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NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, Sample Location Report, SDG 320-47998-1

MCAS
Tustin, CA
April 2021

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-41998-1
Client Project/Site: PFAS, Tustin

For:
Wood E&I Solutions Inc
9210 Sky Park Court
Suite 100
San Diego, California 92123

Attn: Kelli Miller

Authorized for release by:
8/13/2018 1:24:27 PM
David Alltucker, Project Manager I
(916)374-4383
david.alltucker@testamericainc.com

Designee for

Jill Kellmann, Manager of Project Management
(916)374-4402
jill.kellmann@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

LCMS

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Undetected at the Limit of Detection.
M	Manual integrated compound.
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

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 ID: 320-41998-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative
320-41998-1

Receipt
The samples were received on 8/10/2018 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.4° C.

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 Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) associated with the following samples exceeded the instrument calibration range: TW03S-20180713 (320-41998-3), TW03S-20180713 (320-41998-3[MS]), TW03S-20180713 (320-41998-3[MSD]) and TW04S-20180713 (320-41998-4). 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): Due to the high concentration of Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-239407 and analytical batch 320-239432 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) EPA 537 (Mod): The matrix spike (MS) recovery of Perfluorobutanesulfonic acid (PFBS) for preparation batch 320-239407 and analytical batch 320-239460 was outside control limits. Sample non-homogeneity was suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. PFBS was in control in the undiluted extract. Both sets of data were reported.

Method(s) EPA 537 (Mod): Results for sample I012MW07S-20180713 (320-41998-7) was reported from the analysis of a diluted extract due to high concentration of target analytes 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: The following samples: TW01S-20180713 (320-41998-1), TW02S-20180713 (320-41998-2), TW03S-20180713 (320-41998-3), TW03S-20180713 (320-41998-3[MS]), TW03S-20180713 (320-41998-3[MSD]), TW04S-20180713 (320-41998-4) and DUP02-20180713 (320-41998-5) in preparation batch 320-239407 were observed to contain sediment prior to extraction.

Method(s) 3535: The following samples were received to the laboratory outside of preparation holding time: TW01S-20180713 (320-41998-1), TW02S-20180713 (320-41998-2), TW03S-20180713 (320-41998-3), TW04S-20180713 (320-41998-4), DUP02-20180713 (320-41998-5), EB02-20180713 (320-41998-6) and I012MW07S-20180713 (320-41998-7).

Method(s) 3535: The samples were treated as AFFF samples, and were prepped at the 125,000,000x dilution and a 125,000x dilution to be cautious. Therefore, the initial volume(s) used for the following samples deviated from the standard procedure: TW01S-20180713 (320-41998-1), TW02S-20180713 (320-41998-2), TW03S-20180713 (320-41998-3), TW04S-20180713 (320-41998-4), DUP02-20180713 (320-41998-5), EB02-20180713 (320-41998-6) and I012MW07S-20180713 (320-41998-7). The reporting limits (RLs) have been adjusted proportionately.

Method(s) 3535: The labeled extraction standards (IDA; isotope dilution standards) are fortified into the sample prior to extraction. The following samples: TW01S-20180713 (320-41998-1), TW02S-20180713 (320-41998-2), TW04S-20180713 (320-41998-4) and DUP02-20180713 (320-41998-5) had non-settleable particulate matter which plugged the SPE extraction disk prior to the default 250 mL aliquot of sample passing through. As a result, the amount of IDA fortified into these samples was adjusted so data calculations of IDA recovery are based upon the actual reduced volume, and therefore IDA mass, that was filtered. The reporting limit has been elevated proportionally.

Job ID: 320-41998-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

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

Detection Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: TW01S-20180713 — Lab Sample ID: 320-41998-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.18	H	0.0024	0.00056	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.090	H	0.0024	0.00073	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.40	M H	0.0024	0.00064	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.0043	M H	0.0024	0.00062	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.041	H	0.0024	0.00055	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.16	H	0.0024	0.00045	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.098	H	0.0048	0.0013	ug/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TW02S-20180713 — Lab Sample ID: 320-41998-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.12	H	0.0031	0.00072	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.039	H	0.0031	0.00094	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.59	M H	0.0031	0.00083	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.027	H	0.0031	0.00071	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.078	H	0.0031	0.00059	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.041	H	0.0062	0.0017	ug/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TW03S-20180713 — Lab Sample ID: 320-41998-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.23	H J1 M	0.0018	0.00042	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.084	H	0.0018	0.00055	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.41	H J1 M	0.0018	0.00048	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.0035	H	0.0018	0.00047	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.051	H	0.0018	0.00041	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.22	H	0.0018	0.00034	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.59	H J1	0.0036	0.00098	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	0.24	H D	0.0089	0.0021	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.085	H D	0.0089	0.0027	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.47	J1 H D M	0.0089	0.0024	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.0035	J H D	0.0089	0.0023	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.051	H D J1	0.0089	0.0021	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	0.23	H D	0.0089	0.0017	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	0.67	H J1 D	0.018	0.0049	ug/L	5		EPA 537 (Mod)	Total/NA

Client Sample ID: TW04S-20180713 — Lab Sample ID: 320-41998-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.30	H	0.0023	0.00053	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.12	H	0.0023	0.00069	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.52	M J1 H	0.0023	0.00061	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.0056	M H	0.0023	0.00059	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.072	H	0.0023	0.00052	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.37	H	0.0023	0.00043	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.60	J1 H	0.0045	0.0012	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	0.32	H D	0.011	0.0027	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.13	H D	0.011	0.0035	ug/L	5		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample ID: TW04S-20180713 (Continued) — Lab Sample ID: 320-41998-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA) - DL	0.60	H D M	0.011	0.0031	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.0059	J H D M	0.011	0.0029	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.078	H D	0.011	0.0026	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	0.43	H D	0.011	0.0022	ug/L	5		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	0.65	H D	0.023	0.0062	ug/L	5		EPA 537 (Mod)	Total/NA

Client Sample ID: DUP02-20180713 — Lab Sample ID: 320-41998-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.12	H	0.0030	0.00070	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.038	H	0.0030	0.00091	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	0.53	M H	0.0030	0.00080	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.00093	J M H	0.0030	0.00077	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.00088	J H	0.0030	0.00077	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.0015	J H	0.0060	0.0012	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.025	H	0.0030	0.00069	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.078	H	0.0030	0.00057	ug/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.040	H	0.0060	0.0016	ug/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: EB02-20180713 — Lab Sample ID: 320-41998-6

No Detections.

Client Sample ID: I012MW07S-20180713 — Lab Sample ID: 320-41998-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	12	H J1 D	0.018	0.0042	ug/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.4	H J1 D	0.018	0.0054	ug/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	17	H J1 D M	0.018	0.0048	ug/L	10		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	0.054	H D M	0.018	0.0046	ug/L	10		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.3	H J1 D	0.018	0.0041	ug/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	17	H J1 D	0.018	0.0034	ug/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	13	H J1 D	0.035	0.0097	ug/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	18	H D	0.18	0.042	ug/L	100		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	4.9	H D	0.18	0.054	ug/L	100		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	33	H D M	0.18	0.048	ug/L	100		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.057	J H D	0.18	0.046	ug/L	100		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	4.8	H D	0.18	0.041	ug/L	100		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	31	H D	0.18	0.034	ug/L	100		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	13	H D	0.35	0.097	ug/L	100		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TW01S-20180713

Lab Sample ID: 320-41998-1

Date Collected: 07/13/18 09:50

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.18**	**H**	0.0024	0.00056	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluoroheptanoic acid (PFHpA)	**0.090**	**H**	0.0024	0.00073	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorooctanoic acid (PFOA)	**0.40**	**M H**	0.0024	0.00064	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorononanoic acid (PFNA)	**0.0043**	**M H**	0.0024	0.00062	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorodecanoic acid (PFDA)	0.0012	U H	0.0024	0.00057	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluoroundecanoic acid (PFUnA)	0.0018	U H	0.0024	0.00086	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorododecanoic acid (PFDoA)	0.0018	U H	0.0024	0.00062	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorotridecanoic Acid (PFTriA)	0.0036	U H	0.0048	0.00091	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorotetradecanoic acid (PFTeA)	0.0036	U M H	0.0048	0.00099	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorobutanesulfonic acid (PFBS)	**0.041**	**H**	0.0024	0.00055	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorohexanesulfonic acid (PFHxS)	**0.16**	**H**	0.0024	0.00045	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorooctanesulfonic acid (PFOS)	**0.098**	**H**	0.0048	0.0013	ug/L		08/11/18 09:18	08/11/18 20:59	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.012	U H	0.024	0.0036	ug/L		08/11/18 09:18	08/11/18 20:59	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.012	U H	0.024	0.0033	ug/L		08/11/18 09:18	08/11/18 20:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C4-PFHpA	*96*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C4 PFOA	*100*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C5 PFNA	*109*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C2 PFDA	*101*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C2 PFUnA	*86*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C2 PFDoA	*78*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
18O2 PFHxS	*94*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C2-PFTeDA	*74*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C4 PFOS	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C3-PFBS	*95*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
d5-NEtFOSAA	*91*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
d3-NMeFOSAA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*

Client Sample ID: TW02S-20180713

Lab Sample ID: 320-41998-2

Date Collected: 07/13/18 11:50

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.12**	**H**	0.0031	0.00072	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluoroheptanoic acid (PFHpA)	**0.039**	**H**	0.0031	0.00094	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorooctanoic acid (PFOA)	**0.59**	**M H**	0.0031	0.00083	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorononanoic acid (PFNA)	0.0023	U M H	0.0031	0.00080	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorodecanoic acid (PFDA)	0.0015	U H	0.0031	0.00074	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluoroundecanoic acid (PFUnA)	0.0023	U H	0.0031	0.0011	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorododecanoic acid (PFDoA)	0.0023	U H	0.0031	0.00080	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorotridecanoic Acid (PFTriA)	0.0046	U H	0.0062	0.0012	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorotetradecanoic acid (PFTeA)	0.0046	U H	0.0062	0.0013	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorobutanesulfonic acid (PFBS)	**0.027**	**H**	0.0031	0.00071	ug/L		08/11/18 09:18	08/11/18 21:07	1

Client Sample ID: TW02S-20180713

Lab Sample ID: 320-41998-2

Date Collected: 07/13/18 11:50

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	**0.078**	**H**	0.0031	0.00059	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorooctanesulfonic acid (PFOS)	**0.041**	**H**	0.0062	0.0017	ug/L		08/11/18 09:18	08/11/18 21:07	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.015	U H	0.031	0.0046	ug/L		08/11/18 09:18	08/11/18 21:07	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.015	U H	0.031	0.0043	ug/L		08/11/18 09:18	08/11/18 21:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C4-PFHpA	*102*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C4 PFOA	*100*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C5 PFNA	*116*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C2 PFDA	*99*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C2 PFUnA	*84*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C2 PFDoA	*72*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
18O2 PFHxS	*90*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C2-PFTeDA	*72*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C4 PFOS	*87*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C3-PFBS	*84*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
d5-NEtFOSAA	*84*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
d3-NMeFOSAA	*84*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*

Client Sample ID: TW03S-20180713

Lab Sample ID: 320-41998-3

Date Collected: 07/13/18 13:30

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.23**	**H J1 M**	0.0018	0.00042	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluoroheptanoic acid (PFHpA)	**0.084**	**H**	0.0018	0.00055	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorooctanoic acid (PFOA)	**0.41**	**H J1 M**	0.0018	0.00048	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorononanoic acid (PFNA)	**0.0035**	**H**	0.0018	0.00047	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorodecanoic acid (PFDA)	0.00089	U H M	0.0018	0.00043	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluoroundecanoic acid (PFUnA)	0.0013	U H	0.0018	0.00064	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorododecanoic acid (PFDoA)	0.0013	U H	0.0018	0.00047	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0036	0.00068	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0036	0.00074	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorobutanesulfonic acid (PFBS)	**0.051**	**H**	0.0018	0.00041	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorohexanesulfonic acid (PFHxS)	**0.22**	**H**	0.0018	0.00034	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorooctanesulfonic acid (PFOS)	**0.59**	**H J1**	0.0036	0.00098	ug/L		08/11/18 09:18	08/11/18 21:14	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0089	U H M	0.018	0.0027	ug/L		08/11/18 09:18	08/11/18 21:14	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0089	U H	0.018	0.0025	ug/L		08/11/18 09:18	08/11/18 21:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:14*	*1*
13C4-PFHpA	*97*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:14*	*1*

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: TW03S-20180713
Date Collected: 07/13/18 13:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-3
Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	98		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C5 PFNA	99		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C2 PFDA	107		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C2 PFUnA	103		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C2 PFDoA	108		50 - 150	08/11/18 09:18	08/11/18 21:14	1
18O2 PFHxS	90		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C2-PFTeDA	117		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C4 PFOS	88		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C3-PFBS	84		50 - 150	08/11/18 09:18	08/11/18 21:14	1
d5-NEtFOSAA	102		50 - 150	08/11/18 09:18	08/11/18 21:14	1
d3-NMeFOSAA	108		50 - 150	08/11/18 09:18	08/11/18 21:14	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
Perfluorohexanoic acid (PFHxA)	**0.24**	**H D**	0.0089	0.0021	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluoroheptanoic acid (PFHpA)	**0.085**	**H D**	0.0089	0.0027	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorooctanoic acid (PFOA)	**0.47**	**J1 H D M**	0.0089	0.0024	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorononanoic acid (PFNA)	**0.0035**	**J H D**	0.0089	0.0023	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorodecanoic acid (PFDA)	0.0045	U H	0.0089	0.0021	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluoroundecanoic acid (PFUnA)	0.0067	U H	0.0089	0.0032	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorododecanoic acid (PFDoA)	0.0067	U H	0.0089	0.0023	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorotridecanoic Acid (PFTriA)	0.013	U H	0.018	0.0034	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorotetradecanoic acid (PFTeA)	0.013	U H	0.018	0.0037	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorobutanesulfonic acid (PFBS)	**0.051**	**H D J1**	0.0089	0.0021	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorohexanesulfonic acid (PFHxS)	**0.23**	**H D**	0.0089	0.0017	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorooctanesulfonic acid (PFOS)	**0.67**	**H J1 D**	0.018	0.0049	ug/L		08/11/18 09:18	08/12/18 11:03	5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.045	U H	0.089	0.013	ug/L		08/11/18 09:18	08/12/18 11:03	5
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.045	U H	0.089	0.013	ug/L		08/11/18 09:18	08/12/18 11:03	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	82		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C4-PFHpA	95		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C4 PFOA	94		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C5 PFNA	101		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C2 PFDA	94		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C2 PFUnA	88		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C2 PFDoA	83		50 - 150	08/11/18 09:18	08/12/18 11:03	5
18O2 PFHxS	80		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C2-PFTeDA	89		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C4 PFOS	82		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C3-PFBS	73		50 - 150	08/11/18 09:18	08/12/18 11:03	5
d5-NEtFOSAA	102		50 - 150	08/11/18 09:18	08/12/18 11:03	5
d3-NMeFOSAA	98		50 - 150	08/11/18 09:18	08/12/18 11:03	5

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: TW04S-20180713
Date Collected: 07/13/18 14:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-4
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
Perfluorohexanoic acid (PFHxA)	**0.30**	**H**	0.0023	0.00053	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluoroheptanoic acid (PFHpA)	**0.12**	**H**	0.0023	0.00069	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorooctanoic acid (PFOA)	**0.52**	**M J1 H**	0.0023	0.00061	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorononanoic acid (PFNA)	**0.0056**	**M H**	0.0023	0.00059	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorodecanoic acid (PFDA)	0.0011	U H	0.0023	0.00054	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluoroundecanoic acid (PFUnA)	0.0017	U H	0.0023	0.00081	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorododecanoic acid (PFDoA)	0.0017	U H	0.0023	0.00059	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorotridecanoic Acid (PFTriA)	0.0034	U H	0.0045	0.00086	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorotetradecanoic acid (PFTeA)	0.0034	U H	0.0045	0.00094	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorobutanesulfonic acid (PFBS)	**0.072**	**H**	0.0023	0.00052	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorohexanesulfonic acid (PFHxS)	**0.37**	**H**	0.0023	0.00043	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorooctanesulfonic acid (PFOS)	**0.60**	**J1 H**	0.0045	0.0012	ug/L		08/11/18 09:18	08/11/18 21:37	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.011	U H	0.023	0.0034	ug/L		08/11/18 09:18	08/11/18 21:37	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.011	U M H	0.023	0.0032	ug/L		08/11/18 09:18	08/11/18 21:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C4-PFHpA	*97*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C4 PFOA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C5 PFNA	*96*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C2 PFDA	*100*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C2 PFUnA	*89*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C2 PFDoA	*82*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
18O2 PFHxS	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C2-PFTeDA	*83*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C4 PFOS	*79*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C3-PFBS	*87*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
d5-NEtFOSAA	*92*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
d3-NMeFOSAA	*89*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*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
Perfluorohexanoic acid (PFHxA)	**0.32**	**H D**	0.011	0.0027	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluoroheptanoic acid (PFHpA)	**0.13**	**H D**	0.011	0.0035	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorooctanoic acid (PFOA)	**0.60**	**H D M**	0.011	0.0031	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorononanoic acid (PFNA)	**0.0059**	**J H D M**	0.011	0.0029	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorodecanoic acid (PFDA)	0.0057	U H	0.011	0.0027	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluoroundecanoic acid (PFUnA)	0.0085	U H	0.011	0.0041	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorododecanoic acid (PFDoA)	0.0085	U H	0.011	0.0029	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorotridecanoic Acid (PFTriA)	0.017	U H	0.023	0.0043	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorotetradecanoic acid (PFTeA)	0.017	U H	0.023	0.0047	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorobutanesulfonic acid (PFBS)	**0.078**	**H D**	0.011	0.0026	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorohexanesulfonic acid (PFHxS)	**0.43**	**H D**	0.011	0.0022	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorooctanesulfonic acid (PFOS)	**0.65**	**H D**	0.023	0.0062	ug/L		08/11/18 09:18	08/12/18 11:25	5

Client Sample ID: TW04S-20180713

Lab Sample ID: 320-41998-4
Date Collected: 07/13/18 14:30
Matrix: Water
Date Received: 08/10/18 09:50

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
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.057	U H	0.11	0.017	ug/L		08/11/18 09:18	08/12/18 11:25	5
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.057	U H	0.11	0.016	ug/L		08/11/18 09:18	08/12/18 11:25	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C4-PFHpA	*99*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C4 PFOA	*101*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C5 PFNA	*97*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C2 PFDA	*94*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C2 PFUnA	*78*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C2 PFDoA	*74*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
18O2 PFHxS	*84*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C2-PFTeDA	*73*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C4 PFOS	*77*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C3-PFBS	*74*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
d5-NEtFOSAA	*82*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
d3-NMeFOSAA	*88*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*

Client Sample ID: DUP02-20180713

Lab Sample ID: 320-41998-5
Date Collected: 07/13/18 00:00
Matrix: Water
Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.12**	**H**	0.0030	0.00070	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluoroheptanoic acid (PFHpA)	**0.038**	**H**	0.0030	0.00091	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorooctanoic acid (PFOA)	**0.53**	**M H**	0.0030	0.00080	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorononanoic acid (PFNA)	**0.00093**	**J M H**	0.0030	0.00077	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorodecanoic acid (PFDA)	0.0015	U H	0.0030	0.00072	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluoroundecanoic acid (PFUnA)	0.0022	U H	0.0030	0.0011	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorododecanoic acid (PFDoA)	**0.00088**	**J H**	0.0030	0.00077	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorotridecanoic Acid (PFTriA)	0.0045	U H	0.0060	0.0011	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorotetradecanoic acid (PFTeA)	**0.0015**	**J H**	0.0060	0.0012	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorobutanesulfonic acid (PFBS)	**0.025**	**H**	0.0030	0.00069	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorohexanesulfonic acid (PFHxS)	**0.078**	**H**	0.0030	0.00057	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorooctanesulfonic acid (PFOS)	**0.040**	**H**	0.0060	0.0016	ug/L		08/11/18 09:18	08/11/18 21:44	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.015	U H	0.030	0.0045	ug/L		08/11/18 09:18	08/11/18 21:44	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.015	U M H	0.030	0.0042	ug/L		08/11/18 09:18	08/11/18 21:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:44*	*1*
13C4-PFHpA	*99*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:44*	*1*
13C4 PFOA	*107*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:44*	*1*
13C5 PFNA	*105*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:44*	*1*

Client Sample ID: DUP02-20180713

Lab Sample ID: 320-41998-5

Date Collected: 07/13/18 00:00

Matrix: Water

Date Received: 08/10/18 09:50

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C2 PFUnA	75		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C2 PFDoA	74		50 - 150	08/11/18 09:18	08/11/18 21:44	1
18O2 PFHxS	91		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C2-PFTeDA	91		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C4 PFOS	85		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C3-PFBS	90		50 - 150	08/11/18 09:18	08/11/18 21:44	1
d5-NEtFOSAA	85		50 - 150	08/11/18 09:18	08/11/18 21:44	1
d3-NMeFOSAA	81		50 - 150	08/11/18 09:18	08/11/18 21:44	1

Client Sample ID: EB02-20180713

Lab Sample ID: 320-41998-6

Date Collected: 07/13/18 15:45

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.00091	U H	0.0018	0.00043	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluoroheptanoic acid (PFHpA)	0.0014	U H	0.0018	0.00056	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorooctanoic acid (PFOA)	0.0014	U M H	0.0018	0.00049	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorononanoic acid (PFNA)	0.0014	U H	0.0018	0.00047	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorodecanoic acid (PFDA)	0.00091	U H	0.0018	0.00044	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluoroundecanoic acid (PFUnA)	0.0014	U H	0.0018	0.00066	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorododecanoic acid (PFDoA)	0.0014	U H	0.0018	0.00047	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0037	0.00069	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0037	0.00076	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorobutanesulfonic acid (PFBS)	0.00091	U H	0.0018	0.00042	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorohexanesulfonic acid (PFHxS)	0.00091	U M H	0.0018	0.00035	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorooctanesulfonic acid (PFOS)	0.0027	U H	0.0037	0.0010	ug/L		08/11/18 09:18	08/11/18 22:07	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0091	U H	0.018	0.0027	ug/L		08/11/18 09:18	08/11/18 22:07	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0091	U H	0.018	0.0026	ug/L		08/11/18 09:18	08/11/18 22:07	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	84		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C4-PFHpA	88		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C4 PFOA	99		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C5 PFNA	103		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C2 PFDA	97		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C2 PFUnA	98		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C2 PFDoA	95		50 - 150	08/11/18 09:18	08/11/18 22:07	1
18O2 PFHxS	75		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C2-PFTeDA	93		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C4 PFOS	82		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C3-PFBS	76		50 - 150	08/11/18 09:18	08/11/18 22:07	1
d5-NEtFOSAA	97		50 - 150	08/11/18 09:18	08/11/18 22:07	1
d3-NMeFOSAA	99		50 - 150	08/11/18 09:18	08/11/18 22:07	1

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: I012MW07S-20180713
Date Collected: 07/13/18 15:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-7
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
Perfluorohexanoic acid (PFHxA)	**12**	**H J1 D**	0.018	0.0042	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluoroheptanoic acid (PFHpA)	**4.4**	**H J1 D**	0.018	0.0054	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorooctanoic acid (PFOA)	**17**	**H J1 D M**	0.018	0.0048	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorononanoic acid (PFNA)	**0.054**	**H D M**	0.018	0.0046	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorodecanoic acid (PFDA)	0.0088	U H	0.018	0.0042	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluoroundecanoic acid (PFUnA)	0.013	U H	0.018	0.0064	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorododecanoic acid (PFDoA)	0.013	U H	0.018	0.0046	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorotridecanoic Acid (PFTriA)	0.027	U H	0.035	0.0067	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorotetradecanoic acid (PFTeA)	0.027	U H	0.035	0.0073	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorobutanesulfonic acid (PFBS)	**3.3**	**H J1 D**	0.018	0.0041	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorohexanesulfonic acid (PFHxS)	**17**	**H J1 D**	0.018	0.0034	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorooctanesulfonic acid (PFOS)	**13**	**H J1 D**	0.035	0.0097	ug/L		08/11/18 09:18	08/13/18 09:44	10
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.088	U H	0.18	0.027	ug/L		08/11/18 09:18	08/13/18 09:44	10
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.088	U H	0.18	0.025	ug/L		08/11/18 09:18	08/13/18 09:44	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*75*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C4-PFHpA	*56*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C4 PFOA	*67*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C5 PFNA	*85*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C2 PFDA	*93*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C2 PFUnA	*89*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C2 PFDoA	*88*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
18O2 PFHxS	*73*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C2-PFTeDA	*89*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C4 PFOS	*70*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C3-PFBS	*124*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
d5-NEtFOSAA	*99*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
d3-NMeFOSAA	*106*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**18**	**H D**	0.18	0.042	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluoroheptanoic acid (PFHpA)	**4.9**	**H D**	0.18	0.054	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorooctanoic acid (PFOA)	**33**	**H D M**	0.18	0.048	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorononanoic acid (PFNA)	**0.057**	**J H D**	0.18	0.046	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorodecanoic acid (PFDA)	0.088	U H	0.18	0.042	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluoroundecanoic acid (PFUnA)	0.13	U H	0.18	0.064	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorododecanoic acid (PFDoA)	0.13	U H	0.18	0.046	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorotridecanoic Acid (PFTriA)	0.27	U H	0.35	0.067	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorotetradecanoic acid (PFTeA)	0.27	U H	0.35	0.073	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorobutanesulfonic acid (PFBS)	**4.8**	**H D**	0.18	0.041	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorohexanesulfonic acid (PFHxS)	**31**	**H D**	0.18	0.034	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorooctanesulfonic acid (PFOS)	**13**	**H D**	0.35	0.097	ug/L		08/11/18 09:18	08/13/18 09:36	100

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: I012MW07S-20180713
Date Collected: 07/13/18 15:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-7
Matrix: Water

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
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.88	U H	1.8	0.27	ug/L		08/11/18 09:18	08/13/18 09:36	100
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.88	U H M	1.8	0.25	ug/L		08/11/18 09:18	08/13/18 09:36	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*67*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C4-PFHpA	*57*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C4 PFOA	*66*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C5 PFNA	*69*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C2 PFDA	*68*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C2 PFUnA	*63*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C2 PFDoA	*55*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
18O2 PFHxS	*60*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C2-PFTeDA	*63*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C4 PFOS	*63*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C3-PFBS	*94*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
d5-NEtFOSAA	*104*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
d3-NMeFOSAA	*92*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*

Isotope Dilution Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

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

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (50-150)	PFHpA (50-150)	PFOA (50-150)	PFNA (50-150)	PFDA (50-150)	PFUnA (50-150)	PFDoA (50-150)	PFHxS (50-150)
320-41998-1	TW01S-20180713	93	96	100	109	101	86	78	94
320-41998-2	TW02S-20180713	97	102	100	116	99	84	72	90
320-41998-3	TW03S-20180713	92	97	98	99	107	103	108	90
320-41998-3 - DL	TW03S-20180713	82	95	94	101	94	88	83	80
320-41998-3 MS	TW03S-20180713	90	97	97	98	102	95	102	90
320-41998-3 MS - DL	TW03S-20180713	88	97	99	99	104	95	89	83
320-41998-3 MSD	TW03S-20180713	86	91	90	97	97	89	96	84
320-41998-3 MSD - DL	TW03S-20180713	82	93	97	89	95	86	87	79
320-41998-4	TW04S-20180713	90	97	93	96	100	89	82	88
320-41998-4 - DL	TW04S-20180713	88	99	101	97	94	78	74	84
320-41998-5	DUP02-20180713	96	99	107	105	103	75	74	91
320-41998-6	EB02-20180713	84	88	99	103	97	98	95	75
320-41998-7 - DL	I012MW07S-20180713	67	57	66	69	68	63	55	60
320-41998-7	I012MW07S-20180713	75	56	67	85	93	89	88	73
LCS 320-239407/2-A	Lab Control Sample	80	87	93	96	97	90	94	73
MB 320-239407/1-A	Method Blank	88	88	93	95	94	88	93	83

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFTDA (50-150)	PFOS (50-150)	3C3-PFBS (50-150)	-NEtFOSA (50-150)	-NMeFOSA (50-150)			
320-41998-1	TW01S-20180713	74	88	95	91	93			
320-41998-2	TW02S-20180713	72	87	84	84	84			
320-41998-3	TW03S-20180713	117	88	84	102	108			
320-41998-3 - DL	TW03S-20180713	89	82	73	102	98			
320-41998-3 MS	TW03S-20180713	109	87	86	103	108			
320-41998-3 MS - DL	TW03S-20180713	89	85	76	103	103			
320-41998-3 MSD	TW03S-20180713	101	81	83	94	98			
320-41998-3 MSD - DL	TW03S-20180713	82	80	72	89	95			
320-41998-4	TW04S-20180713	83	79	87	92	89			
320-41998-4 - DL	TW04S-20180713	73	77	74	82	88			
320-41998-5	DUP02-20180713	91	85	90	85	81			
320-41998-6	EB02-20180713	93	82	76	97	99			
320-41998-7 - DL	I012MW07S-20180713	63	63	94	104	92			
320-41998-7	I012MW07S-20180713	89	70	124	99	106			
LCS 320-239407/2-A	Lab Control Sample	90	76	72	94	95			
MB 320-239407/1-A	Method Blank	93	83	80	92	102			

Surrogate Legend

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
d5-NEtFOSAA = d5-NEtFOSAA

Isotope Dilution Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

d3-NMeFOSAA = d3-NMeFOSAA

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

Lab Sample ID: MB 320-239407/1-A
Matrix: Water
Analysis Batch: 239432

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 239407

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.0010	U	0.0020	0.00047	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluoroheptanoic acid (PFHpA)	0.0015	U	0.0020	0.00061	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorooctanoic acid (PFOA)	0.0015	U	0.0020	0.00054	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorononanoic acid (PFNA)	0.0015	U	0.0020	0.00052	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorodecanoic acid (PFDA)	0.0010	U	0.0020	0.00048	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluoroundecanoic acid (PFUnA)	0.0015	U	0.0020	0.00072	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorododecanoic acid (PFDoA)	0.0015	U	0.0020	0.00052	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorotridecanoic Acid (PFTriA)	0.0030	U	0.0040	0.00076	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorotetradecanoic acid (PFTeA)	0.0030	U	0.0040	0.00083	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorobutanesulfonic acid (PFBS)	0.0010	U	0.0020	0.00046	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorohexanesulfonic acid (PFHxS)	0.0010	U	0.0020	0.00038	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U M	0.0040	0.0011	ug/L		08/11/18 09:18	08/11/18 20:44	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.010	U	0.020	0.0030	ug/L		08/11/18 09:18	08/11/18 20:44	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.010	U	0.020	0.0028	ug/L		08/11/18 09:18	08/11/18 20:44	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C4-PFHpA	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C4 PFOA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C5 PFNA	*95*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C2 PFDA	*94*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C2 PFUnA	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C2 PFDoA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
18O2 PFHxS	*83*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C2-PFTeDA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C4 PFOS	*83*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C3-PFBS	*80*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
d5-NEtFOSAA	*92*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
d3-NMeFOSAA	*102*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*

Lab Sample ID: LCS 320-239407/2-A
Matrix: Water
Analysis Batch: 239432

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.0400	0.0410		ug/L		103	83 - 109
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0424		ug/L		106	80 - 113
Perfluorooctanoic acid (PFOA)	0.0400	0.0381		ug/L		95	80 - 107
Perfluorononanoic acid (PFNA)	0.0400	0.0389		ug/L		97	83 - 113
Perfluorodecanoic acid (PFDA)	0.0400	0.0382		ug/L		95	85 - 113
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0380		ug/L		95	76 - 105
Perfluorododecanoic acid (PFDoA)	0.0400	0.0403		ug/L		101	87 - 116
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0379		ug/L		95	75 - 129
Perfluorotetradecanoic acid (PFTeA)	0.0400	0.0388		ug/L		97	82 - 115

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

Lab Sample ID: LCS 320-239407/2-A
Matrix: Water
Analysis Batch: 239432

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0362		ug/L		102	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0358	M	ug/L		98	81 - 106
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0366		ug/L		99	82 - 112
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0400	0.0393		ug/L		98	82 - 111
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0400	0.0413		ug/L		103	80 - 109

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*80*		*50 - 150*
13C4-PFHpA	*87*		*50 - 150*
13C4 PFOA	*93*		*50 - 150*
13C5 PFNA	*96*		*50 - 150*
13C2 PFDA	*97*		*50 - 150*
13C2 PFUnA	*90*		*50 - 150*
13C2 PFDoA	*94*		*50 - 150*
18O2 PFHxS	*73*		*50 - 150*
13C2-PFTeDA	*90*		*50 - 150*
13C4 PFOS	*76*		*50 - 150*
13C3-PFBS	*72*		*50 - 150*
d5-NEtFOSAA	*94*		*50 - 150*
d3-NMeFOSAA	*95*		*50 - 150*

Lab Sample ID: 320-41998-3 MS
Matrix: Water
Analysis Batch: 239432

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.23	H J1 M	0.0377	0.260	H 4	ug/L		75	83 - 109
Perfluoroheptanoic acid (PFHpA)	0.084	H	0.0377	0.119	H	ug/L		93	80 - 113
Perfluorooctanoic acid (PFOA)	0.41	H J1 M	0.0377	0.433	H J1 4 M	ug/L		62	80 - 107
Perfluorononanoic acid (PFNA)	0.0035	H	0.0377	0.0382	H	ug/L		92	83 - 113
Perfluorodecanoic acid (PFDA)	0.00089	U H M	0.0377	0.0379	H	ug/L		101	85 - 113
Perfluoroundecanoic acid (PFUnA)	0.0013	U H	0.0377	0.0379	H	ug/L		101	76 - 105
Perfluorododecanoic acid (PFDoA)	0.0013	U H	0.0377	0.0389	H	ug/L		103	87 - 116
Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0377	0.0394	H	ug/L		105	75 - 129
Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0377	0.0353	H	ug/L		94	82 - 115
Perfluorobutanesulfonic acid (PFBS)	0.051	H	0.0333	0.0823	H	ug/L		94	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	0.22	H	0.0343	0.247	H 4	ug/L		86	81 - 106
Perfluorooctanesulfonic acid (PFOS)	0.59	H J1	0.0350	0.600	H J1 4	ug/L		25	82 - 112

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

Lab Sample ID: 320-41998-3 MS — **Client Sample ID: TW03S-20180713**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 239432 — **Prep Batch: 239407**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0089	U H M	0.0377	0.0356	H	ug/L		94	82 - 111
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0089	U H	0.0377	0.0379	H	ug/L		101	80 - 109

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*90*		*50 - 150*
13C4-PFHpA	*97*		*50 - 150*
13C4 PFOA	*97*		*50 - 150*
13C5 PFNA	*98*		*50 - 150*
13C2 PFDA	*102*		*50 - 150*
13C2 PFUnA	*95*		*50 - 150*
13C2 PFDoA	*102*		*50 - 150*
18O2 PFHxS	*90*		*50 - 150*
13C2-PFTeDA	*109*		*50 - 150*
13C4 PFOS	*87*		*50 - 150*
13C3-PFBS	*86*		*50 - 150*
d5-NEtFOSAA	*103*		*50 - 150*
d3-NMeFOSAA	*108*		*50 - 150*

Lab Sample ID: 320-41998-3 MSD — **Client Sample ID: TW03S-20180713**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 239432 — **Prep Batch: 239407**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.23	H J1 M	0.0367	0.247	H 4	ug/L		43	83 - 109	5	30
Perfluoroheptanoic acid (PFHpA)	0.084	H	0.0367	0.117	H	ug/L		89	80 - 113	2	30
Perfluorooctanoic acid (PFOA)	0.41	H J1 M	0.0367	0.453	H J1 4 M	ug/L		117	80 - 107	4	30
Perfluorononanoic acid (PFNA)	0.0035	H	0.0367	0.0388	H	ug/L		96	83 - 113	2	30
Perfluorodecanoic acid (PFDA)	0.00089	U H M	0.0367	0.0369	H	ug/L		101	85 - 113	3	30
Perfluoroundecanoic acid (PFUnA)	0.0013	U H	0.0367	0.0364	H	ug/L		99	76 - 105	4	30
Perfluorododecanoic acid (PFDoA)	0.0013	U H	0.0367	0.0382	H	ug/L		104	87 - 116	2	30
Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0367	0.0370	H	ug/L		101	75 - 129	6	30
Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0367	0.0327	H	ug/L		89	82 - 115	7	30
Perfluorobutanesulfonic acid (PFBS)	0.051	H	0.0324	0.0805	H	ug/L		91	87 - 120	2	30
Perfluorohexanesulfonic acid (PFHxS)	0.22	H	0.0334	0.244	H 4	ug/L		82	81 - 106	1	30
Perfluorooctanesulfonic acid (PFOS)	0.59	H J1	0.0340	0.648	H J1 4	ug/L		167	82 - 112	8	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0089	U H M	0.0367	0.0362	H M	ug/L		99	82 - 111	2	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0089	U H	0.0367	0.0375	H	ug/L		102	80 - 109	1	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA	86		50 - 150
13C4-PFHpA	91		50 - 150
13C4 PFOA	90		50 - 150
13C5 PFNA	97		50 - 150
13C2 PFDA	97		50 - 150
13C2 PFUnA	89		50 - 150
13C2 PFDoA	96		50 - 150
18O2 PFHxS	84		50 - 150
13C2-PFTeDA	101		50 - 150
13C4 PFOS	81		50 - 150
13C3-PFBS	83		50 - 150
d5-NEtFOSAA	94		50 - 150
d3-NMeFOSAA	98		50 - 150

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

Lab Sample ID: 320-41998-3 MS
Matrix: Water
Analysis Batch: 239460

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA) - DL	0.24	H D	0.0377	0.275	H 4 D	ug/L		93	83 - 109
Perfluoroheptanoic acid (PFHpA) - DL	0.085	H D	0.0377	0.125	H D	ug/L		106	80 - 113
Perfluorooctanoic acid (PFOA) - DL	0.47	J1 H D M	0.0377	0.516	H 4 D M	ug/L		112	80 - 107
Perfluorononanoic acid (PFNA) - DL	0.0035	J H D	0.0377	0.0417	H D	ug/L		101	83 - 113
Perfluorodecanoic acid (PFDA) - DL	0.0045	U H	0.0377	0.0367	H D	ug/L		98	85 - 113
Perfluoroundecanoic acid (PFUnA) - DL	0.0067	U H	0.0377	0.0356	H D	ug/L		95	76 - 105
Perfluorododecanoic acid (PFDoA) - DL	0.0067	U H	0.0377	0.0401	H D	ug/L		106	87 - 116
Perfluorotridecanoic Acid (PFTriA) - DL	0.013	U H	0.0377	0.0373	H D	ug/L		99	75 - 129
Perfluorotetradecanoic acid (PFTeA) - DL	0.013	U H	0.0377	0.0383	H D	ug/L		102	82 - 115
Perfluorobutanesulfonic acid (PFBS) - DL	0.051	H D J1	0.0333	0.0931	H J1 D	ug/L		125	87 - 120
Perfluorohexanesulfonic acid (PFHxS) - DL	0.23	H D	0.0343	0.263	H 4 D	ug/L		86	81 - 106
Perfluorooctanesulfonic acid (PFOS) - DL	0.67	H J1 D	0.0350	0.681	H 4 D	ug/L		18	82 - 112
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) - DL	0.045	U H	0.0377	0.0374	J H D	ug/L		99	82 - 111
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA) - DL	0.045	U H	0.0377	0.0402	J H D	ug/L		107	80 - 109

