426	2.432	-0.006	0.774	23235019		1.89(1.13-3.39)		7286	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.728	-0.009	1.000	6460415	9.26		97.7	4188	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.728	-0.009	0.988	774049	2.21		93.0	1356	
D 73 13C8 PFOA										
421.00 > 376.00	2.735	2.744	-0.009		6879581	NC			15664	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	7734289	2.33		93.2	13249	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8235568	2.50			16840	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	27214840	8.17		81.7	1777	
413.00 > 169.00	2.751	2.751	0.0	1.000	11375347		2.39(1.36-4.08)	81.7	9599	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.751	2.760	-0.009	0.877	19649006	9.08		95.4	10966	
449.00 > 99.00	2.751	2.760	-0.009	0.877	5377408		3.65(1.84-5.53)	95.4	7671	
D 72 13C8 PFOS										
507.00 > 99.00	3.118	3.129	-0.011		1196408	NC			2347	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	21024940	9.07		97.7	9164	
499.00 > 99.00	3.136	3.136	0.0	1.000	5441287		3.86(2.04-6.12)	97.7	5471	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.136	0.0	1.140	7454345	2.40		95.9	12096	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	24988022	8.57		85.7	2227	
463.00 > 169.00	3.136	3.136	0.0	1.000	5558667		4.50(2.68-8.03)	85.7	4548	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.136	0.0	1.140	5250354	2.23		93.3	4555	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.336	3.346	-0.010	1.064	21731125	NC			7155	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	29608945	8.29		82.9	9002	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3012041	2.42		96.7	5317	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.482	3.483	-0.001	1.110	12812955	9.03		94.1	5205	
549.00 > 99.00	3.482	3.483	-0.001	1.110	2366309		5.41(3.02-9.05)	94.1	3571	
D 26 M2-8:2FTS										
529.00 > 81.00	3.482	3.485	-0.003	1.266	102619	1.99		83.2	591	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.482	3.485	-0.003	1.000	6151127	9.48		99.0	6127	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.498	0.0	1.000	26563468	8.02		80.2	2695	
513.00 > 169.00	3.498	3.498	0.0	1.000	2263032		11.74(7.12-21.35)	80.2	519	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.498	0.0	1.272	7270400	2.34		93.7	4182	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.643	3.651	-0.008	1.324	3484339	2.49		99.6	3698	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.643	3.653	-0.010	1.000	12749037	9.20		92.0	2389	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.810	3.807	0.003	1.215	16951122	9.49		98.4	8429	
599.00 > 99.00	3.810	3.807	0.003	1.215	4140295		4.09(2.14-6.43)	98.4	7134	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.810	3.819	-0.009	1.385	2480748	2.25		90.1	2241	
D 30 13C2 PFUnA										
565.00 > 520.00	3.825	3.825	0.0	1.391	6090404	2.30		92.2	13059	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.825	3.825	0.0	1.004	8988864	9.74		97.4	4848	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.825	3.825	0.0	1.000	18994666	8.69		86.9	2597	
563.00 > 169.00	3.825	3.825	0.0	1.000	2095818		9.06(5.24-15.72)	86.9	5814	
35 MeFOSA										
512.00 > 169.00	3.946	3.949	-0.003		6875952	NC			929	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.978	3.983	-0.005	1.268	24688548	NC			8495	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.108	4.118	-0.010	1.000	25191162	7.61		76.1	4574	
613.00 > 169.00	4.108	4.118	-0.010	1.000	3534183		7.13(4.68-14.05)	76.1	5503	
D 36 13C2 PFDoA										
615.00 > 570.00	4.108	4.118	-0.010	1.494	8209254	2.55		102	9673	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.108	4.120	-0.012	1.180	4204181	NC			4524	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.142	4.142	0.0		7067831	NC			577	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.360	4.360	0.0	1.390	2106595	NC			4911	
699.00 > 99.00	4.360	4.360	0.0	1.390	3777264		0.56(0.28-0.83)		9201	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.375	4.384	-0.009	1.065	19763356	7.50		75.0	3267	
663.00 > 169.00	4.375	4.384	-0.009	1.065	4029434		4.90(3.09-9.27)	75.0	5506	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.615	4.628	-0.013	1.678	6291947	2.46		98.3	11703	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.633	4.631	0.002	1.004	3893936	9.58		95.8	7422	
713.00 > 219.00	4.615	4.631	-0.016	1.000	2777105		1.40(0.70-2.09)	95.8	6946	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.045	5.053	-0.008	1.000	21065415	NC			3280	
813.00 > 169.00	5.045	5.053	-0.008	1.000	4307334		4.89(2.77-8.32)		5658	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.045	5.053	-0.008	1.834	6730496	2.59		104	10041	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.408	5.416	-0.008	1.072	15992370	NC			2581	
913.00 > 169.00	5.408	5.416	-0.008	1.072	3266966		4.90(2.55-7.64)		5649	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00009 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 13:28:02 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Injection Date: 28-Aug-2018 11:05:49 Instrument ID: A9

Lims ID: IC L7 Full

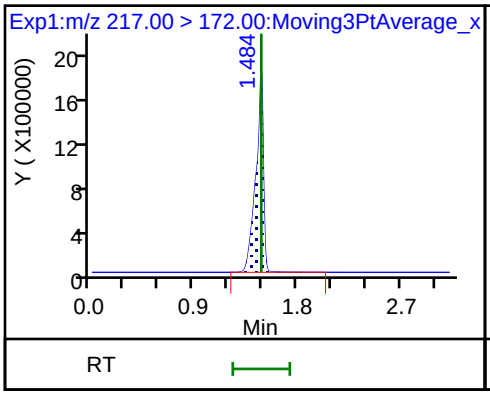
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 16 Worklist Smp#: 8

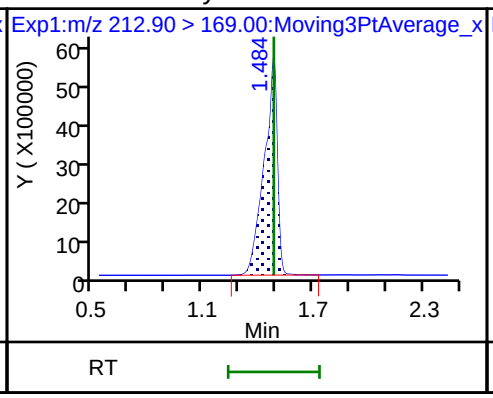
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

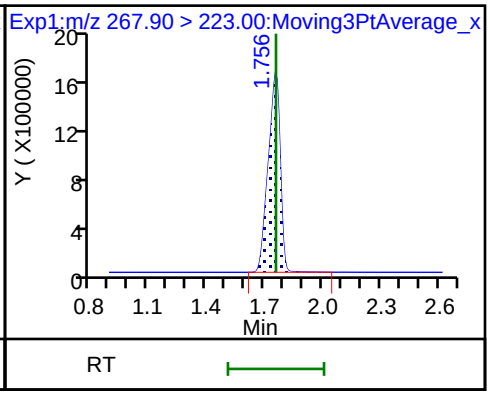
D 1 13C4 PFBA



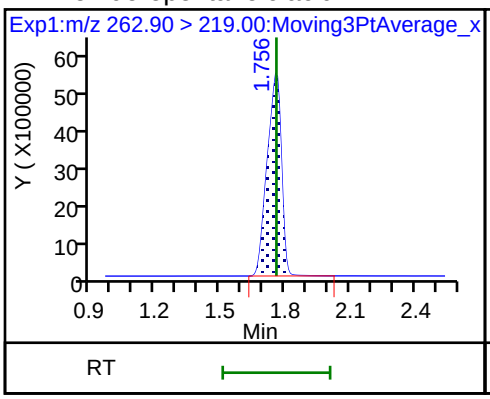
2 Perfluorobutyric acid



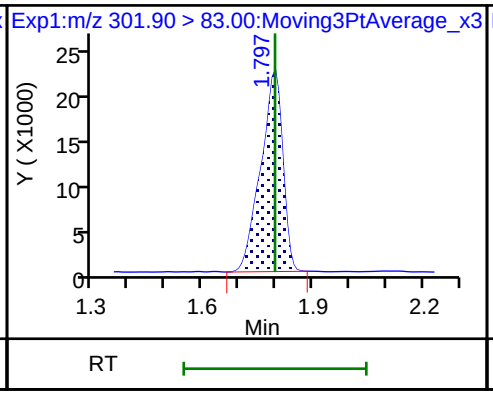
D 3 13C5-PFPeA



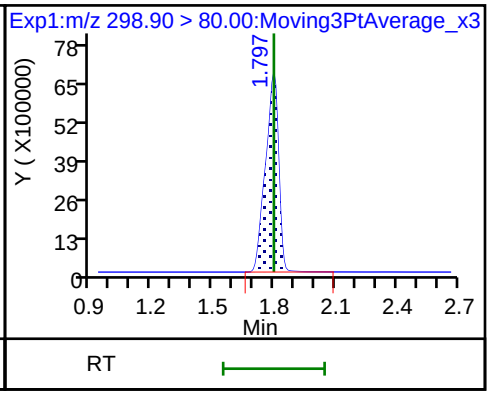
4 Perfluoropentanoic acid



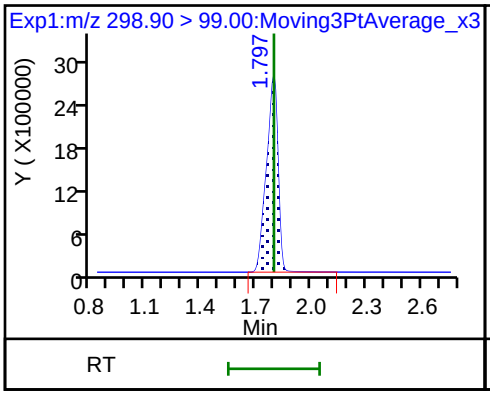
D 47 13C3-PFBS



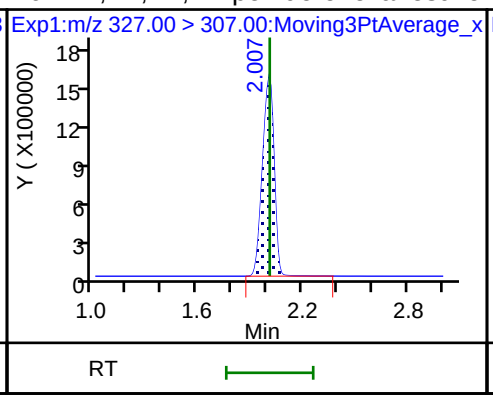
5 Perfluorobutanesulfonic acid



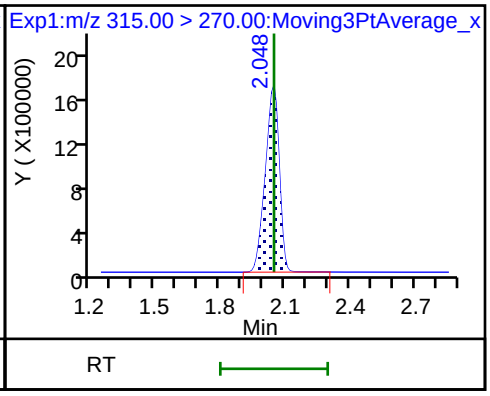
5 Perfluorobutanesulfonic acid



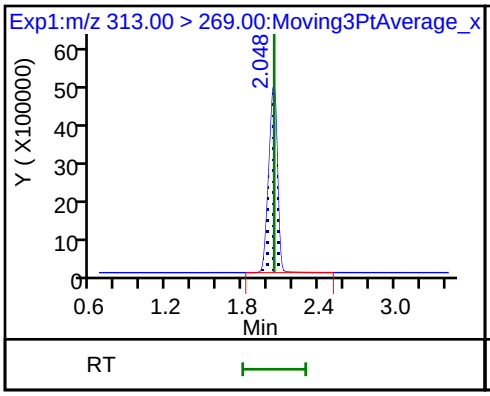
61 1H,1H,2H,2H-perfluorohexanesulfon



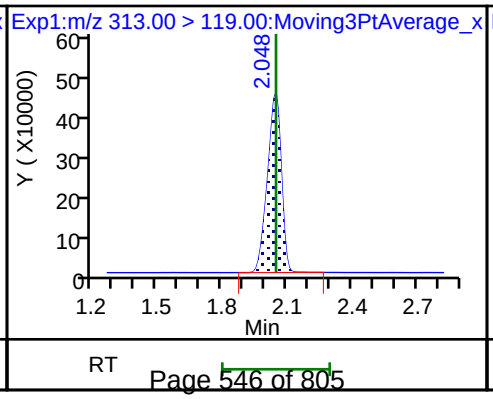
D 7 13C2 PFHxA



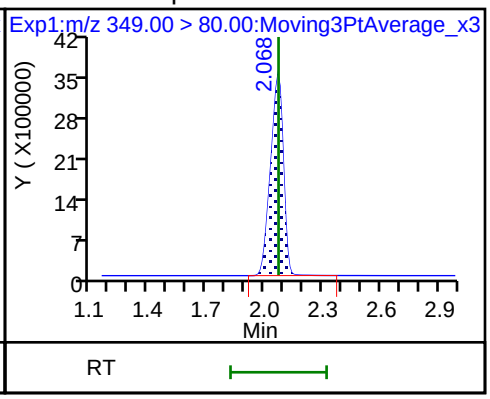
6 Perfluorohexanoic acid



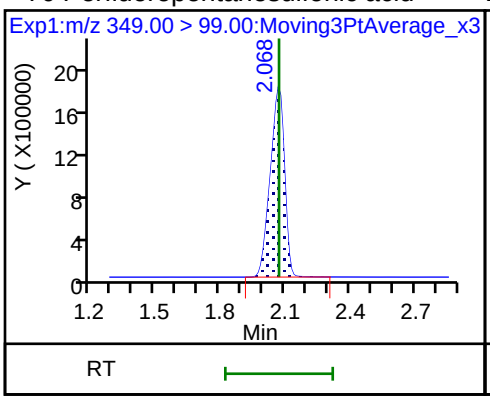
6 Perfluorohexanoic acid



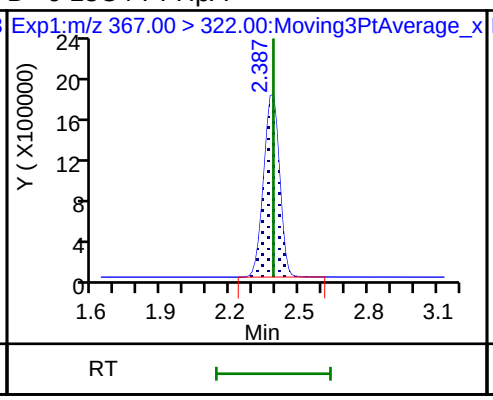
70 Perfluoropentanesulfonic acid



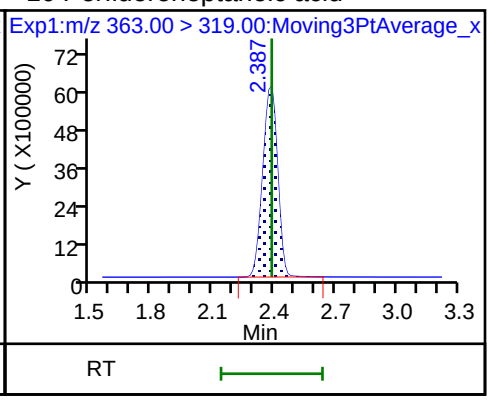
70 Perfluoropentanesulfonic acid



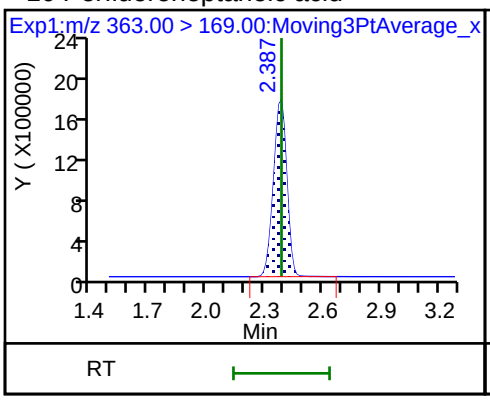
D 9 13C4-PFHpA



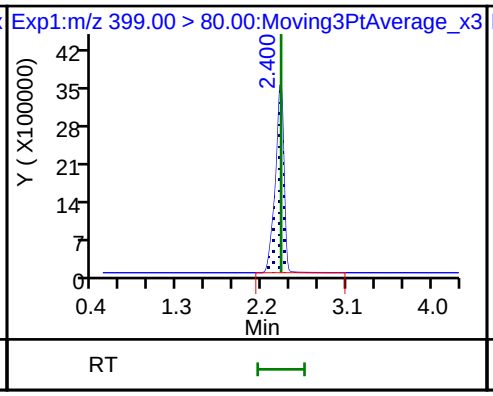
10 Perfluoroheptanoic acid



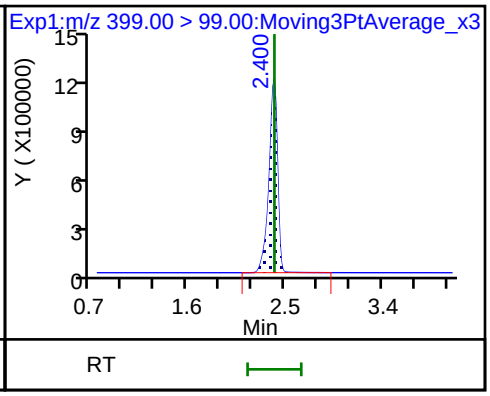
10 Perfluoroheptanoic acid



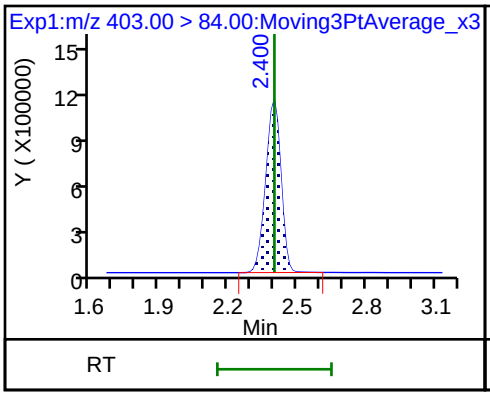
8 Perfluorohexanesulfonic acid



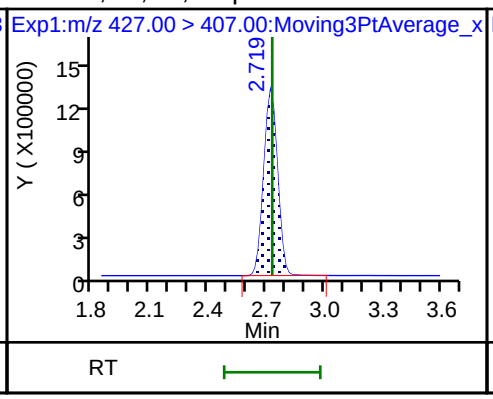
8 Perfluorohexanesulfonic acid



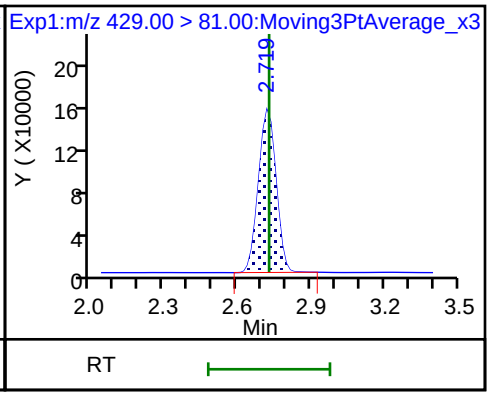
D 11 18O2 PFHxS



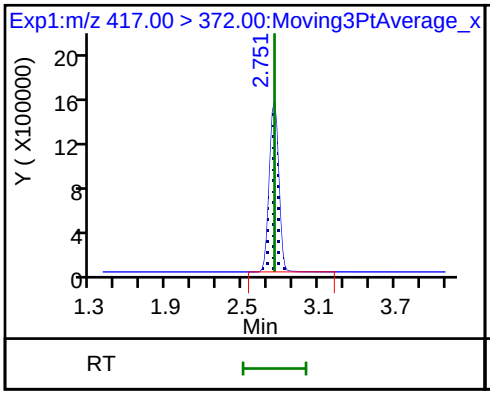
13 1H,1H,2H,2H-perfluorooctanesulfon



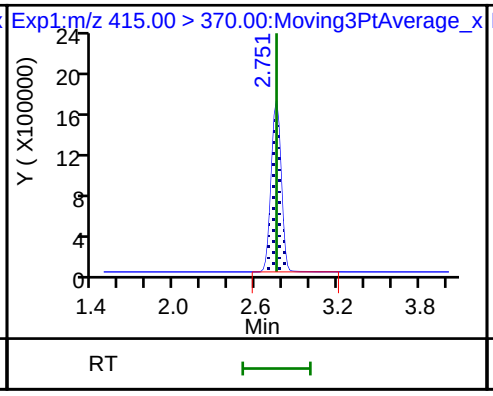
D 12 M2-6:2FTS



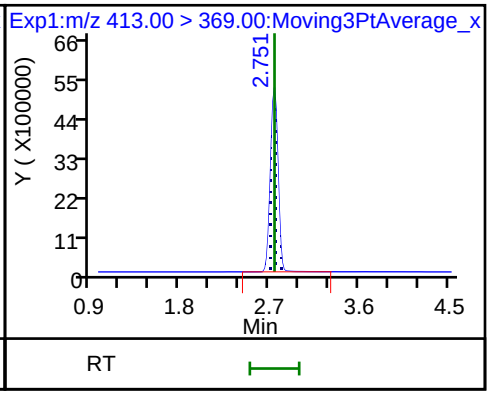
D 14 13C4 PFOA



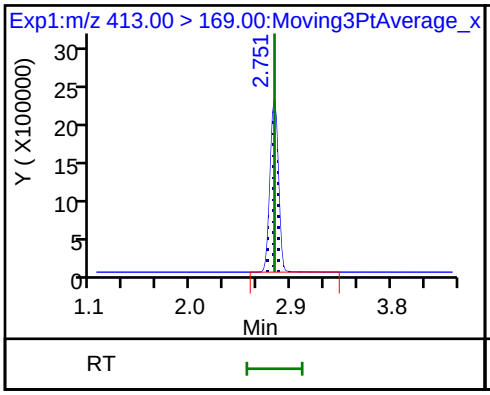
* 62 13C2-PFOA



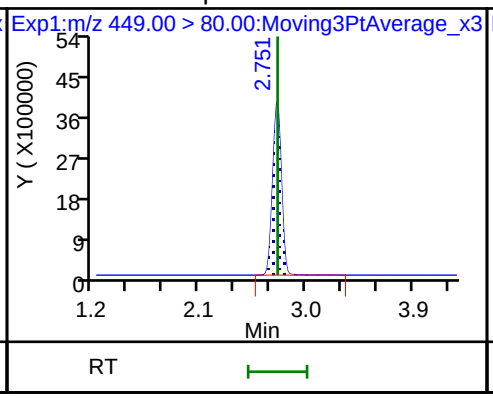
15 Perfluorooctanoic acid



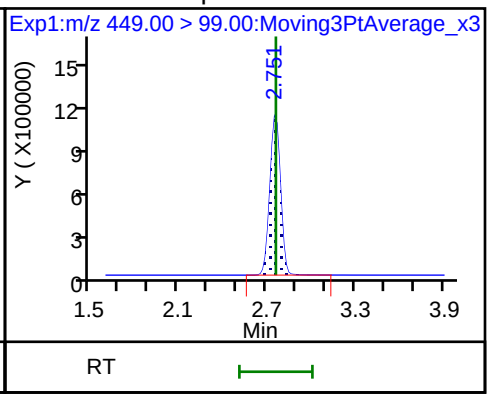
15 Perfluorooctanoic acid



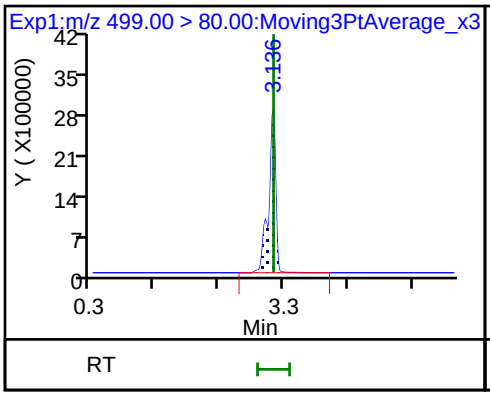
16 Perfluoroheptanesulfonic acid



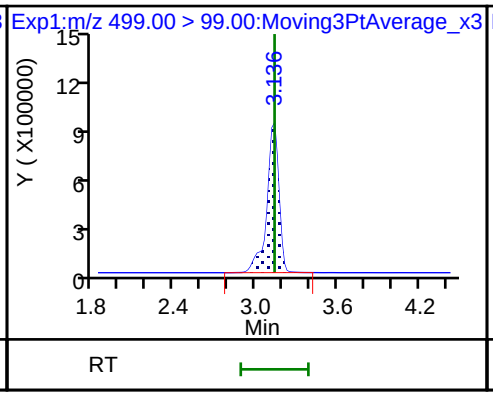
16 Perfluoroheptanesulfonic acid



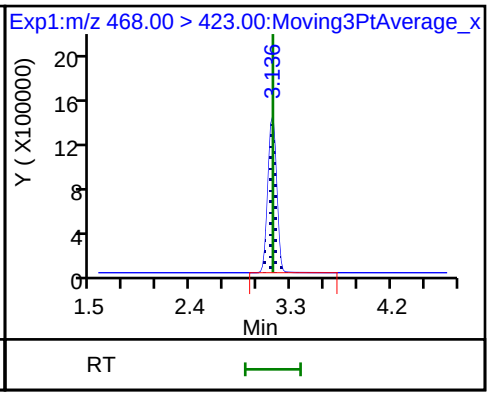
17 Perfluorooctane sulfonic acid



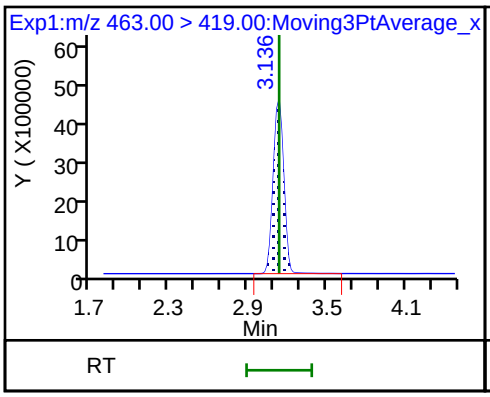
17 Perfluorooctane sulfonic acid



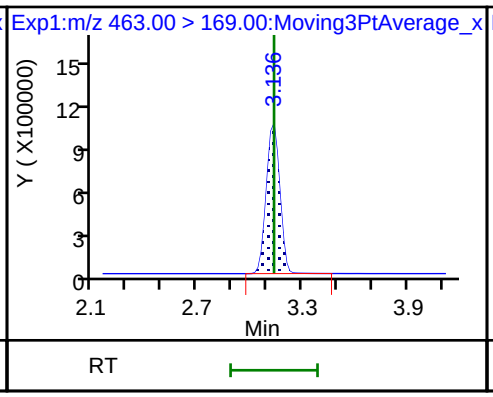
D 19 13C5 PFNA



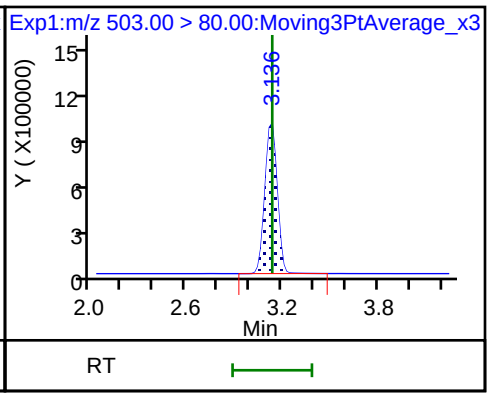
20 Perfluorononanoic acid



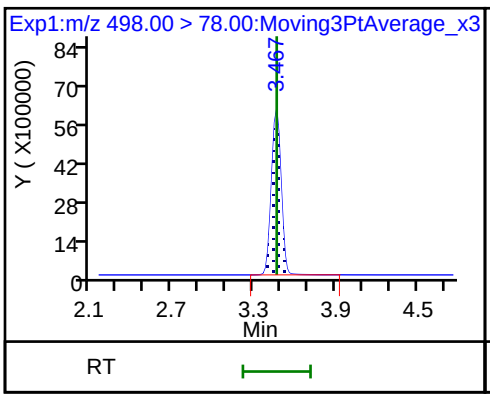
20 Perfluorononanoic acid



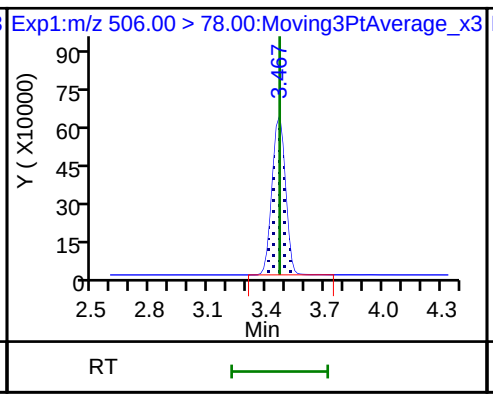
D 18 13C4 PFOS



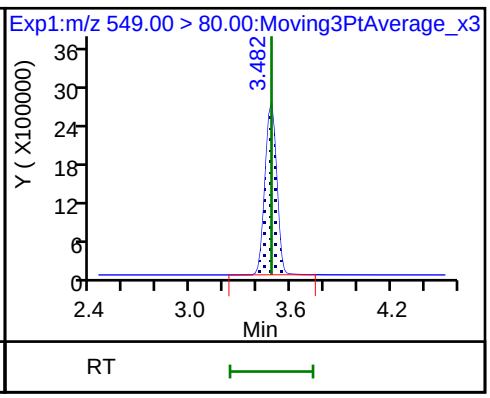
22 Perfluorooctane Sulfonamide



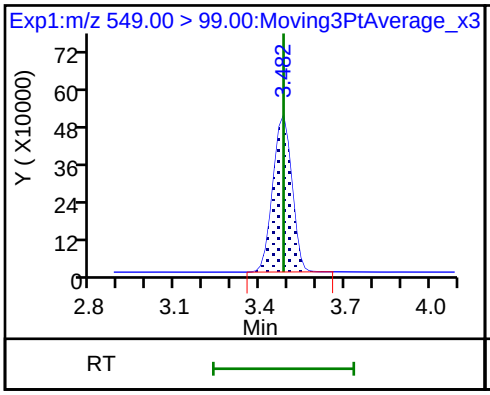
D 21 13C8 FOSA



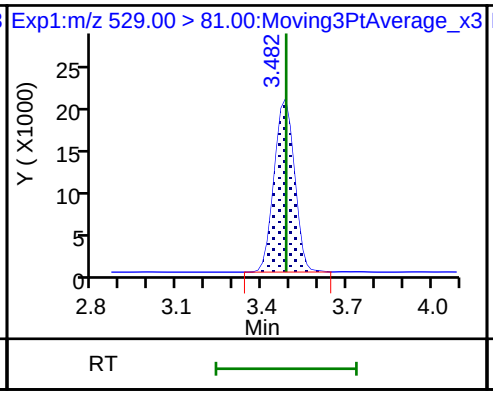
68 Perfluorononanesulfonic acid



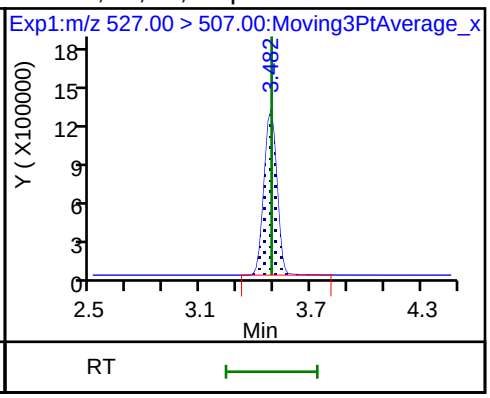
68 Perfluorononanesulfonic acid



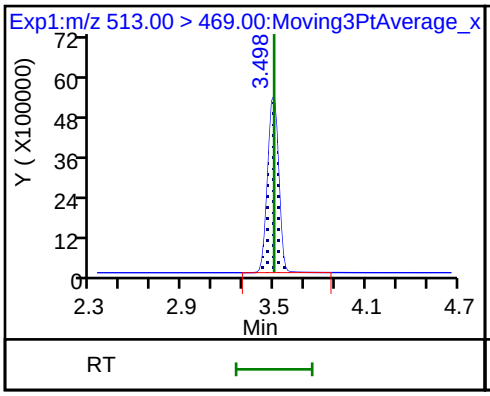
D 26 M2-8:2FTS



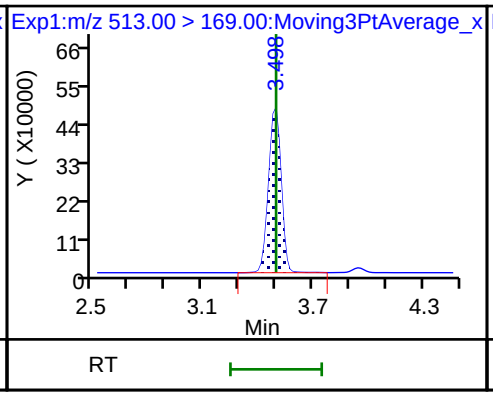
25 1H,1H,2H,2H-perfluorodecanesulfoni



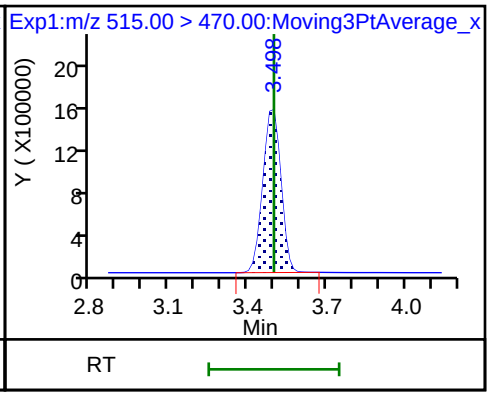
24 Perfluorodecanoic acid



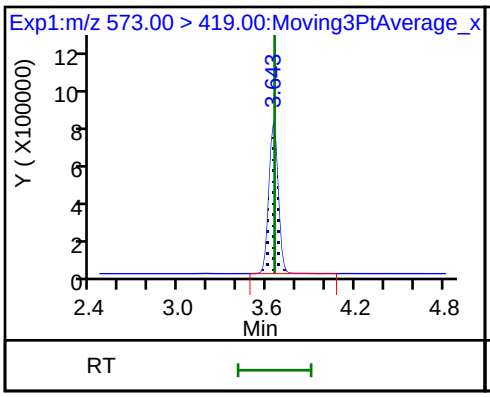
24 Perfluorodecanoic acid



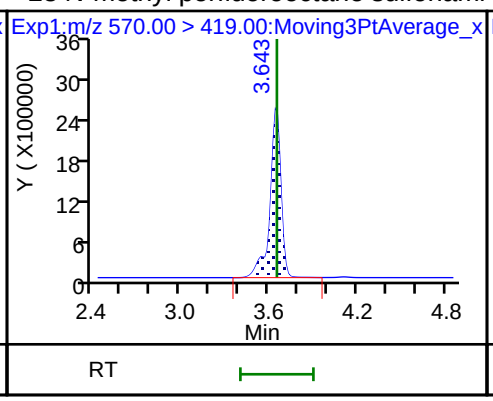
D 23 13C2 PFDA



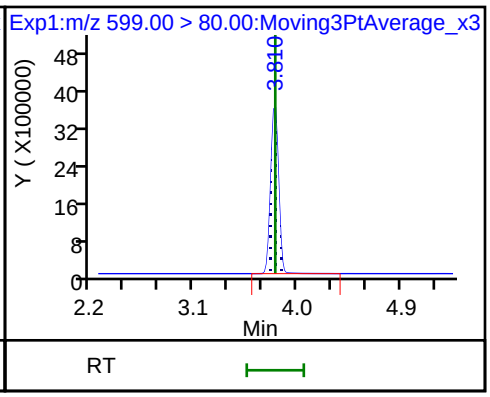
D 27 d3-NMeFOSAA



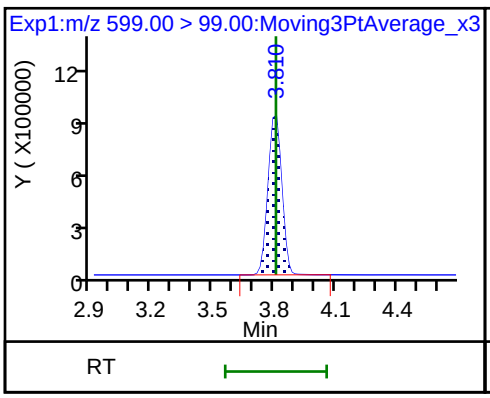
28 N-methyl perfluorooctane sulfonami



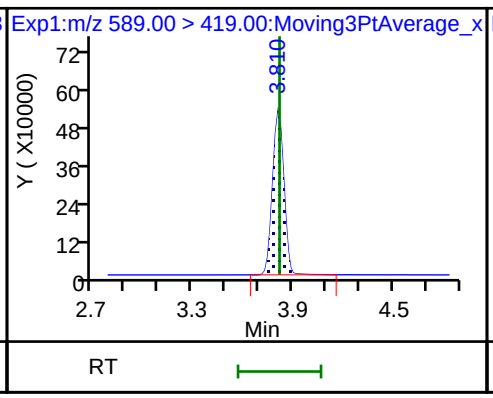
29 Perfluorodecane Sulfonic acid



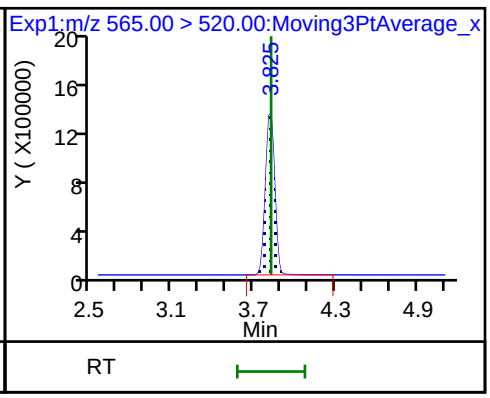
29 Perfluorodecane Sulfonic acid



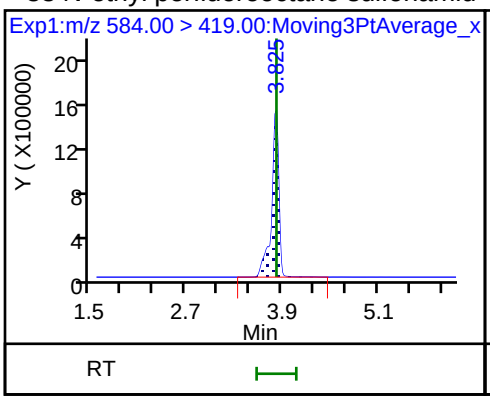
D 32 d5-NEtFOSAA



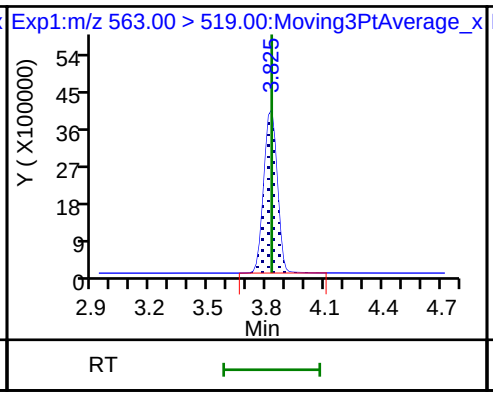
D 30 13C2 PFUnA



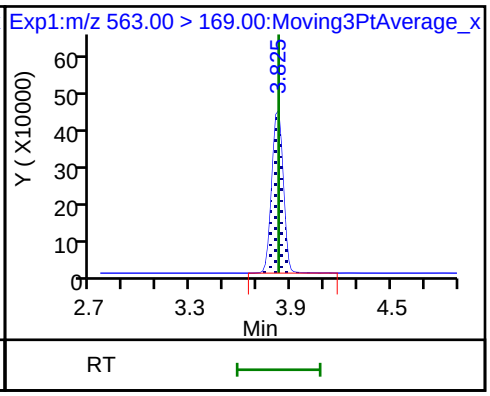
33 N-ethyl perfluorooctane sulfonamid



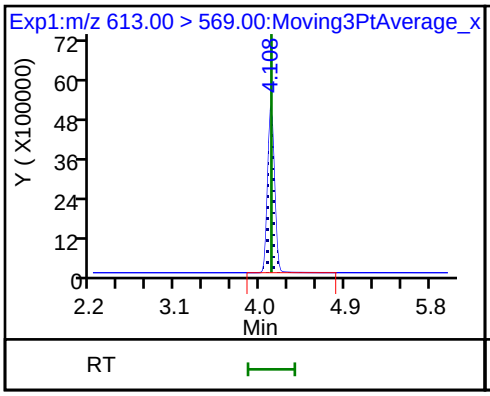
31 Perfluoroundecanoic acid



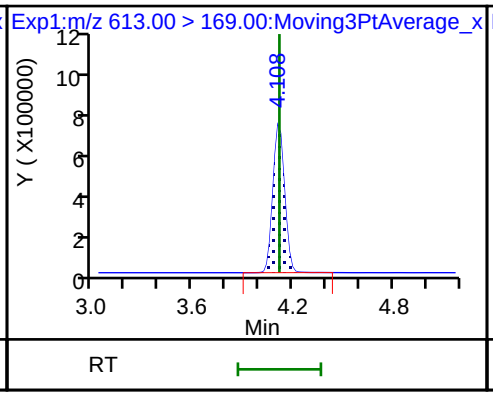
31 Perfluoroundecanoic acid



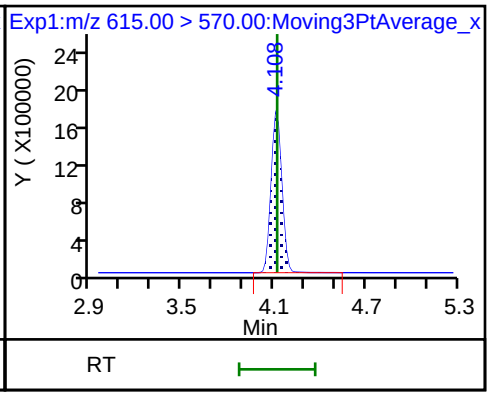
37 Perfluorododecanoic acid



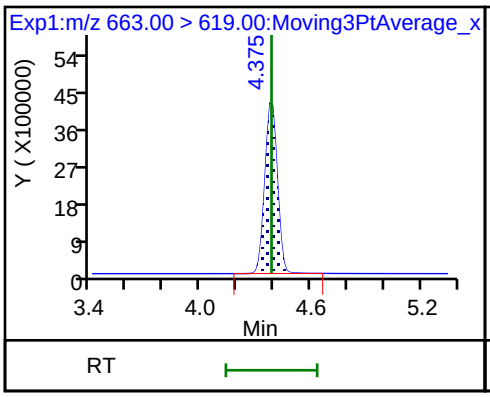
37 Perfluorododecanoic acid



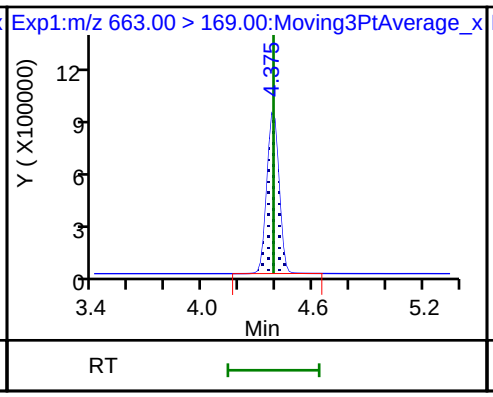
D 36 13C2 PFDoA



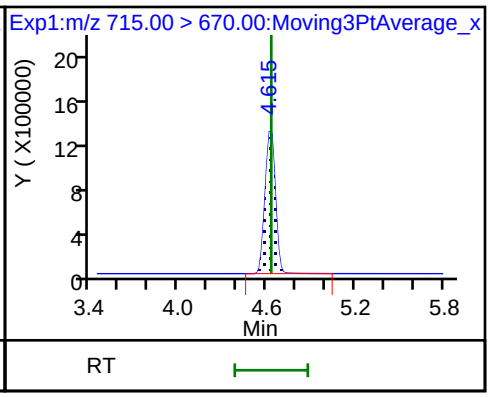
41 Perfluorotridecanoic acid



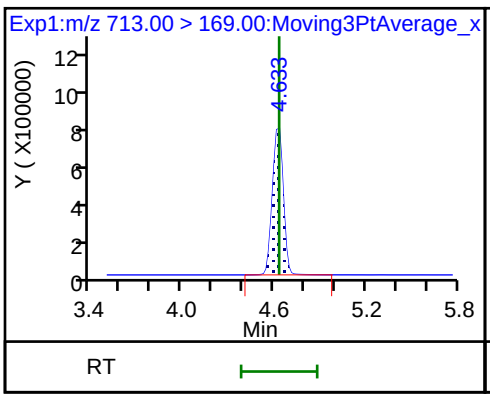
41 Perfluorotridecanoic acid



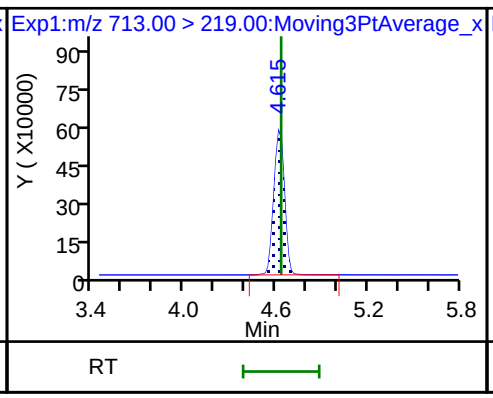
D 43 13C2-PFTeDA



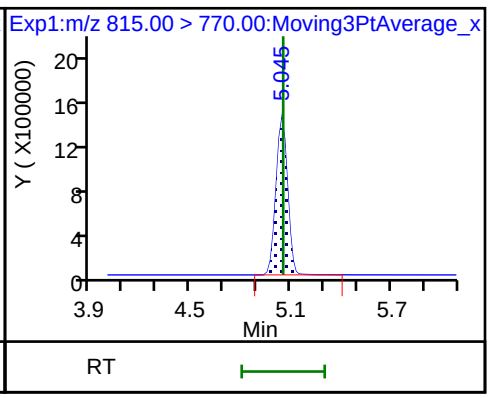
42 Perfluorotetradecanoic acid



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:	AREA
RF Rounding:	0

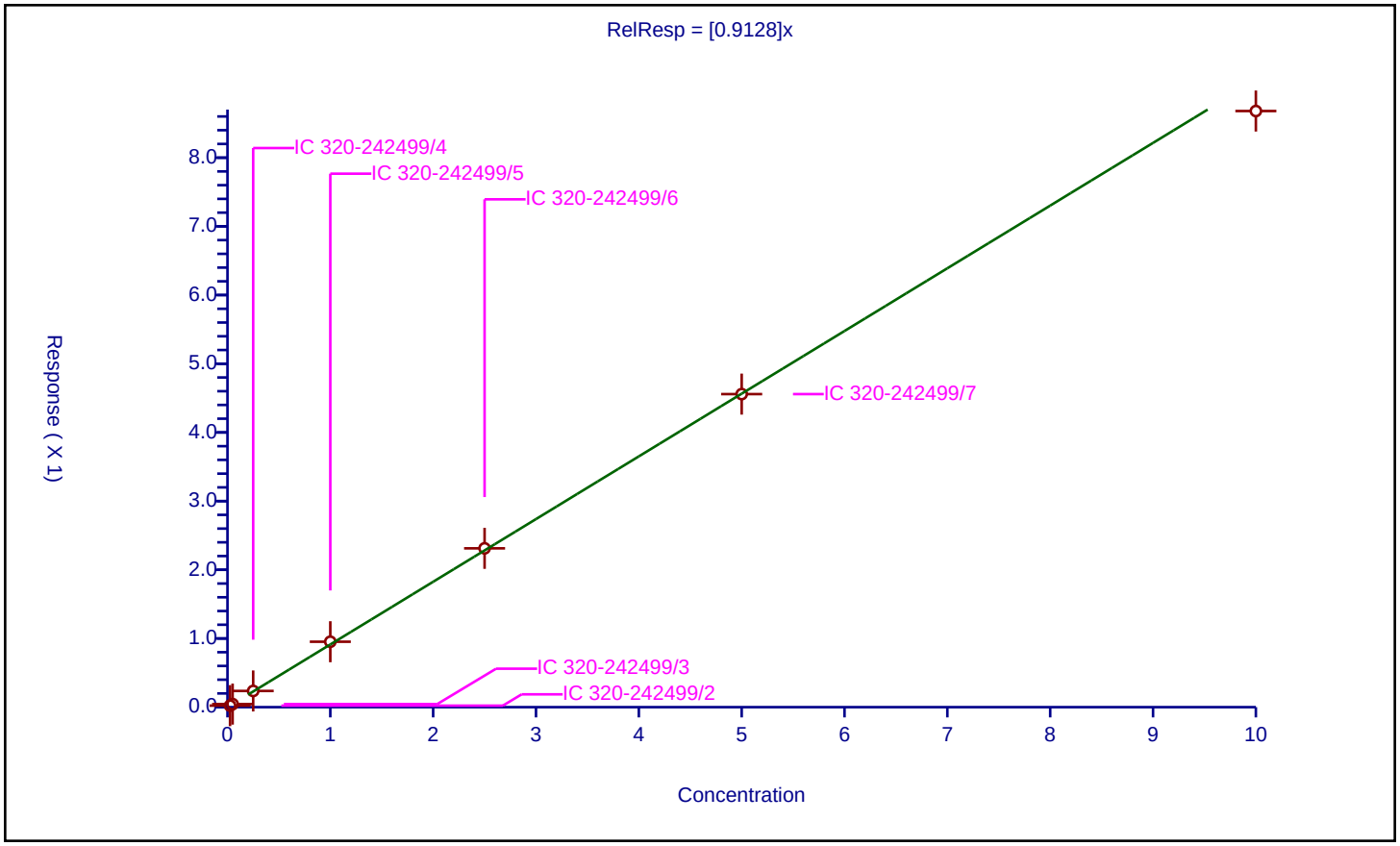
Curve Coefficients

Intercept:	0
Slope:	0.9128

Error Coefficients

Standard Error:	13200000
Relative Standard Error:	3.3
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.022319	2.5	8002830.0	0.892747	Y
2	IC 320-242499/3	0.05	0.044768	2.5	8291131.0	0.895366	Y
3	IC 320-242499/4	0.25	0.236075	2.5	8171064.0	0.944301	Y
4	IC 320-242499/5	1.0	0.952857	2.5	8247082.0	0.952857	Y
5	IC 320-242499/6	2.5	2.312447	2.5	7801898.0	0.924979	Y
6	IC 320-242499/7	5.0	4.557757	2.5	8218830.0	0.911551	Y
7	IC 320-242499/8	10.0	8.679417	2.5	7921655.0	0.867942	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

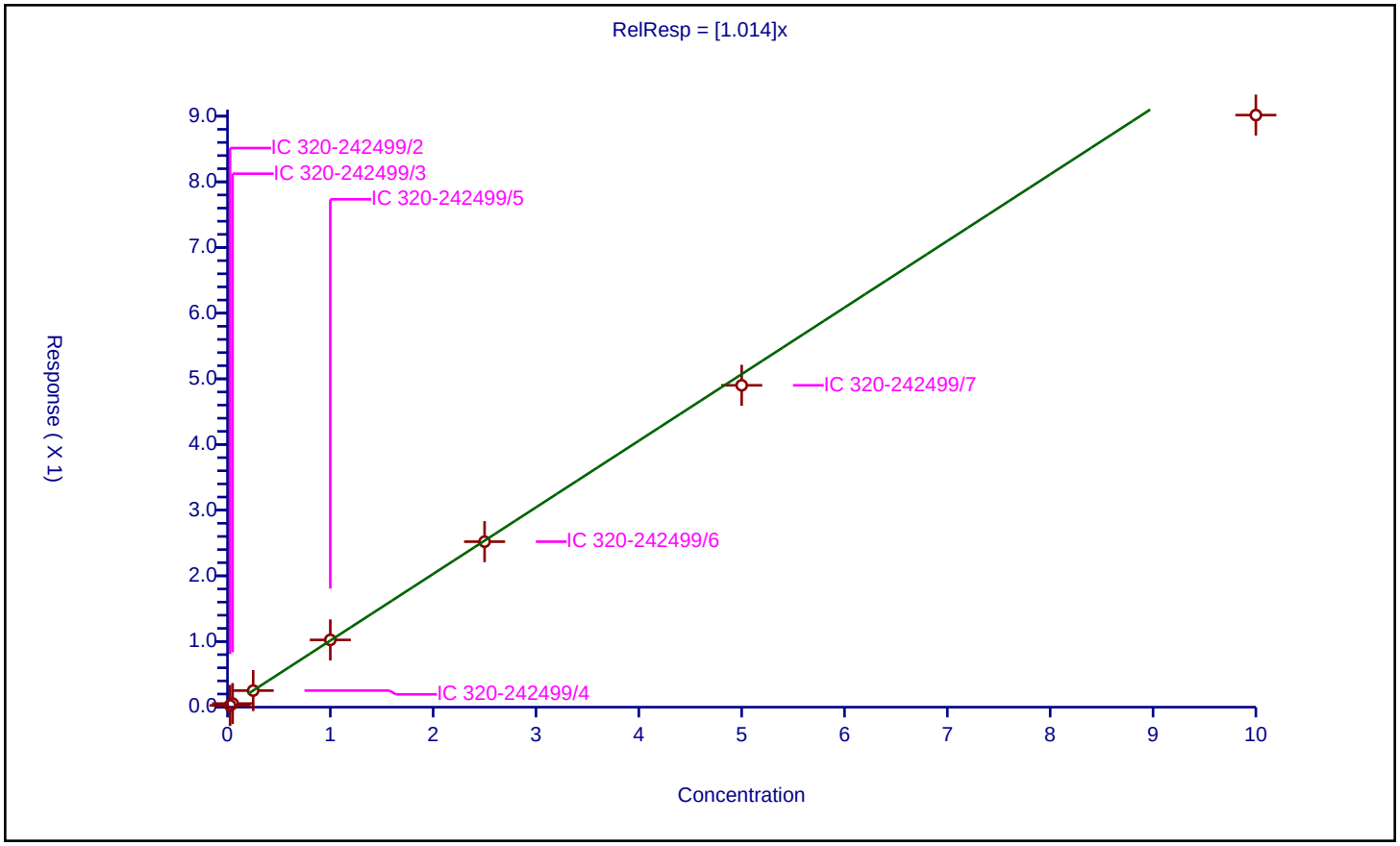
Curve Coefficients

Intercept:	0
Slope:	1.014

Error Coefficients

Standard Error:	12100000
Relative Standard Error:	6.4
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.026872	2.5	7198766.0	1.074879	Y
2	IC 320-242499/3	0.05	0.055047	2.5	7385908.0	1.100948	Y
3	IC 320-242499/4	0.25	0.252447	2.5	7400409.0	1.009786	Y
4	IC 320-242499/5	1.0	1.024099	2.5	7445050.0	1.024099	Y
5	IC 320-242499/6	2.5	2.520275	2.5	6942787.0	1.00811	Y
6	IC 320-242499/7	5.0	4.901175	2.5	7268510.0	0.980235	Y
7	IC 320-242499/8	10.0	9.016334	2.5	6904215.0	0.901633	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

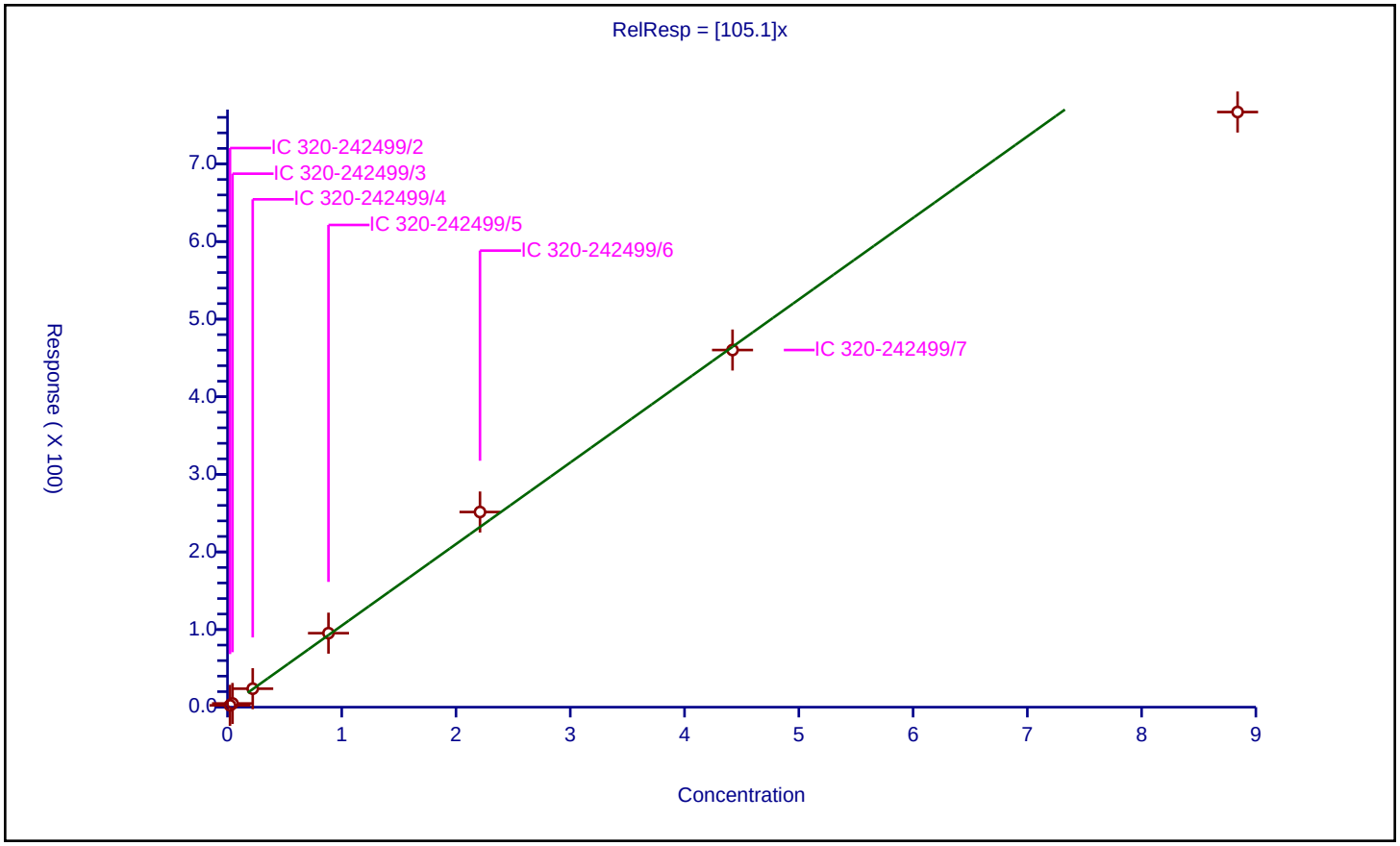
Curve Coefficients

Intercept:	0
Slope:	105.1

Error Coefficients

Standard Error:	14700000
Relative Standard Error:	8.2
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0221	2.373039	2.325	85084.0	107.37733	Y
2	IC 320-242499/3	0.0442	4.767452	2.325	90247.0	107.860901	Y
3	IC 320-242499/4	0.221	23.796965	2.325	88972.0	107.678575	Y
4	IC 320-242499/5	0.884	95.363913	2.325	93328.0	107.877729	Y
5	IC 320-242499/6	2.21	251.458622	2.325	80767.0	113.782182	Y
6	IC 320-242499/7	4.42	460.217906	2.325	87618.0	104.121698	Y
7	IC 320-242499/8	8.84	766.887097	2.325	90962.0	86.751934	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

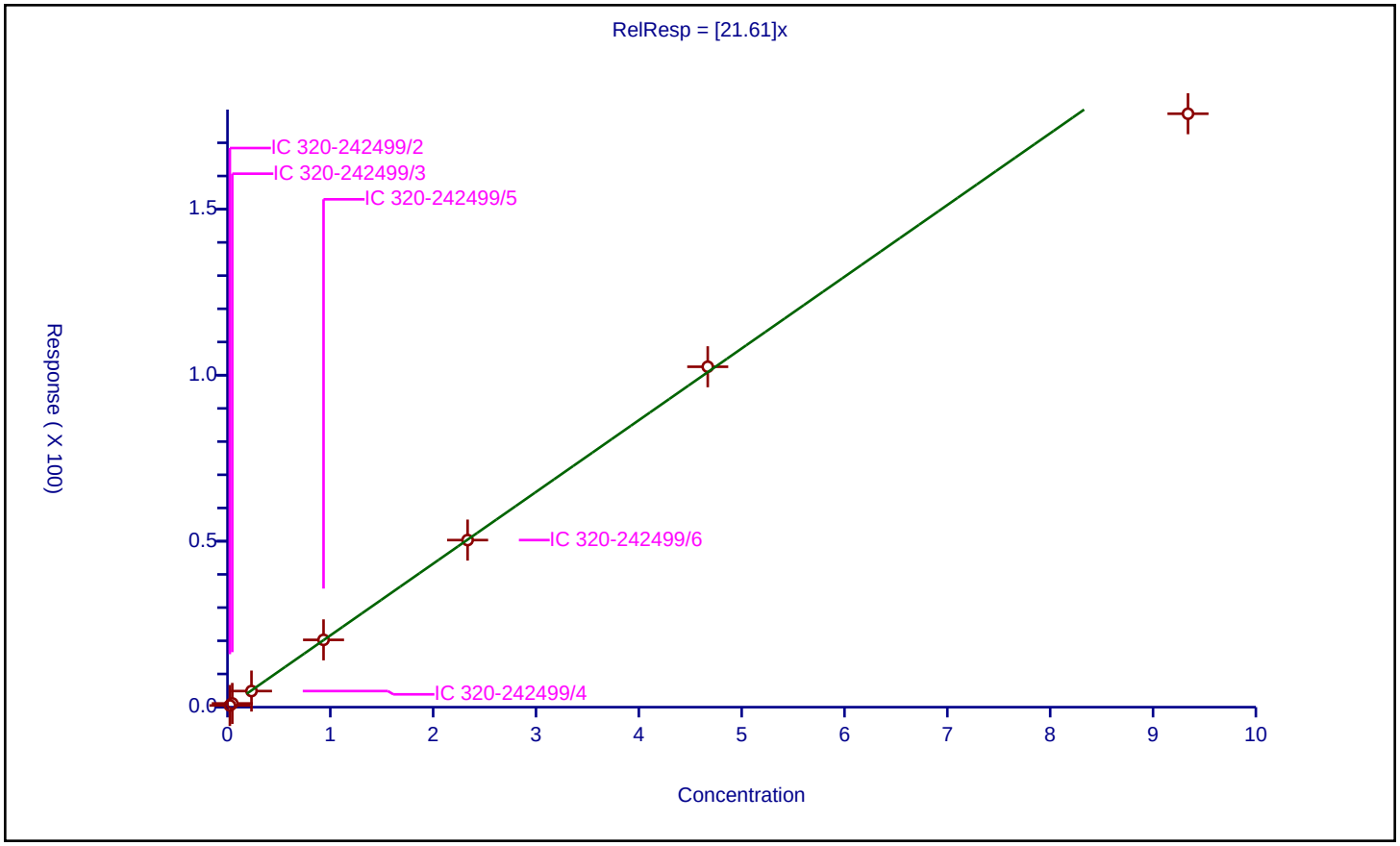
Curve Coefficients

Intercept:	0
Slope:	21.61

Error Coefficients

Standard Error:	3360000
Relative Standard Error:	6.8
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.02335	0.515504	2.325	85084.0	22.07725	Y
2	IC 320-242499/3	0.0467	1.123354	2.325	90247.0	24.054683	Y
3	IC 320-242499/4	0.2335	4.85111	2.325	88972.0	20.775634	Y
4	IC 320-242499/5	0.934	20.271281	2.325	93328.0	21.703727	Y
5	IC 320-242499/6	2.335	50.332377	2.325	80767.0	21.555622	Y
6	IC 320-242499/7	4.67	102.543756	2.325	87618.0	21.957978	Y
7	IC 320-242499/8	9.34	178.760325	2.325	90962.0	19.139221	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

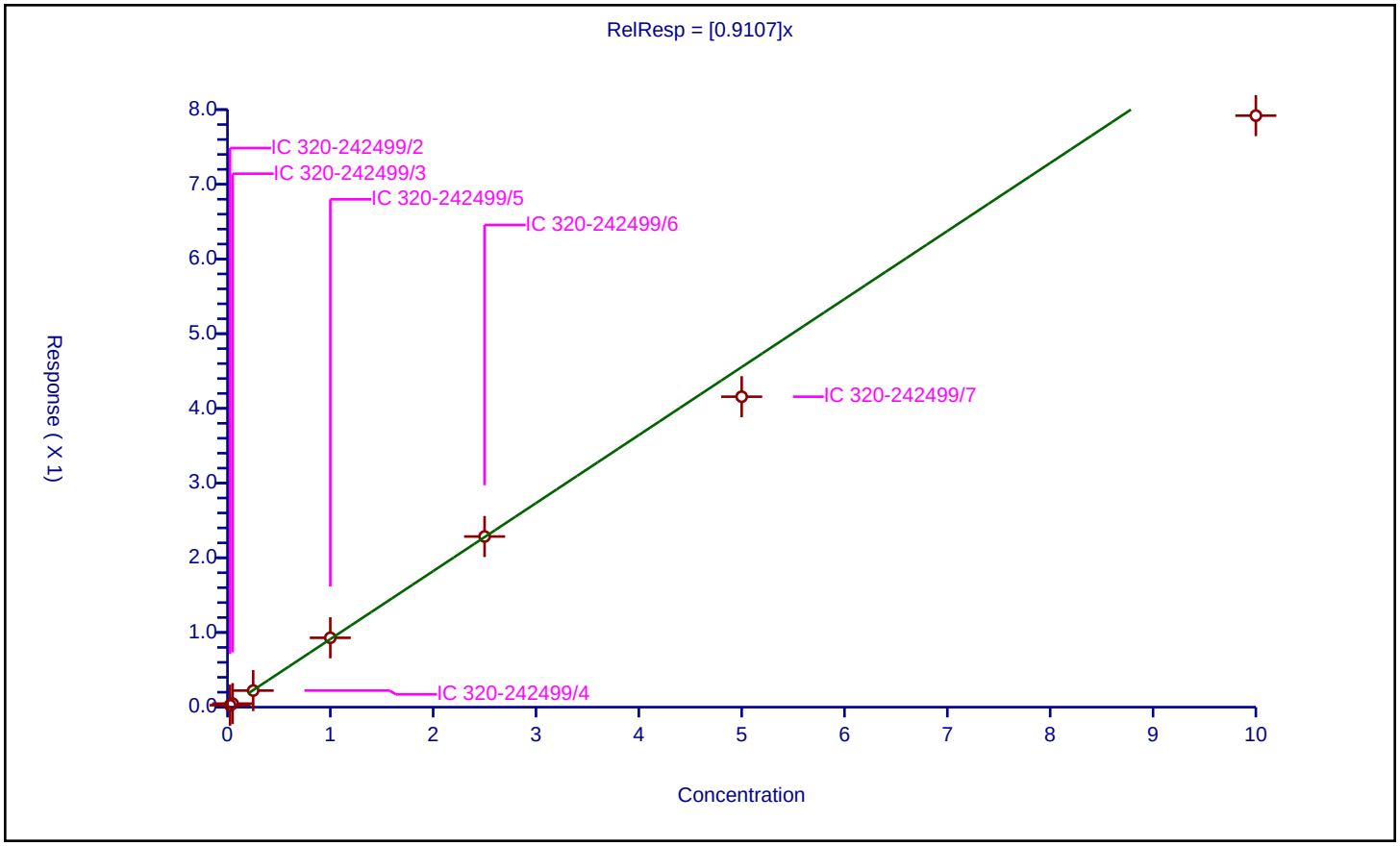
Curve Coefficients

Intercept:	0
Slope:	0.9107

Error Coefficients

Standard Error:	11300000
Relative Standard Error:	9.6
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.026468	2.5	7407564.0	1.058715	Y
2	IC 320-242499/3	0.05	0.048035	2.5	7967390.0	0.960697	Y
3	IC 320-242499/4	0.25	0.222316	2.5	7995321.0	0.889264	Y
4	IC 320-242499/5	1.0	0.928898	2.5	7673418.0	0.928898	Y
5	IC 320-242499/6	2.5	2.284495	2.5	7349652.0	0.913798	Y
6	IC 320-242499/7	5.0	4.156566	2.5	7681141.0	0.831313	Y
7	IC 320-242499/8	10.0	7.919422	2.5	7370188.0	0.791942	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

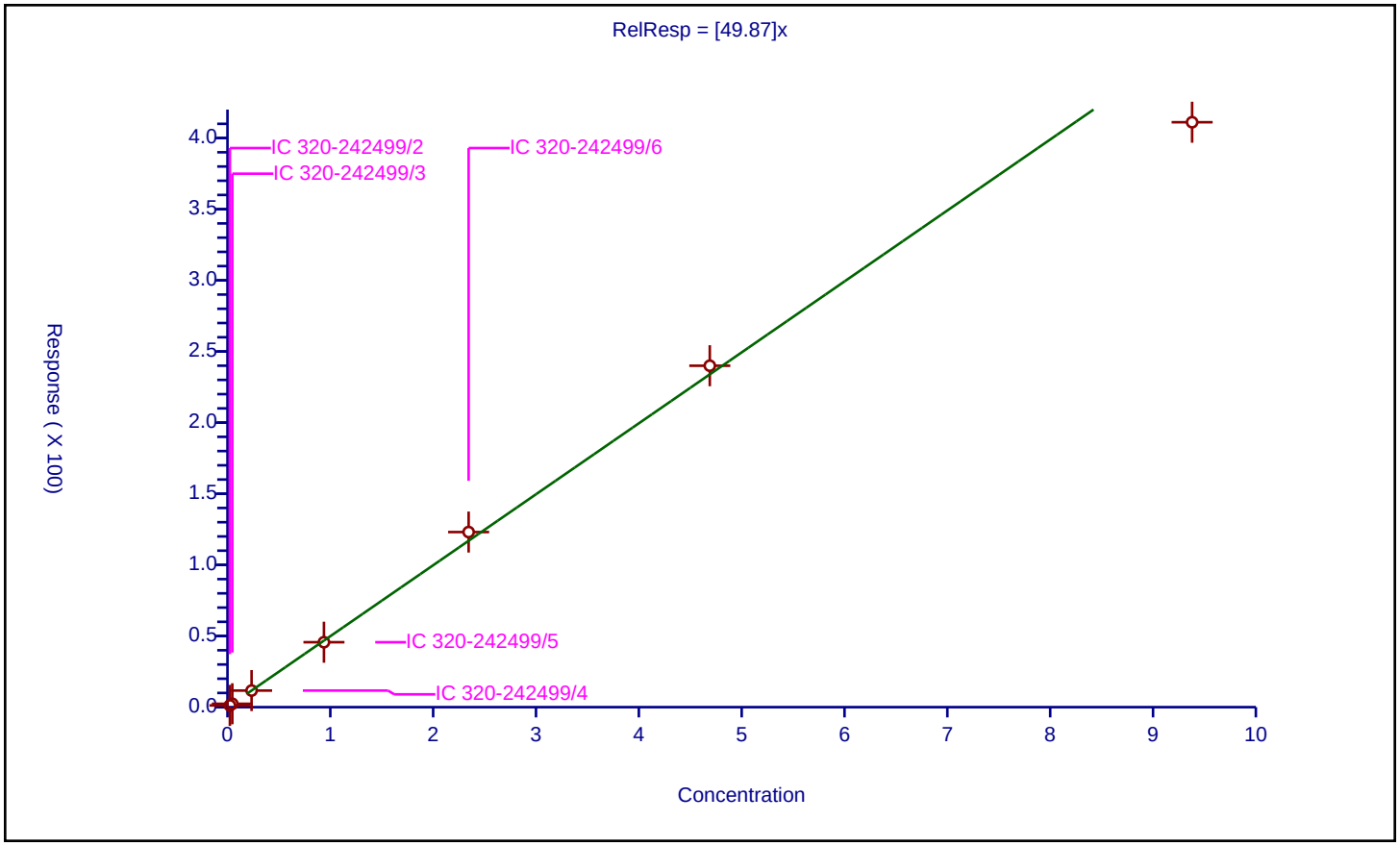
Curve Coefficients

Intercept:	0
Slope:	49.87

Error Coefficients

Standard Error:	7770000
Relative Standard Error:	6.0
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.02345	1.229339	2.325	85084.0	52.423848	Y
2	IC 320-242499/3	0.0469	2.380184	2.325	90247.0	50.750182	Y
3	IC 320-242499/4	0.2345	11.675069	2.325	88972.0	49.787073	Y
4	IC 320-242499/5	0.938	45.651094	2.325	93328.0	48.668544	Y
5	IC 320-242499/6	2.345	123.085414	2.325	80767.0	52.48845	Y
6	IC 320-242499/7	4.69	239.982494	2.325	87618.0	51.168975	Y
7	IC 320-242499/8	9.38	411.117393	2.325	90962.0	43.829146	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

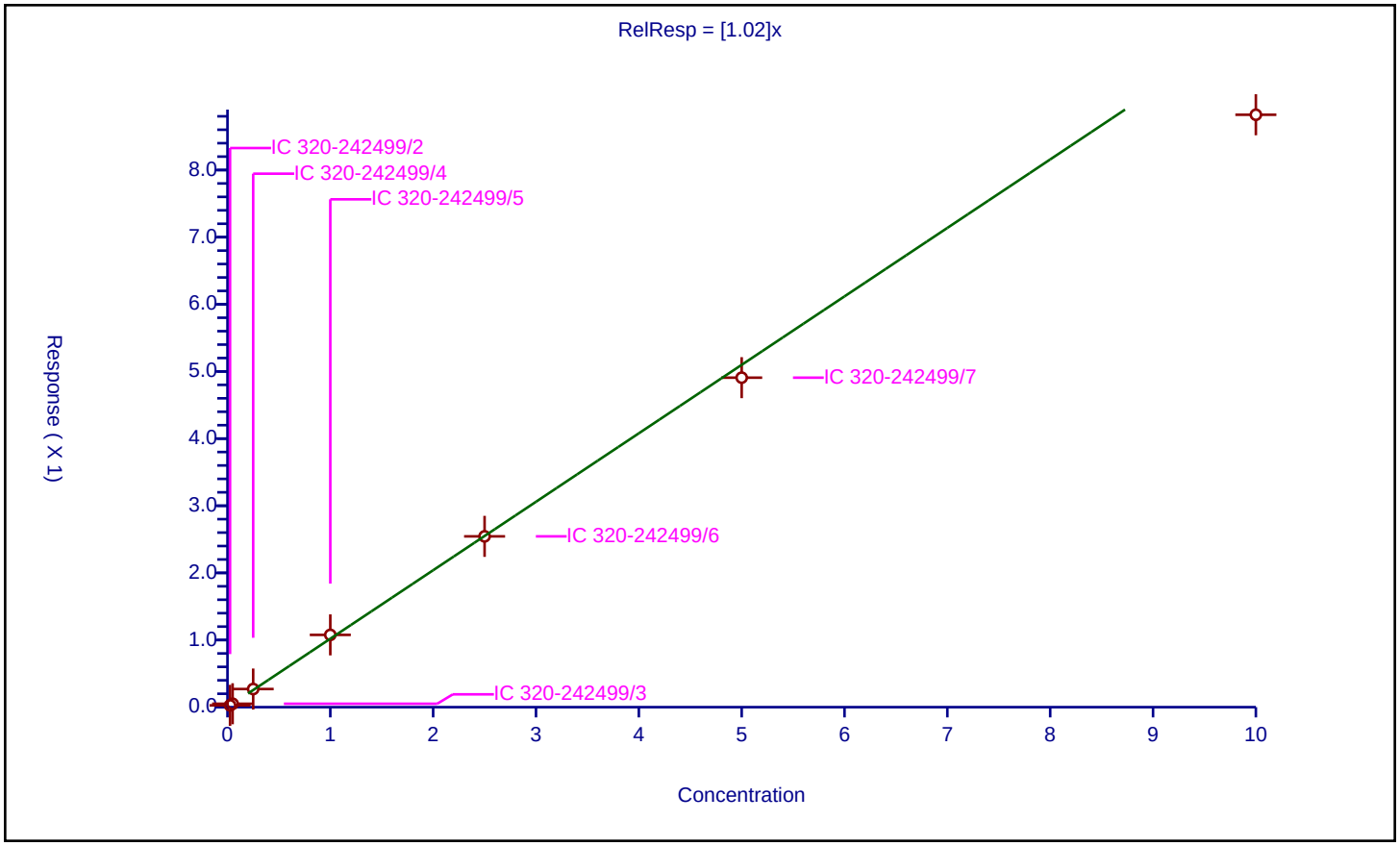
Curve Coefficients

Intercept:	0
Slope:	1.02

Error Coefficients

Standard Error:	14800000
Relative Standard Error:	7.1
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.027045	2.5	9040528.0	1.081784	Y
2	IC 320-242499/3	0.05	0.050867	2.5	9747881.0	1.017339	Y
3	IC 320-242499/4	0.25	0.270251	2.5	9544033.0	1.081005	Y
4	IC 320-242499/5	1.0	1.076495	2.5	9199599.0	1.076495	Y
5	IC 320-242499/6	2.5	2.543915	2.5	8746068.0	1.017566	Y
6	IC 320-242499/7	5.0	4.90743	2.5	8866287.0	0.981486	Y
7	IC 320-242499/8	10.0	8.823435	2.5	8609256.0	0.882343	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

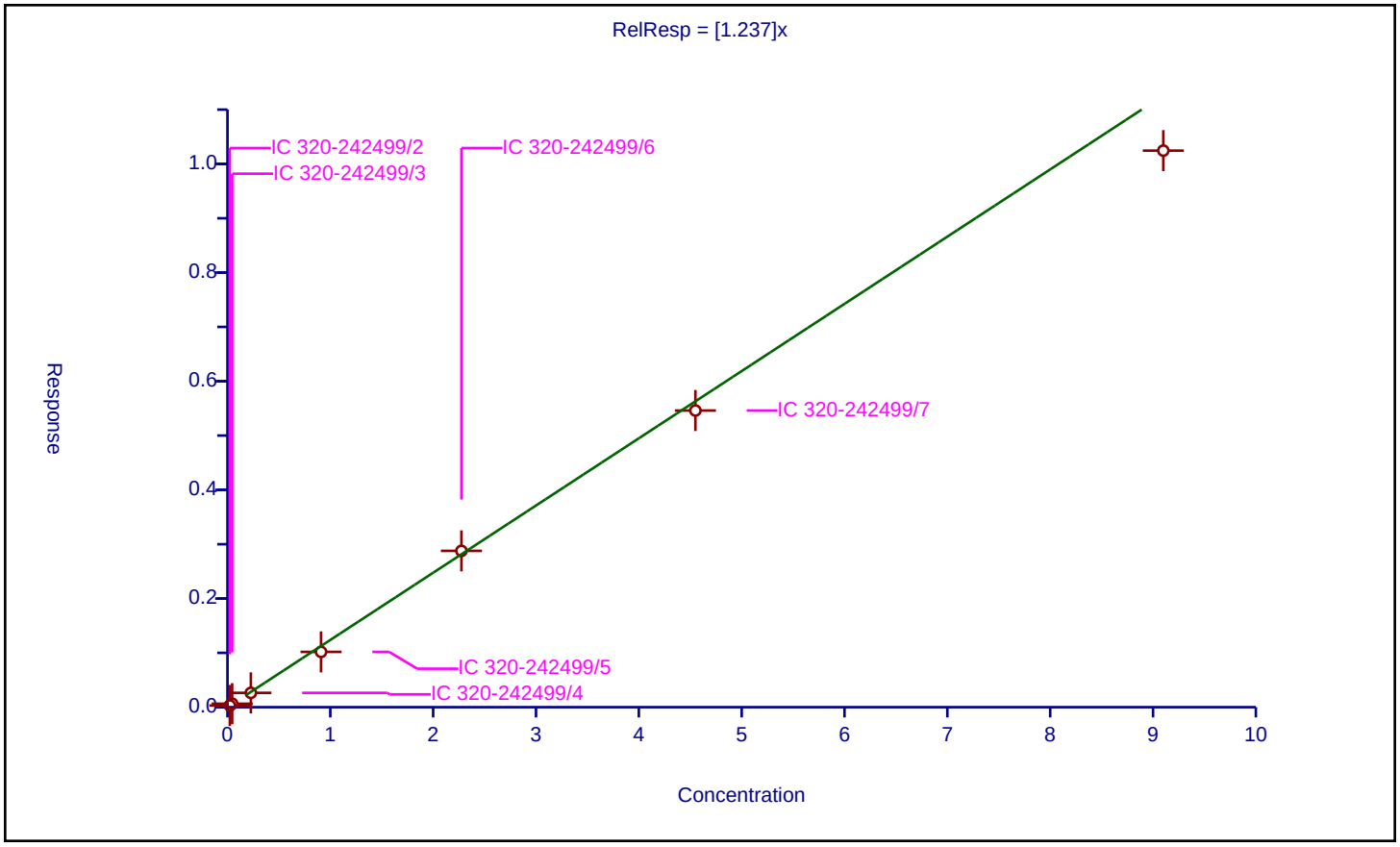
Curve Coefficients

Intercept:	0
Slope:	1.237

Error Coefficients

Standard Error:	10500000
Relative Standard Error:	9.7
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.02275	0.031326	2.365	5209326.0	1.376947	Y
2	IC 320-242499/3	0.0455	0.064403	2.365	5562863.0	1.415457	Y
3	IC 320-242499/4	0.2275	0.263851	2.365	5536160.0	1.159784	Y
4	IC 320-242499/5	0.91	1.018079	2.365	5581192.0	1.118768	Y
5	IC 320-242499/6	2.275	2.877317	2.365	4891052.0	1.264755	Y
6	IC 320-242499/7	4.55	5.460943	2.365	5340279.0	1.200207	Y
7	IC 320-242499/8	9.1	10.245239	2.365	4964565.0	1.12585	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

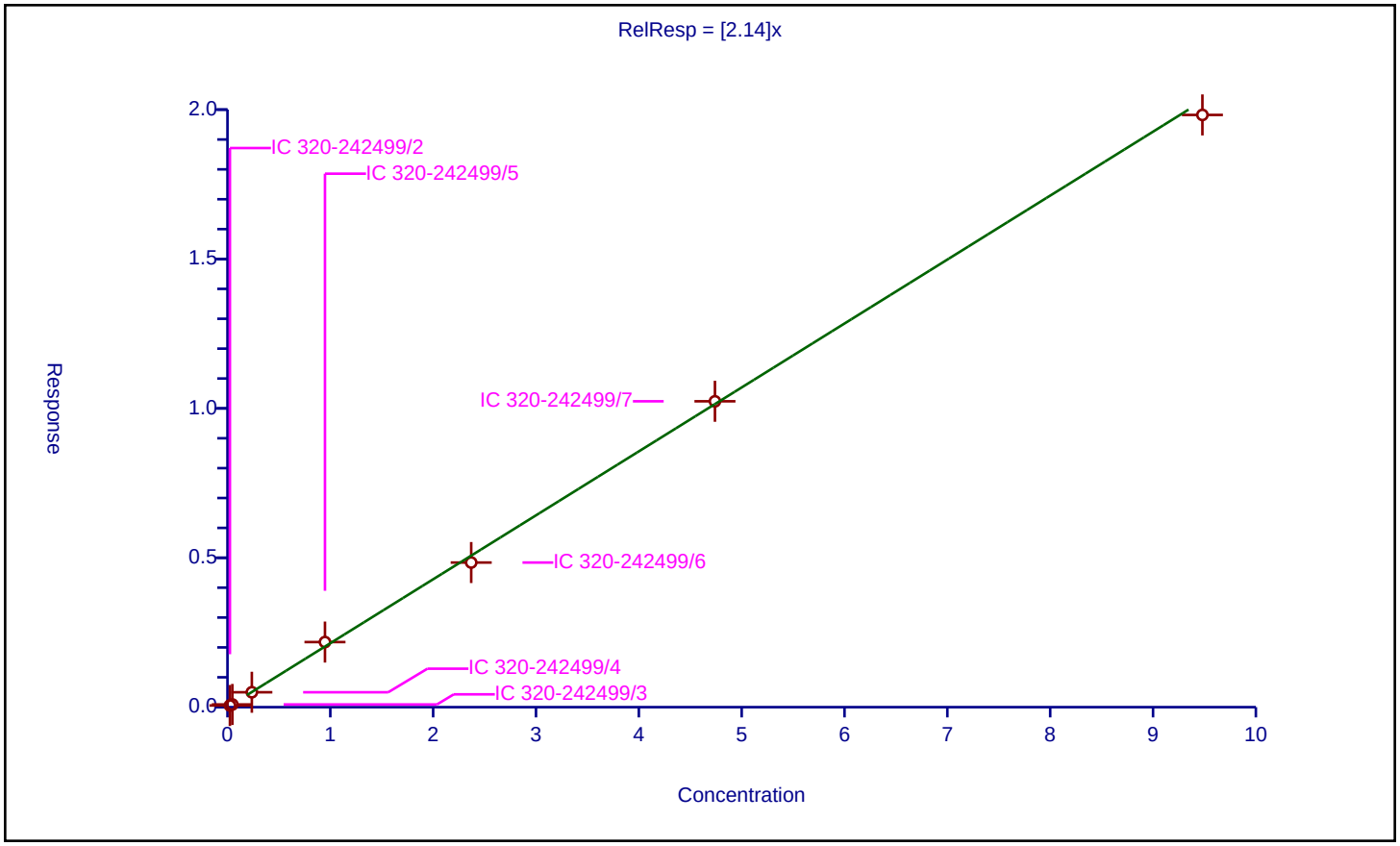
Curve Coefficients

Intercept:	0
Slope:	2.14

Error Coefficients

Standard Error:	3110000
Relative Standard Error:	7.4
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0237	0.056393	2.375	855608.0	2.379461	Y
2	IC 320-242499/3	0.0474	0.090226	2.375	894847.0	1.903494	Y
3	IC 320-242499/4	0.237	0.499153	2.375	889043.0	2.106132	Y
4	IC 320-242499/5	0.948	2.179127	2.375	889676.0	2.298657	Y
5	IC 320-242499/6	2.37	4.840795	2.375	822215.0	2.04253	Y
6	IC 320-242499/7	4.74	10.237242	2.375	826593.0	2.159756	Y
7	IC 320-242499/8	9.48	19.82237	2.375	774049.0	2.090967	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

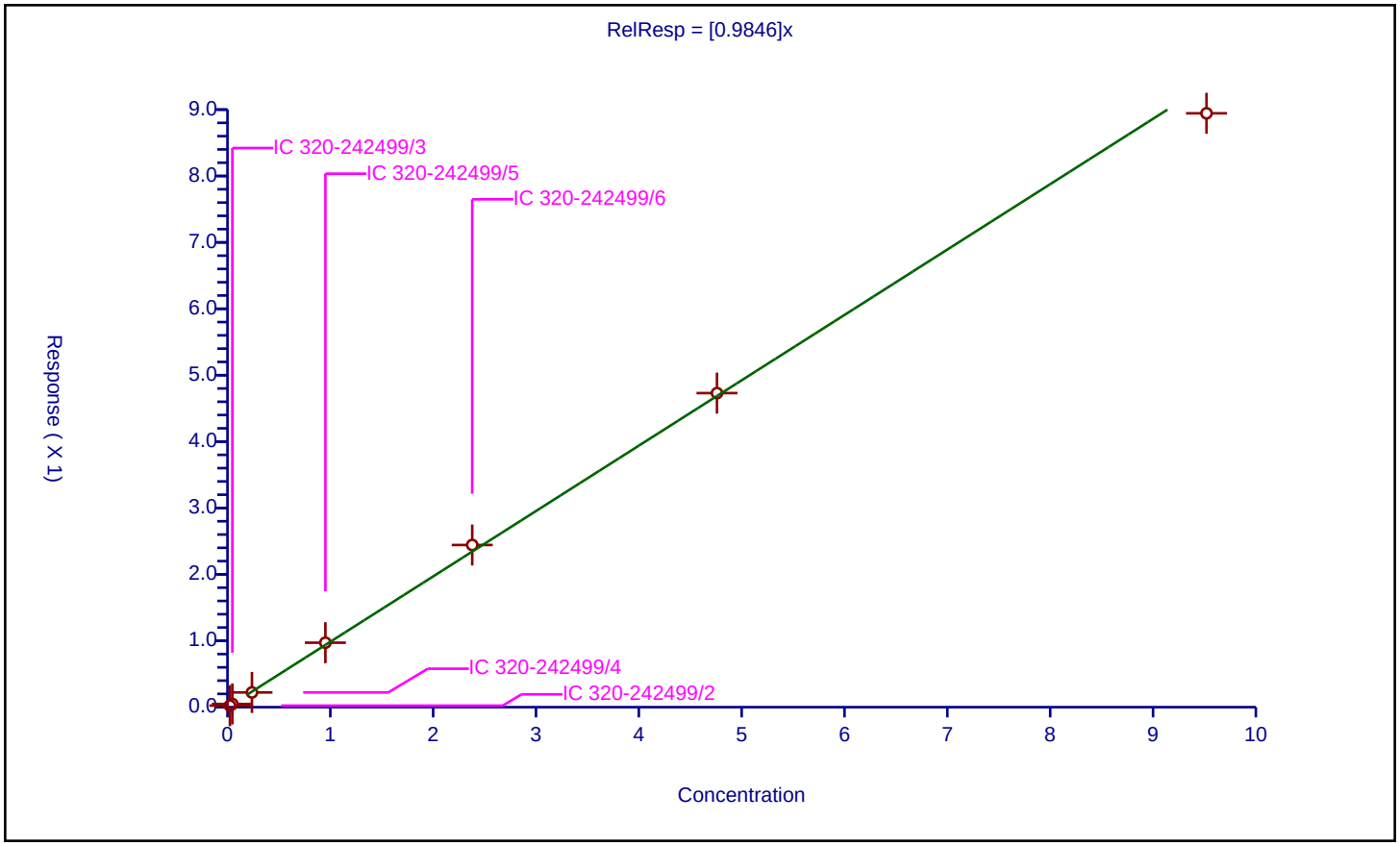
Curve Coefficients

Intercept:	0
Slope:	0.9846

Error Coefficients

Standard Error:	9580000
Relative Standard Error:	3.8
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0238	0.02318	2.39	5768085.0	0.973946	Y
2	IC 320-242499/3	0.0476	0.047953	2.39	5856894.0	1.007426	Y
3	IC 320-242499/4	0.238	0.221718	2.39	6165020.0	0.931587	Y
4	IC 320-242499/5	0.952	0.970912	2.39	5901987.0	1.019866	Y
5	IC 320-242499/6	2.38	2.442409	2.39	5701715.0	1.026222	Y
6	IC 320-242499/7	4.76	4.730073	2.39	5629385.0	0.993713	Y
7	IC 320-242499/8	9.52	8.944373	2.39	5250354.0	0.939535	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

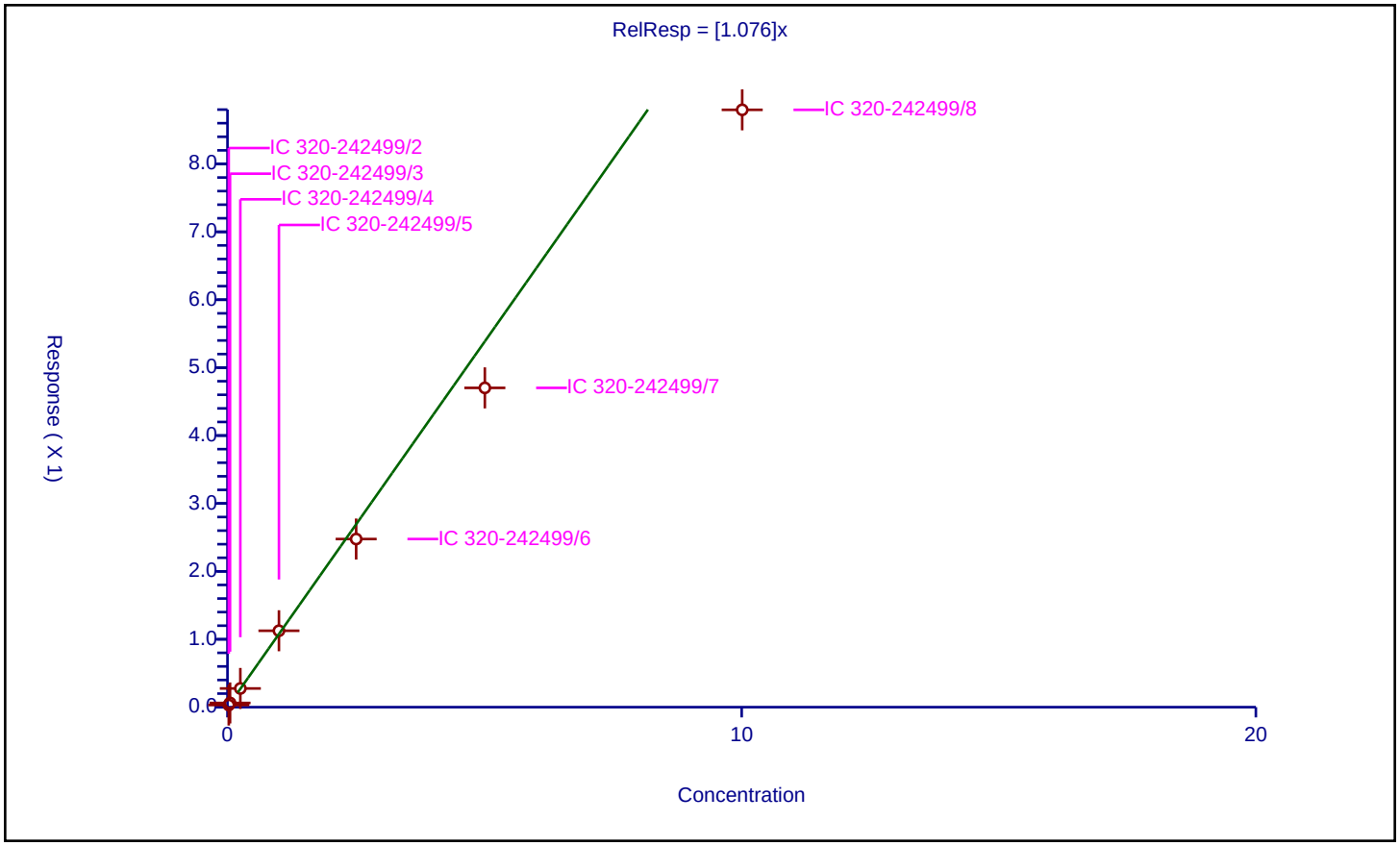
Curve Coefficients

Intercept:	0
Slope:	1.076

Error Coefficients

Standard Error:	13400000
Relative Standard Error:	13.6
Correlation Coefficient:	0.993
Coefficient of Determination (Adjusted):	0.974

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025025	0.031508	2.5	9166204.0	1.259066	Y
2	IC 320-242499/3	0.05005	0.062152	2.5	8538141.0	1.241804	Y
3	IC 320-242499/4	0.25025	0.275567	2.5	8662621.0	1.101167	Y
4	IC 320-242499/5	1.001	1.125071	2.5	8426167.0	1.123947	Y
5	IC 320-242499/6	2.5025	2.476081	2.5	8384516.0	0.989443	Y
6	IC 320-242499/7	5.005	4.702025	2.5	8428311.0	0.939465	Y
7	IC 320-242499/8	10.01	8.796814	2.5	7734289.0	0.878803	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

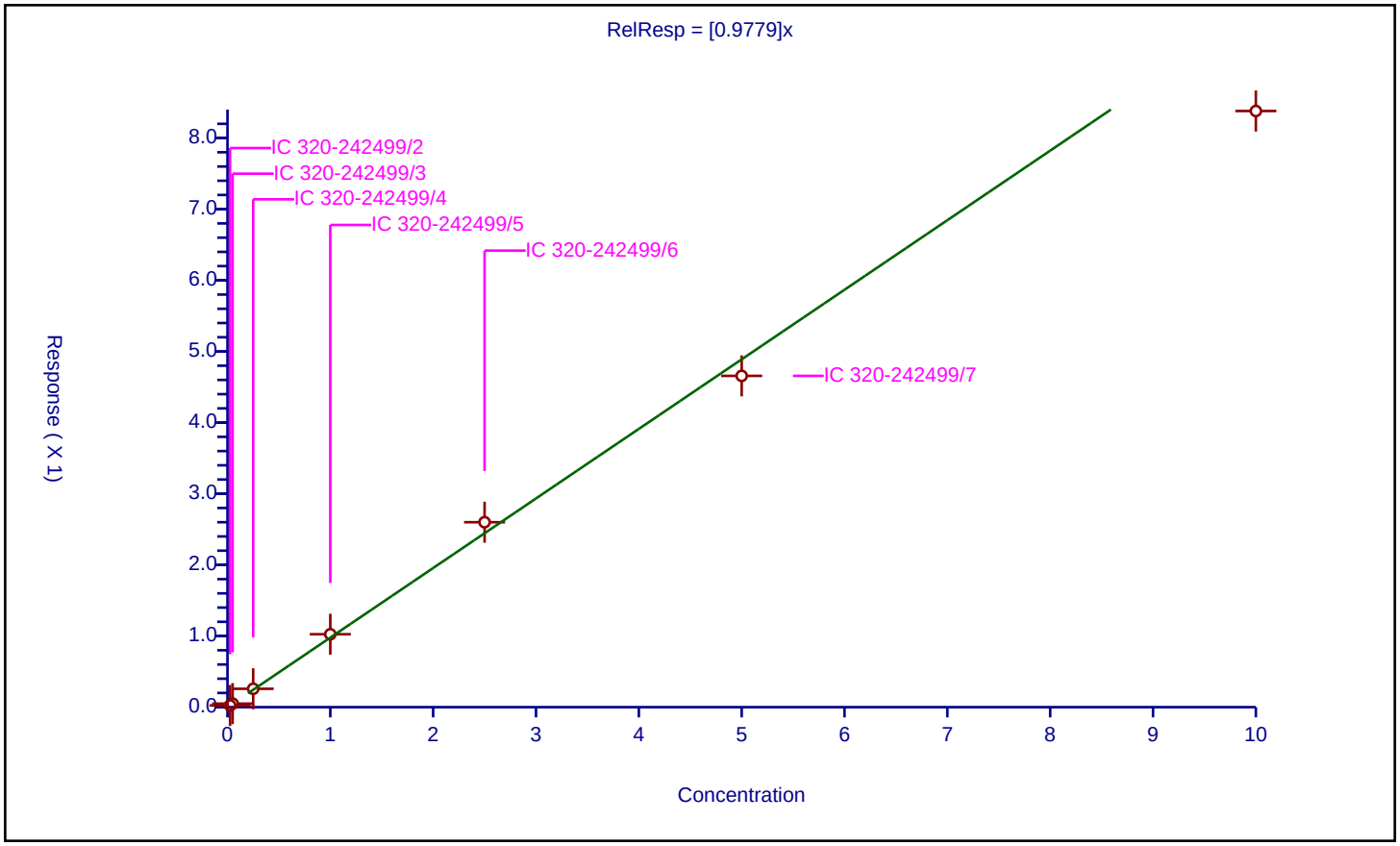
Curve Coefficients

Intercept:	0
Slope:	0.9779

Error Coefficients

Standard Error:	12300000
Relative Standard Error:	7.4
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.024461	2.5	7831909.0	0.97842	Y
2	IC 320-242499/3	0.05	0.049947	2.5	8229151.0	0.998949	Y
3	IC 320-242499/4	0.25	0.258349	2.5	8602003.0	1.033395	Y
4	IC 320-242499/5	1.0	1.025062	2.5	8074769.0	1.025062	Y
5	IC 320-242499/6	2.5	2.600023	2.5	7495131.0	1.040009	Y
6	IC 320-242499/7	5.0	4.656901	2.5	7912109.0	0.93138	Y
7	IC 320-242499/8	10.0	8.380355	2.5	7454345.0	0.838035	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

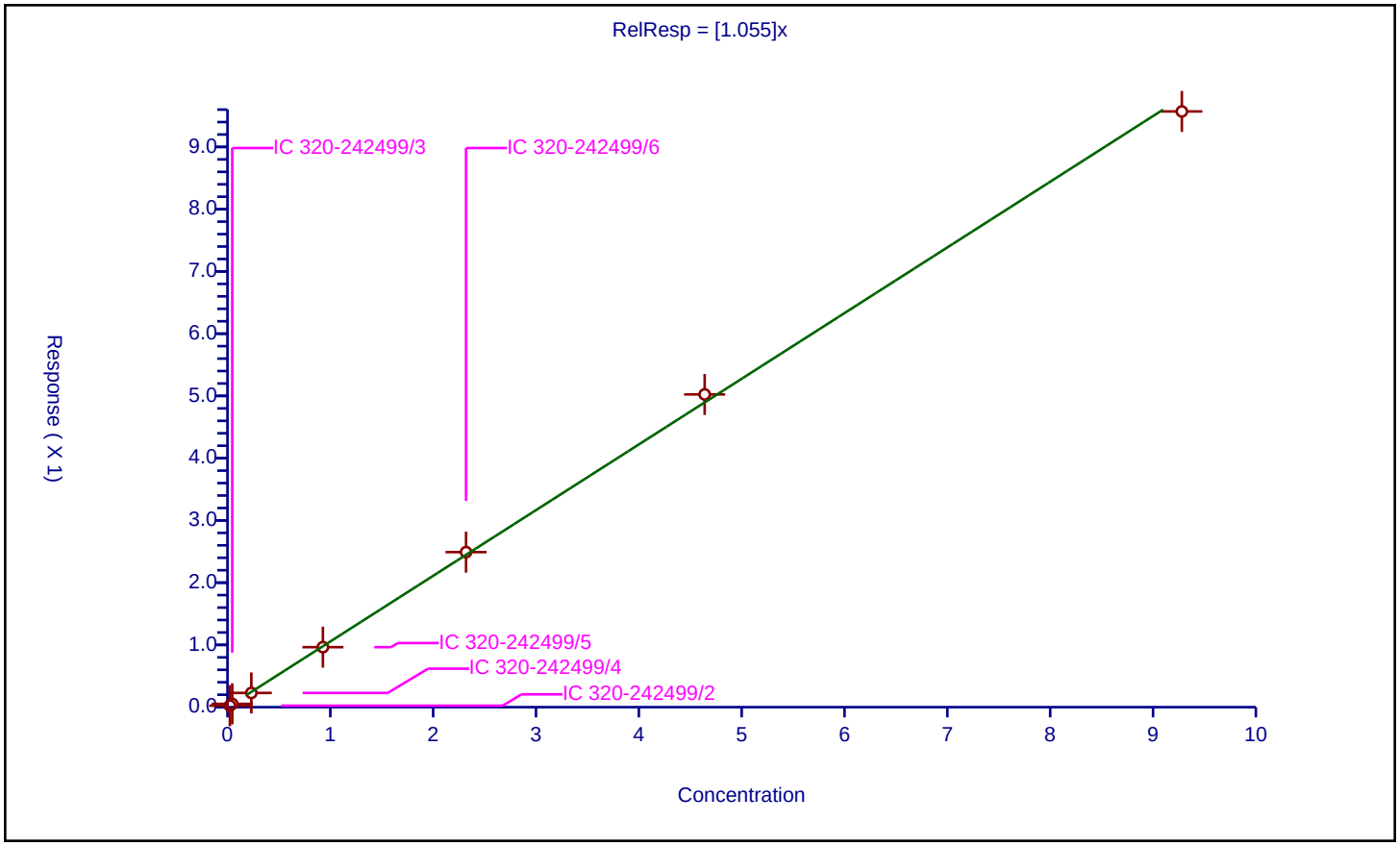
Curve Coefficients

Intercept:	0
Slope:	1.055

Error Coefficients

Standard Error:	10200000
Relative Standard Error:	4.6
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0232	0.024056	2.39	5768085.0	1.036908	Y
2	IC 320-242499/3	0.0464	0.052794	2.39	5856894.0	1.13781	Y
3	IC 320-242499/4	0.232	0.228445	2.39	6165020.0	0.984678	Y
4	IC 320-242499/5	0.928	0.96388	2.39	5901987.0	1.038664	Y
5	IC 320-242499/6	2.32	2.491026	2.39	5701715.0	1.073718	Y
6	IC 320-242499/7	4.64	5.024584	2.39	5629385.0	1.082885	Y
7	IC 320-242499/8	9.28	9.570708	2.39	5250354.0	1.031326	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

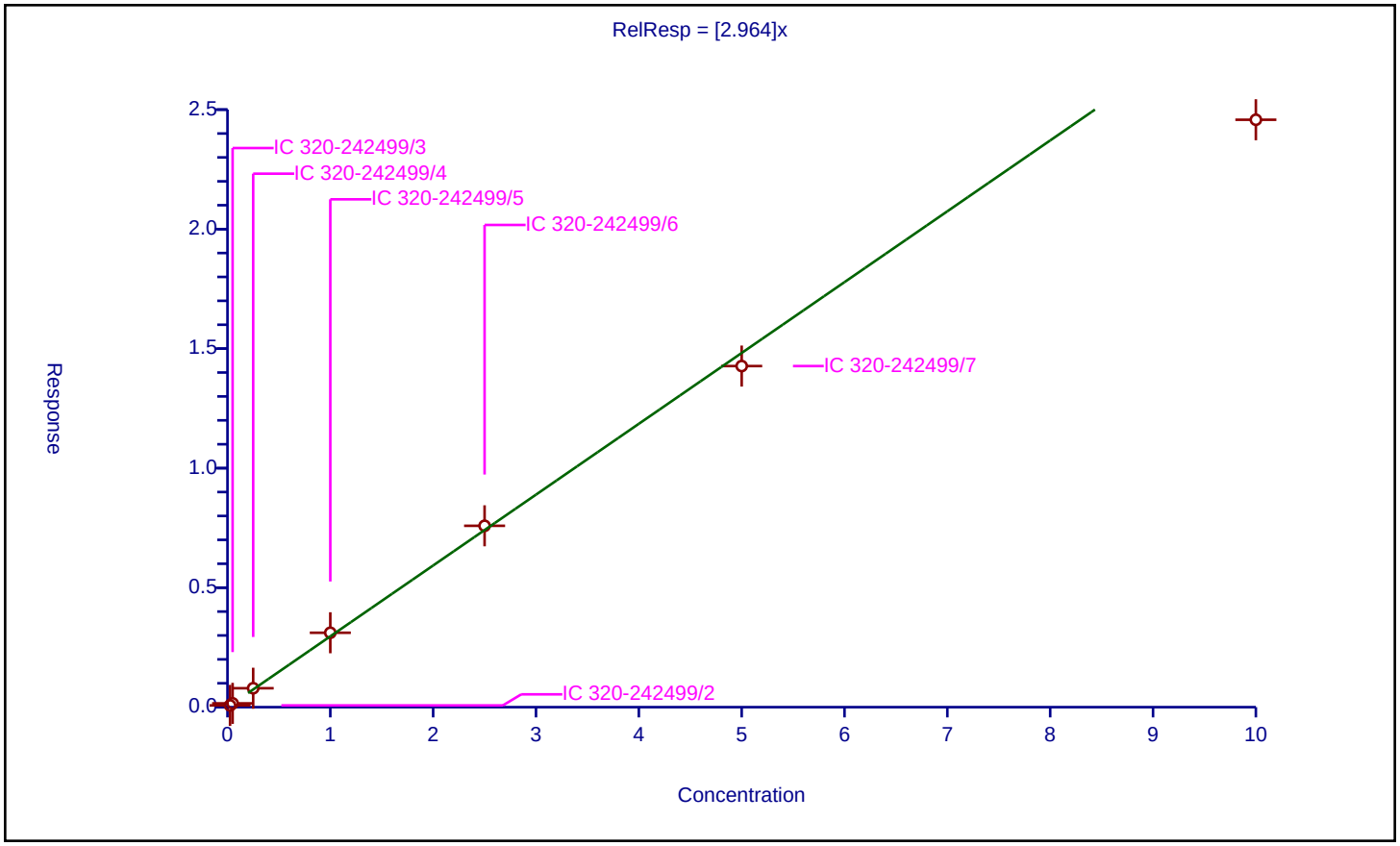
Curve Coefficients

Intercept:	0
Slope:	2.964

Error Coefficients

Standard Error:	14600000
Relative Standard Error:	8.6
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.073099	2.5	3190191.0	2.923963	Y
2	IC 320-242499/3	0.05	0.159804	2.5	3437498.0	3.196075	Y
3	IC 320-242499/4	0.25	0.791707	2.5	3255994.0	3.166827	Y
4	IC 320-242499/5	1.0	3.112581	2.5	3352554.0	3.112581	Y
5	IC 320-242499/6	2.5	7.587566	2.5	3025791.0	3.035027	Y
6	IC 320-242499/7	5.0	14.271161	2.5	3013781.0	2.854232	Y
7	IC 320-242499/8	10.0	24.575483	2.5	3012041.0	2.457548	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

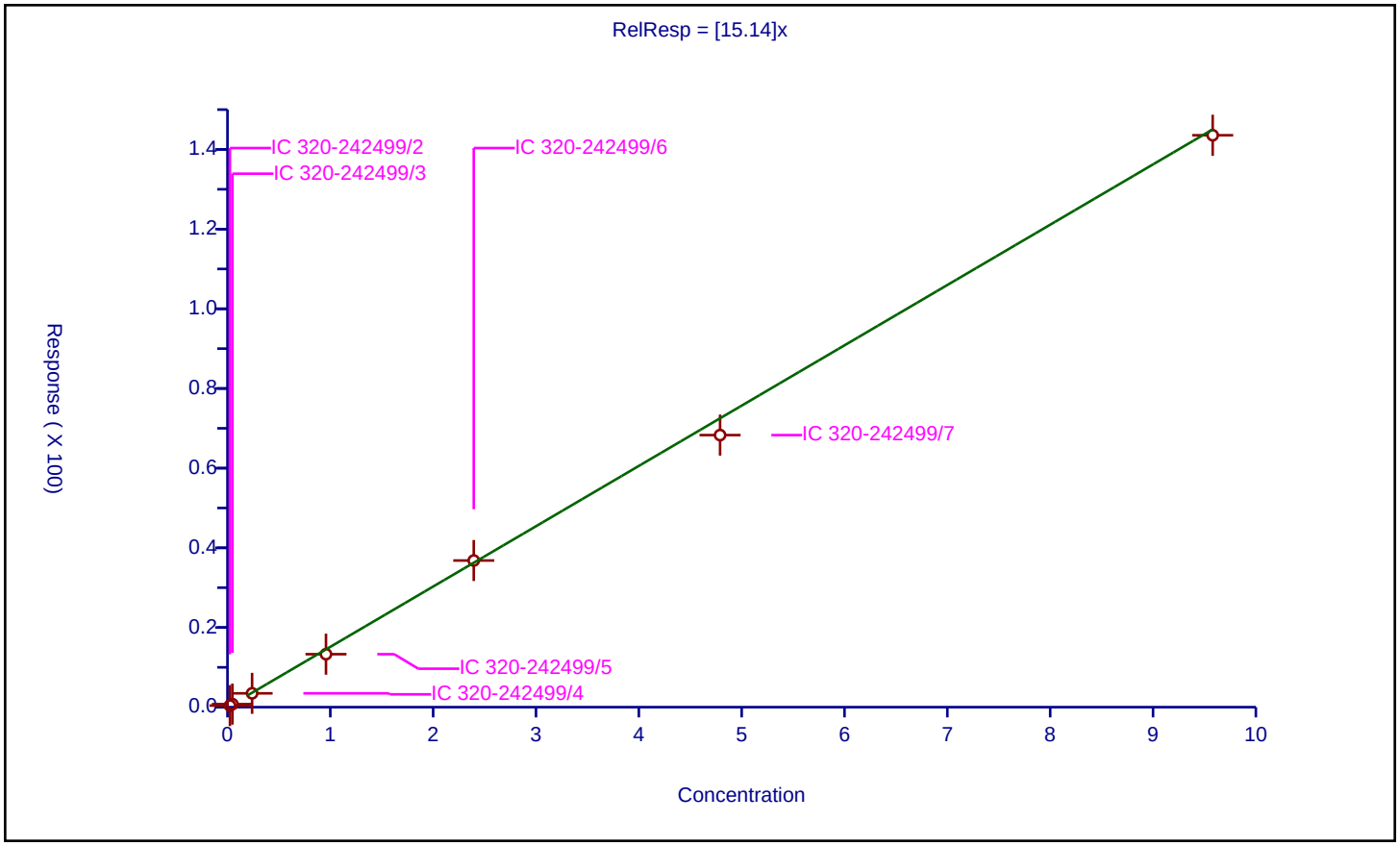
Curve Coefficients

Intercept:	0
Slope:	15.14

Error Coefficients

Standard Error:	2980000
Relative Standard Error:	7.1
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.02395	0.405271	2.395	136855.0	16.921559	Y
2	IC 320-242499/3	0.0479	0.76947	2.395	131131.0	16.064089	Y
3	IC 320-242499/4	0.2395	3.471028	2.395	135294.0	14.492808	Y
4	IC 320-242499/5	0.958	13.296406	2.395	139344.0	13.879338	Y
5	IC 320-242499/6	2.395	36.812257	2.395	118425.0	15.370462	Y
6	IC 320-242499/7	4.79	68.292214	2.395	119770.0	14.257247	Y
7	IC 320-242499/8	9.58	143.559664	2.395	102619.0	14.985351	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

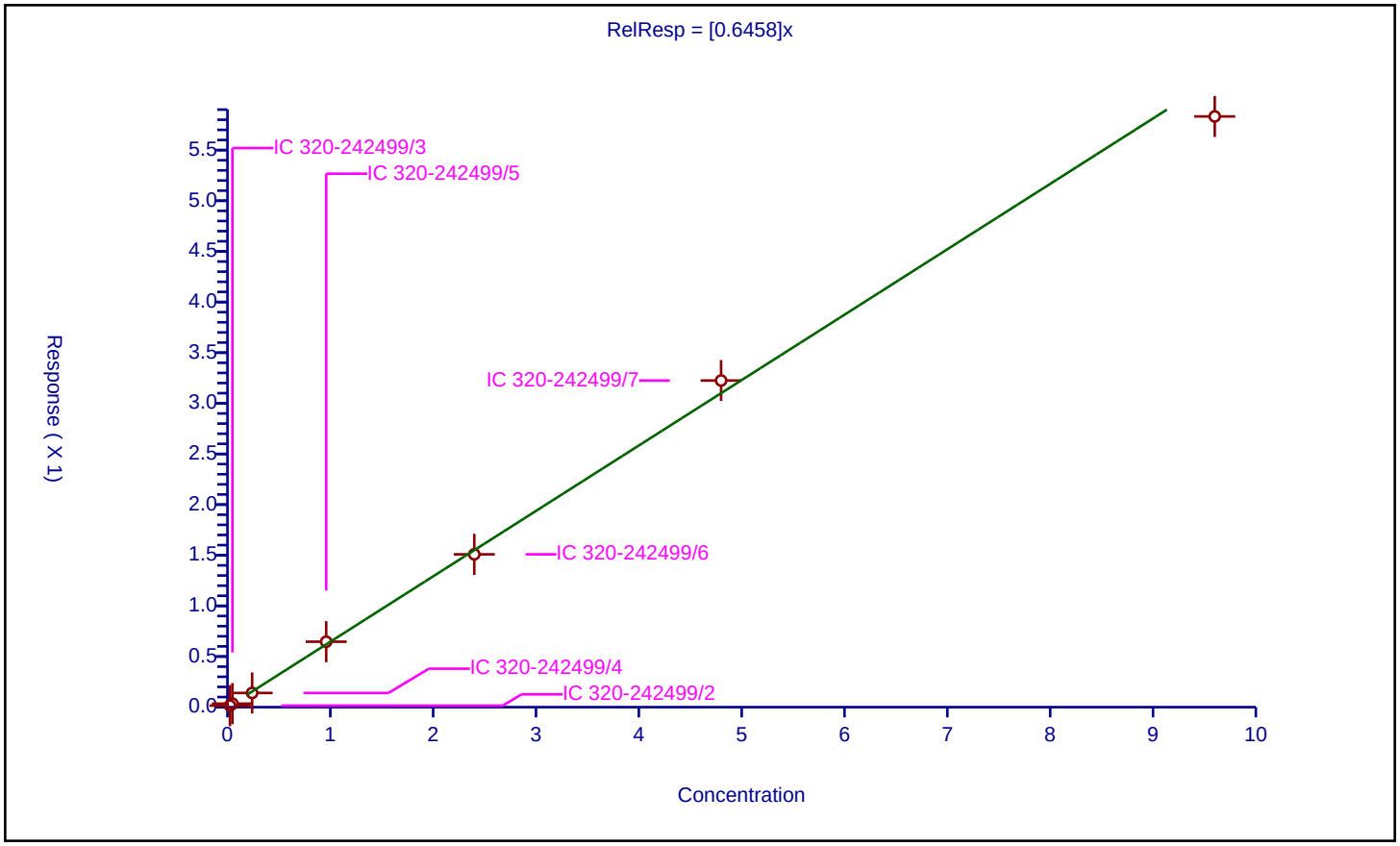
Curve Coefficients

Intercept:	0
Slope:	0.6458

Error Coefficients

Standard Error:	6290000
Relative Standard Error:	7.3
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.024	0.015135	2.39	5768085.0	0.630639	Y
2	IC 320-242499/3	0.048	0.034769	2.39	5856894.0	0.724351	Y
3	IC 320-242499/4	0.24	0.140285	2.39	6165020.0	0.584519	Y
4	IC 320-242499/5	0.96	0.646321	2.39	5901987.0	0.673252	Y
5	IC 320-242499/6	2.4	1.508924	2.39	5701715.0	0.628718	Y
6	IC 320-242499/7	4.8	3.225097	2.39	5629385.0	0.671895	Y
7	IC 320-242499/8	9.6	5.832552	2.39	5250354.0	0.607557	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

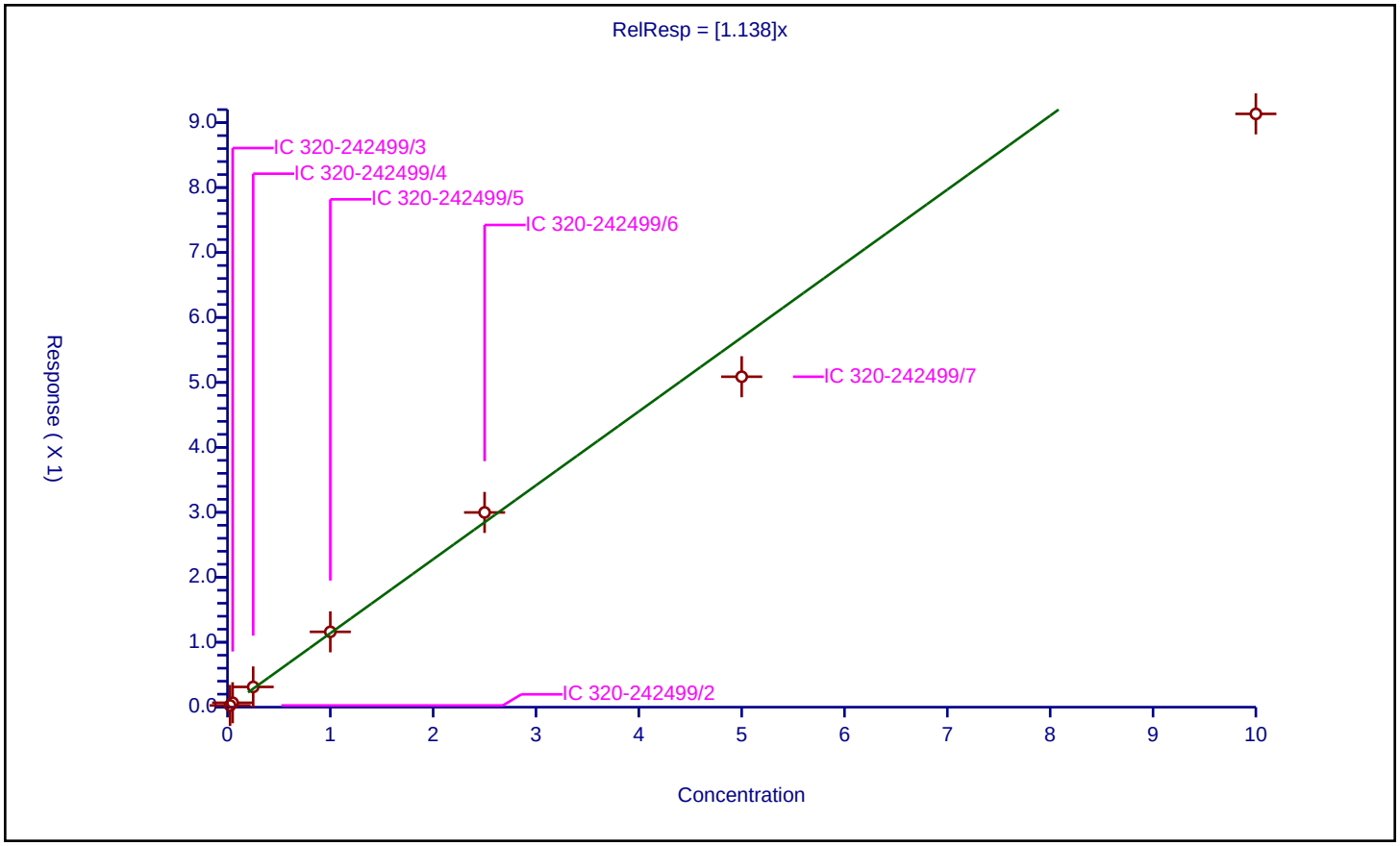
Curve Coefficients

Intercept:	0
Slope:	1.138

Error Coefficients

Standard Error:	13300000
Relative Standard Error:	13.2
Correlation Coefficient:	0.987
Coefficient of Determination (Adjusted):	0.978

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.026744	2.5	8255368.0	1.069777	Y
2	IC 320-242499/3	0.05	0.068125	2.5	8316028.0	1.362495	Y
3	IC 320-242499/4	0.25	0.311626	2.5	8177178.0	1.246506	Y
4	IC 320-242499/5	1.0	1.159702	2.5	8114874.0	1.159702	Y
5	IC 320-242499/6	2.5	2.997825	2.5	7596034.0	1.19913	Y
6	IC 320-242499/7	5.0	5.087568	2.5	7796459.0	1.017514	Y
7	IC 320-242499/8	10.0	9.134115	2.5	7270400.0	0.913412	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

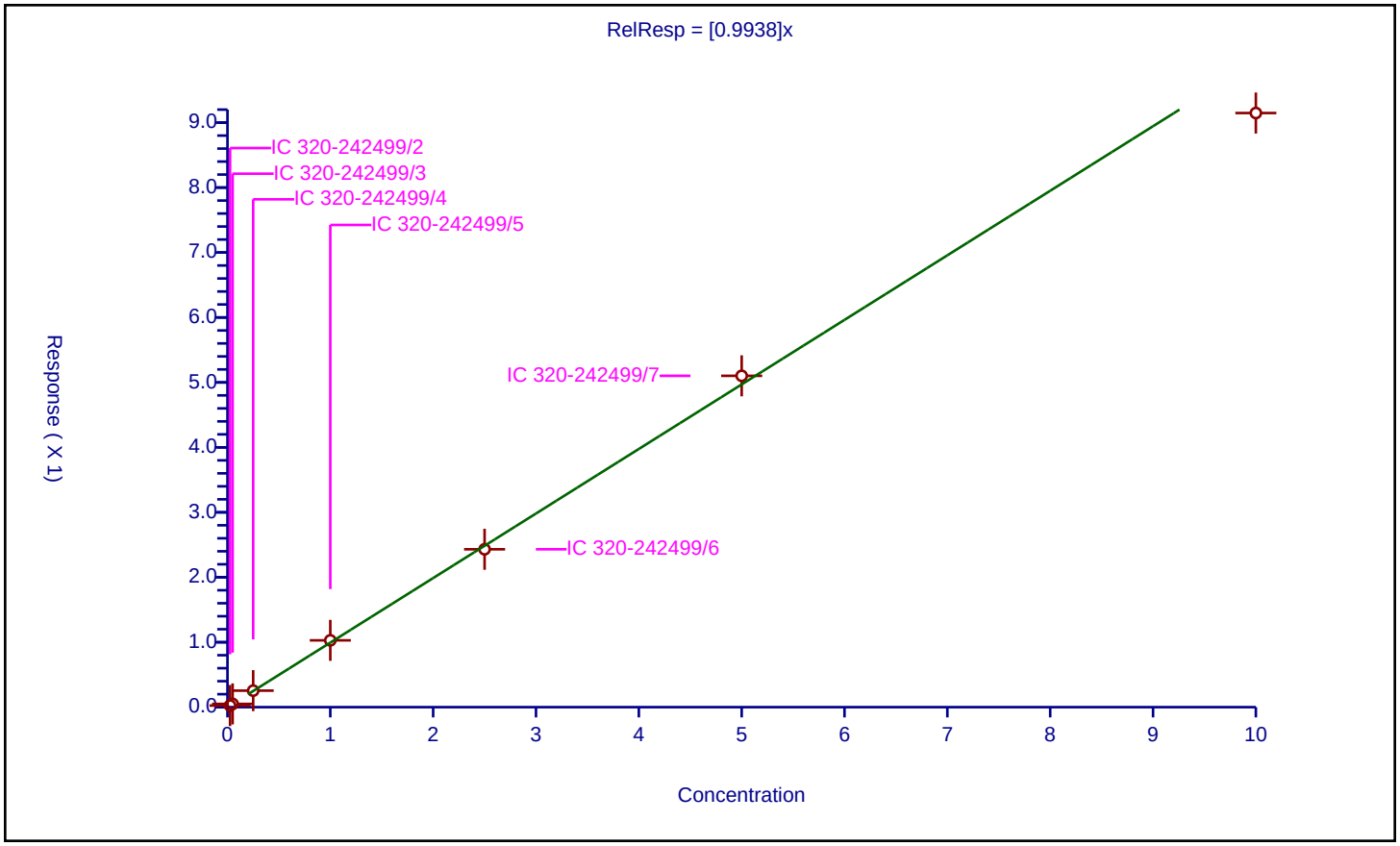
Curve Coefficients

Intercept:	0
Slope:	0.9938

Error Coefficients

Standard Error:	6170000
Relative Standard Error:	4.0
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.025014	2.5	3501055.0	1.000556	Y
2	IC 320-242499/3	0.05	0.050153	2.5	3717380.0	1.003059	Y
3	IC 320-242499/4	0.25	0.25429	2.5	3721760.0	1.017161	Y
4	IC 320-242499/5	1.0	1.028625	2.5	3489761.0	1.028625	Y
5	IC 320-242499/6	2.5	2.430563	2.5	3589091.0	0.972225	Y
6	IC 320-242499/7	5.0	5.101408	2.5	3516347.0	1.020282	Y
7	IC 320-242499/8	10.0	9.147386	2.5	3484339.0	0.914739	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

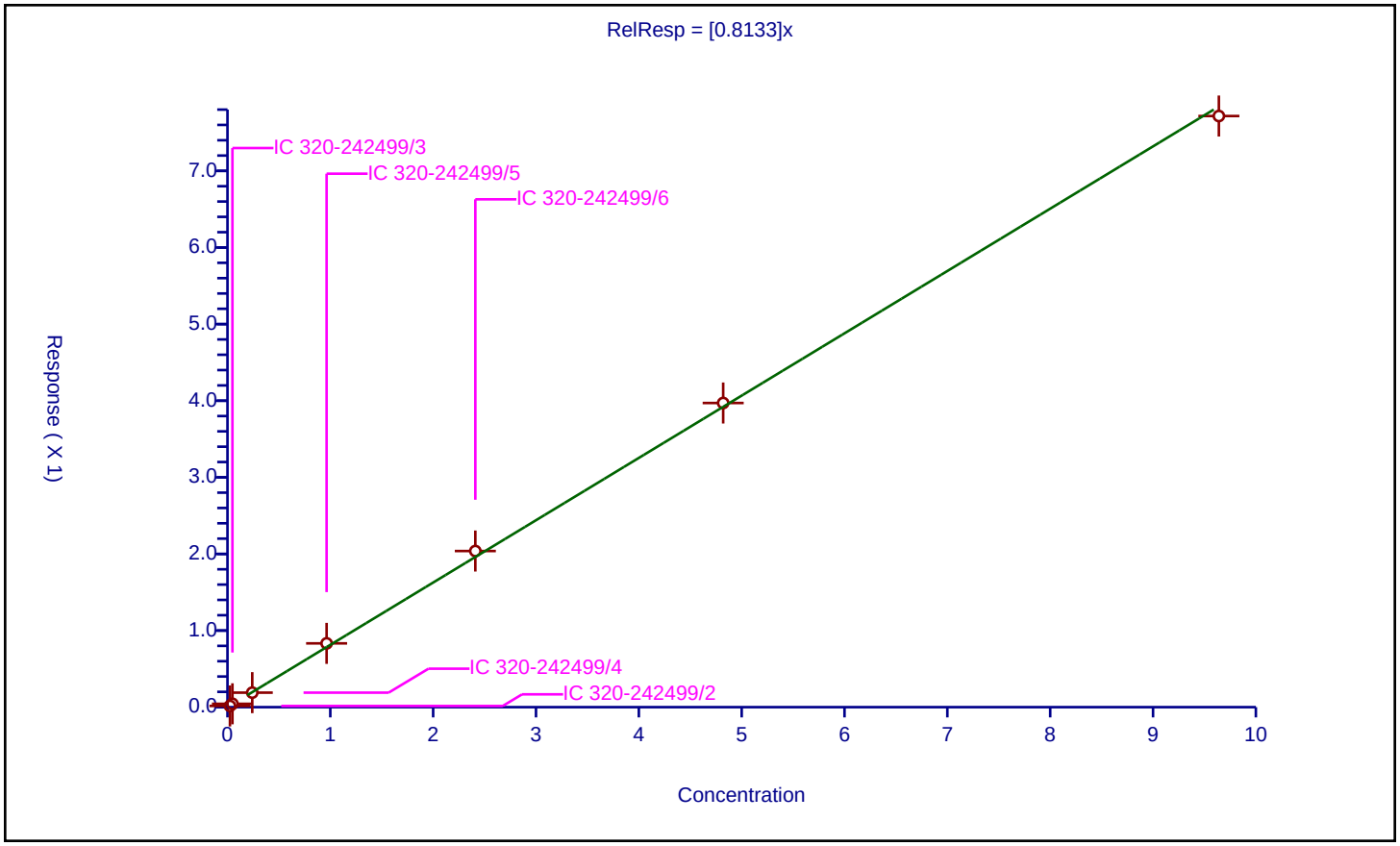
Curve Coefficients

Intercept:	0
Slope:	0.8133

Error Coefficients

Standard Error:	8190000
Relative Standard Error:	9.7
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.989

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0241	0.015965	2.39	5768085.0	0.662443	Y
2	IC 320-242499/3	0.0482	0.043928	2.39	5856894.0	0.911359	Y
3	IC 320-242499/4	0.241	0.189421	2.39	6165020.0	0.78598	Y
4	IC 320-242499/5	0.964	0.832624	2.39	5901987.0	0.863718	Y
5	IC 320-242499/6	2.41	2.038221	2.39	5701715.0	0.845735	Y
6	IC 320-242499/7	4.82	3.970325	2.39	5629385.0	0.823719	Y
7	IC 320-242499/8	9.64	7.716276	2.39	5250354.0	0.800444	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

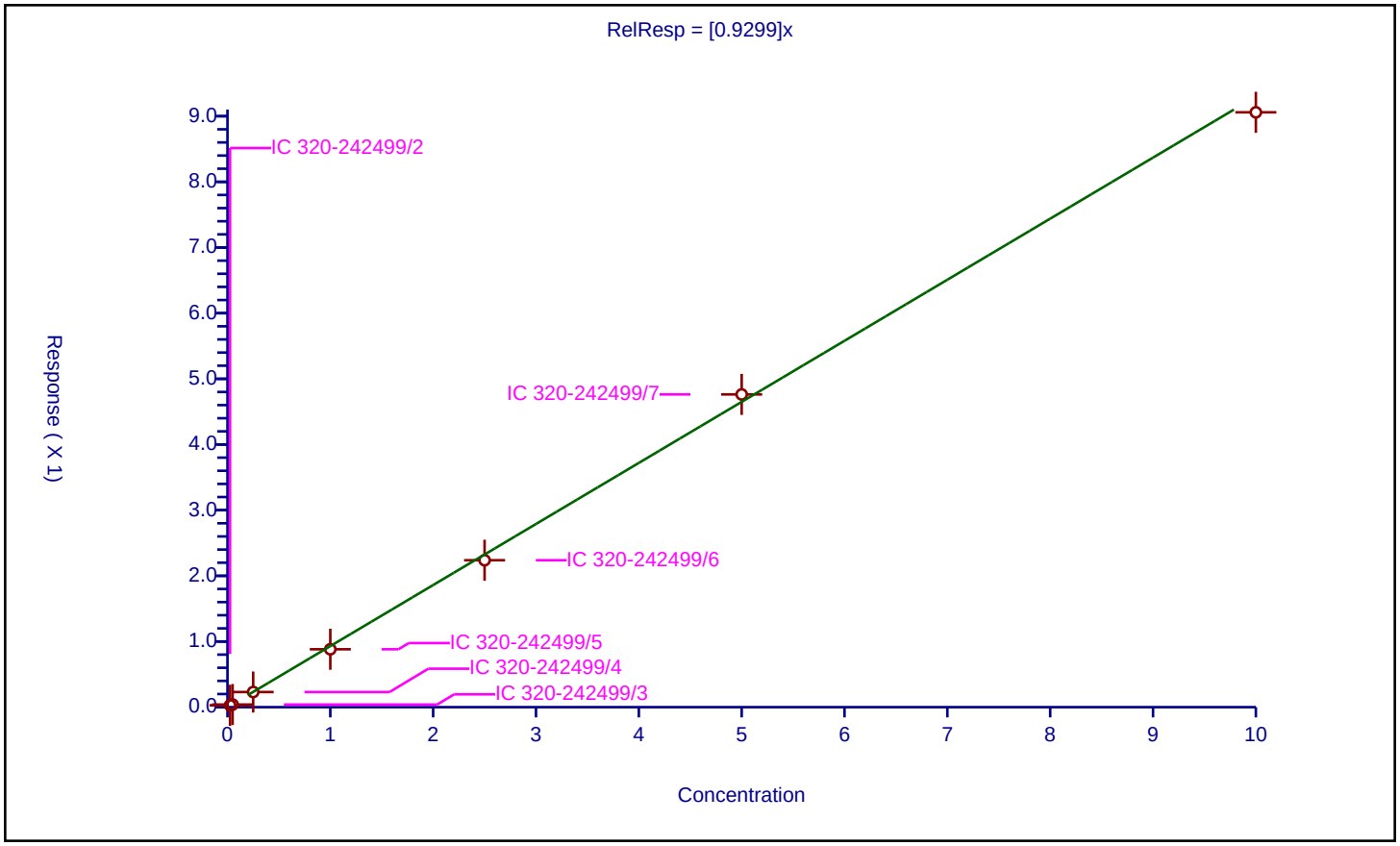
Curve Coefficients

Intercept:	0
Slope:	0.9299

Error Coefficients

Standard Error:	4320000
Relative Standard Error:	11.5
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.982

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.028734	2.5	2749959.0	1.149363	Y
2	IC 320-242499/3	0.05	0.040105	2.5	3123931.0	0.802098	Y
3	IC 320-242499/4	0.25	0.230661	2.5	3035794.0	0.922645	Y
4	IC 320-242499/5	1.0	0.881688	2.5	2980380.0	0.881688	Y
5	IC 320-242499/6	2.5	2.237445	2.5	2766889.0	0.894978	Y
6	IC 320-242499/7	5.0	4.762718	2.5	2566441.0	0.952544	Y
7	IC 320-242499/8	10.0	9.058623	2.5	2480748.0	0.905862	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

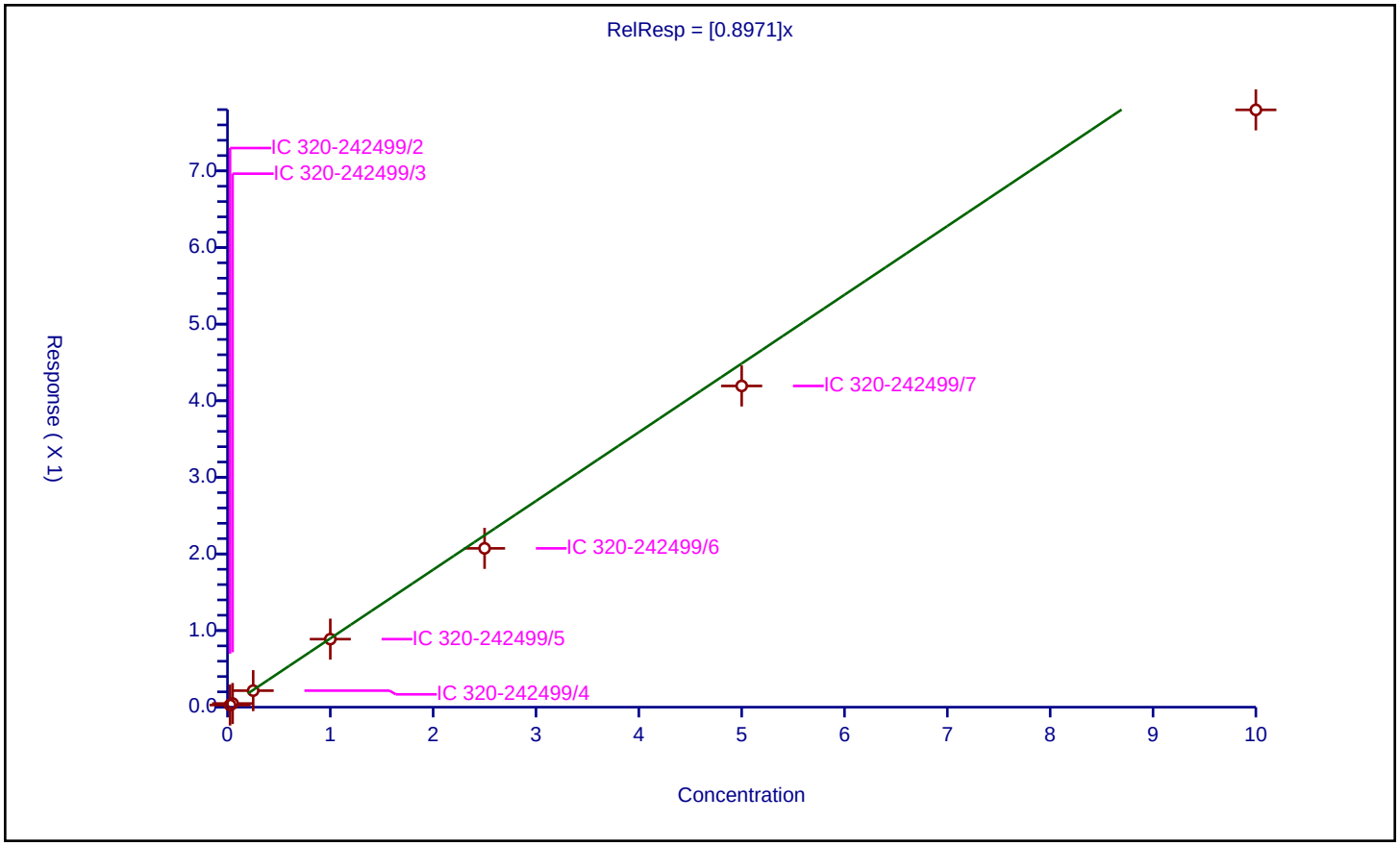
Curve Coefficients

Intercept:	0
Slope:	0.8971

Error Coefficients

Standard Error:	9360000
Relative Standard Error:	12.6
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.977

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.027941	2.5	6578448.0	1.11765	Y
2	IC 320-242499/3	0.05	0.048178	2.5	7323152.0	0.963567	Y
3	IC 320-242499/4	0.25	0.215838	2.5	7021910.0	0.863352	Y
4	IC 320-242499/5	1.0	0.887963	2.5	6840404.0	0.887963	Y
5	IC 320-242499/6	2.5	2.072771	2.5	6654794.0	0.829108	Y
6	IC 320-242499/7	5.0	4.192965	2.5	6750273.0	0.838593	Y
7	IC 320-242499/8	10.0	7.796965	2.5	6090404.0	0.779696	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

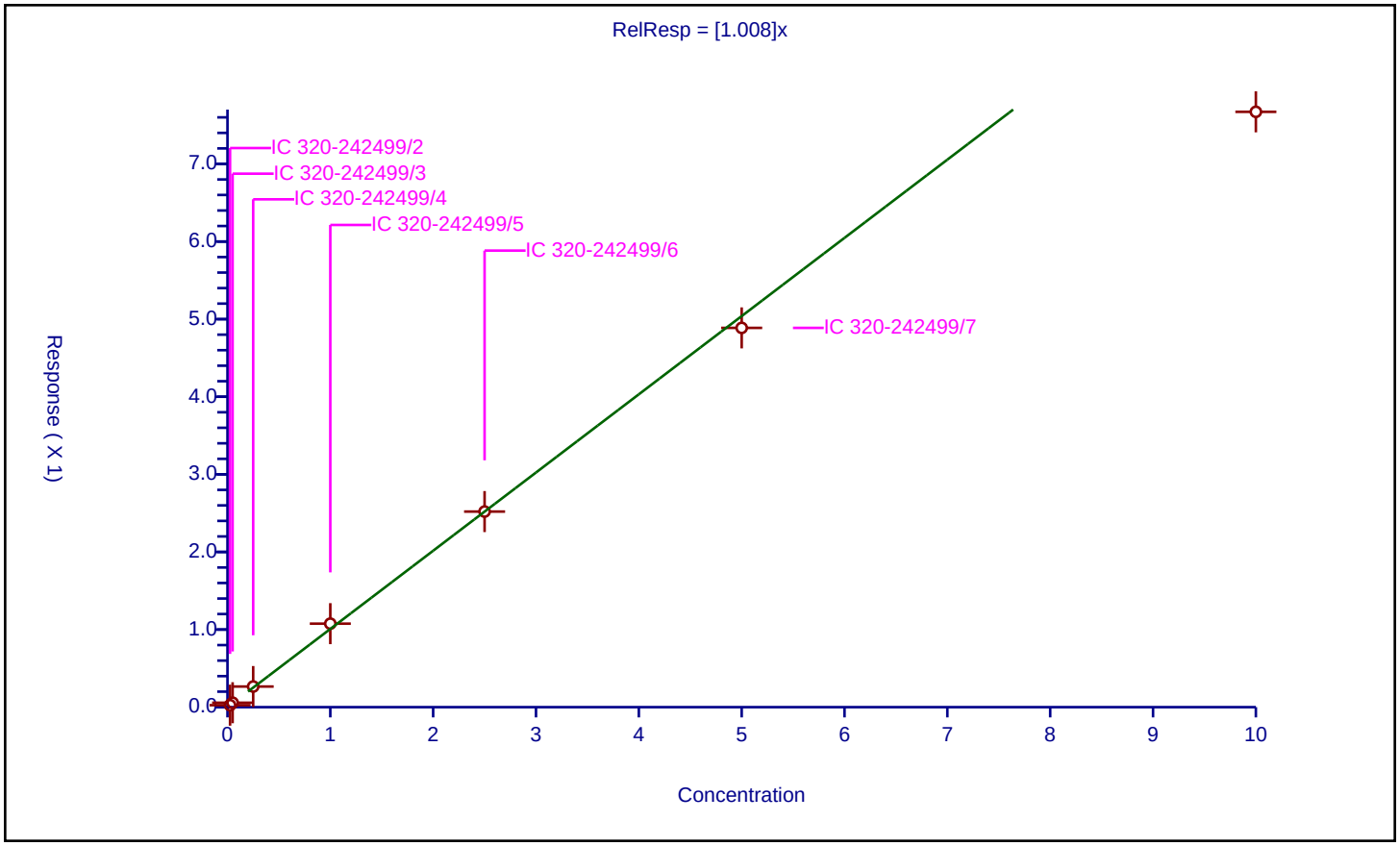
Curve Coefficients

Intercept:	0
Slope:	1.008

Error Coefficients

Standard Error:	12600000
Relative Standard Error:	11.8
Correlation Coefficient:	0.985
Coefficient of Determination (Adjusted):	0.982

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.025463	2.5	8266827.0	1.018529	Y
2	IC 320-242499/3	0.05	0.057211	2.5	8543283.0	1.144226	Y
3	IC 320-242499/4	0.25	0.26586	2.5	8139014.0	1.063438	Y
4	IC 320-242499/5	1.0	1.076042	2.5	8148044.0	1.076042	Y
5	IC 320-242499/6	2.5	2.520483	2.5	8174334.0	1.008193	Y
6	IC 320-242499/7	5.0	4.88743	2.5	7973084.0	0.977486	Y
7	IC 320-242499/8	10.0	7.671575	2.5	8209254.0	0.767157	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

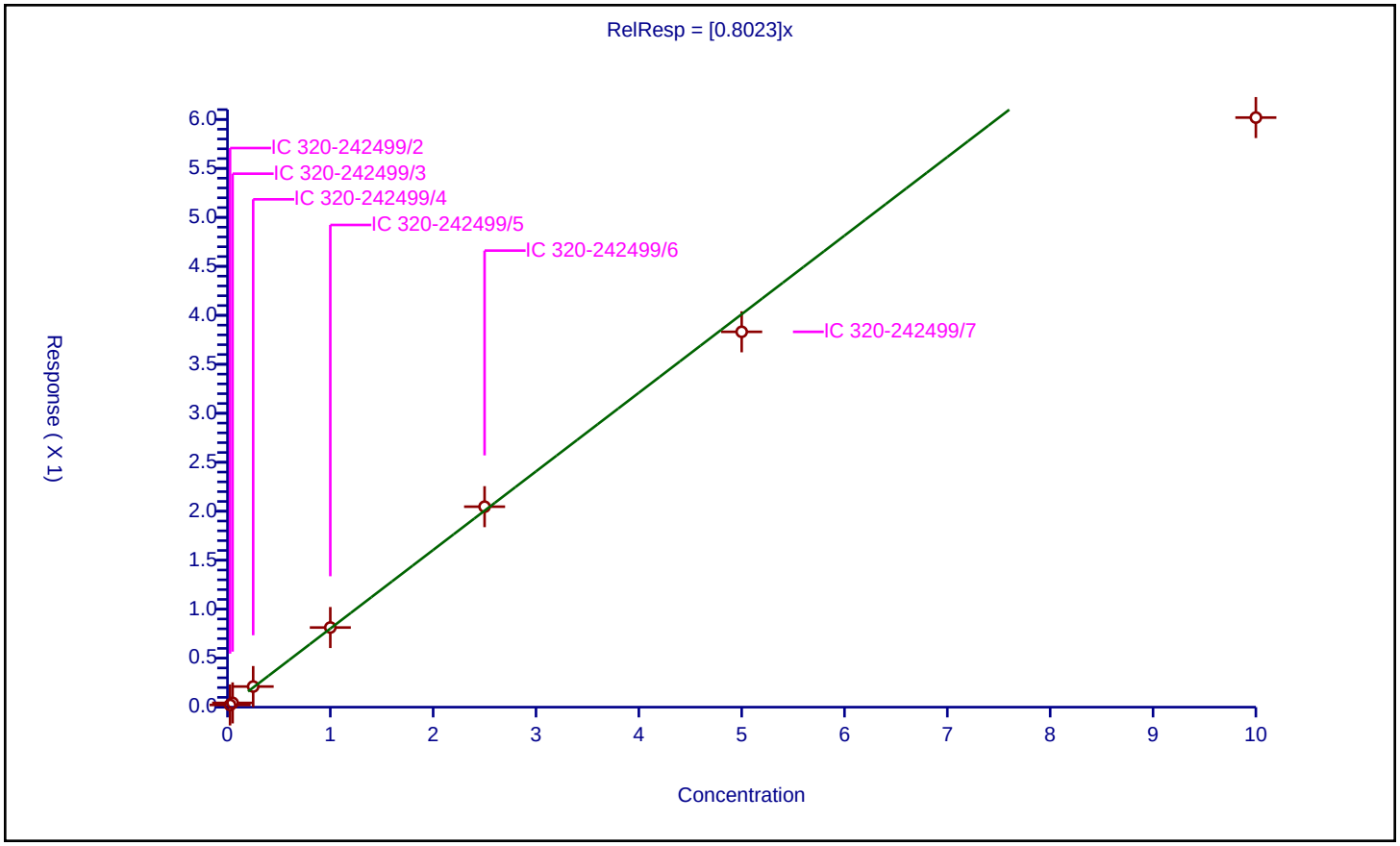
Curve Coefficients

Intercept:	0
Slope:	0.8023

Error Coefficients

Standard Error:	9930000
Relative Standard Error:	12.3
Correlation Coefficient:	0.984
Coefficient of Determination (Adjusted):	0.980

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.022571	2.5	8266827.0	0.902825	Y
2	IC 320-242499/3	0.05	0.043555	2.5	8543283.0	0.871094	Y
3	IC 320-242499/4	0.25	0.210606	2.5	8139014.0	0.842425	Y
4	IC 320-242499/5	1.0	0.813087	2.5	8148044.0	0.813087	Y
5	IC 320-242499/6	2.5	2.046572	2.5	8174334.0	0.818629	Y
6	IC 320-242499/7	5.0	3.831711	2.5	7973084.0	0.766342	Y
7	IC 320-242499/8	10.0	6.018621	2.5	8209254.0	0.601862	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

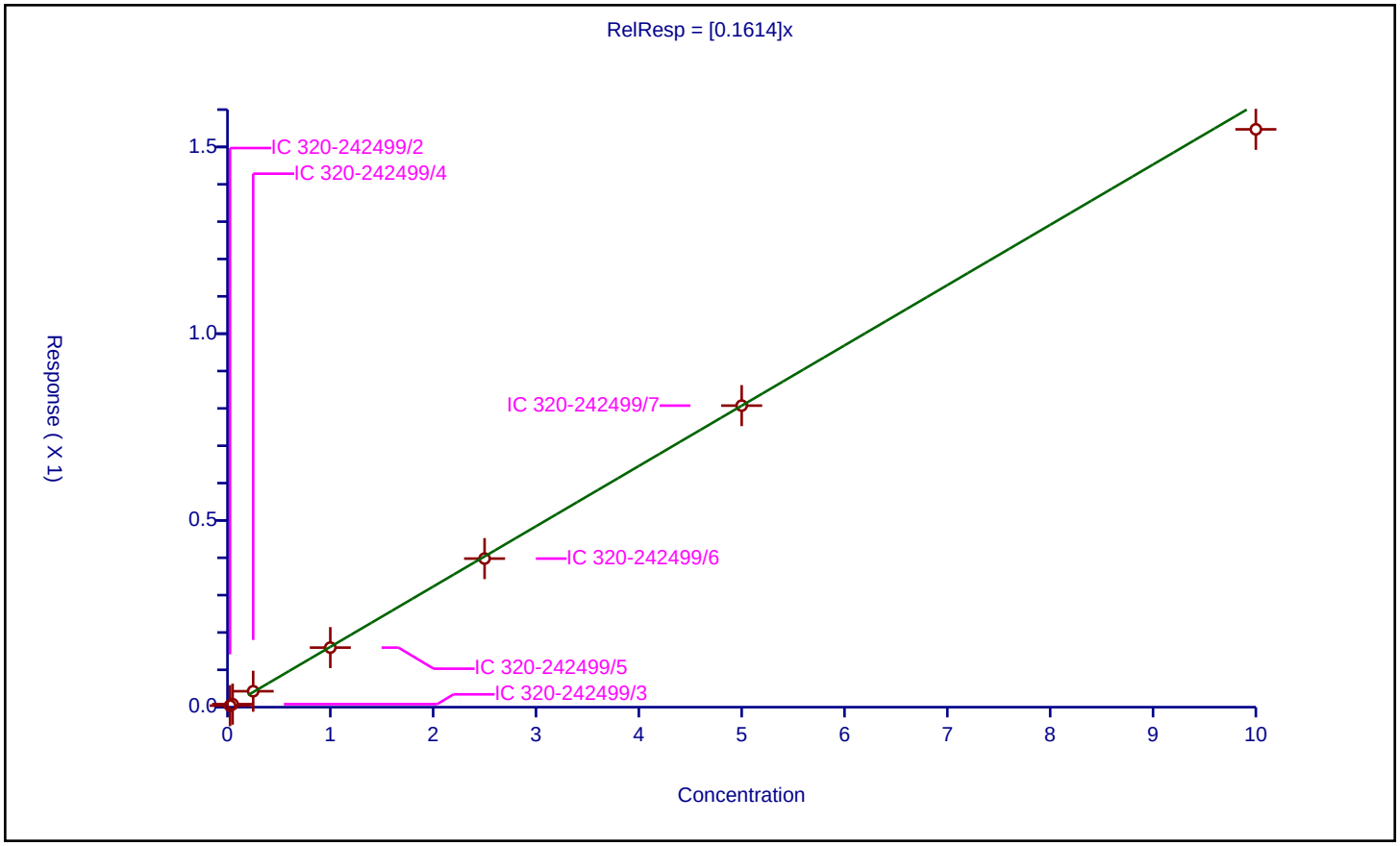
Curve Coefficients

Intercept:	0
Slope:	0.1614

Error Coefficients

Standard Error:	1850000
Relative Standard Error:	3.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.004094	2.5	6620523.0	0.163779	Y
2	IC 320-242499/3	0.05	0.008033	2.5	7100968.0	0.160654	Y
3	IC 320-242499/4	0.25	0.042695	2.5	6427054.0	0.17078	Y
4	IC 320-242499/5	1.0	0.159503	2.5	6392553.0	0.159503	Y
5	IC 320-242499/6	2.5	0.397848	2.5	6634077.0	0.159139	Y
6	IC 320-242499/7	5.0	0.807396	2.5	6312069.0	0.161479	Y
7	IC 320-242499/8	10.0	1.54719	2.5	6291947.0	0.154719	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: ICV 320-242499/10 Calibration Date: 08/28/2018 11:20

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.08.28LLICALA_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9485		2.60	2.50	3.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.004		2.48	2.50	-1.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	112.9		2.38	2.21	7.5	30.0
4:2 FTS	AveID	21.61	22.53		2.44	2.34	4.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9048		2.48	2.50	-0.6	30.0
Perfluoropentanesulfonic acid	AveID	49.87	54.00		2.54	2.35	8.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.030		2.52	2.50	1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.180		2.18	2.28	-4.6	30.0
6:2 FTS	AveID	2.140	2.200		2.44	2.38	2.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.094		2.64	2.38	11.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.046		2.43	2.50	-2.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.063		2.33	2.31	0.8	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.063		2.72	2.50	8.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.245		2.74	2.50	9.5	30.0
8:2 FTS	AveID	15.14	15.07		2.39	2.40	-0.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.125		2.47	2.50	-1.1	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7146		2.66	2.40	10.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.164		2.93	2.50	17.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.9229		2.74	2.41	13.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	1.107		2.98	2.50	19.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9109		2.54	2.50	1.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.087		2.70	2.50	7.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8433		2.63	2.50	5.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1640		2.54	2.50	1.6	30.0
13C4 PFBA	Ave	0.9623	0.9451		2.46	2.50	-1.8	30.0
13C5 PFPeA	Ave	0.8584	0.8602		2.51	2.50	0.2	30.0
13C3-PFBS	Ave	0.0113	0.0107		2.20	2.33	-5.4	30.0
13C2 PFHxA	Ave	0.9075	0.8852		2.44	2.50	-2.5	30.0
13C4-PFHpA	Ave	1.082	1.049		2.42	2.50	-3.1	30.0
18O2 PFHxS	Ave	0.6655	0.6612		2.35	2.37	-0.7	30.0
M2-6:2FTS	Ave	0.1063	0.1028		2.30	2.38	-3.4	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: ICV 320-242499/10 Calibration Date: 08/28/2018 11:20

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.08.28LLICALA_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.9886		2.45	2.50	-1.9	30.0
13C4 PFOS	Ave	0.7151	0.6918		2.31	2.39	-3.3	30.0
13C5 PFNA	Ave	0.9437	0.8968		2.38	2.50	-5.0	30.0
13C8 FOSA	Ave	0.3783	0.3642		2.41	2.50	-3.7	30.0
13C2 PFDA	Ave	0.9426	0.9539		2.53	2.50	1.2	30.0
M2-8:2FTS	Ave	0.0156	0.0139		2.13	2.40	-11.0	30.0
d3-NMeFOSAA	Ave	0.4249	0.4335		2.55	2.50	2.0	30.0
13C2 PFUnA	Ave	0.8023	0.8024		2.50	2.50	0.0	30.0
d5-NEtFOSAA	Ave	0.3342	0.3324		2.49	2.50	-0.5	30.0
13C2 PFDoA	Ave	0.9759	0.9367		2.40	2.50	-4.0	30.0
13C2-PFTeDA	Ave	0.7774	0.7444		2.39	2.50	-4.2	30.0
13C2-PFHxDA	Ave	0.7882	0.8298		2.63	2.50	5.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_013.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 28-Aug-2018 11:20:48 ALS Bottle#: 17 Worklist Smp#: 10
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist:

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 12:43:45 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 12:23:19

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	1.483	1.485	-0.002	0.539	7818437	2.46		98.2	13074	
2 Perfluorobutyric acid										
212.90 > 169.00	1.483	1.486	-0.003	1.000	7415669	2.60			802	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.758	-0.003	0.638	7116172	2.51		100	7335	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.759	-0.004	1.000	7145426	2.48			632	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.796	-0.007	0.650	82043	2.20		94.6	528	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.005	8816096	2.38			3956	
298.90 > 99.00	1.797	1.797	0.0	1.005	3034067		2.91(1.35-4.05)		2538	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.012	-0.005	1.122	1858286	2.44			5651	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.013	-0.006	0.730	750734	NC			844	
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.048	-0.011	0.741	7322944	2.44		97.5	6873	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.005	6625853	2.48			1486	
313.00 > 119.00	2.037	2.048	-0.011	1.000	479100		13.83(6.96-20.87)		861	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.071	-0.003	1.156	4477656	2.54			5354	
349.00 > 99.00	2.068	2.071	-0.003	1.156	2017744		2.22(1.15-3.45)		2899	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.140	2.149	-0.009	1.000	1398449	NC			577	

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	2.140	2.150	-0.010	0.778	779374	NC			2441	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.387	-0.014	0.863	8673867	2.42		96.9	8083	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.373	2.387	-0.014	1.000	8931381	2.52			1205	
363.00 > 169.00	2.373	2.387	-0.014	1.000	2061992		4.33(2.17-6.52)		3143	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	5888331	2.18			3584	
399.00 > 99.00	2.400	2.400	0.0	1.000	1602830		3.67(1.90-5.70)		1543	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5174153	2.35		99.3	11725	
76 DONA										
377.00 > 251.00	2.426	2.432	-0.006	0.778	14614247	NC			13466	
377.00 > 85.00	2.426	2.432	-0.006	0.778	6700701		2.18(1.13-3.39)		3003	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.728	-0.009	1.000	1777055	2.44			1383	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.728	-0.009	0.988	807686	2.30		96.6	1607	
D 73 13C8 PFOA										
421.00 > 376.00	2.735	2.744	-0.009		6795981	NC			7686	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	8178397	2.45		98.1	7841	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8272454	2.50			9101	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	8550596	2.43			579	
413.00 > 169.00	2.751	2.751	0.0	1.000	3160759		2.71(1.36-4.08)		4379	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.751	2.760	-0.009	0.882	5947480	2.64			4166	
449.00 > 99.00	2.751	2.760	-0.009	0.882	1438198		4.14(1.84-5.53)		4257	
D 72 13C8 PFOS										
507.00 > 99.00	3.118	3.129	-0.011		1210221	NC			3025	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.118	3.136	-0.018	1.000	5630426	2.33			2687	
499.00 > 99.00	3.118	3.136	-0.018	1.000	1342419		4.19(2.04-6.12)		2314	
D 19 13C5 PFNA										
468.00 > 423.00	3.118	3.136	-0.018	1.134	7418808	2.38		95.0	7323	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.006	7884470	2.72			781	
463.00 > 169.00	3.118	3.136	-0.018	1.000	1372852		5.74(2.68-8.03)		2643	
D 18 13C4 PFOS										
503.00 > 80.00	3.118	3.136	-0.018	1.134	5470728	2.31		96.7	4464	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.336	3.346	-0.010	1.070	6271013	NC			6344	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	9778618	2.74			5712	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3013180	2.41		96.3	4993	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.482	3.483	-0.001	1.117	3925851	2.66			3709	
549.00 > 99.00	3.482	3.483	-0.001	1.117	645053		6.09(3.02-9.05)		2315	
D 26 M2-8:2FTS										
529.00 > 81.00	3.482	3.485	-0.003	1.266	110298	2.13		89.0	667	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.482	3.485	-0.003	1.000	1665339	2.39			3424	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.482	3.498	-0.016	1.000	8879874	2.47			1169	
513.00 > 169.00	3.482	3.498	-0.016	1.000	619624		14.33(7.12-21.35)		2037	
D 23 13C2 PFDA										
515.00 > 470.00	3.482	3.498	-0.016	1.266	7891039	2.53		101	12046	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.643	3.651	-0.008	1.324	3586265	2.55		102	4119	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.643	3.653	-0.010	1.000	4172723	2.93			8187	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.794	3.807	-0.013	1.217	5096463	2.74			4193	
599.00 > 99.00	3.794	3.807	-0.013	1.217	1060306		4.81(2.14-6.43)		2431	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.809	3.819	-0.010	1.385	2749911	2.49		99.5	2962	
D 30 13C2 PFUnA										
565.00 > 520.00	3.809	3.825	-0.016	1.385	6637764	2.50		100	5750	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.809	3.825	-0.016	1.000	3043946	2.98			4091	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.809	3.825	-0.016	1.000	6046034	2.54			1093	
563.00 > 169.00	3.809	3.825	-0.016	1.000	533788		11.33(5.24-15.72)		1369	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.978	3.983	-0.005	1.276	7538475	NC			6957	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.108	4.118	-0.010	1.000	8422800	2.70			1590	
613.00 > 169.00	4.108	4.118	-0.010	1.000	900345		9.36(4.68-14.05)		1778	
D 36 13C2 PFDoA										
615.00 > 570.00	4.108	4.118	-0.010	1.494	7748743	2.40		96.0	9860	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.108	4.120	-0.012	1.180	1186373	NC			2324	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.344	4.360	-0.016	1.393	512569	NC			1291	
699.00 > 99.00	4.344	4.360	-0.016	1.393	972478		0.53(0.28-0.83)		2361	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.375	4.384	-0.009	1.065	6534380	2.63			2112	
663.00 > 169.00	4.375	4.384	-0.009	1.065	1098281		5.95(3.09-9.27)		3337	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.612	4.628	-0.016	1.677	6158190	2.39		95.8	12830	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.612	4.631	-0.019	1.000	1009829	2.54			3334	
713.00 > 219.00	4.612	4.631	-0.019	1.000	692793		1.46(0.70-2.09)		3141	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.042	5.053	-0.011	1.000	6475285	NC			1309	
813.00 > 169.00	5.042	5.053	-0.011	1.000	1106950		5.85(2.77-8.32)		3071	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.042	5.053	-0.011	1.833	6864378	2.63		105	9588	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.404	5.416	-0.012	1.072	4496921	NC			937	
913.00 > 169.00	5.404	5.416	-0.012	1.072	810463		5.55(2.55-7.64)		2455	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00016 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 12:43:47 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_013.d

Injection Date: 28-Aug-2018 11:20:48 Instrument ID: A9

Lims ID: ICV Full

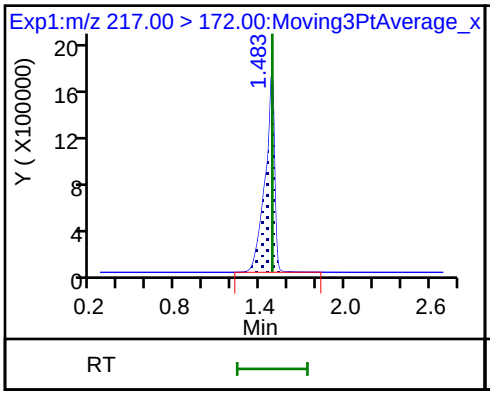
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 17 Worklist Smp#: 10

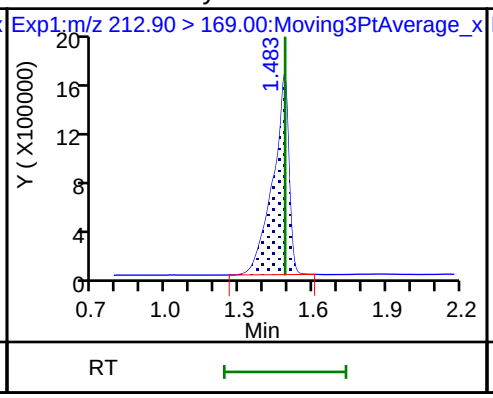
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

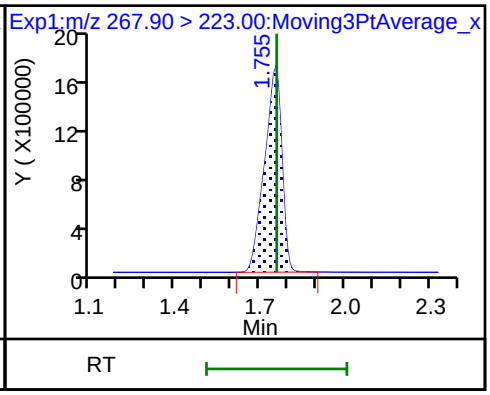
D 1 13C4 PFBA



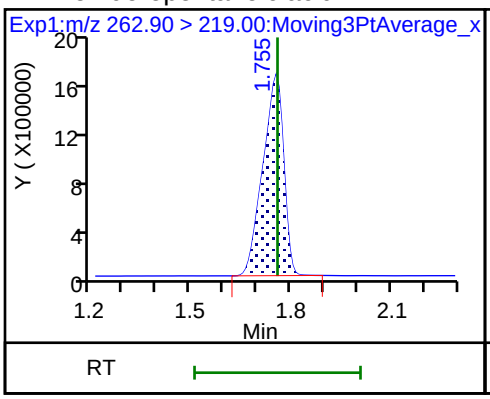
2 Perfluorobutyric acid



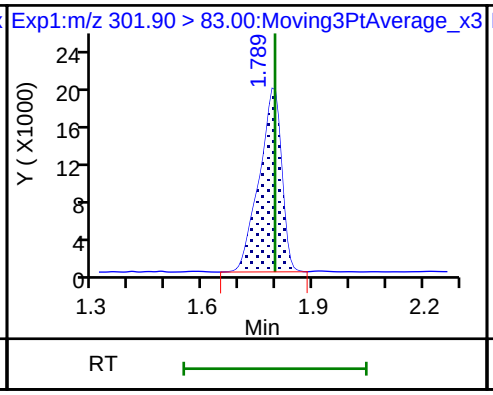
D 3 13C5-PFPeA



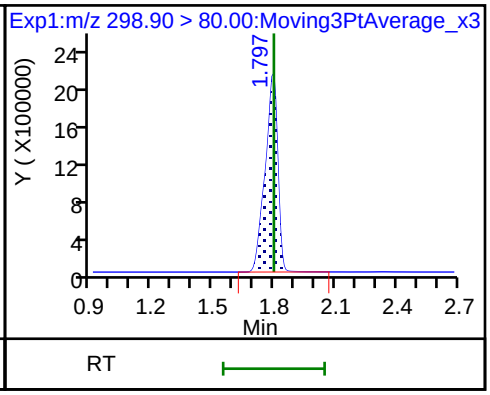
4 Perfluoropentanoic acid



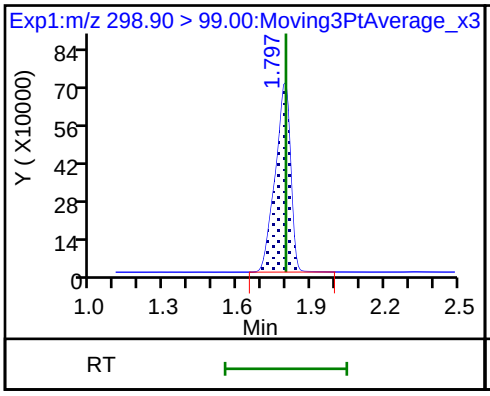
D 47 13C3-PFBS



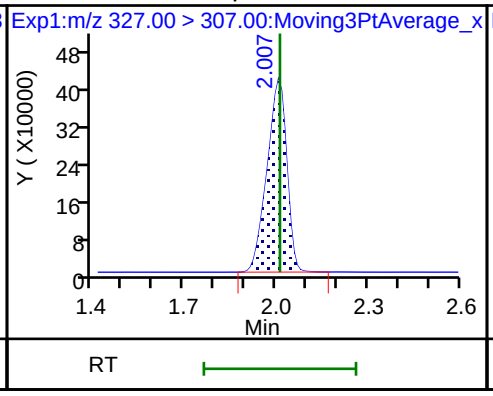
5 Perfluorobutanesulfonic acid



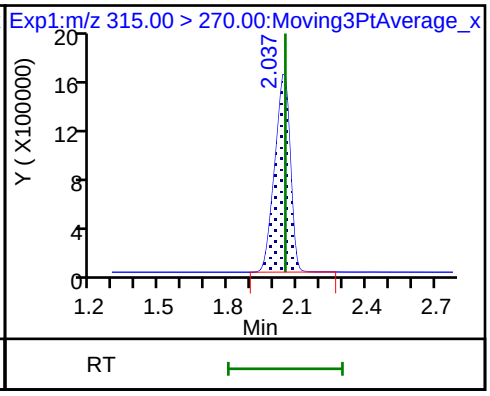
5 Perfluorobutanesulfonic acid



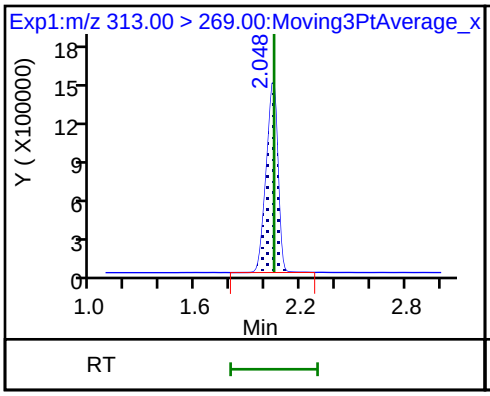
61 1H,1H,2H,2H-perfluorohexanesulfon



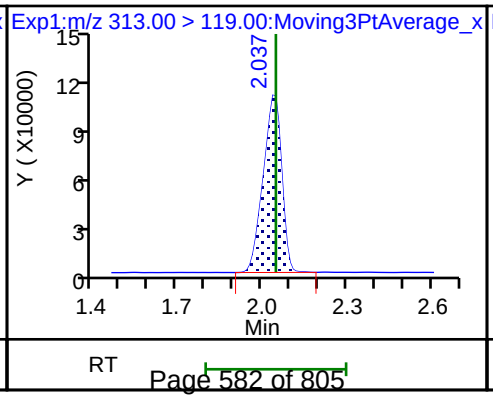
D 7 13C2 PFHxA



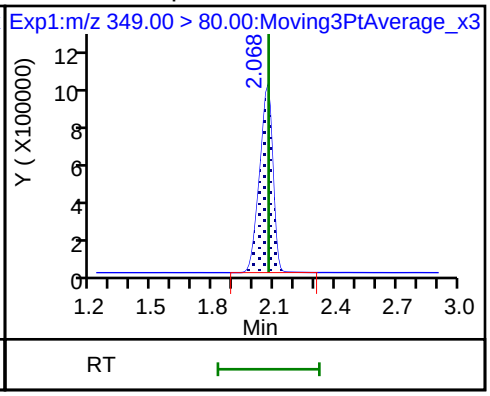
6 Perfluorohexanoic acid



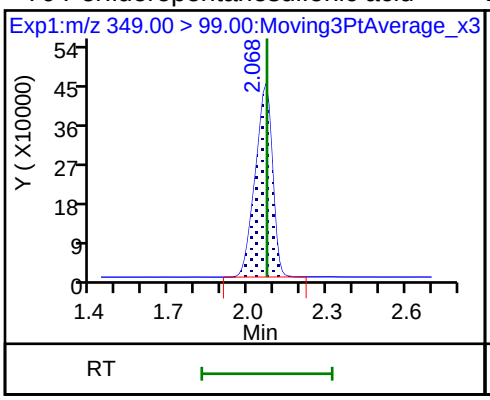
6 Perfluorohexanoic acid



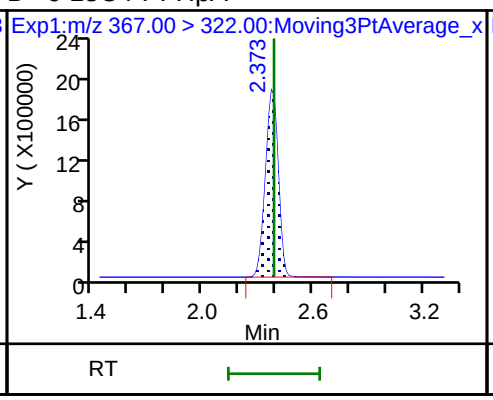
70 Perfluoropentanesulfonic acid



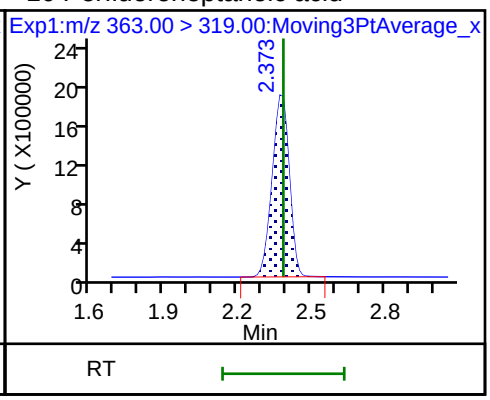
70 Perfluoropentanesulfonic acid



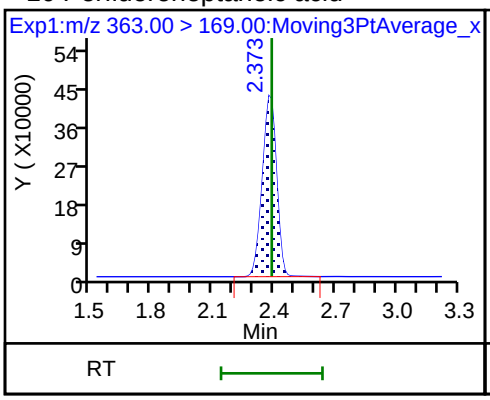
D 9 13C4-PFHpA



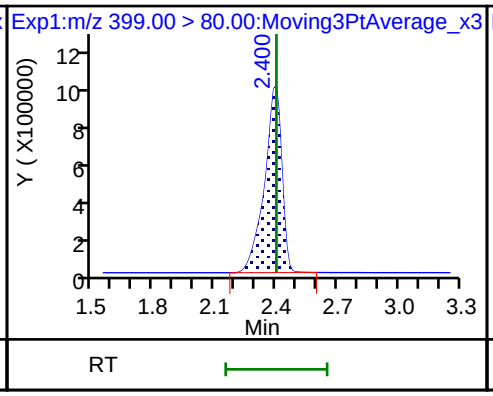
10 Perfluoroheptanoic acid



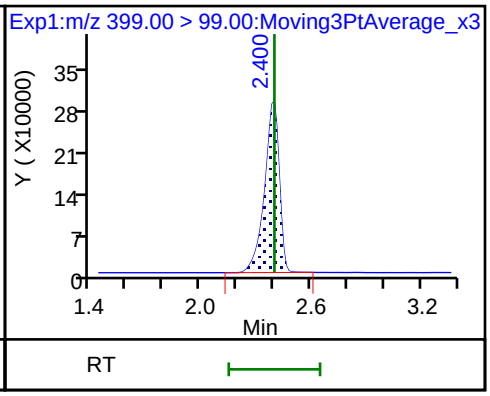
10 Perfluoroheptanoic acid



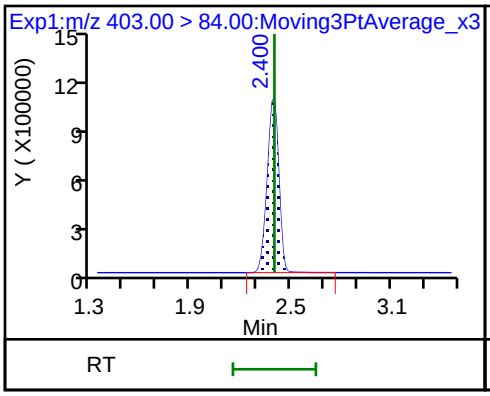
8 Perfluorohexanesulfonic acid



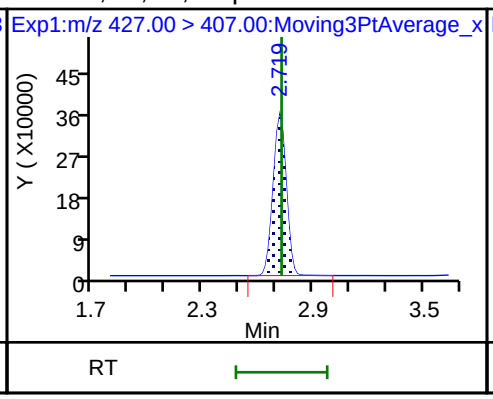
8 Perfluorohexanesulfonic acid



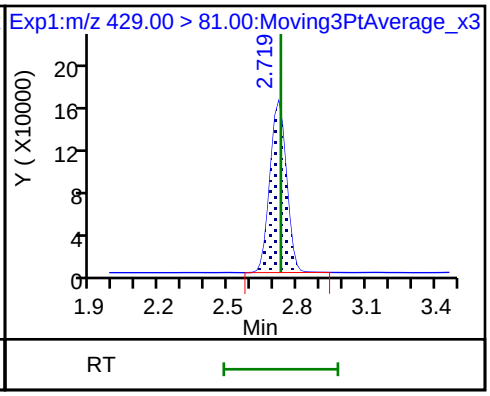
D 11 18O2 PFHxS



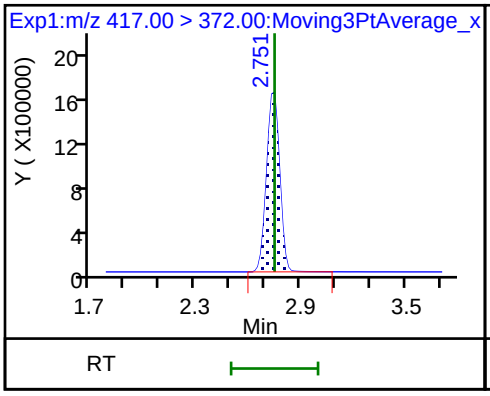
13 1H,1H,2H,2H-perfluorooctanesulfon



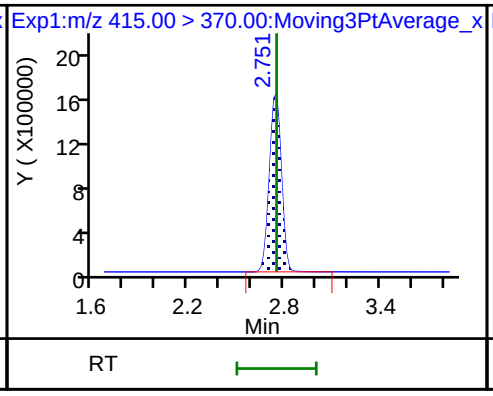
D 12 M2-6:2FTS



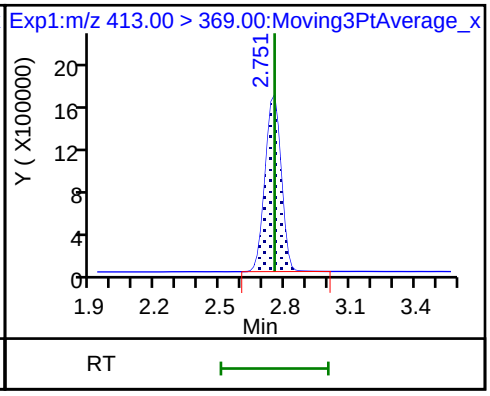
D 14 13C4 PFOA



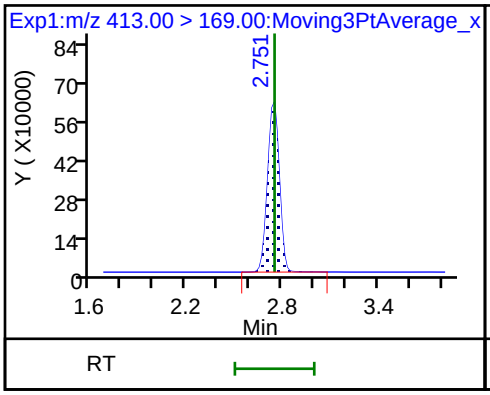
* 62 13C2-PFOA



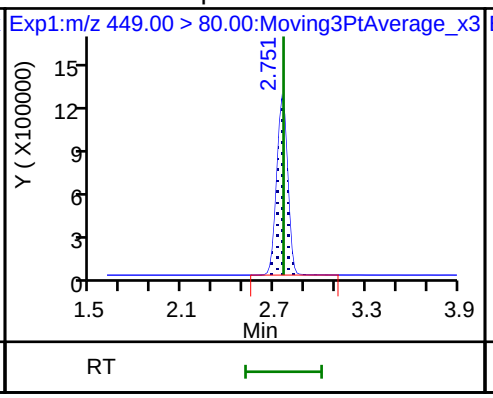
15 Perfluorooctanoic acid



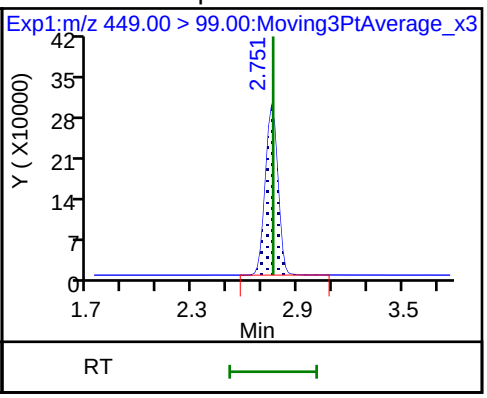
15 Perfluorooctanoic acid



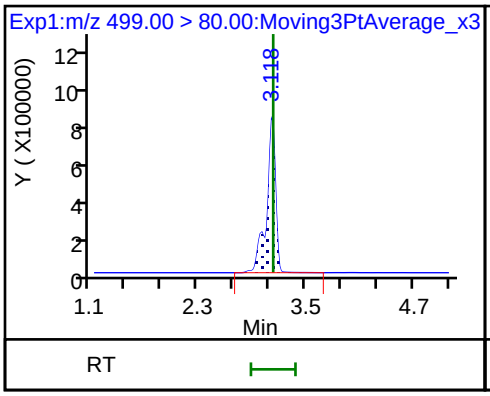
16 Perfluoroheptanesulfonic acid



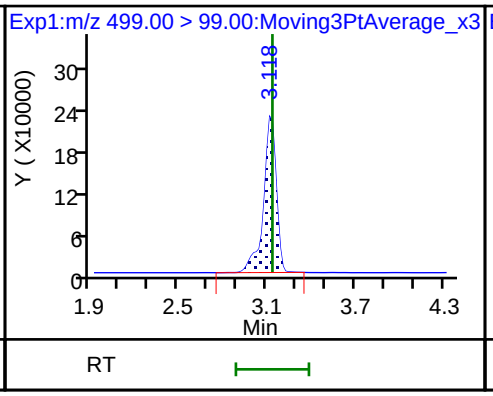
16 Perfluoroheptanesulfonic acid



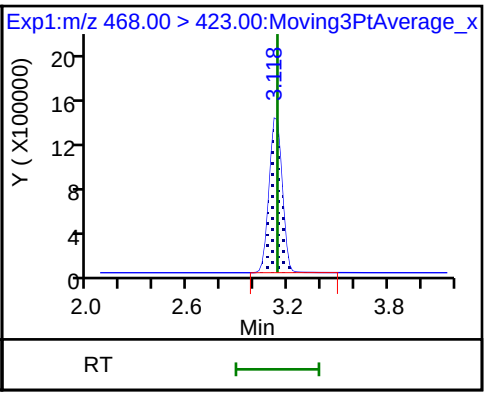
17 Perfluorooctane sulfonic acid



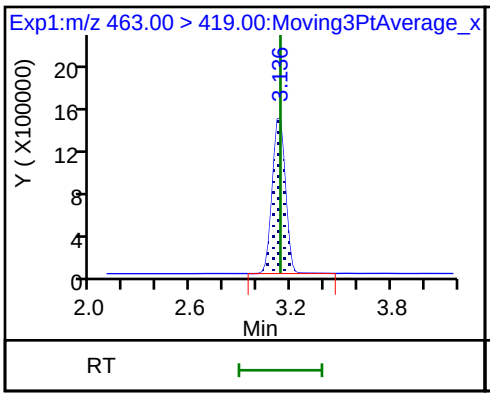
17 Perfluorooctane sulfonic acid



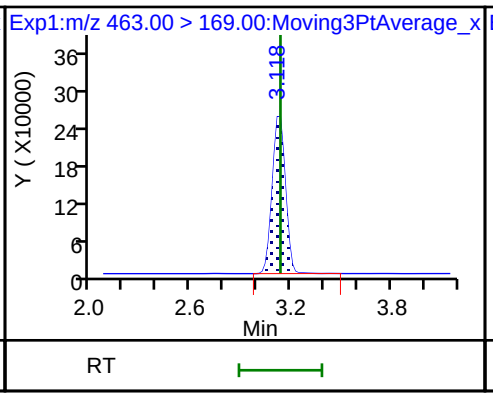
D 19 13C5 PFNA



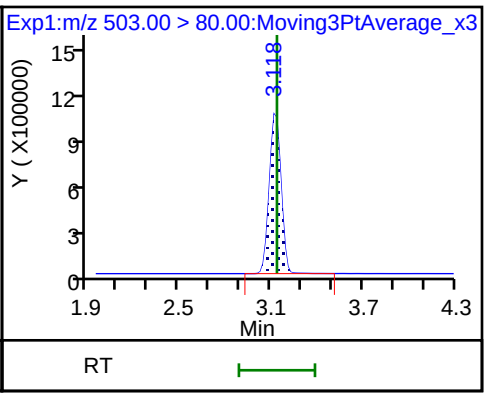
20 Perfluorononanoic acid



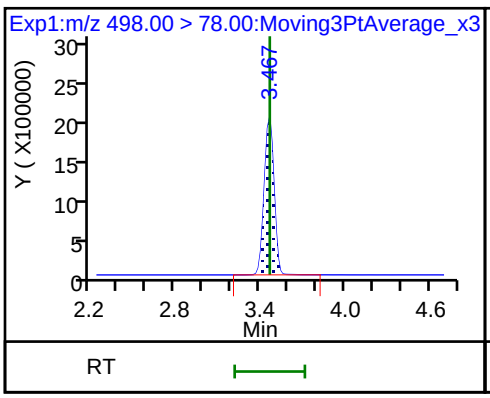
20 Perfluorononanoic acid



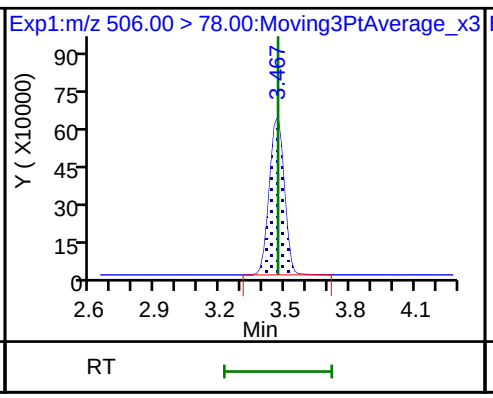
D 18 13C4 PFOS



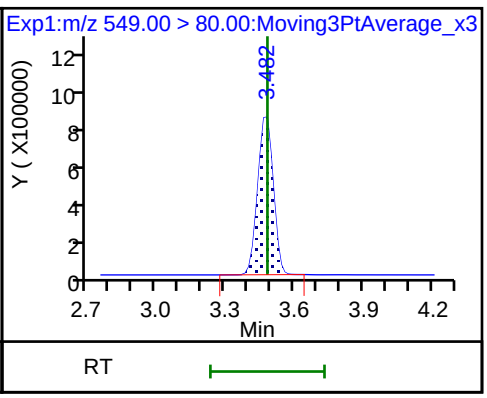
22 Perfluorooctane Sulfonamide



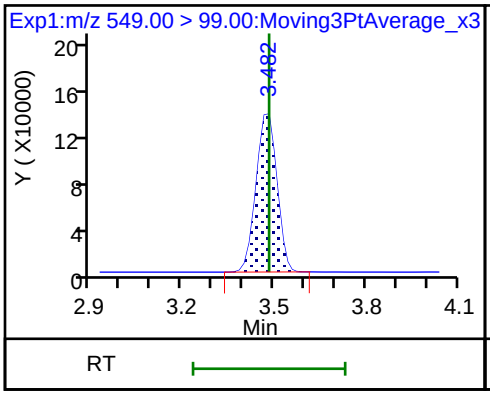
D 21 13C8 FOSA



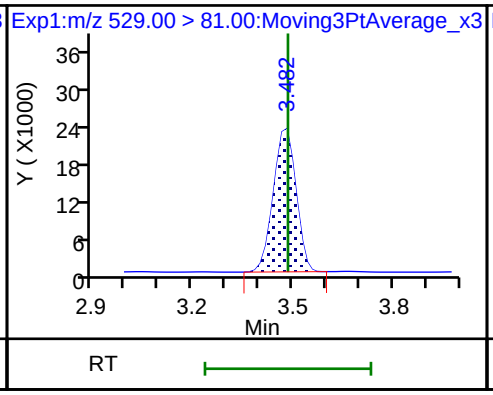
68 Perfluorononanesulfonic acid



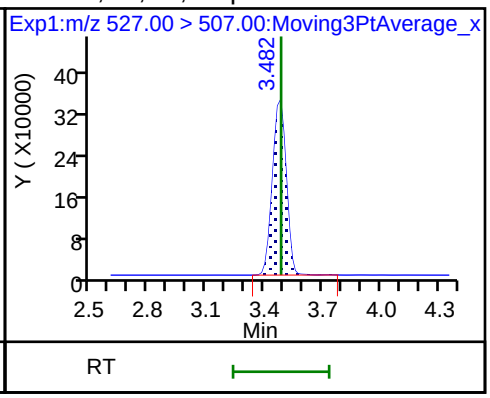
68 Perfluorononanesulfonic acid



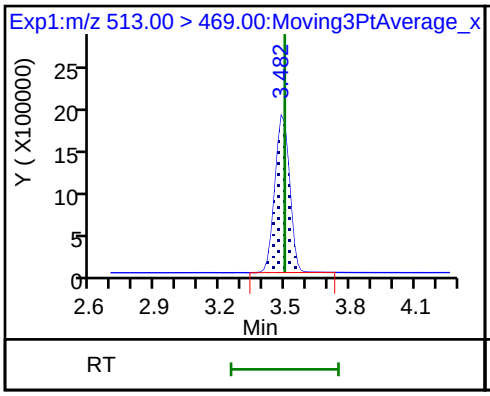
D 26 M2-8:2FTS



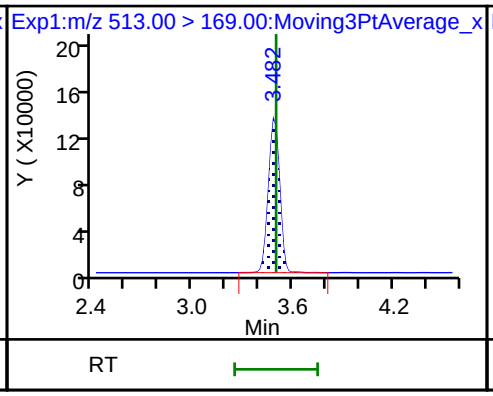
25 1H,1H,2H,2H-perfluorodecanesulfoni



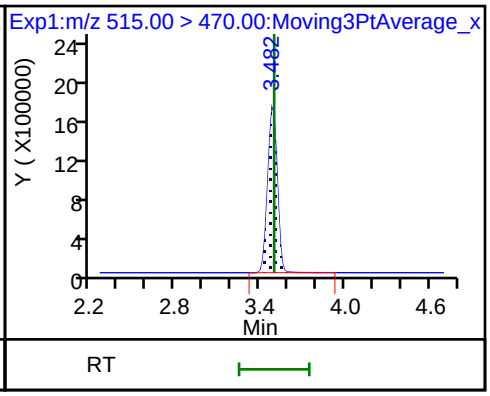
24 Perfluorodecanoic acid



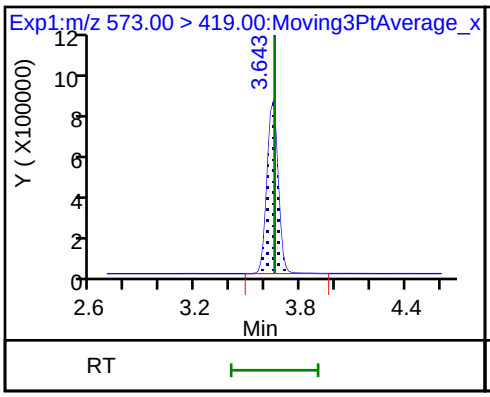
24 Perfluorodecanoic acid



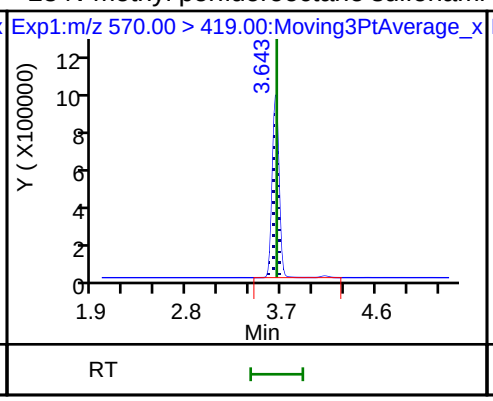
D 23 13C2 PFDA



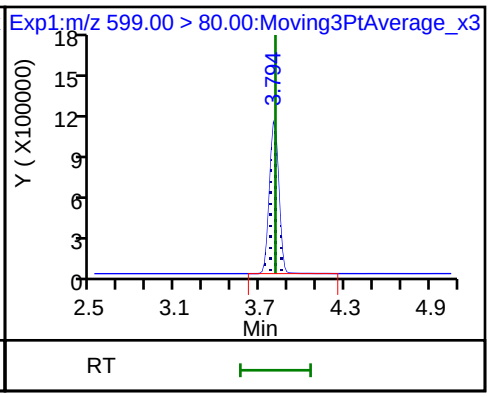
D 27 d3-NMeFOSAA



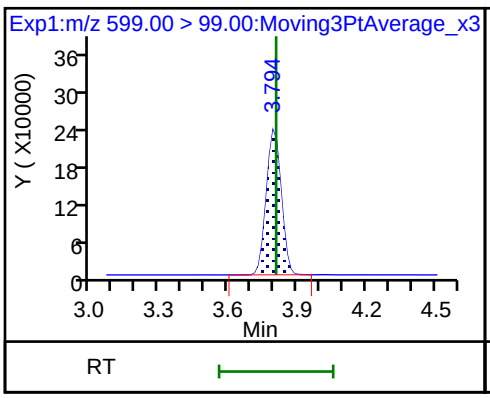
28 N-methyl perfluorooctane sulfonami



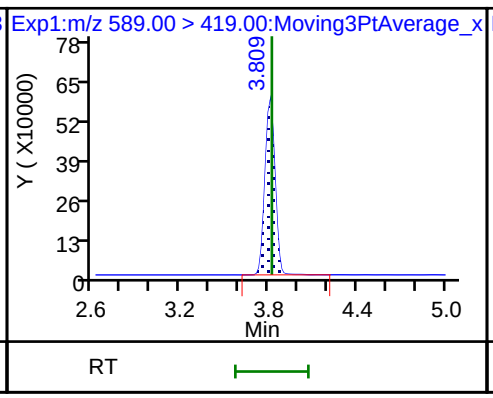
29 Perfluorodecane Sulfonic acid



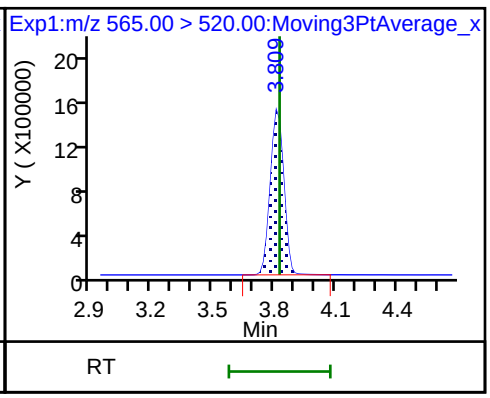
29 Perfluorodecane Sulfonic acid



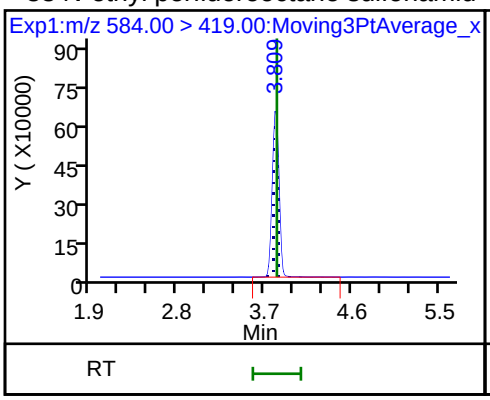
D 32 d5-NEtFOSAA



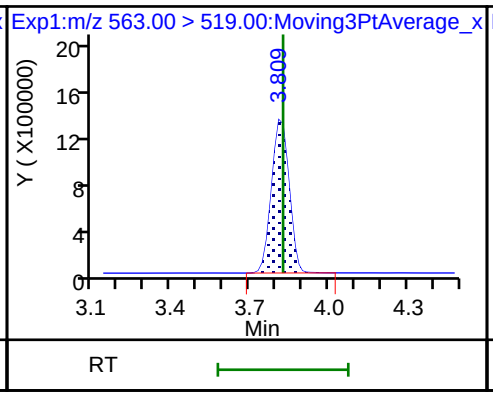
D 30 13C2 PFUnA



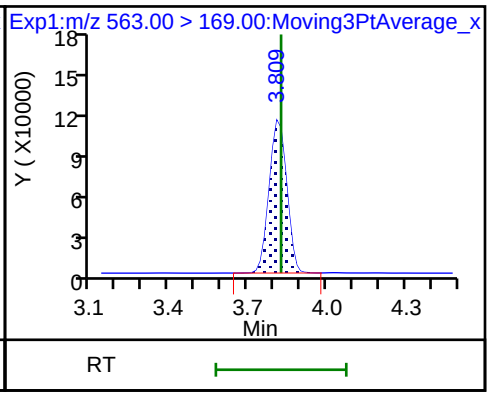
33 N-ethyl perfluorooctane sulfonamid



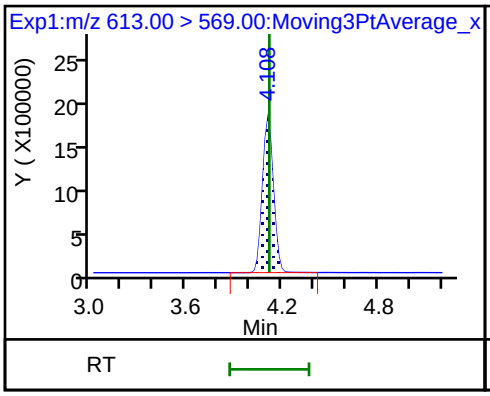
31 Perfluoroundecanoic acid



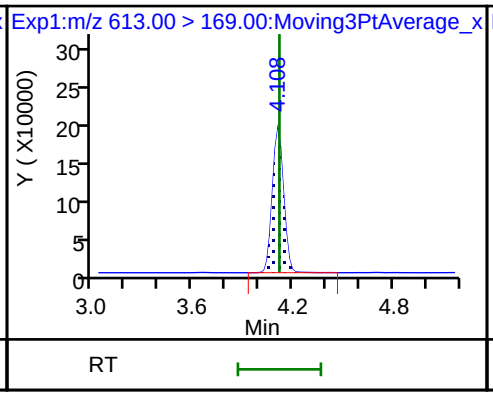
31 Perfluoroundecanoic acid



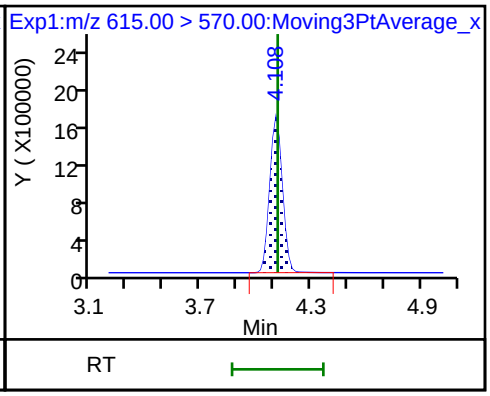
37 Perfluorododecanoic acid



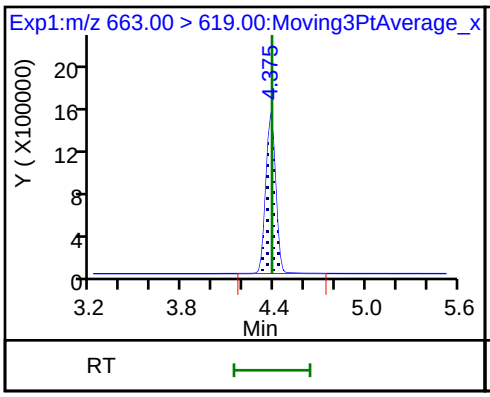
37 Perfluorododecanoic acid



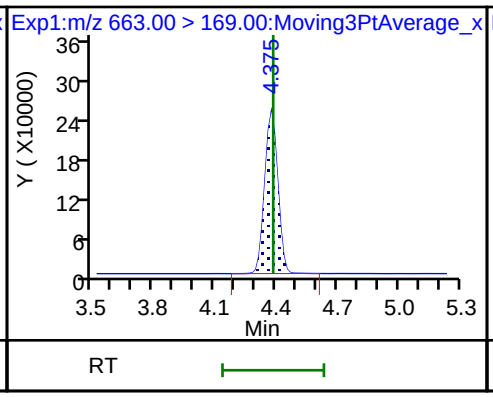
D 36 13C2 PFDoA



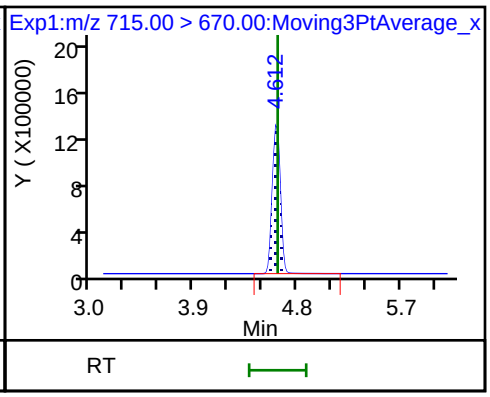
41 Perfluorotridecanoic acid



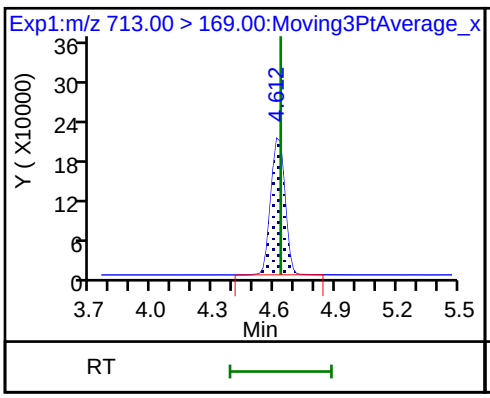
41 Perfluorotridecanoic acid



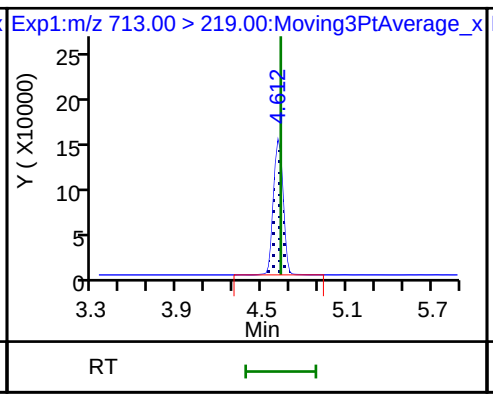
D 43 13C2-PFTeDA



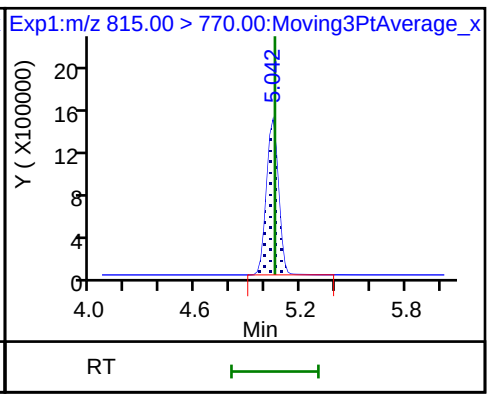
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCVL 320-245884/3 Calibration Date: 09/16/2018 14:01

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_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	0.9128	0.9885		0.0541	0.0500	8.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.056		0.0520	0.0500	4.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	106.1		0.0446	0.0442	1.0	30.0
4:2 FTS	AveID	21.61	21.36		0.400	0.0467	-1.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9297		0.0510	0.0500	2.1	30.0
Perfluoropentanesulfonic acid	AveID	49.87	49.34		0.0464	0.0469	-1.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.186		0.0581	0.0500	16.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.179		0.0434	0.0455	-4.7	30.0
6:2 FTS	AveID	2.140	2.231		0.400	0.0474	4.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.169		0.0544	0.0501	8.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	0.9404		0.0455	0.0476	-4.5	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.007		0.0515	0.0500	3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.070		0.0471	0.0464	1.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	2.716		0.0458	0.0500	-8.4	30.0
8:2 FTS	AveID	15.14	15.67		0.400	0.0479	3.5	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7432		0.0552	0.0480	15.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.344		0.0590	0.0500	18.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.078		0.400	0.0500	8.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8003		0.0474	0.0482	-1.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9576		0.0515	0.0500	3.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	1.058		0.0590	0.0500	18.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.150		0.0571	0.0500	14.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.7745		0.0483	0.0500	-3.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1695		0.0525	0.0500	5.0	30.0
13C4 PFBA	Ave	0.9623	0.9434		2.45	2.50	-2.0	30.0
13C5 PFPeA	Ave	0.8584	0.8307		2.42	2.50	-3.2	30.0
13C3-PFBS	Ave	0.0113	0.0109		2.25	2.33	-3.2	30.0
13C2 PFHxA	Ave	0.9075	0.8946		2.46	2.50	-1.4	30.0
13C4-PFHpA	Ave	1.082	1.136		2.63	2.50	5.0	30.0
18O2 PFHxS	Ave	0.6655	0.7455		2.65	2.37	12.0	30.0
M2-6:2FTS	Ave	0.1063	0.1116		2.49	2.38	4.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCVL 320-245884/3 Calibration Date: 09/16/2018 14:01

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	1.046		2.59	2.50	3.8	30.0
13C4 PFOS	Ave	0.7151	0.7331		2.45	2.39	2.5	30.0
13C5 PFNA	Ave	0.9437	0.9426		2.50	2.50	-0.1	30.0
13C8 FOSA	Ave	0.3783	0.3755		2.48	2.50	-0.7	30.0
M2-8:2FTS	Ave	0.0156	0.0139		2.12	2.40	-11.3	30.0
13C2 PFDA	Ave	0.9426	0.9818		2.60	2.50	4.2	30.0
d3-NMeFOSAA	Ave	0.4249	0.3977		2.34	2.50	-6.4	30.0
13C2 PFUnA	Ave	0.8023	0.7907		2.46	2.50	-1.4	30.0
d5-NEtFOSAA	Ave	0.3342	0.3450		2.58	2.50	3.2	30.0
13C2 PFDoA	Ave	0.9759	0.9499		2.43	2.50	-2.7	30.0
13C2-PFTeDA	Ave	0.7774	0.7165		2.30	2.50	-7.8	30.0
13C2-PFHxDA	Ave	0.7882	0.7107		2.25	2.50	-9.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 16-Sep-2018 14:01:24 ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 10:37:23 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 10:37:23

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	1.499	1.484	0.015	0.538	7652736	2.45		98.0	11131	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.499	1.494	0.005	1.000	151293	0.0541		108	16.2	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.781	1.756	0.025	0.639	6738087	2.42		96.8	10190	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.781	1.772	0.009	1.000	142255	0.0520		104	13.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.822	1.797	0.025	0.654	82315	2.25		96.8	405	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.822	1.814	0.008	1.000	166030	0.0446		101	116	
298.90 > 99.00	1.822	1.814	0.008	1.000	56741		2.93(1.35-4.05)		46.2	
D 60 M2-4:2FTS										
329.00 > 81.00	2.038	2.007	0.031	0.731	739533	NC			670	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.048	2.027	0.021	1.124	35323	0.0462		98.9	294	
D 7 13C2 PFHxA										
315.00 > 270.00	2.079	2.038	0.040	0.746	7256775	2.46		98.6	16661	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.079	2.068	0.010	1.000	134928	0.0510		102	30.2	
313.00 > 119.00	2.079	2.068	0.010	1.000	8969		15.04(6.96-20.87)		22.3	M
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.109	2.099	0.010	1.157	81921	0.0464		98.9	186	
349.00 > 99.00	2.109	2.099	0.010	1.157	37741		2.17(1.15-3.45)		75.3	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.181	2.140	0.041	0.782	925733	NC			2338	

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	2.181	2.170	0.011	1.000	27815	NC			13.4	
D 9 13C4-PFHpA										
367.00 > 322.00	2.426	2.360	0.066	0.870	9217490	2.63		105	11582	
D 11 18O2 PFHxS										
403.00 > 84.00	2.439	2.387	0.052	0.875	5720725	2.65		112	9215	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.426	2.412	0.014	1.000	218588	0.0581		116	29.5	
363.00 > 169.00	2.426	2.412	0.014	1.000	49772		4.39(2.17-6.52)		76.4	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.439	2.426	0.013	1.000	129770	0.0434		95.3	150	
399.00 > 99.00	2.426	2.426	0.0	0.995	37124		3.50(1.90-5.70)		36.7	M
76 DONA										
377.00 > 251.00	2.471	2.452	0.019	0.777	282746	NC			720	
377.00 > 85.00	2.471	2.452	0.019	0.777	124994		2.26(1.13-3.39)		62.5	
D 12 M2-6:2FTS										
429.00 > 81.00	2.772	2.703	0.069	0.994	859614	2.49		105	1284	
D 14 13C4 PFOA										
417.00 > 372.00	2.788	2.719	0.069	1.000	8483314	2.59		104	7890	
D 73 13C8 PFOA										
421.00 > 376.00	2.788	2.719	0.069		6928722	NC			10478	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.772	2.750	0.022	1.000	38268	0.0494		104	20.4	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.788	2.782	0.006	1.000	198491	0.0544		109	12.8	
413.00 > 169.00	2.788	2.782	0.006	1.000	69202		2.87(1.36-4.08)		85.5	
* 62 13C2-PFOA										
415.00 > 370.00	2.788	2.782	0.006		8111538	2.50			12151	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.804	2.782	0.022	0.882	106478	0.0455		95.5	160	
449.00 > 99.00	2.804	2.782	0.022	0.882	29132		3.66(1.84-5.53)		109	
D 72 13C8 PFOS										
507.00 > 99.00	3.179	3.081	0.098		1250137	NC			2562	
D 19 13C5 PFNA										
468.00 > 423.00	3.179	3.099	0.080	1.140	7645878	2.50		99.9	7098	
D 18 13C4 PFOS										
503.00 > 80.00	3.179	3.099	0.080	1.140	5685023	2.45		103	3688	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.179	3.171	0.008	1.000	118124	0.0471		101	140	M
499.00 > 99.00	3.179	3.171	0.008	1.000	25721		4.59(2.04-6.12)		107	
20 Perfluorononanoic acid										
463.00 > 419.00	3.179	3.171	0.008	1.000	154020	0.0515		103	20.9	
463.00 > 169.00	3.179	3.171	0.008	1.000	28897		5.33(2.68-8.03)		71.9	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.388	3.383	0.005	1.066	122513	NC			225	
D 21 13C8 FOSA										
506.00 > 78.00	3.486	3.449	0.037	1.250	3045752	2.48		99.3	3733	

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	3.531	3.449	0.082	1.266	107754	2.12		88.7	464	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.486	3.465	0.021	1.000	165437	0.0458		91.6	262	
D 23 13C2 PFDA										
515.00 > 470.00	3.545	3.465	0.080	1.272	7963754	2.60		104	11008	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.531	3.512	0.019	1.000	33775	0.0496		104	147	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.531	3.512	0.019	1.111	84854	0.0552		115	325	
549.00 > 99.00	3.531	3.512	0.019	1.111	13868		6.12(3.02-9.05)		82.1	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.545	3.527	0.018	1.000	214108	0.0590		118	45.5	
513.00 > 169.00	3.545	3.527	0.018	1.000	15596		13.73(7.12-21.35)		39.5	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.701	3.613	0.088	1.328	3226128	2.34		93.6	4582	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.701	3.682	0.019	1.000	69534	0.0542		108	27.3	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.874	3.776	0.098	1.389	2798724	2.58		103	3109	
D 30 13C2 PFUnA										
565.00 > 520.00	3.874	3.792	0.082	1.389	6413636	2.46		98.6	6202	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.859	3.839	0.020	1.214	91756	0.0474		98.4	187	
599.00 > 99.00	3.859	3.839	0.020	1.214	20550		4.47(2.14-6.43)		105	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.874	3.869	0.005	1.000	53602	0.0515		103	102	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.874	3.869	0.005	1.000	135750	0.0590		118	33.0	
563.00 > 169.00	3.874	3.869	0.005	1.000	13723		9.89(5.24-15.72)		61.4	
35 MeFOSA										
512.00 > 169.00	3.964	3.944	0.020		36836	NC			120	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.044	4.023	0.021	1.272	148144	NC			469	
D 36 13C2 PFDoA										
615.00 > 570.00	4.180	4.073	0.107	1.499	7705497	2.43		97.3	8942	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.143	4.139	0.004		35949	NC			68.2	
74 1H,1H,2H,2H-perfluorododecanesulfo										M
627.00 > 607.00	4.180	4.157	0.023	1.184	24346	NC			22.9	M
37 Perfluorododecanoic acid										
613.00 > 569.00	4.180	4.157	0.023	1.000	177292	0.0571		114	47.9	
613.00 > 169.00	4.180	4.157	0.023	1.000	17734		10.00(4.68-14.05)		25.1	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.423	4.403	0.020	1.391	8706	NC			20.0	
699.00 > 99.00	4.423	4.403	0.020	1.391	17400		0.50(0.28-0.83)		52.3	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										M
663.00 > 619.00	4.454	4.434	0.020	1.066	119350	0.0483		96.5	54.9	
663.00 > 169.00	4.454	4.434	0.020	1.066	19403		6.15(3.09-9.27)		41.2	M
D 43 13C2-PFTeDA										
715.00 > 670.00	4.697	4.573	0.124	1.685	5812190	2.30		92.2	10033	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.697	4.675	0.022	1.000	19705	0.0525		105	79.7	
713.00 > 219.00	4.697	4.675	0.022	1.000	13682		1.44(0.70-2.09)		33.3	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.130	5.007	0.123	1.840	5764856	2.25		90.2	6704	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.130	5.108	0.022	1.000	173195	NC			63.8	
813.00 > 169.00	5.130	5.108	0.022	1.000	29455		5.88(2.77-8.32)		51.6	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.508	5.491	0.017	1.074	70563	NC			35.5	
913.00 > 169.00	5.508	5.491	0.017	1.074	12915		5.46(2.55-7.64)		55.2	

QC Flag Legend

Processing Flags
NC - Not Calibrated
Review Flags
M - Manually Integrated

Reagents:

LCPFC_LL2_00009 Amount Added: 1.00 Units: mL

Report Date: 17-Sep-2018 10:37:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_005.d

Injection Date: 16-Sep-2018 14:01:24 Instrument ID: A9

Lims ID: CCVL

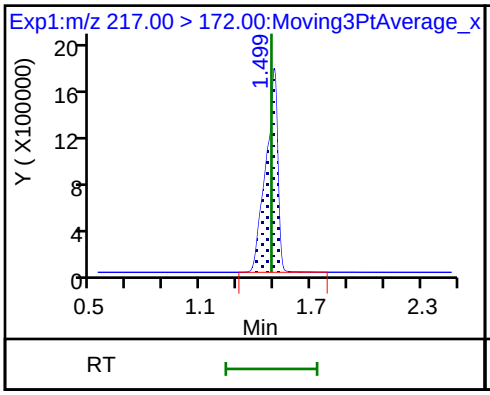
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3

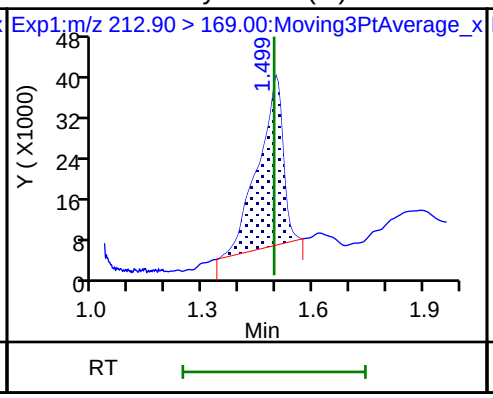
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

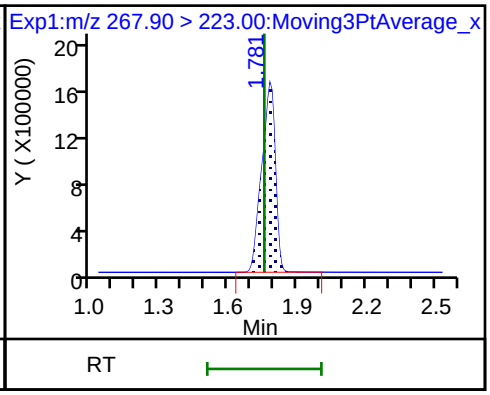
D 1 13C4 PFBA



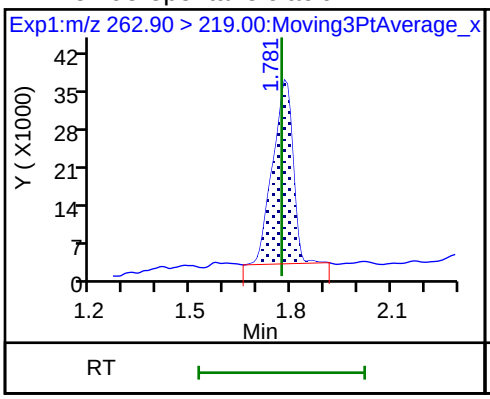
2 Perfluorobutyric acid (M)



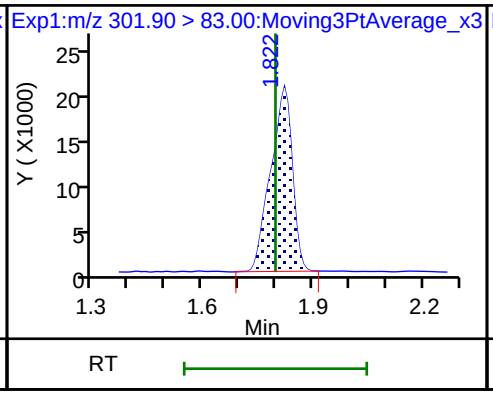
D 3 13C5-PFPeA



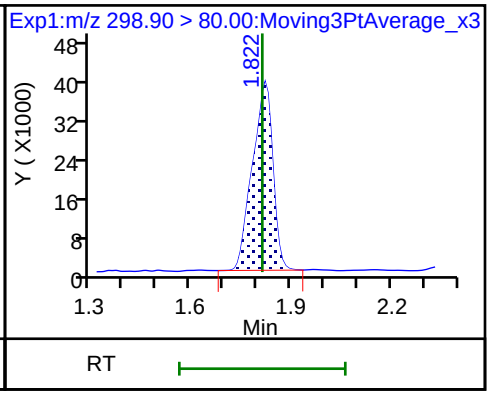
4 Perfluoropentanoic acid



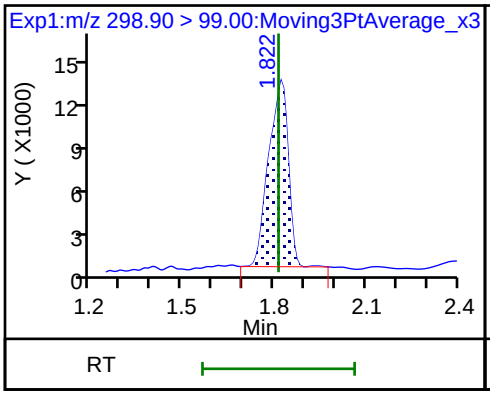
D 47 13C3-PFBS



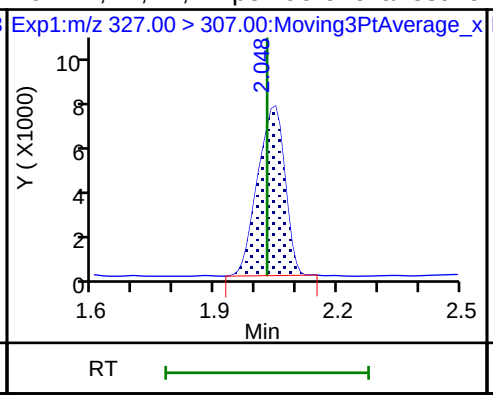
5 Perfluorobutanesulfonic acid



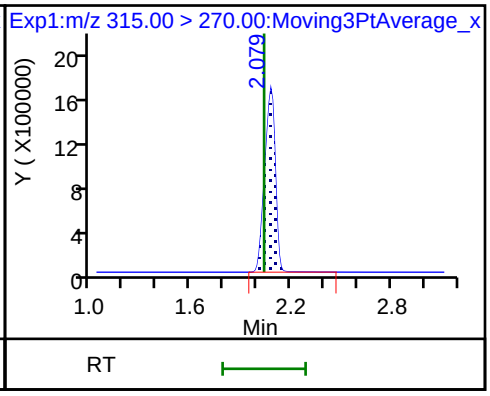
5 Perfluorobutanesulfonic acid



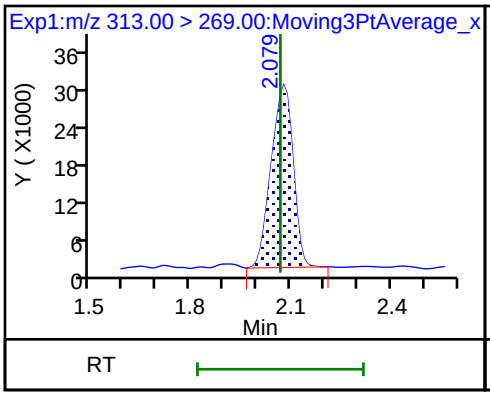
61 1H,1H,2H,2H-perfluorohexanesulfon



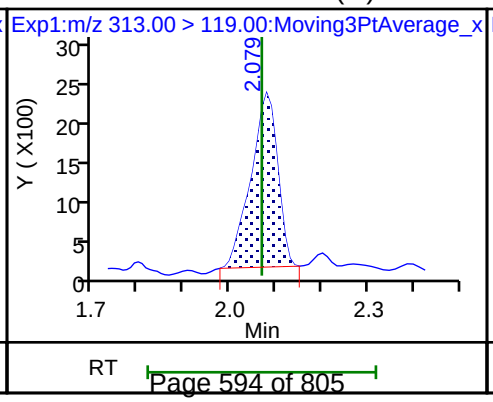
D 7 13C2 PFHxA



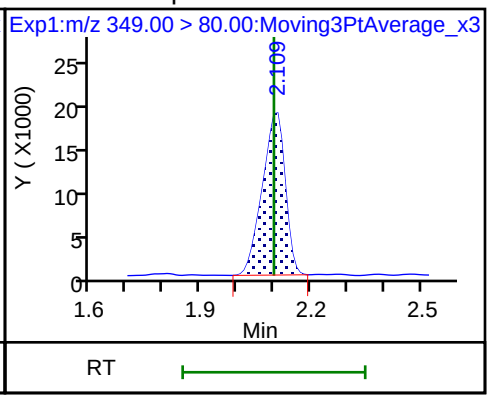
6 Perfluorohexanoic acid



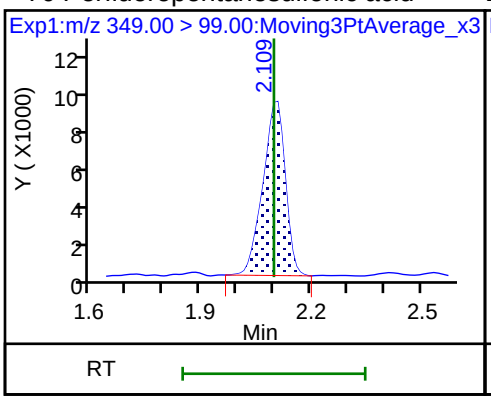
6 Perfluorohexanoic acid (M)



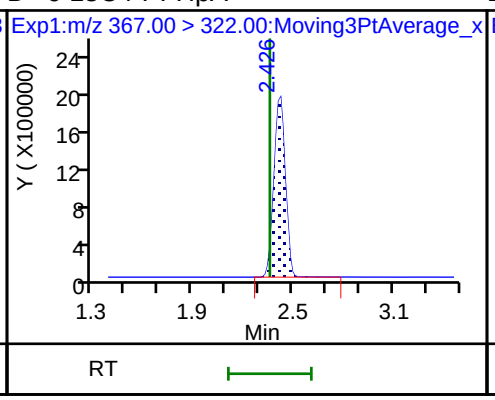
70 Perfluoropentanesulfonic acid



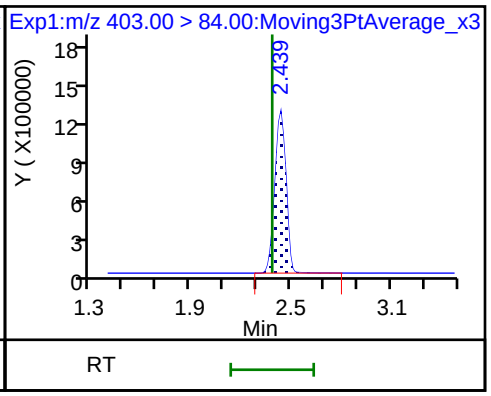
70 Perfluoropentanesulfonic acid



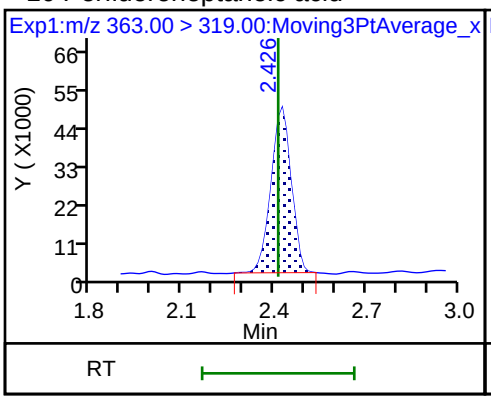
D 9 13C4-PFHpA



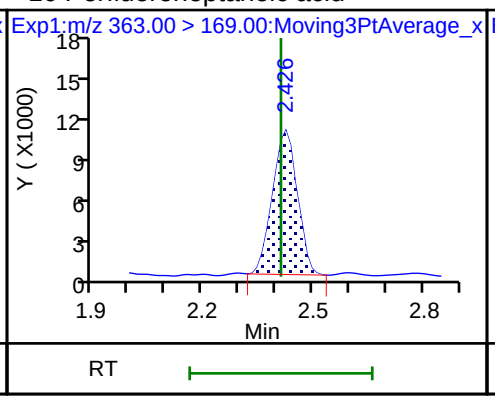
D 11 18O2 PFHxS



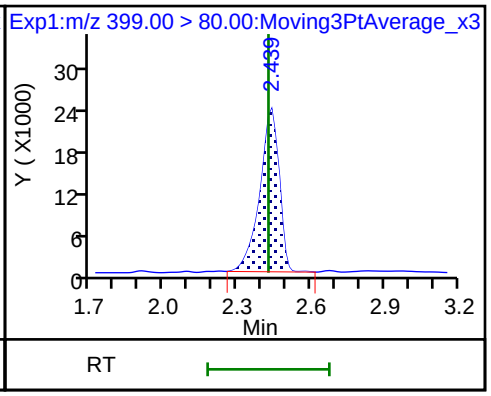
10 Perfluoroheptanoic acid



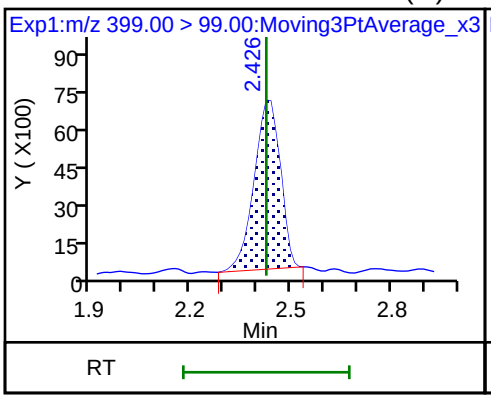
10 Perfluoroheptanoic acid



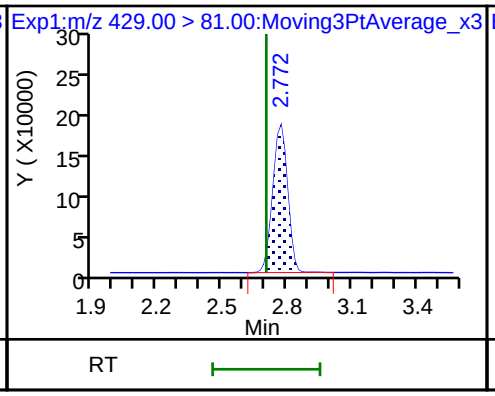
8 Perfluorohexanesulfonic acid



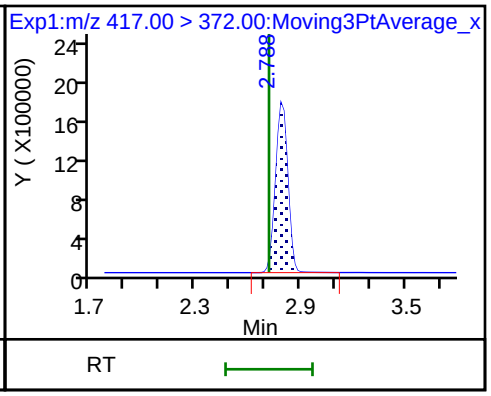
8 Perfluorohexanesulfonic acid (M)



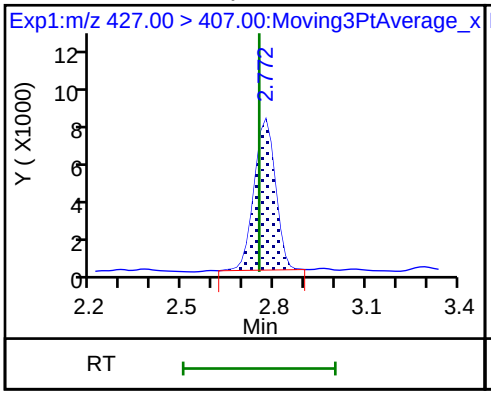
D 12 M2-6:2FTS



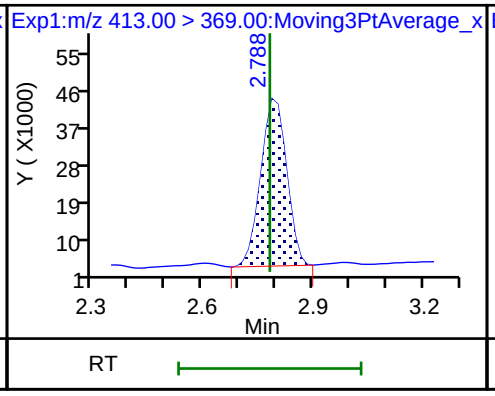
D 14 13C4 PFOA



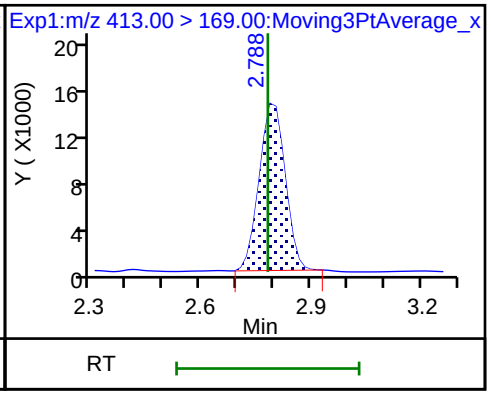
13 1H,1H,2H,2H-perfluorooctanesulfoni



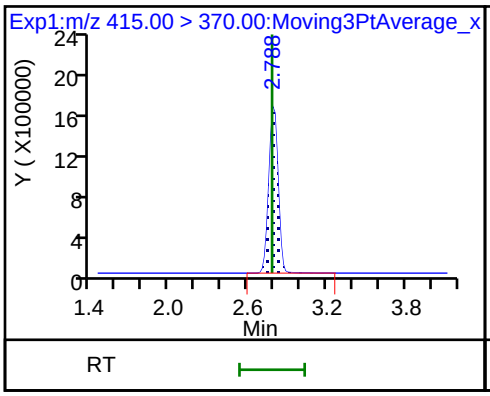
15 Perfluorooctanoic acid



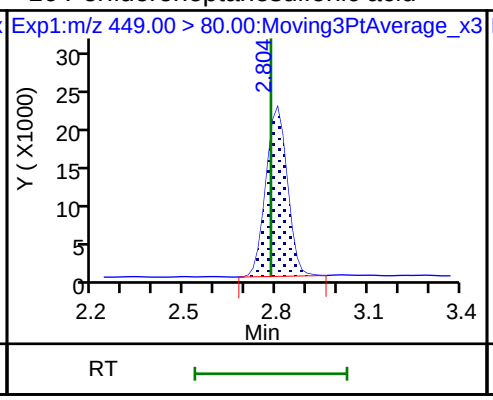
15 Perfluorooctanoic acid



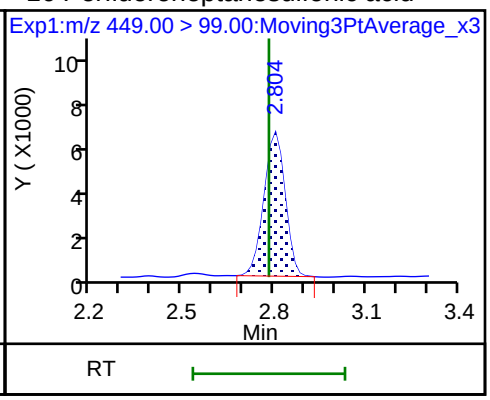
* 62 13C2-PFOA



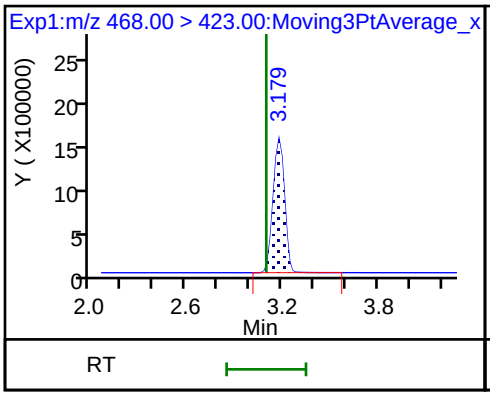
16 Perfluoroheptanesulfonic acid



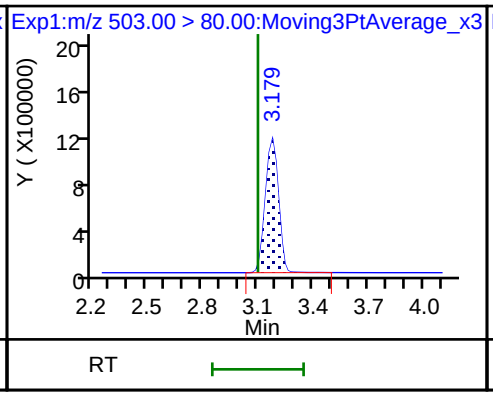
16 Perfluoroheptanesulfonic acid



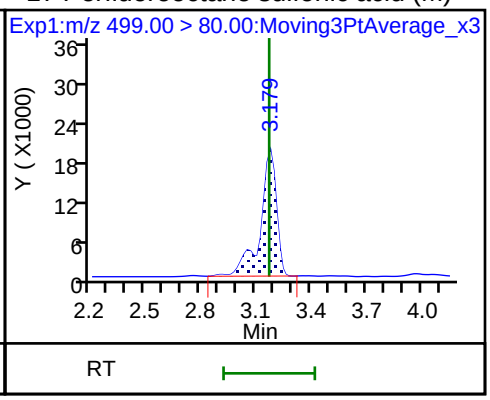
D 19 13C5 PFNA



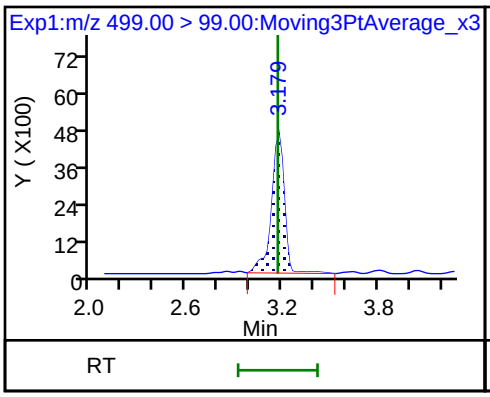
D 18 13C4 PFOS



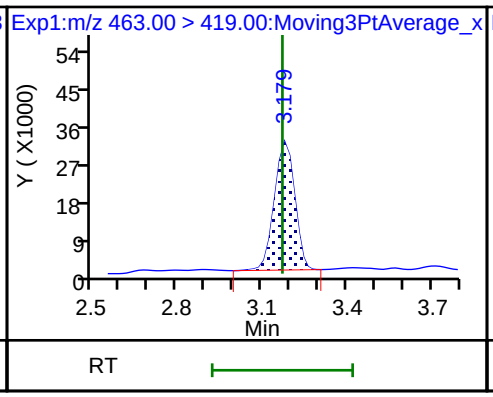
17 Perfluorooctane sulfonic acid (M)



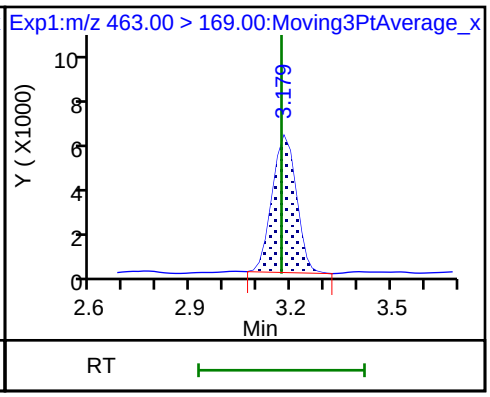
17 Perfluorooctane sulfonic acid



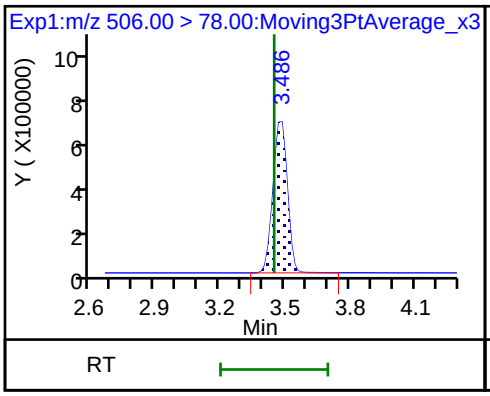
20 Perfluorononanoic acid



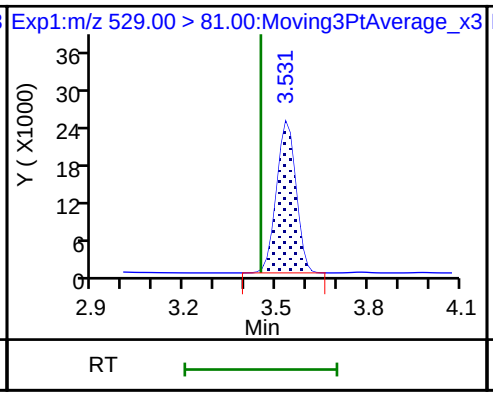
20 Perfluorononanoic acid



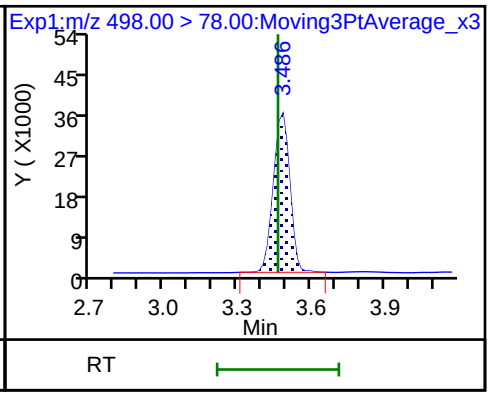
D 21 13C8 FOSA



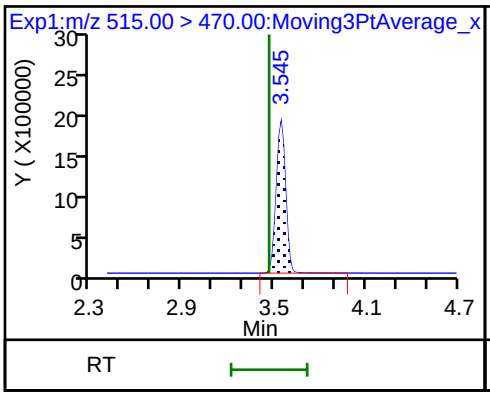
D 26 M2-8:2FTS



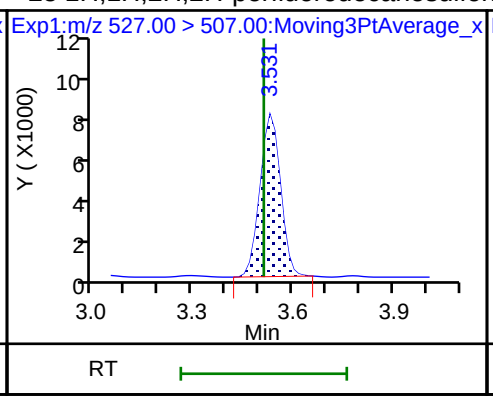
22 Perfluorooctane Sulfonamide



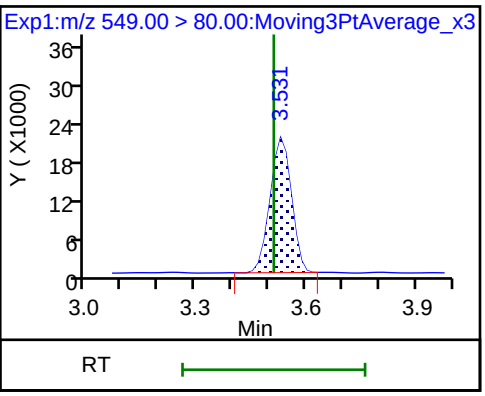
D 23 13C2 PFDA



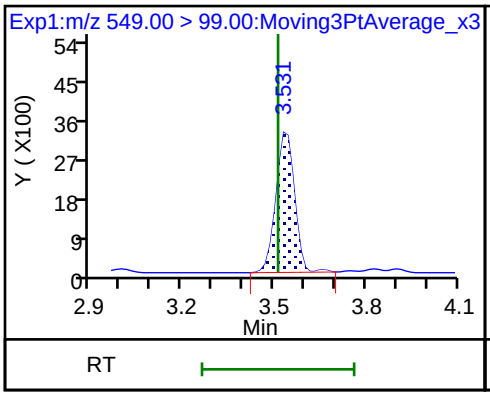
25 1H,1H,2H,2H-perfluorodecanesulfoni



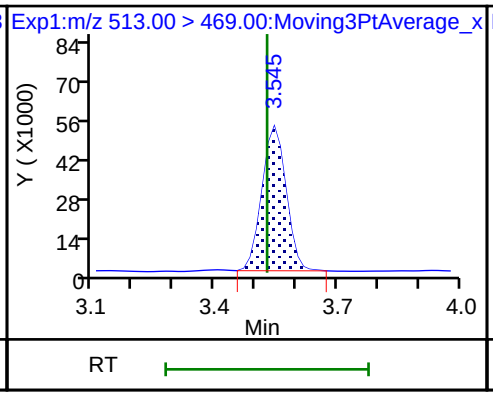
68 Perfluorononanesulfonic acid



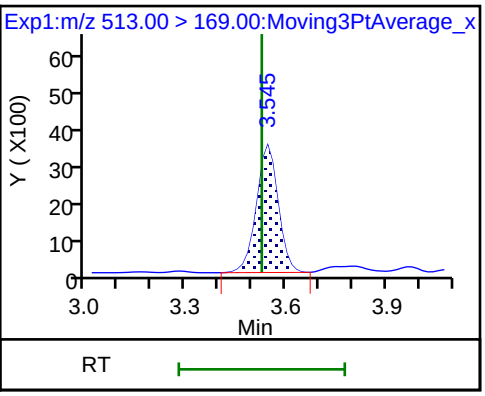
68 Perfluorononanesulfonic acid



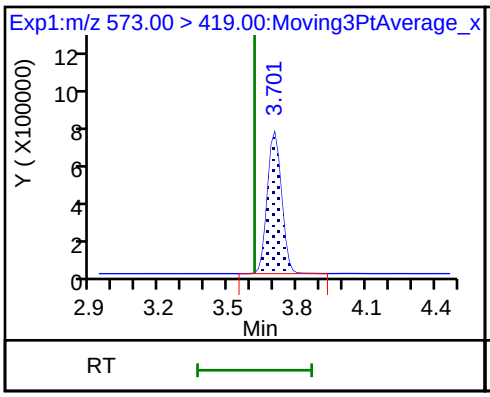
24 Perfluorodecanoic acid



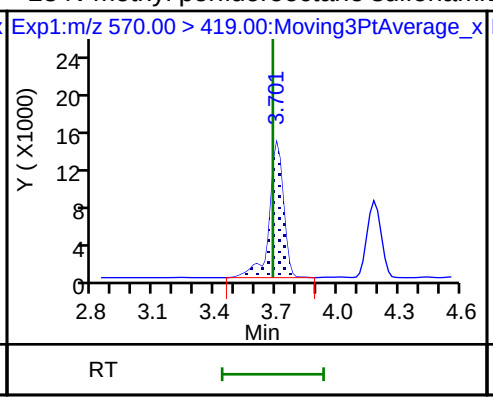
24 Perfluorodecanoic acid



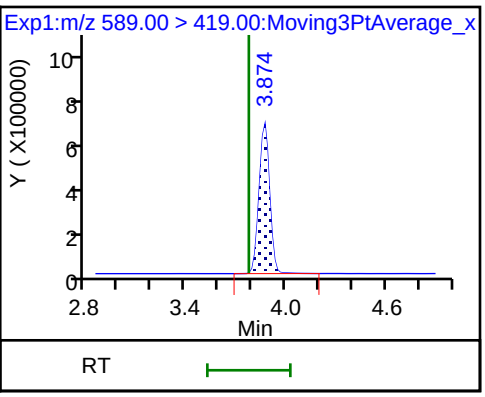
D 27 d3-NMeFOSAA



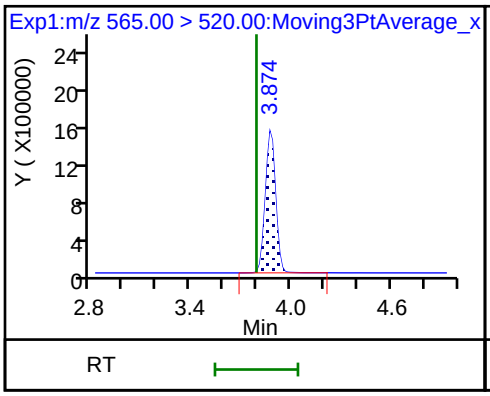
28 N-methyl perfluorooctane sulfonami



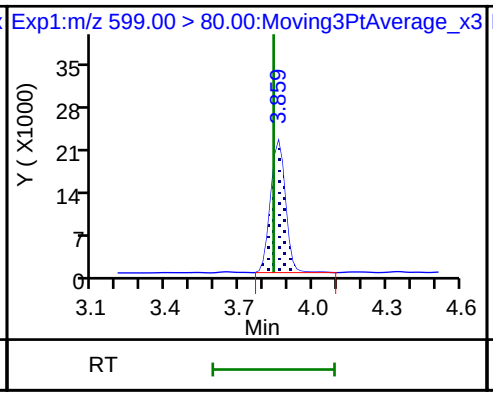
D 32 d5-NEtFOSAA



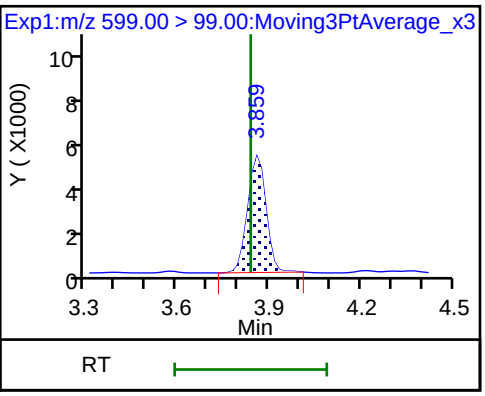
D 30 13C2 PFUnA



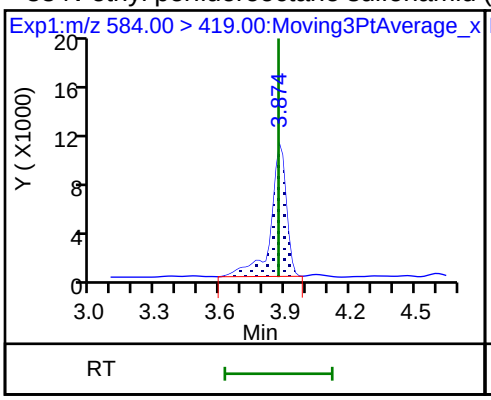
29 Perfluorodecane Sulfonic acid



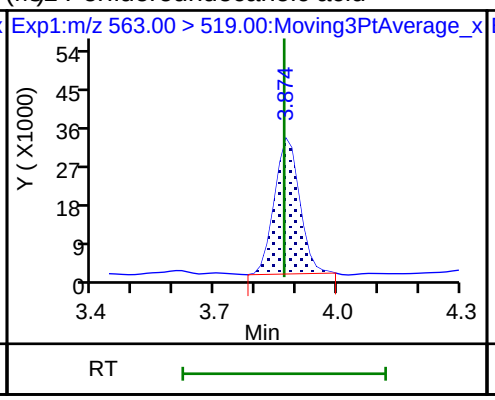
29 Perfluorodecane Sulfonic acid



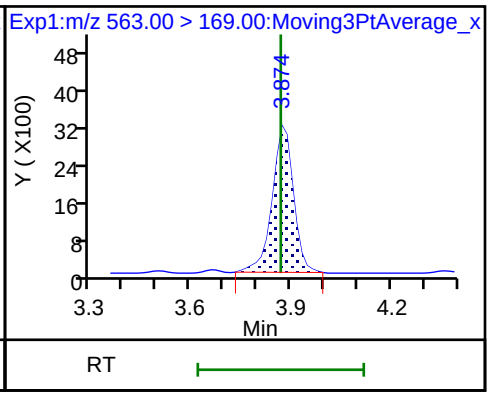
33 N-ethyl perfluorooctane sulfonamid (M)



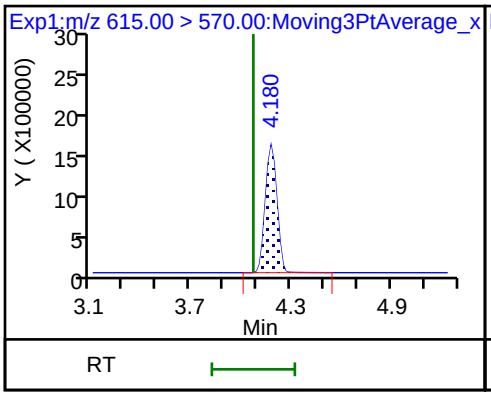
31 Perfluoroundecanoic acid



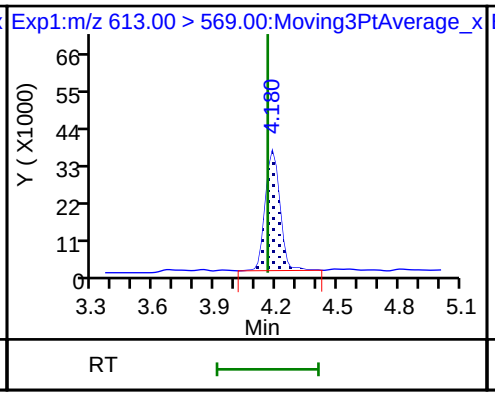
31 Perfluoroundecanoic acid



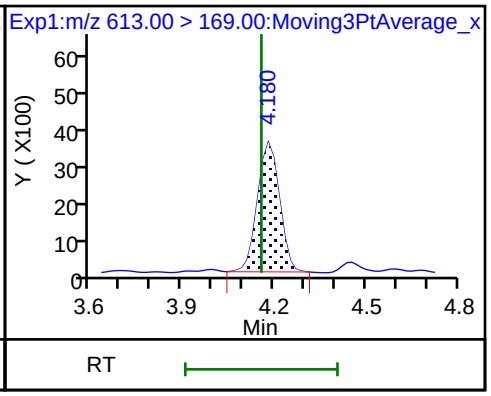
D 36 13C2 PFDoA



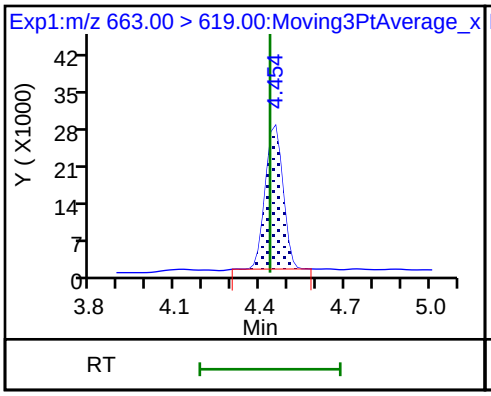
37 Perfluorododecanoic acid



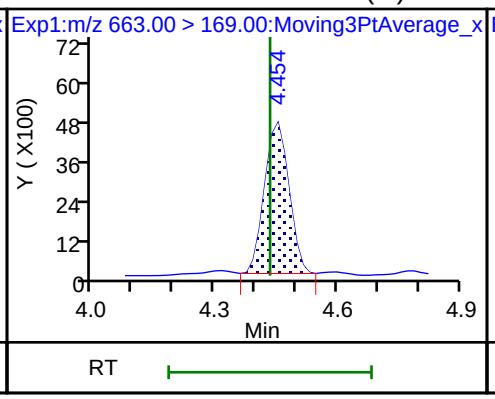
37 Perfluorododecanoic acid



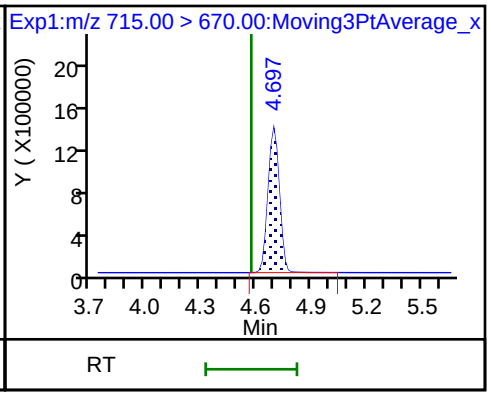
41 Perfluorotridecanoic acid



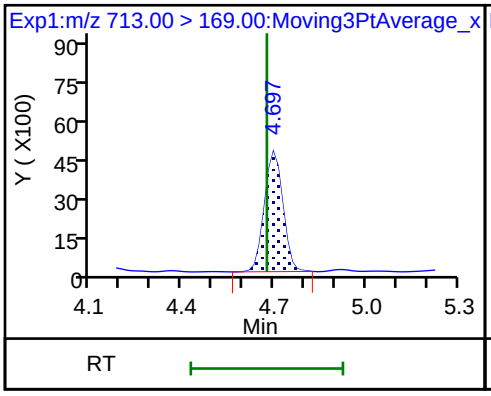
41 Perfluorotridecanoic acid (M)



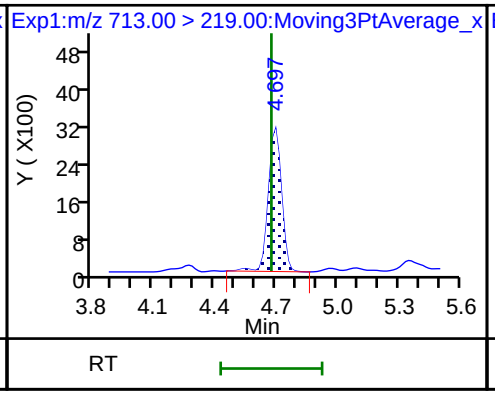
D 43 13C2-PFTeDA



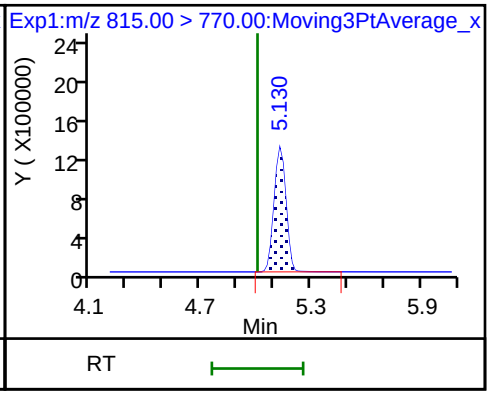
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

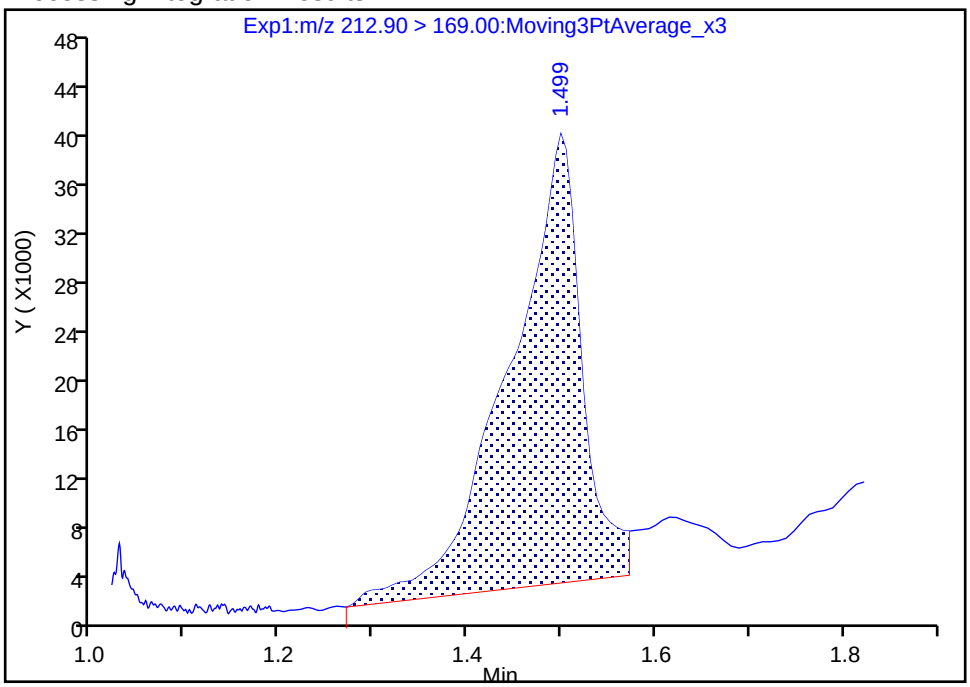
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_005.d
Injection Date: 16-Sep-2018 14:01:24 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

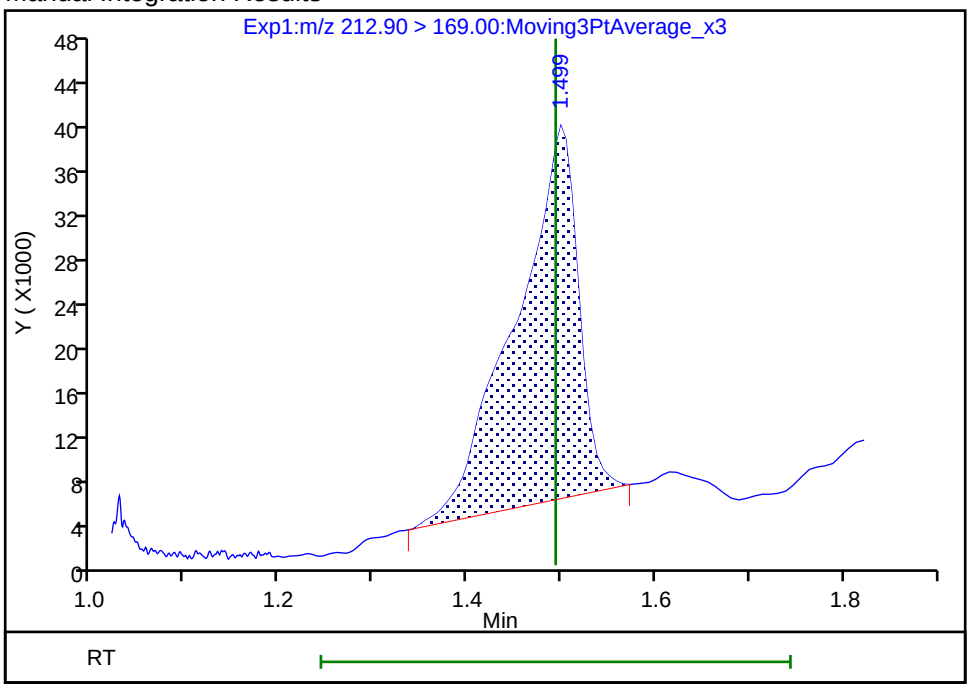
Processing Integration Results

RT: 1.50
Area: 190364
Amount: 0.068128
Amount Units: ng/ml



Manual Integration Results

RT: 1.50
Area: 151293
Amount: 0.054145
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:36:02
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

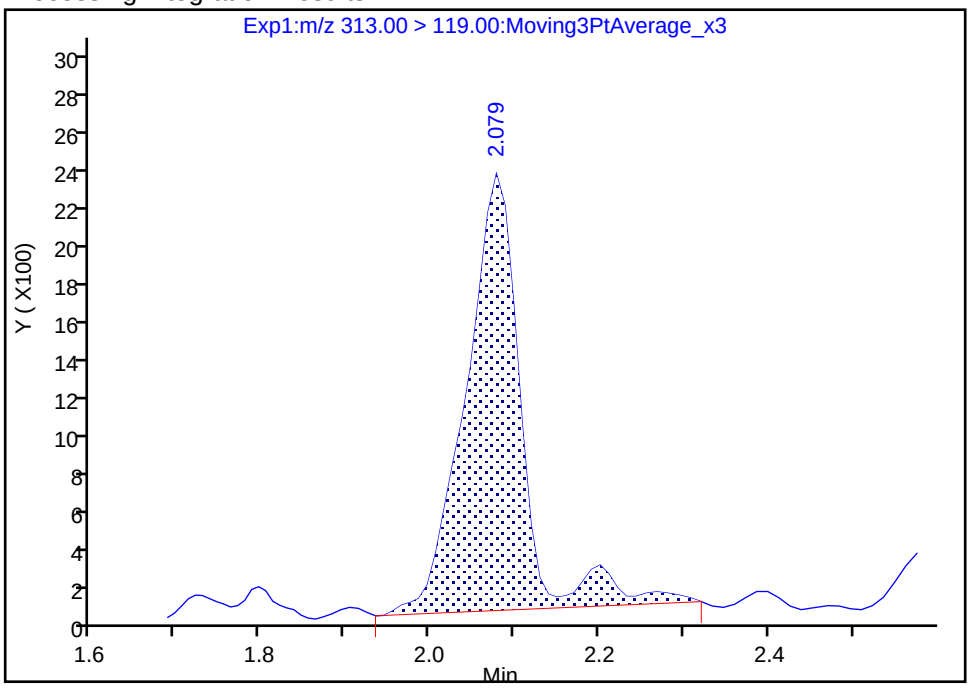
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_005.d
Injection Date: 16-Sep-2018 14:01:24 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

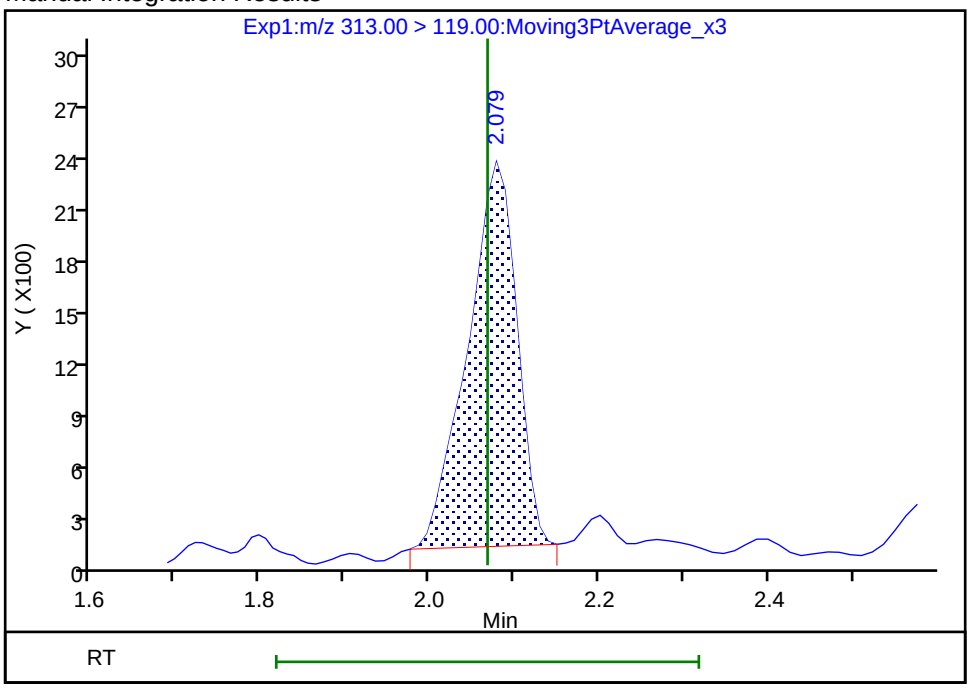
Processing Integration Results

RT: 2.08
Area: 10469
Amount: 0.051044
Amount Units: ng/ml



Manual Integration Results

RT: 2.08
Area: 8969
Amount: 0.051044
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:36:12
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

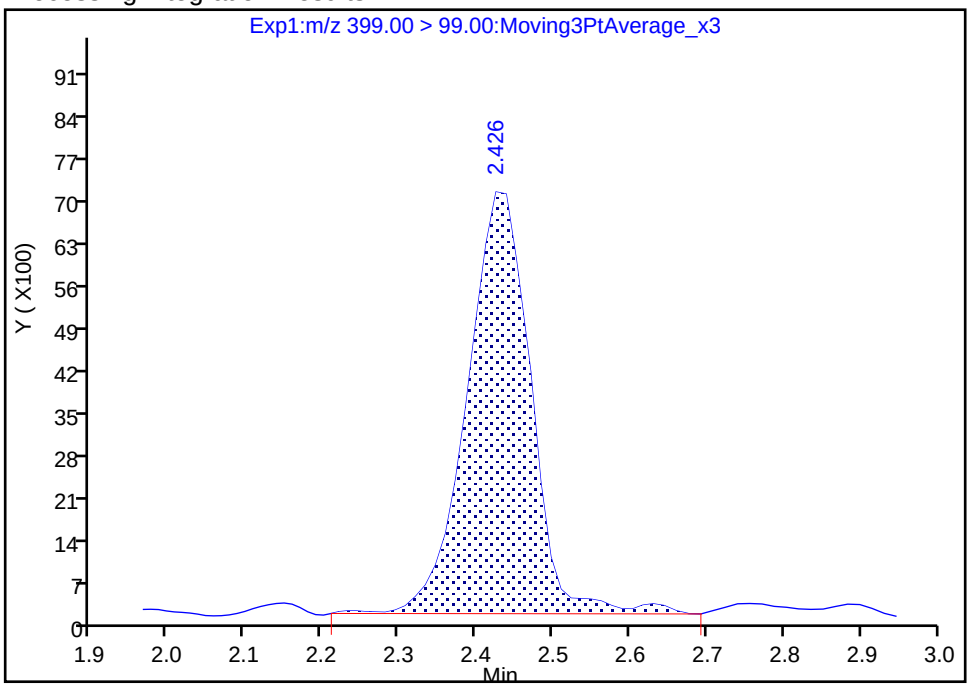
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_005.d
Injection Date: 16-Sep-2018 14:01:24 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

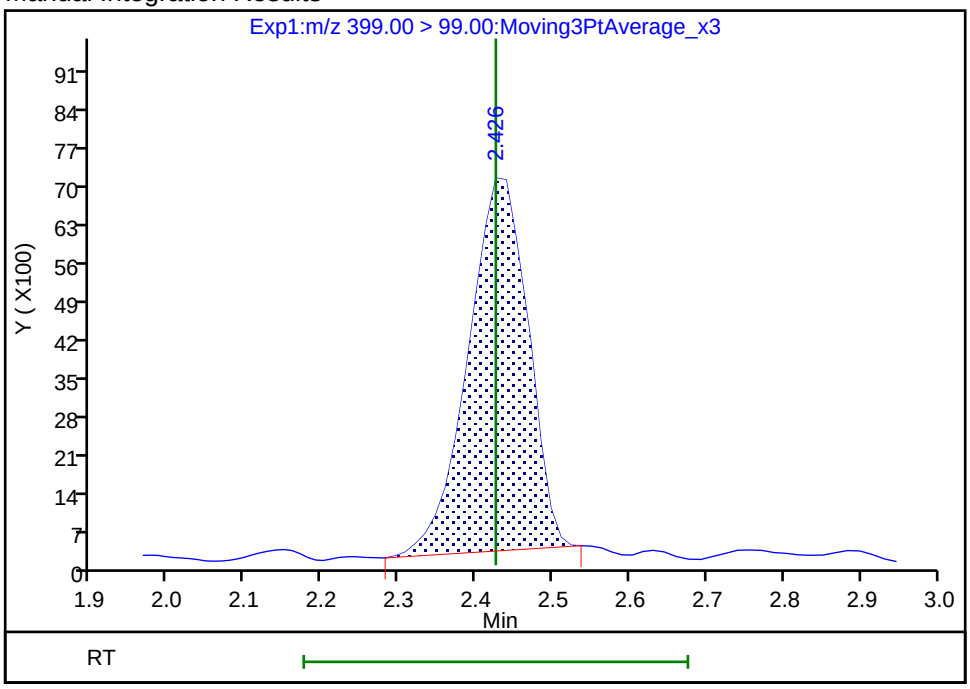
Processing Integration Results

RT: 2.43
Area: 40455
Amount: 0.043356
Amount Units: ng/ml



Manual Integration Results

RT: 2.43
Area: 37124
Amount: 0.043356
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:36:24
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

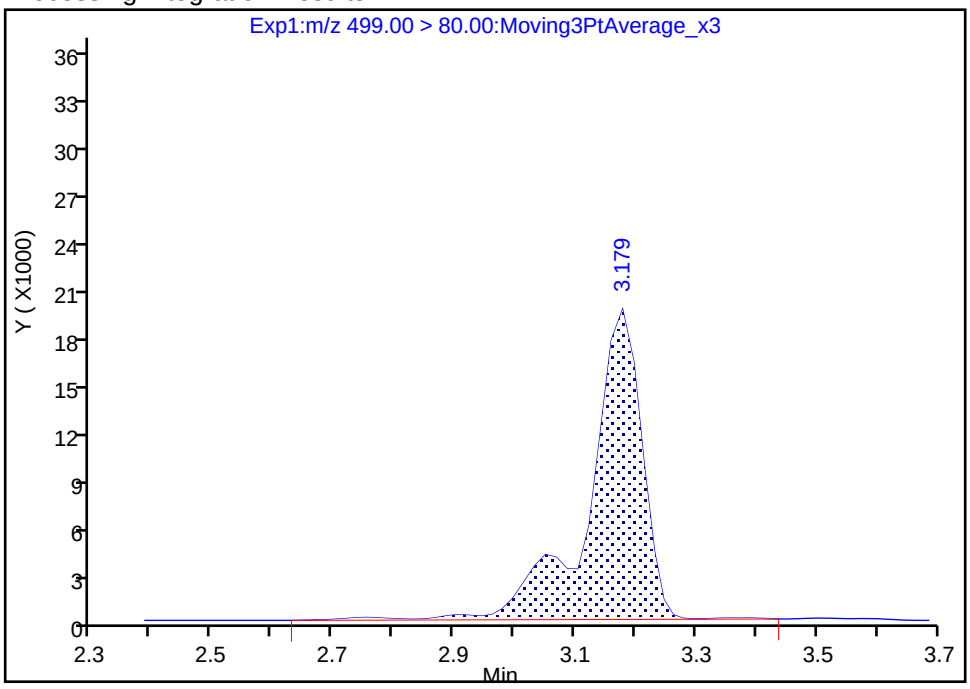
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_005.d
Injection Date: 16-Sep-2018 14:01:24 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

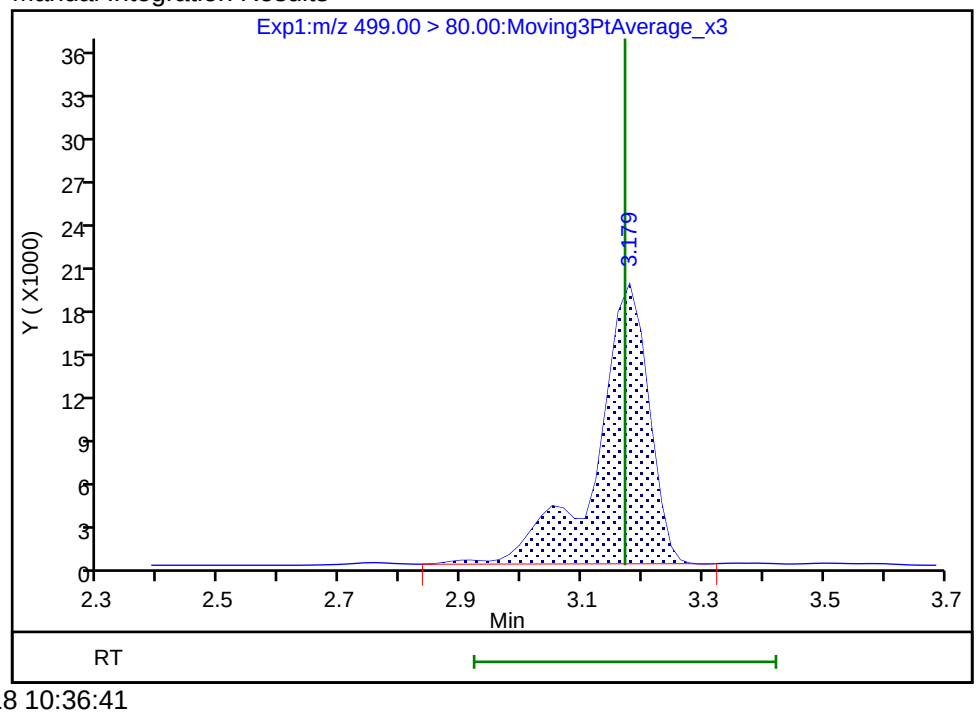
Processing Integration Results

RT: 3.18
Area: 120719
Amount: 0.048098
Amount Units: ng/ml



Manual Integration Results

RT: 3.18
Area: 118124
Amount: 0.047064
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:36:41
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

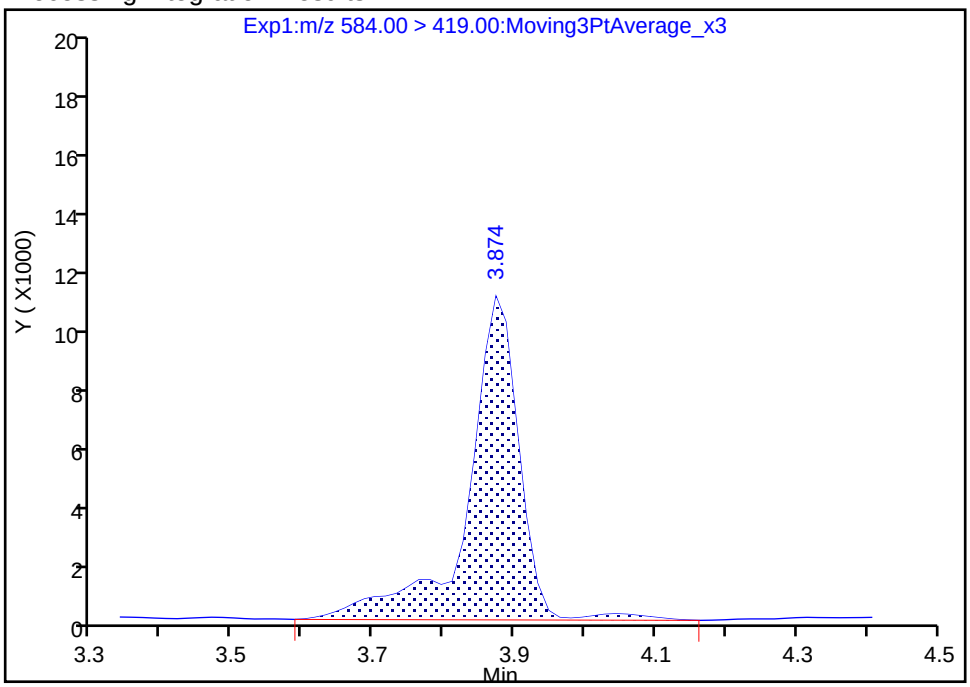
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_005.d
Injection Date: 16-Sep-2018 14:01:24 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

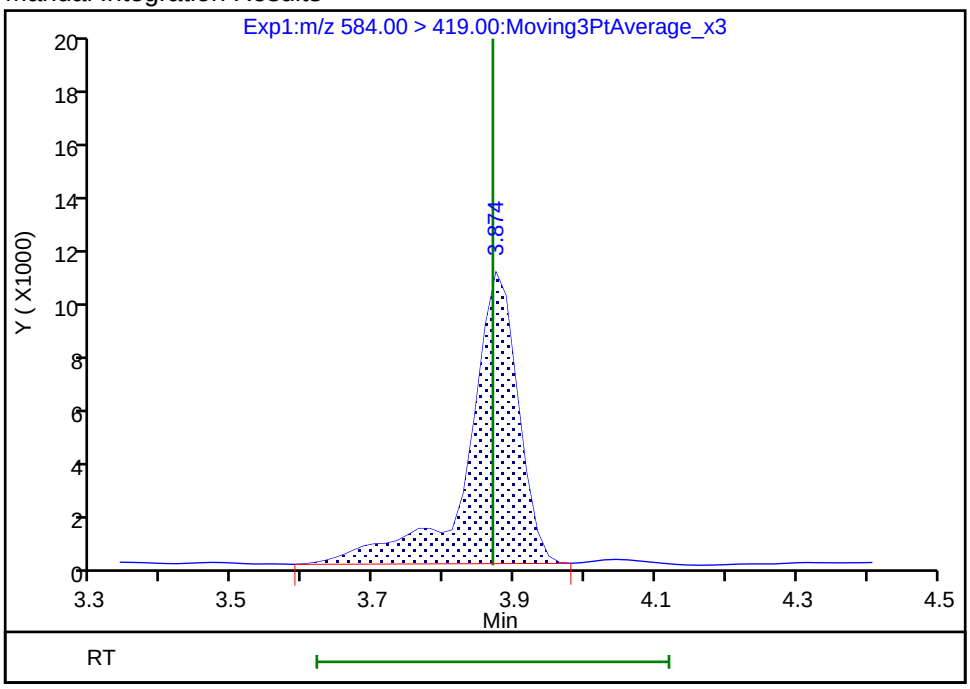
Processing Integration Results

RT: 3.87
Area: 55523
Amount: 0.053337
Amount Units: ng/ml



Manual Integration Results

RT: 3.87
Area: 53602
Amount: 0.051491
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:36:57
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

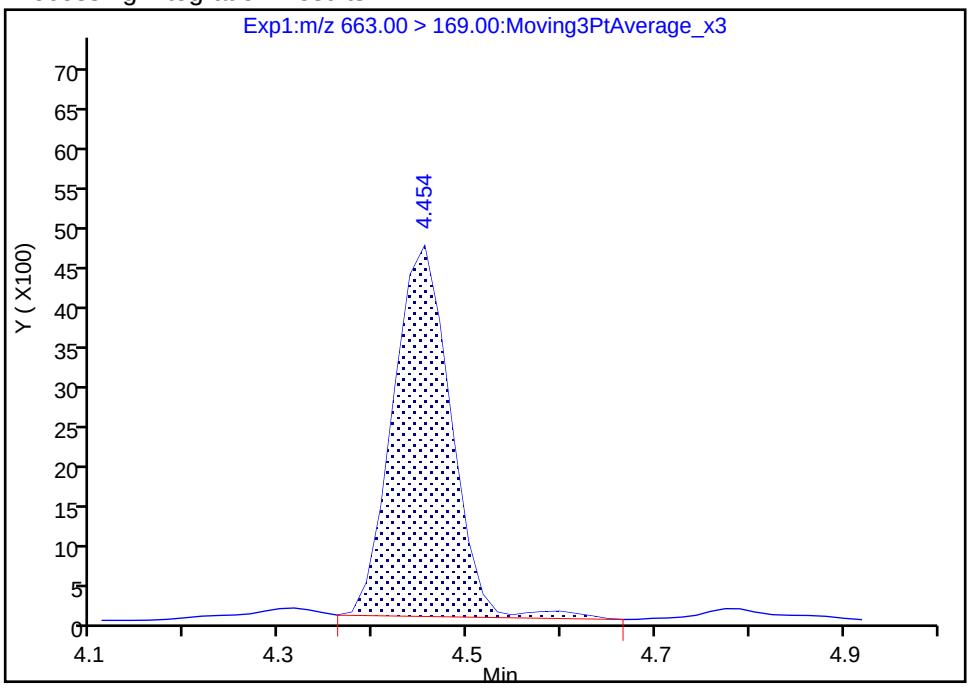
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_005.d
Injection Date: 16-Sep-2018 14:01:24 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

41 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 2

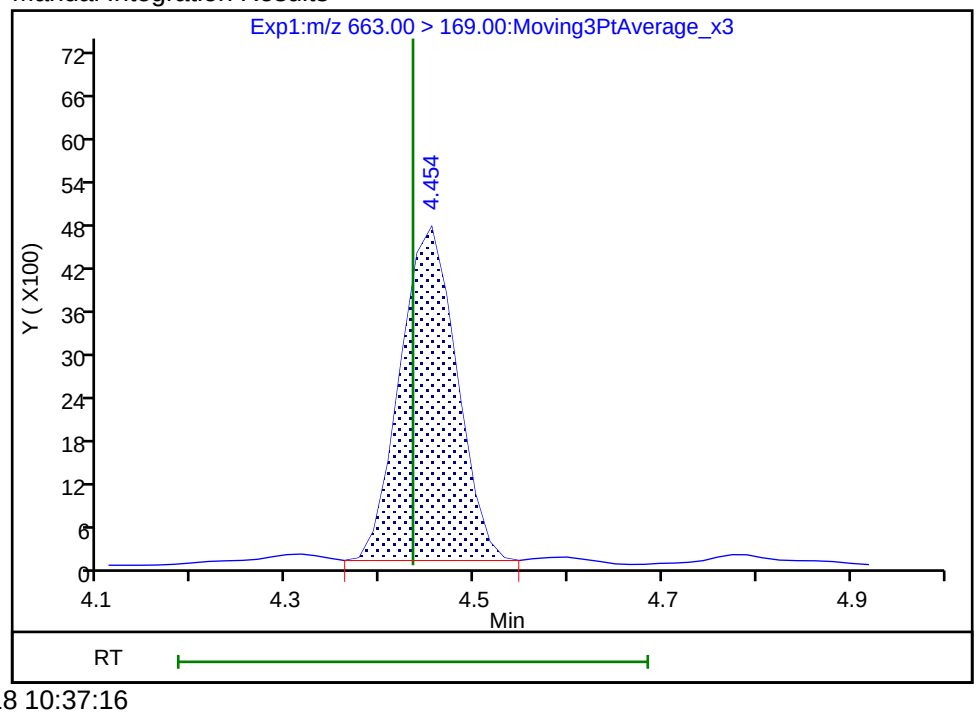
Processing Integration Results

RT: 4.45
Area: 19960
Amount: 0.048263
Amount Units: ng/ml



Manual Integration Results

RT: 4.45
Area: 19403
Amount: 0.048263
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:37:16
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245884/4 Calibration Date: 09/16/2018 14:08

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9281		1.02	1.00	1.7	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.042		1.03	1.00	2.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	109.9		0.924	0.884	4.6	30.0
4:2 FTS	AveID	21.61	21.01		0.908	0.934	-2.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9044		0.993	1.00	-0.7	30.0
Perfluoropentanesulfonic acid	AveID	49.87	51.49		0.968	0.938	3.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.095		1.07	1.00	7.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.181		0.869	0.910	-4.5	30.0
6:2 FTS	AveID	2.140	2.003		0.887	0.948	-6.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.103		1.07	0.952	12.0	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.083		1.01	1.00	0.6	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	0.9900		1.01	1.00	1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.111		0.977	0.928	5.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.190		1.08	1.00	7.6	30.0
8:2 FTS	AveID	15.14	12.57		0.796	0.958	-17.0	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7228		1.07	0.960	11.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.149		1.01	1.00	1.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	0.9377		0.944	1.00	-5.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8957		1.06	0.964	10.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9394		1.01	1.00	1.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9483		1.06	1.00	5.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.053		1.05	1.00	4.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.7902		0.985	1.00	-1.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1654		1.02	1.00	2.5	30.0
13C4 PFBA	Ave	0.9623	0.9441		2.45	2.50	-1.9	30.0
13C5 PFPeA	Ave	0.8584	0.8215		2.39	2.50	-4.3	30.0
13C3-PFBS	Ave	0.0113	0.0112		2.30	2.33	-0.9	30.0
13C2 PFHxA	Ave	0.9075	0.9155		2.52	2.50	0.9	30.0
13C4-PFHpA	Ave	1.082	1.077		2.49	2.50	-0.5	30.0
18O2 PFHxS	Ave	0.6655	0.7042		2.50	2.37	5.8	30.0
M2-6:2FTS	Ave	0.1063	0.1104		2.47	2.38	3.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245884/4 Calibration Date: 09/16/2018 14:08

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.9888		2.45	2.50	-1.9	30.0
13C4 PFOS	Ave	0.7151	0.6979		2.33	2.39	-2.4	30.0
13C5 PFNA	Ave	0.9437	0.9705		2.57	2.50	2.8	30.0
13C8 FOSA	Ave	0.3783	0.4001		2.64	2.50	5.8	30.0
M2-8:2FTS	Ave	0.0156	0.0166		2.54	2.40	5.9	30.0
13C2 PFDA	Ave	0.9426	0.9465		2.51	2.50	0.4	30.0
d3-NMeFOSAA	Ave	0.4249	0.4261		2.51	2.50	0.3	30.0
d5-NEtFOSAA	Ave	0.3342	0.3528		2.64	2.50	5.5	30.0
13C2 PFUnA	Ave	0.8023	0.8477		2.64	2.50	5.7	30.0
13C2 PFDoA	Ave	0.9759	0.9697		2.48	2.50	-0.6	30.0
13C2-PFTeDA	Ave	0.7774	0.7312		2.35	2.50	-6.0	30.0
13C2-PFHxDA	Ave	0.7882	0.6821		2.16	2.50	-13.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 16-Sep-2018 14:08:54 ALS Bottle#: 13 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 10:38:27 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 10:38:27

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	1.494	1.484	0.010	0.537	7566321	2.45		98.1	11556	
2 Perfluorobutyric acid										
212.90 > 169.00	1.494	1.494	0.0	1.000	2808960	1.02		102	340	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.756	0.016	0.637	6583782	2.39		95.7	12934	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.772	0.0	1.000	2743488	1.03		103	251	
D 47 13C3-PFBS										
301.90 > 83.00	1.814	1.797	0.017	0.652	83243	2.30		99.1	473	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.814	1.814	0.0	1.000	3477057	0.9243		105	2148	
298.90 > 99.00	1.814	1.814	0.0	1.000	1148715		3.03(1.35-4.05)		811	
D 60 M2-4:2FTS										
329.00 > 81.00	2.037	2.007	0.030	0.732	756835	NC			767	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.027	2.027	0.0	1.118	702527	0.9080		97.2	2672	
D 7 13C2 PFHxA										
315.00 > 270.00	2.068	2.038	0.030	0.743	7337420	2.52		101	9105	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.068	2.068	0.0	1.000	2654322	0.99		99.3	624	
313.00 > 119.00	2.068	2.068	0.0	1.000	194927		13.62(6.96-20.87)		457	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.099	2.099	0.0	1.157	1729168	0.9684		103	2570	
349.00 > 99.00	2.088	2.099	-0.011	1.152	805588		2.15(1.15-3.45)		1121	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.170	2.140	0.030	0.780	845230	NC			2106	

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	2.170	2.170	0.0	1.000	541149	NC			240	
D 9 13C4-PFHpA										
367.00 > 322.00	2.412	2.360	0.052	0.867	8632752	2.49		99.5	9148	
D 11 18O2 PFHxS										
403.00 > 84.00	2.426	2.387	0.039	0.872	5338893	2.50		106	4797	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.412	2.412	0.0	1.000	3780934	1.07		107	513	
363.00 > 169.00	2.412	2.412	0.0	1.000	849270		4.45(2.17-6.52)		1425	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.426	2.426	0.0	1.000	2426875	0.8688		95.5	2882	
399.00 > 99.00	2.426	2.426	0.0	1.000	693517		3.50(1.90-5.70)		895	
76 DONA										
377.00 > 251.00	2.452	2.452	0.0	0.773	6308293	NC			10929	
377.00 > 85.00	2.452	2.452	0.0	0.773	2643390		2.39(1.13-3.39)		1281	
D 12 M2-6:2FTS										
429.00 > 81.00	2.750	2.703	0.047	0.989	840433	2.47		104	1388	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.719	0.063	1.000	7924532	2.45		98.1	9684	
D 73 13C8 PFOA										
421.00 > 376.00	2.766	2.719	0.047		7016286	NC			6341	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.750	2.750	0.0	1.000	672059	0.8874		93.6	423	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.782	2.782	0.0	1.000	3435372	1.01		101	212	
413.00 > 169.00	2.782	2.782	0.0	1.000	1209945		2.84(1.36-4.08)		1221	
* 62 13C2-PFOA										
415.00 > 370.00	2.782	2.782	0.0		8014697	2.50			5968	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.782	2.782	0.0	0.877	2349537	1.07		112	2707	
449.00 > 99.00	2.782	2.782	0.0	0.877	584270		4.02(1.84-5.53)		1431	
D 72 13C8 PFOS										
507.00 > 99.00	3.153	3.081	0.072		1256002	NC			2006	
D 19 13C5 PFNA										
468.00 > 423.00	3.171	3.099	0.072	1.140	7778587	2.57		103	10861	
D 18 13C4 PFOS										
503.00 > 80.00	3.171	3.099	0.072	1.140	5346959	2.33		97.6	3858	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.171	3.171	0.0	1.000	2307152	0.9774		105	1824	
499.00 > 99.00	3.171	3.171	0.0	1.000	532476		4.33(2.04-6.12)		1094	
20 Perfluorononanoic acid										
463.00 > 419.00	3.171	3.171	0.0	1.000	3080218	1.01		101	351	
463.00 > 169.00	3.171	3.171	0.0	1.000	576078		5.35(2.68-8.03)		1295	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.383	3.383	0.0	1.067	2558908	NC			3041	
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.449	0.016	1.245	3206914	2.64		106	6332	

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	3.512	3.449	0.063	1.262	127148	2.54		106	558	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.465	3.465	0.0	1.000	4092573	1.08		108	3870	
D 23 13C2 PFDA										
515.00 > 470.00	3.527	3.465	0.062	1.268	7586263	2.51		100	10064	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.512	3.512	0.0	1.000	639380	0.7955		83.0	1504	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.512	3.512	0.0	1.107	1552362	1.07		112	1890	
549.00 > 99.00	3.512	3.512	0.0	1.107	270467		5.74(3.02-9.05)		1744	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.527	3.527	0.0	1.000	3487848	1.01		101	684	
513.00 > 169.00	3.527	3.527	0.0	1.000	224475		15.54(7.12-21.35)		326	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.682	3.613	0.069	1.324	3415050	2.51		100	2956	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.682	3.682	0.0	1.000	1280877	0.9435		94.4	354	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.854	3.776	0.078	1.385	2827487	2.64		106	4596	
D 30 13C2 PFUnA										
565.00 > 520.00	3.869	3.792	0.077	1.391	6794337	2.64		106	9300	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.839	3.839	0.0	1.210	1931823	1.06		110	2326	
599.00 > 99.00	3.854	3.839	0.015	1.215	435351		4.44(2.14-6.43)		1599	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.869	3.869	0.0	1.004	1062489	1.01		101	1919	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.869	3.869	0.0	1.000	2577308	1.06		106	558	
563.00 > 169.00	3.869	3.869	0.0	1.000	223898		11.51(5.24-15.72)		748	
35 MeFOSA										
512.00 > 169.00	3.944	3.944	0.0		654399	NC			793	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.023	4.023	0.0	1.268	3393258	NC			4832	
D 36 13C2 PFDoA										
615.00 > 570.00	4.157	4.073	0.084	1.494	7772082	2.48		99.4	6590	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.139	4.139	0.0		718852	NC			481	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.157	4.157	0.0	1.184	457707	NC			441	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.157	4.157	0.0	1.000	3275069	1.05		105	901	
613.00 > 169.00	4.157	4.157	0.0	1.000	328640		9.97(4.68-14.05)		517	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.403	4.403	0.0	1.389	201667	NC			481	
699.00 > 99.00	4.403	4.403	0.0	1.389	365628		0.55(0.28-0.83)		935	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.434	4.434	0.0	1.067	2456694	0.9849		98.5	1121	
663.00 > 169.00	4.434	4.434	0.0	1.067	440180		5.58(3.09-9.27)		977	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.675	4.573	0.102	1.681	5860123	2.35		94.0	7572	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.675	4.675	0.0	1.000	387765	1.02		102	1032	
713.00 > 219.00	4.675	4.675	0.0	1.000	283755		1.37(0.70-2.09)		703	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.108	5.007	0.101	1.836	5466601	2.16		86.5	6618	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.108	5.108	0.0	1.000	2130326	NC			609	
813.00 > 169.00	5.108	5.108	0.0	1.000	364250		5.85(2.77-8.32)		778	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.491	5.491	0.0	1.075	1318029	NC			581	
913.00 > 169.00	5.491	5.491	0.0	1.075	255695		5.15(2.55-7.64)		812	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00009 Amount Added: 1.00 Units: mL

Report Date: 17-Sep-2018 10:38:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_006.d

Injection Date: 16-Sep-2018 14:08:54 Instrument ID: A9

Lims ID: CCV L4

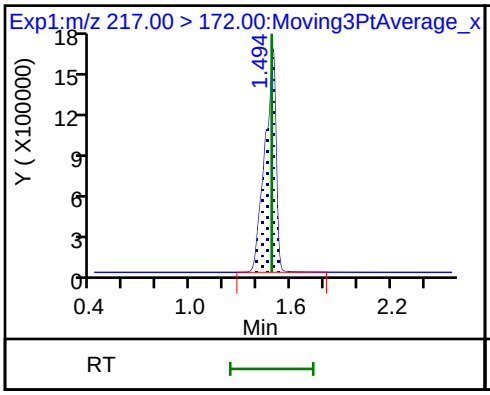
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 4

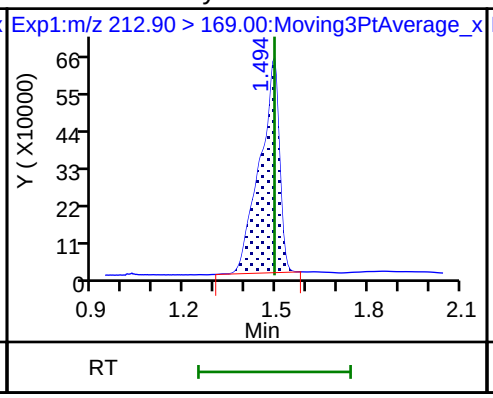
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

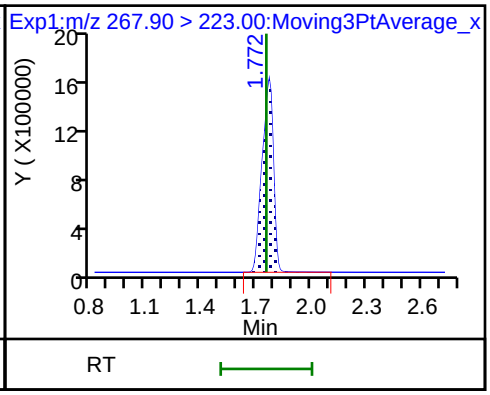
D 1 13C4 PFBA



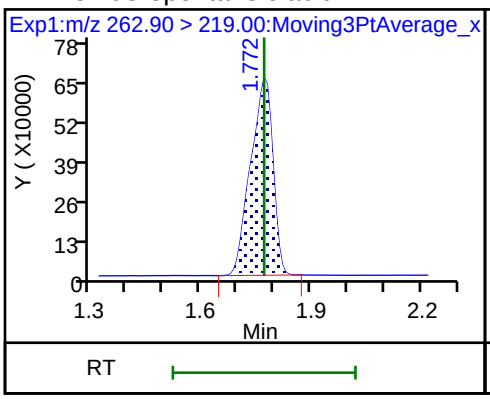
2 Perfluorobutyric acid



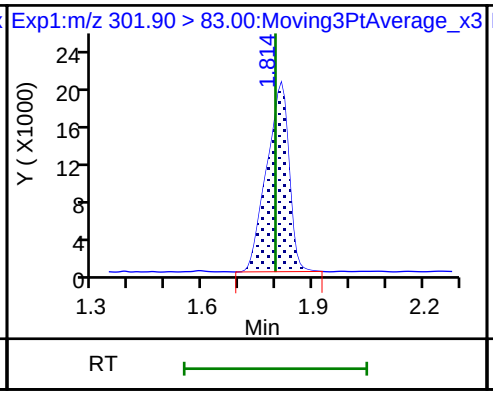
D 3 13C5-PFPeA



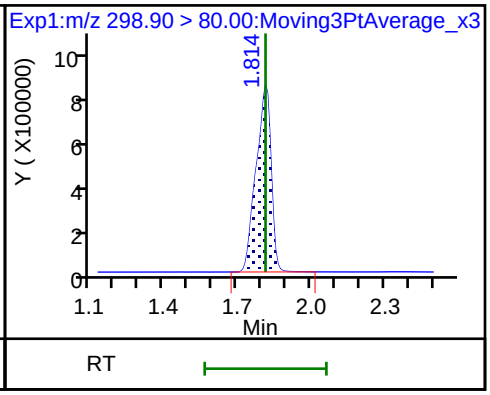
4 Perfluoropentanoic acid



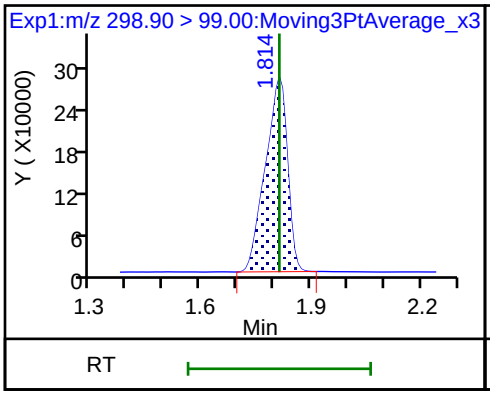
D 47 13C3-PFBS



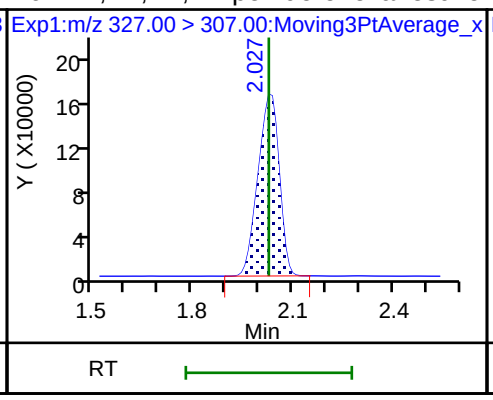
5 Perfluorobutanesulfonic acid



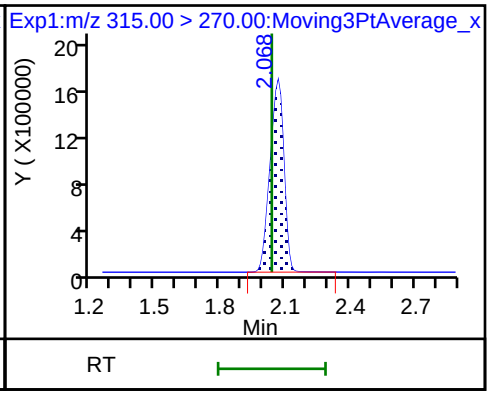
5 Perfluorobutanesulfonic acid



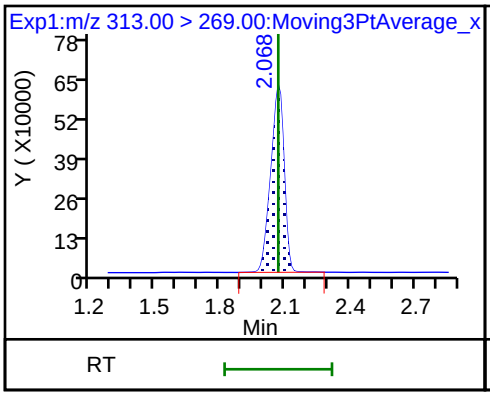
61 1H,1H,2H,2H-perfluorohexanesulfon



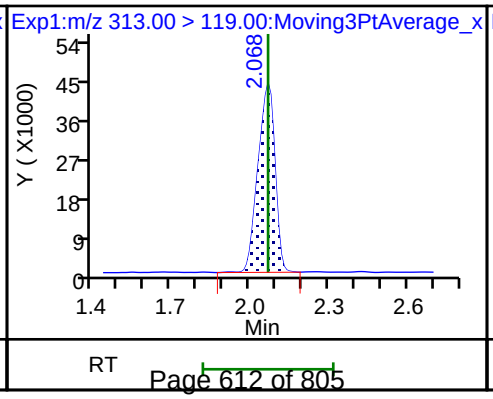
D 7 13C2 PFHxA



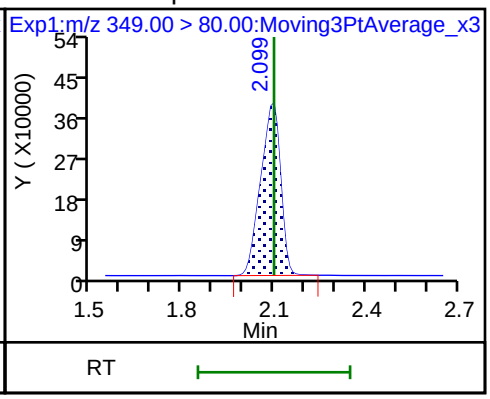
6 Perfluorohexanoic acid



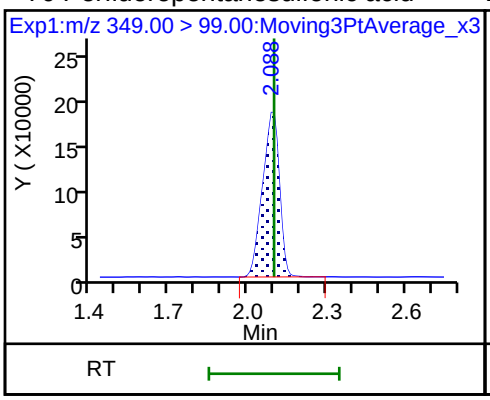
6 Perfluorohexanoic acid



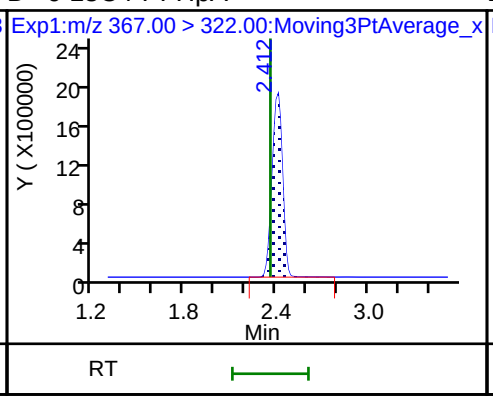
70 Perfluoropentanesulfonic acid



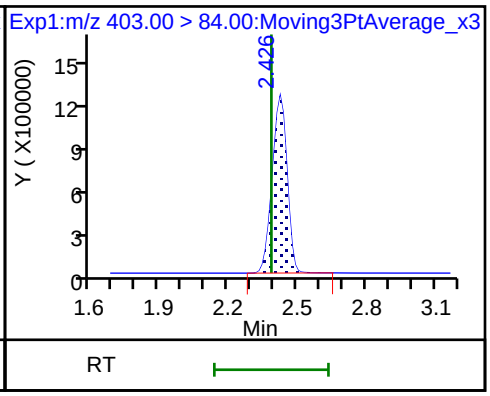
70 Perfluoropentanesulfonic acid



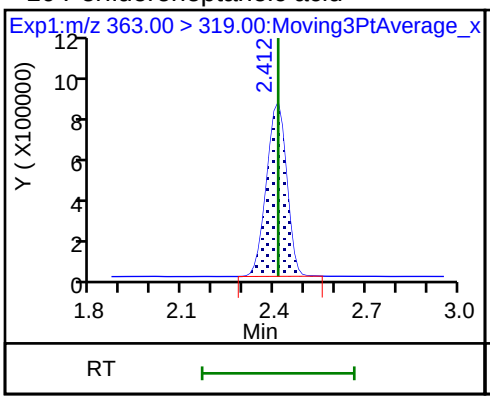
D 9 13C4-PFHpA



D 11 18O2 PFHxS



10 Perfluoroheptanoic acid



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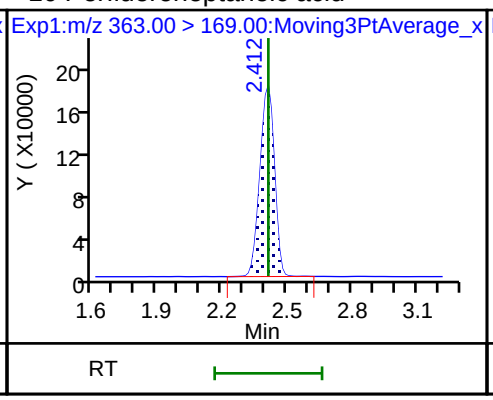
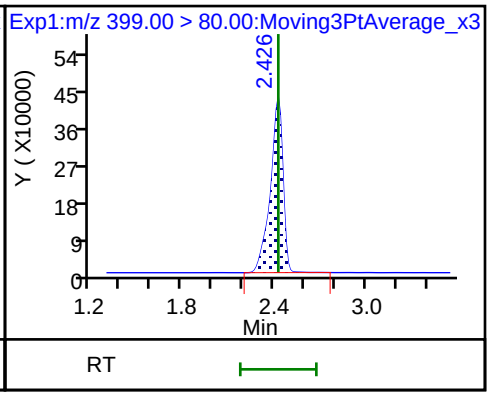


8 Perfluorohexanesulfonic acid



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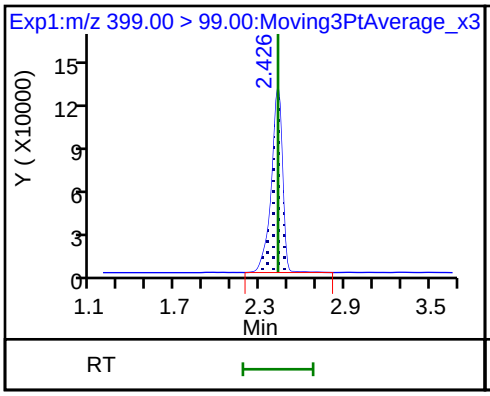
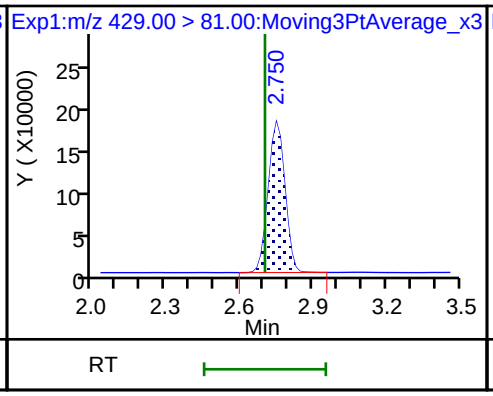
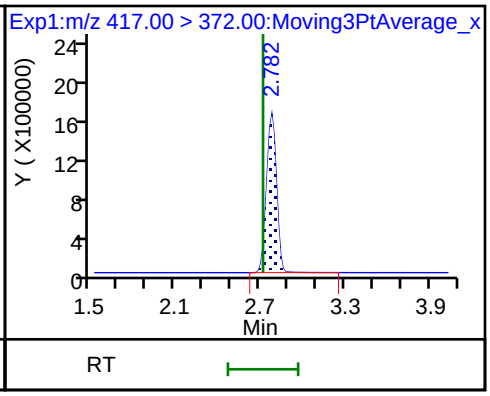


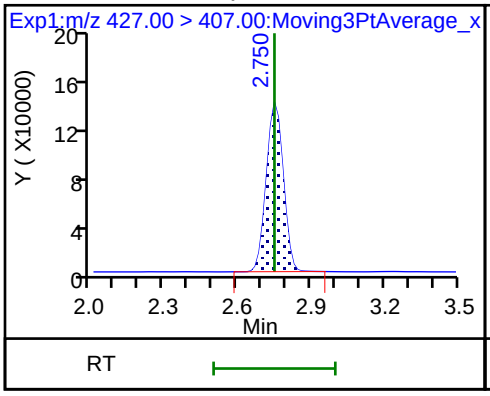
D 12 M2-6:2FTS



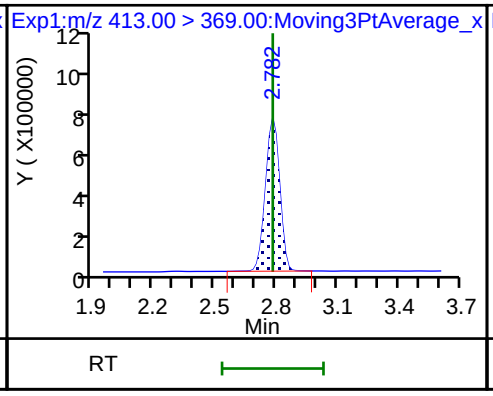
D 14 13C4 PFOA



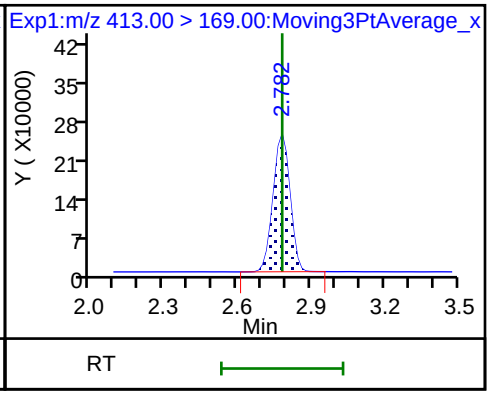
13 1H,1H,2H,2H-perfluorooctanesulfoni



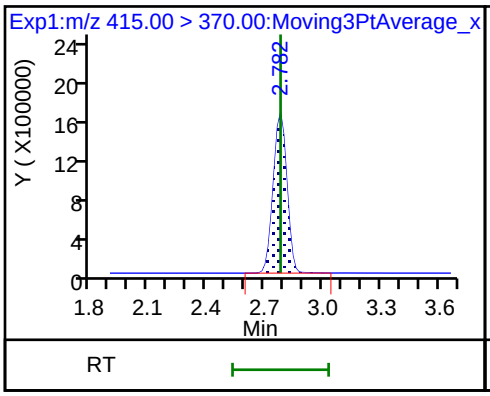
15 Perfluorooctanoic acid



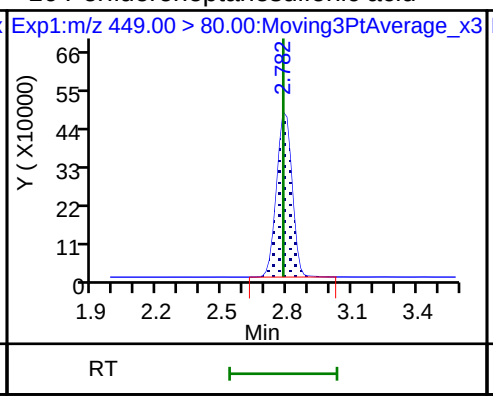
15 Perfluorooctanoic acid



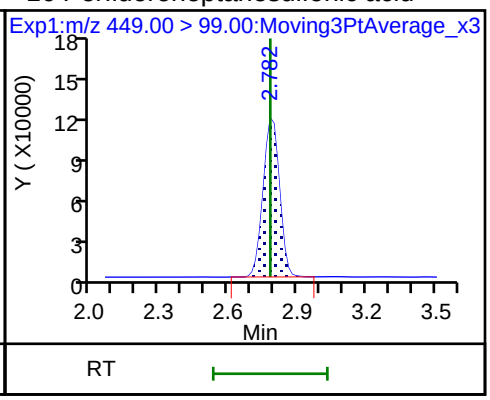
* 62 13C2-PFOA



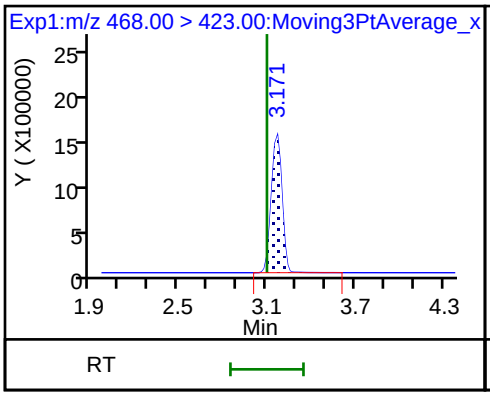
16 Perfluoroheptanesulfonic acid



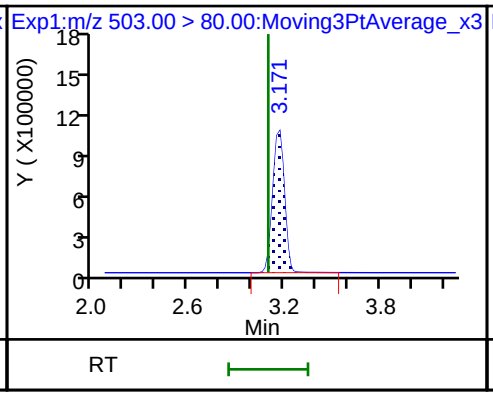
16 Perfluoroheptanesulfonic acid



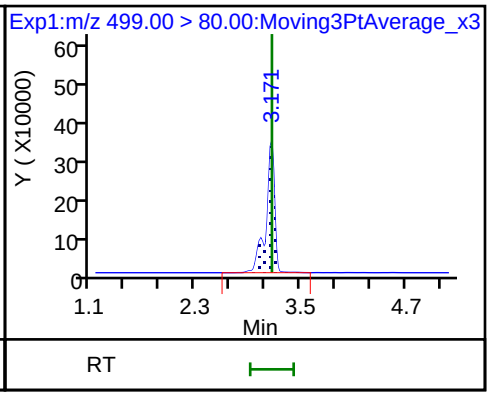
D 19 13C5 PFNA



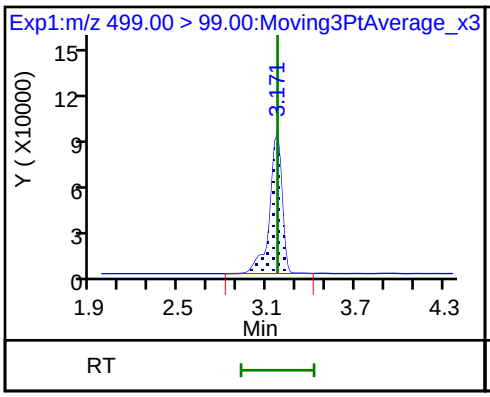
D 18 13C4 PFOS



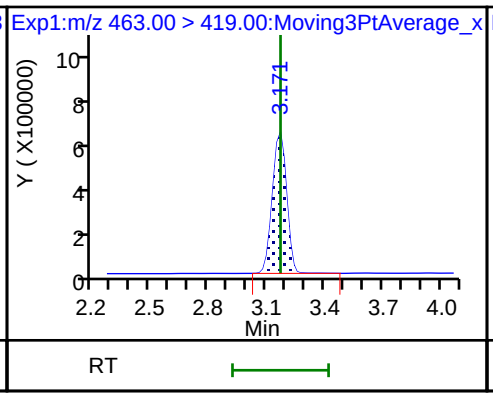
17 Perfluorooctane sulfonic acid



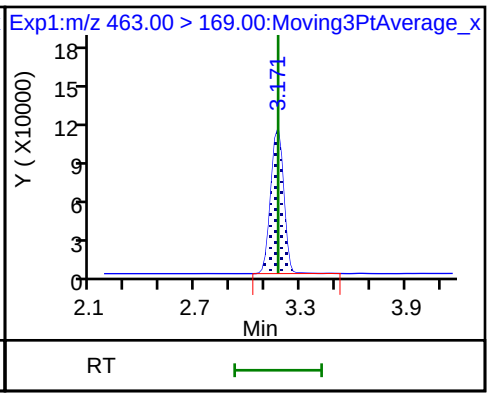
17 Perfluorooctane sulfonic acid



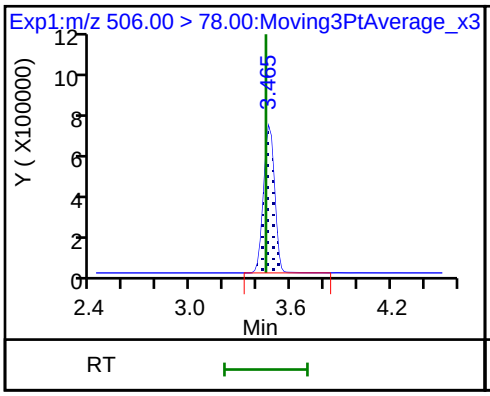
20 Perfluorononanoic acid



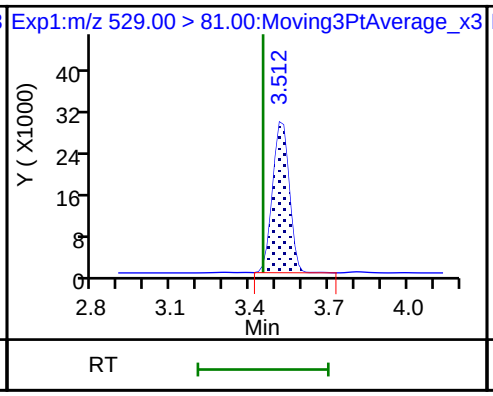
20 Perfluorononanoic acid



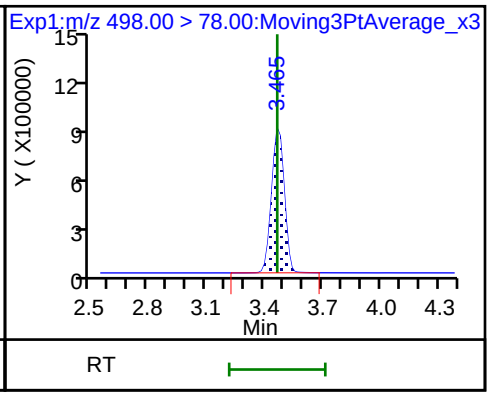
D 21 13C8 FOSA



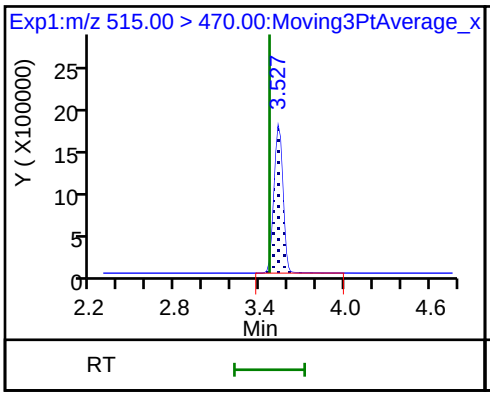
D 26 M2-8:2FTS



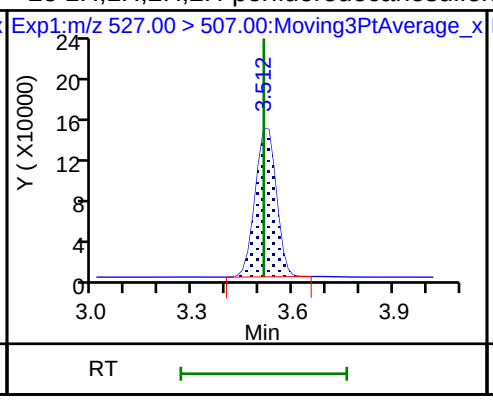
22 Perfluorooctane Sulfonamide



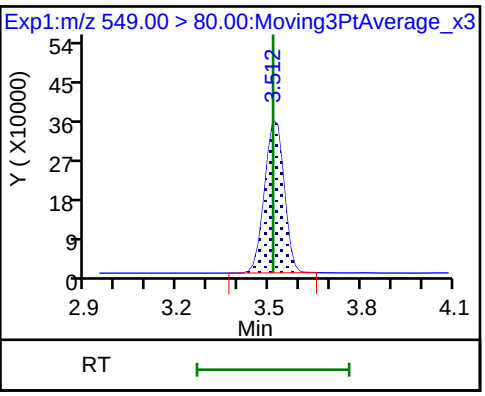
D 23 13C2 PFDA



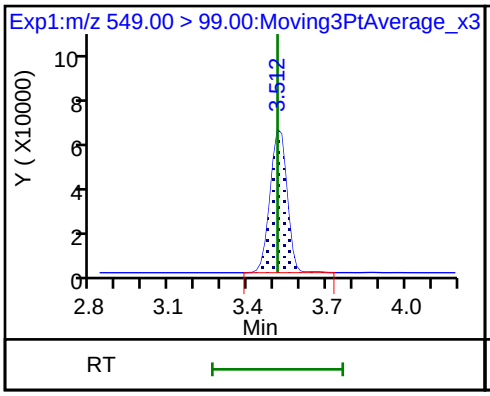
25 1H,1H,2H,2H-perfluorodecanesulfoni



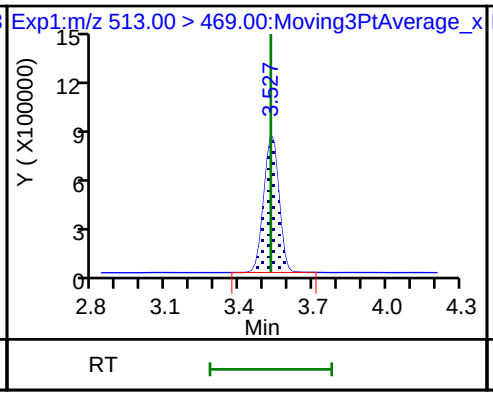
68 Perfluorononanesulfonic acid



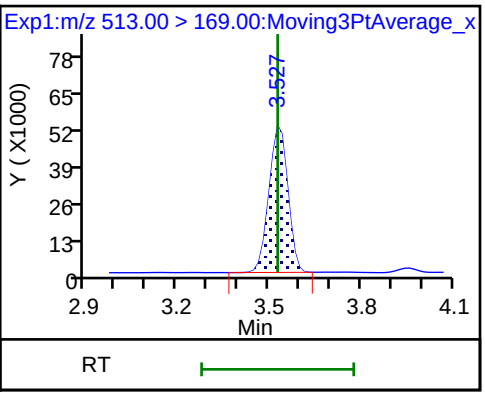
68 Perfluorononanesulfonic acid



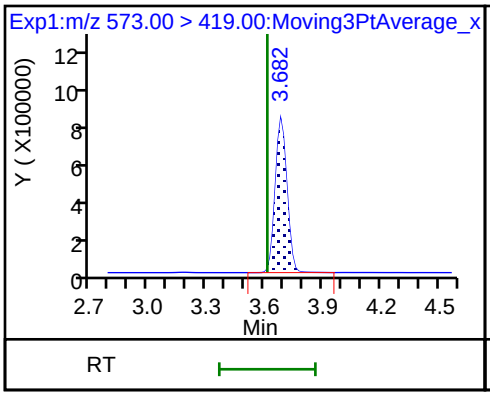
24 Perfluorodecanoic acid



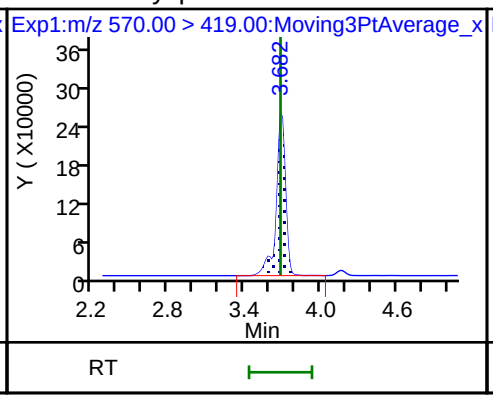
24 Perfluorodecanoic acid



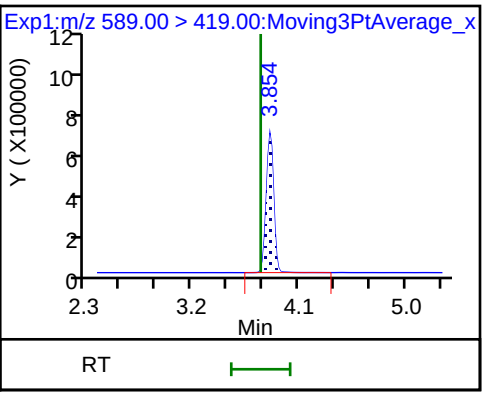
D 27 d3-NMeFOSAA



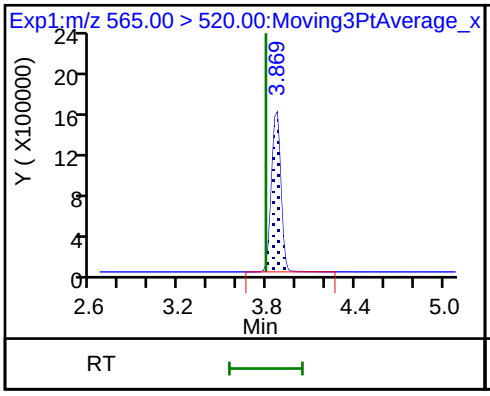
28 N-methyl perfluorooctane sulfonami



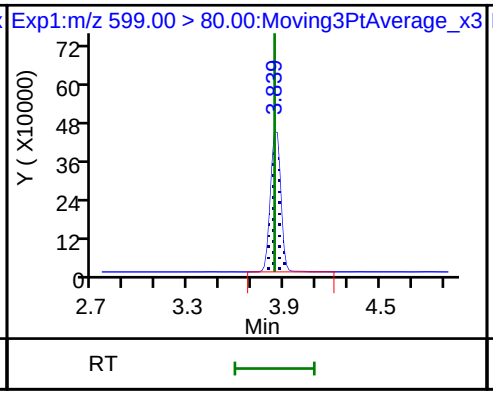
D 32 d5-NEtFOSAA



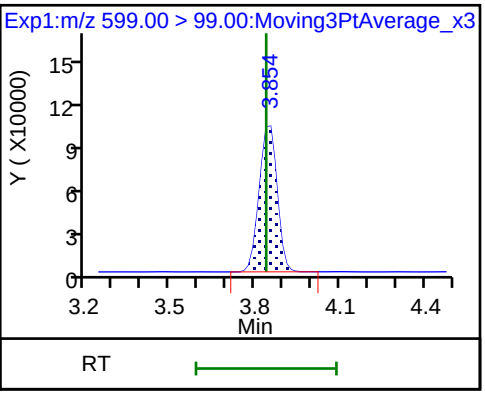
D 30 13C2 PFUnA



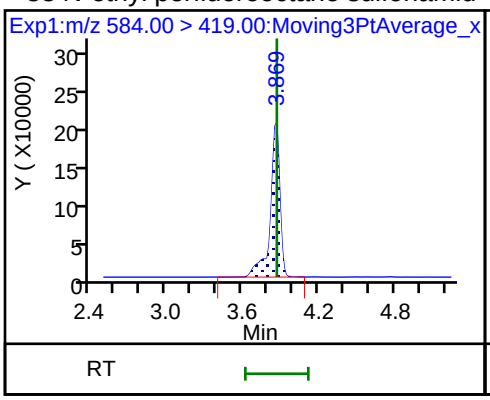
29 Perfluorodecane Sulfonic acid



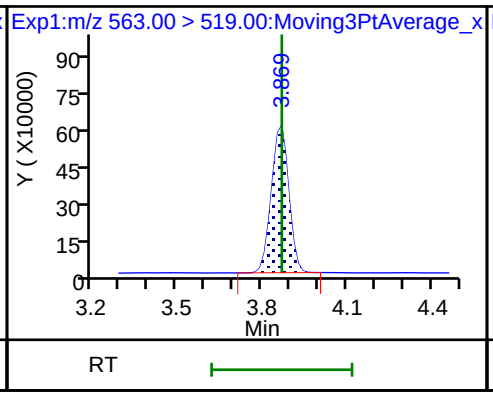
29 Perfluorodecane Sulfonic acid



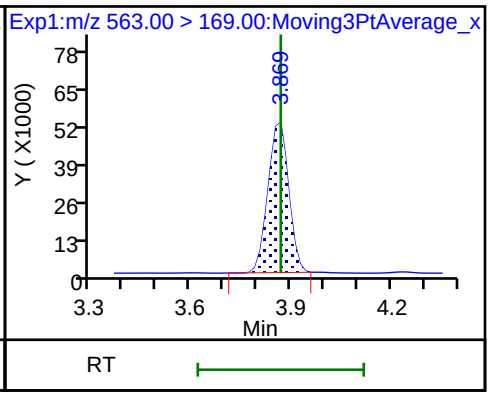
33 N-ethyl perfluorooctane sulfonamid



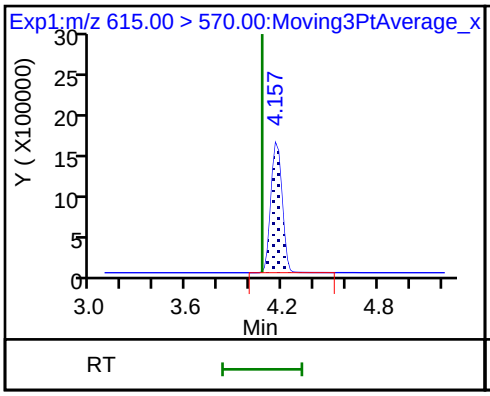
31 Perfluoroundecanoic acid



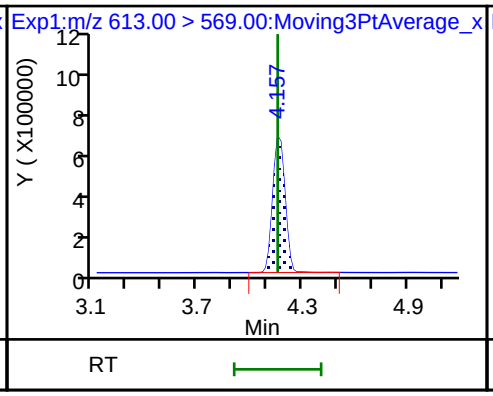
31 Perfluoroundecanoic acid



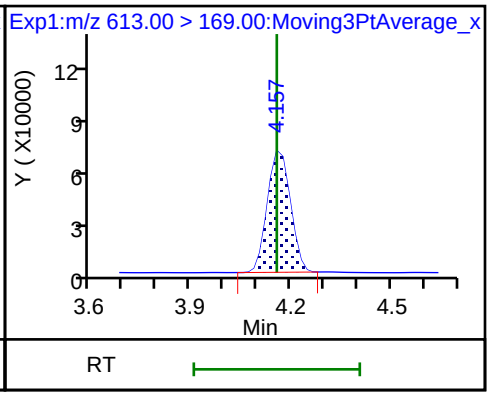
D 36 13C2 PFDoA



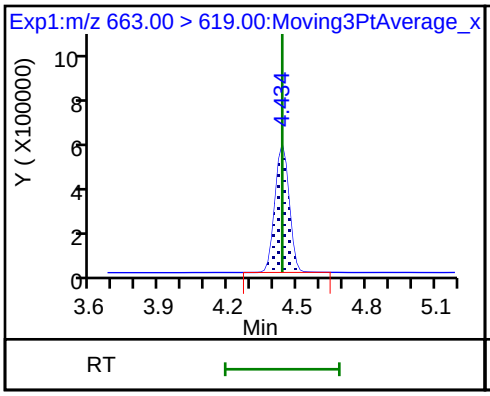
37 Perfluorododecanoic acid



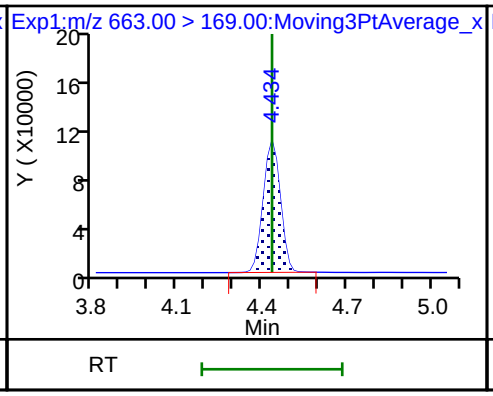
37 Perfluorododecanoic acid



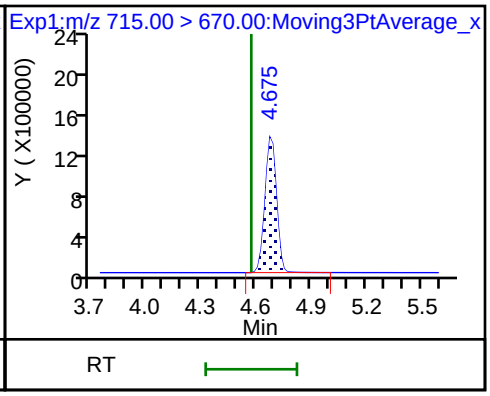
41 Perfluorotridecanoic acid



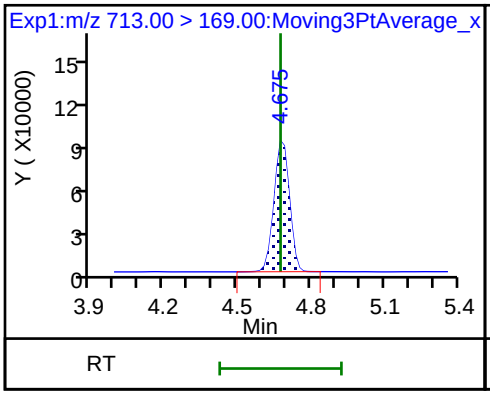
41 Perfluorotridecanoic acid



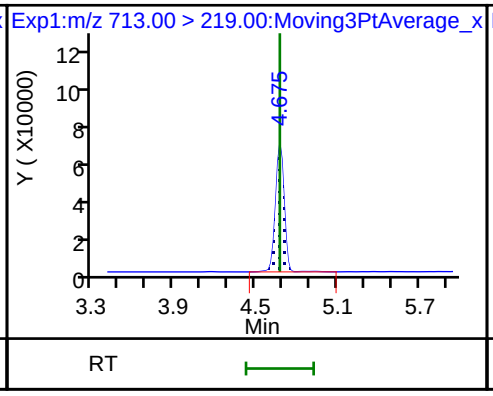
D 43 13C2-PFTeDA



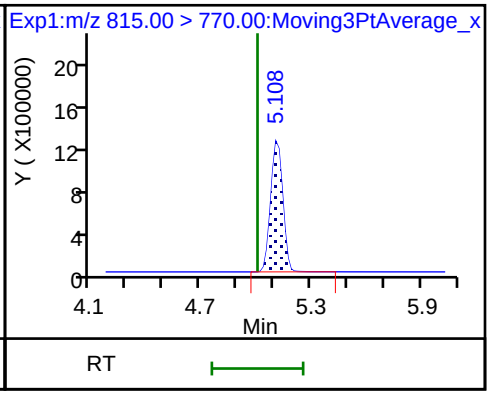
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245887/1 Calibration Date: 09/16/2018 14:53

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9523		2.61	2.50	4.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.014		2.50	2.50	-0.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	111.8		2.35	2.21	6.4	30.0
4:2 FTS	AveID	21.61	21.06		2.28	2.34	-2.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.8949		2.46	2.50	-1.7	30.0
Perfluoropentanesulfonic acid	AveID	49.87	50.59		2.38	2.35	1.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.099		2.69	2.50	7.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.168		2.15	2.28	-5.6	30.0
6:2 FTS	AveID	2.140	2.069		2.29	2.37	-3.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.012		2.35	2.50	-5.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.054		2.55	2.38	7.1	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	0.9257		2.37	2.50	-5.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.045		2.30	2.32	-1.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.124		2.64	2.50	5.4	30.0
8:2 FTS	AveID	15.14	15.10		2.39	2.40	-0.3	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.6468		2.40	2.40	0.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.087		2.39	2.50	-4.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.023		2.57	2.50	2.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8359		2.48	2.41	2.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9544		2.57	2.50	2.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9328		2.60	2.50	4.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	0.995		2.47	2.50	-1.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8472		2.64	2.50	5.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1718		2.66	2.50	6.4	30.0
13C4 PFBA	Ave	0.9623	0.9311		2.42	2.50	-3.2	30.0
13C5 PFPeA	Ave	0.8584	0.8314		2.42	2.50	-3.1	30.0
13C3-PFBS	Ave	0.0113	0.0107		2.20	2.33	-5.3	30.0
13C2 PFHxA	Ave	0.9075	0.8666		2.39	2.50	-4.5	30.0
13C4-PFHpA	Ave	1.082	1.042		2.41	2.50	-3.7	30.0
18O2 PFHxS	Ave	0.6655	0.6770		2.41	2.37	1.7	30.0
M2-6:2FTS	Ave	0.1063	0.1074		2.40	2.38	1.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245887/1 Calibration Date: 09/16/2018 14:53

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.9872		2.45	2.50	-2.0	30.0
13C4 PFOS	Ave	0.7151	0.7285		2.43	2.39	1.9	30.0
13C5 PFNA	Ave	0.9437	0.9656		2.56	2.50	2.3	30.0
13C8 FOSA	Ave	0.3783	0.3702		2.45	2.50	-2.1	30.0
M2-8:2FTS	Ave	0.0156	0.0132		2.03	2.40	-15.3	30.0
13C2 PFDA	Ave	0.9426	0.9580		2.54	2.50	1.6	30.0
d3-NMeFOSAA	Ave	0.4249	0.3898		2.29	2.50	-8.2	30.0
13C2 PFUnA	Ave	0.8023	0.7636		2.38	2.50	-4.8	30.0
d5-NEtFOSAA	Ave	0.3342	0.3131		2.34	2.50	-6.3	30.0
13C2 PFDoA	Ave	0.9759	0.9597		2.46	2.50	-1.7	30.0
13C2-PFTeDA	Ave	0.7774	0.7494		2.41	2.50	-3.6	30.0
13C2-PFHxDA	Ave	0.7882	0.8033		2.55	2.50	1.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_012.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 16-Sep-2018 14:53:59 ALS Bottle#: 14 Worklist Smp#: 1
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 15:54:13 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 15:54:13

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	1.494	1.494	0.0	1.000	7165348	2.61		104	949	
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.494	0.0	0.540	7524120	2.42		96.8	21358	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.772	0.0	1.000	6813568	2.50		100	582	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.772	0.0	0.641	6718254	2.42		96.9	12995	
D 47 13C3-PFBS										
301.90 > 83.00	1.814	1.814	0.0	0.656	80158	2.20		94.7	469	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.814	1.814	0.0	1.000	8516823	2.35		106	4692	
298.90 > 99.00	1.814	1.814	0.0	1.000	3048609		2.79(1.35-4.05)		2154	
D 60 M2-4:2FTS										
329.00 > 81.00	2.027	2.027	0.0	0.733	692224	NC			697	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.027	2.027	0.0	1.118	1695541	2.28		97.5	5197	
D 7 13C2 PFHxA										
315.00 > 270.00	2.068	2.068	0.0	0.748	7002865	2.39		95.5	9667	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.068	2.068	0.0	1.000	6266906	2.46		98.3	1350	
313.00 > 119.00	2.068	2.068	0.0	1.000	452113		13.86(6.96-20.87)		1014	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.089	2.089	0.0	1.152	4089883	2.38		101	5036	
349.00 > 99.00	2.089	2.089	0.0	1.152	1942777		2.11(1.15-3.45)		2340	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.160	2.170	-0.010	0.781	819461	NC			1597	

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	2.170	2.170	0.0	1.005	1396345	NC			607	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.399	0.001	0.867	8422846	2.41		96.3	6014	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.400	2.400	0.0	1.000	9255251	2.69		108	1073	
363.00 > 169.00	2.400	2.400	0.0	1.000	2041115		4.53(2.17-6.52)		2557	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	5816850	2.15		94.4	6527	
399.00 > 99.00	2.413	2.413	0.0	1.000	1598581		3.64(1.90-5.70)		1493	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.426	-0.013	0.872	5175450	2.41		102	7488	
76 DONA										
377.00 > 251.00	2.452	2.452	0.0	0.778	13833294	NC			19455	
377.00 > 85.00	2.452	2.452	0.0	0.778	6631734		2.09(1.13-3.39)		2525	
D 12 M2-6:2FTS										
429.00 > 81.00	2.750	2.750	0.0	0.994	824273	2.40		101	1527	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.750	2.750	0.0	1.000	1701424	2.29		96.7	965	
D 14 13C4 PFOA										
417.00 > 372.00	2.766	2.766	0.0	1.000	7977501	2.45		98.0	9023	
D 73 13C8 PFOA										
421.00 > 376.00	2.766	2.766	0.0		6673722	NC			9657	
* 62 13C2-PFOA										
415.00 > 370.00	2.766	2.766	0.0		8080760	2.50			6893	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.766	2.766	0.0	1.000	8085123	2.35		94.1	461	
413.00 > 169.00	2.766	2.766	0.0	1.000	3166214		2.55(1.36-4.08)		3090	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.782	2.782	0.0	0.882	5909651	2.55		107	4886	
449.00 > 99.00	2.782	2.782	0.0	0.882	1455036		4.06(1.84-5.53)		2908	
D 72 13C8 PFOS										
507.00 > 99.00	3.135	3.153	-0.018		1181603	NC			2545	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0	1.140	7802576	2.56		102	8021	
D 18 13C4 PFOS										
503.00 > 80.00	3.153	3.153	0.0	1.140	5627845	2.43		102	5250	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.153	3.153	0.0	1.000	5707968	2.30		99.0	3263	
499.00 > 99.00	3.153	3.153	0.0	1.000	1329187		4.29(2.04-6.12)		1755	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.153	0.0	1.000	7223124	2.37		94.7	755	
463.00 > 169.00	3.153	3.153	0.0	1.000	1402636		5.15(2.68-8.03)		2197	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.367	3.367	0.0	1.068	6140916	NC			4476	
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.465	0.0	1.253	2991730	2.45		97.9	5459	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.465	3.465	0.0	1.000	9345999	2.64		105	4393	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.496	3.496	0.0	1.109	3655208	2.40		100	2678	
549.00 > 99.00	3.496	3.496	0.0	1.109	640843		5.70(3.02-9.05)		2428	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.496	3.496	0.0	1.000	1547804	2.39		99.7	2860	
D 23 13C2 PFDA										
515.00 > 470.00	3.512	3.512	0.0	1.270	7740970	2.54		102	6964	
D 26 M2-8:2FTS										
529.00 > 81.00	3.496	3.512	-0.016	1.264	102509	2.03		84.7	282	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.512	3.512	0.0	1.000	8416228	2.39		95.5	1370	
513.00 > 169.00	3.512	3.512	0.0	1.000	581591		14.47(7.12-21.35)		534	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.669	3.669	0.0	1.326	3150144	2.29		91.8	2180	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.669	3.669	0.0	1.000	3222206	2.57		103	1150	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.823	3.823	0.0	1.213	4743440	2.48		103	4020	
599.00 > 99.00	3.823	3.823	0.0	1.213	953742		4.97(2.14-6.43)		3229	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.839	3.839	0.0	1.388	2529696	2.34		93.7	2648	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.839	3.839	0.0	1.000	2414257	2.57		103	3611	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.839	3.839	0.0	1.000	5755698	2.60		104	1073	
563.00 > 169.00	3.839	3.839	0.0	1.000	549242		10.48(5.24-15.72)		1962	
D 30 13C2 PFUnA										
565.00 > 520.00	3.839	3.854	-0.015	1.388	6170671	2.38		95.2	5357	
35 MeFOSA										
512.00 > 169.00	3.949	3.949	0.0		1582612	NC			740	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.012	4.012	0.0	1.272	6926759	NC			7025	
D 36 13C2 PFDoA										
615.00 > 570.00	4.144	4.139	0.005	1.498	7754973	2.46		98.3	8939	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.144	4.144	0.0		1761684	NC			584	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.144	4.144	0.0	1.185	1091378	NC			1742	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.144	4.144	0.0	1.000	7718267	2.47		98.7	1948	
613.00 > 169.00	4.144	4.144	0.0	1.000	863093		8.94(4.68-14.05)		2253	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.377	4.377	0.0	1.388	515903	NC			1545	
699.00 > 99.00	4.377	4.377	0.0	1.388	929702		0.55(0.28-0.83)		2316	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.408	4.408	0.0	1.064	6570078	2.64		106	2489	
663.00 > 169.00	4.408	4.408	0.0	1.064	1063932		6.18(3.09-9.27)		3024	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.650	4.660	-0.010	1.681	6055481	2.41		96.4	10781	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.666	4.666	0.0	1.003	1040411	2.66		106	2826	
713.00 > 219.00	4.650	4.666	-0.016	1.000	716661		1.45(0.70-2.09)		3153	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.079	5.079	0.0	1.000	5526594	NC			1279	
813.00 > 169.00	5.079	5.079	0.0	1.000	1051481		5.26(2.77-8.32)		1672	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.079	5.091	-0.012	1.836	6490847	2.55		102	10650	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.451	5.451	0.0	1.073	4246767	NC			1162	
913.00 > 169.00	5.451	5.451	0.0	1.073	794346		5.35(2.55-7.64)		2048	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00009 Amount Added: 1.00 Units: mL