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C2 PFHxA - DL	88		50 - 150
13C4-PFHpA - DL	97		50 - 150
13C4 PFOA - DL	99		50 - 150
13C5 PFNA - DL	99		50 - 150
13C2 PFDA - DL	104		50 - 150

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

Lab Sample ID: 320-41998-3 MS
Matrix: Water
Analysis Batch: 239460

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C2 PFUnA - DL	95		50 - 150
13C2 PFDoA - DL	89		50 - 150
18O2 PFHxS - DL	83		50 - 150
13C2-PFTeDA - DL	89		50 - 150
13C4 PFOS - DL	85		50 - 150
13C3-PFBS - DL	76		50 - 150
d5-NEtFOSAA - DL	103		50 - 150
d3-NMeFOSAA - DL	103		50 - 150

Lab Sample ID: 320-41998-3 MSD
Matrix: Water
Analysis Batch: 239460

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA) - DL	0.24	H D	0.0367	0.275	H 4 D	ug/L		94	83 - 109	0	30
Perfluoroheptanoic acid (PFHpA) - DL	0.085	H D	0.0367	0.118	H D	ug/L		91	80 - 113	5	30
Perfluorooctanoic acid (PFOA) - DL	0.47	J1 H D M	0.0367	0.509	H 4 D M	ug/L		95	80 - 107	1	30
Perfluorononanoic acid (PFNA) - DL	0.0035	J H D	0.0367	0.0417	H D	ug/L		104	83 - 113	0	30
Perfluorodecanoic acid (PFDA) - DL	0.0045	U H	0.0367	0.0350	H D	ug/L		95	85 - 113	5	30
Perfluoroundecanoic acid (PFUnA) - DL	0.0067	U H	0.0367	0.0364	H D	ug/L		99	76 - 105	2	30
Perfluorododecanoic acid (PFDoA) - DL	0.0067	U H	0.0367	0.0397	H D	ug/L		108	87 - 116	1	30
Perfluorotridecanoic Acid (PFTriA) - DL	0.013	U H	0.0367	0.0350	H D	ug/L		95	75 - 129	6	30
Perfluorotetradecanoic acid (PFTeA) - DL	0.013	U H	0.0367	0.0346	H D	ug/L		94	82 - 115	10	30
Perfluorobutanesulfonic acid (PFBS) - DL	0.051	H D J1	0.0324	0.0876	H D	ug/L		112	87 - 120	6	30
Perfluorohexanesulfonic acid (PFHxS) - DL	0.23	H D	0.0334	0.265	H 4 D	ug/L		95	81 - 106	1	30
Perfluorooctanesulfonic acid (PFOS) - DL	0.67	H J1 D	0.0340	0.691	H 4 D	ug/L		48	82 - 112	2	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) - DL	0.045	U H	0.0367	0.0361	J H D	ug/L		98	82 - 111	4	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA) - DL	0.045	U H	0.0367	0.0399	J H D	ug/L		109	80 - 109	1	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA - DL	82		50 - 150
13C4-PFHpA - DL	93		50 - 150
13C4 PFOA - DL	97		50 - 150
13C5 PFNA - DL	89		50 - 150
13C2 PFDA - DL	95		50 - 150
13C2 PFUnA - DL	86		50 - 150

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

Lab Sample ID: 320-41998-3 MSD
Matrix: Water
Analysis Batch: 239460

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFDoA - DL	87		50 - 150
18O2 PFHxS - DL	79		50 - 150
13C2-PFTeDA - DL	82		50 - 150
13C4 PFOS - DL	80		50 - 150
13C3-PFBS - DL	72		50 - 150
d5-NEtFOSAA - DL	89		50 - 150
d3-NMeFOSAA - DL	95		50 - 150

LCMS

Prep Batch: 239407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41998-1	TW01S-20180713	Total/NA	Water	3535	
320-41998-2	TW02S-20180713	Total/NA	Water	3535	
320-41998-3 - DL	TW03S-20180713	Total/NA	Water	3535	
320-41998-3	TW03S-20180713	Total/NA	Water	3535	
320-41998-4 - DL	TW04S-20180713	Total/NA	Water	3535	
320-41998-4	TW04S-20180713	Total/NA	Water	3535	
320-41998-5	DUP02-20180713	Total/NA	Water	3535	
320-41998-6	EB02-20180713	Total/NA	Water	3535	
320-41998-7	I012MW07S-20180713	Total/NA	Water	3535	
320-41998-7 - DL	I012MW07S-20180713	Total/NA	Water	3535	
MB 320-239407/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-239407/2-A	Lab Control Sample	Total/NA	Water	3535	
320-41998-3 MS - DL	TW03S-20180713	Total/NA	Water	3535	
320-41998-3 MS	TW03S-20180713	Total/NA	Water	3535	
320-41998-3 MSD	TW03S-20180713	Total/NA	Water	3535	
320-41998-3 MSD - DL	TW03S-20180713	Total/NA	Water	3535	

Analysis Batch: 239432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41998-1	TW01S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-2	TW02S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-4	TW04S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-5	DUP02-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-6	EB02-20180713	Total/NA	Water	EPA 537 (Mod)	239407
MB 320-239407/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	239407
LCS 320-239407/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3 MS	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3 MSD	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407

Analysis Batch: 239460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41998-3 - DL	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-4 - DL	TW04S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3 MS - DL	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3 MSD - DL	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407

Analysis Batch: 239523

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41998-7 - DL	I012MW07S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-7	I012MW07S-20180713	Total/NA	Water	EPA 537 (Mod)	239407

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: TW01S-20180713
Lab Sample ID: 320-41998-1
Date Collected: 07/13/18 09:50
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			209.8 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1			239432	08/11/18 20:59	AAR	TAL SAC

Client Sample ID: TW02S-20180713
Lab Sample ID: 320-41998-2
Date Collected: 07/13/18 11:50
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			162.2 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1			239432	08/11/18 21:07	AAR	TAL SAC

Client Sample ID: TW03S-20180713
Lab Sample ID: 320-41998-3
Date Collected: 07/13/18 13:30
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			279.5 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1			239432	08/11/18 21:14	AAR	TAL SAC
Total/NA	Prep	3535	DL		279.5 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	5			239460	08/12/18 11:03	AAR	TAL SAC

Client Sample ID: TW04S-20180713
Lab Sample ID: 320-41998-4
Date Collected: 07/13/18 14:30
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			220.9 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1			239432	08/11/18 21:37	AAR	TAL SAC
Total/NA	Prep	3535	DL		220.9 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	5			239460	08/12/18 11:25	AAR	TAL SAC

Client Sample ID: DUP02-20180713
Lab Sample ID: 320-41998-5
Date Collected: 07/13/18 00:00
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			167.8 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1			239432	08/11/18 21:44	AAR	TAL SAC

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: EB02-20180713

Lab Sample ID: 320-41998-6

Date Collected: 07/13/18 15:45

Matrix: Water

Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			273.7 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1			239432	08/11/18 22:07	AAR	TAL SAC

Client Sample ID: I012MW07S-20180713

Lab Sample ID: 320-41998-7

Date Collected: 07/13/18 15:30

Matrix: Water

Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		282.8 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	100			239523	08/13/18 09:36	AAR	TAL SAC
Total/NA	Prep	3535			282.8 mL	10.00 mL	239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		10			239523	08/13/18 09:44	AAR	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
ANAB	DoD ELAP		L2468	01-20-21

Method Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

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: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41998-1	TW01S-20180713	Water	07/13/18 09:50	08/10/18 09:50
320-41998-2	TW02S-20180713	Water	07/13/18 11:50	08/10/18 09:50
320-41998-3	TW03S-20180713	Water	07/13/18 13:30	08/10/18 09:50
320-41998-4	TW04S-20180713	Water	07/13/18 14:30	08/10/18 09:50
320-41998-5	DUP02-20180713	Water	07/13/18 00:00	08/10/18 09:50
320-41998-6	EB02-20180713	Water	07/13/18 15:45	08/10/18 09:50
320-41998-7	I012MW07S-20180713	Water	07/13/18 15:30	08/10/18 09:50

Rev. Date: 06/27/2017

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1801764 Temp: 1.0 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: 160003.008 PO#: P0000798 Sampler: K. Kwok J. Dumont (name)

TAT (check one): Standard: ☐ 21 days; Rush (surcharge may apply): ☒ 14 days ☐ 7 days Specify:

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Invoices	KMEA	2423 Hoover Avenue	National City	CA	(619) 399-5900	(619) 431-3510

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Kelly Kwok	7/13/18	1700	B. Benedict	07/14/18	0941
B. Benedict	08/10/18	1509	Cityfreq	8-10-18	1605

5.4°C

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

Method of Shipment:

ATTN: Jake White-Dobbs Tracking No.:

320-41998 Chain of Custody

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	Mod. EPA Method 537: PFOA/PFOS	UCMR3 PFAS List 6	537 List: 14	Full List of 26	Other: Please List Below	EPA Method 537(DW only): PFOA/PFOS	UCMR3 PFAS List 6	PFAS List: 14	Comments
TW01S-20180713	7/13/18	0950	Former MCAS Tustin	2	P	AQ			/						Level 3
TW02S-20180713	7/13/18	1150	Former MCAS Tustin	2	P	AQ			/						Level 3
TW03S-20180713	7/13/18	1330		6	P	AQ			/						Level 3
TW04S-20180713		~~1530~~ 1430		1	P	AQ			/						Level 3
DUP02-20180713		0000		2	P	AQ			/						Level 3
EB02-20180713		1545		2	P	AQ			/						Level 3
IDW12MW07S-20180713	↓	1530	↓	2	P	AQ			/						Level 3

Special Instructions/Comments:

SEND DOCUMENTATION AND RESULTS TO:

Name: kelly.kwok | kurt.myers | kim.shirood
Company:
Address:
City: State: Zip:
Phone: Fax:
Email: ~~kkwok~~ kkwok@kmea.net *

Container Types: P= HDPE, PJ= HDPE Jar, O = Other:

Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: groundwater

* kurt.myers@woodplc.com
kim.kelly.shirood@woodplc.com.

Page: 1 of 1

8/13/2018

Login Sample Receipt Checklist

Client: Wood E&I Solutions Inc

Job Number: 320-41998-1

Login Number: 41998
List Number: 1
Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Job Number: 320-41998-1

Job Description: PFAS, Tustin

For:
Wood E&I Solutions Inc
9210 Sky Park Court
Suite 100
San Diego, CA 92123

Attention: Kelli Miller



Approved for release.
David R Alltucker
Project Manager I
8/13/2018 1:25 PM

Designee for
Jill Kellmann, Manager of Project Management
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4402
jill.kellmann@testamericainc.com
08/13/2018

cc: Mr. Kevin Olness
Ms. Kestin Schulz
Kimberly Shiroodi

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Qualifiers

LCMS

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Undetected at the Limit of Detection.
M	Manual integrated compound.
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

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
320-41998-1

Receipt
The samples were received on 8/10/2018 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.4° C.

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 Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) associated with the following samples exceeded the instrument calibration range: TW03S-20180713 (320-41998-3), TW03S-20180713 (320-41998-3[MS]), TW03S-20180713 (320-41998-3[MSD]) and TW04S-20180713 (320-41998-4). 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): Due to the high concentration of Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-239407 and analytical batch 320-239432 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) EPA 537 (Mod): The matrix spike (MS) recovery of Perfluorobutanesulfonic acid (PFBS) for preparation batch 320-239407 and analytical batch 320-239460 was outside control limits. Sample non-homogeneity was suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. PFBS was in control in the undiluted extract. Both sets of data were reported.

Method(s) EPA 537 (Mod): Results for sample I012MW07S-20180713 (320-41998-7) was reported from the analysis of a diluted extract due to high concentration of target analytes 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: The following samples: TW01S-20180713 (320-41998-1), TW02S-20180713 (320-41998-2), TW03S-20180713 (320-41998-3), TW03S-20180713 (320-41998-3[MS]), TW03S-20180713 (320-41998-3[MSD]), TW04S-20180713 (320-41998-4) and DUP02-20180713 (320-41998-5) in preparation batch 320-239407 were observed to contain sediment prior to extraction.

Method(s) 3535: The following samples were received to the laboratory outside of preparation holding time: TW01S-20180713 (320-41998-1), TW02S-20180713 (320-41998-2), TW03S-20180713 (320-41998-3), TW04S-20180713 (320-41998-4), DUP02-20180713 (320-41998-5), EB02-20180713 (320-41998-6) and I012MW07S-20180713 (320-41998-7).

Method(s) 3535: The samples were treated as AFFF samples, and were prepped at the 125,000,000x dilution and a 125,000x dilution to be cautious. Therefore, the initial volume(s) used for the following samples deviated from the standard procedure: TW01S-20180713 (320-41998-1), TW02S-20180713 (320-41998-2), TW03S-20180713 (320-41998-3), TW04S-20180713 (320-41998-4), DUP02-20180713 (320-41998-5), EB02-20180713 (320-41998-6) and I012MW07S-20180713 (320-41998-7). The reporting limits (RLs) have been adjusted proportionately.

Method(s) 3535: The labeled extraction standards (IDA; isotope dilution standards) are fortified into the sample prior to extraction. The following samples: TW01S-20180713 (320-41998-1), TW02S-20180713 (320-41998-2), TW04S-20180713 (320-41998-4) and DUP02-20180713 (320-41998-5) had non-settleable particulate matter which plugged the SPE extraction disk prior to the default 250 mL aliquot of sample passing through. As a result, the amount of IDA fortified into these samples was adjusted so data calculations of IDA recovery are based upon the actual reduced volume, and therefore IDA mass, that was filtered. The reporting limit has been elevated proportionally.

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

Detection Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: TW01S-20180713 — Lab Sample ID: 320-41998-1

Sample Analysis Not Complete.

Client Sample ID: TW02S-20180713 — Lab Sample ID: 320-41998-2

Sample Analysis Not Complete.

Client Sample ID: TW03S-20180713 — Lab Sample ID: 320-41998-3

Sample Analysis Not Complete.

Client Sample ID: TW04S-20180713 — Lab Sample ID: 320-41998-4

Sample Analysis Not Complete.

Client Sample ID: DUP02-20180713 — Lab Sample ID: 320-41998-5

Sample Analysis Not Complete.

Client Sample ID: EB02-20180713 — Lab Sample ID: 320-41998-6

Sample Analysis Not Complete.

Client Sample ID: I012MW07S-20180713 — Lab Sample ID: 320-41998-7

Sample Analysis Not Complete.

This Detection Summary does not include radiochemical test results.

Client Sample ID: TW01S-20180713

Lab Sample ID: 320-41998-1

Date Collected: 07/13/18 09:50

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.18**	**H**	0.0024	0.00056	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluoroheptanoic acid (PFHpA)	**0.090**	**H**	0.0024	0.00073	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorooctanoic acid (PFOA)	**0.40**	**M H**	0.0024	0.00064	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorononanoic acid (PFNA)	**0.0043**	**M H**	0.0024	0.00062	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorodecanoic acid (PFDA)	0.0012	U H	0.0024	0.00057	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluoroundecanoic acid (PFUnA)	0.0018	U H	0.0024	0.00086	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorododecanoic acid (PFDoA)	0.0018	U H	0.0024	0.00062	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorotridecanoic Acid (PFTriA)	0.0036	U H	0.0048	0.00091	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorotetradecanoic acid (PFTeA)	0.0036	U M H	0.0048	0.00099	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorobutanesulfonic acid (PFBS)	**0.041**	**H**	0.0024	0.00055	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorohexanesulfonic acid (PFHxS)	**0.16**	**H**	0.0024	0.00045	ug/L		08/11/18 09:18	08/11/18 20:59	1
Perfluorooctanesulfonic acid (PFOS)	**0.098**	**H**	0.0048	0.0013	ug/L		08/11/18 09:18	08/11/18 20:59	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.012	U H	0.024	0.0036	ug/L		08/11/18 09:18	08/11/18 20:59	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.012	U H	0.024	0.0033	ug/L		08/11/18 09:18	08/11/18 20:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C4-PFHpA	*96*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C4 PFOA	*100*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C5 PFNA	*109*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C2 PFDA	*101*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C2 PFUnA	*86*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C2 PFDoA	*78*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
18O2 PFHxS	*94*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C2-PFTeDA	*74*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C4 PFOS	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
13C3-PFBS	*95*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
d5-NEtFOSAA	*91*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*
d3-NMeFOSAA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:59*	*1*

Client Sample ID: TW02S-20180713

Lab Sample ID: 320-41998-2

Date Collected: 07/13/18 11:50

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.12**	**H**	0.0031	0.00072	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluoroheptanoic acid (PFHpA)	**0.039**	**H**	0.0031	0.00094	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorooctanoic acid (PFOA)	**0.59**	**M H**	0.0031	0.00083	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorononanoic acid (PFNA)	0.0023	U M H	0.0031	0.00080	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorodecanoic acid (PFDA)	0.0015	U H	0.0031	0.00074	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluoroundecanoic acid (PFUnA)	0.0023	U H	0.0031	0.0011	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorododecanoic acid (PFDoA)	0.0023	U H	0.0031	0.00080	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorotridecanoic Acid (PFTriA)	0.0046	U H	0.0062	0.0012	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorotetradecanoic acid (PFTeA)	0.0046	U H	0.0062	0.0013	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorobutanesulfonic acid (PFBS)	**0.027**	**H**	0.0031	0.00071	ug/L		08/11/18 09:18	08/11/18 21:07	1

Client Sample ID: TW02S-20180713

Lab Sample ID: 320-41998-2

Date Collected: 07/13/18 11:50

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	**0.078**	**H**	0.0031	0.00059	ug/L		08/11/18 09:18	08/11/18 21:07	1
Perfluorooctanesulfonic acid (PFOS)	**0.041**	**H**	0.0062	0.0017	ug/L		08/11/18 09:18	08/11/18 21:07	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.015	U H	0.031	0.0046	ug/L		08/11/18 09:18	08/11/18 21:07	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.015	U H	0.031	0.0043	ug/L		08/11/18 09:18	08/11/18 21:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C4-PFHpA	*102*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C4 PFOA	*100*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C5 PFNA	*116*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C2 PFDA	*99*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C2 PFUnA	*84*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C2 PFDoA	*72*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
18O2 PFHxS	*90*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C2-PFTeDA	*72*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C4 PFOS	*87*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
13C3-PFBS	*84*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
d5-NEtFOSAA	*84*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*
d3-NMeFOSAA	*84*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:07*	*1*

Client Sample ID: TW03S-20180713

Lab Sample ID: 320-41998-3

Date Collected: 07/13/18 13:30

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.23**	**H J1 M**	0.0018	0.00042	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluoroheptanoic acid (PFHpA)	**0.084**	**H**	0.0018	0.00055	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorooctanoic acid (PFOA)	**0.41**	**H J1 M**	0.0018	0.00048	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorononanoic acid (PFNA)	**0.0035**	**H**	0.0018	0.00047	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorodecanoic acid (PFDA)	0.00089	U H M	0.0018	0.00043	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluoroundecanoic acid (PFUnA)	0.0013	U H	0.0018	0.00064	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorododecanoic acid (PFDoA)	0.0013	U H	0.0018	0.00047	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0036	0.00068	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0036	0.00074	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorobutanesulfonic acid (PFBS)	**0.051**	**H**	0.0018	0.00041	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorohexanesulfonic acid (PFHxS)	**0.22**	**H**	0.0018	0.00034	ug/L		08/11/18 09:18	08/11/18 21:14	1
Perfluorooctanesulfonic acid (PFOS)	**0.59**	**H J1**	0.0036	0.00098	ug/L		08/11/18 09:18	08/11/18 21:14	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0089	U H M	0.018	0.0027	ug/L		08/11/18 09:18	08/11/18 21:14	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0089	U H	0.018	0.0025	ug/L		08/11/18 09:18	08/11/18 21:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:14*	*1*
13C4-PFHpA	*97*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:14*	*1*

Client Sample ID: TW03S-20180713

Date Collected: 07/13/18 13:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-3

Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	98		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C5 PFNA	99		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C2 PFDA	107		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C2 PFUnA	103		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C2 PFDoA	108		50 - 150	08/11/18 09:18	08/11/18 21:14	1
18O2 PFHxS	90		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C2-PFTeDA	117		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C4 PFOS	88		50 - 150	08/11/18 09:18	08/11/18 21:14	1
13C3-PFBS	84		50 - 150	08/11/18 09:18	08/11/18 21:14	1
d5-NEtFOSAA	102		50 - 150	08/11/18 09:18	08/11/18 21:14	1
d3-NMeFOSAA	108		50 - 150	08/11/18 09:18	08/11/18 21:14	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
Perfluorohexanoic acid (PFHxA)	**0.24**	**H D**	0.0089	0.0021	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluoroheptanoic acid (PFHpA)	**0.085**	**H D**	0.0089	0.0027	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorooctanoic acid (PFOA)	**0.47**	**J1 H D M**	0.0089	0.0024	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorononanoic acid (PFNA)	**0.0035**	**J H D**	0.0089	0.0023	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorodecanoic acid (PFDA)	0.0045	U H	0.0089	0.0021	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluoroundecanoic acid (PFUnA)	0.0067	U H	0.0089	0.0032	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorododecanoic acid (PFDoA)	0.0067	U H	0.0089	0.0023	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorotridecanoic Acid (PFTriA)	0.013	U H	0.018	0.0034	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorotetradecanoic acid (PFTeA)	0.013	U H	0.018	0.0037	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorobutanesulfonic acid (PFBS)	**0.051**	**H D J1**	0.0089	0.0021	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorohexanesulfonic acid (PFHxS)	**0.23**	**H D**	0.0089	0.0017	ug/L		08/11/18 09:18	08/12/18 11:03	5
Perfluorooctanesulfonic acid (PFOS)	**0.67**	**H J1 D**	0.018	0.0049	ug/L		08/11/18 09:18	08/12/18 11:03	5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.045	U H	0.089	0.013	ug/L		08/11/18 09:18	08/12/18 11:03	5
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.045	U H	0.089	0.013	ug/L		08/11/18 09:18	08/12/18 11:03	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	82		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C4-PFHpA	95		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C4 PFOA	94		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C5 PFNA	101		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C2 PFDA	94		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C2 PFUnA	88		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C2 PFDoA	83		50 - 150	08/11/18 09:18	08/12/18 11:03	5
18O2 PFHxS	80		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C2-PFTeDA	89		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C4 PFOS	82		50 - 150	08/11/18 09:18	08/12/18 11:03	5
13C3-PFBS	73		50 - 150	08/11/18 09:18	08/12/18 11:03	5
d5-NEtFOSAA	102		50 - 150	08/11/18 09:18	08/12/18 11:03	5
d3-NMeFOSAA	98		50 - 150	08/11/18 09:18	08/12/18 11:03	5

Client Sample ID: TW04S-20180713

Date Collected: 07/13/18 14:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-4

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
Perfluorohexanoic acid (PFHxA)	**0.30**	**H**	0.0023	0.00053	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluoroheptanoic acid (PFHpA)	**0.12**	**H**	0.0023	0.00069	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorooctanoic acid (PFOA)	**0.52**	**M J1 H**	0.0023	0.00061	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorononanoic acid (PFNA)	**0.0056**	**M H**	0.0023	0.00059	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorodecanoic acid (PFDA)	0.0011	U H	0.0023	0.00054	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluoroundecanoic acid (PFUnA)	0.0017	U H	0.0023	0.00081	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorododecanoic acid (PFDoA)	0.0017	U H	0.0023	0.00059	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorotridecanoic Acid (PFTriA)	0.0034	U H	0.0045	0.00086	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorotetradecanoic acid (PFTeA)	0.0034	U H	0.0045	0.00094	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorobutanesulfonic acid (PFBS)	**0.072**	**H**	0.0023	0.00052	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorohexanesulfonic acid (PFHxS)	**0.37**	**H**	0.0023	0.00043	ug/L		08/11/18 09:18	08/11/18 21:37	1
Perfluorooctanesulfonic acid (PFOS)	**0.60**	**J1 H**	0.0045	0.0012	ug/L		08/11/18 09:18	08/11/18 21:37	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.011	U H	0.023	0.0034	ug/L		08/11/18 09:18	08/11/18 21:37	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.011	U M H	0.023	0.0032	ug/L		08/11/18 09:18	08/11/18 21:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C4-PFHpA	*97*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C4 PFOA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C5 PFNA	*96*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C2 PFDA	*100*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C2 PFUnA	*89*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C2 PFDoA	*82*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
18O2 PFHxS	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C2-PFTeDA	*83*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C4 PFOS	*79*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
13C3-PFBS	*87*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
d5-NEtFOSAA	*92*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*1*
d3-NMeFOSAA	*89*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:37*	*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
Perfluorohexanoic acid (PFHxA)	**0.32**	**H D**	0.011	0.0027	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluoroheptanoic acid (PFHpA)	**0.13**	**H D**	0.011	0.0035	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorooctanoic acid (PFOA)	**0.60**	**H D M**	0.011	0.0031	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorononanoic acid (PFNA)	**0.0059**	**J H D M**	0.011	0.0029	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorodecanoic acid (PFDA)	0.0057	U H	0.011	0.0027	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluoroundecanoic acid (PFUnA)	0.0085	U H	0.011	0.0041	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorododecanoic acid (PFDoA)	0.0085	U H	0.011	0.0029	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorotridecanoic Acid (PFTriA)	0.017	U H	0.023	0.0043	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorotetradecanoic acid (PFTeA)	0.017	U H	0.023	0.0047	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorobutanesulfonic acid (PFBS)	**0.078**	**H D**	0.011	0.0026	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorohexanesulfonic acid (PFHxS)	**0.43**	**H D**	0.011	0.0022	ug/L		08/11/18 09:18	08/12/18 11:25	5
Perfluorooctanesulfonic acid (PFOS)	**0.65**	**H D**	0.023	0.0062	ug/L		08/11/18 09:18	08/12/18 11:25	5

Client Sample ID: TW04S-20180713

Lab Sample ID: 320-41998-4

Date Collected: 07/13/18 14:30

Matrix: Water

Date Received: 08/10/18 09:50

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
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.057	U H	0.11	0.017	ug/L		08/11/18 09:18	08/12/18 11:25	5
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.057	U H	0.11	0.016	ug/L		08/11/18 09:18	08/12/18 11:25	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C4-PFHpA	*99*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C4 PFOA	*101*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C5 PFNA	*97*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C2 PFDA	*94*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C2 PFUnA	*78*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C2 PFDoA	*74*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
18O2 PFHxS	*84*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C2-PFTeDA	*73*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C4 PFOS	*77*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
13C3-PFBS	*74*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
d5-NEtFOSAA	*82*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*
d3-NMeFOSAA	*88*		*50 - 150*	*08/11/18 09:18*	*08/12/18 11:25*	*5*

Client Sample ID: DUP02-20180713

Lab Sample ID: 320-41998-5

Date Collected: 07/13/18 00:00

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.12**	**H**	0.0030	0.00070	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluoroheptanoic acid (PFHpA)	**0.038**	**H**	0.0030	0.00091	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorooctanoic acid (PFOA)	**0.53**	**M H**	0.0030	0.00080	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorononanoic acid (PFNA)	**0.00093**	**J M H**	0.0030	0.00077	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorodecanoic acid (PFDA)	0.0015	U H	0.0030	0.00072	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluoroundecanoic acid (PFUnA)	0.0022	U H	0.0030	0.0011	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorododecanoic acid (PFDoA)	**0.00088**	**J H**	0.0030	0.00077	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorotridecanoic Acid (PFTriA)	0.0045	U H	0.0060	0.0011	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorotetradecanoic acid (PFTeA)	**0.0015**	**J H**	0.0060	0.0012	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorobutanesulfonic acid (PFBS)	**0.025**	**H**	0.0030	0.00069	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorohexanesulfonic acid (PFHxS)	**0.078**	**H**	0.0030	0.00057	ug/L		08/11/18 09:18	08/11/18 21:44	1
Perfluorooctanesulfonic acid (PFOS)	**0.040**	**H**	0.0060	0.0016	ug/L		08/11/18 09:18	08/11/18 21:44	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.015	U H	0.030	0.0045	ug/L		08/11/18 09:18	08/11/18 21:44	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.015	U M H	0.030	0.0042	ug/L		08/11/18 09:18	08/11/18 21:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:44*	*1*
13C4-PFHpA	*99*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:44*	*1*
13C4 PFOA	*107*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:44*	*1*
13C5 PFNA	*105*		*50 - 150*	*08/11/18 09:18*	*08/11/18 21:44*	*1*

Client Sample ID: DUP02-20180713

Lab Sample ID: 320-41998-5

Date Collected: 07/13/18 00:00

Matrix: Water

Date Received: 08/10/18 09:50

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	103		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C2 PFUnA	75		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C2 PFDoA	74		50 - 150	08/11/18 09:18	08/11/18 21:44	1
18O2 PFHxS	91		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C2-PFTeDA	91		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C4 PFOS	85		50 - 150	08/11/18 09:18	08/11/18 21:44	1
13C3-PFBS	90		50 - 150	08/11/18 09:18	08/11/18 21:44	1
d5-NEtFOSAA	85		50 - 150	08/11/18 09:18	08/11/18 21:44	1
d3-NMeFOSAA	81		50 - 150	08/11/18 09:18	08/11/18 21:44	1

Client Sample ID: EB02-20180713

Lab Sample ID: 320-41998-6

Date Collected: 07/13/18 15:45

Matrix: Water

Date Received: 08/10/18 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.00091	U H	0.0018	0.00043	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluoroheptanoic acid (PFHpA)	0.0014	U H	0.0018	0.00056	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorooctanoic acid (PFOA)	0.0014	U M H	0.0018	0.00049	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorononanoic acid (PFNA)	0.0014	U H	0.0018	0.00047	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorodecanoic acid (PFDA)	0.00091	U H	0.0018	0.00044	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluoroundecanoic acid (PFUnA)	0.0014	U H	0.0018	0.00066	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorododecanoic acid (PFDoA)	0.0014	U H	0.0018	0.00047	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0037	0.00069	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0037	0.00076	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorobutanesulfonic acid (PFBS)	0.00091	U H	0.0018	0.00042	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorohexanesulfonic acid (PFHxS)	0.00091	U M H	0.0018	0.00035	ug/L		08/11/18 09:18	08/11/18 22:07	1
Perfluorooctanesulfonic acid (PFOS)	0.0027	U H	0.0037	0.0010	ug/L		08/11/18 09:18	08/11/18 22:07	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0091	U H	0.018	0.0027	ug/L		08/11/18 09:18	08/11/18 22:07	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0091	U H	0.018	0.0026	ug/L		08/11/18 09:18	08/11/18 22:07	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	84		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C4-PFHpA	88		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C4 PFOA	99		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C5 PFNA	103		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C2 PFDA	97		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C2 PFUnA	98		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C2 PFDoA	95		50 - 150	08/11/18 09:18	08/11/18 22:07	1
18O2 PFHxS	75		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C2-PFTeDA	93		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C4 PFOS	82		50 - 150	08/11/18 09:18	08/11/18 22:07	1
13C3-PFBS	76		50 - 150	08/11/18 09:18	08/11/18 22:07	1
d5-NEtFOSAA	97		50 - 150	08/11/18 09:18	08/11/18 22:07	1
d3-NMeFOSAA	99		50 - 150	08/11/18 09:18	08/11/18 22:07	1

Client Sample ID: I012MW07S-20180713

Date Collected: 07/13/18 15:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-7

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
Perfluorohexanoic acid (PFHxA)	**12**	**H J1 D**	0.018	0.0042	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluoroheptanoic acid (PFHpA)	**4.4**	**H J1 D**	0.018	0.0054	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorooctanoic acid (PFOA)	**17**	**H J1 D M**	0.018	0.0048	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorononanoic acid (PFNA)	**0.054**	**H D M**	0.018	0.0046	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorodecanoic acid (PFDA)	0.0088	U H	0.018	0.0042	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluoroundecanoic acid (PFUnA)	0.013	U H	0.018	0.0064	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorododecanoic acid (PFDoA)	0.013	U H	0.018	0.0046	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorotridecanoic Acid (PFTriA)	0.027	U H	0.035	0.0067	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorotetradecanoic acid (PFTeA)	0.027	U H	0.035	0.0073	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorobutanesulfonic acid (PFBS)	**3.3**	**H J1 D**	0.018	0.0041	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorohexanesulfonic acid (PFHxS)	**17**	**H J1 D**	0.018	0.0034	ug/L		08/11/18 09:18	08/13/18 09:44	10
Perfluorooctanesulfonic acid (PFOS)	**13**	**H J1 D**	0.035	0.0097	ug/L		08/11/18 09:18	08/13/18 09:44	10
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.088	U H	0.18	0.027	ug/L		08/11/18 09:18	08/13/18 09:44	10
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.088	U H	0.18	0.025	ug/L		08/11/18 09:18	08/13/18 09:44	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*75*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C4-PFHpA	*56*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C4 PFOA	*67*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C5 PFNA	*85*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C2 PFDA	*93*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C2 PFUnA	*89*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C2 PFDoA	*88*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
18O2 PFHxS	*73*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C2-PFTeDA	*89*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C4 PFOS	*70*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
13C3-PFBS	*124*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
d5-NEtFOSAA	*99*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*
d3-NMeFOSAA	*106*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:44*	*10*

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**18**	**H D**	0.18	0.042	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluoroheptanoic acid (PFHpA)	**4.9**	**H D**	0.18	0.054	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorooctanoic acid (PFOA)	**33**	**H D M**	0.18	0.048	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorononanoic acid (PFNA)	**0.057**	**J H D**	0.18	0.046	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorodecanoic acid (PFDA)	0.088	U H	0.18	0.042	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluoroundecanoic acid (PFUnA)	0.13	U H	0.18	0.064	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorododecanoic acid (PFDoA)	0.13	U H	0.18	0.046	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorotridecanoic Acid (PFTriA)	0.27	U H	0.35	0.067	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorotetradecanoic acid (PFTeA)	0.27	U H	0.35	0.073	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorobutanesulfonic acid (PFBS)	**4.8**	**H D**	0.18	0.041	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorohexanesulfonic acid (PFHxS)	**31**	**H D**	0.18	0.034	ug/L		08/11/18 09:18	08/13/18 09:36	100
Perfluorooctanesulfonic acid (PFOS)	**13**	**H D**	0.35	0.097	ug/L		08/11/18 09:18	08/13/18 09:36	100

Client Sample ID: I012MW07S-20180713

Date Collected: 07/13/18 15:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-7

Matrix: Water

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
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.88	U H	1.8	0.27	ug/L		08/11/18 09:18	08/13/18 09:36	100
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.88	U H M	1.8	0.25	ug/L		08/11/18 09:18	08/13/18 09:36	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*67*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C4-PFHpA	*57*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C4 PFOA	*66*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C5 PFNA	*69*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C2 PFDA	*68*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C2 PFUnA	*63*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C2 PFDoA	*55*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
18O2 PFHxS	*60*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C2-PFTeDA	*63*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C4 PFOS	*63*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
13C3-PFBS	*94*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
d5-NEtFOSAA	*104*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*
d3-NMeFOSAA	*92*		*50 - 150*	*08/11/18 09:18*	*08/13/18 09:36*	*100*

Default Detection Limits

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

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

Prep: 3535

Analyte	LOQ	DL	Units	Method
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.020	0.0028	ug/L	EPA 537 (Mod)
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.020	0.0030	ug/L	EPA 537 (Mod)
Perfluorobutanesulfonic acid (PFBS)	0.0020	0.00046	ug/L	EPA 537 (Mod)
Perfluorodecanoic acid (PFDA)	0.0020	0.00048	ug/L	EPA 537 (Mod)
Perfluorododecanoic acid (PFDoA)	0.0020	0.00052	ug/L	EPA 537 (Mod)
Perfluoroheptanoic acid (PFHpA)	0.0020	0.00061	ug/L	EPA 537 (Mod)
Perfluorohexanesulfonic acid (PFHxS)	0.0020	0.00038	ug/L	EPA 537 (Mod)
Perfluorohexanoic acid (PFHxA)	0.0020	0.00047	ug/L	EPA 537 (Mod)
Perfluorononanoic acid (PFNA)	0.0020	0.00052	ug/L	EPA 537 (Mod)
Perfluorooctanesulfonic acid (PFOS)	0.0040	0.0011	ug/L	EPA 537 (Mod)
Perfluorooctanoic acid (PFOA)	0.0020	0.00054	ug/L	EPA 537 (Mod)
Perfluorotetradecanoic acid (PFTeA)	0.0040	0.00083	ug/L	EPA 537 (Mod)
Perfluorotridecanoic Acid (PFTriA)	0.0040	0.00076	ug/L	EPA 537 (Mod)
Perfluoroundecanoic acid (PFUnA)	0.0020	0.00072	ug/L	EPA 537 (Mod)

Isotope Dilution Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

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

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (50-150)	PFHpA (50-150)	PFOA (50-150)	PFNA (50-150)	PFDA (50-150)	PFUnA (50-150)	PFDoA (50-150)	PFHxS (50-150)
320-41998-1	TW01S-20180713	93	96	100	109	101	86	78	94
320-41998-2	TW02S-20180713	97	102	100	116	99	84	72	90
320-41998-3	TW03S-20180713	92	97	98	99	107	103	108	90
320-41998-3 - DL	TW03S-20180713	82	95	94	101	94	88	83	80
320-41998-3 MS	TW03S-20180713	90	97	97	98	102	95	102	90
320-41998-3 MS - DL	TW03S-20180713	88	97	99	99	104	95	89	83
320-41998-3 MSD	TW03S-20180713	86	91	90	97	97	89	96	84
320-41998-3 MSD - DL	TW03S-20180713	82	93	97	89	95	86	87	79
320-41998-4	TW04S-20180713	90	97	93	96	100	89	82	88
320-41998-4 - DL	TW04S-20180713	88	99	101	97	94	78	74	84
320-41998-5	DUP02-20180713	96	99	107	105	103	75	74	91
320-41998-6	EB02-20180713	84	88	99	103	97	98	95	75
320-41998-7 - DL	I012MW07S-20180713	67	57	66	69	68	63	55	60
320-41998-7	I012MW07S-20180713	75	56	67	85	93	89	88	73
LCS 320-239407/2-A	Lab Control Sample	80	87	93	96	97	90	94	73
MB 320-239407/1-A	Method Blank	88	88	93	95	94	88	93	83