Report Date: 17-Sep-2018 15:54:15 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_012.d

Injection Date: 16-Sep-2018 14:53:59 Instrument ID: A9

Lims ID: CCV L5

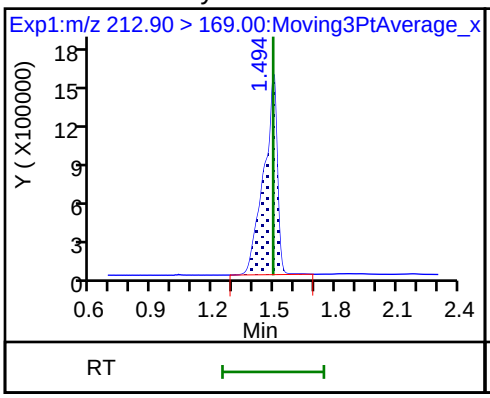
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 1

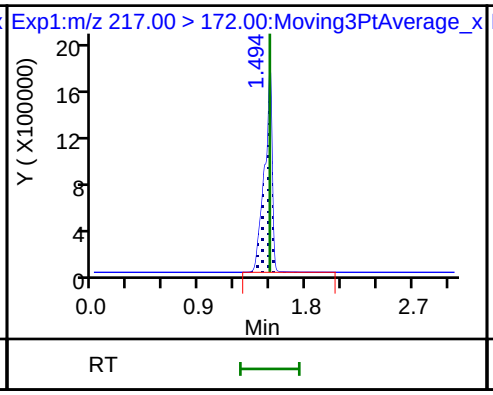
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

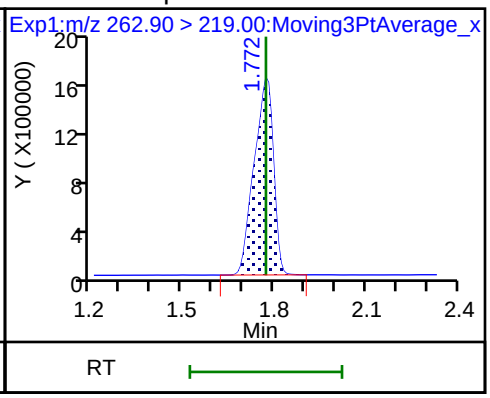
2 Perfluorobutyric acid



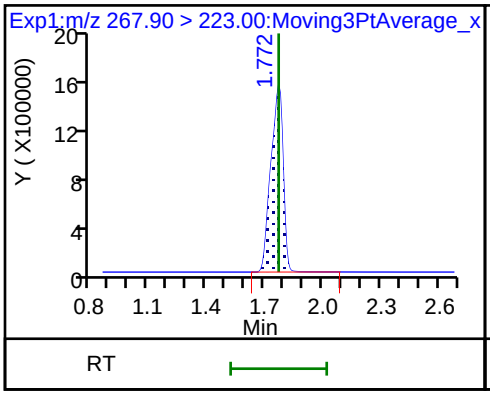
D 1 13C4 PFBA



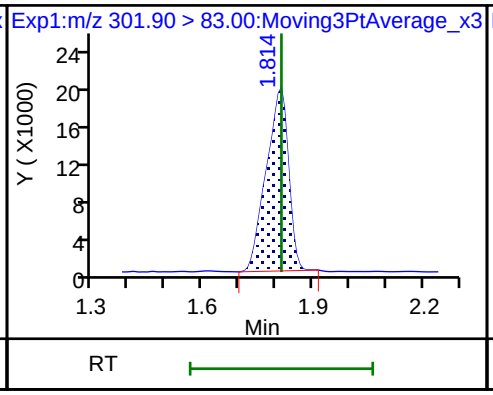
4 Perfluoropentanoic acid



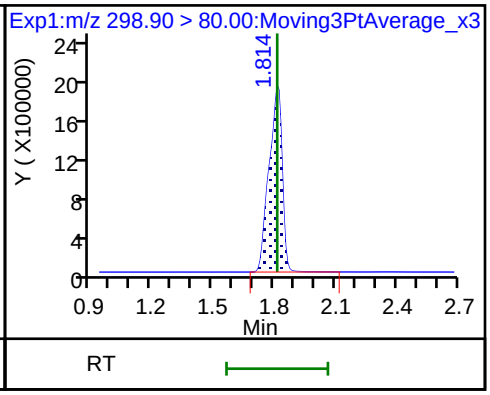
D 3 13C5-PFPeA



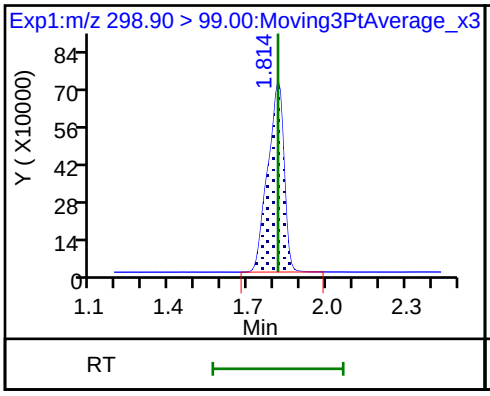
D 47 13C3-PFBS



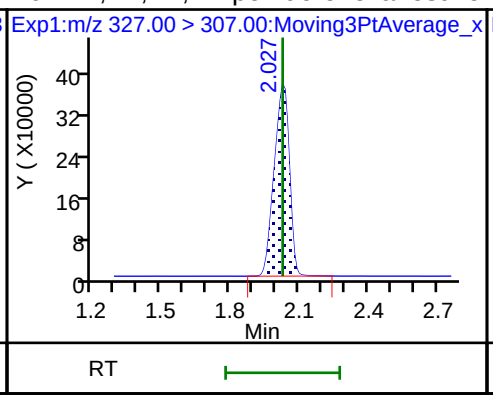
5 Perfluorobutanesulfonic acid



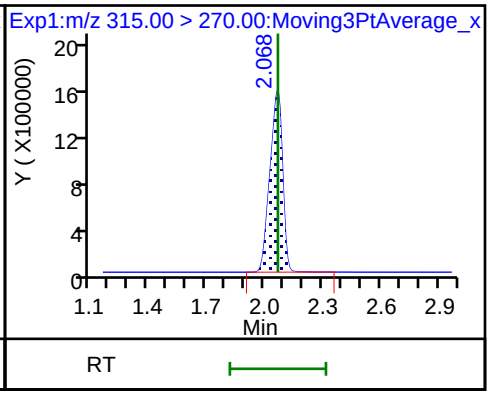
5 Perfluorobutanesulfonic acid



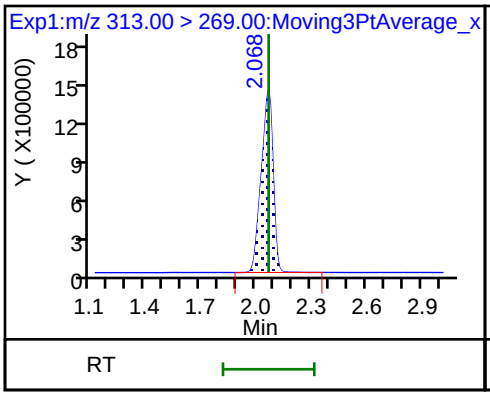
61 1H,1H,2H,2H-perfluorohexanesulfon



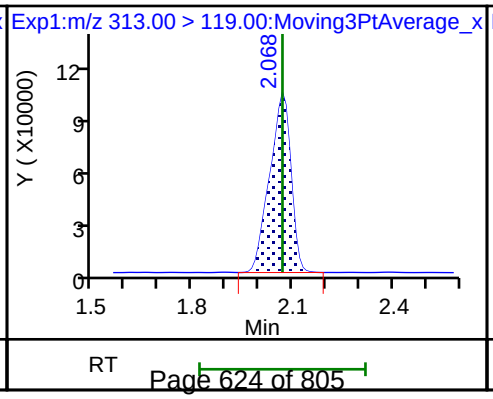
D 7 13C2 PFHxA



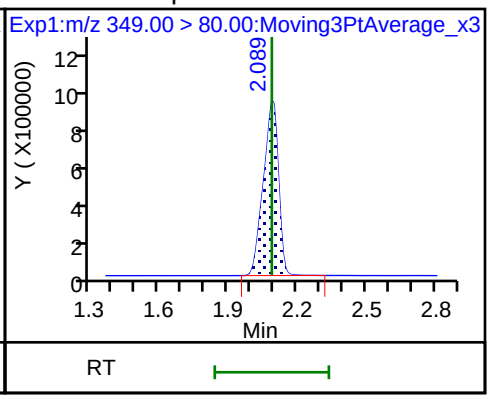
6 Perfluorohexanoic acid



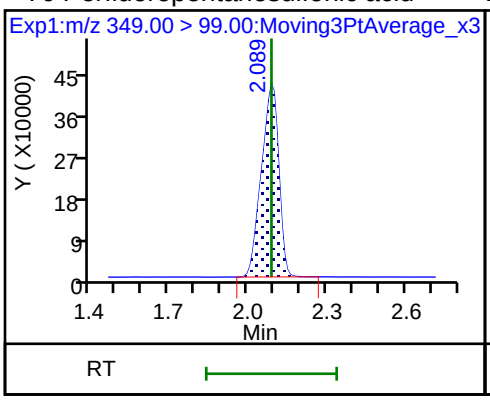
6 Perfluorohexanoic acid



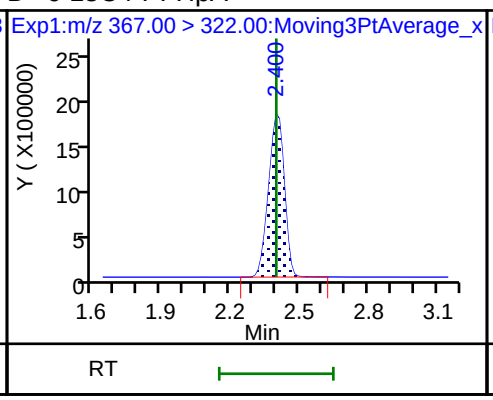
70 Perfluoropentanesulfonic acid



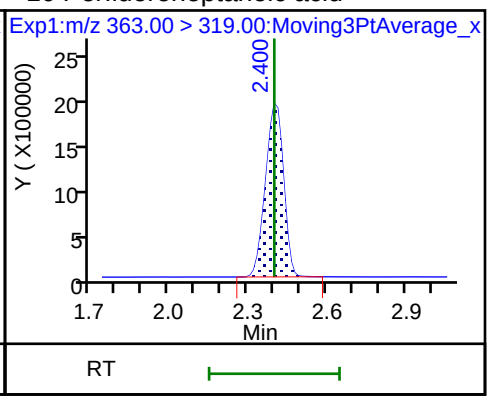
70 Perfluoropentanesulfonic acid



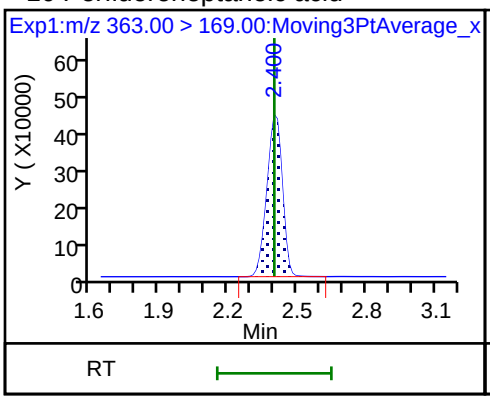
D 9 13C4-PFHpA



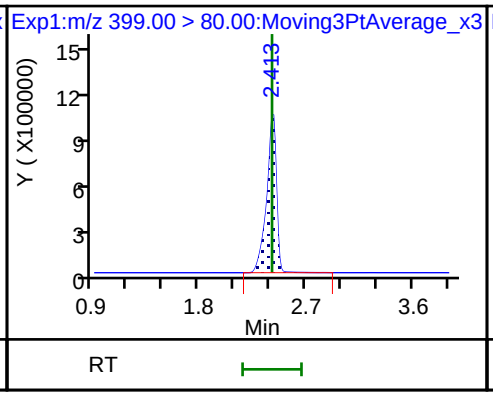
10 Perfluoroheptanoic acid



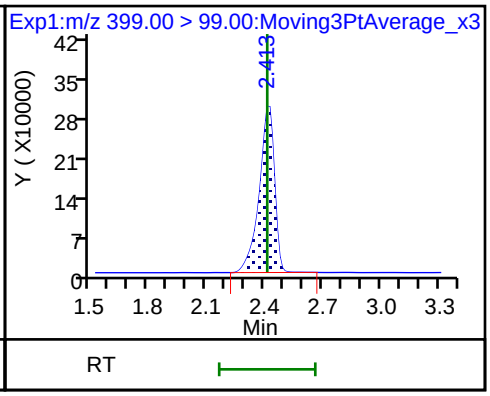
10 Perfluoroheptanoic acid



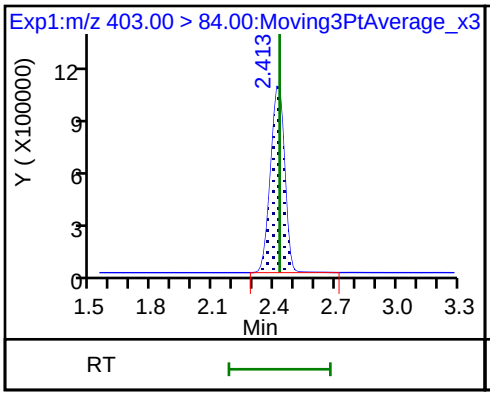
8 Perfluorohexanesulfonic acid



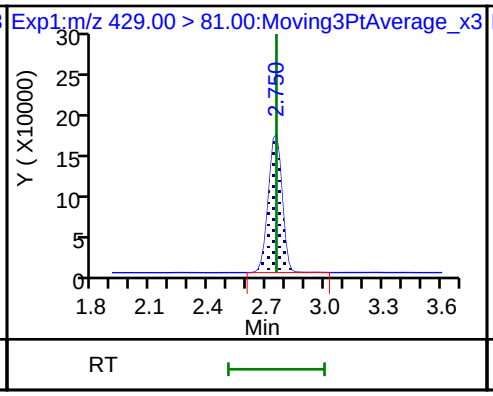
8 Perfluorohexanesulfonic acid



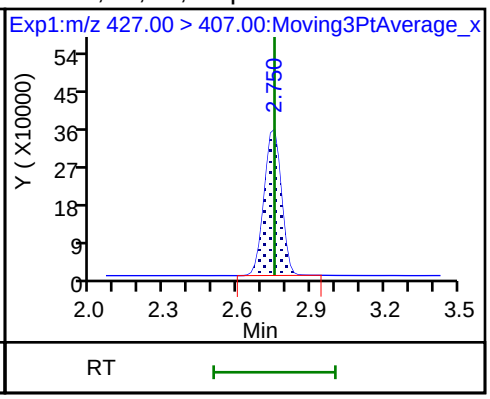
D 11 18O2 PFHxS



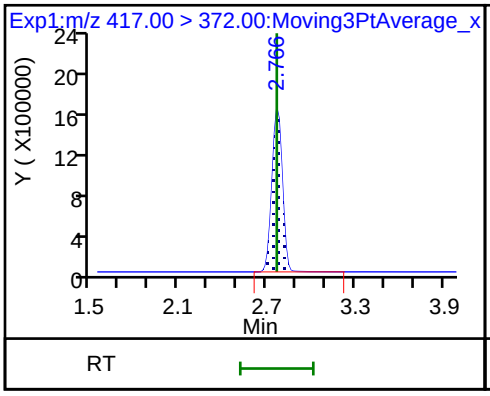
D 12 M2-6:2FTS



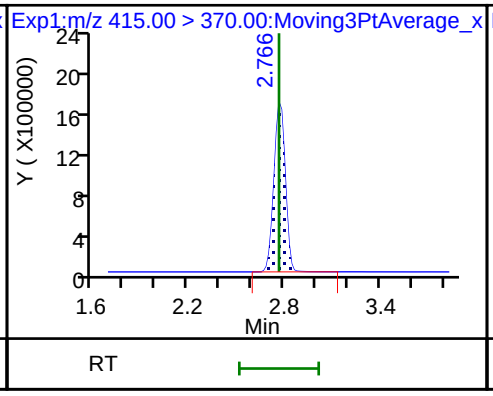
13 1H,1H,2H,2H-perfluorooctanesulfoni



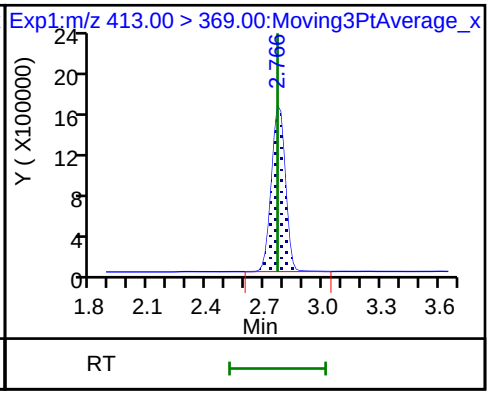
D 14 13C4 PFOA



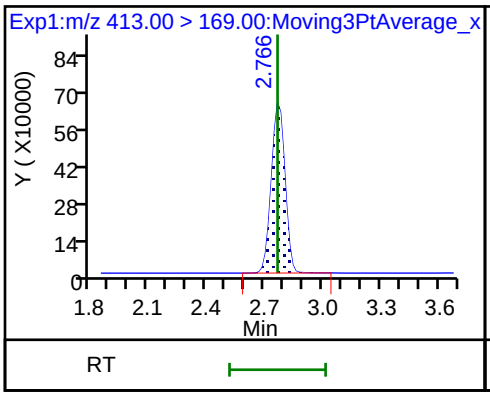
* 62 13C2-PFOA



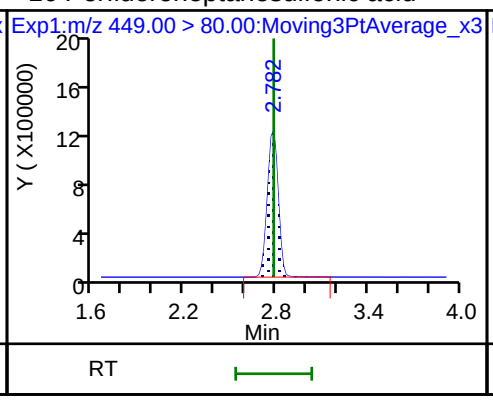
15 Perfluorooctanoic acid



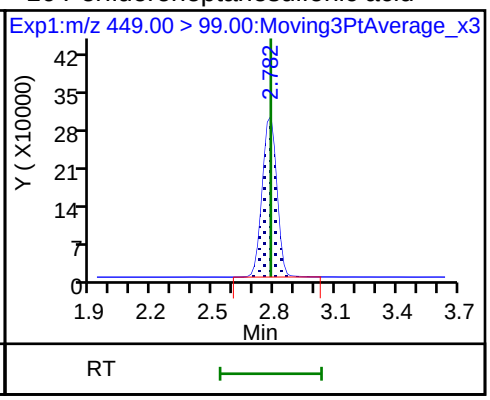
15 Perfluorooctanoic acid



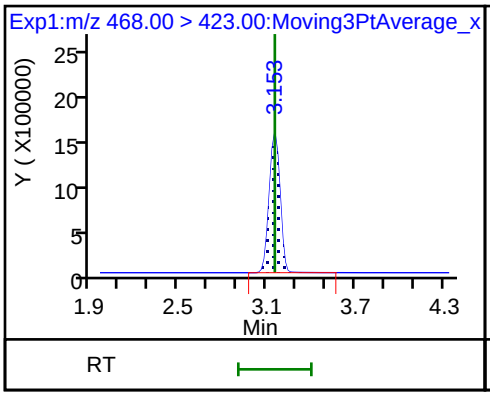
16 Perfluoroheptanesulfonic acid



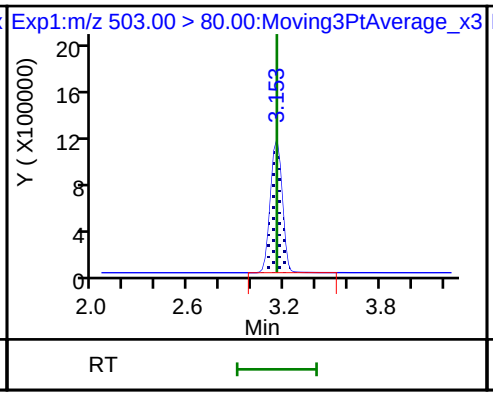
16 Perfluoroheptanesulfonic acid



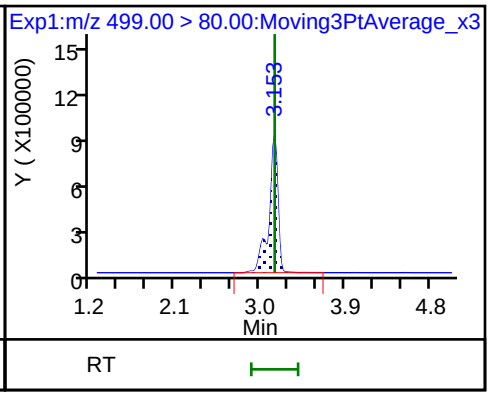
D 19 13C5 PFNA



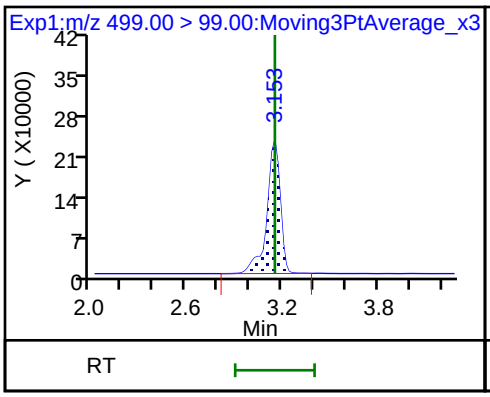
D 18 13C4 PFOS



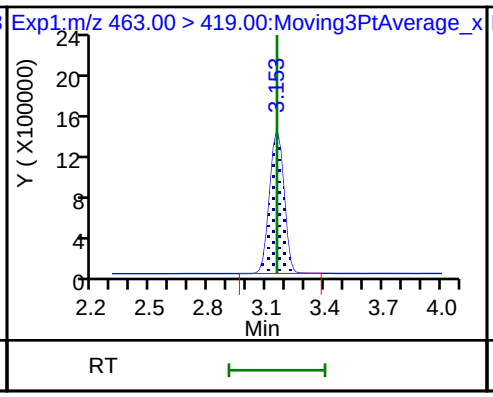
17 Perfluorooctane sulfonic acid



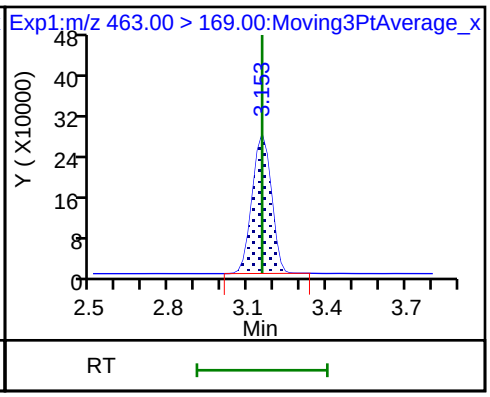
17 Perfluorooctane sulfonic acid



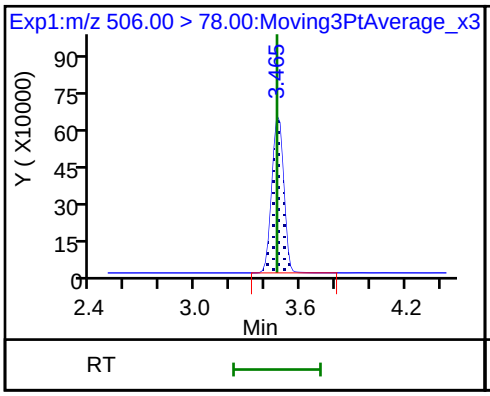
20 Perfluorononanoic acid



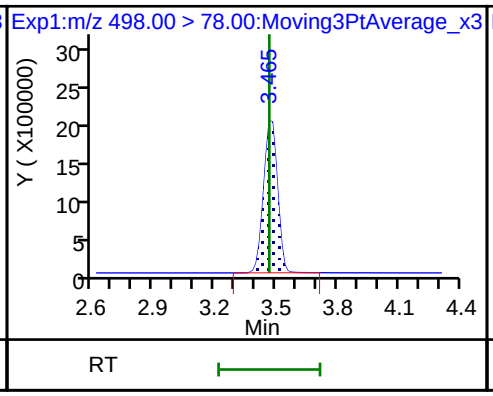
20 Perfluorononanoic acid



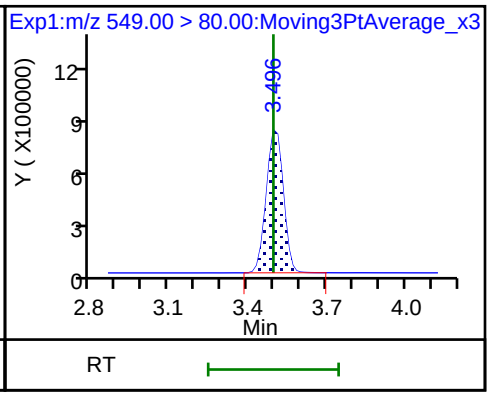
D 21 13C8 FOSA



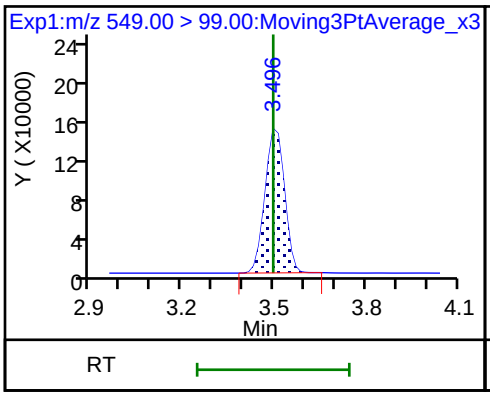
22 Perfluorooctane Sulfonamide



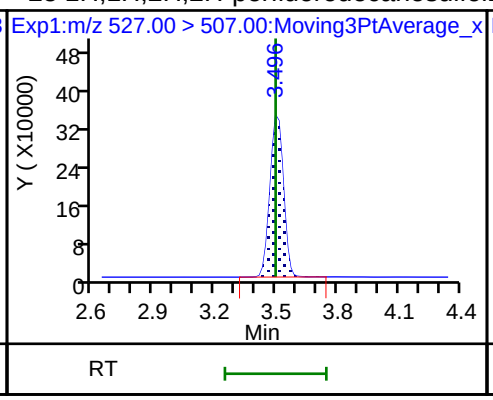
68 Perfluorononanesulfonic acid



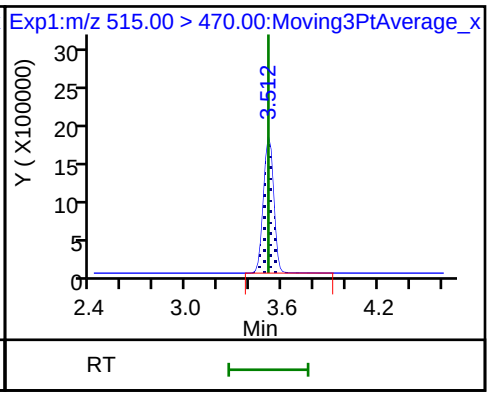
68 Perfluorononanesulfonic acid



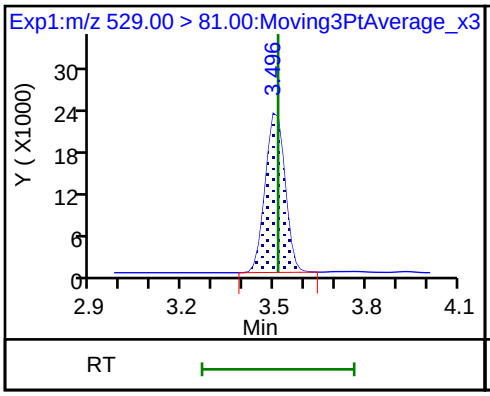
25 1H,1H,2H,2H-perfluorodecanesulfon



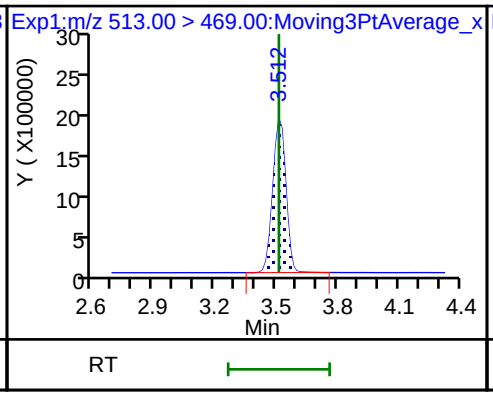
D 23 13C2 PFDA



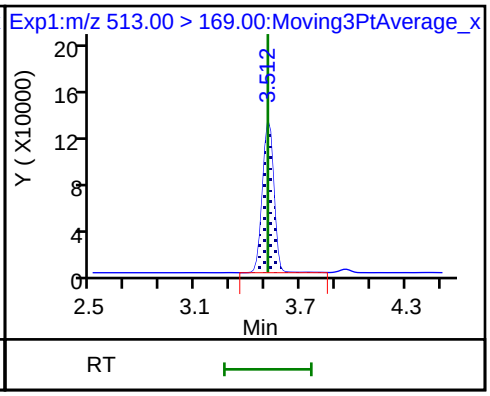
D 26 M2-8:2FTS



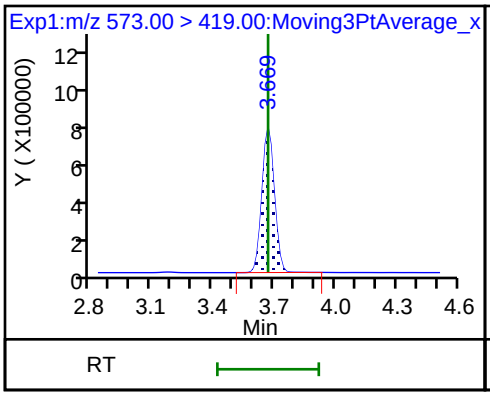
24 Perfluorodecanoic acid



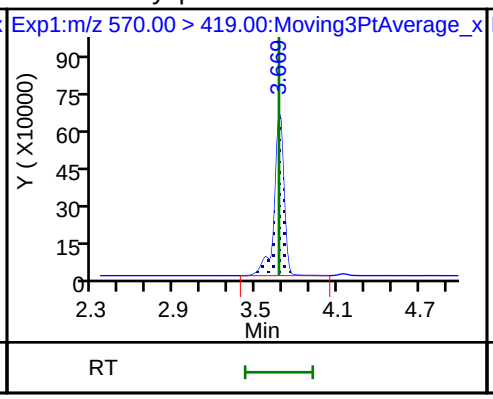
24 Perfluorodecanoic acid



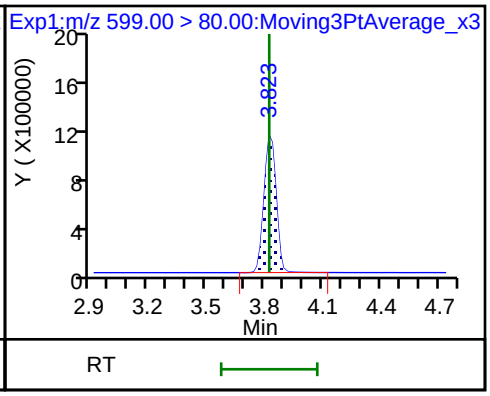
D 27 d3-NMeFOSAA



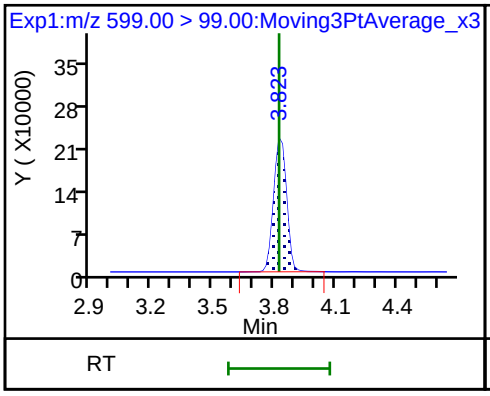
28 N-methyl perfluorooctane sulfonami



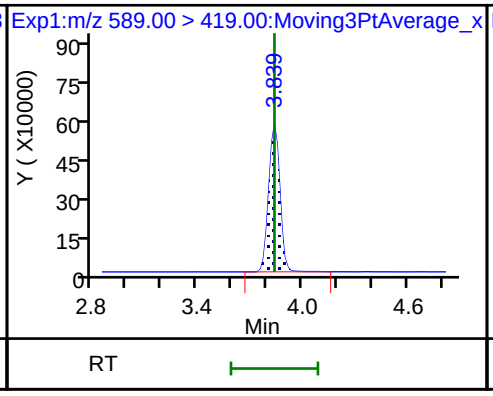
29 Perfluorodecane Sulfonic acid



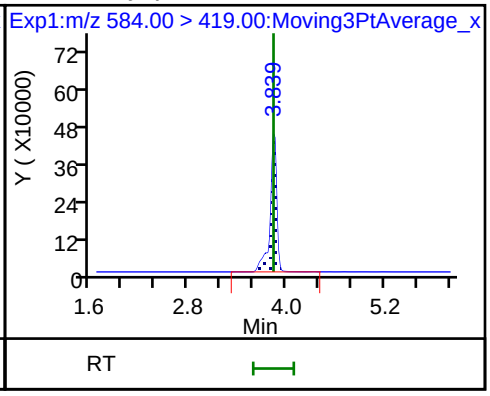
29 Perfluorodecane Sulfonic acid



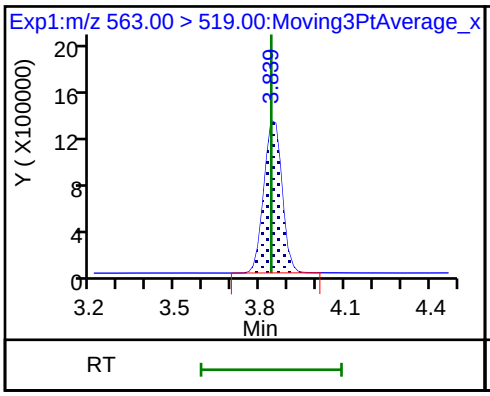
D 32 d5-NEtFOSAA



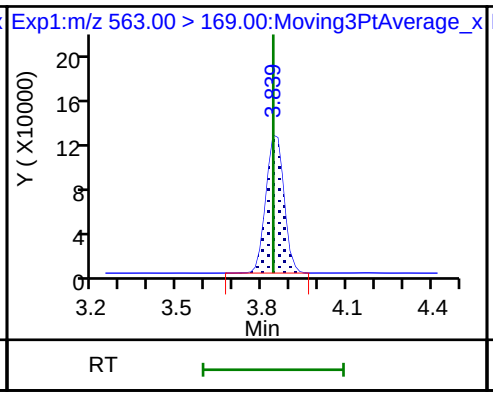
33 N-ethyl perfluorooctane sulfonamid



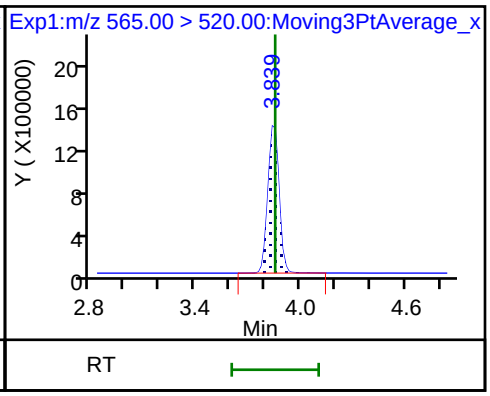
31 Perfluoroundecanoic acid



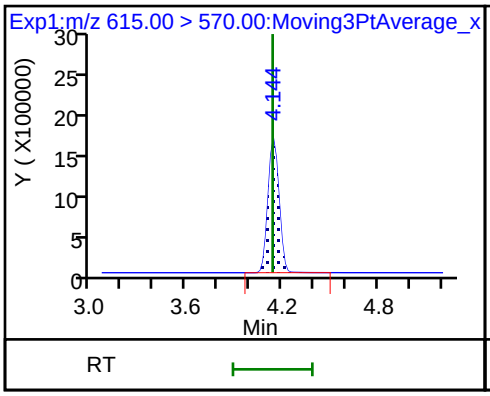
31 Perfluoroundecanoic acid



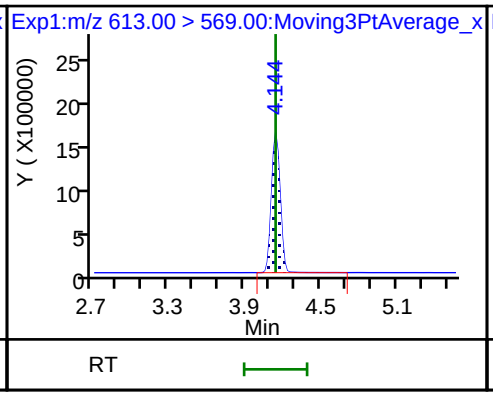
D 30 13C2 PFUnA



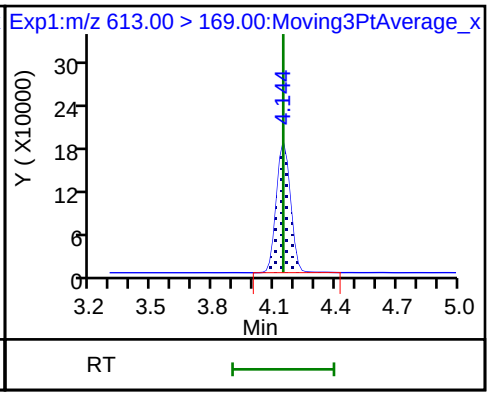
D 36 13C2 PFDoA



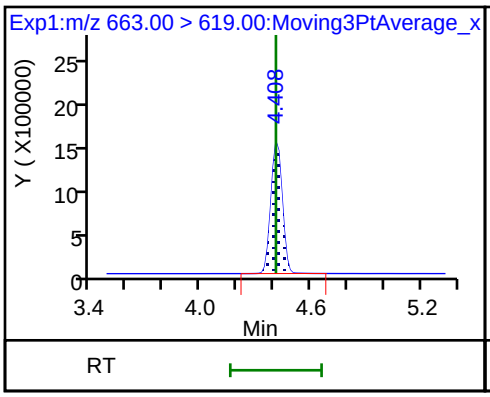
37 Perfluorododecanoic acid



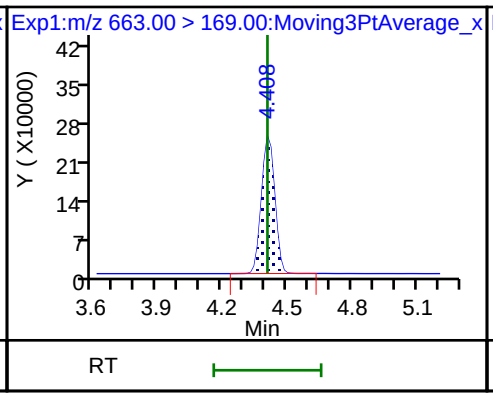
37 Perfluorododecanoic acid



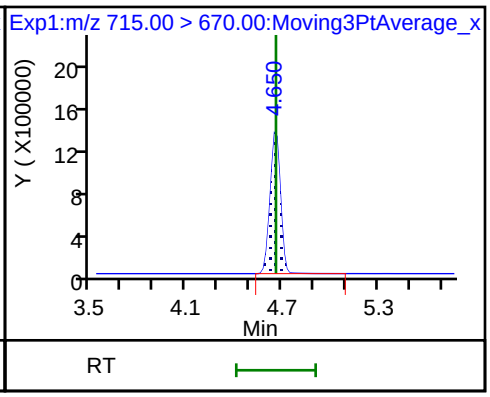
41 Perfluorotridecanoic acid



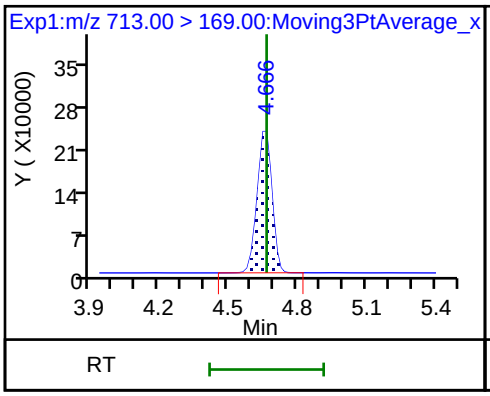
41 Perfluorotridecanoic acid



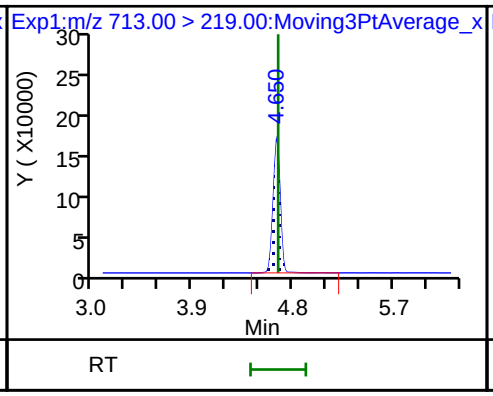
D 43 13C2-PFTeDA



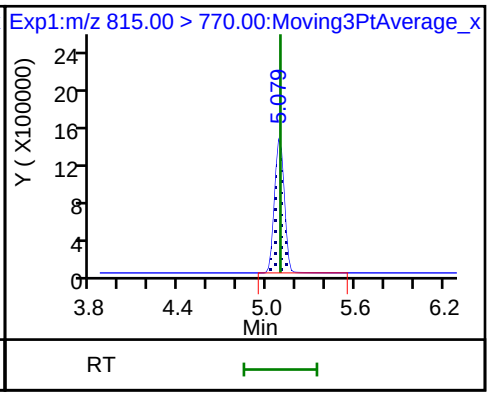
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245887/12 Calibration Date: 09/16/2018 16:16

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9449		1.04	1.00	3.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	0.997		0.983	1.00	-1.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	116.2		0.977	0.884	10.6	30.0
4:2 FTS	AveID	21.61	20.48		0.885	0.934	-5.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9011		0.989	1.00	-1.1	30.0
Perfluoropentanesulfonic acid	AveID	49.87	51.85		0.975	0.938	4.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.109		1.09	1.00	8.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.235		0.908	0.910	-0.2	30.0
6:2 FTS	AveID	2.140	2.122		0.940	0.948	-0.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.047		1.01	0.952	6.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.047		0.973	1.00	-2.7	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.093		1.12	1.00	11.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.037		0.912	0.928	-1.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.100		1.05	1.00	4.6	30.0
8:2 FTS	AveID	15.14	14.87		0.941	0.958	-1.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.056		0.927	1.00	-7.3	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.6586		0.979	0.960	2.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.016		1.02	1.00	2.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8686		1.03	0.964	6.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9196		0.989	1.00	-1.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9181		1.02	1.00	2.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	0.998		0.990	1.00	-1.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8144		1.02	1.00	1.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1517		0.940	1.00	-6.0	30.0
13C4 PFBA	Ave	0.9623	0.8714		2.26	2.50	-9.4	30.0
13C5 PFPeA	Ave	0.8584	0.7919		2.31	2.50	-7.7	30.0
13C3-PFBS	Ave	0.0113	0.0106		2.19	2.33	-6.0	30.0
13C2 PFHxA	Ave	0.9075	0.8211		2.26	2.50	-9.5	30.0
13C4-PFHpA	Ave	1.082	0.999		2.31	2.50	-7.7	30.0
18O2 PFHxS	Ave	0.6655	0.6077		2.16	2.37	-8.7	30.0
M2-6:2FTS	Ave	0.1063	0.0962		2.15	2.38	-9.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245887/12 Calibration Date: 09/16/2018 16:16

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.9545		2.37	2.50	-5.3	30.0
13C4 PFOS	Ave	0.7151	0.6745		2.25	2.39	-5.7	30.0
13C5 PFNA	Ave	0.9437	0.8545		2.26	2.50	-9.5	30.0
13C8 FOSA	Ave	0.3783	0.3679		2.43	2.50	-2.7	30.0
13C2 PFDA	Ave	0.9426	0.9781		2.59	2.50	3.8	30.0
M2-8:2FTS	Ave	0.0156	0.0144		2.21	2.40	-7.7	30.0
d3-NMeFOSAA	Ave	0.4249	0.3884		2.29	2.50	-8.6	30.0
13C2 PFUnA	Ave	0.8023	0.7773		2.42	2.50	-3.1	30.0
d5-NEtFOSAA	Ave	0.3342	0.3257		2.44	2.50	-2.6	30.0
13C2 PFDoA	Ave	0.9759	0.9432		2.42	2.50	-3.4	30.0
13C2-PFTeDA	Ave	0.7774	0.7422		2.39	2.50	-4.5	30.0
13C2-PFHxDA	Ave	0.7882	0.7475		2.37	2.50	-5.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_023.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 16-Sep-2018 16:16:33 ALS Bottle#: 13 Worklist Smp#: 12
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 16:14:06 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 16:14:06

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	1.488	1.488	0.0	1.000	2815902	1.04		104	356	
D 1 13C4 PFBA										
217.00 > 172.00	1.488	1.494	-0.006	0.541	7450536	2.26		90.6	12322	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.763	1.763	0.0	1.000	2700286	0.9830		98.3	246	
D 3 13C5-PFPeA										
267.90 > 223.00	1.763	1.772	-0.009	0.641	6770772	2.31		92.3	10015	
D 47 13C3-PFBS										
301.90 > 83.00	1.805	1.814	-0.009	0.656	84232	2.19		94.0	379	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.805	1.805	0.0	1.000	3720406	0.9774		111	2277	
298.90 > 99.00	1.805	1.805	0.0	1.000	1206219		3.08(1.35-4.05)		975	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.027	-0.010	0.733	699256	NC			751	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.017	0.0	1.117	692885	0.8851		94.8	2823	
D 7 13C2 PFHxA										
315.00 > 270.00	2.047	2.068	-0.021	0.744	7020598	2.26		90.5	12629	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.047	2.047	0.0	1.000	2530485	0.9895		98.9	560	
313.00 > 119.00	2.047	2.047	0.0	1.000	192671		13.13(6.96-20.87)		391	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.078	2.078	0.0	1.151	1762165	0.9753		104	3133	
349.00 > 99.00	2.078	2.078	0.0	1.151	803434		2.19(1.15-3.45)		1243	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.149	2.170	-0.021	0.782	859015	NC			1699	

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	2.149	2.149	0.0	1.000	545577	NC			274	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.399	-0.013	0.868	8537870	2.31		92.3	10367	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.386	0.0	1.000	3788422	1.09		109	523	
363.00 > 169.00	2.386	2.386	0.0	1.000	868408		4.36(2.17-6.52)		1421	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.399	0.0	1.000	2335024	0.9080		99.8	2135	
399.00 > 99.00	2.399	2.399	0.0	1.000	668390		3.49(1.90-5.70)		748	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.426	-0.027	0.872	4914859	2.16		91.3	9715	
76 DONA										
377.00 > 251.00	2.425	2.425	0.0	0.778	6389296	NC			6436	
377.00 > 85.00	2.425	2.425	0.0	0.778	2827090		2.26(1.13-3.39)		1546	
D 12 M2-6:2FTS										
429.00 > 81.00	2.718	2.750	-0.032	0.988	781055	2.15		90.4	1326	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.718	2.718	0.0	1.000	661683	0.9401		99.2	334	
D 14 13C4 PFOA										
417.00 > 372.00	2.750	2.766	-0.016	1.000	8161038	2.37		94.7	9547	
D 73 13C8 PFOA										
421.00 > 376.00	2.734	2.766	-0.032		6922830	NC			7579	
* 62 13C2-PFOA										
415.00 > 370.00	2.750	2.750	0.0		8549947	2.50			7420	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.750	2.750	0.0	1.000	3420151	0.9735		97.3	195	
413.00 > 169.00	2.750	2.750	0.0	1.000	1290191		2.65(1.36-4.08)		1280	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.750	2.750	0.0	0.882	2299645	1.01		106	2712	
449.00 > 99.00	2.750	2.750	0.0	0.882	557376		4.13(1.84-5.53)		1474	
D 72 13C8 PFOS										
507.00 > 99.00	3.116	3.153	-0.037		1250367	NC			2726	
D 19 13C5 PFNA										
468.00 > 423.00	3.116	3.153	-0.037	1.133	7306070	2.26		90.5	5152	
D 18 13C4 PFOS										
503.00 > 80.00	3.116	3.153	-0.037	1.133	5513296	2.25		94.3	4602	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.116	3.116	0.0	1.000	2219653	0.9119		98.3	1891	
499.00 > 99.00	3.116	3.116	0.0	1.000	557683		3.98(2.04-6.12)		1229	
20 Perfluorononanoic acid										
463.00 > 419.00	3.116	3.116	0.0	1.000	3193408	1.12		112	313	
463.00 > 169.00	3.116	3.116	0.0	1.000	580042		5.51(2.68-8.03)		1381	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.334	3.334	0.0	1.070	2611850	NC			3433	
D 21 13C8 FOSA										
506.00 > 78.00	3.448	3.465	-0.017	1.254	3145905	2.43		97.3	6406	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.448	3.448	0.0	1.000	3901396	1.05		105	2786	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.480	3.480	0.0	1.117	1458459	0.9789		102	2253	
549.00 > 99.00	3.464	3.480	-0.016	1.112	261069		5.59(3.02-9.05)		880	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.480	3.480	0.0	1.000	703277	0.9410		98.2	1589	
D 23 13C2 PFDA										
515.00 > 470.00	3.480	3.512	-0.032	1.266	8362601	2.59		104	7951	
D 26 M2-8:2FTS										
529.00 > 81.00	3.480	3.512	-0.032	1.266	118240	2.21		92.3	688	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.480	3.480	0.0	1.000	3530904	0.9273		92.7	637	
513.00 > 169.00	3.480	3.480	0.0	1.000	259638		13.60(7.12-21.35)		348	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.641	3.669	-0.028	1.324	3321039	2.29		91.4	4402	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.641	3.641	0.0	1.000	1349979	1.02		102	381	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.791	3.791	0.0	1.217	1931609	1.03		107	2235	
599.00 > 99.00	3.791	3.791	0.0	1.217	402153		4.80(2.14-6.43)		1535	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.807	3.839	-0.032	1.384	2784251	2.44		97.4	2188	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.807	3.807	0.0	1.000	1024177	0.9890		98.9	1586	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.807	3.807	0.0	1.000	2440626	1.02		102	503	
563.00 > 169.00	3.807	3.807	0.0	1.000	228950		10.66(5.24-15.72)		824	
D 30 13C2 PFUnA										
565.00 > 520.00	3.807	3.854	-0.047	1.384	6645670	2.42		96.9	5408	
35 MeFOSA										
512.00 > 169.00	3.943	3.943	0.0		672365	NC			550	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.975	3.975	0.0	1.276	3030307	NC			5548	
D 36 13C2 PFDoA										
615.00 > 570.00	4.105	4.139	-0.034	1.493	8064266	2.42		96.6	7883	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.138	4.138	0.0		696486	NC			488	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.105	4.105	0.0	1.180	440218	NC			1076	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.105	4.105	0.0	1.000	3219875	0.99		99.0	687	
613.00 > 169.00	4.105	4.105	0.0	1.000	336101		9.58(4.68-14.05)		954	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.357	4.357	0.0	1.398	215839	NC			647	
699.00 > 99.00	4.357	4.357	0.0	1.398	362036		0.60(0.28-0.83)		1047	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.372	4.372	0.0	1.065	2626920	1.02		102	997	
663.00 > 169.00	4.372	4.372	0.0	1.065	433815		6.06(3.09-9.27)		1228	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.627	4.660	-0.033	1.682	6345790	2.39		95.5	10912	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.627	4.627	0.0	1.000	385008	0.9396		94.0	1721	
713.00 > 219.00	4.609	4.627	-0.018	0.996	295631		1.30(0.70-2.09)		1461	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.040	5.040	0.0	1.000	2284597	NC			521	
813.00 > 169.00	5.040	5.040	0.0	1.000	400646		5.70(2.77-8.32)		905	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.040	5.091	-0.051	1.833	6391443	2.37		94.8	6440	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.404	5.404	0.0	1.072	1759421	NC			497	
913.00 > 169.00	5.404	5.404	0.0	1.072	317437		5.54(2.55-7.64)		1179	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00009 Amount Added: 1.00 Units: mL

Report Date: 17-Sep-2018 16:14:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_023.d

Injection Date: 16-Sep-2018 16:16:33 Instrument ID: A9

Lims ID: CCV L4

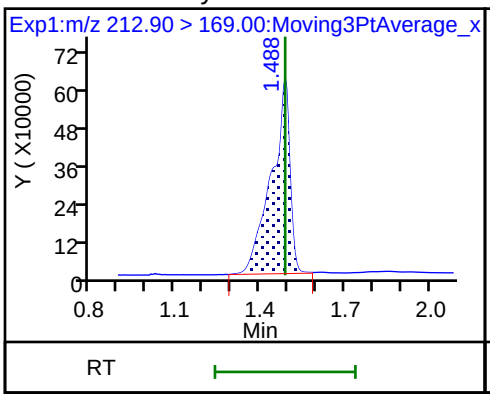
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 12

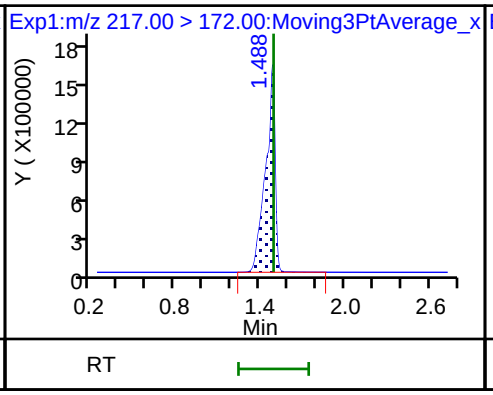
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

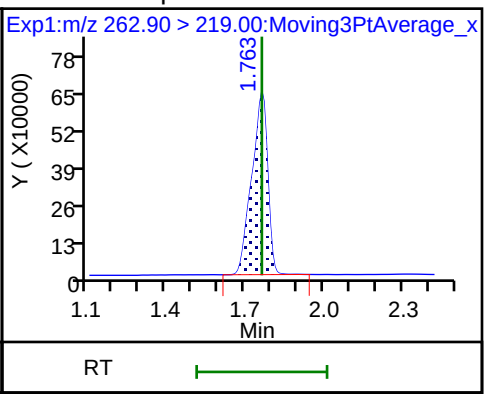
2 Perfluorobutyric acid



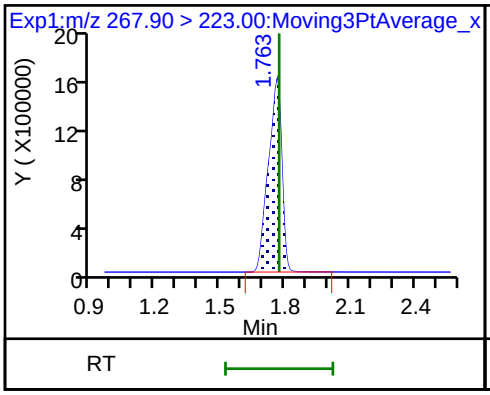
D 1 13C4 PFBA



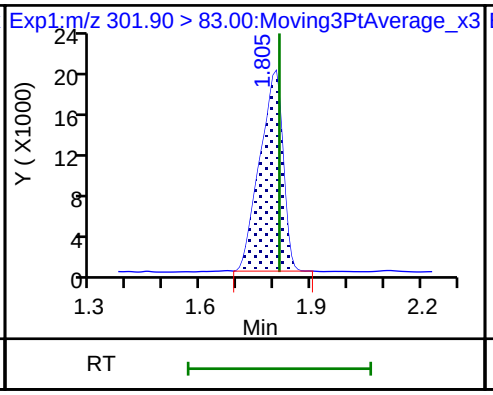
4 Perfluoropentanoic acid



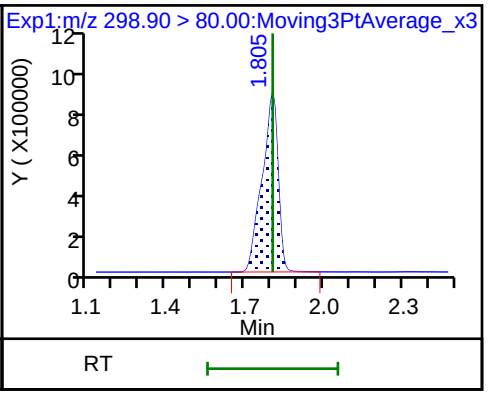
D 3 13C5-PFPeA



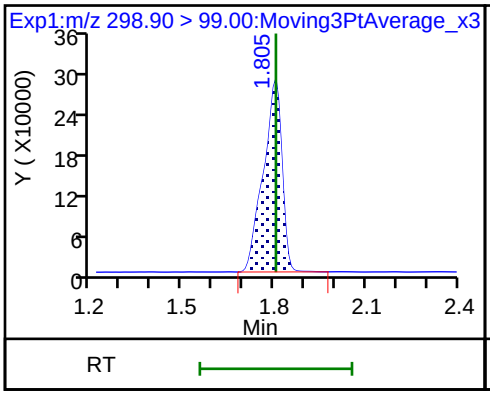
D 47 13C3-PFBS



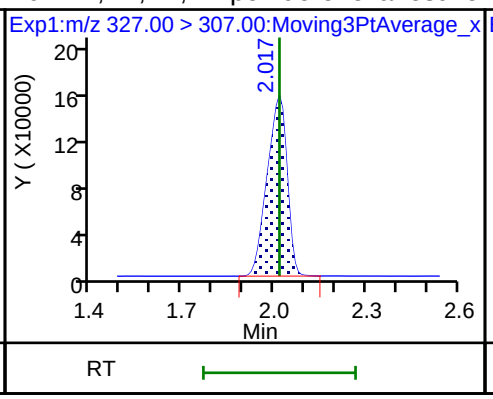
5 Perfluorobutanesulfonic acid



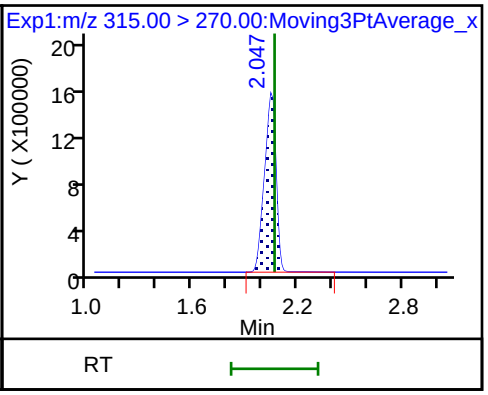
5 Perfluorobutanesulfonic acid



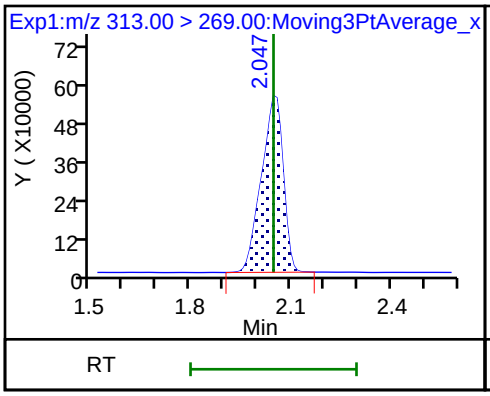
61 1H,1H,2H,2H-perfluorohexanesulfon



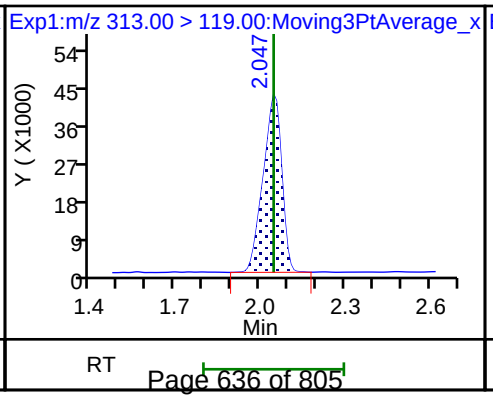
D 7 13C2 PFHxA



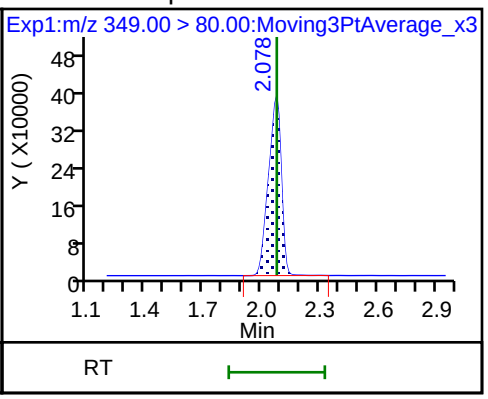
6 Perfluorohexanoic acid



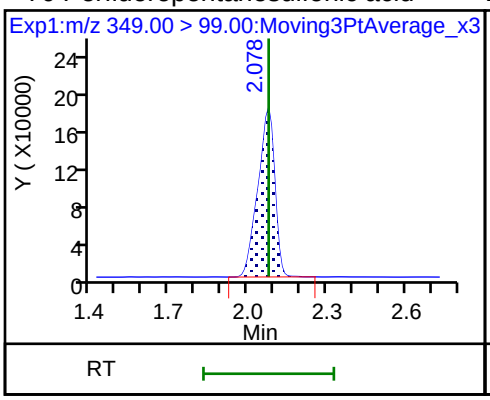
6 Perfluorohexanoic acid



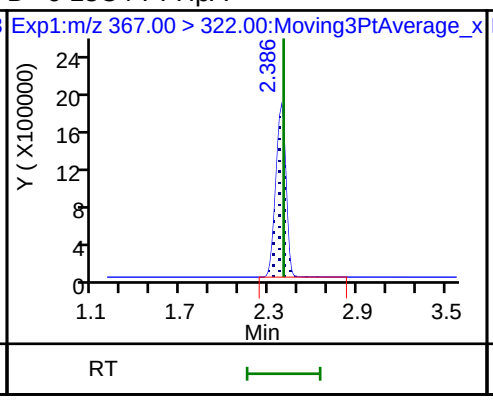
70 Perfluoropentanesulfonic acid



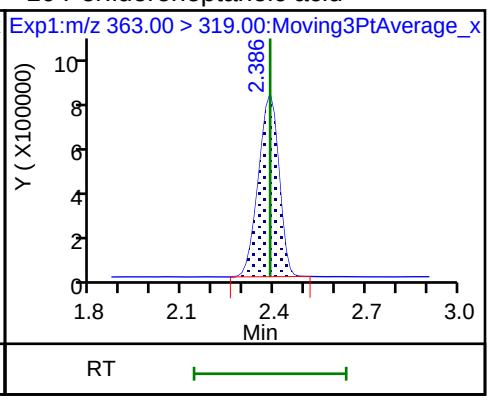
70 Perfluoropentanesulfonic acid



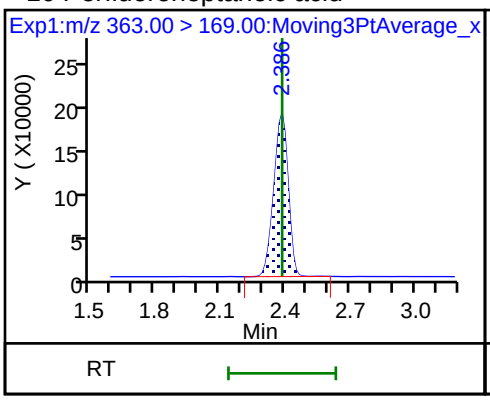
D 9 13C4-PFHpA



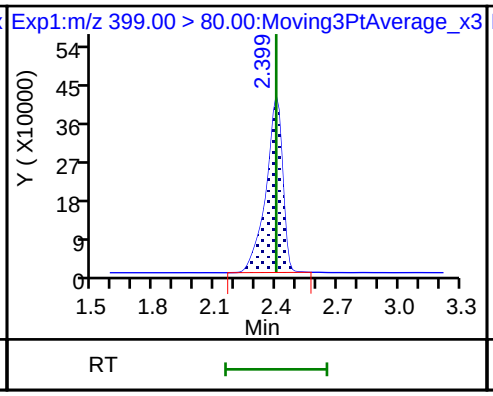
10 Perfluoroheptanoic acid



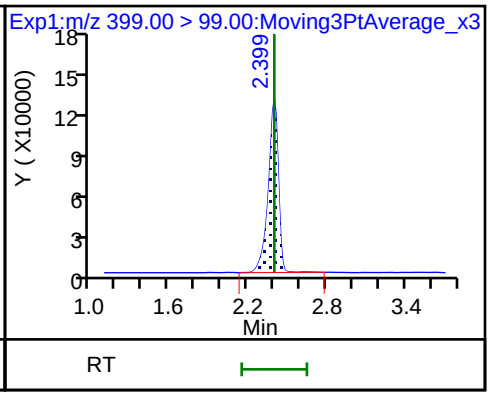
10 Perfluoroheptanoic acid



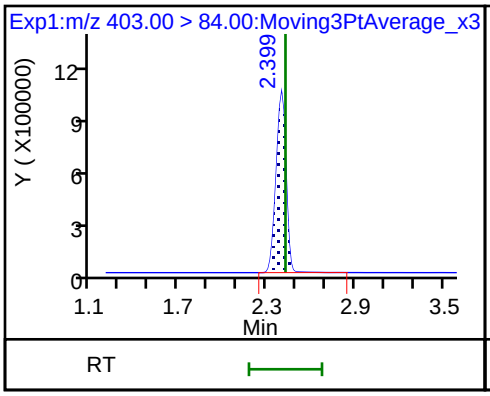
8 Perfluorohexanesulfonic acid



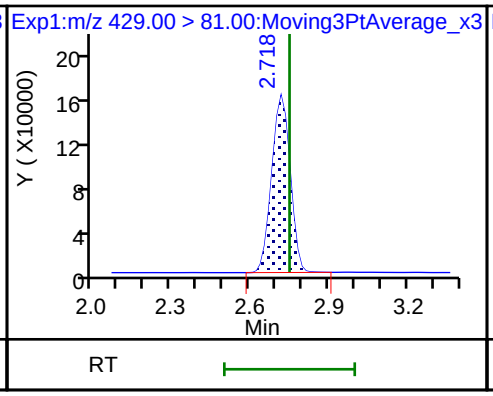
8 Perfluorohexanesulfonic acid



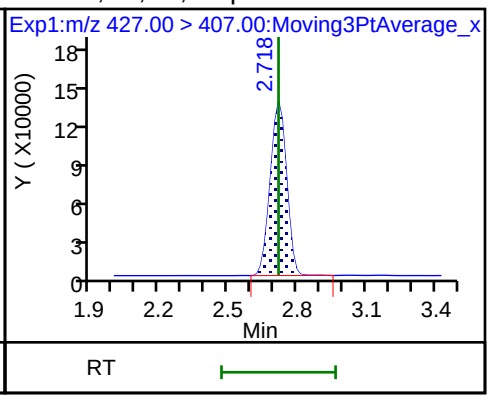
D 11 18O2 PFHxS



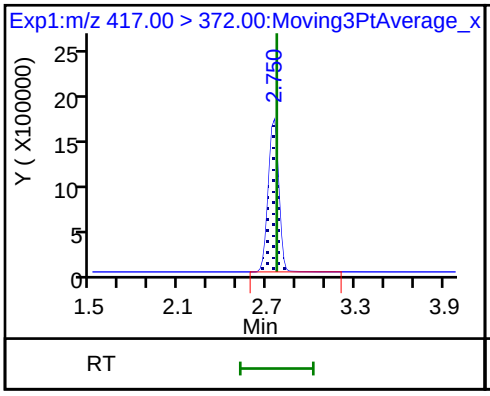
D 12 M2-6:2FTS



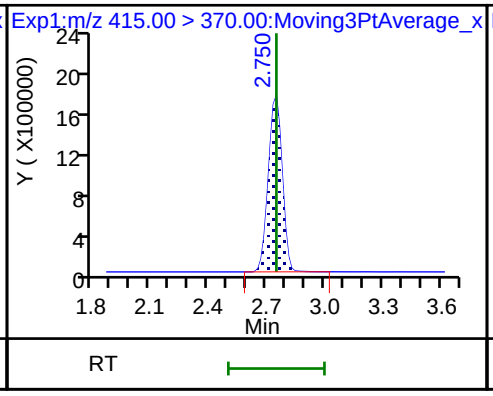
13 1H,1H,2H,2H-perfluorooctanesulfoni



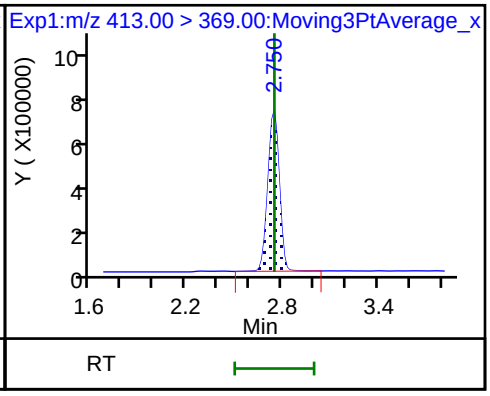
D 14 13C4 PFOA



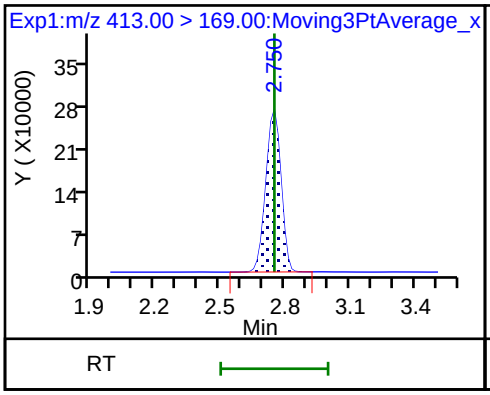
* 62 13C2-PFOA



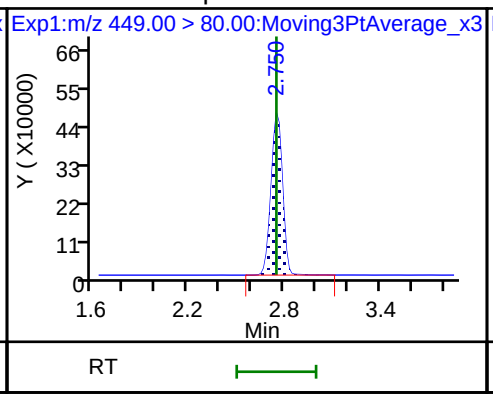
15 Perfluorooctanoic acid



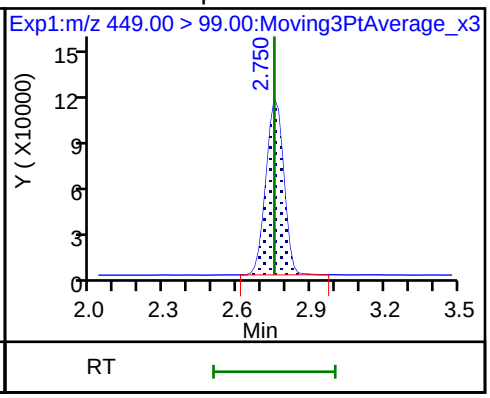
15 Perfluorooctanoic acid



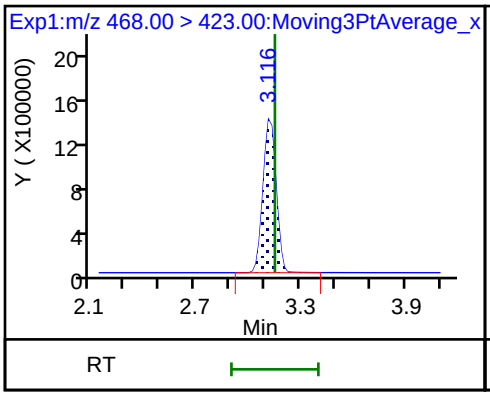
16 Perfluoroheptanesulfonic acid



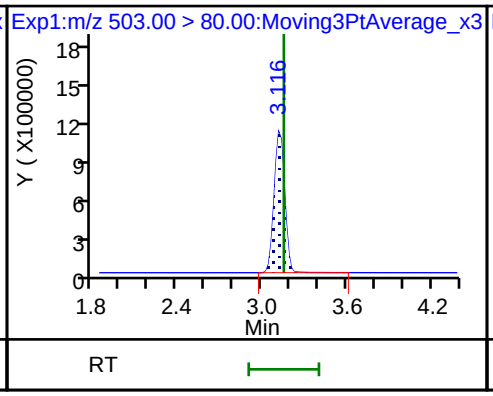
16 Perfluoroheptanesulfonic acid



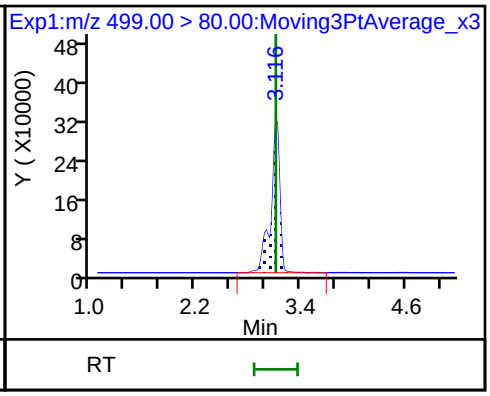
D 19 13C5 PFNA



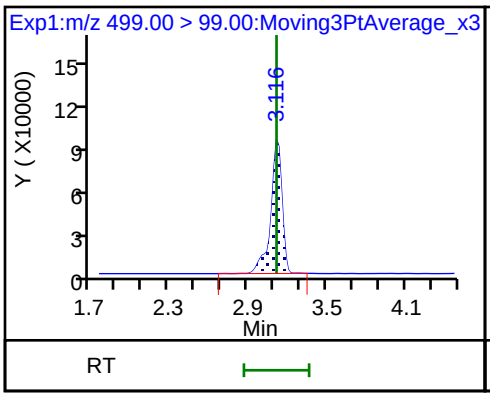
D 18 13C4 PFOS



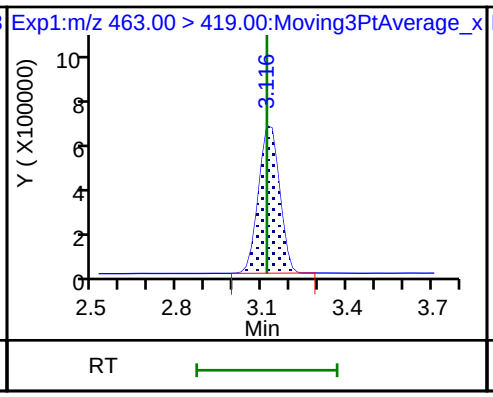
17 Perfluorooctane sulfonic acid



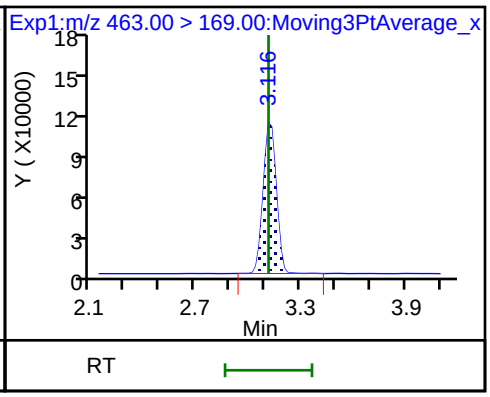
17 Perfluorooctane sulfonic acid



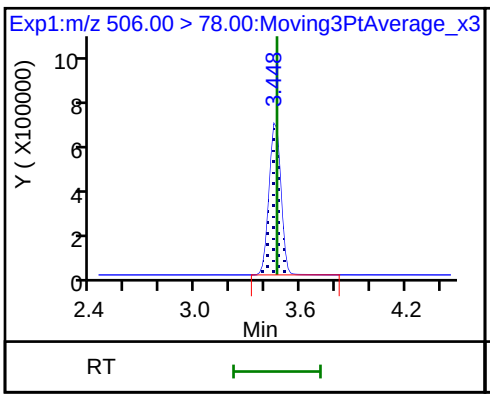
20 Perfluorononanoic acid



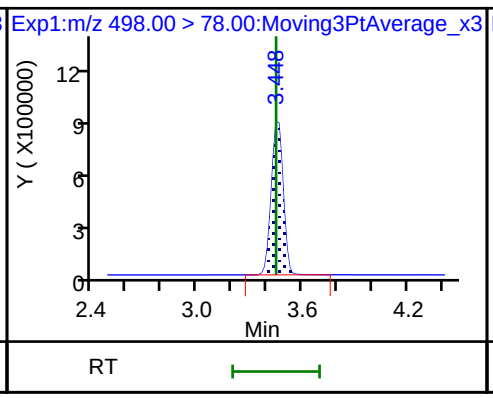
20 Perfluorononanoic acid



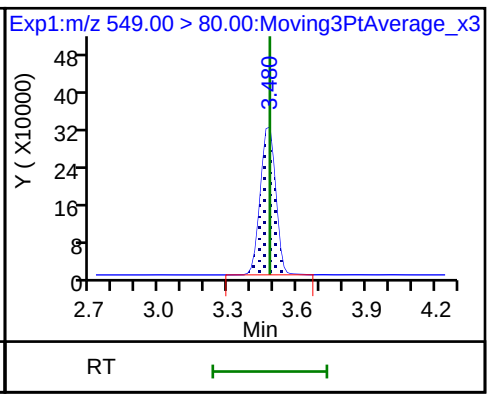
D 21 13C8 FOSA



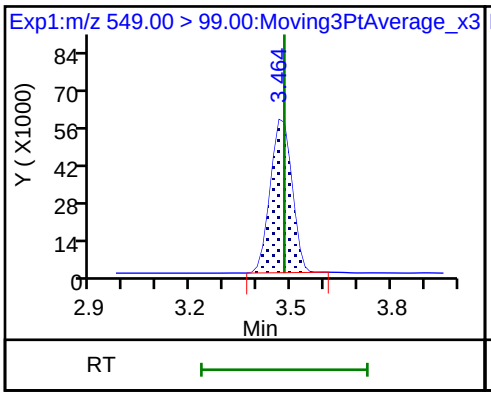
22 Perfluorooctane Sulfonamide



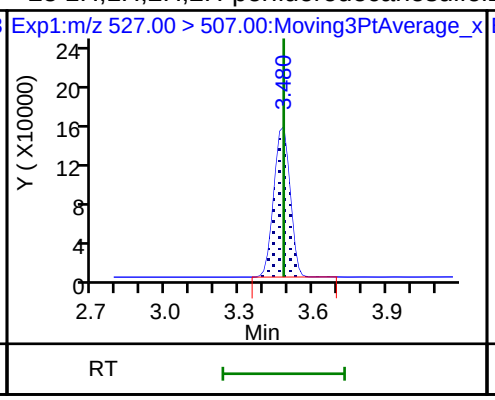
68 Perfluorononanesulfonic acid



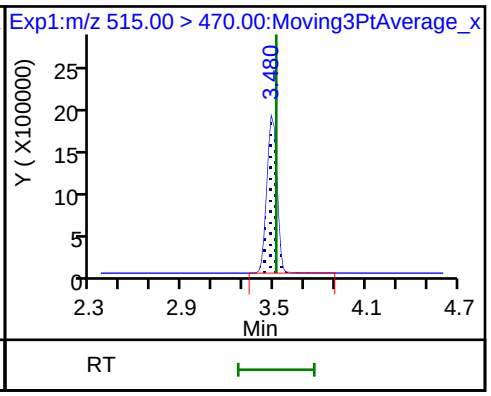
68 Perfluorononanesulfonic acid



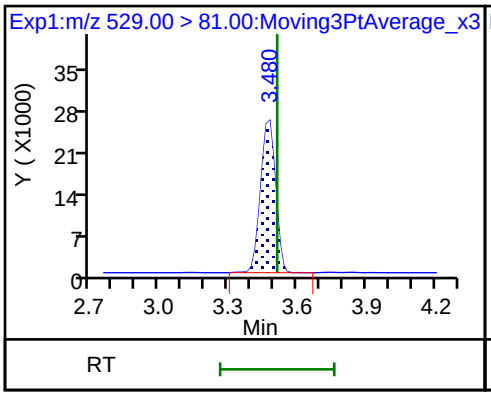
25 1H,1H,2H,2H-perfluorodecanesulfon



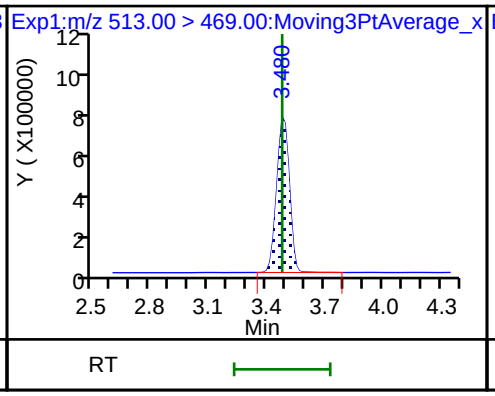
D 23 13C2 PFDA



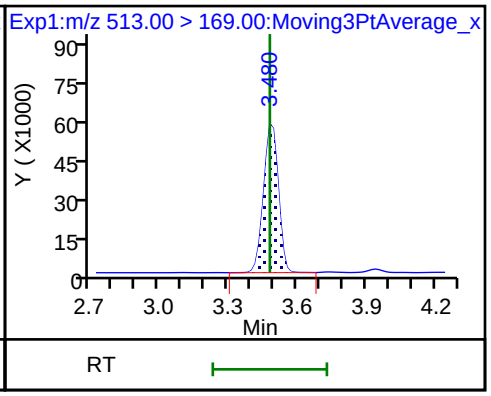
D 26 M2-8:2FTS



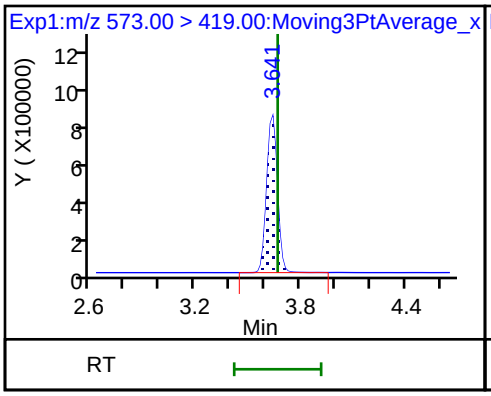
24 Perfluorodecanoic acid



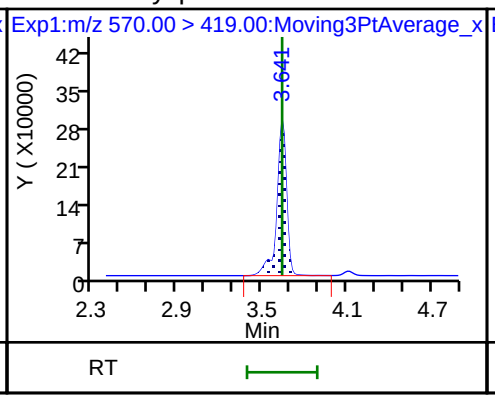
24 Perfluorodecanoic acid



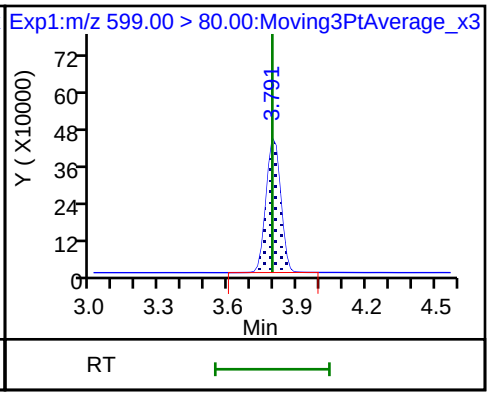
D 27 d3-NMeFOSAA



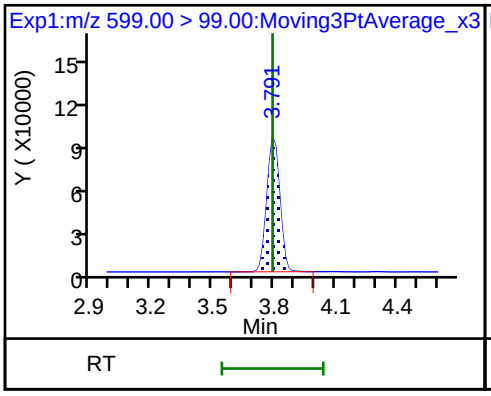
28 N-methyl perfluorooctane sulfonami



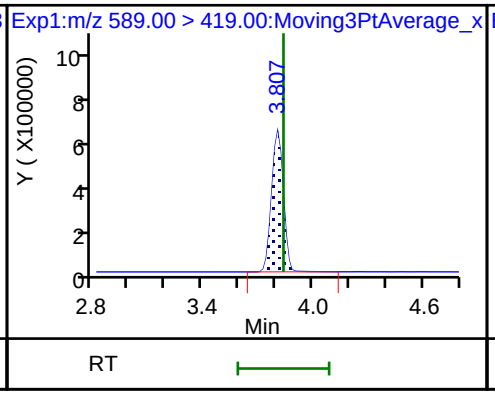
29 Perfluorodecane Sulfonic acid



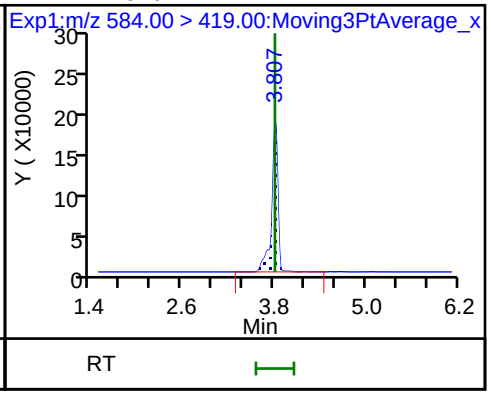
29 Perfluorodecane Sulfonic acid



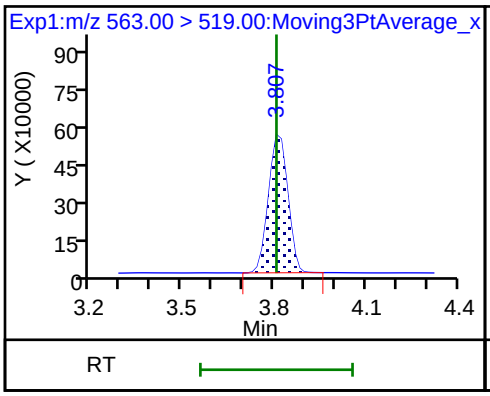
D 32 d5-NEtFOSAA



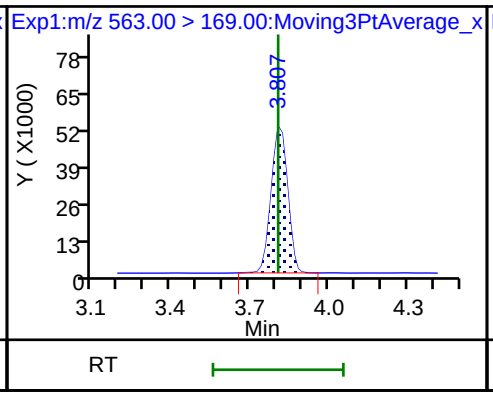
33 N-ethyl perfluorooctane sulfonamid



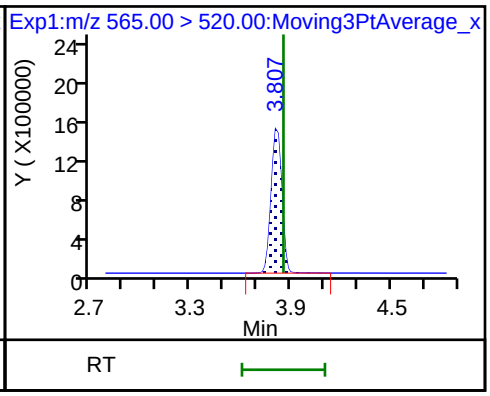
31 Perfluoroundecanoic acid



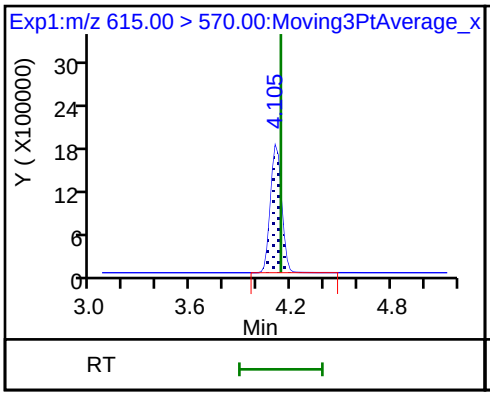
31 Perfluoroundecanoic acid



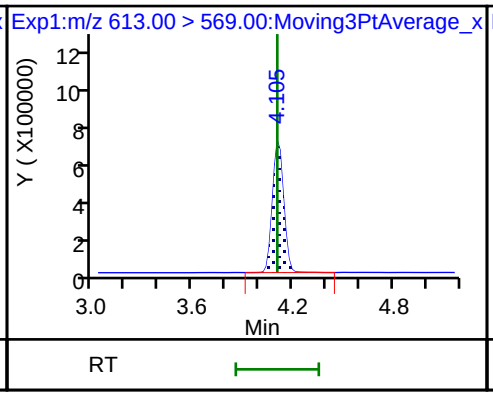
D 30 13C2 PFUnA



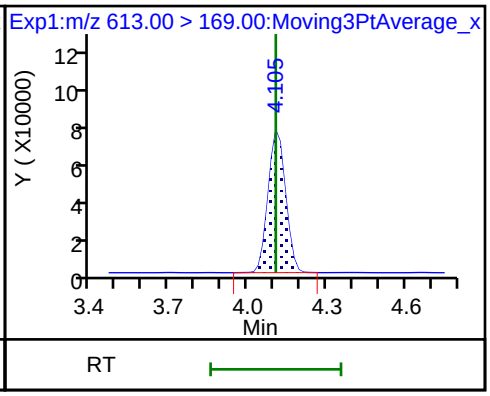
D 36 13C2 PFDoA



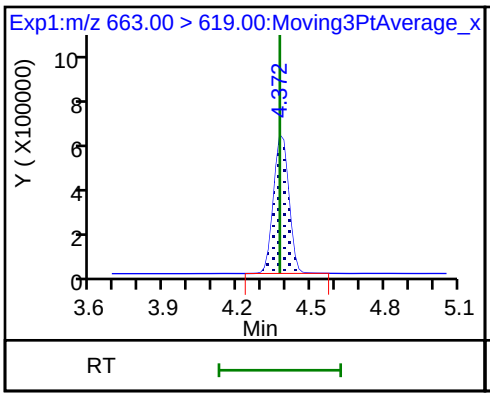
37 Perfluorododecanoic acid



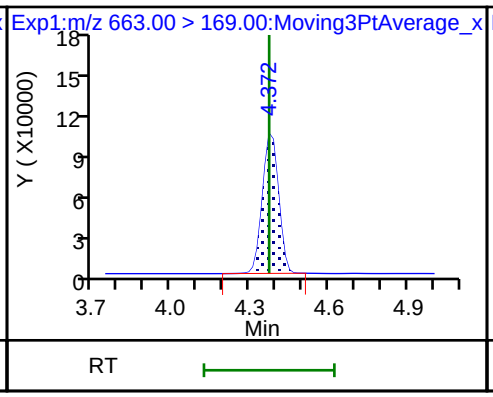
37 Perfluorododecanoic acid



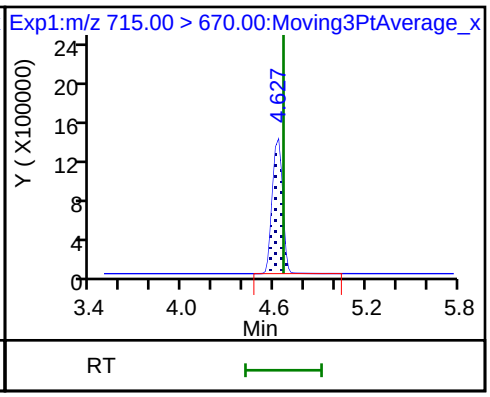
41 Perfluorotridecanoic acid



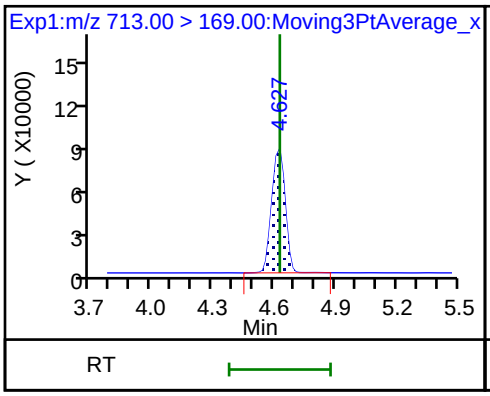
41 Perfluorotridecanoic acid



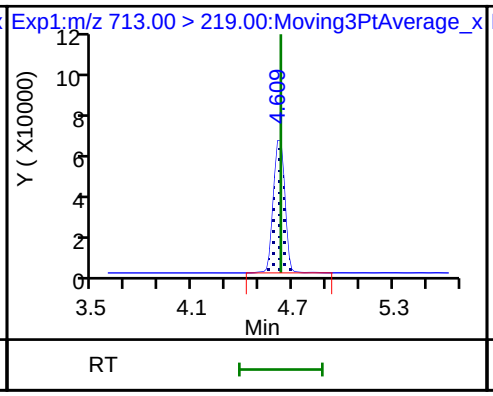
D 43 13C2-PFTeDA



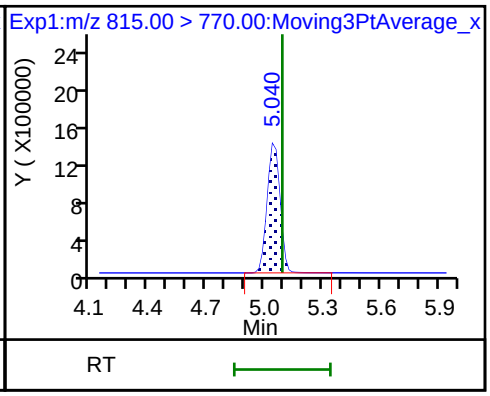
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCVL 320-246099/3 Calibration Date: 09/17/2018 18:17

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_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	0.9128	0.9600		0.0526	0.0500	5.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.015		0.0501	0.0500	0.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	110.0		0.0463	0.0442	4.7	30.0
4:2 FTS	AveID	21.61	21.26		0.400	0.0467	-1.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9288		0.0510	0.0500	2.0	30.0
Perfluoropentanesulfonic acid	AveID	49.87	48.12		0.0452	0.0469	-3.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.232		0.0604	0.0500	20.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.306		0.0480	0.0455	5.5	30.0
6:2 FTS	AveID	2.140	2.451		0.0543	0.0474	14.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.015		0.0491	0.0476	3.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.101		0.0512	0.0501	2.3	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.034		0.0529	0.0500	5.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.044		0.0459	0.0464	-1.1	30.0
8:2 FTS	AveID	15.14	15.68		0.400	0.0479	3.6	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7085		0.0527	0.0480	9.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.066		0.0468	0.0500	-6.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.182		0.0537	0.0500	7.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.061		0.400	0.0500	6.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	1.010		0.0599	0.0482	24.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9159		0.0492	0.0500	-1.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.998		0.0556	0.0500	11.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.174		0.0582	0.0500	16.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.9278		0.0578	0.0500	15.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1711		0.0530	0.0500	6.0	30.0
13C4 PFBA	Ave	0.9623	0.9183		2.39	2.50	-4.6	30.0
13C5 PFPeA	Ave	0.8584	0.8603		2.51	2.50	0.2	30.0
13C3-PFBS	Ave	0.0113	0.0111		2.29	2.33	-1.3	30.0
13C2 PFHxA	Ave	0.9075	0.9482		2.61	2.50	4.5	30.0
13C4-PFHpA	Ave	1.082	1.097		2.53	2.50	1.4	30.0
18O2 PFHxS	Ave	0.6655	0.6944		2.47	2.37	4.3	30.0
M2-6:2FTS	Ave	0.1063	0.1068		2.39	2.38	0.5	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCVL 320-246099/3 Calibration Date: 09/17/2018 18:17

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	1.012		2.51	2.50	0.4	30.0
13C4 PFOS	Ave	0.7151	0.6763		2.26	2.39	-5.4	30.0
13C5 PFNA	Ave	0.9437	0.9362		2.48	2.50	-0.8	30.0
13C8 FOSA	Ave	0.3783	0.3798		2.51	2.50	0.4	30.0
M2-8:2FTS	Ave	0.0156	0.0153		2.35	2.40	-1.9	30.0
13C2 PFDA	Ave	0.9426	0.9692		2.57	2.50	2.8	30.0
d3-NMeFOSAA	Ave	0.4249	0.3871		2.28	2.50	-8.9	30.0
d5-NEtFOSAA	Ave	0.3342	0.3578		2.68	2.50	7.0	30.0
13C2 PFUnA	Ave	0.8023	0.8788		2.74	2.50	9.5	30.0
13C2 PFDoA	Ave	0.9759	0.9528		2.44	2.50	-2.4	30.0
13C2-PFTeDA	Ave	0.7774	0.7973		2.56	2.50	2.6	30.0
13C2-PFHxDA	Ave	0.7882	0.8401		2.66	2.50	6.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 17-Sep-2018 18:17:01 ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 18-Sep-2018 15:02:42 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK013

First Level Reviewer: mongkols Date: 18-Sep-2018 15:02:42

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	1.483	1.484	-0.001	1.004	144785	0.0526		105	22.9	
D 1 13C4 PFBA										
217.00 > 172.00	1.478	1.488	-0.010	0.541	7540602	2.39		95.4	9466	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.756	-0.001	1.000	143457	0.0501		100	13.6	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.763	-0.008	0.642	7064491	2.51		100	14193	
D 47 13C3-PFBS										
301.90 > 83.00	1.796	1.797	-0.001	0.657	84920	2.29		98.7	440	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.796	1.797	-0.001	1.000	177536	0.0463		105	71.4	
298.90 > 99.00	1.796	1.797	-0.001	1.000	63010		2.82(1.35-4.05)		56.2	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.006	2.007	-0.001	1.117	36255	0.0459		98.4	264	
D 60 M2-4:2FTS										
329.00 > 81.00	2.006	2.017	-0.011	0.734	761357	NC			819	
D 7 13C2 PFHxA										
315.00 > 270.00	2.047	2.047	0.0	0.749	7786079	2.61		104	23900	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.037	2.048	-0.011	0.995	144629	0.0510		102	35.6	
313.00 > 119.00	2.047	2.048	-0.001	1.000	10236		14.13(6.96-20.87)		20.2	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.068	0.0	1.151	82422	0.0452		96.5	195	
349.00 > 99.00	2.068	2.068	0.0	1.151	40295		2.05(1.15-3.45)		93.3	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.139	2.140	-0.001	1.000	24771	NC			10.2	

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	2.139	2.150	-0.011	0.782	763365	NC			1228	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.373	0.0	0.868	9007036	2.53		101	18773	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.373	2.373	0.0	1.000	221847	0.0604		121	35.7	
363.00 > 169.00	2.373	2.373	0.0	1.000	52094		4.26(2.17-6.52)		108	
D 11 18O2 PFHxS										
403.00 > 84.00	2.386	2.386	0.0	0.873	5394318	2.47		104	8070	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.386	2.387	0.0	1.000	135524	0.0480		106	154	
399.00 > 99.00	2.386	2.387	0.0	1.000	40742		3.33(1.90-5.70)		55.6	
76 DONA										
377.00 > 251.00	2.412	2.413	-0.001	0.779	297529	NC			773	
377.00 > 85.00	2.412	2.413	-0.001	0.779	132556		2.24(1.13-3.39)		74.1	
13 1H,1H,2H,2H-perfluorooctanesulfoni										M
427.00 > 407.00	2.702	2.703	-0.001	1.000	40761	0.0543		115	39.6	M
D 73 13C8 PFOA										
421.00 > 376.00	2.718	2.718	0.0		6583861	NC			5990	
D 12 M2-6:2FTS										
429.00 > 81.00	2.702	2.718	-0.016	0.988	833398	2.39		100	1548	
D 14 13C4 PFOA										
417.00 > 372.00	2.734	2.734	0.0	1.000	8310918	2.51		100	15865	
* 62 13C2-PFOA										
415.00 > 370.00	2.734	2.735	-0.001		8211716	2.50			9944	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.734	2.735	-0.001	1.000	183186	0.0512		102	10.2	
413.00 > 169.00	2.734	2.735	-0.001	1.000	71527		2.56(1.36-4.08)		117	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.734	2.735	-0.001	0.882	107346	0.0491		103	139	
449.00 > 99.00	2.734	2.735	-0.001	0.882	27477		3.91(1.84-5.53)		112	
D 72 13C8 PFOS										
507.00 > 99.00	3.098	3.098	0.0		1157472	NC			3358	
20 Perfluorononanoic acid										
463.00 > 419.00	3.098	3.099	-0.001	1.000	158976	0.0529		106	16.7	
463.00 > 169.00	3.098	3.099	-0.001	1.000	33088		4.80(2.68-8.03)		72.2	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.098	3.099	-0.001	1.000	107614	0.0459		98.9	137	M
499.00 > 99.00	3.098	3.099	-0.001	1.000	22309		4.82(2.04-6.12)		65.1	M
D 19 13C5 PFNA										
468.00 > 423.00	3.098	3.116	-0.018	1.133	7688024	2.48		99.2	5982	
D 18 13C4 PFOS										
503.00 > 80.00	3.098	3.116	-0.018	1.133	5309480	2.26		94.6	4897	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.317	3.318	-0.001	1.071	139280	NC			287	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.448	3.449	-0.001	1.113	75547	0.0527		110	219	
549.00 > 99.00	3.448	3.449	-0.001	1.113	14270		5.29(3.02-9.05)		75.9	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.448	3.449	-0.001	1.000	37829	0.0496		104	206	
D 23 13C2 PFDA										
515.00 > 470.00	3.464	3.465	-0.001	1.267	7958457	2.57		103	9482	
D 21 13C8 FOSA										
506.00 > 78.00	3.448	3.465	-0.017	1.261	3118440	2.51		100	5286	
D 26 M2-8:2FTS										
529.00 > 81.00	3.448	3.465	-0.017	1.261	120654	2.35		98.1	536	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.464	3.465	-0.001	1.005	198465	0.0537		107	380	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.464	3.465	-0.001	1.000	169724	0.0468		93.7	33.6	
513.00 > 169.00	3.464	3.465	-0.001	1.000	14067		12.07(7.12-21.35)		36.0	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.612	3.627	-0.015	1.321	3178635	2.28		91.1	3009	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.627	3.627	0.0	1.004	67460	0.0534		107	20.2	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.775	3.776	-0.001	1.219	108185	0.0599		124	171	
599.00 > 99.00	3.775	3.776	-0.001	1.219	24611		4.40(2.14-6.43)		91.3	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.775	3.791	-0.016	1.381	2937721	2.68		107	3547	
D 30 13C2 PFUnA										
565.00 > 520.00	3.791	3.791	0.0	1.387	7216050	2.74		110	11431	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.791	3.791	0.0	1.000	144006	0.0556		111	30.6	
563.00 > 169.00	3.791	3.791	0.0	1.000	11637		12.37(5.24-15.72)		57.0	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.791	3.791	0.0	1.004	53813	0.0492		98.5	114	
35 MeFOSA										
512.00 > 169.00	3.959	3.944	0.015		39338	NC			213	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.943	3.944	-0.001	1.273	165069	NC			576	
D 36 13C2 PFDoA										
615.00 > 570.00	4.088	4.089	-0.001	1.496	7823873	2.44		97.6	8885	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.088	4.089	-0.001	1.000	183659	0.0582		116	45.6	
613.00 > 169.00	4.088	4.089	-0.001	1.000	18808		9.76(4.68-14.05)		67.7	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.088	4.089	-0.001	1.186	23022	NC			83.1	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.138	4.139	-0.001		37820	NC			70.6	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.326	4.326	0.0	1.396	10506	NC			39.8	
699.00 > 99.00	4.326	4.326	0.0	1.396	18750		0.56(0.28-0.83)		69.0	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.341	4.357	-0.016	1.062	145180	0.0578		116	53.0	
663.00 > 169.00	4.357	4.357	0.0	1.066	22402		6.48(3.09-9.27)		92.6	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.590	4.591	-0.001	1.679	6547413	2.56		103	6675	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.590	4.591	-0.001	1.000	22399	0.0530		106	125	
713.00 > 219.00	4.590	4.591	-0.001	1.000	15534		1.44(0.70-2.09)		83.6	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.006	5.007	-0.001	1.831	6898273	2.66		107	7999	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.006	5.007	-0.001	1.000	195266	NC			71.6	
813.00 > 169.00	5.006	5.007	-0.001	1.000	30942		6.31(2.77-8.32)		107	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.347	5.348	-0.001	1.068	97296	NC			42.7	
913.00 > 169.00	5.347	5.348	-0.001	1.068	18121		5.37(2.55-7.64)		154	

QC Flag Legend

Processing Flags
NC - Not Calibrated
Review Flags
M - Manually Integrated

Reagents:

LCPFC_LL2_00009 Amount Added: 1.00 Units: mL

Report Date: 18-Sep-2018 15:02:45 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_005.d

Injection Date: 17-Sep-2018 18:17:01 Instrument ID: A9

Lims ID: CCVL

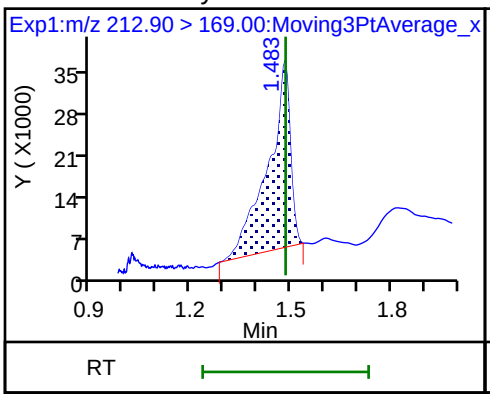
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3

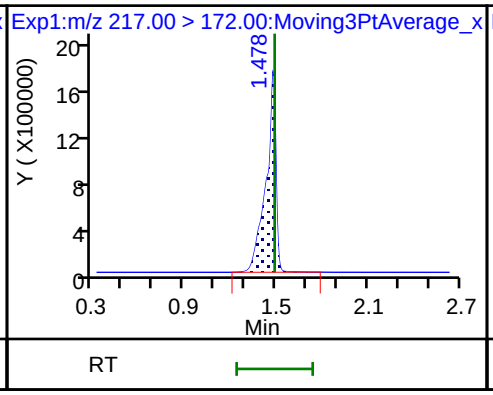
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

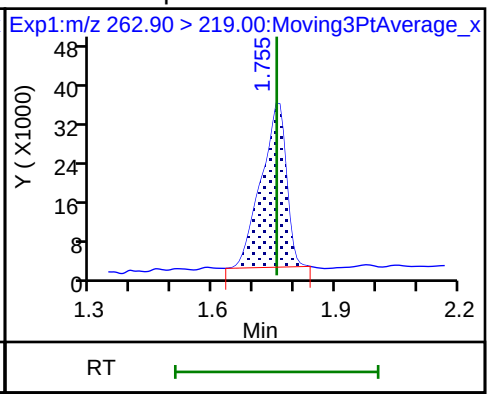
2 Perfluorobutyric acid



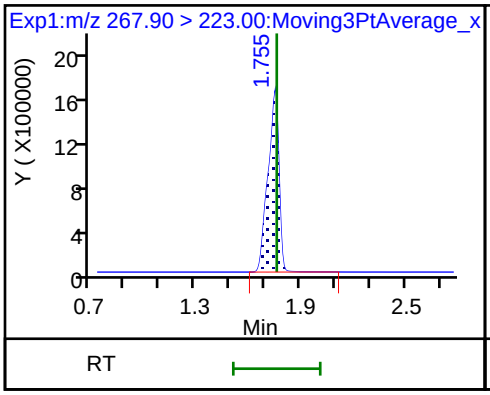
D 1 13C4 PFBA



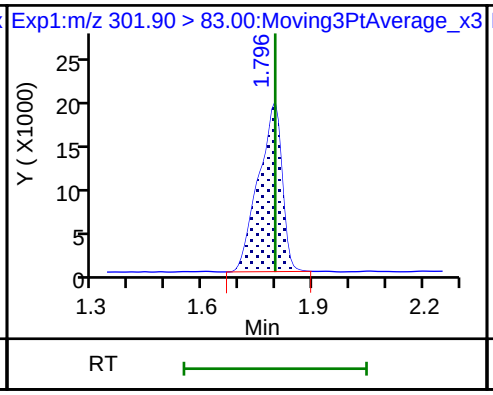
4 Perfluoropentanoic acid



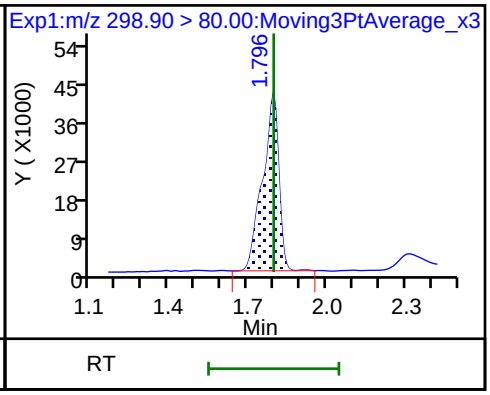
D 3 13C5-PFPeA



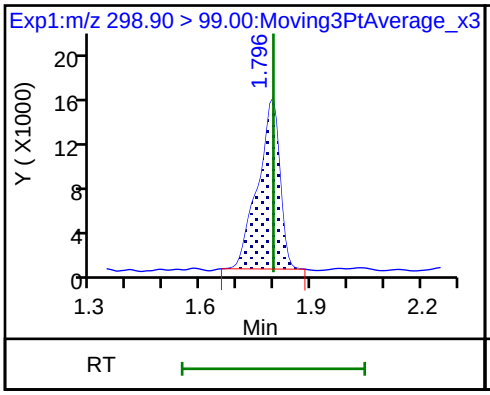
D 47 13C3-PFBS



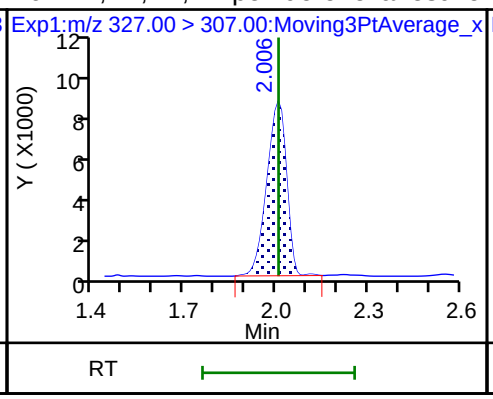
5 Perfluorobutanesulfonic acid



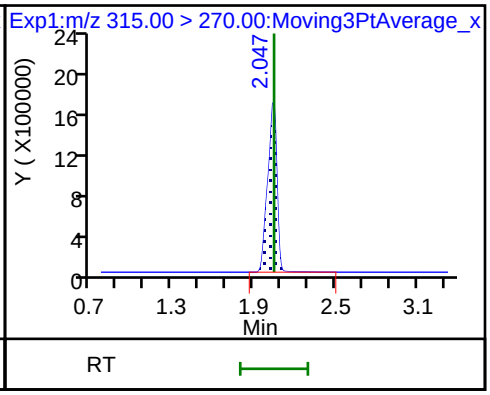
5 Perfluorobutanesulfonic acid



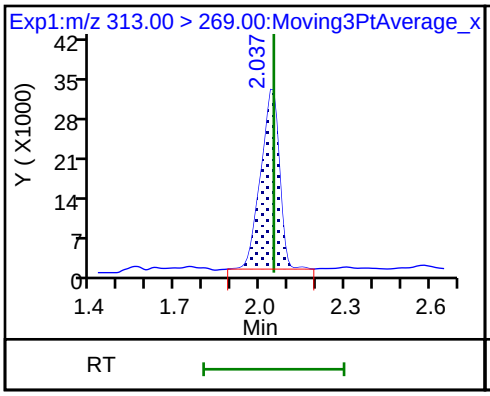
61 1H,1H,2H,2H-perfluorohexanesulfon



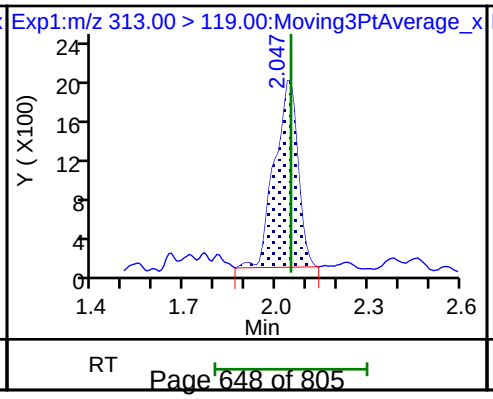
D 7 13C2 PFHxA



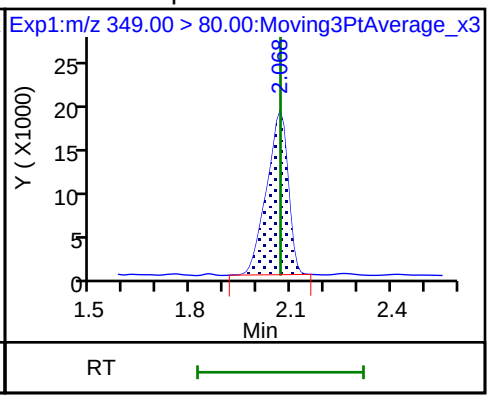
6 Perfluorohexanoic acid



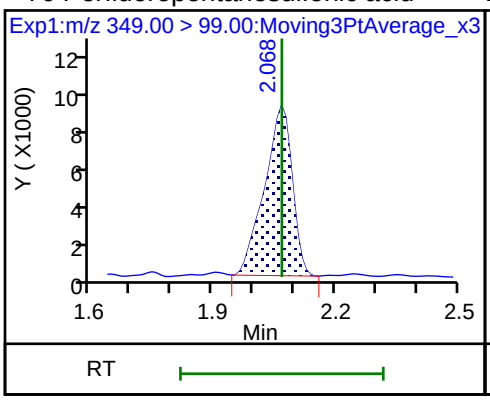
6 Perfluorohexanoic acid



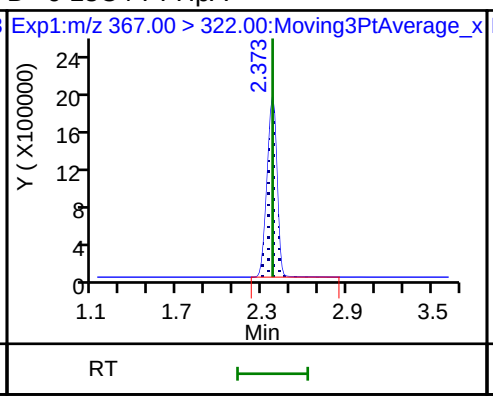
70 Perfluoropentanesulfonic acid



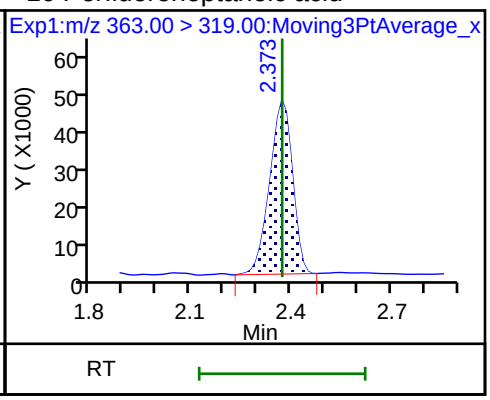
70 Perfluoropentanesulfonic acid



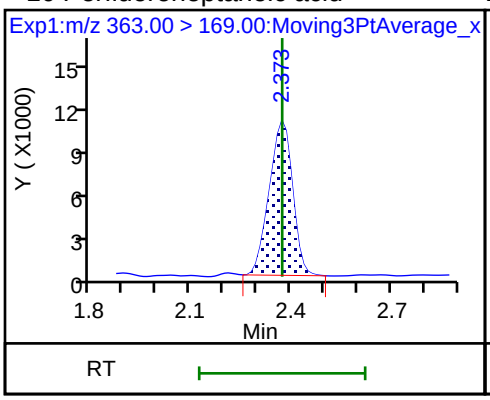
D 9 13C4-PFHpA



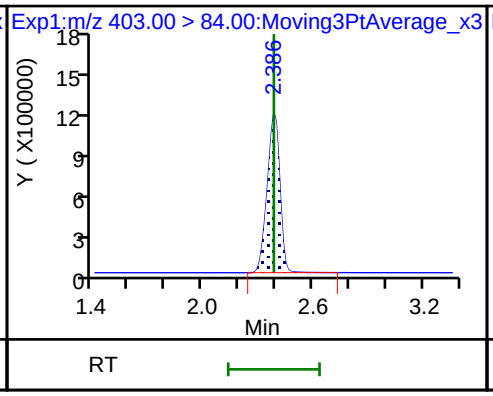
10 Perfluoroheptanoic acid



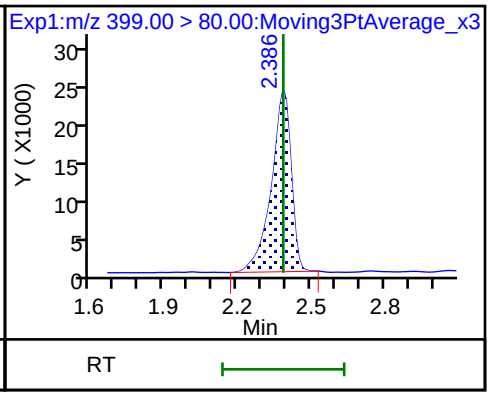
10 Perfluoroheptanoic acid



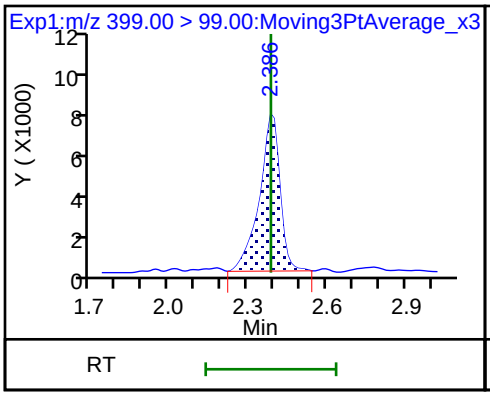
D 11 18O2 PFHxS



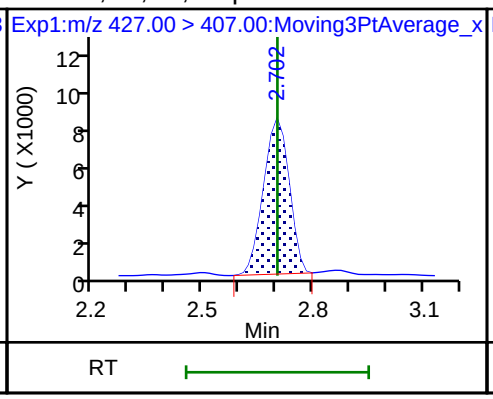
8 Perfluorohexanesulfonic acid



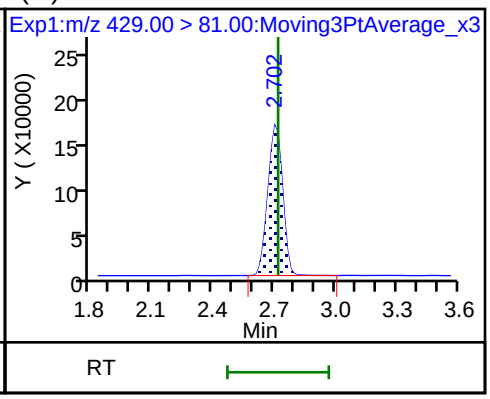
8 Perfluorohexanesulfonic acid



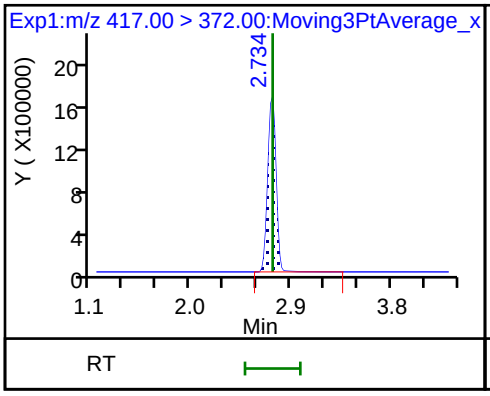
13 1H,1H,2H,2H-perfluorooctanesulfonic (M2



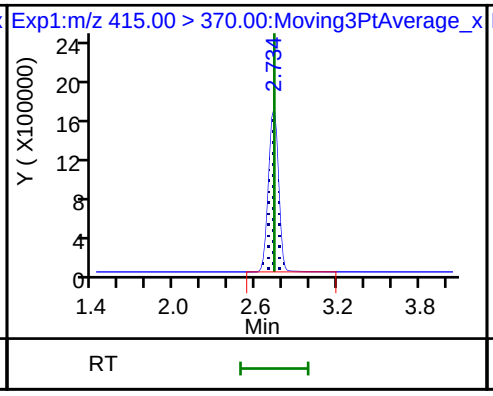
D 12 M2-6:2FTS



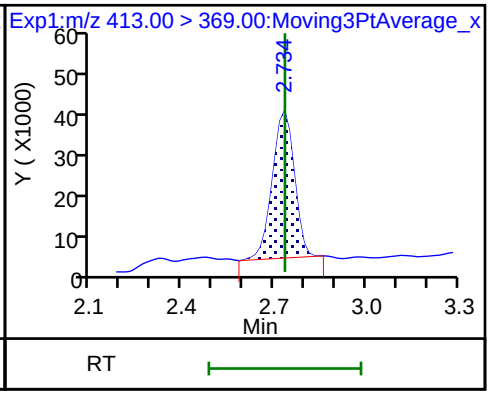
D 14 13C4 PFOA



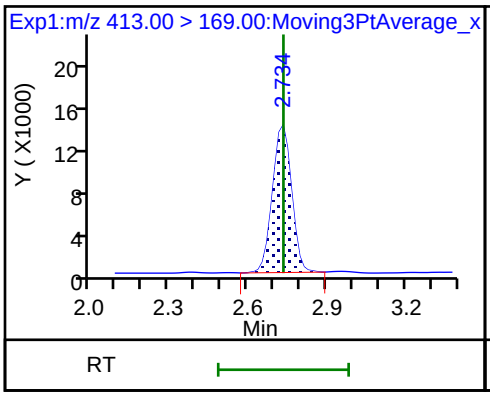
* 62 13C2-PFOA



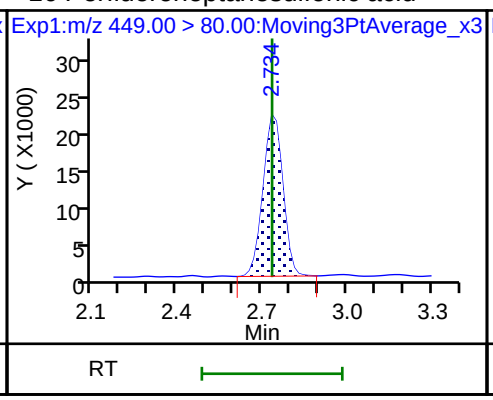
15 Perfluorooctanoic acid



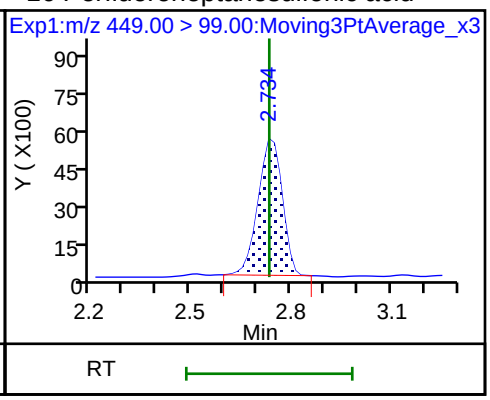
15 Perfluorooctanoic acid



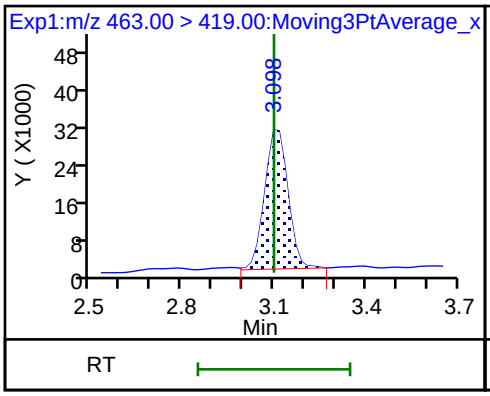
16 Perfluoroheptanesulfonic acid



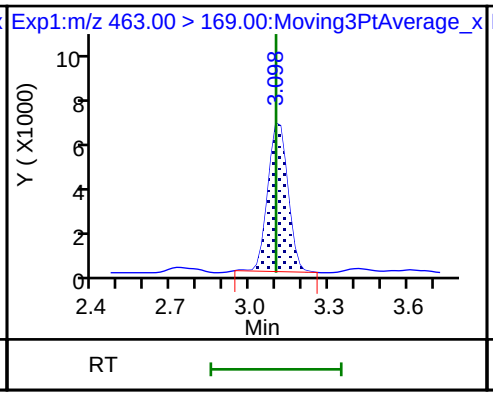
16 Perfluoroheptanesulfonic acid



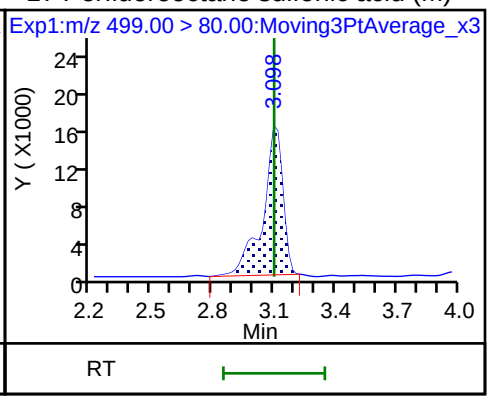
20 Perfluorononanoic acid



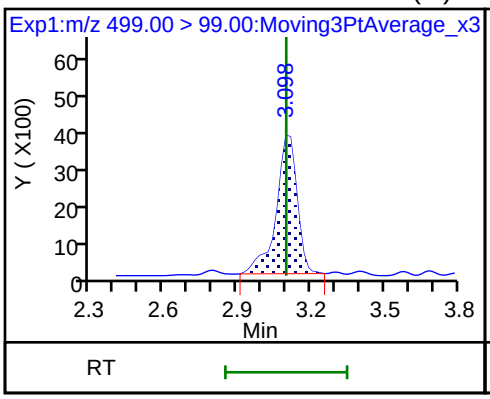
20 Perfluorononanoic acid



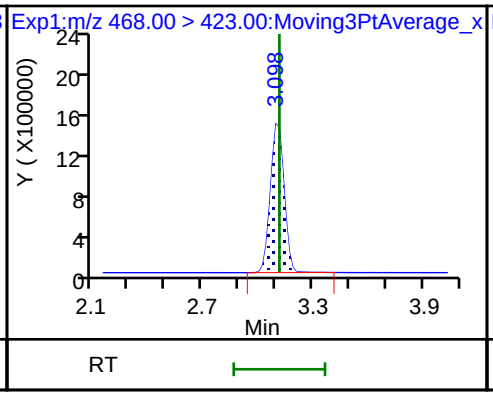
17 Perfluorooctane sulfonic acid (M)



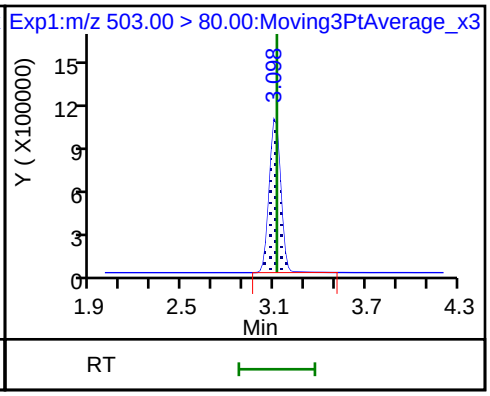
17 Perfluorooctane sulfonic acid (M)



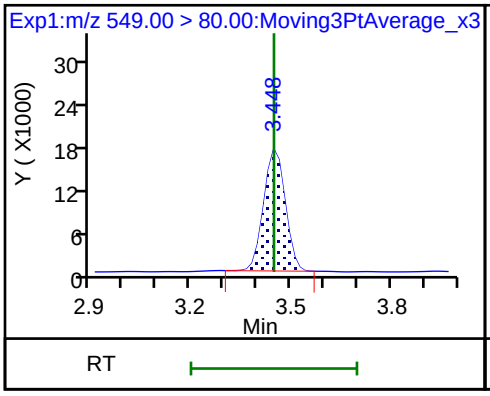
D 19 13C5 PFNA



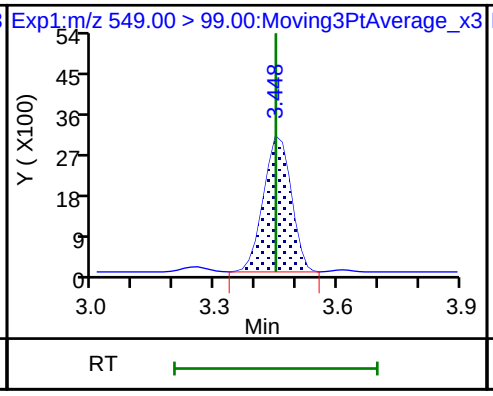
D 18 13C4 PFOS



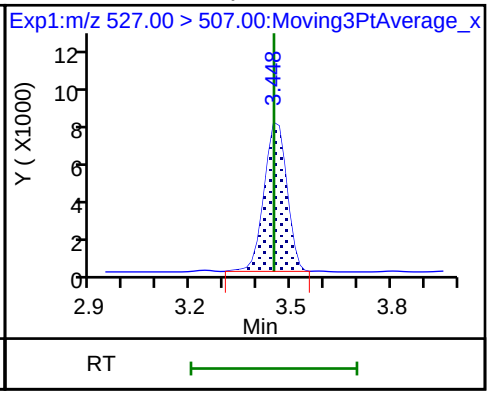
68 Perfluorononanesulfonic acid



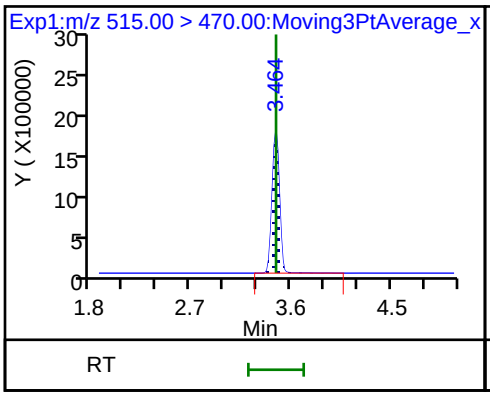
68 Perfluorononanesulfonic acid



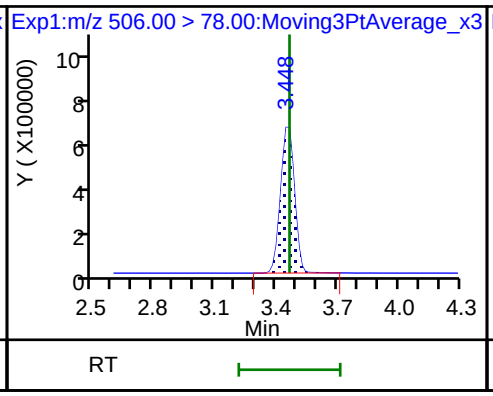
25 1H,1H,2H,2H-perfluorodecanesulfoni



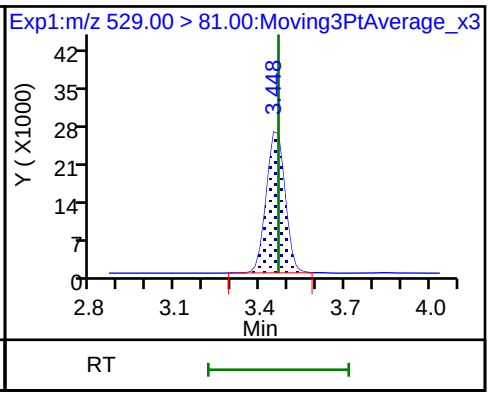
D 23 13C2 PFDA



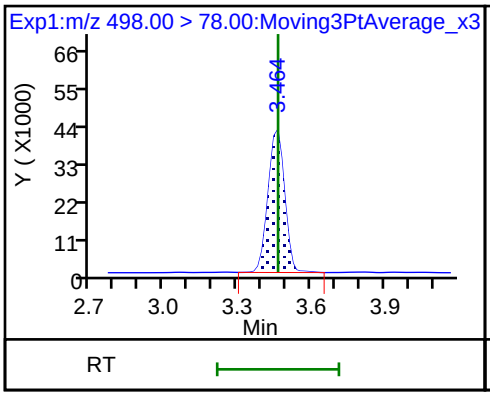
D 21 13C8 FOSA



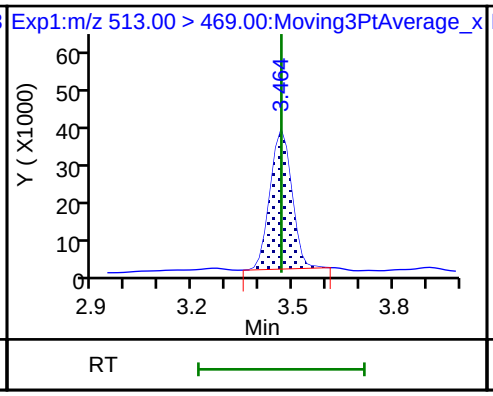
D 26 M2-8:2FTS



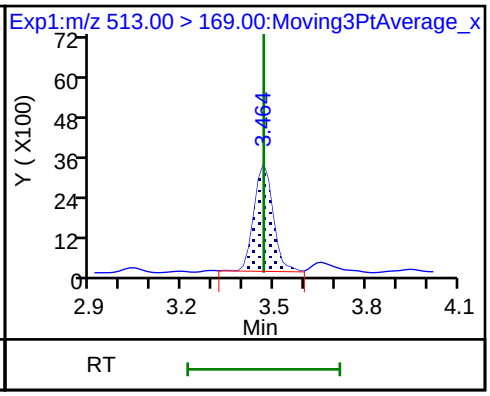
22 Perfluorooctane Sulfonamide



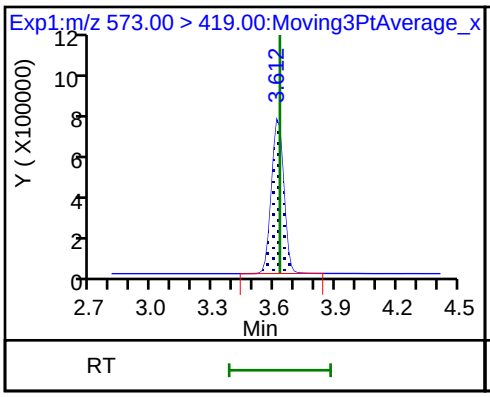
24 Perfluorodecanoic acid



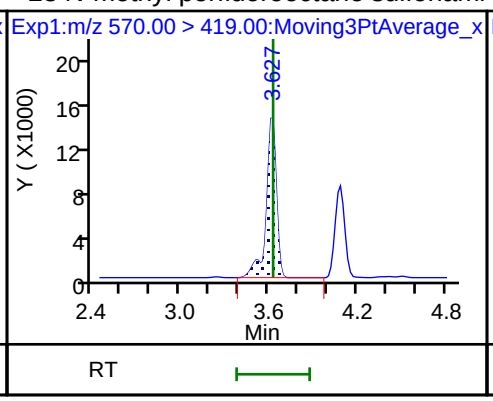
24 Perfluorodecanoic acid



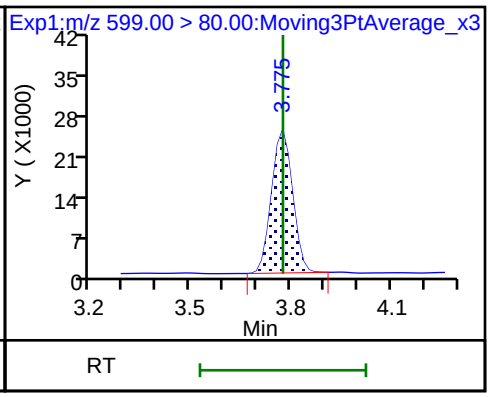
D 27 d3-NMeFOSAA



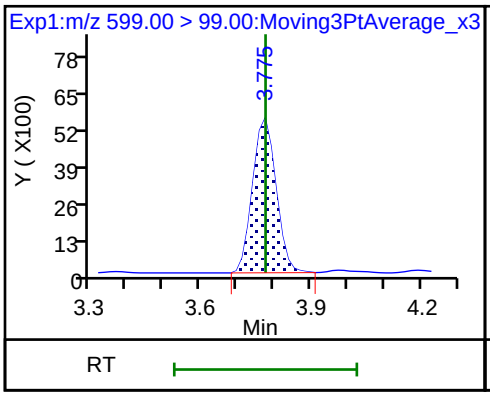
28 N-methyl perfluorooctane sulfonami



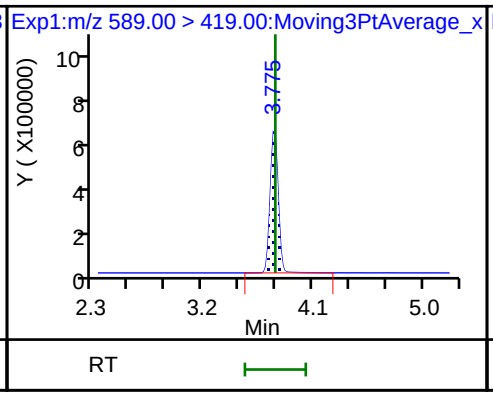
29 Perfluorodecane Sulfonic acid



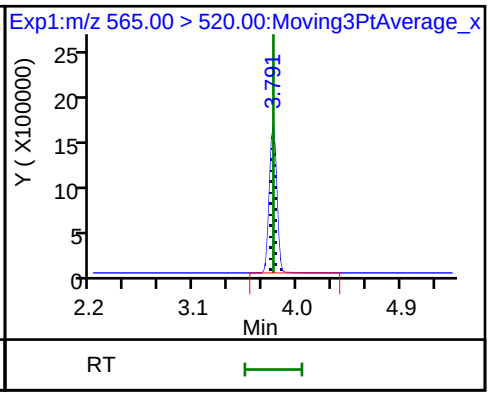
29 Perfluorodecane Sulfonic acid



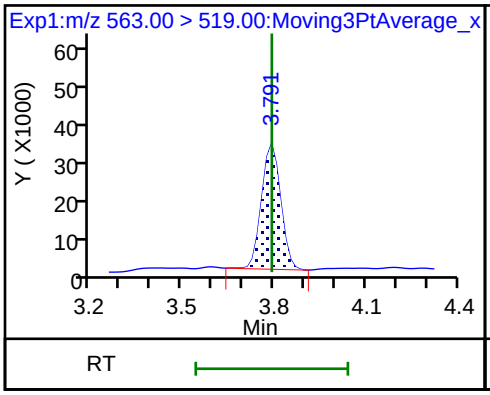
D 32 d5-NEtFOSAA



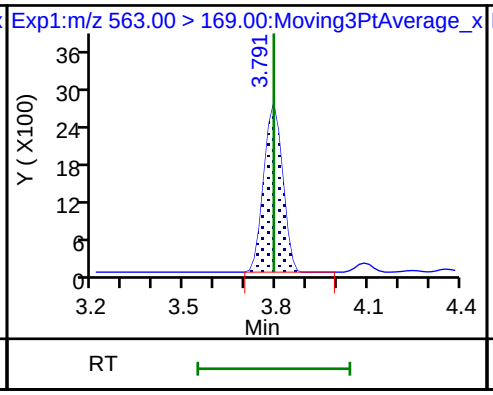
D 30 13C2 PFUnA



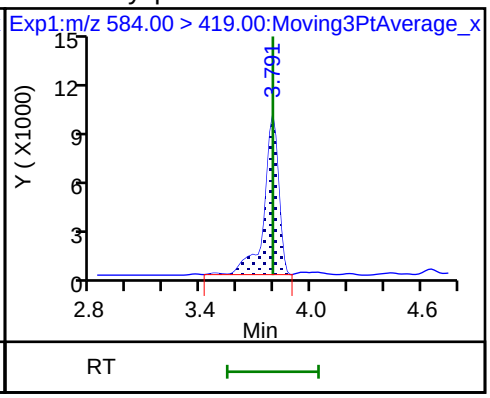
31 Perfluoroundecanoic acid



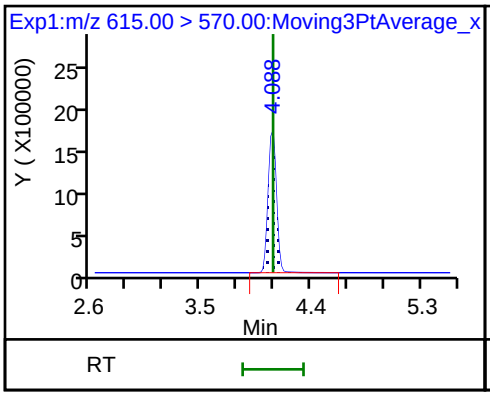
31 Perfluoroundecanoic acid



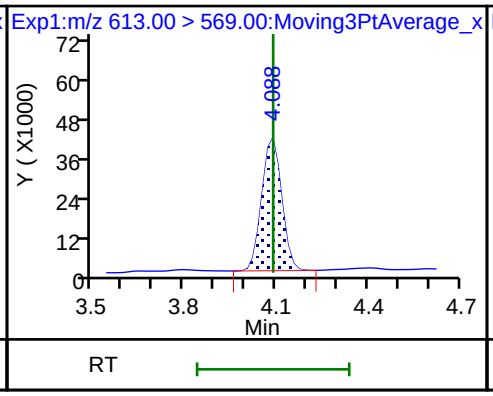
33 N-ethyl perfluorooctane sulfonamid



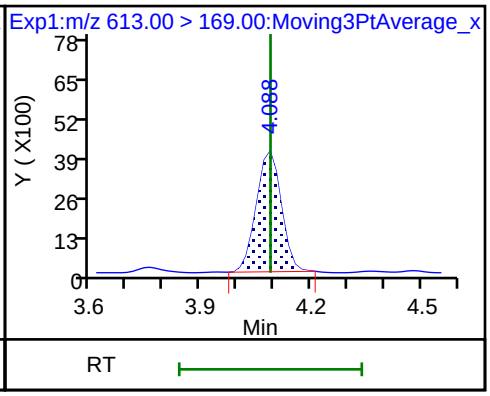
D 36 13C2 PFDoA



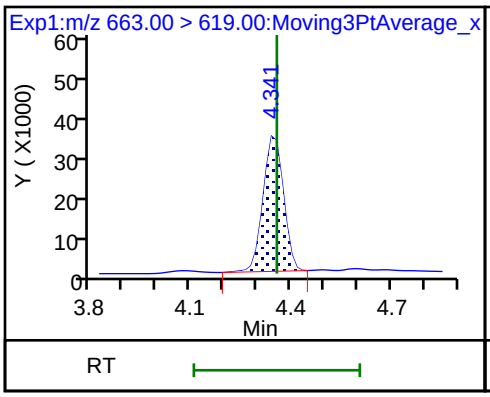
37 Perfluorododecanoic acid



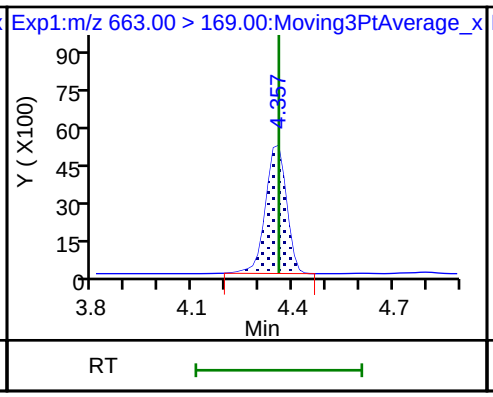
37 Perfluorododecanoic acid



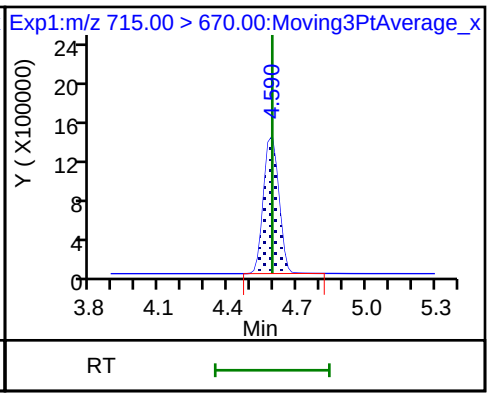
41 Perfluorotridecanoic acid



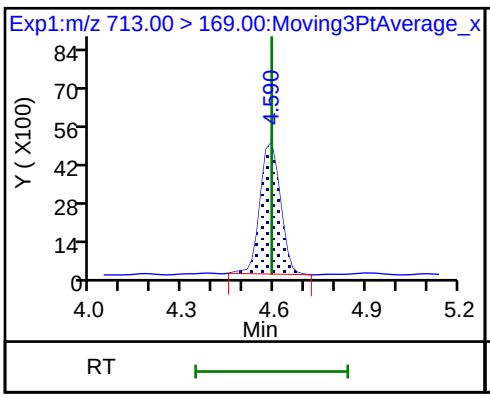
41 Perfluorotridecanoic acid



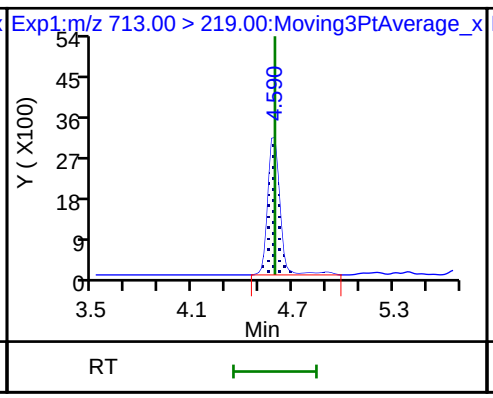
D 43 13C2-PFTeDA



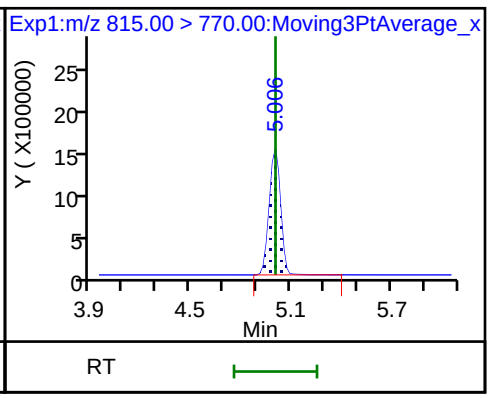
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

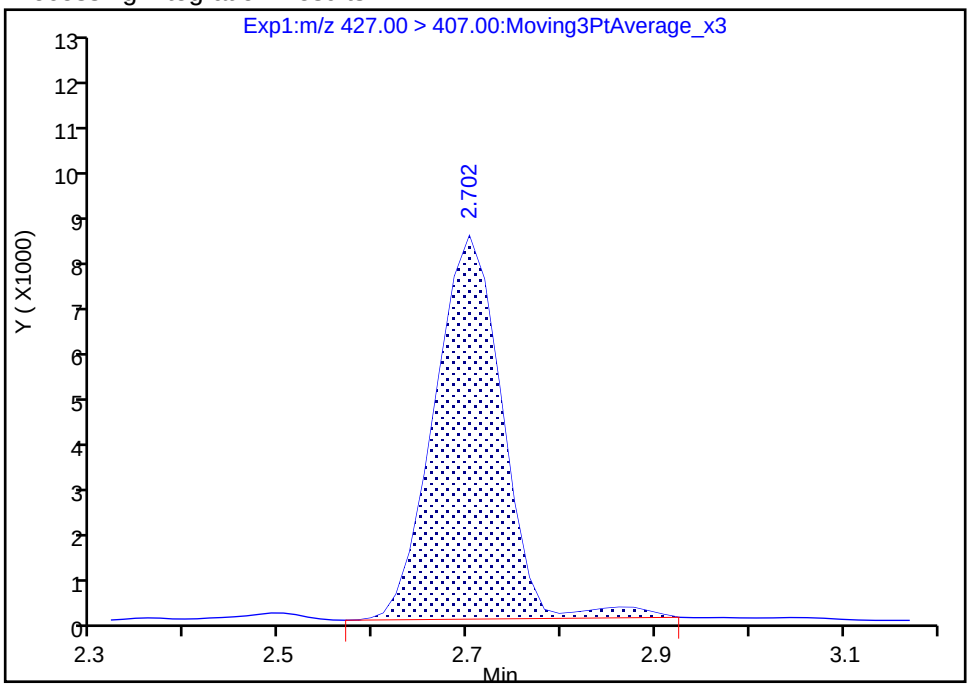
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_005.d
Injection Date: 17-Sep-2018 18:17:01 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

13 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:, CAS: 27619-97-2

Signal: 1

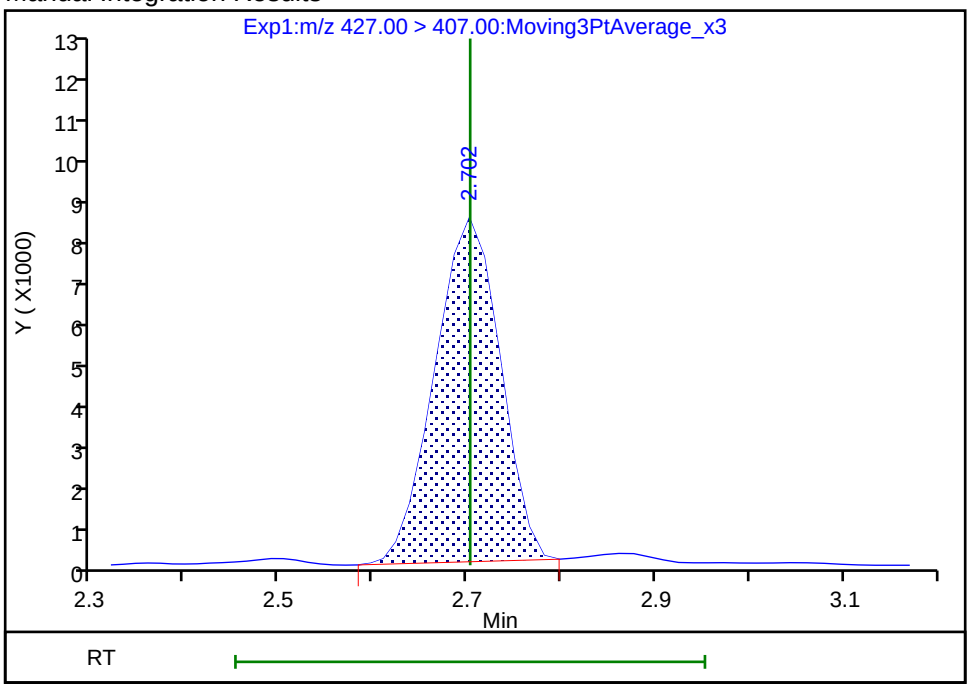
Processing Integration Results

RT: 2.70
Area: 42609
Amount: 0.056737
Amount Units: ng/ml



Manual Integration Results

RT: 2.70
Area: 40761
Amount: 0.054277
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:02:11
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

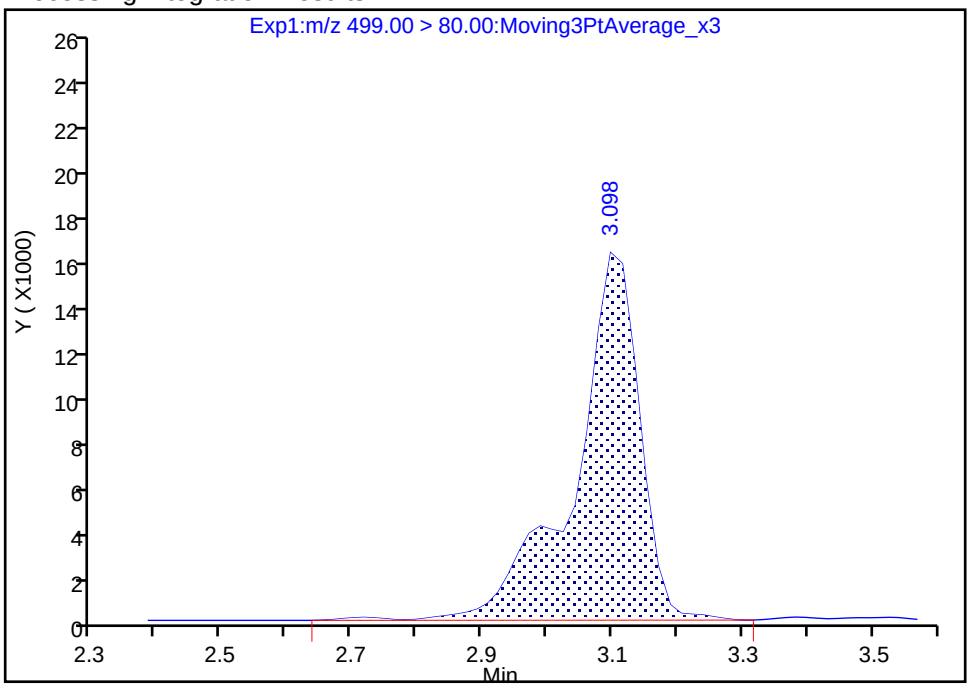
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_005.d
Injection Date: 17-Sep-2018 18:17:01 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

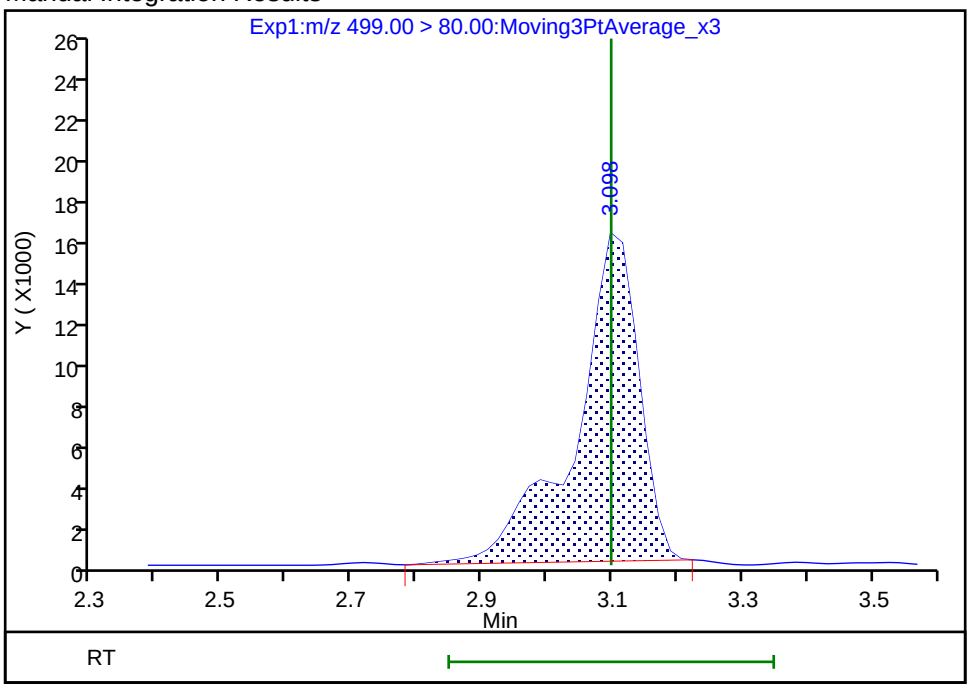
Processing Integration Results

RT: 3.10
Area: 112337
Amount: 0.047925
Amount Units: ng/ml



Manual Integration Results

RT: 3.10
Area: 107614
Amount: 0.045910
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:02:21
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

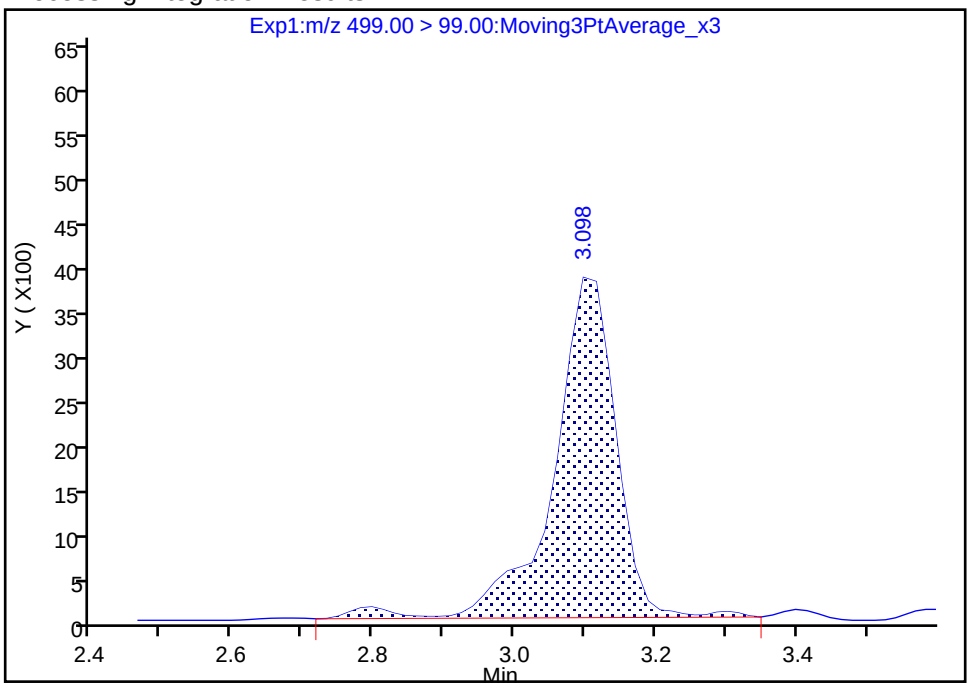
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_005.d
Injection Date: 17-Sep-2018 18:17:01 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

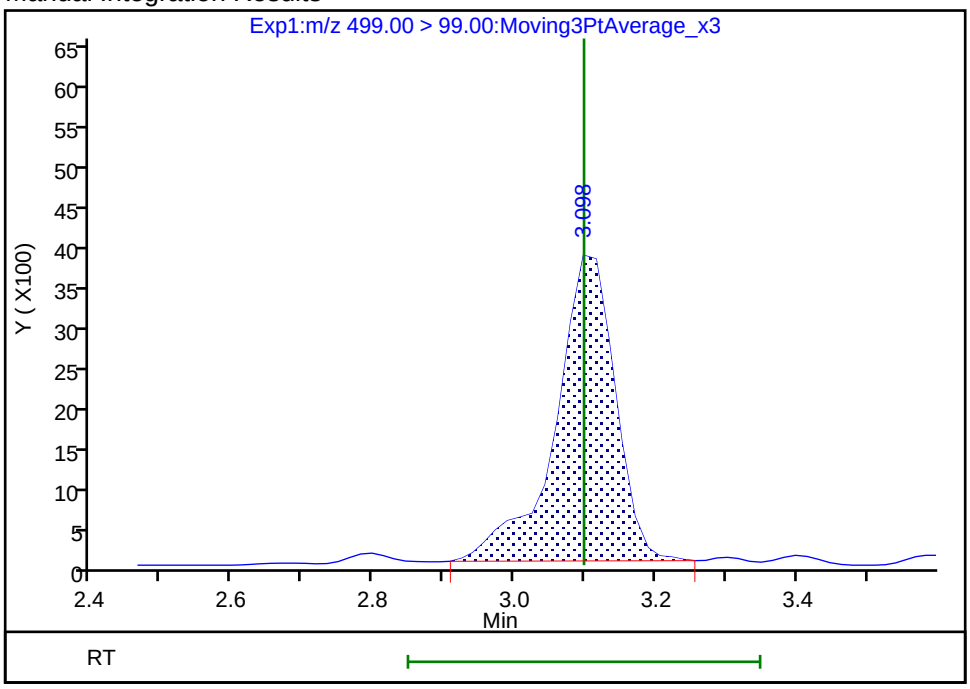
Processing Integration Results

RT: 3.10
Area: 23580
Amount: 0.047925
Amount Units: ng/ml



Manual Integration Results

RT: 3.10
Area: 22309
Amount: 0.045910
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:02:24
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246099/4 Calibration Date: 09/17/2018 18:24

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9310		1.02	1.00	2.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	0.9697		0.956	1.00	-4.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	106.9		0.899	0.884	1.7	30.0
4:2 FTS	AveID	21.61	21.24		0.918	0.934	-1.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9062		0.995	1.00	-0.5	30.0
Perfluoropentanesulfonic acid	AveID	49.87	51.73		0.973	0.938	3.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.115		1.09	1.00	9.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.179		0.867	0.910	-4.7	30.0
6:2 FTS	AveID	2.140	2.164		0.959	0.948	1.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.103		1.03	1.00	2.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.062		1.03	0.952	7.9	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.095		1.12	1.00	11.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.124		0.988	0.928	6.5	30.0
8:2 FTS	AveID	15.14	13.92		0.881	0.958	-8.1	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7312		1.09	0.960	13.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.235		1.09	1.00	9.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.165		1.02	1.00	2.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	0.9785		0.985	1.00	-1.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.9138		1.08	0.964	12.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9206		0.990	1.00	-1.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.8823		0.983	1.00	-1.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.072		1.06	1.00	6.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.9535		1.19	1.00	18.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1412		0.875	1.00	-12.5	30.0
13C4 PFBA	Ave	0.9623	0.9254		2.40	2.50	-3.8	30.0
13C5 PFPeA	Ave	0.8584	0.8789		2.56	2.50	2.4	30.0
13C3-PFBS	Ave	0.0113	0.0115		2.38	2.33	2.4	30.0
13C2 PFHxA	Ave	0.9075	0.9141		2.52	2.50	0.7	30.0
13C4-PFHpA	Ave	1.082	1.136		2.62	2.50	5.0	30.0
18O2 PFHxS	Ave	0.6655	0.7068		2.51	2.37	6.2	30.0
M2-6:2FTS	Ave	0.1063	0.1013		2.26	2.38	-4.7	30.0

FORM VII EPA 537 (Mod)

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Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.999		2.48	2.50	-0.9	30.0
13C4 PFOS	Ave	0.7151	0.6875		2.30	2.39	-3.9	30.0
13C5 PFNA	Ave	0.9437	0.9170		2.43	2.50	-2.8	30.0
13C2 PFDA	Ave	0.9426	0.9687		2.57	2.50	2.8	30.0
13C8 FOSA	Ave	0.3783	0.3781		2.50	2.50	-0.0	30.0
M2-8:2FTS	Ave	0.0156	0.0138		2.11	2.40	-11.8	30.0
d3-NMeFOSAA	Ave	0.4249	0.4211		2.48	2.50	-0.9	30.0
13C2 PFUnA	Ave	0.8023	0.8362		2.61	2.50	4.2	30.0
d5-NEtFOSAA	Ave	0.3342	0.3547		2.65	2.50	6.1	30.0
13C2 PFDoA	Ave	0.9759	0.9087		2.33	2.50	-6.9	30.0
13C2-PFTeDA	Ave	0.7774	0.7863		2.53	2.50	1.1	30.0
13C2-PFHxDA	Ave	0.7882	0.8108		2.57	2.50	2.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 17-Sep-2018 18:24:32 ALS Bottle#: 39 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 18-Sep-2018 15:03:21 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK013

First Level Reviewer: mongkols Date: 18-Sep-2018 15:03:21

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	1.489	1.489	0.0	1.000	2838936	1.02		102	429	
D 1 13C4 PFBA										
217.00 > 172.00	1.489	1.488	0.001	0.544	7623304	2.40		96.2	9064	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.000	2808535	0.9561		95.6	236	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.763	0.001	0.645	7240761	2.56		102	6880	
D 47 13C3-PFBS										
301.90 > 83.00	1.805	1.797	0.008	0.660	88441	2.38		102	461	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.805	1.805	0.0	1.000	3593961	0.8993		102	1187	
298.90 > 99.00	1.805	1.805	0.0	1.000	1228545		2.93(1.35-4.05)		778	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.017	0.0	1.117	754587	0.9180		98.3	2686	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.017	0.0	0.738	733745	NC			705	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.047	0.001	0.749	7530837	2.52		101	7826	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	2729689	1.00		99.5	619	
313.00 > 119.00	2.048	2.048	0.0	1.000	205610		13.28(6.96-20.87)		484	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.068	0.0	1.146	1845923	0.9730		104	2486	
349.00 > 99.00	2.078	2.068	0.010	1.151	821051		2.25(1.15-3.45)		1426	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.150	0.0	1.005	587422	NC			295	

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	2.140	2.150	-0.010	0.783	866886	NC			2026	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.373	0.0	0.868	9358225	2.62		105	16457	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.386	0.0	1.006	4173412	1.09		109	565	
363.00 > 169.00	2.373	2.386	-0.013	1.000	838764		4.98(2.17-6.52)		1263	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.386	0.013	0.878	5508187	2.51		106	13111	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.399	0.0	1.000	2498046	0.8668		95.3	2021	
399.00 > 99.00	2.399	2.399	0.0	1.000	731634		3.41(1.90-5.70)		876	
76 DONA										
377.00 > 251.00	2.426	2.426	0.0	0.778	6536809	NC			10270	
377.00 > 85.00	2.426	2.426	0.0	0.778	2748338		2.38(1.13-3.39)		1179	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.718	2.718	0.0	1.000	684883	0.9586		101	666	
D 73 13C8 PFOA										
421.00 > 376.00	2.734	2.718	0.016		6917365	NC			15708	
D 12 M2-6:2FTS										
429.00 > 81.00	2.718	2.718	0.0	0.994	792903	2.26		95.3	1181	
D 14 13C4 PFOA										
417.00 > 372.00	2.734	2.734	0.0	1.000	8228602	2.48		99.1	9169	
* 62 13C2-PFOA										
415.00 > 370.00	2.734	2.734	0.0		8238197	2.50			20796	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.734	2.734	0.0	1.000	3633539	1.03		102	201	
413.00 > 169.00	2.734	2.734	0.0	1.000	1242508		2.92(1.36-4.08)		1187	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.750	2.750	0.0	0.882	2291147	1.03		108	2555	
449.00 > 99.00	2.750	2.750	0.0	0.882	549043		4.17(1.84-5.53)		2091	
D 72 13C8 PFOS										
507.00 > 99.00	3.098	3.098	0.0		1201089	NC			2225	
20 Perfluorononanoic acid										
463.00 > 419.00	3.116	3.116	0.0	1.000	3307486	1.12		112	357	
463.00 > 169.00	3.116	3.116	0.0	1.000	568692		5.82(2.68-8.03)		1320	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.116	3.116	0.0	1.000	2362340	0.9883		107	1677	
499.00 > 99.00	3.116	3.116	0.0	1.000	559281		4.22(2.04-6.12)		1468	
D 19 13C5 PFNA										
468.00 > 423.00	3.116	3.116	0.0	1.140	7554472	2.43		97.2	4957	
D 18 13C4 PFOS										
503.00 > 80.00	3.116	3.116	0.0	1.140	5414132	2.30		96.1	4126	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.318	3.318	0.0	1.065	2651779	NC			3119	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.465	3.465	0.0	1.112	1590235	1.09		113	2667	
549.00 > 99.00	3.465	3.465	0.0	1.112	308835		5.15(3.02-9.05)		1160	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.465	3.465	0.0	1.000	606330	0.8808		91.9	1822	
D 23 13C2 PFDA										
515.00 > 470.00	3.465	3.465	0.0	1.267	7980618	2.57		103	6203	
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.465	0.0	1.267	3114675	2.50		99.9	3709	
D 26 M2-8:2FTS										
529.00 > 81.00	3.465	3.465	0.0	1.267	108901	2.11		88.2	488	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.465	3.465	0.0	1.000	4030630	1.09		109	3881	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.480	3.480	0.0	1.004	3718948	1.02		102	629	
513.00 > 169.00	3.465	3.480	-0.015	1.000	232687		15.98(7.12-21.35)		309	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.627	3.627	0.0	1.327	3469216	2.48		99.1	2892	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.627	3.627	0.0	1.000	1357893	0.9846		98.5	520	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.775	3.775	0.0	1.211	1995509	1.08		112	2595	
599.00 > 99.00	3.775	3.775	0.0	1.211	427019		4.67(2.14-6.43)		1151	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.791	3.791	0.0	1.387	2922267	2.65		106	3117	
D 30 13C2 PFUnA										
565.00 > 520.00	3.791	3.791	0.0	1.387	6888687	2.61		104	11569	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.791	3.791	0.0	1.000	2431147	0.9835		98.3	552	
563.00 > 169.00	3.791	3.791	0.0	1.000	238031		10.21(5.24-15.72)		1015	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.791	3.791	0.0	1.000	1076124	0.99		99.0	1339	
35 MeFOSA										
512.00 > 169.00	3.960	3.960	0.0		678088	NC			700	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.960	3.960	0.0	1.271	3264295	NC			5226	
D 36 13C2 PFDoA										
615.00 > 570.00	4.089	4.089	0.0	1.495	7486387	2.33		93.1	9693	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.089	4.089	0.0	1.000	3209612	1.06		106	724	
613.00 > 169.00	4.089	4.089	0.0	1.000	355168		9.04(4.68-14.05)		1269	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.089	4.089	0.0	1.180	415352	NC			1224	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.139	4.139	0.0		722789	NC			601	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.326	4.326	0.0	1.388	215535	NC			599	
699.00 > 99.00	4.326	4.326	0.0	1.388	376877		0.57(0.28-0.83)		1420	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.357	4.357	0.0	1.066	2855364	1.19		119	1004	
663.00 > 169.00	4.357	4.357	0.0	1.066	474028		6.02(3.09-9.27)		1311	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.591	4.591	0.0	1.679	6477405	2.53		101	11999	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.591	4.591	0.0	1.000	365838	0.8746		87.5	1085	
713.00 > 219.00	4.591	4.591	0.0	1.000	278329		1.31(0.70-2.09)		1163	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.007	5.007	0.0	1.831	6679430	2.57		103	11389	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.007	5.007	0.0	1.000	2502976	NC			695	
813.00 > 169.00	5.007	5.007	0.0	1.000	423355		5.91(2.77-8.32)		1320	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.363	5.363	0.0	1.071	1938156	NC			547	
913.00 > 169.00	5.363	5.363	0.0	1.071	339411		5.71(2.55-7.64)		1609	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00009 Amount Added: 1.00 Units: mL

Report Date: 18-Sep-2018 15:03:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_006.d

Injection Date: 17-Sep-2018 18:24:32 Instrument ID: A9

Lims ID: CCV L4

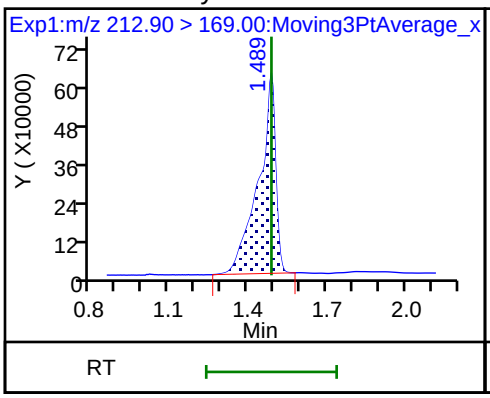
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 39 Worklist Smp#: 4

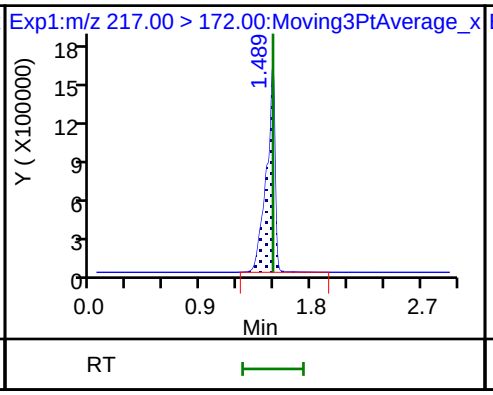
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

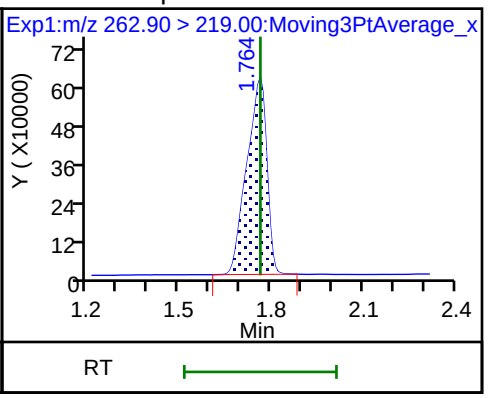
2 Perfluorobutyric acid



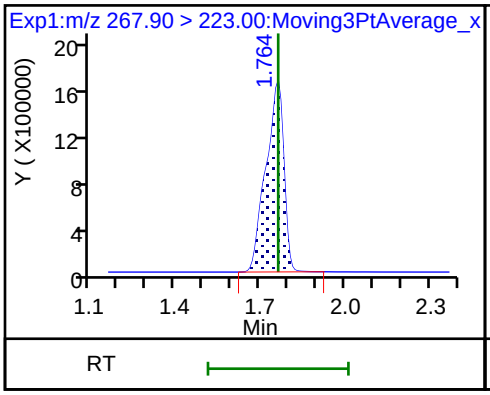
D 1 13C4 PFBA



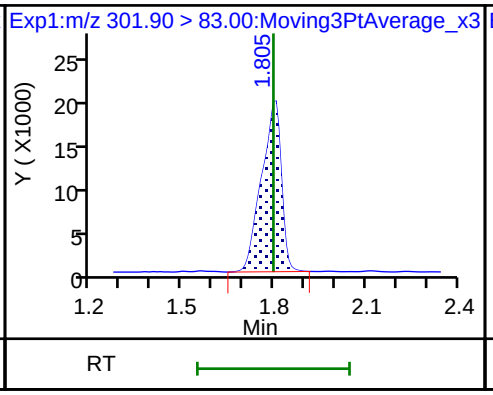
4 Perfluoropentanoic acid



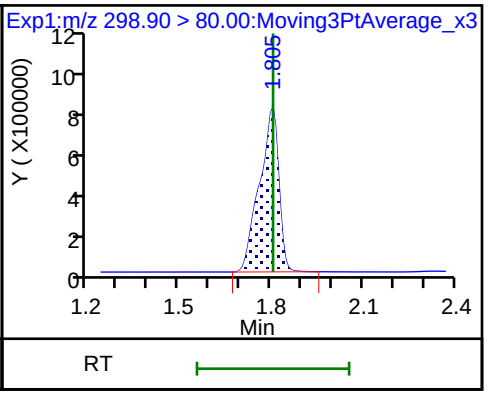
D 3 13C5-PFPeA



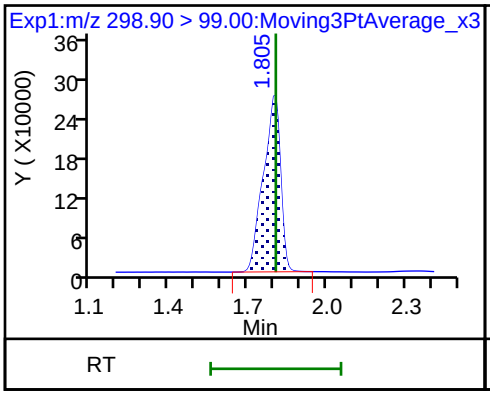
D 47 13C3-PFBS



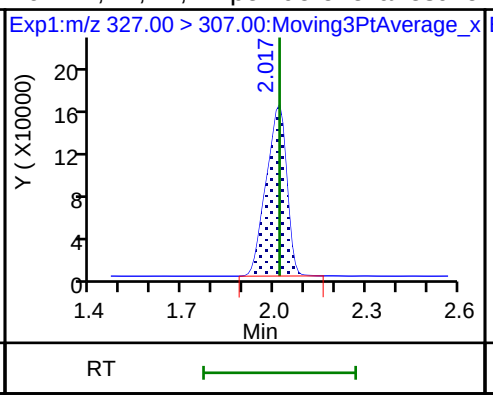
5 Perfluorobutanesulfonic acid



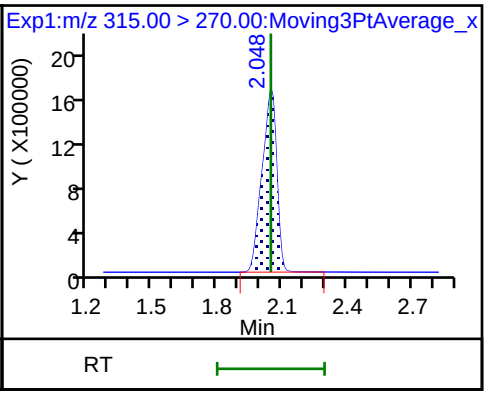
5 Perfluorobutanesulfonic acid



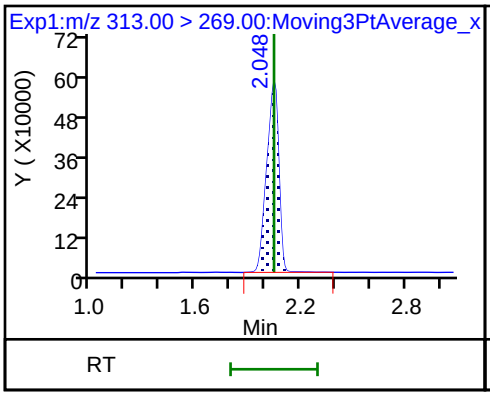
61 1H,1H,2H,2H-perfluorohexanesulfon



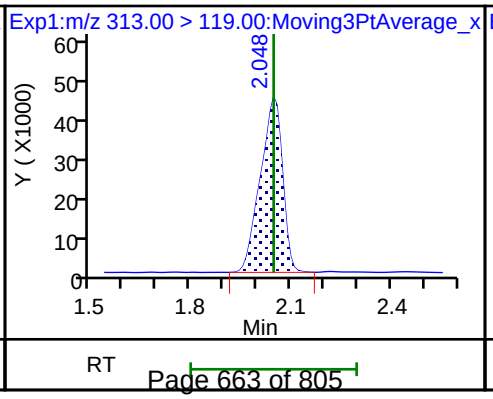
D 7 13C2 PFHxA



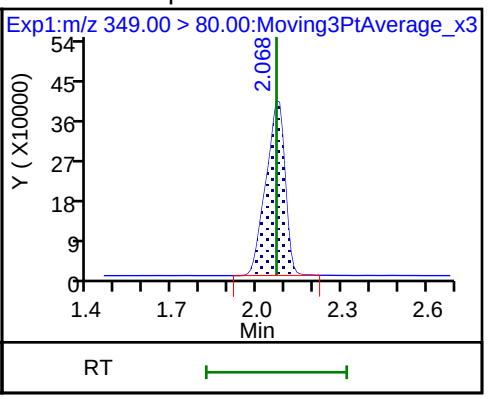
6 Perfluorohexanoic acid



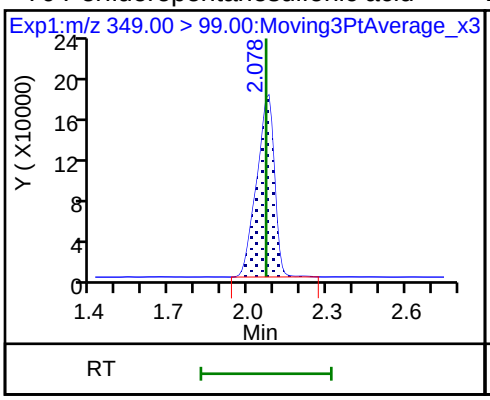
6 Perfluorohexanoic acid



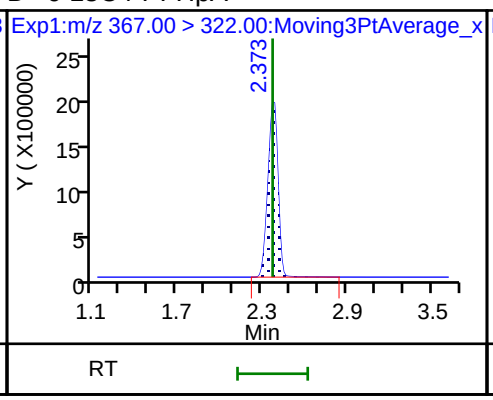
70 Perfluoropentanesulfonic acid



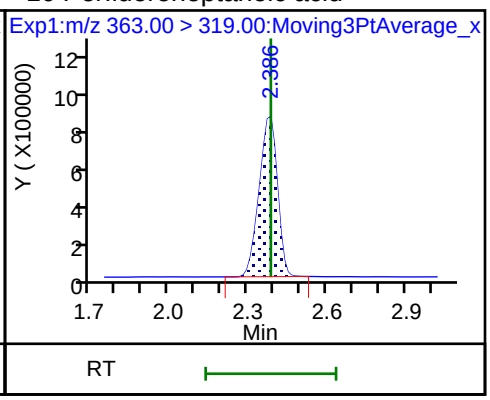
70 Perfluoropentanesulfonic acid



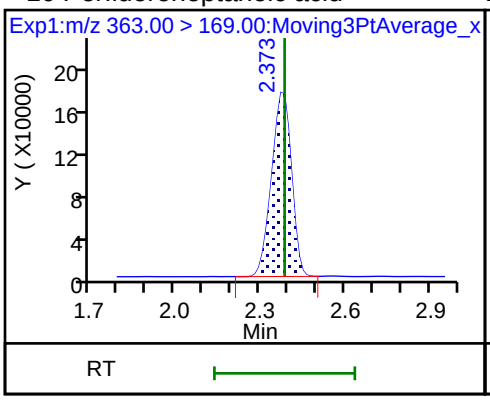
D 9 13C4-PFHpA



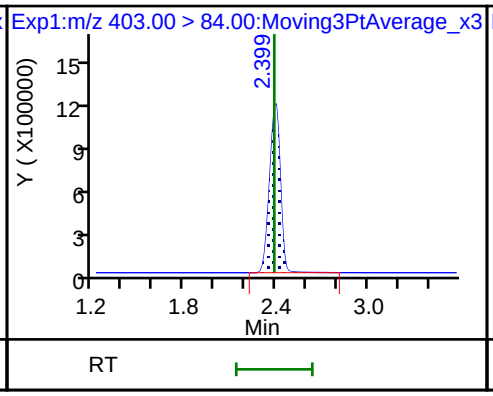
10 Perfluoroheptanoic acid



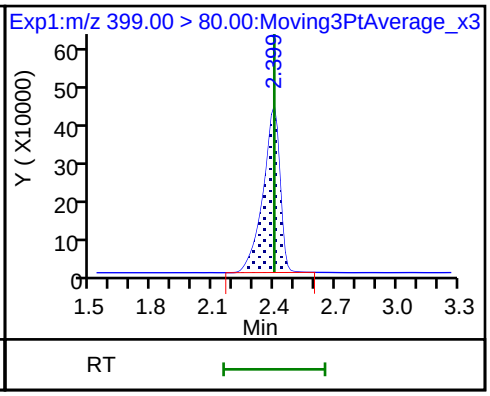
10 Perfluoroheptanoic acid



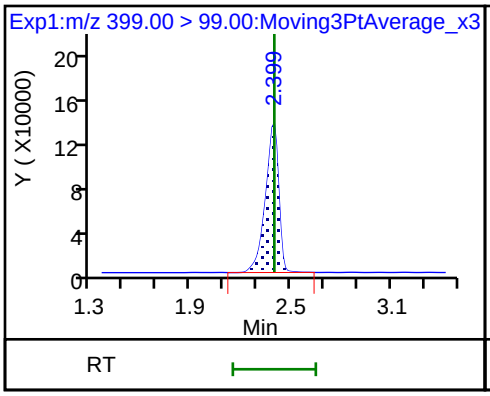
D 11 18O2 PFHxS



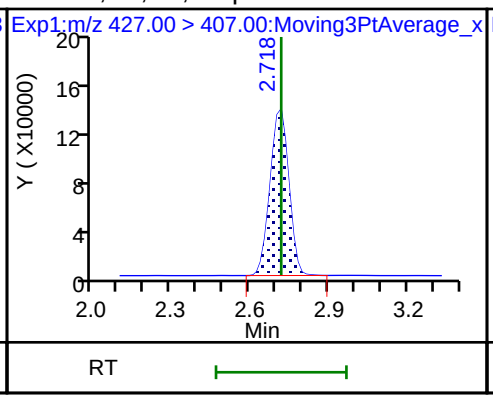
8 Perfluorohexanesulfonic acid



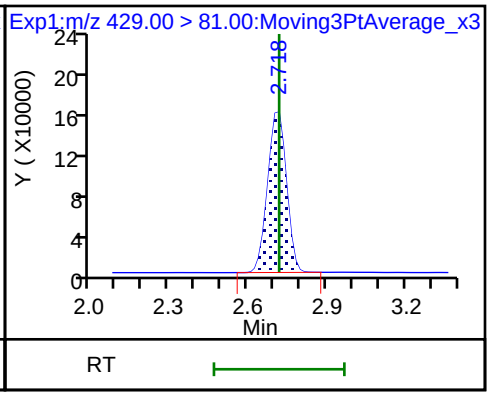
8 Perfluorohexanesulfonic acid



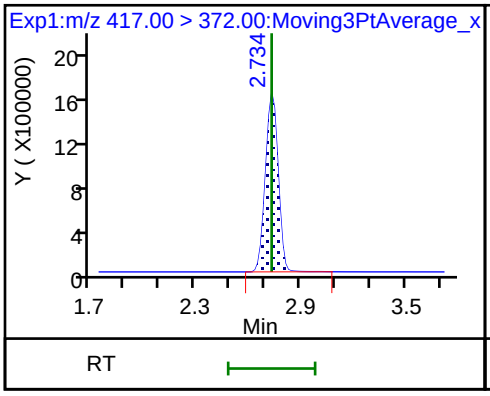
13 1H,1H,2H,2H-perfluorooctanesulfon



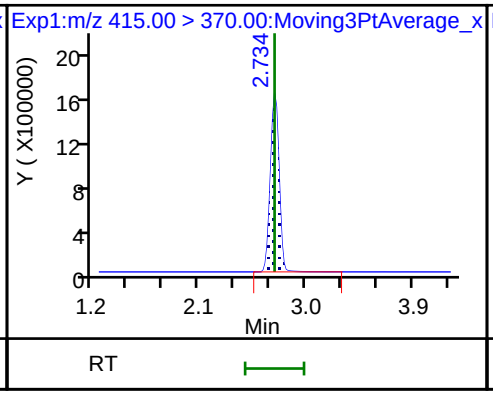
D 12 M2-6:2FTS



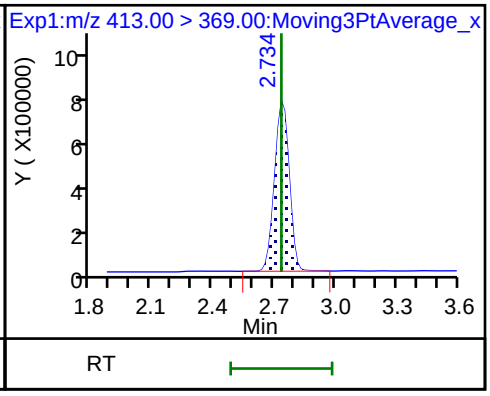
D 14 13C4 PFOA



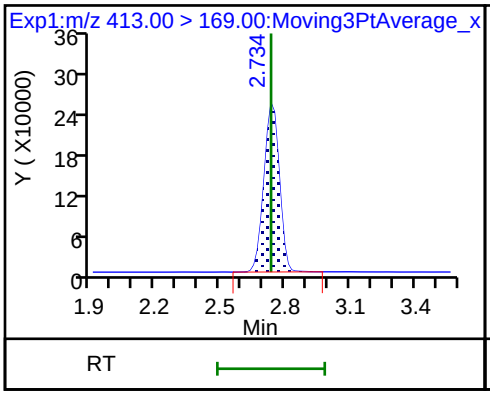
* 62 13C2-PFOA



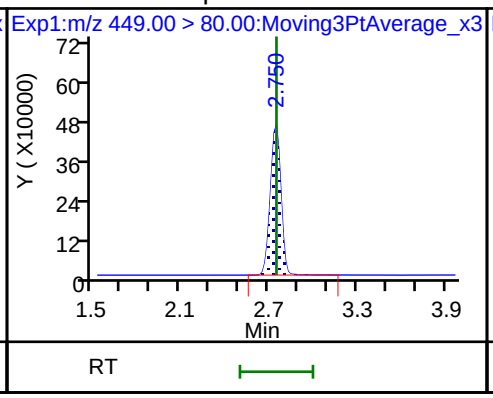
15 Perfluorooctanoic acid



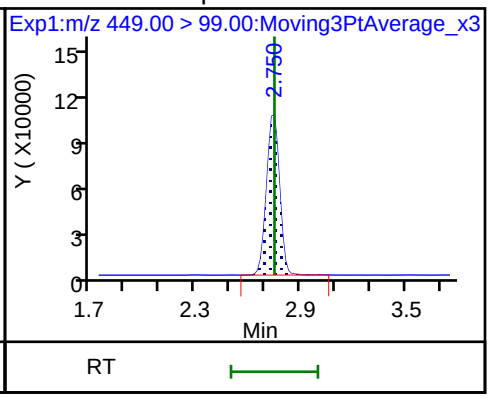
15 Perfluorooctanoic acid



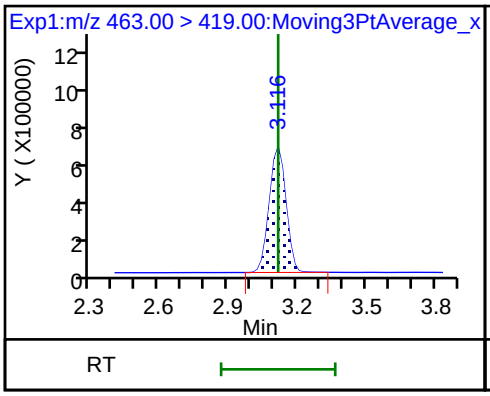
16 Perfluoroheptanesulfonic acid



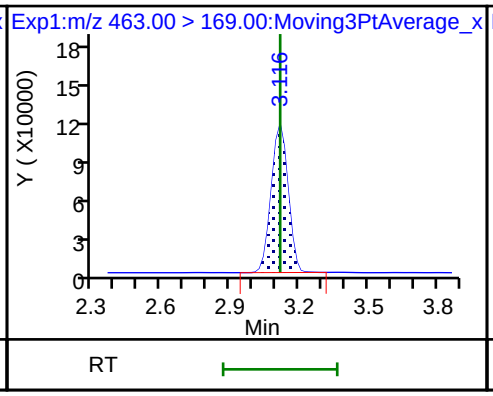
16 Perfluoroheptanesulfonic acid



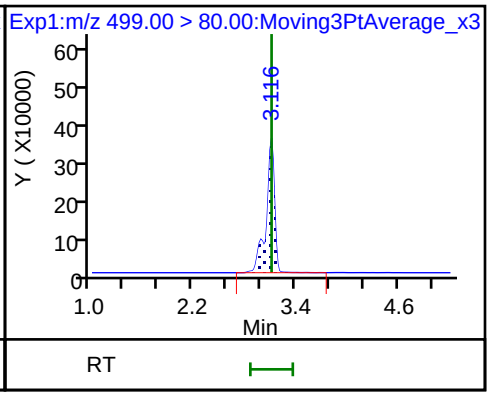
20 Perfluorononanoic acid



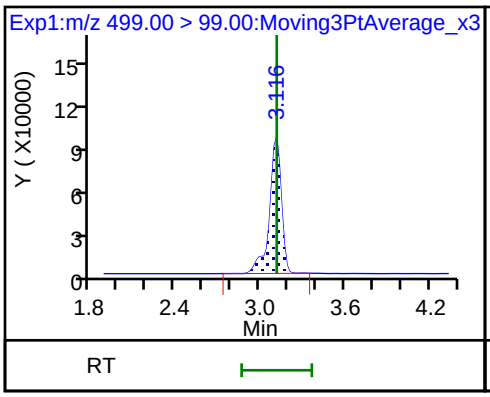
20 Perfluorononanoic acid



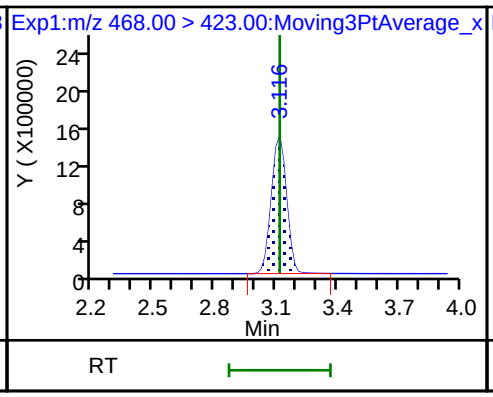
17 Perfluorooctane sulfonic acid



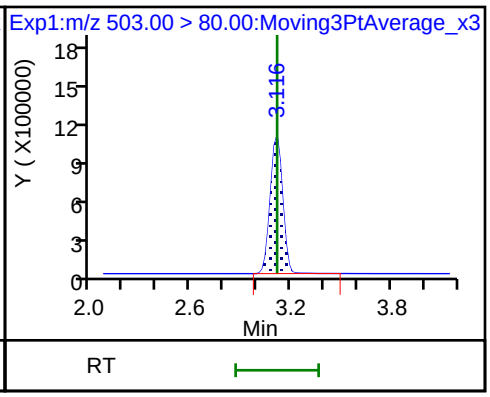
17 Perfluorooctane sulfonic acid



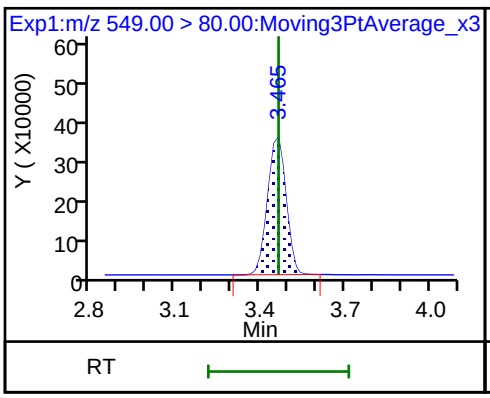
D 19 13C5 PFNA



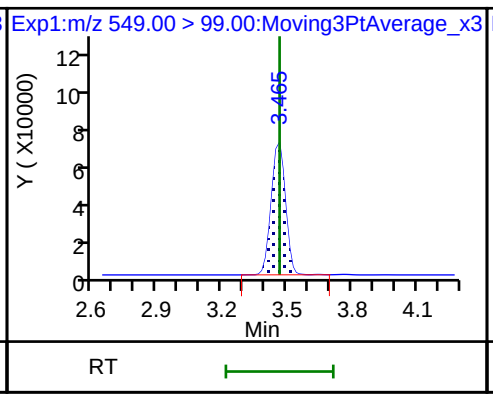
D 18 13C4 PFOS



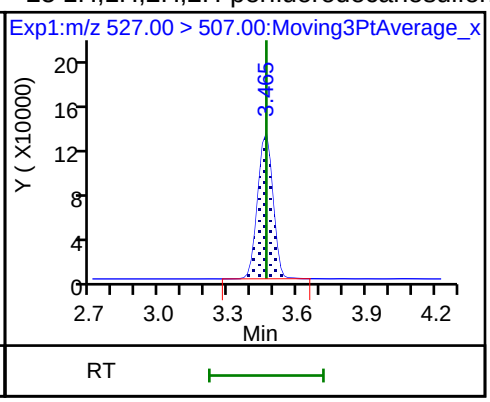
68 Perfluorononanesulfonic acid



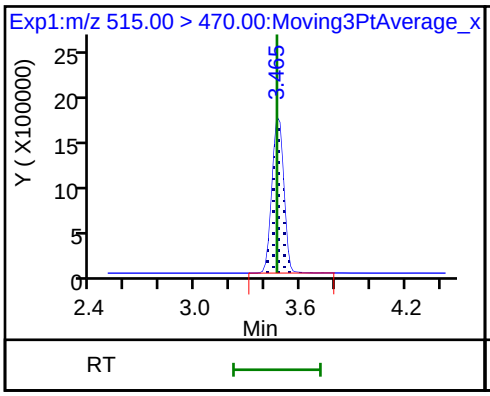
68 Perfluorononanesulfonic acid



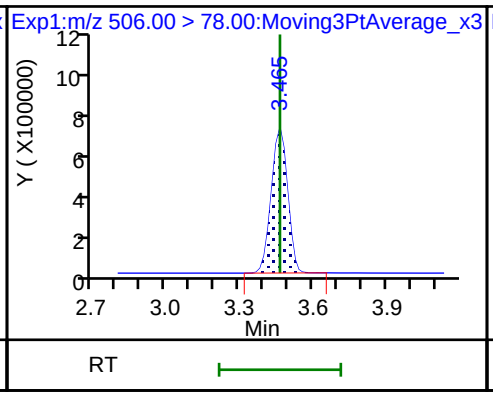
25 1H,1H,2H,2H-perfluorodecanesulfoni



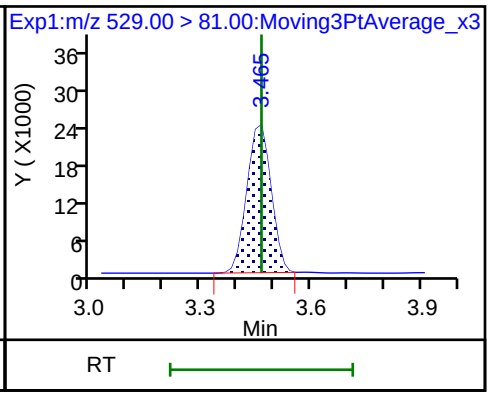
D 23 13C2 PFDA



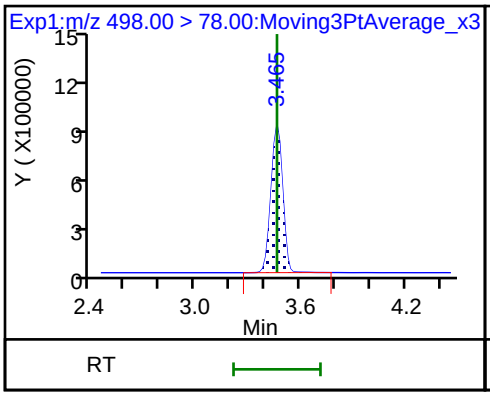
D 21 13C8 FOSA



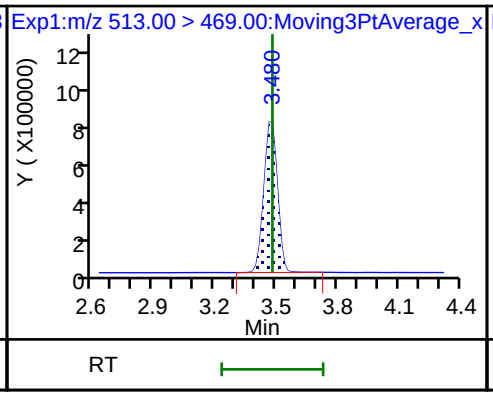
D 26 M2-8:2FTS



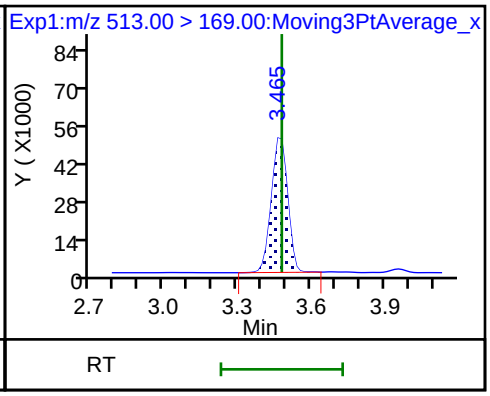
22 Perfluorooctane Sulfonamide



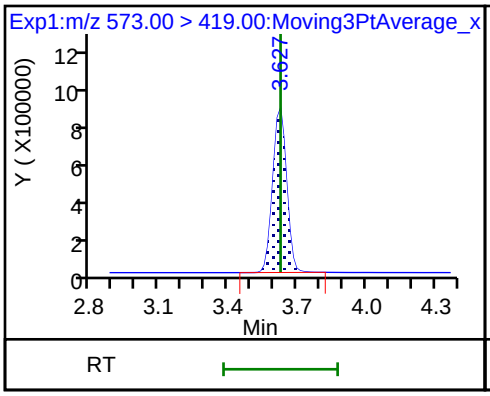
24 Perfluorodecanoic acid



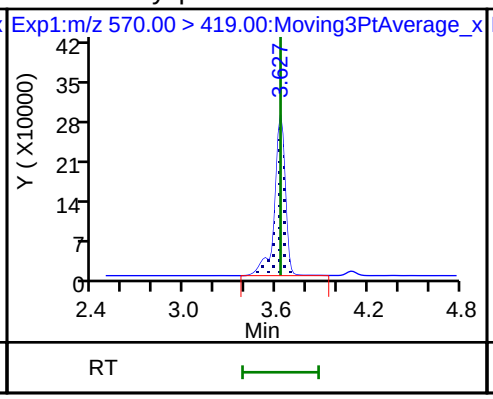
24 Perfluorodecanoic acid



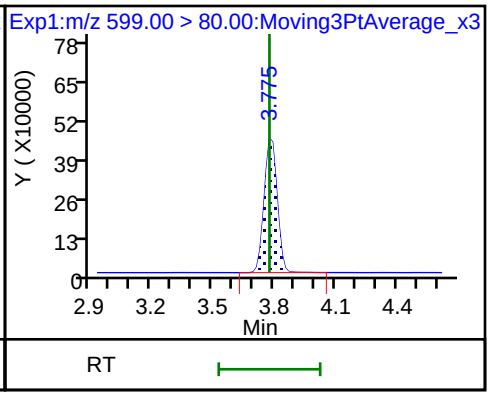
D 27 d3-NMeFOSAA



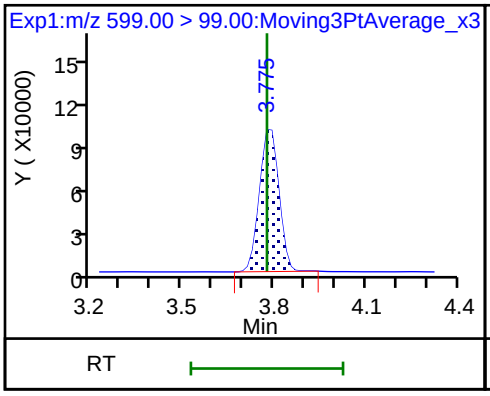
28 N-methyl perfluorooctane sulfonami



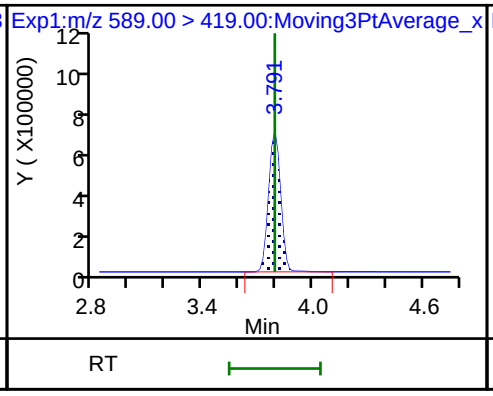
29 Perfluorodecane Sulfonic acid



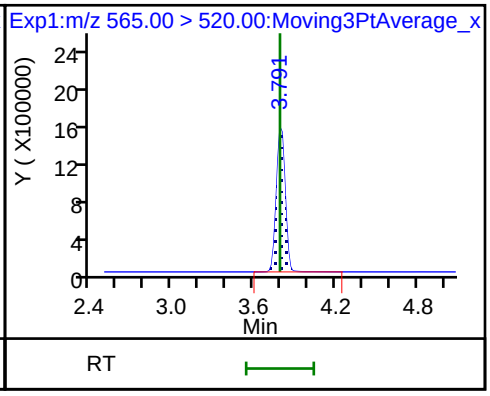
29 Perfluorodecane Sulfonic acid



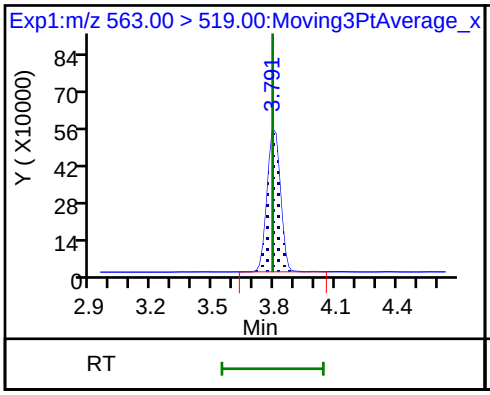
D 32 d5-NEtFOSAA



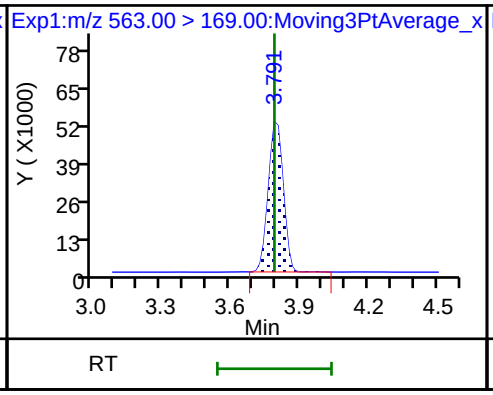
D 30 13C2 PFUnA



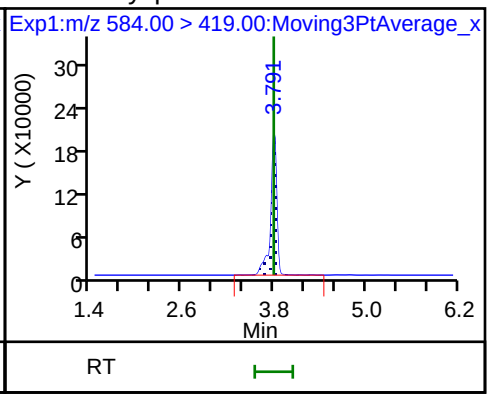
31 Perfluoroundecanoic acid



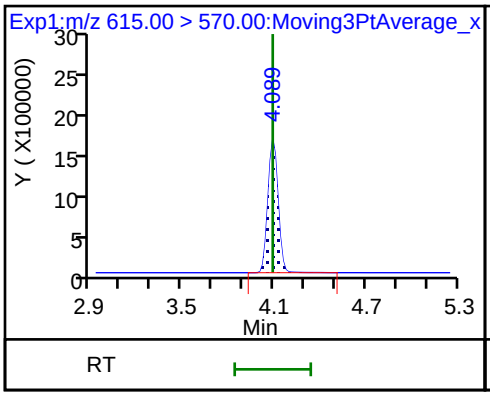
31 Perfluoroundecanoic acid



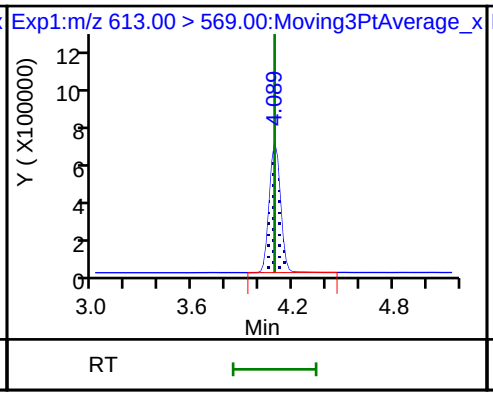
33 N-ethyl perfluorooctane sulfonamid



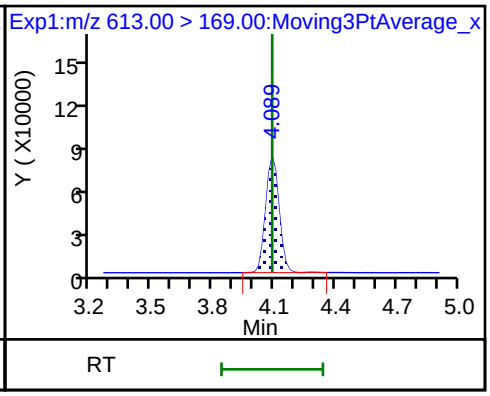
D 36 13C2 PFDoA



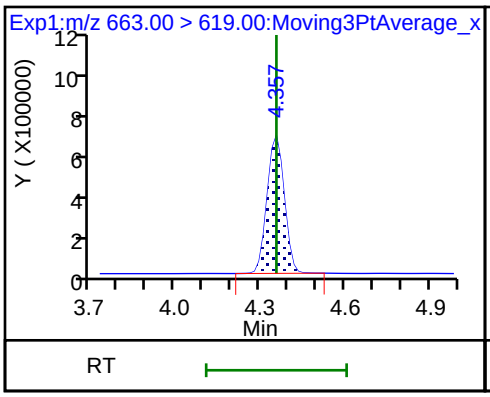
37 Perfluorododecanoic acid



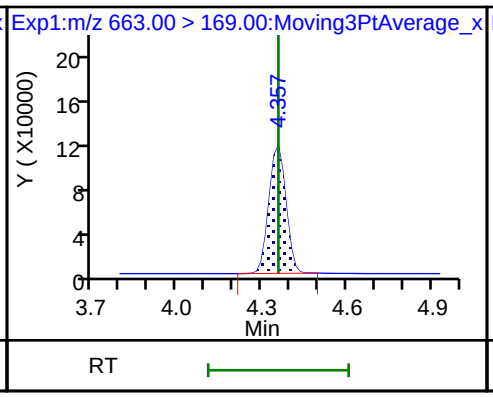
37 Perfluorododecanoic acid



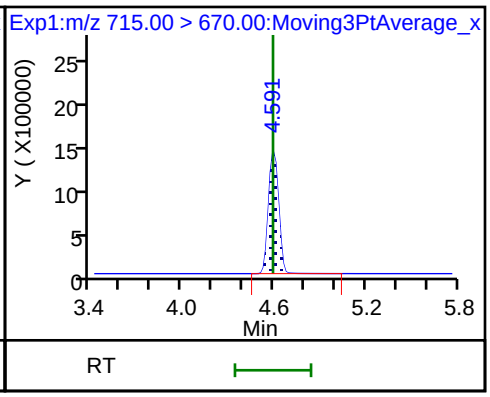
41 Perfluorotridecanoic acid



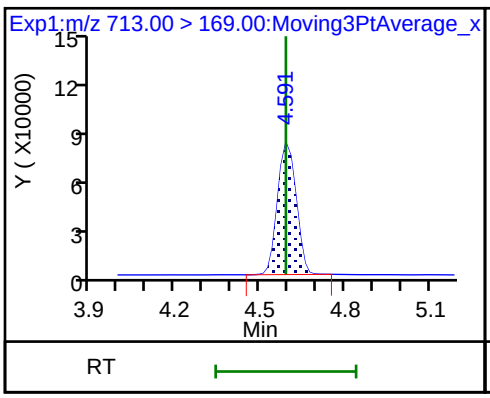
41 Perfluorotridecanoic acid



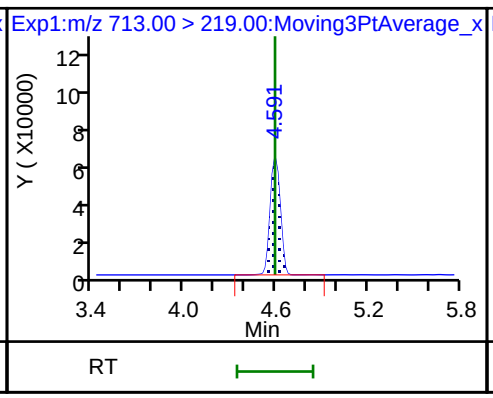
D 43 13C2-PFTeDA



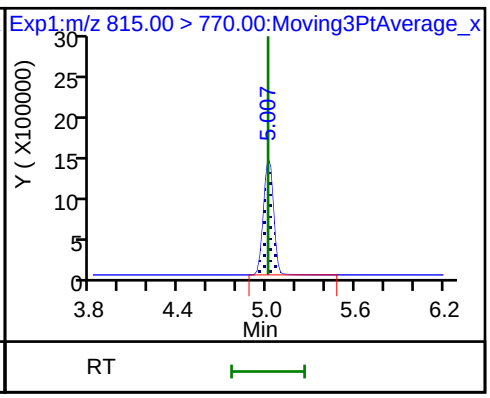
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246405/1 Calibration Date: 09/18/2018 00:02

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_051.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9434		1.03	1.00	3.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.011		0.997	1.00	-0.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	115.8		0.974	0.884	10.2	30.0
4:2 FTS	AveID	21.61	23.72		1.03	0.934	9.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.8789		0.965	1.00	-3.5	30.0
Perfluoropentanesulfonic acid	AveID	49.87	52.57		0.989	0.938	5.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.058		1.04	1.00	3.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.163		0.855	0.910	-6.0	30.0
6:2 FTS	AveID	2.140	2.288		1.01	0.948	6.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.086		1.05	0.952	10.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.064		0.989	1.00	-1.2	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.033		1.06	1.00	5.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.057		0.930	0.928	0.2	30.0
8:2 FTS	AveID	15.14	15.41		0.975	0.958	1.8	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7192		1.07	0.960	11.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.136		0.998	1.00	-0.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.332		1.12	1.00	12.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.063		1.07	1.00	7.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.9441		1.12	0.964	16.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9544		1.03	1.00	2.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9334		1.04	1.00	4.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	0.9938		0.986	1.00	-1.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8354		1.04	1.00	4.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1628		1.01	1.00	0.8	30.0
13C4 PFBA	Ave	0.9623	0.9102		2.36	2.50	-5.4	30.0
13C5 PFPeA	Ave	0.8584	0.8140		2.37	2.50	-5.2	30.0
13C3-PFBS	Ave	0.0113	0.0104		2.15	2.33	-7.6	30.0
13C2 PFHxA	Ave	0.9075	0.8892		2.45	2.50	-2.0	30.0
13C4-PFHpA	Ave	1.082	1.095		2.53	2.50	1.2	30.0
18O2 PFHxS	Ave	0.6655	0.6710		2.38	2.37	0.8	30.0
M2-6:2FTS	Ave	0.1063	0.1053		2.35	2.38	-1.0	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246405/1 Calibration Date: 09/18/2018 00:02

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_051.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	1.014		2.52	2.50	0.6	30.0
13C4 PFOS	Ave	0.7151	0.6689		2.24	2.39	-6.5	30.0
13C5 PFNA	Ave	0.9437	0.9444		2.50	2.50	0.0	30.0
M2-8:2FTS	Ave	0.0156	0.0146		2.23	2.40	-6.9	30.0
13C2 PFDA	Ave	0.9426	0.9687		2.57	2.50	2.8	30.0
13C8 FOSA	Ave	0.3783	0.3557		2.35	2.50	-6.0	30.0
d3-NMeFOSAA	Ave	0.4249	0.4124		2.43	2.50	-2.9	30.0
d5-NEtFOSAA	Ave	0.3342	0.3675		2.75	2.50	9.9	30.0
13C2 PFUnA	Ave	0.8023	0.8107		2.53	2.50	1.0	30.0
13C2 PFDoA	Ave	0.9759	0.9560		2.45	2.50	-2.0	30.0
13C2-PFTeDA	Ave	0.7774	0.7804		2.51	2.50	0.4	30.0
13C2-PFHxDA	Ave	0.7882	0.8184		2.60	2.50	3.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_051.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 18-Sep-2018 00:02:36 ALS Bottle#: 39 Worklist Smp#: 1
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 20-Sep-2018 09:00:55 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 20-Sep-2018 09:00:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.483	1.479	0.005	0.542	7737382	2.36		94.6	13350	
2 Perfluorobutyric acid										
212.90 > 169.00	1.488	1.488	0.0	1.004	2919783	1.03		103	472	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.755	0.0	1.000	2799116	1.00		99.7	236	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.756	-0.001	0.642	6919696	2.37		94.8	7390	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.789	0.008	0.657	82334	2.15		92.4	463	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	3623563	0.9739		110	1366	
298.90 > 99.00	1.797	1.797	0.0	1.000	1223203		2.96(1.35-4.05)		930	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.007	0.0	1.117	784460	1.03		110	4460	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.007	0.0	0.734	705602	NC			904	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.038	0.010	0.749	7559375	2.45		98.0	20002	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	2657504	0.9651		96.5	544	
313.00 > 119.00	2.048	2.048	0.0	1.000	194757		13.65(6.96-20.87)		396	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.068	0.0	1.151	1746169	0.9887		105	2506	
349.00 > 99.00	2.068	2.068	0.0	1.151	784992		2.22(1.15-3.45)		1413	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.140	2.130	0.010	0.783	901181	NC			2121	

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	2.140	0.0	1.000	628386	NC			305	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.360	0.013	0.868	9305569	2.53		101	15660	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.373	2.373	0.0	1.000	3937550	1.04		104	503	
363.00 > 169.00	2.373	2.373	0.0	1.000	838097		4.70(2.17-6.52)		1452	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.386	2.386	0.0	1.000	2414654	0.8553		94.0	2268	
399.00 > 99.00	2.386	2.386	0.0	1.000	683235		3.53(1.90-5.70)		781	
D 11 18O2 PFHxS										
403.00 > 84.00	2.386	2.387	-0.001	0.873	5395730	2.38		101	6599	
76 DONA										
377.00 > 251.00	2.413	2.413	0.0	0.779	6347531	NC			16109	
377.00 > 85.00	2.413	2.413	0.0	0.779	2702148		2.35(1.13-3.39)		1230	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.703	2.703	0.0	1.000	776702	1.01		107	650	
D 12 M2-6:2FTS										
429.00 > 81.00	2.703	2.703	0.0	0.988	850620	2.35		99.0	1456	
D 73 13C8 PFOA										
421.00 > 376.00	2.719	2.719	-0.001		7253105	NC			20657	
D 14 13C4 PFOA										
417.00 > 372.00	2.734	2.719	0.015	1.000	8617352	2.52		101	12025	
* 62 13C2-PFOA										
415.00 > 370.00	2.734	2.734	0.0		8500955	2.50			9857	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.734	2.734	0.0	1.000	3670579	0.9894		98.8	201	
413.00 > 169.00	2.734	2.734	0.0	1.000	1254978		2.92(1.36-4.08)		1677	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.734	2.734	0.0	0.883	2350694	1.05		110	2826	
449.00 > 99.00	2.734	2.734	0.0	0.883	578452		4.06(1.84-5.53)		1921	
20 Perfluorononanoic acid										
463.00 > 419.00	3.098	3.098	0.0	1.000	3316061	1.06		106	327	
463.00 > 169.00	3.098	3.098	0.0	1.000	635318		5.22(2.68-8.03)		1732	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.098	3.098	0.0	1.000	2231786	0.9299		100	1129	
499.00 > 99.00	3.098	3.098	0.0	1.000	561228		3.98(2.04-6.12)		1175	
D 72 13C8 PFOS										
507.00 > 99.00	3.098	3.099	-0.001		1197237	NC			2446	
D 19 13C5 PFNA										
468.00 > 423.00	3.098	3.099	-0.001	1.133	8028165	2.50		100	7472	
D 18 13C4 PFOS										
503.00 > 80.00	3.098	3.099	-0.001	1.133	5436387	2.24		93.5	3674	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.318	3.318	0.0	1.071	2794881	NC			2951	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.449	3.449	0.0	1.113	1570515	1.07		111	2252	
549.00 > 99.00	3.449	3.449	0.0	1.113	256629		6.12(3.02-9.05)		1623	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.449	3.449	0.0	1.000	730939	0.9754		102	1815	
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.449	0.016	1.267	3023890	2.35		94.0	4196	
D 26 M2-8:2FTS										
529.00 > 81.00	3.449	3.449	0.0	1.261	118549	2.23		93.1	498	
D 23 13C2 PFDA										
515.00 > 470.00	3.465	3.449	0.016	1.267	8234828	2.57		103	7020	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.465	3.465	0.0	1.000	4029862	1.12		112	4742	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.465	3.465	0.0	1.000	3743331	1.00		99.8	644	
513.00 > 169.00	3.465	3.465	0.0	1.000	252682		14.81(7.12-21.35)		354	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.613	3.613	0.0	1.000	1490700	1.07		107	459	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.613	3.613	0.0	1.321	3505721	2.43		97.1	8869	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.776	3.776	0.0	1.219	2070239	1.12		116	1789	
599.00 > 99.00	3.776	3.776	0.0	1.219	452510		4.58(2.14-6.43)		1447	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.776	3.776	0.0	1.381	3123886	2.75		110	2500	
D 30 13C2 PFUnA										
565.00 > 520.00	3.791	3.776	0.015	1.387	6891617	2.53		101	4031	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.791	3.791	0.0	1.000	2573142	1.04		104	536	
563.00 > 169.00	3.791	3.791	0.0	1.000	232134		11.08(5.24-15.72)		1017	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.791	3.791	0.0	1.004	1192548	1.03		103	1970	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.944	3.944	0.0	1.273	3377473	NC			8202	
35 MeFOSA										
512.00 > 169.00	3.944	3.944	0.0		696422	NC			588	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.073	4.073	0.0	1.000	3230421	0.9860		98.6	611	
613.00 > 169.00	4.073	4.073	0.0	1.000	367308		8.79(4.68-14.05)		896	
D 36 13C2 PFDoA										
615.00 > 570.00	4.073	4.073	0.0	1.489	8126568	2.45		98.0	11010	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.089	4.089	0.0	1.186	438927	NC			1448	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.139	4.139	0.0		778220	NC			670	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.311	4.311	0.0	1.391	206945	NC			315	
699.00 > 99.00	4.311	4.311	0.0	1.391	375637		0.55(0.28-0.83)		1493	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.342	4.342	0.0	1.066	2715674	1.04		104	949	
663.00 > 169.00	4.342	4.342	0.0	1.066	442494		6.14(3.09-9.27)		984	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.573	4.573	0.0	1.672	6634365	2.51		100	12453	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.591	4.591	0.0	1.004	432050	1.01		101	1569	
713.00 > 219.00	4.573	4.591	-0.018	1.000	274621		1.57(0.70-2.09)		1227	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.007	4.989	0.018	1.831	6956866	2.60		104	10347	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.007	5.007	0.0	1.000	2575758	NC			890	
813.00 > 169.00	5.007	5.007	0.0	1.000	435490		5.91(2.77-8.32)		1131	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.349	5.349	0.0	1.068	1990055	NC			608	
913.00 > 169.00	5.349	5.349	0.0	1.068	351447		5.66(2.55-7.64)		1754	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00009 Amount Added: 1.00 Units: mL

Report Date: 20-Sep-2018 09:00:57 Chrom Revision: 2.3 18-Sep-2018 21:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_051.d

Injection Date: 18-Sep-2018 00:02:36 Instrument ID: A9

Lims ID: CCV L4

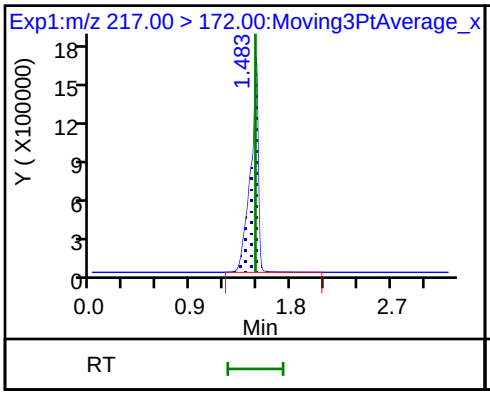
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 39 Worklist Smp#: 1

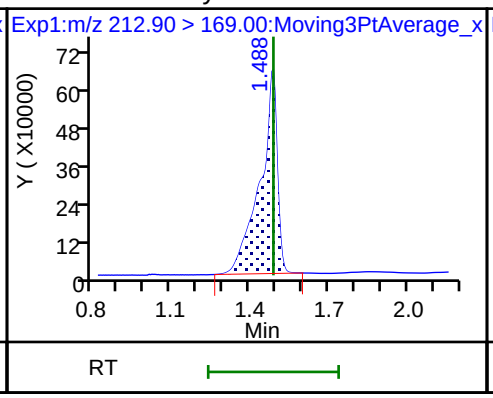
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

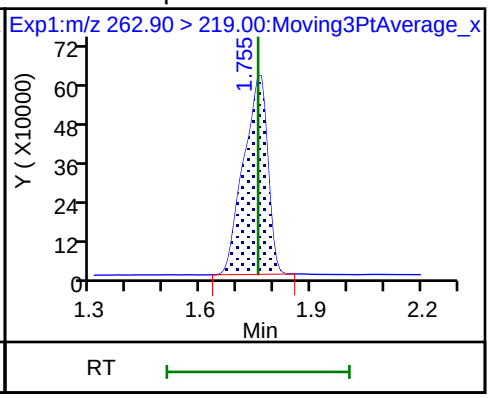
D 1 13C4 PFBA



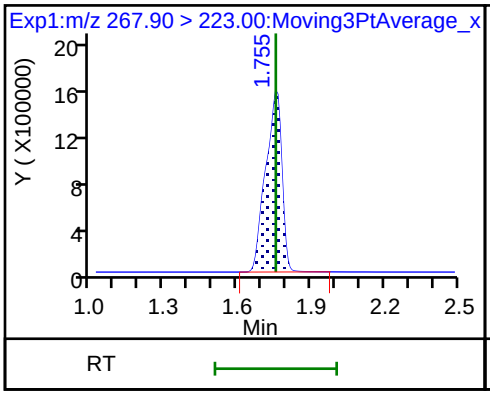
2 Perfluorobutyric acid



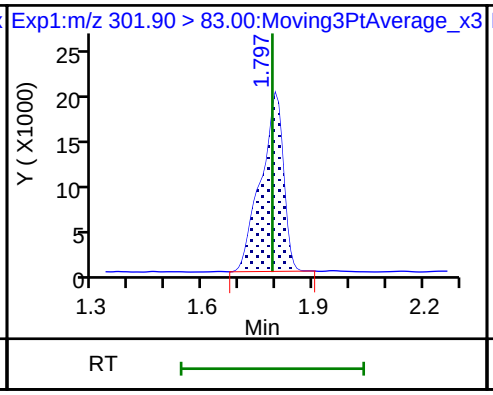
4 Perfluoropentanoic acid



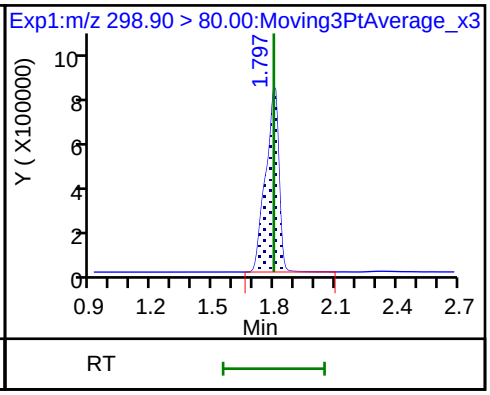
D 3 13C5-PFPeA



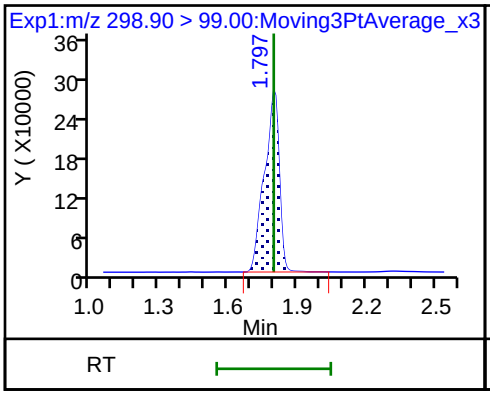
D 47 13C3-PFBS



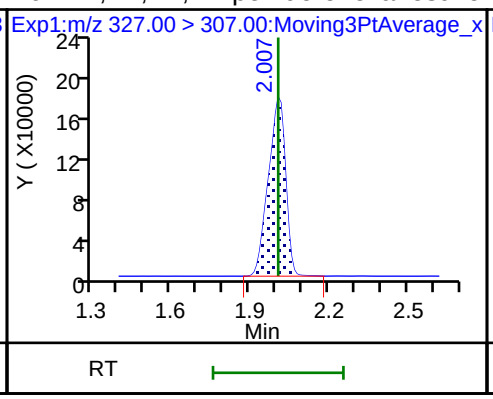
5 Perfluorobutanesulfonic acid



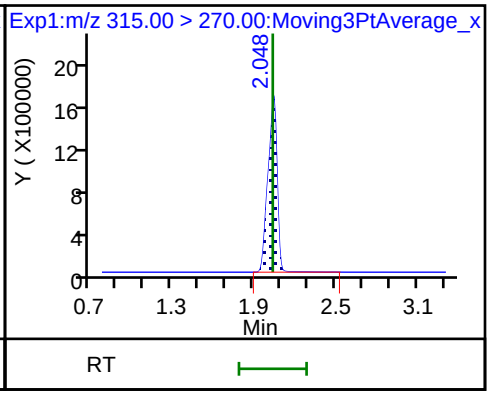
5 Perfluorobutanesulfonic acid



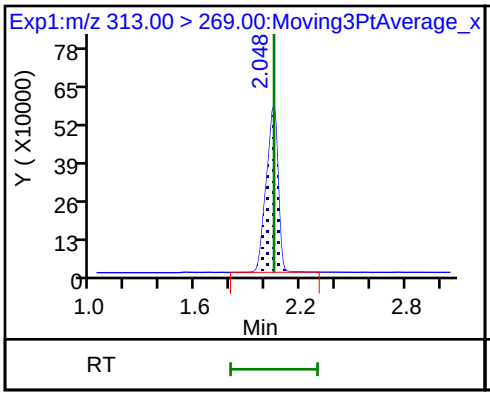
61 1H,1H,2H,2H-perfluorohexanesulfon



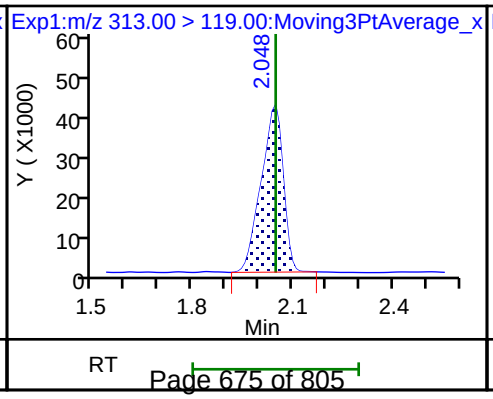
D 7 13C2 PFHxA



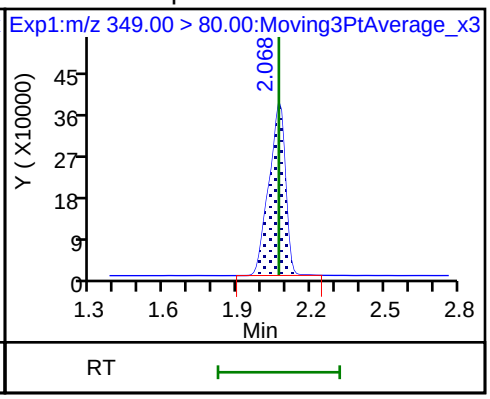
6 Perfluorohexanoic acid



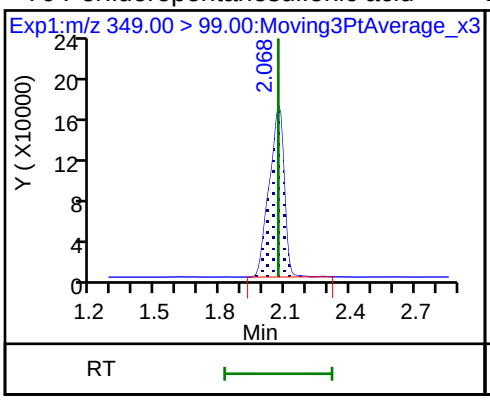
6 Perfluorohexanoic acid



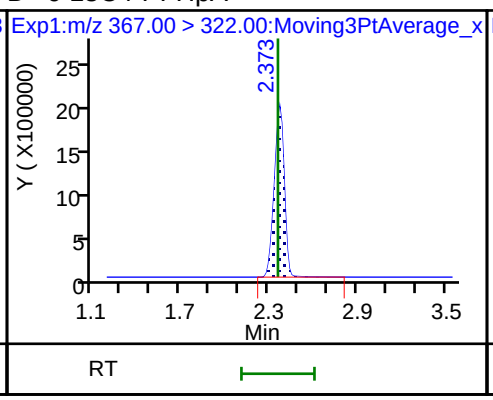
70 Perfluoropentanesulfonic acid



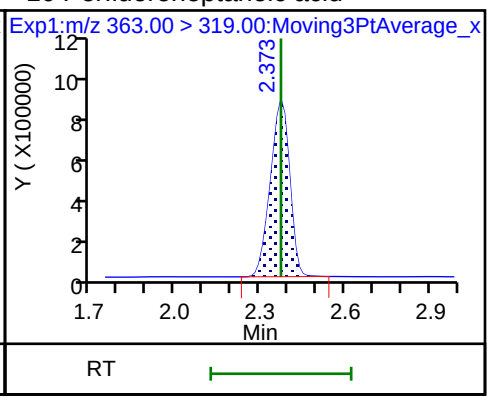
70 Perfluoropentanesulfonic acid



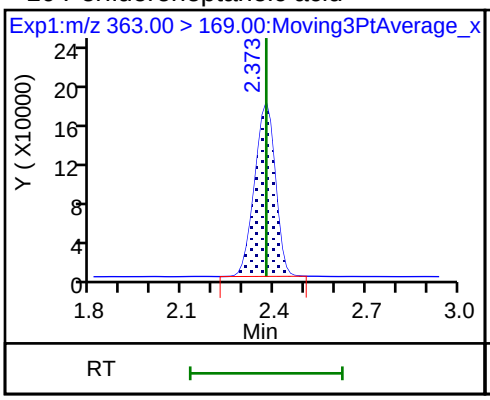
D 9 13C4-PFHpA



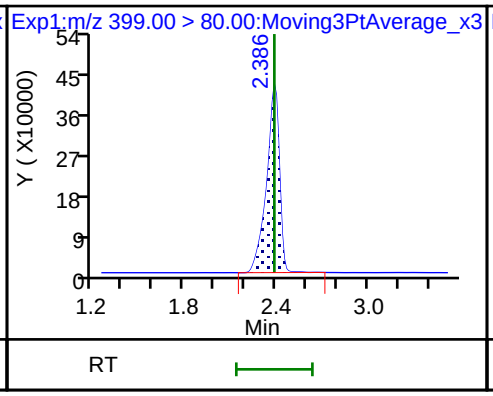
10 Perfluoroheptanoic acid



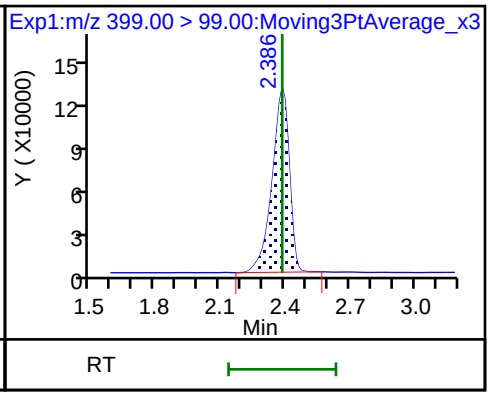
10 Perfluoroheptanoic acid



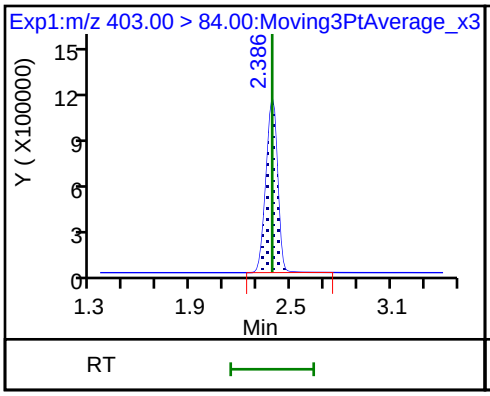
8 Perfluorohexanesulfonic acid



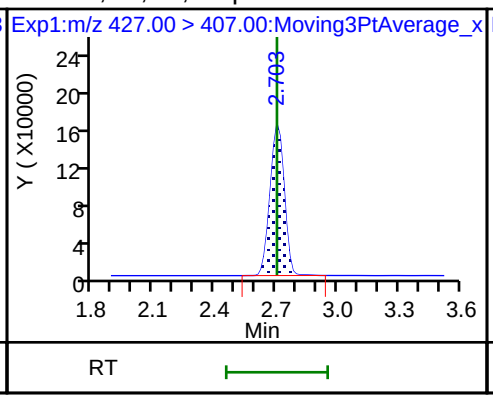
8 Perfluorohexanesulfonic acid



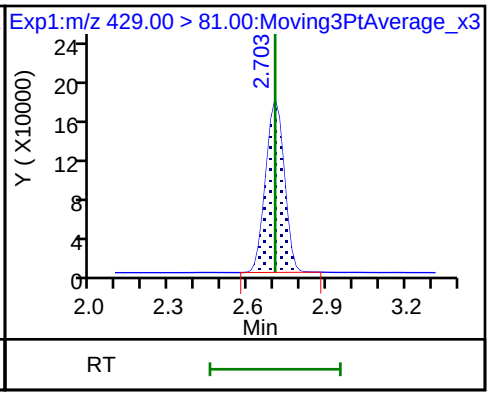
D 11 18O2 PFHxS



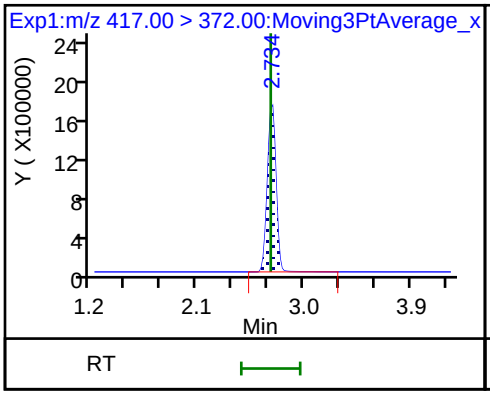
13 1H,1H,2H,2H-perfluorooctanesulfon



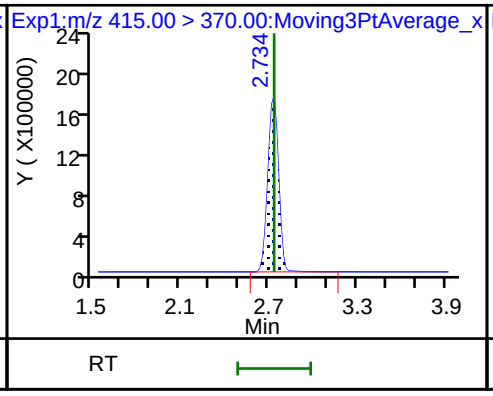
D 12 M2-6:2FTS



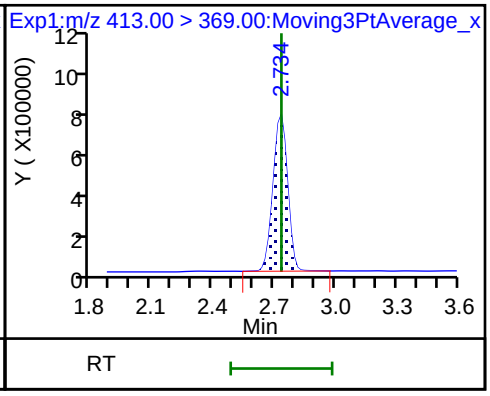
D 14 13C4 PFOA



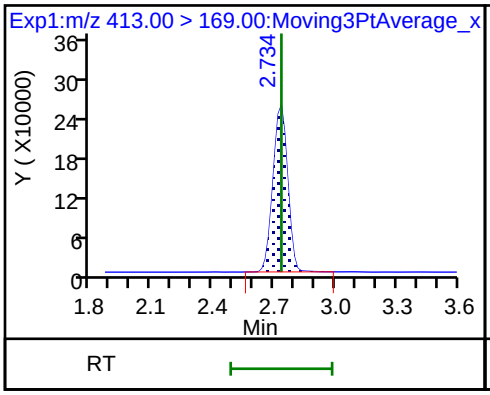
* 62 13C2-PFOA



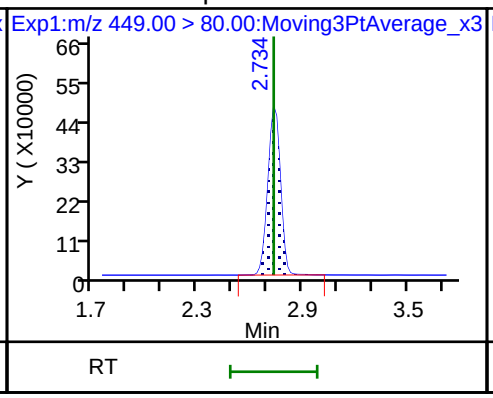
15 Perfluorooctanoic acid



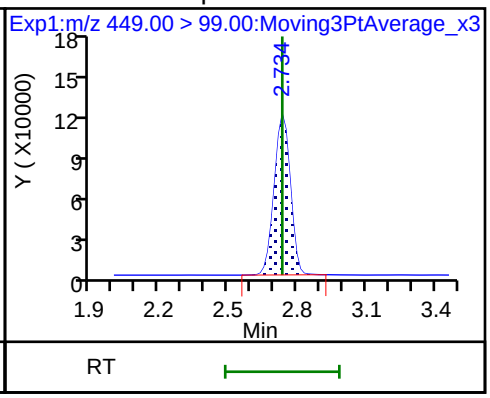
15 Perfluorooctanoic acid



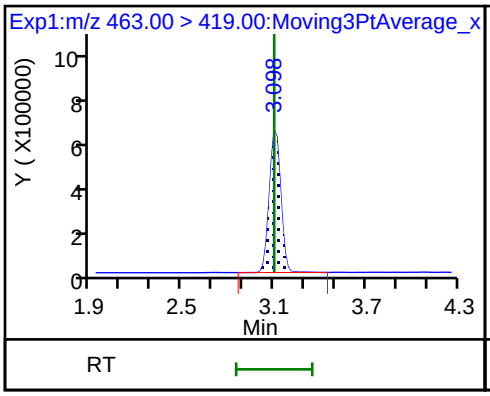
16 Perfluoroheptanesulfonic acid



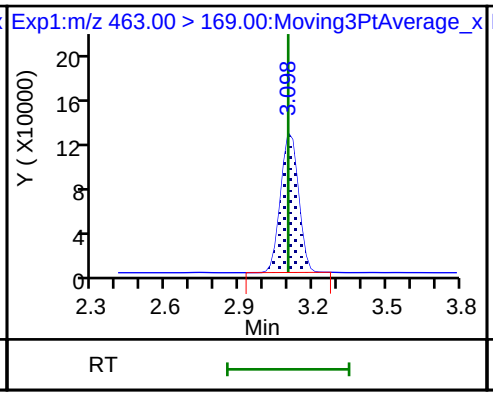
16 Perfluoroheptanesulfonic acid



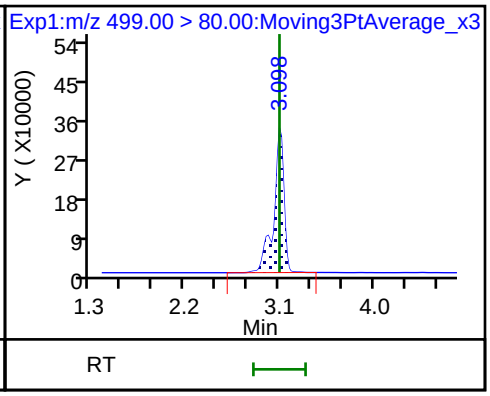
20 Perfluorononanoic acid



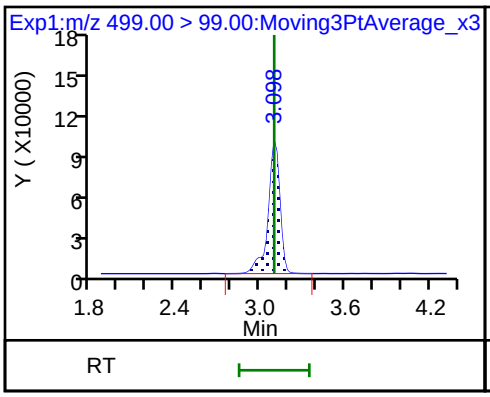
20 Perfluorononanoic acid



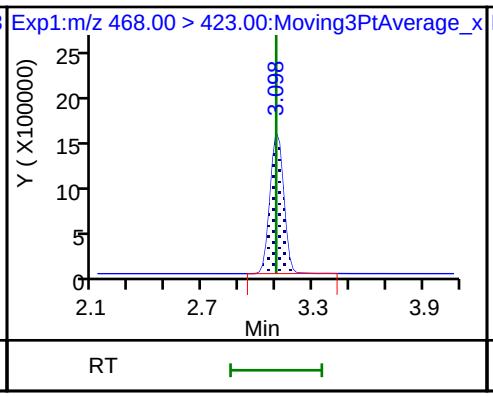
17 Perfluorooctane sulfonic acid



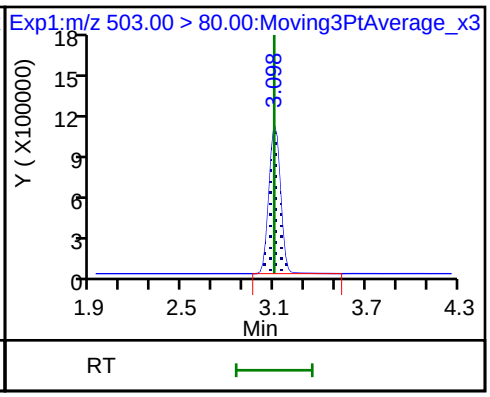
17 Perfluorooctane sulfonic acid



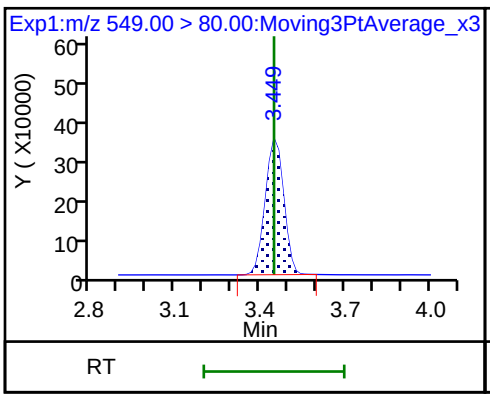
D 19 13C5 PFNA



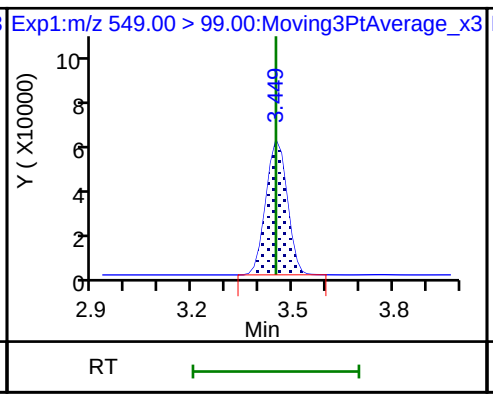
D 18 13C4 PFOS



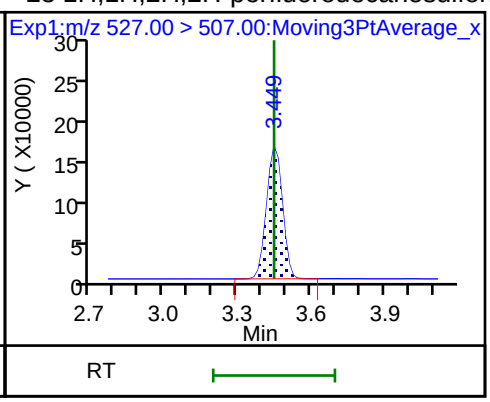
68 Perfluorononanesulfonic acid



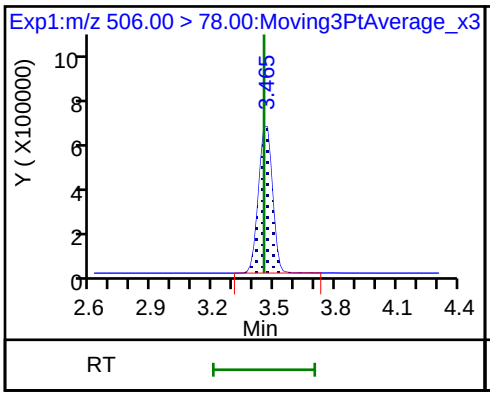
68 Perfluorononanesulfonic acid



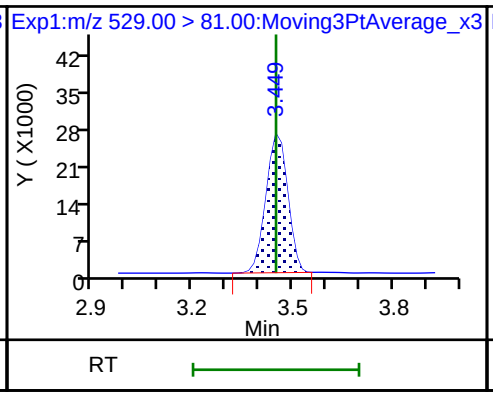
25 1H,1H,2H,2H-perfluorodecanesulfoni



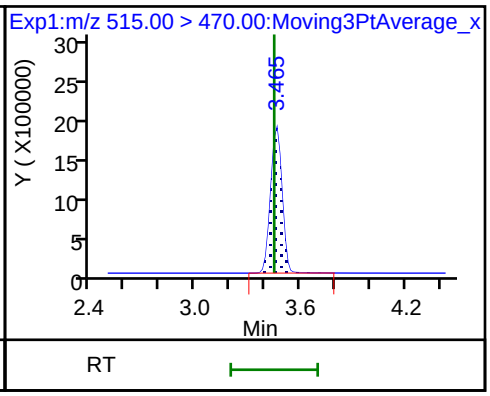
D 21 13C8 FOSA



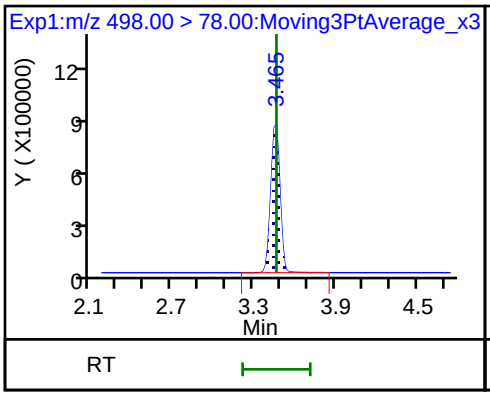
D 26 M2-8:2FTS



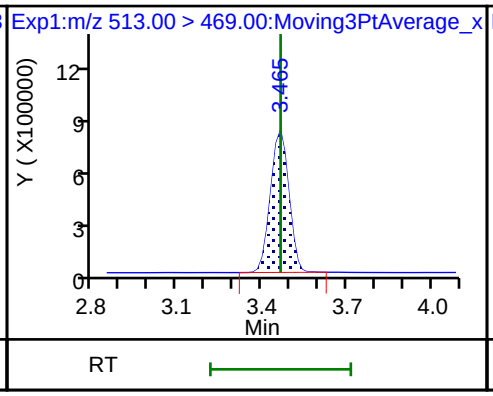
D 23 13C2 PFDA



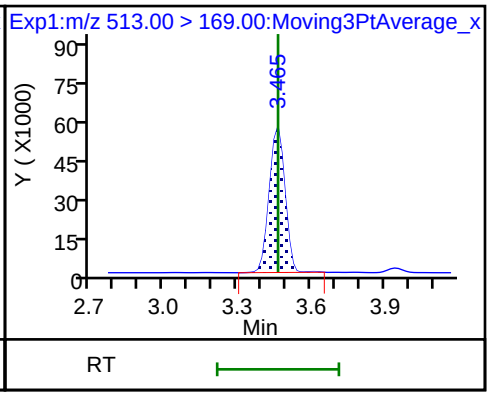
22 Perfluorooctane Sulfonamide



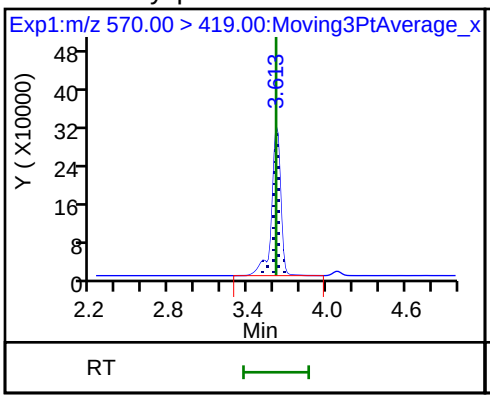
24 Perfluorodecanoic acid



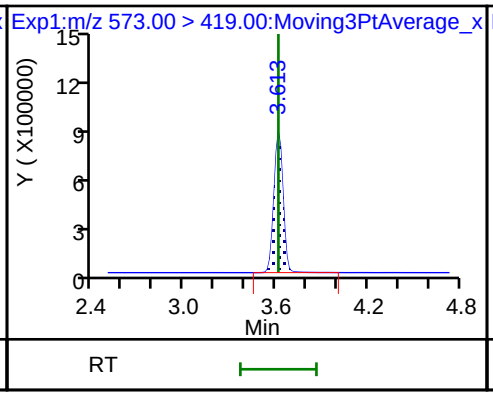
24 Perfluorodecanoic acid



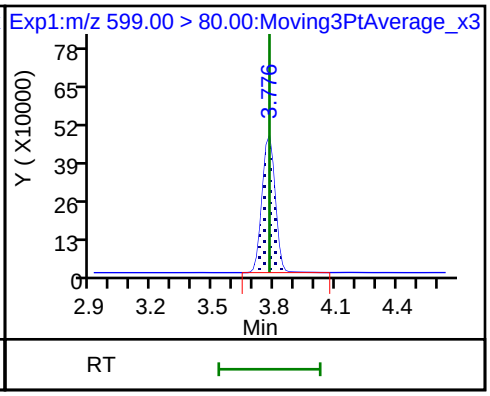
28 N-methyl perfluorooctane sulfonami



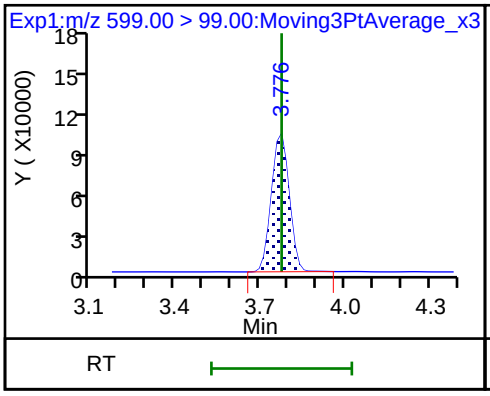
D 27 d3-NMeFOSAA



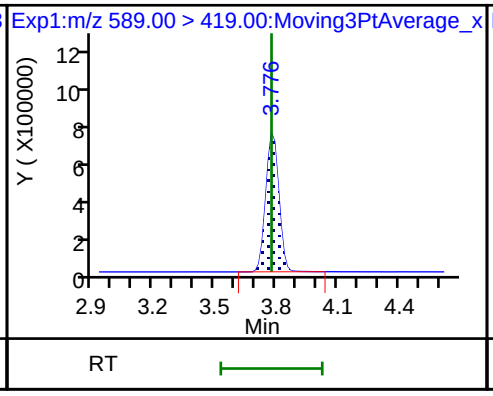
29 Perfluorodecane Sulfonic acid



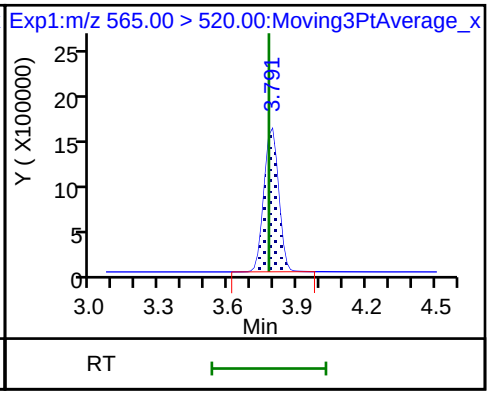
29 Perfluorodecane Sulfonic acid



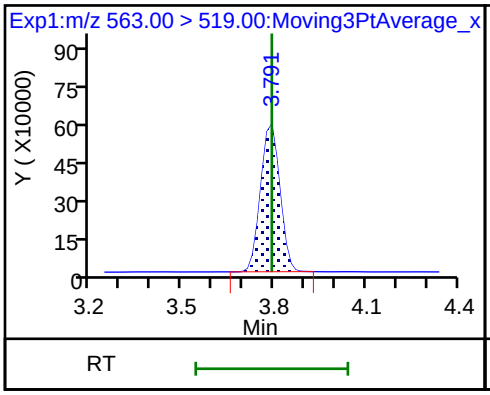
D 32 d5-NEtFOSAA



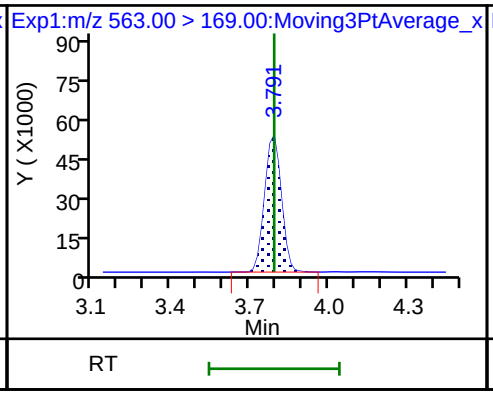
D 30 13C2 PFUnA



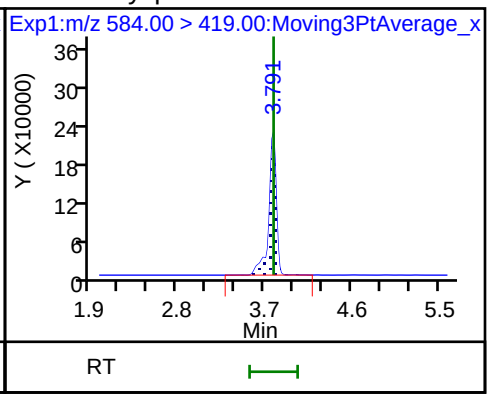
31 Perfluoroundecanoic acid



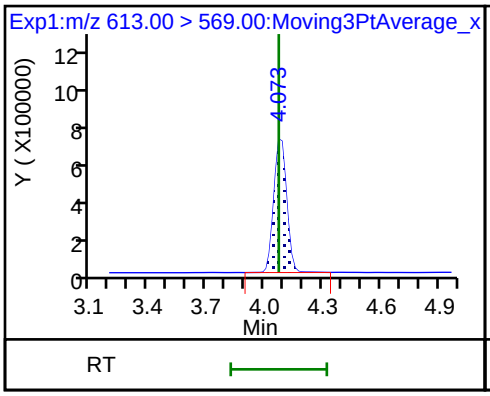
31 Perfluoroundecanoic acid



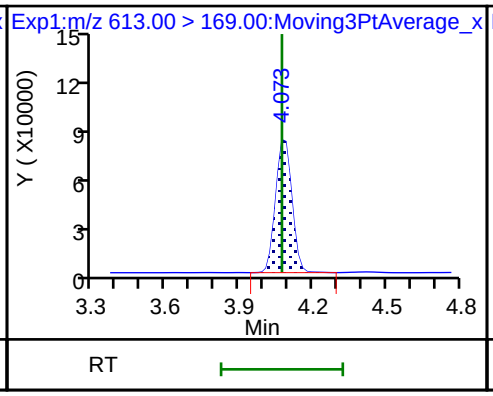
33 N-ethyl perfluorooctane sulfonamid



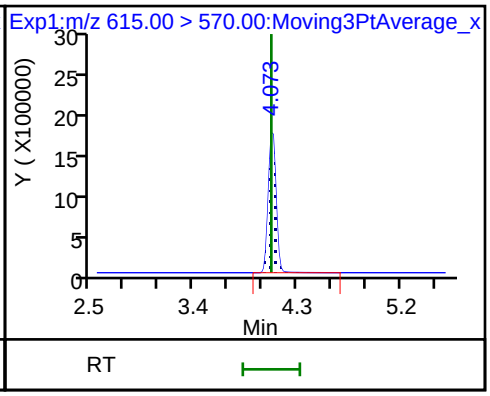
37 Perfluorododecanoic acid



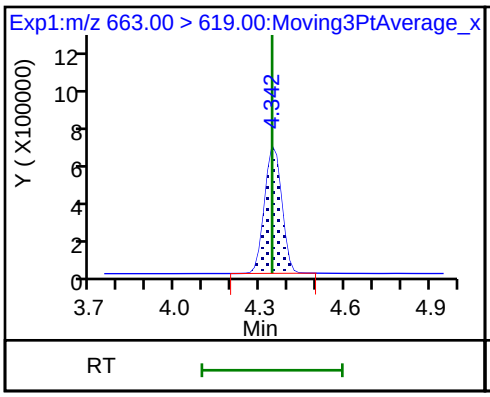
37 Perfluorododecanoic acid



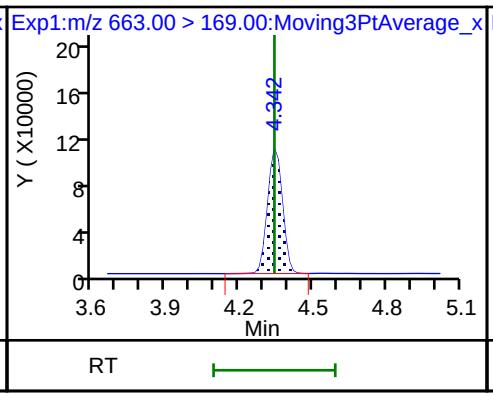
D 36 13C2 PFDoA



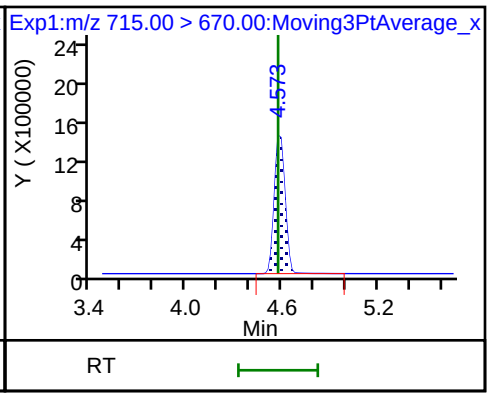
41 Perfluorotridecanoic acid



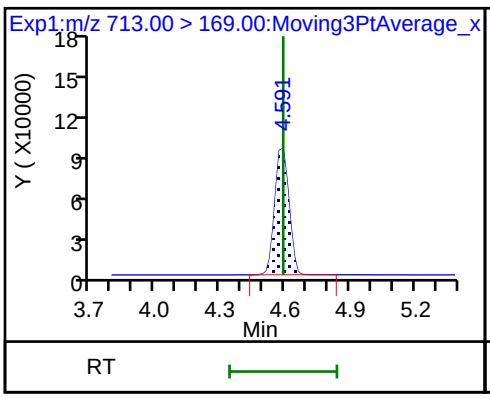
41 Perfluorotridecanoic acid



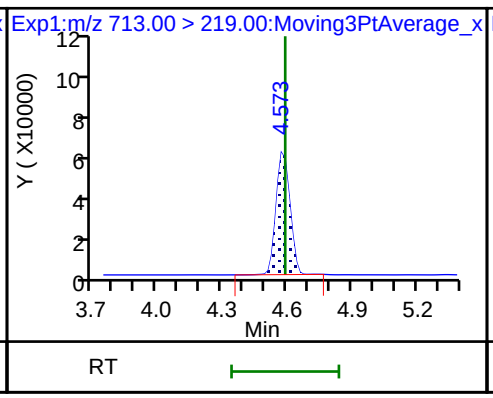
D 43 13C2-PFTeDA



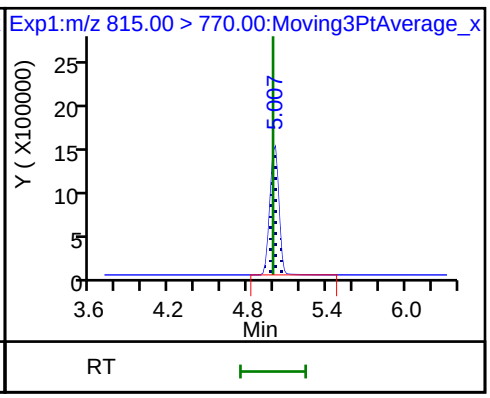
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246405/4 Calibration Date: 09/18/2018 00:25

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9233		2.53	2.50	1.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.020		2.51	2.50	0.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	107.2		2.26	2.21	2.0	30.0
4:2 FTS	AveID	21.61	22.66		2.45	2.34	4.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.8905		2.44	2.50	-2.2	30.0
Perfluoropentanesulfonic acid	AveID	49.87	51.10		2.40	2.35	2.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.095		2.68	2.50	7.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.161		2.13	2.28	-6.2	30.0
6:2 FTS	AveID	2.140	2.194		2.43	2.37	2.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.100		2.66	2.38	11.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.071		2.49	2.50	-0.5	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	0.9667		2.47	2.50	-1.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.037		2.28	2.32	-1.7	30.0
8:2 FTS	AveID	15.14	13.99		2.21	2.40	-7.6	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.6431		2.39	2.40	-0.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.083		2.60	2.50	4.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.125		2.47	2.50	-1.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.056		2.66	2.50	6.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8680		2.57	2.41	6.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.8863		2.38	2.50	-4.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.8822		2.46	2.50	-1.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	0.9891		2.45	2.50	-1.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8369		2.61	2.50	4.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1561		2.42	2.50	-3.3	30.0
13C4 PFBA	Ave	0.9623	0.9375		2.44	2.50	-2.6	30.0
13C5 PFPeA	Ave	0.8584	0.8645		2.52	2.50	0.7	30.0
13C3-PFBS	Ave	0.0113	0.0114		2.36	2.33	1.5	30.0
13C2 PFHxA	Ave	0.9075	0.9057		2.49	2.50	-0.2	30.0
13C4-PFHpA	Ave	1.082	1.059		2.45	2.50	-2.2	30.0
18O2 PFHxS	Ave	0.6655	0.6825		2.43	2.37	2.5	30.0
M2-6:2FTS	Ave	0.1063	0.1006		2.25	2.38	-5.4	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246405/4 Calibration Date: 09/18/2018 00:25

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	1.018		2.53	2.50	1.0	30.0
13C4 PFOS	Ave	0.7151	0.6945		2.32	2.39	-2.9	30.0
13C5 PFNA	Ave	0.9437	0.9247		2.45	2.50	-2.0	30.0
13C8 FOSA	Ave	0.3783	0.3626		2.40	2.50	-4.2	30.0
M2-8:2FTS	Ave	0.0156	0.0157		2.40	2.40	0.0	30.0
13C2 PFDA	Ave	0.9426	0.9408		2.50	2.50	-0.2	30.0
d3-NMeFOSAA	Ave	0.4249	0.4033		2.37	2.50	-5.1	30.0
d5-NEtFOSAA	Ave	0.3342	0.3478		2.60	2.50	4.1	30.0
13C2 PFUnA	Ave	0.8023	0.8305		2.59	2.50	3.5	30.0
13C2 PFDoA	Ave	0.9759	0.9264		2.37	2.50	-5.1	30.0
13C2-PFTeDA	Ave	0.7774	0.7991		2.57	2.50	2.8	30.0
13C2-PFHxDA	Ave	0.7882	0.7897		2.50	2.50	0.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_054.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 18-Sep-2018 00:25:07 ALS Bottle#: 40 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9
Sublist: chrom-PFAS_A9*sub5

Method: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 20-Sep-2018 09:06:59 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 20-Sep-2018 09:06:59

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	1.483	1.479	0.005	0.542	7790048	2.44		97.4	18965	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.483	1.483	0.0	1.000	7192279	2.53		101	1077	M
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.005	7328214	2.51		101	618	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.756	-0.001	0.642	7183500	2.52		101	11458	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.789	0.008	0.657	88352	2.36		101	591	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	9004124	2.26		102	2955	
298.90 > 99.00	1.797	1.797	0.0	1.000	3157277		2.85(1.35-4.05)		2069	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.007	0.0	1.117	2010240	2.45		105	5563	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.007	0.0	0.734	742051	NC			877	
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.038	-0.001	0.745	7525594	2.49		99.8	19665	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.047	2.047	0.0	1.005	6701524	2.44		97.8	1156	
313.00 > 119.00	2.047	2.047	0.0	1.005	509180		13.16(6.96-20.87)		1007	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.068	0.0	1.151	4553630	2.40		102	6013	
349.00 > 99.00	2.068	2.068	0.0	1.151	2021874		2.25(1.15-3.45)		2442	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.140	2.130	0.010	0.783	905893	NC			1679	

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	2.140	0.0	1.000	1564484	NC			728	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.360	0.013	0.868	8797211	2.45		97.8	5836	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.373	2.373	0.0	1.000	9632073	2.68		107	1123	
363.00 > 169.00	2.373	2.373	0.0	1.000	2141895		4.50(2.17-6.52)		3126	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.386	2.386	0.0	1.000	5992624	2.13		93.8	3045	
399.00 > 99.00	2.386	2.386	0.0	1.000	1727556		3.47(1.90-5.70)		2280	
D 11 18O2 PFHxS										
403.00 > 84.00	2.386	2.387	-0.001	0.873	5364751	2.43		103	6792	
76 DONA										
377.00 > 251.00	2.412	2.412	0.0	0.779	15895791	NC			31482	
377.00 > 85.00	2.412	2.412	0.0	0.779	7432594		2.14(1.13-3.39)		3254	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.702	2.702	0.0	1.000	1737965	2.43		103	1363	
D 12 M2-6:2FTS										
429.00 > 81.00	2.702	2.703	-0.001	0.988	793728	2.25		94.6	1690	
D 73 13C8 PFOA										
421.00 > 376.00	2.718	2.719	-0.001		7411723	NC			13336	
D 14 13C4 PFOA										
417.00 > 372.00	2.734	2.719	0.015	1.000	8459128	2.53		101	11615	
* 62 13C2-PFOA										
415.00 > 370.00	2.734	2.734	0.0		8309242	2.50			18090	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.734	2.734	0.0	1.000	9064705	2.49		99.5	462	
413.00 > 169.00	2.734	2.734	0.0	1.000	3289475		2.76(1.36-4.08)		3146	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.734	2.734	0.0	0.882	6041131	2.66		112	5456	
449.00 > 99.00	2.734	2.734	0.0	0.882	1355575		4.46(1.84-5.53)		3371	
20 Perfluorononanoic acid										
463.00 > 419.00	3.098	3.098	0.0	1.000	7427136	2.47		98.9	676	
463.00 > 169.00	3.098	3.098	0.0	1.000	1448469		5.13(2.68-8.03)		2258	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.098	3.098	0.0	1.000	5554460	2.28		98.3	2767	
499.00 > 99.00	3.098	3.098	0.0	1.000	1363829		4.07(2.04-6.12)		2130	
D 72 13C8 PFOS										
507.00 > 99.00	3.098	3.099	-0.001		1148314	NC			4291	
D 19 13C5 PFNA										
468.00 > 423.00	3.098	3.099	-0.001	1.133	7683132	2.45		98.0	12549	
D 18 13C4 PFOS										
503.00 > 80.00	3.098	3.099	-0.001	1.133	5517113	2.32		97.1	4851	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.303	3.303	0.0	1.066	6493029	NC			5088	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.448	3.448	0.0	1.113	3562605	2.39		99.6	2777	
549.00 > 99.00	3.448	3.448	0.0	1.113	610777		5.83(3.02-9.05)		2136	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.448	3.448	0.0	1.000	1743711	2.21		92.4	4263	
D 21 13C8 FOSA										
506.00 > 78.00	3.448	3.449	-0.001	1.261	3012508	2.40		95.8	3271	
D 26 M2-8:2FTS										
529.00 > 81.00	3.448	3.449	-0.001	1.261	124622	2.40		100	672	
D 23 13C2 PFDA										
515.00 > 470.00	3.465	3.449	0.016	1.267	7816915	2.50		99.8	6333	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.448	3.448	0.0	1.000	9287201	2.60		104	7058	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.465	3.465	0.0	1.000	8793248	2.47		98.8	1482	
513.00 > 169.00	3.465	3.465	0.0	1.000	586842		14.98(7.12-21.35)		451	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.613	3.613	0.0	1.000	3539081	2.66		106	1079	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.613	3.613	0.0	1.321	3351422	2.37		94.9	4415	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.775	3.775	0.0	1.219	4828837	2.57		107	3739	
599.00 > 99.00	3.775	3.775	0.0	1.219	1037019		4.66(2.14-6.43)		2013	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.775	3.776	-0.001	1.381	2890048	2.60		104	2646	
D 30 13C2 PFUnA										
565.00 > 520.00	3.791	3.776	0.015	1.387	6900586	2.59		104	9100	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.791	3.791	0.0	1.000	6087984	2.46		98.3	957	
563.00 > 169.00	3.791	3.791	0.0	1.000	586207		10.39(5.24-15.72)		1592	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.791	3.791	0.0	1.004	2561337	2.38		95.3	3612	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.944	3.944	0.0	1.273	7413674	NC			12457	
35 MeFOSA										
512.00 > 169.00	3.944	3.944	0.0		1741912	NC			1136	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.072	4.072	0.0	1.000	7613662	2.45		98.1	1675	
613.00 > 169.00	4.072	4.072	0.0	1.000	814036		9.35(4.68-14.05)		1430	
D 36 13C2 PFDoA										
615.00 > 570.00	4.072	4.073	-0.001	1.489	7697261	2.37		94.9	11637	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.072	4.072	0.0	1.181	1089952	NC			3318	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.139	4.139	0.0		1752200	NC			701	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.311	4.311	0.0	1.391	524793	NC			1198	
699.00 > 99.00	4.311	4.311	0.0	1.391	922723		0.57(0.28-0.83)		2187	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.342	4.342	0.0	1.066	6441991	2.61		104	2369	
663.00 > 169.00	4.342	4.342	0.0	1.066	1093723		5.89(3.09-9.27)		2860	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.573	4.573	0.0	1.672	6639552	2.57		103	12521	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.573	4.573	0.0	1.000	1036636	2.42		96.7	3829	
713.00 > 219.00	4.573	4.573	0.0	1.000	674103		1.54(0.70-2.09)		2885	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.007	4.989	0.018	1.831	6561879	2.50		100	11990	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.007	5.007	0.0	1.000	5916098	NC			1923	
813.00 > 169.00	5.007	5.007	0.0	1.000	1011836		5.85(2.77-8.32)		2119	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.347	5.347	0.0	1.068	4453486	NC			1508	
913.00 > 169.00	5.347	5.347	0.0	1.068	816228		5.46(2.55-7.64)		2517	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL5_00009 Amount Added: 1.00 Units: mL

Report Date: 20-Sep-2018 09:07:01 Chrom Revision: 2.3 18-Sep-2018 21:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_054.d

Injection Date: 18-Sep-2018 00:25:07 Instrument ID: A9

Lims ID: CCV L5

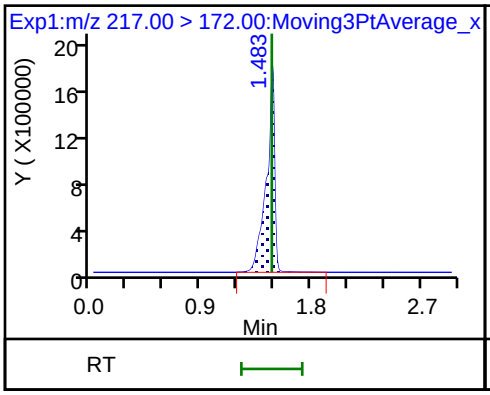
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 40 Worklist Smp#: 4

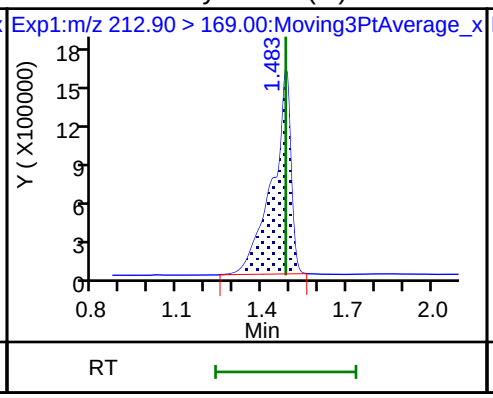
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

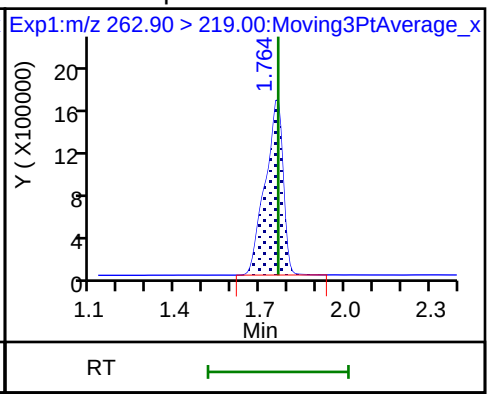
D 1 13C4 PFBA



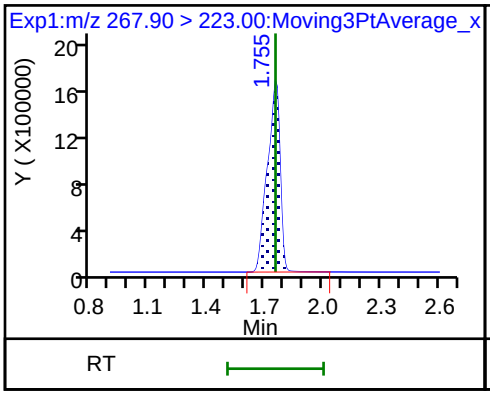
2 Perfluorobutyric acid (M)



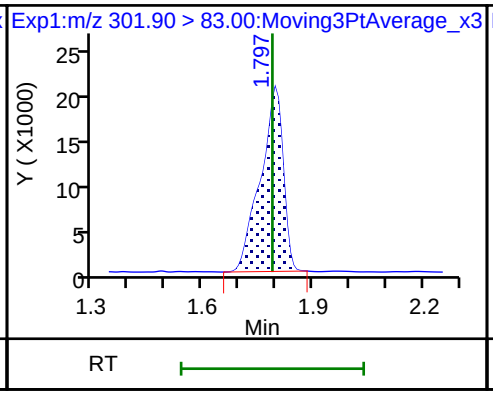
4 Perfluoropentanoic acid



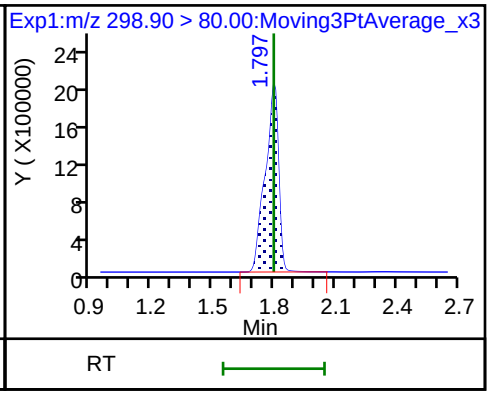
D 3 13C5-PFPeA



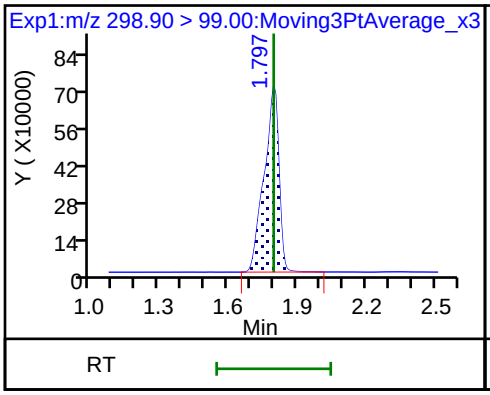
D 47 13C3-PFBS



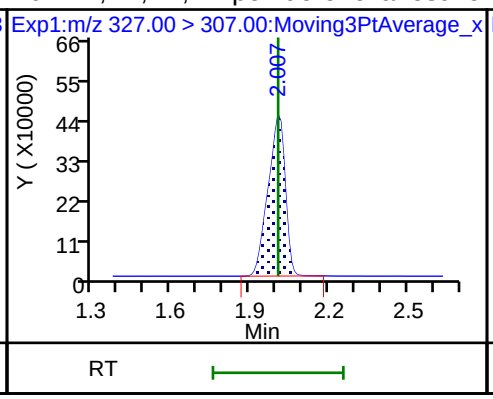
5 Perfluorobutanesulfonic acid



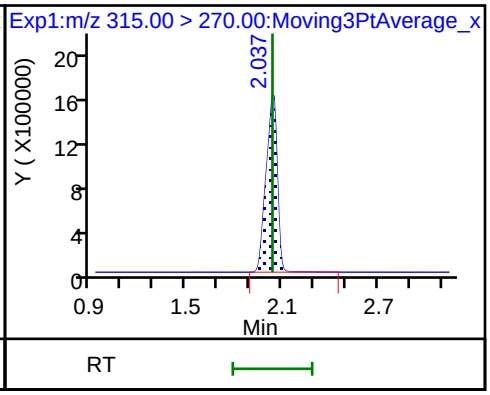
5 Perfluorobutanesulfonic acid



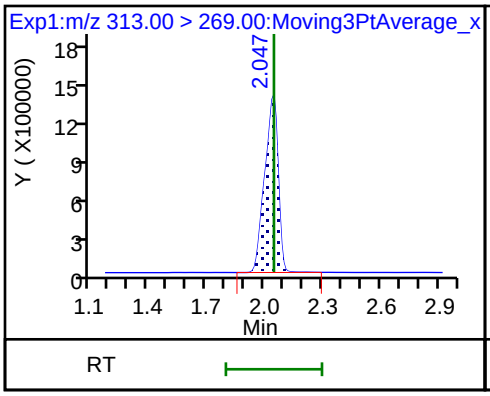
61 1H,1H,2H,2H-perfluorohexanesulfon



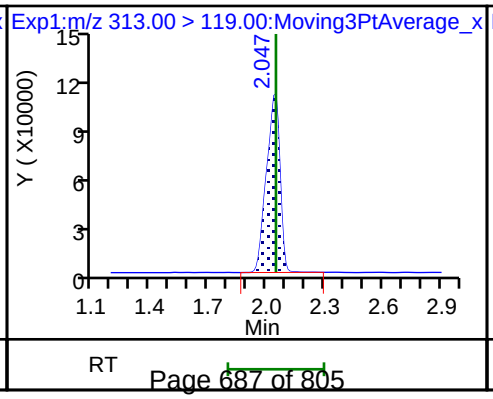
D 7 13C2 PFHxA



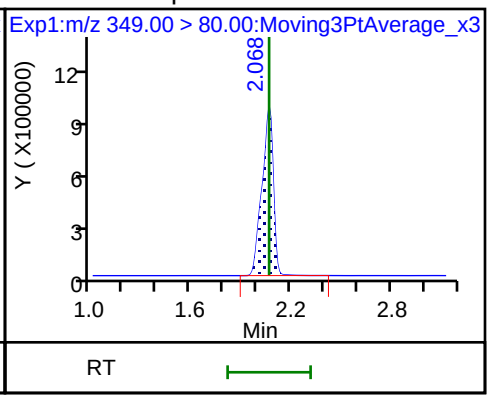
6 Perfluorohexanoic acid



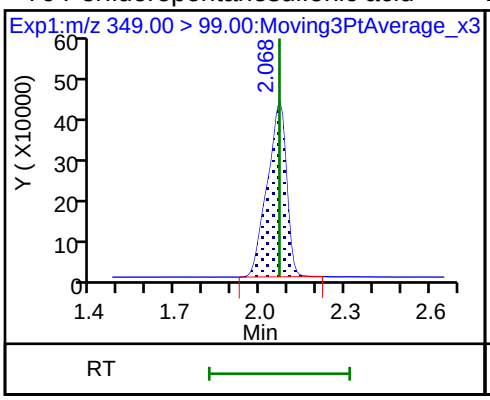
6 Perfluorohexanoic acid



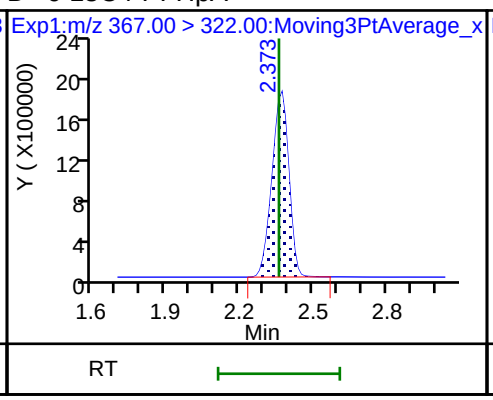
70 Perfluoropentanesulfonic acid



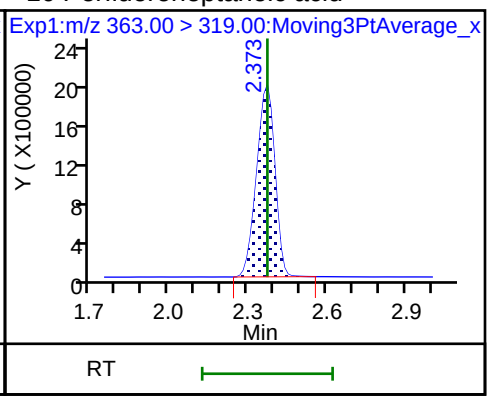
70 Perfluoropentanesulfonic acid



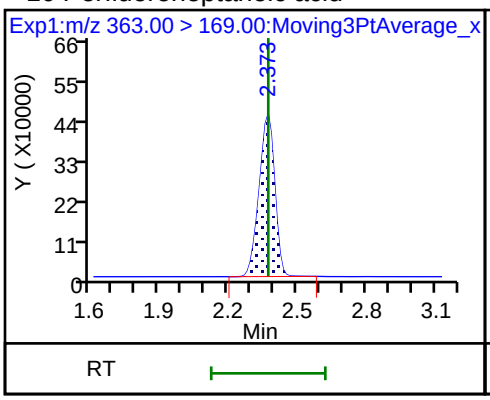
D 9 13C4-PFHpA



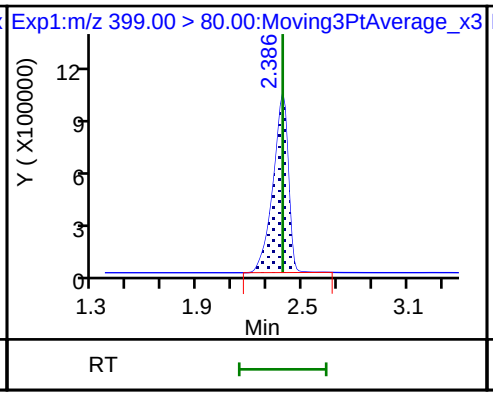
10 Perfluoroheptanoic acid



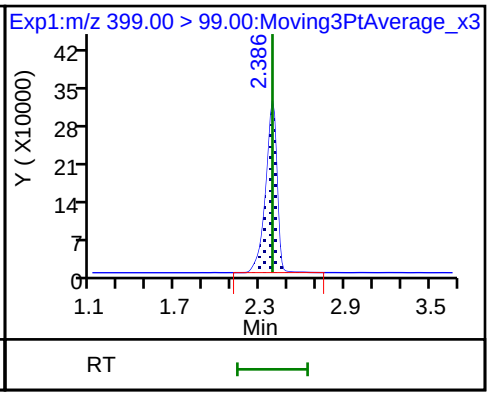
10 Perfluoroheptanoic acid



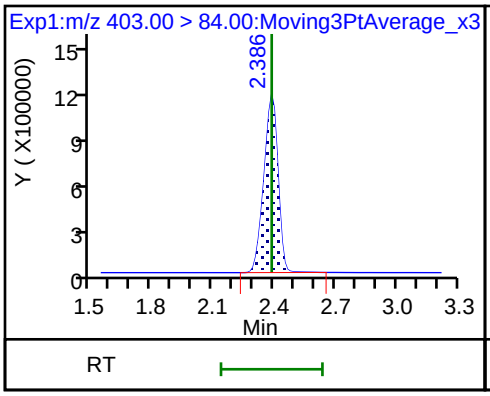
8 Perfluorohexanesulfonic acid



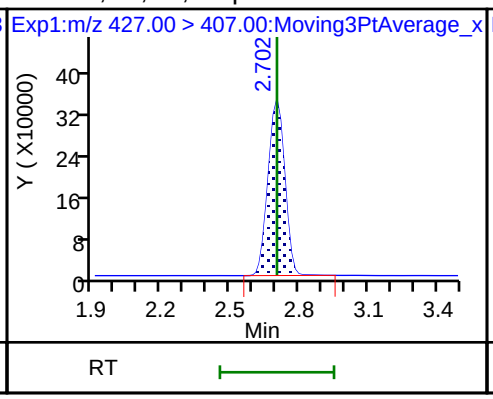
8 Perfluorohexanesulfonic acid



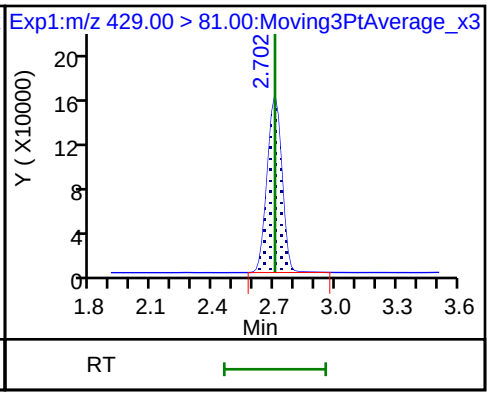
D 11 18O2 PFHxS



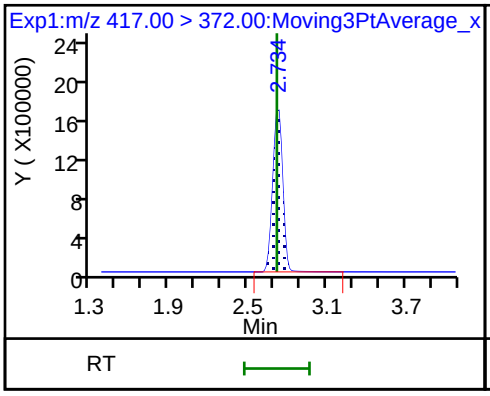
13 1H,1H,2H,2H-perfluorooctanesulfon



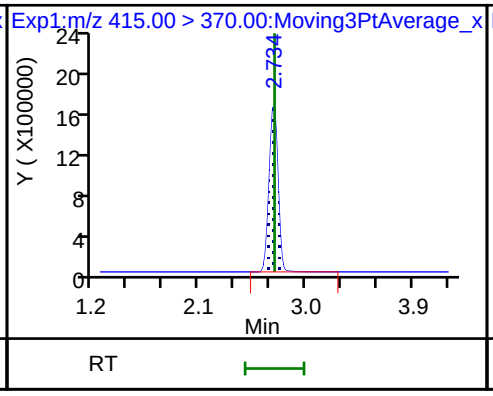
D 12 M2-6:2FTS



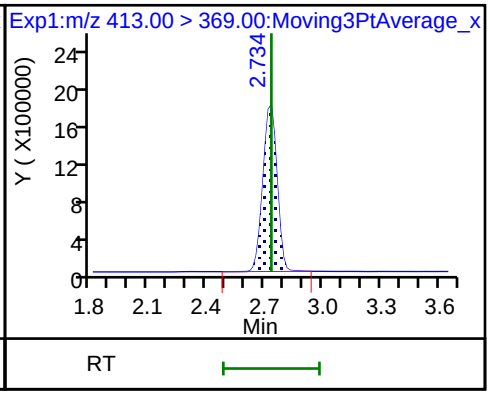
D 14 13C4 PFOA



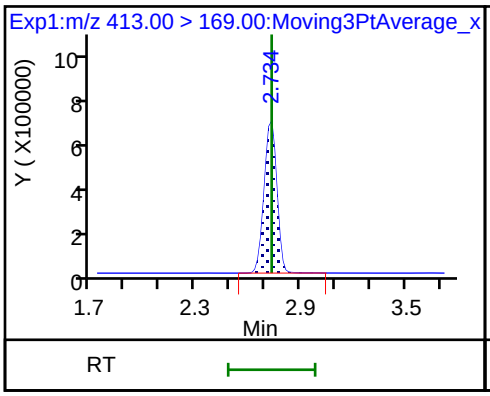
* 62 13C2-PFOA



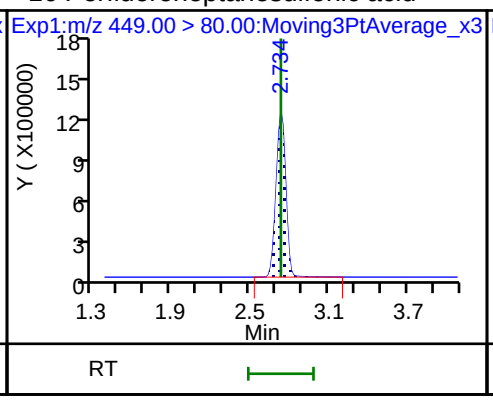
15 Perfluorooctanoic acid



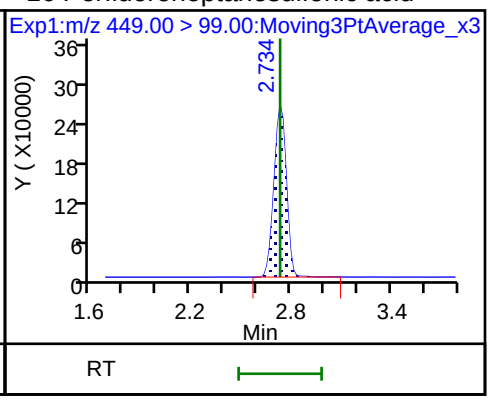
15 Perfluorooctanoic acid



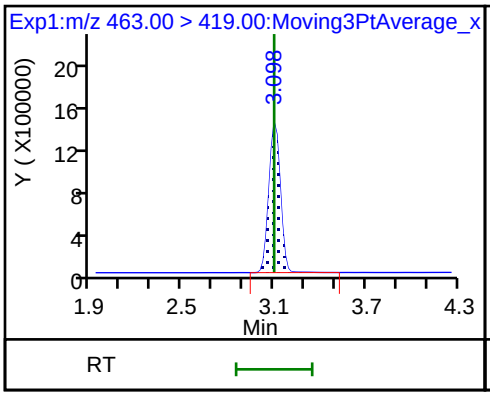
16 Perfluoroheptanesulfonic acid



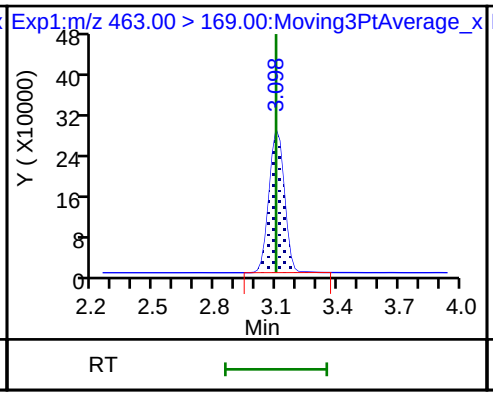
16 Perfluoroheptanesulfonic acid



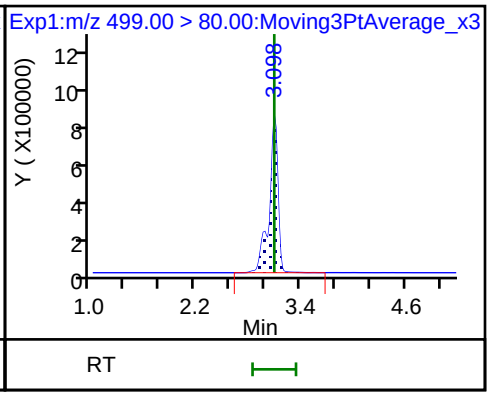
20 Perfluorononanoic acid



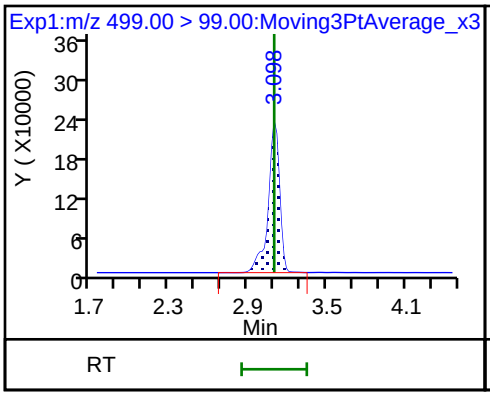
20 Perfluorononanoic acid



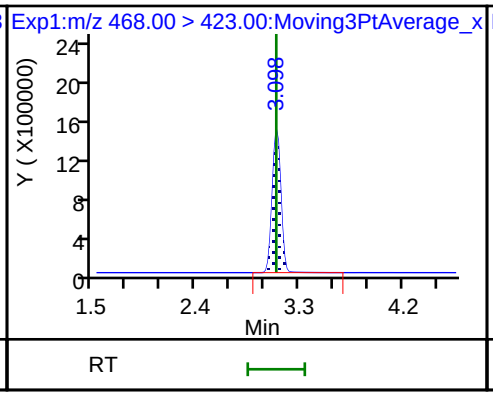
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



D 19 13C5 PFNA



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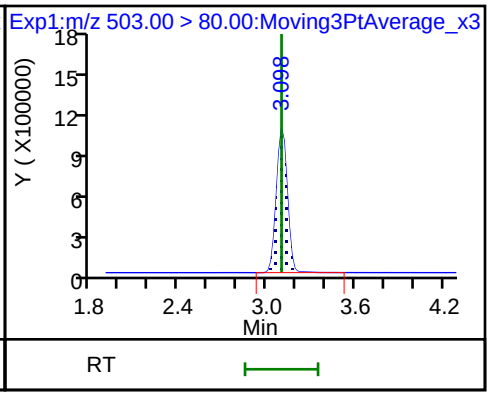
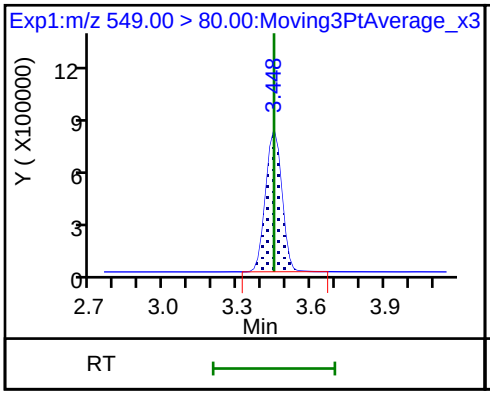
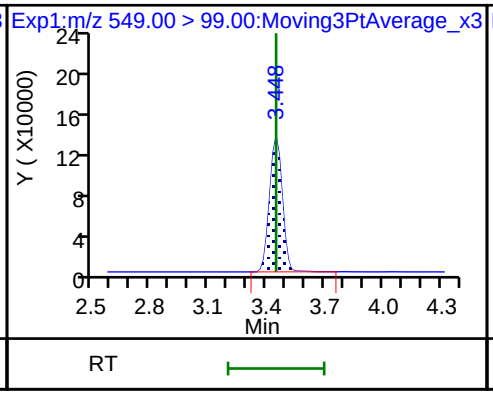


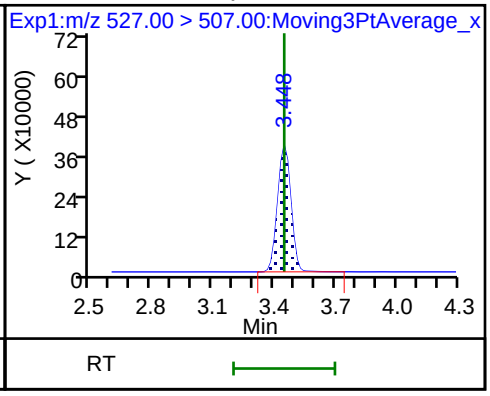
68 Perfluorononanesulfonic acid



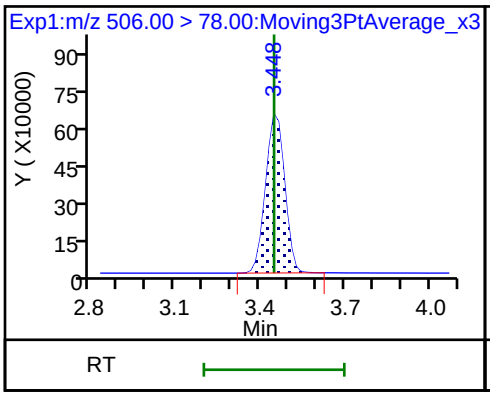
68 Perfluorononanesulfonic acid



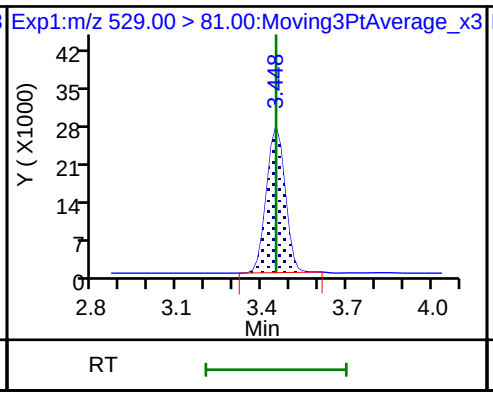
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 21 13C8 FOSA



D 26 M2-8:2FTS



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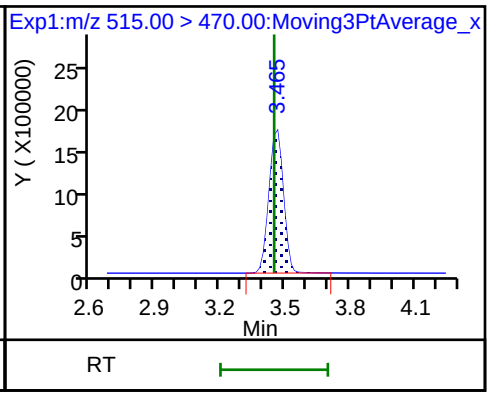
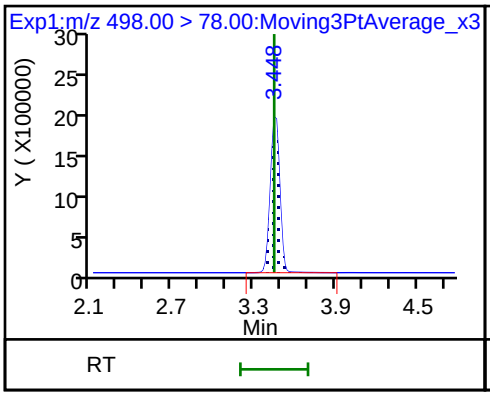
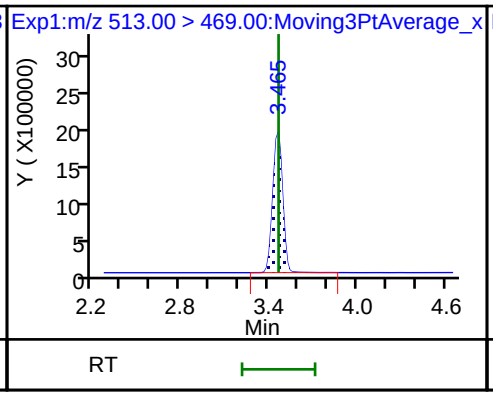


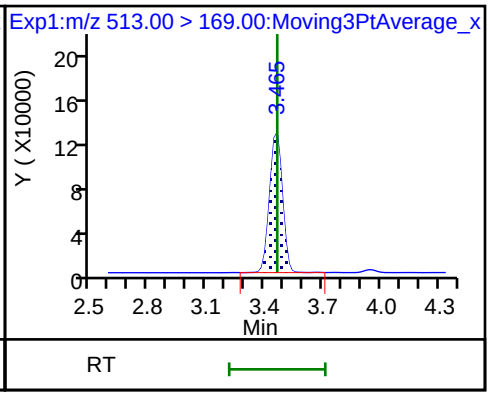
22 Perfluorooctane Sulfonamide



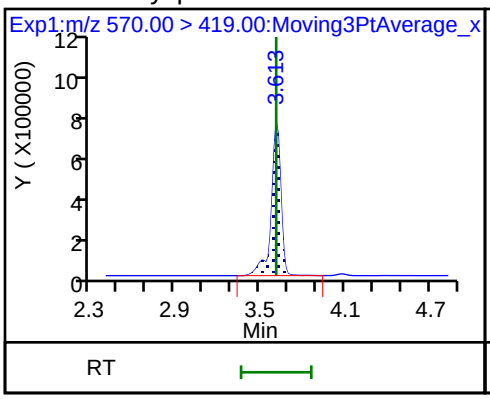
24 Perfluorodecanoic acid



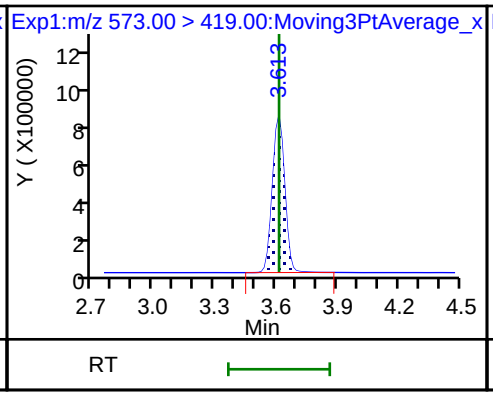
24 Perfluorodecanoic acid



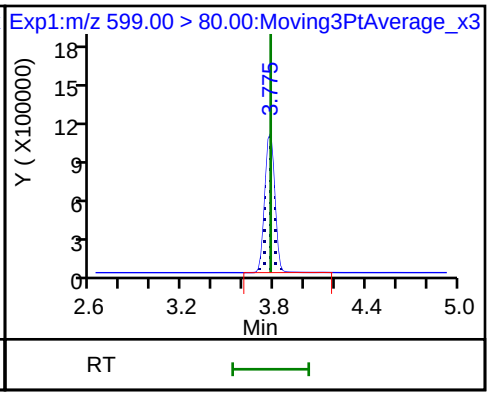
28 N-methyl perfluorooctane sulfonami



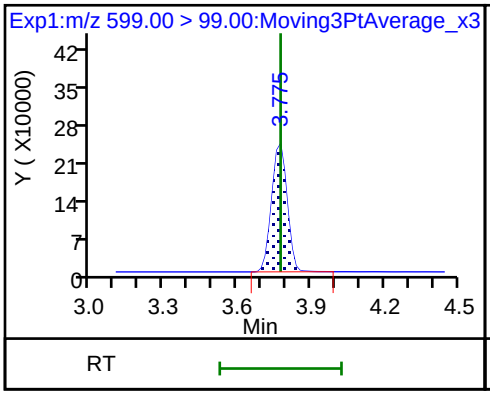
D 27 d3-NMeFOSAA



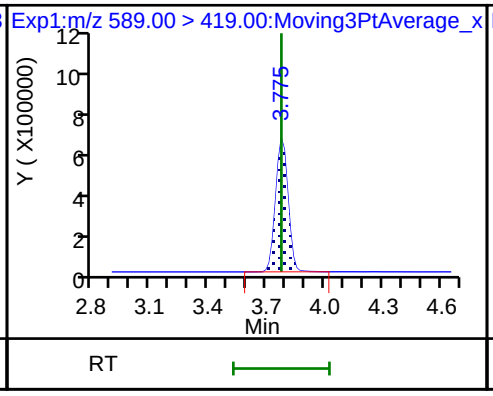
29 Perfluorodecane Sulfonic acid



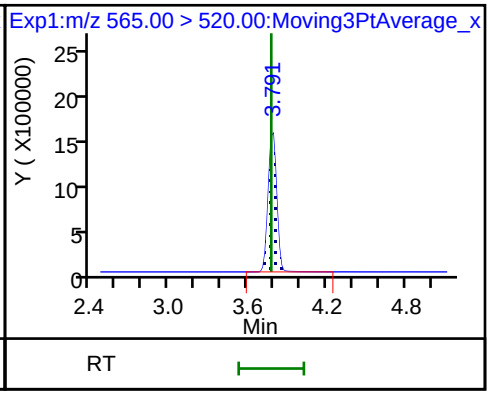
29 Perfluorodecane Sulfonic acid



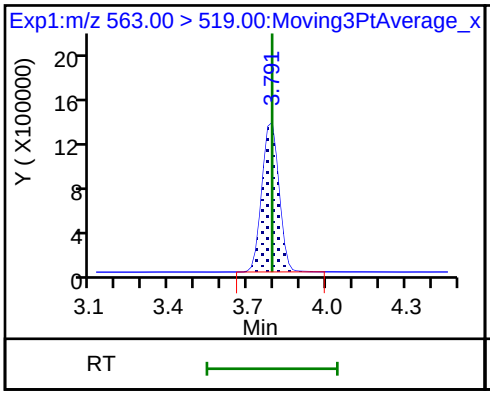
D 32 d5-NEtFOSAA



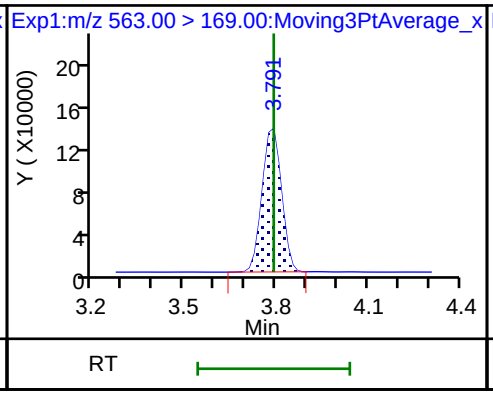
D 30 13C2 PFUnA



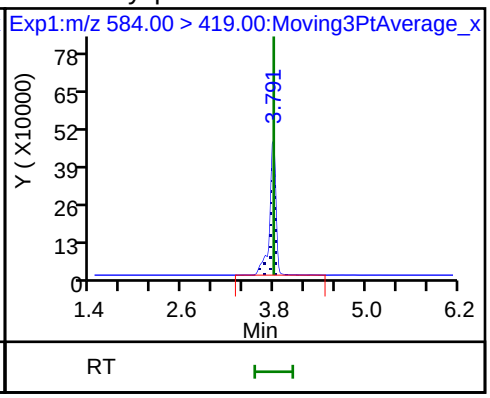
31 Perfluoroundecanoic acid



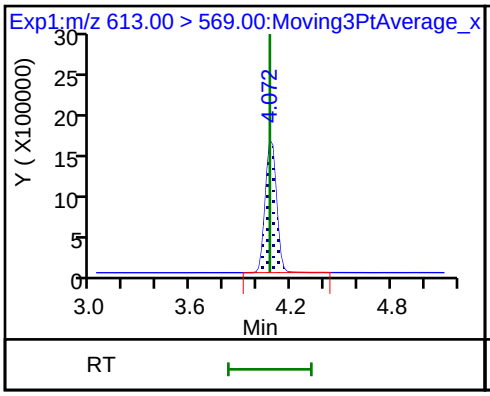
31 Perfluoroundecanoic acid



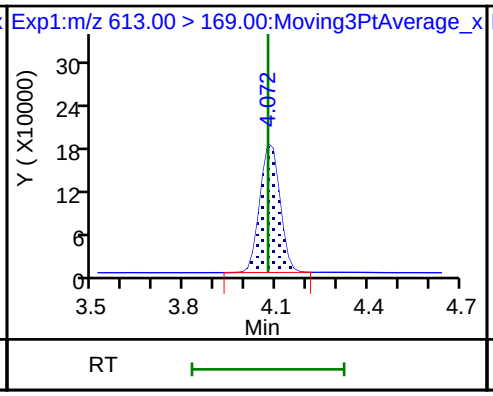
33 N-ethyl perfluorooctane sulfonamid



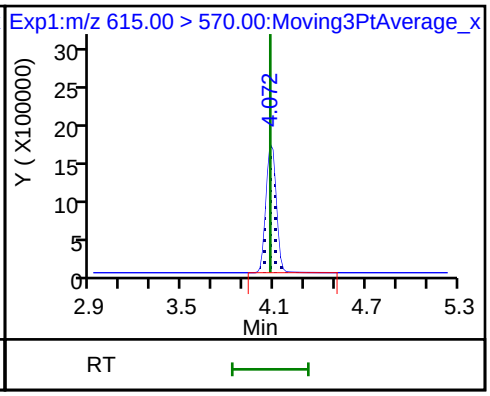
37 Perfluorododecanoic acid



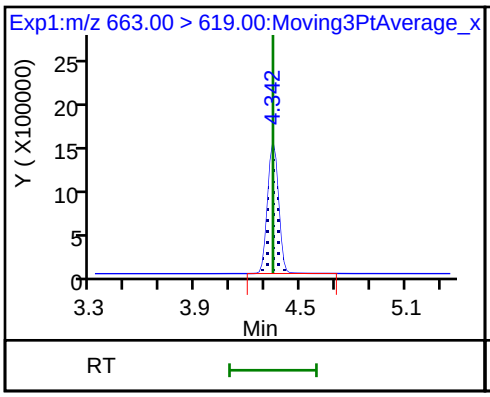
37 Perfluorododecanoic acid



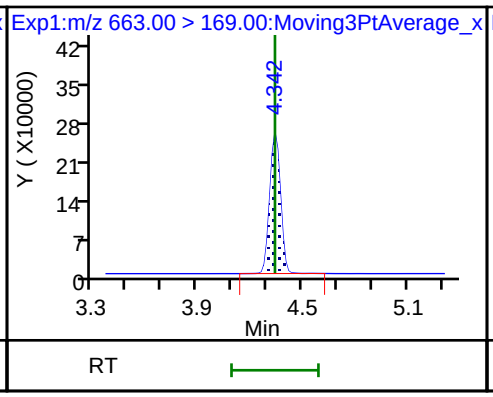
D 36 13C2 PFDoA



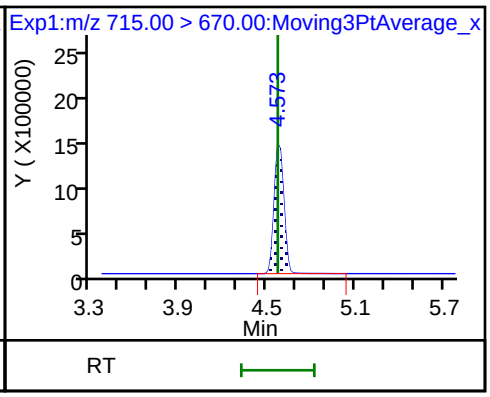
41 Perfluorotridecanoic acid



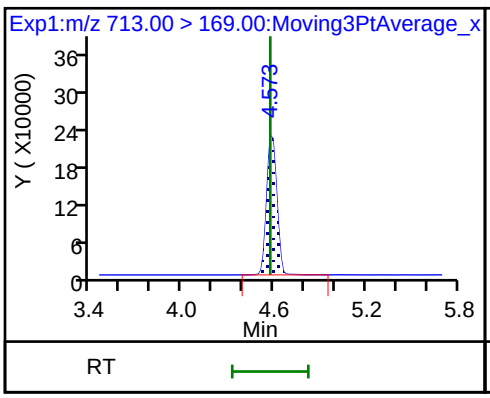
41 Perfluorotridecanoic acid



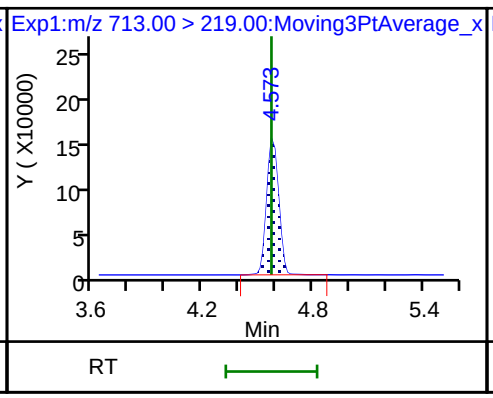
D 43 13C2-PFTeDA



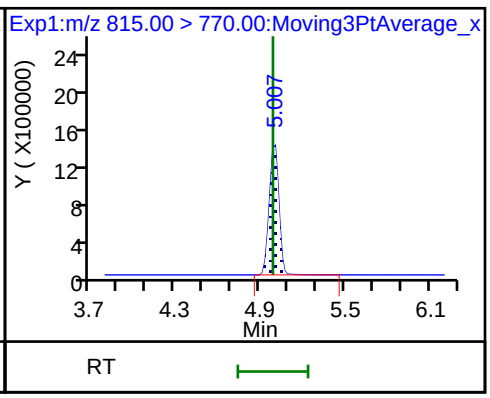
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

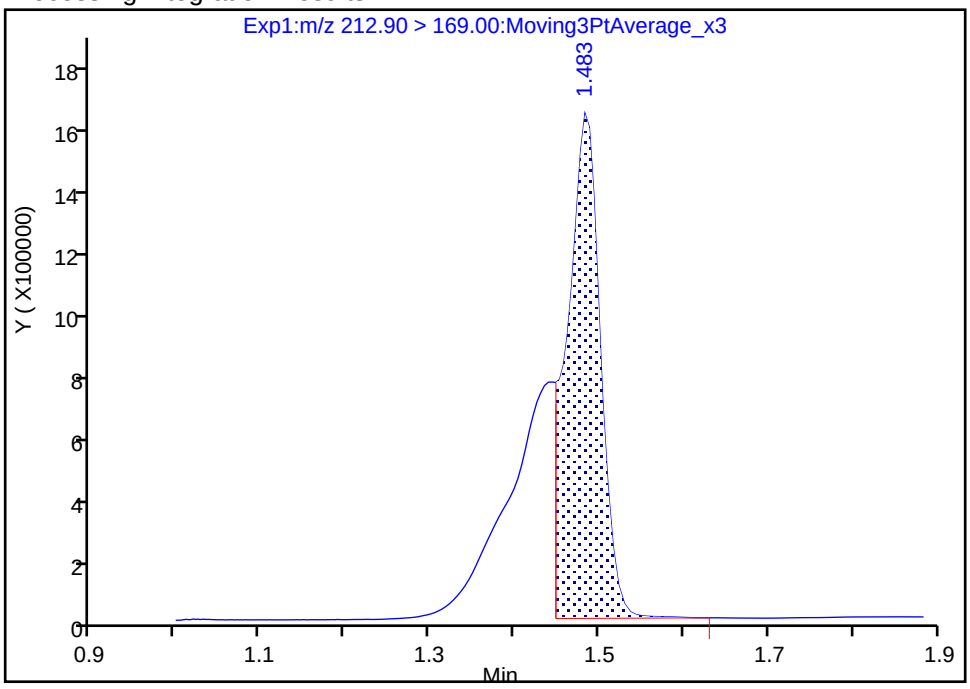
Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_054.d
Injection Date: 18-Sep-2018 00:25:07 Instrument ID: A9
Lims ID: CCV L5
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 40 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

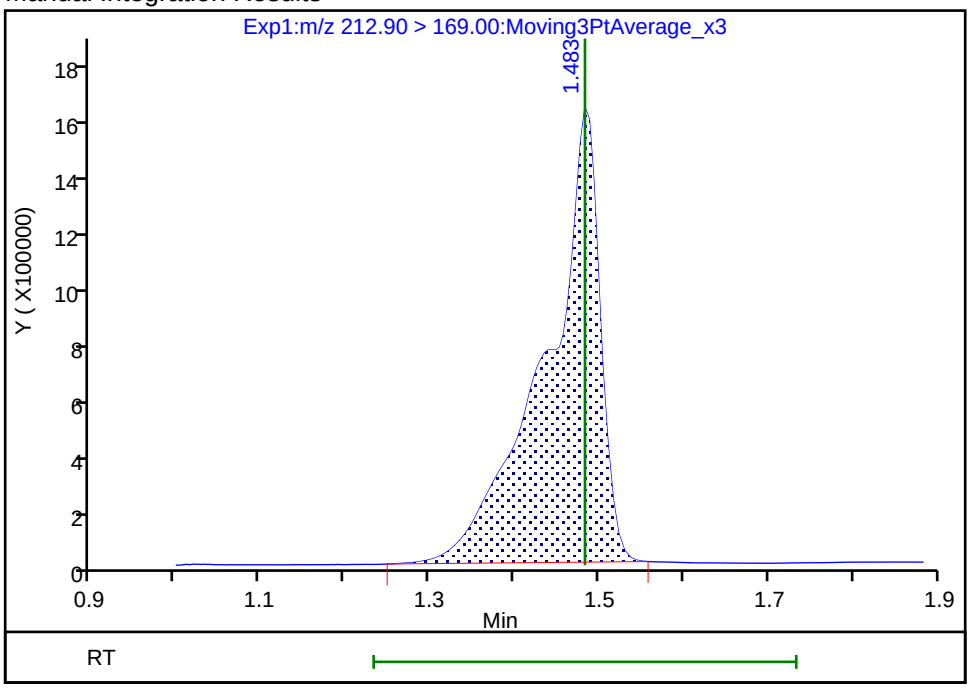
Processing Integration Results

RT: 1.48
Area: 4325713
Amount: 1.520800
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 7192279
Amount: 2.528605
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:06:41
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-245574/1-A

Matrix: Water | Lab File ID: 2018.09.16_LLA_013.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 09/12/2018 08:12

Sample wt/vol: 250.00(mL) | Date Analyzed: 09/16/2018 15:01

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | 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 M	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 M	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 M	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	U M	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 M	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.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-245574/1-A

Matrix: Water Lab File ID: 2018.09.16_LLA_013.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 09/12/2018 08:12

Sample wt/vol: 250.00(mL) Date Analyzed: 09/16/2018 15:01

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	88		50-150
STL00992	13C4 PFBA	84		50-150
STL01893	13C5 PFPeA	87		50-150
STL00993	13C2 PFHxA	87		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	96		50-150
STL00995	13C5 PFNA	89		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	97		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	88		50-150
STL02337	13C3-PFBS	86	M	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Lims ID: MB 320-245574/1-A
Client ID:
Sample Type: MB
Inject. Date: 16-Sep-2018 15:01:26 ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-245574/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 15:56:41 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 15:56:41

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	1.499	1.494	0.005	1.004	7707	0.003073			2.1	
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.494	0.0	0.540	6868446	2.11		84.2	14321	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.772	0.0	0.641	6305278	2.17		86.7	7279	
D 47 13C3-PFBS										M
301.90 > 83.00	1.814	1.814	0.0	0.656	75959	1.99		85.6	453	M
D 7 13C2 PFHxA										
315.00 > 270.00	2.068	2.068	0.0	0.748	6696380	2.18		87.1	7312	
6 Perfluorohexanoic acid										RM
313.00 > 269.00	2.058	2.068	-0.010	0.995	5107	0.002094			1.1	R
313.00 > 119.00	2.068	2.068	0.0	1.000	165		30.95(6.96-20.87)		0.7	M
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.171	2.170	0.001	0.785	779917	NC			1833	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.399	0.001	0.867	8627337	2.35		94.1	8376	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	19929	0.007375			28.2	
399.00 > 99.00	2.413	2.413	0.0	1.000	6772		2.94(1.90-5.70)		8.2	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.426	-0.013	0.872	5164547	2.29		96.8	8813	
D 12 M2-6:2FTS										
429.00 > 81.00	2.751	2.750	0.001	0.994	852486	2.37		99.6	1627	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.750	-0.015	0.994	530954	0.6912			304	
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.766	0.001	1.000	8204218	2.40		96.1	8155	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 73 13C8 PFOA										
421.00 > 376.00	2.767	2.766	0.001		10673	NC			74.0	
* 62 13C2-PFOA										
415.00 > 370.00	2.767	2.766	0.001		8471882	2.50			10653	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.767	2.766	0.001	1.000	20950	0.005932			1.0	M
413.00 > 169.00	2.767	2.766	0.001	1.000	6540		3.20(1.36-4.08)		8.9	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0	1.140	7105507	2.22		88.9	8990	
D 18 13C4 PFOS										
503.00 > 80.00	3.153	3.153	0.0	1.140	5083814	2.10		87.8	3526	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.153	3.153	0.0	1.000	61180	0.0273			53.0	M
499.00 > 99.00	3.153	3.153	0.0	1.000	13860		4.41(2.04-6.12)		54.4	
20 Perfluorononanoic acid										RM
463.00 > 419.00	3.153	3.153	0.0	1.000	797	0.000287			0.2	RM
463.00 > 169.00	3.153	3.153	0.0	1.000	2453		0.32(2.68-8.03)		4.0	M
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.465	0.0	1.253	2809493	2.19		87.7	3449	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.465	3.465	0.0	1.000	6824	0.002049			15.3	
25 1H,1H,2H,2H-perfluorodecanesulfoni										M
527.00 > 507.00	3.512	3.496	0.016	1.005	1519	0.002449			6.9	M
D 23 13C2 PFDA										
515.00 > 470.00	3.512	3.512	0.0	1.270	6851660	2.15		85.8	4889	
D 26 M2-8:2FTS										
529.00 > 81.00	3.496	3.512	-0.016	1.264	98128	1.85		77.3	467	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.669	3.669	0.0	1.326	3104691	2.16		86.3	4216	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.669	3.669	0.0	1.000	13832	0.0112			4.8	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.839	3.839	0.0	1.388	2517531	2.22		88.9	2540	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.839	3.839	0.0	1.000	11535	0.0123			21.3	M
31 Perfluoroundecanoic acid										Ma
563.00 > 519.00	3.839	3.839	0.0	1.000	16365	0.007471			3.4	a
563.00 > 169.00	3.839	3.839	0.0	1.000	1179		13.88(5.24-15.72)		5.4	
D 30 13C2 PFUnA										
565.00 > 520.00	3.839	3.854	-0.015	1.388	6103871	2.25		89.8	5802	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.007	4.012	-0.005	1.271	4482	NC			17.2	
D 36 13C2 PFDoA										
615.00 > 570.00	4.139	4.139	0.0	1.496	7191791	2.17		87.0	4409	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.158	4.144	0.014	1.189	2238	NC			6.7	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
37 Perfluorododecanoic acid										RM
613.00 > 569.00	4.123	4.144	-0.021	0.996	11293	0.003895			2.3	RM
613.00 > 169.00	4.139	4.144	-0.005	1.000	2832		3.99(4.68-14.05)		7.0	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.660	4.660	0.0	1.684	5203279	1.98		79.0	11826	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.644	4.666	-0.022	0.997	1557	0.004634			7.0	
713.00 > 219.00	4.644	4.666	-0.022	0.997	1620		0.96(0.70-2.09)		6.2	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.075	5.079	-0.004	1.000	32334	NC			10.4	
813.00 > 169.00	5.075	5.079	-0.004	1.000	6103		5.30(2.77-8.32)		13.9	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.075	5.091	-0.016	1.834	3217296	1.20		48.2	4198	

QC Flag Legend

Processing Flags
- NC - Not Calibrated
- R - Failed Signal Ratio Test

Review Flags
- M - Manually Integrated
- a - User Assigned ID

Report Date: 17-Sep-2018 15:56:42 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d

Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9

Lims ID: MB 320-245574/1-A

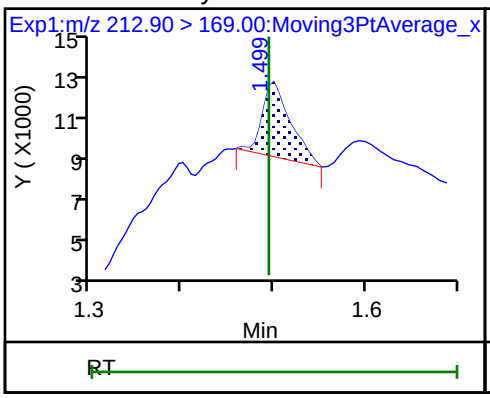
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2

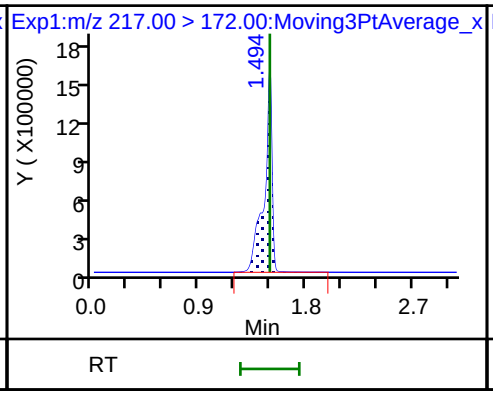
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

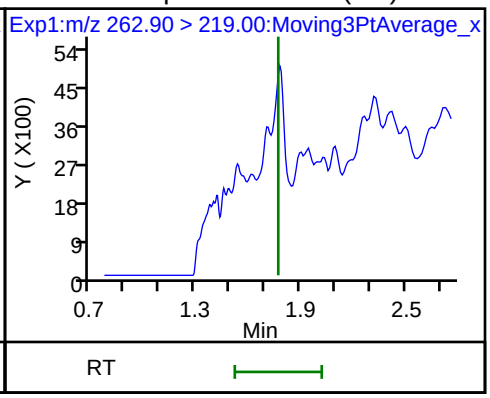
2 Perfluorobutyric acid



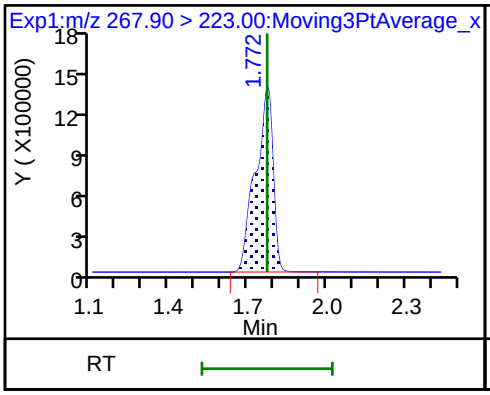
D 1 13C4 PFBA



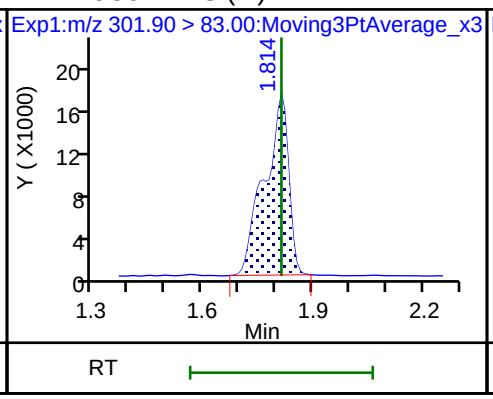
4 Perfluoropentanoic acid (ND)



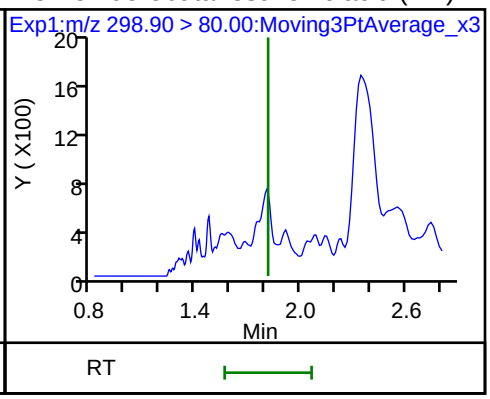
D 3 13C5-PFPeA



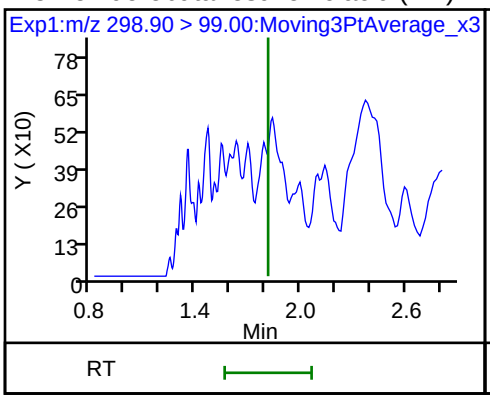
D 47 13C3-PFBS (M)



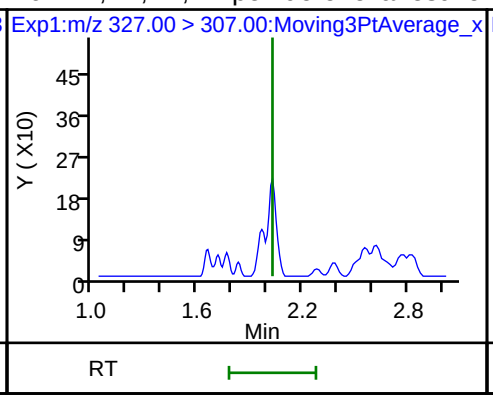
5 Perfluorobutanesulfonic acid (ND)



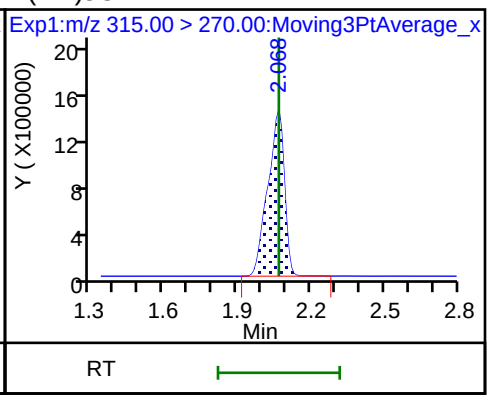
5 Perfluorobutanesulfonic acid (ND)



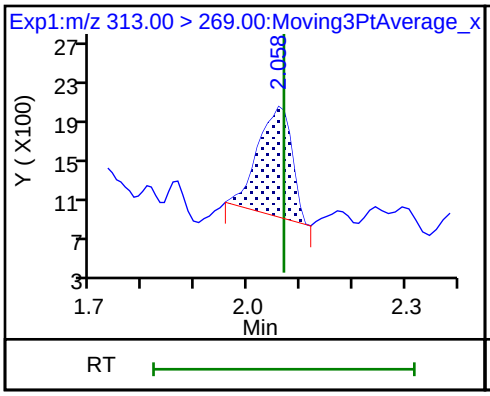
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (NTD)



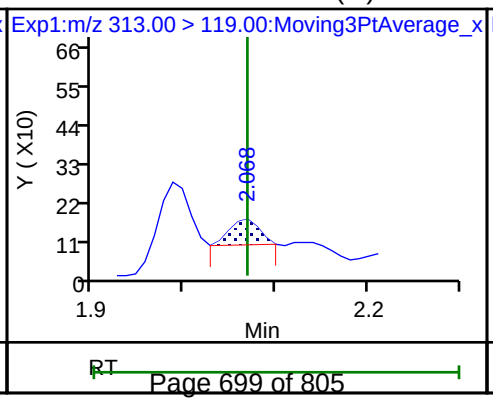
D 13C2 PFHxA



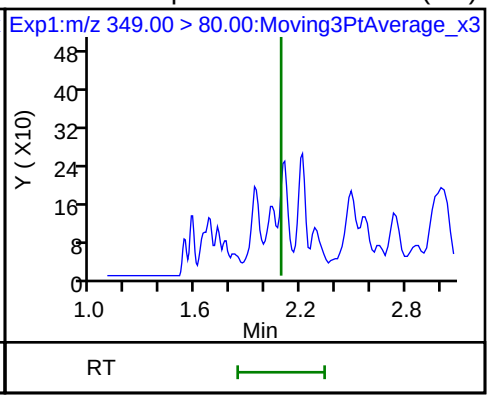
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid (M)



70 Perfluoropentanesulfonic acid (ND)



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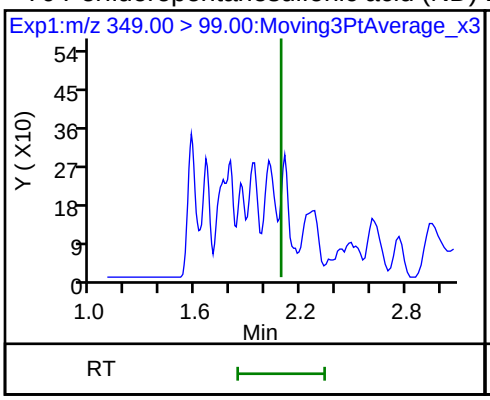

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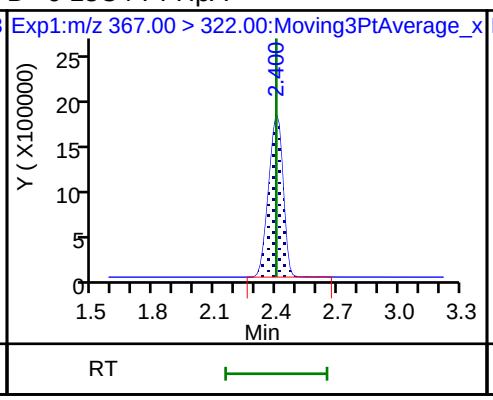
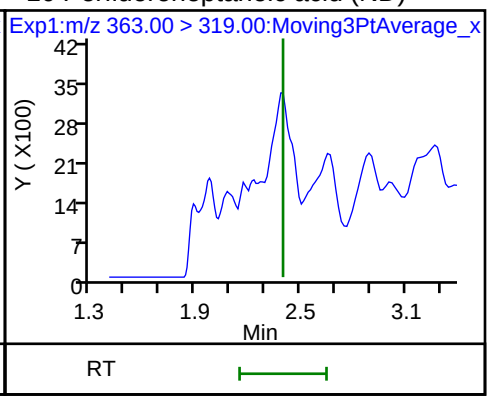
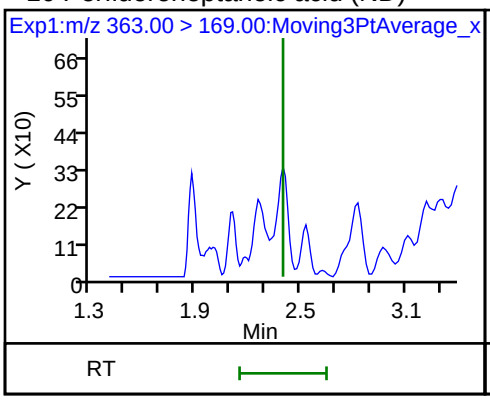


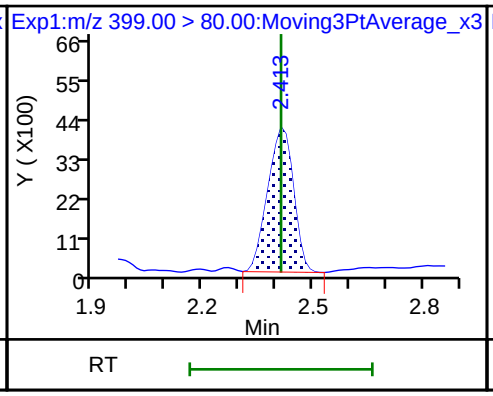
10 Perfluoroheptanoic acid (ND)



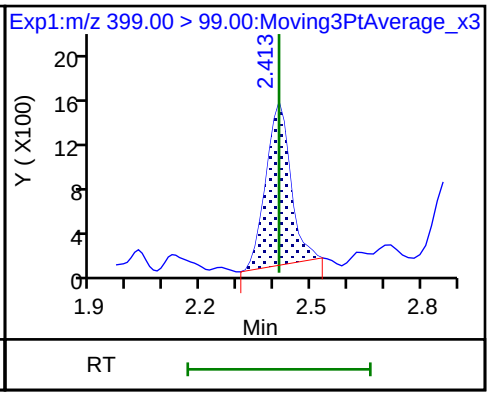
10 Perfluoroheptanoic acid (ND)



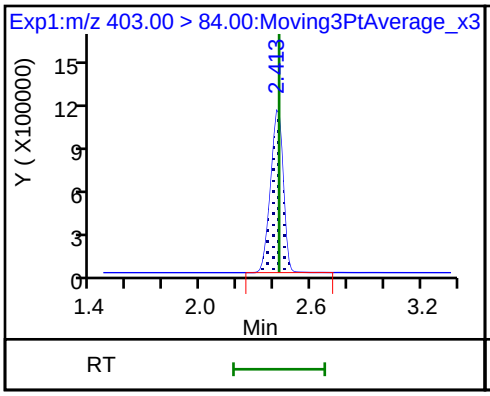
8 Perfluorohexanesulfonic acid



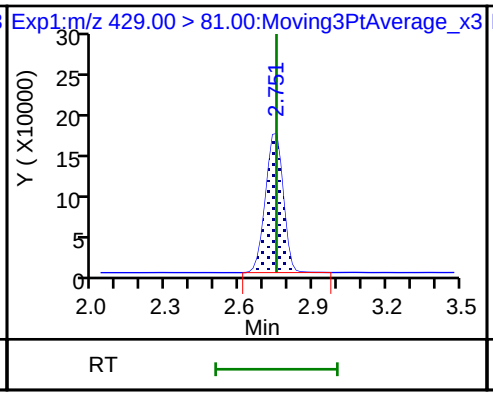
8 Perfluorohexanesulfonic acid



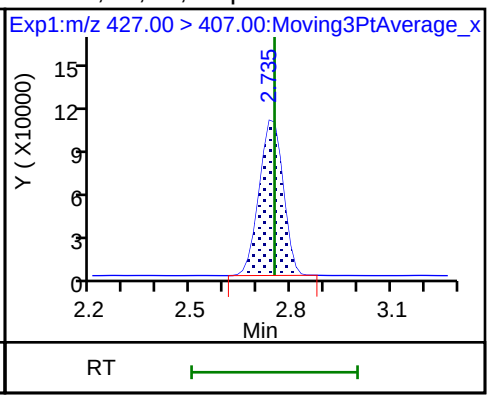
D 11 18O2 PFHxS



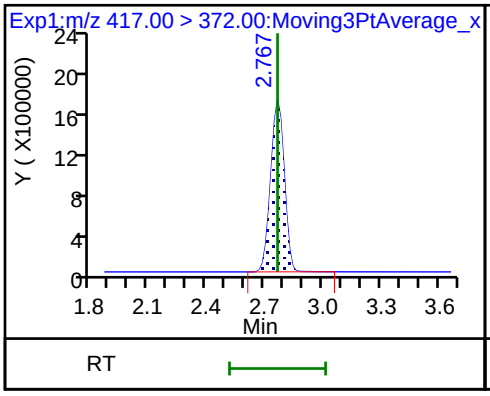
D 12 M2-6:2FTS



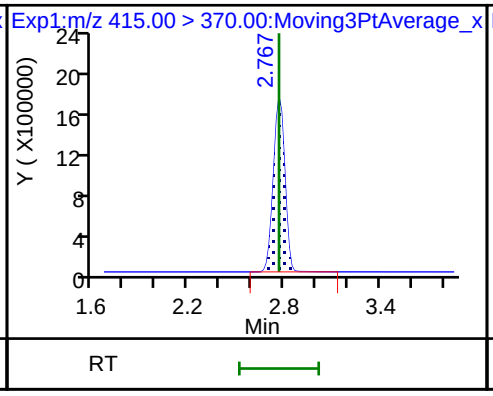
13 1H,1H,2H,2H-perfluorooctanesulfoni



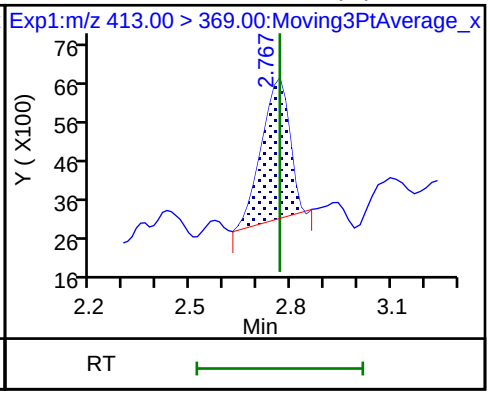
D 14 13C4 PFOA



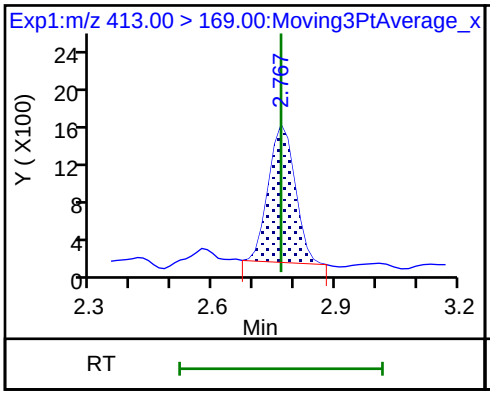
* 62 13C2-PFOA



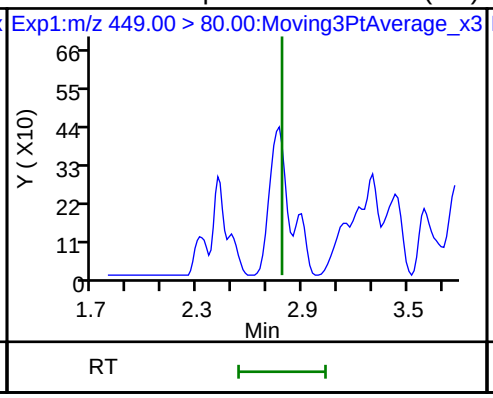
15 Perfluorooctanoic acid (M)