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFTDA (50-150)	PFOS (50-150)	3C3-PFBS (50-150)	-NEtFOSA (50-150)	-NMeFOSA (50-150)			
320-41998-1	TW01S-20180713	74	88	95	91	93			
320-41998-2	TW02S-20180713	72	87	84	84	84			
320-41998-3	TW03S-20180713	117	88	84	102	108			
320-41998-3 - DL	TW03S-20180713	89	82	73	102	98			
320-41998-3 MS	TW03S-20180713	109	87	86	103	108			
320-41998-3 MS - DL	TW03S-20180713	89	85	76	103	103			
320-41998-3 MSD	TW03S-20180713	101	81	83	94	98			
320-41998-3 MSD - DL	TW03S-20180713	82	80	72	89	95			
320-41998-4	TW04S-20180713	83	79	87	92	89			
320-41998-4 - DL	TW04S-20180713	73	77	74	82	88			
320-41998-5	DUP02-20180713	91	85	90	85	81			
320-41998-6	EB02-20180713	93	82	76	97	99			
320-41998-7 - DL	I012MW07S-20180713	63	63	94	104	92			
320-41998-7	I012MW07S-20180713	89	70	124	99	106			
LCS 320-239407/2-A	Lab Control Sample	90	76	72	94	95			
MB 320-239407/1-A	Method Blank	93	83	80	92	102			

Surrogate Legend

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
d5-NEtFOSAA = d5-NEtFOSAA

Isotope Dilution Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

d3-NMeFOSAA = d3-NMeFOSAA

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

Lab Sample ID: MB 320-239407/1-A
Matrix: Water
Analysis Batch: 239432

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 239407

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.0010	U	0.0020	0.00047	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluoroheptanoic acid (PFHpA)	0.0015	U	0.0020	0.00061	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorooctanoic acid (PFOA)	0.0015	U	0.0020	0.00054	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorononanoic acid (PFNA)	0.0015	U	0.0020	0.00052	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorodecanoic acid (PFDA)	0.0010	U	0.0020	0.00048	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluoroundecanoic acid (PFUnA)	0.0015	U	0.0020	0.00072	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorododecanoic acid (PFDoA)	0.0015	U	0.0020	0.00052	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorotridecanoic Acid (PFTriA)	0.0030	U	0.0040	0.00076	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorotetradecanoic acid (PFTeA)	0.0030	U	0.0040	0.00083	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorobutanesulfonic acid (PFBS)	0.0010	U	0.0020	0.00046	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorohexanesulfonic acid (PFHxS)	0.0010	U	0.0020	0.00038	ug/L		08/11/18 09:18	08/11/18 20:44	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U M	0.0040	0.0011	ug/L		08/11/18 09:18	08/11/18 20:44	1
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.010	U	0.020	0.0030	ug/L		08/11/18 09:18	08/11/18 20:44	1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.010	U	0.020	0.0028	ug/L		08/11/18 09:18	08/11/18 20:44	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C4-PFHpA	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C4 PFOA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C5 PFNA	*95*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C2 PFDA	*94*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C2 PFUnA	*88*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C2 PFDoA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
18O2 PFHxS	*83*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C2-PFTeDA	*93*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C4 PFOS	*83*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
13C3-PFBS	*80*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
d5-NEtFOSAA	*92*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*
d3-NMeFOSAA	*102*		*50 - 150*	*08/11/18 09:18*	*08/11/18 20:44*	*1*

Lab Sample ID: LCS 320-239407/2-A
Matrix: Water
Analysis Batch: 239432

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.0400	0.0410		ug/L		103	83 - 109
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0424		ug/L		106	80 - 113
Perfluorooctanoic acid (PFOA)	0.0400	0.0381		ug/L		95	80 - 107
Perfluorononanoic acid (PFNA)	0.0400	0.0389		ug/L		97	83 - 113
Perfluorodecanoic acid (PFDA)	0.0400	0.0382		ug/L		95	85 - 113
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0380		ug/L		95	76 - 105
Perfluorododecanoic acid (PFDoA)	0.0400	0.0403		ug/L		101	87 - 116
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0379		ug/L		95	75 - 129
Perfluorotetradecanoic acid (PFTeA)	0.0400	0.0388		ug/L		97	82 - 115

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

Lab Sample ID: LCS 320-239407/2-A
Matrix: Water
Analysis Batch: 239432

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0362		ug/L		102	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0358	M	ug/L		98	81 - 106
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0366		ug/L		99	82 - 112
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0400	0.0393		ug/L		98	82 - 111
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0400	0.0413		ug/L		103	80 - 109

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*80*		*50 - 150*
13C4-PFHpA	*87*		*50 - 150*
13C4 PFOA	*93*		*50 - 150*
13C5 PFNA	*96*		*50 - 150*
13C2 PFDA	*97*		*50 - 150*
13C2 PFUnA	*90*		*50 - 150*
13C2 PFDoA	*94*		*50 - 150*
18O2 PFHxS	*73*		*50 - 150*
13C2-PFTeDA	*90*		*50 - 150*
13C4 PFOS	*76*		*50 - 150*
13C3-PFBS	*72*		*50 - 150*
d5-NEtFOSAA	*94*		*50 - 150*
d3-NMeFOSAA	*95*		*50 - 150*

Lab Sample ID: 320-41998-3 MS
Matrix: Water
Analysis Batch: 239432

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.23	H J1 M	0.0377	0.260	H 4	ug/L		75	83 - 109
Perfluoroheptanoic acid (PFHpA)	0.084	H	0.0377	0.119	H	ug/L		93	80 - 113
Perfluorooctanoic acid (PFOA)	0.41	H J1 M	0.0377	0.433	H J1 4 M	ug/L		62	80 - 107
Perfluorononanoic acid (PFNA)	0.0035	H	0.0377	0.0382	H	ug/L		92	83 - 113
Perfluorodecanoic acid (PFDA)	0.00089	U H M	0.0377	0.0379	H	ug/L		101	85 - 113
Perfluoroundecanoic acid (PFUnA)	0.0013	U H	0.0377	0.0379	H	ug/L		101	76 - 105
Perfluorododecanoic acid (PFDoA)	0.0013	U H	0.0377	0.0389	H	ug/L		103	87 - 116
Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0377	0.0394	H	ug/L		105	75 - 129
Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0377	0.0353	H	ug/L		94	82 - 115
Perfluorobutanesulfonic acid (PFBS)	0.051	H	0.0333	0.0823	H	ug/L		94	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	0.22	H	0.0343	0.247	H 4	ug/L		86	81 - 106
Perfluorooctanesulfonic acid (PFOS)	0.59	H J1	0.0350	0.600	H J1 4	ug/L		25	82 - 112

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

Lab Sample ID: 320-41998-3 MS — **Client Sample ID: TW03S-20180713**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 239432 — **Prep Batch: 239407**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0089	U H M	0.0377	0.0356	H	ug/L		94	82 - 111
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0089	U H	0.0377	0.0379	H	ug/L		101	80 - 109

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*90*		*50 - 150*
13C4-PFHpA	*97*		*50 - 150*
13C4 PFOA	*97*		*50 - 150*
13C5 PFNA	*98*		*50 - 150*
13C2 PFDA	*102*		*50 - 150*
13C2 PFUnA	*95*		*50 - 150*
13C2 PFDoA	*102*		*50 - 150*
18O2 PFHxS	*90*		*50 - 150*
13C2-PFTeDA	*109*		*50 - 150*
13C4 PFOS	*87*		*50 - 150*
13C3-PFBS	*86*		*50 - 150*
d5-NEtFOSAA	*103*		*50 - 150*
d3-NMeFOSAA	*108*		*50 - 150*

Lab Sample ID: 320-41998-3 MSD — **Client Sample ID: TW03S-20180713**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 239432 — **Prep Batch: 239407**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.23	H J1 M	0.0367	0.247	H 4	ug/L		43	83 - 109	5	30
Perfluoroheptanoic acid (PFHpA)	0.084	H	0.0367	0.117	H	ug/L		89	80 - 113	2	30
Perfluorooctanoic acid (PFOA)	0.41	H J1 M	0.0367	0.453	H J1 4 M	ug/L		117	80 - 107	4	30
Perfluorononanoic acid (PFNA)	0.0035	H	0.0367	0.0388	H	ug/L		96	83 - 113	2	30
Perfluorodecanoic acid (PFDA)	0.00089	U H M	0.0367	0.0369	H	ug/L		101	85 - 113	3	30
Perfluoroundecanoic acid (PFUnA)	0.0013	U H	0.0367	0.0364	H	ug/L		99	76 - 105	4	30
Perfluorododecanoic acid (PFDoA)	0.0013	U H	0.0367	0.0382	H	ug/L		104	87 - 116	2	30
Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0367	0.0370	H	ug/L		101	75 - 129	6	30
Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0367	0.0327	H	ug/L		89	82 - 115	7	30
Perfluorobutanesulfonic acid (PFBS)	0.051	H	0.0324	0.0805	H	ug/L		91	87 - 120	2	30
Perfluorohexanesulfonic acid (PFHxS)	0.22	H	0.0334	0.244	H 4	ug/L		82	81 - 106	1	30
Perfluorooctanesulfonic acid (PFOS)	0.59	H J1	0.0340	0.648	H J1 4	ug/L		167	82 - 112	8	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0089	U H M	0.0367	0.0362	H M	ug/L		99	82 - 111	2	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0089	U H	0.0367	0.0375	H	ug/L		102	80 - 109	1	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA	86		50 - 150
13C4-PFHpA	91		50 - 150
13C4 PFOA	90		50 - 150
13C5 PFNA	97		50 - 150
13C2 PFDA	97		50 - 150
13C2 PFUnA	89		50 - 150
13C2 PFDoA	96		50 - 150
18O2 PFHxS	84		50 - 150
13C2-PFTeDA	101		50 - 150
13C4 PFOS	81		50 - 150
13C3-PFBS	83		50 - 150
d5-NEtFOSAA	94		50 - 150
d3-NMeFOSAA	98		50 - 150

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

Lab Sample ID: 320-41998-3 MS
Matrix: Water
Analysis Batch: 239460

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA) - DL	0.24	H D	0.0377	0.275	H 4 D	ug/L		93	83 - 109
Perfluoroheptanoic acid (PFHpA) - DL	0.085	H D	0.0377	0.125	H D	ug/L		106	80 - 113
Perfluorooctanoic acid (PFOA) - DL	0.47	J1 H D M	0.0377	0.516	H 4 D M	ug/L		112	80 - 107
Perfluorononanoic acid (PFNA) - DL	0.0035	J H D	0.0377	0.0417	H D	ug/L		101	83 - 113
Perfluorodecanoic acid (PFDA) - DL	0.0045	U H	0.0377	0.0367	H D	ug/L		98	85 - 113
Perfluoroundecanoic acid (PFUnA) - DL	0.0067	U H	0.0377	0.0356	H D	ug/L		95	76 - 105
Perfluorododecanoic acid (PFDoA) - DL	0.0067	U H	0.0377	0.0401	H D	ug/L		106	87 - 116
Perfluorotridecanoic Acid (PFTriA) - DL	0.013	U H	0.0377	0.0373	H D	ug/L		99	75 - 129
Perfluorotetradecanoic acid (PFTeA) - DL	0.013	U H	0.0377	0.0383	H D	ug/L		102	82 - 115
Perfluorobutanesulfonic acid (PFBS) - DL	0.051	H D J1	0.0333	0.0931	H J1 D	ug/L		125	87 - 120
Perfluorohexanesulfonic acid (PFHxS) - DL	0.23	H D	0.0343	0.263	H 4 D	ug/L		86	81 - 106
Perfluorooctanesulfonic acid (PFOS) - DL	0.67	H J1 D	0.0350	0.681	H 4 D	ug/L		18	82 - 112
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) - DL	0.045	U H	0.0377	0.0374	J H D	ug/L		99	82 - 111
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA) - DL	0.045	U H	0.0377	0.0402	J H D	ug/L		107	80 - 109

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C2 PFHxA - DL	88		50 - 150
13C4-PFHpA - DL	97		50 - 150
13C4 PFOA - DL	99		50 - 150
13C5 PFNA - DL	99		50 - 150
13C2 PFDA - DL	104		50 - 150

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

Lab Sample ID: 320-41998-3 MS
Matrix: Water
Analysis Batch: 239460

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C2 PFUnA - DL	95		50 - 150
13C2 PFDoA - DL	89		50 - 150
18O2 PFHxS - DL	83		50 - 150
13C2-PFTeDA - DL	89		50 - 150
13C4 PFOS - DL	85		50 - 150
13C3-PFBS - DL	76		50 - 150
d5-NEtFOSAA - DL	103		50 - 150
d3-NMeFOSAA - DL	103		50 - 150

Lab Sample ID: 320-41998-3 MSD
Matrix: Water
Analysis Batch: 239460

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA) - DL	0.24	H D	0.0367	0.275	H 4 D	ug/L		94	83 - 109	0	30
Perfluoroheptanoic acid (PFHpA) - DL	0.085	H D	0.0367	0.118	H D	ug/L		91	80 - 113	5	30
Perfluorooctanoic acid (PFOA) - DL	0.47	J1 H D M	0.0367	0.509	H 4 D M	ug/L		95	80 - 107	1	30
Perfluorononanoic acid (PFNA) - DL	0.0035	J H D	0.0367	0.0417	H D	ug/L		104	83 - 113	0	30
Perfluorodecanoic acid (PFDA) - DL	0.0045	U H	0.0367	0.0350	H D	ug/L		95	85 - 113	5	30
Perfluoroundecanoic acid (PFUnA) - DL	0.0067	U H	0.0367	0.0364	H D	ug/L		99	76 - 105	2	30
Perfluorododecanoic acid (PFDoA) - DL	0.0067	U H	0.0367	0.0397	H D	ug/L		108	87 - 116	1	30
Perfluorotridecanoic Acid (PFTriA) - DL	0.013	U H	0.0367	0.0350	H D	ug/L		95	75 - 129	6	30
Perfluorotetradecanoic acid (PFTeA) - DL	0.013	U H	0.0367	0.0346	H D	ug/L		94	82 - 115	10	30
Perfluorobutanesulfonic acid (PFBS) - DL	0.051	H D J1	0.0324	0.0876	H D	ug/L		112	87 - 120	6	30
Perfluorohexanesulfonic acid (PFHxS) - DL	0.23	H D	0.0334	0.265	H 4 D	ug/L		95	81 - 106	1	30
Perfluorooctanesulfonic acid (PFOS) - DL	0.67	H J1 D	0.0340	0.691	H 4 D	ug/L		48	82 - 112	2	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) - DL	0.045	U H	0.0367	0.0361	J H D	ug/L		98	82 - 111	4	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA) - DL	0.045	U H	0.0367	0.0399	J H D	ug/L		109	80 - 109	1	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA - DL	82		50 - 150
13C4-PFHpA - DL	93		50 - 150
13C4 PFOA - DL	97		50 - 150
13C5 PFNA - DL	89		50 - 150
13C2 PFDA - DL	95		50 - 150
13C2 PFUnA - DL	86		50 - 150

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

Lab Sample ID: 320-41998-3 MSD
Matrix: Water
Analysis Batch: 239460

Client Sample ID: TW03S-20180713
Prep Type: Total/NA
Prep Batch: 239407

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFDoA - DL	87		50 - 150
18O2 PFHxS - DL	79		50 - 150
13C2-PFTeDA - DL	82		50 - 150
13C4 PFOS - DL	80		50 - 150
13C3-PFBS - DL	72		50 - 150
d5-NEtFOSAA - DL	89		50 - 150
d3-NMeFOSAA - DL	95		50 - 150

LCMS

Prep Batch: 239407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41998-1	TW01S-20180713	Total/NA	Water	3535	
320-41998-2	TW02S-20180713	Total/NA	Water	3535	
320-41998-3 - DL	TW03S-20180713	Total/NA	Water	3535	
320-41998-3	TW03S-20180713	Total/NA	Water	3535	
320-41998-4 - DL	TW04S-20180713	Total/NA	Water	3535	
320-41998-4	TW04S-20180713	Total/NA	Water	3535	
320-41998-5	DUP02-20180713	Total/NA	Water	3535	
320-41998-6	EB02-20180713	Total/NA	Water	3535	
320-41998-7 - DL	I012MW07S-20180713	Total/NA	Water	3535	
320-41998-7	I012MW07S-20180713	Total/NA	Water	3535	
MB 320-239407/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-239407/2-A	Lab Control Sample	Total/NA	Water	3535	
320-41998-3 MS	TW03S-20180713	Total/NA	Water	3535	
320-41998-3 MS - DL	TW03S-20180713	Total/NA	Water	3535	
320-41998-3 MSD	TW03S-20180713	Total/NA	Water	3535	
320-41998-3 MSD - DL	TW03S-20180713	Total/NA	Water	3535	

Analysis Batch: 239432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41998-1	TW01S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-2	TW02S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-4	TW04S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-5	DUP02-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-6	EB02-20180713	Total/NA	Water	EPA 537 (Mod)	239407
MB 320-239407/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	239407
LCS 320-239407/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3 MS	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3 MSD	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407

Analysis Batch: 239460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41998-3 - DL	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-4 - DL	TW04S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3 MS - DL	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-3 MSD - DL	TW03S-20180713	Total/NA	Water	EPA 537 (Mod)	239407

Analysis Batch: 239523

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41998-7 - DL	I012MW07S-20180713	Total/NA	Water	EPA 537 (Mod)	239407
320-41998-7	I012MW07S-20180713	Total/NA	Water	EPA 537 (Mod)	239407

Client Sample ID: TW01S-20180713
Lab Sample ID: 320-41998-1
Date Collected: 07/13/18 09:50
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239432	08/11/18 20:59	AAR	TAL SAC

Client Sample ID: TW02S-20180713
Lab Sample ID: 320-41998-2
Date Collected: 07/13/18 11:50
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239432	08/11/18 21:07	AAR	TAL SAC

Client Sample ID: TW03S-20180713
Lab Sample ID: 320-41998-3
Date Collected: 07/13/18 13:30
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239432	08/11/18 21:14	AAR	TAL SAC
Total/NA	Prep	3535	DL		239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	5	239460	08/12/18 11:03	AAR	TAL SAC

Client Sample ID: TW04S-20180713
Lab Sample ID: 320-41998-4
Date Collected: 07/13/18 14:30
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239432	08/11/18 21:37	AAR	TAL SAC
Total/NA	Prep	3535	DL		239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	5	239460	08/12/18 11:25	AAR	TAL SAC

Client Sample ID: DUP02-20180713
Lab Sample ID: 320-41998-5
Date Collected: 07/13/18 00:00
Matrix: Water
Date Received: 08/10/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239432	08/11/18 21:44	AAR	TAL SAC

Lab Chronicle

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Client Sample ID: EB02-20180713
Date Collected: 07/13/18 15:45
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239432	08/11/18 22:07	AAR	TAL SAC

Client Sample ID: I012MW07S-20180713
Date Collected: 07/13/18 15:30
Date Received: 08/10/18 09:50

Lab Sample ID: 320-41998-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	100	239523	08/13/18 09:36	AAR	TAL SAC
Total/NA	Prep	3535			239407	08/11/18 09:18	SK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		10	239523	08/13/18 09:44	AAR	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
ANAB	DoD ELAP		L2468	01-20-21

Method Summary

Client: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

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: Wood E&I Solutions Inc
Project/Site: PFAS, Tustin

TestAmerica Job ID: 320-41998-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41998-1	TW01S-20180713	Water	07/13/18 09:50	08/10/18 09:50
320-41998-2	TW02S-20180713	Water	07/13/18 11:50	08/10/18 09:50
320-41998-3	TW03S-20180713	Water	07/13/18 13:30	08/10/18 09:50
320-41998-4	TW04S-20180713	Water	07/13/18 14:30	08/10/18 09:50
320-41998-5	DUP02-20180713	Water	07/13/18 00:00	08/10/18 09:50
320-41998-6	EB02-20180713	Water	07/13/18 15:45	08/10/18 09:50
320-41998-7	I012MW07S-20180713	Water	07/13/18 15:30	08/10/18 09:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 237921

Lab Sample ID: IC 320-237921/2 Client Sample ID:

Date Analyzed: 08/03/18 16:12 Lab File ID: 2018.08.03LLICAL_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.49	Incomplete Integration	roycea	08/03/18 17:12
Perfluorohexanoic acid (PFHxA)	2.05	Baseline	roycea	08/03/18 17:12
Perfluorohexanesulfonic acid (PFHxS)	2.40	Baseline	roycea	08/03/18 17:12
Perfluorononanoic acid (PFNA)	3.14	Baseline	roycea	08/03/18 17:13
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.83	Baseline	roycea	08/03/18 17:13
Perfluorododecanoic acid (PFDoA)	4.13	Baseline	roycea	08/03/18 17:13
Perfluorotetradecanoic acid (PFTeA)	4.64	Baseline	roycea	08/03/18 17:13

Lab Sample ID: IC 320-237921/3 Client Sample ID:

Date Analyzed: 08/03/18 16:19 Lab File ID: 2018.08.03LLICAL_006.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.49	Baseline	roycea	08/03/18 17:49
Perfluorohexanoic acid (PFHxA)	2.05	Baseline	roycea	08/03/18 17:50
Perfluorohexanesulfonic acid (PFHxS)	2.40	Baseline	roycea	08/03/18 17:50
Perfluorooctanesulfonic acid (PFOS)	3.14	Baseline	roycea	08/03/18 17:50
Perfluorodecanoic acid (PFDA)	3.51	Baseline	roycea	08/03/18 17:50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.66	Baseline	roycea	08/03/18 17:50
Perfluorododecanoic acid (PFDoA)	4.13	Baseline	roycea	08/03/18 17:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 237921

Lab Sample ID: IC 320-237921/4 Client Sample ID:

Date Analyzed: 08/03/18 16:27 Lab File ID: 2018.08.03LLICAL_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.49	Baseline	roycea	08/03/18 17:52

Lab Sample ID: IC 320-237921/6 Client Sample ID:

Date Analyzed: 08/03/18 16:42 Lab File ID: 2018.08.03LLICAL_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.49	Incomplete Integration	roycea	08/03/18 17:54

Lab Sample ID: ICB 320-237921/9 Client Sample ID:

Date Analyzed: 08/03/18 17:04 Lab File ID: 2018.08.03LLICAL_012.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)		Invalid Compound ID	roycea	08/03/18 17:56
Perfluorooctanesulfonic acid (PFOS)		Invalid Compound ID	roycea	08/03/18 17:57

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 239432

Lab Sample ID: CCB 320-239432/1 Client Sample ID:

Date Analyzed: 08/11/18 20:22 Lab File ID: 2018.08.11LA9A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.17	Assign Peak	roycea	08/12/18 09:21

Lab Sample ID: CCVL 320-239432/2 Client Sample ID:

Date Analyzed: 08/11/18 20:29 Lab File ID: 2018.08.11LA9A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.41	Baseline	roycea	08/12/18 09:22
Perfluorodecanoic acid (PFDA)	3.53	Baseline	roycea	08/12/18 09:22

Lab Sample ID: MB 320-239407/1-A Client Sample ID:

Date Analyzed: 08/11/18 20:44 Lab File ID: 2018.08.11LA9A_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)		Invalid Compound ID	roycea	08/12/18 13:26

Lab Sample ID: LCS 320-239407/2-A Client Sample ID:

Date Analyzed: 08/11/18 20:52 Lab File ID: 2018.08.11LA9A_008.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.41	Isomers	roycea	08/12/18 13:27

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 239432

Lab Sample ID: 320-41998-1 Client Sample ID: TW01S-20180713

Date Analyzed: 08/11/18 20:59 Lab File ID: 2018.08.11LA9A_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.77	Isomers	roycea	08/12/18 13:29
Perfluorononanoic acid (PFNA)	3.16	Baseline	roycea	08/12/18 13:29
Perfluorotetradecanoic acid (PFTeA)	4.65	Baseline	roycea	08/12/18 13:29

Lab Sample ID: 320-41998-2 Client Sample ID: TW02S-20180713

Date Analyzed: 08/11/18 21:07 Lab File ID: 2018.08.11LA9A_010.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:30
Perfluorononanoic acid (PFNA)	3.14	Baseline	roycea	08/12/18 13:30

Lab Sample ID: 320-41998-3 Client Sample ID: TW03S-20180713

Date Analyzed: 08/11/18 21:14 Lab File ID: 2018.08.11LA9A_011.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	2.05	Incomplete Integration	roycea	08/12/18 13:31
Perfluorooctanoic acid (PFOA)	2.77	Isomers	roycea	08/12/18 13:31
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		Invalid Compound ID	roycea	08/12/18 13:32
Perfluorodecanoic acid (PFDA)		Invalid Compound ID	roycea	08/12/18 13:32

Lab Sample ID: 320-41998-3 MS Client Sample ID: TW03S-20180713 MS

Date Analyzed: 08/11/18 21:22 Lab File ID: 2018.08.11LA9A_012.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:33

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 239432

Lab Sample ID: 320-41998-3 MSD Client Sample ID: TW03S-20180713 MSD

Date Analyzed: 08/11/18 21:29 Lab File ID: 2018.08.11LA9A_013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.77	Isomers	roycea	08/12/18 13:34
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.67	Baseline	roycea	08/12/18 13:35

Lab Sample ID: 320-41998-4 Client Sample ID: TW04S-20180713

Date Analyzed: 08/11/18 21:37 Lab File ID: 2018.08.11LA9A_014.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:36
Perfluorononanoic acid (PFNA)	3.14	Split Peak	roycea	08/12/18 13:36
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		Invalid Compound ID	roycea	08/12/18 13:37

Lab Sample ID: 320-41998-5 Client Sample ID: DUP02-20180713

Date Analyzed: 08/11/18 21:44 Lab File ID: 2018.08.11LA9A_015.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:37
Perfluorononanoic acid (PFNA)	3.14	Baseline	roycea	08/12/18 13:37
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.84	Baseline	roycea	08/12/18 13:38

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 239432

Lab Sample ID: 320-41998-6 Client Sample ID: EB02-20180713

Date Analyzed: 08/11/18 22:07 Lab File ID: 2018.08.11LA9A_018.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.40	Baseline	roycea	08/12/18 13:40
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:41

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 239460

Lab Sample ID: CCB 320-239460/1 Client Sample ID:

Date Analyzed: 08/12/18 10:25 Lab File ID: 2018.08.12LLA_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.17	Assign Peak	roycea	08/12/18 13:49
Perfluorohexanoic acid (PFHxA)		Invalid Compound ID	roycea	08/12/18 13:48

Lab Sample ID: CCVL 320-239460/2 Client Sample ID:

Date Analyzed: 08/12/18 10:33 Lab File ID: 2018.08.12LLA_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.76	Baseline	roycea	08/12/18 13:49
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.69	Baseline	roycea	08/12/18 13:50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.86	Baseline	roycea	08/12/18 13:50
Perfluoroundecanoic acid (PFUnA)	3.86	Baseline	roycea	08/12/18 13:50

Lab Sample ID: CCV 320-239460/3 CCVIS Client Sample ID:

Date Analyzed: 08/12/18 10:40 Lab File ID: 2018.08.12LLA_006.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.84	Isomers	roycea	08/12/18 13:51

Lab Sample ID: 320-41998-3 DL Client Sample ID: TW03S-20180713 DL

Date Analyzed: 08/12/18 11:03 Lab File ID: 2018.08.12LLA_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:54

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 239460

Lab Sample ID: 320-41998-3 MS DL Client Sample ID: TW03S-20180713 MS DL

Date Analyzed: 08/12/18 11:10 Lab File ID: 2018.08.12LLA_010.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:57

Lab Sample ID: 320-41998-3 MSD DL Client Sample ID: TW03S-20180713 MSD DL

Date Analyzed: 08/12/18 11:18 Lab File ID: 2018.08.12LLA_011.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:58

Lab Sample ID: 320-41998-4 DL Client Sample ID: TW04S-20180713 DL

Date Analyzed: 08/12/18 11:25 Lab File ID: 2018.08.12LLA_012.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/12/18 13:59
Perfluorononanoic acid (PFNA)	3.15	Baseline	roycea	08/12/18 14:00

Lab Sample ID: CCV 320-239460/16 Client Sample ID:

Date Analyzed: 08/12/18 12:18 Lab File ID: 2018.08.12LLA_019.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	2.05	Incomplete Integration	roycea	08/13/18 11:35

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 239481

Lab Sample ID: CCB 320-239481/1 Client Sample ID:

Date Analyzed: 08/13/18 08:06 Lab File ID: 2018.08.13LLA_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.15	Assign Peak	roycea	08/13/18 08:55
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		Invalid Compound ID	roycea	08/13/18 08:56

Lab Sample ID: CCV 320-239481/3 CCVIS Client Sample ID:

Date Analyzed: 08/13/18 08:21 Lab File ID: 2018.08.13LLA_019.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.69	Baseline	roycea	08/13/18 08:58

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Analysis Batch Number: 239523

Lab Sample ID: 320-41998-7 DL Client Sample ID: I012MW07S-20180713 DL

Date Analyzed: 08/13/18 09:36 Lab File ID: 2018.08.13LLA_028.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/13/18 09:51
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.83	Baseline	roycea	08/13/18 09:51

Lab Sample ID: 320-41998-7 Client Sample ID: I012MW07S-20180713

Date Analyzed: 08/13/18 09:44 Lab File ID: 2018.08.13LLA_029.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.75	Isomers	roycea	08/13/18 10:02
Perfluorononanoic acid (PFNA)	3.14	Split Peak	roycea	08/13/18 10:02

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00092	01/30/19	07/30/18	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_00055	12/01/18	06/01/18	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_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
.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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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
..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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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_00007	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_00163	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 (NEtFOSAA)	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.025 ng/mL
							Perfluorobutyric acid	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.: 320-41998-1

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
							Perfluorodecane Sulfonic acid	0.0241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic acid	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	0.025 ng/mL
							Perfluoropentanoic acid	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
..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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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_00163	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 (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	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	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	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	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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 (NEtFOSAA)	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	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)		Perfluorodecane Sulfonic acid	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	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	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	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_LL2_00006	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

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

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-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_00163	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 (NEtFOSAA)	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.05 ng/mL
							Perfluorobutyric acid	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
							Perfluorodecane Sulfonic acid	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic acid	0.0476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05005 ng/mL
							Perfluorononanesulfonic acid	0.048 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide	0.05 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid	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
..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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	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 (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	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	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	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	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	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 (NEtFOSAA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

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 (NMeFOSAA)	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	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)		Perfluorodecane Sulfonic acid	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	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	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	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_00006	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00163	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 (NEtFOSAA)	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.25 ng/mL
							Perfluorobutyric acid	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
							Perfluorodecane Sulfonic acid	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic acid	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	0.25 ng/mL
							Perfluoropentanoic acid	0.25 ng/mL
							Perfluoropentanesulfonic acid	0.2345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.25 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.25 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.25 ng/mL
.LCMPFC_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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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_00163	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 (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	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	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	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 (NEtFOSAA)	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	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)		Perfluorodecane Sulfonic acid	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	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	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_00006	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_00163	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 (NEtFOSAA)	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1 ng/mL
							Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid (PFDA)	1 ng/mL
							Perfluorododecanoic acid (PFDoA)	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic acid	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	1 ng/mL
							Perfluoropentanoic acid	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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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_00163	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 (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	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	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	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	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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 (NEtFOSAA)	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	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)		Perfluorodecane Sulfonic acid	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	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	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	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_00006	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

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-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_00163	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
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	2.395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2.5 ng/mL
							Perfluorobutyric acid	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
							Perfluorodecane Sulfonic acid	2.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluoroheptanesulfonic acid	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	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid	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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFUdA_00018	05/11/23	Wellington Laboratories, Lot MPFUdA0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	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 (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	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	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	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	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	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 (NEtFOSAA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

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 (NMeFOSAA)	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	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)		Perfluorodecane Sulfonic acid	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	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	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	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	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
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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

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	25 mL	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	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
							Perfluoroheptanoic acid (PFHpA)	2.5 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
							Perfluorooctanesulfonic acid (PFOS)	2.32 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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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
.LCPFCSP_00174	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	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
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 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
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	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
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 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
..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
..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_00007	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_00163	7.5 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	4.67 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

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-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 (NEtFOSAA)	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	5 ng/mL
							Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic acid	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	5 ng/mL
							Perfluoropentanoic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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_00163	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 (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	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	Perfluorodecane Sulfonic acid	0.01928 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	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	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	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 (NEtFOSAA)	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	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)		Perfluorodecane Sulfonic acid	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	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFOS-br_00007	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	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	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_LL7_00006	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_00163	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 (NEtFOSAA)	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	10 ng/mL
							Perfluorobutyric acid	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid (PFDA)	10 ng/mL
							Perfluorododecanoic acid (PFDoA)	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecane Sulfonic acid	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic acid	9.52 ng/mL
							Perfluorohexanoic acid (PFHxA)	10 ng/mL
							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	10 ng/mL
							Perfluoropentanoic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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_00163	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 (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	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	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	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	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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 (NEtFOSAA)	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	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)		Perfluorodecane Sulfonic acid	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	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	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	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_00013	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_00013	01/25/19	07/31/18	MeOH/H2O, Lot 09285	100 mL	LCMPFC_ICALSU_00001	5 mL	d3-NMeFOSAA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5-PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFAC-24PAR_00002	125 uL	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 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
							Perfluorooctanesulfonic acid (PFOS)	2.31375 ng/mL
							Perfluorooctanoic acid (PFOA)	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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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)		N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid (PFDoA)	2 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.824 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.851 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	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 (NEtFOSAA)	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.02 ug/mL
					LCDONA_00002	100 uL	ADONA	0.02 ug/mL
					LCHFPO-DA_00002	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCN-EtFOSA-M_00011	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.02 ug/mL
					LCN-MeFOSA-M_00010	100 uL	MeFOSA	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutyric acid	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_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDoS_00004	100 uL	Perfluorododecanesulfonic acid (PFDoS)	0.01936 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecane Sulfonic acid	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid	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
.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 (NEtFOSAA)	50 ug/mL
.LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	50 ug/mL
.LCDONA_00002	03/26/23	WELLINGTON, Lot NADONA0318			(Purchased Reagent)		ADONA	50 ug/mL
.LCHFPO-DA_00002	03/26/21	WELLINGTON, Lot HFPODA0318			(Purchased Reagent)		Perfluoro(2-propoxypropanoic) acid	50 ug/mL
.LCN-EtFOSA-M_00011	05/31/23	WELLINGTON, Lot NEtFOSA0518M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
.LCN-MeFOSA-M_00010	05/31/23	WELLINGTON, Lot NMeFOSA0518M			(Purchased Reagent)		MeFOSA	50 ug/mL
.LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutyric acid	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
.LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.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)		Perfluorodecane Sulfonic acid	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	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	50 ug/mL
.LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid	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

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

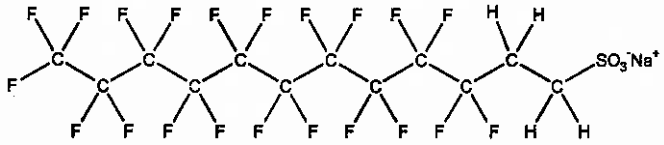
WELLINGTON LABORATORIES

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:

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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UNCERTAINTY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

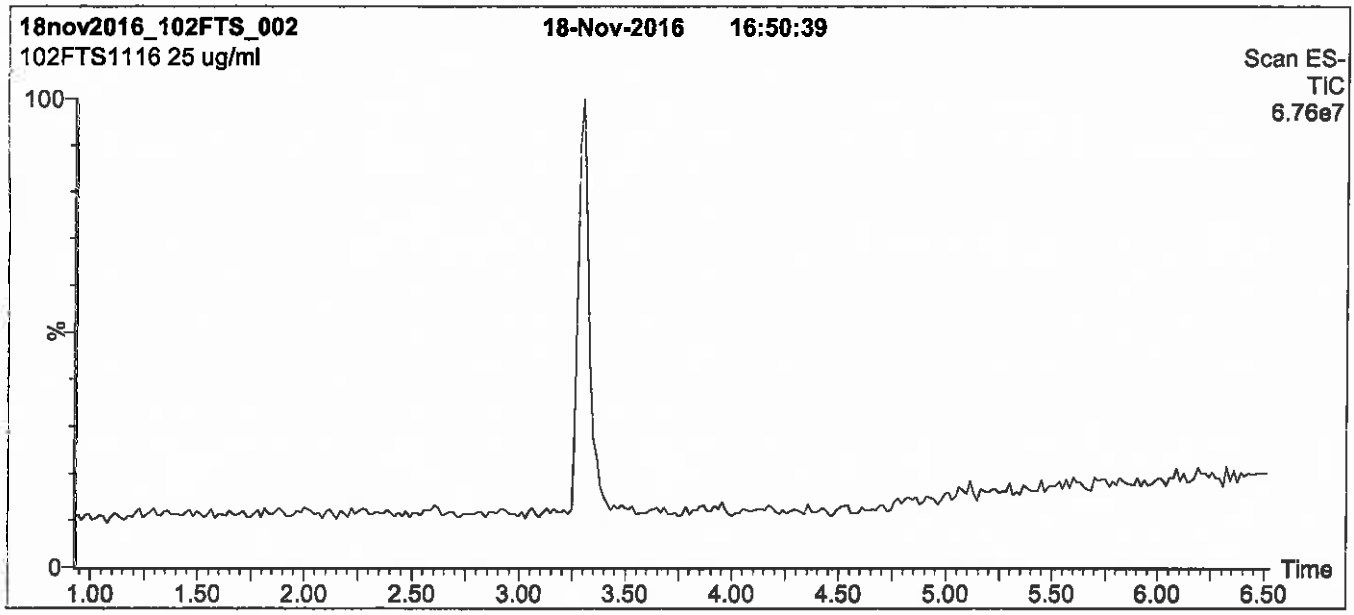
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