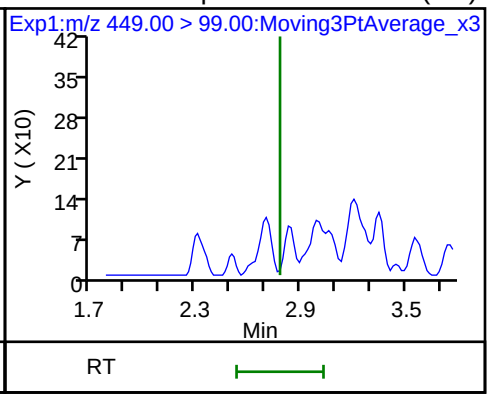
15 Perfluorooctanoic acid



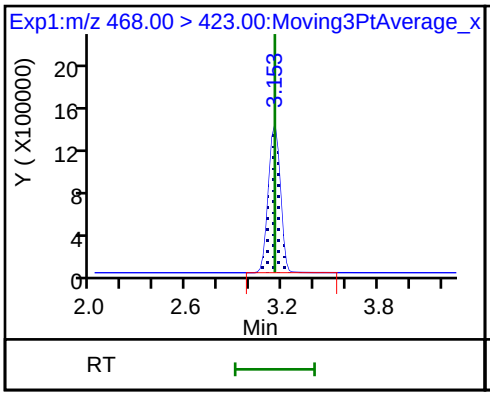
16 Perfluoroheptanesulfonic acid (ND)



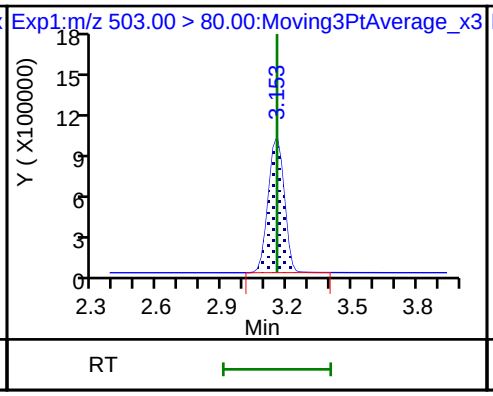
16 Perfluoroheptanesulfonic acid (ND)



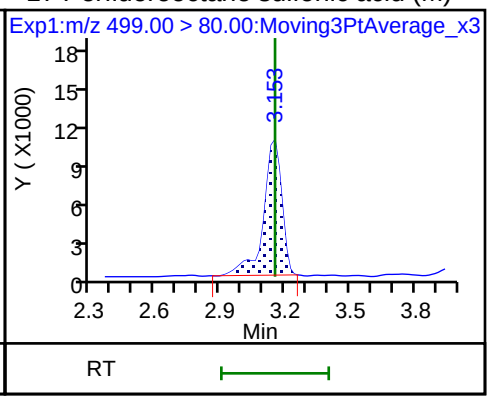
D 19 13C5 PFNA



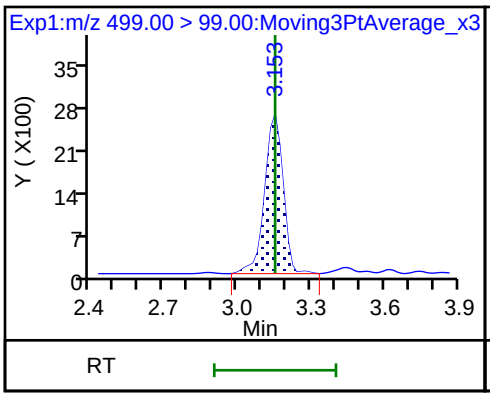
D 18 13C4 PFOS



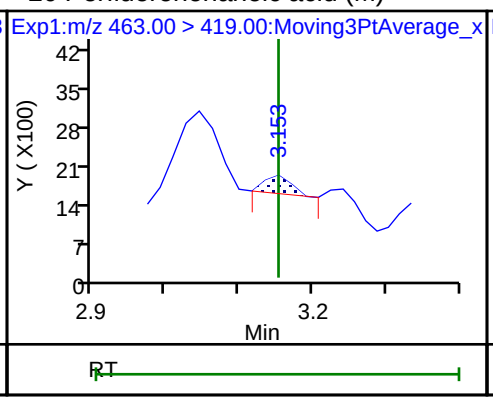
17 Perfluorooctane sulfonic acid (M)



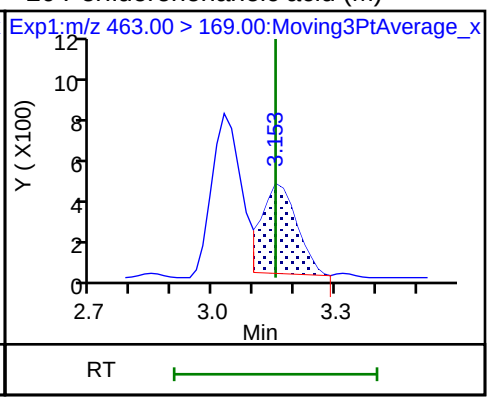
17 Perfluorooctane sulfonic acid



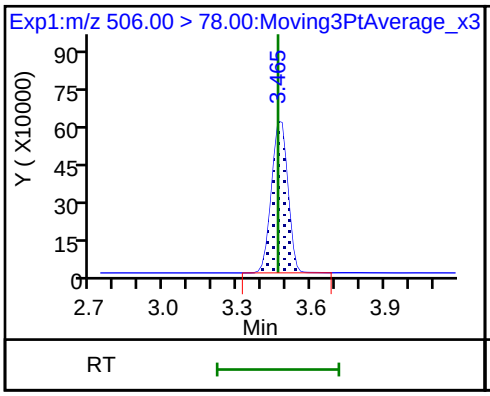
20 Perfluorononanoic acid (M)



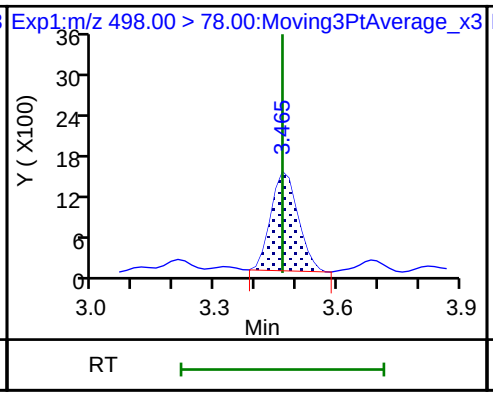
20 Perfluorononanoic acid (M)



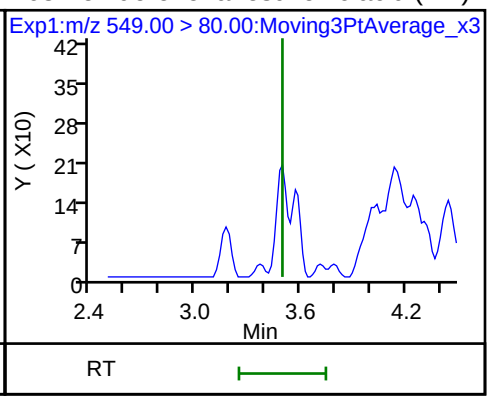
D 21 13C8 FOSA



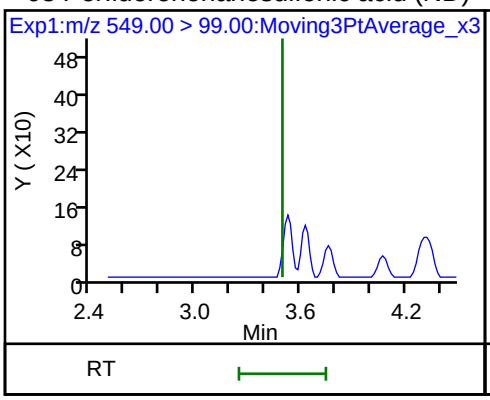
22 Perfluorooctane Sulfonamide



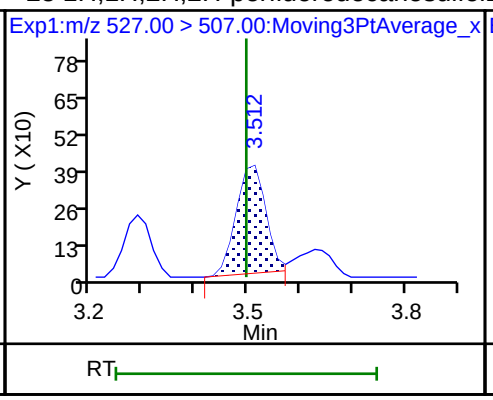
68 Perfluorononanesulfonic acid (ND)



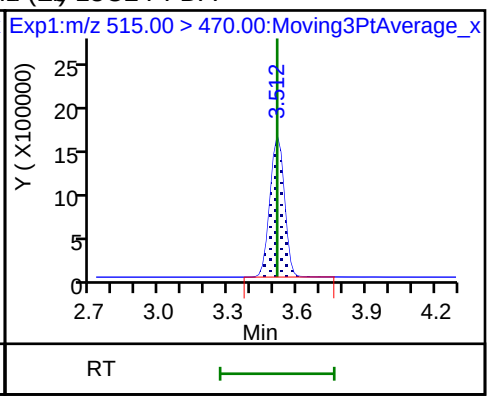
68 Perfluorononanesulfonic acid (ND)



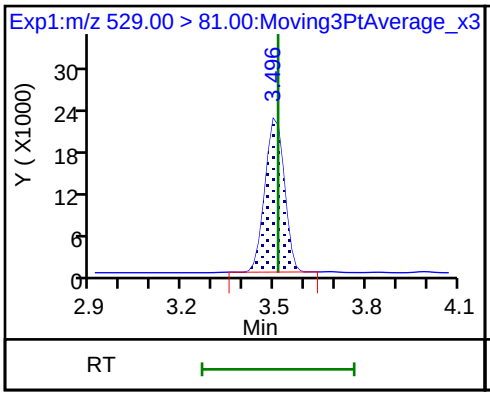
25 1H,1H,2H,2H-perfluorodecanesulfonic (M2)



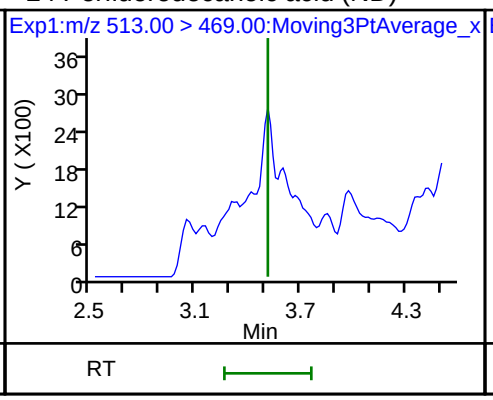
D 23 13C2 PFDA



D 26 M2-8:2FTS



24 Perfluorodecanoic acid (ND)



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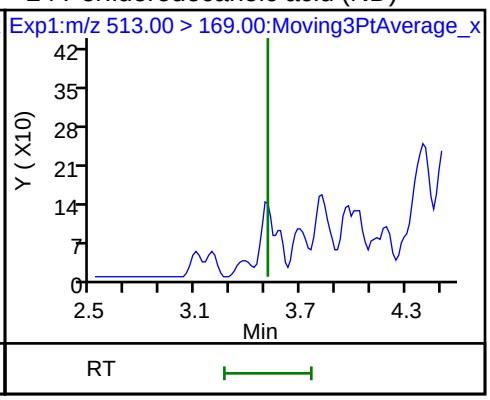
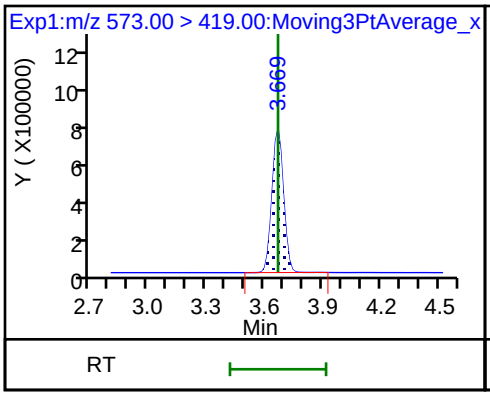
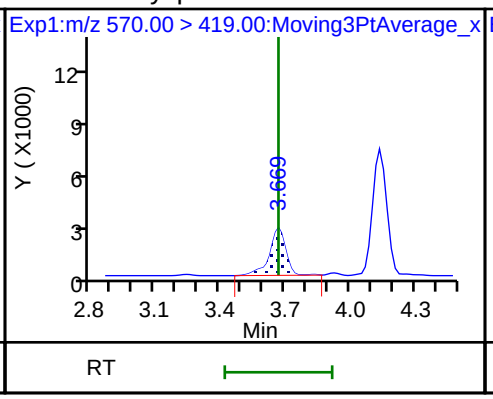


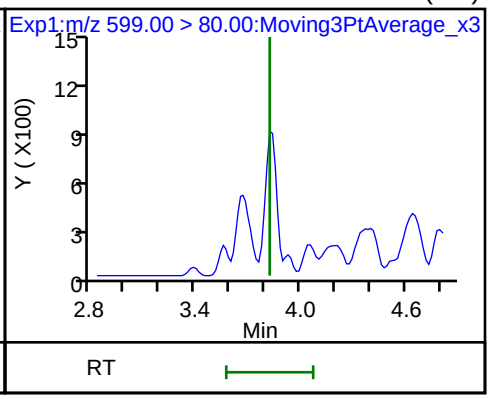
D 27 d3-NMeFOSAA



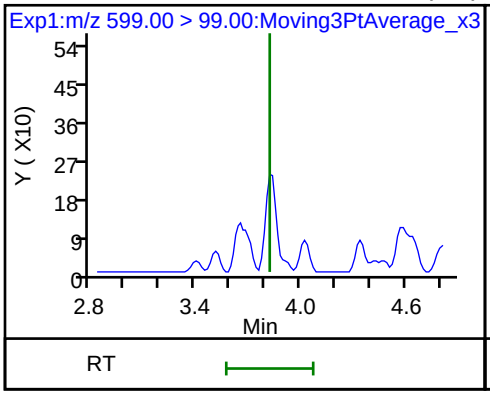
28 N-methyl perfluorooctane sulfonami



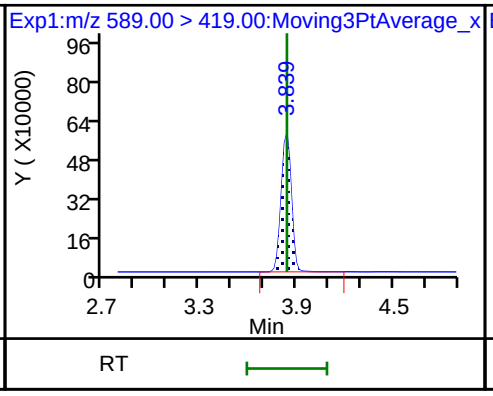
29 Perfluorodecane Sulfonic acid (ND)



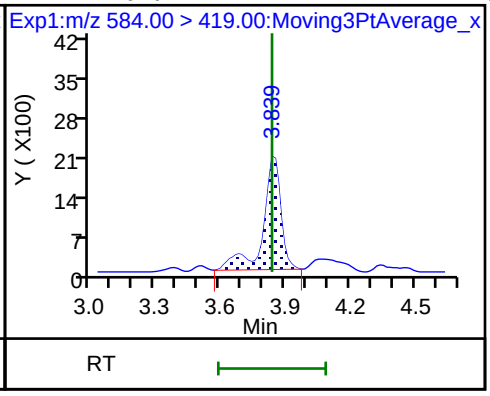
29 Perfluorodecane Sulfonic acid (ND)



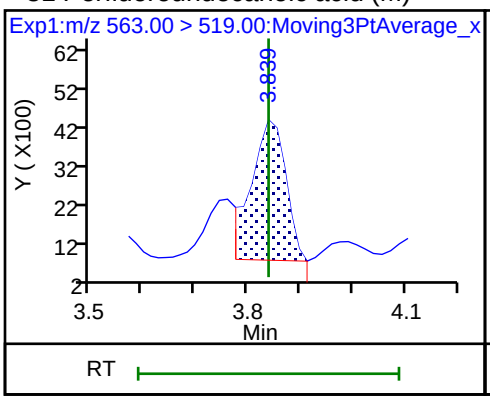
D 32 d5-NEtFOSAA



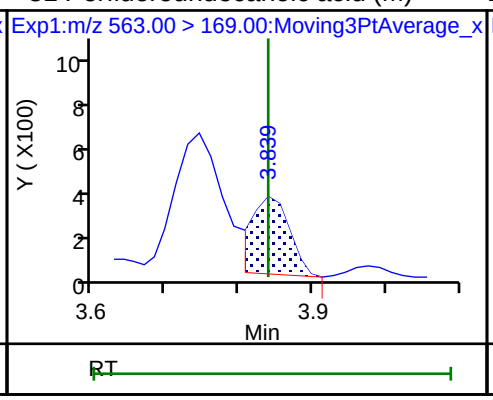
33 N-ethyl perfluorooctane sulfonamid (M)



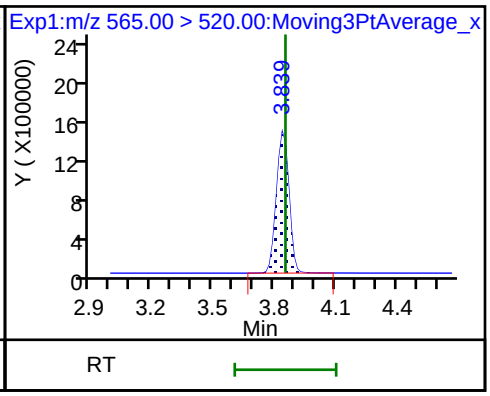
31 Perfluoroundecanoic acid (M)



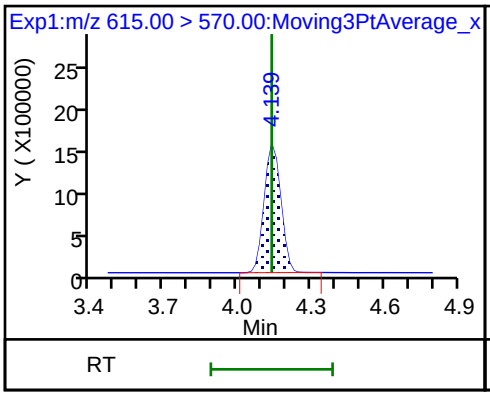
31 Perfluoroundecanoic acid (M)



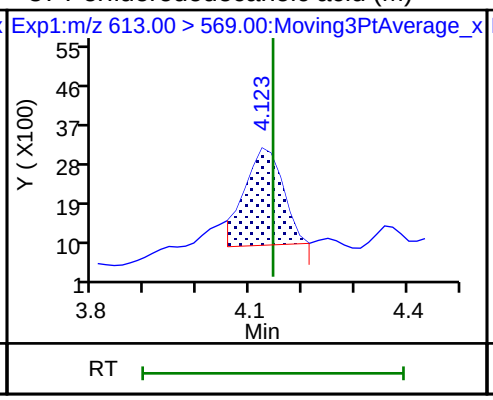
D 30 13C2 PFUnA



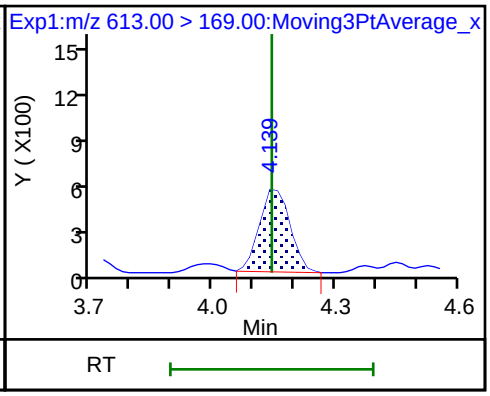
D 36 13C2 PFDoA



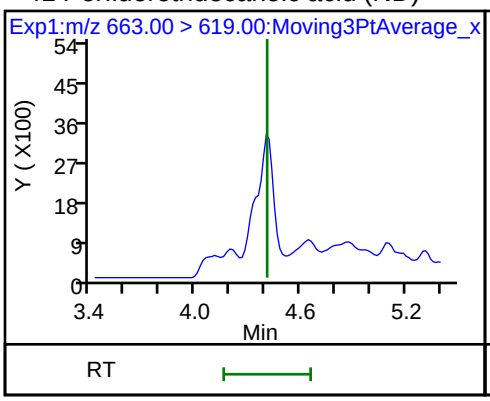
37 Perfluorododecanoic acid (M)



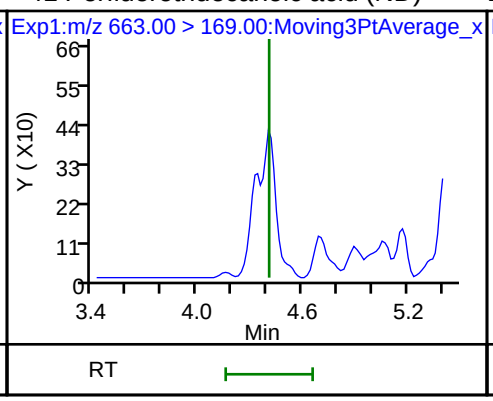
37 Perfluorododecanoic acid



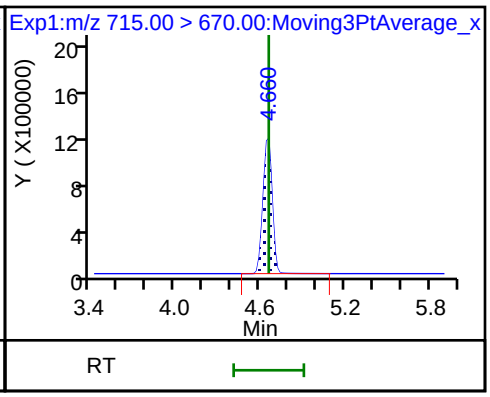
41 Perfluorotridecanoic acid (ND)



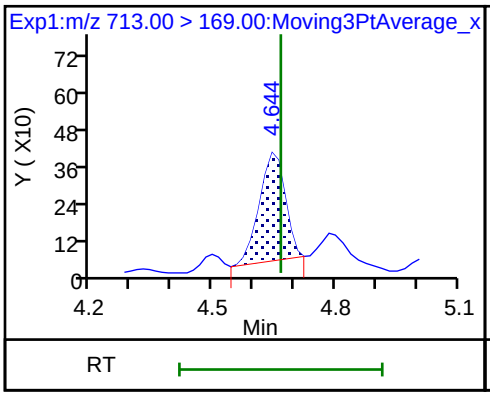
41 Perfluorotridecanoic acid (ND)



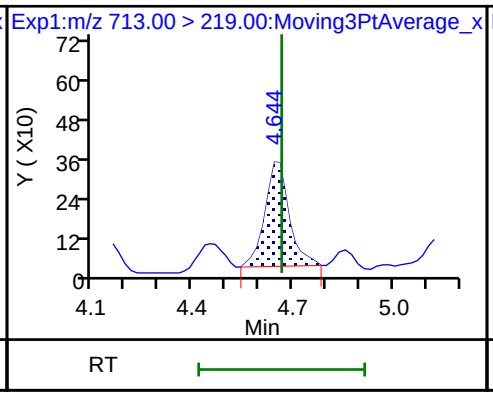
D 43 13C2-PFTeDA



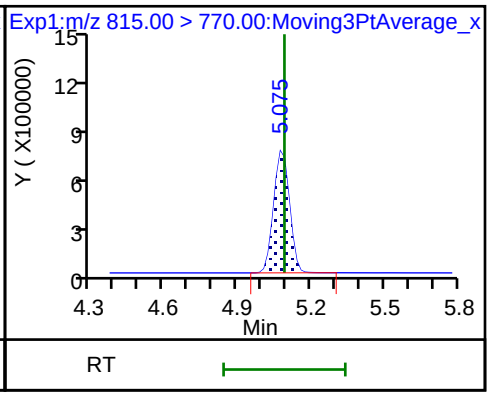
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

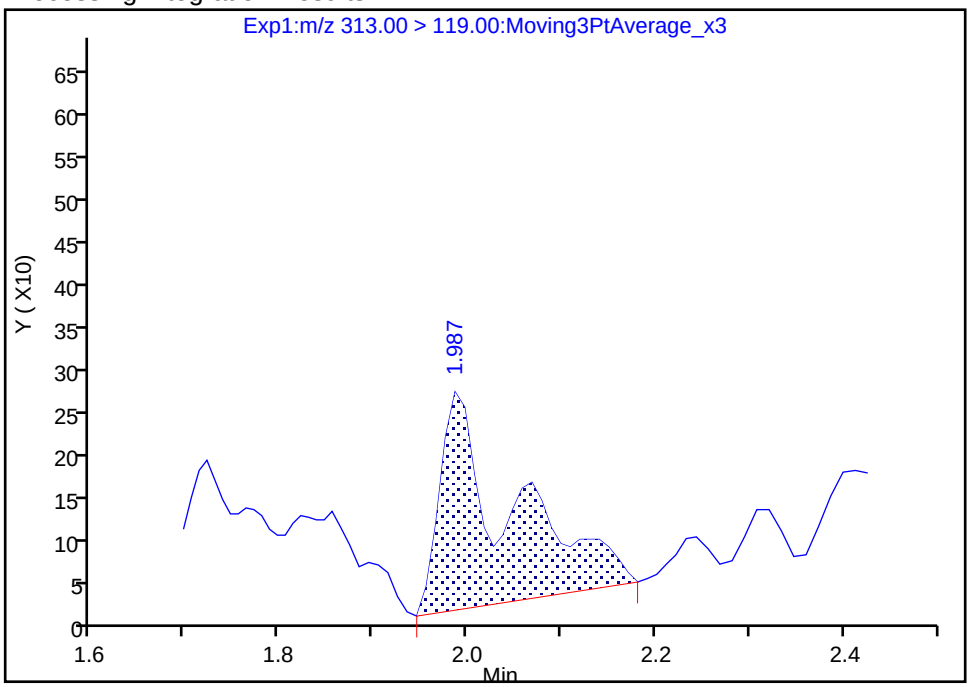
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

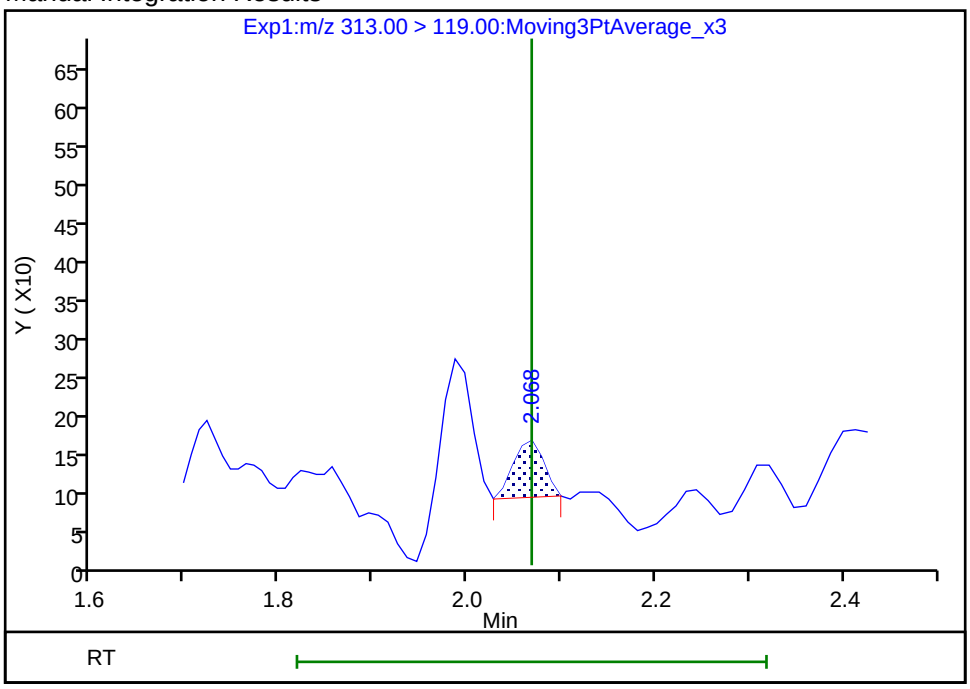
Processing Integration Results

RT: 1.99
Area: 1334
Amount: 0.002094
Amount Units: ng/ml



Manual Integration Results

RT: 2.07
Area: 165
Amount: 0.002094
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:54:54
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

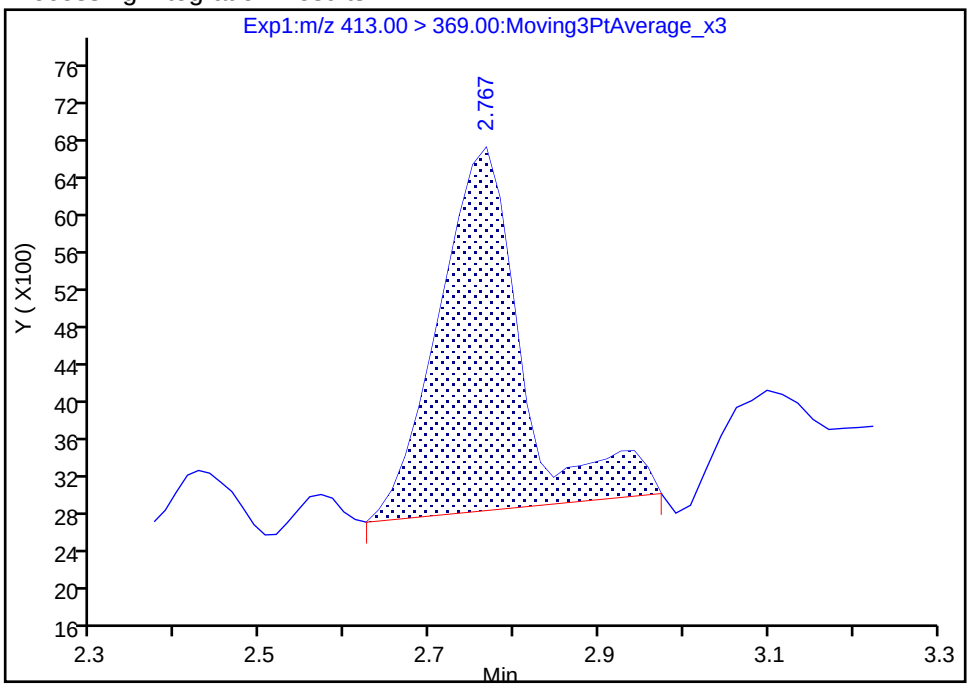
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

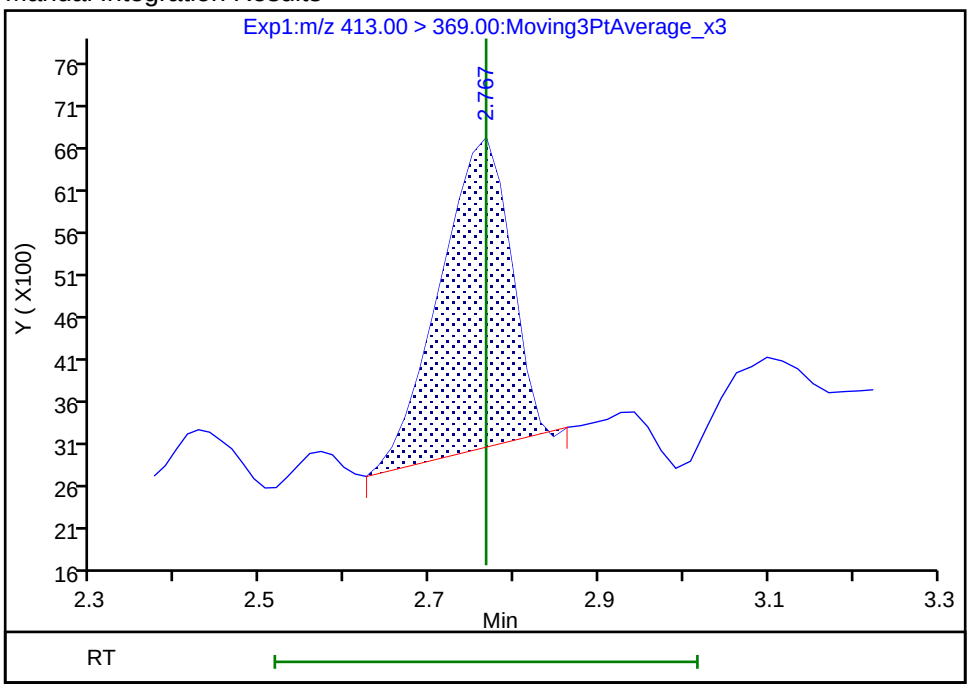
Processing Integration Results

RT: 2.77
Area: 26090
Amount: 0.007387
Amount Units: ng/ml



Manual Integration Results

RT: 2.77
Area: 20950
Amount: 0.005932
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:55:05
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

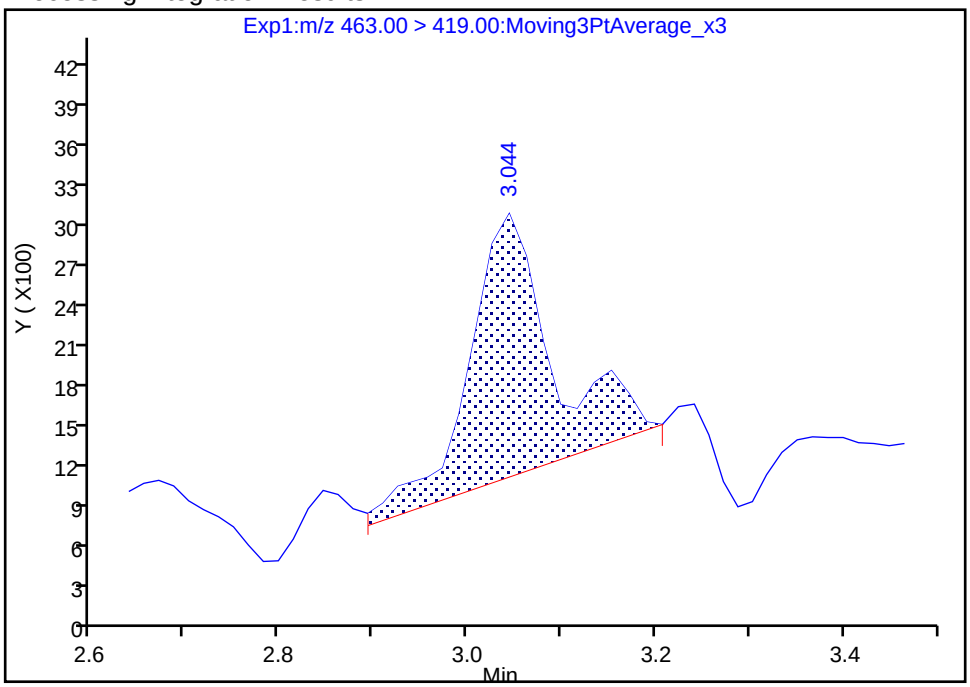
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

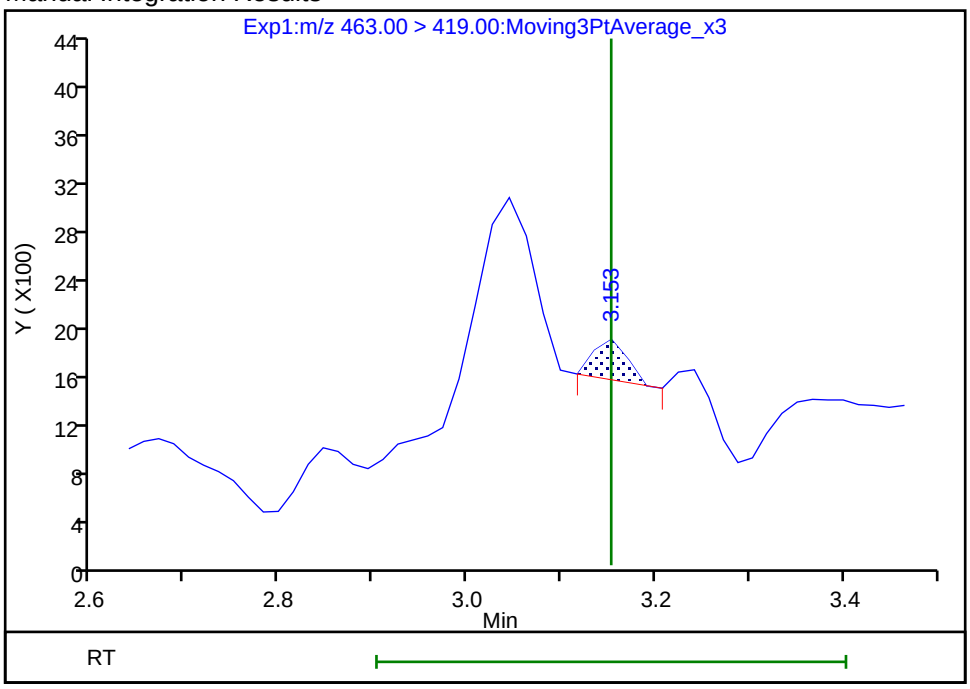
Processing Integration Results

RT: 3.04
Area: 11839
Amount: 0.004260
Amount Units: ng/ml



Manual Integration Results

RT: 3.15
Area: 797
Amount: 0.000287
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:55:24
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

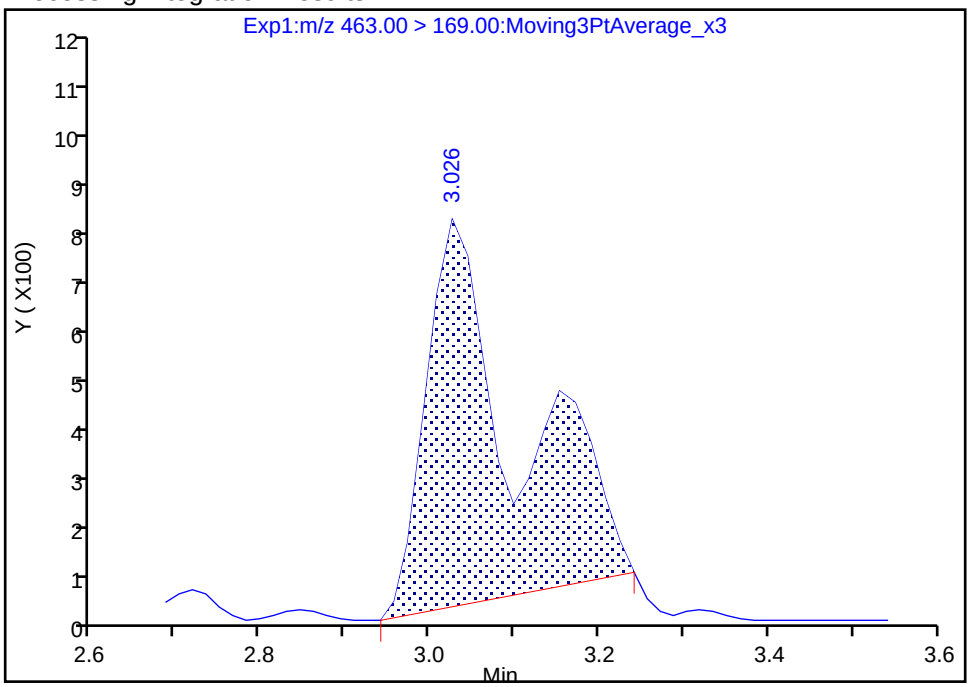
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

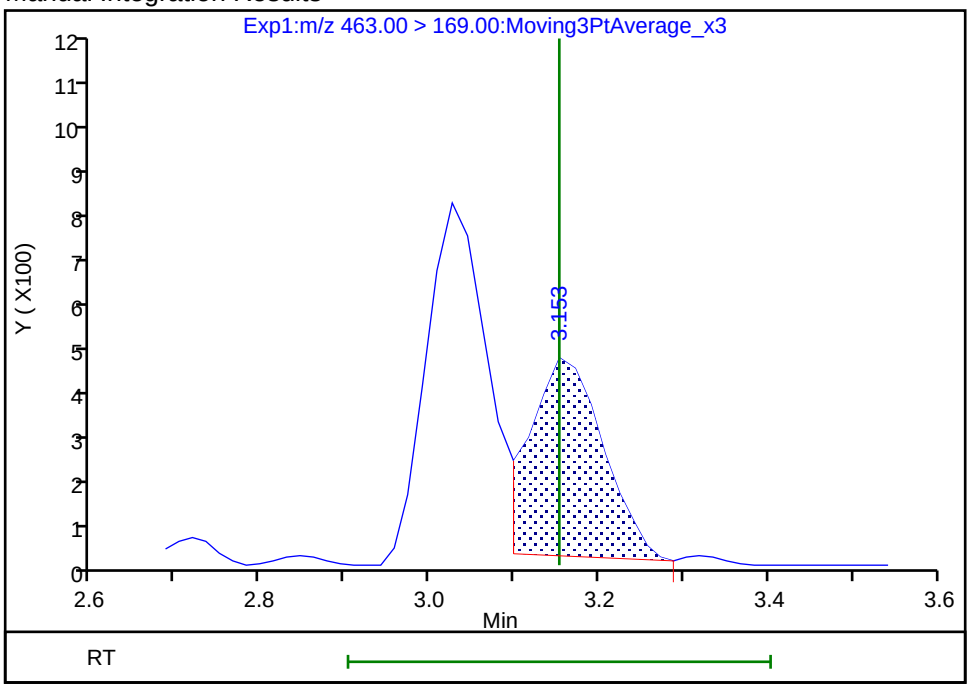
Processing Integration Results

RT: 3.03
Area: 5514
Amount: 0.004260
Amount Units: ng/ml



Manual Integration Results

RT: 3.15
Area: 2453
Amount: 0.000287
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:55:27
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

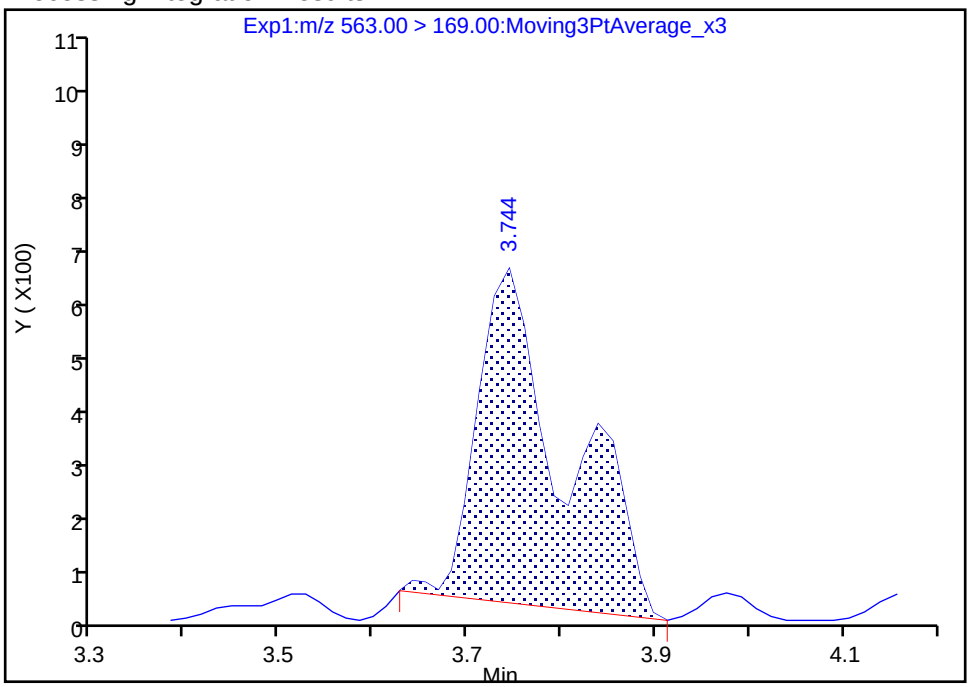
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

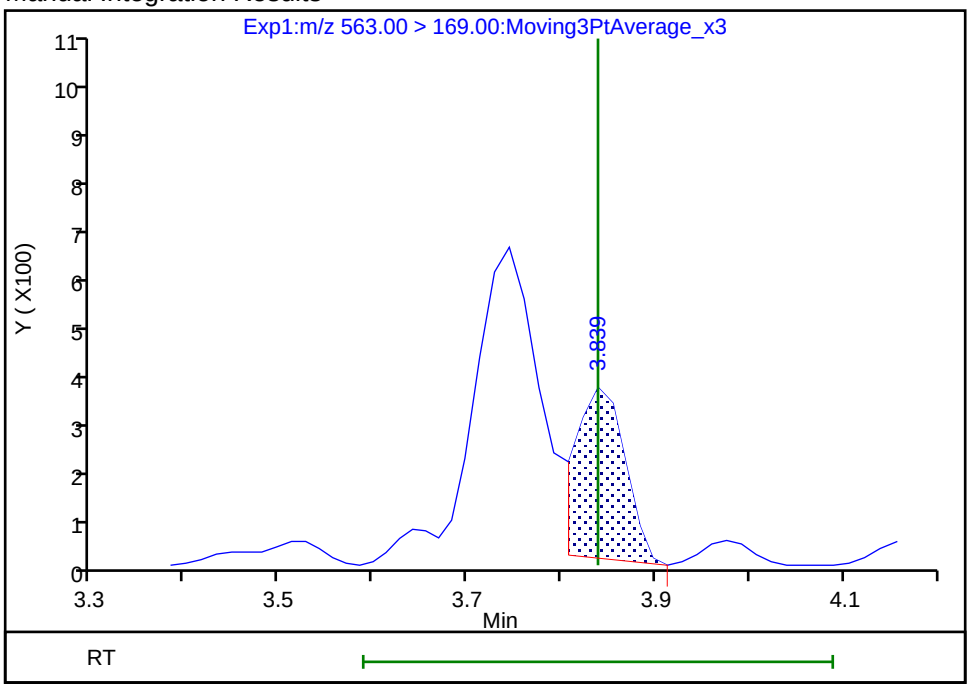
Processing Integration Results

RT: 3.74
Area: 3903
Amount: 0.002644
Amount Units: ng/ml



Manual Integration Results

RT: 3.84
Area: 1179
Amount: 0.007471
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:55:52
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

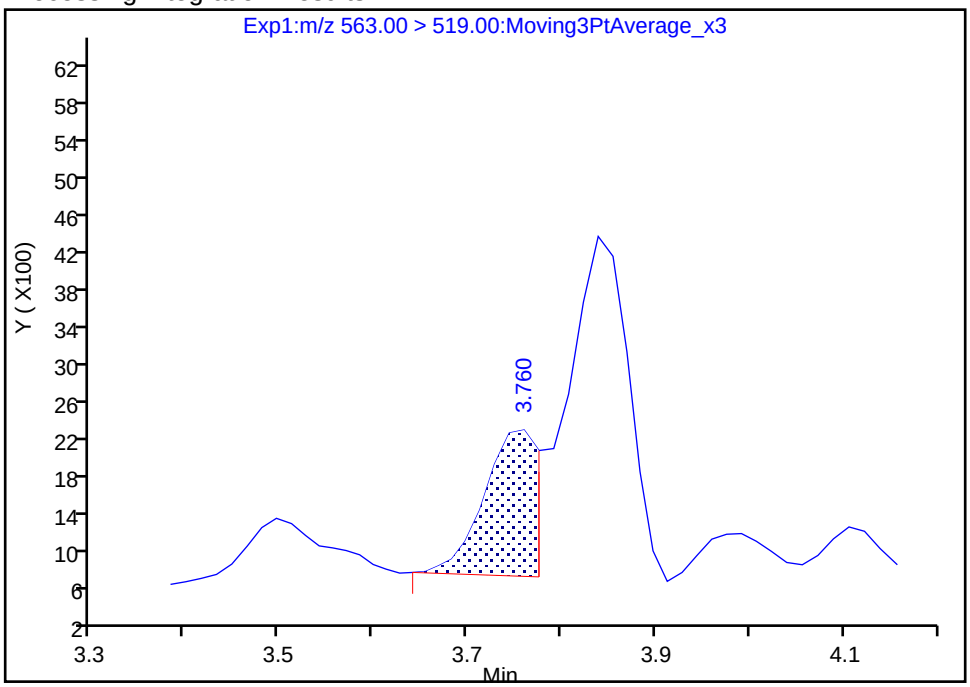
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

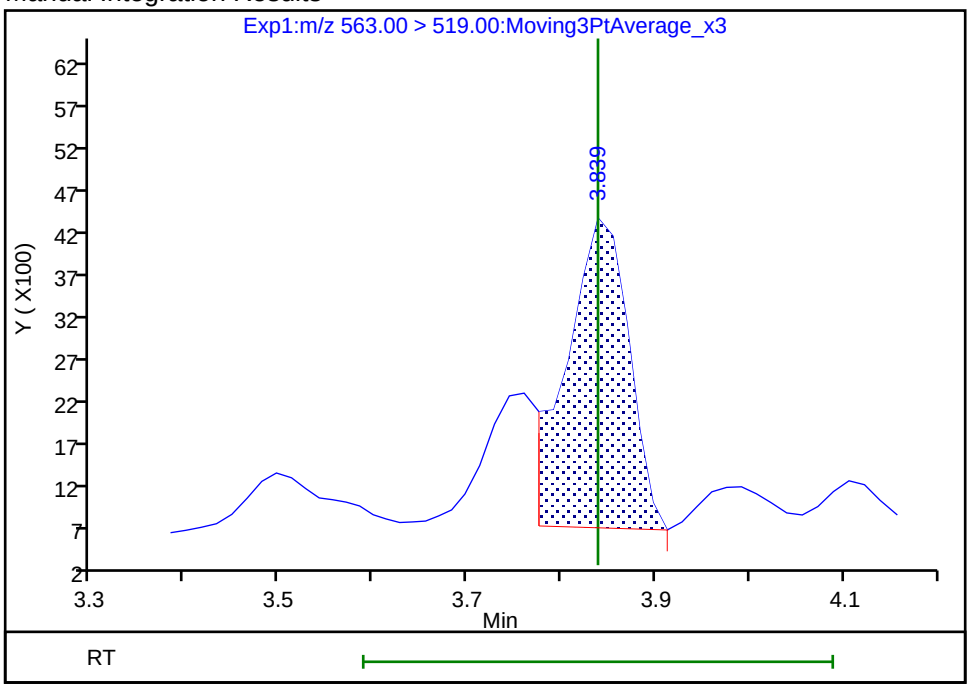
Processing Integration Results

RT: 3.76
Area: 5792
Amount: 0.002644
Amount Units: ng/ml



Manual Integration Results

RT: 3.84
Area: 16365
Amount: 0.007471
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:56:02
Audit Action: Manually Integrated/Assigned Compound ID Audit Reason: Wrong peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

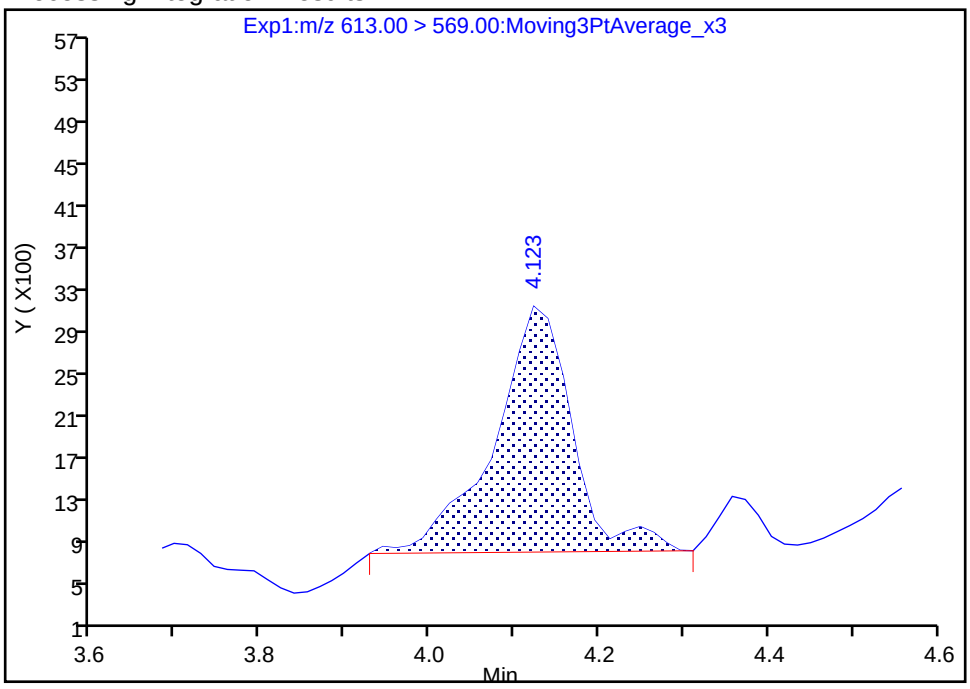
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

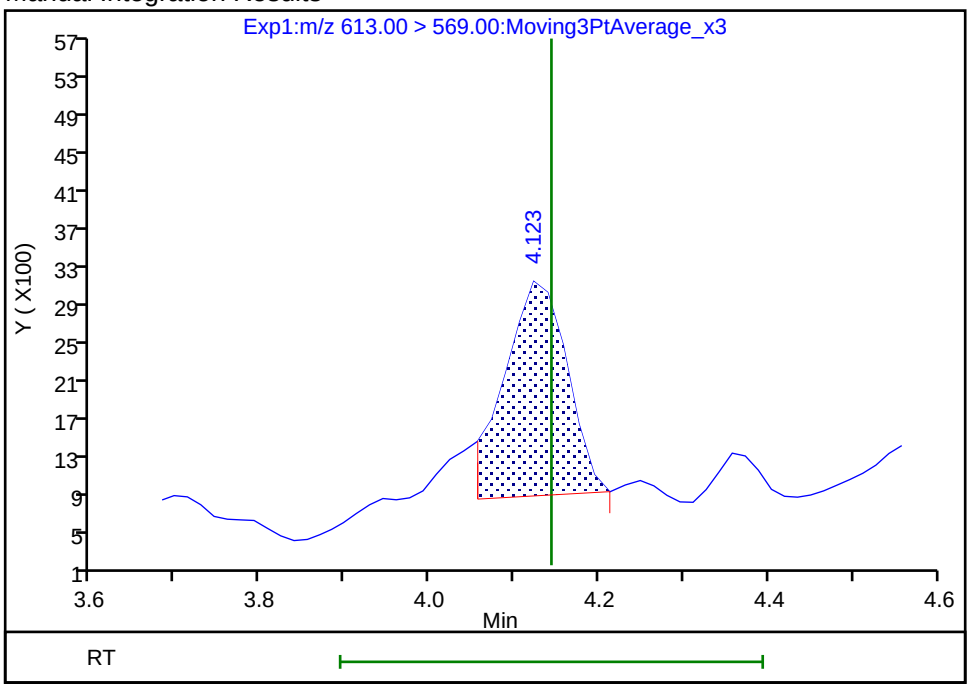
Processing Integration Results

RT: 4.12
Area: 14727
Amount: 0.005079
Amount Units: ng/ml



Manual Integration Results

RT: 4.12
Area: 11293
Amount: 0.003895
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:56:34
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

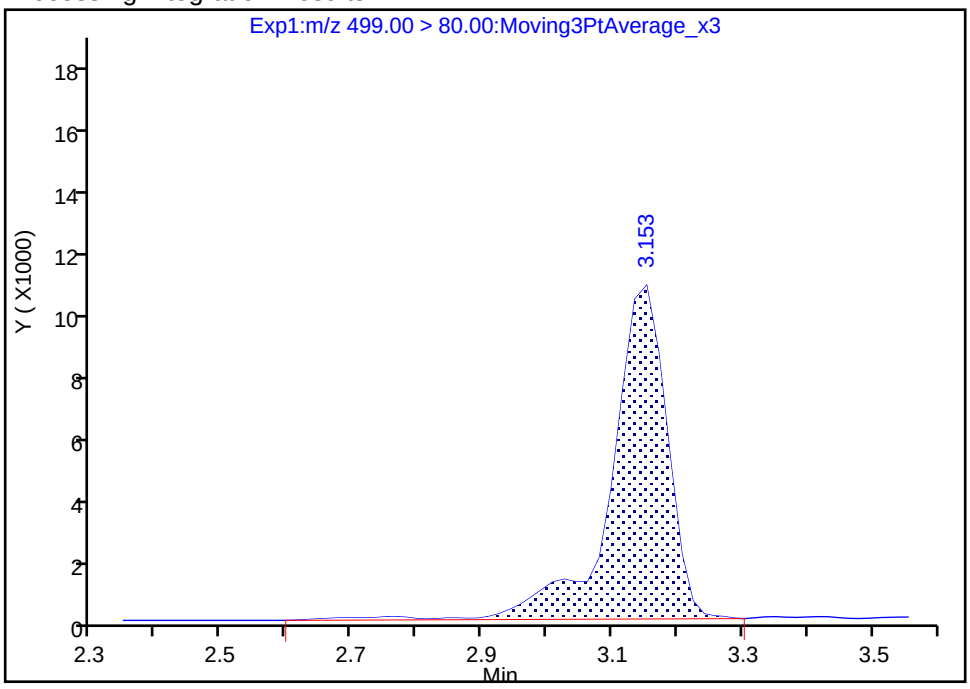
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

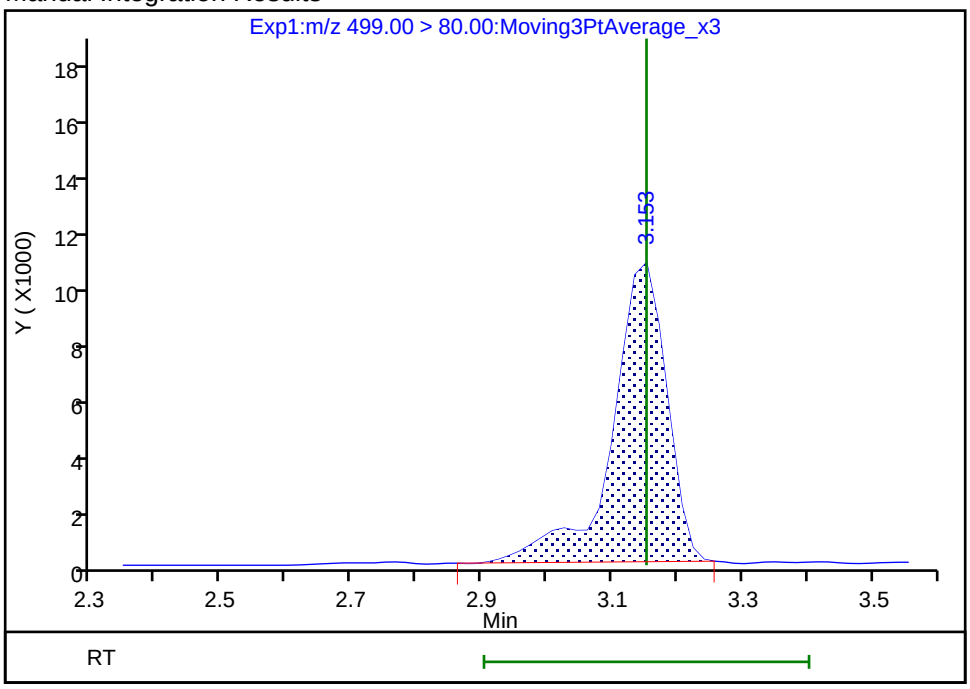
Processing Integration Results

RT: 3.15
Area: 63840
Amount: 0.028444
Amount Units: ng/ml



Manual Integration Results

RT: 3.15
Area: 61180
Amount: 0.027259
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:55:12
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

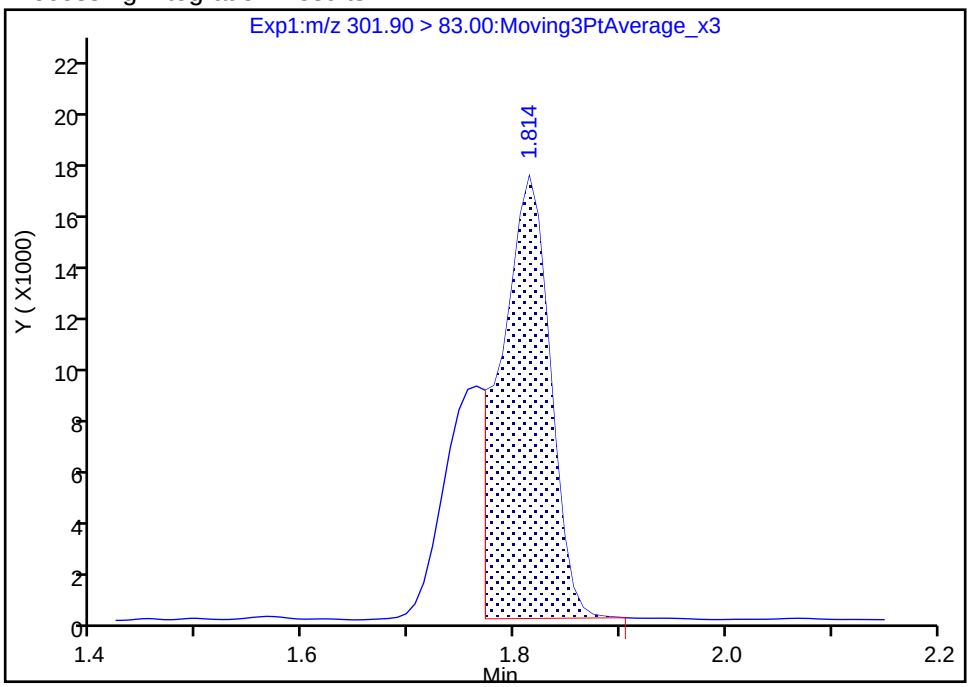
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_013.d
Injection Date: 16-Sep-2018 15:01:26 Instrument ID: A9
Lims ID: MB 320-245574/1-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

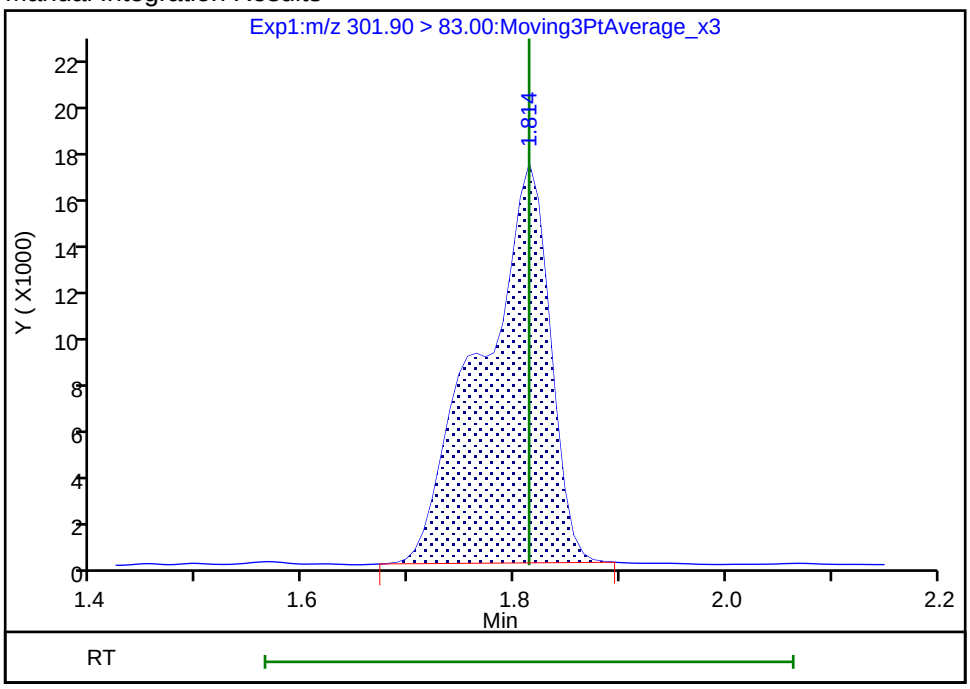
Processing Integration Results

RT: 1.81
Area: 53284
Amount: 1.395375
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 75959
Amount: 1.989177
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:54:33
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-245884/2

Matrix: Water Lab File ID: 2018.09.16_LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 09/16/2018 13:53

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245884 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	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 M	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 M	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)	0.00684	J M	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 M	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.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-245884/2

Matrix: Water Lab File ID: 2018.09.16_LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 09/16/2018 13:53

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245884 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	90		50-150
STL00992	13C4 PFBA	91		50-150
STL01893	13C5 PFPeA	91		50-150
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	95		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	90		50-150
STL00996	13C2 PFDA	101		50-150
STL00997	13C2 PFUnA	100		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	96		50-150
STL02116	13C2-PFTeDA	90		50-150
STL00991	13C4 PFOS	94		50-150
STL02337	13C3-PFBS	92		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 16-Sep-2018 13:53:54 ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 10:35:11 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 10:35:11

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	1.499	1.484	0.015	0.536	7561704	2.28		91.2	19622	
D 3 13C5-PFPeA										
267.90 > 223.00	1.780	1.756	0.024	0.636	6756814	2.28		91.4	10290	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.772	0.0	0.995	9330	0.003404			1.0	
D 47 13C3-PFBS										
301.90 > 83.00	1.822	1.797	0.025	0.651	83113	2.14		92.1	485	
D 60 M2-4:2FTS										
329.00 > 81.00	2.038	2.007	0.031	0.728	799065	NC			714	
D 7 13C2 PFHxA										
315.00 > 270.00	2.078	2.038	0.040	0.743	6850977	2.19		87.7	6449	
6 Perfluorohexanoic acid										RM
313.00 > 269.00	2.078	2.068	0.010	1.000	8271	0.003314			2.0	RM
313.00 > 119.00	2.068	2.068	0.0	0.995	30		275.70(6.96-20.87)		0.2	M
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.181	2.140	0.041	0.779	956846	NC			2364	
D 9 13C4-PFHpA										
367.00 > 322.00	2.426	2.360	0.066	0.867	8887773	2.38		95.4	12776	
D 11 18O2 PFHxS										
403.00 > 84.00	2.439	2.387	0.052	0.872	5206087	2.27		96.0	14615	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.439	2.426	0.013	1.000	18637	0.006842			35.9	M
399.00 > 99.00	2.439	2.426	0.013	1.000	6868		2.71(1.90-5.70)		10.2	M
D 12 M2-6:2FTS										
429.00 > 81.00	2.766	2.703	0.063	0.989	879103	2.40		101	1301	
D 14 13C4 PFOA										
417.00 > 372.00	2.798	2.719	0.079	1.000	8149155	2.35		93.9	9511	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 73 13C8 PFOA										
421.00 > 376.00	2.782	2.719	0.063		6766043	NC			8017	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.798	2.782	0.016	1.000	27808	0.007927			1.9	
413.00 > 169.00	2.798	2.782	0.016	1.000	10120		2.75(1.36-4.08)		13.7	
* 62 13C2-PFOA										
415.00 > 370.00	2.798	2.782	0.016		8612340	2.50			10286	
D 72 13C8 PFOS										
507.00 > 99.00	3.172	3.081	0.091		1237419	NC			2654	
D 19 13C5 PFNA										
468.00 > 423.00	3.190	3.099	0.091	1.140	7286215	2.24		89.6	8360	
D 18 13C4 PFOS										
503.00 > 80.00	3.190	3.099	0.091	1.140	5549905	2.25		94.3	4386	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.190	3.171	0.019	1.000	2924	0.001193			4.0	M
499.00 > 99.00	3.207	3.171	0.036	1.005	1813		1.61(2.04-6.12)		4.9	M
20 Perfluorononanoic acid										RM
463.00 > 419.00	3.153	3.171	-0.018	0.988	4063	0.001426			0.5	RM
463.00 > 169.00	3.153	3.171	-0.018	0.988	478		8.50(2.68-8.03)		1.2	M
D 21 13C8 FOSA										
506.00 > 78.00	3.480	3.449	0.031	1.244	2919866	2.24		89.6	6550	
D 26 M2-8:2FTS										
529.00 > 81.00	3.542	3.449	0.093	1.266	120423	2.23		93.3	962	
D 23 13C2 PFDA										
515.00 > 470.00	3.542	3.465	0.077	1.266	8196142	2.52		101	9278	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.697	3.613	0.084	1.321	3202042	2.19		87.5	4107	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.869	3.776	0.093	1.383	2920818	2.54		101	3312	
D 30 13C2 PFUnA										
565.00 > 520.00	3.883	3.792	0.091	1.388	6938873	2.51		100	5699	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.823	3.869	-0.046	0.988	1138	0.001047			1.9	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.883	3.869	0.014	1.000	16085	0.006460			4.5	
563.00 > 169.00	3.883	3.869	0.014	1.000	2069		7.77(5.24-15.72)		12.1	
D 36 13C2 PFDoA										
615.00 > 570.00	4.176	4.073	0.103	1.492	7295960	2.17		86.8	8523	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.295	4.139	0.156		2284	NC			8.3	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.706	4.573	0.133	1.682	6019020	2.25		89.9	8934	
42 Perfluorotetradecanoic acid										M
713.00 > 169.00	4.706	4.675	0.031	1.000	1444	0.003715			4.7	M
713.00 > 219.00	4.691	4.675	0.016	0.997	1115		1.30(0.70-2.09)		2.8	M
D 44 13C2-PFHxDA										
815.00 > 770.00	5.142	5.007	0.135	1.838	5312126	1.96		78.3	5363	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										M
813.00 > 769.00	5.142	5.108	0.034	1.000	48772	NC			18.2	M
813.00 > 169.00	5.142	5.108	0.034	1.000	8090		6.03(2.77-8.32)		15.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00008 Amount Added: 1.00 Units: mL

Report Date: 17-Sep-2018 10:35:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d

Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9

Lims ID: CCB

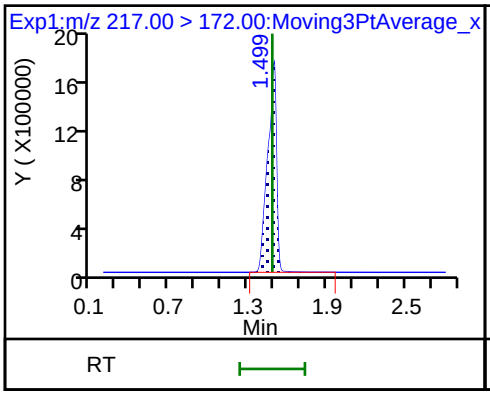
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2

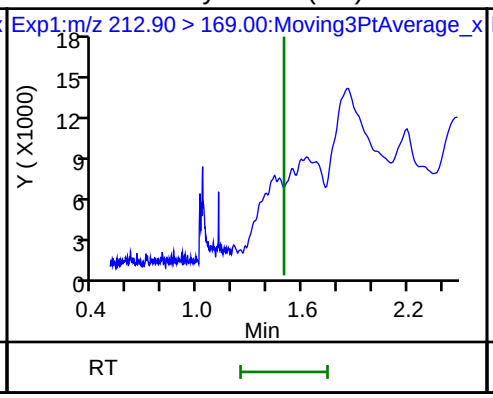
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

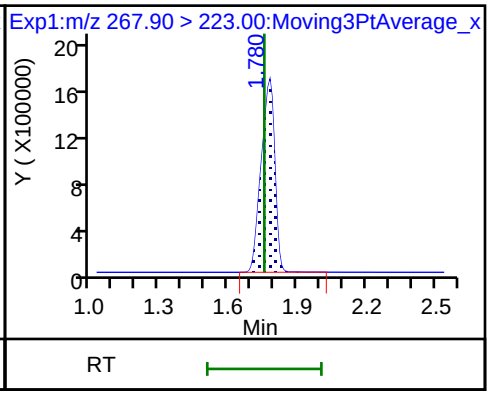
D 1 13C4 PFBA



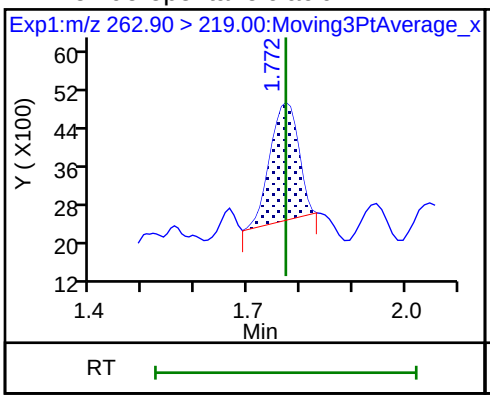
2 Perfluorobutyric acid (ND)



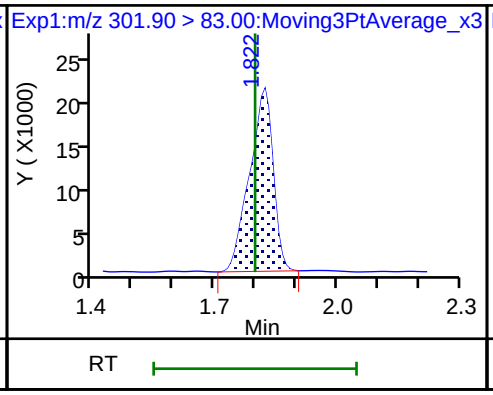
D 3 13C5-PFPeA



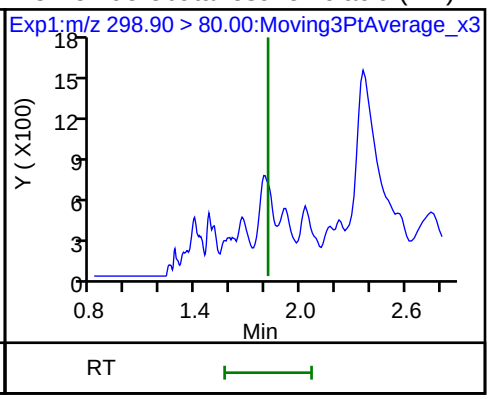
4 Perfluoropentanoic acid



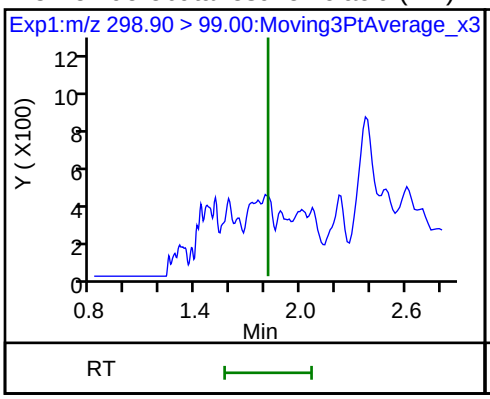
D 47 13C3-PFBS



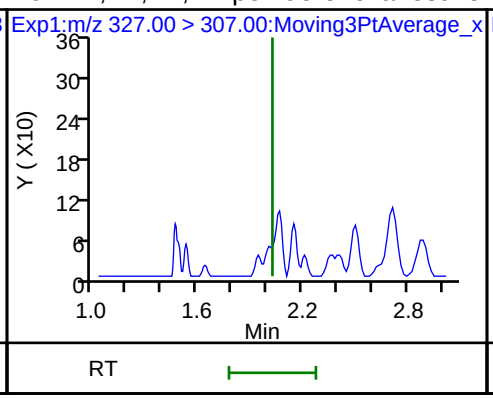
5 Perfluorobutanesulfonic acid (ND)



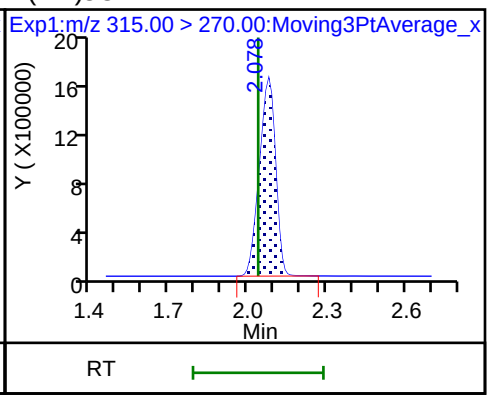
5 Perfluorobutanesulfonic acid (ND)



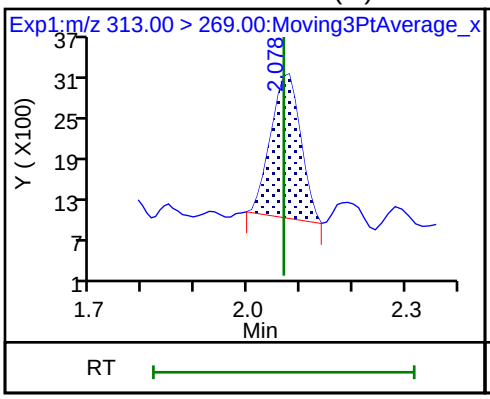
61 1H,1H,2H,2H-perfluorohexanesulfonic (NT)



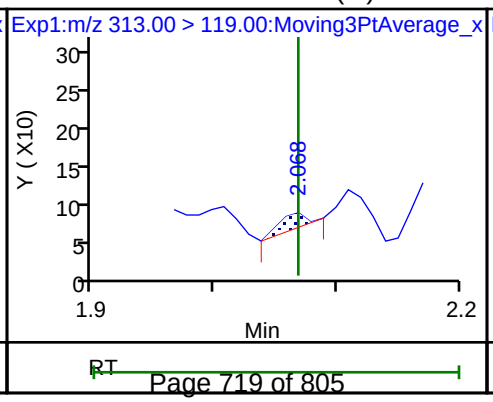
D 13C2 PFHxA



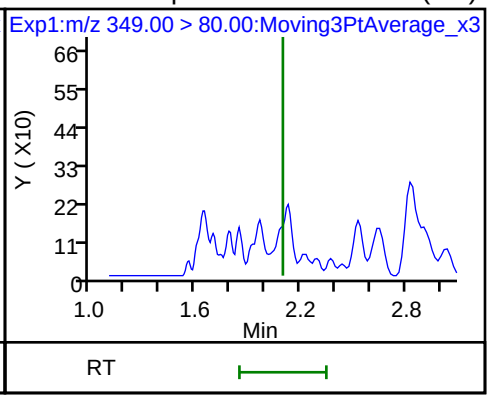
6 Perfluorohexanoic acid (M)



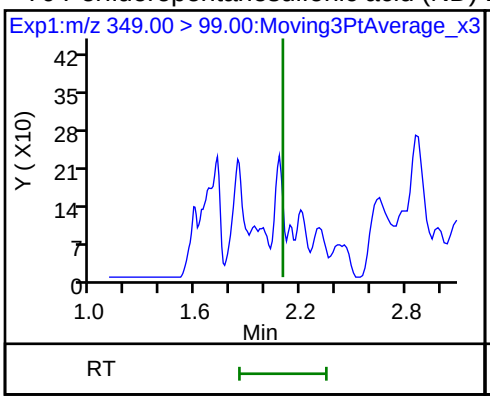
6 Perfluorohexanoic acid (M)



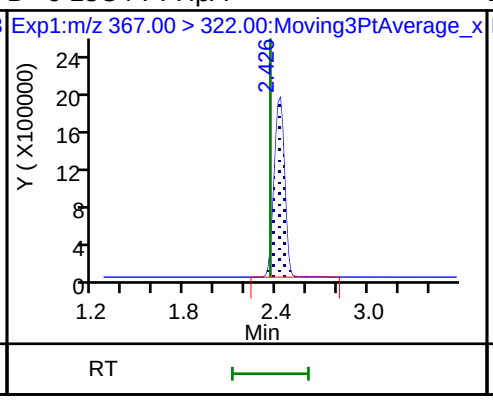
70 Perfluoropentanesulfonic acid (ND)



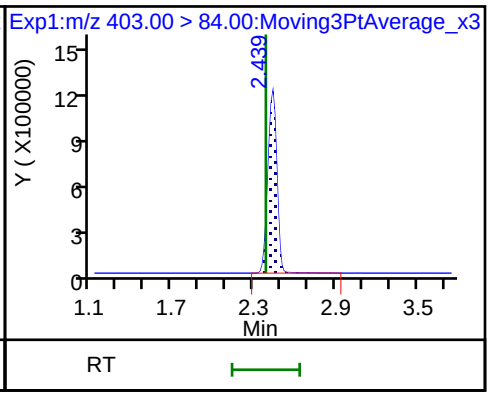
70 Perfluoropentanesulfonic acid (ND)



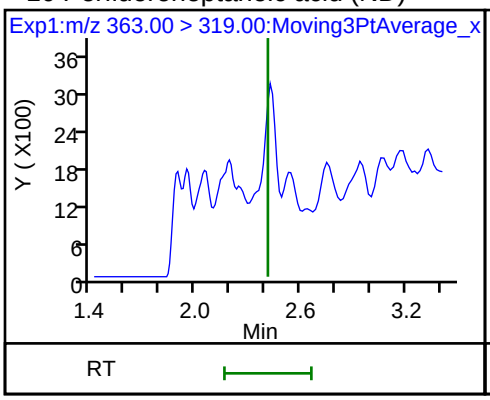
D 9 13C4-PFHpA



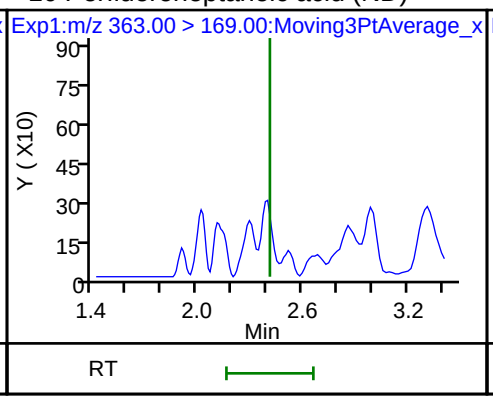
D 11 18O2 PFHxS



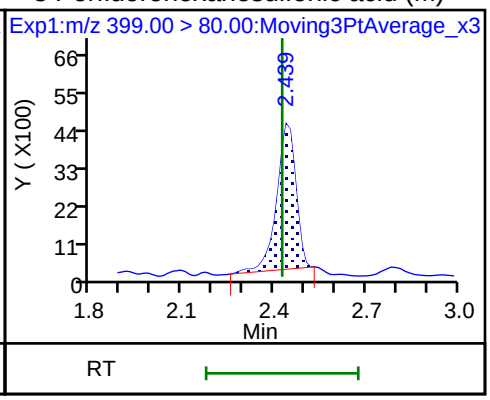
10 Perfluoroheptanoic acid (ND)



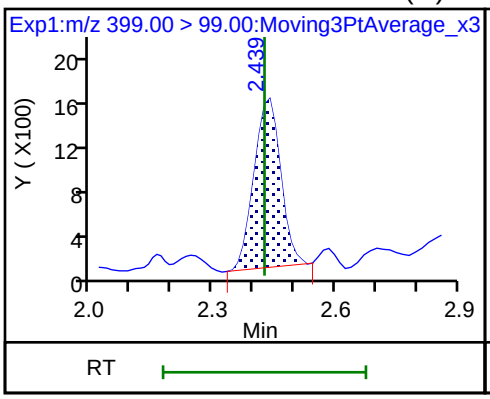
10 Perfluoroheptanoic acid (ND)



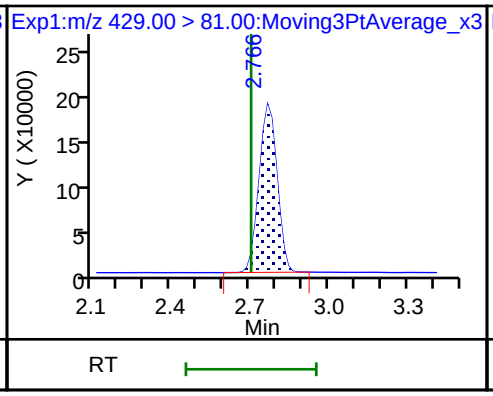
8 Perfluorohexanesulfonic acid (M)



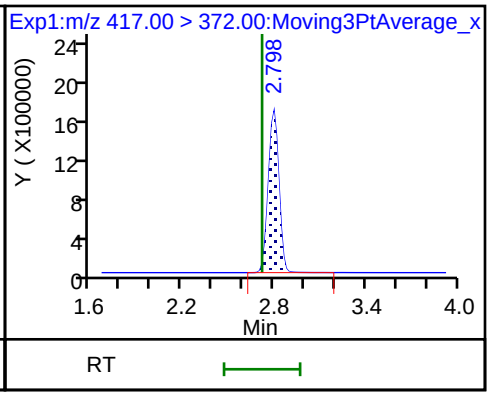
8 Perfluorohexanesulfonic acid (M)



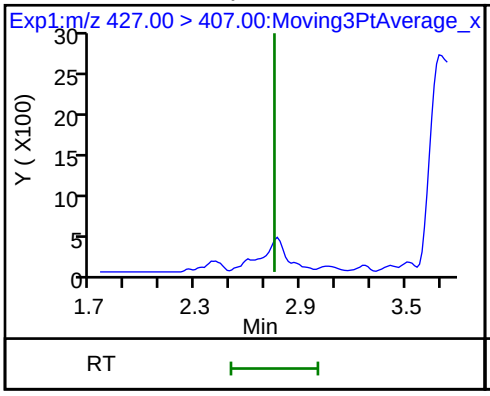
D 12 M2-6:2FTS



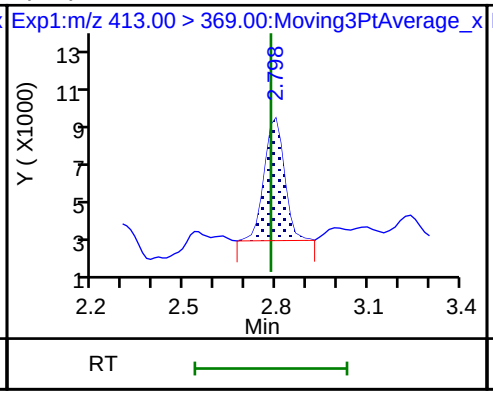
D 14 13C4 PFOA



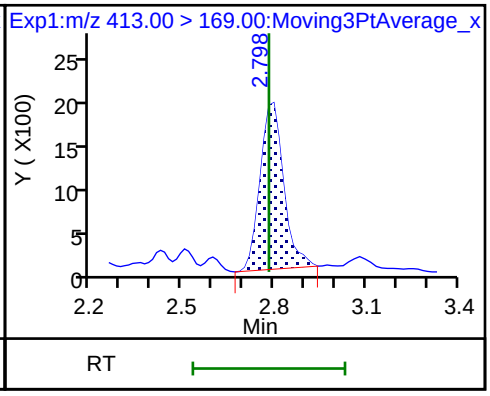
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



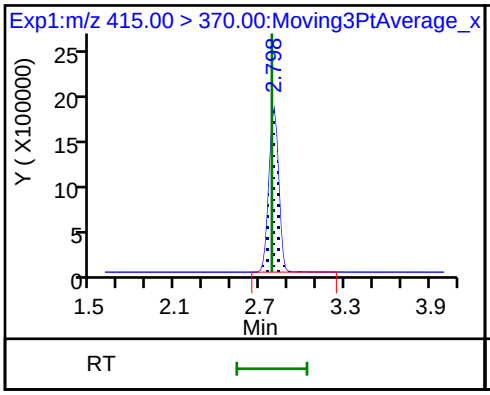
15 Perfluorooctanoic acid



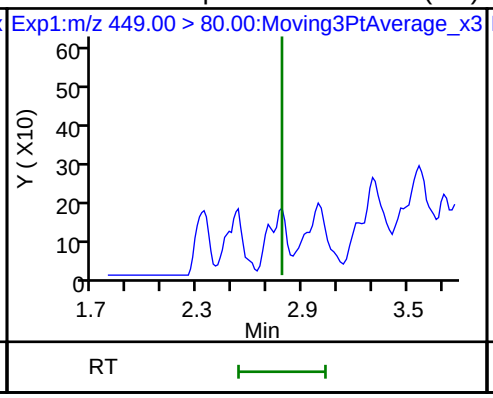
15 Perfluorooctanoic acid



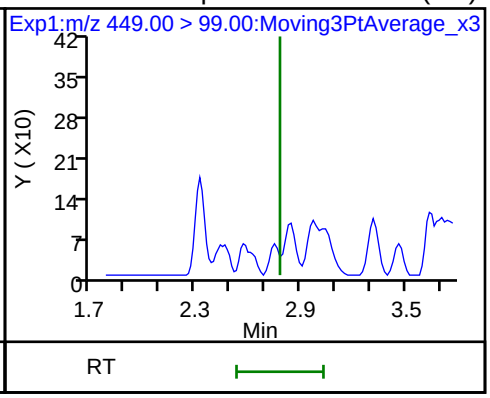
* 62 13C2-PFOA



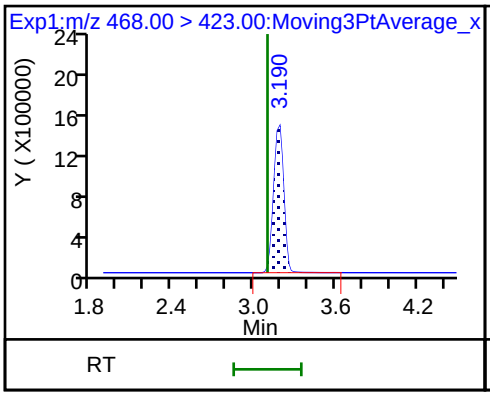
16 Perfluoroheptanesulfonic acid (ND)



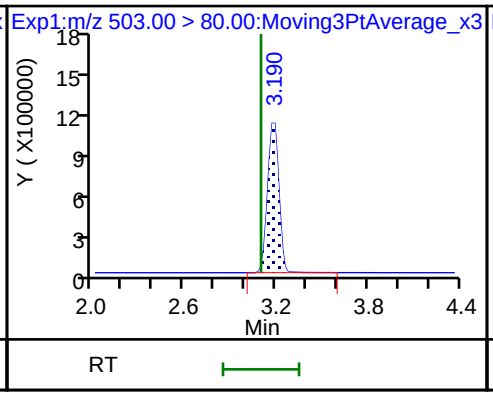
16 Perfluoroheptanesulfonic acid (ND)



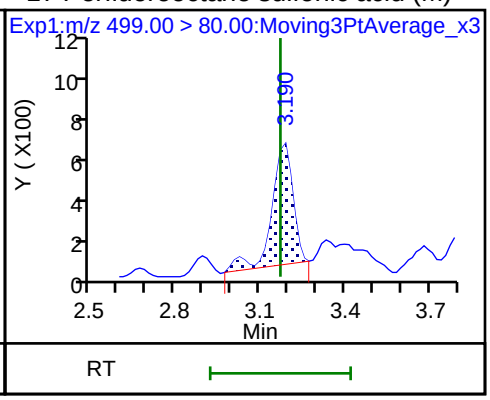
D 19 13C5 PFNA



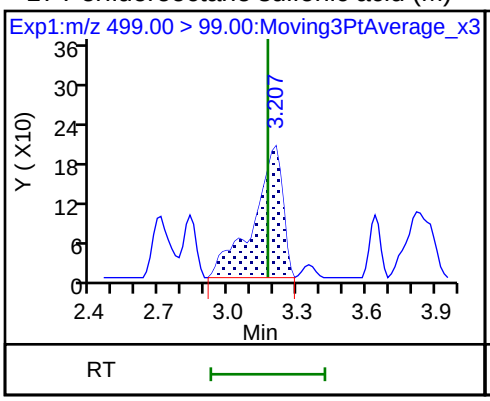
D 18 13C4 PFOS



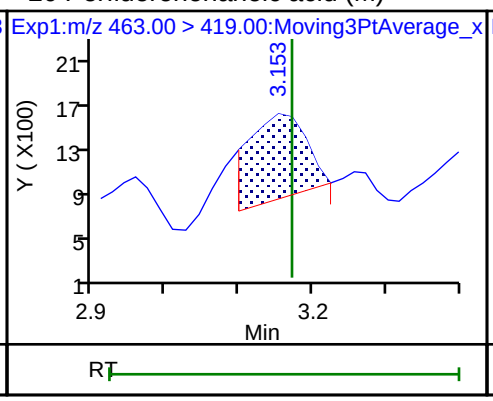
17 Perfluorooctane sulfonic acid (M)



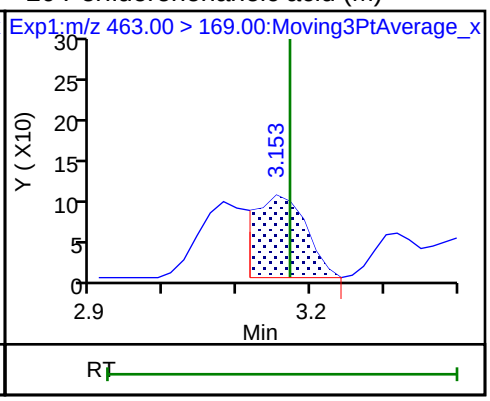
17 Perfluorooctane sulfonic acid (M)



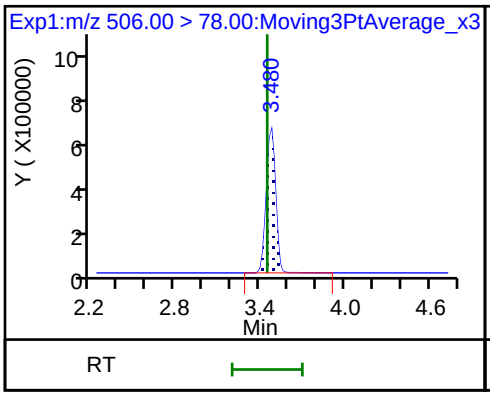
20 Perfluorononanoic acid (M)



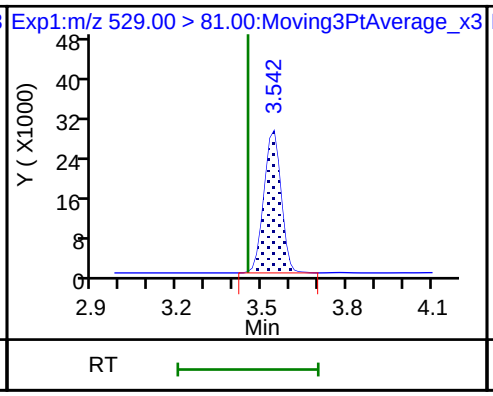
20 Perfluorononanoic acid (M)



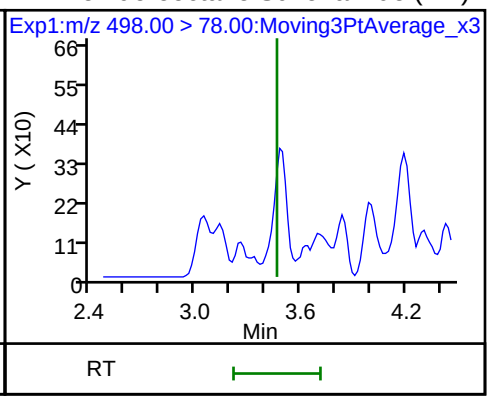
D 21 13C8 FOSA



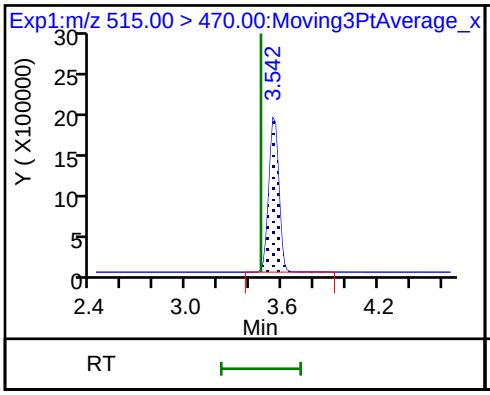
D 26 M2-8:2FTS



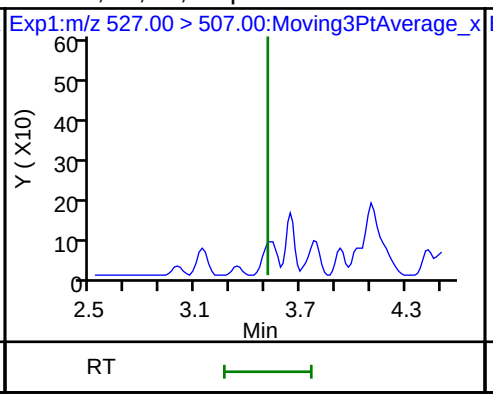
22 Perfluorooctane Sulfonamide (ND)



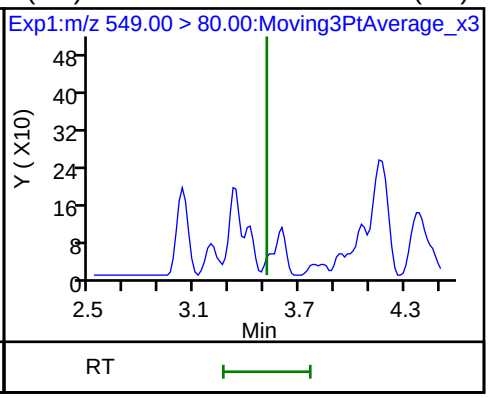
D 23 13C2 PFDA



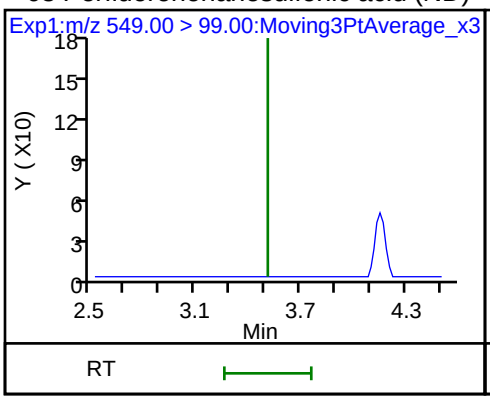
25 1H,1H,2H,2H-perfluorodecanesulfoni (8:2)



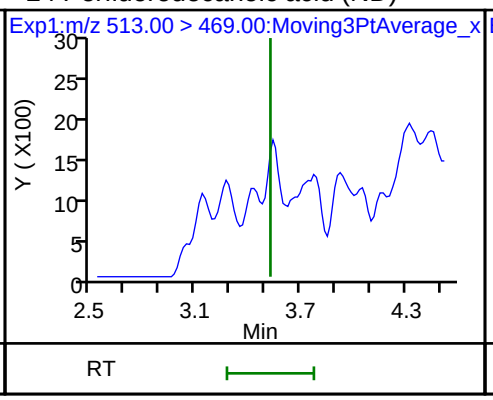
68 Perfluorononanesulfonic acid (ND)



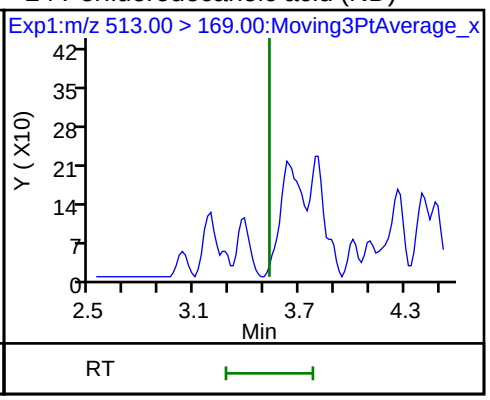
68 Perfluorononanesulfonic acid (ND)



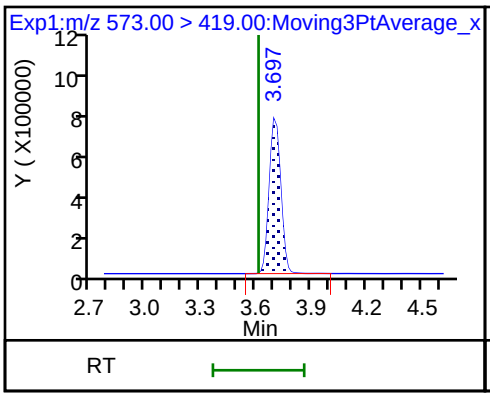
24 Perfluorodecanoic acid (ND)



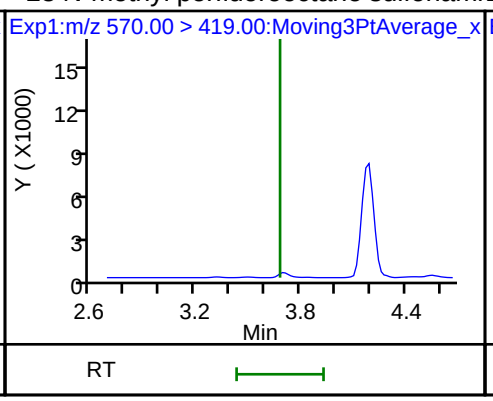
24 Perfluorodecanoic acid (ND)



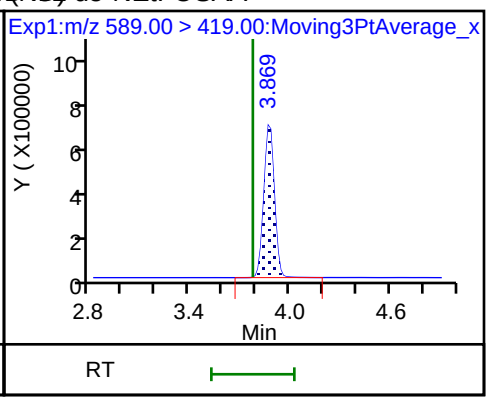
D 27 d3-NMeFOSAA



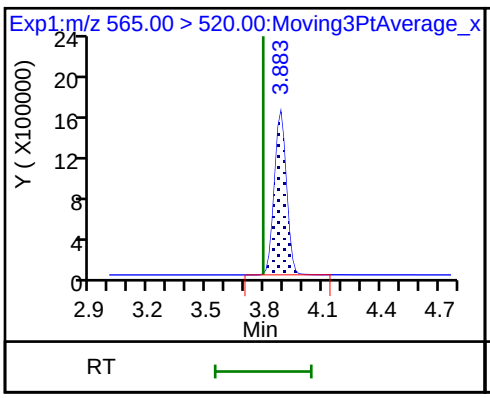
28 N-methyl perfluorooctane sulfonamid



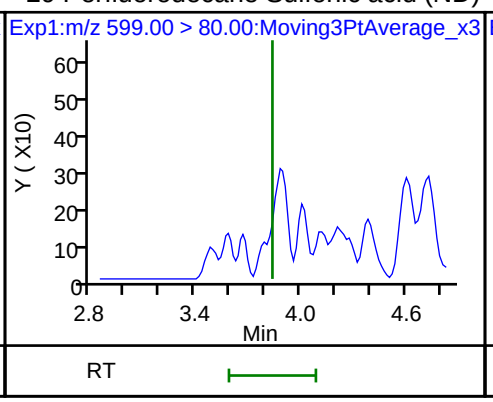
D 32 d5-NEtFOSAA



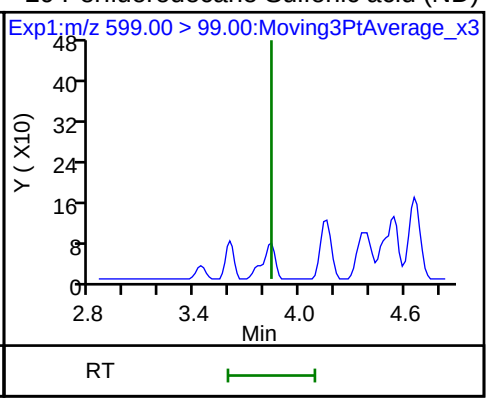
D 30 13C2 PFUnA



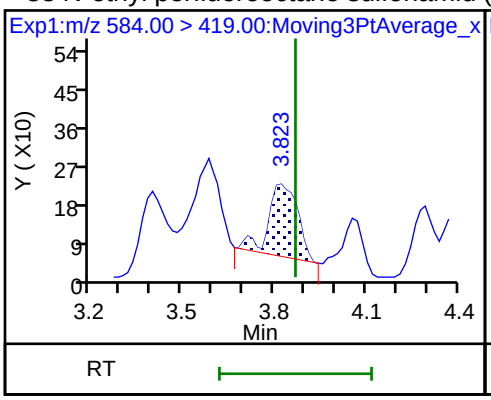
29 Perfluorodecane Sulfonic acid (ND)



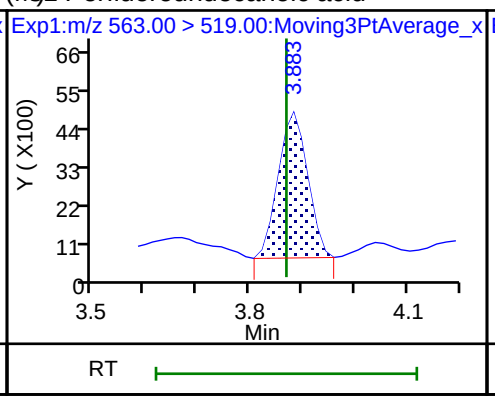
29 Perfluorodecane Sulfonic acid (ND)



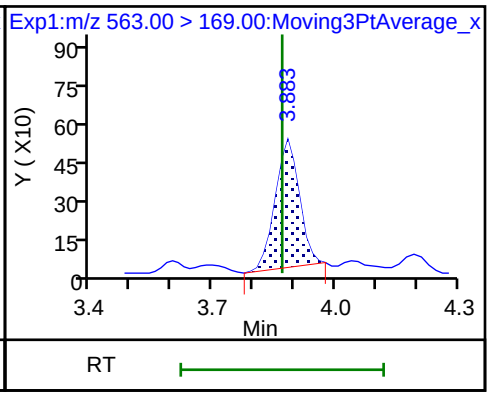
33 N-ethyl perfluorooctane sulfonamid (M)



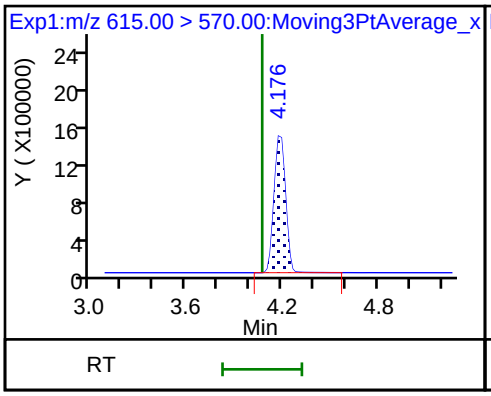
31 Perfluoroundecanoic acid



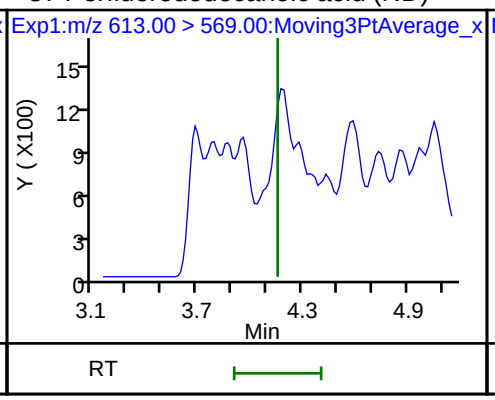
31 Perfluoroundecanoic acid



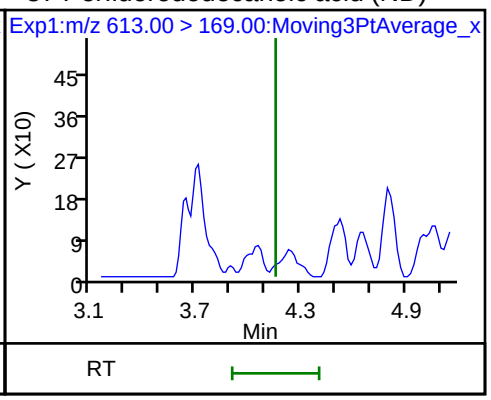
D 36 13C2 PFDoA



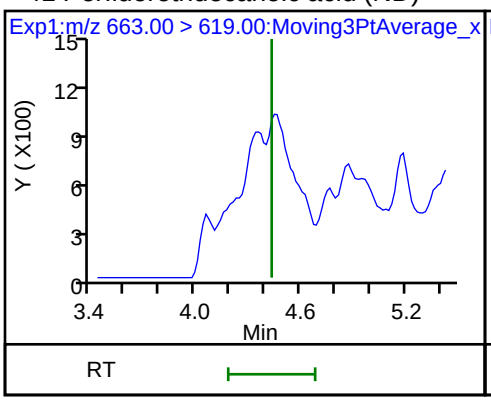
37 Perfluorododecanoic acid (ND)



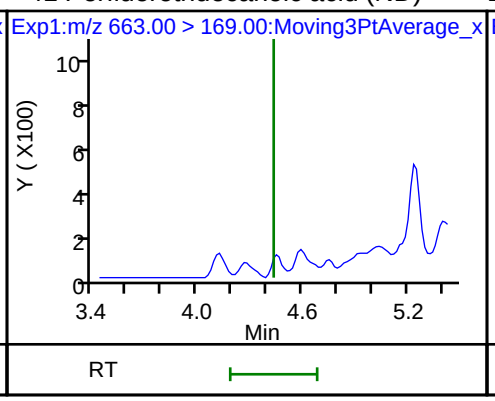
37 Perfluorododecanoic acid (ND)



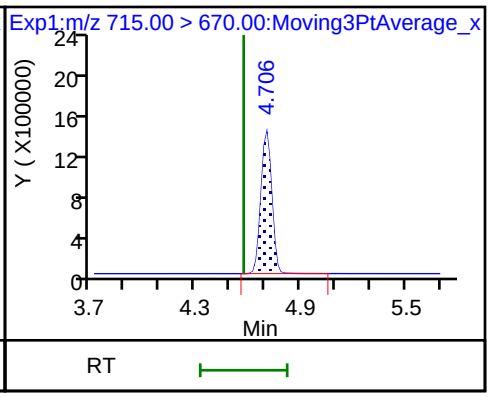
41 Perfluorotridecanoic acid (ND)



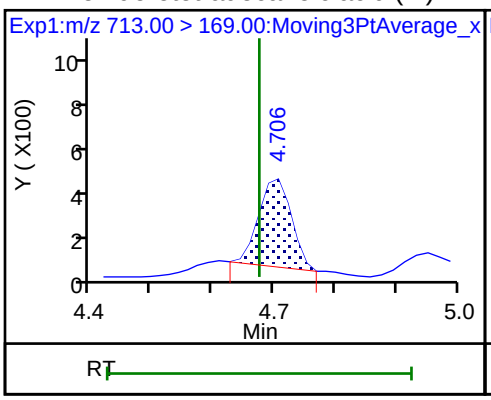
41 Perfluorotridecanoic acid (ND)



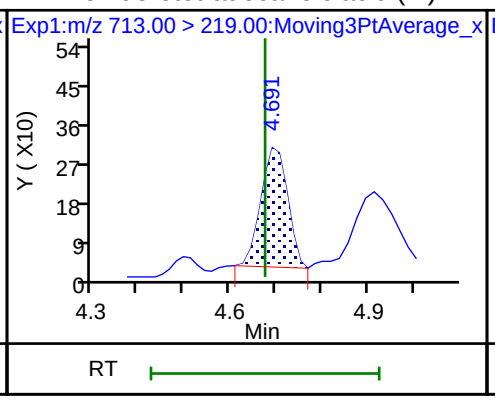
D 43 13C2-PFTeDA



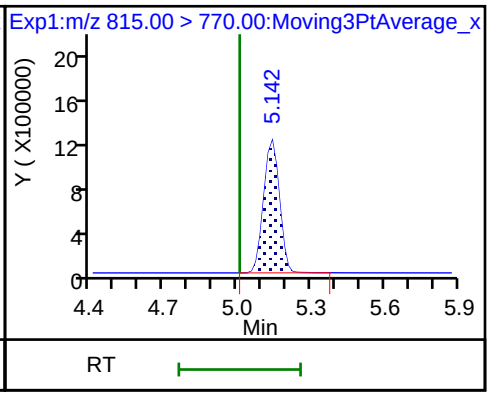
42 Perfluorotetradecanoic acid (M)



42 Perfluorotetradecanoic acid (M)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

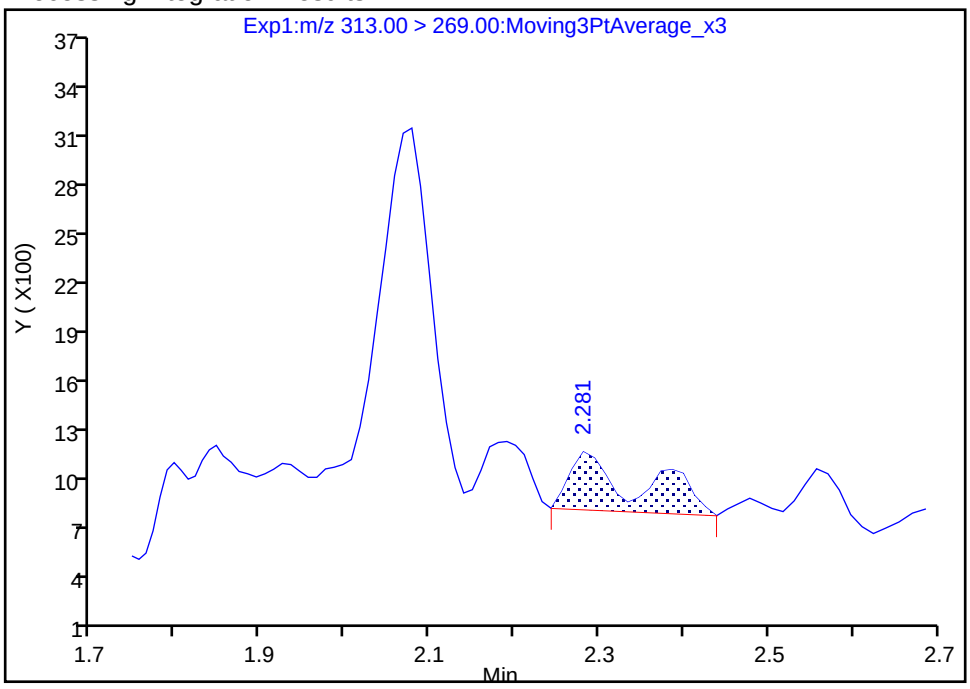
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

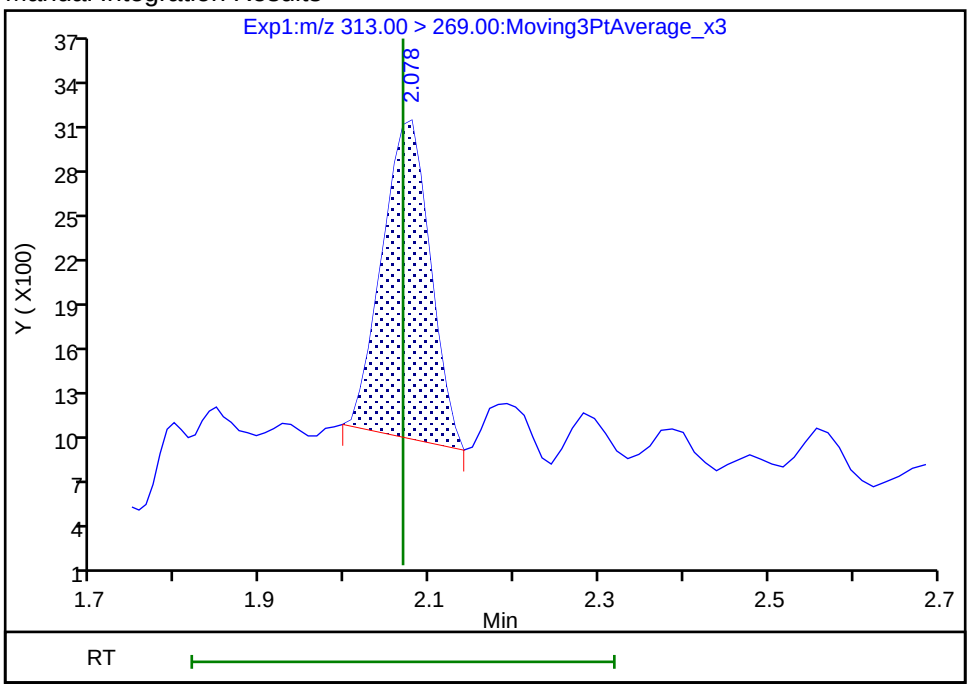
Processing Integration Results

RT: 2.28
Area: 1993
Amount: 0.000799
Amount Units: ng/ml



Manual Integration Results

RT: 2.08
Area: 8271
Amount: 0.003314
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:33:18
Audit Action: Manually Integrated Audit Reason: Wrong peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

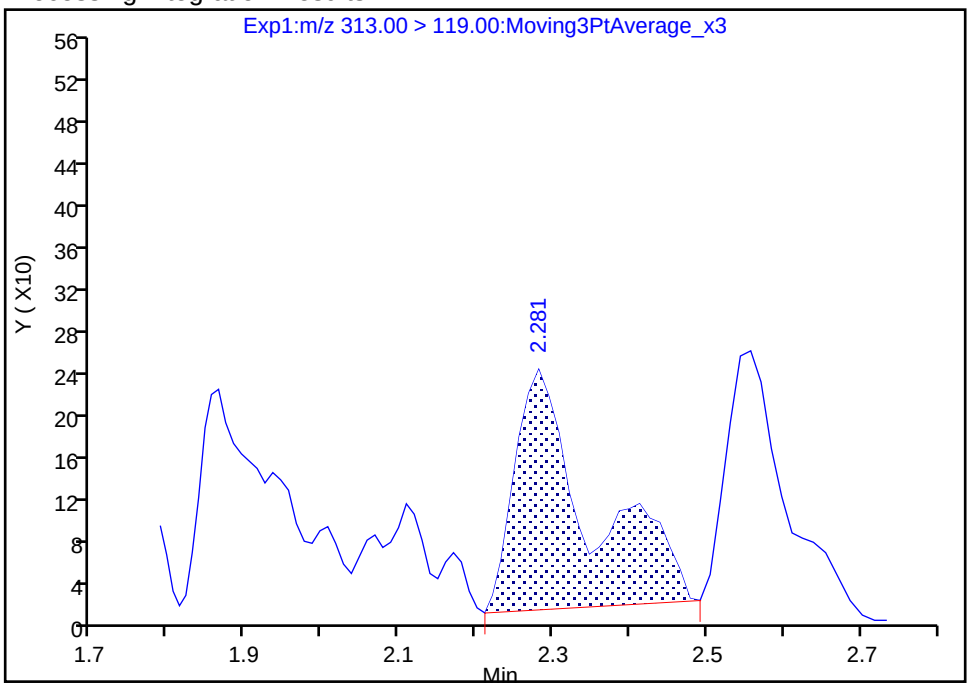
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

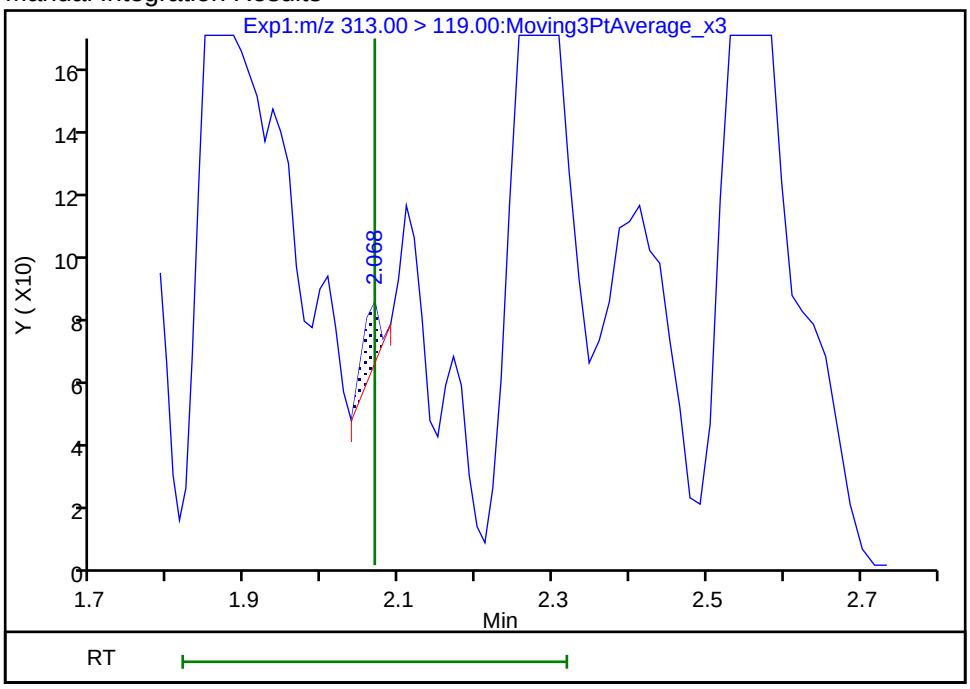
Processing Integration Results

RT: 2.28
Area: 1575
Amount: 0.000799
Amount Units: ng/ml



Manual Integration Results

RT: 2.07
Area: 30
Amount: 0.003314
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:33:20
Audit Action: Manually Integrated Audit Reason: Wrong peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

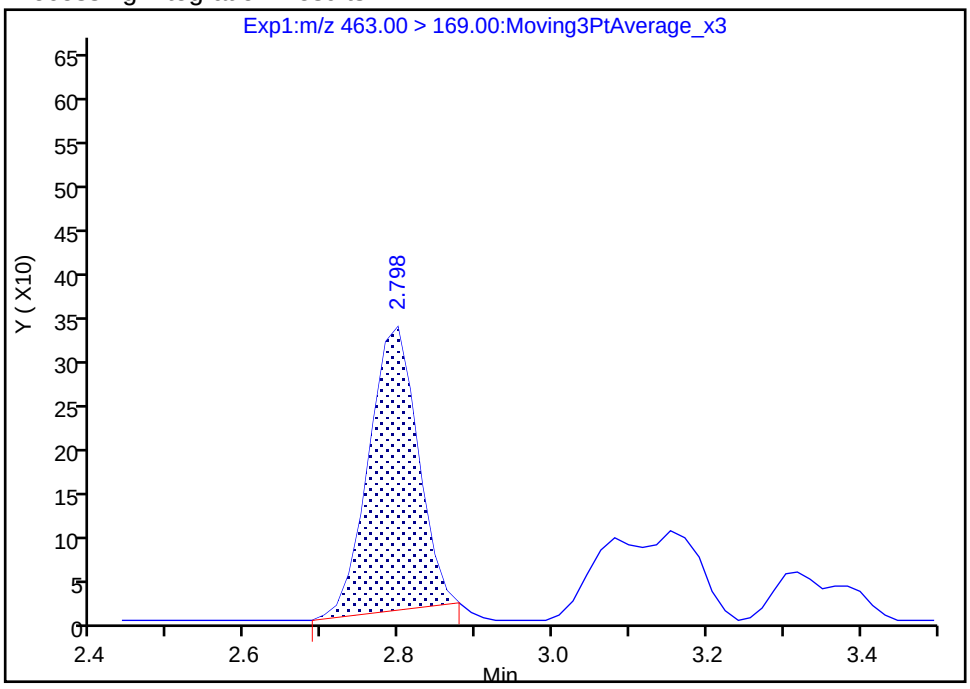
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

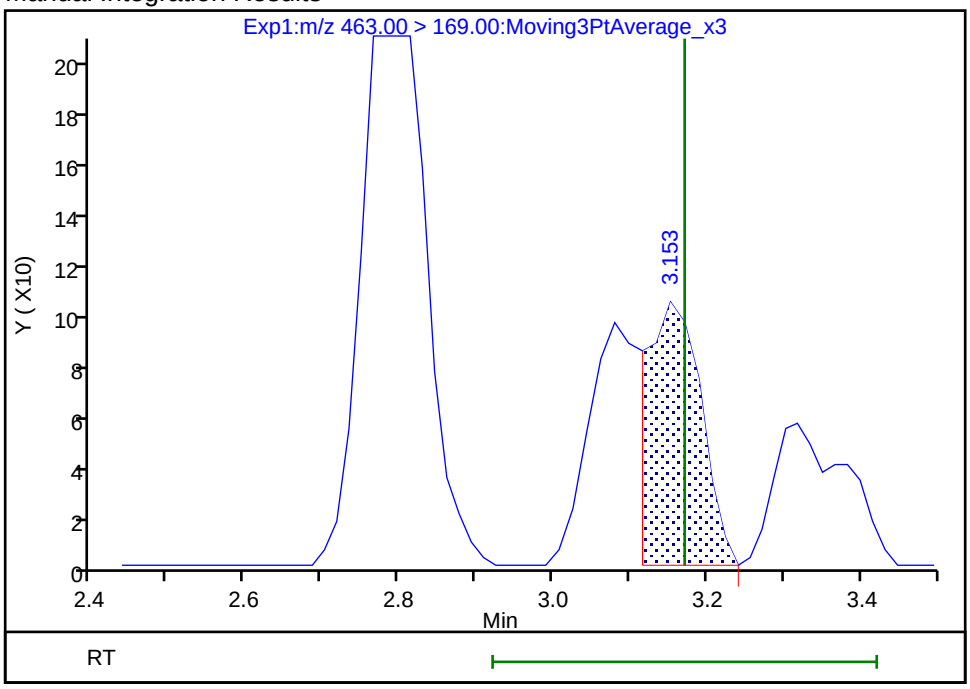
Processing Integration Results

RT: 2.80
Area: 1423
Amount: 0.000595
Amount Units: ng/ml



Manual Integration Results

RT: 3.15
Area: 478
Amount: 0.001426
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:34:27
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

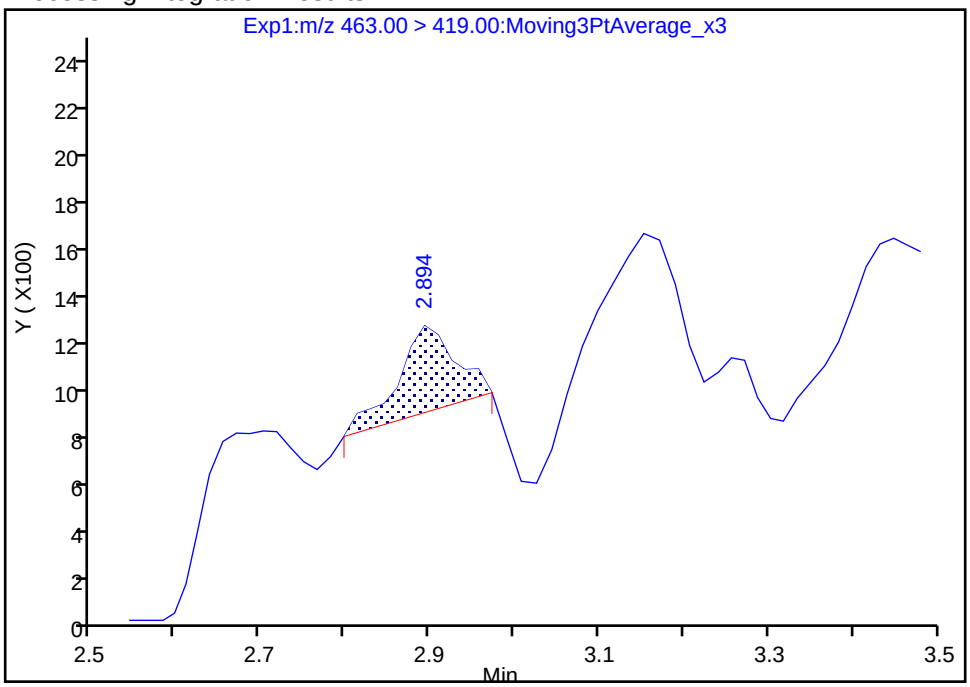
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

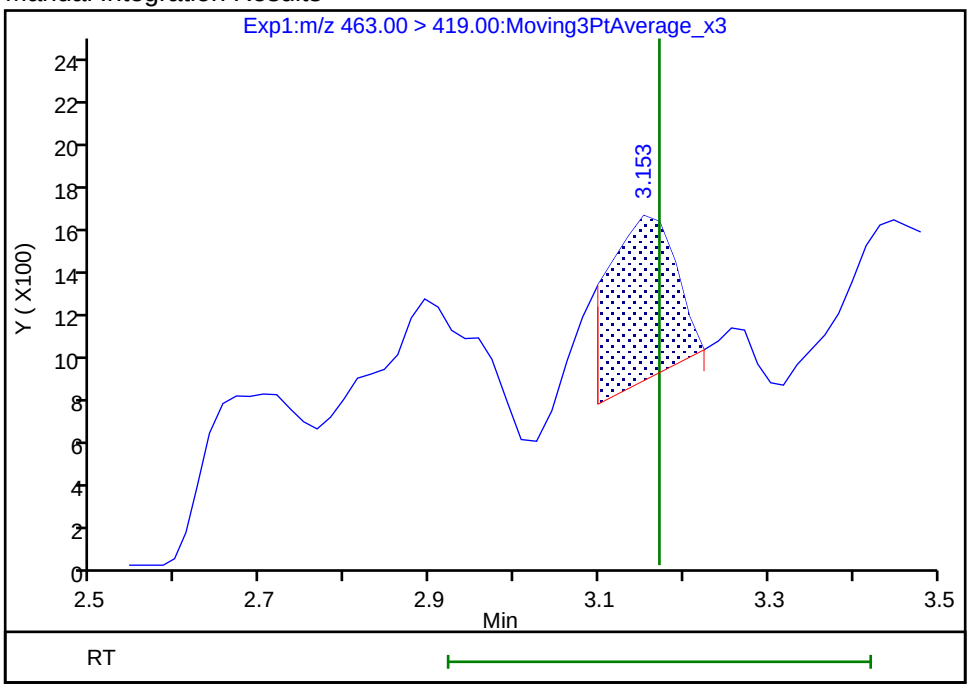
Processing Integration Results

RT: 2.89
Area: 1695
Amount: 0.000595
Amount Units: ng/ml



Manual Integration Results

RT: 3.15
Area: 4063
Amount: 0.001426
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:34:30
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

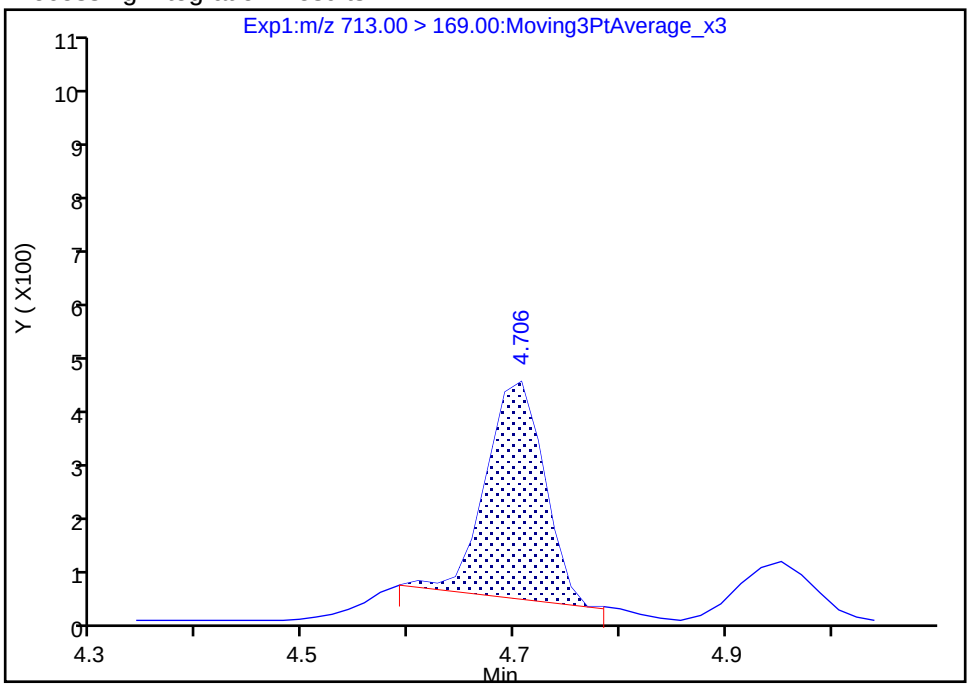
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

42 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 1

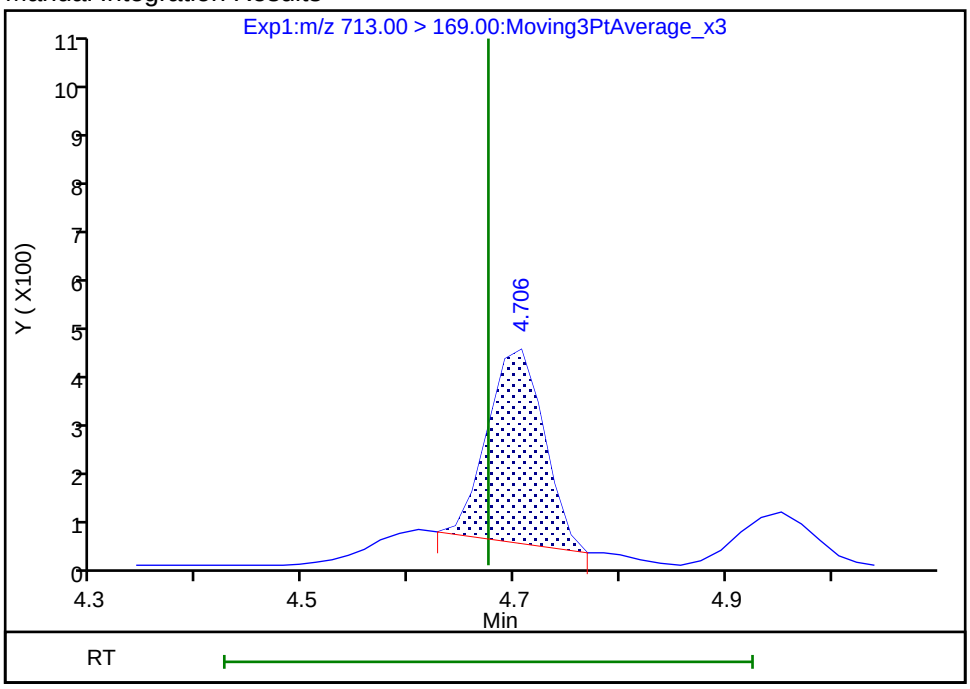
Processing Integration Results

RT: 4.71
Area: 1514
Amount: 0.003895
Amount Units: ng/ml



Manual Integration Results

RT: 4.71
Area: 1444
Amount: 0.003715
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:34:58
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

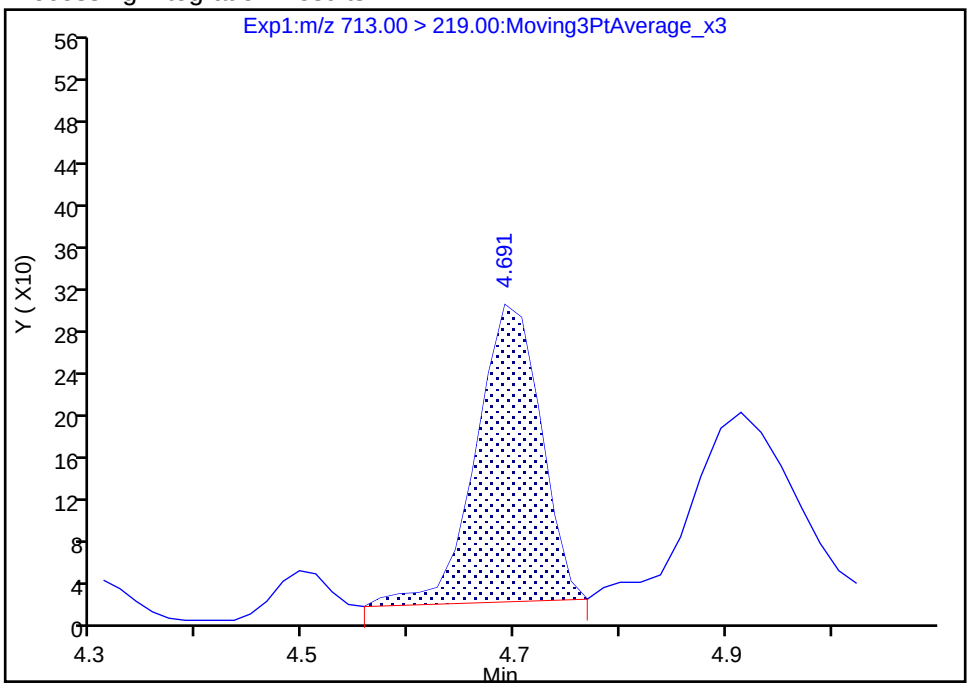
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

42 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 2

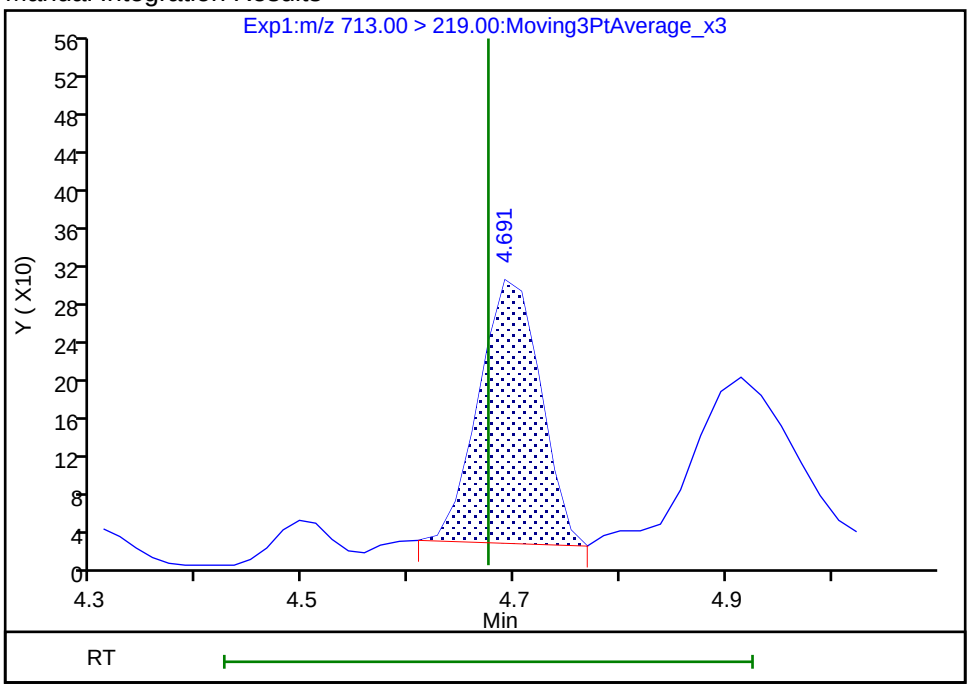
Processing Integration Results

RT: 4.69
Area: 1195
Amount: 0.003895
Amount Units: ng/ml



Manual Integration Results

RT: 4.69
Area: 1115
Amount: 0.003715
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:35:01
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

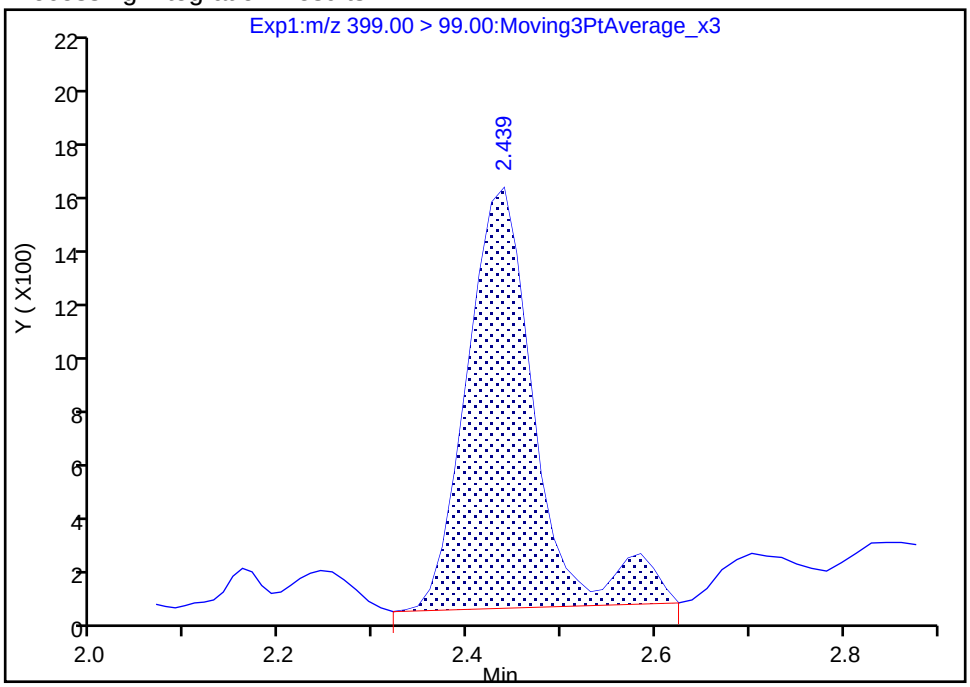
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

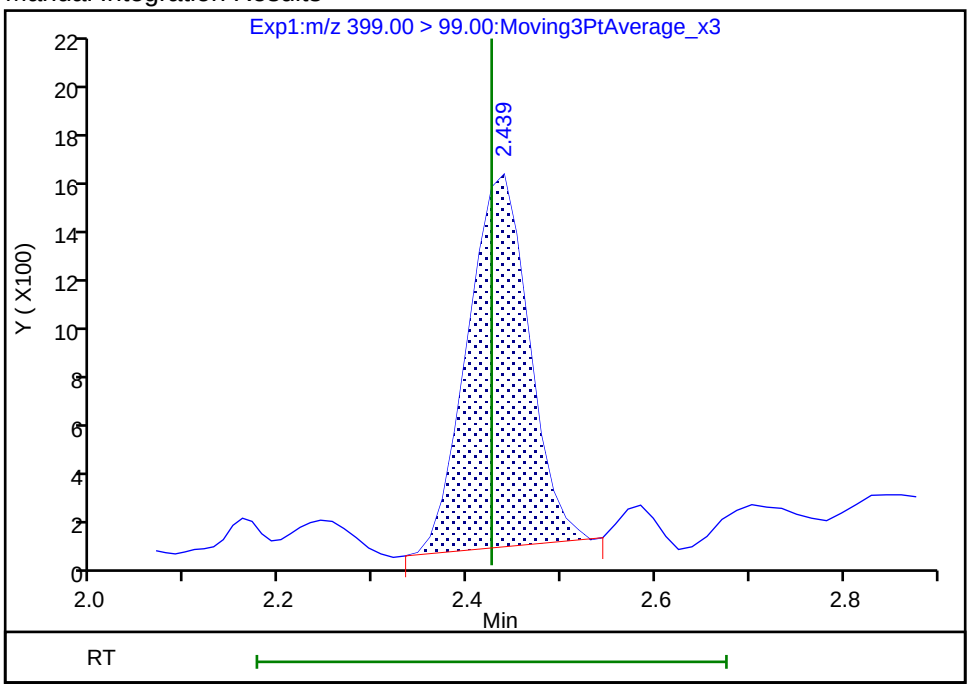
Processing Integration Results

RT: 2.44
Area: 7800
Amount: 0.006649
Amount Units: ng/ml



Manual Integration Results

RT: 2.44
Area: 6868
Amount: 0.006842
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:33:30
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

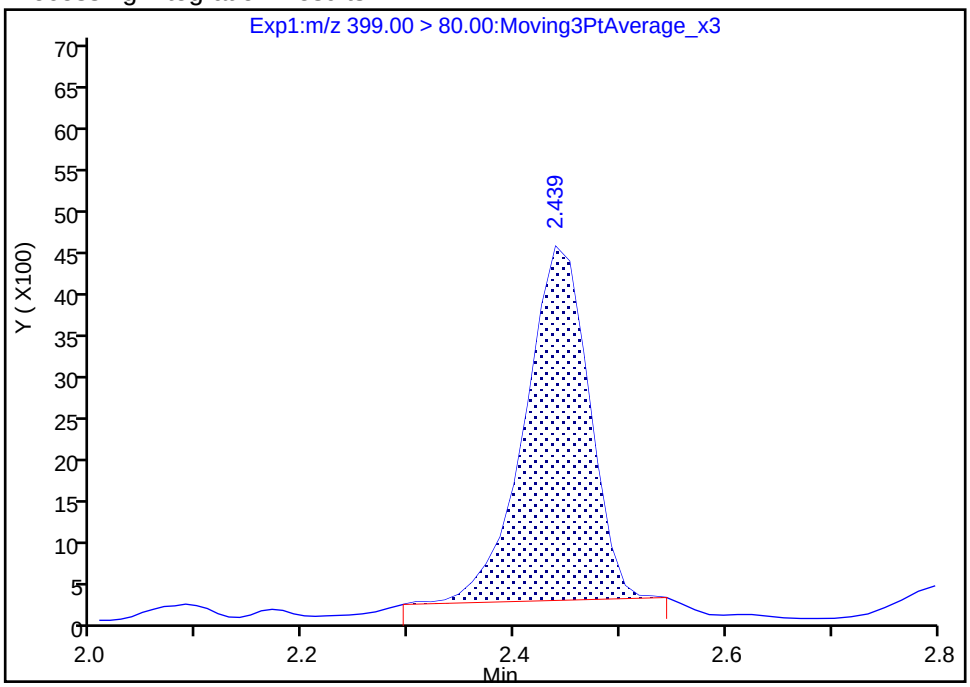
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

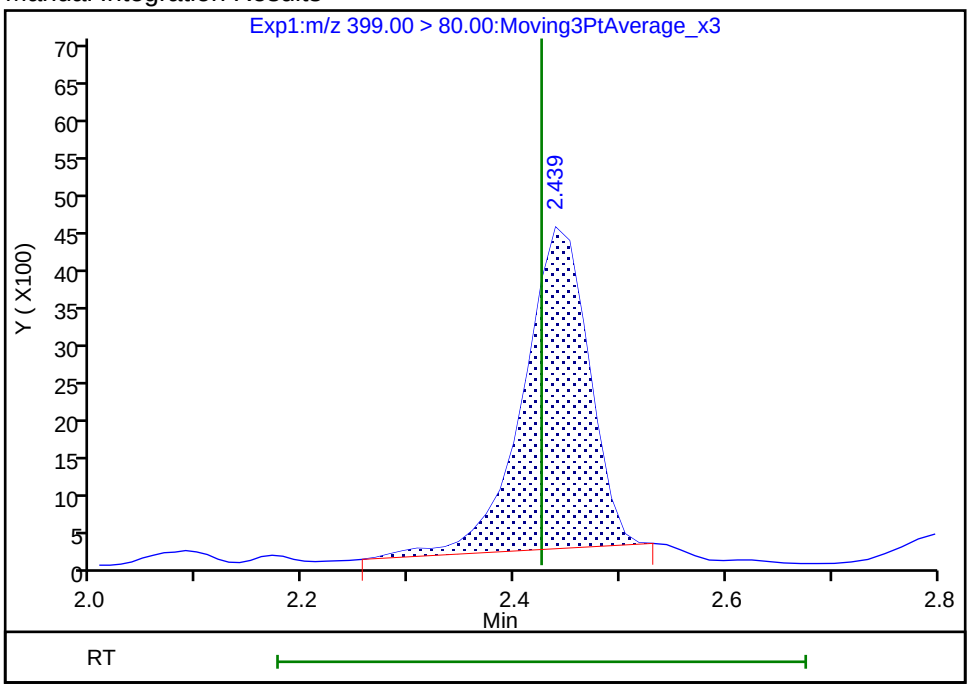
Processing Integration Results

RT: 2.44
Area: 18112
Amount: 0.006649
Amount Units: ng/ml



Manual Integration Results

RT: 2.44
Area: 18637
Amount: 0.006842
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:33:34
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

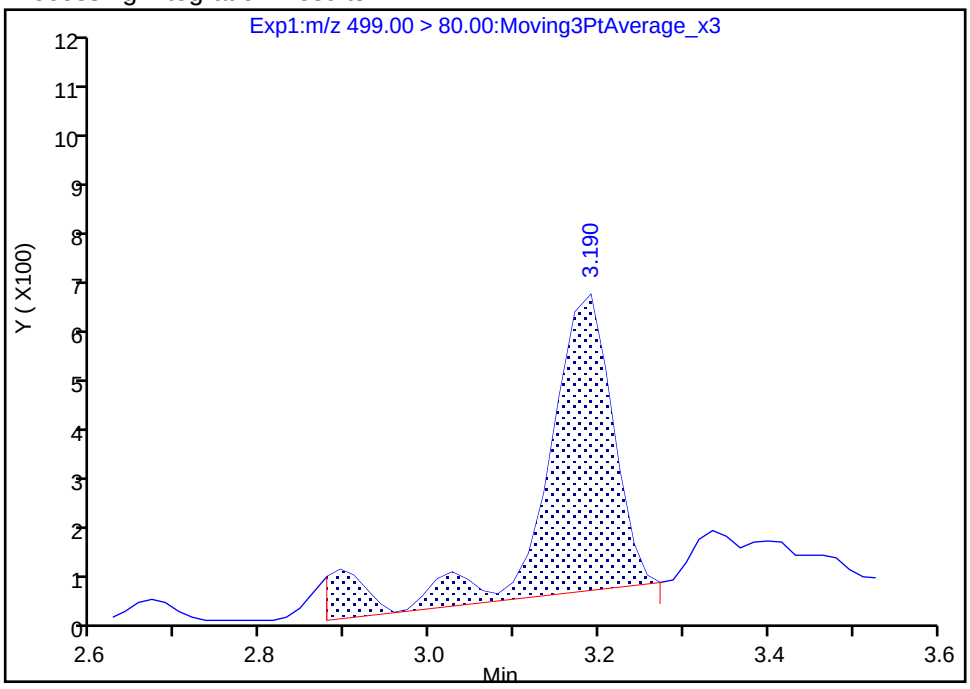
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

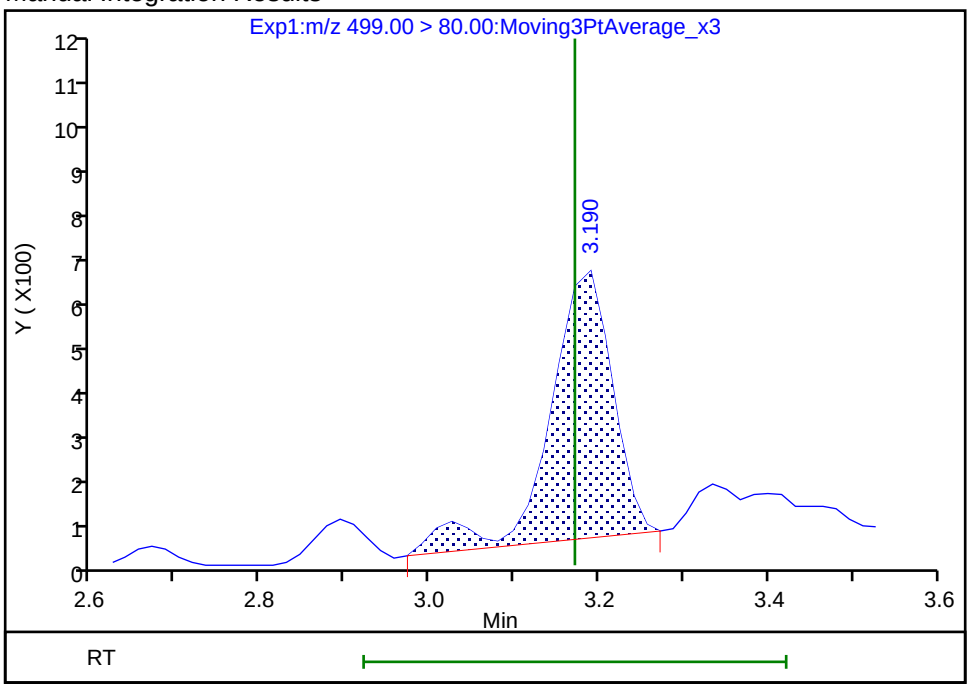
Processing Integration Results

RT: 3.19
Area: 3221
Amount: 0.001315
Amount Units: ng/ml



Manual Integration Results

RT: 3.19
Area: 2924
Amount: 0.001193
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:33:56
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

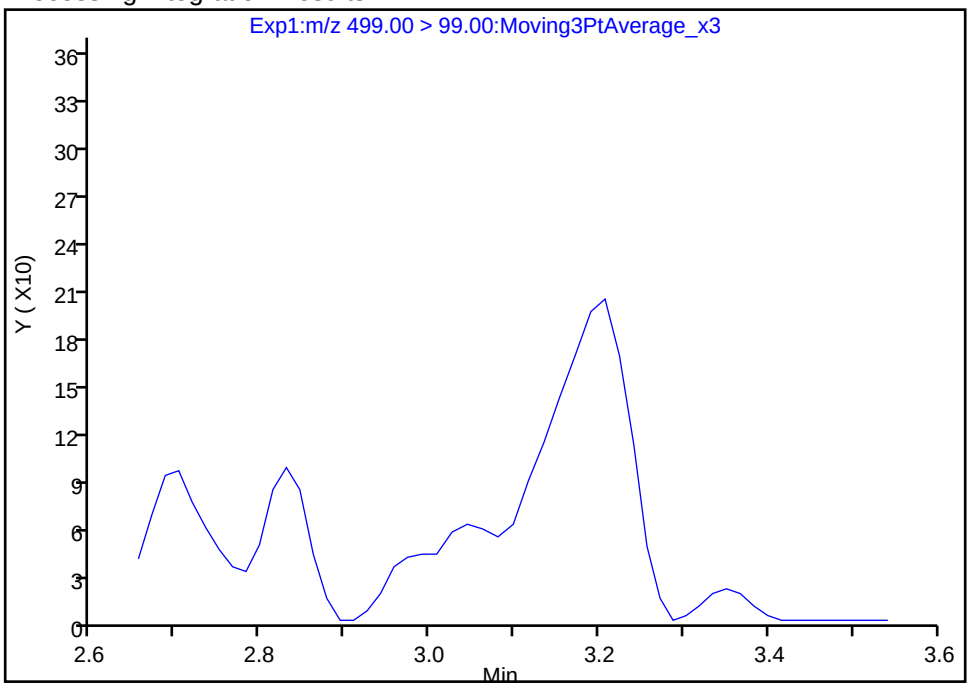
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64256.b\2018.09.16_LLA_004.d
Injection Date: 16-Sep-2018 13:53:54 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

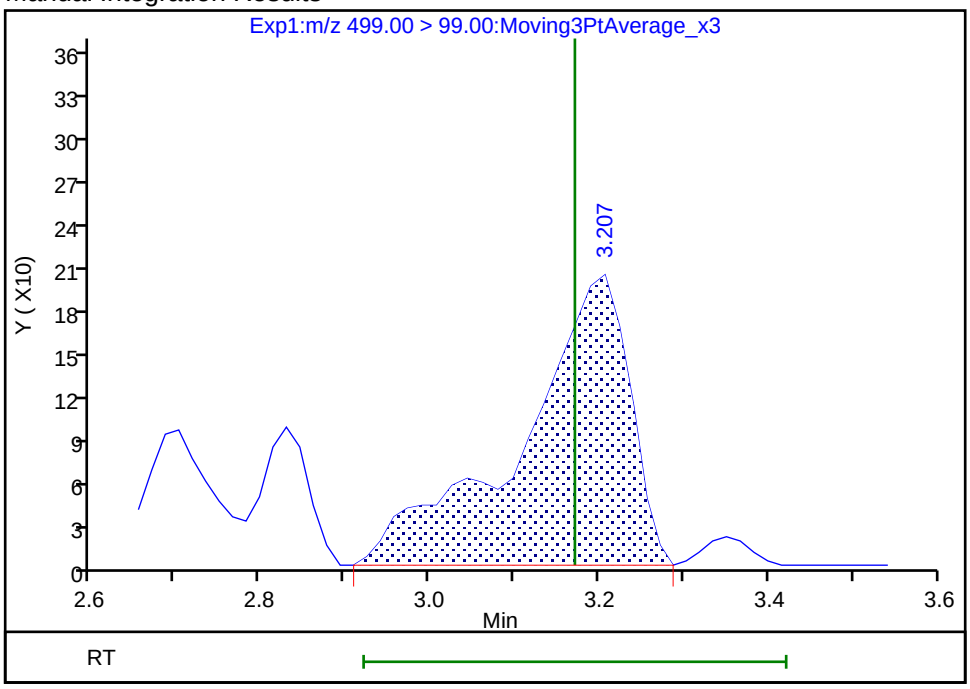
Processing Integration Results

RT: 3.10
Area: 0
Amount: 0.001315
Amount Units: ng/ml



Manual Integration Results

RT: 3.21
Area: 1813
Amount: 0.001193
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 10:34:08
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-246099/2

Matrix: Water Lab File ID: 2018.09.17_LLB_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 09/17/2018 18:09

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 246099 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	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	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U M	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U M	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)	0.00721	J M	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 M	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 M	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-246099/2

Matrix: Water Lab File ID: 2018.09.17_LLB_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 09/17/2018 18:09

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 246099 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	100		50-150
STL00993	13C2 PFHxA	96		50-150
STL01892	13C4-PFHpA	100		50-150
STL00990	13C4 PFOA	98		50-150
STL00995	13C5 PFNA	101		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	99		50-150
STL00998	13C2 PFDoA	99		50-150
STL00994	18O2 PFHxS	102		50-150
STL02116	13C2-PFTeDA	98		50-150
STL00991	13C4 PFOS	98		50-150
STL02337	13C3-PFBS	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 17-Sep-2018 18:09:32 ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: CCB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 18-Sep-2018 15:01:19 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK013

First Level Reviewer: mongkols Date: 18-Sep-2018 15:01:19

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	1.483	1.488	-0.005	0.542	7603019	2.36		94.3	10429	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.763	0.001	0.645	7188252	2.50		99.9	6638	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.797	0.0	0.657	82006	2.17		93.4	493	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.017	0.0	0.738	768117	NC			953	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.047	0.001	0.749	7328202	2.41		96.3	15946	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.150	0.0	0.786	877436	NC			2247	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.373	0.0	0.868	9077822	2.50		100	22970	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.386	0.014	0.878	5396806	2.42		102	9225	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.400	2.387	0.014	1.000	20349	0.007207			28.1	M
399.00 > 99.00	2.400	2.387	0.014	1.000	4181		4.87(1.90-5.70)		5.3	M
D 73 13C8 PFOA										
421.00 > 376.00	2.734	2.718	0.016		7057979	NC			17577	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.718	0.001	0.994	835851	2.34		98.7	1358	
D 14 13C4 PFOA										
417.00 > 372.00	2.734	2.734	0.0	1.000	8297011	2.46		98.2	14596	
* 62 13C2-PFOA										
415.00 > 370.00	2.734	2.735	-0.001		8382047	2.50			14855	

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	2.734	2.735	-0.001	1.000	21352	0.005978			1.3	M
413.00 > 169.00	2.734	2.735	-0.001	1.000	10263		2.08(1.36-4.08)		20.6	
D 72 13C8 PFOS										
507.00 > 99.00	3.098	3.098	0.0		1160843	NC			1809	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.117	3.099	0.018	1.000	3889	0.001568			5.9	M
499.00 > 99.00	3.117	3.099	0.018	1.000	208		18.70(2.04-6.12)		1.0	M
D 19 13C5 PFNA										
468.00 > 423.00	3.117	3.116	0.001	1.140	7958166	2.52		101	13077	
D 18 13C4 PFOS										
503.00 > 80.00	3.117	3.116	0.001	1.140	5618660	2.34		98.1	4415	
D 23 13C2 PFDA										
515.00 > 470.00	3.465	3.465	0.0	1.267	8055510	2.55		102	10970	
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.465	0.0	1.267	3210424	2.53		101	5429	
D 26 M2-8:2FTS										
529.00 > 81.00	3.465	3.465	0.0	1.267	115176	2.20		91.7	408	
22 Perfluorooctane Sulfonamide										M
498.00 > 78.00	3.480	3.465	0.015	1.004	2915	0.000766			5.4	M
24 Perfluorodecanoic acid										RM
513.00 > 469.00	3.465	3.465	0.0	1.000	4215	0.001149			1.0	RM
513.00 > 169.00	3.449	3.465	-0.016	0.995	1083		3.89(7.12-21.35)		3.1	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.627	3.627	0.0	1.327	3509389	2.46		98.5	4271	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.791	3.791	0.0	1.387	2985277	2.66		107	2985	
D 30 13C2 PFUnA										
565.00 > 520.00	3.791	3.791	0.0	1.387	6634561	2.47		98.7	19121	
31 Perfluoroundecanoic acid										RM
563.00 > 519.00	3.791	3.791	0.0	1.000	13430	0.005641			3.2	RM
563.00 > 169.00	3.807	3.791	0.016	1.004	3106		4.32(5.24-15.72)		18.2	
D 36 13C2 PFDoA										
615.00 > 570.00	4.089	4.089	0.0	1.495	8092891	2.47		98.9	14989	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.295	4.139	0.156		11021	NC			43.9	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.591	4.591	0.0	1.679	6374441	2.45		97.8	13083	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.007	5.007	0.0	1.831	6922087	2.62		105	6126	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.007	5.007	0.0	1.000	64852	NC			24.3	
813.00 > 169.00	5.007	5.007	0.0	1.000	10533		6.16(2.77-8.32)		42.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00008 Amount Added: 1.00 Units: mL

Report Date: 18-Sep-2018 15:01:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d

Injection Date: 17-Sep-2018 18:09:32 Instrument ID: A9

Lims ID: CCB

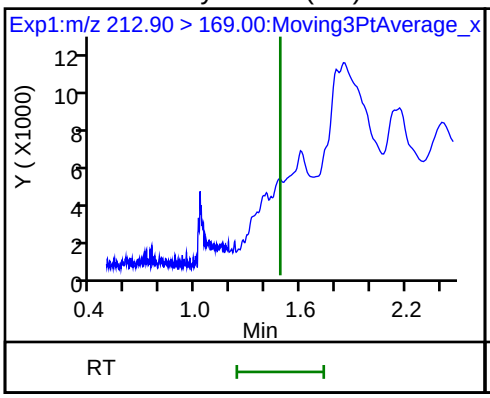
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2

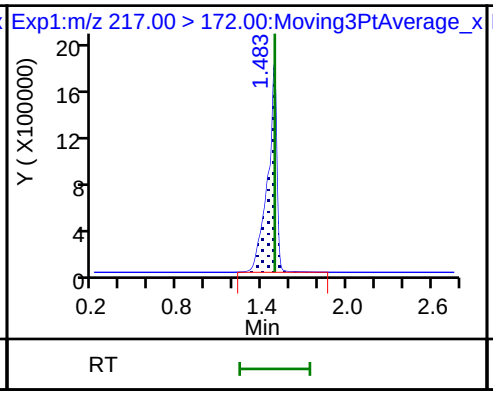
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

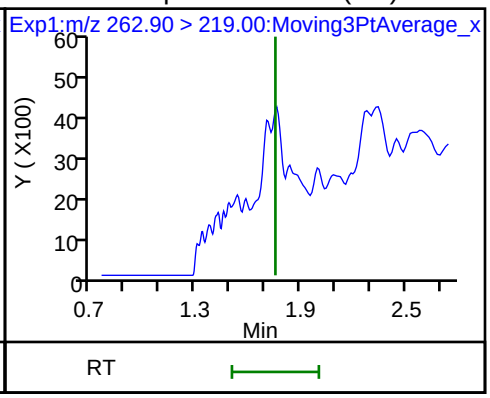
2 Perfluorobutyric acid (ND)



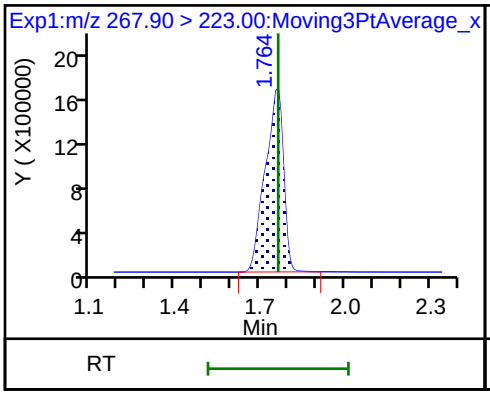
D 1 13C4 PFBA



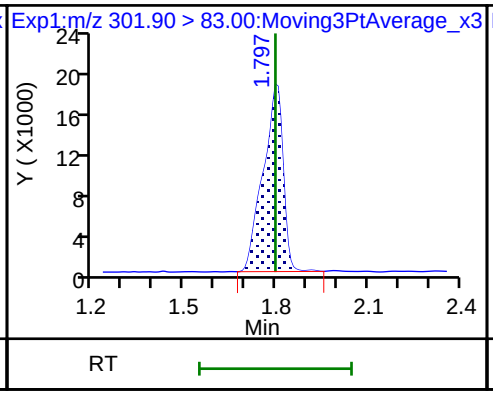
4 Perfluoropentanoic acid (ND)



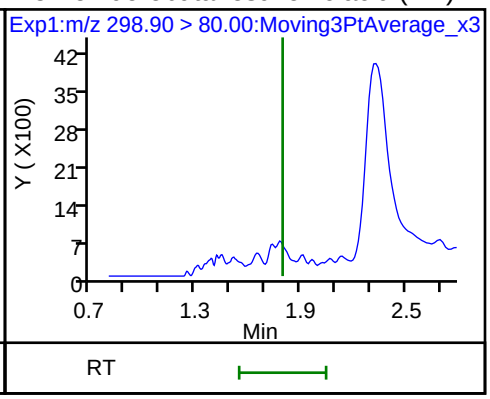
D 3 13C5-PFPeA



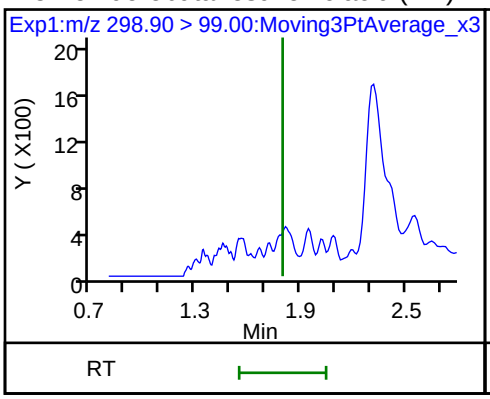
D 47 13C3-PFBS



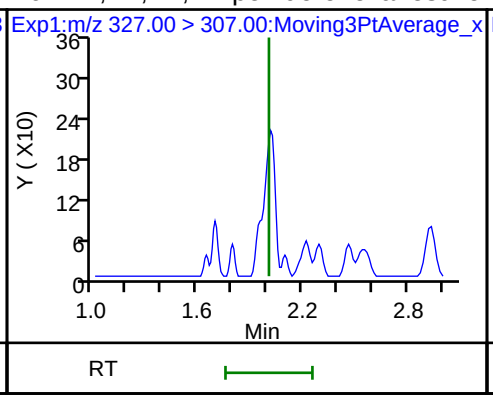
5 Perfluorobutanesulfonic acid (ND)



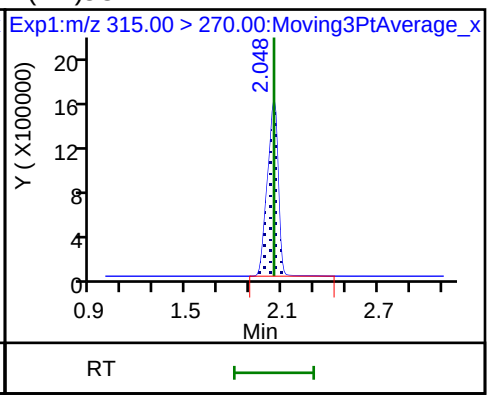
5 Perfluorobutanesulfonic acid (ND)



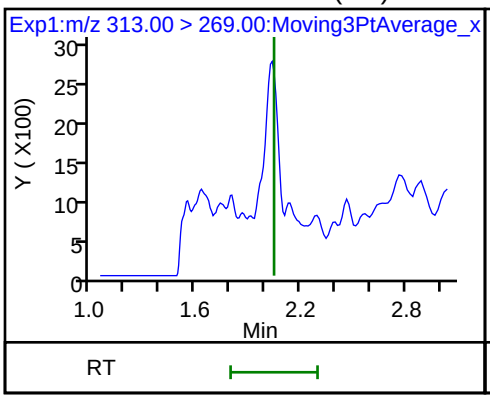
61 1H,1H,2H,2H-perfluorohexanesulfonic (NT)



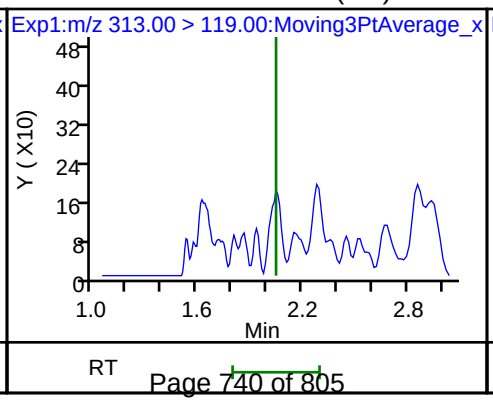
D 13C2 PFHxA



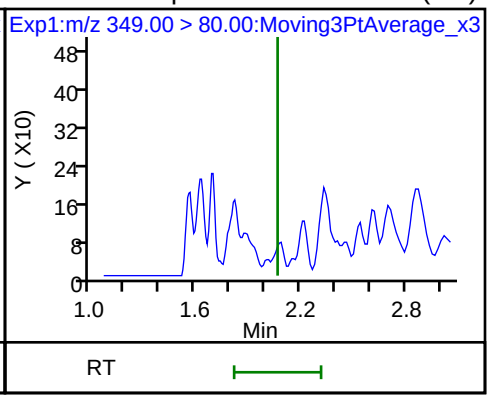
6 Perfluorohexanoic acid (ND)



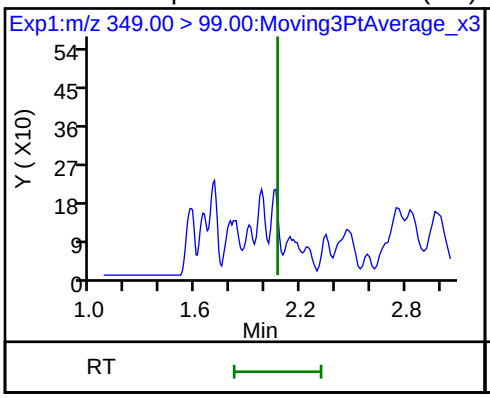
6 Perfluorohexanoic acid (ND)



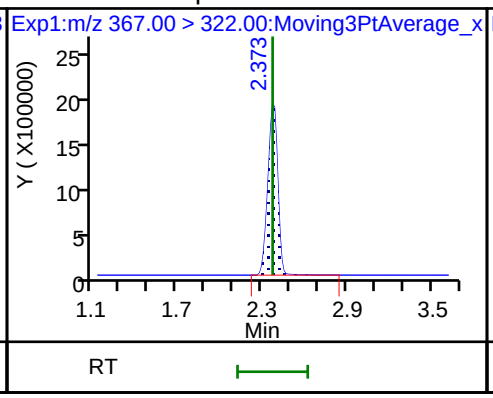
70 Perfluoropentanesulfonic acid (ND)



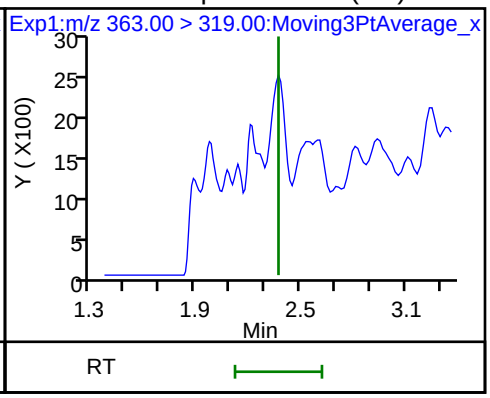
70 Perfluoropentanesulfonic acid (ND)



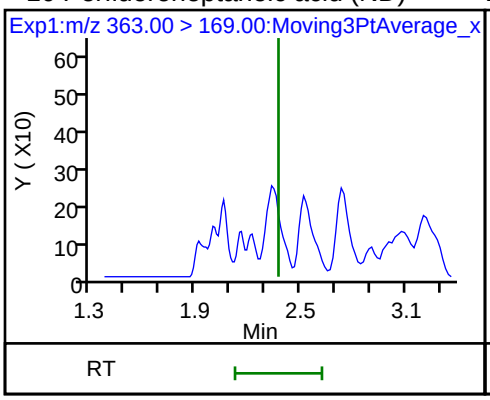
D 9 13C4-PFHpA



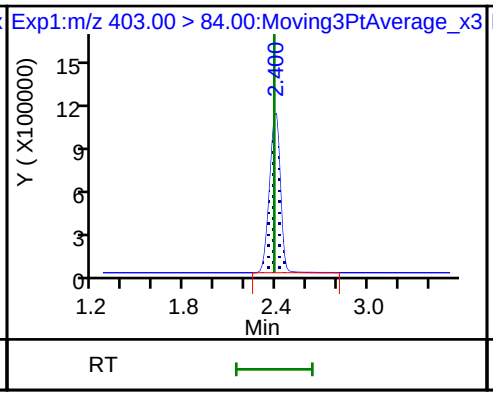
10 Perfluoroheptanoic acid (ND)



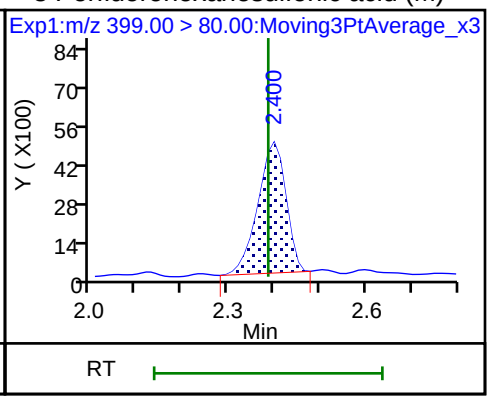
10 Perfluoroheptanoic acid (ND)



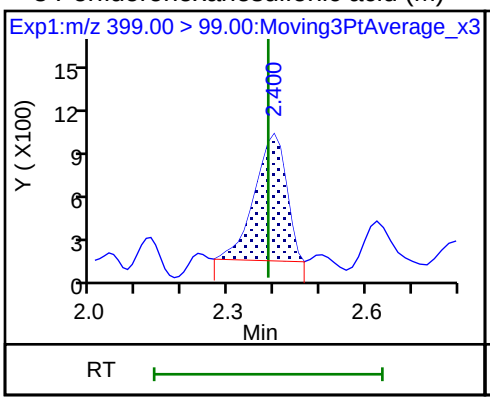
D 11 18O2 PFHxS



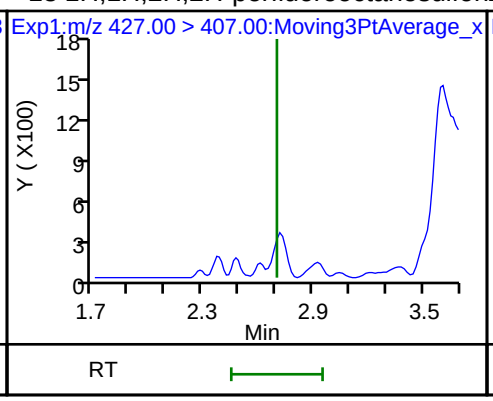
8 Perfluorohexanesulfonic acid (M)



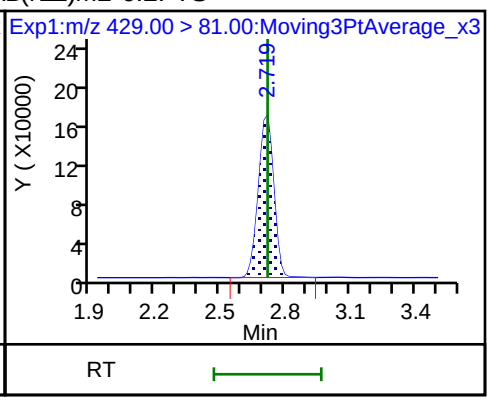
8 Perfluorohexanesulfonic acid (M)



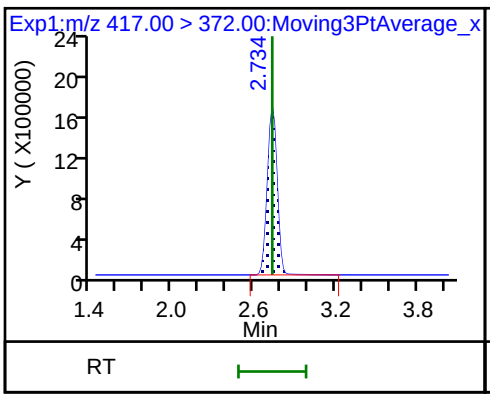
13 1H,1H,2H,2H-perfluorooctanesulfonic(M2)



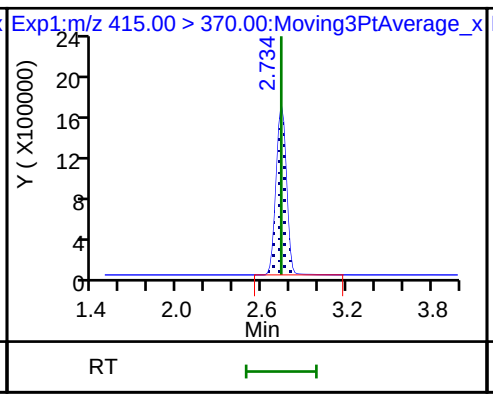
D(M2)M2-6:2FTS



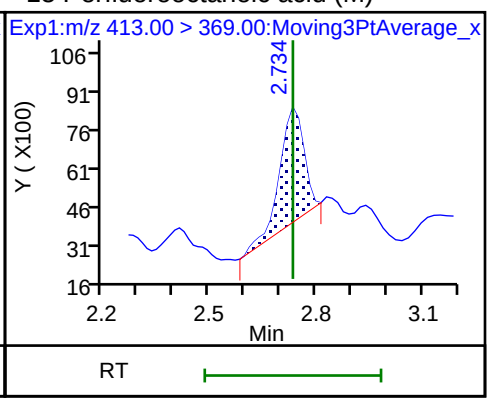
D 14 13C4 PFOA



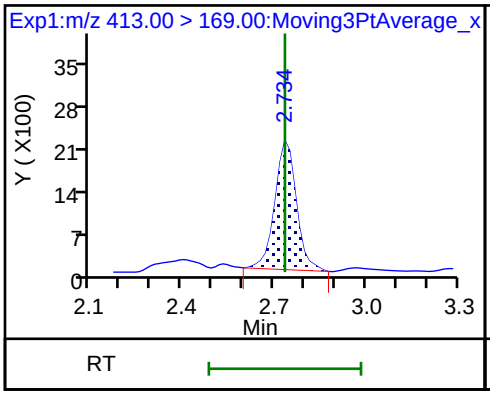
* 62 13C2-PFOA



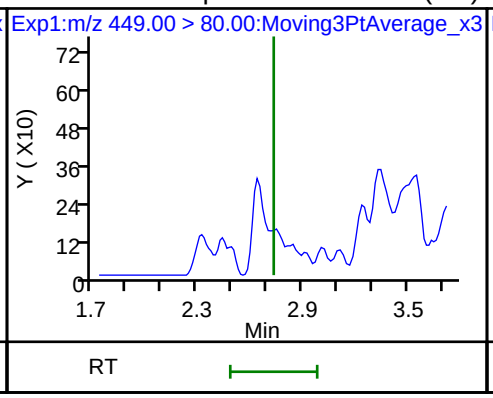
15 Perfluorooctanoic acid (M)



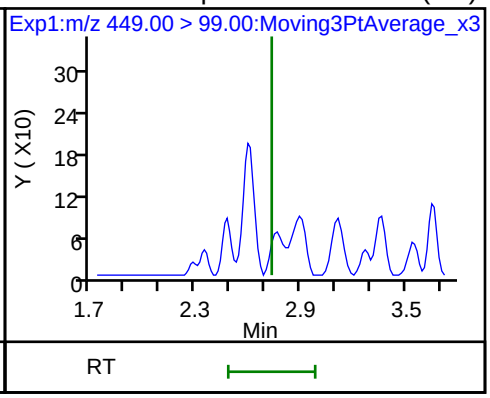
15 Perfluorooctanoic acid



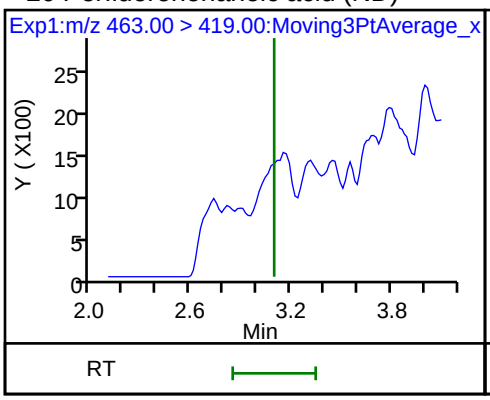
16 Perfluoroheptanesulfonic acid (ND)



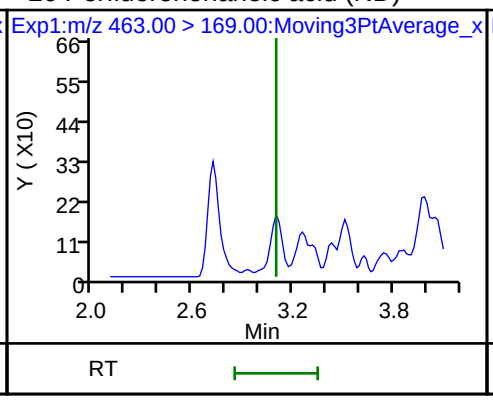
16 Perfluoroheptanesulfonic acid (ND)



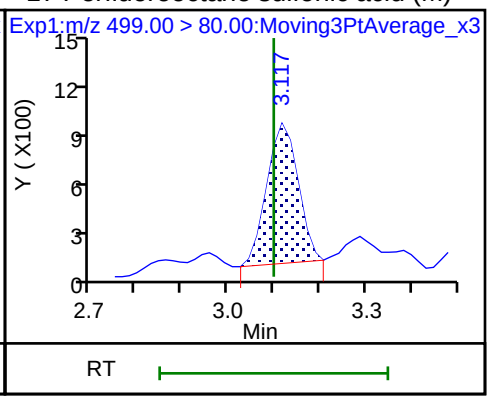
20 Perfluorononanoic acid (ND)



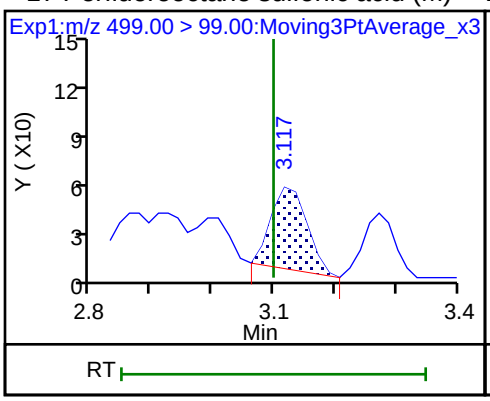
20 Perfluorononanoic acid (ND)



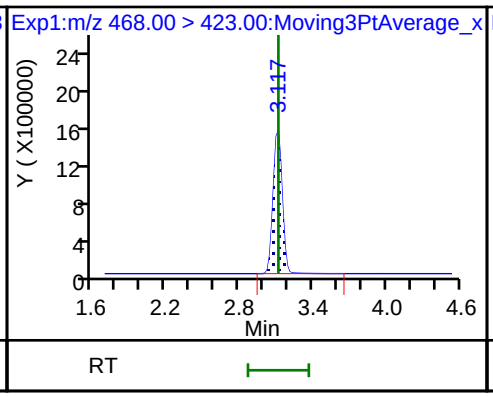
17 Perfluorooctane sulfonic acid (M)



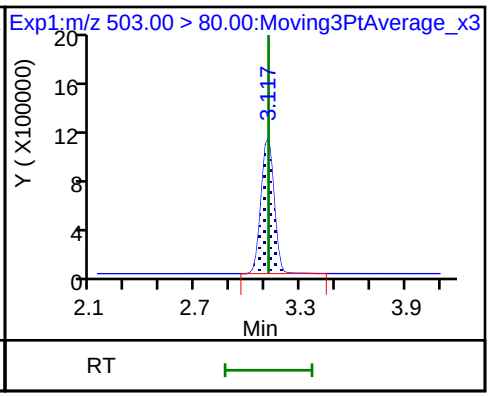
17 Perfluorooctane sulfonic acid (M)



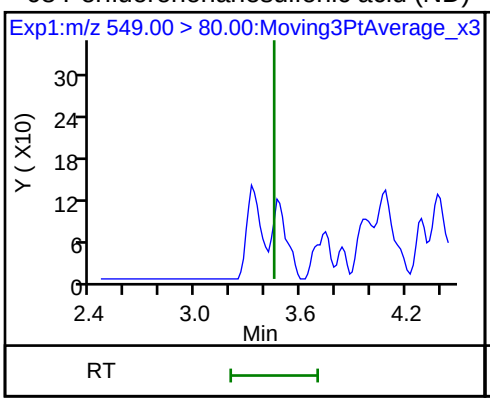
D 19 13C5 PFNA



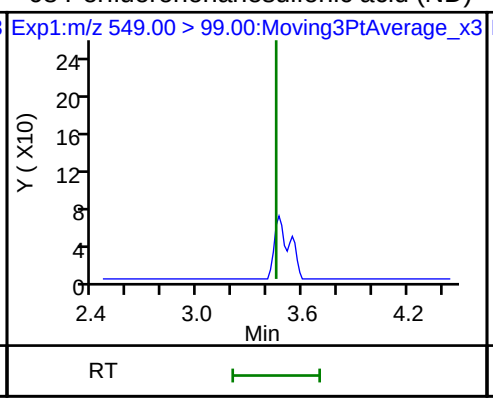
D 18 13C4 PFOS



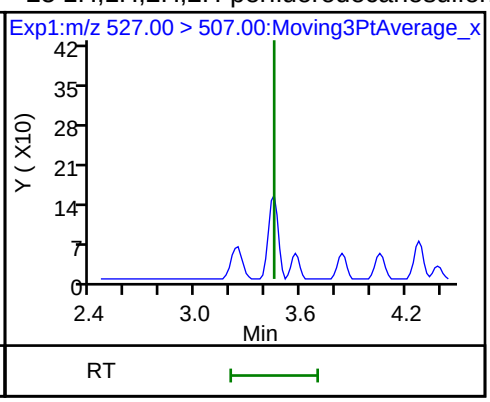
68 Perfluorononanesulfonic acid (ND)



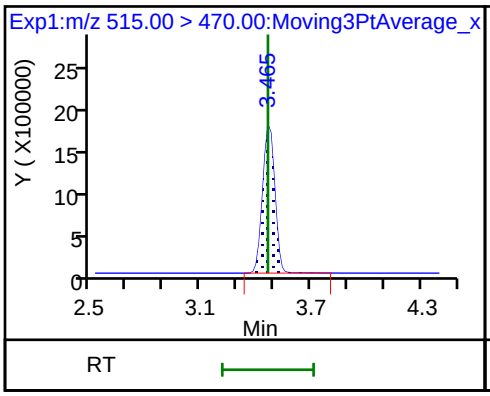
68 Perfluorononanesulfonic acid (ND)



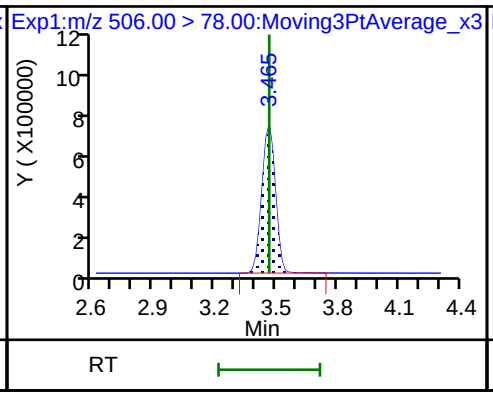
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



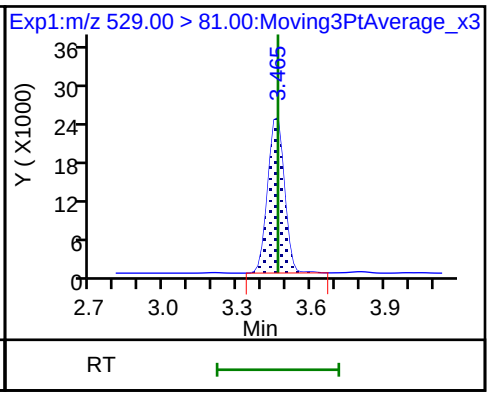
D 23 13C2 PFDA



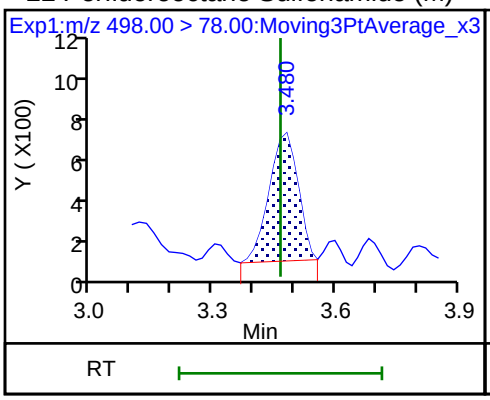
D 21 13C8 FOSA



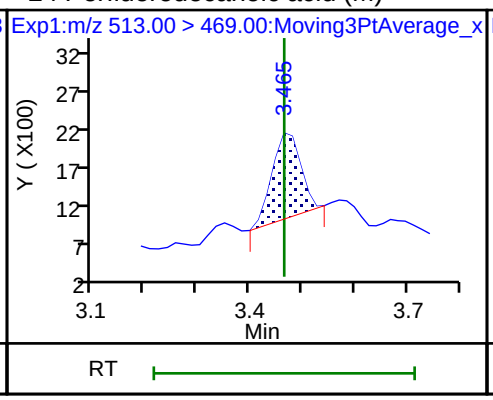
D 26 M2-8:2FTS



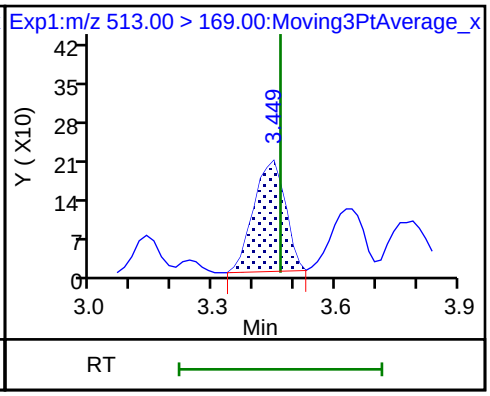
22 Perfluorooctane Sulfonamide (M)



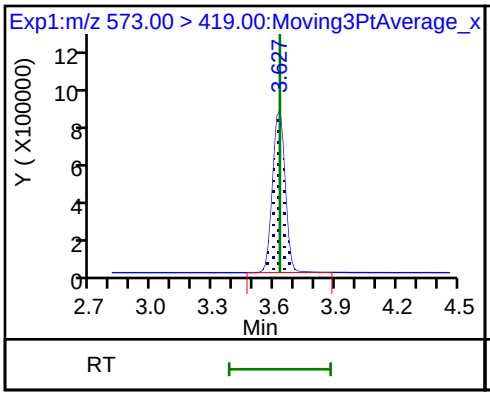
24 Perfluorodecanoic acid (M)



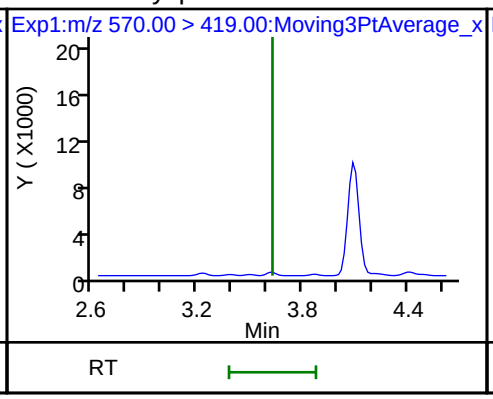
24 Perfluorodecanoic acid



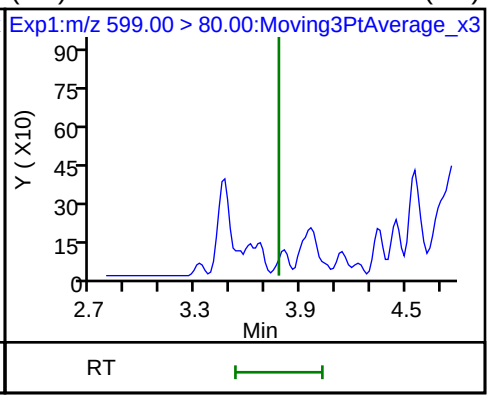
D 27 d3-NMeFOSAA



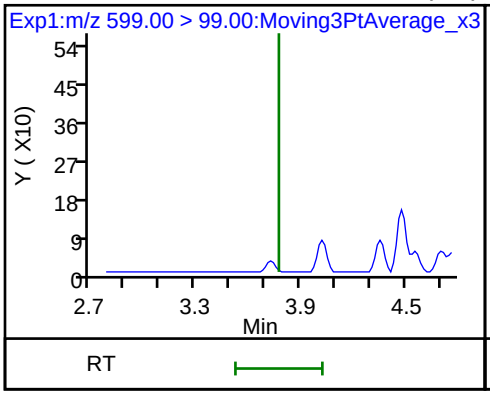
28 N-methyl perfluorooctane sulfonami (M)



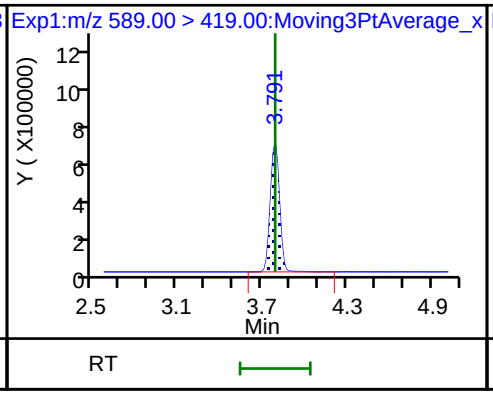
29 Perfluorodecane Sulfonic acid (ND)



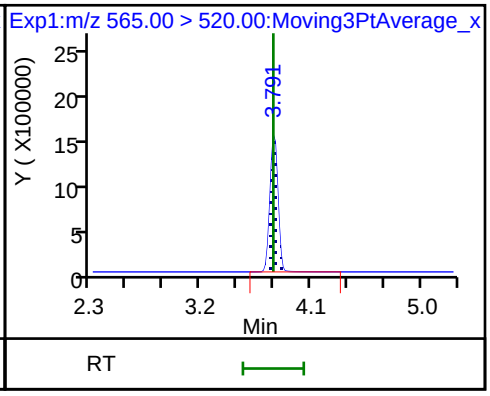
29 Perfluorodecane Sulfonic acid (ND)



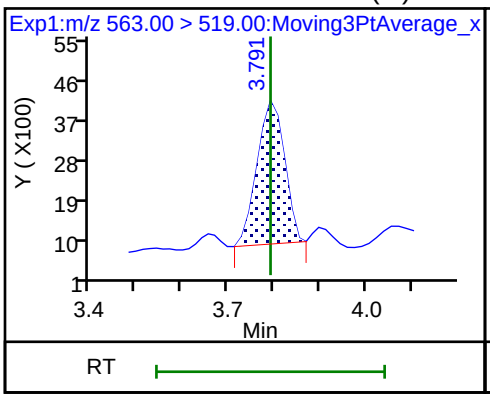
D 32 d5-NEtFOSAA



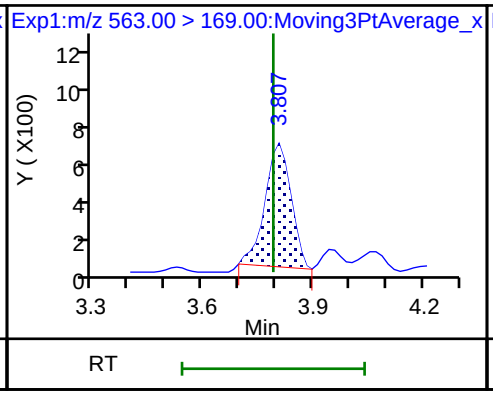
D 30 13C2 PFUnA



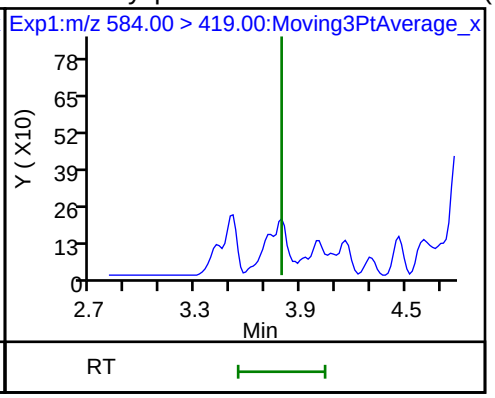
31 Perfluoroundecanoic acid (M)



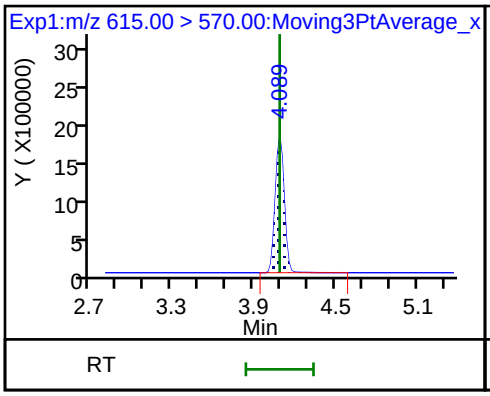
31 Perfluoroundecanoic acid



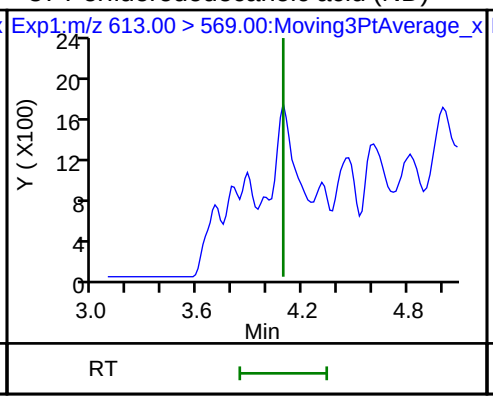
33 N-ethyl perfluorooctane sulfonamid (ND)



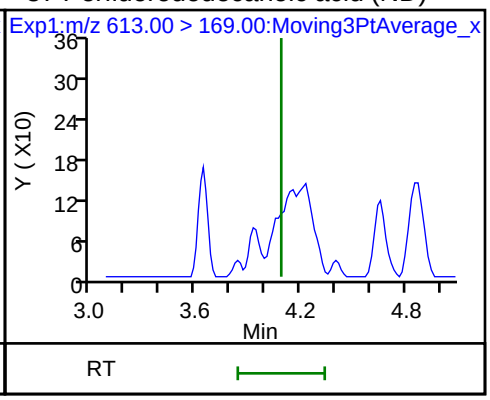
D 36 13C2 PFDoA



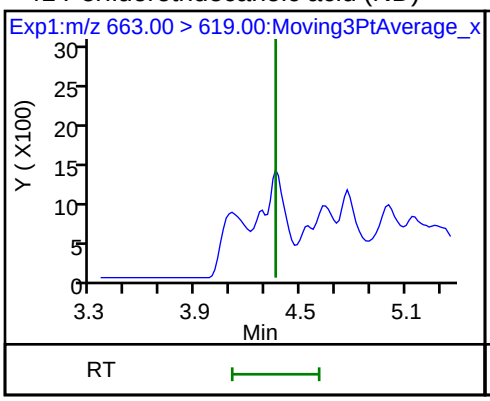
37 Perfluorododecanoic acid (ND)



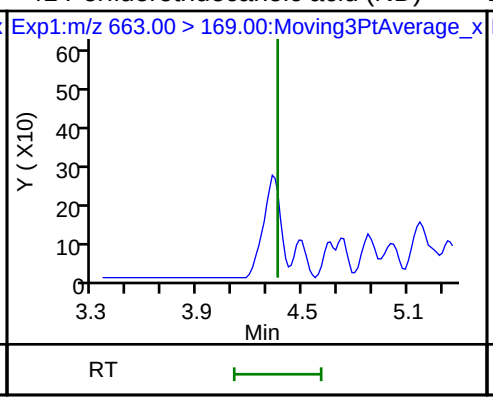
37 Perfluorododecanoic acid (ND)



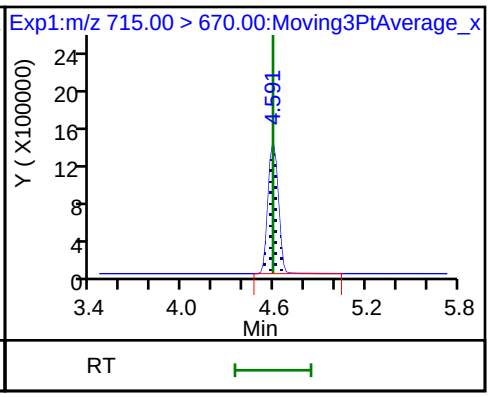
41 Perfluorotridecanoic acid (ND)



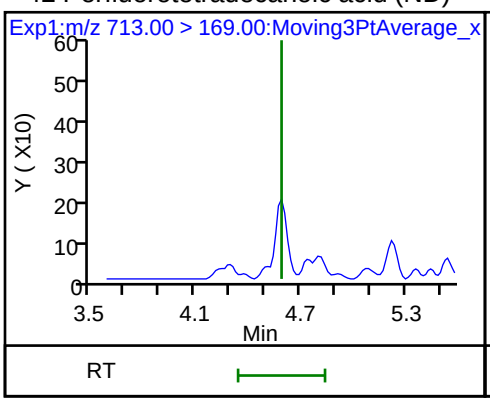
41 Perfluorotridecanoic acid (ND)



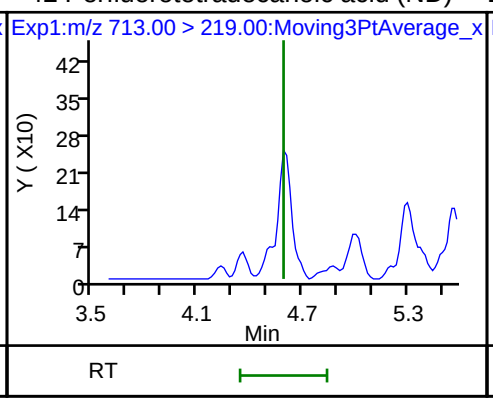
D 43 13C2-PFTeDA



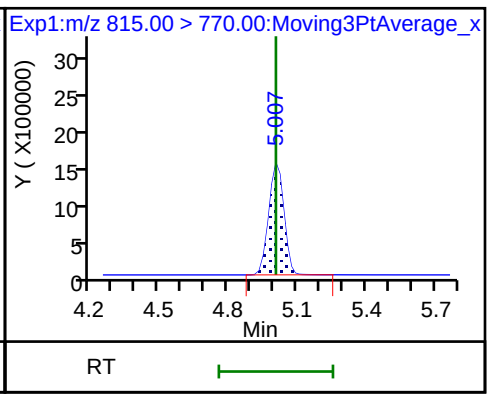
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

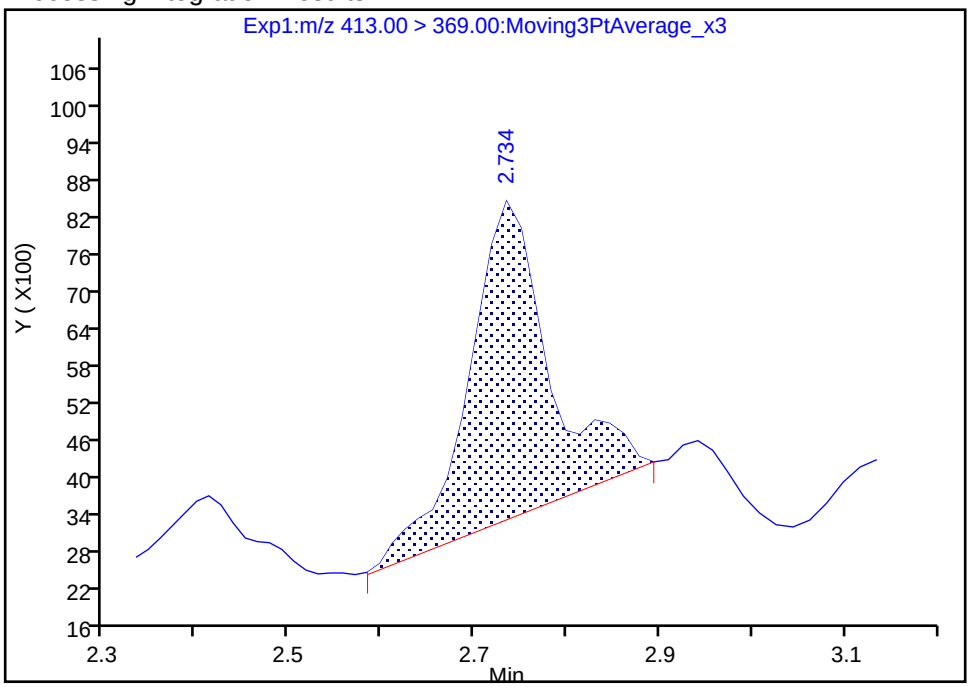
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d
Injection Date: 17-Sep-2018 18:09:32 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

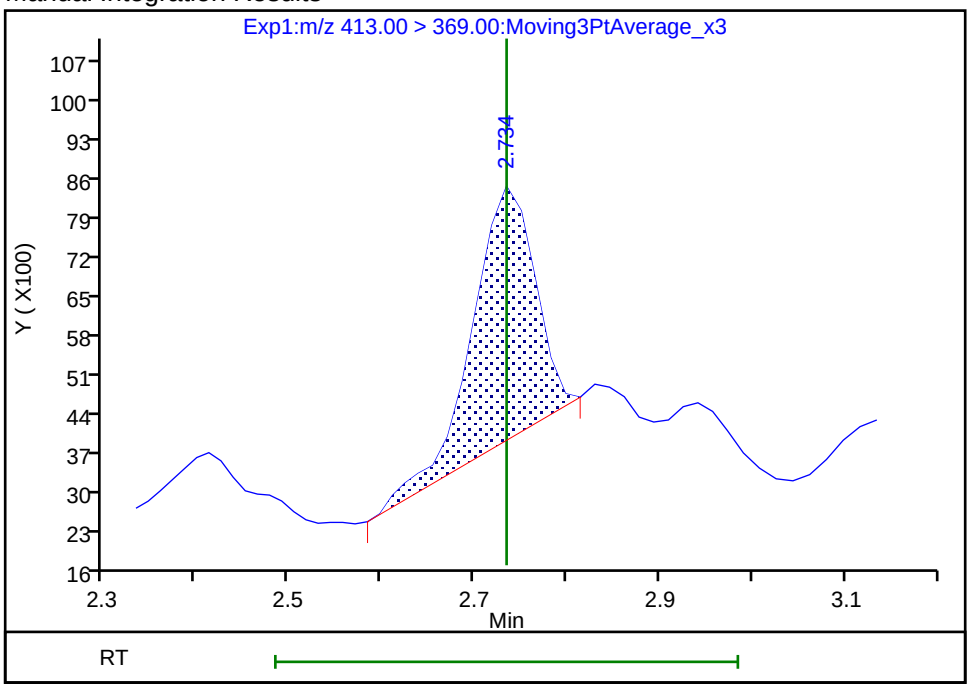
Processing Integration Results

RT: 2.73
Area: 31016
Amount: 0.008683
Amount Units: ng/ml



Manual Integration Results

RT: 2.73
Area: 21352
Amount: 0.005978
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:00:43
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

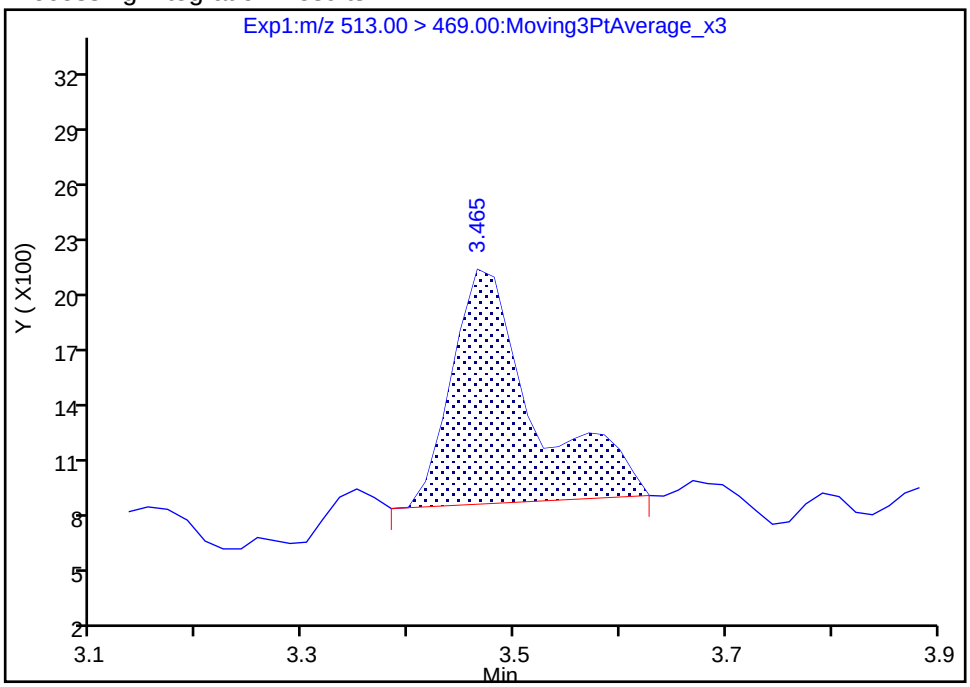
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d
Injection Date: 17-Sep-2018 18:09:32 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 1

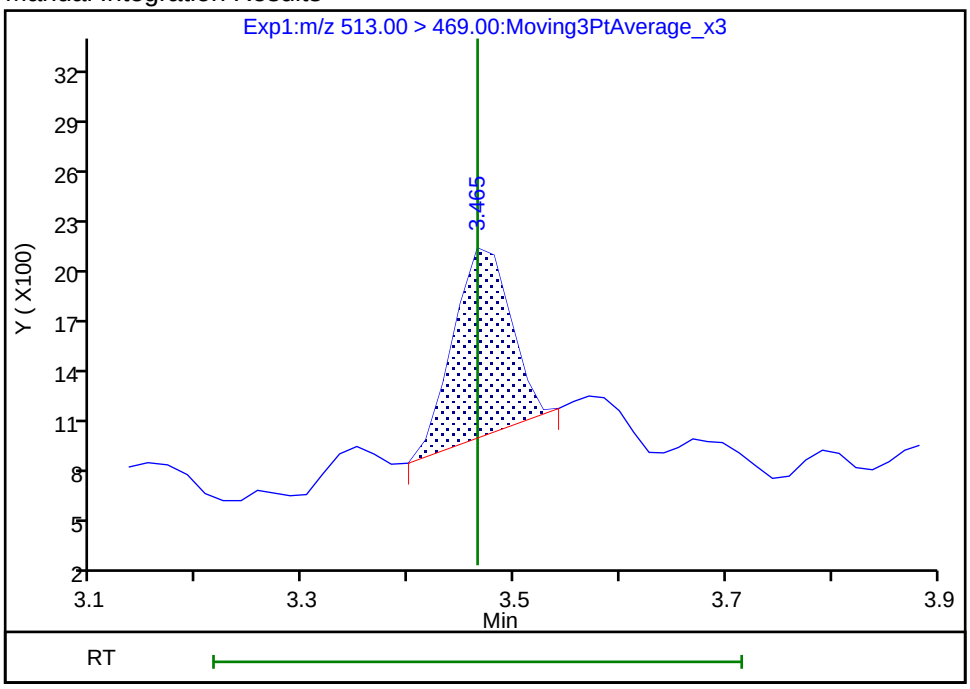
Processing Integration Results

RT: 3.46
Area: 6745
Amount: 0.001839
Amount Units: ng/ml



Manual Integration Results

RT: 3.46
Area: 4215
Amount: 0.001149
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:01:05
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

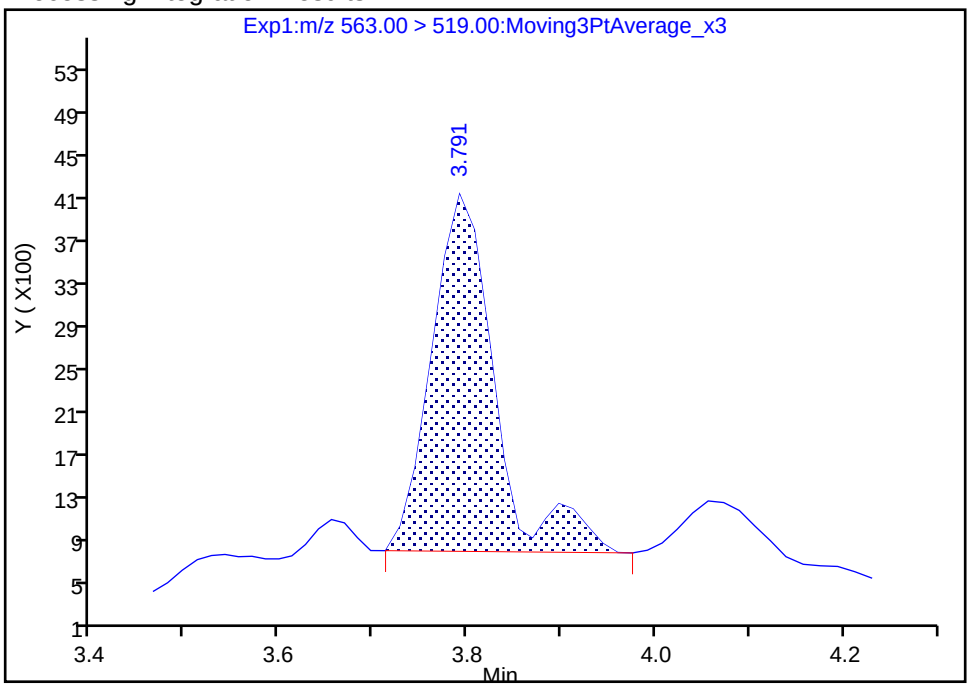
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d
Injection Date: 17-Sep-2018 18:09:32 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

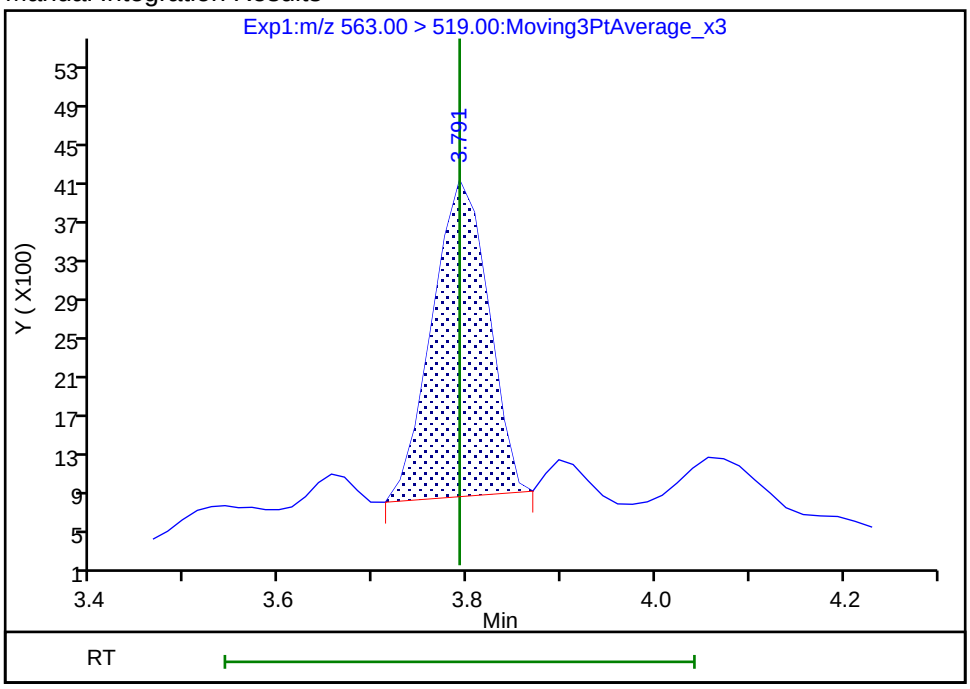
Processing Integration Results

RT: 3.79
Area: 15406
Amount: 0.006471
Amount Units: ng/ml



Manual Integration Results

RT: 3.79
Area: 13430
Amount: 0.005641
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:01:12
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

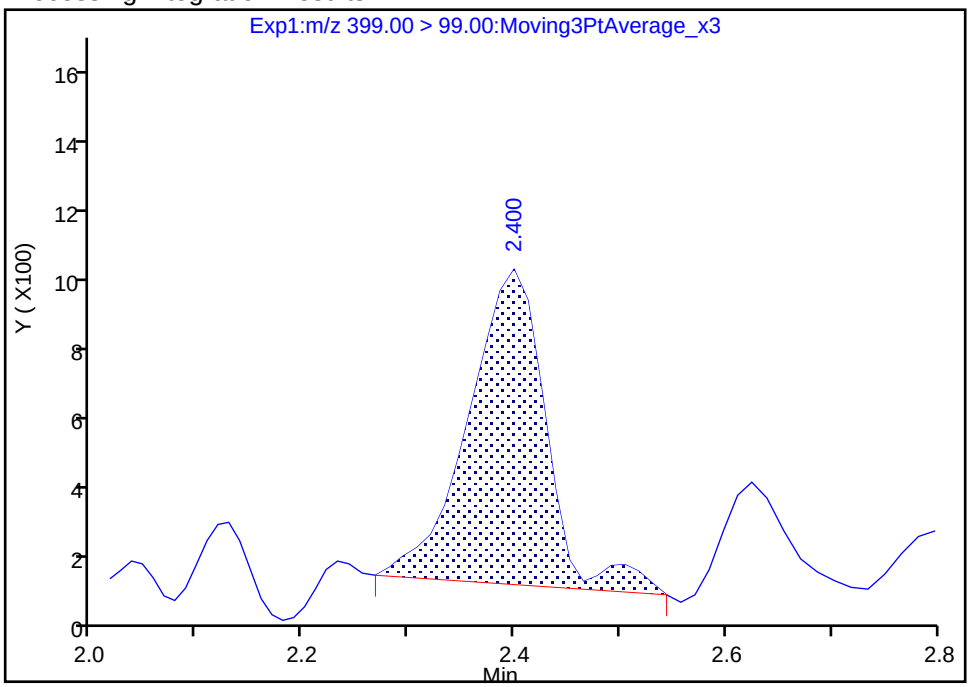
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d				
Injection Date:	17-Sep-2018 18:09:32	Instrument ID:	A9		
Lims ID:	CCB				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	20	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

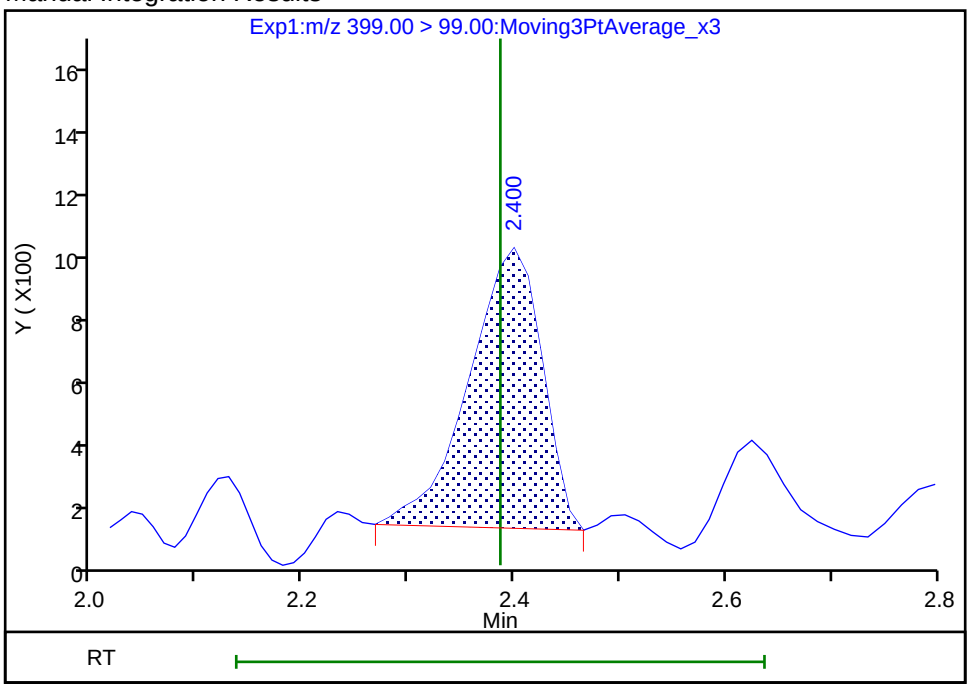
Processing Integration Results

RT: 2.40
Area: 4534
Amount: 0.007567
Amount Units: ng/ml



Manual Integration Results

RT: 2.40
Area: 4181
Amount: 0.007207
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:00:31

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

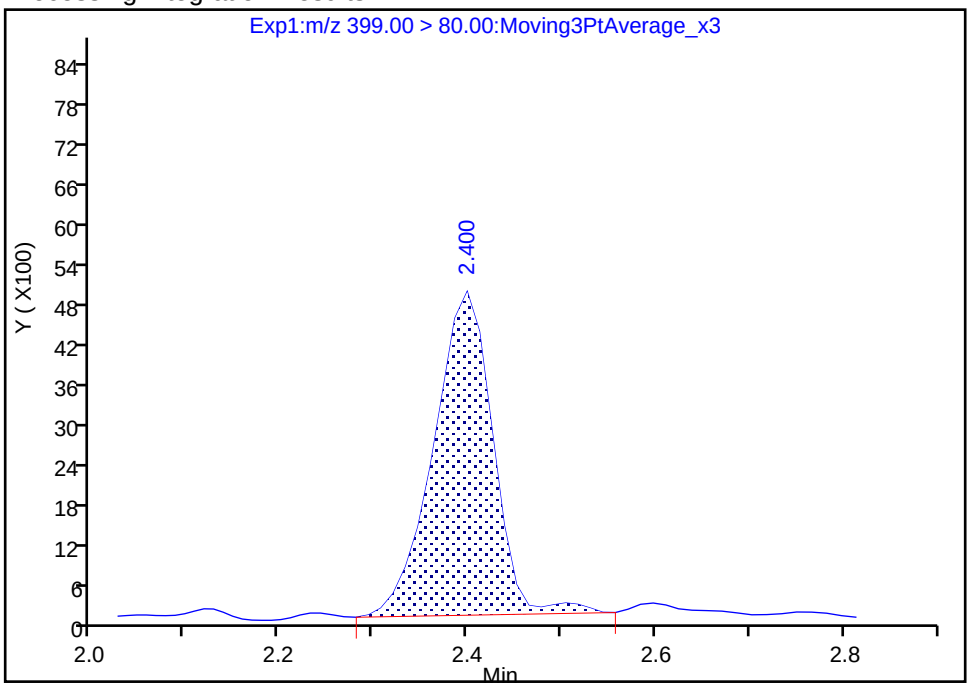
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d
Injection Date: 17-Sep-2018 18:09:32 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

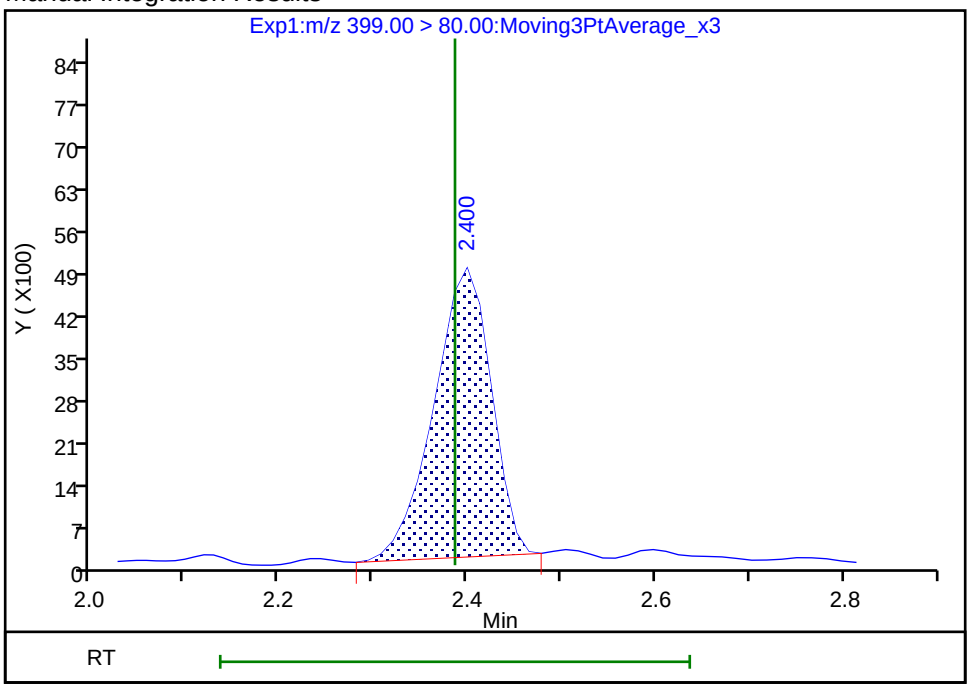
Processing Integration Results

RT: 2.40
Area: 21368
Amount: 0.007567
Amount Units: ng/ml



Manual Integration Results

RT: 2.40
Area: 20349
Amount: 0.007207
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:00:34
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

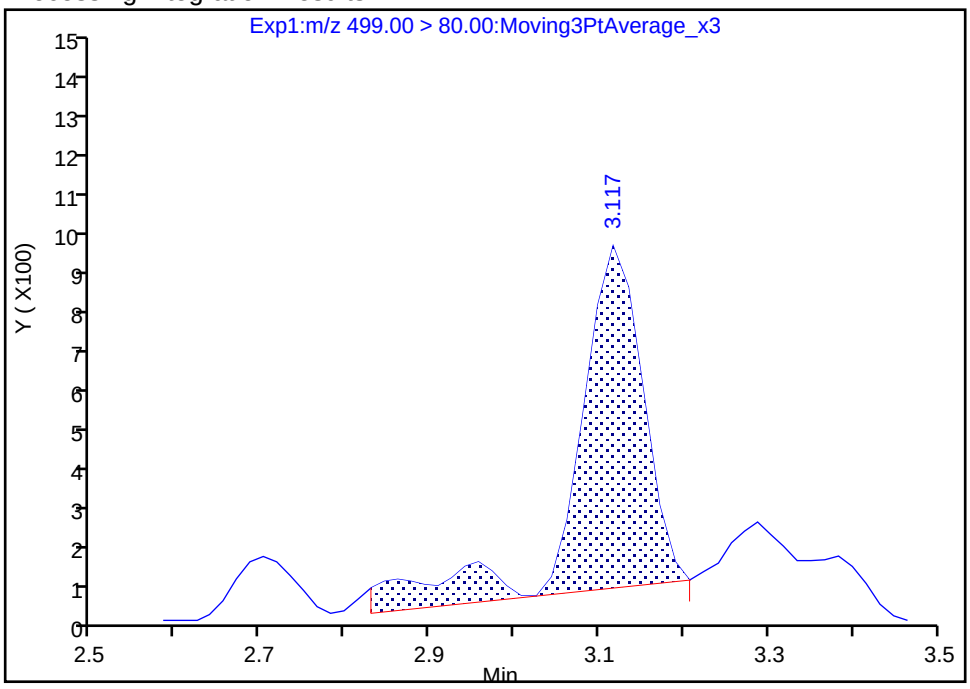
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d
Injection Date: 17-Sep-2018 18:09:32 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

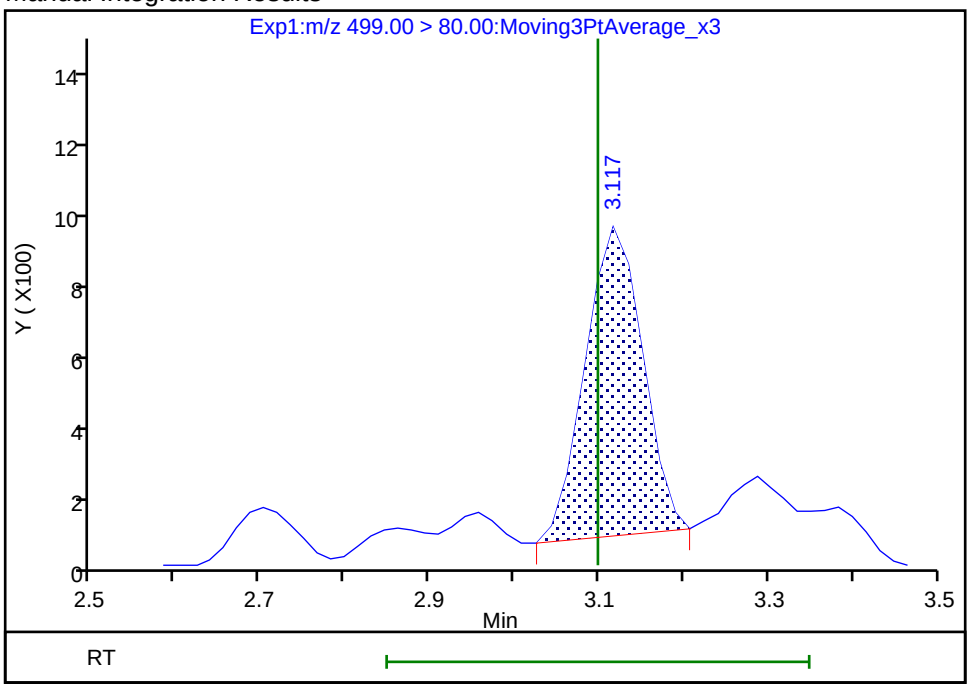
Processing Integration Results

RT: 3.12
Area: 4575
Amount: 0.001844
Amount Units: ng/ml



Manual Integration Results

RT: 3.12
Area: 3889
Amount: 0.001568
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:00:49
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

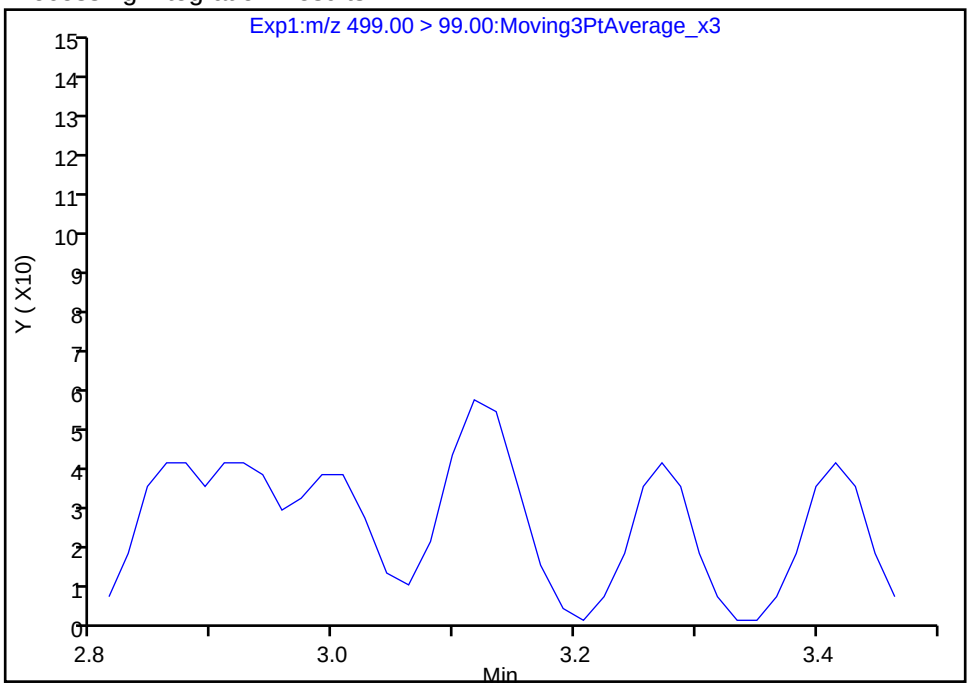
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d
Injection Date: 17-Sep-2018 18:09:32 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

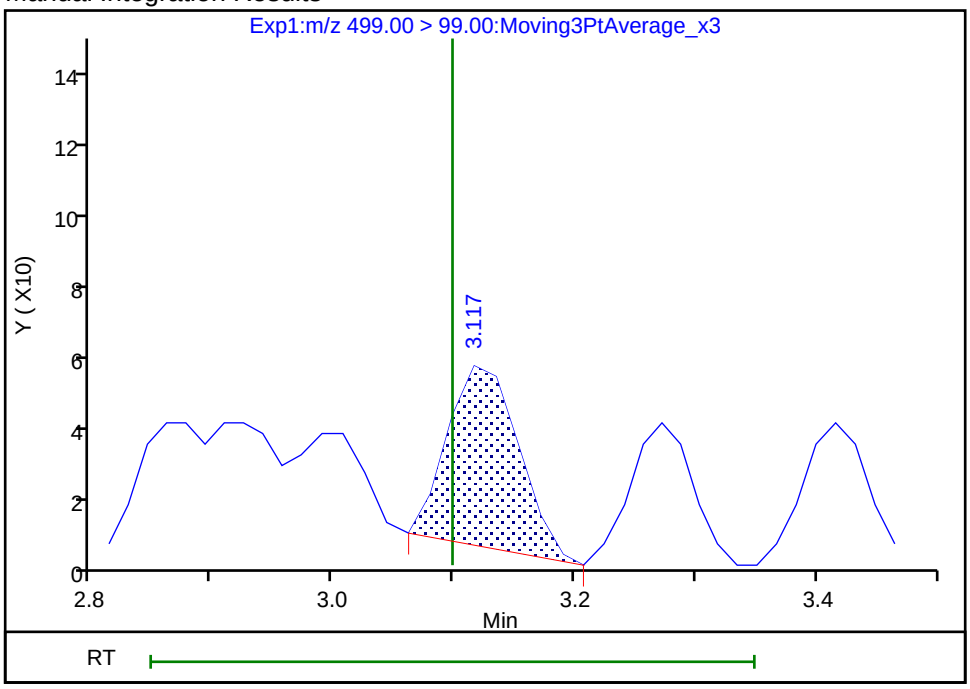
Processing Integration Results

RT: 3.12
Area: 0
Amount: 0.001844
Amount Units: ng/ml



Manual Integration Results

RT: 3.12
Area: 208
Amount: 0.001568
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:00:51
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

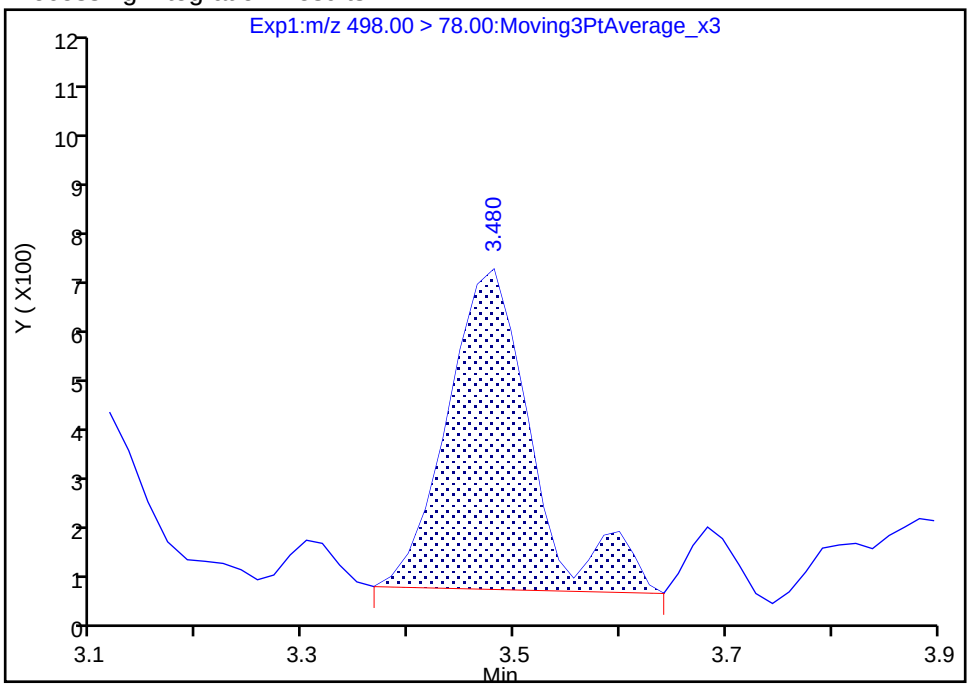
Data File: \\ChromNA\Sacramento\ChromData\A9\20180917-64320.b\2018.09.17_LLB_004.d
Injection Date: 17-Sep-2018 18:09:32 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

22 Perfluorooctane Sulfonamide, CAS: 754-91-6

Signal: 1

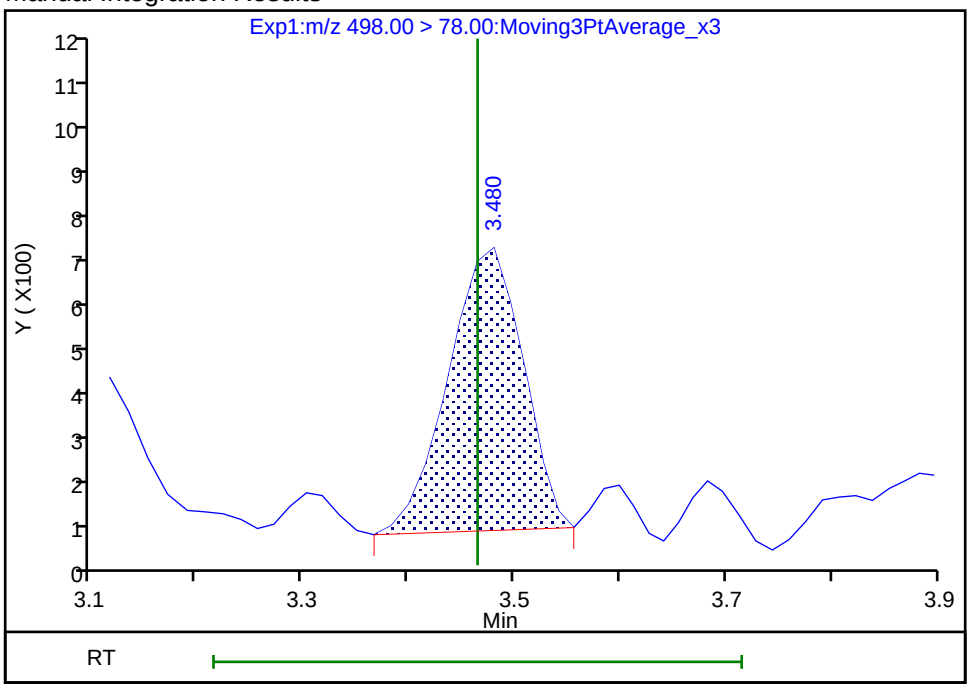
Processing Integration Results

RT: 3.48
Area: 3376
Amount: 0.000887
Amount Units: ng/ml



Manual Integration Results

RT: 3.48
Area: 2915
Amount: 0.000766
Amount Units: ng/ml



Reviewer: mongkols, 18-Sep-2018 15:00:57
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: | Lab Sample ID: ICB 320-242499/9

Matrix: Water | Lab File ID: 2018.08.28LLICALA_012.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 08/28/2018 11:13

Con. Extract Vol.: | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 242499 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	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	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)	0.00753	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.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: ICB 320-242499/9

Matrix: Water Lab File ID: 2018.08.28LLICALA_012.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/28/2018 11:13

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 242499 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	92		50-150
STL00992	13C4 PFBA	95		50-150
STL01893	13C5 PFPeA	94		50-150
STL00993	13C2 PFHxA	92		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	96		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	18O2 PFHxS	93		50-150
STL02116	13C2-PFTeDA	88		50-150
STL00991	13C4 PFOS	97		50-150
STL02337	13C3-PFBS	93		50-150

Report Date: 28-Aug-2018 12:43:41 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_012.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 28-Aug-2018 11:13:17 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: ICB
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 28-Aug-2018 12:43:33 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK023

First Level Reviewer: roycea Date: 28-Aug-2018 12:21:40

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	1.484	1.485	-0.001	0.539	7943897	2.38		95.1	20333	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.758	-0.002	0.638	6972566	2.34		93.6	13846	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.759	0.005	1.005	8201	0.002899			1.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.796	0.001	0.653	84438	2.16		92.8	564	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.013	-0.006	0.730	736702	NC			927	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.744	7274937	2.31		92.4	9233	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	11836	0.004466			3.0	
313.00 > 119.00	2.048	2.048	0.0	1.000	686		17.25(6.96-20.87)		2.4	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.171	2.149	0.022	1.010	2352	NC			1.0	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.150	0.0	0.782	889700	NC			2318	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	8765959	2.33		93.3	7089	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	19350	0.005412			3.2	
363.00 > 169.00	2.374	2.387	-0.013	0.994	4623		4.19(2.17-6.52)		12.7	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	20076	0.007531			28.5	
399.00 > 99.00	2.400	2.400	0.0	1.000	4576		4.39(1.90-5.70)		7.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5094777	2.21		93.2	9974	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
76 DONA										
377.00 > 251.00	2.426	2.432	-0.006	0.774	4441	NC			9.7	
377.00 > 85.00	2.426	2.432	-0.006	0.774	2205		2.01(1.13-3.39)		1.3	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.728	-0.009	0.988	904577	2.45		103	1585	
D 73 13C8 PFOA										
421.00 > 376.00	2.735	2.744	-0.009		6860442	NC			14011	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.751	0.0	1.000	8241826	2.36		94.3	9359	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		8678444	2.50			23258	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	34838	0.009819			2.5	
413.00 > 169.00	2.751	2.751	0.0	1.000	12850		2.71(1.36-4.08)		24.3	
D 72 13C8 PFOS										
507.00 > 99.00	3.118	3.129	-0.011		1262797	NC			3806	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.118	3.136	-0.018	0.994	7853	0.003092			6.3	
499.00 > 99.00	3.136	3.136	0.0	1.000	0		0.00(2.04-6.12)			
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.136	0.0	1.140	7568507	2.31		92.4	6226	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.136	0.0	1.140	5753049	2.32		97.0	4274	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.353	3.346	0.007	1.069	1572	NC			3.0	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.451	3.467	-0.016	0.995	4566	0.001279			5.2	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3011081	2.29		91.7	3962	
D 26 M2-8:2FTS										
529.00 > 81.00	3.483	3.485	-0.002	1.266	129879	2.39		99.9	911	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.483	3.498	-0.015	1.000	9713	0.002714			1.4	R
513.00 > 169.00	3.451	3.498	-0.047	0.991	453		21.44(7.12-21.35)		1.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.483	3.498	-0.015	1.266	7859929	2.40		96.1	5890	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.643	3.651	-0.008	1.324	3451429	2.34		93.6	5258	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.643	3.653	-0.010	1.000	35203	0.0257			15.3	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.810	3.819	-0.009	1.385	2875714	2.48		99.1	2869	
D 30 13C2 PFUnA										
565.00 > 520.00	3.826	3.825	0.001	1.391	6760625	2.43		97.1	5794	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.810	3.825	-0.015	1.000	23250	0.0217			41.5	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.826	3.825	0.001	1.000	14212	0.005858			2.8	
563.00 > 169.00	3.810	3.825	-0.015	0.996	2020		7.04(5.24-15.72)		8.4	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.978	3.983	-0.005	1.268	2985	NC			8.1	
D 36 13C2 PFDoA										
615.00 > 570.00	4.109	4.118	-0.009	1.494	7549838	2.23		89.1	12357	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.630	4.628	0.002	1.683	5925737	2.20		87.8	8544	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.042	5.053	-0.011	1.000	61943	NC			14.5	
813.00 > 169.00	5.042	5.053	-0.011	1.000	11248		5.51(2.77-8.32)		44.4	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.042	5.053	-0.011	1.833	6276609	2.29		91.8	11283	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.405	5.416	-0.011	1.072	13625	NC			3.2	
913.00 > 169.00	5.419	5.416	0.003	1.075	2232		6.10(2.55-7.64)		11.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL0_00008 Amount Added: 1.00 Units: mL

Report Date: 28-Aug-2018 12:43:41 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_012.d

Injection Date: 28-Aug-2018 11:13:17 Instrument ID: A9

Lims ID: ICB

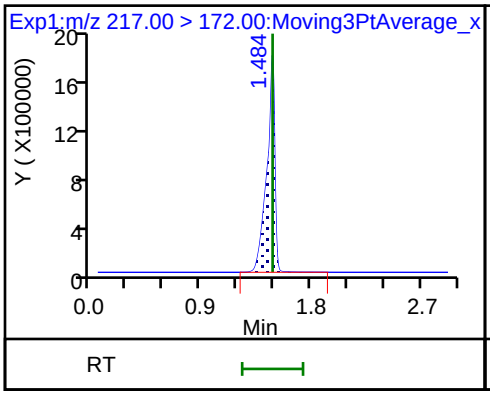
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 9

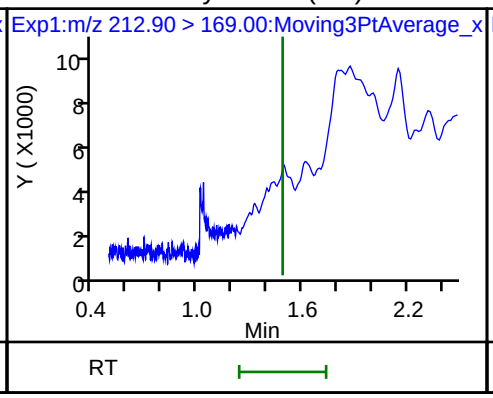
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

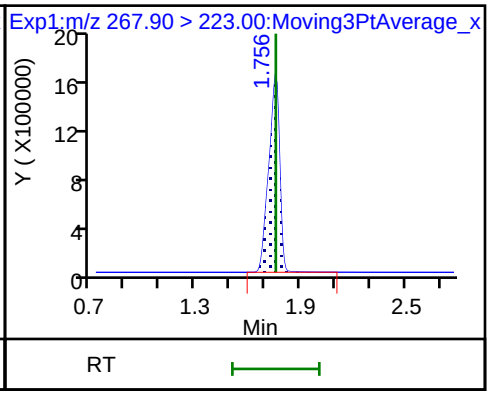
D 1 13C4 PFBA



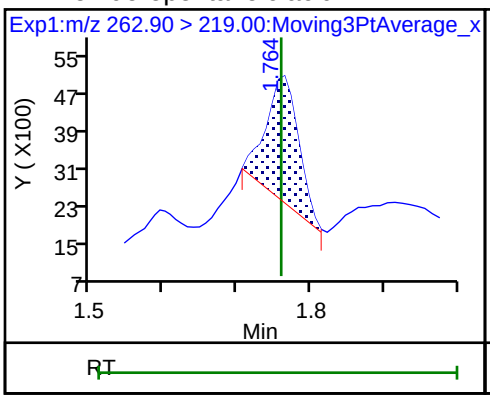
2 Perfluorobutyric acid (ND)



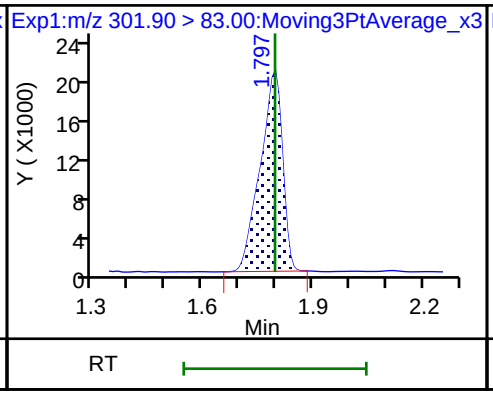
D 3 13C5-PFPeA



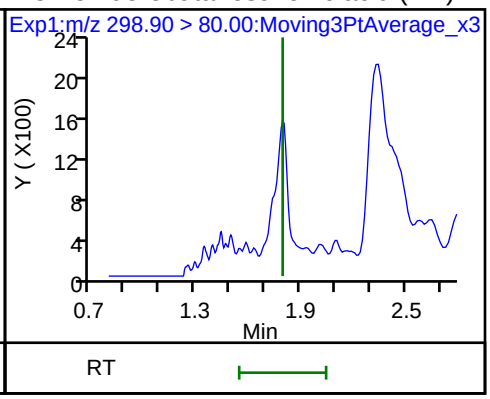
4 Perfluoropentanoic acid



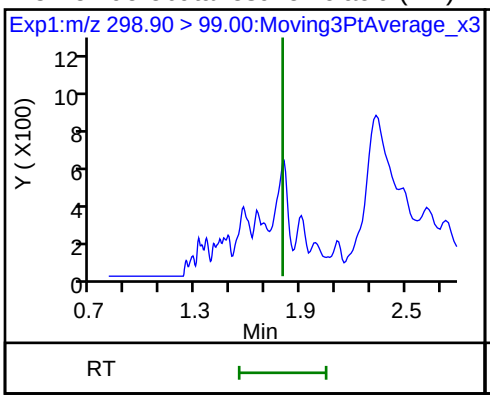
D 47 13C3-PFBS



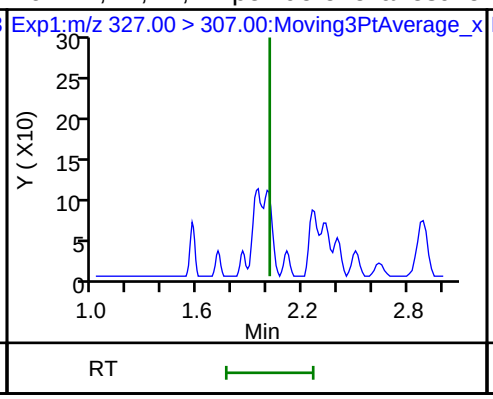
5 Perfluorobutanesulfonic acid (ND)



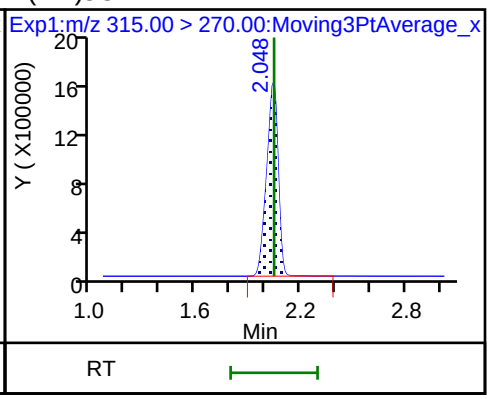
5 Perfluorobutanesulfonic acid (ND)



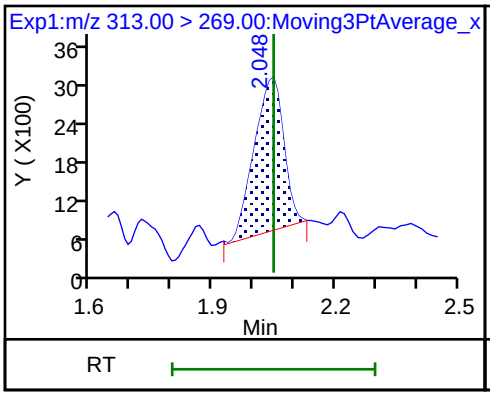
61 1H,1H,2H,2H-perfluorohexanesulfonic (NT)



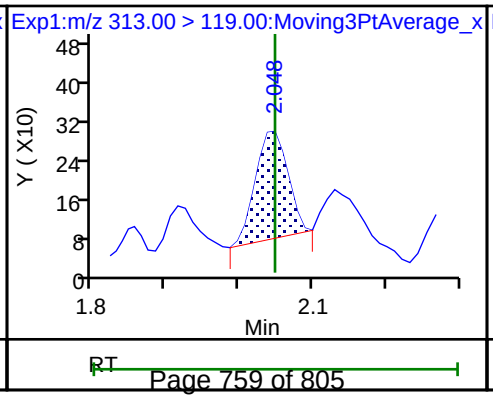
D 13C2 PFHxA



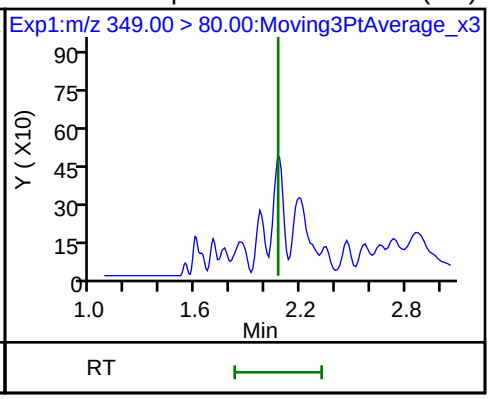
6 Perfluorohexanoic acid



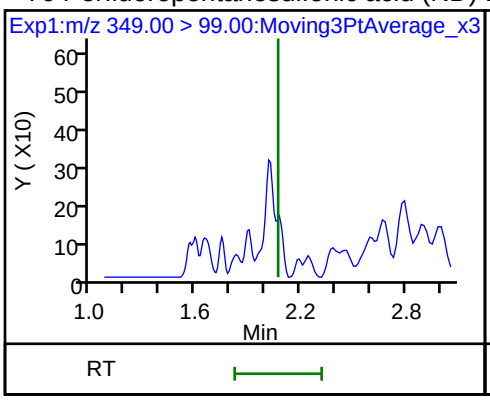
6 Perfluorohexanoic acid



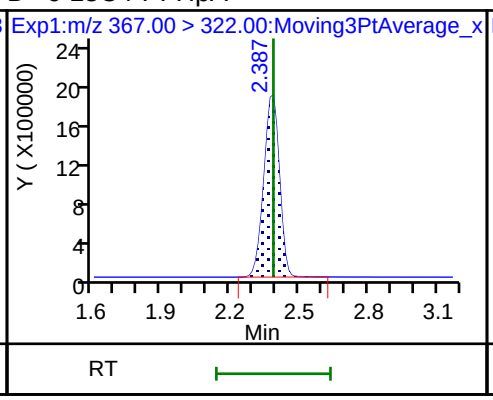
70 Perfluoropentanesulfonic acid (ND)



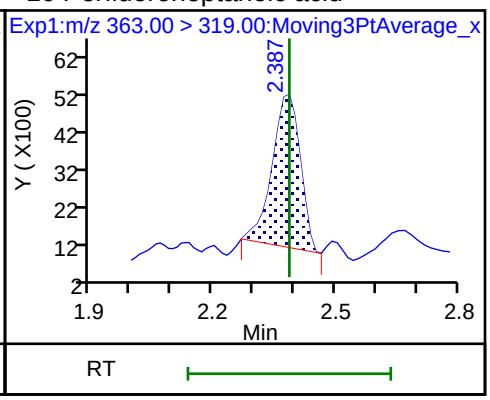
70 Perfluoropentanesulfonic acid (ND)



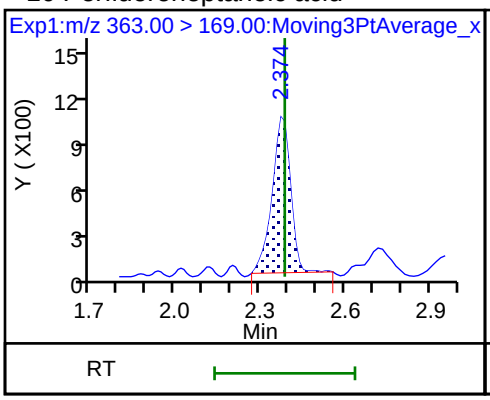
D 9 13C4-PFHpA



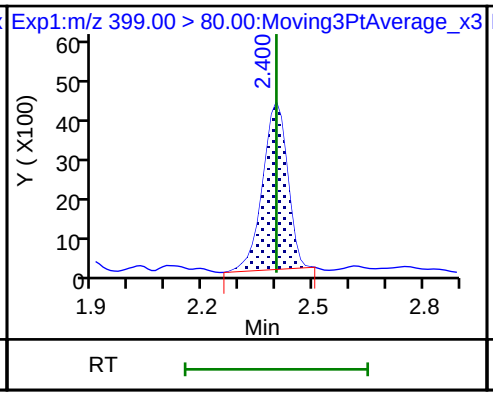
10 Perfluoroheptanoic acid



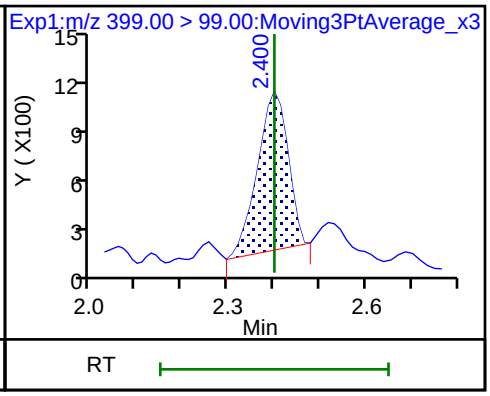
10 Perfluoroheptanoic acid



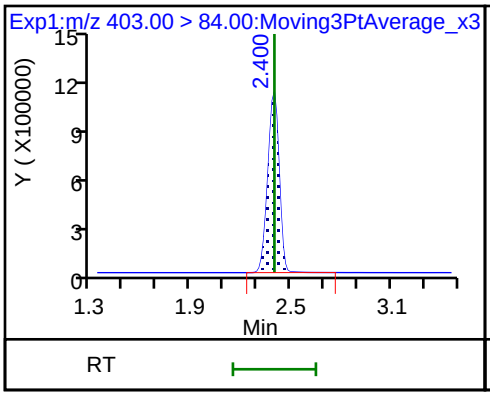
8 Perfluorohexanesulfonic acid



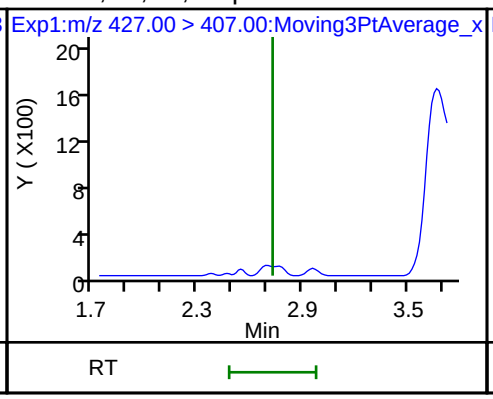
8 Perfluorohexanesulfonic acid



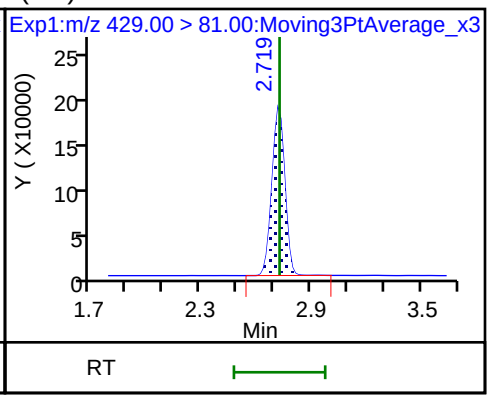
D 11 18O2 PFHxS



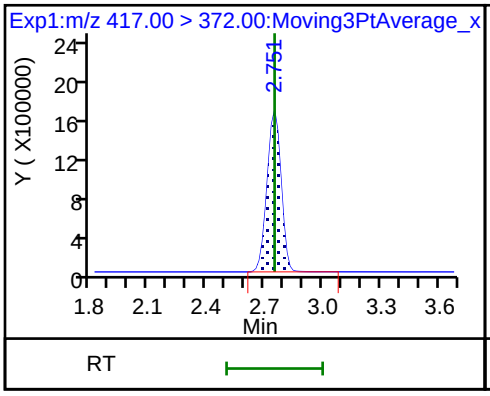
13 1H,1H,2H,2H-perfluorooctanesulfonic



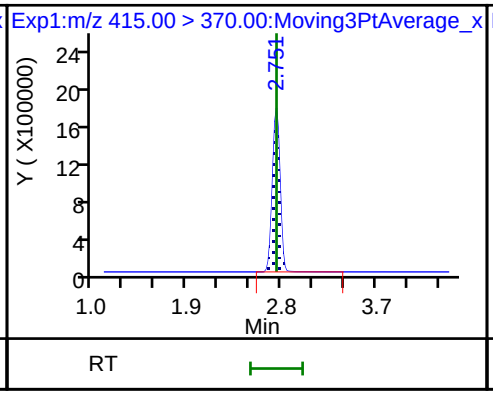
D(12)M2-6:2FTS



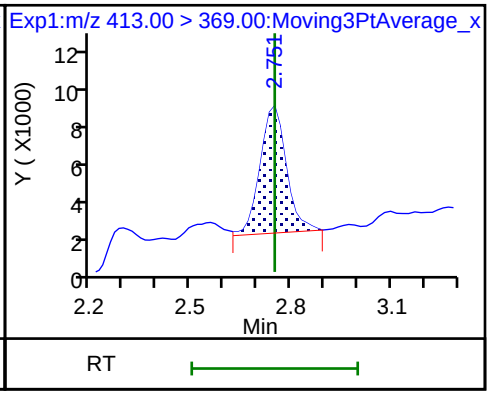
D 14 13C4 PFOA



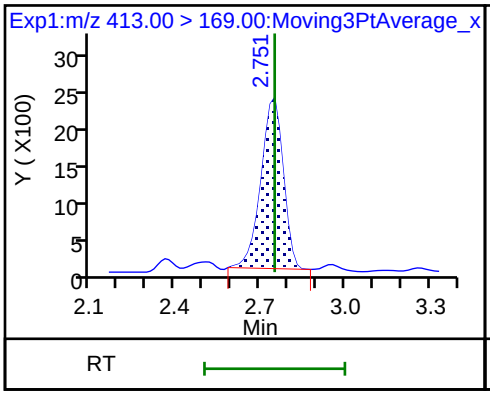
* 62 13C2-PFOA



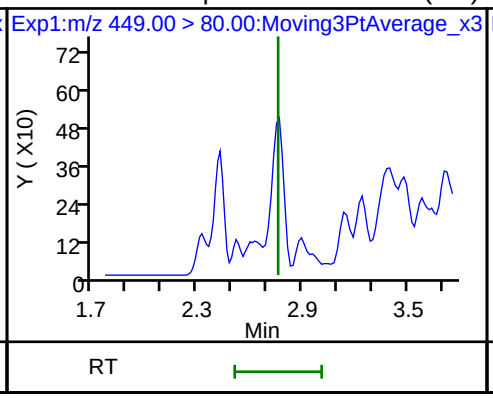
15 Perfluorooctanoic acid



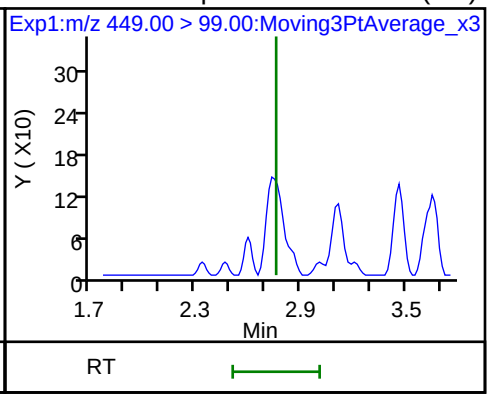
15 Perfluorooctanoic acid



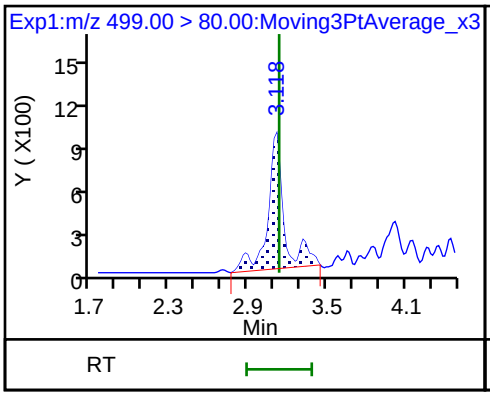
16 Perfluoroheptanesulfonic acid (ND)



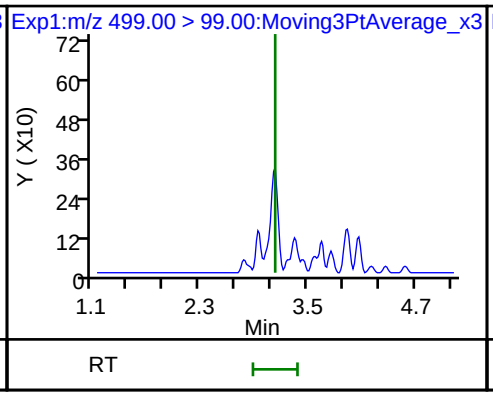
16 Perfluoroheptanesulfonic acid (ND)



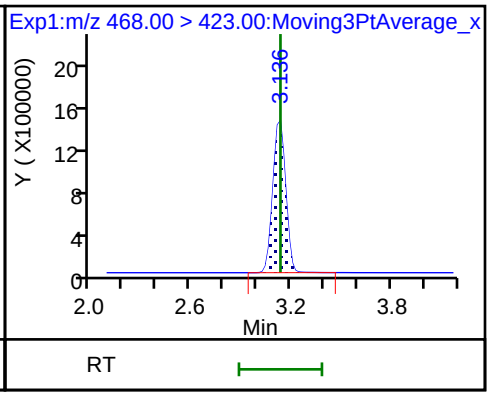
17 Perfluorooctane sulfonic acid



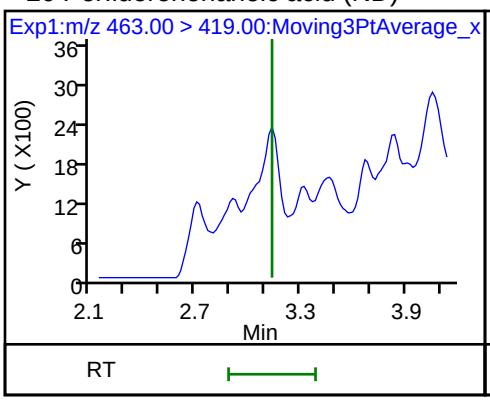
17 Perfluorooctane sulfonic acid



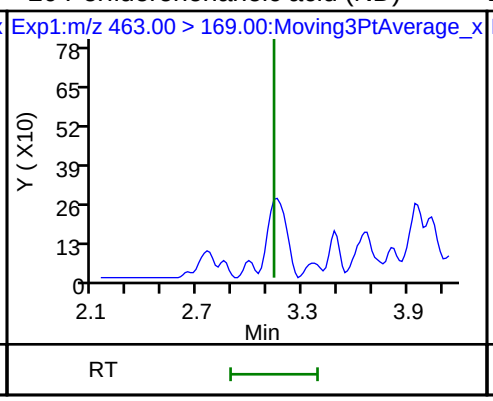
D 19 13C5 PFNA



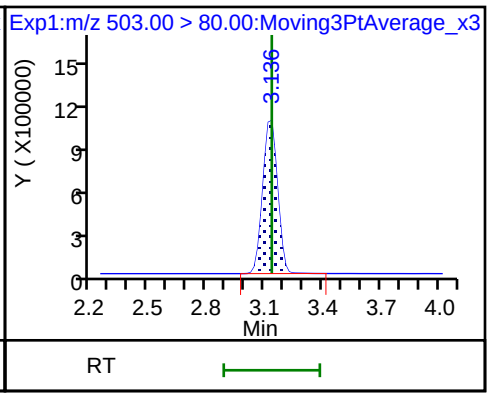
20 Perfluorononanoic acid (ND)



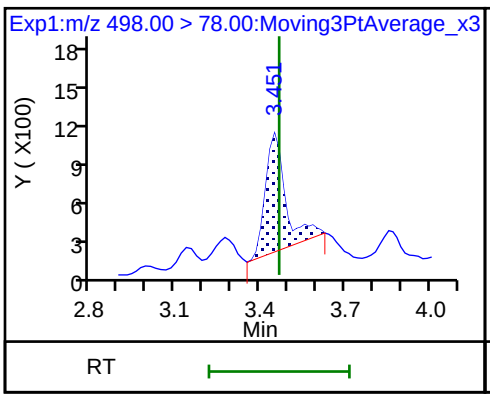
20 Perfluorononanoic acid (ND)



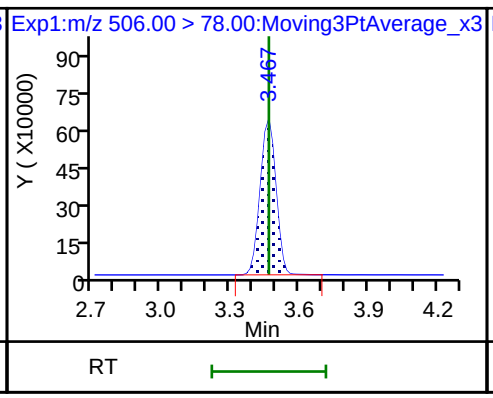
D 18 13C4 PFOS



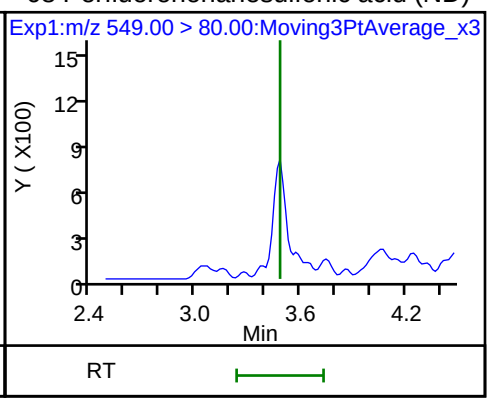
22 Perfluorooctane Sulfonamide



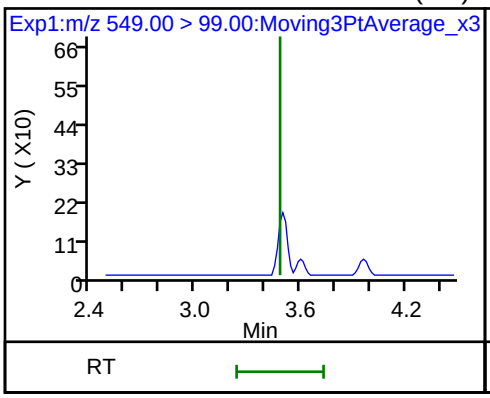
D 21 13C8 FOSA



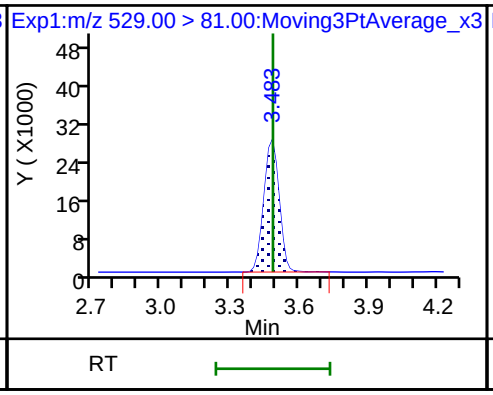
68 Perfluorononanesulfonic acid (ND)



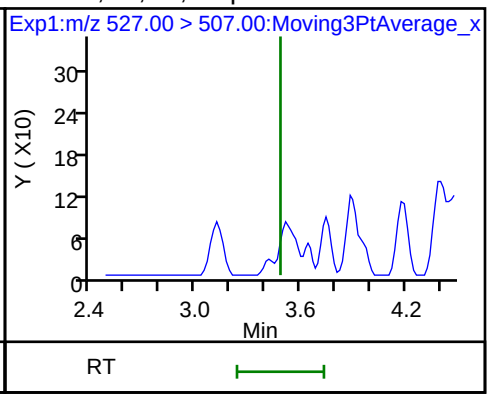
68 Perfluorononanesulfonic acid (ND)



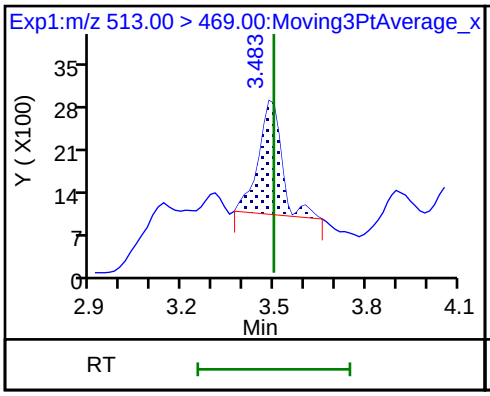
D 26 M2-8:2FTS



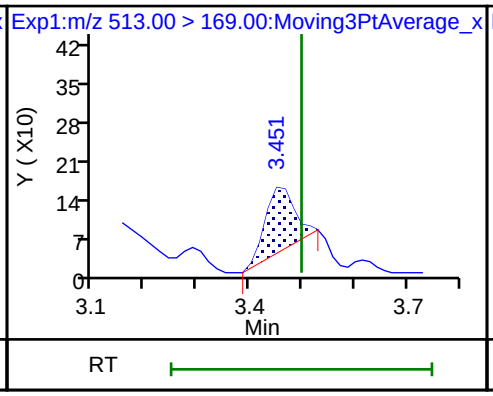
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



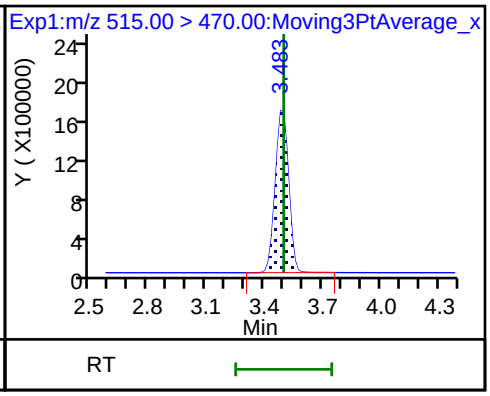
24 Perfluorodecanoic acid



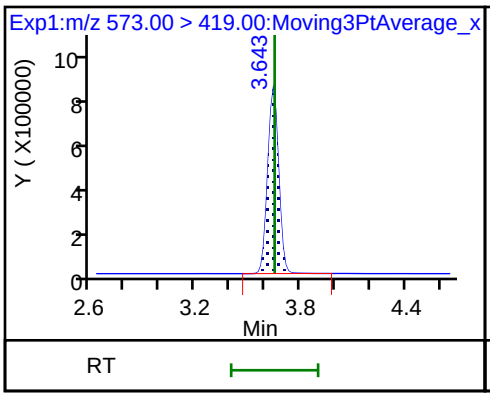
24 Perfluorodecanoic acid



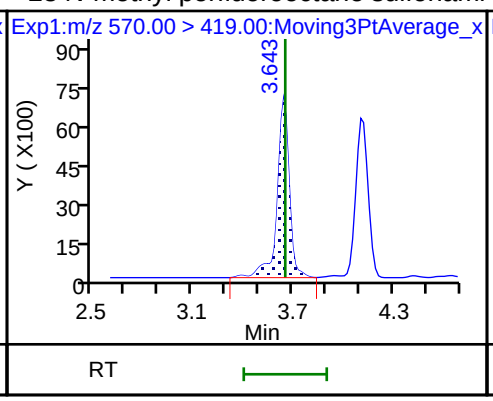
D 23 13C2 PFDA



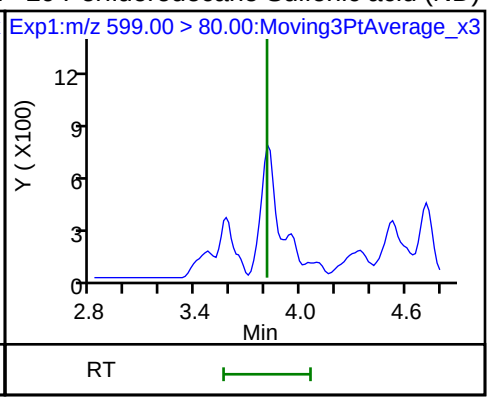
D 27 d3-NMeFOSAA



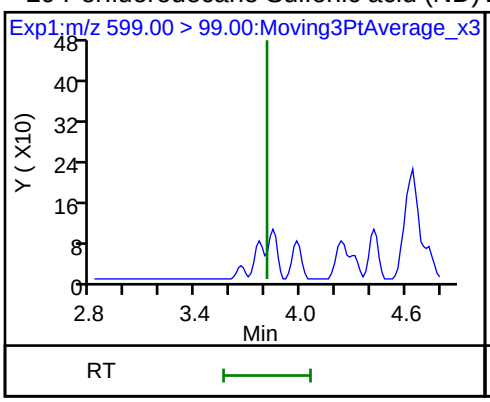
28 N-methyl perfluorooctane sulfonami



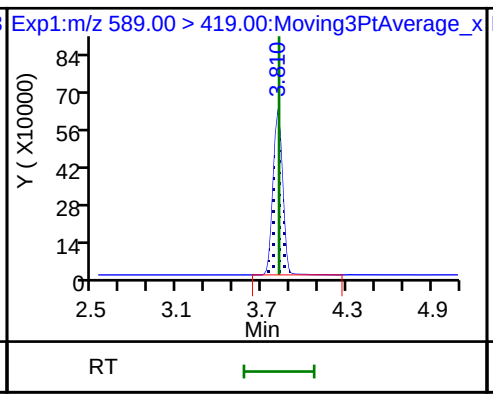
29 Perfluorodecane Sulfonic acid (ND)



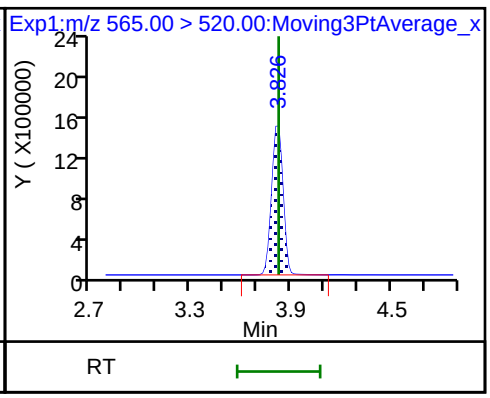
29 Perfluorodecane Sulfonic acid (ND)



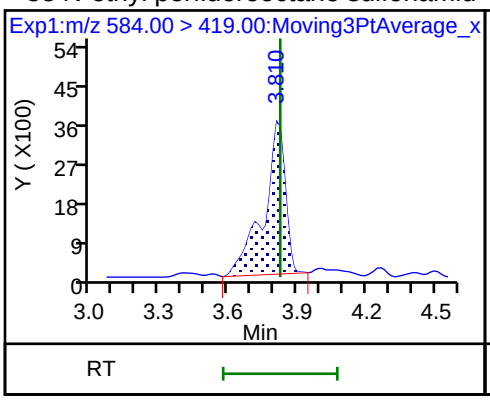
D 32 d5-NEtFOSAA



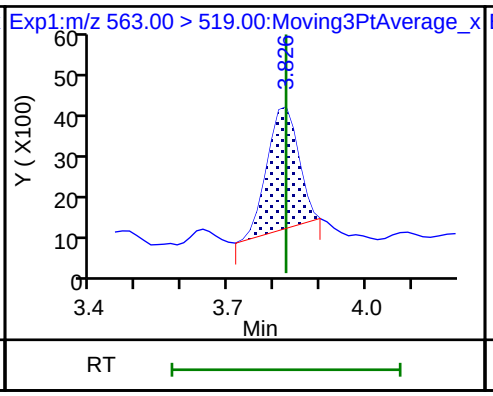
D 30 13C2 PFUnA



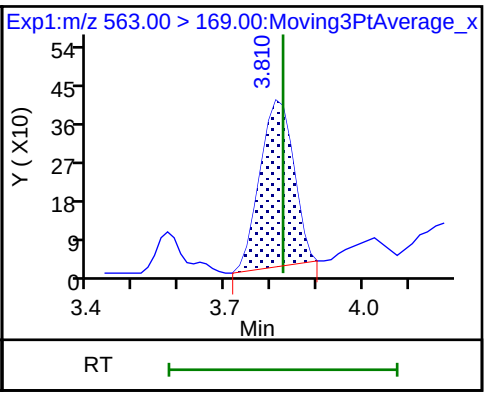
33 N-ethyl perfluorooctane sulfonamid



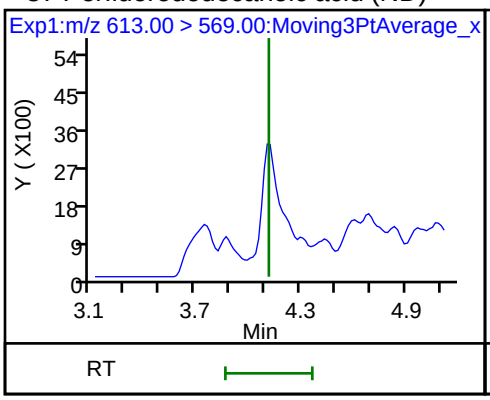
31 Perfluoroundecanoic acid



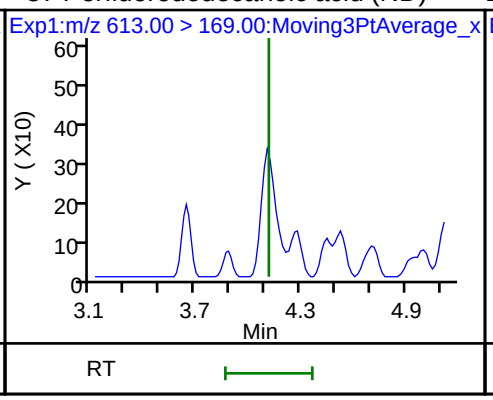
31 Perfluoroundecanoic acid



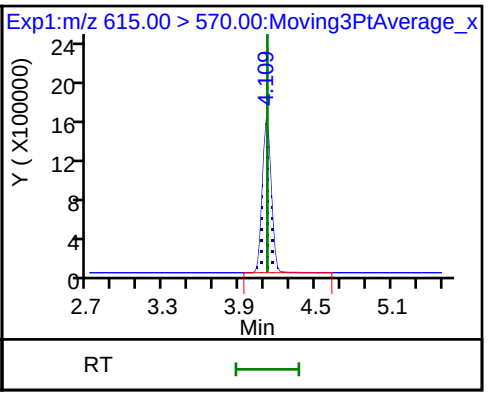
37 Perfluorododecanoic acid (ND)



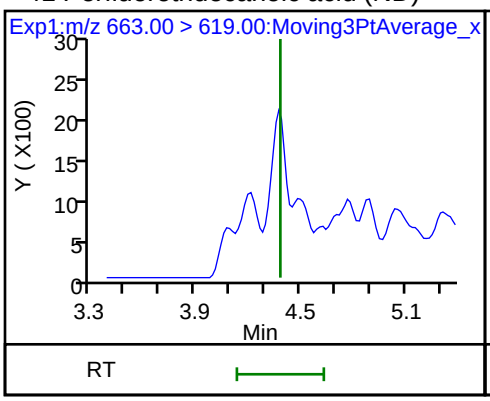
37 Perfluorododecanoic acid (ND)



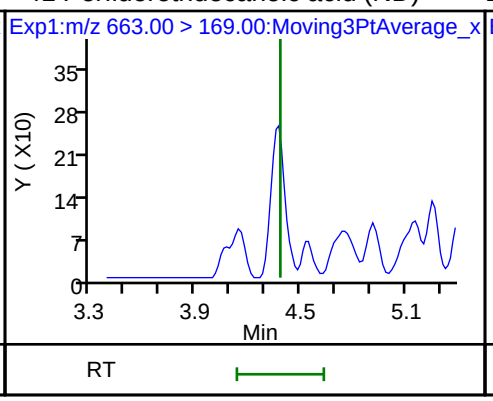
D 36 13C2 PFDoA



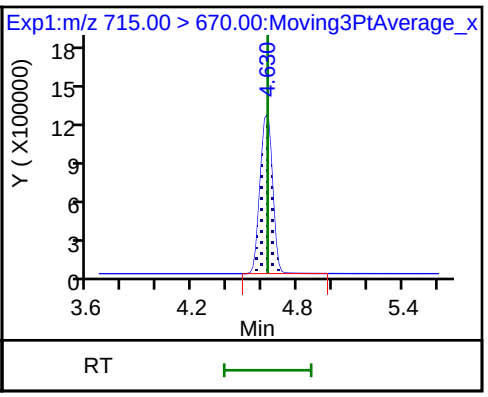
41 Perfluorotridecanoic acid (ND)



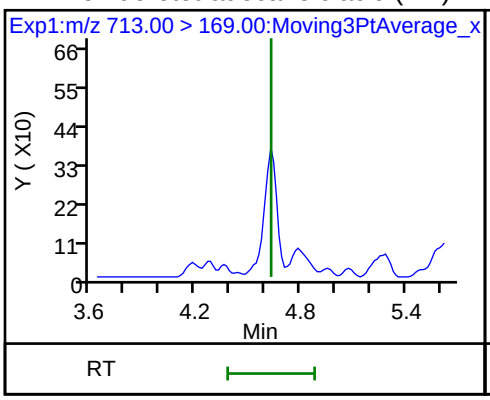
41 Perfluorotridecanoic acid (ND)



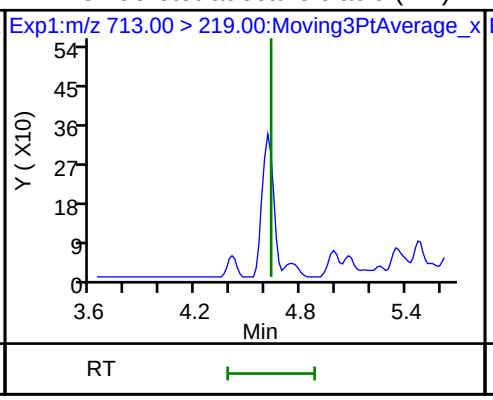
D 43 13C2-PFTeDA



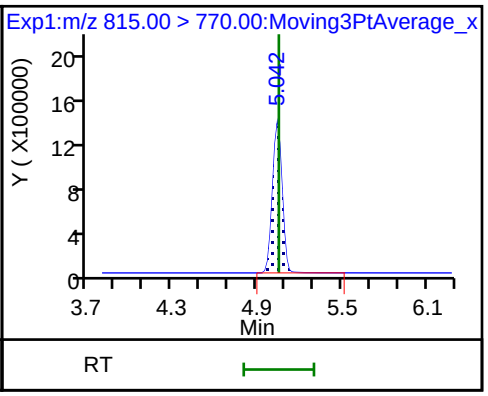
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-245574/2-A

Matrix: Water | Lab File ID: 2018.09.16_LLA_014.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 09/12/2018 08:12

Sample wt/vol: 250.00(mL) | Date Analyzed: 09/16/2018 15:08

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	41.0	M	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	40.1		2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	38.4		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	44.5		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	39.4		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	44.7		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	39.3		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	41.9		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	41.3		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	36.0		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	38.1		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35.6		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	35.5		2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	40.1		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	35.4		4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	40.8		2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	44.4		4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 320-245574/2-A

Matrix: Water Lab File ID: 2018.09.16_LLA_014.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 09/12/2018 08:12

Sample wt/vol: 250.00(mL) Date Analyzed: 09/16/2018 15:08

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	84		50-150
STL01893	13C5 PFPeA	90		50-150
STL00993	13C2 PFHxA	92		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	91		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	91		50-150
STL02116	13C2-PFTeDA	80		50-150
STL00991	13C4 PFOS	92		50-150
STL02337	13C3-PFBS	91		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_014.d
Lims ID: LCS 320-245574/2-A
Client ID:
Sample Type: LCS
Inject. Date: 16-Sep-2018 15:08:58 ALS Bottle#: 6 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-245574/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 15:58:00 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 15:58:00

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	1.494	1.494	0.0	1.000	2430905	1.02		102	326	M
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.494	0.0	0.540	6497032	2.10		84.1	7378	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.772	0.0	1.000	2509975	1.00		100	207	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.772	0.0	0.641	6178796	2.24		89.7	9466	
D 47 13C3-PFBS										
301.90 > 83.00	1.813	1.814	-0.001	0.656	76494	2.11		90.9	410	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.813	1.814	-0.001	1.000	3073262	0.8891		101	1901	
298.90 > 99.00	1.813	1.814	-0.001	1.000	1049149		2.93(1.35-4.05)		752	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.027	2.027	0.0	1.118	663309	0.9330		99.9	2379	
D 7 13C2 PFHxA										
315.00 > 270.00	2.068	2.068	0.0	0.748	6698306	2.30		92.0	8382	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.068	2.068	0.0	1.000	2345089	0.9611		96.1	468	
313.00 > 119.00	2.068	2.068	0.0	1.000	174171		13.46(6.96-20.87)		363	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.088	2.089	-0.001	1.152	1574692	0.9597		102	3086	
349.00 > 99.00	2.088	2.089	-0.001	1.152	744624		2.11(1.15-3.45)		1116	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.160	2.170	-0.010	0.781	773919	NC			1567	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.170	2.170	0.0	1.005	539664	NC			236	
D 9 13C4-PFHpA										
367.00 > 322.00	2.399	2.399	0.0	0.867	7947855	2.29		91.5	10923	

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	2.399	2.400	-0.001	1.000	3604159	1.11		111	449	
363.00 > 169.00	2.399	2.400	-0.001	1.000	767083		4.70(2.17-6.52)		1264	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.412	2.413	-0.001	1.000	2145219	0.8878		97.6	1958	
399.00 > 99.00	2.412	2.413	-0.001	1.000	610734		3.51(1.90-5.70)		584	
D 11 18O2 PFHxS										
403.00 > 84.00	2.412	2.426	-0.014	0.872	4618284	2.16		91.4	8006	
76 DONA										
377.00 > 251.00	2.452	2.452	0.0	0.778	6031397	NC			9051	
377.00 > 85.00	2.452	2.452	0.0	0.778	2462599		2.45(1.13-3.39)		1134	
D 12 M2-6:2FTS										
429.00 > 81.00	2.734	2.750	-0.016	0.988	762609	2.23		94.0	1150	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.734	2.750	-0.016	1.000	1208026	1.76		185	567	
D 14 13C4 PFOA										
417.00 > 372.00	2.766	2.766	0.0	1.000	7416243	2.29		91.7	6233	
* 62 13C2-PFOA										
415.00 > 370.00	2.766	2.766	0.0		8026611	2.50			5496	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.766	2.766	0.0	1.000	3144848	0.9850		98.4	188	
413.00 > 169.00	2.766	2.766	0.0	1.000	1136170		2.77(1.36-4.08)		1292	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.782	2.782	0.0	0.882	2080466	1.00		105	2576	
449.00 > 99.00	2.782	2.782	0.0	0.882	509066		4.09(1.84-5.53)		1840	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0	1.140	6944619	2.29		91.7	5878	
D 18 13C4 PFOS										
503.00 > 80.00	3.153	3.153	0.0	1.140	5036458	2.19		91.8	3716	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.153	3.153	0.0	1.000	1968301	0.8852		95.4	1304	
499.00 > 99.00	3.153	3.153	0.0	1.000	481441		4.09(2.04-6.12)		1395	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.153	0.0	1.000	3036576	1.12		112	340	
463.00 > 169.00	3.153	3.153	0.0	1.000	502522		6.04(2.68-8.03)		1018	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.367	3.367	0.0	1.068	2297303	NC			2557	
D 21 13C8 FOSA										
506.00 > 78.00	3.480	3.465	0.015	1.258	2389635	1.97		78.7	4947	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.480	3.465	0.015	1.000	3142161	1.11		111	3017	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.496	3.496	0.0	1.109	1332949	0.9794		102	2533	
549.00 > 99.00	3.496	3.496	0.0	1.109	225714		5.91(3.02-9.05)		881	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.496	3.496	0.0	1.000	566033	0.9269		96.7	1281	
D 23 13C2 PFDA										
515.00 > 470.00	3.512	3.512	0.0	1.270	7388381	2.44		97.7	6500	

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	3.496	3.512	-0.016	1.264	96615	1.92		80.3	551	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.512	3.512	0.0	1.000	3301632	0.9814		98.1	632	
513.00 > 169.00	3.512	3.512	0.0	1.000	213058		15.50(7.12-21.35)		521	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.668	3.669	-0.001	1.326	2806798	2.06		82.3	3938	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.668	3.669	-0.001	1.000	1119719	1.00		100	490	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.823	3.823	0.0	1.213	1748574	1.02		106	2824	
599.00 > 99.00	3.823	3.823	0.0	1.213	330543		5.29(2.14-6.43)		1240	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.838	3.839	-0.001	1.388	2256559	2.10		84.1	2450	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.838	3.839	-0.001	1.000	797846	0.9506		95.1	1227	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.838	3.839	-0.001	1.000	2199353	1.05		105	524	
563.00 > 169.00	3.838	3.839	-0.001	1.000	195312		11.26(5.24-15.72)		637	
D 30 13C2 PFUnA										
565.00 > 520.00	3.838	3.854	-0.016	1.388	5857218	2.27		91.0	6399	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.007	4.012	-0.005	1.271	2614369	NC			6307	
D 36 13C2 PFDoA										
615.00 > 570.00	4.139	4.139	0.0	1.496	6853821	2.19		87.5	8921	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.139	4.144	-0.005	1.184	371370	NC			623	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.139	4.144	-0.005	1.000	2854360	1.03		103	696	
613.00 > 169.00	4.139	4.144	-0.005	1.000	292807		9.75(4.68-14.05)		679	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.372	4.377	-0.005	1.387	159539	NC			522	
699.00 > 99.00	4.372	4.377	-0.005	1.387	292896		0.54(0.28-0.83)		935	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.403	4.408	-0.005	1.064	1980454	0.9004		90.0	796	
663.00 > 169.00	4.403	4.408	-0.005	1.064	338872		5.84(3.09-9.27)		1079	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.660	4.660	0.0	1.685	4997750	2.00		80.1	8934	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.660	4.666	-0.006	1.000	307512	0.9529		95.3	1247	
713.00 > 219.00	4.644	4.666	-0.022	0.997	216599		1.42(0.70-2.09)		776	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.074	5.079	-0.005	1.000	1114672	NC			323	
813.00 > 169.00	5.074	5.079	-0.005	1.000	172407		6.47(2.77-8.32)		448	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.074	5.091	-0.017	1.834	2762124	1.09		43.7	4405	

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	5.448	5.451	-0.003	1.074	153297	NC			89.3	
913.00 > 169.00	5.448	5.451	-0.003	1.074	28589		5.36(2.55-7.64)		188	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 17-Sep-2018 15:58:01 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_014.d

Injection Date: 16-Sep-2018 15:08:58 Instrument ID: A9

Lims ID: LCS 320-245574/2-A

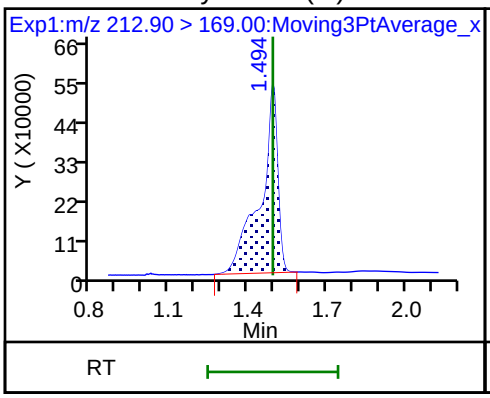
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 6 Worklist Smp#: 3

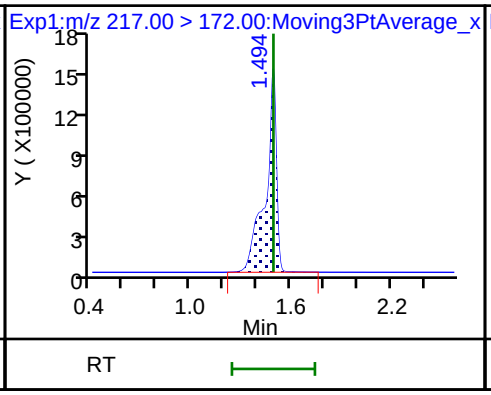
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

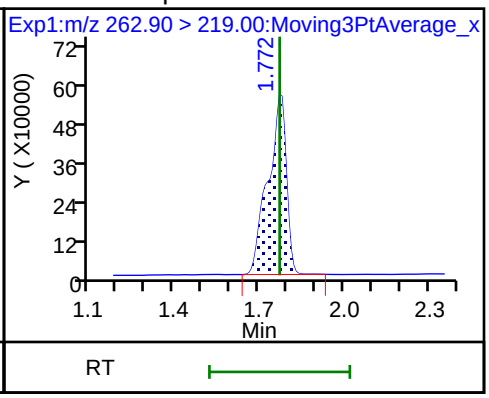
2 Perfluorobutyric acid (M)



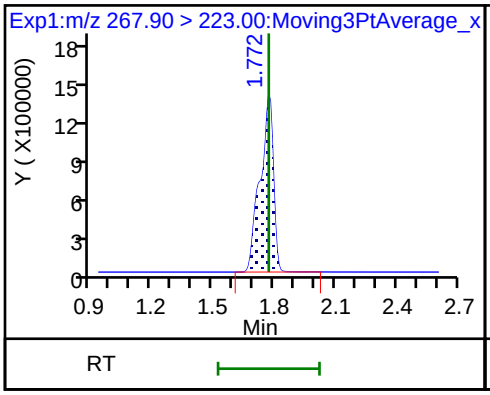
D 1 13C4 PFBA



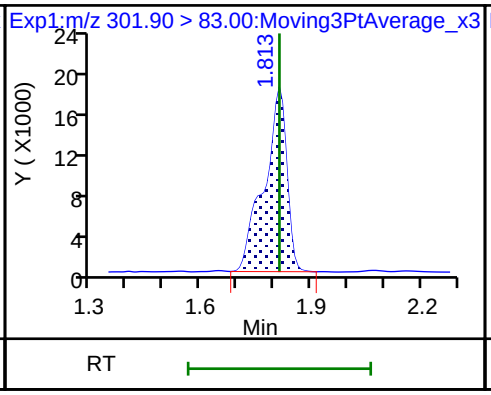
4 Perfluoropentanoic acid



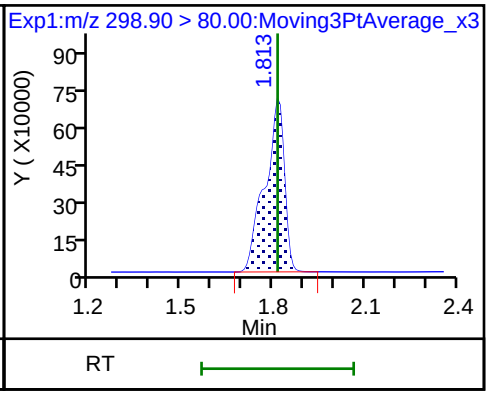
D 3 13C5-PFPeA



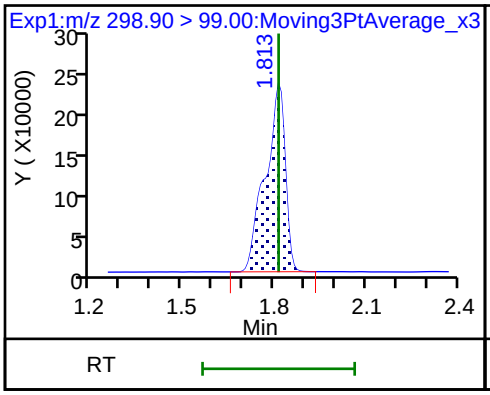
D 47 13C3-PFBS



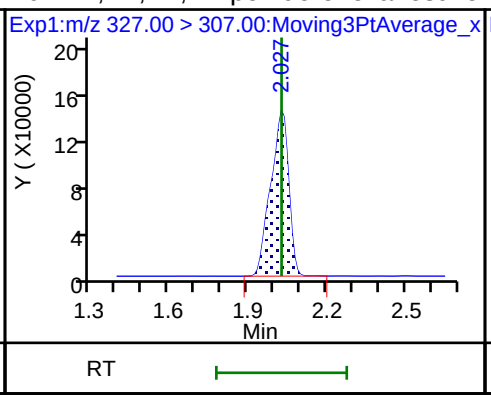
5 Perfluorobutanesulfonic acid



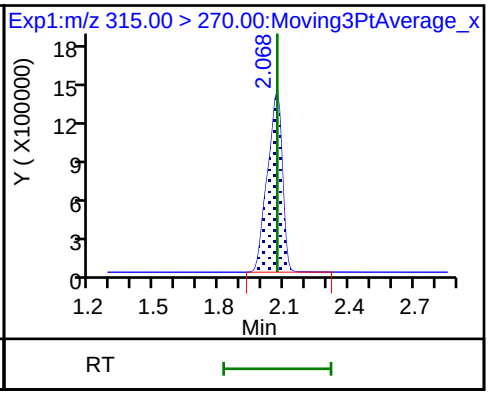
5 Perfluorobutanesulfonic acid



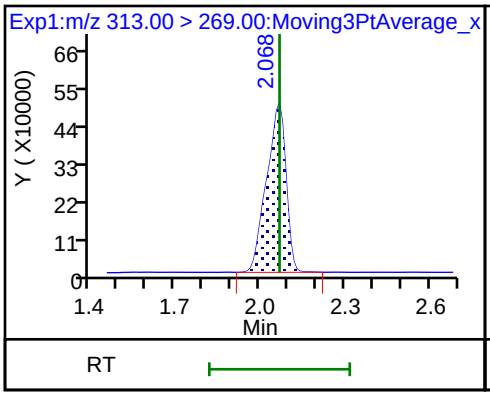
61 1H,1H,2H,2H-perfluorohexanesulfon



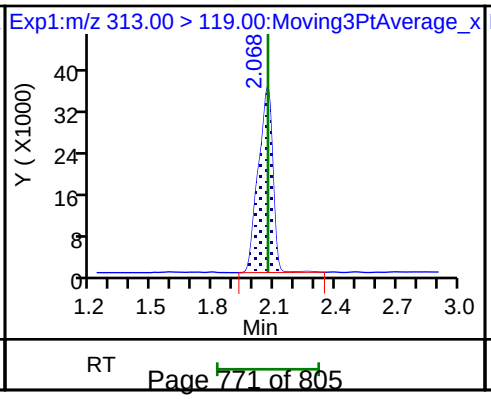
D 7 13C2 PFHxA



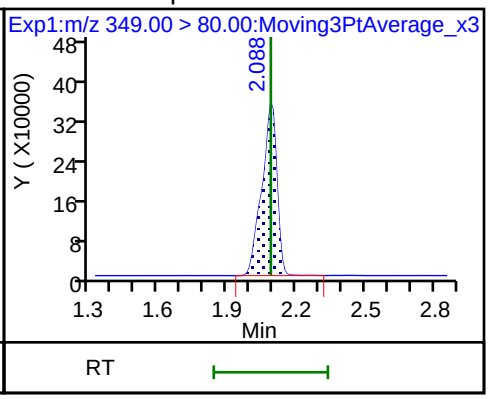
6 Perfluorohexanoic acid



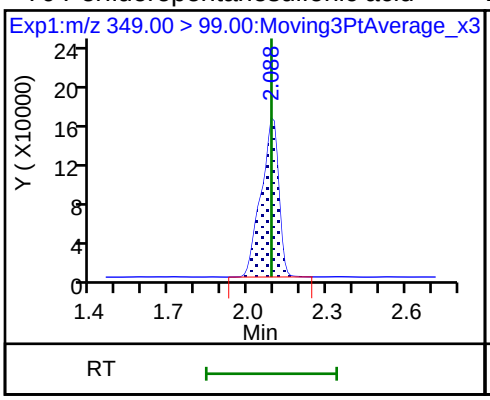
6 Perfluorohexanoic acid



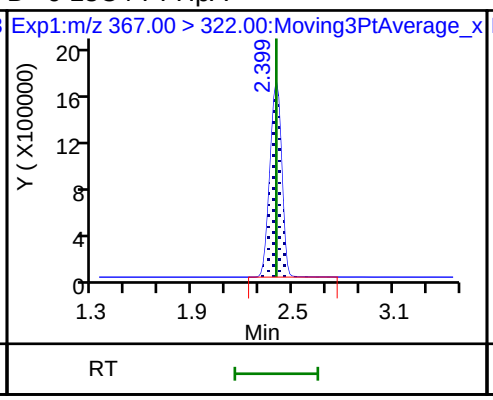
70 Perfluoropentanesulfonic acid



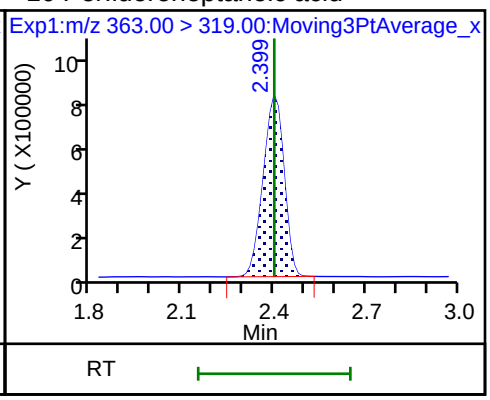
70 Perfluoropentanesulfonic acid



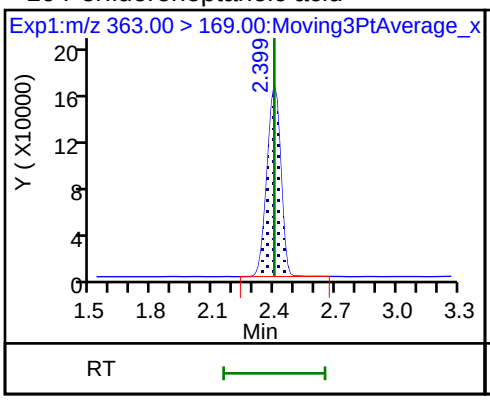
D 9 13C4-PFHpA



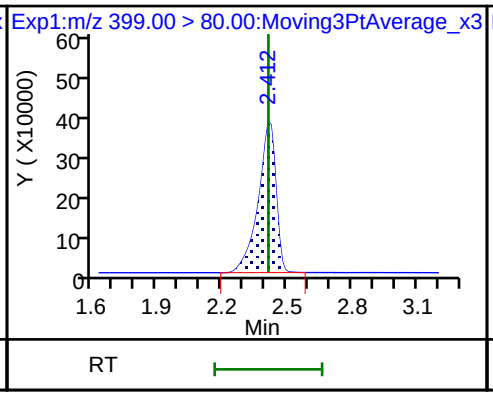
10 Perfluoroheptanoic acid



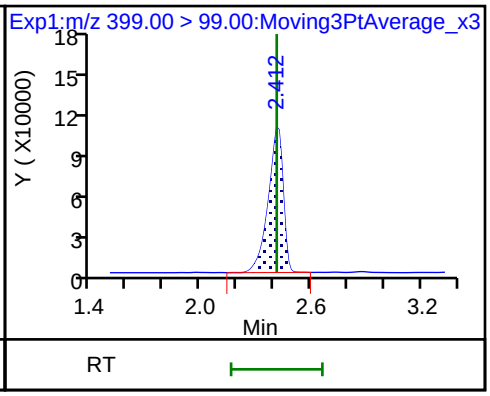
10 Perfluoroheptanoic acid



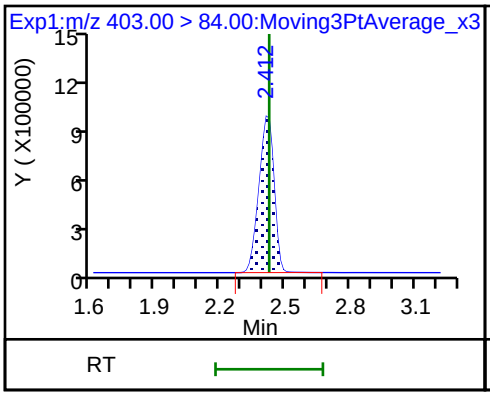
8 Perfluorohexanesulfonic acid



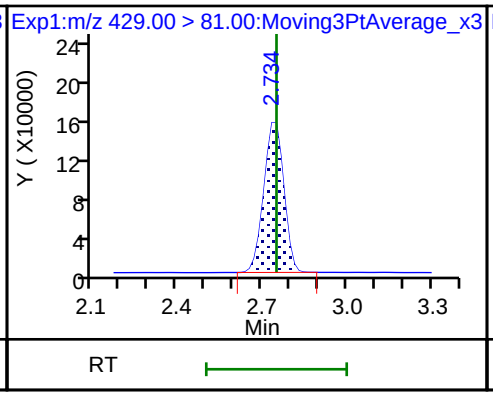
8 Perfluorohexanesulfonic acid



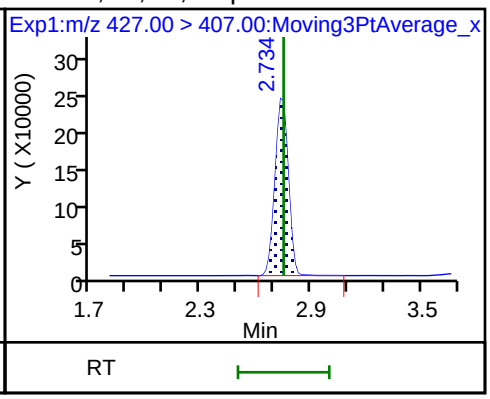
D 11 18O2 PFHxS



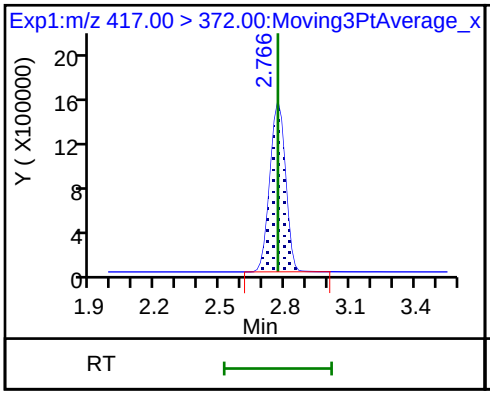
D 12 M2-6:2FTS



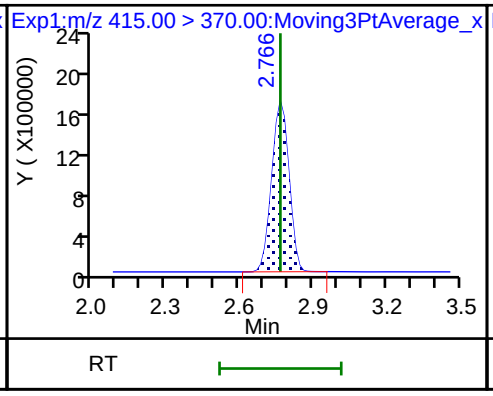
13 1H,1H,2H,2H-perfluorooctanesulfoni



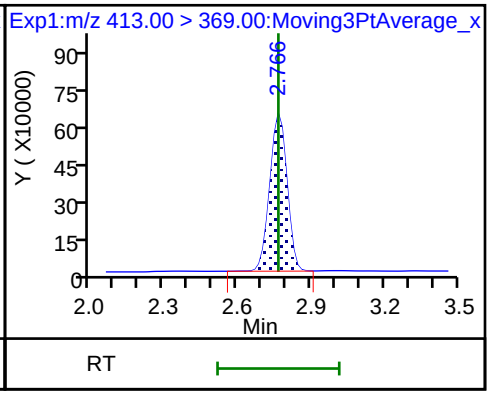
D 14 13C4 PFOA



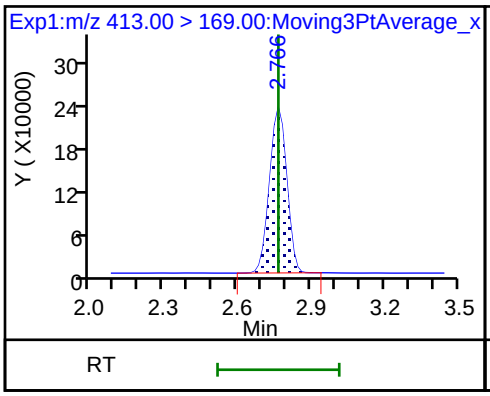
* 62 13C2-PFOA



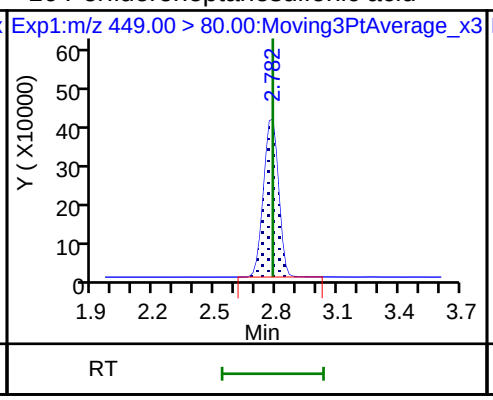
15 Perfluorooctanoic acid



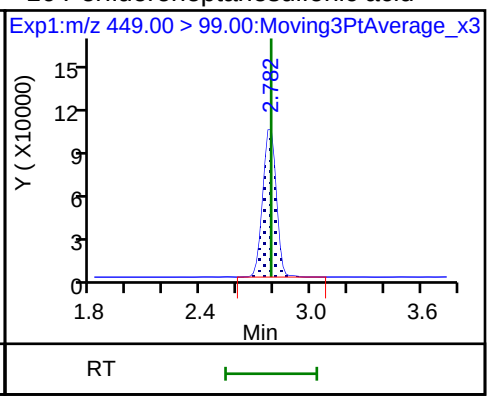
15 Perfluorooctanoic acid



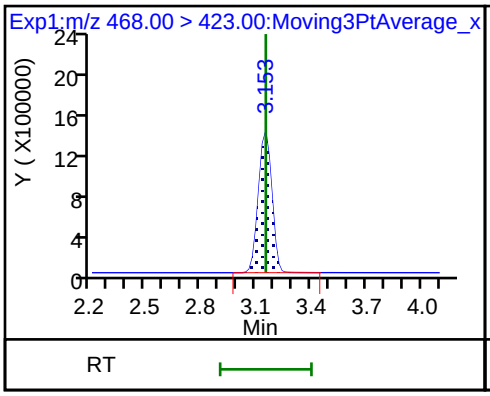
16 Perfluoroheptanesulfonic acid



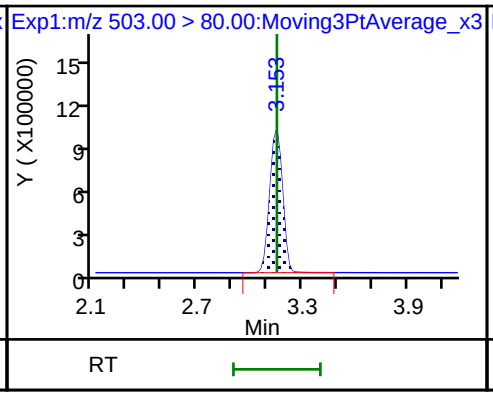
16 Perfluoroheptanesulfonic acid



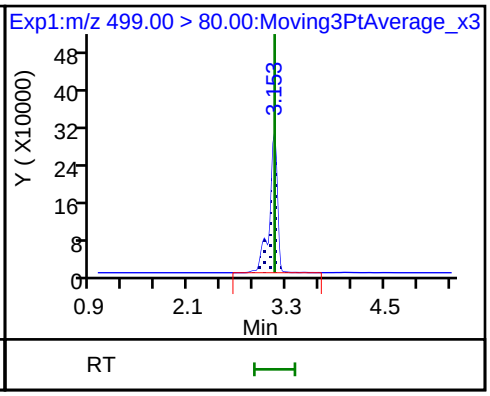
D 19 13C5 PFNA



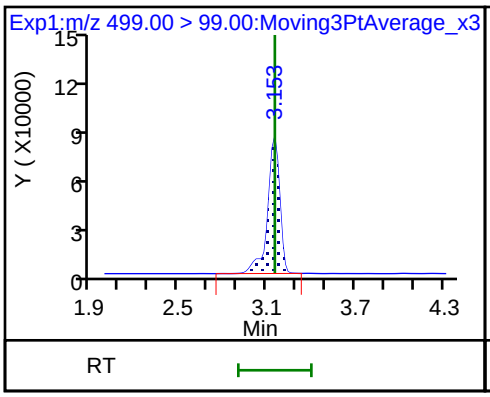
D 18 13C4 PFOS



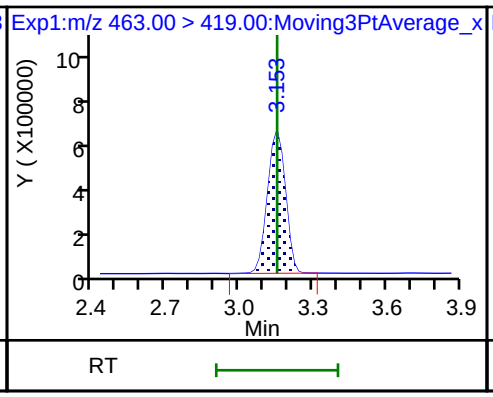
17 Perfluorooctane sulfonic acid



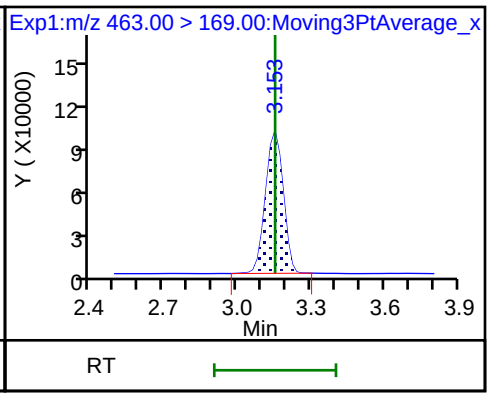
17 Perfluorooctane sulfonic acid



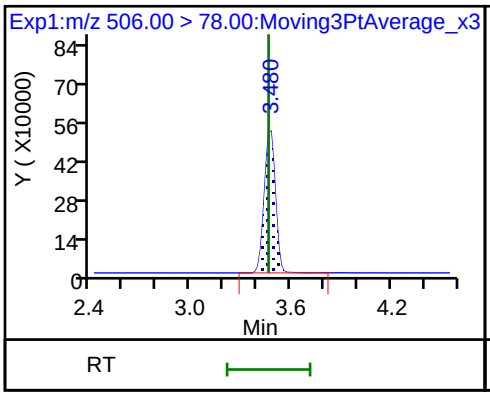
20 Perfluorononanoic acid



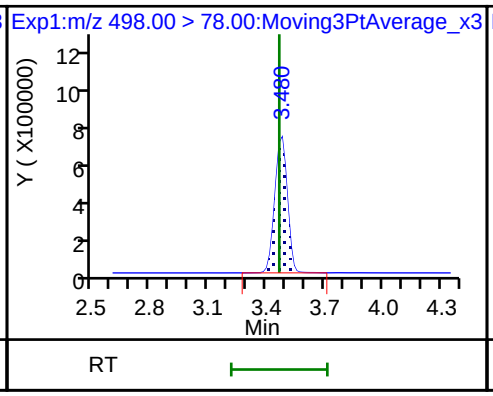
20 Perfluorononanoic acid



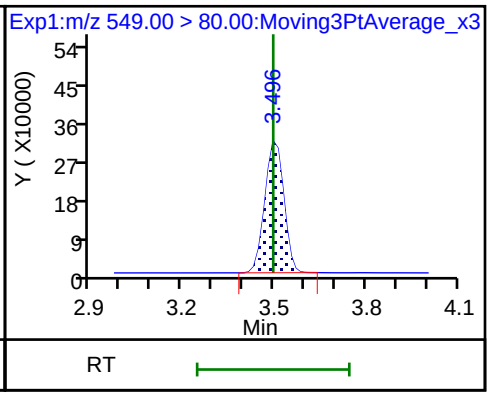
D 21 13C8 FOSA



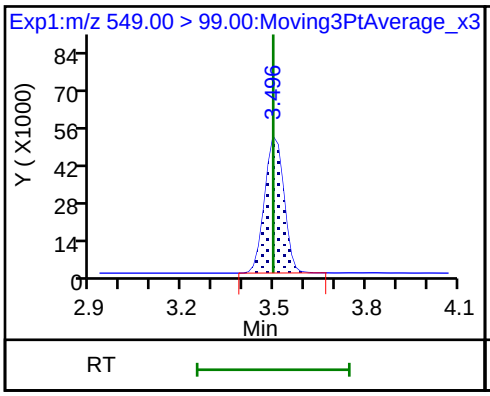
22 Perfluorooctane Sulfonamide



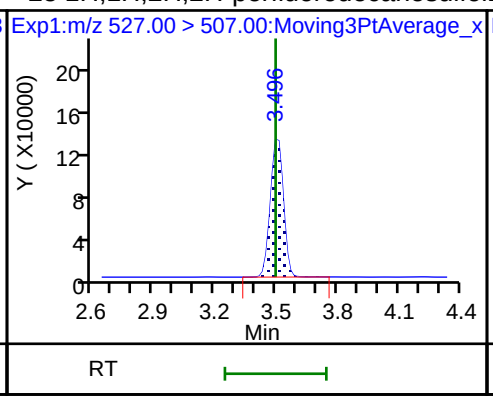
68 Perfluorononanesulfonic acid



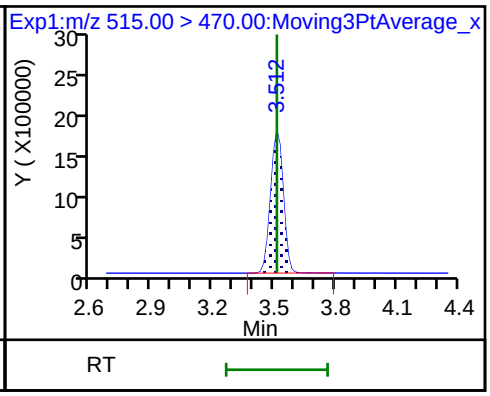
68 Perfluorononanesulfonic acid



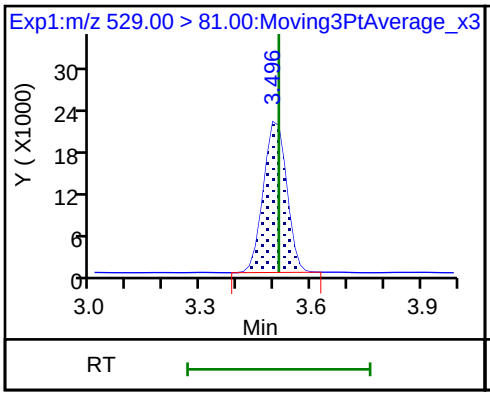
25 1H,1H,2H,2H-perfluorodecanesulfon



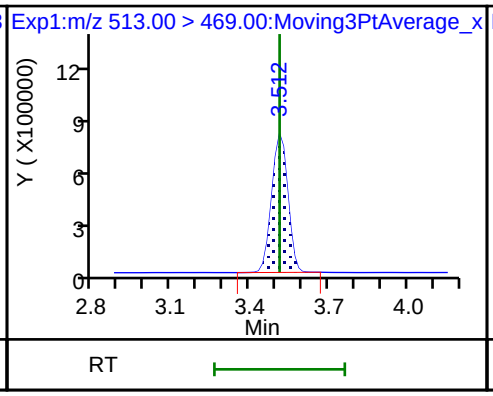
D 23 13C2 PFDA



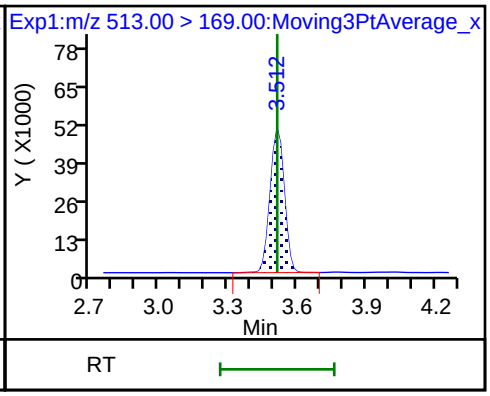
D 26 M2-8:2FTS



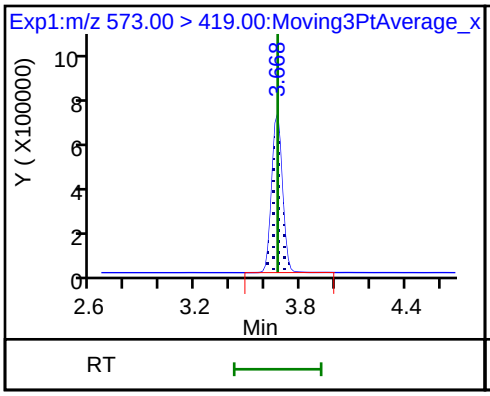
24 Perfluorodecanoic acid



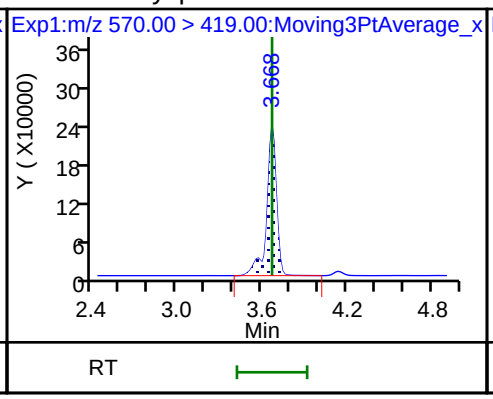
24 Perfluorodecanoic acid



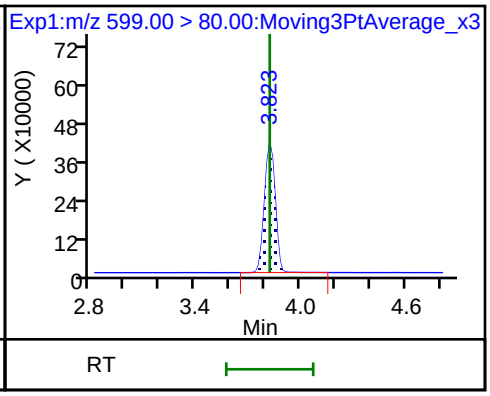
D 27 d3-NMeFOSAA



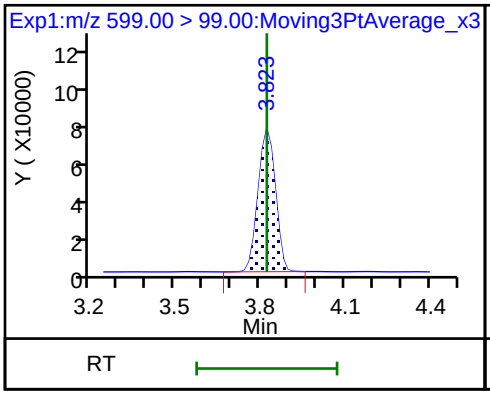
28 N-methyl perfluorooctane sulfonami



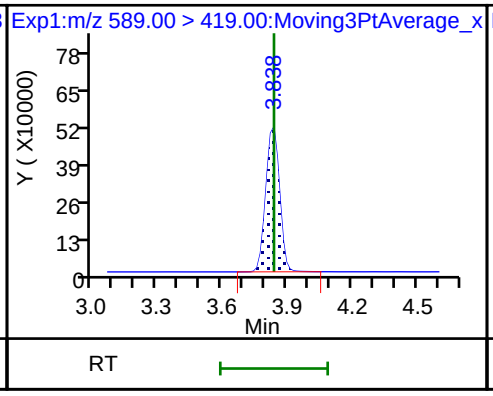
29 Perfluorodecane Sulfonic acid



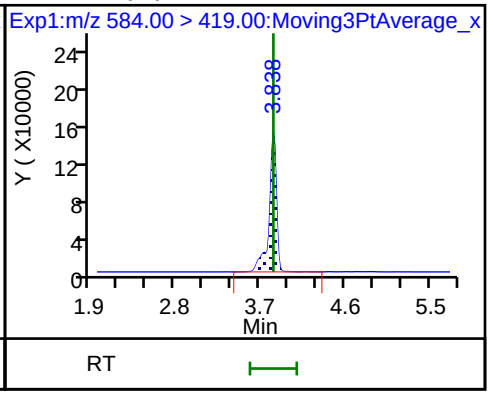
29 Perfluorodecane Sulfonic acid



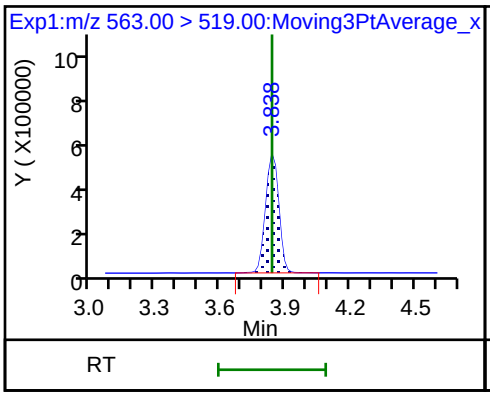
D 32 d5-NEtFOSAA



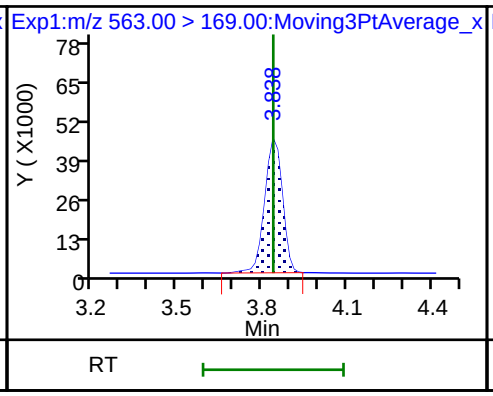
33 N-ethyl perfluorooctane sulfonamid



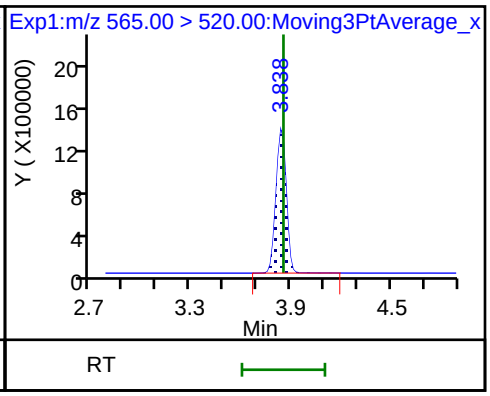
31 Perfluoroundecanoic acid



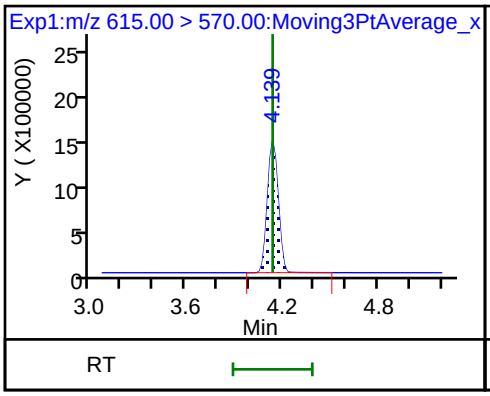
31 Perfluoroundecanoic acid



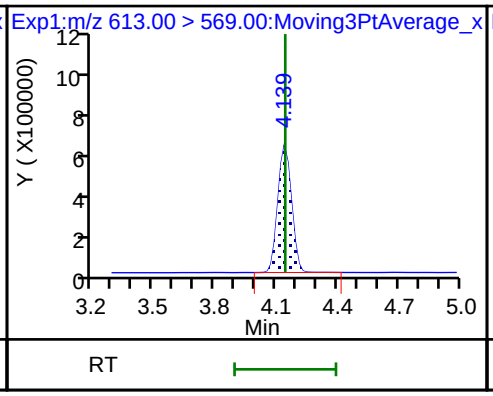
D 30 13C2 PFUnA



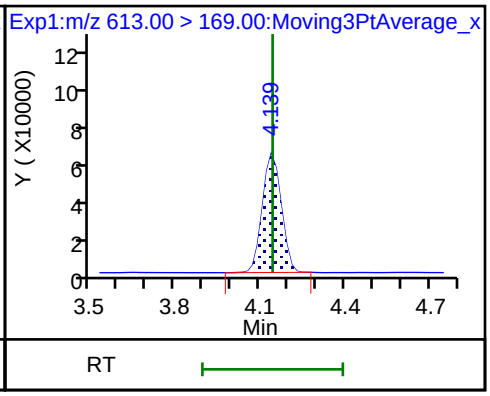
D 36 13C2 PFDoA



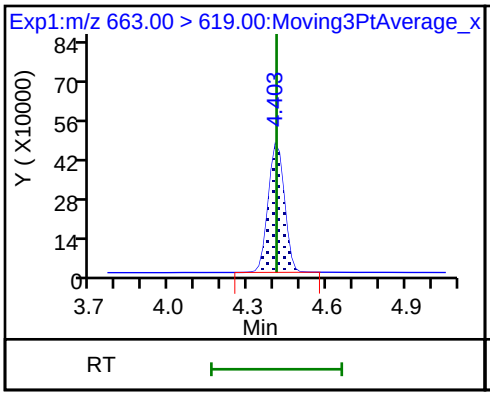
37 Perfluorododecanoic acid



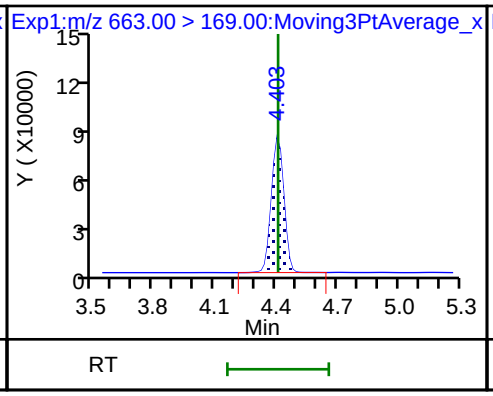
37 Perfluorododecanoic acid



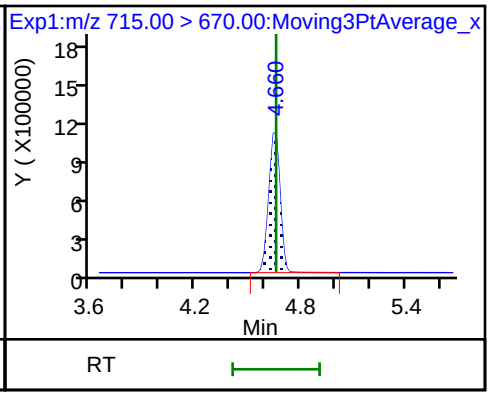
41 Perfluorotridecanoic acid



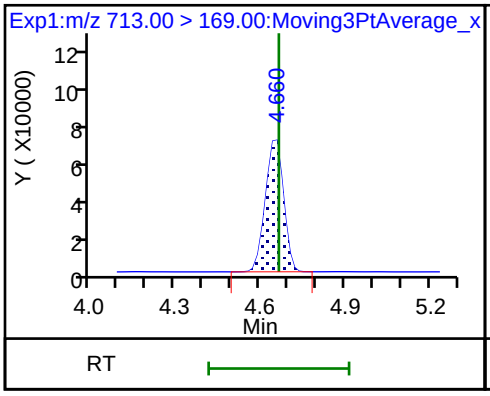
41 Perfluorotridecanoic acid



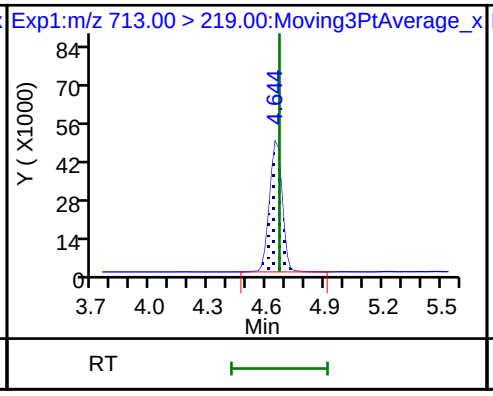
D 43 13C2-PFTeDA



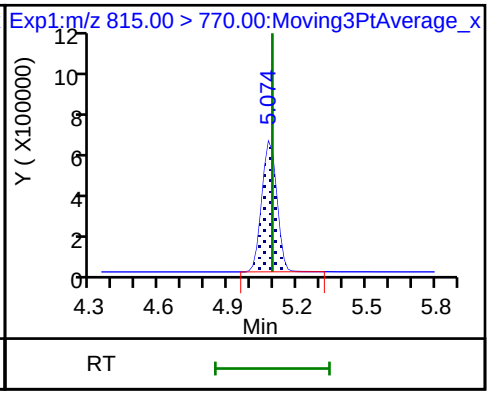
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

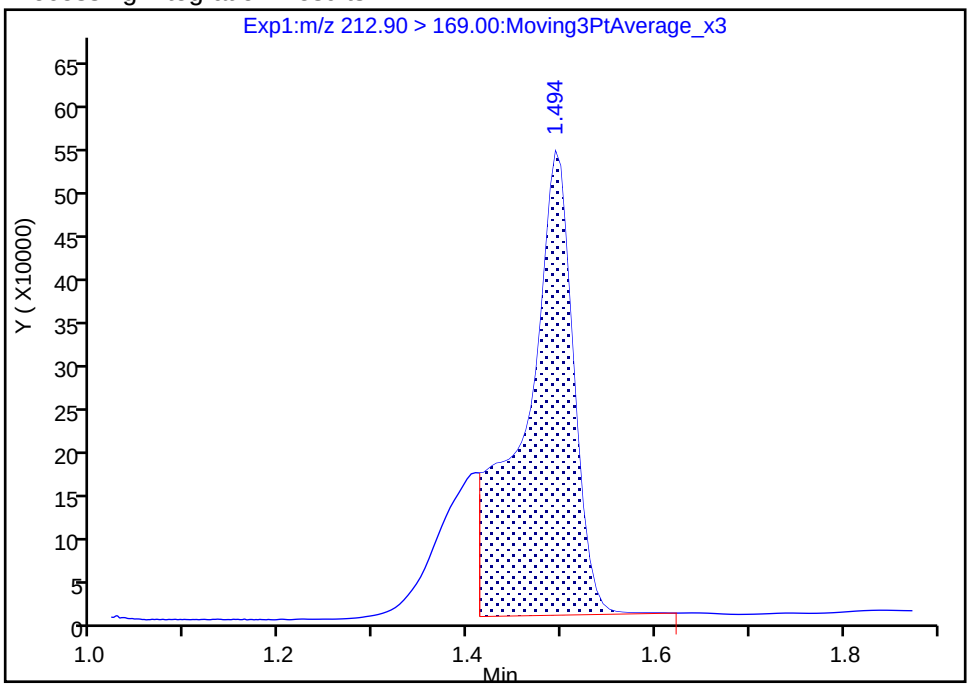
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_014.d
Injection Date: 16-Sep-2018 15:08:58 Instrument ID: A9
Lims ID: LCS 320-245574/2-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 6 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

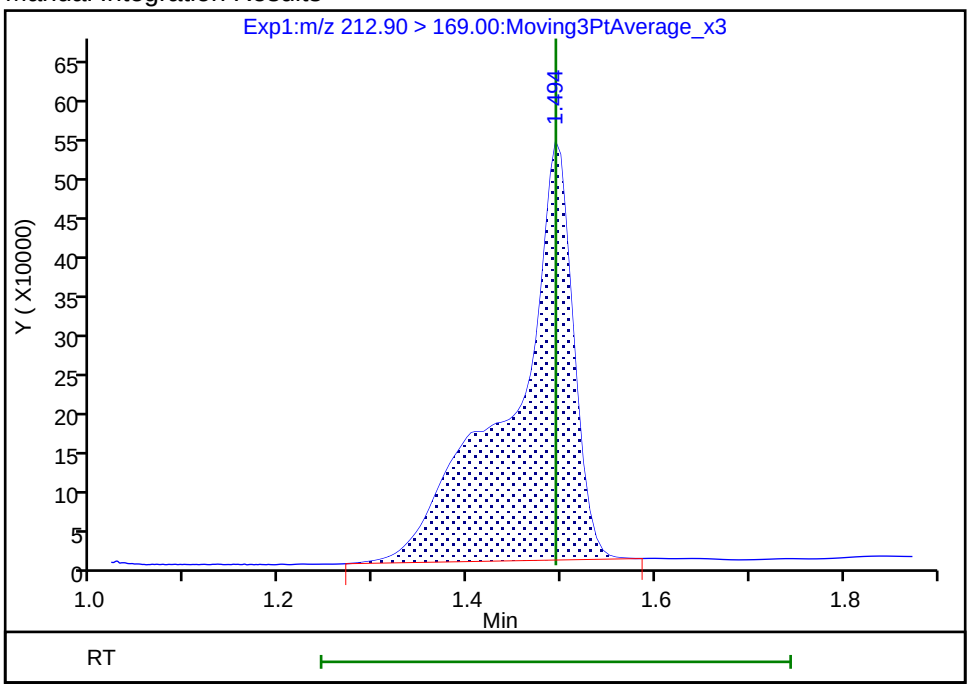
Processing Integration Results

RT: 1.49
Area: 1933513
Amount: 0.815055
Amount Units: ng/ml



Manual Integration Results

RT: 1.49
Area: 2430905
Amount: 1.024726
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:57:42
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-245574/3-A

Matrix: Water | Lab File ID: 2018.09.16_LLA_015.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 250.00(mL) | Date Analyzed: 09/16/2018 15:16

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	39.3	M	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	38.5	M	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	38.1		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	40.8		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	37.9		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	40.6		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	42.7		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	41.5		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	40.3		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	36.9		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	40.7		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35.1	M	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	34.5		2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	41.6		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	36.7		4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	43.5		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.: 320-42924-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-245574/3-A

Matrix: Water | Lab File ID: 2018.09.16_LLA_015.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 250.00(mL) | Date Analyzed: 09/16/2018 15:16

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	84		50-150
STL00992	13C4 PFBA	79		50-150
STL01893	13C5 PFPeA	87	M	50-150
STL00993	13C2 PFHxA	87		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	96		50-150
STL00995	13C5 PFNA	93		50-150
STL00996	13C2 PFDA	90		50-150
STL00997	13C2 PFUnA	88		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	88		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	85	M	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_015.d
Lims ID: LCSD 320-245574/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 16-Sep-2018 15:16:29 ALS Bottle#: 7 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-245574/3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 17-Sep-2018 15:59:29 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 17-Sep-2018 15:59:29

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	1.494	1.494	0.0	1.000	2283329	0.9820		98.2	250	M
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.494	0.0	0.540	6368017	1.97		78.7	914	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.772	1.772	0.0	1.000	2441788	0.9634		96.3	181	M
D 3 13C5-PFPeA										M
267.90 > 223.00	1.772	1.772	0.0	0.641	6247594	2.16		86.5	7470	M
D 47 13C3-PFBS										M
301.90 > 83.00	1.813	1.814	-0.001	0.656	74811	1.97		84.9	397	M
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.813	1.814	-0.001	1.000	2968538	0.8781		99.3	1524	M
298.90 > 99.00	1.813	1.814	-0.001	1.000	1017879		2.92(1.35-4.05)		652	M
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.027	2.027	0.0	1.118	674731	0.9704		104	2657	
D 7 13C2 PFHxA										
315.00 > 270.00	2.068	2.068	0.0	0.748	6608123	2.16		86.6	5831	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.068	2.068	0.0	1.000	2291644	0.9520		95.2	439	
313.00 > 119.00	2.068	2.068	0.0	1.000	178750		12.82(6.96-20.87)		423	
70 Perfluoropentanesulfonic acid										M
349.00 > 80.00	2.088	2.089	-0.001	1.152	1522874	0.9490		101	2010	M
349.00 > 99.00	2.088	2.089	-0.001	1.152	700512		2.17(1.15-3.45)		936	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.170	2.170	0.0	0.785	731475	NC			1272	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.160	2.170	-0.010	0.995	502643	NC			177	
D 9 13C4-PFHpA										
367.00 > 322.00	2.399	2.399	0.0	0.867	8419309	2.31		92.5	9136	

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	2.399	2.400	-0.001	1.000	3503733	1.02		102	414	
363.00 > 169.00	2.399	2.400	-0.001	1.000	763631		4.59(2.17-6.52)		1126	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.412	2.413	-0.001	1.000	2111645	0.8613		94.7	2199	
399.00 > 99.00	2.412	2.413	-0.001	1.000	591369		3.57(1.90-5.70)		391	
D 11 18O2 PFHxS										
403.00 > 84.00	2.412	2.426	-0.014	0.872	4685710	2.09		88.5	7424	
76 DONA										
377.00 > 251.00	2.438	2.452	-0.014	0.778	5707416	NC			6489	
377.00 > 85.00	2.438	2.452	-0.014	0.778	2505744		2.28(1.13-3.39)		1067	
D 12 M2-6:2FTS										
429.00 > 81.00	2.734	2.750	-0.016	0.988	725903	2.03		85.4	1089	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.734	2.750	-0.016	1.000	1216868	1.86		196	488	
D 14 13C4 PFOA										
417.00 > 372.00	2.766	2.766	0.0	1.000	8103589	2.39		95.6	4754	
* 62 13C2-PFOA										
415.00 > 370.00	2.766	2.766	0.0		8409709	2.50			9195	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.766	2.766	0.0	1.000	3304506	0.9472		94.6	172	
413.00 > 169.00	2.766	2.766	0.0	1.000	1121292		2.95(1.36-4.08)		876	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.766	2.782	-0.016	0.882	2215330	1.04		109	2416	
449.00 > 99.00	2.766	2.782	-0.016	0.882	518420		4.27(1.84-5.53)		1576	
D 19 13C5 PFNA										
468.00 > 423.00	3.134	3.153	-0.019	1.133	7354323	2.32		92.7	7517	
D 18 13C4 PFOS										
503.00 > 80.00	3.134	3.153	-0.019	1.133	5171589	2.15		90.0	3588	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.134	3.153	-0.019	1.000	2093212	0.9168		98.8	922	
499.00 > 99.00	3.134	3.153	-0.019	1.000	490656		4.27(2.04-6.12)		1327	
20 Perfluorononanoic acid										
463.00 > 419.00	3.134	3.153	-0.019	1.000	2921327	1.02		102	264	
463.00 > 169.00	3.134	3.153	-0.019	1.000	529697		5.52(2.68-8.03)		1268	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.350	3.367	-0.017	1.069	2229915	NC			2645	
D 21 13C8 FOSA										
506.00 > 78.00	3.464	3.465	-0.001	1.253	2682938	2.11		84.3	5711	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.464	3.465	-0.001	1.000	3223331	1.01		101	2629	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.496	3.496	0.0	1.115	1320530	0.9449		98.4	2137	
549.00 > 99.00	3.496	3.496	0.0	1.115	237535		5.56(3.02-9.05)		1310	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.496	3.496	0.0	1.000	577012	0.8659		90.4	1799	
D 23 13C2 PFDA										
515.00 > 470.00	3.512	3.512	0.0	1.270	7098318	2.24		89.5	7787	