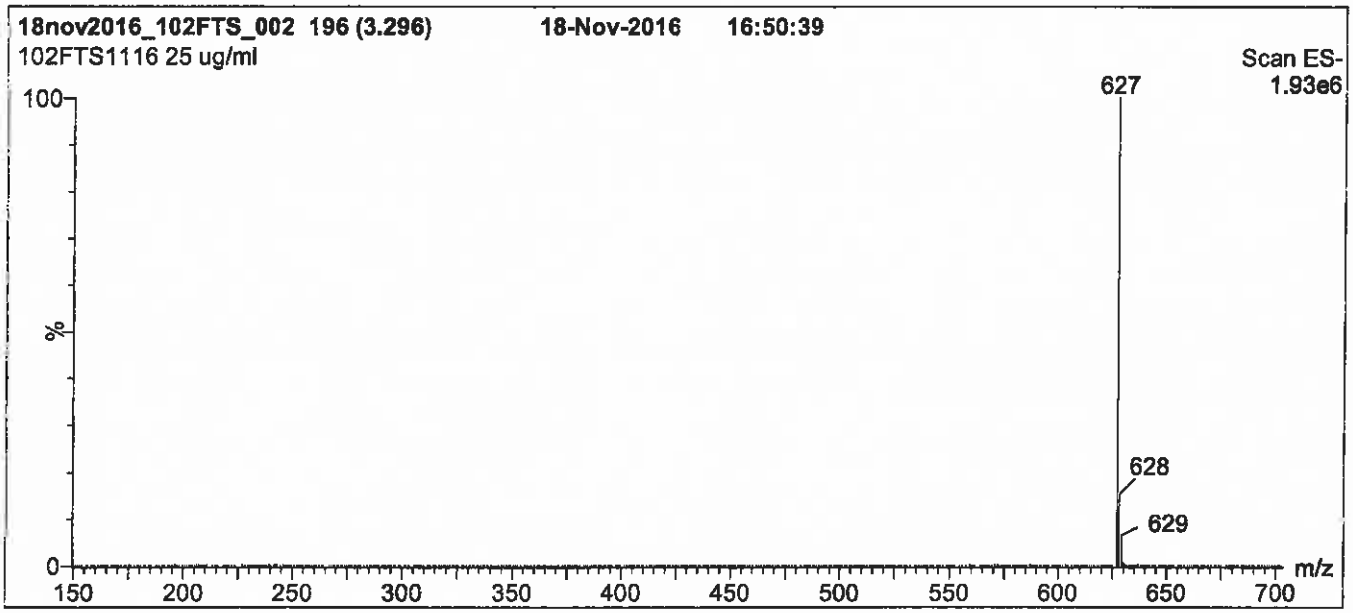
CALA

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

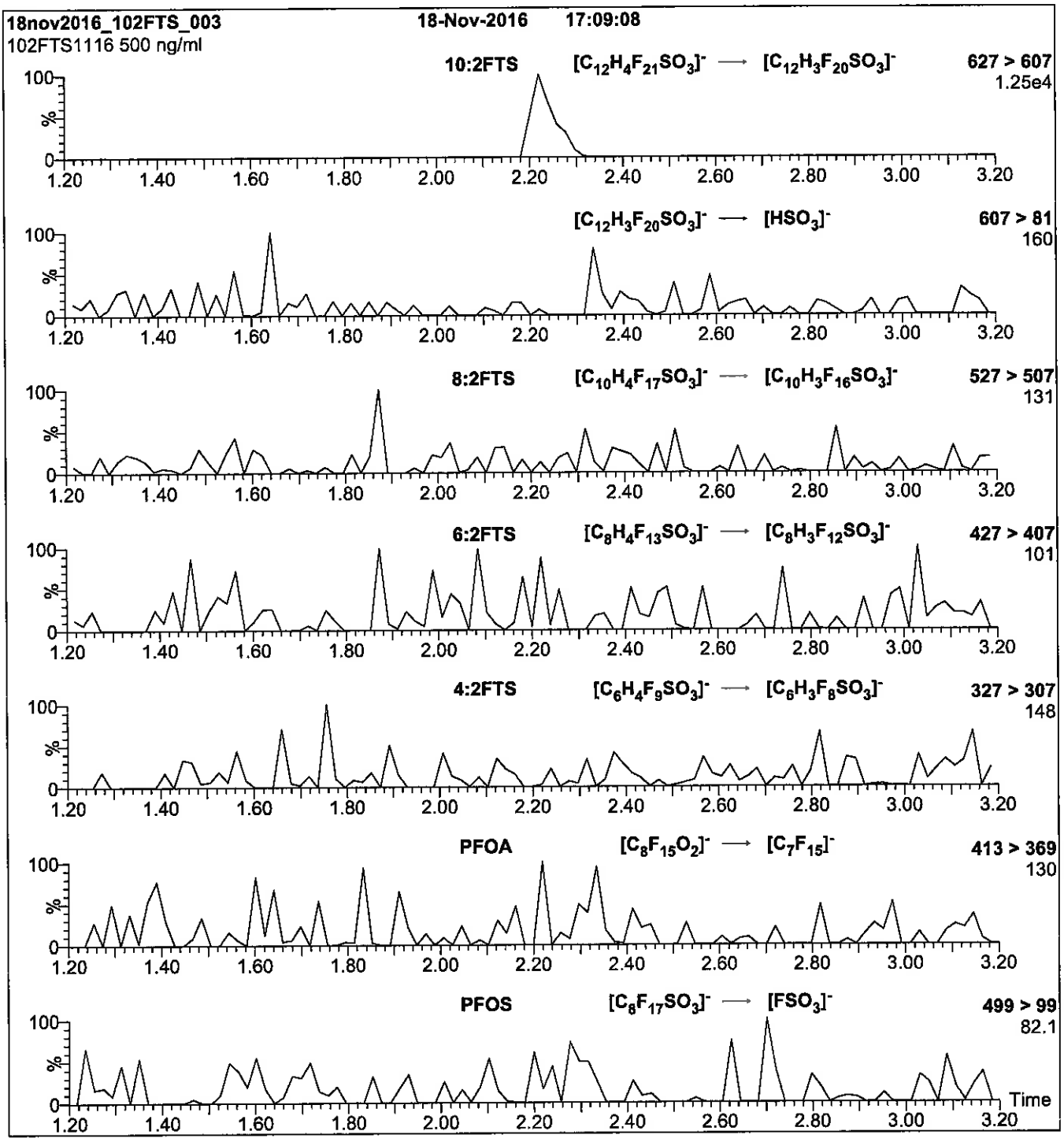
Flow: 300 µl/min

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

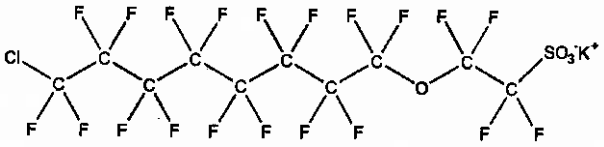
WELLINGTON LABORATORIES

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:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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:

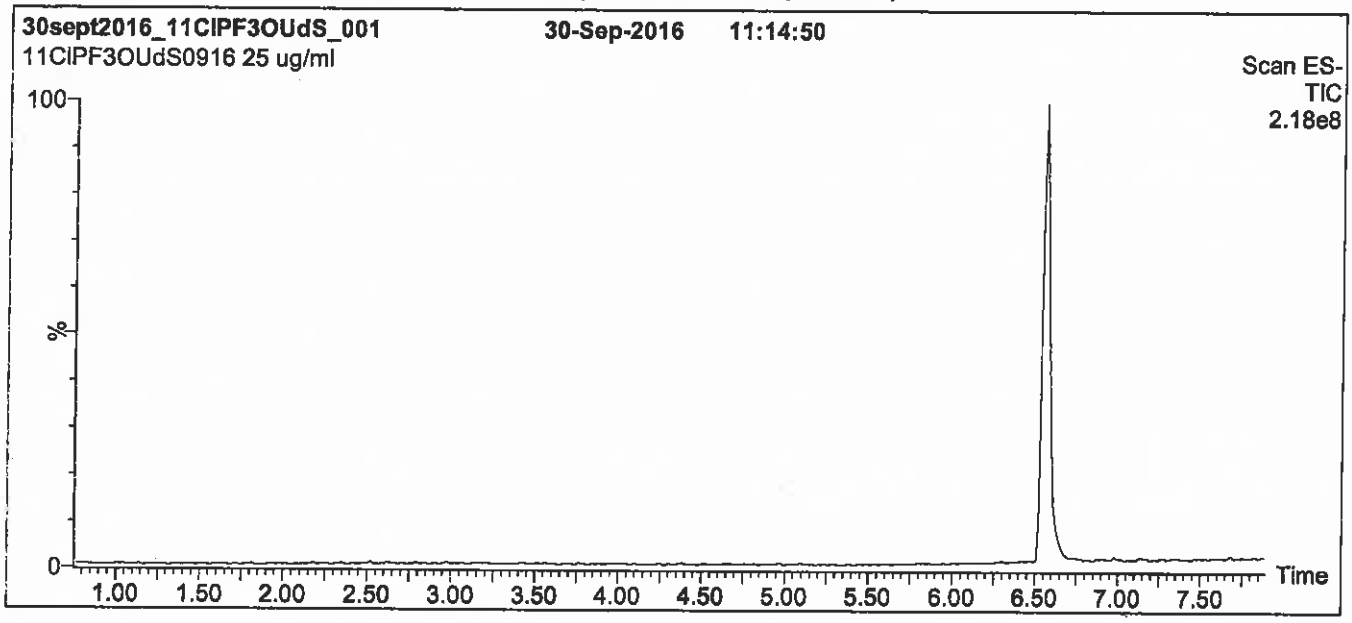
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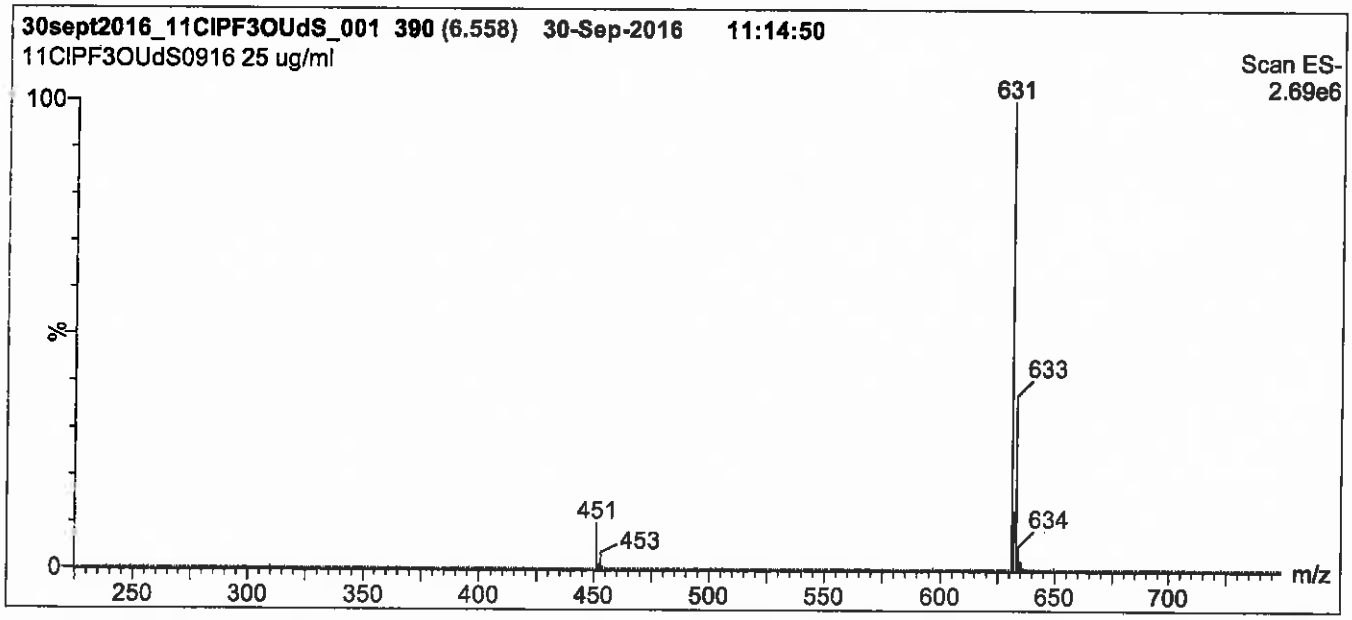
CALA

ANAB ACCREDITED 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

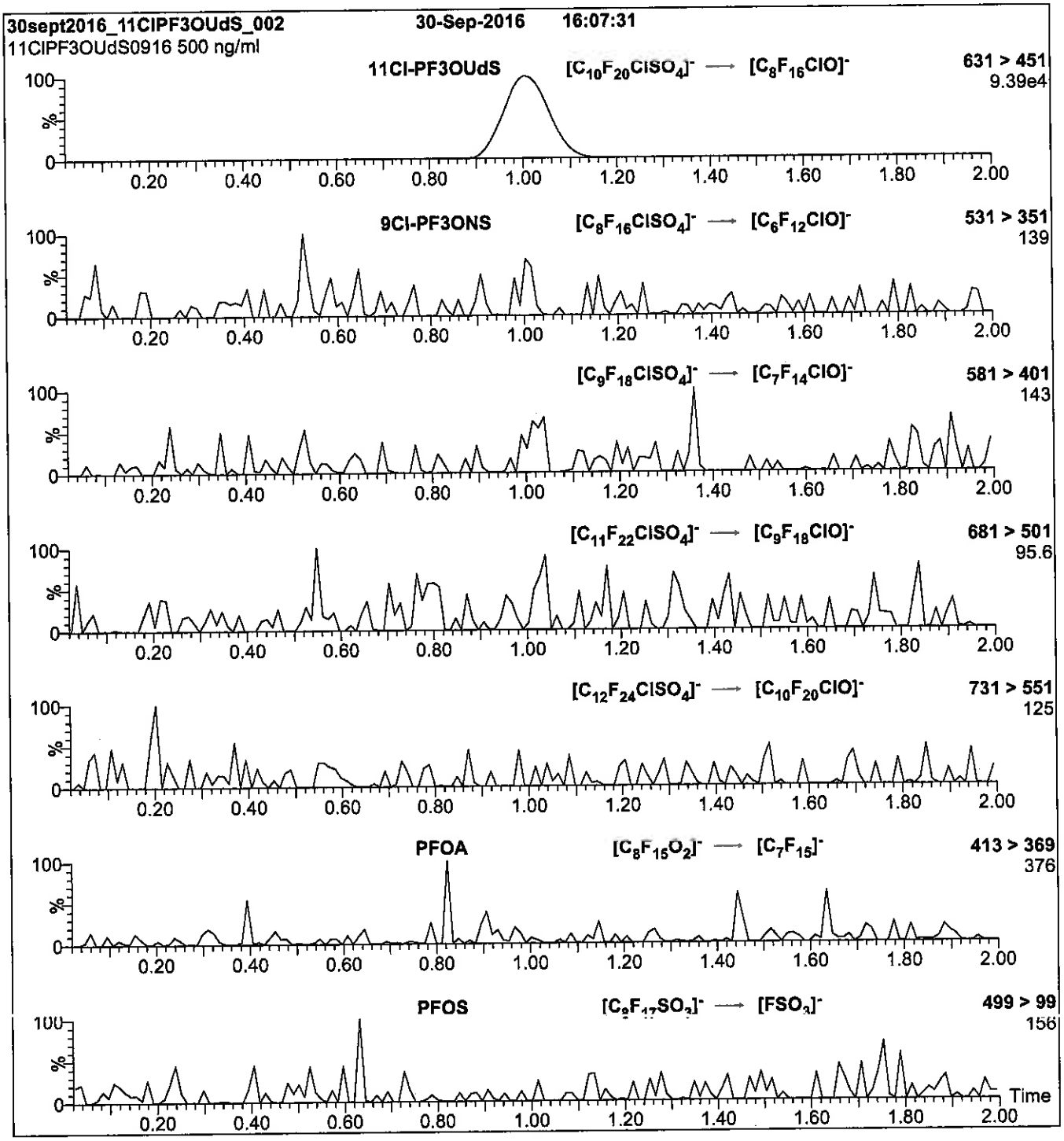
Flow: 300 µl/min

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

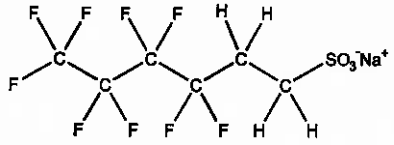
WELLINGTON LABORATORIES

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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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:

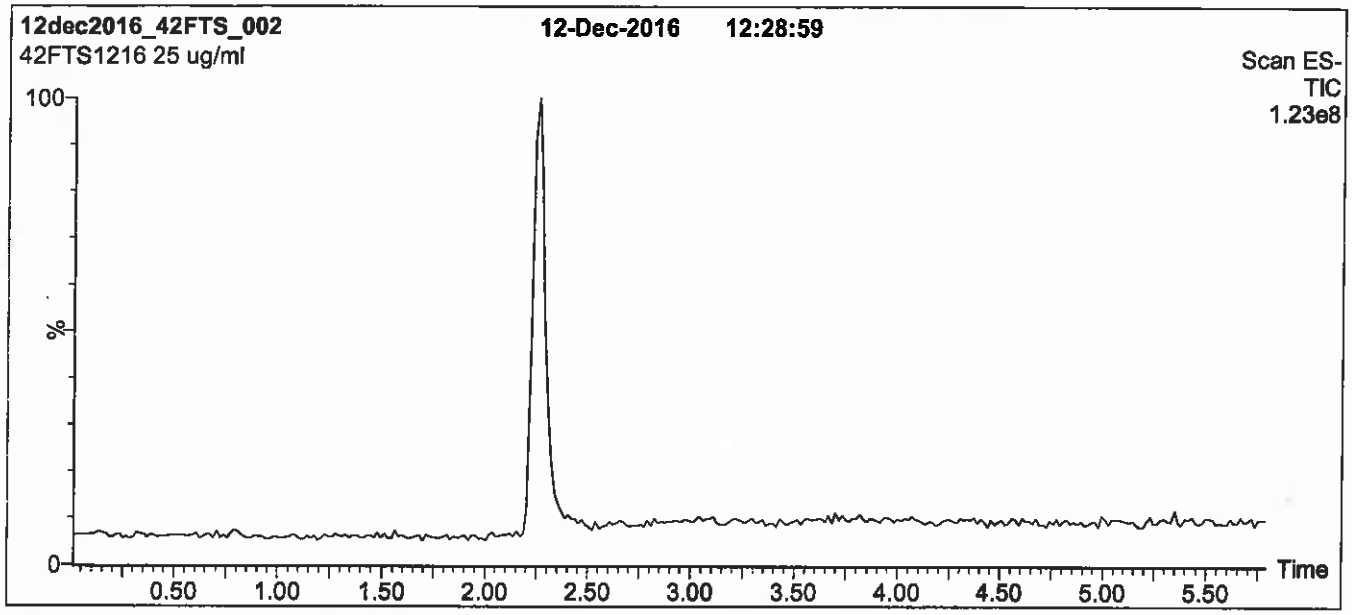
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

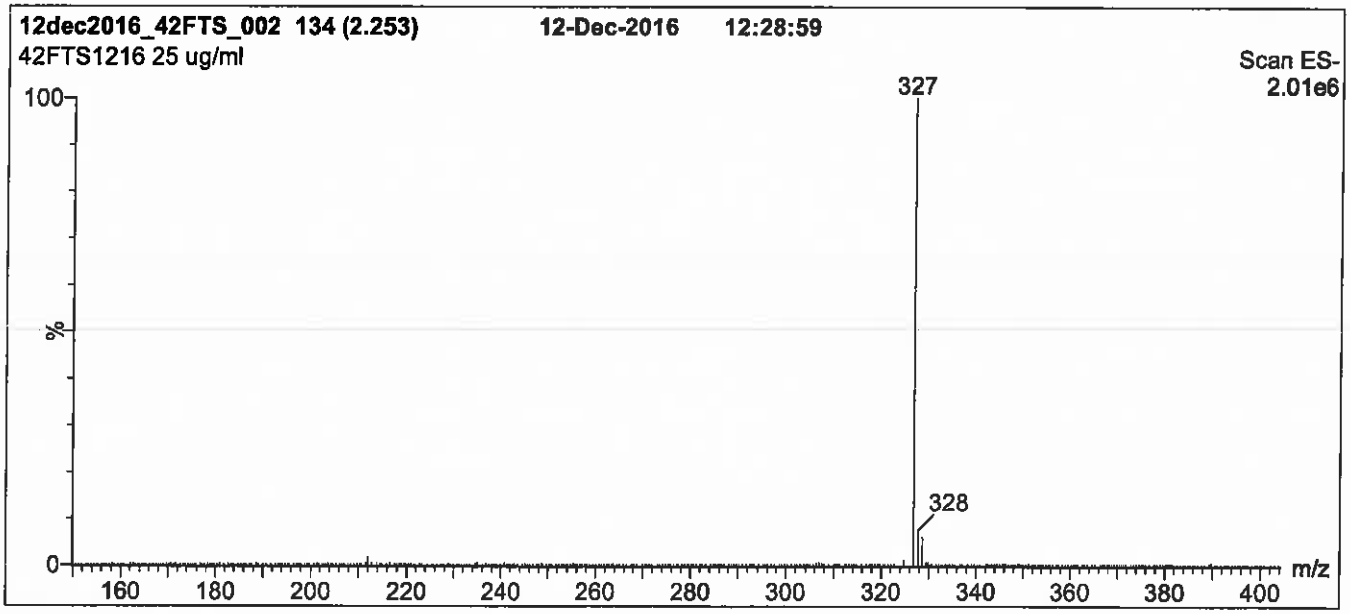
CALA

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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

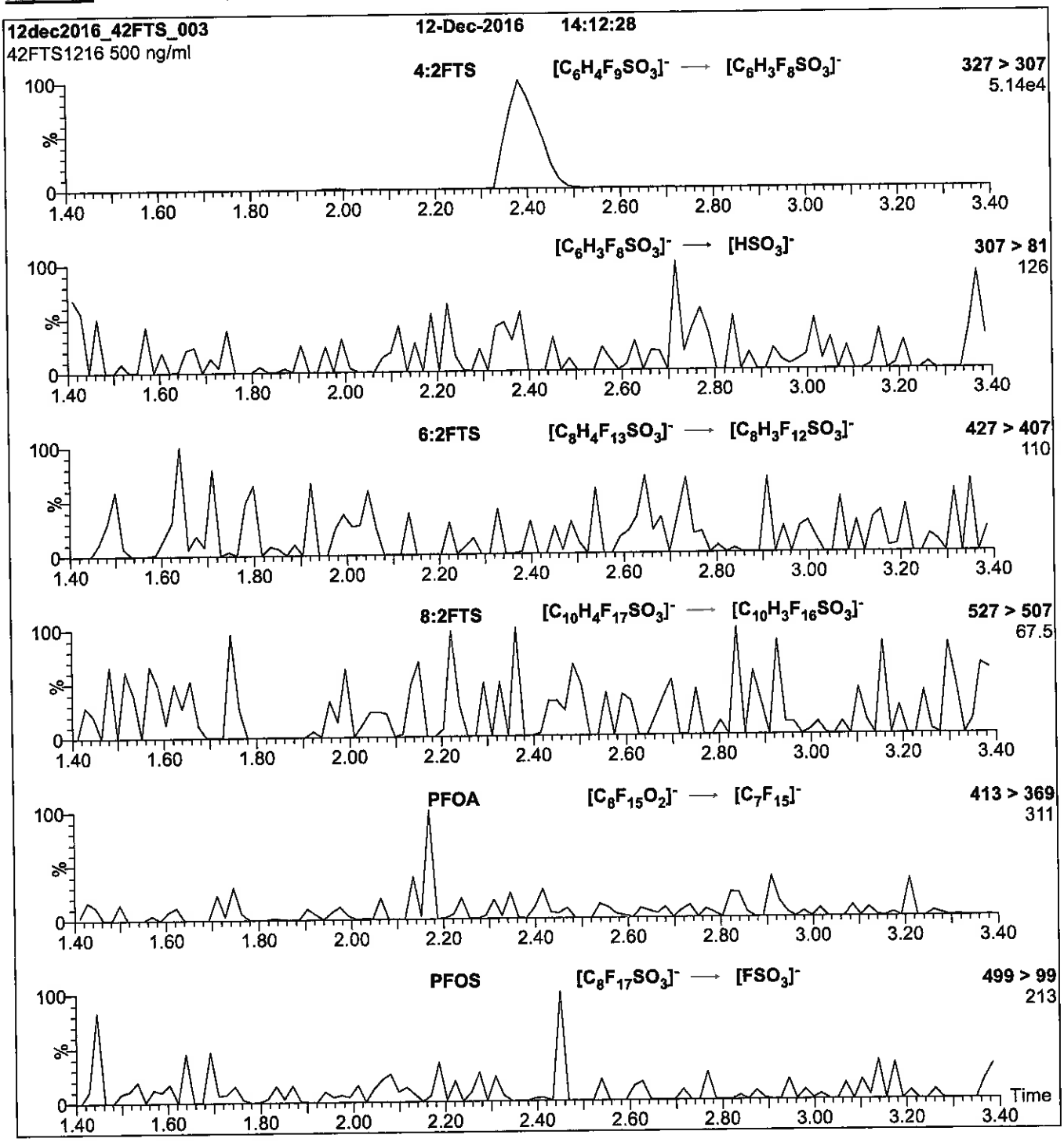
Flow: 300 µl/min

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

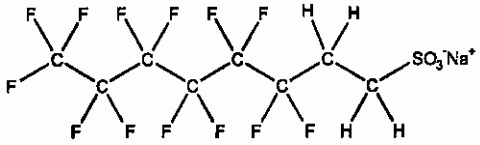
LC6:2FTS_00007

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:

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:

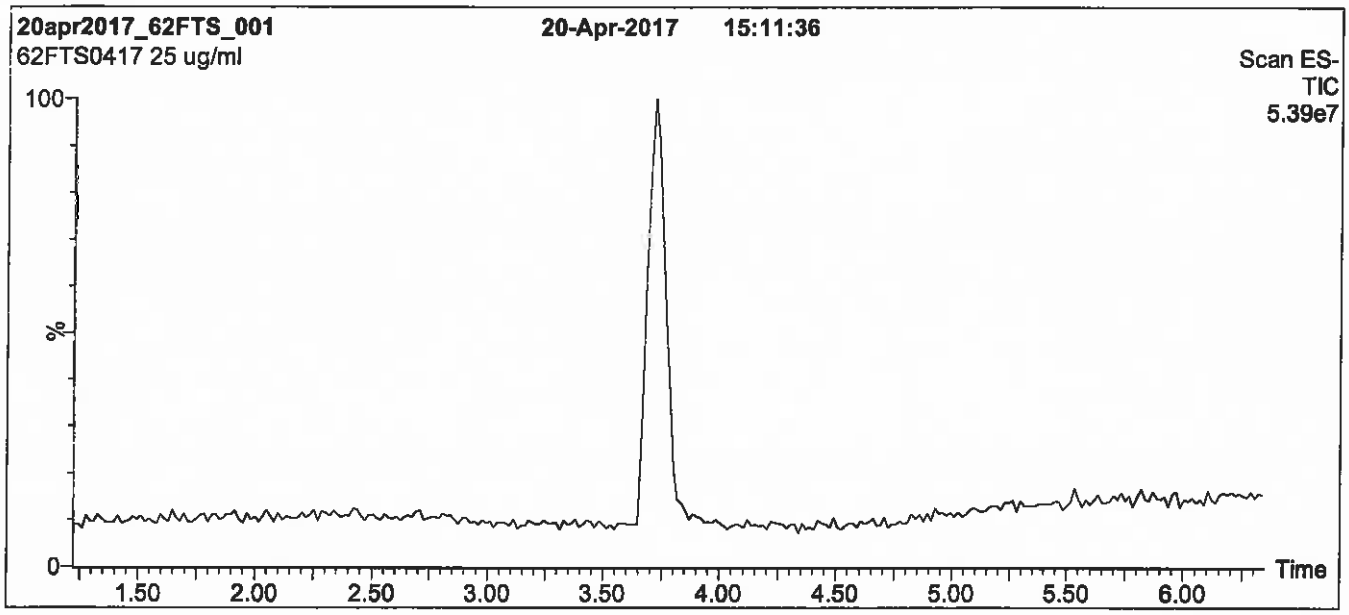
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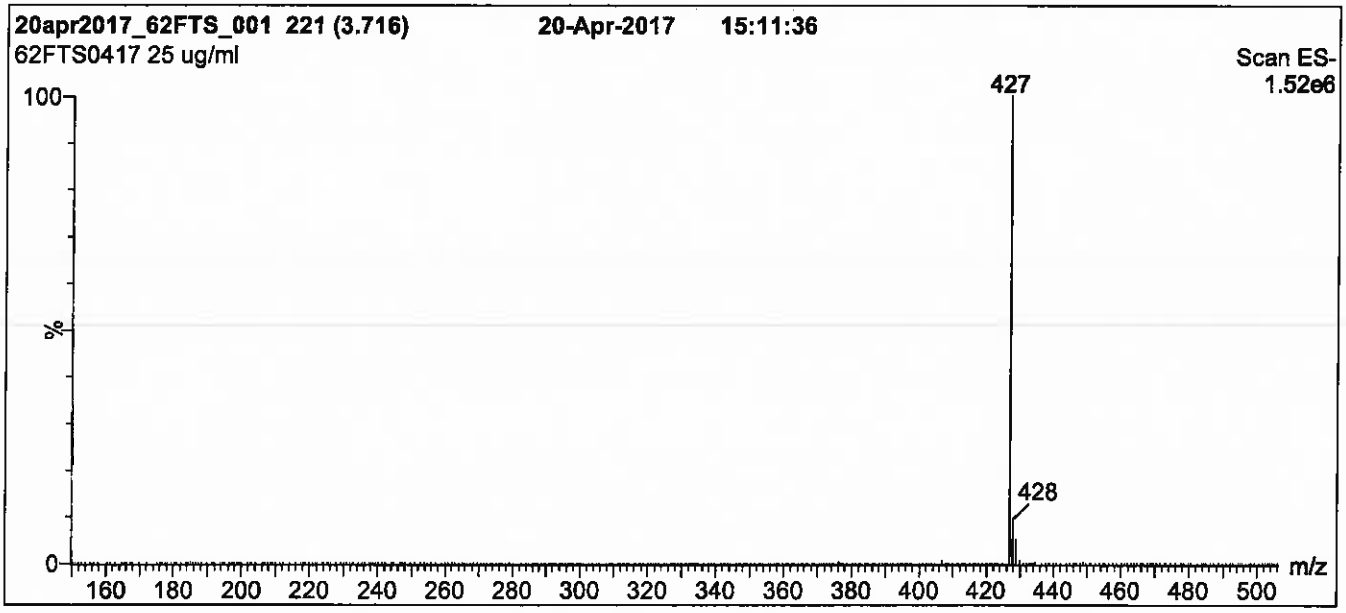
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Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

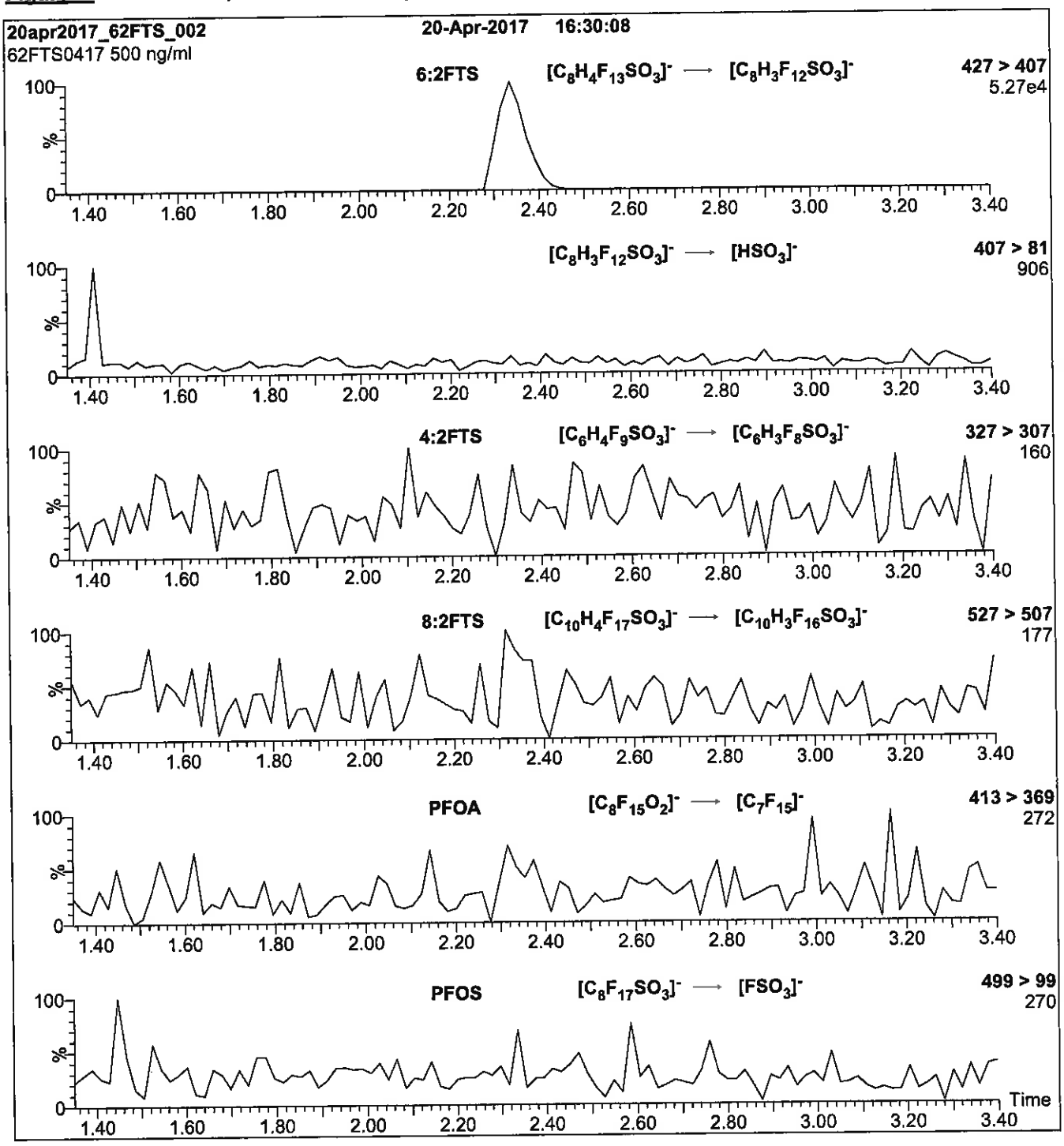
Flow: 300 µl/min

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

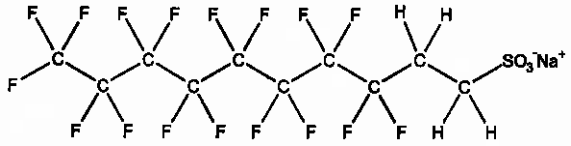
n: 9/21/17-SK

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:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

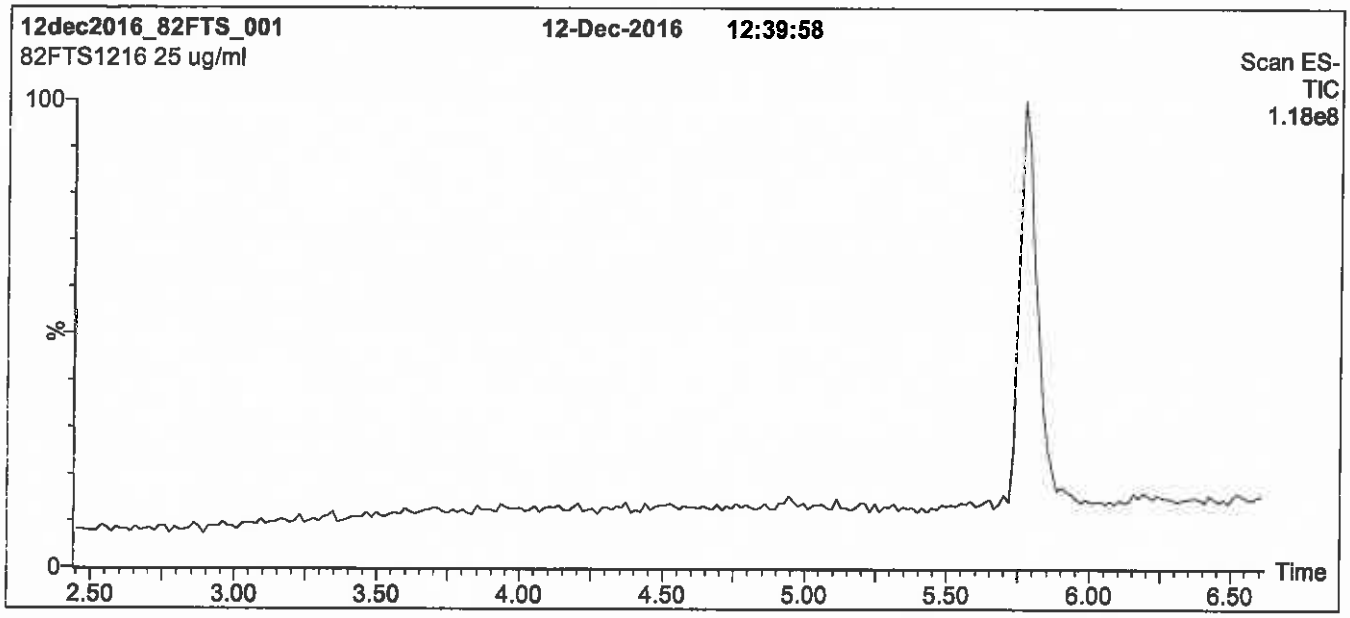
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

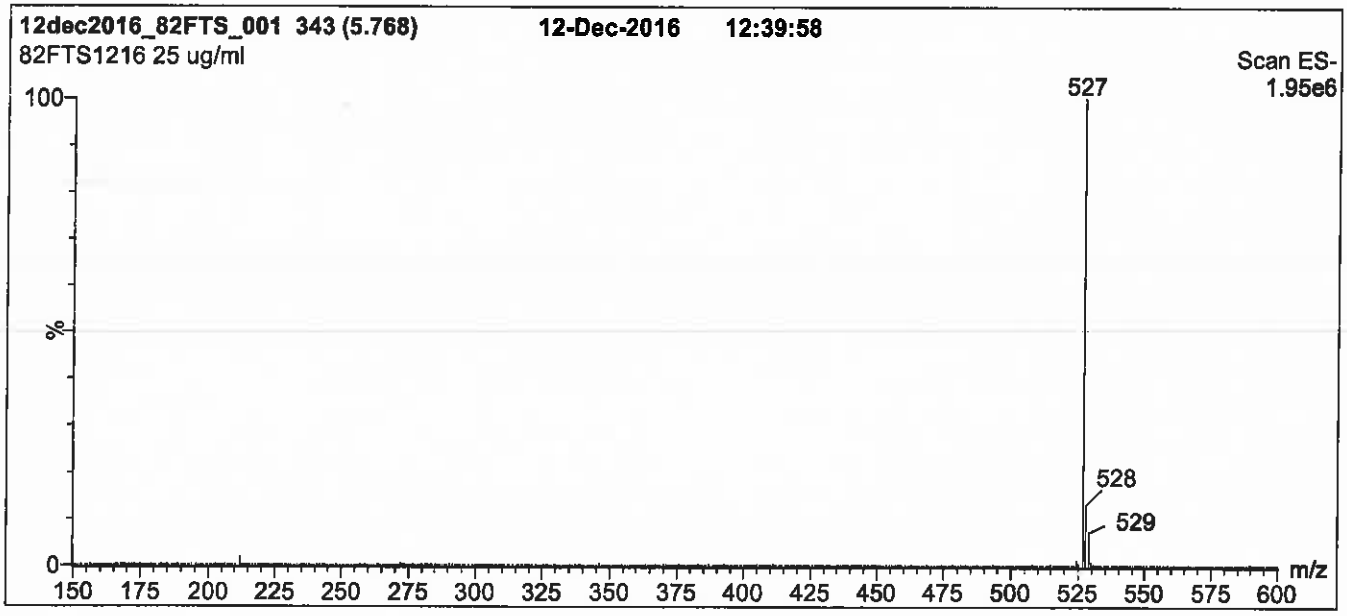
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Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