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	3.496	3.512	-0.016	1.264	105425	2.00		83.7	625	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.512	3.512	0.0	1.000	3451099	1.07		107	597	
513.00 > 169.00	3.512	3.512	0.0	1.000	212755		16.22(7.12-21.35)		502	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.655	3.669	-0.014	1.321	2948274	2.06		82.5	4214	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.655	3.669	-0.014	1.000	1202109	1.03		103	459	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.823	3.823	0.0	1.220	1912029	1.09		113	2283	
599.00 > 99.00	3.823	3.823	0.0	1.220	394107		4.85(2.14-6.43)		1468	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.823	3.839	-0.016	1.382	2445809	2.18		87.0	2610	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.838	3.839	-0.001	1.004	866342	0.9523		95.2	2245	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.838	3.839	-0.001	1.000	2204502	1.04		104	490	
563.00 > 169.00	3.838	3.839	-0.001	1.000	208496		10.57(5.24-15.72)		1024	
D 30 13C2 PFUnA										
565.00 > 520.00	3.838	3.854	-0.016	1.388	5921727	2.19		87.8	8009	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.991	4.012	-0.021	1.273	2694953	NC			5051	
D 36 13C2 PFDoA										
615.00 > 570.00	4.122	4.139	-0.017	1.490	7167404	2.18		87.3	8456	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.139	4.144	-0.005	1.184	412104	NC			937	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.139	4.144	-0.005	1.004	2909875	1.01		101	609	
613.00 > 169.00	4.122	4.144	-0.022	1.000	287305		10.13(4.68-14.05)		694	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.372	4.377	-0.005	1.395	152374	NC			497	
699.00 > 99.00	4.372	4.377	-0.005	1.395	289497		0.53(0.28-0.83)		604	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.403	4.408	-0.005	1.068	2119354	0.9214		92.1	1004	
663.00 > 169.00	4.403	4.408	-0.005	1.068	365362		5.80(3.09-9.27)		1350	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.644	4.660	-0.016	1.679	5143981	1.97		78.7	6760	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.644	4.666	-0.022	1.000	338300	1.02		102	1117	
713.00 > 219.00	4.644	4.666	-0.022	1.000	212427		1.59(0.70-2.09)		844	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.074	5.079	-0.005	1.000	1450326	NC			463	
813.00 > 169.00	5.074	5.079	-0.005	1.000	253368		5.72(2.77-8.32)		605	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.074	5.091	-0.017	1.835	3947481	1.49		59.6	6602	

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	5.432	5.451	-0.019	1.071	351074	NC			173	
913.00 > 169.00	5.432	5.451	-0.019	1.071	66650		5.27(2.55-7.64)		401	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 17-Sep-2018 15:59:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_015.d

Injection Date: 16-Sep-2018 15:16:29 Instrument ID: A9

Lims ID: LCSD 320-245574/3-A

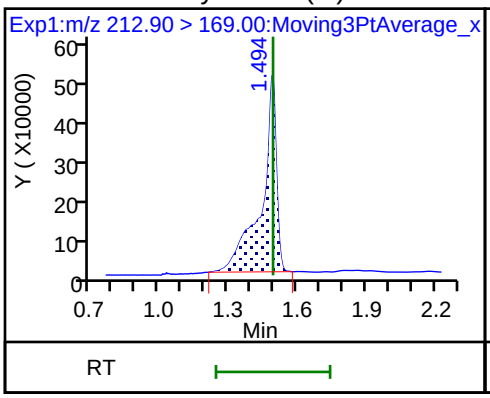
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 7 Worklist Smp#: 4

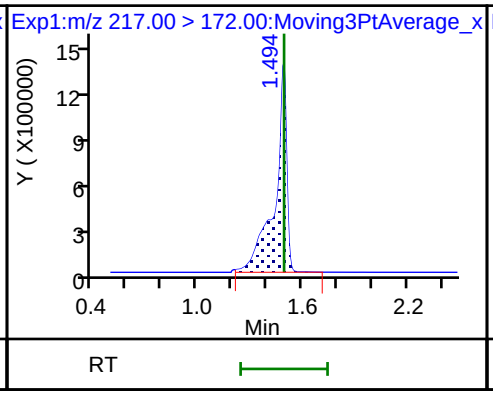
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

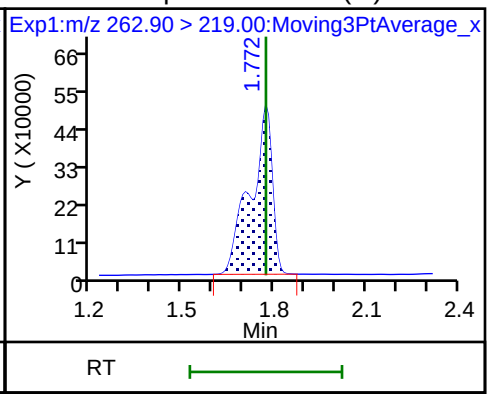
2 Perfluorobutyric acid (M)



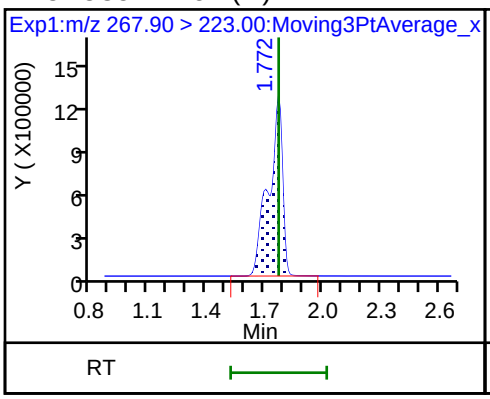
D 1 13C4 PFBA



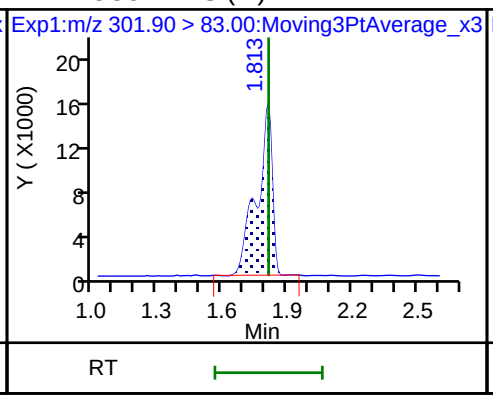
4 Perfluoropentanoic acid (M)



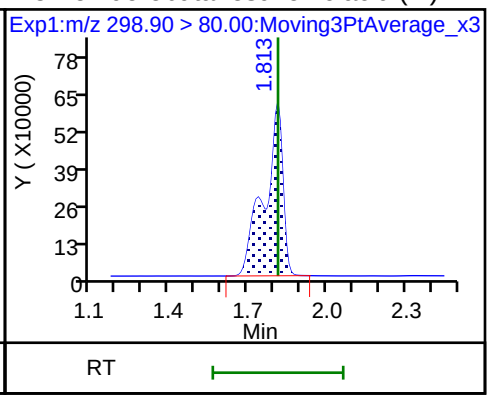
D 3 13C5-PFPeA (M)



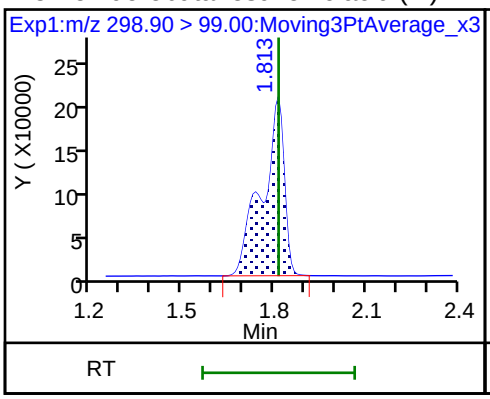
D 47 13C3-PFBS (M)



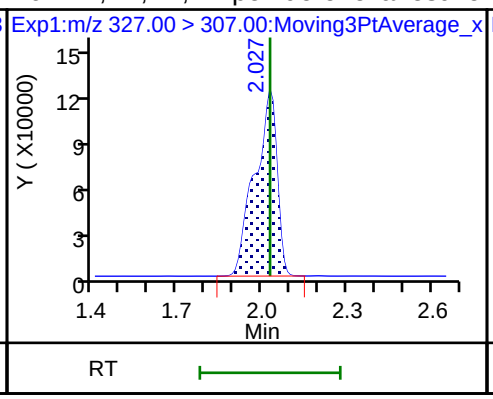
5 Perfluorobutanesulfonic acid (M)



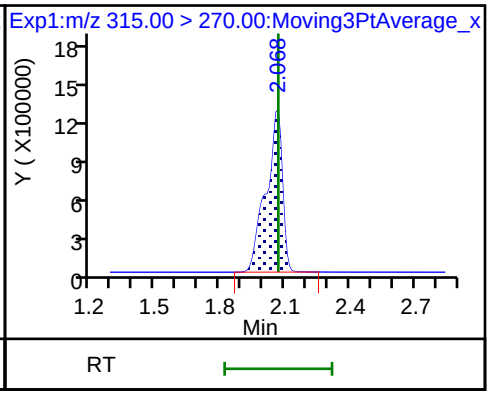
5 Perfluorobutanesulfonic acid (M)



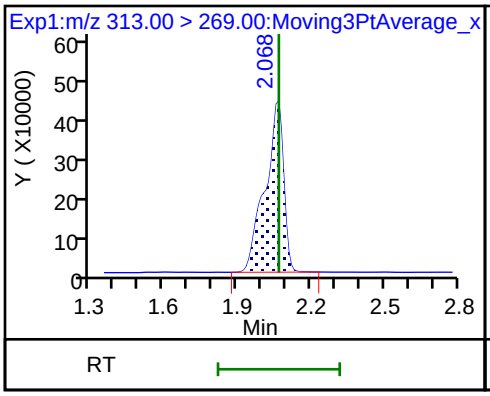
61 1H,1H,2H,2H-perfluorohexanesulfon



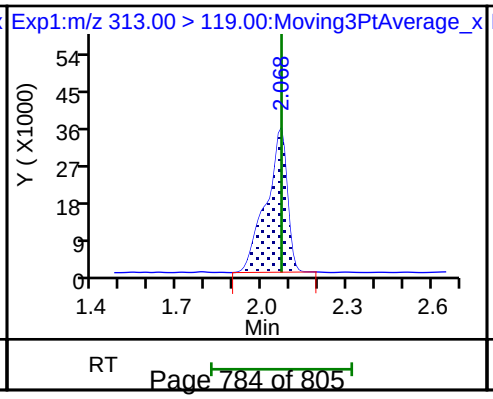
D 7 13C2 PFHxA



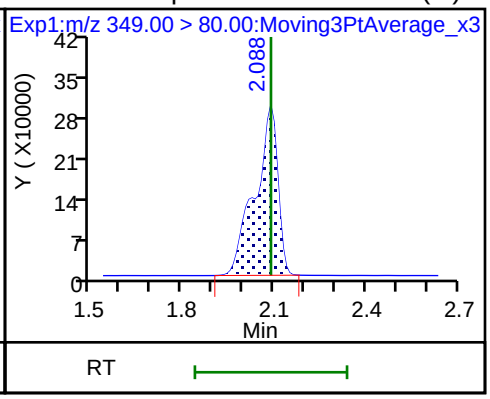
6 Perfluorohexanoic acid



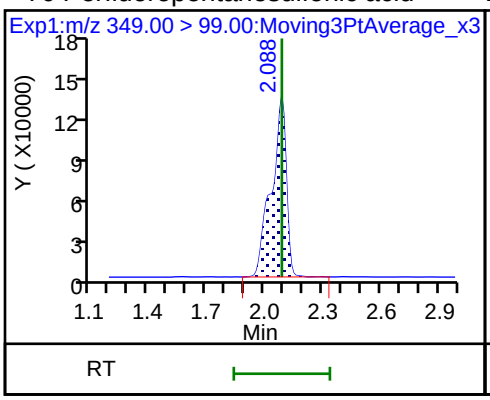
6 Perfluorohexanoic acid



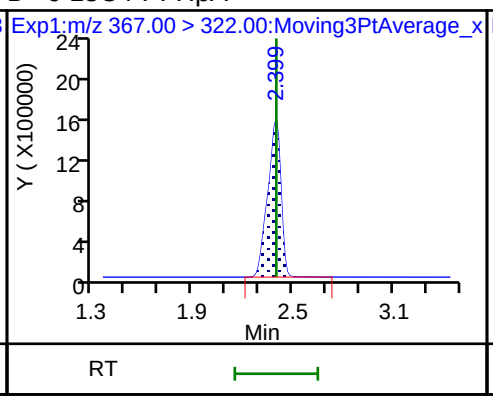
70 Perfluoropentanesulfonic acid (M)



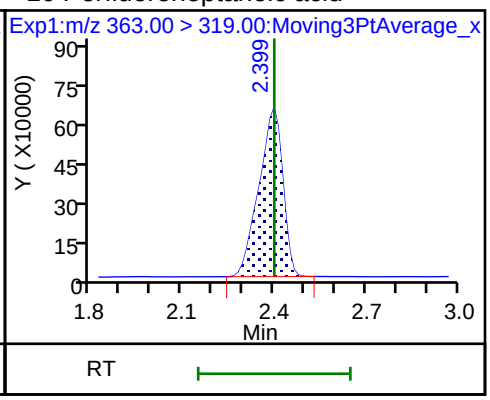
70 Perfluoropentanesulfonic acid



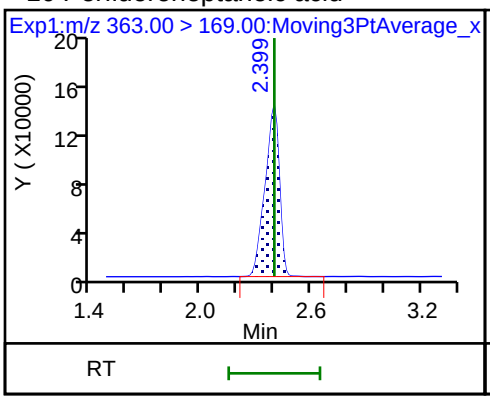
D 9 13C4-PFHpA



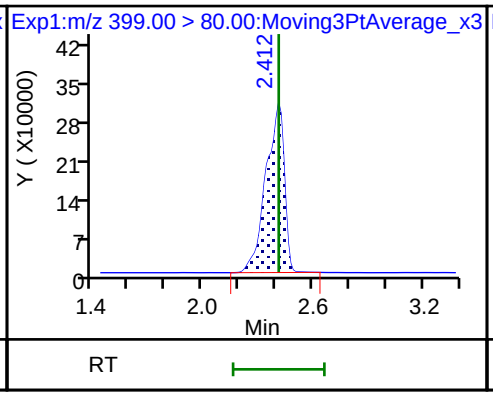
10 Perfluoroheptanoic acid



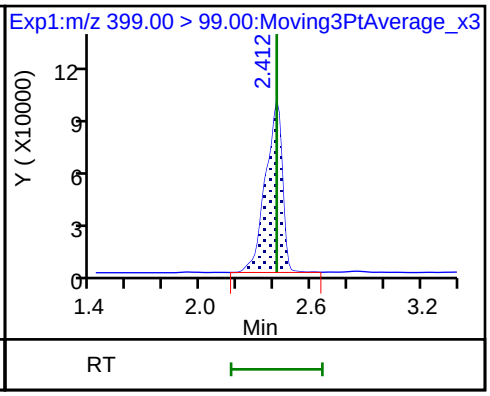
10 Perfluoroheptanoic acid



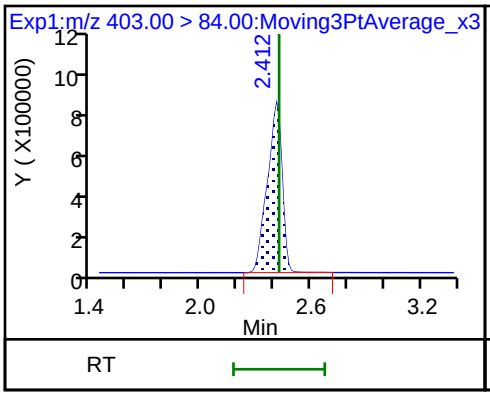
8 Perfluorohexanesulfonic acid



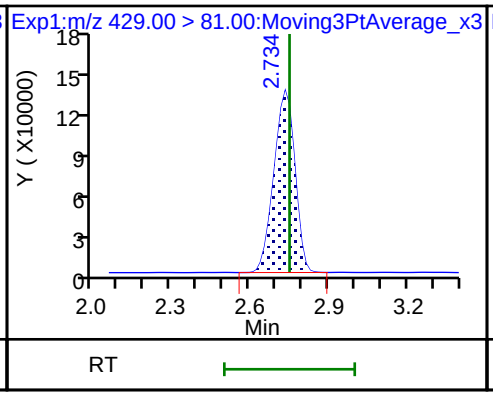
8 Perfluorohexanesulfonic acid



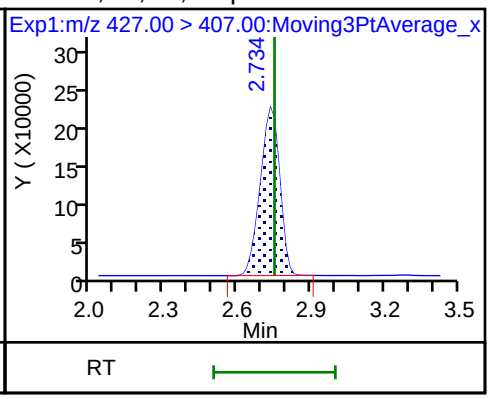
D 11 18O2 PFHxS



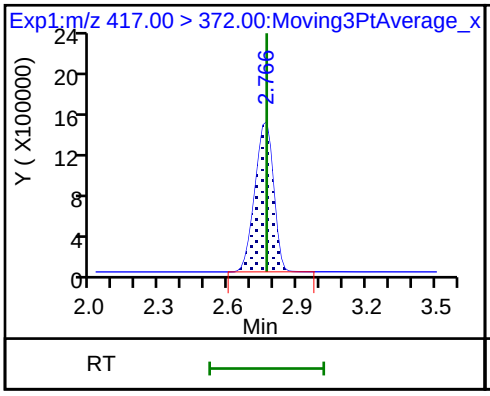
D 12 M2-6:2FTS



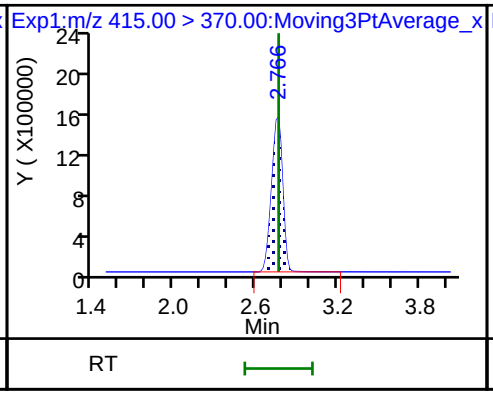
13 1H,1H,2H,2H-perfluorooctanesulfoni



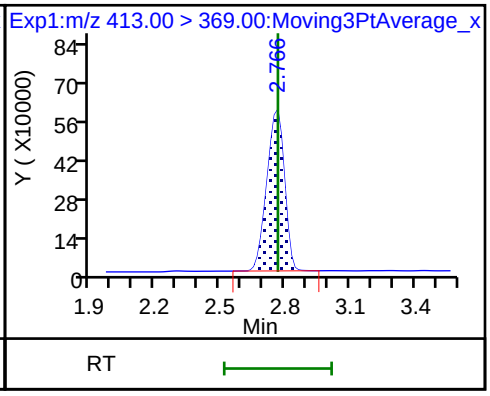
D 14 13C4 PFOA



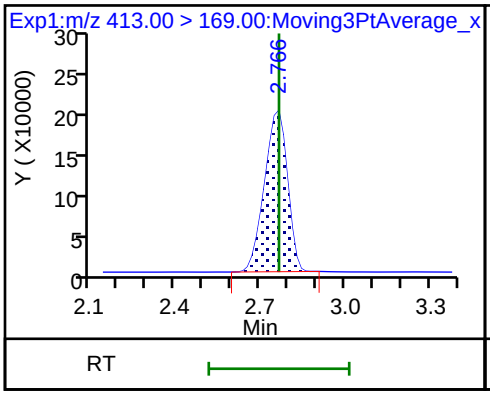
* 62 13C2-PFOA



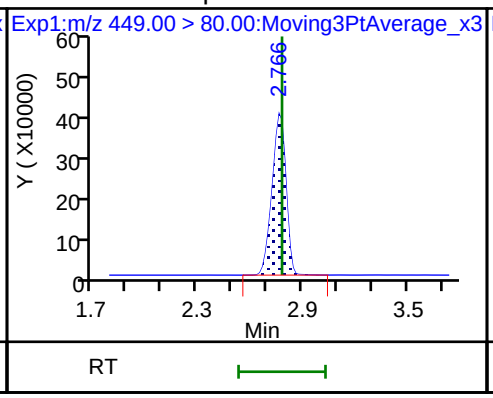
15 Perfluorooctanoic acid



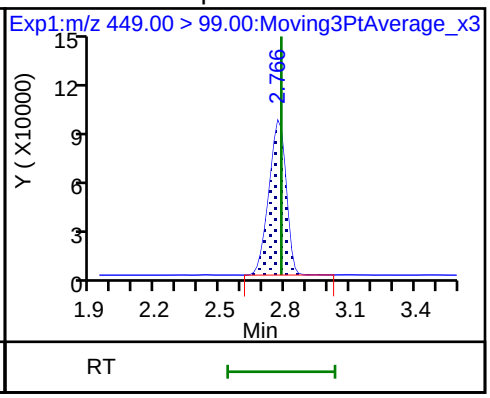
15 Perfluorooctanoic acid



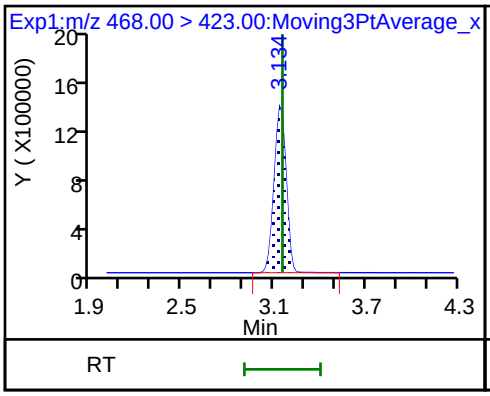
16 Perfluoroheptanesulfonic acid



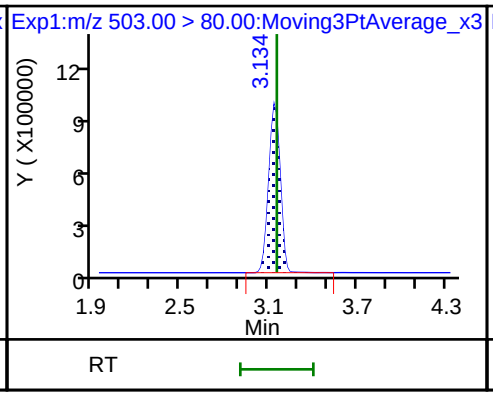
16 Perfluoroheptanesulfonic acid



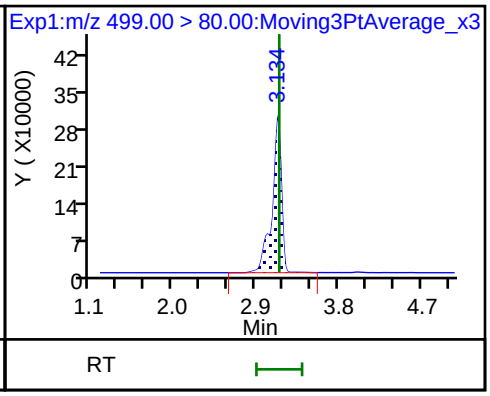
D 19 13C5 PFNA



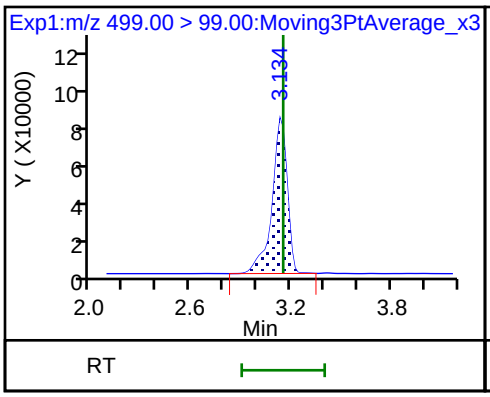
D 18 13C4 PFOS



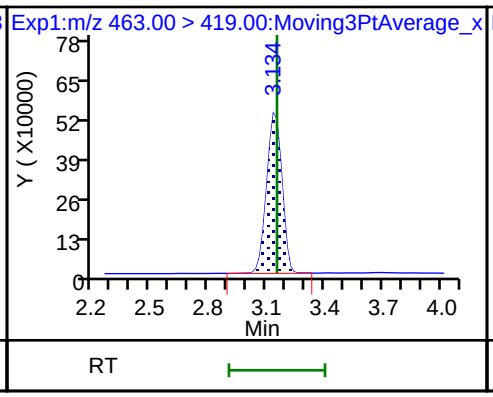
17 Perfluorooctane sulfonic acid



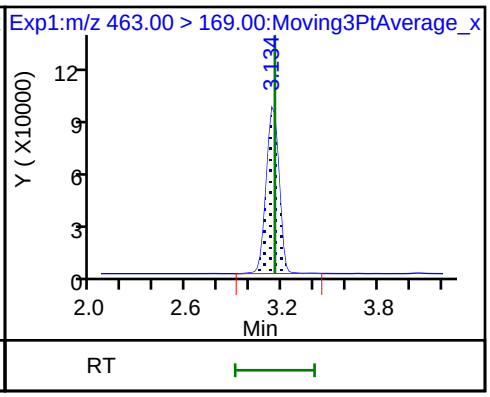
17 Perfluorooctane sulfonic acid



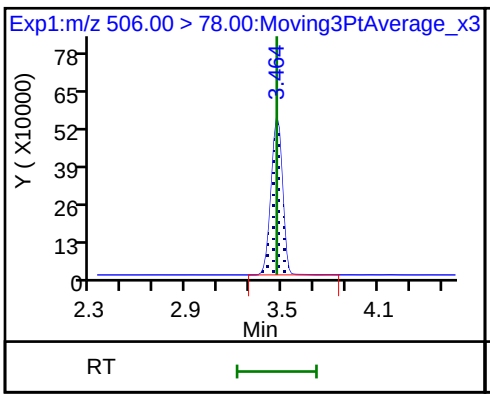
20 Perfluorononanoic acid



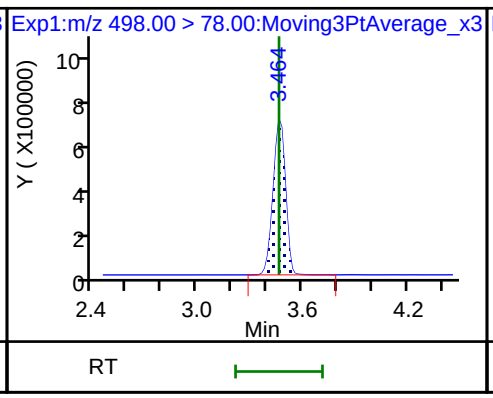
20 Perfluorononanoic acid



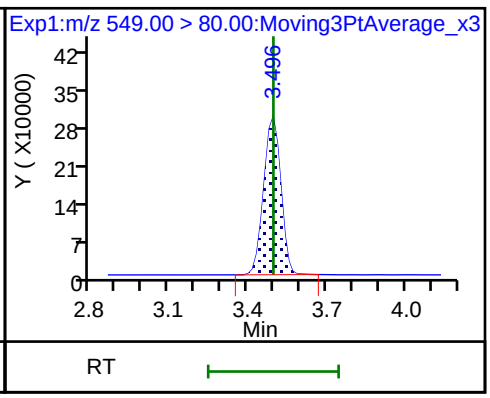
D 21 13C8 FOSA



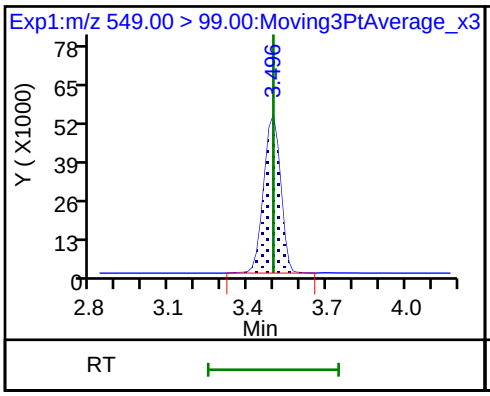
22 Perfluorooctane Sulfonamide



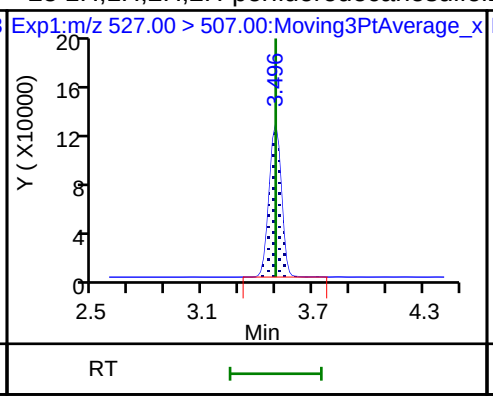
68 Perfluorononanesulfonic acid



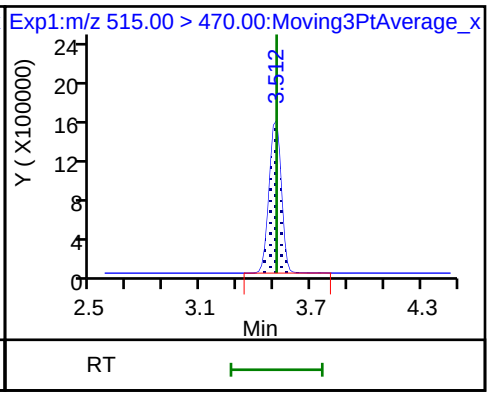
68 Perfluorononanesulfonic acid



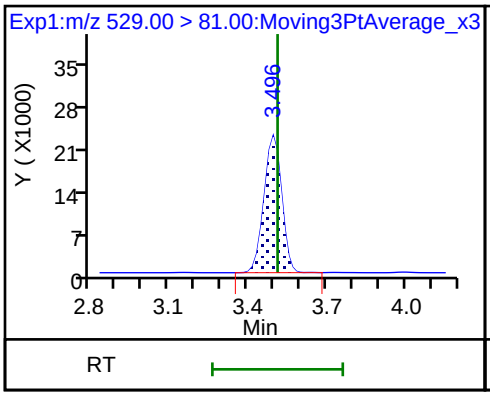
25 1H,1H,2H,2H-perfluorodecanesulfon



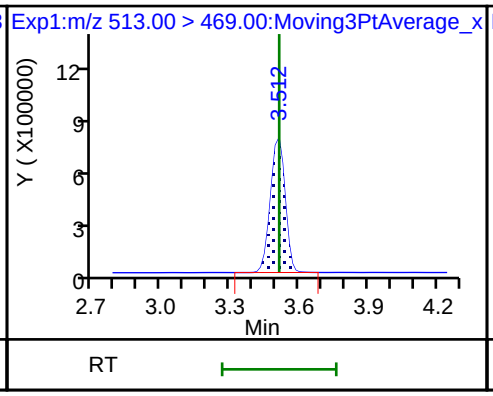
D 23 13C2 PFDA



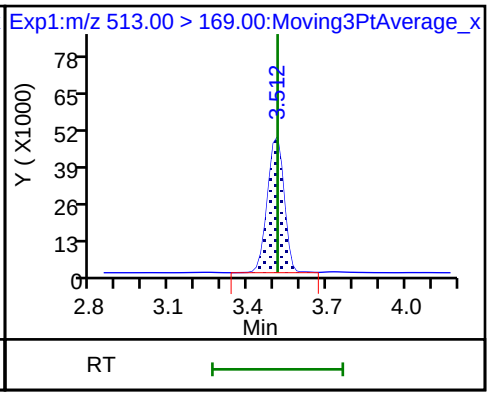
D 26 M2-8:2FTS



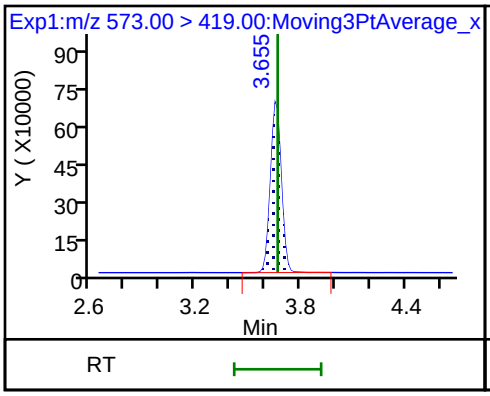
24 Perfluorodecanoic acid



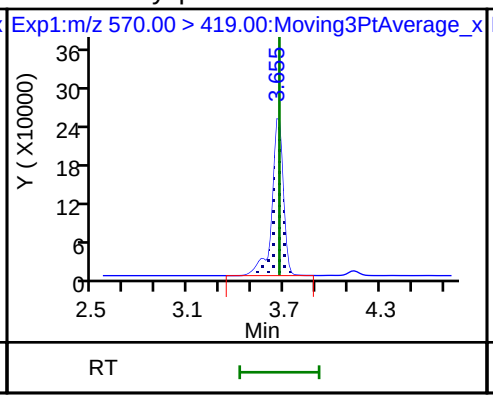
24 Perfluorodecanoic acid



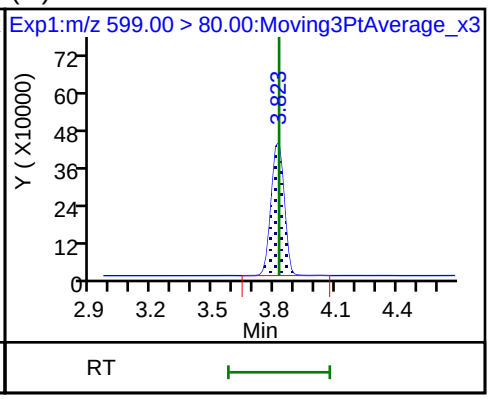
D 27 d3-NMeFOSAA



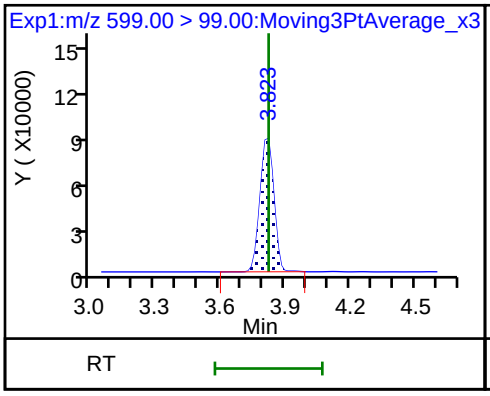
28 N-methyl perfluorooctane sulfonami (M)



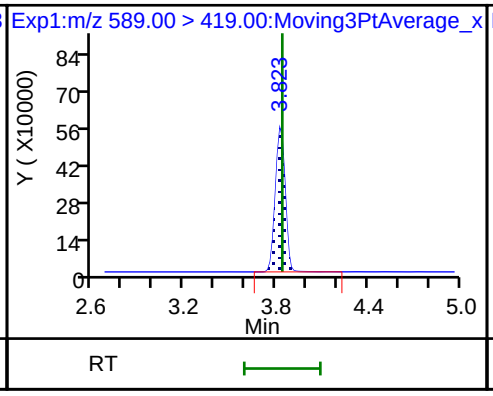
29 Perfluorodecane Sulfonic acid



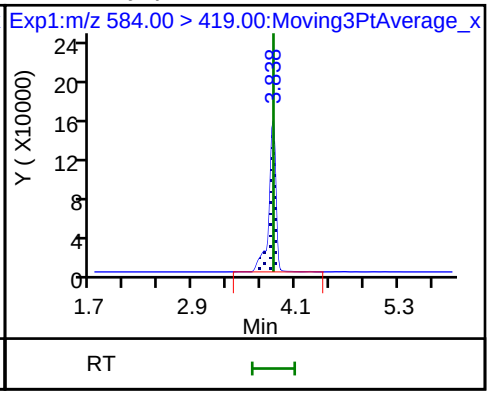
29 Perfluorodecane Sulfonic acid



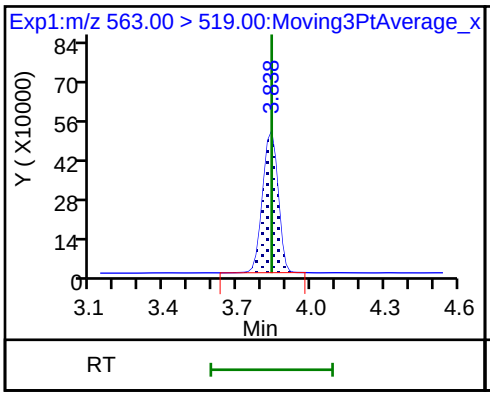
D 32 d5-NEtFOSAA



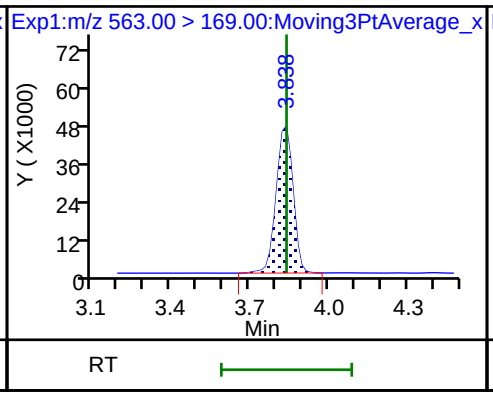
33 N-ethyl perfluorooctane sulfonamid



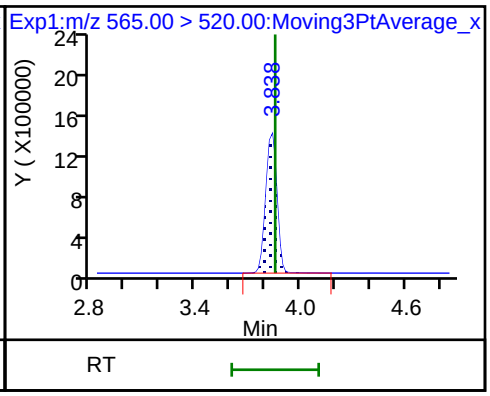
31 Perfluoroundecanoic acid



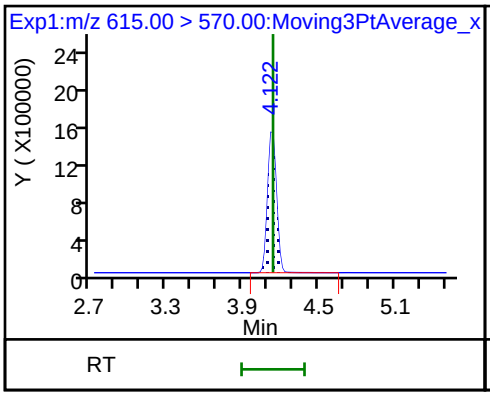
31 Perfluoroundecanoic acid



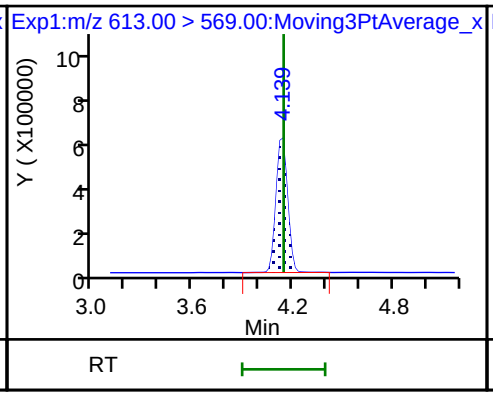
D 30 13C2 PFUnA



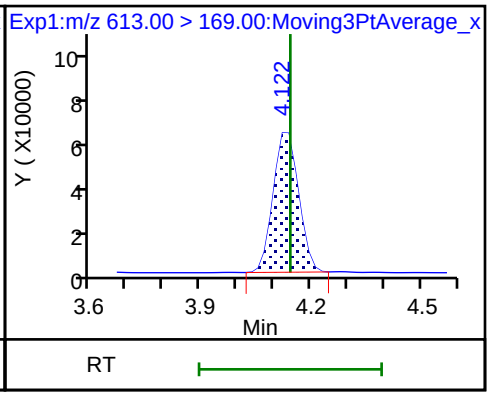
D 36 13C2 PFDoA



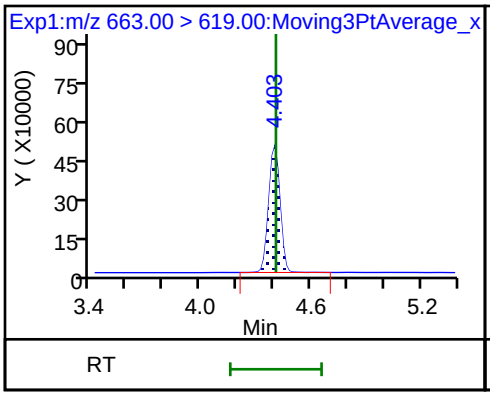
37 Perfluorododecanoic acid



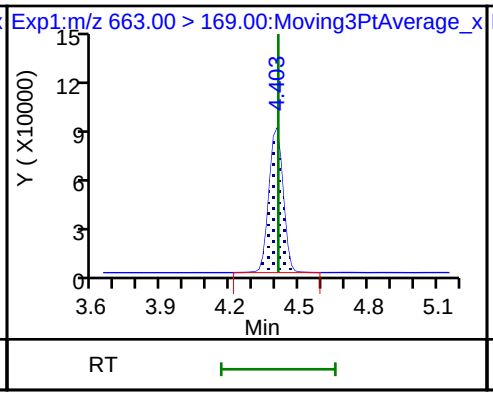
37 Perfluorododecanoic acid



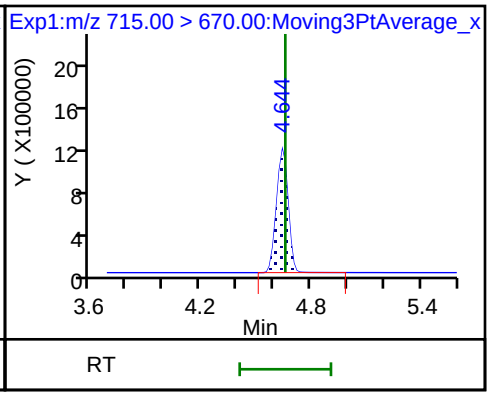
41 Perfluorotridecanoic acid



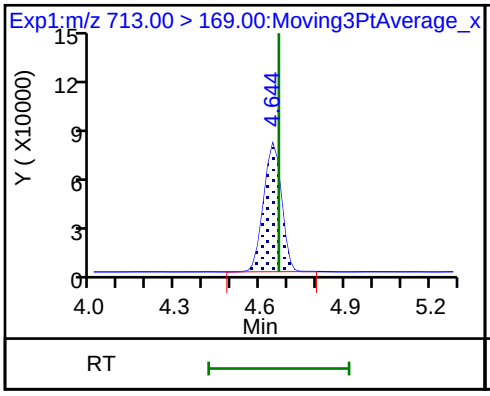
41 Perfluorotridecanoic acid



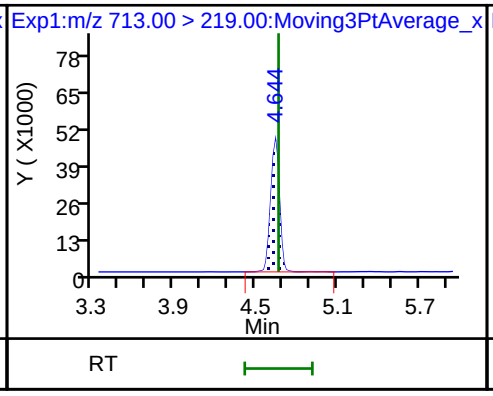
D 43 13C2-PFTeDA



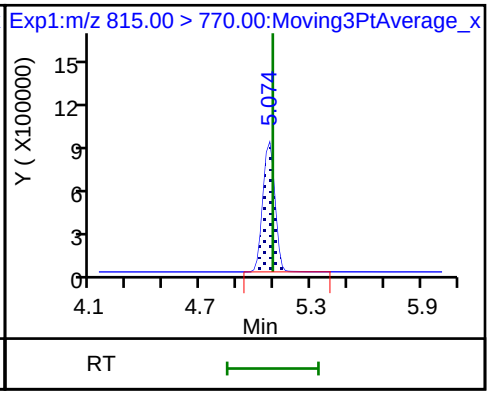
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

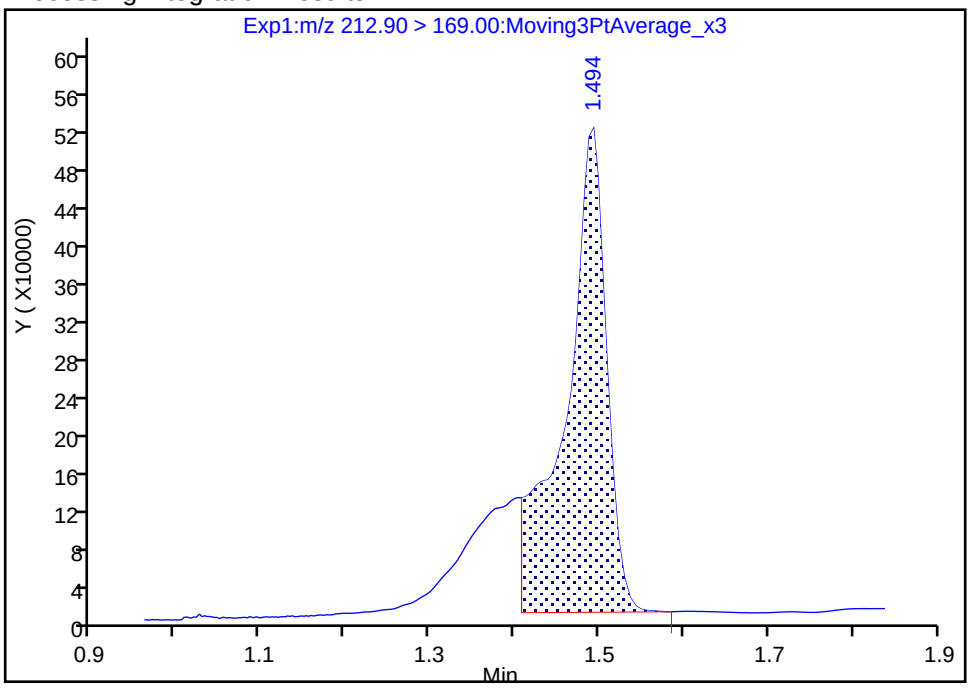
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_015.d
Injection Date: 16-Sep-2018 15:16:29 Instrument ID: A9
Lims ID: LCSD 320-245574/3-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 7 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

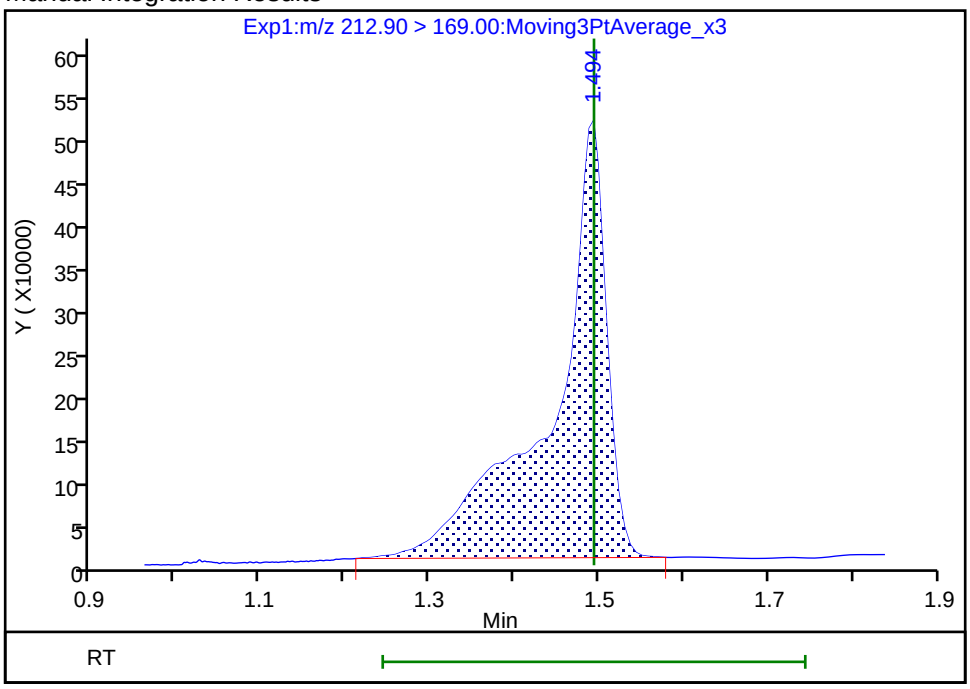
Processing Integration Results

RT: 1.49
Area: 1728025
Amount: 0.743191
Amount Units: ng/ml



Manual Integration Results

RT: 1.49
Area: 2283329
Amount: 0.982017
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:58:41
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

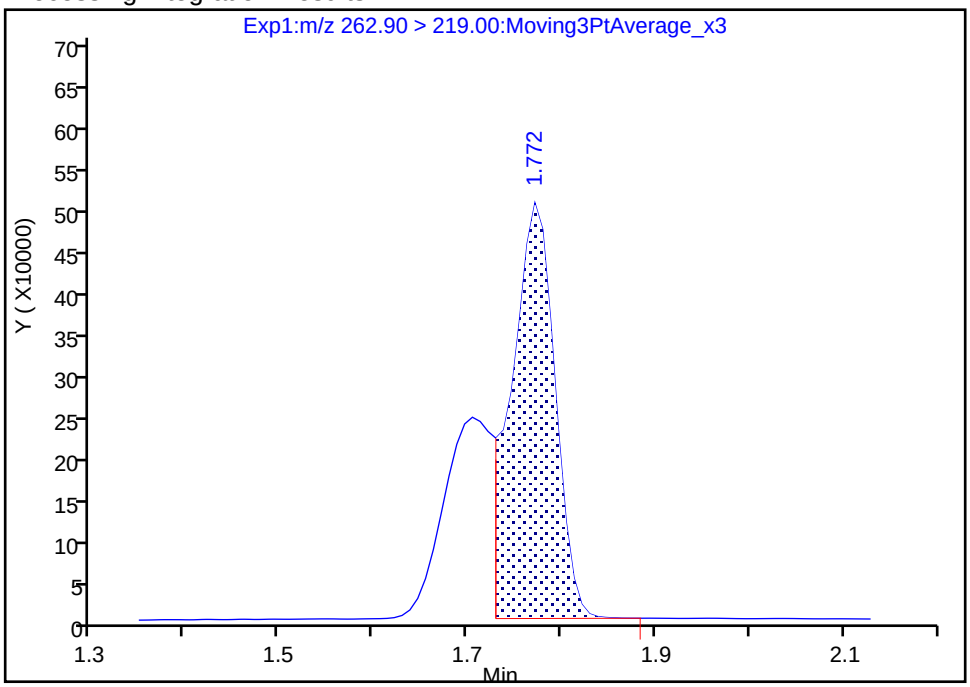
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_015.d
Injection Date: 16-Sep-2018 15:16:29 Instrument ID: A9
Lims ID: LCSD 320-245574/3-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 7 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

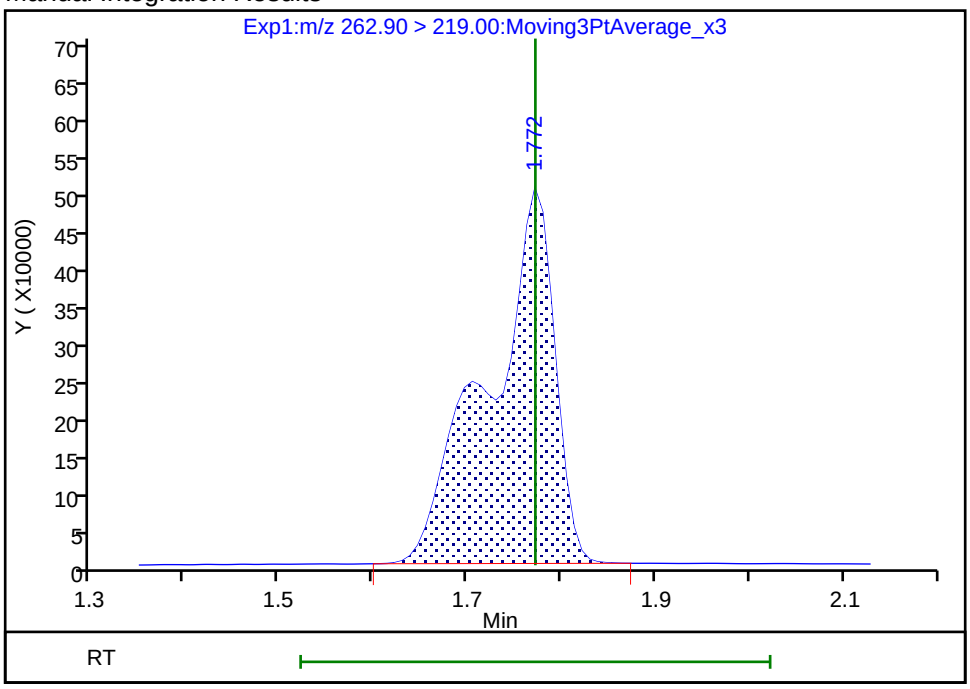
Processing Integration Results

RT: 1.77
Area: 1580654
Amount: 0.623624
Amount Units: ng/ml



Manual Integration Results

RT: 1.77
Area: 2441788
Amount: 0.963372
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:58:46
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

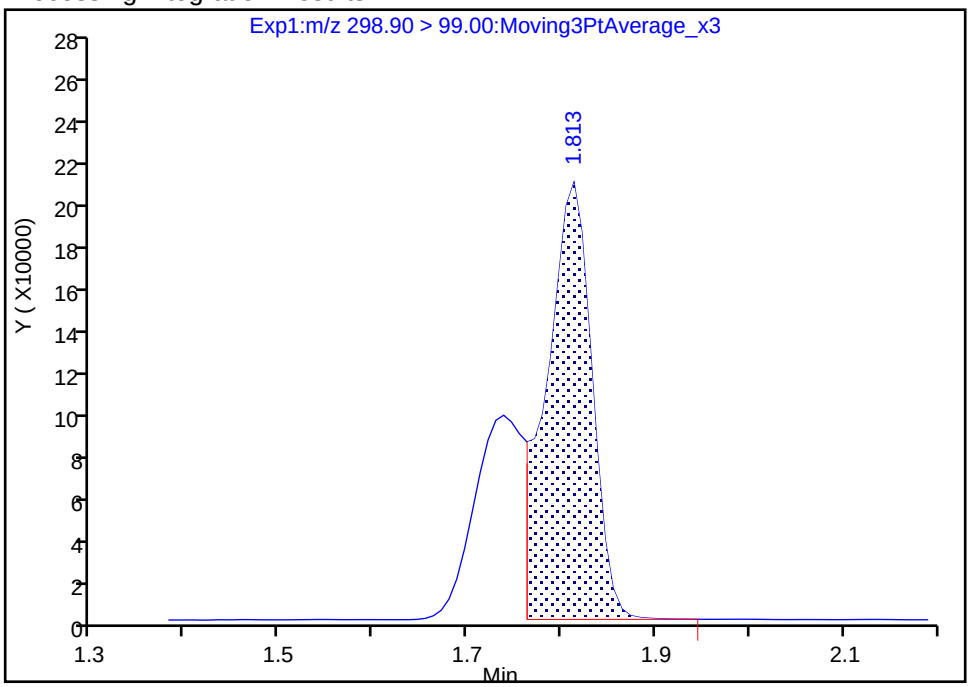
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_015.d
Injection Date: 16-Sep-2018 15:16:29 Instrument ID: A9
Lims ID: LCSD 320-245574/3-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 7 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

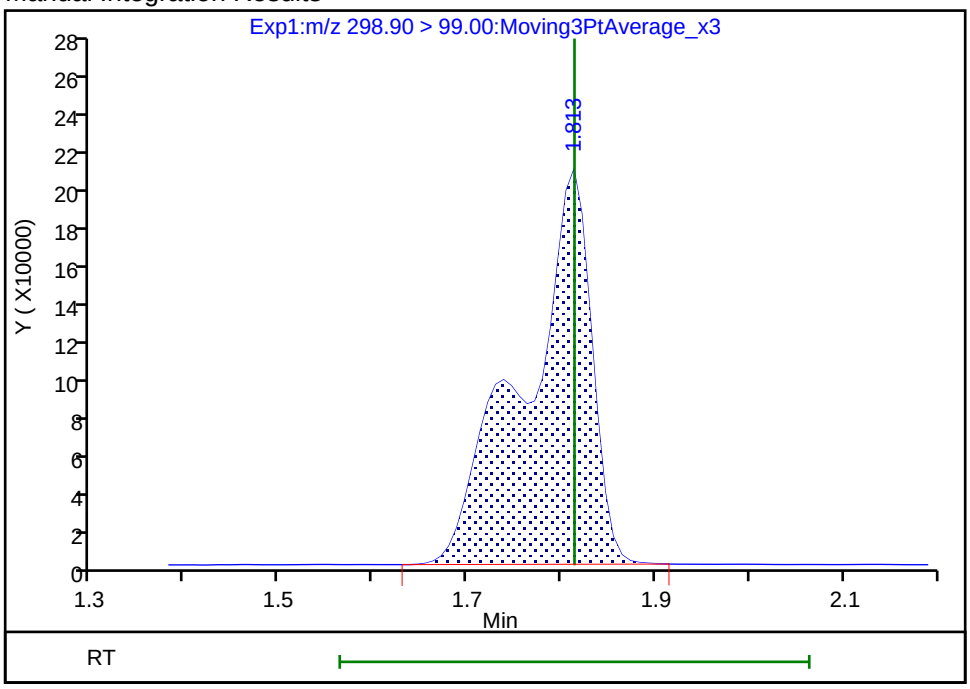
Processing Integration Results

RT: 1.81
Area: 678101
Amount: 0.553981
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 1017879
Amount: 0.878102
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:58:50
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

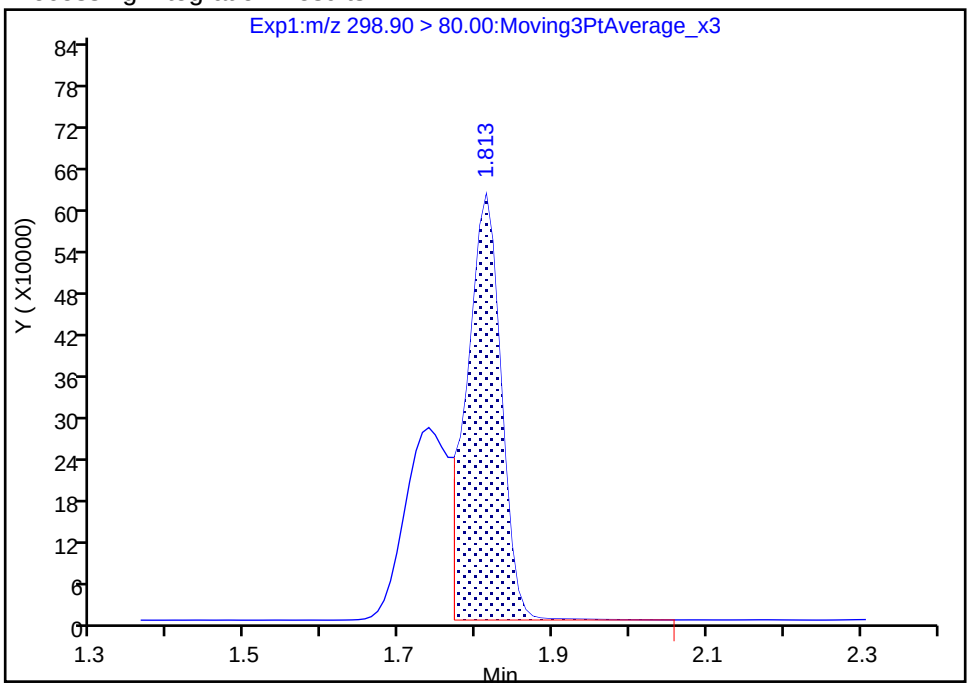
Data File: \\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_015.d
Injection Date: 16-Sep-2018 15:16:29 Instrument ID: A9
Lims ID: LCSD 320-245574/3-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 7 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

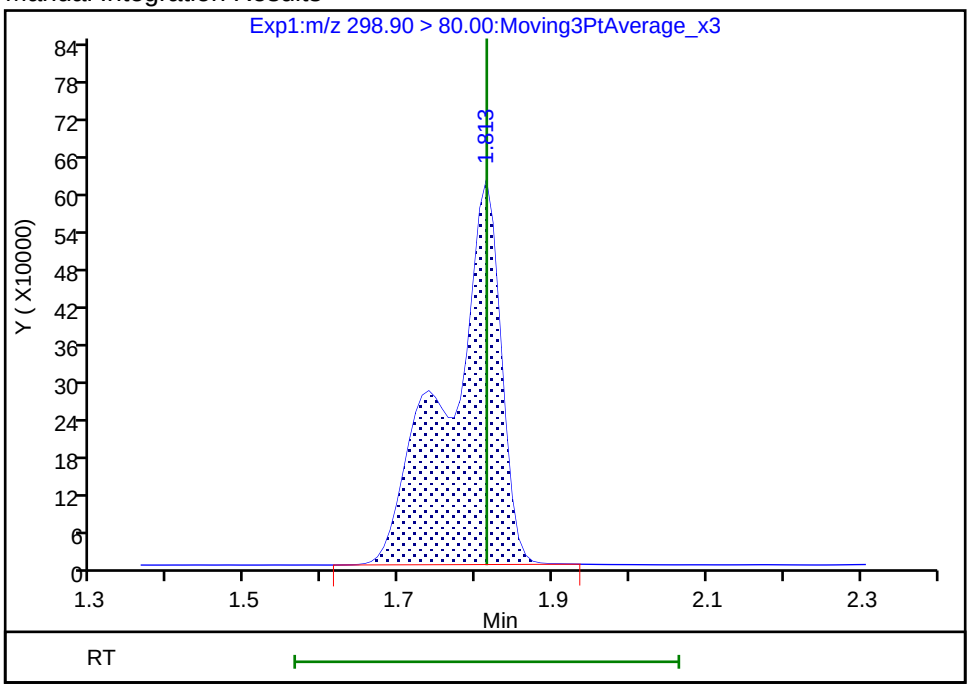
Processing Integration Results

RT: 1.81
Area: 1872806
Amount: 0.553981
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 2968538
Amount: 0.878102
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:58:53
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

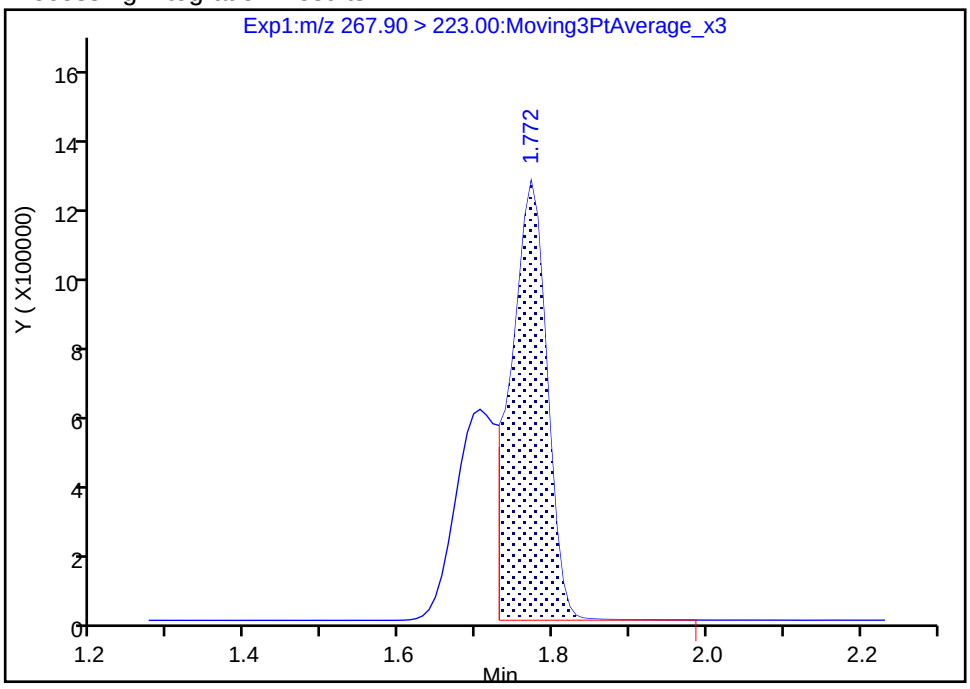
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_015.d				
Injection Date:	16-Sep-2018 15:16:29	Instrument ID:	A9		
Lims ID:	LCSD 320-245574/3-A				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	7	Worklist Smp#:	4
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 3 13C5-PFPeA, CAS: STL01893

Signal: 1

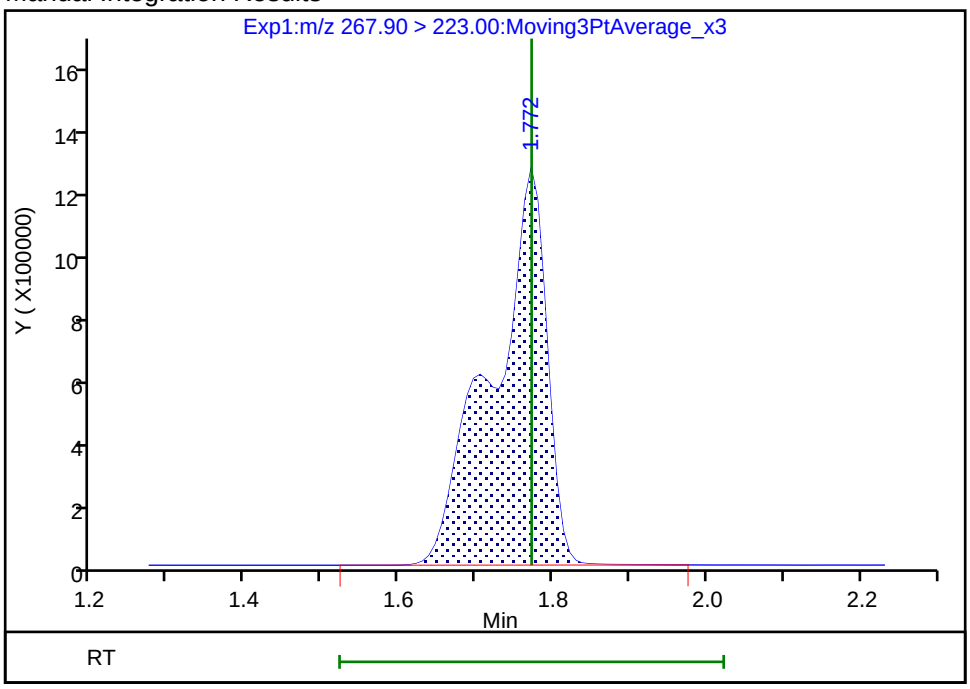
Processing Integration Results

RT: 1.77
Area: 4032184
Amount: 1.396411
Amount Units: ng/ml



Manual Integration Results

RT: 1.77
Area: 6247594
Amount: 2.163643
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:58:26

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

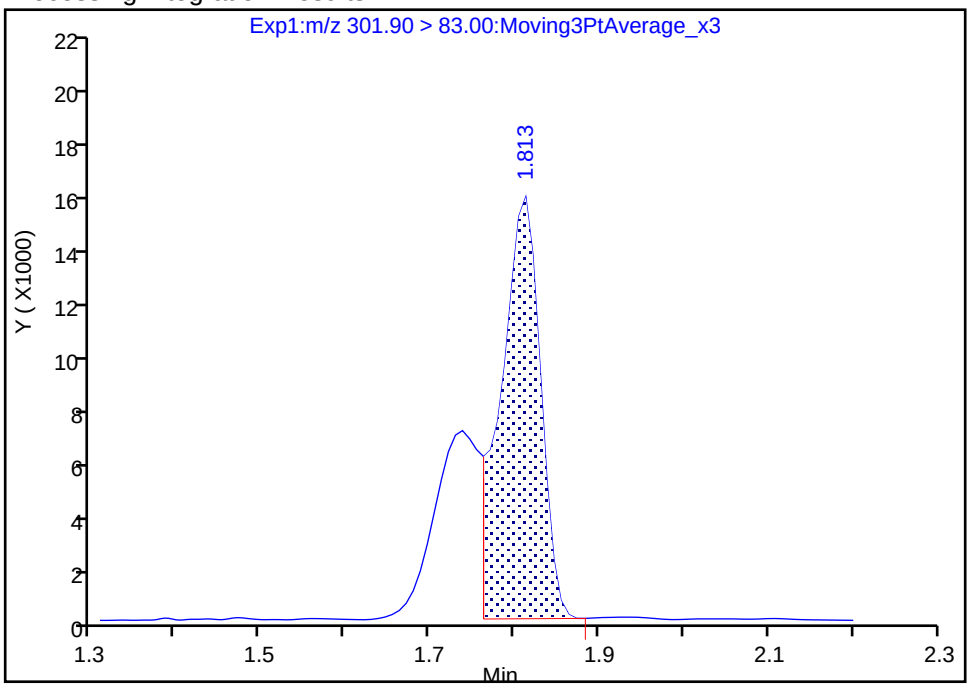
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180916-64257.b\2018.09.16_LLA_015.d				
Injection Date:	16-Sep-2018 15:16:29	Instrument ID:	A9		
Lims ID:	LCSD 320-245574/3-A				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	7	Worklist Smp#:	4
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

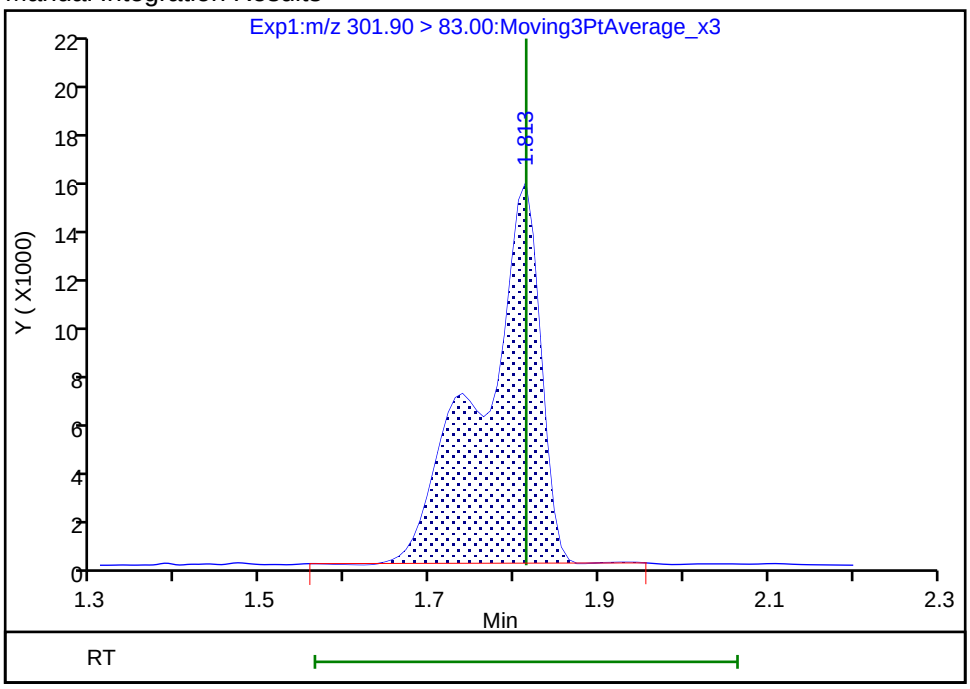
Processing Integration Results

RT: 1.81
Area: 49565
Amount: 1.307580
Amount Units: ng/ml



Manual Integration Results

RT: 1.81
Area: 74811
Amount: 1.973597
Amount Units: ng/ml



Reviewer: mongkols, 17-Sep-2018 15:58:31

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 08/28/2018 10:20

Analysis Batch Number: 242499 End Date: 08/28/2018 11:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-242499/2		08/28/2018 10:20	1	2018.08.28LLICA LA 005.d	Acquity 2.1(mm)
IC 320-242499/3		08/28/2018 10:28	1	2018.08.28LLICA LA 006.d	Acquity 2.1(mm)
IC 320-242499/4		08/28/2018 10:35	1	2018.08.28LLICA LA 007.d	Acquity 2.1(mm)
IC 320-242499/5 ICIS		08/28/2018 10:43	1	2018.08.28LLICA LA 008.d	Acquity 2.1(mm)
IC 320-242499/6		08/28/2018 10:50	1	2018.08.28LLICA LA 009.d	Acquity 2.1(mm)
IC 320-242499/7		08/28/2018 10:58	1	2018.08.28LLICA LA 010.d	Acquity 2.1(mm)
IC 320-242499/8		08/28/2018 11:05	1	2018.08.28LLICA LA 011.d	Acquity 2.1(mm)
ICB 320-242499/9		08/28/2018 11:13	1	2018.08.28LLICA LA 012.d	Acquity 2.1(mm)
ICV 320-242499/10		08/28/2018 11:20	1	2018.08.28LLICA LA 013.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 09/16/2018 13:53

Analysis Batch Number: 245884 End Date: 09/16/2018 14:46

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-245884/2		09/16/2018 13:53	1	2018.09.16_LLA_004.d	Acquity 2.1(mm)
CCVL 320-245884/3		09/16/2018 14:01	1	2018.09.16_LLA_005.d	Acquity 2.1(mm)
CCV 320-245884/4 CCVIS		09/16/2018 14:08	1	2018.09.16_LLA_006.d	Acquity 2.1(mm)
CCV 320-245884/9		09/16/2018 14:46	1		Acquity 2.1(mm)

EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 09/16/2018 14:53

Analysis Batch Number: 245887 End Date: 09/16/2018 16:16

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-245887/1		09/16/2018 14:53	1	2018.09.16_LLA_012.d	Acquity 2.1(mm)
MB 320-245574/1-A		09/16/2018 15:01	1	2018.09.16_LLA_013.d	Acquity 2.1(mm)
LCS 320-245574/2-A		09/16/2018 15:08	1	2018.09.16_LLA_014.d	Acquity 2.1(mm)
LCSD 320-245574/3-A		09/16/2018 15:16	1	2018.09.16_LLA_015.d	Acquity 2.1(mm)
ZZZZZ		09/16/2018 15:23	1		Acquity 2.1(mm)
320-42924-1		09/16/2018 15:31	1	2018.09.16_LLA_017.d	Acquity 2.1(mm)
320-42924-2		09/16/2018 15:39	1	2018.09.16_LLA_018.d	Acquity 2.1(mm)
320-42924-3		09/16/2018 15:46	1	2018.09.16_LLA_019.d	Acquity 2.1(mm)
320-42924-4		09/16/2018 15:54	1	2018.09.16_LLA_020.d	Acquity 2.1(mm)
ZZZZZ		09/16/2018 16:01	1		Acquity 2.1(mm)
ZZZZZ		09/16/2018 16:09	1		Acquity 2.1(mm)
CCV 320-245887/12		09/16/2018 16:16	1	2018.09.16_LLA_023.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 09/17/2018 18:09

Analysis Batch Number: 246099 End Date: 09/17/2018 21:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-246099/2		09/17/2018 18:09	1	2018.09.17_LLB_004.d	Acquity 2.1(mm)
CCVL 320-246099/3		09/17/2018 18:17	1	2018.09.17_LLB_005.d	Acquity 2.1(mm)
CCV 320-246099/4 CCVIS		09/17/2018 18:24	1	2018.09.17_LLB_006.d	Acquity 2.1(mm)
ZZZZZ		09/17/2018 18:32	20		Acquity 2.1(mm)
ZZZZZ		09/17/2018 18:39	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 18:47	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 18:54	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:02	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:09	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:17	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:24	10		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:32	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:39	1		Acquity 2.1(mm)
CCV 320-246099/7		09/17/2018 19:47	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:54	20		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:02	100		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:09	10		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:24	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:32	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:39	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:47	20		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:54	1		Acquity 2.1(mm)
CCV 320-246099/27		09/17/2018 21:02	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 09/18/2018 00:02

Analysis Batch Number: 246405 End Date: 09/18/2018 00:25

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-246405/1		09/18/2018 00:02	1	2018.09.17_LLB_051.d	Acquity 2.1(mm)
320-42924-1 DL		09/18/2018 00:10	10	2018.09.17_LLB_052.d	Acquity 2.1(mm)
ZZZZZ		09/18/2018 00:17	1		Acquity 2.1(mm)
CCV 320-246405/4		09/18/2018 00:25	1	2018.09.17_LLB_054.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Batch Number: 245574 Batch Start Date: 09/14/18 08:20 Batch Analyst: Vang, Mai Neng

Batch Method: 3535 Batch End Date: 09/14/18 16:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00103	LCPFC-IS 00082
MB 320-245574/1		3535, EPA 537 (Mod)				250.00 mL	10.00 mL	500 uL	500 uL
LCS 320-245574/2		3535, EPA 537 (Mod)				250.00 mL	10.00 mL	500 uL	500 uL
LCSD 320-245574/3		3535, EPA 537 (Mod)				250.00 mL	10.00 mL	500 uL	500 uL
320-42924-A-1	TP-PFC-033-TPI	3535, EPA 537 (Mod)	T	329.38 g	27.98 g	301.4 mL	10.00 mL	500 uL	500 uL
320-42924-A-2	TP-PFC-033-MID CARBON	3535, EPA 537 (Mod)	T	327.39 g	27.72 g	299.7 mL	10.00 mL	500 uL	500 uL
320-42924-A-3	TP-PFC-033-TPE	3535, EPA 537 (Mod)	T	334.27 g	28.49 g	305.8 mL	10.00 mL	500 uL	500 uL
320-42924-A-4	TP-PFC-033-TPE-D	3535, EPA 537 (Mod)	T	334.54 g	27.40 g	307.1 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00181					
MB 320-245574/1		3535, EPA 537 (Mod)							
LCS 320-245574/2		3535, EPA 537 (Mod)		500 uL					
LCSD 320-245574/3		3535, EPA 537 (Mod)		500 uL					
320-42924-A-1	TP-PFC-033-TPI	3535, EPA 537 (Mod)	T						
320-42924-A-2	TP-PFC-033-MID CARBON	3535, EPA 537 (Mod)	T						
320-42924-A-3	TP-PFC-033-TPE	3535, EPA 537 (Mod)	T						
320-42924-A-4	TP-PFC-033-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.: 320-42924-1

SDG No.:

Batch Number: 245574 Batch Start Date: 09/14/18 08:20 Batch Analyst: Vang, Mai Neng

Batch Method: 3535 Batch End Date: 09/14/18 16:30

Batch Notes	
Analyst ID - Aliquot Step	MNV
Balance ID	QA-078
Batch Comment	Client labels match TA label, MNV 09/14/18. Envi carb: 103370
Analyst ID - Final Volume Step	MNV
H2O ID	09/13/18
Hexane ID	1347702
Internal Standard ID#	1346857
Manifold ID	F
Methanol ID	1364330
Sodium Hydroxide ID	1364157
Pipette ID	I46345G
Analyst ID - Reagent Drop	MNV
Analyst ID - IS Reagent Drop	MNV
Analyst ID - IS Reagent Drop Witness	KJP
Analyst ID - SU Reagent Drop	MNV
Analyst ID - SU Reagent Drop Witness	KJP
Solvent Lot #	1362573
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	500mg
Solid Phase Extraction Disk ID	003938109A

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.

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record

240688

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 Griben	Date: 9/6/18	COC No: 240688
Company Name: TETRA TECH [redacted]	Tel/Fax: 412-421-0650	Lab Contact: DAVE ALITUCK	Carrier: FedEx	1 of 1 COCs
Address: 881 ANDERSON DR FOSTER PLAZA	Analysis Turnaround Time			Sampler: D G
City/State/Zip: PITTSBURGH PA 015210	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 412-421-0650	TAT if different from Below			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: BRUNSWICK GWETS	☐ 1 week			
Site: FORMER BRUNSWICK	☐ 2 days			Job / SDG No.:
PO# 112G0R005-ME21	☐ 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-033-TPI	9/6/18	0910	G	W	4	N	N	X	
TP-PFC-033-MID CARBON	↓	0915	G	W	4	N	N	X	
TP-PFC-033-TPE		0920	G	W	4	N	N	X	
TP-PFC-033-TPE-D	↓	0000	G	W	4	N	N	X	

320-42924 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: 0.4 Corr'd: 0.4		Therm ID No.: AC-5
Relinquished by:	Company: T+	Date/Time: 9/6/18 1200	Received by: FEDEX	Company: FEDEX	Date/Time: 9/6/18 1200
Relinquished by:	Company:	Date/Time:	Received by:	Company: TAS AC	Date/Time: 9/7/18 915
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-42924-1

Login Number: 42924
List Number: 1
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","350","ng/L","D","9.1","DL","","TRG","","","33","LOQ","YES","-99","","301.4","10.00","25",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","12","ng/L","U","6.0","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","12",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","220","ng/L","D","3.6","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","8.3",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","390","ng/L","D","3.9","DL","","TRG","","","17","LOQ","YES","-99","","301.4","10.00","8.3",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","12","ng/L","U","4.3","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","12",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1700","ng/L","D","4.5","DL","","TRG","","","17","LOQ","YES","-99","","301.4","10.00","12",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","8.3","ng/L","U","4.0","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","8.3",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","12","ng/L","U","4.6","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","12",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","430","ng/L","D","3.2","DL","","TRG","","","17","LOQ","YES","-99","","301.4","10.00","8.3",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","78","ng/L","D M","4.9","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","12",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","63","ng/L","D","3.8","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","8.3",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","82","ng/L","D","5.1","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","12",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","9.3","ng/L","J D M","3.1","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","8.3",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","12","ng/L","U M","4.3","DL","","TRG","","","17","LOQ","NO","-99","","301.4","10.00","12",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","25","ng/L","U","6.9","DL","","TRG","","","33","LOQ","NO","-99","","301.4","10.00","25",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","25","ng/L","U","6.3","DL","","TRG","","","33","LOQ","NO","-99","","301.4","10.00","25",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","25","ng/L","U","11","DL","","TRG","","","33","LOQ","NO","-99","","301.4","10.00","25",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00990","13C4 PFOA","72","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00991","13C4 PFOS","62","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","79.3","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00992","13C4 PFBA","62","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00993","13C2 PFHxA","64","ng/L","","-99","DL","","TRG","77","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00994","18O2 PFHxS","62","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","78.5","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00995","13C5 PFNA","70","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00996","13C2 PFDA","71","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00997","13C2 PFUnA","70","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL00998","13C2 PFDoA","63","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL01056","13C8

FOSA","62","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL01892","13C4-
PFHpA","66","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL01893","13C5
PFPeA","64","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL02116","13C2-
PFTeDA","61","ng/L","","-99","DL","","TRG","74","","-99","LOQ","YES","82.9","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","DL","320-42924-1","TALSAC","STL02337","13C3-
PFBS","54","ng/L","M","-99","DL","","TRG","70","","-99","LOQ","YES","77.1","","301.4","10.00","830",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","360","ng/L","E","0.91","DL","","TRG","","","3.3","LOQ","NO","-99","","301.4","10.00","2.5",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","1.2","ng/L","U M","0.60","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","1.2",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","210","ng/L","M","0.36","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","0.83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","370","ng/L","E","0.39","DL","","TRG","","","1.7","LOQ","NO","-99","","301.4","10.00","0.83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.2","ng/L","U","0.43","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","1.2",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1100","ng/L","E","0.45","DL","","TRG","","","1.7","LOQ","NO","-99","","301.4","10.00","1.2",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","1.0","ng/L","J","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","0.83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","1.2","ng/L","U","0.46","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","1.2",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","400","ng/L","E","0.32","DL","","TRG","","","1.7","LOQ","NO","-99","","301.4","10.00","0.83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","74","ng/L","M","0.49","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","1.2",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","55","ng/L","M","0.38","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","0.83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","82","ng/L","","0.51","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","1.2",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","8.0","ng/L","M","0.31","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","0.83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","3.0","ng/L","M","0.43","DL","","TRG","","","1.7","LOQ","YES","-99","","301.4","10.00","1.2",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","2.5","ng/L","U","0.69","DL","","TRG","","","3.3","LOQ","YES","-99","","301.4","10.00","2.5",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.5","ng/L","U","0.63","DL","","TRG","","","3.3","LOQ","YES","-99","","301.4","10.00","2.5",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","2.5","ng/L","U","1.1","DL","","TRG","","","3.3","LOQ","YES","-99","","301.4","10.00","2.5",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00990","13C4
PFOA","76","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00991","13C4
PFOS","74","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","79.3","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00992","13C4
PFBA","67","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00993","13C2
PFHxA","74","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00994","18O2
PFHxS","76","ng/L","","-99","DL","","TRG","97","","-99","LOQ","YES","78.5","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00995","13C5

PFNA","82","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00996","13C2
PFDA","82","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00997","13C2
PFUnA","80","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL00998","13C2
PFDoA","77","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL01056","13C8
FOSA","76","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL01892","13C4-
PFHpA","80","ng/L","","-99","DL","","TRG","97","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL01893","13C5
PFPeA","80","ng/L","M","-99","DL","","TRG","96","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL02116","13C2-
PFTeDA","75","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","82.9","","301.4","10.00","83",""
"TP-PFC-033-TPI","EPA 537 (Mod)","RES","320-42924-1","TALSAC","STL02337","13C3-
PFBS","73","ng/L","M","-99","DL","","TRG","95","","-99","LOQ","YES","77.1","","301.4","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid (PFOS)","2.5","ng/L","U
M","0.92","DL","","TRG","","","3.3","LOQ","YES","-99","","299.7","10.00","2.5",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","2058-94-
8","Perfluoroundecanoic acid (PFUnA)","1.3","ng/L","U
M","0.60","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","1.3",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","290","ng/L","M","0.36","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","0.83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","270","ng/L","","0.39","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","0.83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","1.3","ng/L","U","0.43","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","1.3",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","72","ng/L","M","0.45","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","1.3",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","0.83","ng/L","U","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","0.83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.47","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","1.3",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","5.1","ng/L","M","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","0.83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","110","ng/L","","0.49","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","1.3",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","13","ng/L","M","0.38","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","0.83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","7.2","ng/L","","0.51","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","1.3",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.83","ng/L","U","0.31","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","0.83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","1.3","ng/L","U M","0.43","DL","","TRG","","","1.7","LOQ","YES","-99","","299.7","10.00","1.3",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","2.5","ng/L","U","0.69","DL","","TRG","","","3.3","LOQ","YES","-99","","299.7","10.00","2.5",""

"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.5","ng/L","U M","0.63","DL","","TRG","","","3.3","LOQ","YES","-99","","299.7","10.00","2.5",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.5","ng/L","U","1.1","DL","","TRG","","","3.3","LOQ","YES","-99","","299.7","10.00","2.5",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00990","13C4 PFOA","78","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00991","13C4 PFOS","70","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","79.7","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00992","13C4 PFBA","66","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00993","13C2 PFHxA","73","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00994","18O2 PFHxS","72","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","78.9","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00995","13C5 PFNA","73","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00996","13C2 PFDA","78","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00997","13C2 PFUnA","76","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL00998","13C2 PFDoA","69","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL01056","13C8 FOSA","73","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL01892","13C4-PFHpA","79","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL01893","13C5 PFPeA","72","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL02116","13C2-PFTeDA","66","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","83.4","","299.7","10.00","83",""
"TP-PFC-033-MID CARBON","EPA 537 (Mod)","RES","320-42924-2","TALSAC","STL02337","13C3-PFBS","67","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","77.6","","299.7","10.00","83",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.5","ng/L","U M","0.90","DL","","TRG","","","3.3","LOQ","YES","-99","","305.8","10.00","2.5",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.2","ng/L","U M","0.59","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","1.2",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","260","ng/L","","0.35","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","0.82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","170","ng/L","M","0.38","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","0.82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","1.2","ng/L","U","0.43","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","1.2",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","9.1","ng/L","M","0.44","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","1.2",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","0.82","ng/L","U","0.39","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","0.82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.2","ng/L","U","0.46","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","1.2",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","0.66","ng/L","J M","0.31","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","0.82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","120","ng/L","","0.48","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","1.2",""

"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","4.8","ng/L","","0.38","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","0.82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.2","ng/L","J M","0.50","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","1.2",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","0.82","ng/L","U","0.30","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","0.82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.2","ng/L","U M","0.43","DL","","TRG","","","1.6","LOQ","YES","-99","","305.8","10.00","1.2",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","2.5","ng/L","U","0.68","DL","","TRG","","","3.3","LOQ","YES","-99","","305.8","10.00","2.5",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.5","ng/L","U M","0.62","DL","","TRG","","","3.3","LOQ","YES","-99","","305.8","10.00","2.5",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.5","ng/L","U","1.1","DL","","TRG","","","3.3","LOQ","YES","-99","","305.8","10.00","2.5",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00990","13C4 PFOA","74","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00991","13C4 PFOS","70","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","78.2","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00992","13C4 PFBA","66","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00993","13C2 PFHxA","72","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00994","18O2 PFHxS","69","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","77.3","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00995","13C5 PFNA","74","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00996","13C2 PFDA","79","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00997","13C2 PFUnA","76","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL00998","13C2 PFDoA","68","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL01056","13C8 FOSA","74","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL01892","13C4-PFHpA","77","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL01893","13C5 PFPeA","74","ng/L","M","-99","DL","","TRG","90","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL02116","13C2-PFTeDA","69","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","81.8","","305.8","10.00","82",""
"TP-PFC-033-TPE","EPA 537 (Mod)","RES","320-42924-3","TALSAC","STL02337","13C3-PFBS","67","ng/L","M","-99","DL","","TRG","88","","-99","LOQ","YES","76.0","","305.8","10.00","82",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.4","ng/L","U M","0.90","DL","","TRG","","","3.3","LOQ","YES","-99","","307.1","10.00","2.4",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.2","ng/L","U M","0.59","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","1.2",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","280","ng/L","","0.35","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","0.81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","170","ng/L","M","0.38","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","0.81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","1.2","ng/L","U","0.42","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","1.2",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","9.2","ng/L","M","0.44","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","1.2",""

"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","0.81","ng/L","U","0.39","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","0.81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.2","ng/L","U","0.46","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","1.2",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","0.65","ng/L","J M","0.31","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","0.81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","130","ng/L","","0.48","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","1.2",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","4.5","ng/L","","0.37","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","0.81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.4","ng/L","J M","0.50","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","1.2",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","0.81","ng/L","U","0.30","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","0.81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.2","ng/L","U M","0.42","DL","","TRG","","","1.6","LOQ","YES","-99","","307.1","10.00","1.2",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","2.4","ng/L","U","0.68","DL","","TRG","","","3.3","LOQ","YES","-99","","307.1","10.00","2.4",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.4","ng/L","U M","0.62","DL","","TRG","","","3.3","LOQ","YES","-99","","307.1","10.00","2.4",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.4","ng/L","U","1.1","DL","","TRG","","","3.3","LOQ","YES","-99","","307.1","10.00","2.4",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00990","13C4 PFOA","72","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00991","13C4 PFOS","70","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","77.8","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00992","13C4 PFBA","61","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00993","13C2 PFHxA","68","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00994","18O2 PFHxS","67","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","77.0","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00995","13C5 PFNA","71","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00996","13C2 PFDA","75","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00997","13C2 PFUnA","70","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL00998","13C2 PFDoA","68","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL01056","13C8 FOSA","70","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL01892","13C4-PFHpA","71","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL01893","13C5 PFPeA","67","ng/L","M","-99","DL","","TRG","83","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL02116","13C2-PFTeDA","64","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","81.4","","307.1","10.00","81",""
"TP-PFC-033-TPE-D","EPA 537 (Mod)","RES","320-42924-4","TALSAC","STL02337","13C3-PFBS","68","ng/L","M","-99","DL","","TRG","89","","-99","LOQ","YES","75.7","","307.1","10.00","81",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","35.4","ng/L","","1.1","DL","","SPK","95","","4.0","LOQ","YES","37.1","","250.00","10.00","3.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","2058-94-

8","Perfluoroundecanoic acid
(PFUnA)","41.9","ng/L","","0.72","DL","","SPK","105","","2.0","LOQ","YES","40.0","","250.00","10.00","1.5",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","40.1","ng/L","","0.43","DL","","SPK","100","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","38.4","ng/L","","0.47","DL","","SPK","96","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","307-55-
1","Perfluorododecanoic acid
(PFDoA)","41.3","ng/L","","0.52","DL","","SPK","103","","2.0","LOQ","YES","40.0","","250.00","10.00","1.5",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","39.4","ng/L","","0.54","DL","","SPK","98","","2.0","LOQ","YES","40.0","","250.00","10.00","1.5",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","39.3","ng/L","","0.48","DL","","SPK","98","","2.0","LOQ","YES","40.0","","250.00","10.00","1.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","40.8","ng/L","","0.56","DL","","SPK","106","","2.0","LOQ","YES","38.6","","250.00","10.00","1.5",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","35.5","ng/L","","0.38","DL","","SPK","98","","2.0","LOQ","YES","36.4","","250.00","10.00","1.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","375-22-4","Perfluorobutanoic
acid
(PFBA)","41.0","ng/L","M","0.59","DL","","SPK","102","","2.0","LOQ","YES","40.0","","250.00","10.00","1.5",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","35.6","ng/L","","0.46","DL","","SPK","101","","2.0","LOQ","YES","35.4","","250.00","10.00","1.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","375-85-9","Perfluoroheptanoic
acid
(PFHpA)","44.5","ng/L","","0.61","DL","","SPK","111","","2.0","LOQ","YES","40.0","","250.00","10.00","1.5",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","40.1","ng/L","","0.37","DL","","SPK","105","","2.0","LOQ","YES","38.1","","250.00","10.00","1.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","44.7","ng/L","","0.52","DL","","SPK","112","","2.0","LOQ","YES","40.0","","250.00","10.00","1.5",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","38.1","ng/L","","0.83","DL","","SPK","95","","4.0","LOQ","YES","40.0","","250.00","10.00","3.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","72629-94-
8","Perfluorotridecanoic Acid
(PFTriA)","36.0","ng/L","","0.76","DL","","SPK","90","","4.0","LOQ","YES","40.0","","250.00","10.00","3.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","44.4","ng/L","","1.3","DL","","SPK","111","","4.0","LOQ","YES","40.0","","250.00","10.00","3.0",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00990","13C4
PFOA","91.7","ng/L","","-99","DL","","SPK","92","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00991","13C4
PFOS","87.7","ng/L","","-99","DL","","SPK","92","","-99","LOQ","YES","95.6","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00992","13C4
PFBA","84.1","ng/L","","-99","DL","","SPK","84","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00993","13C2
PFHxA","92.0","ng/L","","-99","DL","","SPK","92","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00994","18O2
PFHxS","86.5","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","94.6","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00995","13C5
PFNA","91.7","ng/L","","-99","DL","","SPK","92","","-99","LOQ","YES","100","","250.00","10.00","100",""

"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00996","13C2 PFDA","97.7","ng/L","","-99","DL","","SPK","98","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00997","13C2 PFUnA","91.0","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL00998","13C2 PFDoA","87.5","ng/L","","-99","DL","","SPK","87","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL01056","13C8 FOSA","78.7","ng/L","","-99","DL","","SPK","79","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL01892","13C4-PFHpA","91.5","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL01893","13C5 PFPeA","89.7","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL02116","13C2-PFTeDA","80.1","ng/L","","-99","DL","","SPK","80","","-99","LOQ","YES","100","","250.00","10.00","100",""
"LCS 320-245574/2-A","EPA 537 (Mod)","RES","LCS 320-245574/2-A","TALSAC","STL02337","13C3-PFBS","84.6","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","93.0","","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","36.7","ng/L","","1.1","DL","","SPK","99","4","4.0","LOQ","YES","37.1","LCS 320-245574/2-A","250.00","10.00","3.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","41.5","ng/L","","0.72","DL","","SPK","104","1","2.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","1.5",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","38.5","ng/L","M","0.43","DL","","SPK","96","4","2.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","1.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","38.1","ng/L","","0.47","DL","","SPK","95","1","2.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","1.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","40.3","ng/L","","0.52","DL","","SPK","101","3","2.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","1.5",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","37.9","ng/L","","0.54","DL","","SPK","95","4","2.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","1.5",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","42.7","ng/L","","0.48","DL","","SPK","107","8","2.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","1.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","43.5","ng/L","","0.56","DL","","SPK","113","6","2.0","LOQ","YES","38.6","LCS 320-245574/2-A","250.00","10.00","1.5",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","34.5","ng/L","","0.38","DL","","SPK","95","3","2.0","LOQ","YES","36.4","LCS 320-245574/2-A","250.00","10.00","1.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","39.3","ng/L","M","0.59","DL","","SPK","98","4","2.0","LOQ","YES","40.0","LCS 320-245574/2-

A","250.00","10.00","1.5",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35.1","ng/L","M","0.46","DL","","SPK","99","1","2.0","LOQ","YES","35.4","LCS 320-245574/2-A","250.00","10.00","1.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","40.8","ng/L","","0.61","DL","","SPK","102","9","2.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","1.5",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","41.6","ng/L","","0.37","DL","","SPK","109","4","2.0","LOQ","YES","38.1","LCS 320-245574/2-A","250.00","10.00","1.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","40.6","ng/L","","0.52","DL","","SPK","102","10","2.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","1.5",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","40.7","ng/L","","0.83","DL","","SPK","102","7","4.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","3.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","36.9","ng/L","","0.76","DL","","SPK","92","2","4.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","3.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","40.5","ng/L","","1.3","DL","","SPK","101","9","4.0","LOQ","YES","40.0","LCS 320-245574/2-A","250.00","10.00","3.0",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00990","13C4 PFOA","95.6","ng/L","","-99","DL","","SPK","96","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00991","13C4 PFOS","86.0","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","95.6","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00992","13C4 PFBA","78.7","ng/L","","-99","DL","","SPK","79","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00993","13C2 PFHxA","86.6","ng/L","","-99","DL","","SPK","87","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00994","18O2 PFHxS","83.7","ng/L","","-99","DL","","SPK","88","","-99","LOQ","YES","94.6","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00995","13C5 PFNA","92.7","ng/L","","-99","DL","","SPK","93","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00996","13C2 PFDA","89.5","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00997","13C2 PFUnA","87.8","ng/L","","-99","DL","","SPK","88","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL00998","13C2 PFDoA","87.3","ng/L","","-99","DL","","SPK","87","","-99","LOQ","YES","100","LCS 320-245574/2-

A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL01056","13C8 FOSA","84.3","ng/L","","-99","DL","","SPK","84","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL01892","13C4-PFHpA","92.5","ng/L","","-99","DL","","SPK","93","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL01893","13C5 PFPeA","86.5","ng/L","M","-99","DL","","SPK","87","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL02116","13C2-PFTeDA","78.7","ng/L","","-99","DL","","SPK","79","","-99","LOQ","YES","100","LCS 320-245574/2-A","250.00","10.00","100",""
"LCSD 320-245574/3-A","EPA 537 (Mod)","RES","LCSD 320-245574/3-A","TALSAC","STL02337","13C3-PFBS","78.9","ng/L","M","-99","DL","","SPK","85","","-99","LOQ","YES","93.0","LCS 320-245574/2-A","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","3.0","ng/L","U M","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.5","ng/L","U M","0.72","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.5",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","1.0","ng/L","U","0.43","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","1.0","ng/L","U M","0.47","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","1.5","ng/L","U M","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.5",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1.5","ng/L","U M","0.54","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.5",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","1.0","ng/L","U","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.5","ng/L","U","0.56","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.5",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","1.0","ng/L","U","0.38","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","1.5","ng/L","U","0.59","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.5",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","1.0","ng/L","U","0.46","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.5","ng/L","U","0.61","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.5",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","1.0","ng/L","U","0.37","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.5","ng/L","U M","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250.00","10.00","1.5",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","3.0","ng/L","U","0.83","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","72629-94-

8","Perfluorotridecanoic Acid
(PFTriA)","3.0","ng/L","U","0.76","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00990","13C4
PFOA","96.1","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00991","13C4
PFOS","83.9","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","95.6","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00992","13C4
PFBA","84.2","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00993","13C2
PFHxA","87.1","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00994","18O2
PFHxS","91.6","ng/L","","-99","DL","","TRG","97","","-99","LOQ","YES","94.6","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00995","13C5
PFNA","88.9","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00996","13C2
PFDA","85.8","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00997","13C2
PFUnA","89.8","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL00998","13C2
PFDoA","87.0","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL01056","13C8
FOSA","87.7","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL01892","13C4-
PFHpA","94.1","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL01893","13C5
PFPeA","86.7","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL02116","13C2-
PFTeDA","79.0","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","100","","250.00","10.00","100",""
"MB 320-245574/1-A","EPA 537 (Mod)","RES","MB 320-245574/1-A","TALSAC","STL02337","13C3-
PFBS","79.6","ng/L","M","-99","DL","","TRG","86","","-99","LOQ","YES","93.0","","250.00","10.00","100",""
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(Mod)","3535","RES","09/14/2018 08:21","09/16/2018
15:31","TALSAC","COA","WET","NA","1","NA","NA","","100","320-245574","320-245574","NA","320-
245887","320-42924-1","09/07/2018 09:15","09/20/2018 16:16",""
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(Mod)","3535","DL","09/14/2018 08:21","09/18/2018
00:10","TALSAC","COA","WET","NA","10","NA","NA","","100","320-245574","320-245574","NA","320-
246405","320-42924-1","09/07/2018 09:15","09/20/2018 16:16",""
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2","NM","","8.40","EPA 537 (Mod)","3535","RES","09/14/2018 08:21","09/16/2018
15:39","TALSAC","COA","WET","NA","1","NA","NA","","100","320-245574","320-245574","NA","320-
245887","320-42924-1","09/07/2018 09:15","09/20/2018 16:16",""
"Unknown","Unknown","TP-PFC-033-TPE","09/06/2018 09:20","AQ","320-42924-3","NM","","8.40","EPA 537
(Mod)","3535","RES","09/14/2018 08:21","09/16/2018
15:46","TALSAC","COA","WET","NA","1","NA","NA","","100","320-245574","320-245574","NA","320-
245887","320-42924-1","09/07/2018 09:15","09/20/2018 16:16",""
"Unknown","Unknown","TP-PFC-033-TPE-D","09/06/2018 00:00","AQ","320-42924-4","FD","","8.40","EPA 537
(Mod)","3535","RES","09/14/2018 08:21","09/16/2018
15:54","TALSAC","COA","WET","NA","1","NA","NA","","100","320-245574","320-245574","NA","320-
245887","320-42924-1","09/07/2018 09:15","09/20/2018 16:16",""
"Unknown","Unknown","LCS 320-245574/2-A","","AQ","LCS 320-245574/2-A","LCS","","-99","EPA 537

(Mod)","3535","RES","09/12/2018 08:12","09/16/2018
15:08","TALSAC","COA","WET","NA","1","NA","NA","","100","320-245574","320-245574","NA","320-
245887","320-42924-1","09/12/2018 08:12","09/20/2018 16:16",""
"Unknown","Unknown","LCSD 320-245574/3-A","","AQ","LCSD 320-245574/3-A","LCSD","","-99","EPA 537
(Mod)","3535","RES","09/14/2018 08:21","09/16/2018
15:16","TALSAC","COA","WET","NA","1","NA","NA","","100","320-245574","320-245574","NA","320-
245887","320-42924-1","09/14/2018 08:21","09/20/2018 16:16",""
"Unknown","Unknown","MB 320-245574/1-A","","AQ","MB 320-245574/1-A","MB","","-99","EPA 537
(Mod)","3535","RES","09/12/2018 08:12","09/16/2018
15:01","TALSAC","COA","WET","NA","1","NA","NA","","100","320-245574","320-245574","NA","320-
245887","320-42924-1","09/12/2018 08:12","09/20/2018 16:16",""

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **J. ORIENT** **DATE:** **NOVEMBER 1, 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) 320-42924-1

SAMPLES: 4/Aqueous/PFAS

TP-PFC-033-MID CARBON TP-PFC-033-TPE TP-PFC-033-TPE-D
TP-PFC-033-TPI

Overview

The sample set for former NAS Brunswick, SDG 320-42924-1 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-033-TPE/TP-PFC-033-TPE-D.

The samples were collected by Tetra Tech, Inc. on September 6, 2018 and analyzed by Test America, Inc. The analyses were conducted in compliance with Department of Defense (DoD)/Department of Energy (DOE) Quality Systems Manual (QSM) for Environmental Laboratories version 5.1 PFAS using LC/MS/MS Appendix B Table B-15 (July 2017). 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 these SDGs. 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:

Analyte	Maximum Concentration	Action Level Limit of Quantitation (LOQ) > or <
Perfluorohexanesulfonic acid (PFHxS) (1)	0.00753 ng/ml	< LOQ

(2) – Maximum concentration detected in the ICB and CCBs affecting all samples.

The detected results reported for PFHxS reported below the Limit of Detection (LOD) were raised to LOD and qualified as non-detected, (U).

NOTES

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-033-TPI. No action was taken because the sample was diluted ten times and the internal standard area response varied proportionately because of the dilution.

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentrations of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)), PFHxS, perfluorohexanoic acid (PFHxA), and perfluorooctanesulfonic acid (PFOS) exceeded the instrument calibration range in sample TP-PFC-033-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: Contaminants were detected in the ICB and CCBs. The injected internal standard area was low in the diluted sample.

Other Factors Affecting Data Quality: One sample was further diluted. Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the EPA New England Environmental Data Review Supplement for Regional Data Review Elements Superfund Guidance/Procedures (April 2013), National Functional Guidelines for Organic Data Validation (January 2017), and the DoD/DOE QSM for Environmental Laboratories" (July 2017). 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 ANALYTICAL 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-033-MID CARBON			TP-PFC-033-TPE			TP-PFC-033-TPE-D			TP-PFC-033-TPI		
SDG: 320-42924-1	LAB_ID	320-42924-2			320-42924-3			320-42924-4			320-42924-1		
FRACTION: PFAS	SAMP_DATE	9/6/2018			9/6/2018			9/6/2018			9/6/2018		
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-033-TPE					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		72			9.1			9.2					
PERFLUOROBUTANESULFONIC ACID (PFBS)		13			4.8			4.5			55		
PERFLUOROBUTANOIC ACID (PFBA)		110			120			130			74		
PERFLUORODECANESULFONIC ACID (PFDS)		1.3	U		1.2	U		1.2	U		1.2	U	
PERFLUORODECANOIC ACID (PFDA)		0.83	U		0.82	U		0.81	U		1	J	P
PERFLUORODODECANOIC ACID (PFDOA)		1.3	U		1.2	U		1.2	U		1.2	U	
PERFLUOROHEPTANESULFONIC ACID (PFHPS)		0.83	U		0.82	U		0.81	U		8		
PERFLUOROHEPTANOIC ACID (PFHPA)		7.2			1.2	J	P	1.4	J	P	82		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		5.1			0.82	U	A	0.81	U	A			
PERFLUOROHEXANOIC ACID (PFHXA)		270			170			170					
PERFLUORONONANOIC ACID (PFNA)		1.3	U		1.2	U		1.2	U		3		
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2.5	U		2.5	U		2.4	U		2.5	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2.5	U		2.5	U		2.4	U				
PERFLUOROPENTANOIC ACID (PFPEA)		290			260			280			210		
PERFLUOROTETRADECANOIC ACID (PFTEA)		2.5	U		2.5	U		2.4	U		2.5	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2.5	U		2.5	U		2.4	U		2.5	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.3	U		1.2	U		1.2	U		1.2	U	

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-033-TPI-DL		
SDG: 320-42924-1	LAB_ID	320-42924-1		
FRACTION: PFAS	SAMP_DATE	9/6/2018		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1700		
PERFLUOROBUTANESULFONIC ACID (PFBS)				
PERFLUOROBUTANOIC ACID (PFBA)				
PERFLUORODECANESULFONIC ACID (PFDS)				
PERFLUORODECANOIC ACID (PFDA)				
PERFLUORODODECANOIC ACID (PFDOA)				
PERFLUOROHEPTANESULFONIC ACID (PFHPS)				
PERFLUOROHEPTANOIC ACID (PFHPA)				
PERFLUOROHEXANESULFONIC ACID (PFHXS)		430		
PERFLUOROHEXANOIC ACID (PFHXA)		390		
PERFLUORONONANOIC ACID (PFNA)				
PERFLUOROOCTANE SULFONAMIDE (FOSA)				
PERFLUOROOCTANESULFONIC ACID (PFOS)		350		
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.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPI | Lab Sample ID: 320-42924-1

Matrix: Water | Lab File ID: 2018.09.16_LLA_017.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:10

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 301.4(mL) | Date Analyzed: 09/16/2018 15:31

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74	M	1.7	1.2	0.49
2706-90-3	Perfluoropentanoic acid (PFPeA)	210	M	1.7	0.83	0.36
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*370*	*E*	*1.7*	0.83	*0.39*
375-85-9	Perfluoroheptanoic acid (PFHpA)	82		1.7	1.2	0.51
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1100*	*E*	*1.7*	1.2	*0.45*
375-95-1	Perfluorononanoic acid (PFNA)	3.0	M	1.7	1.2	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	J	1.7	0.83	0.40
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.7	1.2	0.60
307-55-1	Perfluorododecanoic acid (PFDoA)	1.2	U	1.7	1.2	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	0.63
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.69
375-73-5	Perfluorobutanesulfonic acid (PFBS)	55	M	1.7	0.83	0.38
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*400*	*E*	*1.7*	0.83	*0.32*
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	8.0	M	1.7	0.83	0.31
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*360*	*E*	*3.3*	2.5	*0.91*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.7	1.2	0.46
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPI Lab Sample ID: 320-42924-1

Matrix: Water Lab File ID: 2018.09.16_LLA_017.d

Analysis Method: EPA 537 (Mod) Date Collected: 09/06/2018 09:10

Extraction Method: 3535 Date Extracted: 09/14/2018 08:21

Sample wt/vol: 301.4(mL) Date Analyzed: 09/16/2018 15:31

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		50-150
STL00992	13C4 PFBA	81		50-150
STL01893	13C5 PFPeA	96	M	50-150
STL00993	13C2 PFHxA	89		50-150
STL01892	13C4-PFHpA	97		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	99		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	96		50-150
STL00998	13C2 PFDoA	92		50-150
STL00994	18O2 PFHxS	97		50-150
STL02116	13C2-PFTeDA	90		50-150
STL00991	13C4 PFOS	93		50-150
STL02337	13C3-PFBS	95	M	50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPI DL | Lab Sample ID: 320-42924-1 DL

Matrix: Water | Lab File ID: 2018.09.17_LLB_052.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:10

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 301.4(mL) | Date Analyzed: 09/18/2018 00:10

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 10

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 246405 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*78*	*D M*	*17*	12	*4.9*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*220*	*D*	*17*	8.3	*3.6*
307-24-4	Perfluorohexanoic acid (PFHxA)	390	D	17	8.3	3.9
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*82*	*D*	*17*	12	*5.1*
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D	17	12	4.5
375-95-1	*Perfluorononanoic acid (PFNA)*	*12*	*U M*	*17*	12	*4.3*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*8.3*	*U*	*17*	8.3	*4.0*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*12*	*U*	*17*	12	*6.0*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*12*	*U*	*17*	12	*4.3*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*25*	*U*	*33*	25	*6.3*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*25*	*U*	*33*	25	*6.9*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*63*	*D*	*17*	8.3	*3.8*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	430	D	17	8.3	3.2
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*9.3*	*J D M*	*17*	8.3	*3.1*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	350	D	33	25	9.1
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*12*	*U*	*17*	12	*4.6*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*25*	*U*	*33*	25	*11*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPI DL Lab Sample ID: 320-42924-1 DL

Matrix: Water Lab File ID: 2018.09.17_LLB_052.d

Analysis Method: EPA 537 (Mod) Date Collected: 09/06/2018 09:10

Extraction Method: 3535 Date Extracted: 09/14/2018 08:21

Sample wt/vol: 301.4(mL) Date Analyzed: 09/18/2018 00:10

Con. Extract Vol.: 10.00(mL) Dilution Factor: 10

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 246405 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	75		50-150
STL00992	13C4 PFBA	75		50-150
STL01893	13C5 PFPeA	78		50-150
STL00993	13C2 PFHxA	77		50-150
STL01892	13C4-PFHpA	79		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	84		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	84		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	18O2 PFHxS	79		50-150
STL02116	13C2-PFTeDA	74		50-150
STL00991	13C4 PFOS	78		50-150
STL02337	13C3-PFBS	70	M	50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-MID CARBON | Lab Sample ID: 320-42924-2

Matrix: Water | Lab File ID: 2018.09.16_LLA_018.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:15

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 299.7(mL) | Date Analyzed: 09/16/2018 15:39

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.7	1.3	0.49
2706-90-3	Perfluoropentanoic acid (PFPeA)	290	M	1.7	0.83	0.36
307-24-4	Perfluorohexanoic acid (PFHxA)	270		1.7	0.83	0.39
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.2		1.7	1.3	0.51
335-67-1	Perfluorooctanoic acid (PFOA)	72	M	1.7	1.3	0.45
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U M	1.7	1.3	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	0.83	U	1.7	0.83	0.40
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U M	1.7	1.3	0.60
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U M	3.3	2.5	0.63
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.69
375-73-5	Perfluorobutanesulfonic acid (PFBS)	13	M	1.7	0.83	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.1	M	1.7	0.83	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.83	U	1.7	0.83	0.31
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U M	3.3	2.5	0.92
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.47
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-MID CARBON Lab Sample ID: 320-42924-2

Matrix: Water Lab File ID: 2018.09.16_LLA_018.d

Analysis Method: EPA 537 (Mod) Date Collected: 09/06/2018 09:15

Extraction Method: 3535 Date Extracted: 09/14/2018 08:21

Sample wt/vol: 299.7(mL) Date Analyzed: 09/16/2018 15:39

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	88		50-150
STL00992	13C4 PFBA	79		50-150
STL01893	13C5 PFPeA	87		50-150
STL00993	13C2 PFHxA	87		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	87		50-150
STL00996	13C2 PFDA	94		50-150
STL00997	13C2 PFUnA	91		50-150
STL00998	13C2 PFDoA	83		50-150
STL00994	18O2 PFHxS	92		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	88		50-150
STL02337	13C3-PFBS	86		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPE | Lab Sample ID: 320-42924-3

Matrix: Water | Lab File ID: 2018.09.16_LLA_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:20

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 305.8(mL) | Date Analyzed: 09/16/2018 15:46

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		1.6	1.2	0.48
2706-90-3	Perfluoropentanoic acid (PFPeA)	260		1.6	0.82	0.35
307-24-4	Perfluorohexanoic acid (PFHxA)	170	M	1.6	0.82	0.38
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.2	J M	1.6	1.2	0.50
335-67-1	Perfluorooctanoic acid (PFOA)	9.1	M	1.6	1.2	0.44
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U M	1.6	1.2	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	0.82	U	1.6	0.82	0.39
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.6	1.2	0.59
307-55-1	Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	1.2	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U M	3.3	2.5	0.62
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.68
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.8		1.6	0.82	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.66	J M	1.6	0.82	0.31
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.82	U	1.6	0.82	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U M	3.3	2.5	0.90
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	1.2	0.46
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPE | Lab Sample ID: 320-42924-3

Matrix: Water | Lab File ID: 2018.09.16_LLA_019.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 09:20

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 305.8(mL) | Date Analyzed: 09/16/2018 15:46

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	90		50-150
STL00992	13C4 PFBA	80		50-150
STL01893	13C5 PFPeA	90	M	50-150
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	96		50-150
STL00997	13C2 PFUnA	93		50-150
STL00998	13C2 PFDoA	83		50-150
STL00994	18O2 PFHxS	90		50-150
STL02116	13C2-PFTeDA	84		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	88	M	50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPE-D | Lab Sample ID: 320-42924-4

Matrix: Water | Lab File ID: 2018.09.16_LLA_020.d

Analysis Method: EPA 537 (Mod) | Date Collected: 09/06/2018 00:00

Extraction Method: 3535 | Date Extracted: 09/14/2018 08:21

Sample wt/vol: 307.1(mL) | Date Analyzed: 09/16/2018 15:54

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.6	1.2	0.48
2706-90-3	Perfluoropentanoic acid (PFPeA)	280		1.6	0.81	0.35
307-24-4	Perfluorohexanoic acid (PFHxA)	170	M	1.6	0.81	0.38
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.4	J M	1.6	1.2	0.50
335-67-1	Perfluorooctanoic acid (PFOA)	9.2	M	1.6	1.2	0.44
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U M	1.6	1.2	0.42
335-76-2	Perfluorodecanoic acid (PFDA)	0.81	U	1.6	0.81	0.39
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.2	U M	1.6	1.2	0.59
307-55-1	Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	1.2	0.42
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.4	U M	3.3	2.4	0.62
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.4	U	3.3	2.4	0.68
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.5		1.6	0.81	0.37
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.65	J M	1.6	0.81	0.31
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.81	U	1.6	0.81	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.4	U M	3.3	2.4	0.90
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	1.2	0.46
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.4	U	3.3	2.4	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: TP-PFC-033-TPE-D Lab Sample ID: 320-42924-4

Matrix: Water Lab File ID: 2018.09.16_LLA_020.d

Analysis Method: EPA 537 (Mod) Date Collected: 09/06/2018 00:00

Extraction Method: 3535 Date Extracted: 09/14/2018 08:21

Sample wt/vol: 307.1(mL) Date Analyzed: 09/16/2018 15:54

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	86		50-150
STL00992	13C4 PFBA	75		50-150
STL01893	13C5 PFPeA	83	M	50-150
STL00993	13C2 PFHxA	83		50-150
STL01892	13C4-PFHpA	87		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	87		50-150
STL00996	13C2 PFDA	92		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	84		50-150
STL00994	18O2 PFHxS	87		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	89		50-150
STL02337	13C3-PFBS	89	M	50-150

APPENDIX C

SUPPORT DOCUMENTATION

NAS BRUNSWICK
SDG 320-42924-1

SAMPLE IDENTIFICATION	TP-PFC-033-TPI	
COMPOUND	PENTADECAFLUOROOCTANOIC ACID (PFOA)	
COMPOUND AREA	18007814	
INTERNAL STANDARD AMOUNT (ng/ml)	0.25	
DILUTION FACTOR	10	
INTERNAL STANDARD AREA	806777	
AVERAGE RRF	1.0762	
SAMPLE VOLUME (ml)	301.4	
VOLUME EXTRACT (ml)	10	
ml to L	1000	
CONCENTRATION =	1720.33	ng/L

18007814 x 0.25ng/ml x 1000ml x 10ml x 10/(806777 x 1.0762 x 301.4ml x 1L)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d
Lims ID: 320-42924-A-1-A
Client ID: TP-PFC-033-TPI
Sample Type: Client
Inject. Date: 18-Sep-2018 00:10:06 ALS Bottle#: 35 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 10.0000
Sample Info: 320-42924-a-1-a 10X (#245574)
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 20-Sep-2018 09:02:10 Calib Date: 28-Aug-2018 11:05:49
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180828-63368.b\2018.08.28LLICALA_011.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: mongkols Date: 20-Sep-2018 09:02:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.478	1.479	0.0	0.544	663841	0.1869		74.8	2077	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.483	1.488	-0.005	1.004	566303	0.2336			76.6	M
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.755	0.0	1.000	1631135	0.6549			92.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.756	-0.001	0.646	613881	0.1938		77.5	1130	
D 47 13C3-PFBS										M
301.90 > 83.00	1.797	1.789	0.008	0.661	6737	0.1620		69.7	38.9	M
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	581217	0.1909			176	
298.90 > 99.00	1.797	1.797	0.0	1.000	200911		2.89(1.35-4.05)		114	
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.038	-0.001	0.749	645003	0.1926		77.0	2270	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.037	2.048	-0.011	1.000	2793759	1.19			354	
313.00 > 119.00	2.037	2.048	-0.011	1.000	173379		16.11(6.96-20.87)		285	
D 9 13C4-PFHpA										
367.00 > 322.00	2.360	2.360	0.0	0.868	791105	0.1981		79.2	2669	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.373	2.373	0.0	1.006	801894	0.2485			83.6	
363.00 > 169.00	2.373	2.373	0.0	1.006	166411		4.82(2.17-6.52)		238	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.386	2.386	0.0	1.000	3069820	1.28			2392	
399.00 > 99.00	2.386	2.386	0.0	1.000	822940		3.73(1.90-5.70)		1033	
D 11 18O2 PFHxS										
403.00 > 84.00	2.386	2.387	-0.001	0.878	456698	0.1860		78.6	3088	

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	2.718	2.719	-0.001	1.000	806777	0.2170		86.8	1989	
* 62 13C2-PFOA										
415.00 > 370.00	2.718	2.734	-0.016		922488	0.2500			3809	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.718	2.734	-0.016	1.000	18007814	5.18			755	
413.00 > 169.00	2.718	2.734	-0.016	1.000	7768513		2.32(1.36-4.08)		7356	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.734	2.734	0.0	0.882	56355	0.0279			30.1	
449.00 > 99.00	2.734	2.734	0.0	0.882	13171		4.28(1.84-5.53)		34.2	M
20 Perfluorononanoic acid										M
463.00 > 419.00	3.098	3.098	0.0	1.000	31769	0.0111			2.9	
463.00 > 169.00	3.098	3.098	0.0	1.000	4001		7.94(2.68-8.03)		10.6	M
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.098	3.098	0.0	1.000	2300180	1.06			865	
499.00 > 99.00	3.098	3.098	0.0	1.000	504237		4.56(2.04-6.12)		1187	
D 19 13C5 PFNA										
468.00 > 423.00	3.098	3.099	-0.001	1.140	731320	0.2100		84.0	2234	
D 18 13C4 PFOS										
503.00 > 80.00	3.098	3.099	-0.001	1.140	489533	0.1855		77.6	198	
D 21 13C8 FOSA										
506.00 > 78.00	3.448	3.449	-0.001	1.269	262312	0.1879		75.2	923	
D 23 13C2 PFDA										
515.00 > 470.00	3.448	3.449	-0.001	1.269	746135	0.2145		85.8	3321	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.448	3.465	-0.017	1.000	3040	0.000978			7.5	
D 30 13C2 PFUnA										
565.00 > 520.00	3.775	3.776	-0.001	1.389	623390	0.2106		84.2	2821	
D 36 13C2 PFDoA										
615.00 > 570.00	4.072	4.073	-0.001	1.498	686127	0.1905		76.2	1841	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.573	4.573	-0.001	1.682	527587	0.1839		73.6	2414	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 20-Sep-2018 09:02:11 Chrom Revision: 2.3 18-Sep-2018 21:45:20

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d

Injection Date: 18-Sep-2018 00:10:06 Instrument ID: A9

Lims ID: 320-42924-A-1-A Lab Sample ID: 320-42924-1

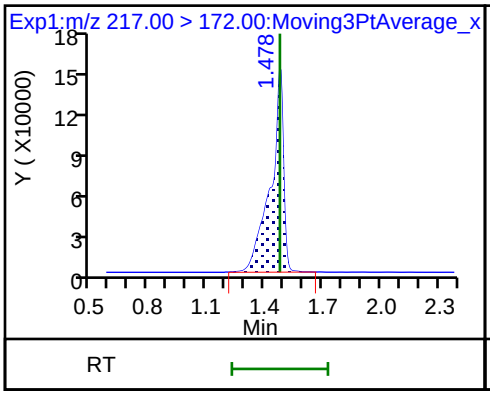
Client ID: TP-PFC-033-TPI

Operator ID: A9\Administrator ALS Bottle#: 35 Worklist Smp#: 2

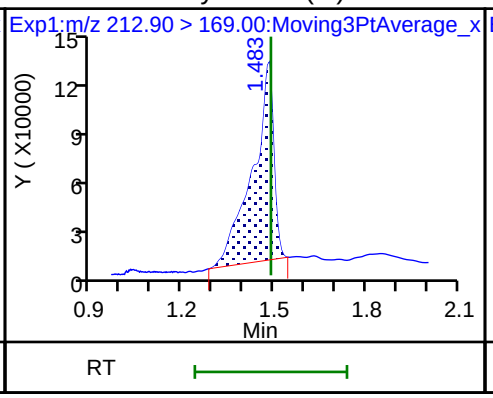
Injection Vol: 20.0 ul Dil. Factor: 10.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

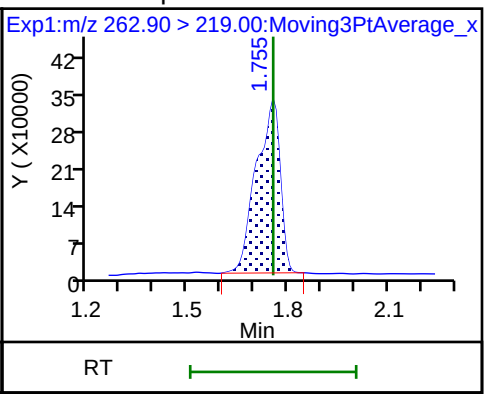
D 1 13C4 PFBA



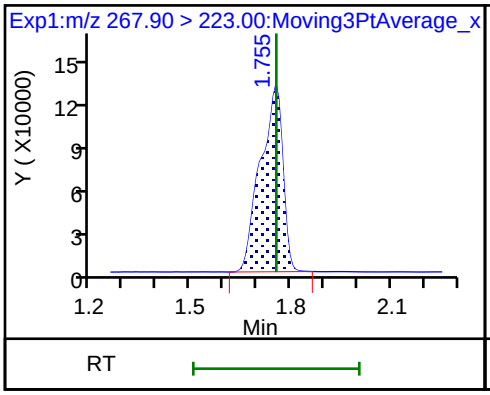
2 Perfluorobutyric acid (M)



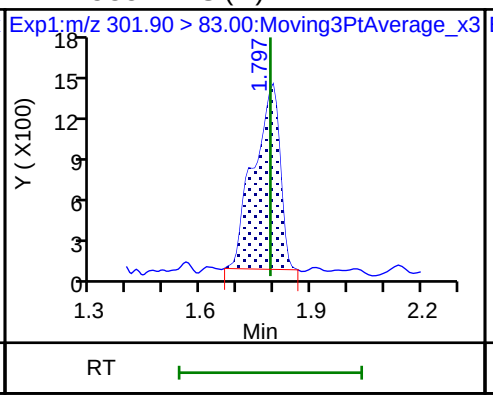
4 Perfluoropentanoic acid



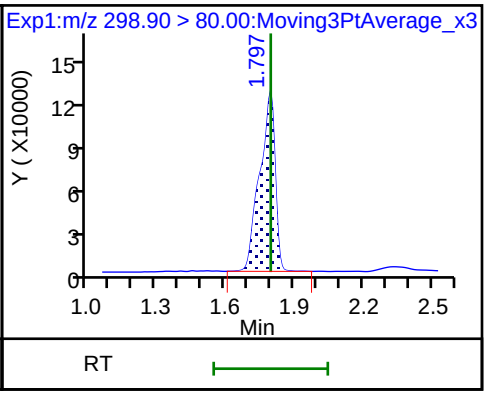
D 3 13C5-PFPeA



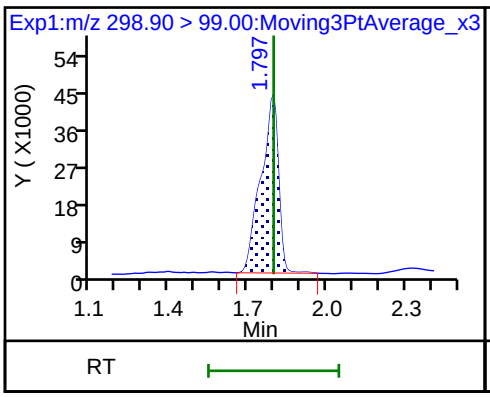
D 47 13C3-PFBS (M)



5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid



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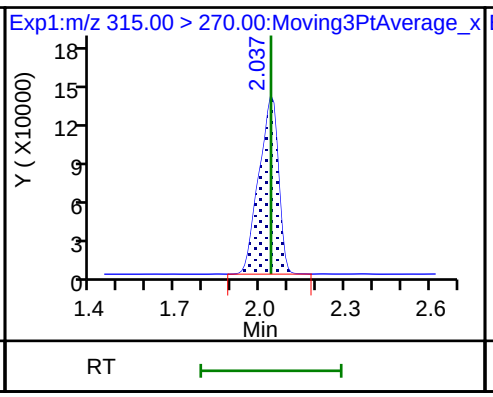
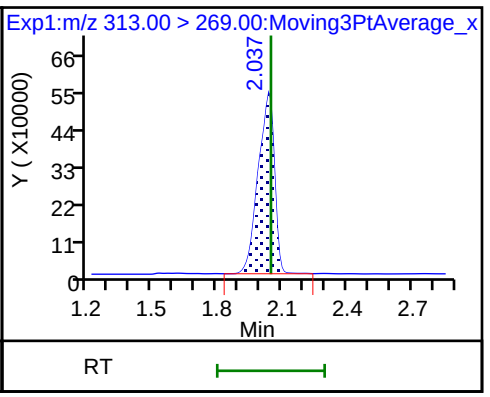
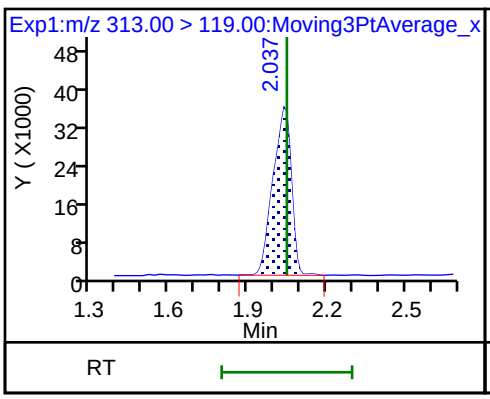


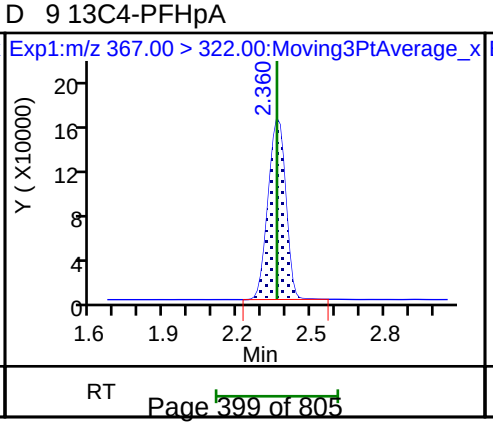
6 Perfluorohexanoic acid



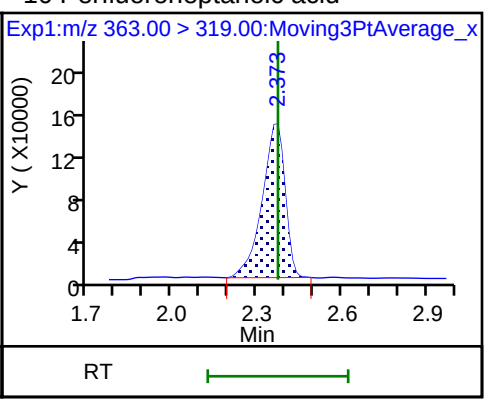
6 Perfluorohexanoic acid



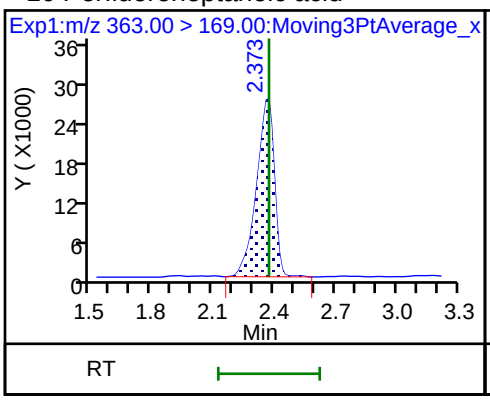
D 9 13C4-PFHpA



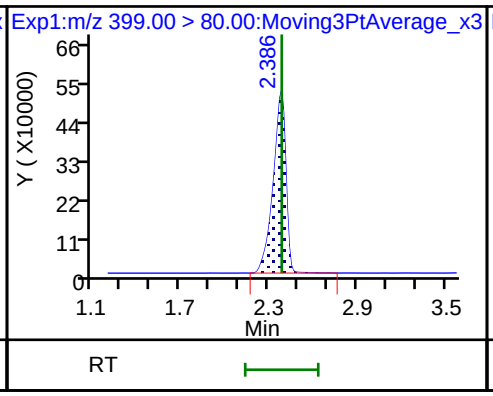
10 Perfluoroheptanoic acid



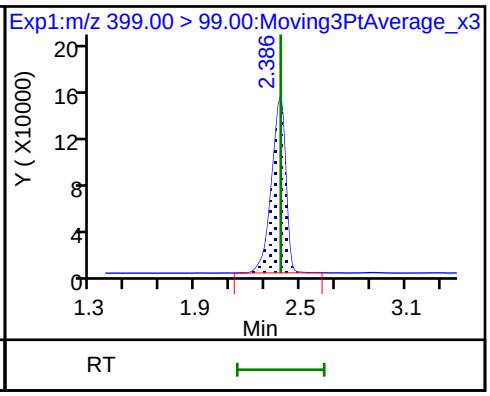
10 Perfluoroheptanoic acid



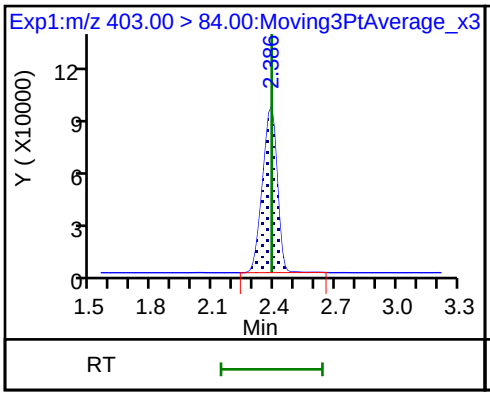
8 Perfluorohexanesulfonic acid



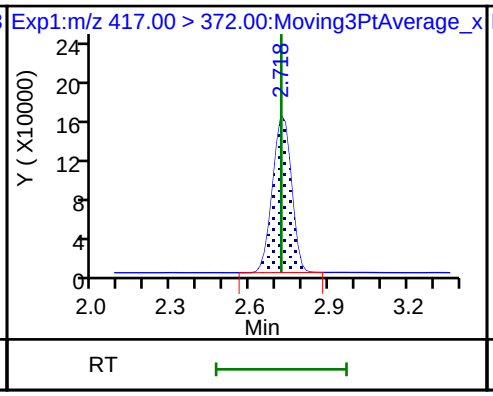
8 Perfluorohexanesulfonic acid



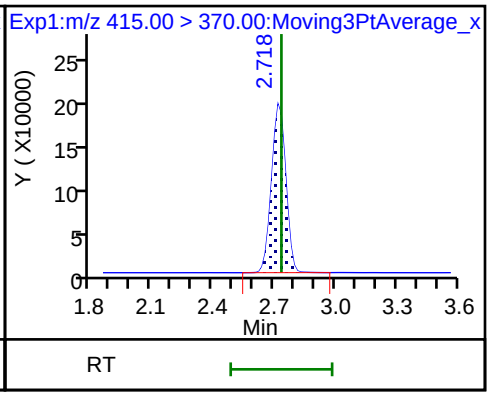
D 11 18O2 PFHxS



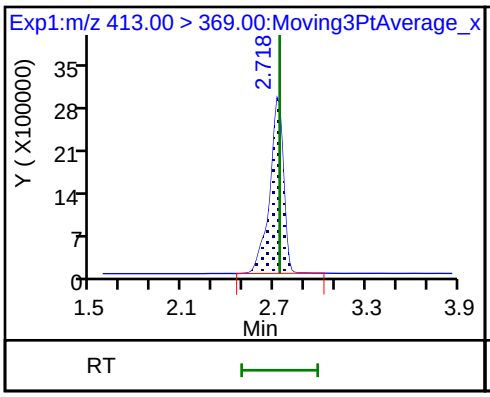
D 14 13C4 PFOA



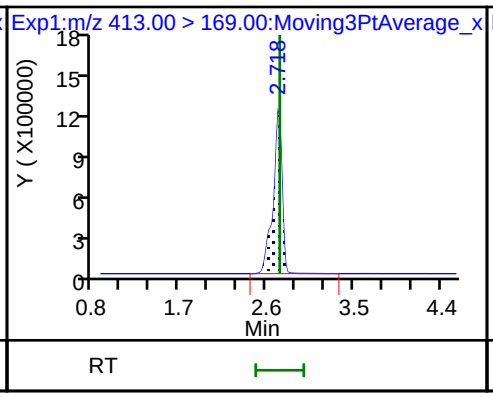
* 62 13C2-PFOA



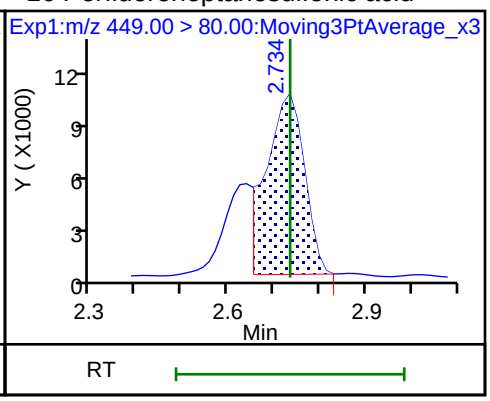
15 Perfluorooctanoic acid



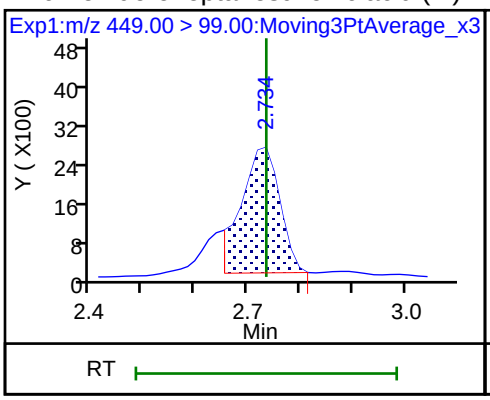
15 Perfluorooctanoic acid



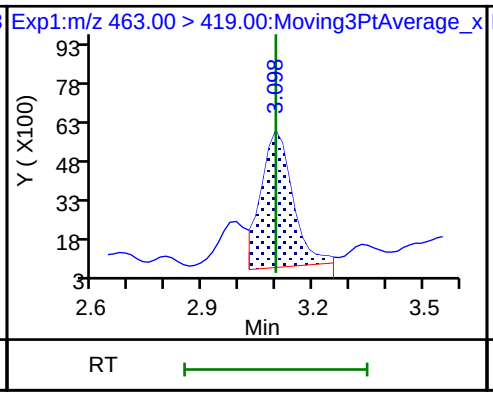
16 Perfluoroheptanesulfonic acid



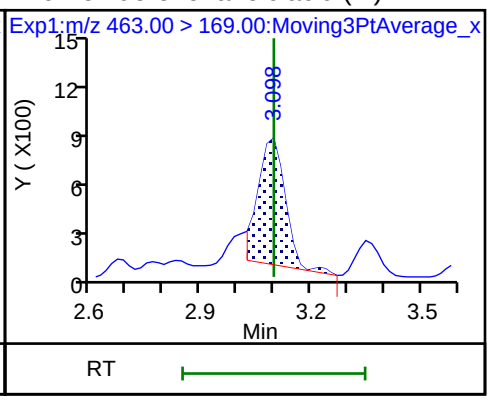
16 Perfluoroheptanesulfonic acid (M)



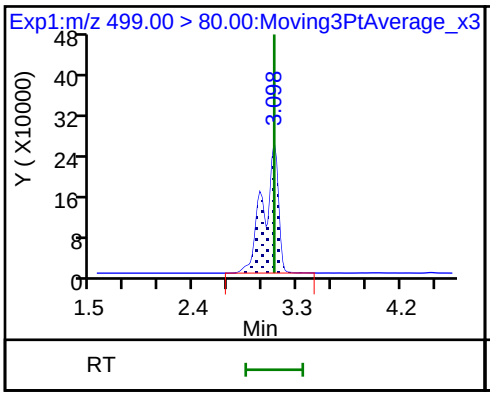
20 Perfluorononanoic acid



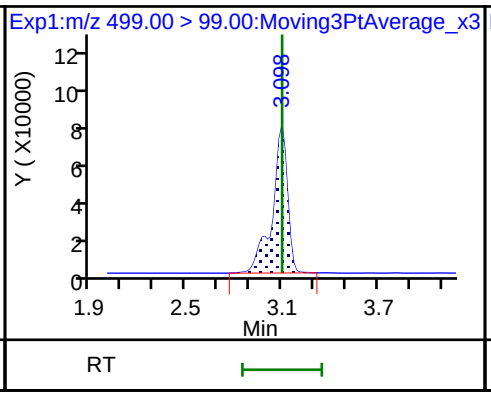
20 Perfluorononanoic acid (M)



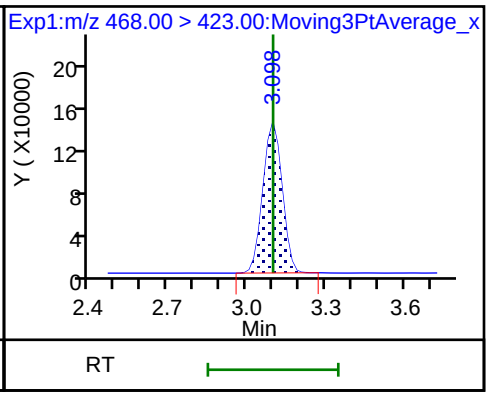
17 Perfluorooctane sulfonic acid



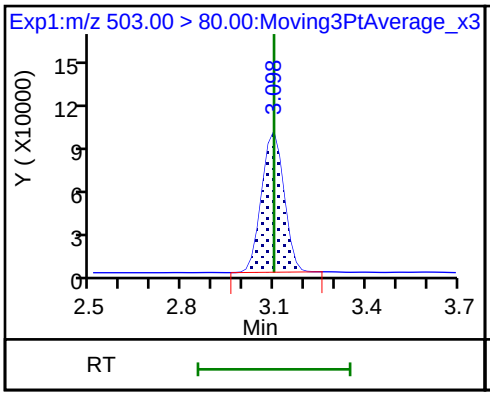
17 Perfluorooctane sulfonic acid



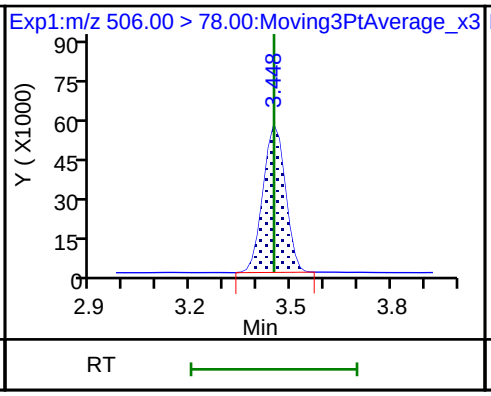
D 19 13C5 PFNA



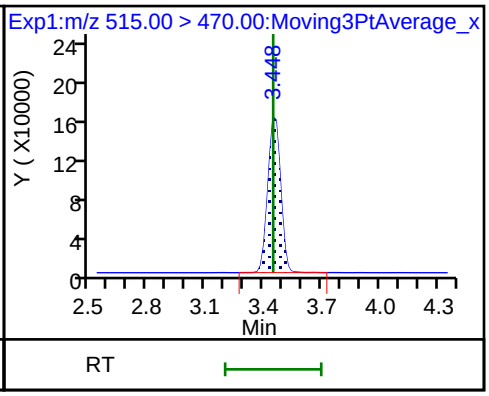
D 18 13C4 PFOS



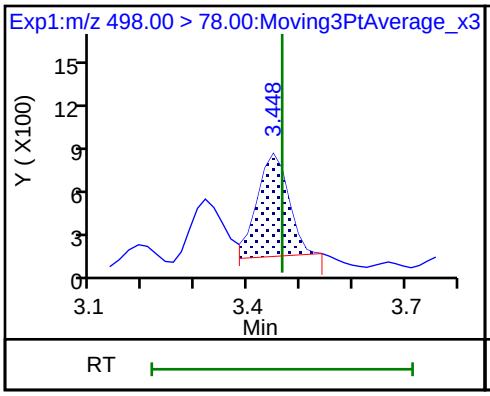
D 21 13C8 FOSA



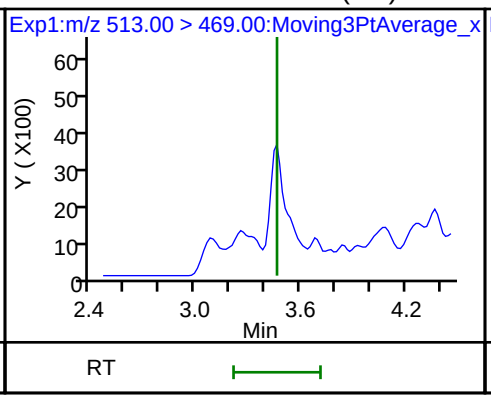
D 23 13C2 PFDA



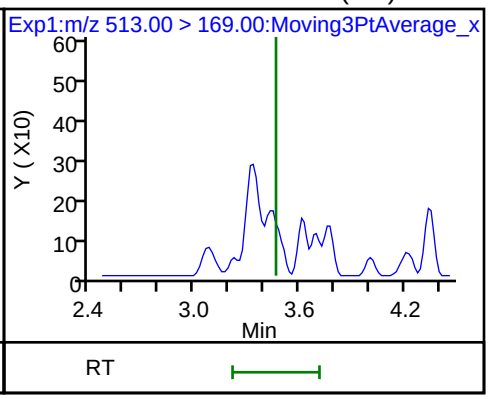
22 Perfluorooctane Sulfonamide



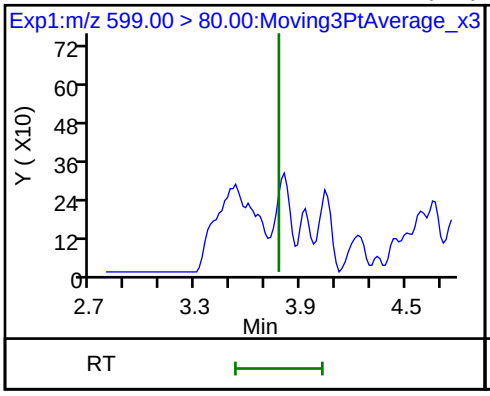
24 Perfluorodecanoic acid (ND)



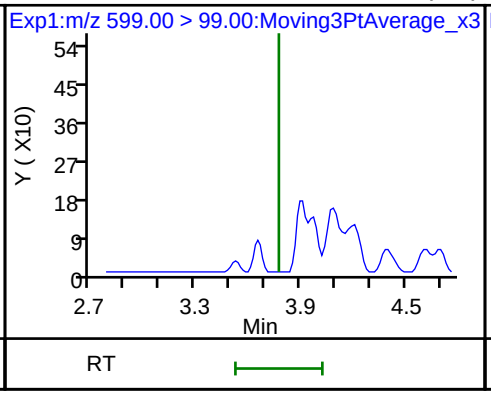
24 Perfluorodecanoic acid (ND)



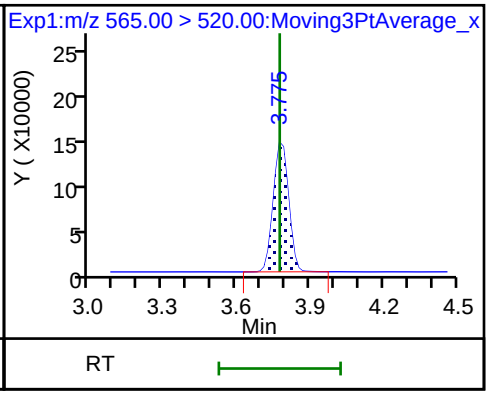
29 Perfluorodecane Sulfonic acid (ND)



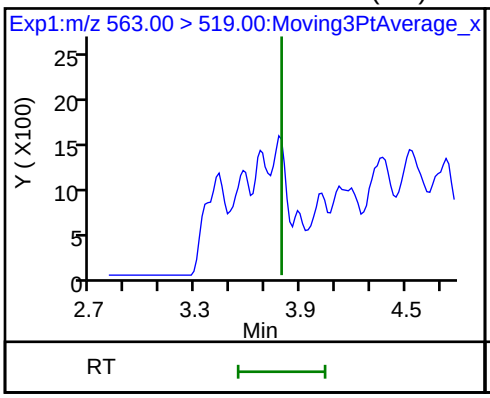
29 Perfluorodecane Sulfonic acid (ND)



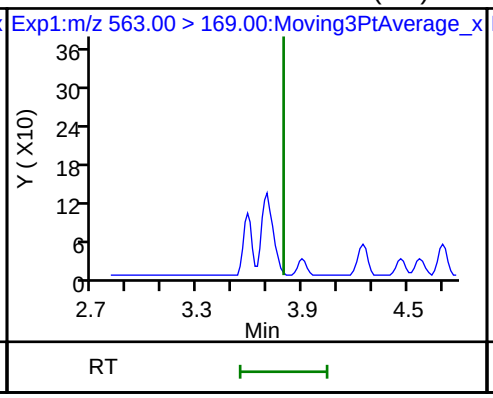
D 30 13C2 PFUnA



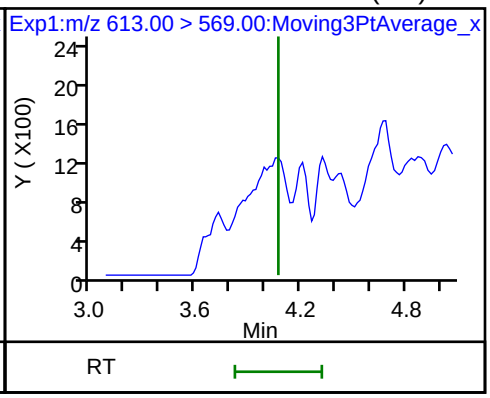
31 Perfluoroundecanoic acid (ND)



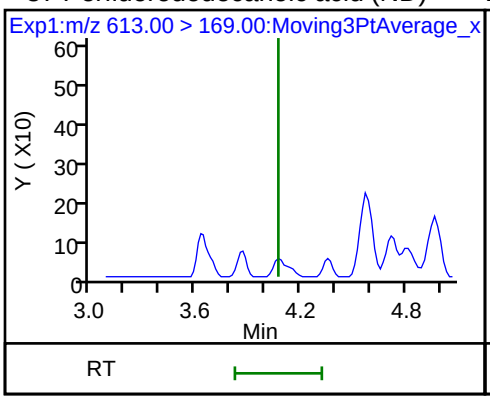
31 Perfluoroundecanoic acid (ND)



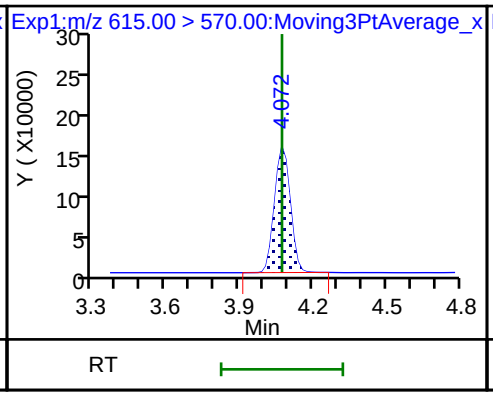
37 Perfluorododecanoic acid (ND)



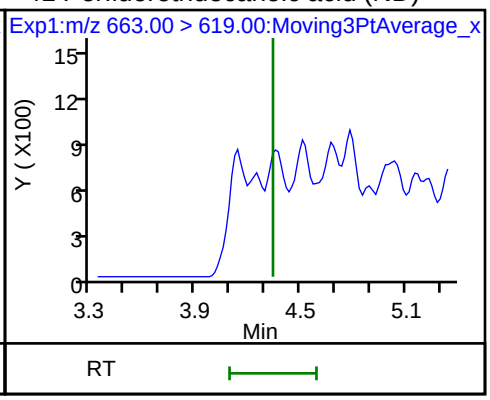
37 Perfluorododecanoic acid (ND)



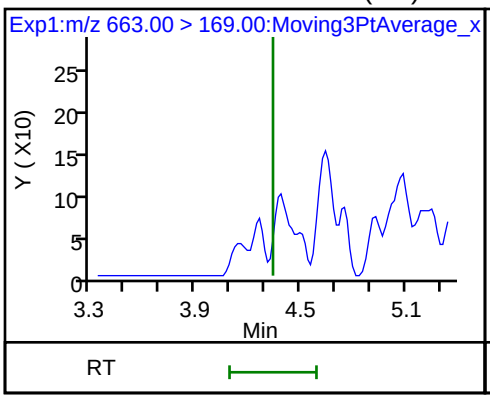
D 36 13C2 PFDoA



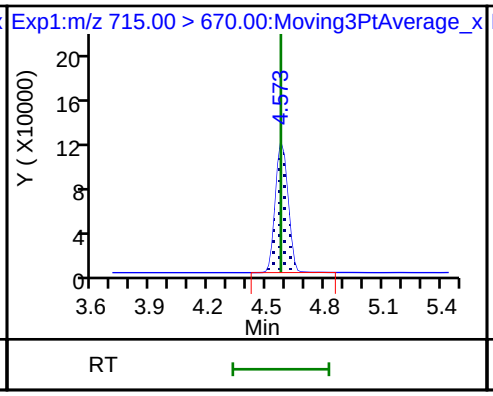
41 Perfluorotridecanoic acid (ND)



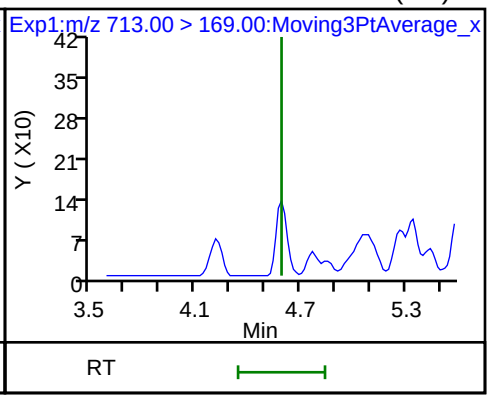
41 Perfluorotridecanoic acid (ND)



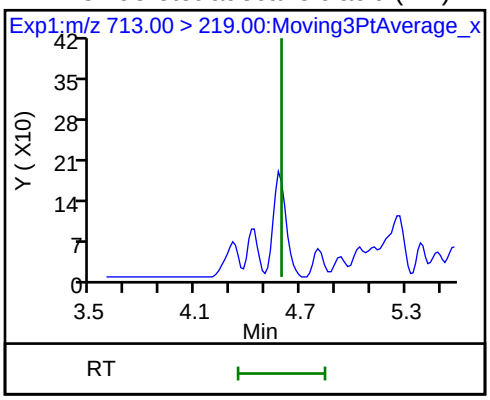
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

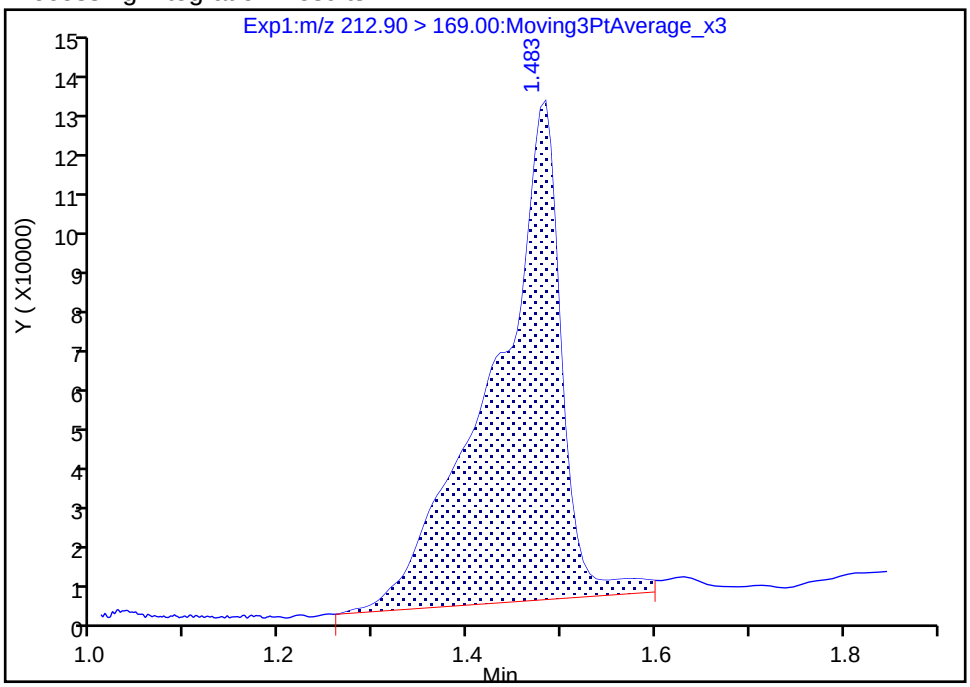
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d				
Injection Date:	18-Sep-2018 00:10:06	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	35	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

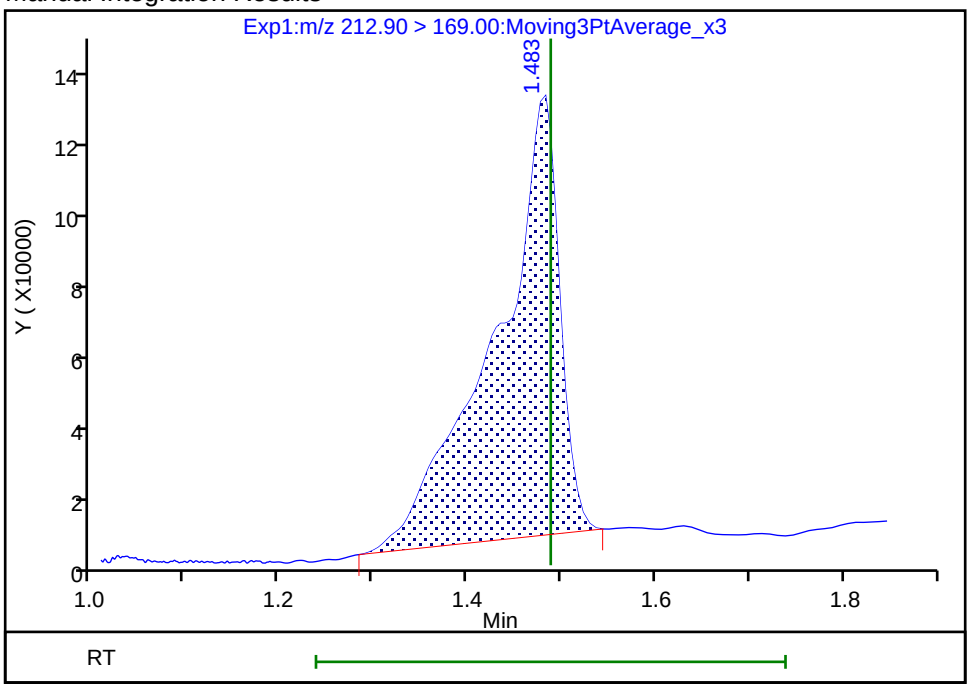
Processing Integration Results

RT: 1.48
Area: 615638
Amount: 0.253990
Amount Units: ng/ml



Manual Integration Results

RT: 1.48
Area: 566303
Amount: 0.233636
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:01:33

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

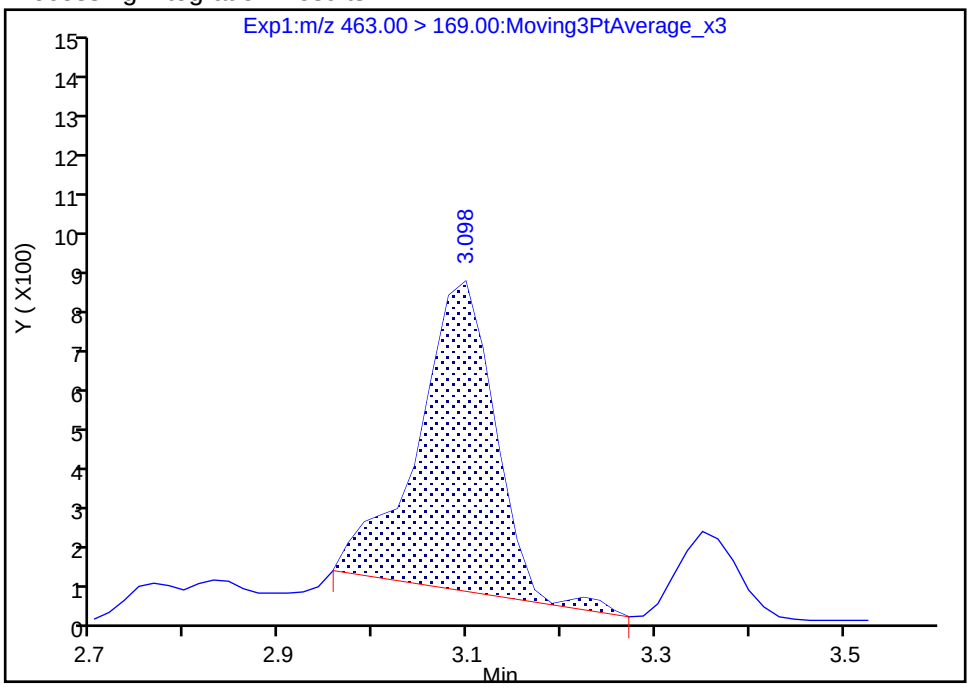
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d				
Injection Date:	18-Sep-2018 00:10:06	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	35	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

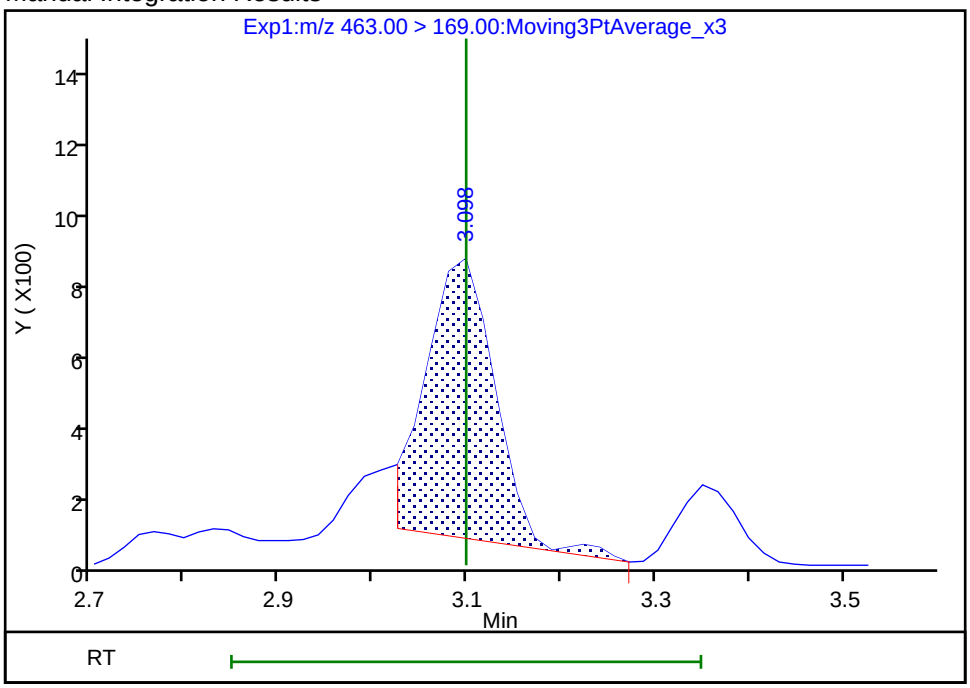
Processing Integration Results

RT: 3.10
Area: 4502
Amount: 0.011106
Amount Units: ng/ml



Manual Integration Results

RT: 3.10
Area: 4001
Amount: 0.011106
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:02:00

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

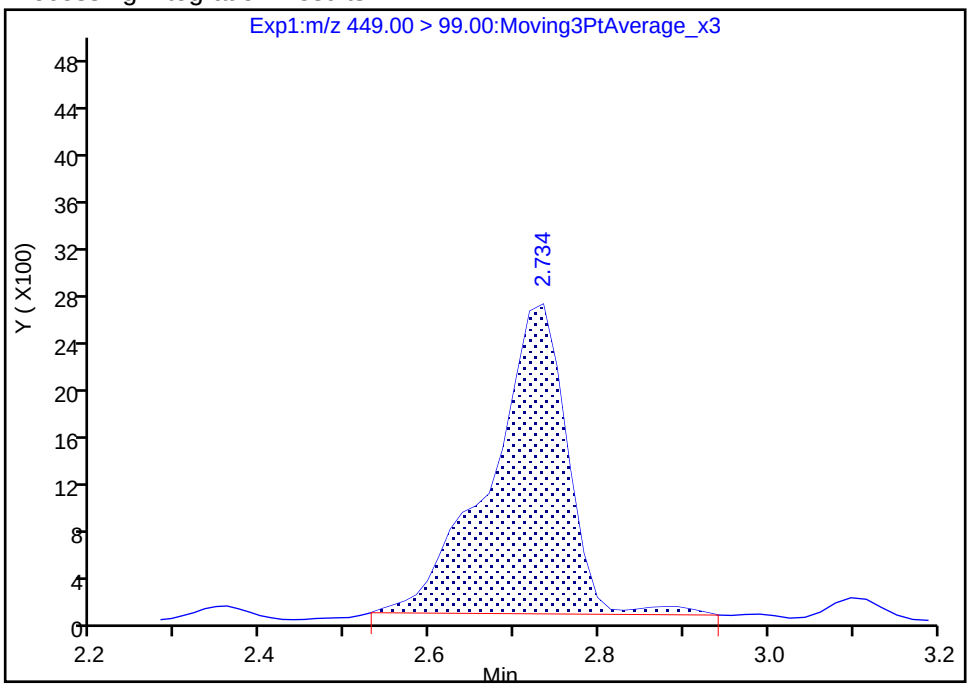
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d				
Injection Date:	18-Sep-2018 00:10:06	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	35	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

16 Perfluoroheptanesulfonic acid, CAS: 375-92-8

Signal: 2

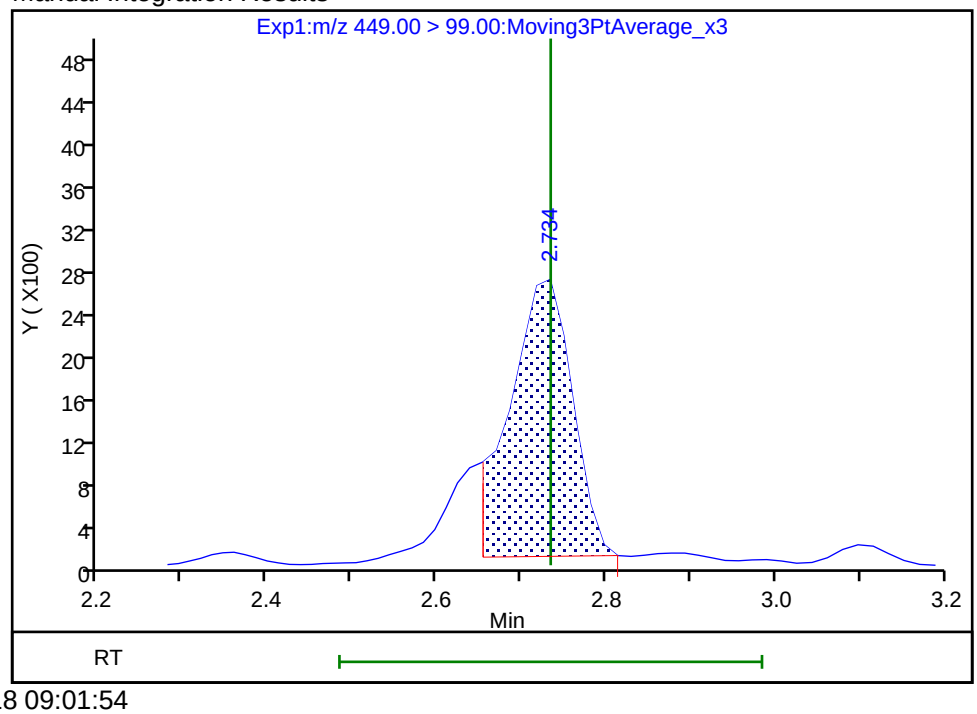
Processing Integration Results

RT: 2.73
Area: 16484
Amount: 0.027944
Amount Units: ng/ml



Manual Integration Results

RT: 2.73
Area: 13171
Amount: 0.027944
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:01:54

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

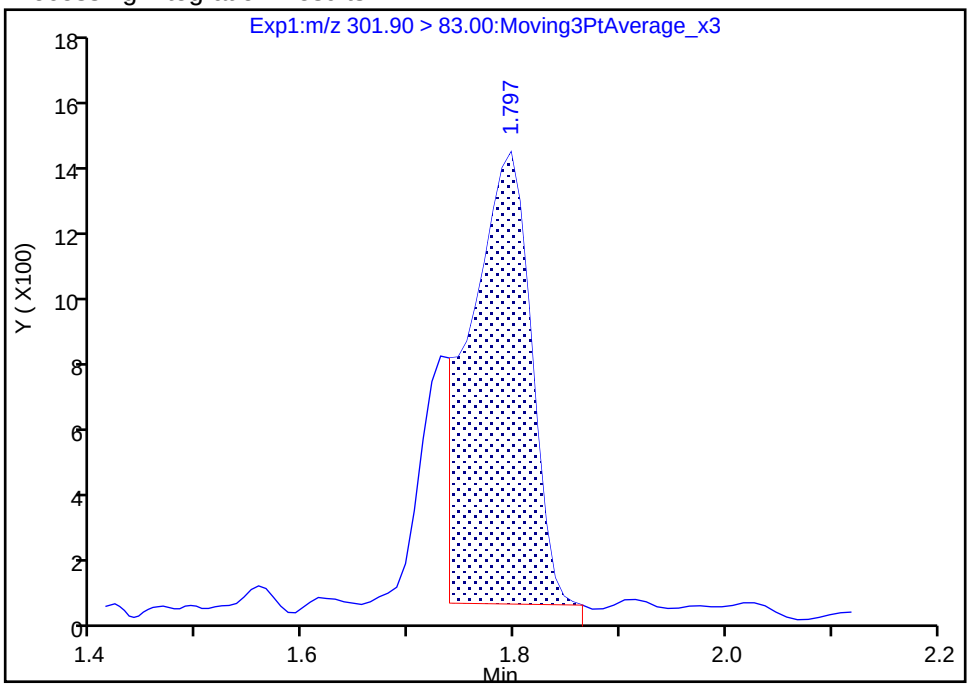
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180919-64401.b\2018.09.17_LLB_052.d				
Injection Date:	18-Sep-2018 00:10:06	Instrument ID:	A9		
Lims ID:	320-42924-A-1-A	Lab Sample ID:	320-42924-1		
Client ID:	TP-PFC-033-TPI				
Operator ID:	A9\Administrator	ALS Bottle#:	35	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

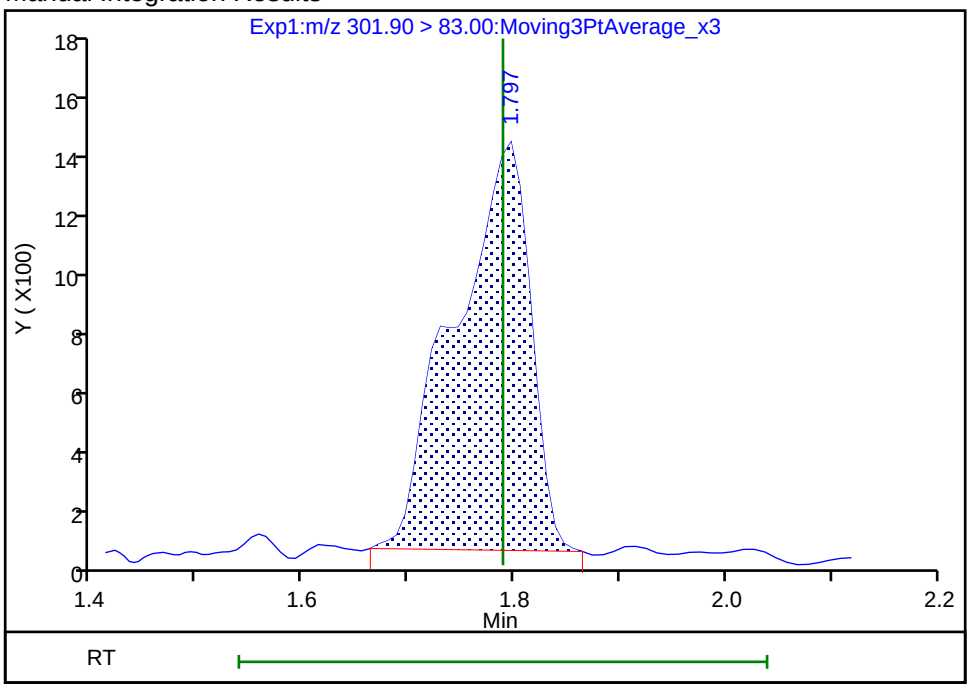
Processing Integration Results

RT: 1.80
Area: 5363
Amount: 0.128980
Amount Units: ng/ml



Manual Integration Results

RT: 1.80
Area: 6737
Amount: 0.162024
Amount Units: ng/ml



Reviewer: mongkols, 20-Sep-2018 09:01:19

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2xRL
PENTADECAFLUOROOCTANOIC ACID (PFOA)	9.1	9.2	1.6	1.09	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	4.8	4.5	1.6	6.45	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	120	130	1.6	8.00	FALSE	TRUE	TRUE	TRUE
PERFLUOROHEPTANOIC ACID (PFHPA)	1.2	1.4	1.6	15.38	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANOIC ACID (PFHXA)	170	170	1.6	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROPENTANOIC ACID (PFPEA)	260	280	1.6	7.41	FALSE	TRUE	TRUE	TRUE

SDG 320-42924-1

TP-PFC-033-TPE/TP-PFC-033-TPE-D

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record

240688

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 Griben	Date: 9/6/18	COC No: 240688
Company Name: TETRA TECH [illegible]	Tel/Fax: 412-421-0650	Lab Contact: DAVE ALLTUCKER	Carrier: FEDEX	1 of 1 COCs
Address: 881 ANDERSON DR FOSTER PLAZA	Analysis Turnaround Time			Sampler: D G
City/State/Zip: PITTSBURGH PA 015210	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 412-421-0650	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: BRUNSWICK GWETS	☐ 1 week			
Site: FORMER BRUNSWICK	☐ 2 days			Job / SDG No.:
PO# 112G0R005-ME21	☐ 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-033-TPI	9/6/18	0910	G	W	4	N	N	X	
TP-PFC-033-MID CARBON		0915	G	W	4	N	N	X	
TP-PFC-033-TPE		0920	G	W	4	N	N	X	
TP-PFC-033-TPE-D	↓	0000	G	W	4	N	N	X	

320-42924 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: 0.4 Corr'd: 0.4		Therm ID No.: AC-5
Relinquished by:	Company: T+	Date/Time: 9/6/18 1200	Received by: FEDEX	Company: FEDEX	Date/Time: 9/6/18 1200
Relinquished by:	Company:	Date/Time:	Received by:	Company: TAS SAC	Date/Time: 9/7/18 915
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-42924-1

Login Number: 42924
List Number: 1
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative
320-42924-1

Receipt
The samples were received on 9/7/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 8.4º C.