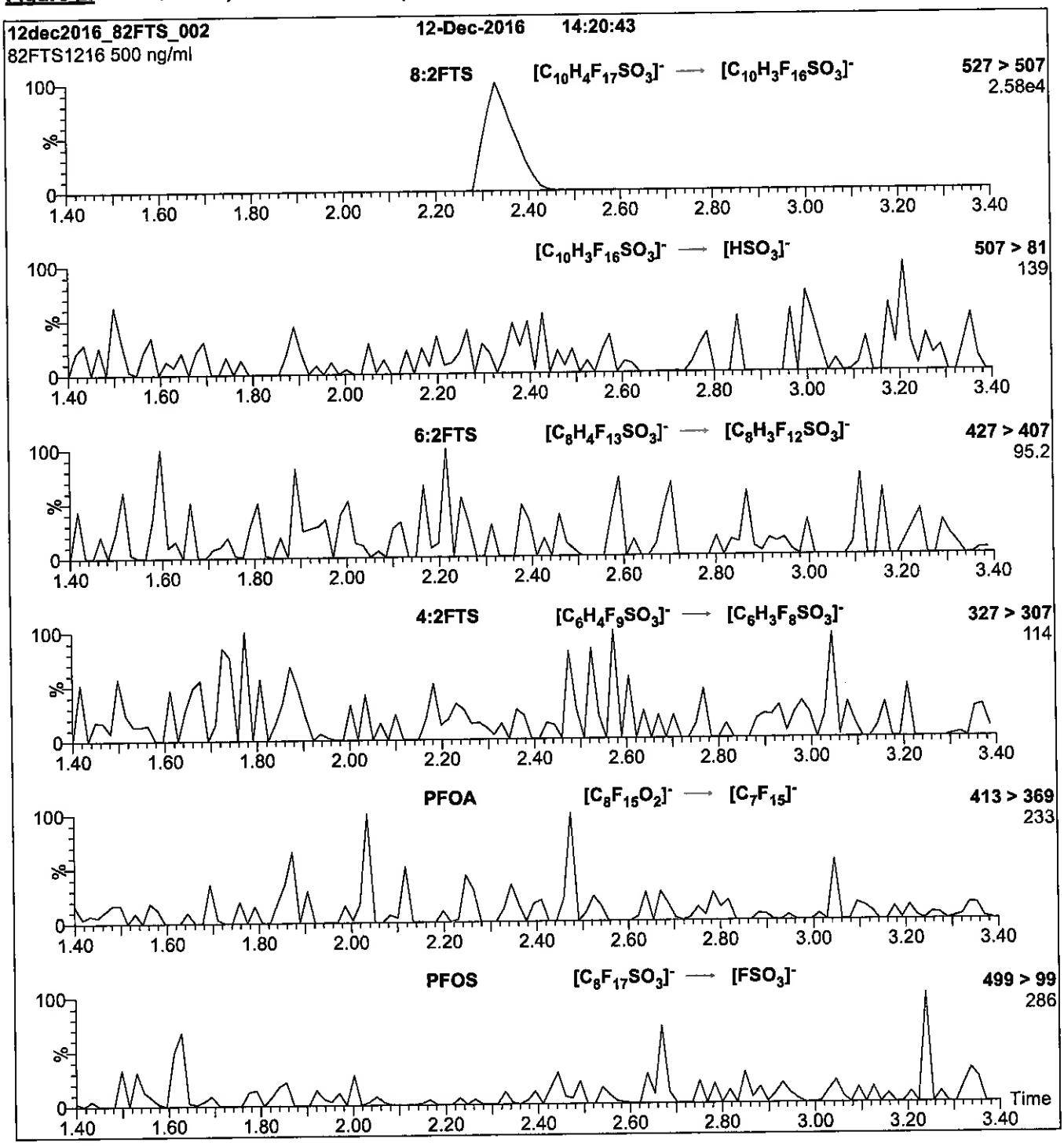
Flow: 300 µl/min

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

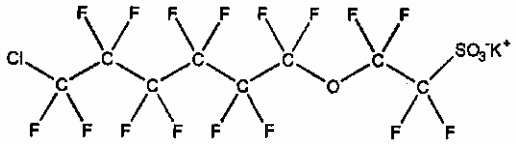
P: 4/25/18 SKV

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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EXPIRY DATE / PERIOD OF VALIDITY:

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

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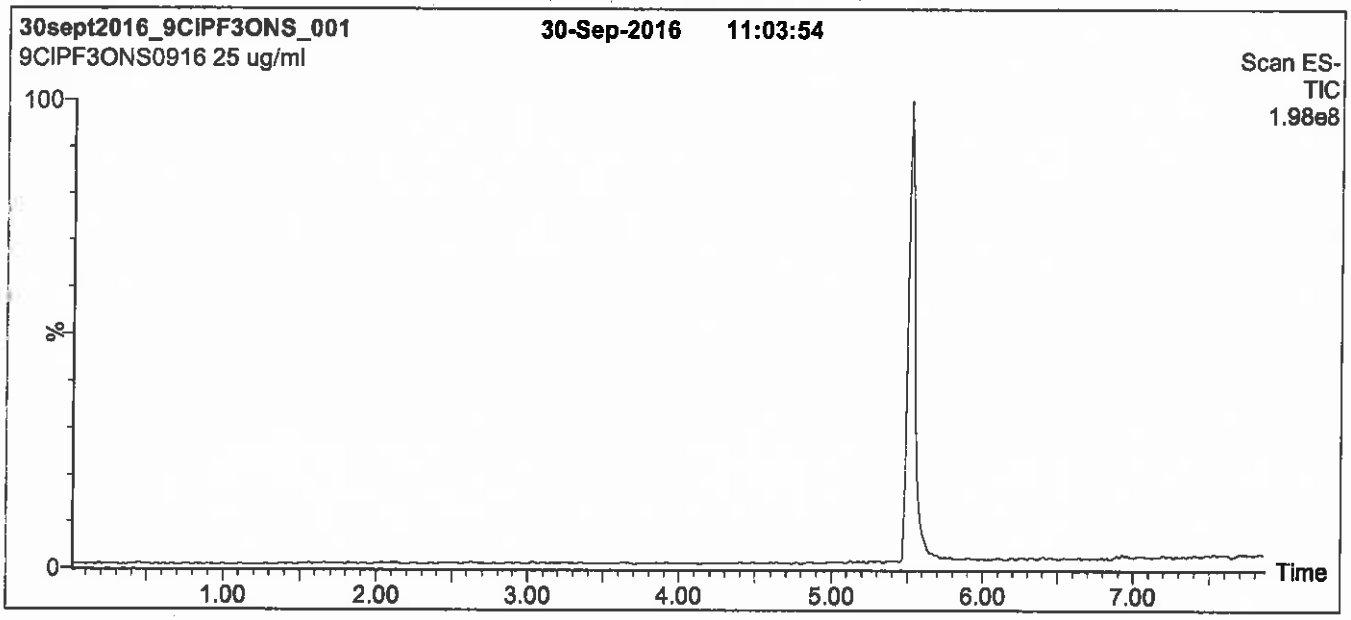
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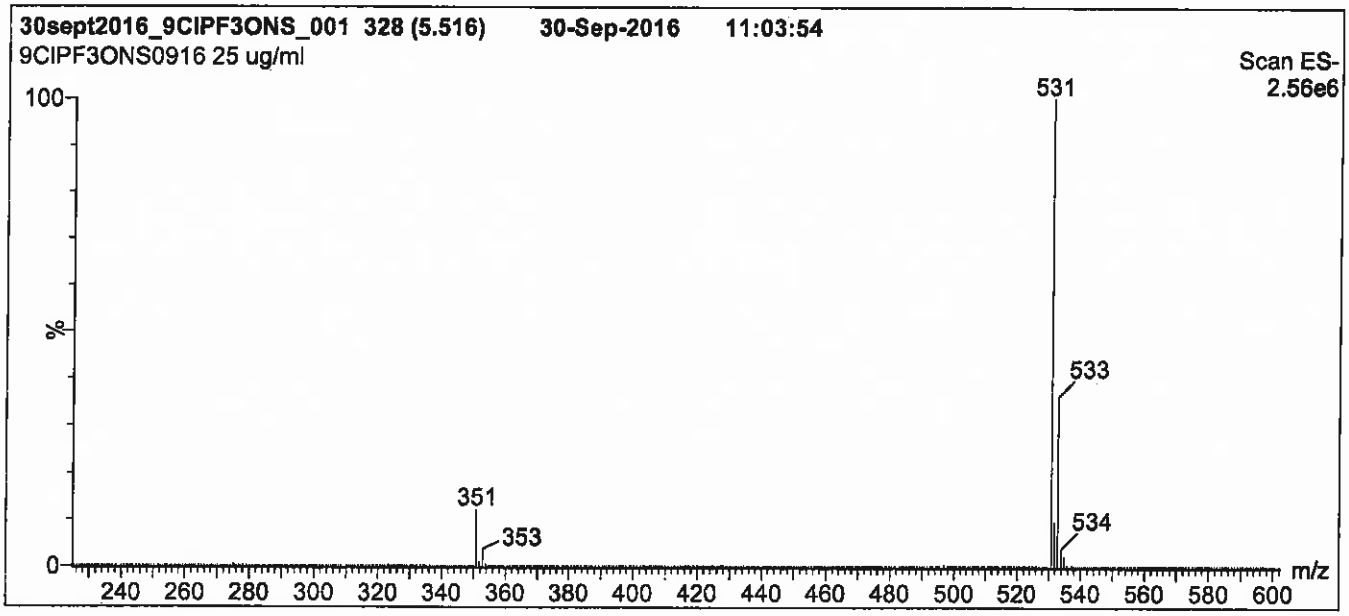
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Figure 1: **9Cl-PF3ONS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

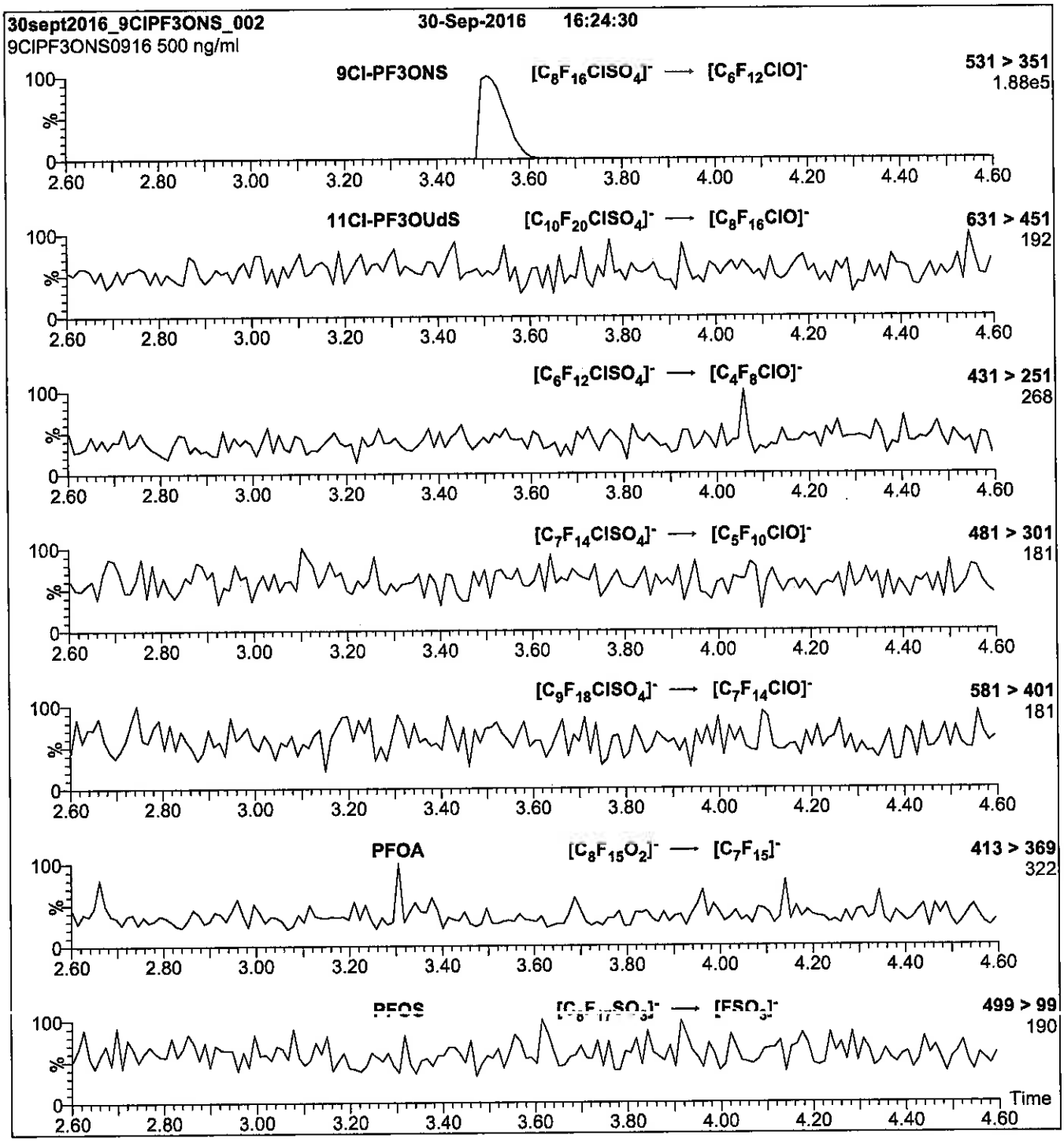
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 25

Reagent

LCbr-NEtFOSAA_00001

RE 4/18/19 SEV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-NEtFOSAA

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

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

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-ethylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HANDLING:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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)***

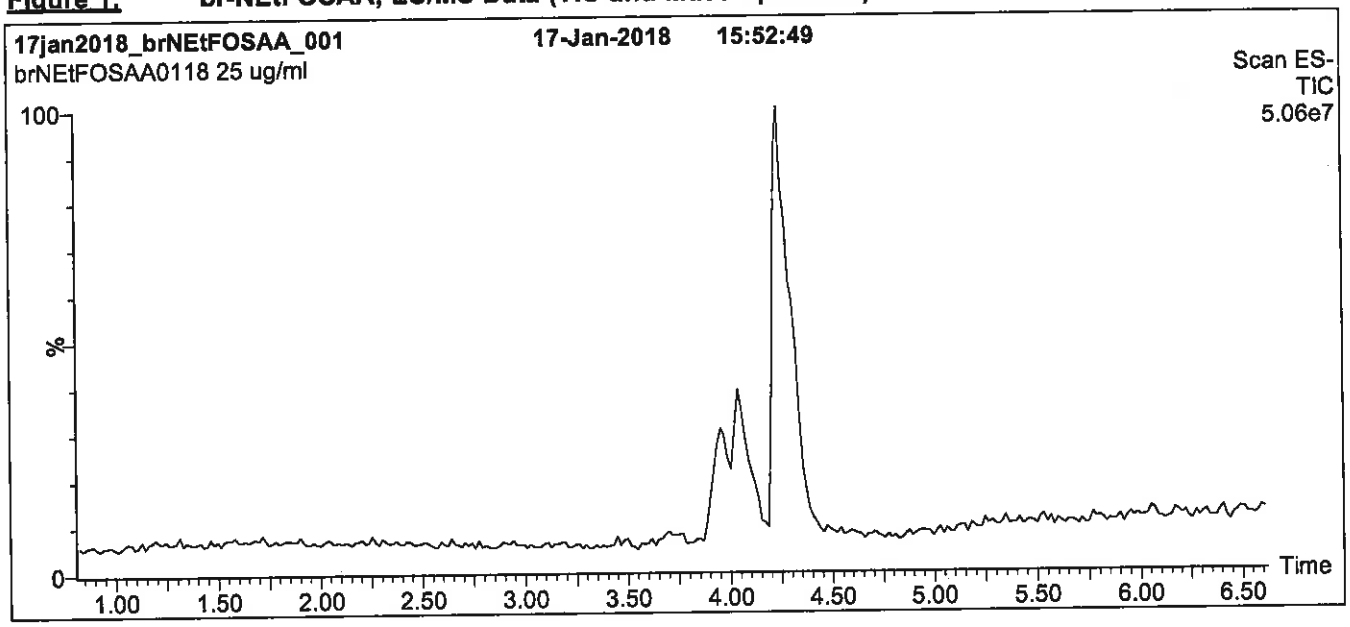
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(C_2H_5)CH_2CO_2H$	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	2.3
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic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

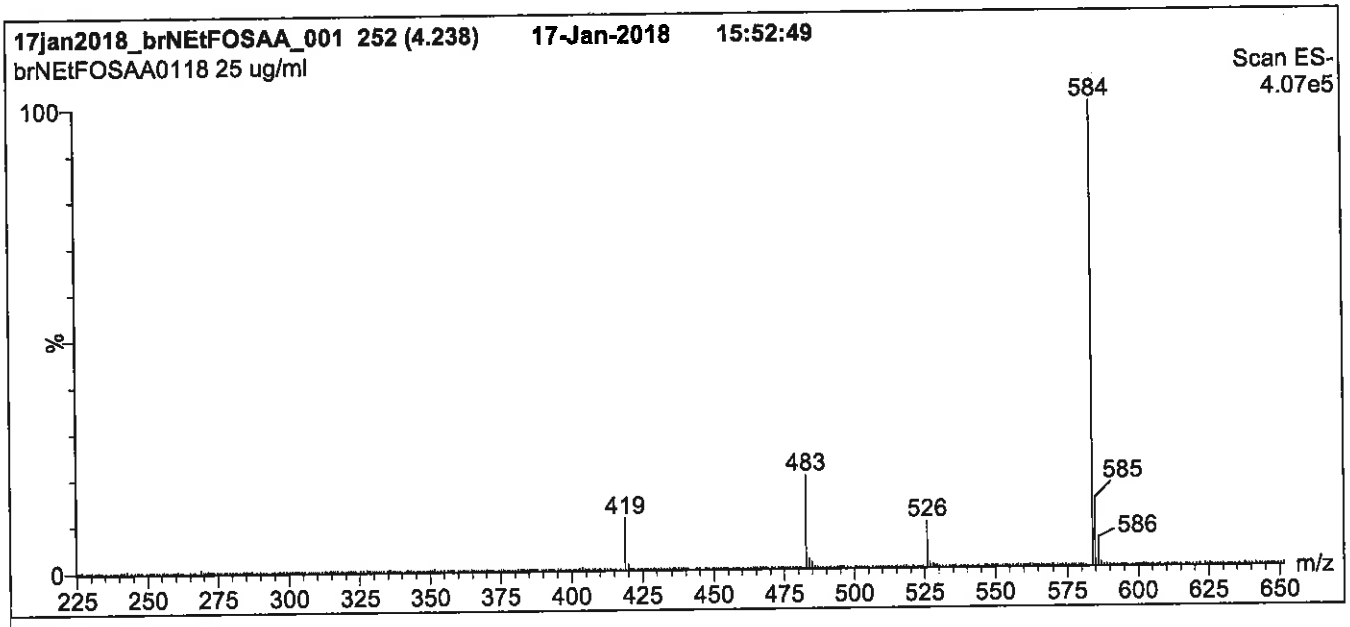
* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

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

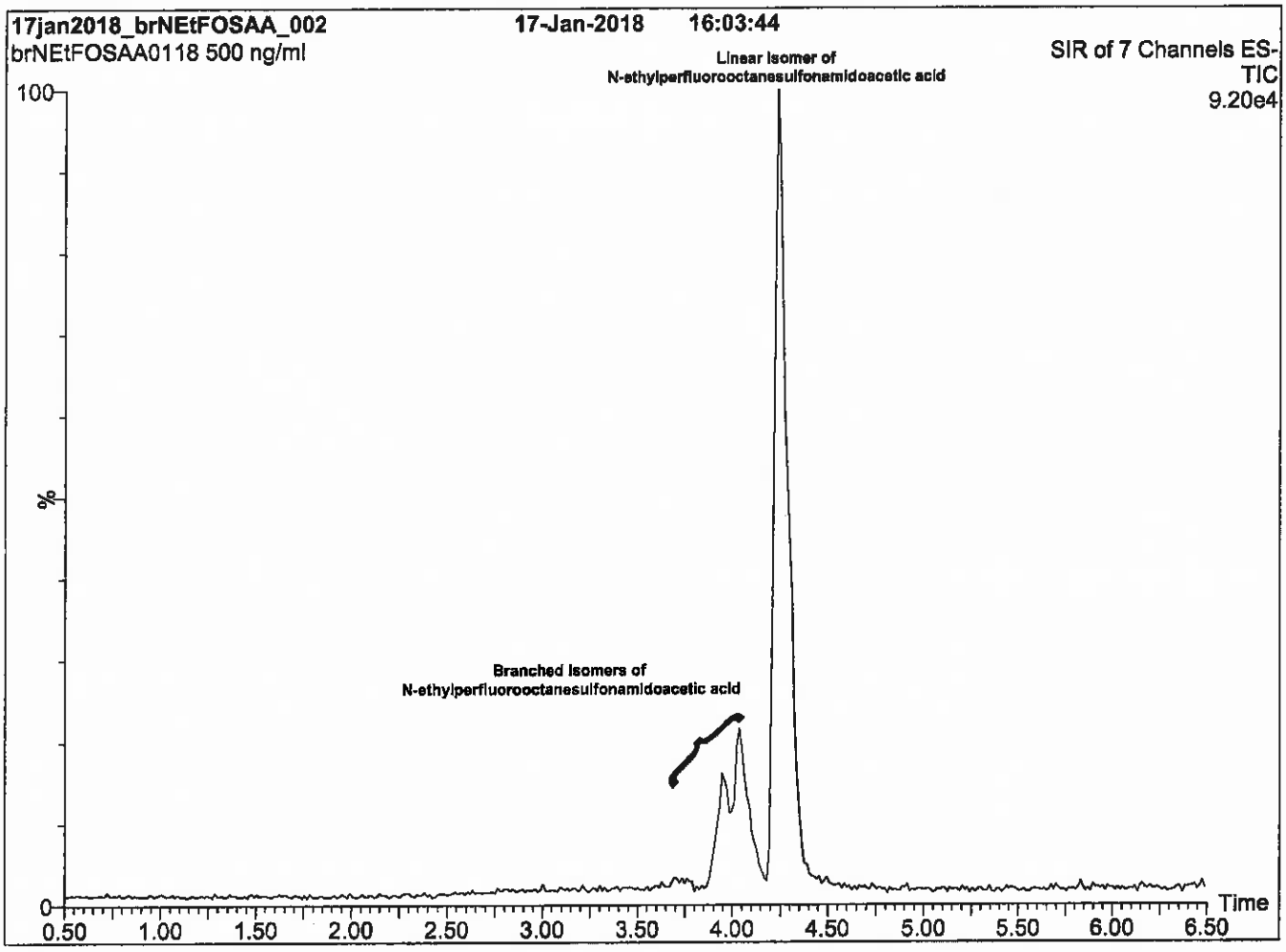
Flow: 300 µl/min

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

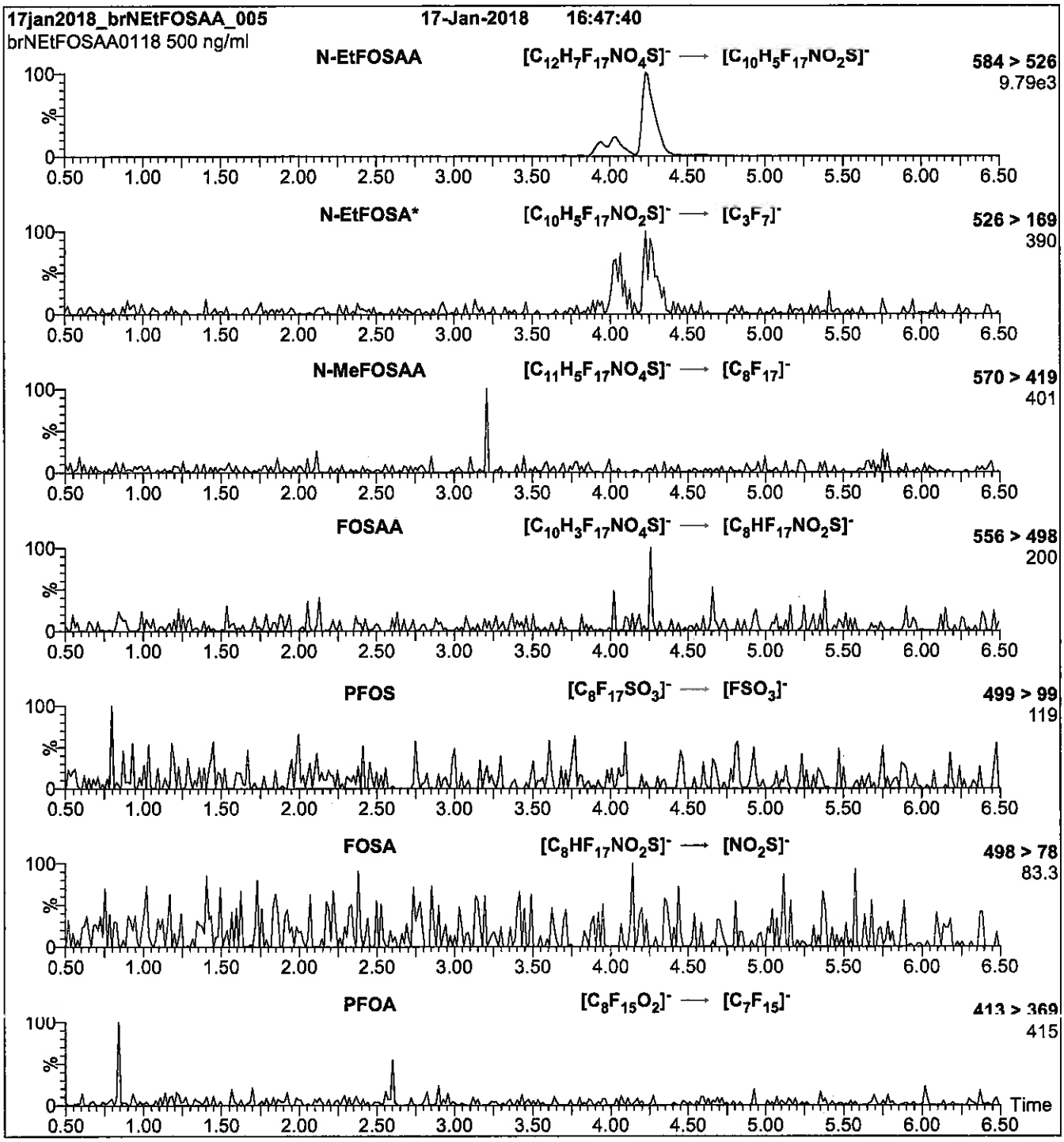
Flow: 300 µl/min

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.

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

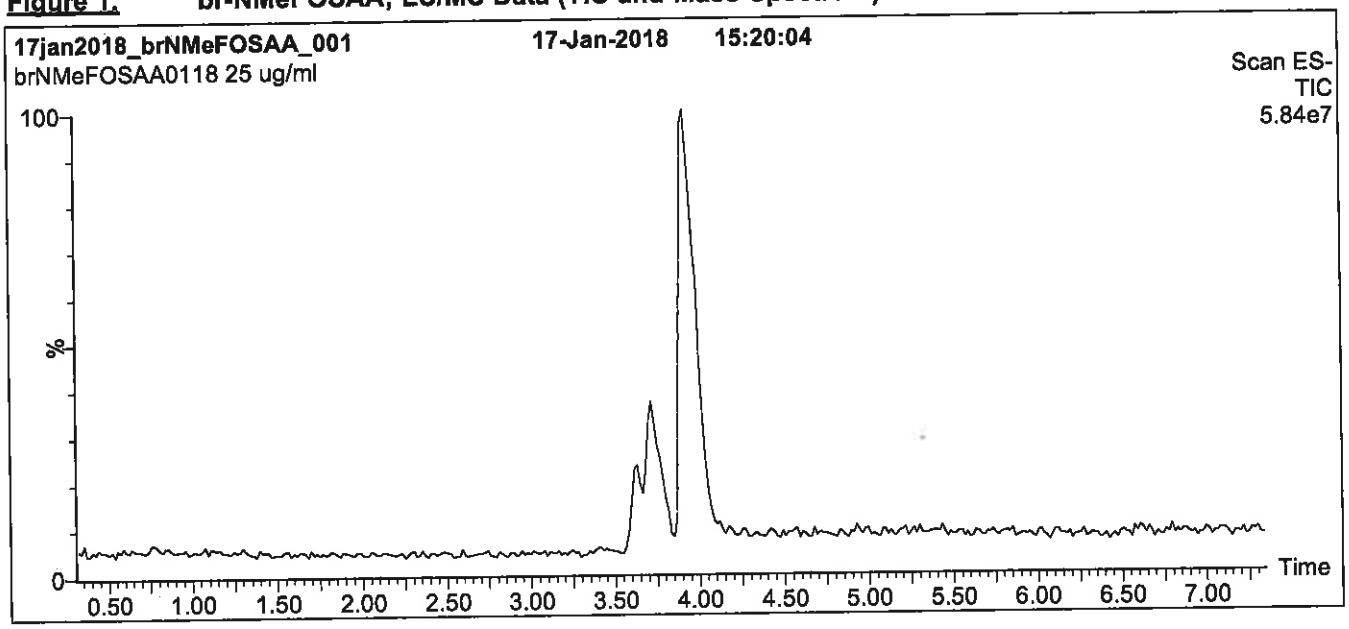
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(CH_3)CH_2CO_2H$	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(CH_3)CH_2CO_2H$	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic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

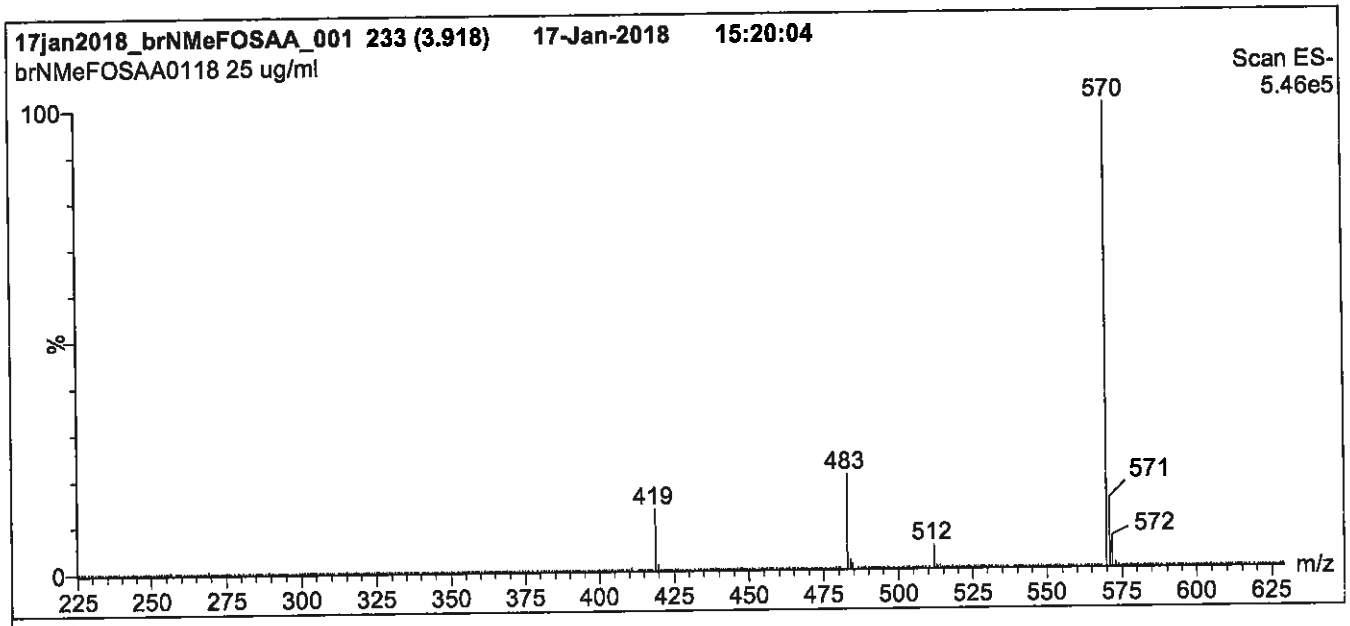
* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

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

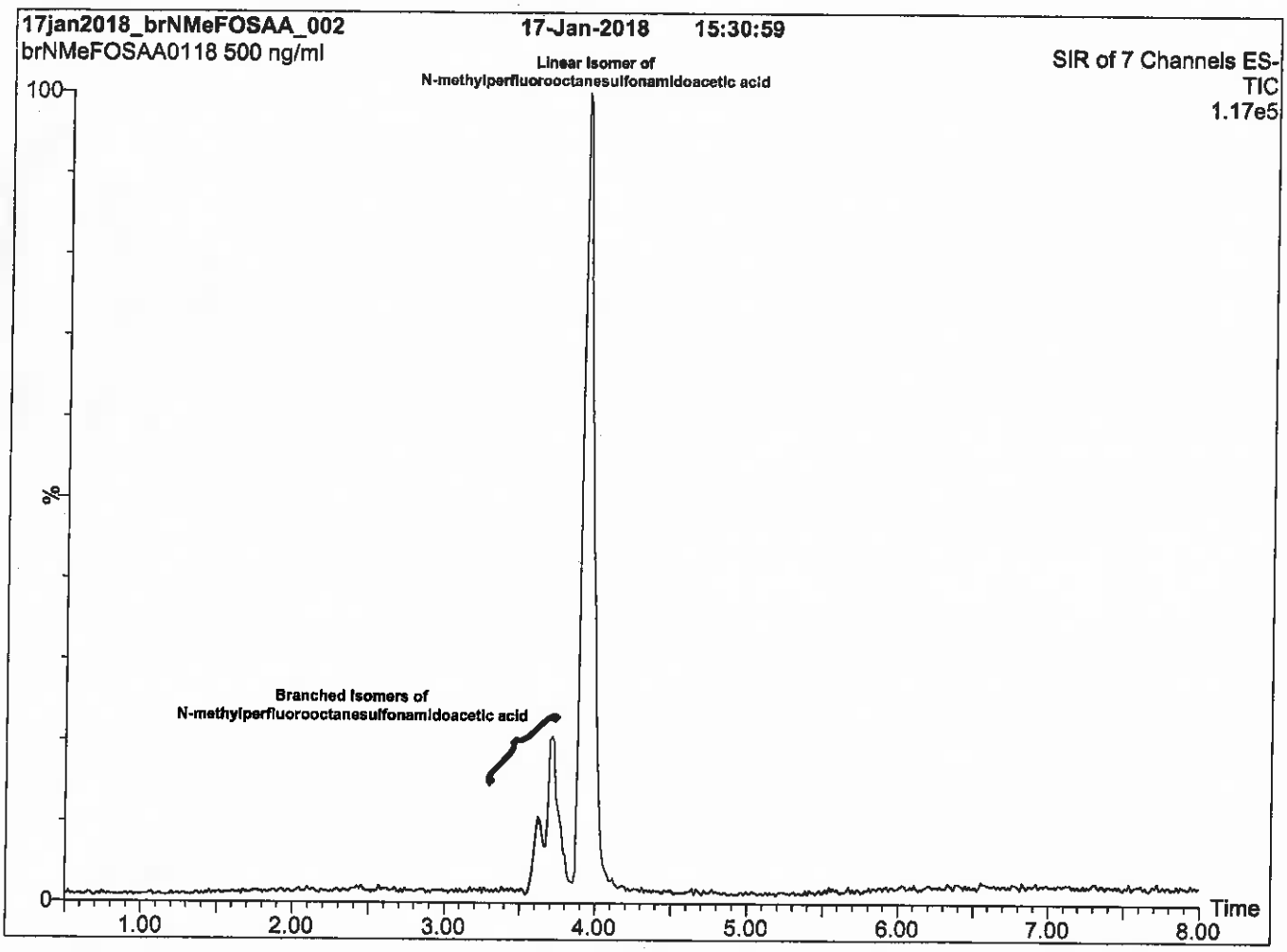
Flow: 300 µl/min

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

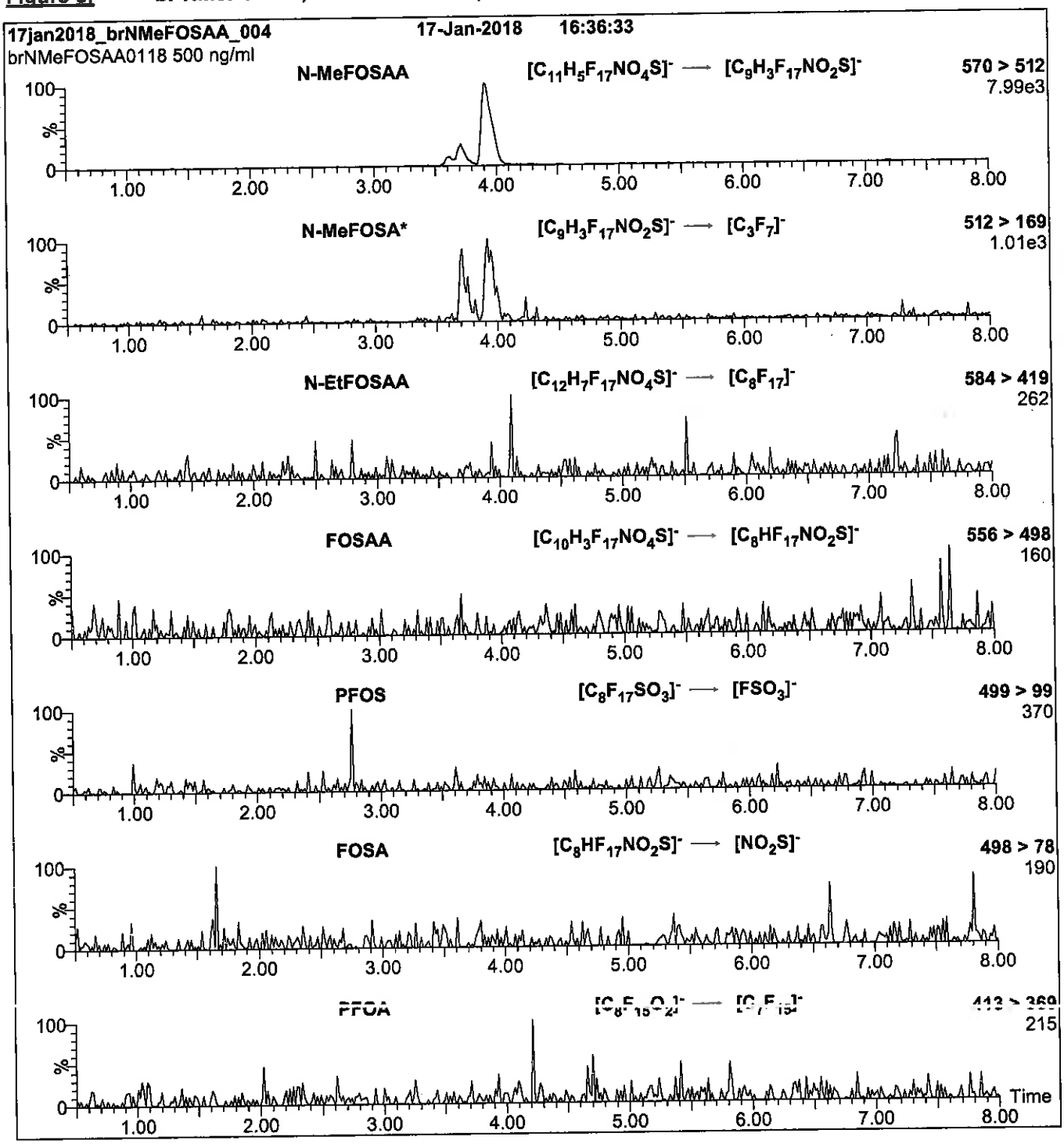
Flow: 300 µl/min

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

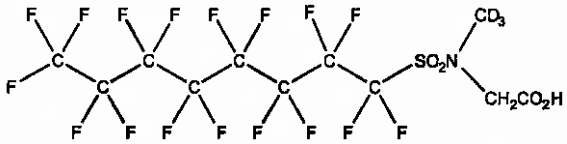
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Exp:11/08/22 Prpd:CBW Opn:06/26/18
d3-N-MeFOSAA