Receipt Exceptions
The following samples were received at the laboratory outside the required temperature criteria: TP-PFC-033-TPI (320-42924-1), TP-PFC-033-MID CARBON (320-42924-2), TP-PFC-033-TPE (320-42924-3) and TP-PFC-033-TPE-D (320-42924-4). The client was contacted regarding this issue, and the laboratory was instructed to proceed with/cancel analysis. Received at 8.4'C and ice was melted with delivery for Thursday and received Friday.

LCMS
Method(s) 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 concentration of several analytes associated with the following samples exceeded the instrument calibration range: TP-PFC-033-TPI (320-42924-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

Method(s) EPA 537 (Mod): Results for sample TP-PFC-033-TPI (320-42924-1) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

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

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-245574.

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

Qualifiers

LCMS

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

Glossary

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

Sample Summary

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

TestAmerica Job ID: 320-42924-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-42924-1	TP-PFC-033-TPI	Water	09/06/18 09:10	09/07/18 09:15
320-42924-2	TP-PFC-033-MID CARBON	Water	09/06/18 09:15	09/07/18 09:15
320-42924-3	TP-PFC-033-TPE	Water	09/06/18 09:20	09/07/18 09:15
320-42924-4	TP-PFC-033-TPE-D	Water	09/06/18 00:00	09/07/18 09:15

Method Summary

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

TestAmerica Job ID: 320-42924-1

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.: 320-42924-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-033-TPI	320-42924-1	81	96 M	95 M	89	97	97	91	99
TP-PFC-033-TPI DL	320-42924-1 DL	75	78	70 M	77	79	79	87	84
TP-PFC-033-MID CARBON	320-42924-2	79	87	86	87	94	92	93	87
TP-PFC-033-TPE	320-42924-3	80	90 M	88 M	88	94	90	91	91
TP-PFC-033-TPE-D	320-42924-4	75	83 M	89 M	83	87	87	88	87
	MB 320-245574/1-A	84	87	86 M	87	94	97	96	89
	LCS 320-245574/2-A	84	90	91	92	91	91	92	92
	LCSD 320-245574/3-A	79	87 M	85 M	87	93	88	96	93

	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.: 320-42924-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-033-TPI	320-42924-1	93	91	98	96	92	90
TP-PFC-033-TPI DL	320-42924-1 DL	78	75	86	84	76	74
TP-PFC-033-MID CARBON	320-42924-2	88	88	94	91	83	79
TP-PFC-033-TPE	320-42924-3	90	90	96	93	83	84
TP-PFC-033-TPE-D	320-42924-4	89	86	92	86	84	79
	MB 320-245574/1-A	88	88	86	90	87	79
	LCS 320-245574/2-A	92	79	98	91	87	80
	LCSD 320-245574/3-A	90	84	90	88	87	79

	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.: 320-42924-1

SDG No.:

Sample No.: IC 320-242499/5 Date Analyzed: 08/28/2018 10:43

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.08.28LLICALA_0 Heated Purge: (Y/N) N

Calibration ID: 40823

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		8409228	2.75				
UPPER LIMIT		12613842	2.95				
LOWER LIMIT		4204614	2.55				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-242499/9		8678444	2.75				
ICV 320-242499/10		8272454	2.75				
CCV 320-245884/4 CCVIS		8014697	2.78				
CCV 320-246099/4 CCVIS		8238197	2.73				

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.: 320-42924-1

SDG No.:

Sample No.: CCV 320-245884/4 Date Analyzed: 09/16/2018 14:08

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.09.16_LLA_006. Heated Purge: (Y/N) N

Calibration ID: 40823

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		8014697	2.78				
UPPER LIMIT		12022046	2.98				
LOWER LIMIT		4007349	2.58				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-245884/2		8612340	2.80				
CCVL 320-245884/3		8111538	2.79				
CCV 320-245887/1		8080760	2.77				
MB 320-245574/1-A		8471882	2.77				
LCS 320-245574/2-A		8026611	2.77				
LCSD 320-245574/3-A		8409709	2.77				
320-42924-1	TP-PFC-033-TPI	7282148	2.76				
320-42924-2	TP-PFC-033-MID CARBON	8316580	2.75				
320-42924-3	TP-PFC-033-TPE	8293025	2.75				
320-42924-4	TP-PFC-033-TPE-D	8629172	2.75				
CCV 320-245887/12		8549947	2.75				

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.: 320-42924-1

SDG No.:

Sample No.: CCV 320-246099/4 Date Analyzed: 09/17/2018 18:24

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 2018.09.17_LLB_006. Heated Purge: (Y/N) N

Calibration ID: 40823

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		8238197	2.73				
UPPER LIMIT		12357296	2.93				
LOWER LIMIT		4119099	2.53				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-246099/2		8382047	2.73				
CCVL 320-246099/3		8211716	2.73				
CCV 320-246405/1		8500955	2.73				
320-42924-1 DL	TP-PFC-033-TPI DL	922488Q	2.72				
CCV 320-246405/4		8309242	2.73				

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.: 320-42924-1

SDG No.:

Lab File ID: 2018.09.16_LLA_013.d Lab Sample ID: MB 320-245574/1-A

Matrix: Water Date Extracted: 09/12/2018 08:12

Instrument ID: A9 Date Analyzed: 09/16/2018 15:01

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-245574/2-A	2018.09.16_LLA_014.d	09/16/2018 15:08
	LCSD 320-245574/3-A	2018.09.16_LLA_015.d	09/16/2018 15:16
TP-PFC-033-TPI	320-42924-1	2018.09.16_LLA_017.d	09/16/2018 15:31
TP-PFC-033-MID CARBON	320-42924-2	2018.09.16_LLA_018.d	09/16/2018 15:39
TP-PFC-033-TPE	320-42924-3	2018.09.16_LLA_019.d	09/16/2018 15:46
TP-PFC-033-TPE-D	320-42924-4	2018.09.16_LLA_020.d	09/16/2018 15:54
TP-PFC-033-TPI DL	320-42924-1 DL	2018.09.17_LLB_052.d	09/18/2018 00:10

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-42924-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-245574/1-A

Matrix: Water | Lab File ID: 2018.09.16_LLA_013.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 09/12/2018 08:12

Sample wt/vol: 250.00(mL) | Date Analyzed: 09/16/2018 15:01

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 20(uL) | GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 | 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 M	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 M	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 M	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	U M	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 M	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.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-245574/1-A

Matrix: Water Lab File ID: 2018.09.16_LLA_013.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 09/12/2018 08:12

Sample wt/vol: 250.00(mL) Date Analyzed: 09/16/2018 15:01

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245887 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	88		50-150
STL00992	13C4 PFBA	84		50-150
STL01893	13C5 PFPeA	87		50-150
STL00993	13C2 PFHxA	87		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	96		50-150
STL00995	13C5 PFNA	89		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	97		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	88		50-150
STL02337	13C3-PFBS	86	M	50-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.09.16_LLA_014.d

Lab ID: LCS 320-245574/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	41.0	102	83-118	M
Perfluoropentanoic acid (PFPeA)	40.0	40.1	100	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	38.4	96	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	44.5	111	80-113	
Perfluorooctanoic acid (PFOA)	40.0	39.4	98	80-107	
Perfluorononanoic acid (PFNA)	40.0	44.7	112	83-113	
Perfluorodecanoic acid (PFDA)	40.0	39.3	98	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	41.9	105	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	41.3	103	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	36.0	90	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	38.1	95	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	35.6	101	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.5	98	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.1	105	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	35.4	95	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	40.8	106	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	44.4	111	85-114	
13C8 FOSA	100	78.7	79	50-150	
13C4 PFBA	100	84.1	84	50-150	
13C5 PFPeA	100	89.7	90	50-150	
13C2 PFHxA	100	92.0	92	50-150	
13C4-PFHpA	100	91.5	91	50-150	
13C4 PFOA	100	91.7	92	50-150	
13C5 PFNA	100	91.7	92	50-150	
13C2 PFDA	100	97.7	98	50-150	
13C2 PFUnA	100	91.0	91	50-150	
13C2 PFDoA	100	87.5	87	50-150	
18O2 PFHxS	94.6	86.5	91	50-150	
13C2-PFTeDA	100	80.1	80	50-150	
13C4 PFOS	95.6	87.7	92	50-150	
13C3-PFBS	93.0	84.6	91	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.09.16_LLA_015.d

Lab ID: LCSD 320-245574/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	39.3	98	4	30	83-118	M
Perfluoropentanoic acid (PFPeA)	40.0	38.5	96	4	30	83-108	M
Perfluorohexanoic acid (PFHxA)	40.0	38.1	95	1	30	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	40.8	102	9	30	80-113	
Perfluorooctanoic acid (PFOA)	40.0	37.9	95	4	30	80-107	
Perfluorononanoic acid (PFNA)	40.0	40.6	102	10	30	83-113	
Perfluorodecanoic acid (PFDA)	40.0	42.7	107	8	30	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	41.5	104	1	30	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	40.3	101	3	30	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	36.9	92	2	30	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7	102	7	30	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	35.1	99	1	30	87-120	M
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.5	95	3	30	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	41.6	109	4	30	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.7	99	4	30	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	43.5	113	6	30	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	40.5	101	9	30	85-114	
13C8 FOSA	100	84.3	84			50-150	
13C4 PFBA	100	78.7	79			50-150	
13C5 PFPeA	100	86.5	87			50-150	M
13C2 PFHxA	100	86.6	87			50-150	
13C4-PFHpA	100	92.5	93			50-150	
13C4 PFOA	100	95.6	96			50-150	
13C5 PFNA	100	92.7	93			50-150	
13C2 PFDA	100	89.5	90			50-150	
13C2 PFUnA	100	87.8	88			50-150	
13C2 PFDoA	100	87.3	87			50-150	
18O2 PFHxS	94.6	83.7	88			50-150	
13C2-PFTeDA	100	78.7	79			50-150	
13C4 PFOS	95.6	86.0	90			50-150	
13C3-PFBS	93.0	78.9	85			50-150	M

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.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 08/28/2018 10:20

Analysis Batch Number: 242499 End Date: 08/28/2018 11:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-242499/2		08/28/2018 10:20	1	2018.08.28LLICA LA 005.d	Acquity 2.1(mm)
IC 320-242499/3		08/28/2018 10:28	1	2018.08.28LLICA LA 006.d	Acquity 2.1(mm)
IC 320-242499/4		08/28/2018 10:35	1	2018.08.28LLICA LA 007.d	Acquity 2.1(mm)
IC 320-242499/5 ICIS		08/28/2018 10:43	1	2018.08.28LLICA LA 008.d	Acquity 2.1(mm)
IC 320-242499/6		08/28/2018 10:50	1	2018.08.28LLICA LA 009.d	Acquity 2.1(mm)
IC 320-242499/7		08/28/2018 10:58	1	2018.08.28LLICA LA 010.d	Acquity 2.1(mm)
IC 320-242499/8		08/28/2018 11:05	1	2018.08.28LLICA LA 011.d	Acquity 2.1(mm)
ICB 320-242499/9		08/28/2018 11:13	1	2018.08.28LLICA LA 012.d	Acquity 2.1(mm)
ICV 320-242499/10		08/28/2018 11:20	1	2018.08.28LLICA LA 013.d	Acquity 2.1(mm)

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

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-242499/2	2018.08.28LLICALA_005.d
Level 2	IC 320-242499/3	2018.08.28LLICALA_006.d
Level 3	IC 320-242499/4	2018.08.28LLICALA_007.d
Level 4	IC 320-242499/5	2018.08.28LLICALA_008.d
Level 5	IC 320-242499/6	2018.08.28LLICALA_009.d
Level 6	IC 320-242499/7	2018.08.28LLICALA_010.d
Level 7	IC 320-242499/8	2018.08.28LLICALA_011.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)	0.8927 0.9116	0.8954 0.8679	0.9443	0.9529	0.9250	AveID		0.9128				3.3		20.0			
Perfluoropentanoic acid (PFPeA)	1.0749 0.9802	1.1009 0.9016	1.0098	1.0241	1.0081	AveID		1.0142				6.4		20.0			
Perfluorobutanesulfonic acid (PFBS)	107.38 104.12	107.86 86.752	107.68	107.88	113.78	AveID		105.06				8.2		20.0			
4:2 FTS	22.077 21.958	24.055 19.139	20.776	21.704	21.556	AveID		21.609				6.8		20.0			
Perfluorohexanoic acid (PFHxA)	1.0587 0.8313	0.9607 0.7919	0.8893	0.9289	0.9138	AveID		0.9107				9.6		20.0			
Perfluoropentanesulfonic acid	52.424 51.169	50.750 43.829	49.787	48.669	52.488	AveID		49.874				6.0		20.0			
Perfluoroheptanoic acid (PFHpA)	1.0818 0.9815	1.0173 0.8823	1.0810	1.0765	1.0176	AveID		1.0197				7.1		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3769 1.2002	1.4155 1.1259	1.1598	1.1188	1.2648	AveID		1.2374				9.7		20.0			
6:2 FTS	2.3795 2.1598	1.9035 2.0910	2.1061	2.2987	2.0425	AveID		2.1401				7.4		20.0			
Perfluorooctanoic acid (PFOA)	1.2591 0.9395	1.2418 0.8788	1.1012	1.1239	0.9894	AveID		1.0762				13.6		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	0.9739 0.9937	1.0074 0.9395	0.9316	1.0199	1.0262	AveID		0.9846				3.8		20.0			
Perfluorononanoic acid (PFNA)	0.9784 0.9314	0.9989 0.8380	1.0334	1.0251	1.0400	AveID		0.9779				7.4		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.0369 1.0829	1.1378 1.0313	0.9847	1.0387	1.0737	AveID		1.0551				4.6		20.0			
Perfluorooctane Sulfonamide (FOSA)	2.9240 2.8542	3.1961 2.4575	3.1668	3.1126	3.0350	AveID		2.9638				8.6		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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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	0.6306 0.6719	0.7244 0.6076	0.5845	0.6733	0.6287	AveID		0.6458				7.3		20.0			
8:2 FTS	16.922 14.257	16.064 14.985	14.493	13.879	15.370	AveID		15.139				7.1		20.0			
Perfluorodecanoic acid (PFDA)	1.0698 1.0175	1.3625 0.9134	1.2465	1.1597	1.1991	AveID		1.1384				13.2		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.0006 1.0203	1.0031 0.9147	1.0172	1.0286	0.9722	AveID		0.9938				4.0		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6624 0.8237	0.9114 0.8004	0.7860	0.8637	0.8457	AveID		0.8133				9.7		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.1494 0.9525	0.8021 0.9059	0.9226	0.8817	0.8950	AveID		0.9299				11.5		20.0			
Perfluoroundecanoic acid (PFUnA)	1.1176 0.8386	0.9636 0.7797	0.8634	0.8880	0.8291	AveID		0.8971				12.6		20.0			
Perfluorododecanoic acid (PFDoA)	1.0185 0.9775	1.1442 0.7672	1.0634	1.0760	1.0082	AveID		1.0079				11.8		20.0			
Perfluorotridecanoic Acid (PFTriA)	0.9028 0.7663	0.8711 0.6019	0.8424	0.8131	0.8186	AveID		0.8023				12.3		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.1638 0.1615	0.1607 0.1547	0.1708	0.1595	0.1591	AveID		0.1614				3.1		20.0			
13C4 PFBA	0.9405 1.0096	0.9644 0.9619	0.9327	0.9807	0.9467	Ave		0.9623				2.7		20.0			
13C5 PFPeA	0.8460 0.8928	0.8591 0.8383	0.8447	0.8853	0.8424	Ave		0.8584				2.6		20.0			
13C3-PFBS	0.0108 0.0116	0.0113 0.0119	0.0109	0.0119	0.0105	Ave		0.0113				4.9		20.0			
13C2 PFHxA	0.8705 0.9435	0.9268 0.8949	0.9126	0.9125	0.8918	Ave		0.9075				2.7		20.0			
13C4-PFHpA	1.0624 1.0891	1.1339 1.0454	1.0894	1.0940	1.0613	Ave		1.0822				2.7		20.0			
18O2 PFHxS	0.6471 0.6934	0.6840 0.6372	0.6680	0.7016	0.6274	Ave		0.6655				4.3		20.0			
M2-6:2FTS	0.1058 0.1069	0.1096 0.0989	0.1068	0.1114	0.1050	Ave		0.1063				3.7		20.0			
13C4 PFOA	1.0772 1.0353	0.9932 0.9391	0.9888	1.0020	1.0174	Ave		1.0076				4.2		20.0			
13C4 PFOS	0.7090 0.7233	0.7126 0.6669	0.7361	0.7341	0.7237	Ave		0.7151				3.3		20.0			
13C5 PFNA	0.9204 0.9719	0.9572 0.9051	0.9819	0.9602	0.9095	Ave		0.9437				3.3		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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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	0.3749 0.3702	0.3999 0.3657	0.3716	0.3987	0.3672	Ave		0.3783				3.9		20.0			
M2-8:2FTS	0.0168 0.0154	0.0159 0.0130	0.0161	0.0173	0.0150	Ave		0.0156				9.0		20.0			
13C2 PFDA	0.9701 0.9577	0.9673 0.8828	0.9334	0.9650	0.9217	Ave		0.9426				3.4		20.0			
d3-NMeFOSAA	0.4114 0.4319	0.4324 0.4231	0.4248	0.4150	0.4355	Ave		0.4249				2.2		20.0			
d5-NEtFOSAA	0.3232 0.3152	0.3634 0.3012	0.3465	0.3544	0.3357	Ave		0.3342				6.7		20.0			
13C2 PFUnA	0.7731 0.8292	0.8518 0.7395	0.8015	0.8134	0.8075	Ave		0.8023				4.6		20.0			
13C2 PFDoA	0.9715 0.9794	0.9938 0.9968	0.9290	0.9689	0.9919	Ave		0.9759				2.4		20.0			
13C2-PFTeDA	0.7780 0.7753	0.8260 0.7640	0.7336	0.7602	0.8050	Ave		0.7774				3.9		20.0			
13C2-PFHxDA	0.8072 0.8373	0.8184 0.8172	0.7701	0.6493	0.8177	Ave		0.7882				8.2		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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-242499/2	2018.08.28LLICALA_005.d
Level 2	IC 320-242499/3	2018.08.28LLICALA_006.d
Level 3	IC 320-242499/4	2018.08.28LLICALA_007.d
Level 4	IC 320-242499/5	2018.08.28LLICALA_008.d
Level 5	IC 320-242499/6	2018.08.28LLICALA_009.d
Level 6	IC 320-242499/7	2018.08.28LLICALA_010.d
Level 7	IC 320-242499/8	2018.08.28LLICALA_011.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	71445 14983771	148472 27502138	771594	3143317	7216590	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	77378 14249697	162630 24900282	747283	3049788	6999092	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	86842 17343386	185053 30003262	910651	3828010	8735294	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	18865 3864378	43604 6993719	185640	813711	1748471	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	78425 12770869	153085 23347053	710995	2851130	6716098	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	44988 9043779	92389 16084327	446776	1832484	4275802	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	97799 17404274	198338 30385284	1031715	3961330	8899700	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	69000 12331061	151487 21506619	617641	2402576	5950574	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	20316 3562961	33995 6460415	186850	816302	1675863	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	115524 15852050	212266 27214840	954853	3792013	8304297	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	55943 11141173	117514 19649006	571922	2397620	5826744	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	76629 14738364	164410 24988022	888927	3310854	7795005	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	58058 11834862	129377 21024940	589276	2380254	5942729	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorooctane Sulfonamide (FOSA)		AveID	93280 17204061	219730 29608945	1031117	4174038	9183356	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorononanesulfonic acid		AveID	36528 7596364	85204 12812955	361865	1596059	3599772	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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
8:2 FTS		AveID	23158 3415181	42130 6151127	196079	773601	1820247	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	88314 15866006	226611 26563468	1019290	3764333	9108633	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	35030 7175328	74575 12749037	378563	1435862	3489405	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	38530 9351668	107648 16951122	488613	2056125	4862491	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	31607 4889294	50114 8988864	280096	1051106	2476305	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	73524 11321464	141127 18994666	606238	2429610	5517545	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	84200 15587157	195509 25191162	865534	3507055	8241309	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	74635 12220220	148840 19763356	685651	2650027	6691746	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	10843 2038535	22816 3893936	109761	407853	1055743	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	8002830 8218830	8291131 7921655	8171064	8247082	7801898	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	7198766 7268510	7385908 6904215	7400409	7445050	6942787	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	85084 87618	90247 90962	88972	93328	80767	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	7407564 7681141	7967390 7370188	7995321	7673418	7349652	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	9040528 8866287	9747881 8609256	9544033	9199599	8746068	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5209326 5340279	5562863 4964565	5536160	5581192	4891052	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	855608 826593	894847 774049	889043	889676	822215	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	9166204 8428311	8538141 7734289	8662621	8426167	8384516	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	5768085 5629385	5856894 5250354	6165020	5901987	5701715	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	7831909 7912109	8229151 7454345	8602003	8074769	7495131	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	3190191 3013781	3437498 3012041	3255994	3352554	3025791	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	136855 119770	131131 102619	135294	139344	118425	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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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	8255368 7796459	8316028 7270400	8177178	8114874	7596034	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	3501055 3516347	3717380 3484339	3721760	3489761	3589091	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	2749959 2566441	3123931 2480748	3035794	2980380	2766889	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	6578448 6750273	7323152 6090404	7021910	6840404	6654794	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	8266827 7973084	8543283 8209254	8139014	8148044	8174334	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	6620523 6312069	7100968 6291947	6427054	6392553	6634077	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6868821 6816429	7035360 6730496	6746927	5459924	6738965	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-242499/2	2018.08.28LLICALA_005.d
Level 2	IC 320-242499/3	2018.08.28LLICALA_006.d
Level 3	IC 320-242499/4	2018.08.28LLICALA_007.d
Level 4	IC 320-242499/5	2018.08.28LLICALA_008.d
Level 5	IC 320-242499/6	2018.08.28LLICALA_009.d
Level 6	IC 320-242499/7	2018.08.28LLICALA_010.d
Level 7	IC 320-242499/8	2018.08.28LLICALA_011.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)	-2.2 -4.9	-1.9	3.4	4.4	1.3	-0.1	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	6.0 -11.1	8.5	-0.4	1.0	-0.6	-3.4	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	2.2 -17.4	2.7	2.5	2.7	8.3	-0.9	30 30	30	30	30	30	30
4:2 FTS	2.2 -11.4	11.3	-3.9	0.4	-0.2	1.6	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	16.3 -13.0	5.5	-2.3	2.0	0.3	-8.7	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	5.1 -12.1	1.8	-0.2	-2.4	5.2	2.6	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	6.1 -13.5	-0.2	6.0	5.6	-0.2	-3.7	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	11.3 -9.0	14.4	-6.3	-9.6	2.2	-3.0	30 30	30	30	30	30	30
6:2 FTS	11.2 -2.3	-11.1	-1.6	7.4	-4.6	0.9	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	17.0 -18.3	15.4	2.3	4.4	-8.1	-12.7	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-1.1 -4.6	2.3	-5.4	3.6	4.2	0.9	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	0.1 -14.3	2.2	5.7	4.8	6.4	-4.8	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-1.7 -2.3	7.8	-6.7	-1.6	1.8	2.6	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-1.3 -17.1	7.8	6.9	5.0	2.4	-3.7	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-2.4 -5.9	12.2	-9.5	4.2	-2.7	4.0	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.: 320-42924-1 Analy Batch No.: 242499

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/28/2018 10:20 Calibration End Date: 08/28/2018 11:05 Calibration ID: 40823

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
8:2 FTS	11.8 -1.0	6.1	-4.3	-8.3	1.5	-5.8	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	-6.0 -19.8	19.7	9.5	1.9	5.3	-10.6	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.7 -8.0	0.9	2.4	3.5	-2.2	2.7	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-18.6 -1.6	12.1	-3.4	6.2	4.0	1.3	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	23.6 -2.6	-13.7	-0.8	-5.2	-3.8	2.4	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	24.6 -13.1	7.4	-3.8	-1.0	-7.6	-6.5	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	1.1 -23.9	13.5	5.5	6.8	0.0	-3.0	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	12.5 -25.0	8.6	5.0	1.3	2.0	-4.5	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	1.5 -4.2	-0.5	5.8	-1.2	-1.4	0.0	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:	AREA
RF Rounding:	0

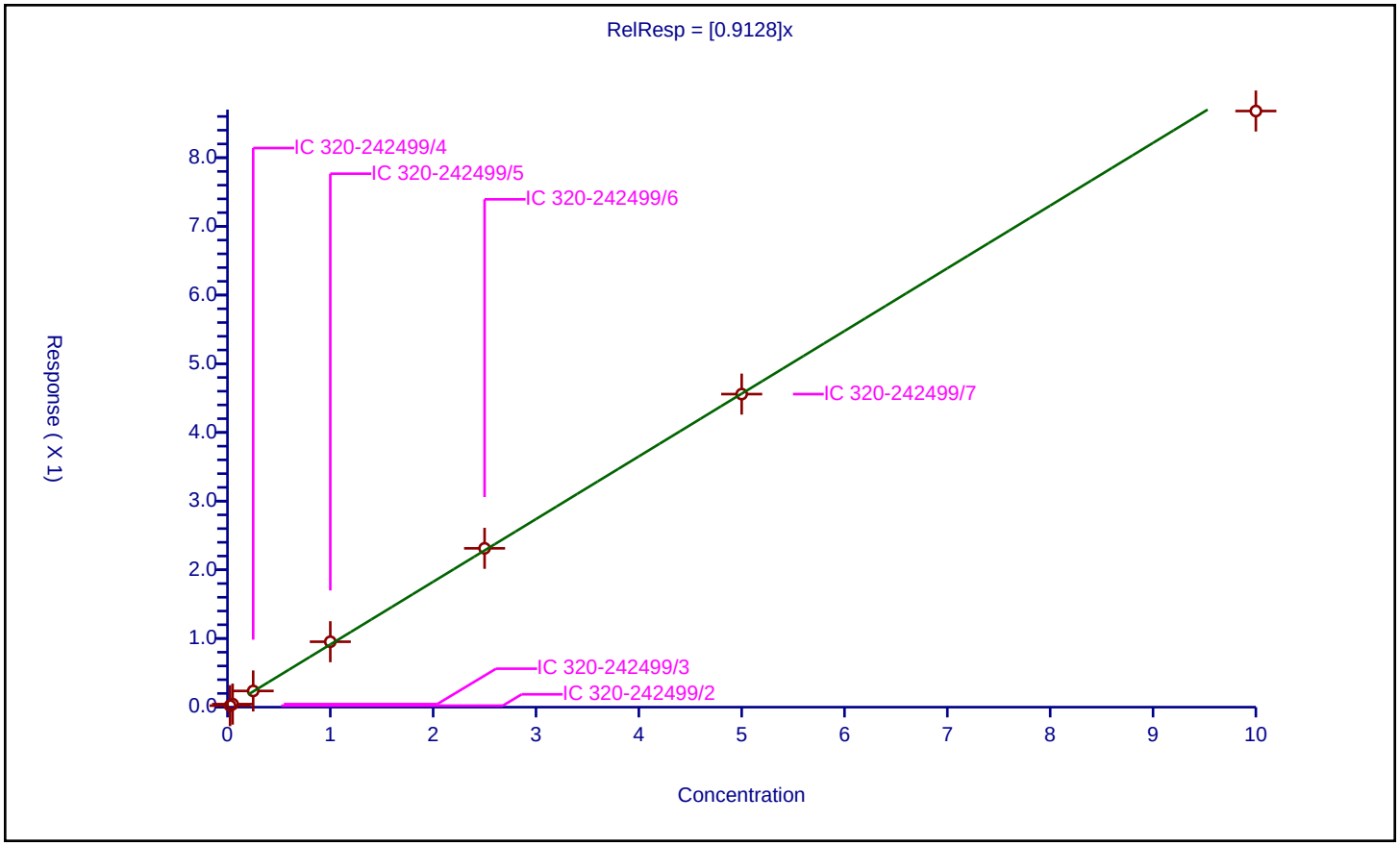
Curve Coefficients

Intercept:	0
Slope:	0.9128

Error Coefficients

Standard Error:	13200000
Relative Standard Error:	3.3
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.022319	2.5	8002830.0	0.892747	Y
2	IC 320-242499/3	0.05	0.044768	2.5	8291131.0	0.895366	Y
3	IC 320-242499/4	0.25	0.236075	2.5	8171064.0	0.944301	Y
4	IC 320-242499/5	1.0	0.952857	2.5	8247082.0	0.952857	Y
5	IC 320-242499/6	2.5	2.312447	2.5	7801898.0	0.924979	Y
6	IC 320-242499/7	5.0	4.557757	2.5	8218830.0	0.911551	Y
7	IC 320-242499/8	10.0	8.679417	2.5	7921655.0	0.867942	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

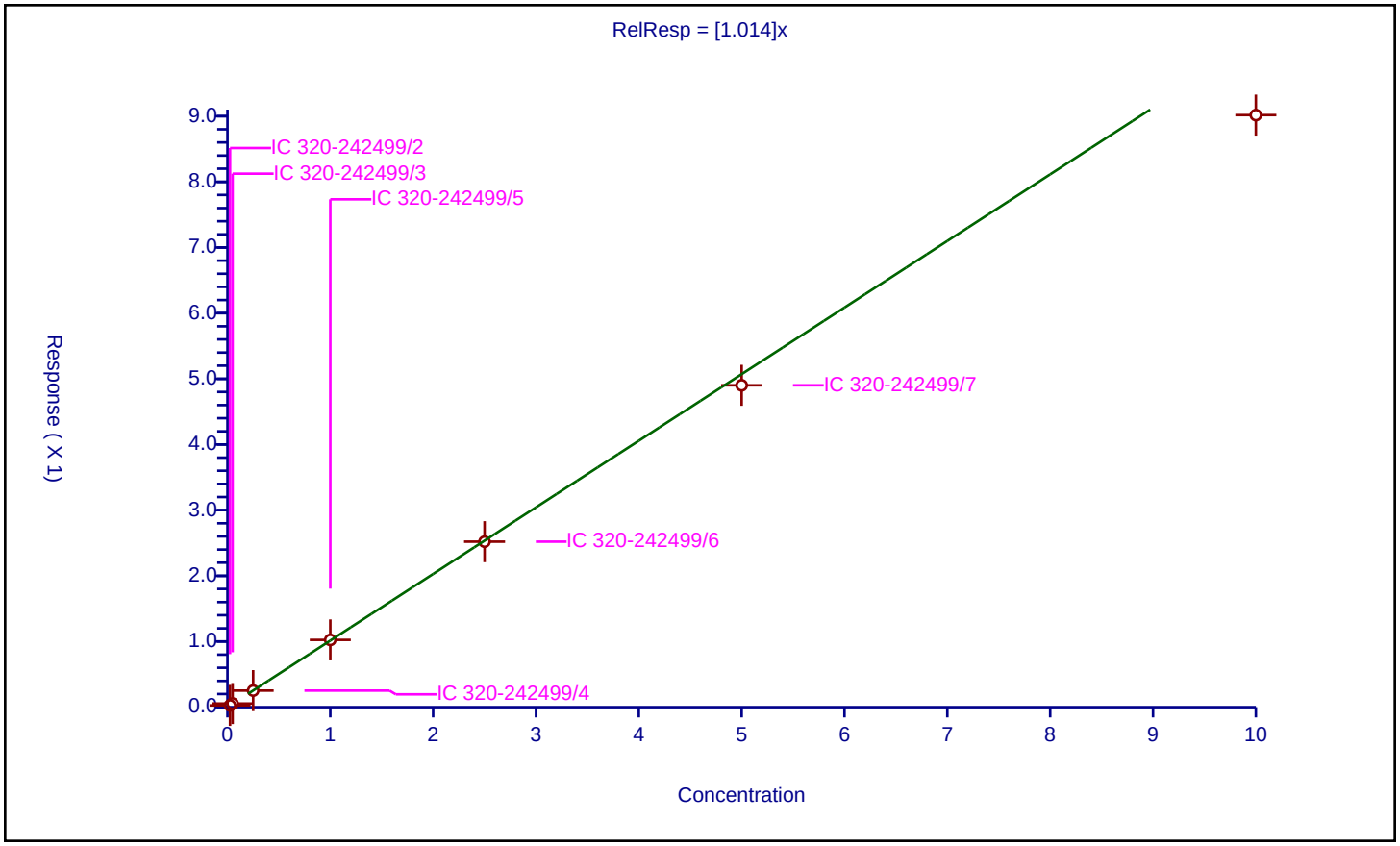
Curve Coefficients

Intercept:	0
Slope:	1.014

Error Coefficients

Standard Error:	12100000
Relative Standard Error:	6.4
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.026872	2.5	7198766.0	1.074879	Y
2	IC 320-242499/3	0.05	0.055047	2.5	7385908.0	1.100948	Y
3	IC 320-242499/4	0.25	0.252447	2.5	7400409.0	1.009786	Y
4	IC 320-242499/5	1.0	1.024099	2.5	7445050.0	1.024099	Y
5	IC 320-242499/6	2.5	2.520275	2.5	6942787.0	1.00811	Y
6	IC 320-242499/7	5.0	4.901175	2.5	7268510.0	0.980235	Y
7	IC 320-242499/8	10.0	9.016334	2.5	6904215.0	0.901633	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

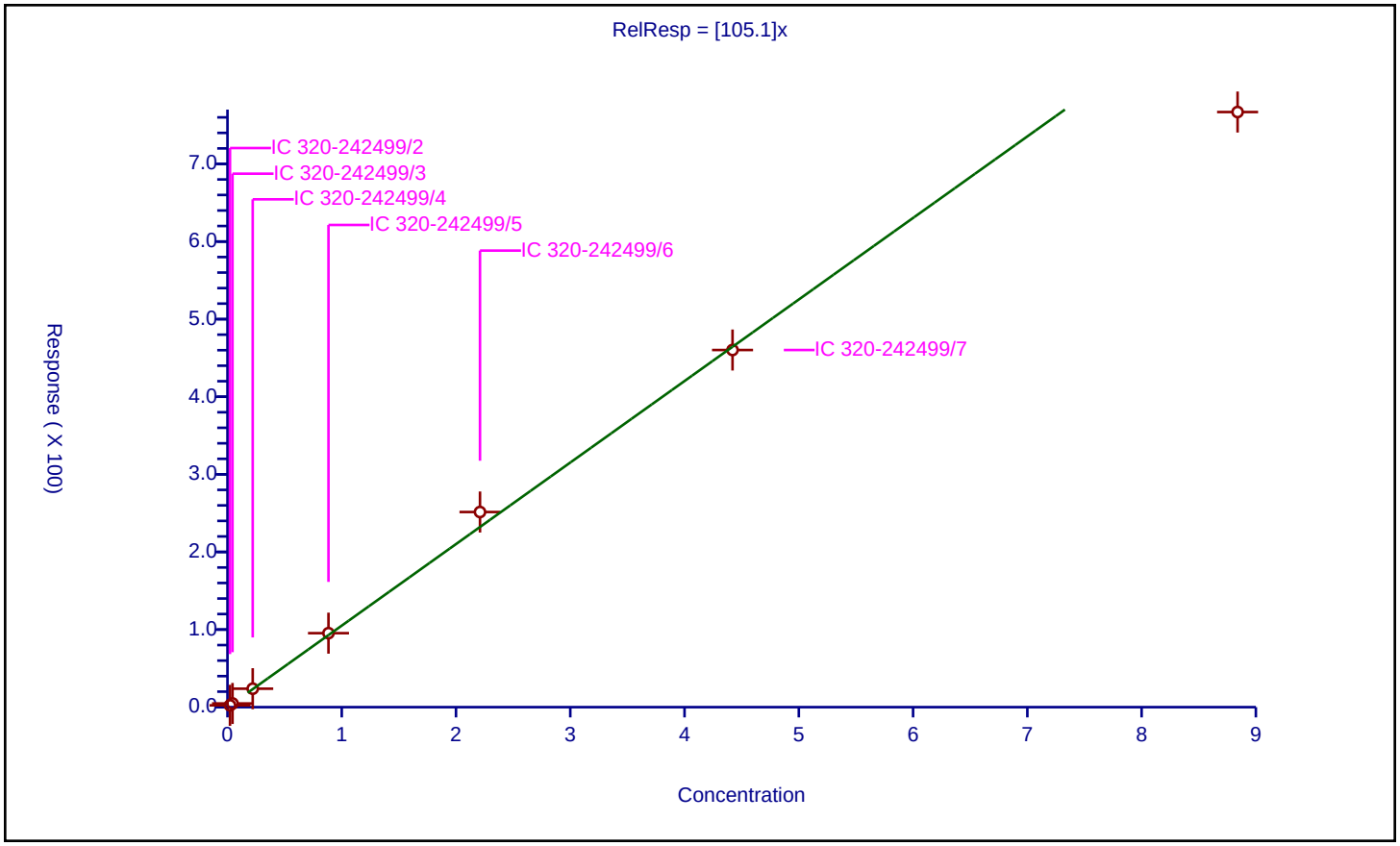
Curve Coefficients

Intercept:	0
Slope:	105.1

Error Coefficients

Standard Error:	14700000
Relative Standard Error:	8.2
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0221	2.373039	2.325	85084.0	107.37733	Y
2	IC 320-242499/3	0.0442	4.767452	2.325	90247.0	107.860901	Y
3	IC 320-242499/4	0.221	23.796965	2.325	88972.0	107.678575	Y
4	IC 320-242499/5	0.884	95.363913	2.325	93328.0	107.877729	Y
5	IC 320-242499/6	2.21	251.458622	2.325	80767.0	113.782182	Y
6	IC 320-242499/7	4.42	460.217906	2.325	87618.0	104.121698	Y
7	IC 320-242499/8	8.84	766.887097	2.325	90962.0	86.751934	Y



Calibration / 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

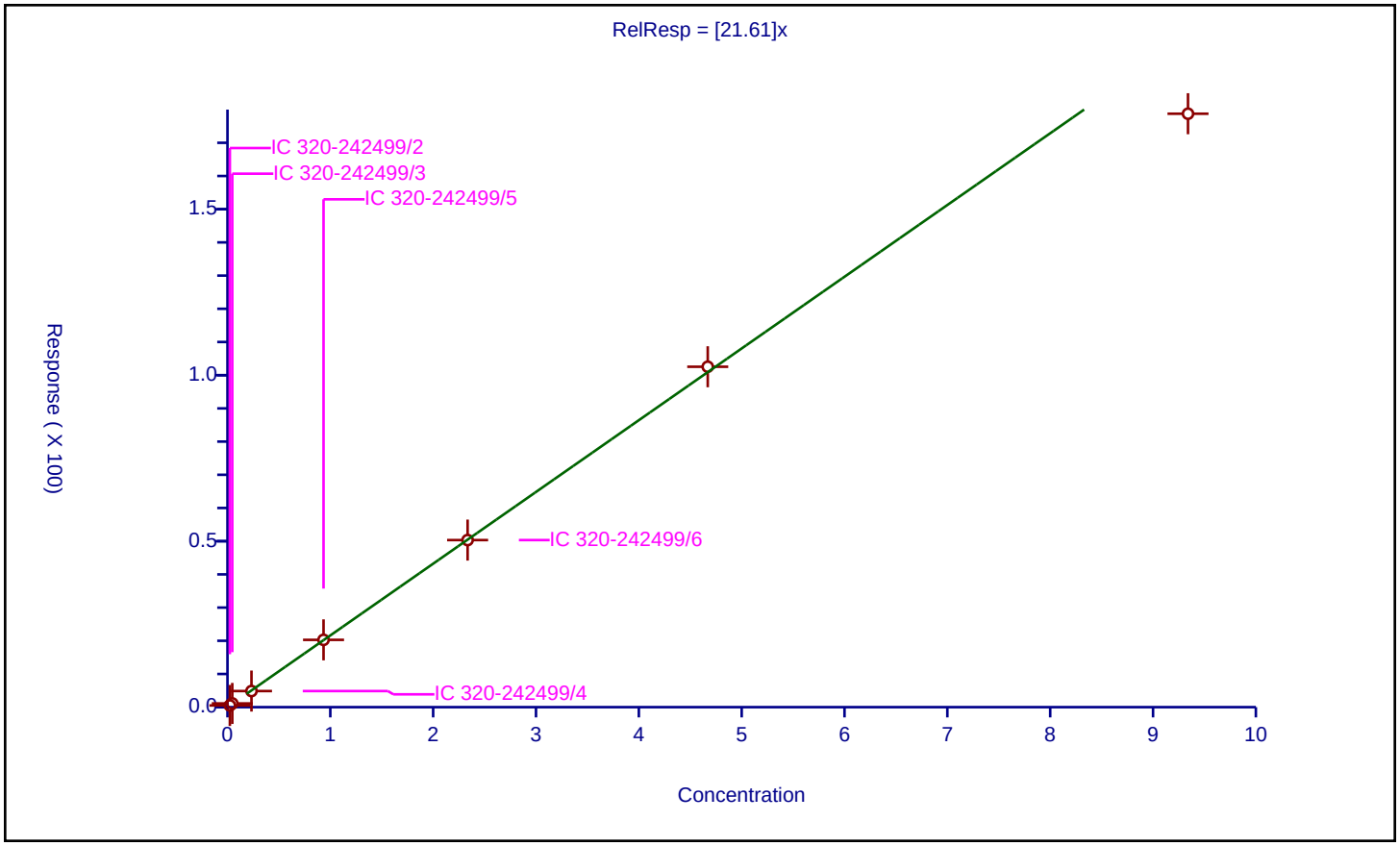
Curve Coefficients

Intercept:	0
Slope:	21.61

Error Coefficients

Standard Error:	3360000
Relative Standard Error:	6.8
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.02335	0.515504	2.325	85084.0	22.07725	Y
2	IC 320-242499/3	0.0467	1.123354	2.325	90247.0	24.054683	Y
3	IC 320-242499/4	0.2335	4.85111	2.325	88972.0	20.775634	Y
4	IC 320-242499/5	0.934	20.271281	2.325	93328.0	21.703727	Y
5	IC 320-242499/6	2.335	50.332377	2.325	80767.0	21.555622	Y
6	IC 320-242499/7	4.67	102.543756	2.325	87618.0	21.957978	Y
7	IC 320-242499/8	9.34	178.760325	2.325	90962.0	19.139221	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

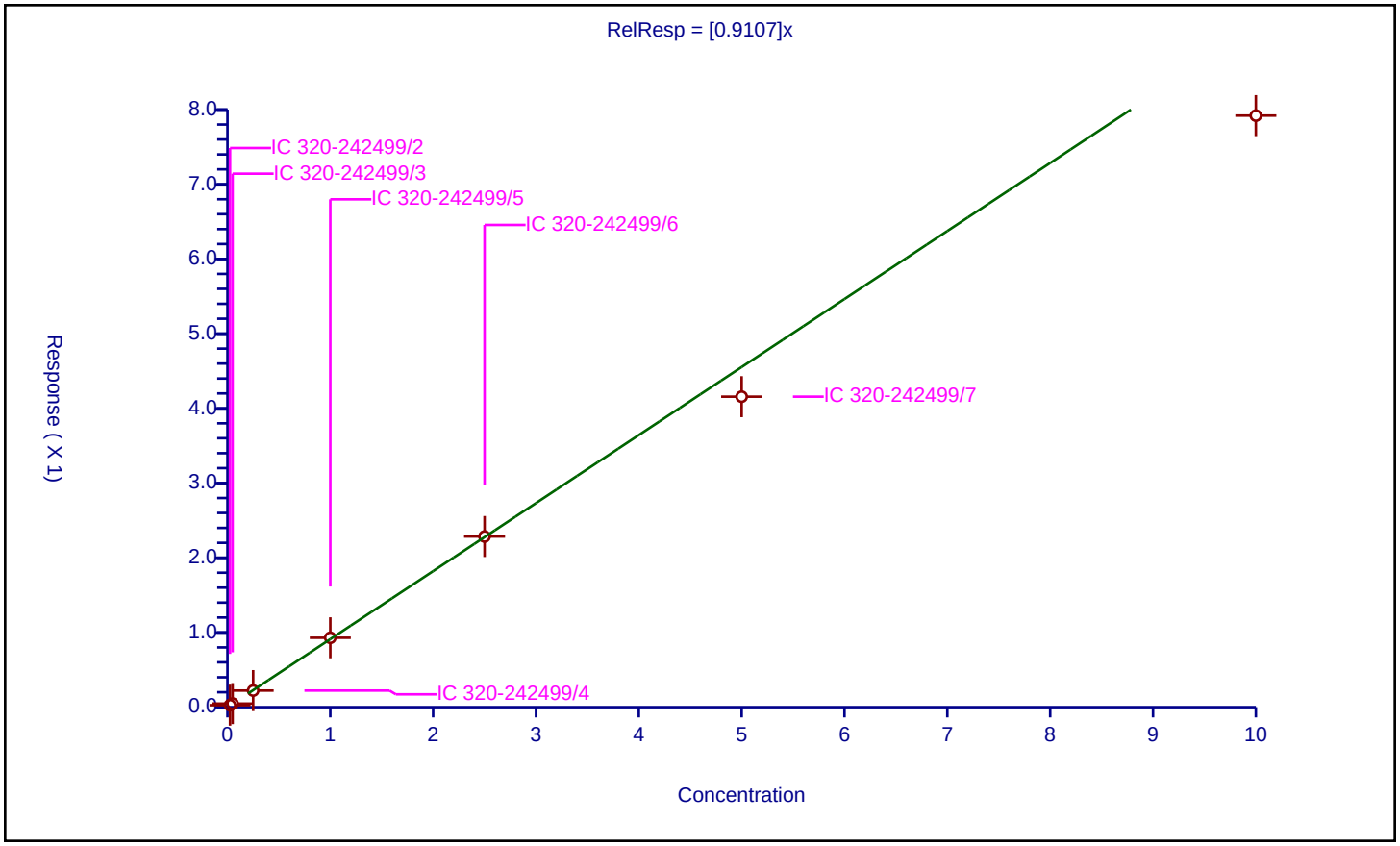
Curve Coefficients

Intercept:	0
Slope:	0.9107

Error Coefficients

Standard Error:	11300000
Relative Standard Error:	9.6
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.026468	2.5	7407564.0	1.058715	Y
2	IC 320-242499/3	0.05	0.048035	2.5	7967390.0	0.960697	Y
3	IC 320-242499/4	0.25	0.222316	2.5	7995321.0	0.889264	Y
4	IC 320-242499/5	1.0	0.928898	2.5	7673418.0	0.928898	Y
5	IC 320-242499/6	2.5	2.284495	2.5	7349652.0	0.913798	Y
6	IC 320-242499/7	5.0	4.156566	2.5	7681141.0	0.831313	Y
7	IC 320-242499/8	10.0	7.919422	2.5	7370188.0	0.791942	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

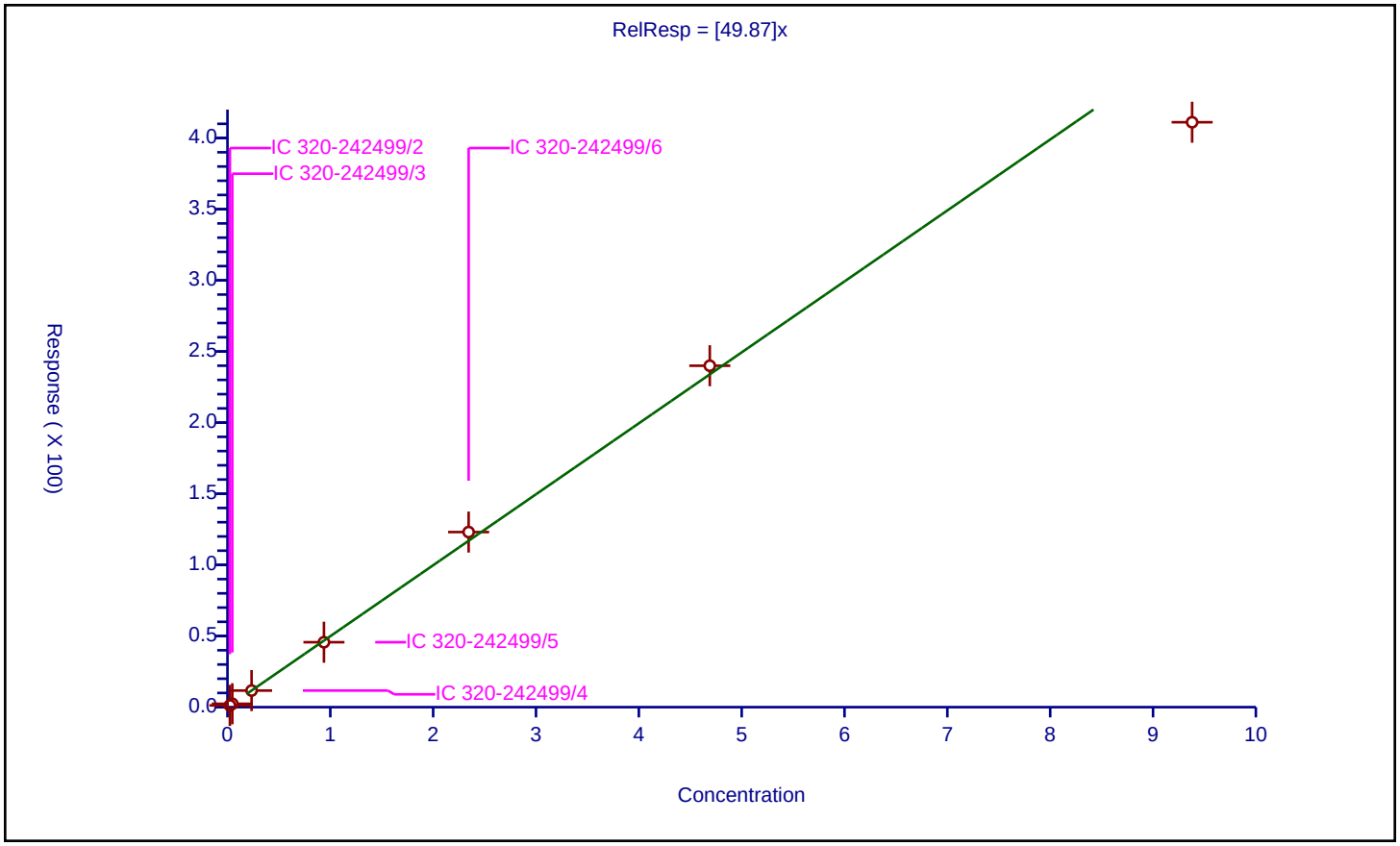
Curve Coefficients

Intercept:	0
Slope:	49.87

Error Coefficients

Standard Error:	7770000
Relative Standard Error:	6.0
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.02345	1.229339	2.325	85084.0	52.423848	Y
2	IC 320-242499/3	0.0469	2.380184	2.325	90247.0	50.750182	Y
3	IC 320-242499/4	0.2345	11.675069	2.325	88972.0	49.787073	Y
4	IC 320-242499/5	0.938	45.651094	2.325	93328.0	48.668544	Y
5	IC 320-242499/6	2.345	123.085414	2.325	80767.0	52.48845	Y
6	IC 320-242499/7	4.69	239.982494	2.325	87618.0	51.168975	Y
7	IC 320-242499/8	9.38	411.117393	2.325	90962.0	43.829146	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

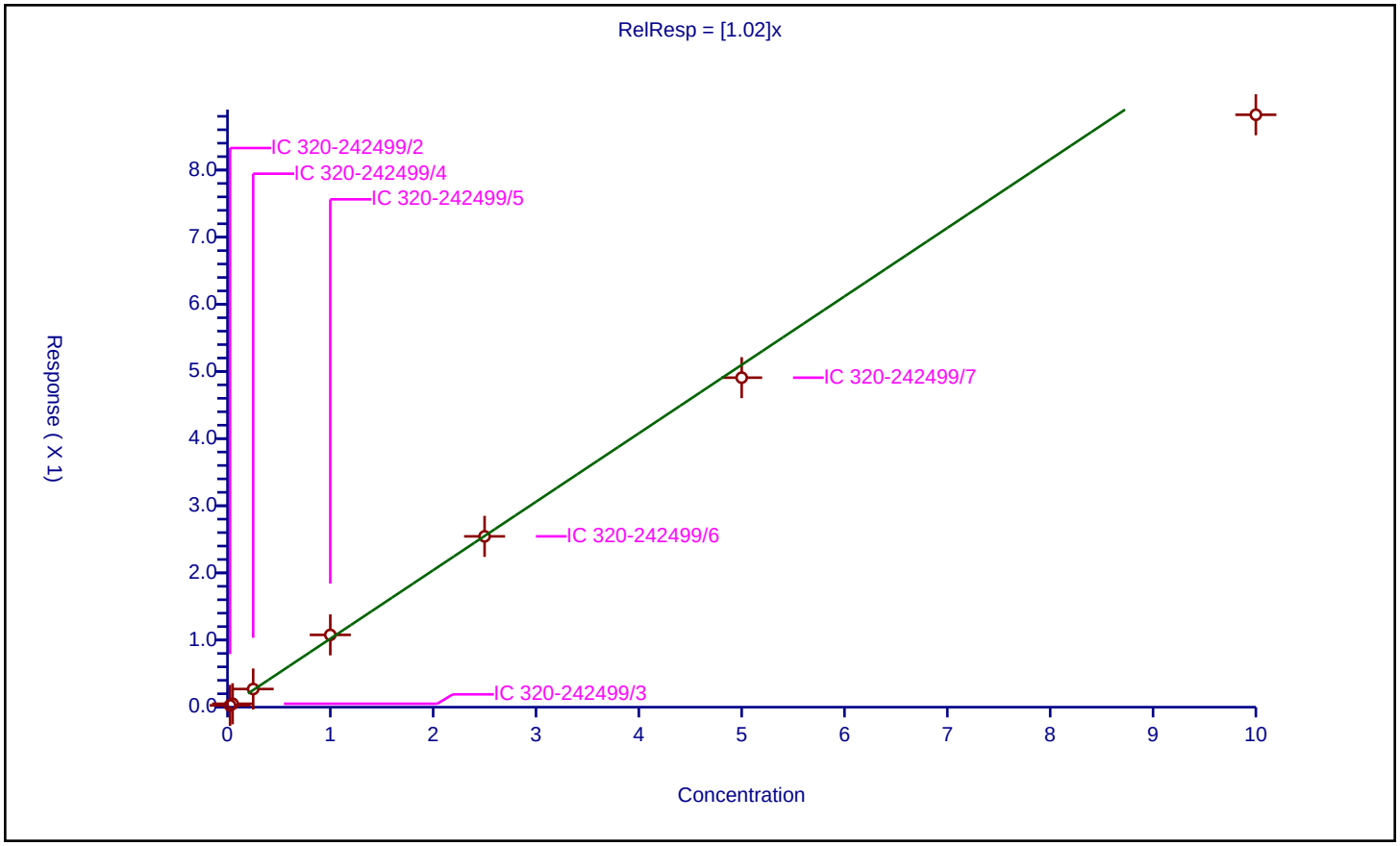
Curve Coefficients

Intercept:	0
Slope:	1.02

Error Coefficients

Standard Error:	14800000
Relative Standard Error:	7.1
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.027045	2.5	9040528.0	1.081784	Y
2	IC 320-242499/3	0.05	0.050867	2.5	9747881.0	1.017339	Y
3	IC 320-242499/4	0.25	0.270251	2.5	9544033.0	1.081005	Y
4	IC 320-242499/5	1.0	1.076495	2.5	9199599.0	1.076495	Y
5	IC 320-242499/6	2.5	2.543915	2.5	8746068.0	1.017566	Y
6	IC 320-242499/7	5.0	4.90743	2.5	8866287.0	0.981486	Y
7	IC 320-242499/8	10.0	8.823435	2.5	8609256.0	0.882343	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

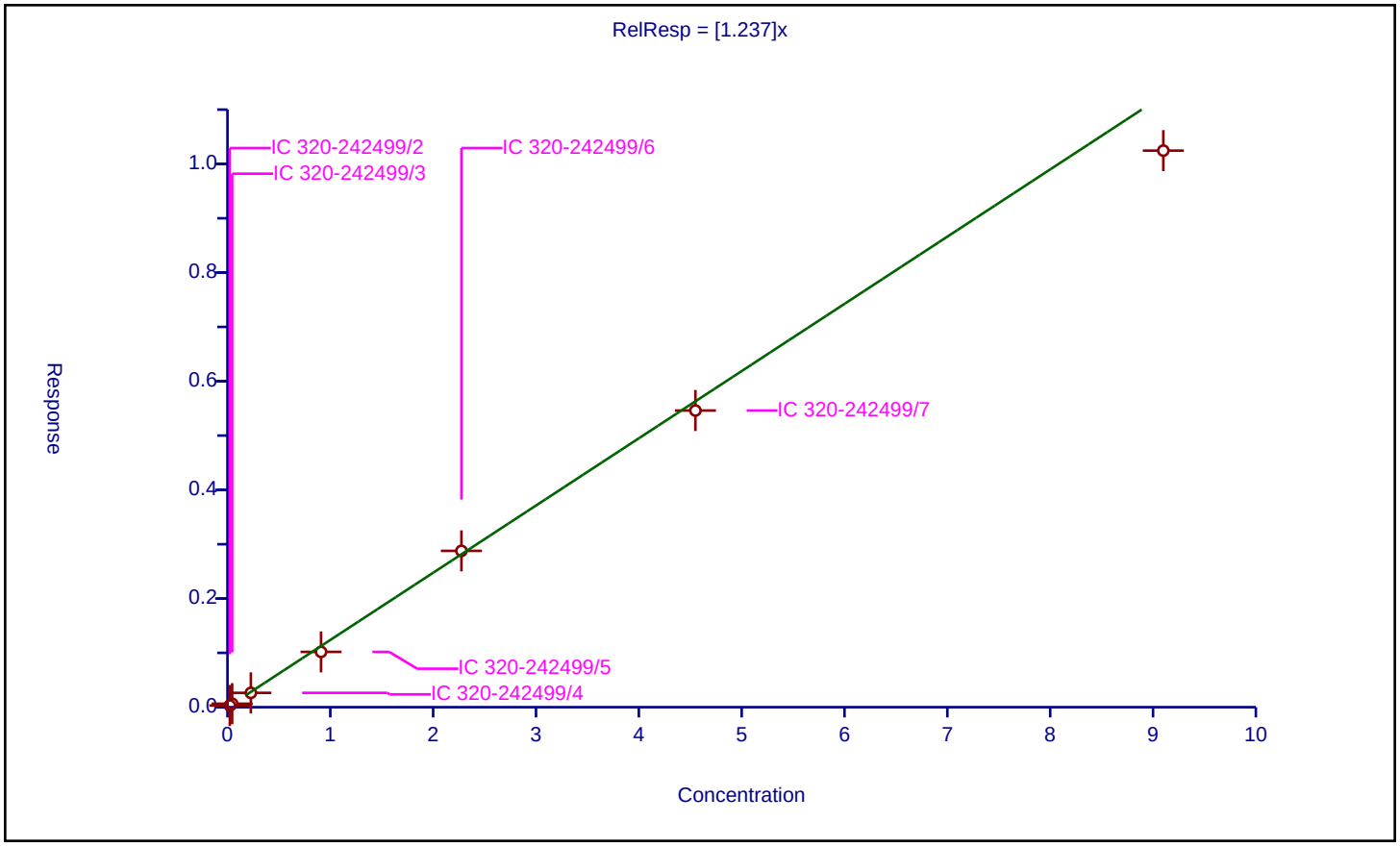
Curve Coefficients

Intercept:	0
Slope:	1.237

Error Coefficients

Standard Error:	10500000
Relative Standard Error:	9.7
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.02275	0.031326	2.365	5209326.0	1.376947	Y
2	IC 320-242499/3	0.0455	0.064403	2.365	5562863.0	1.415457	Y
3	IC 320-242499/4	0.2275	0.263851	2.365	5536160.0	1.159784	Y
4	IC 320-242499/5	0.91	1.018079	2.365	5581192.0	1.118768	Y
5	IC 320-242499/6	2.275	2.877317	2.365	4891052.0	1.264755	Y
6	IC 320-242499/7	4.55	5.460943	2.365	5340279.0	1.200207	Y
7	IC 320-242499/8	9.1	10.245239	2.365	4964565.0	1.12585	Y



Calibration / 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

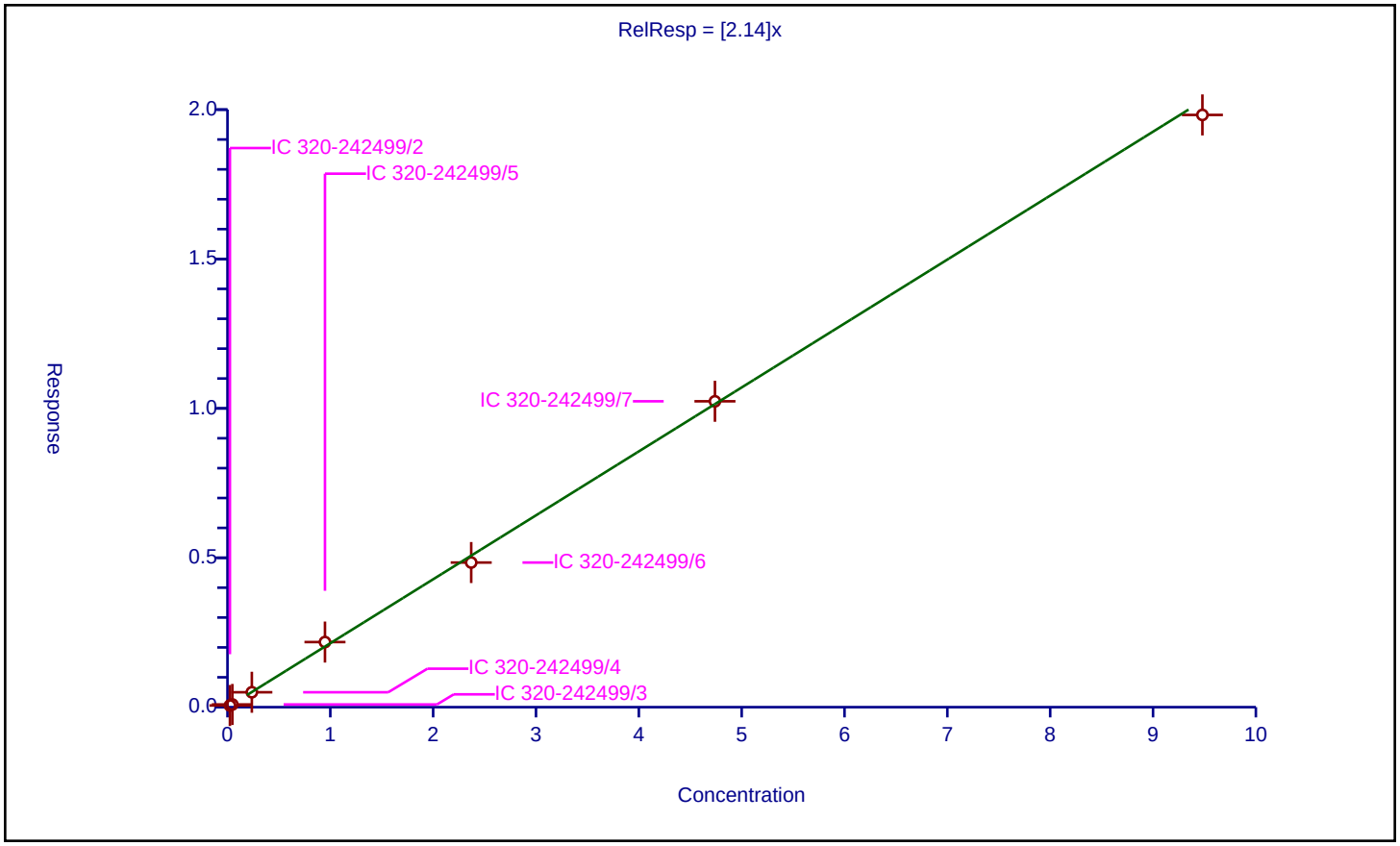
Curve Coefficients

Intercept:	0
Slope:	2.14

Error Coefficients

Standard Error:	3110000
Relative Standard Error:	7.4
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0237	0.056393	2.375	855608.0	2.379461	Y
2	IC 320-242499/3	0.0474	0.090226	2.375	894847.0	1.903494	Y
3	IC 320-242499/4	0.237	0.499153	2.375	889043.0	2.106132	Y
4	IC 320-242499/5	0.948	2.179127	2.375	889676.0	2.298657	Y
5	IC 320-242499/6	2.37	4.840795	2.375	822215.0	2.04253	Y
6	IC 320-242499/7	4.74	10.237242	2.375	826593.0	2.159756	Y
7	IC 320-242499/8	9.48	19.82237	2.375	774049.0	2.090967	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

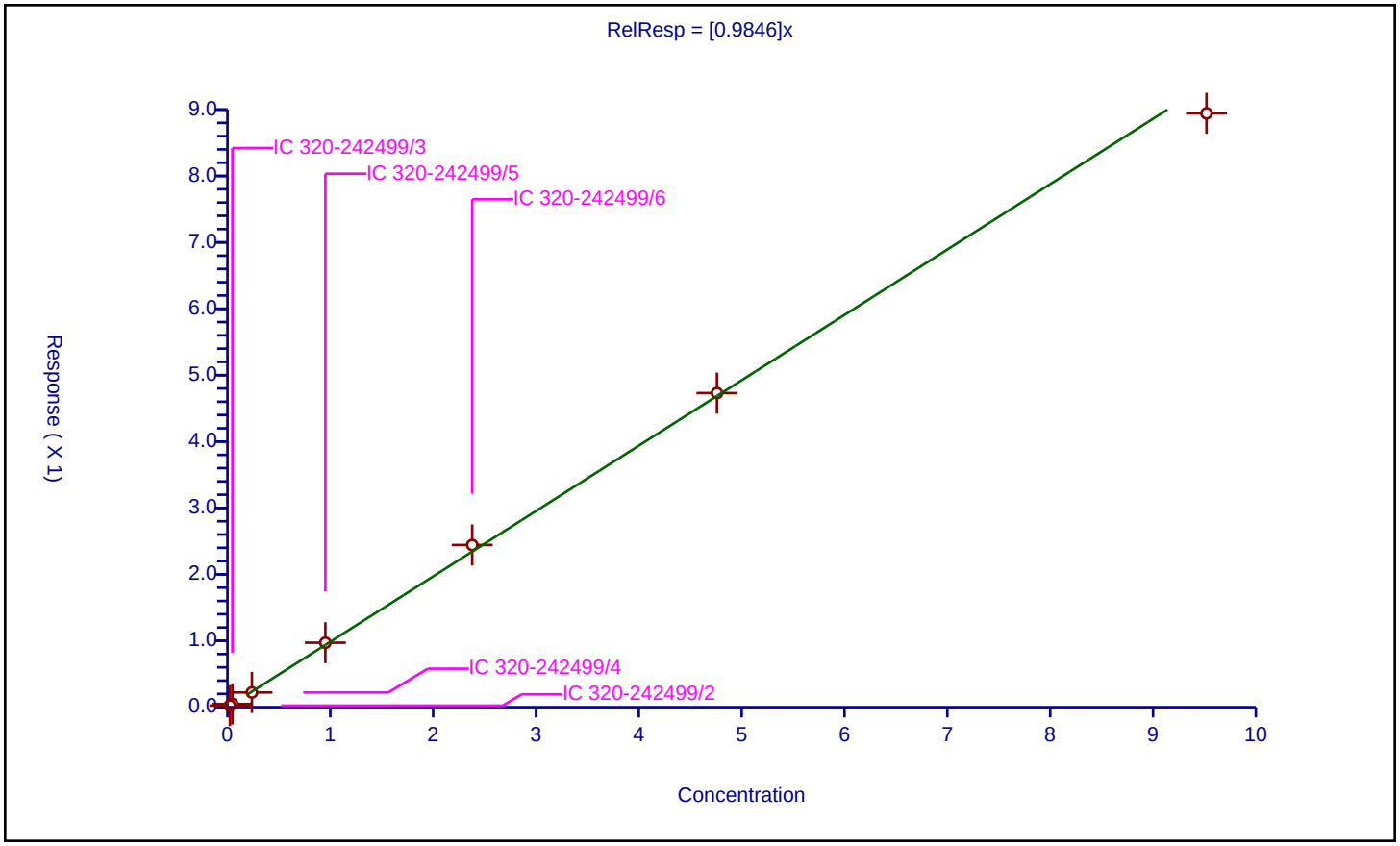
Curve Coefficients

Intercept:	0
Slope:	0.9846

Error Coefficients

Standard Error:	9580000
Relative Standard Error:	3.8
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0238	0.02318	2.39	5768085.0	0.973946	Y
2	IC 320-242499/3	0.0476	0.047953	2.39	5856894.0	1.007426	Y
3	IC 320-242499/4	0.238	0.221718	2.39	6165020.0	0.931587	Y
4	IC 320-242499/5	0.952	0.970912	2.39	5901987.0	1.019866	Y
5	IC 320-242499/6	2.38	2.442409	2.39	5701715.0	1.026222	Y
6	IC 320-242499/7	4.76	4.730073	2.39	5629385.0	0.993713	Y
7	IC 320-242499/8	9.52	8.944373	2.39	5250354.0	0.939535	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

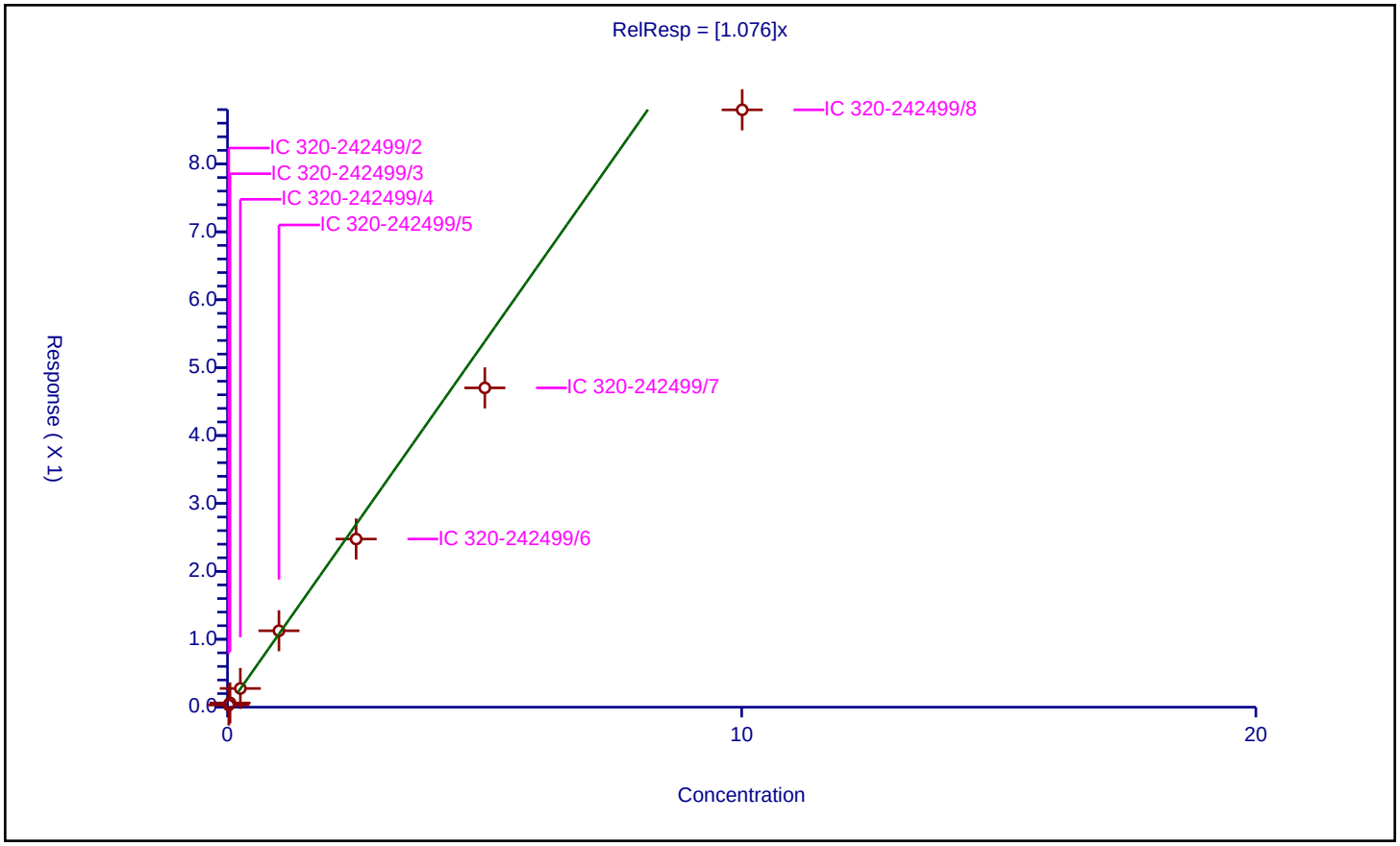
Curve Coefficients

Intercept:	0
Slope:	1.076

Error Coefficients

Standard Error:	13400000
Relative Standard Error:	13.6
Correlation Coefficient:	0.993
Coefficient of Determination (Adjusted):	0.974

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025025	0.031508	2.5	9166204.0	1.259066	Y
2	IC 320-242499/3	0.05005	0.062152	2.5	8538141.0	1.241804	Y
3	IC 320-242499/4	0.25025	0.275567	2.5	8662621.0	1.101167	Y
4	IC 320-242499/5	1.001	1.125071	2.5	8426167.0	1.123947	Y
5	IC 320-242499/6	2.5025	2.476081	2.5	8384516.0	0.989443	Y
6	IC 320-242499/7	5.005	4.702025	2.5	8428311.0	0.939465	Y
7	IC 320-242499/8	10.01	8.796814	2.5	7734289.0	0.878803	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

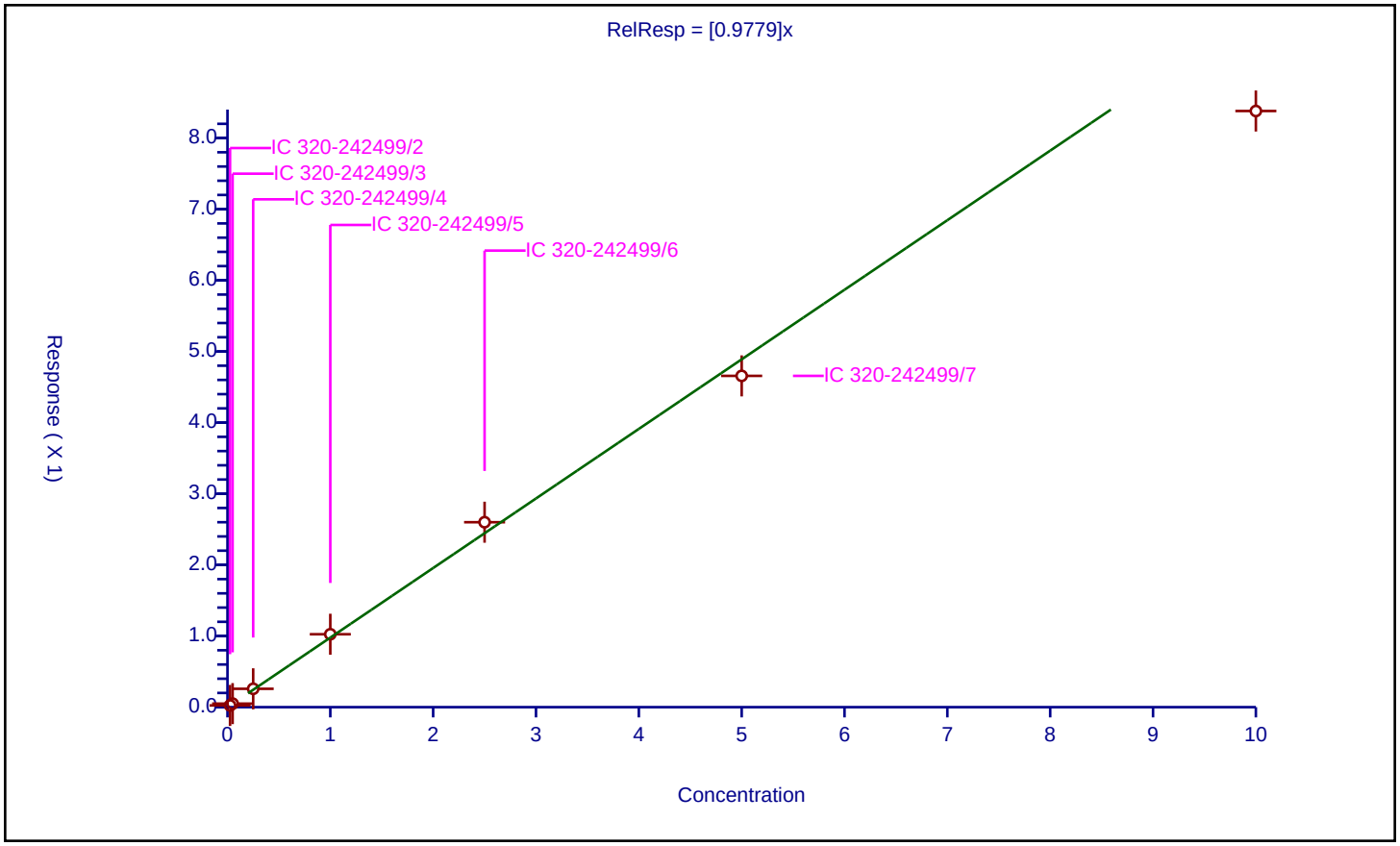
Curve Coefficients

Intercept:	0
Slope:	0.9779

Error Coefficients

Standard Error:	12300000
Relative Standard Error:	7.4
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.024461	2.5	7831909.0	0.97842	Y
2	IC 320-242499/3	0.05	0.049947	2.5	8229151.0	0.998949	Y
3	IC 320-242499/4	0.25	0.258349	2.5	8602003.0	1.033395	Y
4	IC 320-242499/5	1.0	1.025062	2.5	8074769.0	1.025062	Y
5	IC 320-242499/6	2.5	2.600023	2.5	7495131.0	1.040009	Y
6	IC 320-242499/7	5.0	4.656901	2.5	7912109.0	0.93138	Y
7	IC 320-242499/8	10.0	8.380355	2.5	7454345.0	0.838035	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

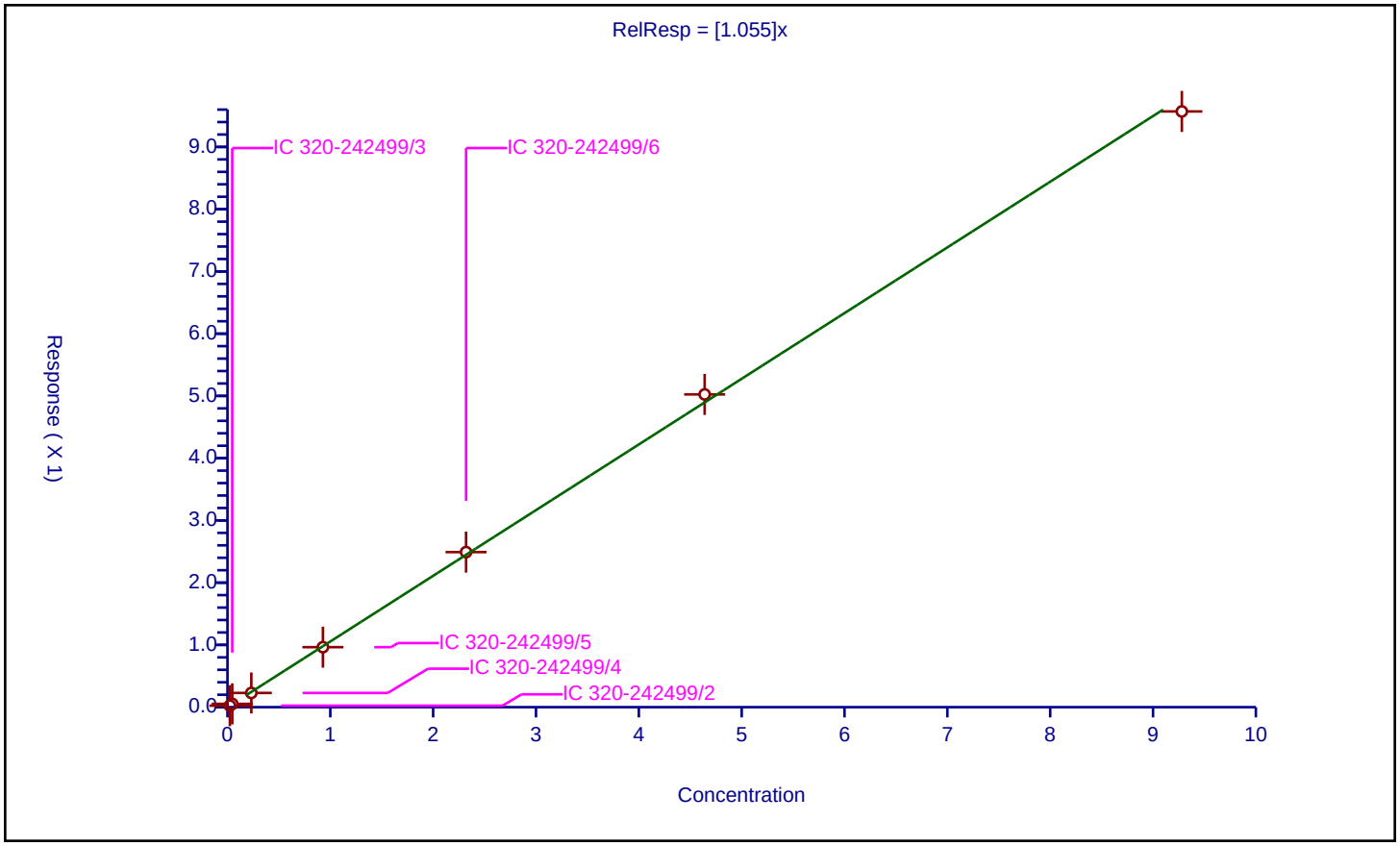
Curve Coefficients

Intercept:	0
Slope:	1.055

Error Coefficients

Standard Error:	10200000
Relative Standard Error:	4.6
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0232	0.024056	2.39	5768085.0	1.036908	Y
2	IC 320-242499/3	0.0464	0.052794	2.39	5856894.0	1.13781	Y
3	IC 320-242499/4	0.232	0.228445	2.39	6165020.0	0.984678	Y
4	IC 320-242499/5	0.928	0.96388	2.39	5901987.0	1.038664	Y
5	IC 320-242499/6	2.32	2.491026	2.39	5701715.0	1.073718	Y
6	IC 320-242499/7	4.64	5.024584	2.39	5629385.0	1.082885	Y
7	IC 320-242499/8	9.28	9.570708	2.39	5250354.0	1.031326	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

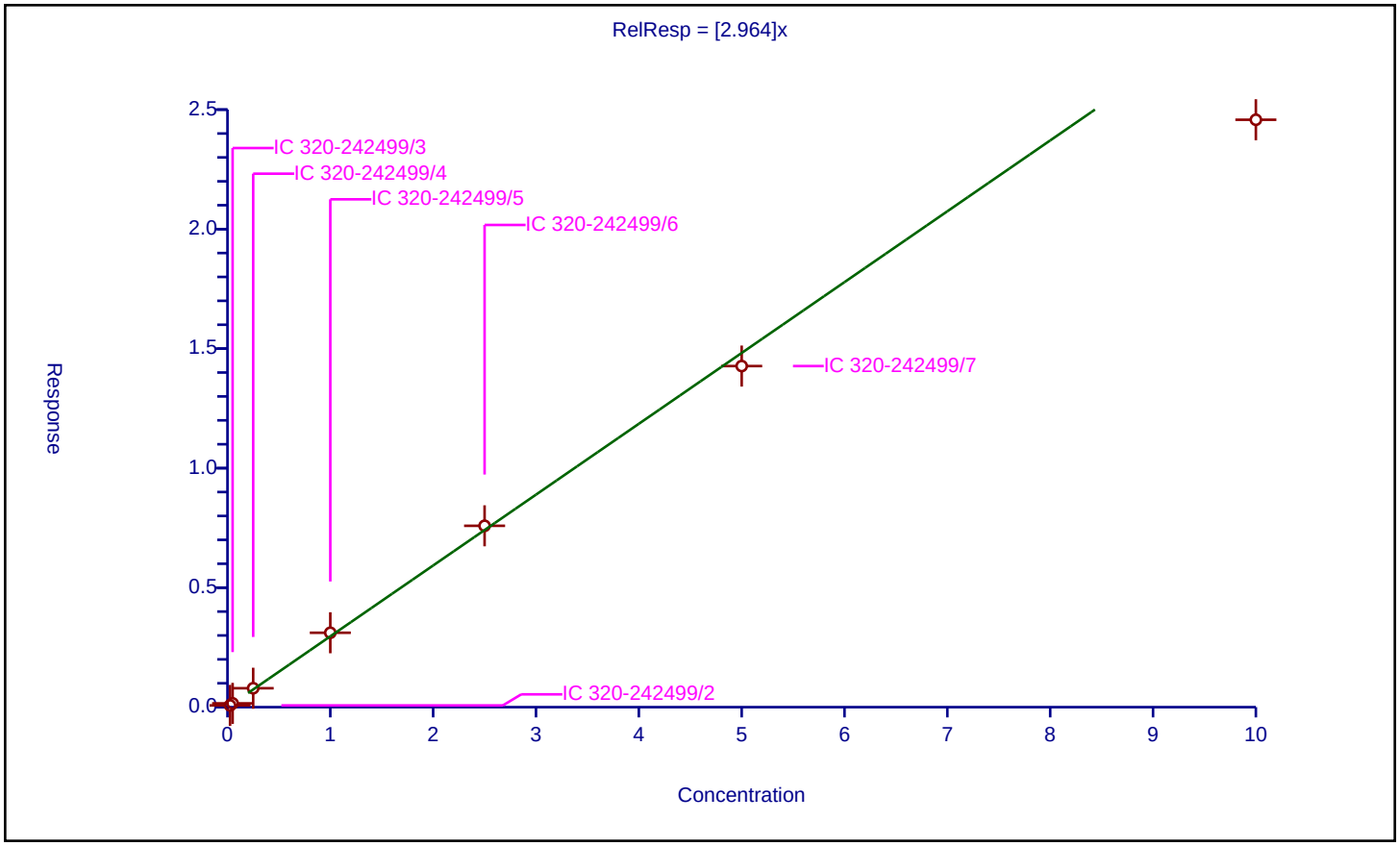
Curve Coefficients

Intercept:	0
Slope:	2.964

Error Coefficients

Standard Error:	14600000
Relative Standard Error:	8.6
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.073099	2.5	3190191.0	2.923963	Y
2	IC 320-242499/3	0.05	0.159804	2.5	3437498.0	3.196075	Y
3	IC 320-242499/4	0.25	0.791707	2.5	3255994.0	3.166827	Y
4	IC 320-242499/5	1.0	3.112581	2.5	3352554.0	3.112581	Y
5	IC 320-242499/6	2.5	7.587566	2.5	3025791.0	3.035027	Y
6	IC 320-242499/7	5.0	14.271161	2.5	3013781.0	2.854232	Y
7	IC 320-242499/8	10.0	24.575483	2.5	3012041.0	2.457548	Y



Calibration / 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

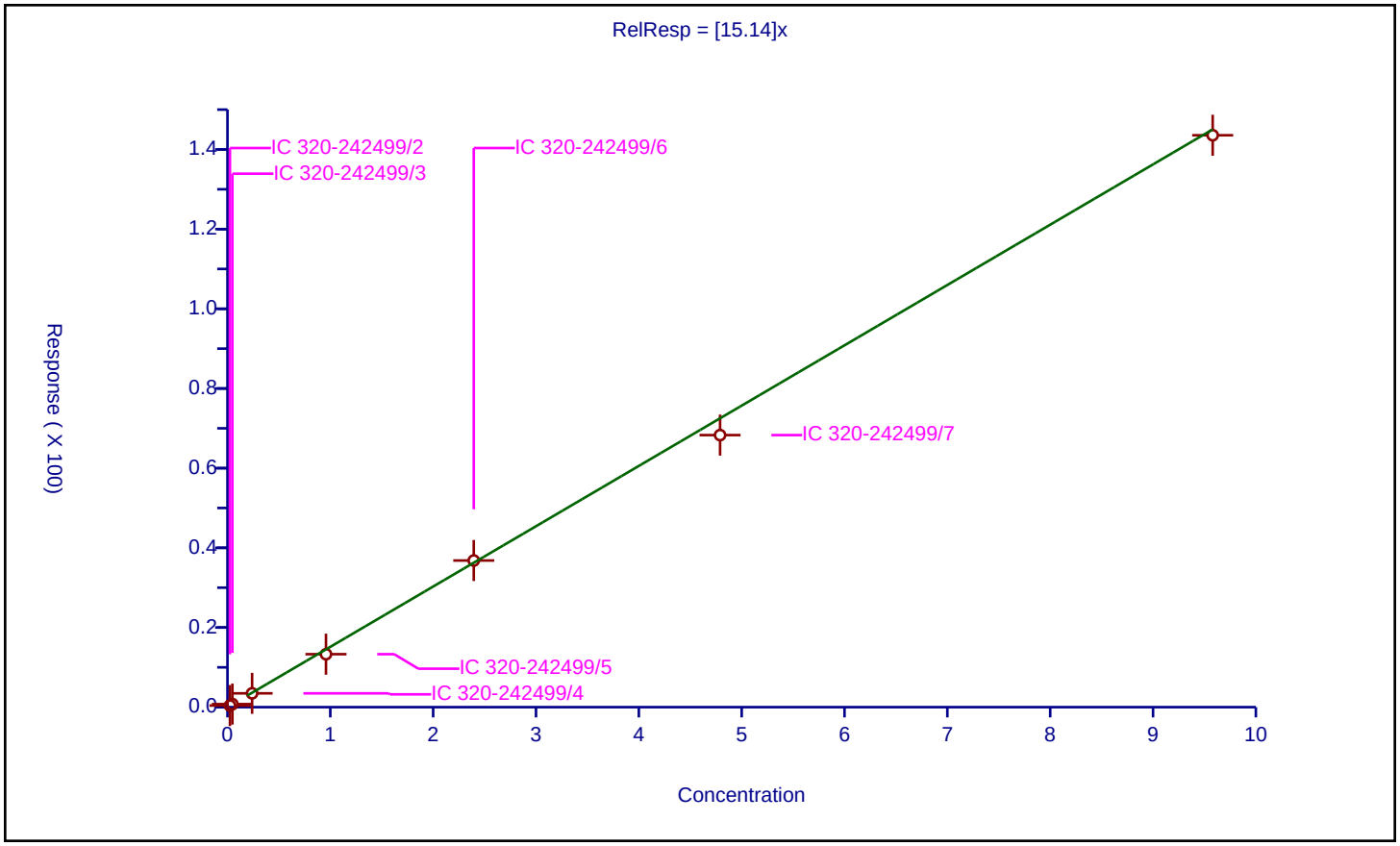
Curve Coefficients

Intercept:	0
Slope:	15.14

Error Coefficients

Standard Error:	2980000
Relative Standard Error:	7.1
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.02395	0.405271	2.395	136855.0	16.921559	Y
2	IC 320-242499/3	0.0479	0.76947	2.395	131131.0	16.064089	Y
3	IC 320-242499/4	0.2395	3.471028	2.395	135294.0	14.492808	Y
4	IC 320-242499/5	0.958	13.296406	2.395	139344.0	13.879338	Y
5	IC 320-242499/6	2.395	36.812257	2.395	118425.0	15.370462	Y
6	IC 320-242499/7	4.79	68.292214	2.395	119770.0	14.257247	Y
7	IC 320-242499/8	9.58	143.559664	2.395	102619.0	14.985351	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

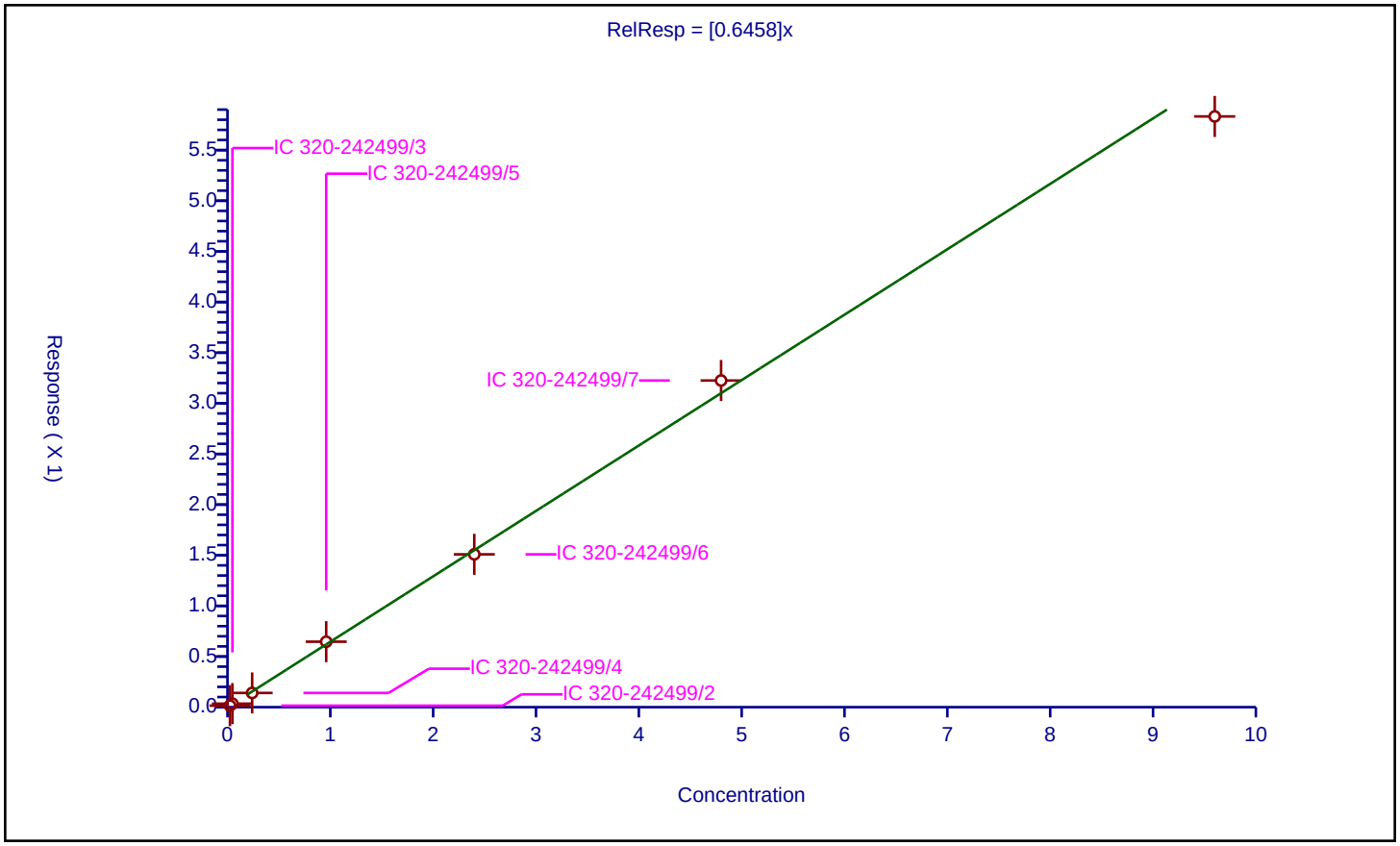
Curve Coefficients

Intercept:	0
Slope:	0.6458

Error Coefficients

Standard Error:	6290000
Relative Standard Error:	7.3
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.024	0.015135	2.39	5768085.0	0.630639	Y
2	IC 320-242499/3	0.048	0.034769	2.39	5856894.0	0.724351	Y
3	IC 320-242499/4	0.24	0.140285	2.39	6165020.0	0.584519	Y
4	IC 320-242499/5	0.96	0.646321	2.39	5901987.0	0.673252	Y
5	IC 320-242499/6	2.4	1.508924	2.39	5701715.0	0.628718	Y
6	IC 320-242499/7	4.8	3.225097	2.39	5629385.0	0.671895	Y
7	IC 320-242499/8	9.6	5.832552	2.39	5250354.0	0.607557	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

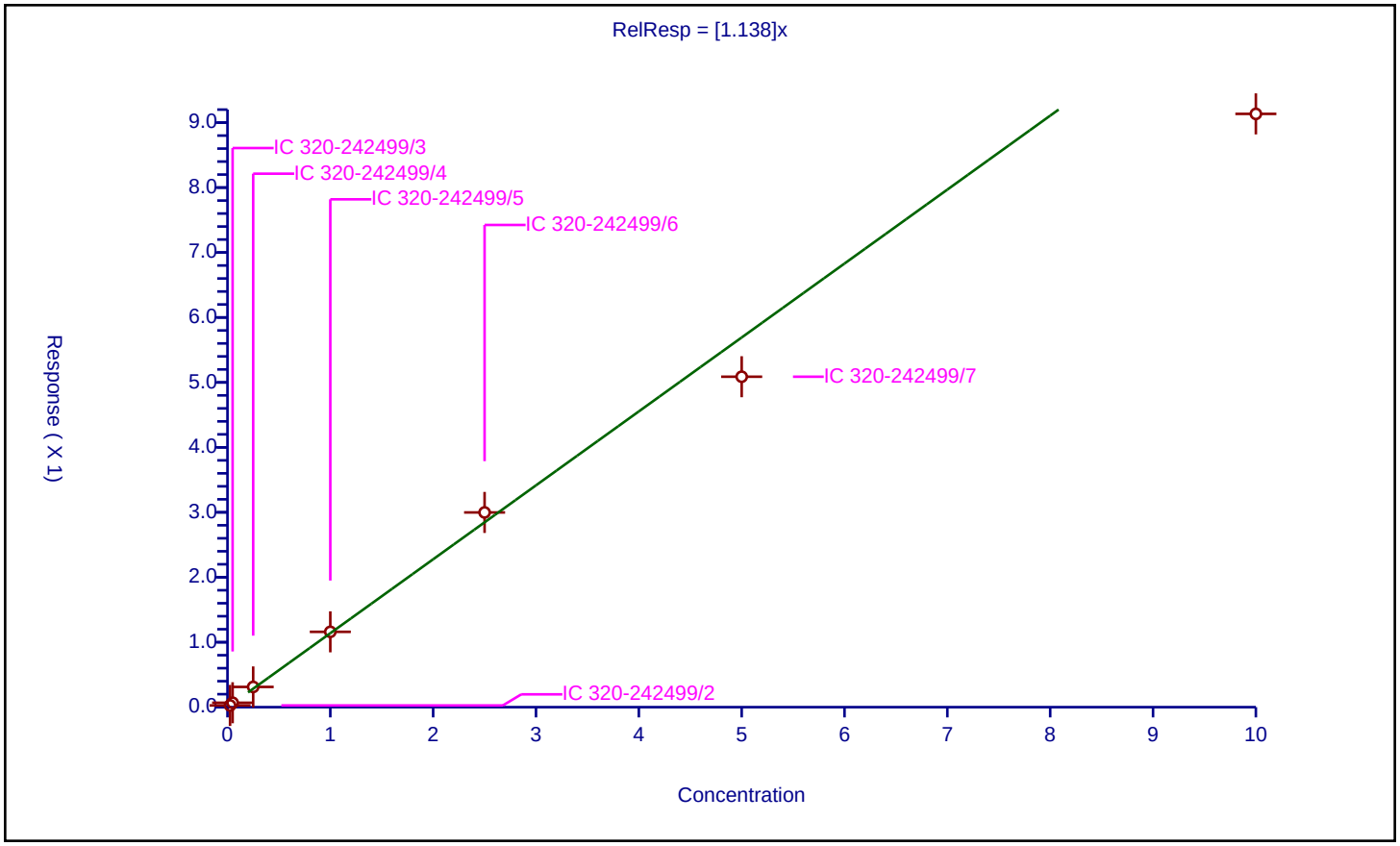
Curve Coefficients

Intercept:	0
Slope:	1.138

Error Coefficients

Standard Error:	13300000
Relative Standard Error:	13.2
Correlation Coefficient:	0.987
Coefficient of Determination (Adjusted):	0.978

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.026744	2.5	8255368.0	1.069777	Y
2	IC 320-242499/3	0.05	0.068125	2.5	8316028.0	1.362495	Y
3	IC 320-242499/4	0.25	0.311626	2.5	8177178.0	1.246506	Y
4	IC 320-242499/5	1.0	1.159702	2.5	8114874.0	1.159702	Y
5	IC 320-242499/6	2.5	2.997825	2.5	7596034.0	1.19913	Y
6	IC 320-242499/7	5.0	5.087568	2.5	7796459.0	1.017514	Y
7	IC 320-242499/8	10.0	9.134115	2.5	7270400.0	0.913412	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

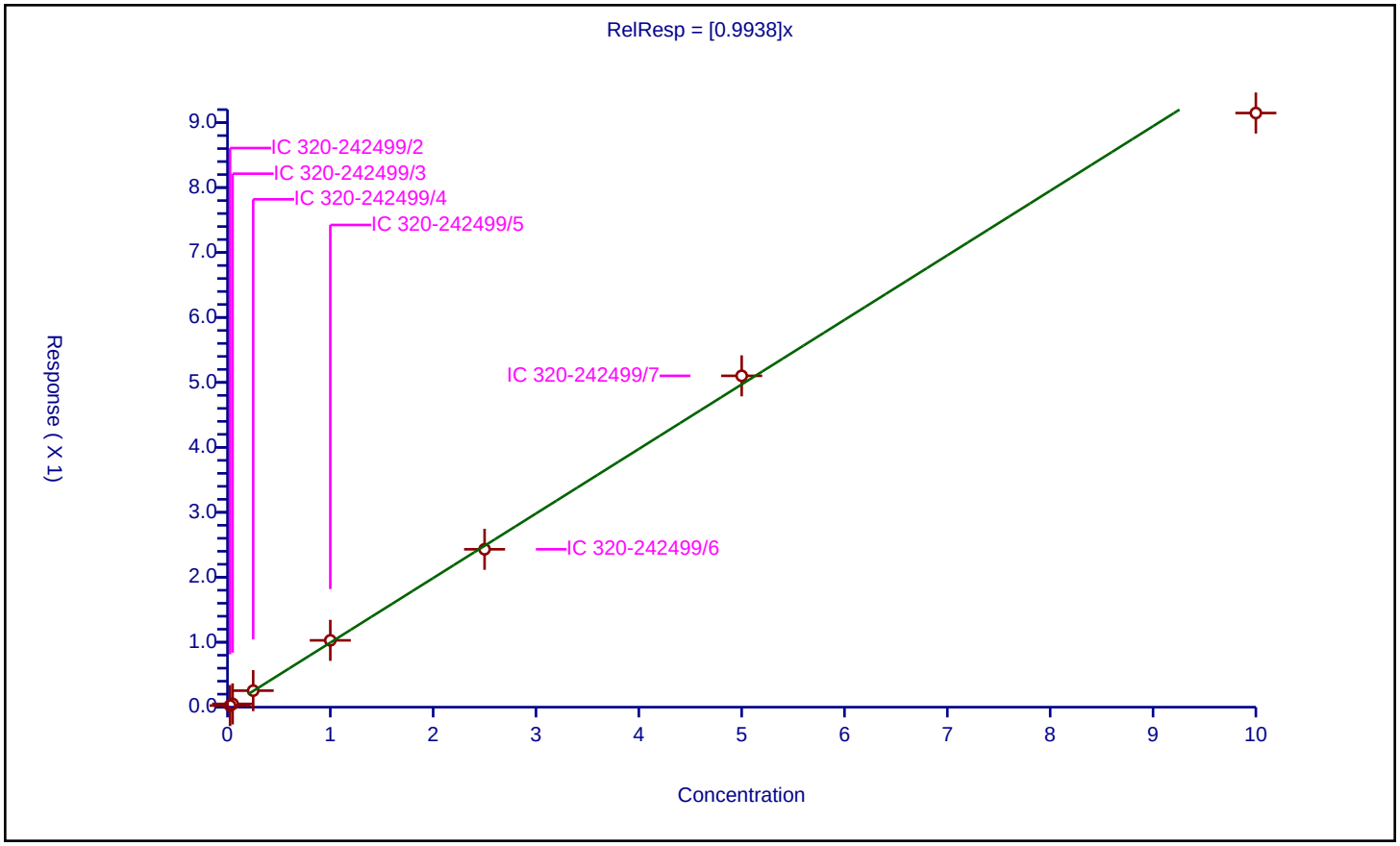
Curve Coefficients

Intercept:	0
Slope:	0.9938

Error Coefficients

Standard Error:	6170000
Relative Standard Error:	4.0
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.025014	2.5	3501055.0	1.000556	Y
2	IC 320-242499/3	0.05	0.050153	2.5	3717380.0	1.003059	Y
3	IC 320-242499/4	0.25	0.25429	2.5	3721760.0	1.017161	Y
4	IC 320-242499/5	1.0	1.028625	2.5	3489761.0	1.028625	Y
5	IC 320-242499/6	2.5	2.430563	2.5	3589091.0	0.972225	Y
6	IC 320-242499/7	5.0	5.101408	2.5	3516347.0	1.020282	Y
7	IC 320-242499/8	10.0	9.147386	2.5	3484339.0	0.914739	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

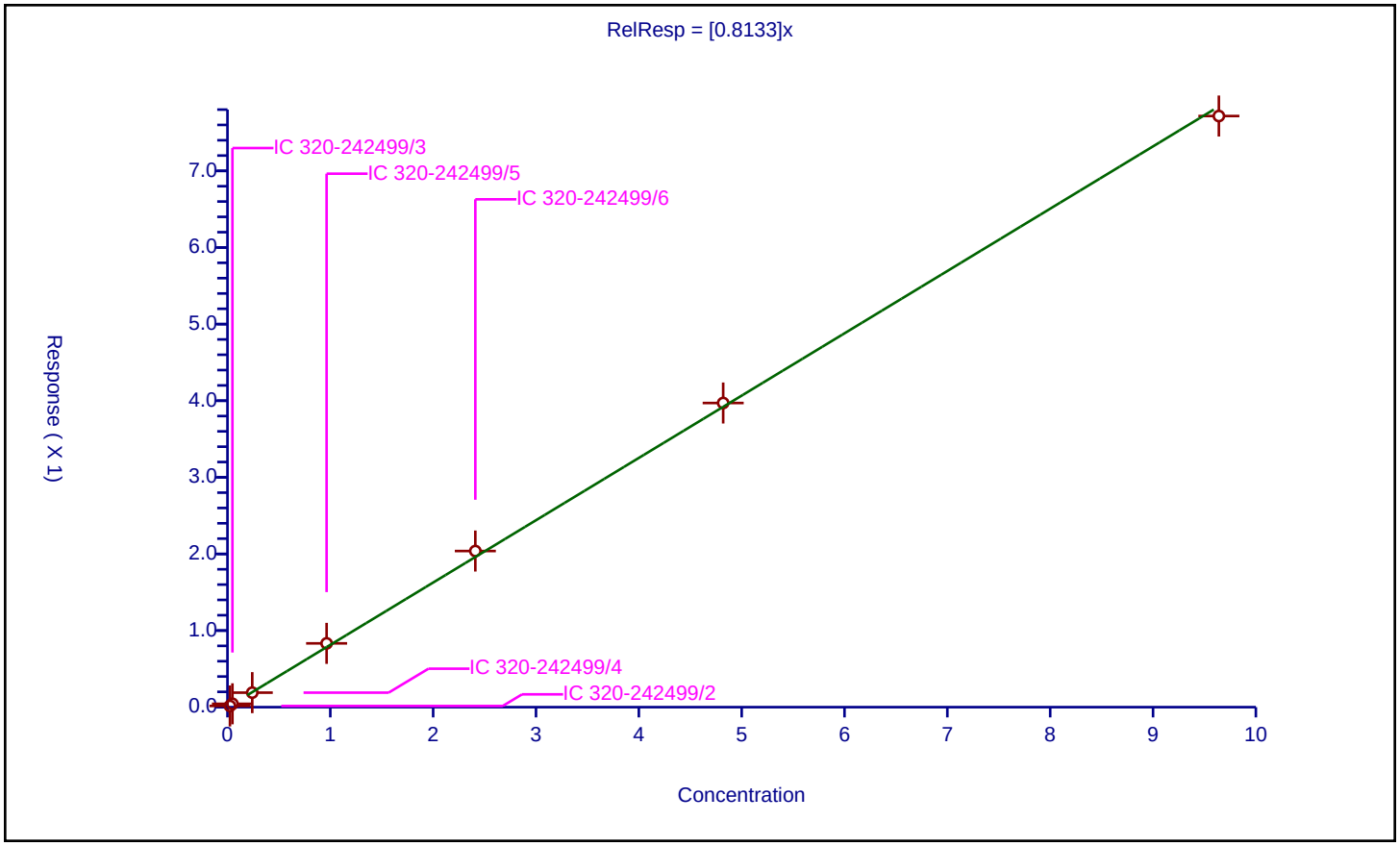
Curve Coefficients

Intercept:	0
Slope:	0.8133

Error Coefficients

Standard Error:	8190000
Relative Standard Error:	9.7
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.989

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.0241	0.015965	2.39	5768085.0	0.662443	Y
2	IC 320-242499/3	0.0482	0.043928	2.39	5856894.0	0.911359	Y
3	IC 320-242499/4	0.241	0.189421	2.39	6165020.0	0.78598	Y
4	IC 320-242499/5	0.964	0.832624	2.39	5901987.0	0.863718	Y
5	IC 320-242499/6	2.41	2.038221	2.39	5701715.0	0.845735	Y
6	IC 320-242499/7	4.82	3.970325	2.39	5629385.0	0.823719	Y
7	IC 320-242499/8	9.64	7.716276	2.39	5250354.0	0.800444	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

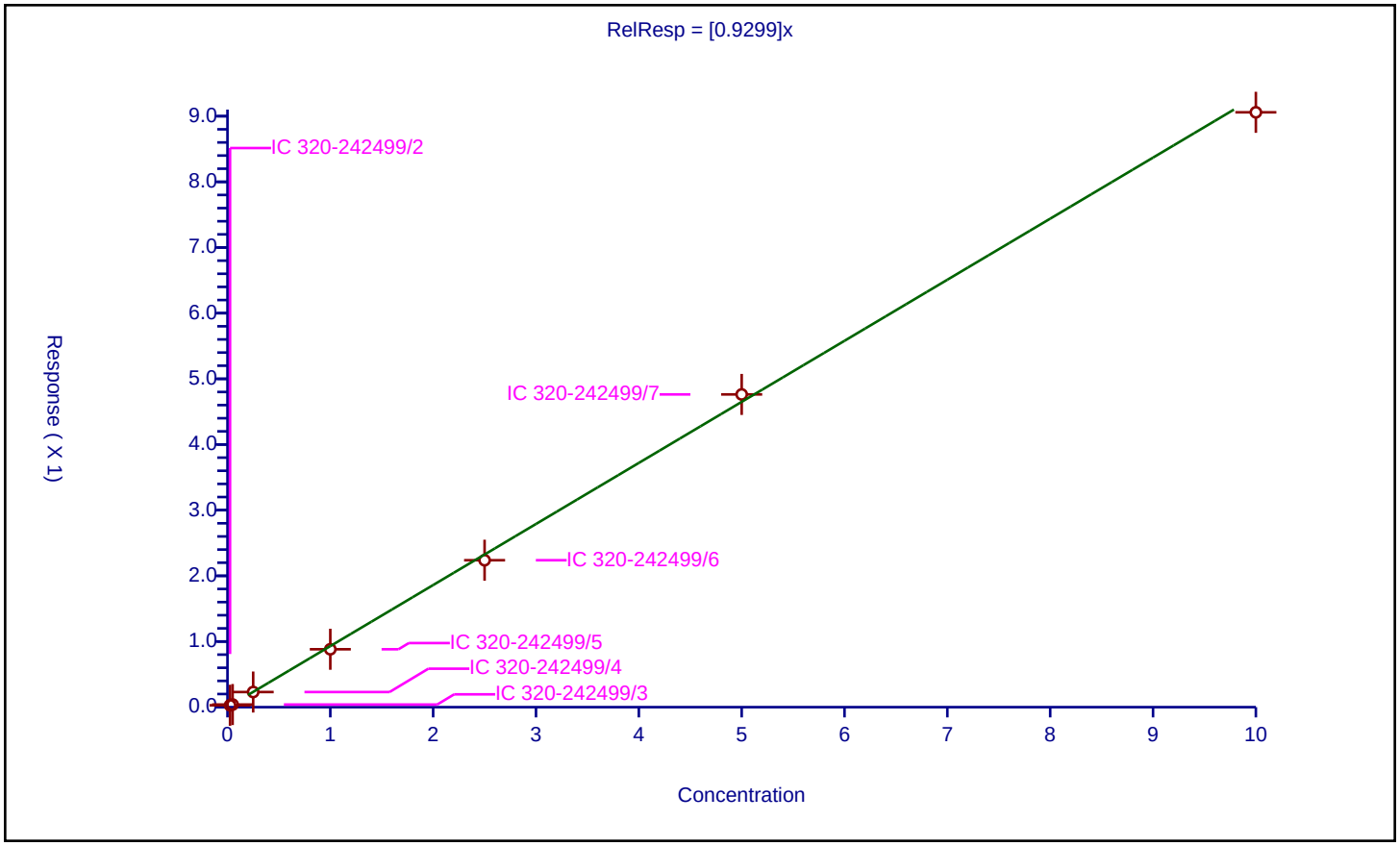
Curve Coefficients

Intercept:	0
Slope:	0.9299

Error Coefficients

Standard Error:	4320000
Relative Standard Error:	11.5
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.982

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.028734	2.5	2749959.0	1.149363	Y
2	IC 320-242499/3	0.05	0.040105	2.5	3123931.0	0.802098	Y
3	IC 320-242499/4	0.25	0.230661	2.5	3035794.0	0.922645	Y
4	IC 320-242499/5	1.0	0.881688	2.5	2980380.0	0.881688	Y
5	IC 320-242499/6	2.5	2.237445	2.5	2766889.0	0.894978	Y
6	IC 320-242499/7	5.0	4.762718	2.5	2566441.0	0.952544	Y
7	IC 320-242499/8	10.0	9.058623	2.5	2480748.0	0.905862	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

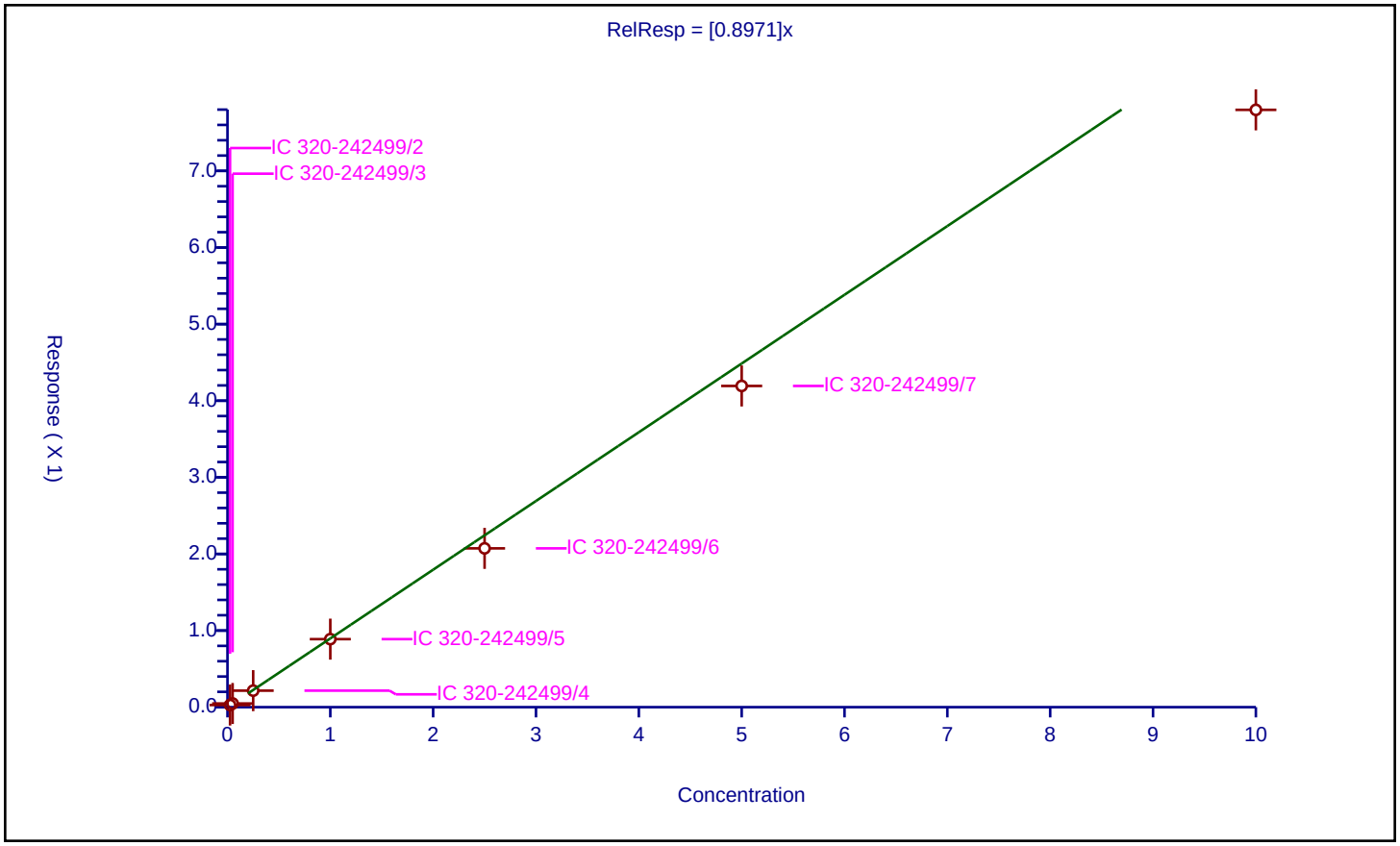
Curve Coefficients

Intercept:	0
Slope:	0.8971

Error Coefficients

Standard Error:	9360000
Relative Standard Error:	12.6
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.977

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.027941	2.5	6578448.0	1.11765	Y
2	IC 320-242499/3	0.05	0.048178	2.5	7323152.0	0.963567	Y
3	IC 320-242499/4	0.25	0.215838	2.5	7021910.0	0.863352	Y
4	IC 320-242499/5	1.0	0.887963	2.5	6840404.0	0.887963	Y
5	IC 320-242499/6	2.5	2.072771	2.5	6654794.0	0.829108	Y
6	IC 320-242499/7	5.0	4.192965	2.5	6750273.0	0.838593	Y
7	IC 320-242499/8	10.0	7.796965	2.5	6090404.0	0.779696	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

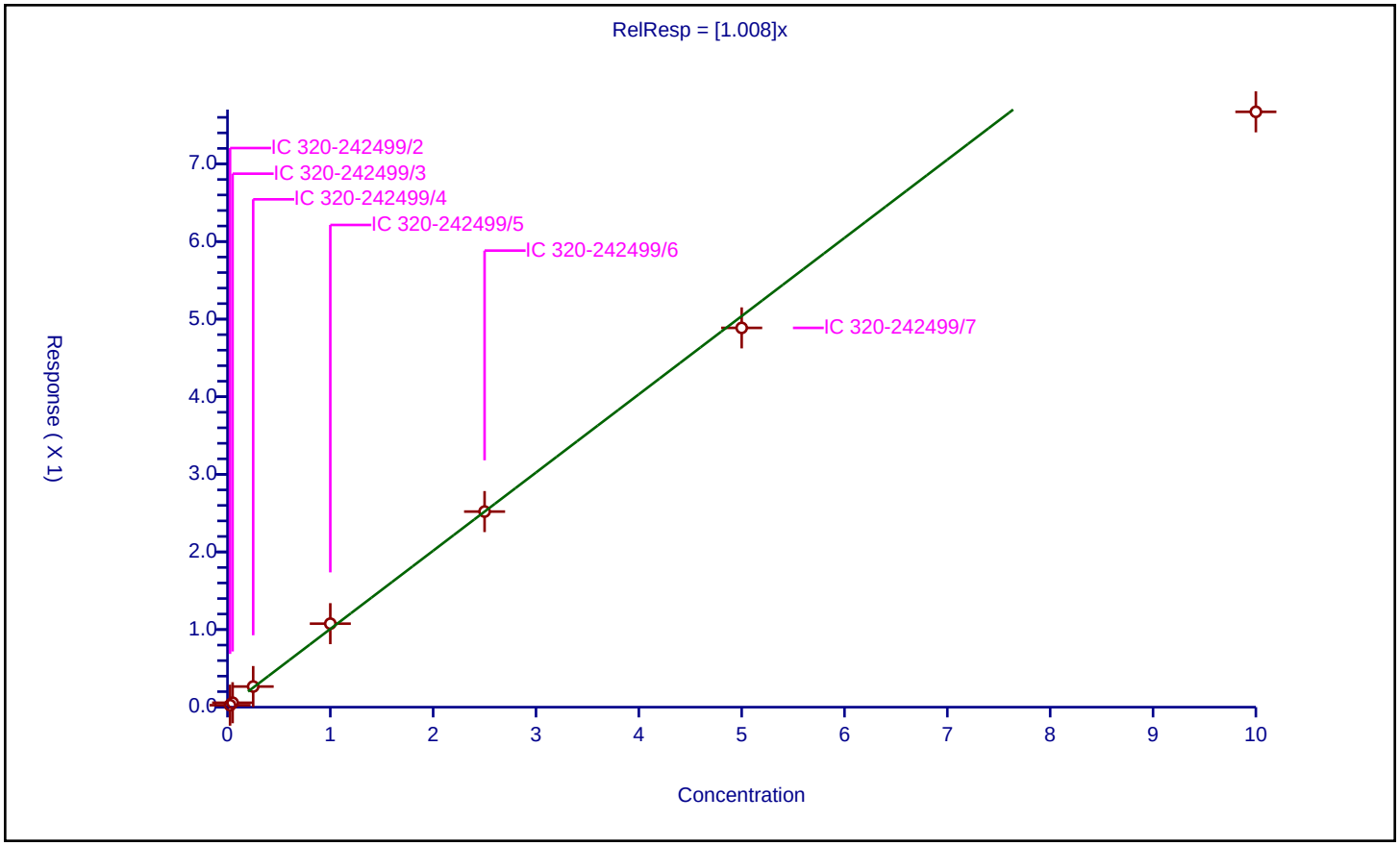
Curve Coefficients

Intercept:	0
Slope:	1.008

Error Coefficients

Standard Error:	12600000
Relative Standard Error:	11.8
Correlation Coefficient:	0.985
Coefficient of Determination (Adjusted):	0.982

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.025463	2.5	8266827.0	1.018529	Y
2	IC 320-242499/3	0.05	0.057211	2.5	8543283.0	1.144226	Y
3	IC 320-242499/4	0.25	0.26586	2.5	8139014.0	1.063438	Y
4	IC 320-242499/5	1.0	1.076042	2.5	8148044.0	1.076042	Y
5	IC 320-242499/6	2.5	2.520483	2.5	8174334.0	1.008193	Y
6	IC 320-242499/7	5.0	4.88743	2.5	7973084.0	0.977486	Y
7	IC 320-242499/8	10.0	7.671575	2.5	8209254.0	0.767157	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

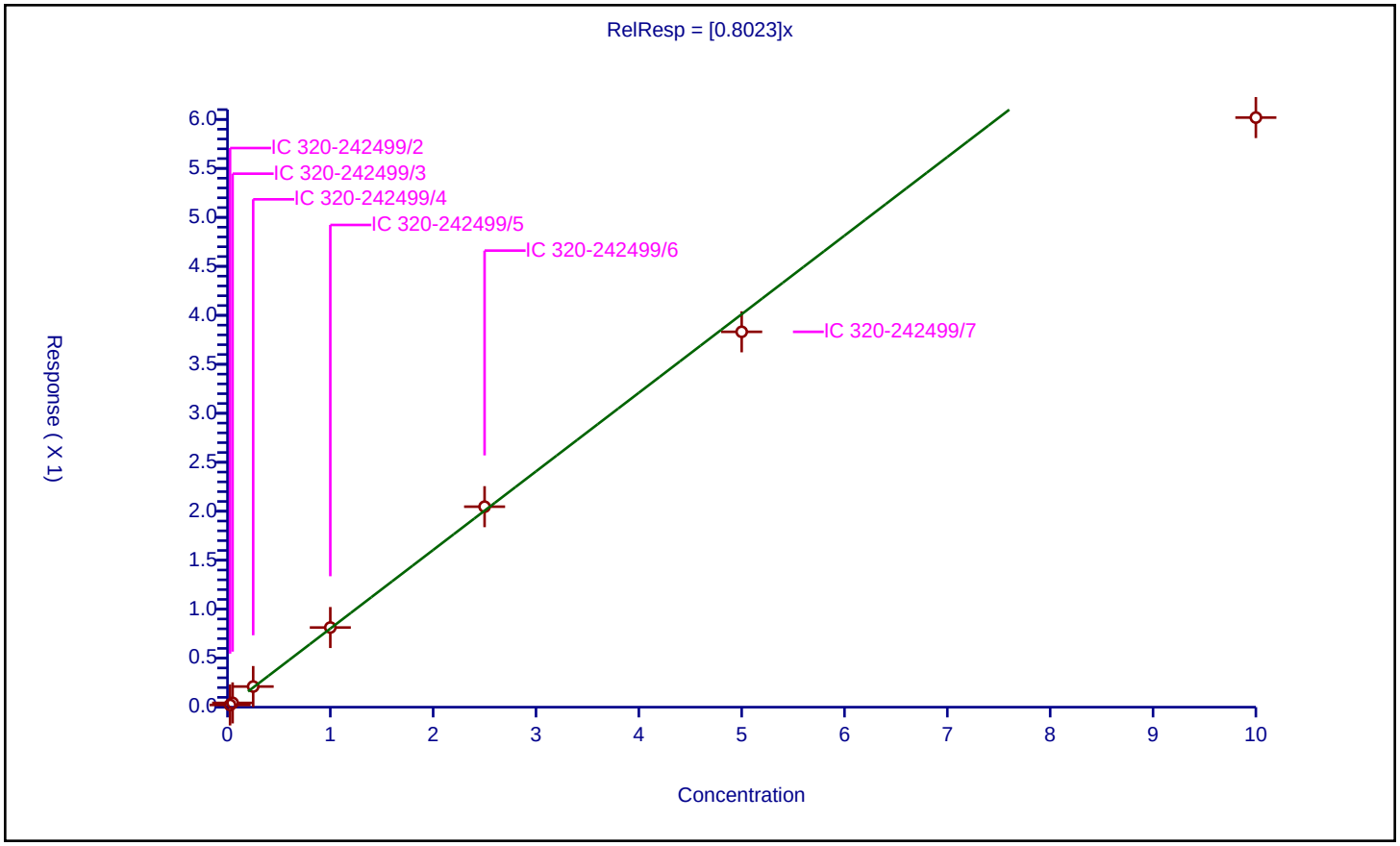
Curve Coefficients

Intercept:	0
Slope:	0.8023

Error Coefficients

Standard Error:	9930000
Relative Standard Error:	12.3
Correlation Coefficient:	0.984
Coefficient of Determination (Adjusted):	0.980

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.022571	2.5	8266827.0	0.902825	Y
2	IC 320-242499/3	0.05	0.043555	2.5	8543283.0	0.871094	Y
3	IC 320-242499/4	0.25	0.210606	2.5	8139014.0	0.842425	Y
4	IC 320-242499/5	1.0	0.813087	2.5	8148044.0	0.813087	Y
5	IC 320-242499/6	2.5	2.046572	2.5	8174334.0	0.818629	Y
6	IC 320-242499/7	5.0	3.831711	2.5	7973084.0	0.766342	Y
7	IC 320-242499/8	10.0	6.018621	2.5	8209254.0	0.601862	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

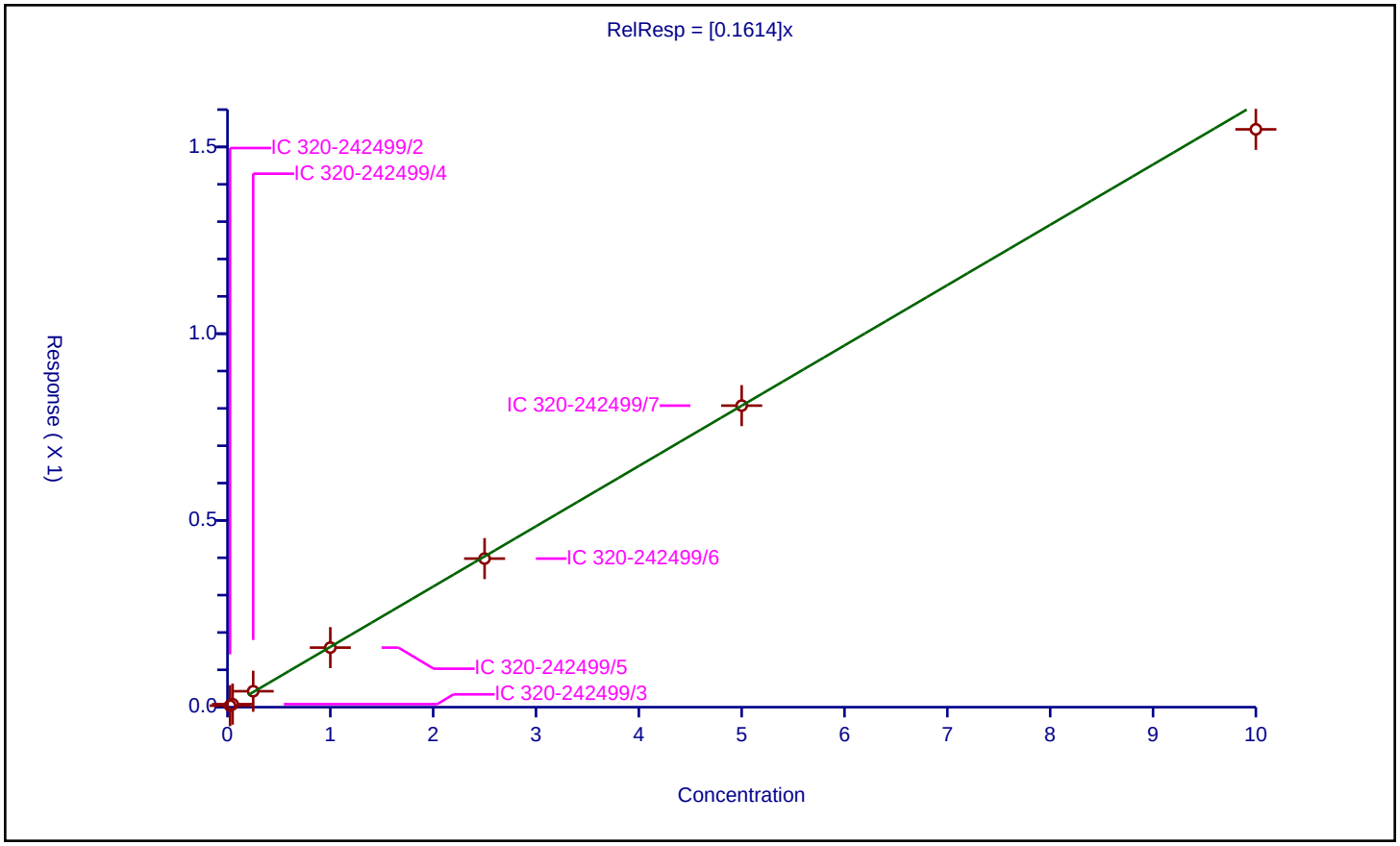
Curve Coefficients

Intercept:	0
Slope:	0.1614

Error Coefficients

Standard Error:	1850000
Relative Standard Error:	3.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-242499/2	0.025	0.004094	2.5	6620523.0	0.163779	Y
2	IC 320-242499/3	0.05	0.008033	2.5	7100968.0	0.160654	Y
3	IC 320-242499/4	0.25	0.042695	2.5	6427054.0	0.17078	Y
4	IC 320-242499/5	1.0	0.159503	2.5	6392553.0	0.159503	Y
5	IC 320-242499/6	2.5	0.397848	2.5	6634077.0	0.159139	Y
6	IC 320-242499/7	5.0	0.807396	2.5	6312069.0	0.161479	Y
7	IC 320-242499/8	10.0	1.54719	2.5	6291947.0	0.154719	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: ICV 320-242499/10 Calibration Date: 08/28/2018 11:20

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.08.28LLICALA_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9485		2.60	2.50	3.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.004		2.48	2.50	-1.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	112.9		2.38	2.21	7.5	30.0
4:2 FTS	AveID	21.61	22.53		2.44	2.34	4.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9048		2.48	2.50	-0.6	30.0
Perfluoropentanesulfonic acid	AveID	49.87	54.00		2.54	2.35	8.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.030		2.52	2.50	1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.180		2.18	2.28	-4.6	30.0
6:2 FTS	AveID	2.140	2.200		2.44	2.38	2.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.094		2.64	2.38	11.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.046		2.43	2.50	-2.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.063		2.33	2.31	0.8	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.063		2.72	2.50	8.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.245		2.74	2.50	9.5	30.0
8:2 FTS	AveID	15.14	15.07		2.39	2.40	-0.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.125		2.47	2.50	-1.1	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7146		2.66	2.40	10.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.164		2.93	2.50	17.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.9229		2.74	2.41	13.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	1.107		2.98	2.50	19.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9109		2.54	2.50	1.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.087		2.70	2.50	7.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8433		2.63	2.50	5.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1640		2.54	2.50	1.6	30.0
13C4 PFBA	Ave	0.9623	0.9451		2.46	2.50	-1.8	30.0
13C5 PFPeA	Ave	0.8584	0.8602		2.51	2.50	0.2	30.0
13C3-PFBS	Ave	0.0113	0.0107		2.20	2.33	-5.4	30.0
13C2 PFHxA	Ave	0.9075	0.8852		2.44	2.50	-2.5	30.0
13C4-PFHpA	Ave	1.082	1.049		2.42	2.50	-3.1	30.0
18O2 PFHxS	Ave	0.6655	0.6612		2.35	2.37	-0.7	30.0
M2-6:2FTS	Ave	0.1063	0.1028		2.30	2.38	-3.4	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: ICV 320-242499/10 Calibration Date: 08/28/2018 11:20

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.08.28LLICALA_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.9886		2.45	2.50	-1.9	30.0
13C4 PFOS	Ave	0.7151	0.6918		2.31	2.39	-3.3	30.0
13C5 PFNA	Ave	0.9437	0.8968		2.38	2.50	-5.0	30.0
13C8 FOSA	Ave	0.3783	0.3642		2.41	2.50	-3.7	30.0
13C2 PFDA	Ave	0.9426	0.9539		2.53	2.50	1.2	30.0
M2-8:2FTS	Ave	0.0156	0.0139		2.13	2.40	-11.0	30.0
d3-NMeFOSAA	Ave	0.4249	0.4335		2.55	2.50	2.0	30.0
13C2 PFUnA	Ave	0.8023	0.8024		2.50	2.50	0.0	30.0
d5-NEtFOSAA	Ave	0.3342	0.3324		2.49	2.50	-0.5	30.0
13C2 PFDoA	Ave	0.9759	0.9367		2.40	2.50	-4.0	30.0
13C2-PFTeDA	Ave	0.7774	0.7444		2.39	2.50	-4.2	30.0
13C2-PFHxDA	Ave	0.7882	0.8298		2.63	2.50	5.3	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 09/16/2018 13:53

Analysis Batch Number: 245884 End Date: 09/16/2018 14:46

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-245884/2		09/16/2018 13:53	1	2018.09.16_LLA_004.d	Acquity 2.1(mm)
CCVL 320-245884/3		09/16/2018 14:01	1	2018.09.16_LLA_005.d	Acquity 2.1(mm)
CCV 320-245884/4 CCVIS		09/16/2018 14:08	1	2018.09.16_LLA_006.d	Acquity 2.1(mm)
CCV 320-245884/9		09/16/2018 14:46	1		Acquity 2.1(mm)

EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCVL 320-245884/3 Calibration Date: 09/16/2018 14:01

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_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	0.9128	0.9885		0.0541	0.0500	8.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.056		0.0520	0.0500	4.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	106.1		0.0446	0.0442	1.0	30.0
4:2 FTS	AveID	21.61	21.36		0.400	0.0467	-1.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9297		0.0510	0.0500	2.1	30.0
Perfluoropentanesulfonic acid	AveID	49.87	49.34		0.0464	0.0469	-1.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.186		0.0581	0.0500	16.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.179		0.0434	0.0455	-4.7	30.0
6:2 FTS	AveID	2.140	2.231		0.400	0.0474	4.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.169		0.0544	0.0501	8.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	0.9404		0.0455	0.0476	-4.5	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.007		0.0515	0.0500	3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.070		0.0471	0.0464	1.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	2.716		0.0458	0.0500	-8.4	30.0
8:2 FTS	AveID	15.14	15.67		0.400	0.0479	3.5	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7432		0.0552	0.0480	15.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.344		0.0590	0.0500	18.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.078		0.400	0.0500	8.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8003		0.0474	0.0482	-1.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9576		0.0515	0.0500	3.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	1.058		0.0590	0.0500	18.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.150		0.0571	0.0500	14.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.7745		0.0483	0.0500	-3.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1695		0.0525	0.0500	5.0	30.0
13C4 PFBA	Ave	0.9623	0.9434		2.45	2.50	-2.0	30.0
13C5 PFPeA	Ave	0.8584	0.8307		2.42	2.50	-3.2	30.0
13C3-PFBS	Ave	0.0113	0.0109		2.25	2.33	-3.2	30.0
13C2 PFHxA	Ave	0.9075	0.8946		2.46	2.50	-1.4	30.0
13C4-PFHpA	Ave	1.082	1.136		2.63	2.50	5.0	30.0
18O2 PFHxS	Ave	0.6655	0.7455		2.65	2.37	12.0	30.0
M2-6:2FTS	Ave	0.1063	0.1116		2.49	2.38	4.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCVL 320-245884/3 Calibration Date: 09/16/2018 14:01

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	1.046		2.59	2.50	3.8	30.0
13C4 PFOS	Ave	0.7151	0.7331		2.45	2.39	2.5	30.0
13C5 PFNA	Ave	0.9437	0.9426		2.50	2.50	-0.1	30.0
13C8 FOSA	Ave	0.3783	0.3755		2.48	2.50	-0.7	30.0
M2-8:2FTS	Ave	0.0156	0.0139		2.12	2.40	-11.3	30.0
13C2 PFDA	Ave	0.9426	0.9818		2.60	2.50	4.2	30.0
d3-NMeFOSAA	Ave	0.4249	0.3977		2.34	2.50	-6.4	30.0
13C2 PFUnA	Ave	0.8023	0.7907		2.46	2.50	-1.4	30.0
d5-NEtFOSAA	Ave	0.3342	0.3450		2.58	2.50	3.2	30.0
13C2 PFDoA	Ave	0.9759	0.9499		2.43	2.50	-2.7	30.0
13C2-PFTeDA	Ave	0.7774	0.7165		2.30	2.50	-7.8	30.0
13C2-PFHxDA	Ave	0.7882	0.7107		2.25	2.50	-9.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245884/4 Calibration Date: 09/16/2018 14:08

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9281		1.02	1.00	1.7	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.042		1.03	1.00	2.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	109.9		0.924	0.884	4.6	30.0
4:2 FTS	AveID	21.61	21.01		0.908	0.934	-2.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9044		0.993	1.00	-0.7	30.0
Perfluoropentanesulfonic acid	AveID	49.87	51.49		0.968	0.938	3.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.095		1.07	1.00	7.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.181		0.869	0.910	-4.5	30.0
6:2 FTS	AveID	2.140	2.003		0.887	0.948	-6.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.103		1.07	0.952	12.0	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.083		1.01	1.00	0.6	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	0.9900		1.01	1.00	1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.111		0.977	0.928	5.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.190		1.08	1.00	7.6	30.0
8:2 FTS	AveID	15.14	12.57		0.796	0.958	-17.0	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7228		1.07	0.960	11.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.149		1.01	1.00	1.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	0.9377		0.944	1.00	-5.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8957		1.06	0.964	10.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9394		1.01	1.00	1.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9483		1.06	1.00	5.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.053		1.05	1.00	4.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.7902		0.985	1.00	-1.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1654		1.02	1.00	2.5	30.0
13C4 PFBA	Ave	0.9623	0.9441		2.45	2.50	-1.9	30.0
13C5 PFPeA	Ave	0.8584	0.8215		2.39	2.50	-4.3	30.0
13C3-PFBS	Ave	0.0113	0.0112		2.30	2.33	-0.9	30.0
13C2 PFHxA	Ave	0.9075	0.9155		2.52	2.50	0.9	30.0
13C4-PFHpA	Ave	1.082	1.077		2.49	2.50	-0.5	30.0
18O2 PFHxS	Ave	0.6655	0.7042		2.50	2.37	5.8	30.0
M2-6:2FTS	Ave	0.1063	0.1104		2.47	2.38	3.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245884/4 Calibration Date: 09/16/2018 14:08

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.9888		2.45	2.50	-1.9	30.0
13C4 PFOS	Ave	0.7151	0.6979		2.33	2.39	-2.4	30.0
13C5 PFNA	Ave	0.9437	0.9705		2.57	2.50	2.8	30.0
13C8 FOSA	Ave	0.3783	0.4001		2.64	2.50	5.8	30.0
M2-8:2FTS	Ave	0.0156	0.0166		2.54	2.40	5.9	30.0
13C2 PFDA	Ave	0.9426	0.9465		2.51	2.50	0.4	30.0
d3-NMeFOSAA	Ave	0.4249	0.4261		2.51	2.50	0.3	30.0
d5-NEtFOSAA	Ave	0.3342	0.3528		2.64	2.50	5.5	30.0
13C2 PFUnA	Ave	0.8023	0.8477		2.64	2.50	5.7	30.0
13C2 PFDoA	Ave	0.9759	0.9697		2.48	2.50	-0.6	30.0
13C2-PFTeDA	Ave	0.7774	0.7312		2.35	2.50	-6.0	30.0
13C2-PFHxDA	Ave	0.7882	0.6821		2.16	2.50	-13.5	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 09/16/2018 14:53

Analysis Batch Number: 245887 End Date: 09/16/2018 16:16

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-245887/1		09/16/2018 14:53	1	2018.09.16_LLA_012.d	Acquity 2.1(mm)
MB 320-245574/1-A		09/16/2018 15:01	1	2018.09.16_LLA_013.d	Acquity 2.1(mm)
LCS 320-245574/2-A		09/16/2018 15:08	1	2018.09.16_LLA_014.d	Acquity 2.1(mm)
LCSD 320-245574/3-A		09/16/2018 15:16	1	2018.09.16_LLA_015.d	Acquity 2.1(mm)
ZZZZZ		09/16/2018 15:23	1		Acquity 2.1(mm)
320-42924-1		09/16/2018 15:31	1	2018.09.16_LLA_017.d	Acquity 2.1(mm)
320-42924-2		09/16/2018 15:39	1	2018.09.16_LLA_018.d	Acquity 2.1(mm)
320-42924-3		09/16/2018 15:46	1	2018.09.16_LLA_019.d	Acquity 2.1(mm)
320-42924-4		09/16/2018 15:54	1	2018.09.16_LLA_020.d	Acquity 2.1(mm)
ZZZZZ		09/16/2018 16:01	1		Acquity 2.1(mm)
ZZZZZ		09/16/2018 16:09	1		Acquity 2.1(mm)
CCV 320-245887/12		09/16/2018 16:16	1	2018.09.16_LLA_023.d	Acquity 2.1(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245887/1 Calibration Date: 09/16/2018 14:53

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9523		2.61	2.50	4.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.014		2.50	2.50	-0.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	111.8		2.35	2.21	6.4	30.0
4:2 FTS	AveID	21.61	21.06		2.28	2.34	-2.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.8949		2.46	2.50	-1.7	30.0
Perfluoropentanesulfonic acid	AveID	49.87	50.59		2.38	2.35	1.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.099		2.69	2.50	7.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.168		2.15	2.28	-5.6	30.0
6:2 FTS	AveID	2.140	2.069		2.29	2.37	-3.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.012		2.35	2.50	-5.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.054		2.55	2.38	7.1	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	0.9257		2.37	2.50	-5.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.045		2.30	2.32	-1.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.124		2.64	2.50	5.4	30.0
8:2 FTS	AveID	15.14	15.10		2.39	2.40	-0.3	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.6468		2.40	2.40	0.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.087		2.39	2.50	-4.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.023		2.57	2.50	2.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8359		2.48	2.41	2.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9544		2.57	2.50	2.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9328		2.60	2.50	4.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	0.995		2.47	2.50	-1.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8472		2.64	2.50	5.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1718		2.66	2.50	6.4	30.0
13C4 PFBA	Ave	0.9623	0.9311		2.42	2.50	-3.2	30.0
13C5 PFPeA	Ave	0.8584	0.8314		2.42	2.50	-3.1	30.0
13C3-PFBS	Ave	0.0113	0.0107		2.20	2.33	-5.3	30.0
13C2 PFHxA	Ave	0.9075	0.8666		2.39	2.50	-4.5	30.0
13C4-PFHpA	Ave	1.082	1.042		2.41	2.50	-3.7	30.0
18O2 PFHxS	Ave	0.6655	0.6770		2.41	2.37	1.7	30.0
M2-6:2FTS	Ave	0.1063	0.1074		2.40	2.38	1.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245887/1 Calibration Date: 09/16/2018 14:53

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.9872		2.45	2.50	-2.0	30.0
13C4 PFOS	Ave	0.7151	0.7285		2.43	2.39	1.9	30.0
13C5 PFNA	Ave	0.9437	0.9656		2.56	2.50	2.3	30.0
13C8 FOSA	Ave	0.3783	0.3702		2.45	2.50	-2.1	30.0
M2-8:2FTS	Ave	0.0156	0.0132		2.03	2.40	-15.3	30.0
13C2 PFDA	Ave	0.9426	0.9580		2.54	2.50	1.6	30.0
d3-NMeFOSAA	Ave	0.4249	0.3898		2.29	2.50	-8.2	30.0
13C2 PFUnA	Ave	0.8023	0.7636		2.38	2.50	-4.8	30.0
d5-NEtFOSAA	Ave	0.3342	0.3131		2.34	2.50	-6.3	30.0
13C2 PFDoA	Ave	0.9759	0.9597		2.46	2.50	-1.7	30.0
13C2-PFTeDA	Ave	0.7774	0.7494		2.41	2.50	-3.6	30.0
13C2-PFHxDA	Ave	0.7882	0.8033		2.55	2.50	1.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245887/12 Calibration Date: 09/16/2018 16:16

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9449		1.04	1.00	3.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	0.997		0.983	1.00	-1.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	116.2		0.977	0.884	10.6	30.0
4:2 FTS	AveID	21.61	20.48		0.885	0.934	-5.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9011		0.989	1.00	-1.1	30.0
Perfluoropentanesulfonic acid	AveID	49.87	51.85		0.975	0.938	4.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.109		1.09	1.00	8.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.235		0.908	0.910	-0.2	30.0
6:2 FTS	AveID	2.140	2.122		0.940	0.948	-0.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.047		1.01	0.952	6.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.047		0.973	1.00	-2.7	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.093		1.12	1.00	11.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.037		0.912	0.928	-1.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.100		1.05	1.00	4.6	30.0
8:2 FTS	AveID	15.14	14.87		0.941	0.958	-1.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.056		0.927	1.00	-7.3	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.6586		0.979	0.960	2.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.016		1.02	1.00	2.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8686		1.03	0.964	6.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9196		0.989	1.00	-1.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9181		1.02	1.00	2.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	0.998		0.990	1.00	-1.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8144		1.02	1.00	1.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1517		0.940	1.00	-6.0	30.0
13C4 PFBA	Ave	0.9623	0.8714		2.26	2.50	-9.4	30.0
13C5 PFPeA	Ave	0.8584	0.7919		2.31	2.50	-7.7	30.0
13C3-PFBS	Ave	0.0113	0.0106		2.19	2.33	-6.0	30.0
13C2 PFHxA	Ave	0.9075	0.8211		2.26	2.50	-9.5	30.0
13C4-PFHpA	Ave	1.082	0.999		2.31	2.50	-7.7	30.0
18O2 PFHxS	Ave	0.6655	0.6077		2.16	2.37	-8.7	30.0
M2-6:2FTS	Ave	0.1063	0.0962		2.15	2.38	-9.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-245887/12 Calibration Date: 09/16/2018 16:16

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.16_LLA_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.9545		2.37	2.50	-5.3	30.0
13C4 PFOS	Ave	0.7151	0.6745		2.25	2.39	-5.7	30.0
13C5 PFNA	Ave	0.9437	0.8545		2.26	2.50	-9.5	30.0
13C8 FOSA	Ave	0.3783	0.3679		2.43	2.50	-2.7	30.0
13C2 PFDA	Ave	0.9426	0.9781		2.59	2.50	3.8	30.0
M2-8:2FTS	Ave	0.0156	0.0144		2.21	2.40	-7.7	30.0
d3-NMeFOSAA	Ave	0.4249	0.3884		2.29	2.50	-8.6	30.0
13C2 PFUnA	Ave	0.8023	0.7773		2.42	2.50	-3.1	30.0
d5-NEtFOSAA	Ave	0.3342	0.3257		2.44	2.50	-2.6	30.0
13C2 PFDoA	Ave	0.9759	0.9432		2.42	2.50	-3.4	30.0
13C2-PFTeDA	Ave	0.7774	0.7422		2.39	2.50	-4.5	30.0
13C2-PFHxDA	Ave	0.7882	0.7475		2.37	2.50	-5.2	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 09/17/2018 18:09

Analysis Batch Number: 246099 End Date: 09/17/2018 21:02

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-246099/2		09/17/2018 18:09	1	2018.09.17_LLB_004.d	Acquity 2.1(mm)
CCVL 320-246099/3		09/17/2018 18:17	1	2018.09.17_LLB_005.d	Acquity 2.1(mm)
CCV 320-246099/4 CCVIS		09/17/2018 18:24	1	2018.09.17_LLB_006.d	Acquity 2.1(mm)
ZZZZZ		09/17/2018 18:32	20		Acquity 2.1(mm)
ZZZZZ		09/17/2018 18:39	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 18:47	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 18:54	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:02	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:09	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:17	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:24	10		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:32	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:39	1		Acquity 2.1(mm)
CCV 320-246099/7		09/17/2018 19:47	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 19:54	20		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:02	100		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:09	10		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:24	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:32	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:39	1		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:47	20		Acquity 2.1(mm)
ZZZZZ		09/17/2018 20:54	1		Acquity 2.1(mm)
CCV 320-246099/27		09/17/2018 21:02	1		Acquity 2.1(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCVL 320-246099/3 Calibration Date: 09/17/2018 18:17

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_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	0.9128	0.9600		0.0526	0.0500	5.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.015		0.0501	0.0500	0.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	110.0		0.0463	0.0442	4.7	30.0
4:2 FTS	AveID	21.61	21.26		0.400	0.0467	-1.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9288		0.0510	0.0500	2.0	30.0
Perfluoropentanesulfonic acid	AveID	49.87	48.12		0.0452	0.0469	-3.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.232		0.0604	0.0500	20.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.306		0.0480	0.0455	5.5	30.0
6:2 FTS	AveID	2.140	2.451		0.0543	0.0474	14.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.015		0.0491	0.0476	3.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.101		0.0512	0.0501	2.3	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.034		0.0529	0.0500	5.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.044		0.0459	0.0464	-1.1	30.0
8:2 FTS	AveID	15.14	15.68		0.400	0.0479	3.6	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7085		0.0527	0.0480	9.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.066		0.0468	0.0500	-6.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.182		0.0537	0.0500	7.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.061		0.400	0.0500	6.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	1.010		0.0599	0.0482	24.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9159		0.0492	0.0500	-1.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.998		0.0556	0.0500	11.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.174		0.0582	0.0500	16.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.9278		0.0578	0.0500	15.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1711		0.0530	0.0500	6.0	30.0
13C4 PFBA	Ave	0.9623	0.9183		2.39	2.50	-4.6	30.0
13C5 PFPeA	Ave	0.8584	0.8603		2.51	2.50	0.2	30.0
13C3-PFBS	Ave	0.0113	0.0111		2.29	2.33	-1.3	30.0
13C2 PFHxA	Ave	0.9075	0.9482		2.61	2.50	4.5	30.0
13C4-PFHpA	Ave	1.082	1.097		2.53	2.50	1.4	30.0
18O2 PFHxS	Ave	0.6655	0.6944		2.47	2.37	4.3	30.0
M2-6:2FTS	Ave	0.1063	0.1068		2.39	2.38	0.5	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCVL 320-246099/3 Calibration Date: 09/17/2018 18:17

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	1.012		2.51	2.50	0.4	30.0
13C4 PFOS	Ave	0.7151	0.6763		2.26	2.39	-5.4	30.0
13C5 PFNA	Ave	0.9437	0.9362		2.48	2.50	-0.8	30.0
13C8 FOSA	Ave	0.3783	0.3798		2.51	2.50	0.4	30.0
M2-8:2FTS	Ave	0.0156	0.0153		2.35	2.40	-1.9	30.0
13C2 PFDA	Ave	0.9426	0.9692		2.57	2.50	2.8	30.0
d3-NMeFOSAA	Ave	0.4249	0.3871		2.28	2.50	-8.9	30.0
d5-NEtFOSAA	Ave	0.3342	0.3578		2.68	2.50	7.0	30.0
13C2 PFUnA	Ave	0.8023	0.8788		2.74	2.50	9.5	30.0
13C2 PFDoA	Ave	0.9759	0.9528		2.44	2.50	-2.4	30.0
13C2-PFTeDA	Ave	0.7774	0.7973		2.56	2.50	2.6	30.0
13C2-PFHxDA	Ave	0.7882	0.8401		2.66	2.50	6.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246099/4 Calibration Date: 09/17/2018 18:24

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9310		1.02	1.00	2.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	0.9697		0.956	1.00	-4.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	106.9		0.899	0.884	1.7	30.0
4:2 FTS	AveID	21.61	21.24		0.918	0.934	-1.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.9062		0.995	1.00	-0.5	30.0
Perfluoropentanesulfonic acid	AveID	49.87	51.73		0.973	0.938	3.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.115		1.09	1.00	9.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.179		0.867	0.910	-4.7	30.0
6:2 FTS	AveID	2.140	2.164		0.959	0.948	1.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.103		1.03	1.00	2.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.062		1.03	0.952	7.9	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.095		1.12	1.00	11.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.124		0.988	0.928	6.5	30.0
8:2 FTS	AveID	15.14	13.92		0.881	0.958	-8.1	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7312		1.09	0.960	13.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.235		1.09	1.00	9.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.165		1.02	1.00	2.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	0.9785		0.985	1.00	-1.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.9138		1.08	0.964	12.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9206		0.990	1.00	-1.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.8823		0.983	1.00	-1.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	1.072		1.06	1.00	6.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.9535		1.19	1.00	18.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1412		0.875	1.00	-12.5	30.0
13C4 PFBA	Ave	0.9623	0.9254		2.40	2.50	-3.8	30.0
13C5 PFPeA	Ave	0.8584	0.8789		2.56	2.50	2.4	30.0
13C3-PFBS	Ave	0.0113	0.0115		2.38	2.33	2.4	30.0
13C2 PFHxA	Ave	0.9075	0.9141		2.52	2.50	0.7	30.0
13C4-PFHpA	Ave	1.082	1.136		2.62	2.50	5.0	30.0
18O2 PFHxS	Ave	0.6655	0.7068		2.51	2.37	6.2	30.0
M2-6:2FTS	Ave	0.1063	0.1013		2.26	2.38	-4.7	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246099/4 Calibration Date: 09/17/2018 18:24

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	0.999		2.48	2.50	-0.9	30.0
13C4 PFOS	Ave	0.7151	0.6875		2.30	2.39	-3.9	30.0
13C5 PFNA	Ave	0.9437	0.9170		2.43	2.50	-2.8	30.0
13C2 PFDA	Ave	0.9426	0.9687		2.57	2.50	2.8	30.0
13C8 FOSA	Ave	0.3783	0.3781		2.50	2.50	-0.0	30.0
M2-8:2FTS	Ave	0.0156	0.0138		2.11	2.40	-11.8	30.0
d3-NMeFOSAA	Ave	0.4249	0.4211		2.48	2.50	-0.9	30.0
13C2 PFUnA	Ave	0.8023	0.8362		2.61	2.50	4.2	30.0
d5-NEtFOSAA	Ave	0.3342	0.3547		2.65	2.50	6.1	30.0
13C2 PFDoA	Ave	0.9759	0.9087		2.33	2.50	-6.9	30.0
13C2-PFTeDA	Ave	0.7774	0.7863		2.53	2.50	1.1	30.0
13C2-PFHxDA	Ave	0.7882	0.8108		2.57	2.50	2.9	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Instrument ID: A9 Start Date: 09/18/2018 00:02

Analysis Batch Number: 246405 End Date: 09/18/2018 00:25

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-246405/1		09/18/2018 00:02	1	2018.09.17_LLB_051.d	Acquity 2.1(mm)
320-42924-1 DL		09/18/2018 00:10	10	2018.09.17_LLB_052.d	Acquity 2.1(mm)
ZZZZZ		09/18/2018 00:17	1		Acquity 2.1(mm)
CCV 320-246405/4		09/18/2018 00:25	1	2018.09.17_LLB_054.d	Acquity 2.1(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246405/1 Calibration Date: 09/18/2018 00:02

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_051.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9434		1.03	1.00	3.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.011		0.997	1.00	-0.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	115.8		0.974	0.884	10.2	30.0
4:2 FTS	AveID	21.61	23.72		1.03	0.934	9.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.8789		0.965	1.00	-3.5	30.0
Perfluoropentanesulfonic acid	AveID	49.87	52.57		0.989	0.938	5.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.058		1.04	1.00	3.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.163		0.855	0.910	-6.0	30.0
6:2 FTS	AveID	2.140	2.288		1.01	0.948	6.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.086		1.05	0.952	10.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.064		0.989	1.00	-1.2	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	1.033		1.06	1.00	5.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.057		0.930	0.928	0.2	30.0
8:2 FTS	AveID	15.14	15.41		0.975	0.958	1.8	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.7192		1.07	0.960	11.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.136		0.998	1.00	-0.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.332		1.12	1.00	12.4	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.063		1.07	1.00	7.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.9441		1.12	0.964	16.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.9544		1.03	1.00	2.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.9334		1.04	1.00	4.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	0.9938		0.986	1.00	-1.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8354		1.04	1.00	4.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1628		1.01	1.00	0.8	30.0
13C4 PFBA	Ave	0.9623	0.9102		2.36	2.50	-5.4	30.0
13C5 PFPeA	Ave	0.8584	0.8140		2.37	2.50	-5.2	30.0
13C3-PFBS	Ave	0.0113	0.0104		2.15	2.33	-7.6	30.0
13C2 PFHxA	Ave	0.9075	0.8892		2.45	2.50	-2.0	30.0
13C4-PFHpA	Ave	1.082	1.095		2.53	2.50	1.2	30.0
18O2 PFHxS	Ave	0.6655	0.6710		2.38	2.37	0.8	30.0
M2-6:2FTS	Ave	0.1063	0.1053		2.35	2.38	-1.0	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246405/1 Calibration Date: 09/18/2018 00:02

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_051.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	1.014		2.52	2.50	0.6	30.0
13C4 PFOS	Ave	0.7151	0.6689		2.24	2.39	-6.5	30.0
13C5 PFNA	Ave	0.9437	0.9444		2.50	2.50	0.0	30.0
M2-8:2FTS	Ave	0.0156	0.0146		2.23	2.40	-6.9	30.0
13C2 PFDA	Ave	0.9426	0.9687		2.57	2.50	2.8	30.0
13C8 FOSA	Ave	0.3783	0.3557		2.35	2.50	-6.0	30.0
d3-NMeFOSAA	Ave	0.4249	0.4124		2.43	2.50	-2.9	30.0
d5-NEtFOSAA	Ave	0.3342	0.3675		2.75	2.50	9.9	30.0
13C2 PFUnA	Ave	0.8023	0.8107		2.53	2.50	1.0	30.0
13C2 PFDoA	Ave	0.9759	0.9560		2.45	2.50	-2.0	30.0
13C2-PFTeDA	Ave	0.7774	0.7804		2.51	2.50	0.4	30.0
13C2-PFHxDA	Ave	0.7882	0.8184		2.60	2.50	3.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246405/4 Calibration Date: 09/18/2018 00:25

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9128	0.9233		2.53	2.50	1.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.014	1.020		2.51	2.50	0.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	105.1	107.2		2.26	2.21	2.0	30.0
4:2 FTS	AveID	21.61	22.66		2.45	2.34	4.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9107	0.8905		2.44	2.50	-2.2	30.0
Perfluoropentanesulfonic acid	AveID	49.87	51.10		2.40	2.35	2.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.020	1.095		2.68	2.50	7.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.237	1.161		2.13	2.28	-6.2	30.0
6:2 FTS	AveID	2.140	2.194		2.43	2.37	2.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.9846	1.100		2.66	2.38	11.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.076	1.071		2.49	2.50	-0.5	30.0
Perfluorononanoic acid (PFNA)	AveID	0.9779	0.9667		2.47	2.50	-1.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.055	1.037		2.28	2.32	-1.7	30.0
8:2 FTS	AveID	15.14	13.99		2.21	2.40	-7.6	30.0
Perfluorononanesulfonic acid	AveID	0.6458	0.6431		2.39	2.40	-0.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	2.964	3.083		2.60	2.50	4.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.138	1.125		2.47	2.50	-1.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9938	1.056		2.66	2.50	6.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8133	0.8680		2.57	2.41	6.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9299	0.8863		2.38	2.50	-4.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8971	0.8822		2.46	2.50	-1.7	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.008	0.9891		2.45	2.50	-1.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8023	0.8369		2.61	2.50	4.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1614	0.1561		2.42	2.50	-3.3	30.0
13C4 PFBA	Ave	0.9623	0.9375		2.44	2.50	-2.6	30.0
13C5 PFPeA	Ave	0.8584	0.8645		2.52	2.50	0.7	30.0
13C3-PFBS	Ave	0.0113	0.0114		2.36	2.33	1.5	30.0
13C2 PFHxA	Ave	0.9075	0.9057		2.49	2.50	-0.2	30.0
13C4-PFHpA	Ave	1.082	1.059		2.45	2.50	-2.2	30.0
18O2 PFHxS	Ave	0.6655	0.6825		2.43	2.37	2.5	30.0
M2-6:2FTS	Ave	0.1063	0.1006		2.25	2.38	-5.4	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Lab Sample ID: CCV 320-246405/4 Calibration Date: 09/18/2018 00:25

Instrument ID: A9 Calib Start Date: 08/28/2018 10:20

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/28/2018 11:05

Lab File ID: 2018.09.17_LLB_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	1.008	1.018		2.53	2.50	1.0	30.0
13C4 PFOS	Ave	0.7151	0.6945		2.32	2.39	-2.9	30.0
13C5 PFNA	Ave	0.9437	0.9247		2.45	2.50	-2.0	30.0
13C8 FOSA	Ave	0.3783	0.3626		2.40	2.50	-4.2	30.0
M2-8:2FTS	Ave	0.0156	0.0157		2.40	2.40	0.0	30.0
13C2 PFDA	Ave	0.9426	0.9408		2.50	2.50	-0.2	30.0
d3-NMeFOSAA	Ave	0.4249	0.4033		2.37	2.50	-5.1	30.0
d5-NEtFOSAA	Ave	0.3342	0.3478		2.60	2.50	4.1	30.0
13C2 PFUnA	Ave	0.8023	0.8305		2.59	2.50	3.5	30.0
13C2 PFDoA	Ave	0.9759	0.9264		2.37	2.50	-5.1	30.0
13C2-PFTeDA	Ave	0.7774	0.7991		2.57	2.50	2.8	30.0
13C2-PFHxDA	Ave	0.7882	0.7897		2.50	2.50	0.2	30.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-245884/2

Matrix: Water Lab File ID: 2018.09.16_LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 09/16/2018 13:53

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245884 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	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 M	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 M	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)	0.00684	J M	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 M	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.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-245884/2

Matrix: Water Lab File ID: 2018.09.16_LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 09/16/2018 13:53

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 245884 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	90		50-150
STL00992	13C4 PFBA	91		50-150
STL01893	13C5 PFPeA	91		50-150
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	95		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	90		50-150
STL00996	13C2 PFDA	101		50-150
STL00997	13C2 PFUnA	100		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	96		50-150
STL02116	13C2-PFTeDA	90		50-150
STL00991	13C4 PFOS	94		50-150
STL02337	13C3-PFBS	92		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-246099/2

Matrix: Water Lab File ID: 2018.09.17_LLB_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 09/17/2018 18:09

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 246099 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	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	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U M	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U M	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)	0.00721	J M	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 M	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 M	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-246099/2

Matrix: Water Lab File ID: 2018.09.17_LLB_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 09/17/2018 18:09

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 246099 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	100		50-150
STL00993	13C2 PFHxA	96		50-150
STL01892	13C4-PFHpA	100		50-150
STL00990	13C4 PFOA	98		50-150
STL00995	13C5 PFNA	101		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	99		50-150
STL00998	13C2 PFDoA	99		50-150
STL00994	18O2 PFHxS	102		50-150
STL02116	13C2-PFTeDA	98		50-150
STL00991	13C4 PFOS	98		50-150
STL02337	13C3-PFBS	93		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: ICB 320-242499/9

Matrix: Water Lab File ID: 2018.08.28LLICALA_012.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/28/2018 11:13

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 242499 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	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	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)	0.00753	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.: 320-42924-1

SDG No.:

Client Sample ID: Lab Sample ID: ICB 320-242499/9

Matrix: Water Lab File ID: 2018.08.28LLICALA_012.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/28/2018 11:13

Con. Extract Vol.: Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 242499 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	92		50-150
STL00992	13C4 PFBA	95		50-150
STL01893	13C5 PFPeA	94		50-150
STL00993	13C2 PFHxA	92		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	96		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	18O2 PFHxS	93		50-150
STL02116	13C2-PFTeDA	88		50-150
STL00991	13C4 PFOS	97		50-150
STL02337	13C3-PFBS	93		50-150

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-42924-1

SDG No.:

Batch Number: 245574 Batch Start Date: 09/14/18 08:20 Batch Analyst: Vang, Mai Neng

Batch Method: 3535 Batch End Date: 09/14/18 16:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00103	LCPFC-IS 00082
MB 320-245574/1		3535, EPA 537 (Mod)				250.00 mL	10.00 mL	500 uL	500 uL
LCS 320-245574/2		3535, EPA 537 (Mod)				250.00 mL	10.00 mL	500 uL	500 uL
LCSD 320-245574/3		3535, EPA 537 (Mod)				250.00 mL	10.00 mL	500 uL	500 uL
320-42924-A-1	TP-PFC-033-TPI	3535, EPA 537 (Mod)	T	329.38 g	27.98 g	301.4 mL	10.00 mL	500 uL	500 uL
320-42924-A-2	TP-PFC-033-MID CARBON	3535, EPA 537 (Mod)	T	327.39 g	27.72 g	299.7 mL	10.00 mL	500 uL	500 uL
320-42924-A-3	TP-PFC-033-TPE	3535, EPA 537 (Mod)	T	334.27 g	28.49 g	305.8 mL	10.00 mL	500 uL	500 uL
320-42924-A-4	TP-PFC-033-TPE-D	3535, EPA 537 (Mod)	T	334.54 g	27.40 g	307.1 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00181					
MB 320-245574/1		3535, EPA 537 (Mod)							
LCS 320-245574/2		3535, EPA 537 (Mod)		500 uL					
LCSD 320-245574/3		3535, EPA 537 (Mod)		500 uL					
320-42924-A-1	TP-PFC-033-TPI	3535, EPA 537 (Mod)	T						
320-42924-A-2	TP-PFC-033-MID CARBON	3535, EPA 537 (Mod)	T						
320-42924-A-3	TP-PFC-033-TPE	3535, EPA 537 (Mod)	T						
320-42924-A-4	TP-PFC-033-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.: 320-42924-1

SDG No.:

Batch Number: 245574 Batch Start Date: 09/14/18 08:20 Batch Analyst: Vang, Mai Neng

Batch Method: 3535 Batch End Date: 09/14/18 16:30

Batch Notes	
Analyst ID - Aliquot Step	MNV
Balance ID	QA-078
Batch Comment	Client labels match TA label, MNV 09/14/18. Envi carb: 103370
Analyst ID - Final Volume Step	MNV
H2O ID	09/13/18
Hexane ID	1347702
Internal Standard ID#	1346857
Manifold ID	F
Methanol ID	1364330
Sodium Hydroxide ID	1364157
Pipette ID	I46345G
Analyst ID - Reagent Drop	MNV
Analyst ID - IS Reagent Drop	MNV
Analyst ID - IS Reagent Drop Witness	KJP
Analyst ID - SU Reagent Drop	MNV
Analyst ID - SU Reagent Drop Witness	KJP
Solvent Lot #	1362573
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	500mg
Solid Phase Extraction Disk ID	003938109A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	BRUNSWICK_NAS	320-42924-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-033-TPE-D	Ground water	Field duplicate	6-Sep-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-42924-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-033-TPE	Ground water	Normal (Regular)	6-Sep-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-42924-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-033-TPI	Ground water	Normal (Regular)	6-Sep-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-42924-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-033-MID CARBON	Ground water	Normal (Regular)	6-Sep-18	537	Perfluoroalkyl Compounds