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:

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:

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

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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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:

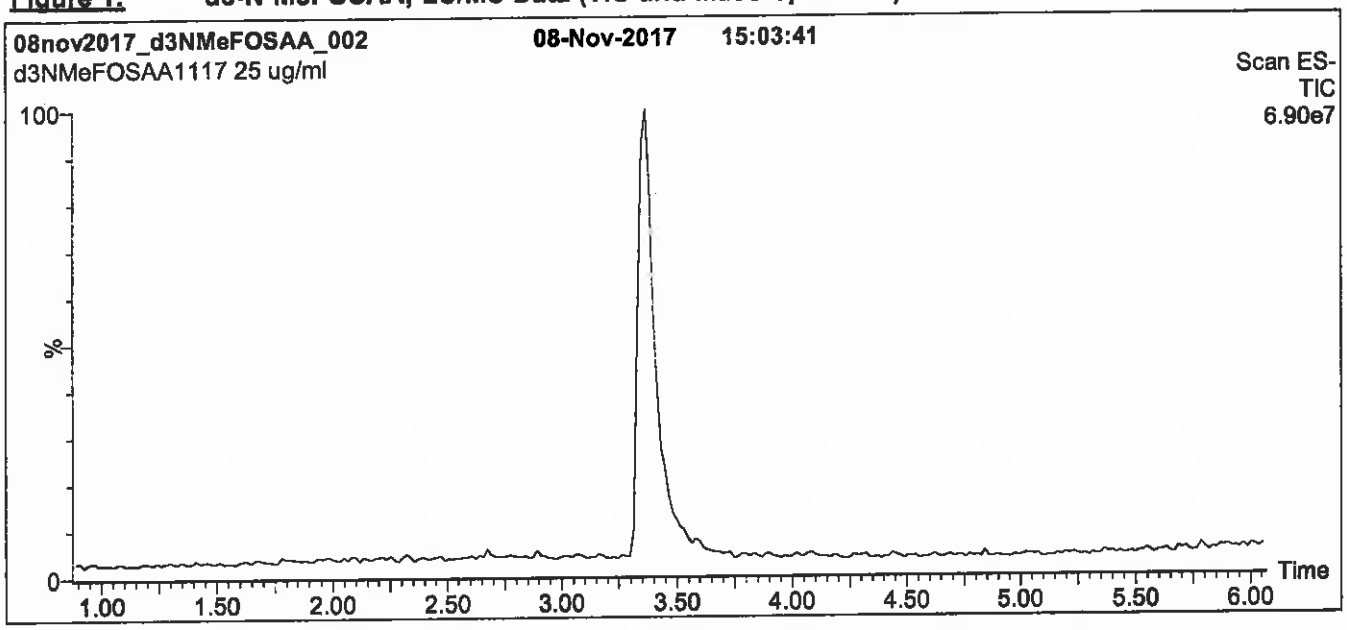
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

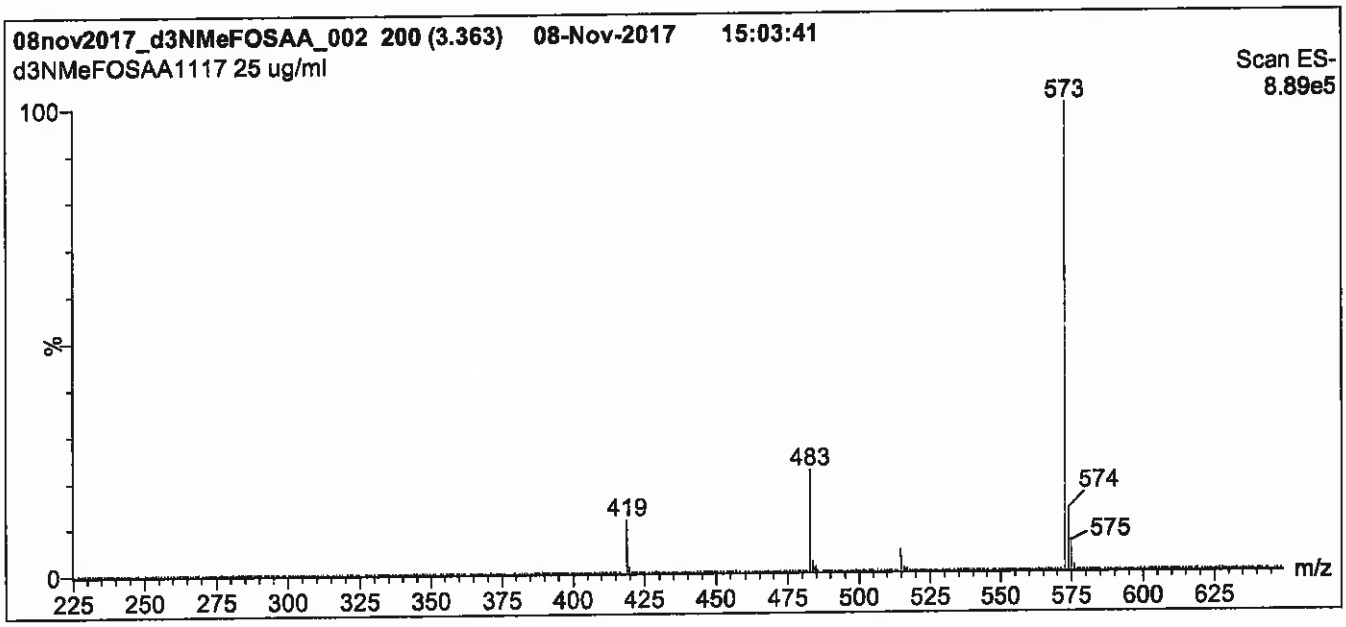
CALA

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: **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

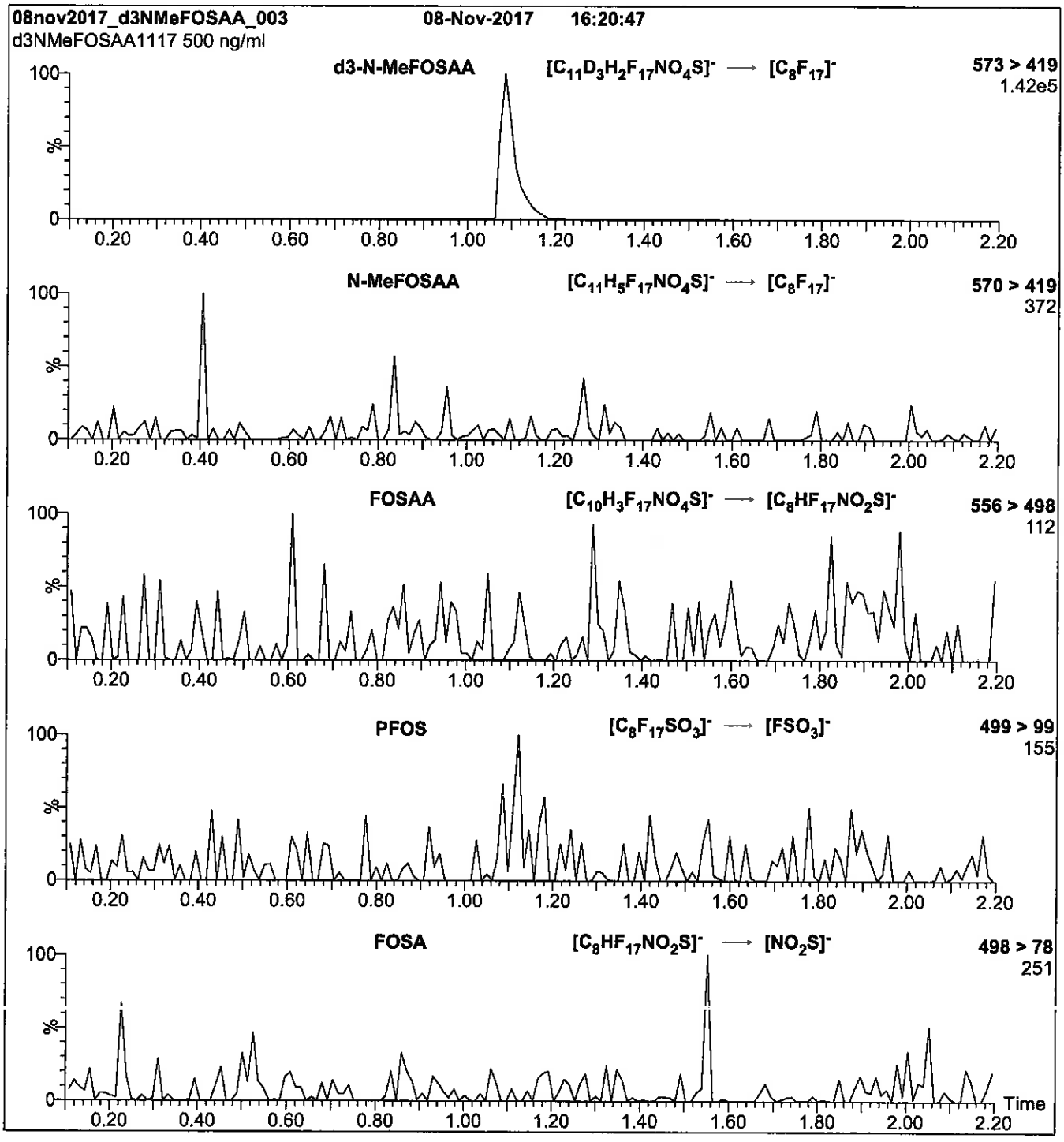
Flow: 300 µl/min

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

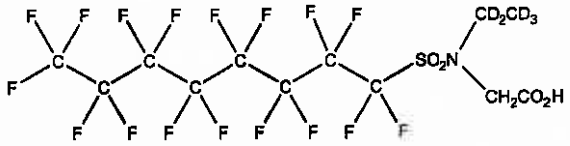
R: 6/26/18 CBW

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.

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

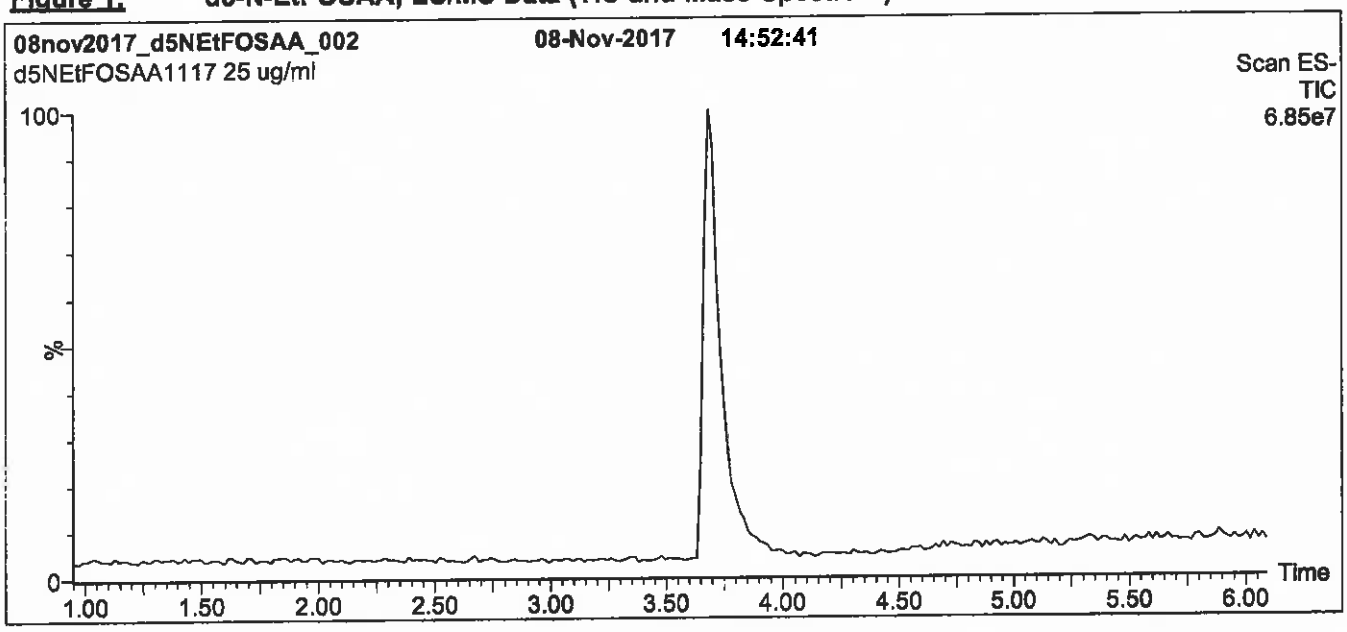
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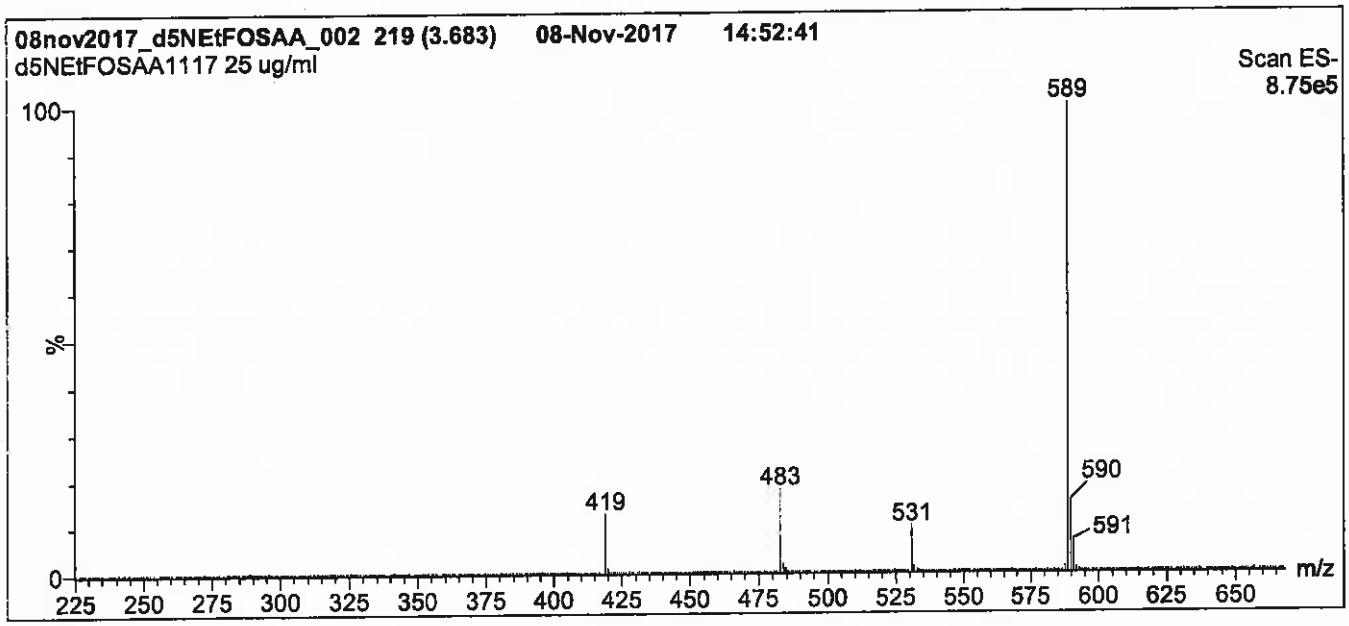
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Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

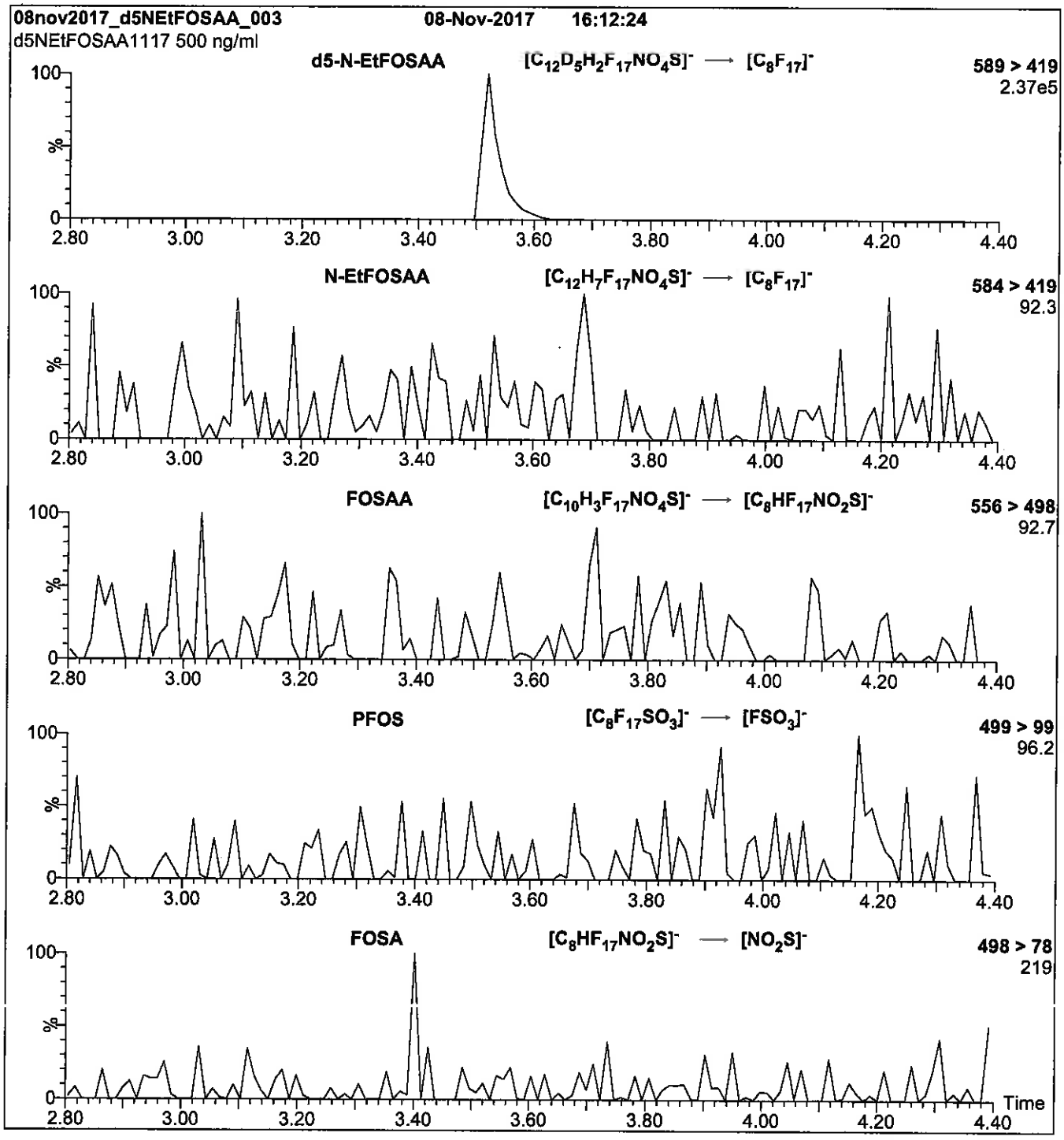
Flow: 300 µl/min

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

LCDONA_00002

r: 4/18/18 Sad

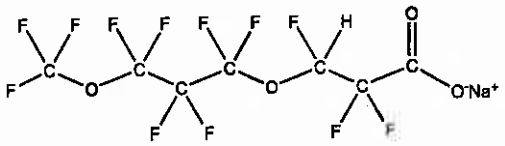
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: NaDONA
LOT NUMBER: NaDONA0318
COMPOUND: Sodium dodecafluoro-3H-4,8-dioxanonanoate

STRUCTURE:

CAS #: 958445-44-8 (ammonium salt)



MOLECULAR FORMULA: $C_7HF_{12}O_4Na$
MOLECULAR WEIGHT: 400.05
CONCENTRATION: 50 ± 2.5 µg/ml (Na Salt)
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/26/2018
EXPIRY DATE: (mm/dd/yyyy) 03/26/2023
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.
- Product is commercially known as ADONA.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/27/2018 (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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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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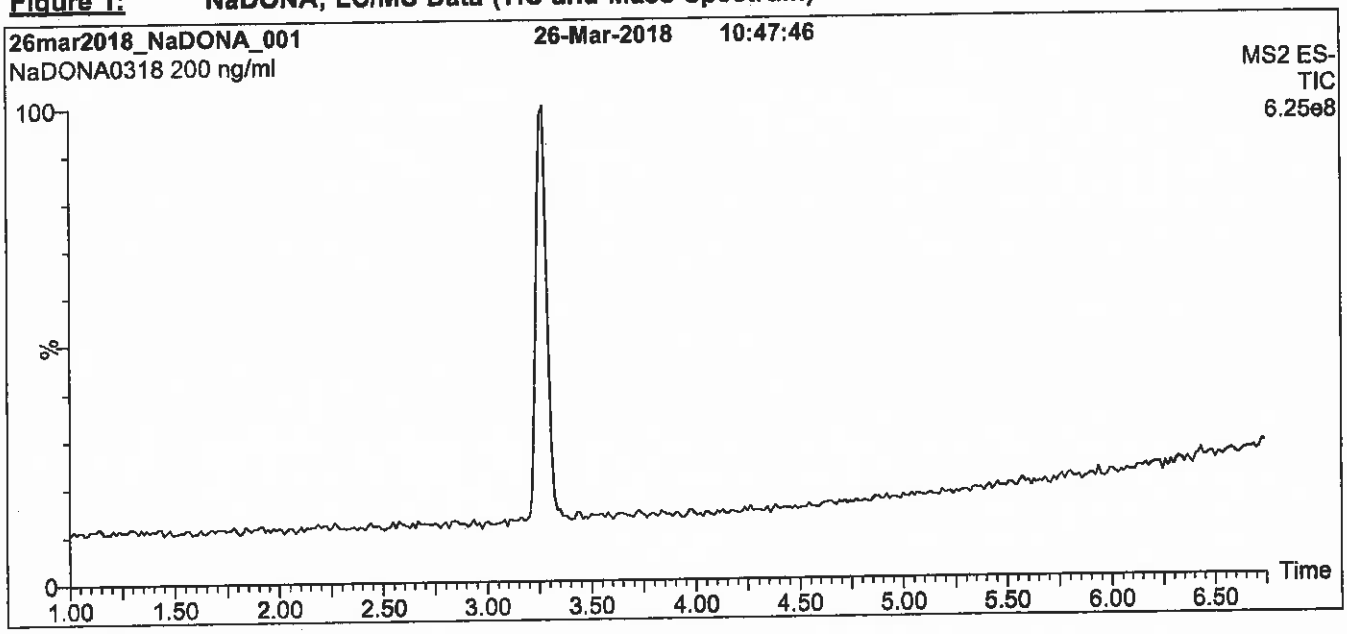
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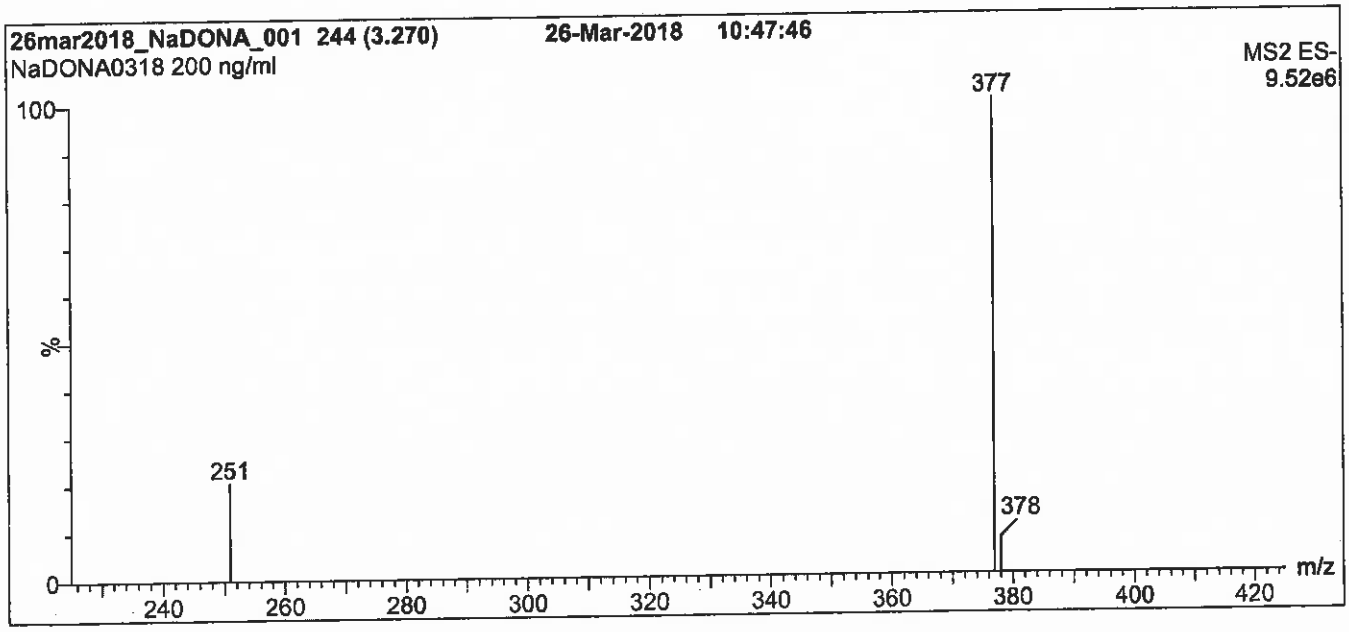
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Figure 1: **NaDONA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **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

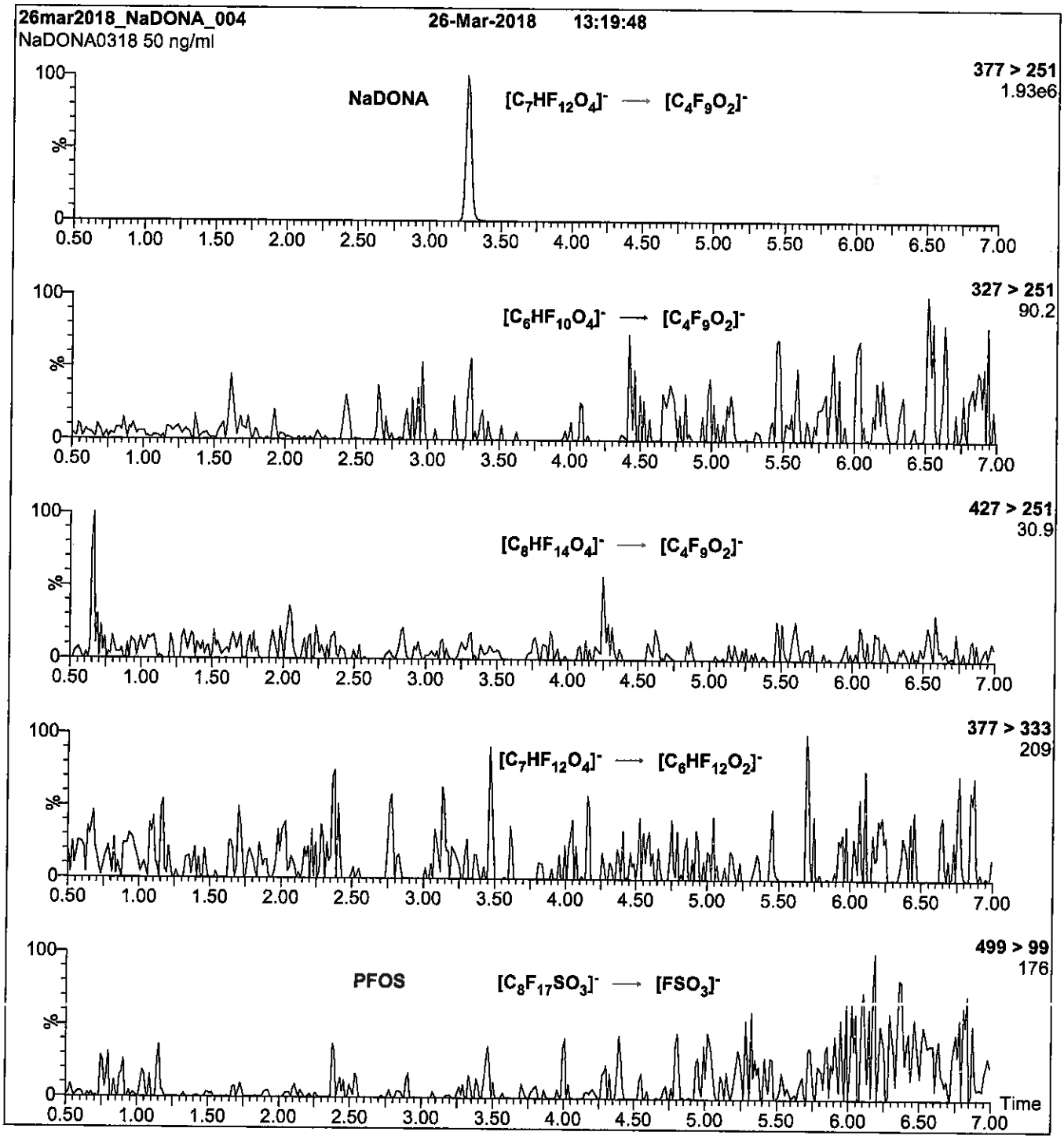
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.70
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (NaDONA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.65e-3
Collision Energy (eV) = 10

Reagent

LCHFPO-DA_00002

P: 4/18/18 SW

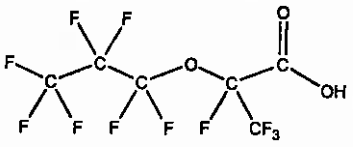
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CERTIFICATE OF ANALYSIS DOCUMENTATION

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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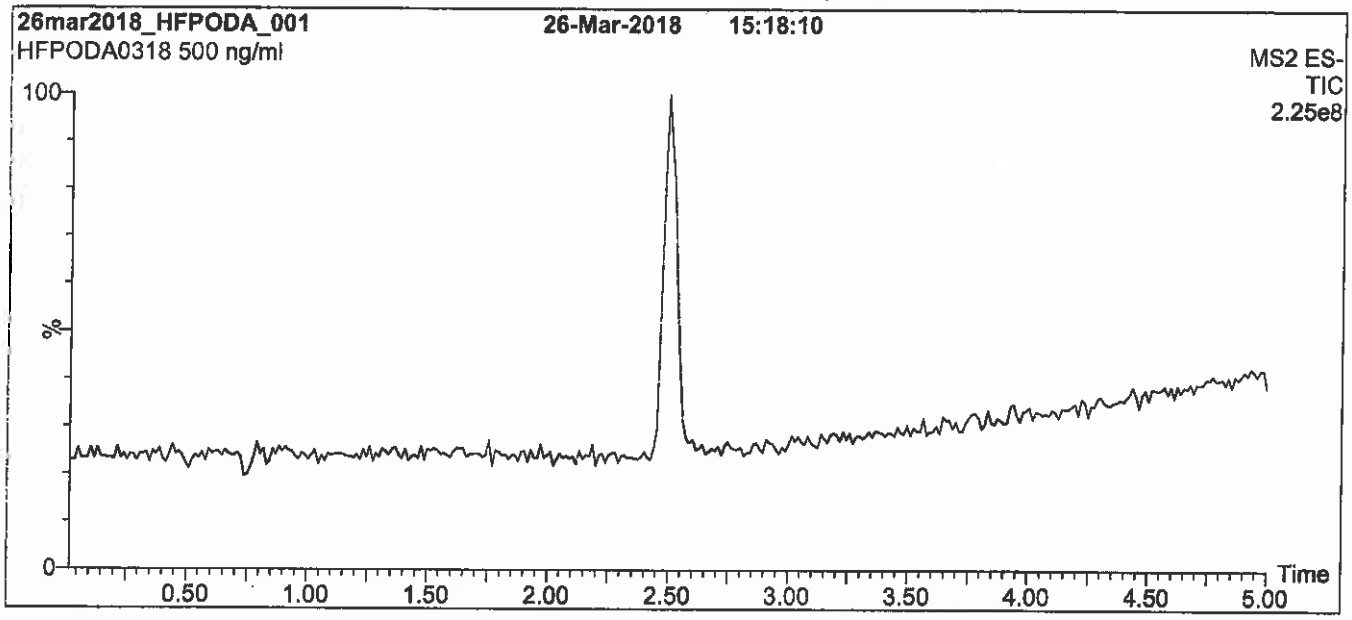
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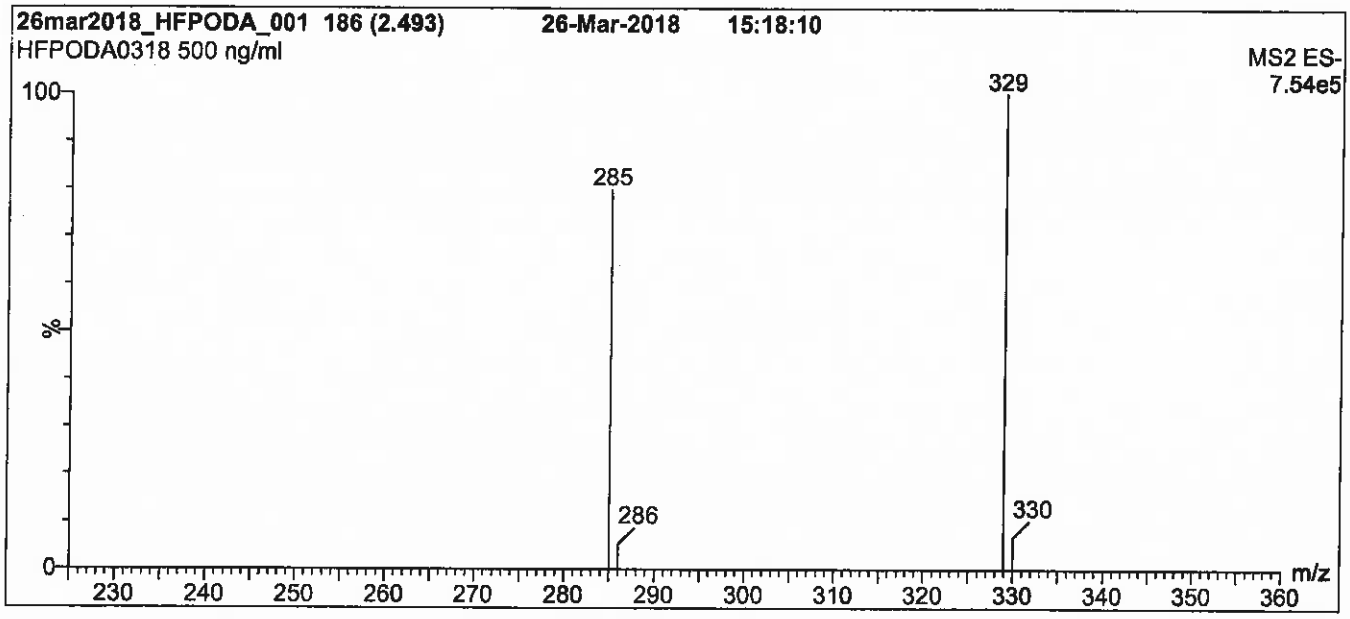
CALA

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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

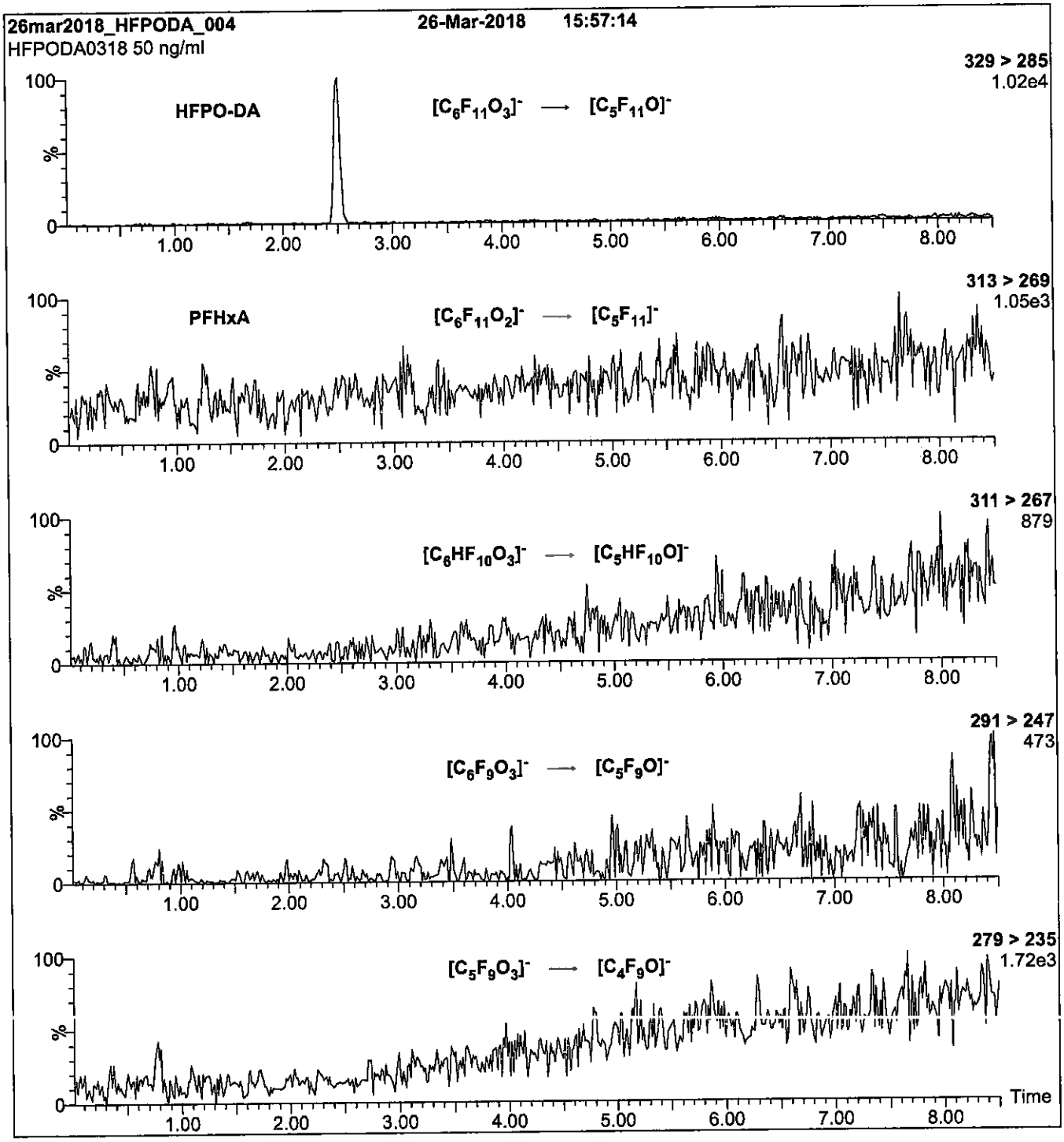
Flow: 300 µl/min

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

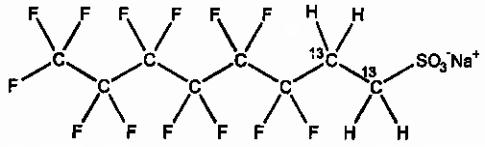
WELLINGTON LABORATORIES

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
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:

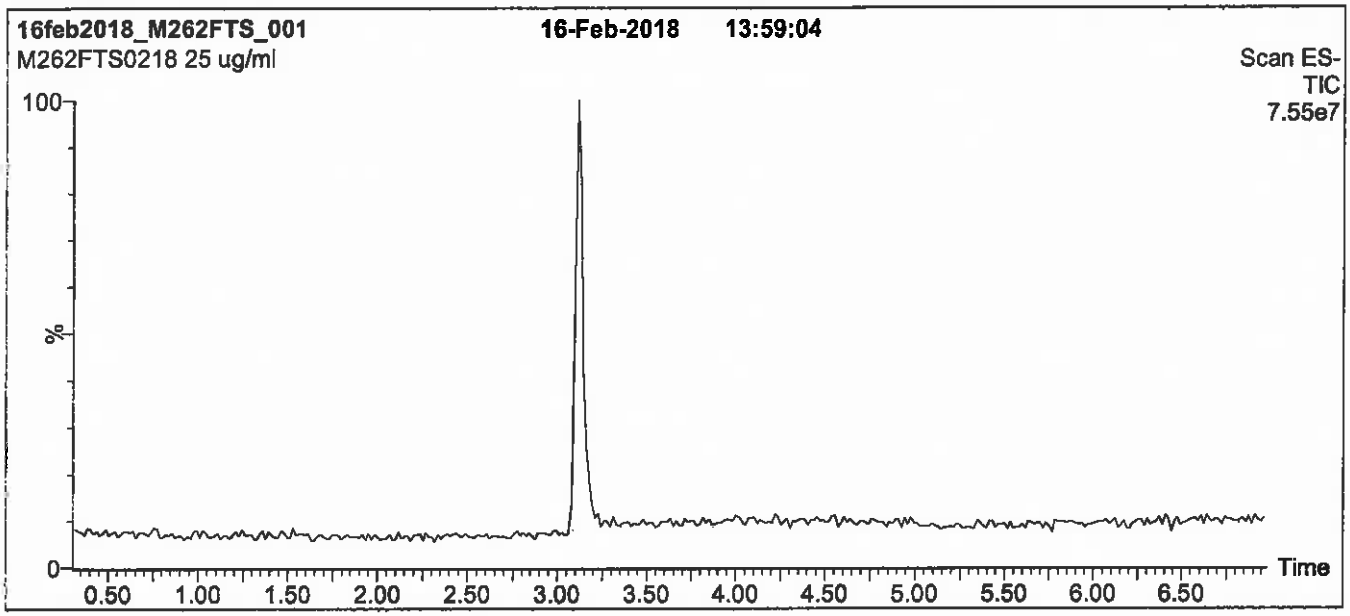
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

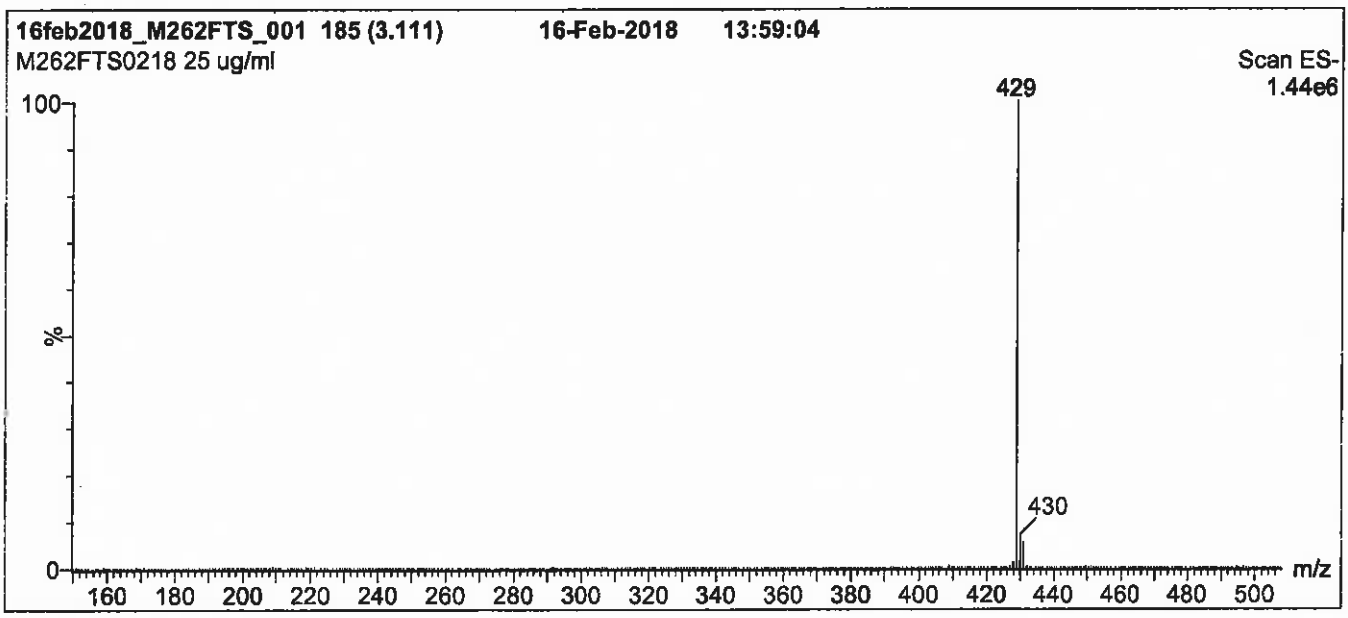
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

Figure 1: **M2-6:2FTS; 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

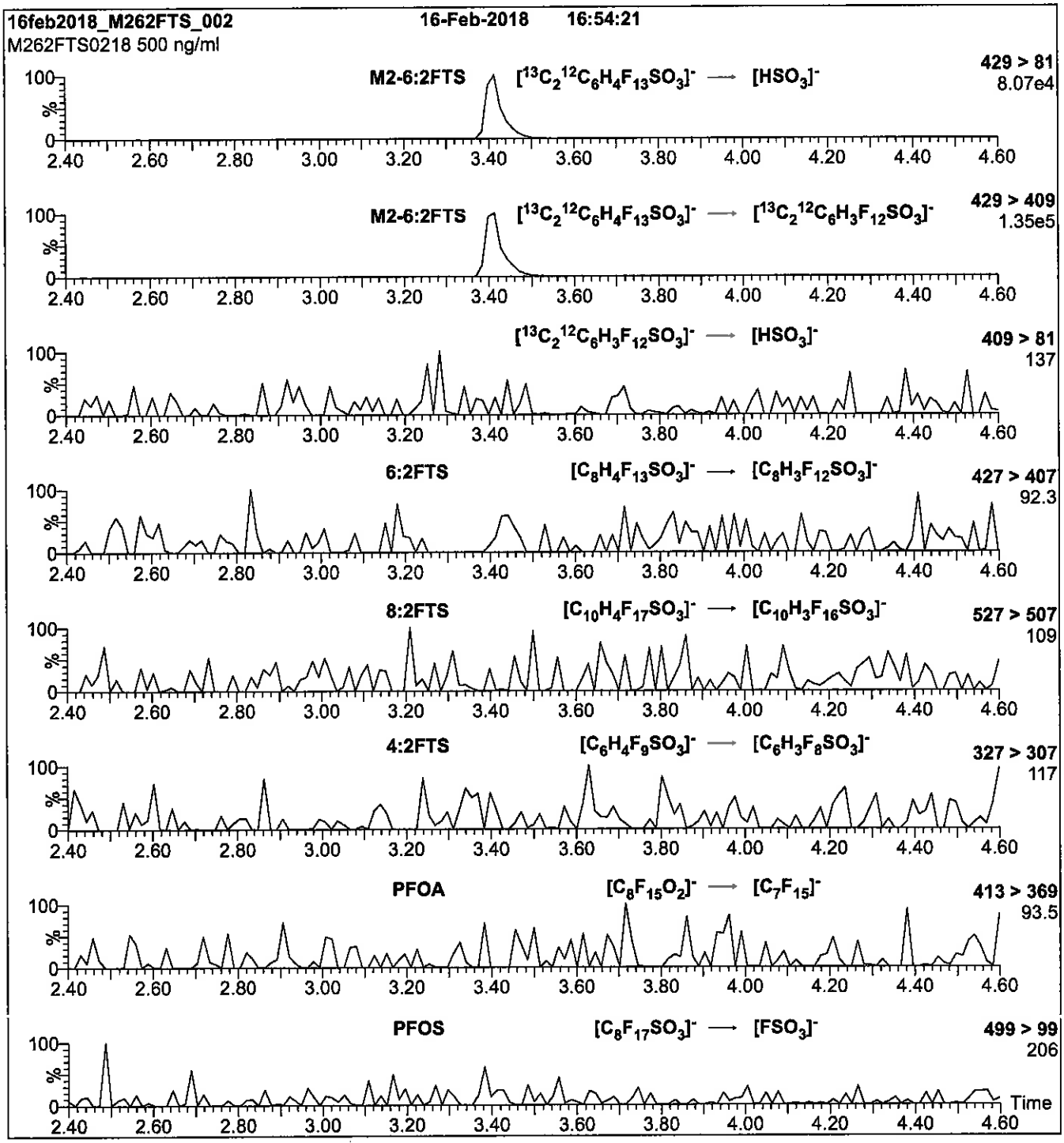
Flow: 300 µl/min

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

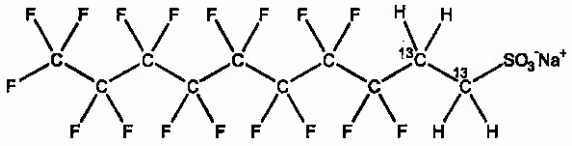
WELLINGTON LABORATORIES

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
LAST TESTED: (mm/dd/yyyy)	01/24/2018		($1,2\text{-}^{13}C_2$)
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

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

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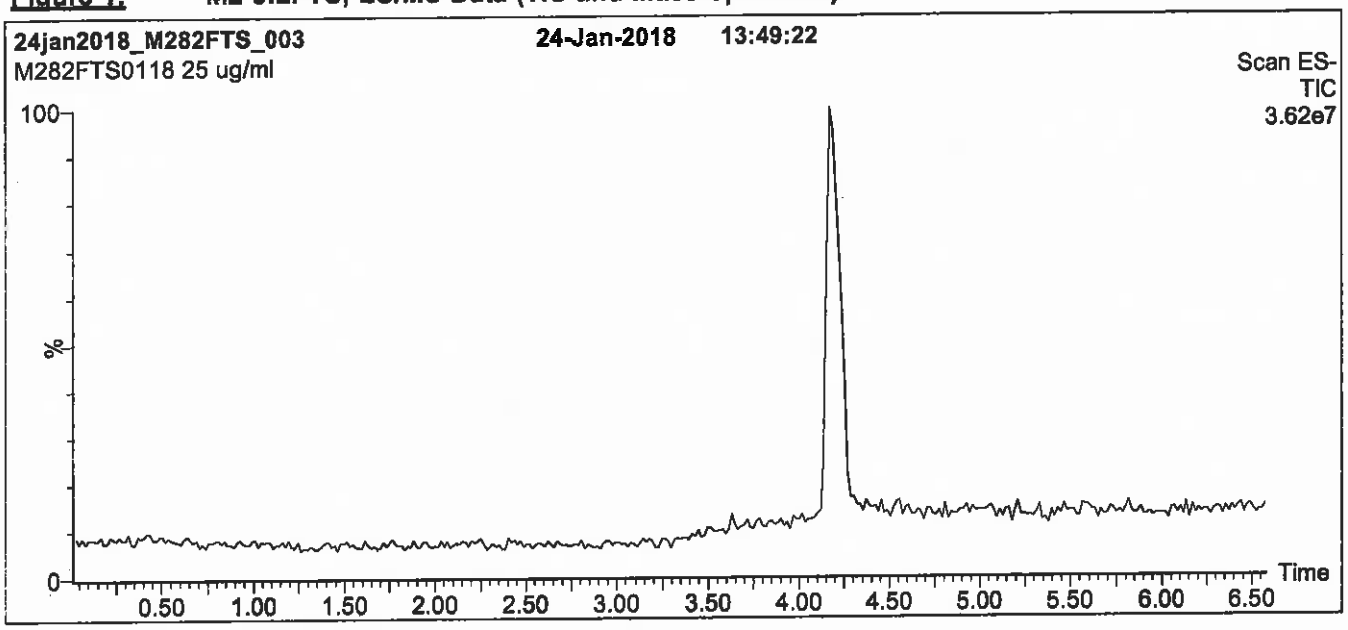
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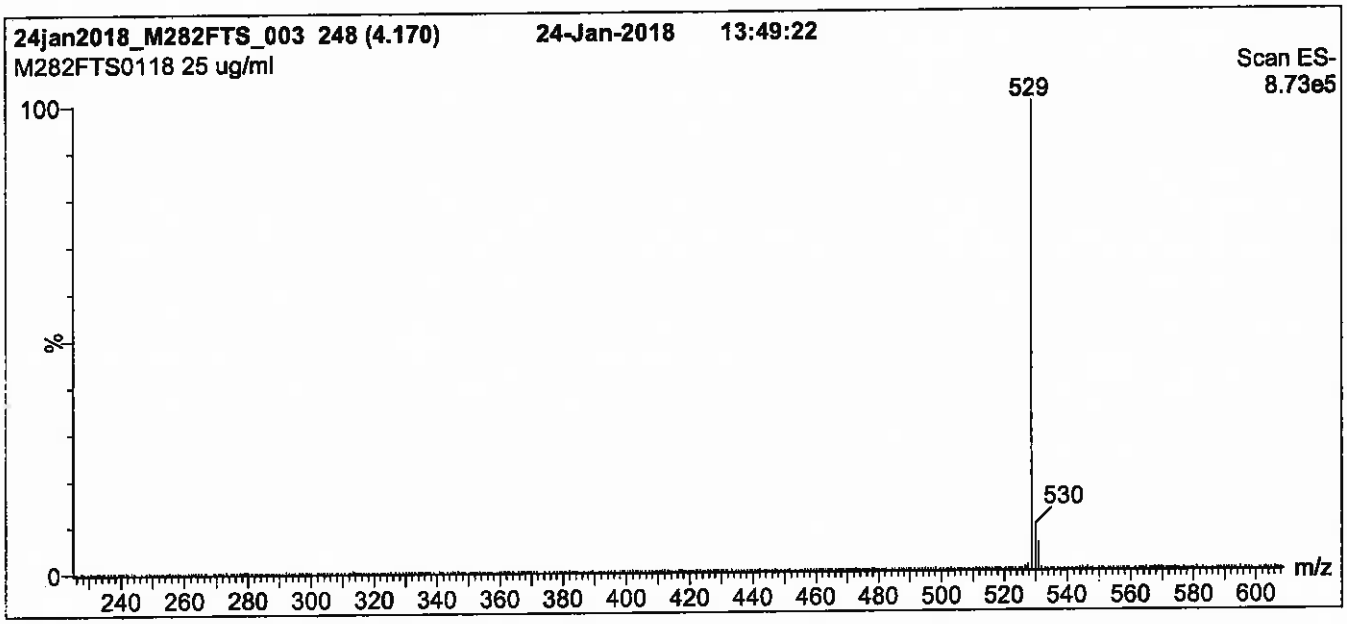
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Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

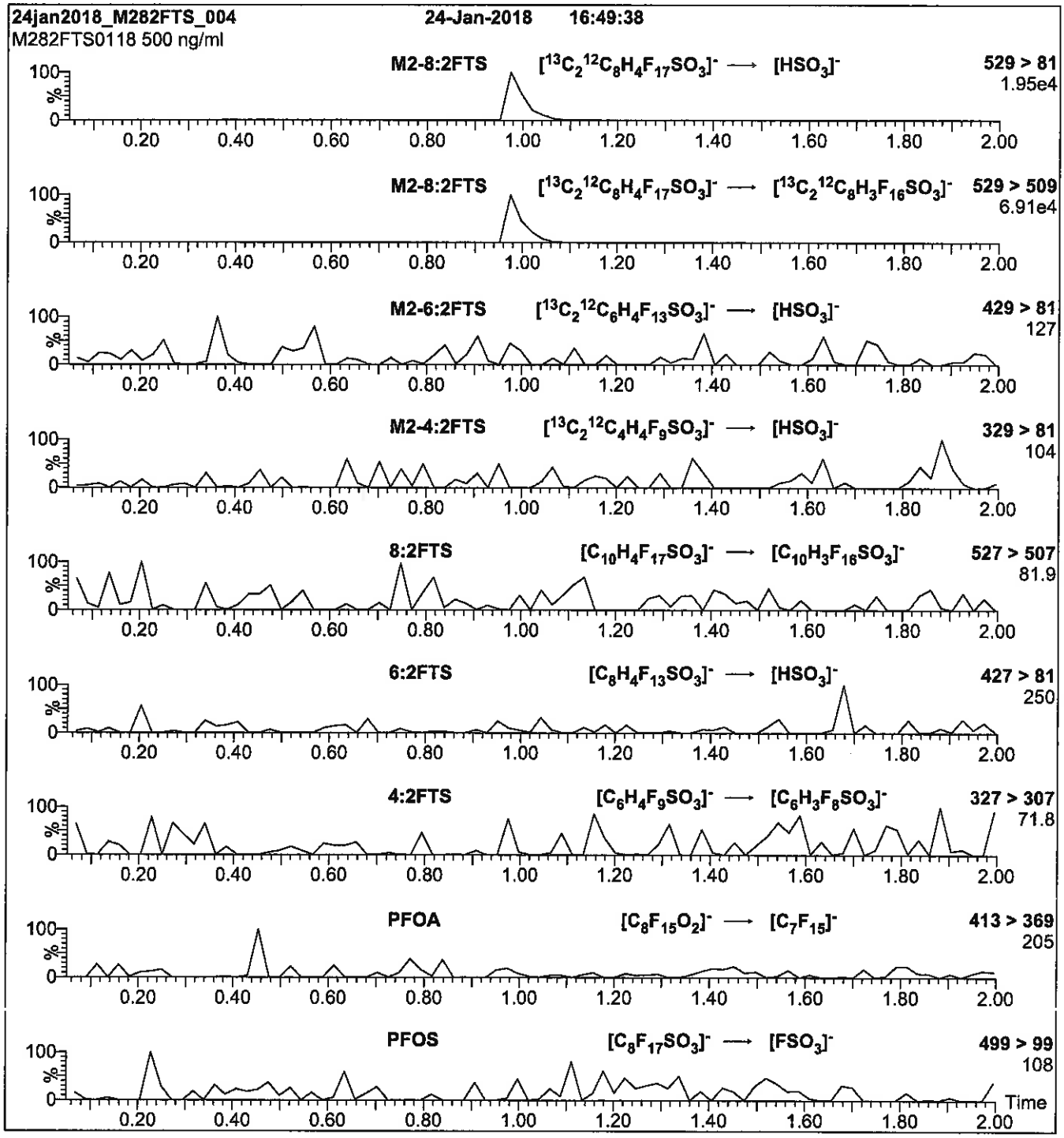
Flow: 300 µl/min

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

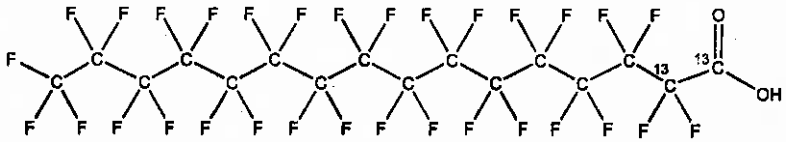
1287278
ID: LCM2PFHxDA_00017
Exp:07/13/22 Prpd:CBW Opn:06/26/18
13C2-PFHxDA at 50ug/mL

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

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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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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

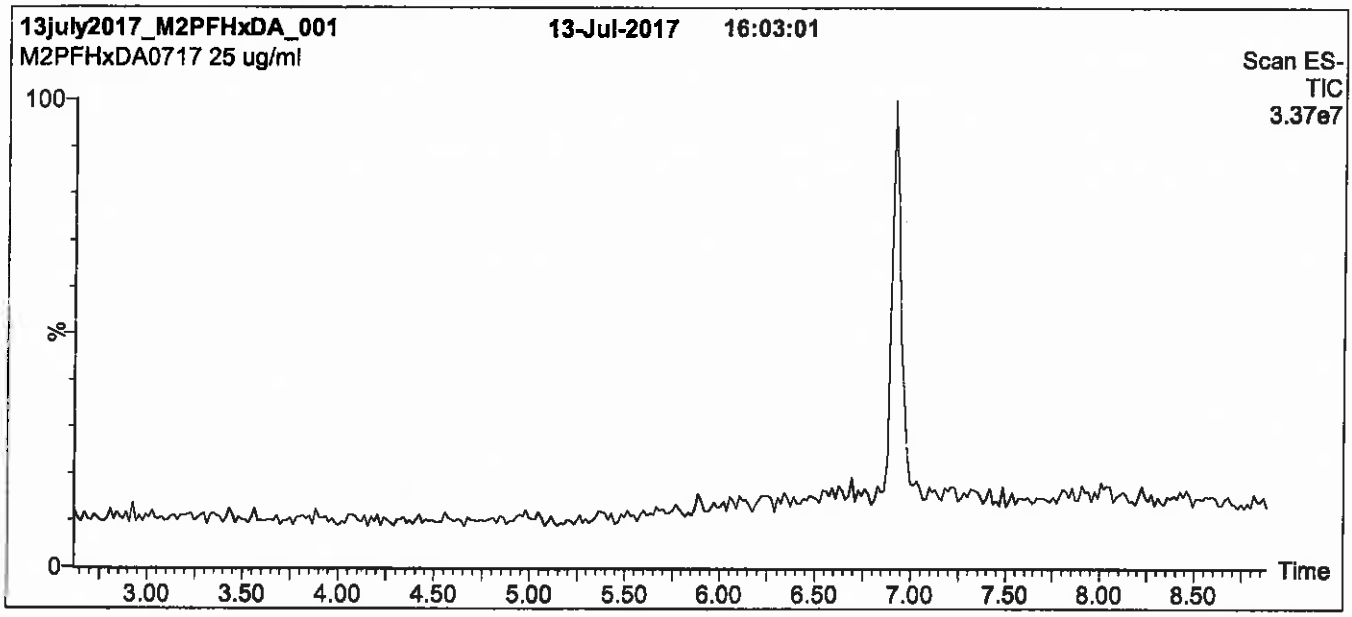
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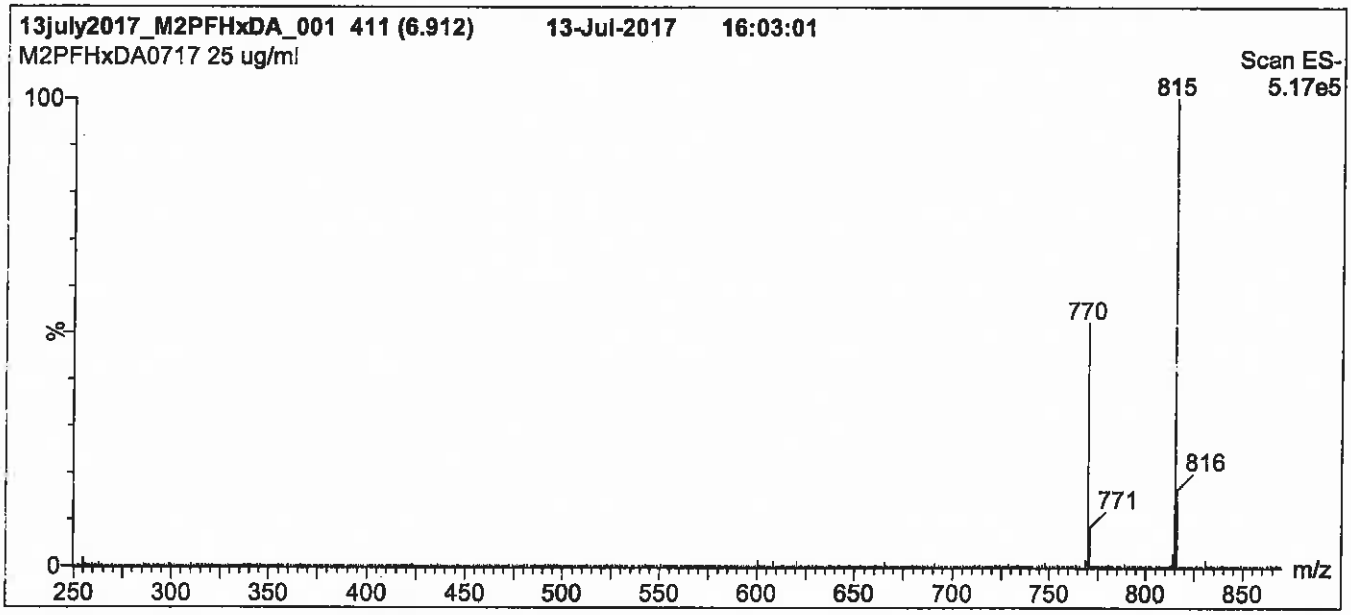
CALA

ANAB ACCREDITED

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

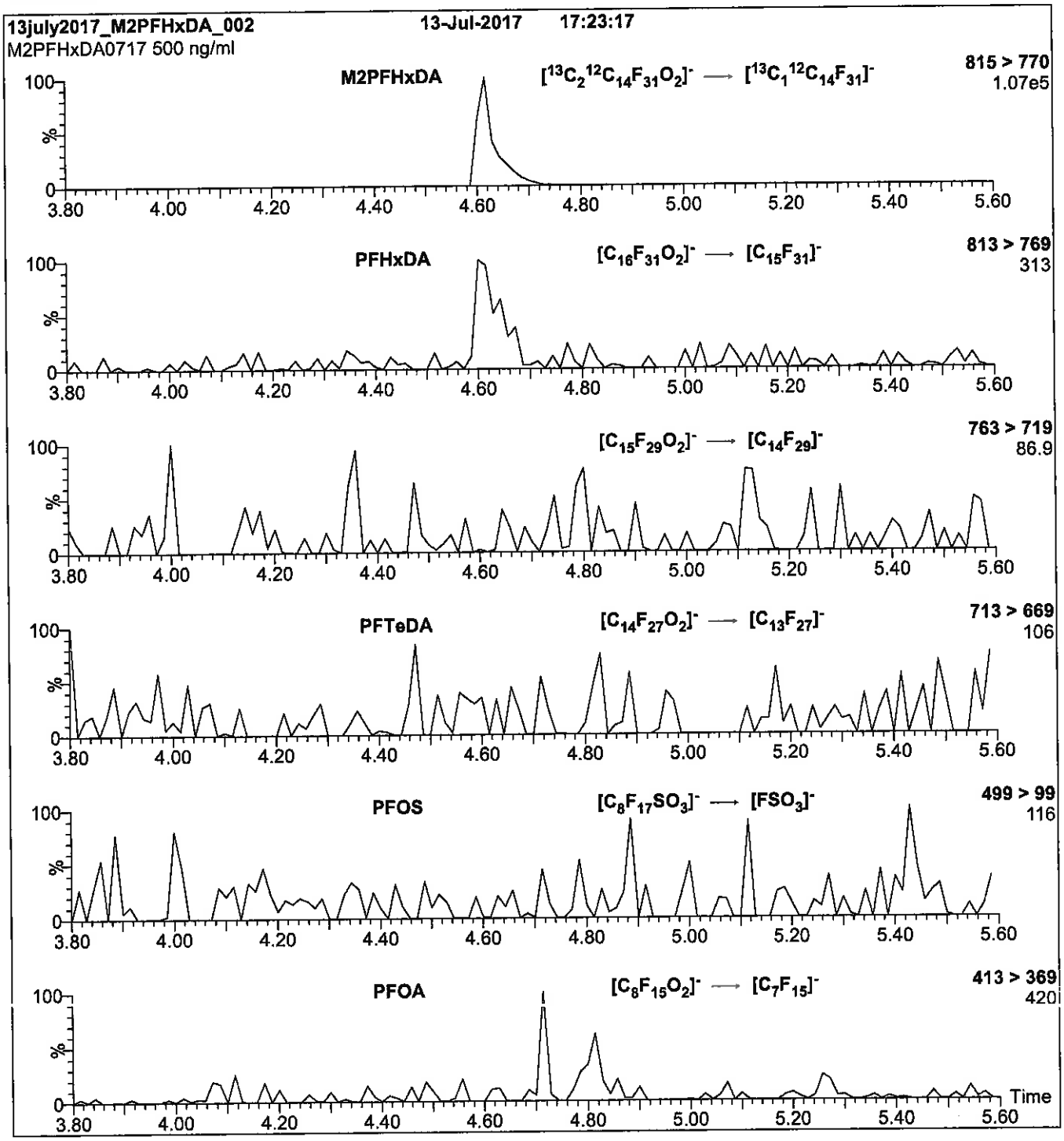
Flow: 300 µl/min

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

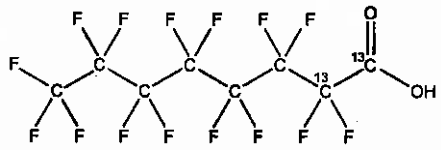
LCM2PFOA_00008

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)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

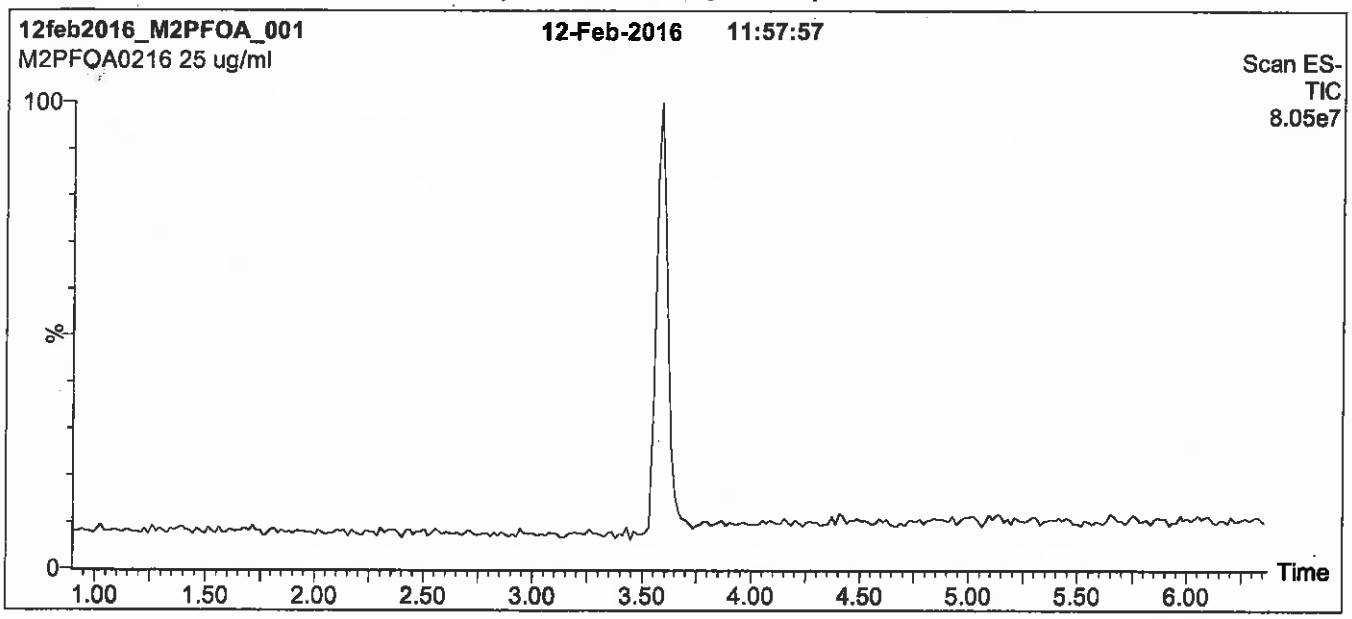
QUALITY MANAGEMENT:

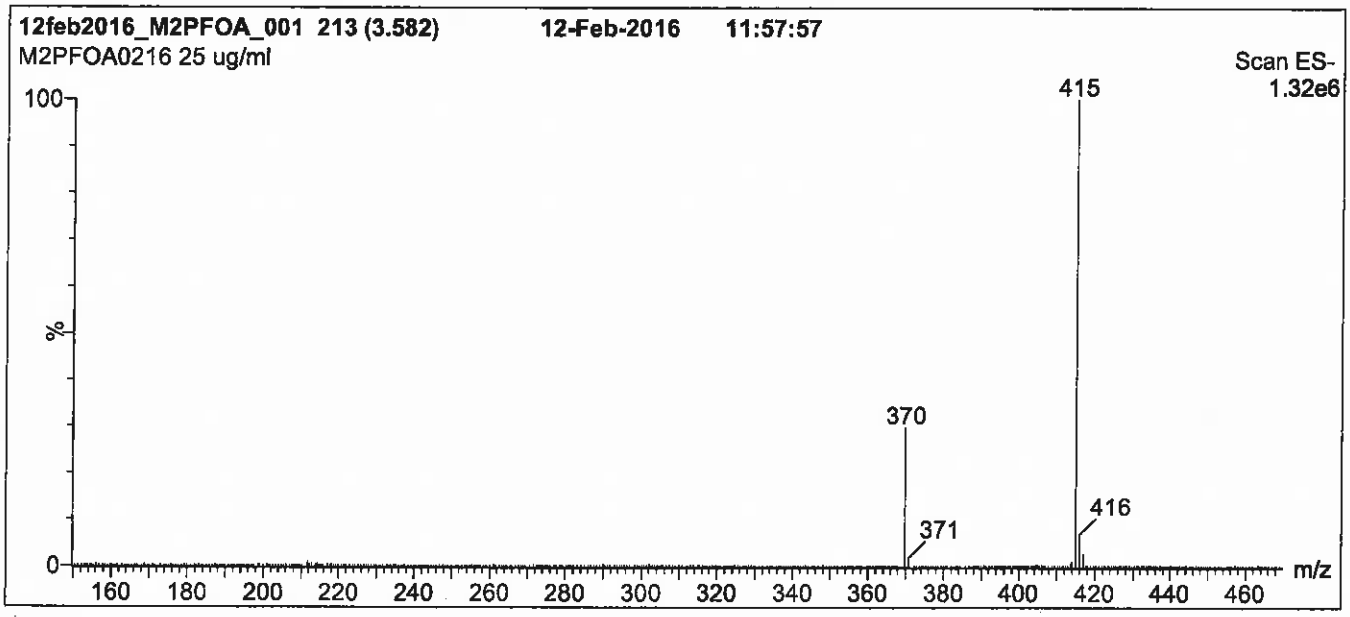
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA ANAB

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

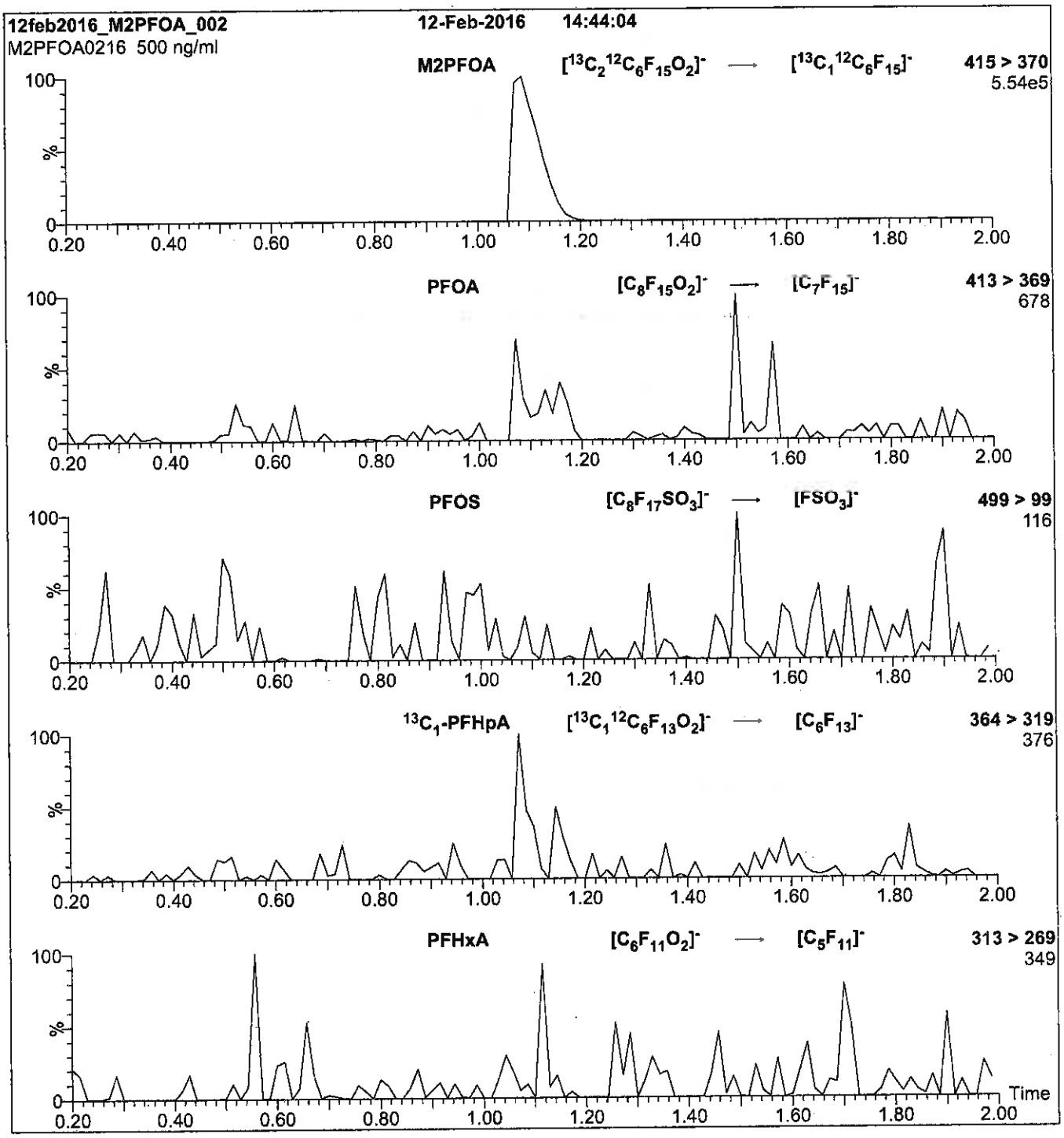
Flow: 300 µl/min

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

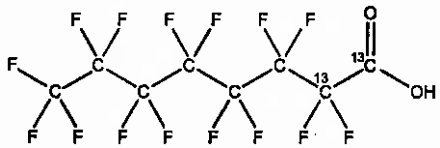
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ID: LCM2PFOA_00012
Exp:10/26/22 Prpd:CBW Opn:06/26/18
13C2-PFOA Stock 50ug/mL

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

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

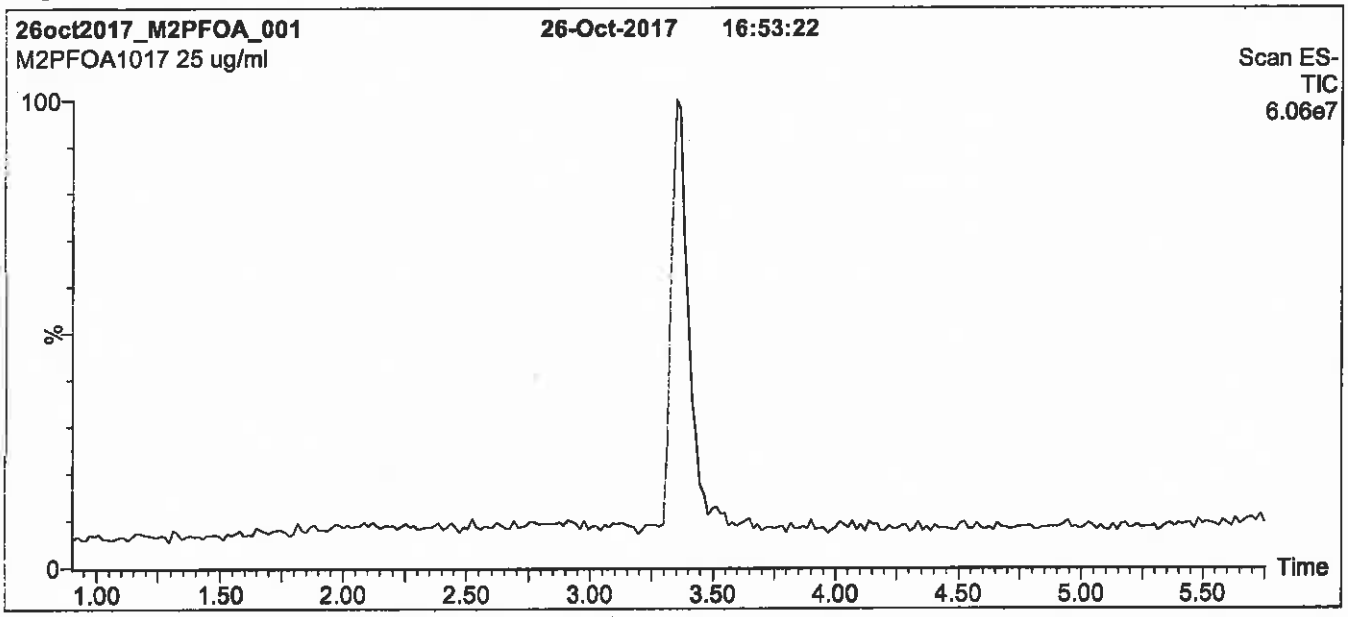
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

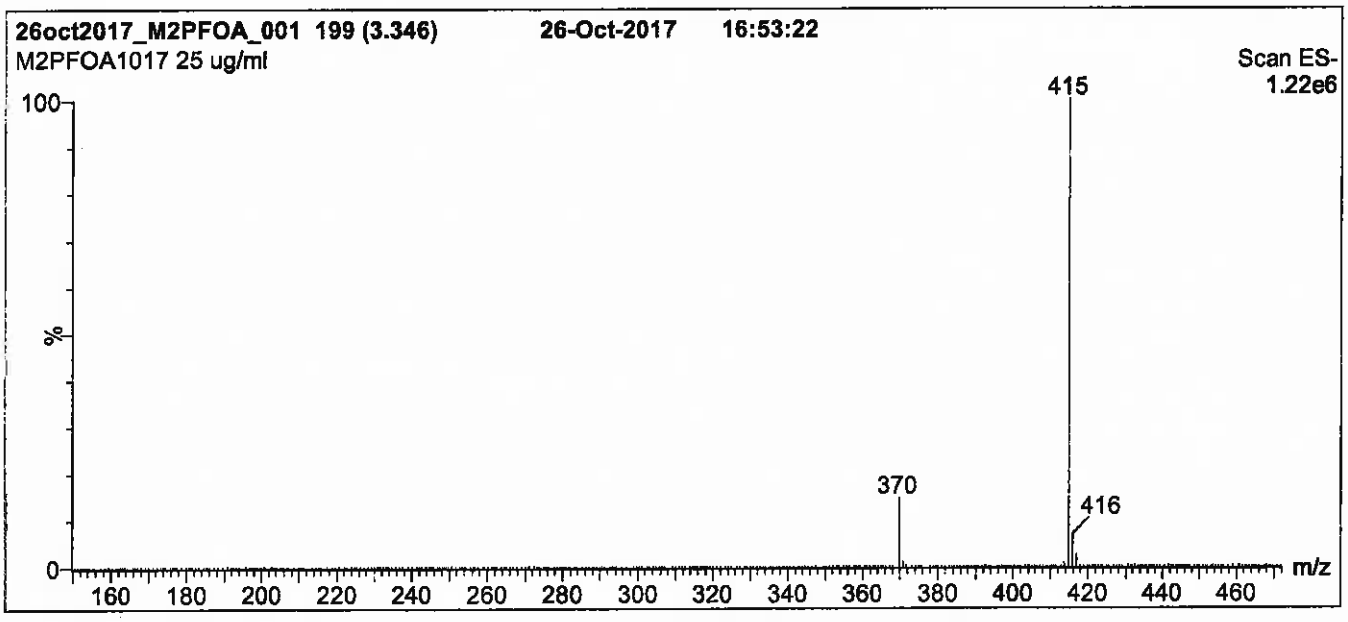
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

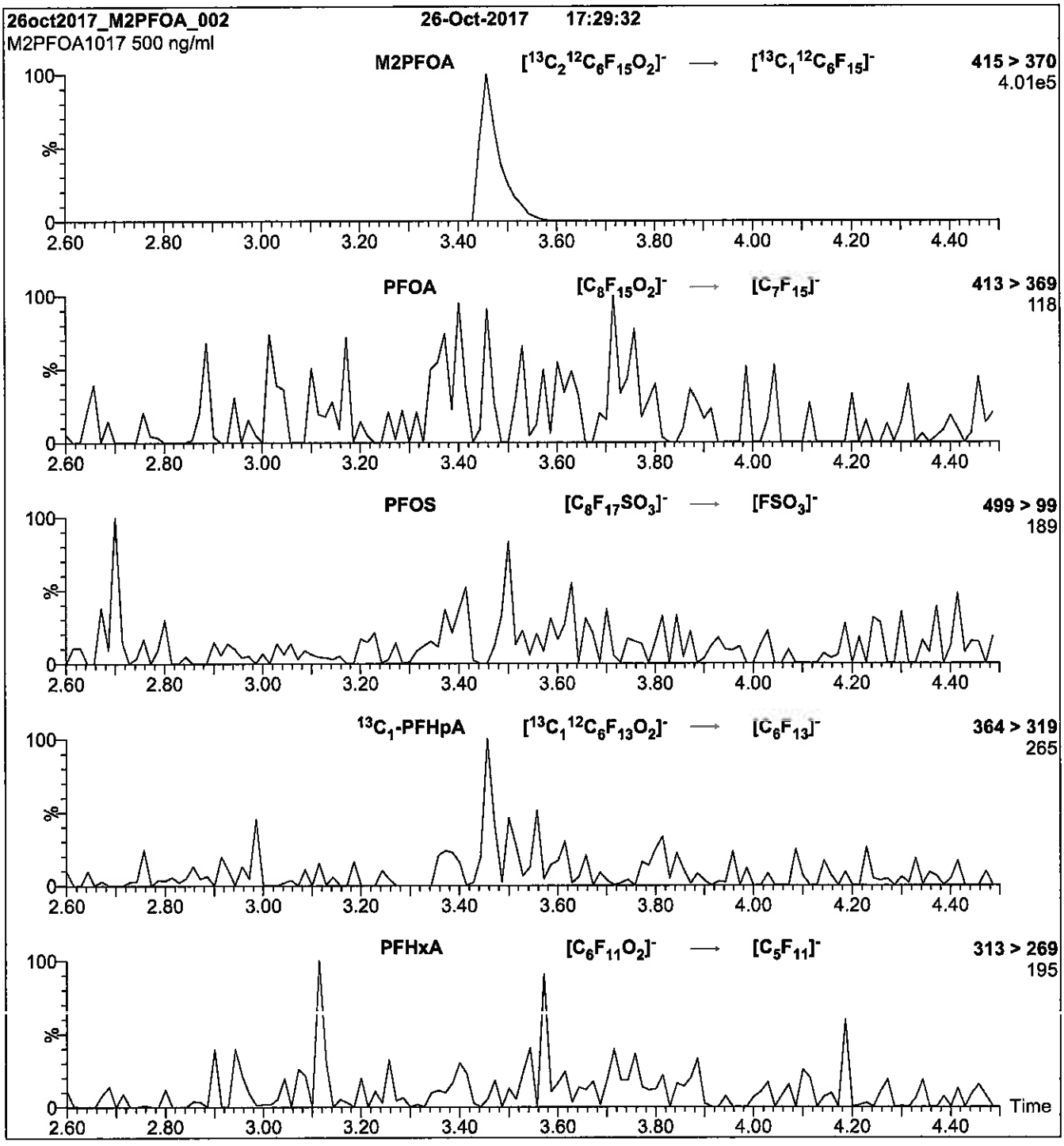
Flow: 300 µl/min

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

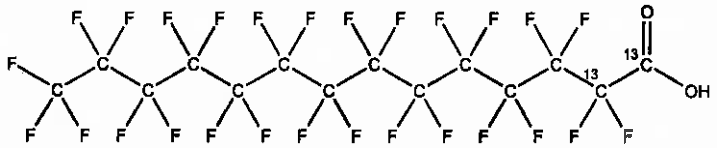
1287281
ID: LCM2PFTeDA_00015
Exp:11/30/22 Prpd:CBW Opn:06/26/18
13C2-PFTeDA at 50ug/mL

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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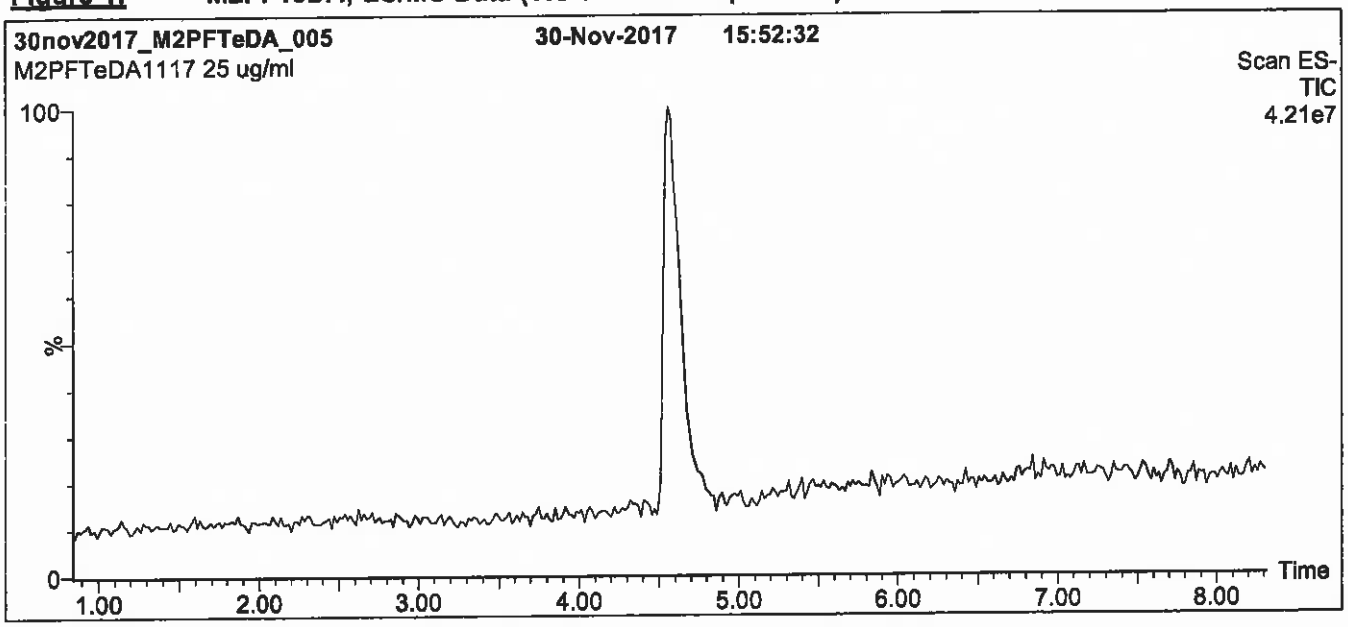
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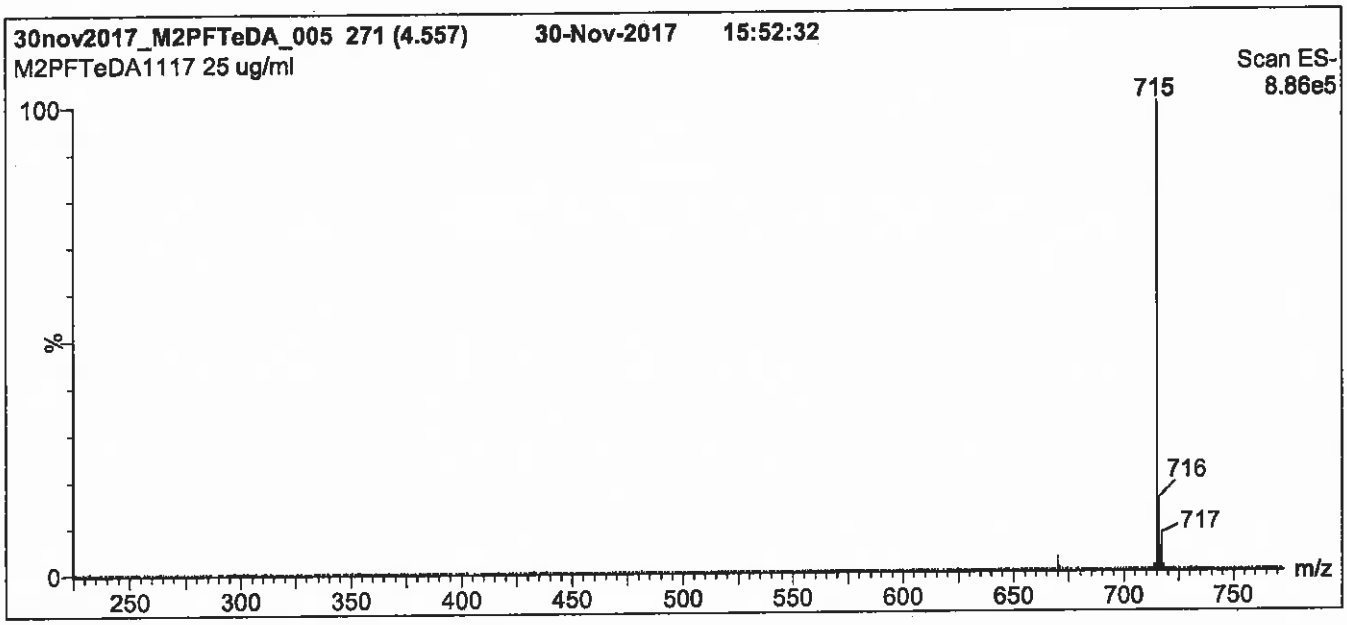
CALA

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

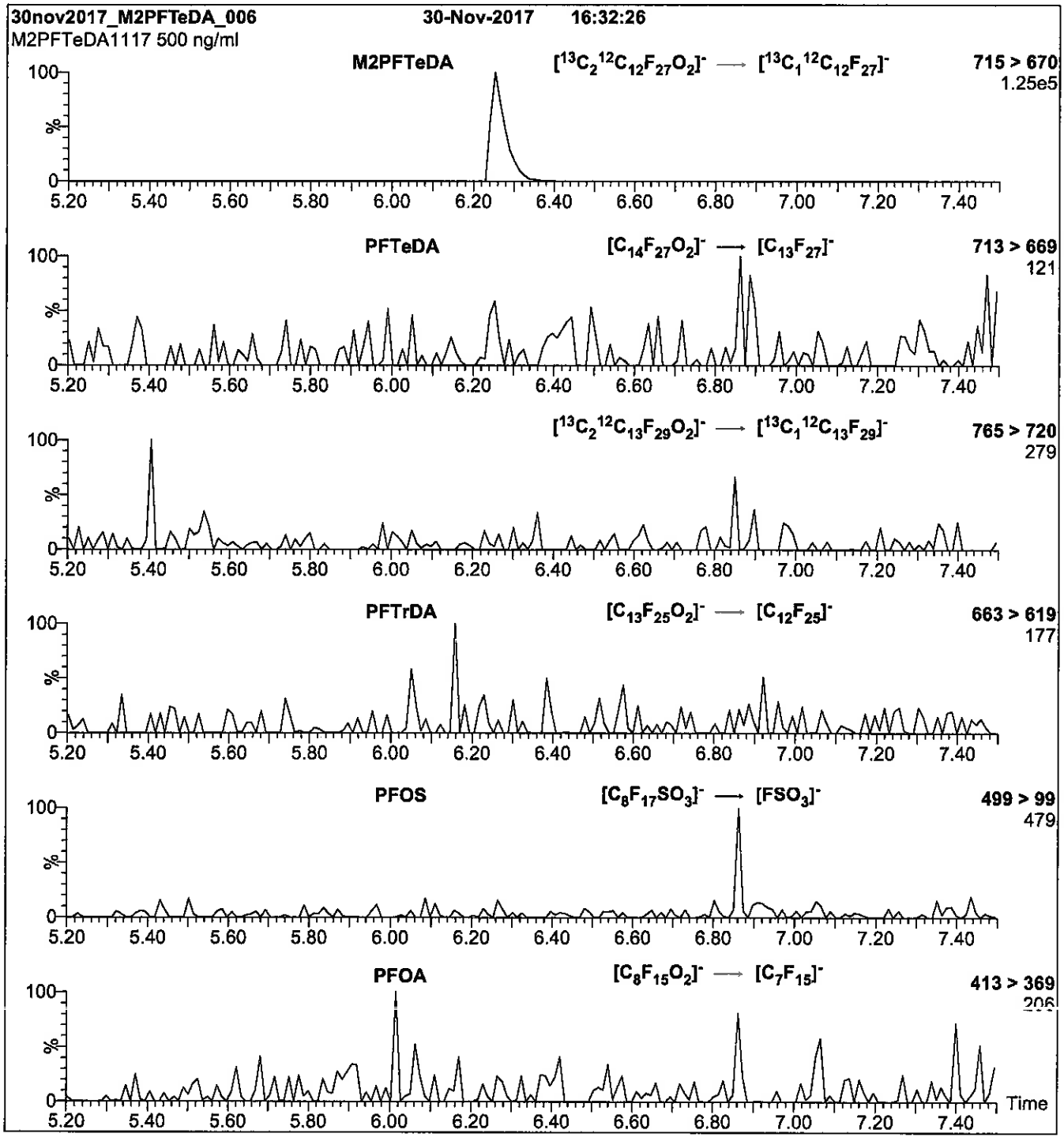
Flow: 300 µl/min

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

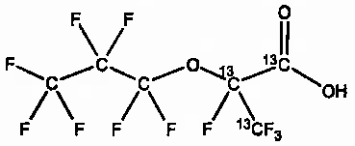
WELLINGTON LABORATORIES

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

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:

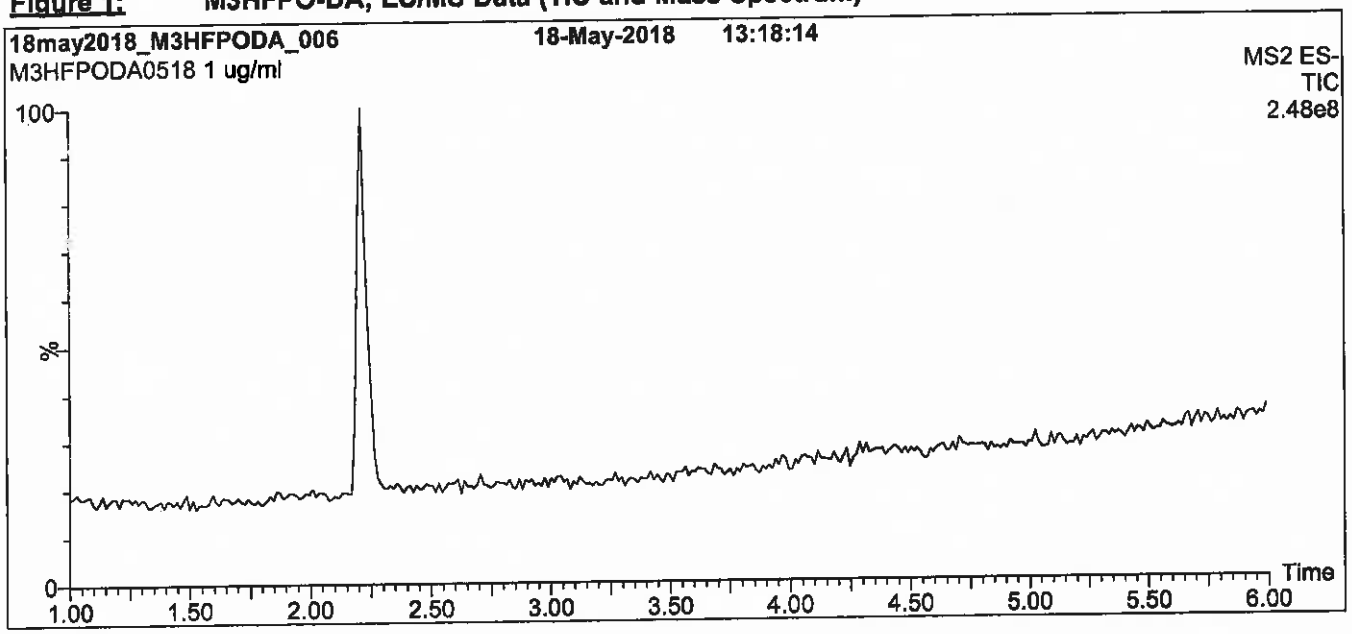
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

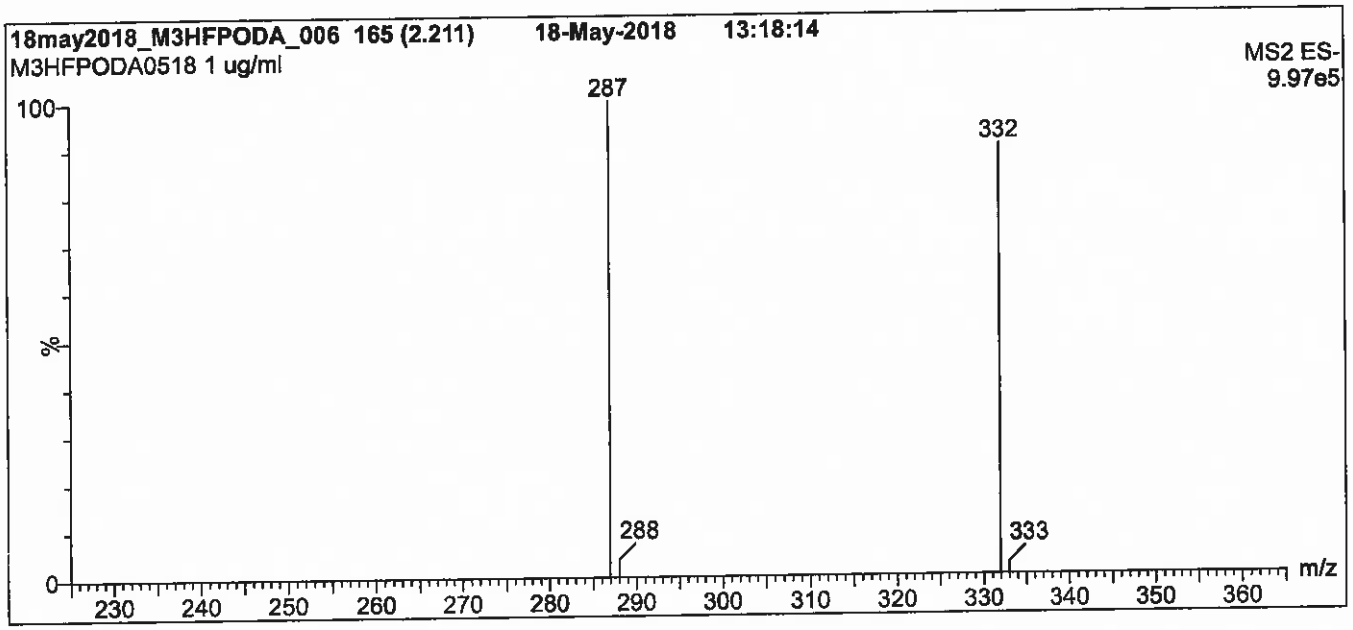
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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Figure 1: **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

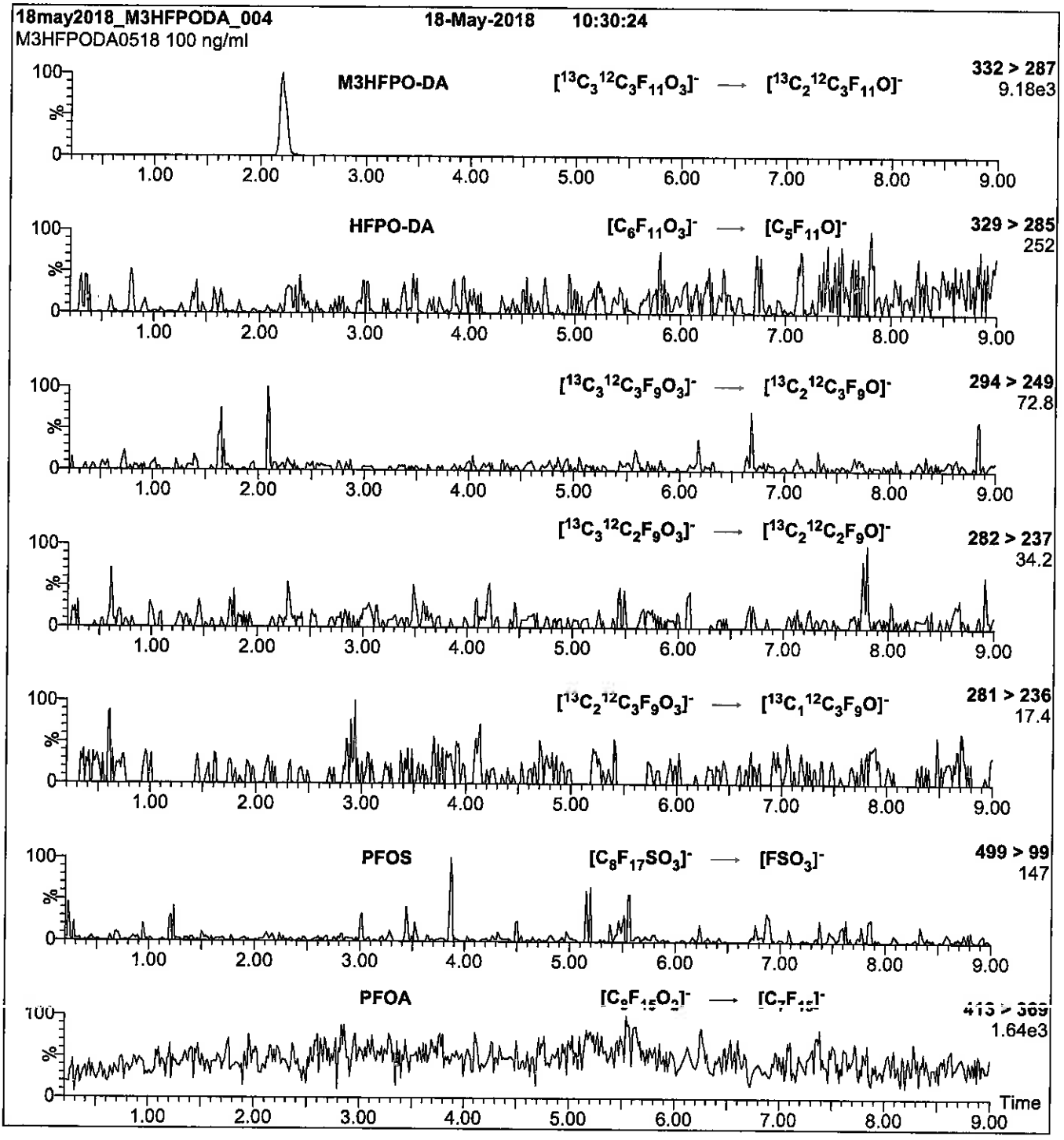
Flow: 300 µl/min

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

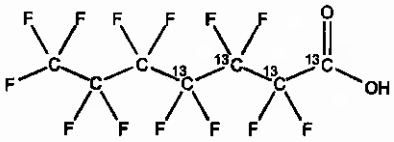
1287287
ID: LCM4PFHPA_00015
Exp:05/03/22 Prpd:CBW Opn:06/26/18
13C4-Perfluoroheptanoic a

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

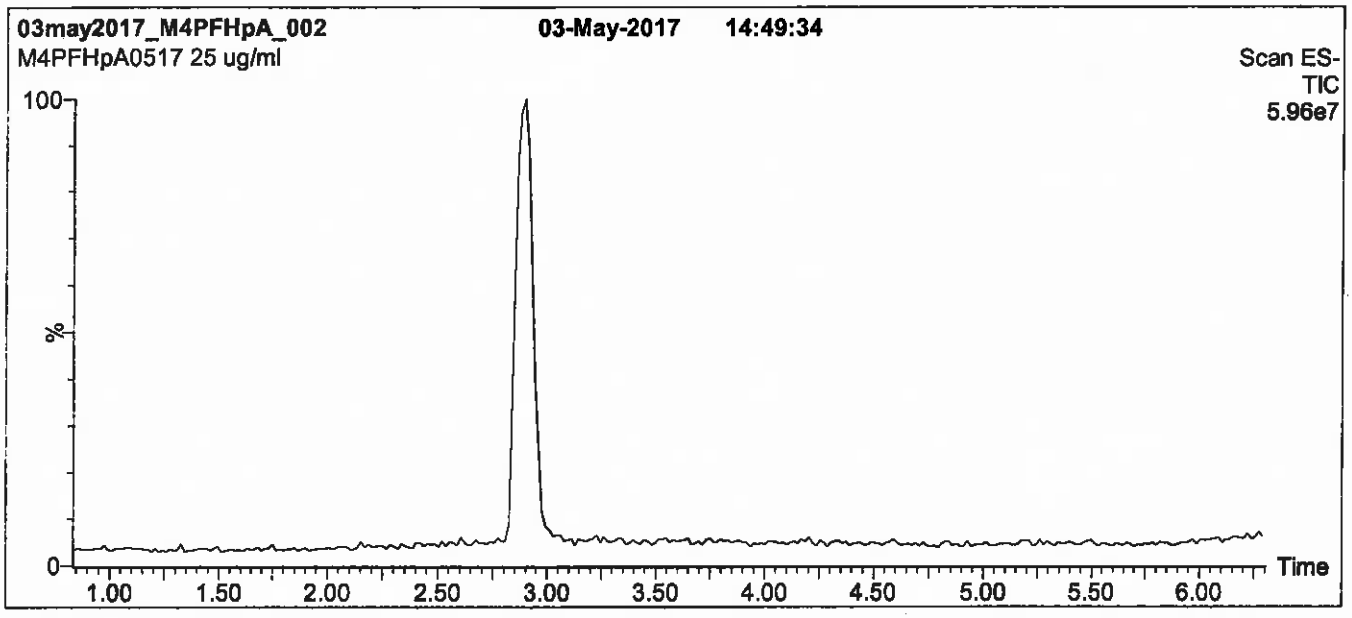
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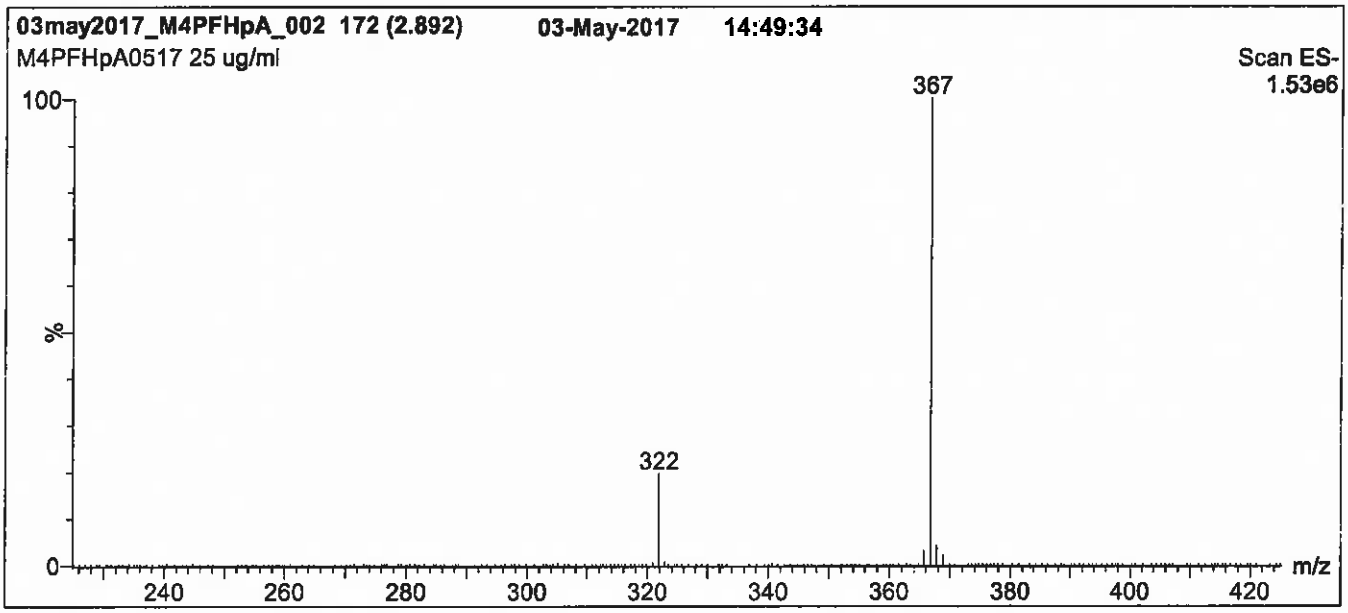
CALA

ANAB ACCREDITED

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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

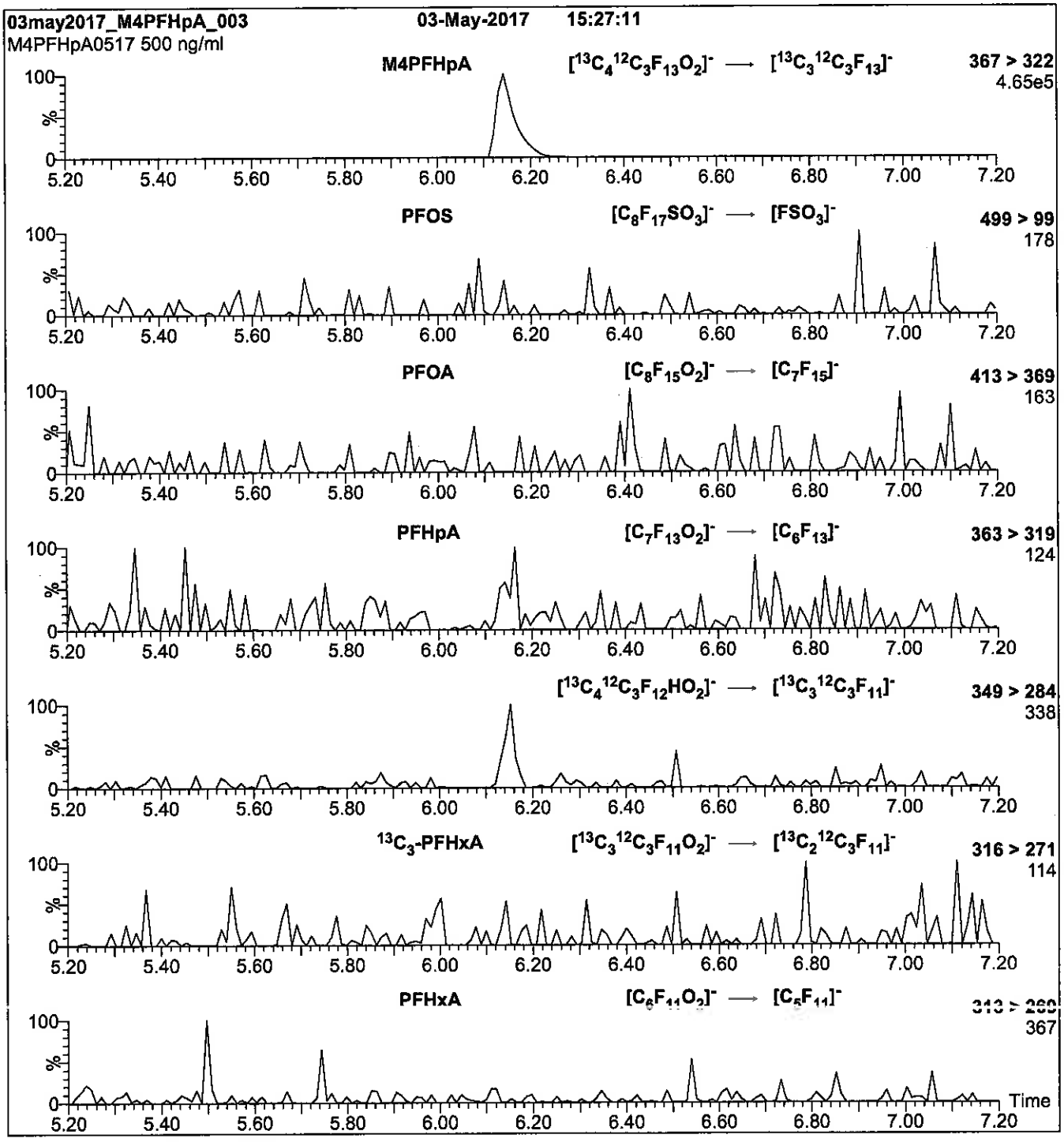
Flow: 300 µl/min

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

1287290
ID: LCM5PFPEA_00016
Exp:07/20/22 Prpd:CBW Opn:06/26/18
13C5-Perfluoropentanoic a

R- 6/26/18 CBW

WELLINGTON LABORATORIES

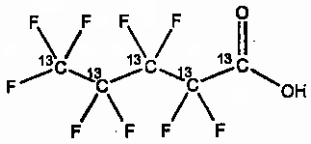
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: M5PFPeA0717

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_6HF_8O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 269.01
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

ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_6$)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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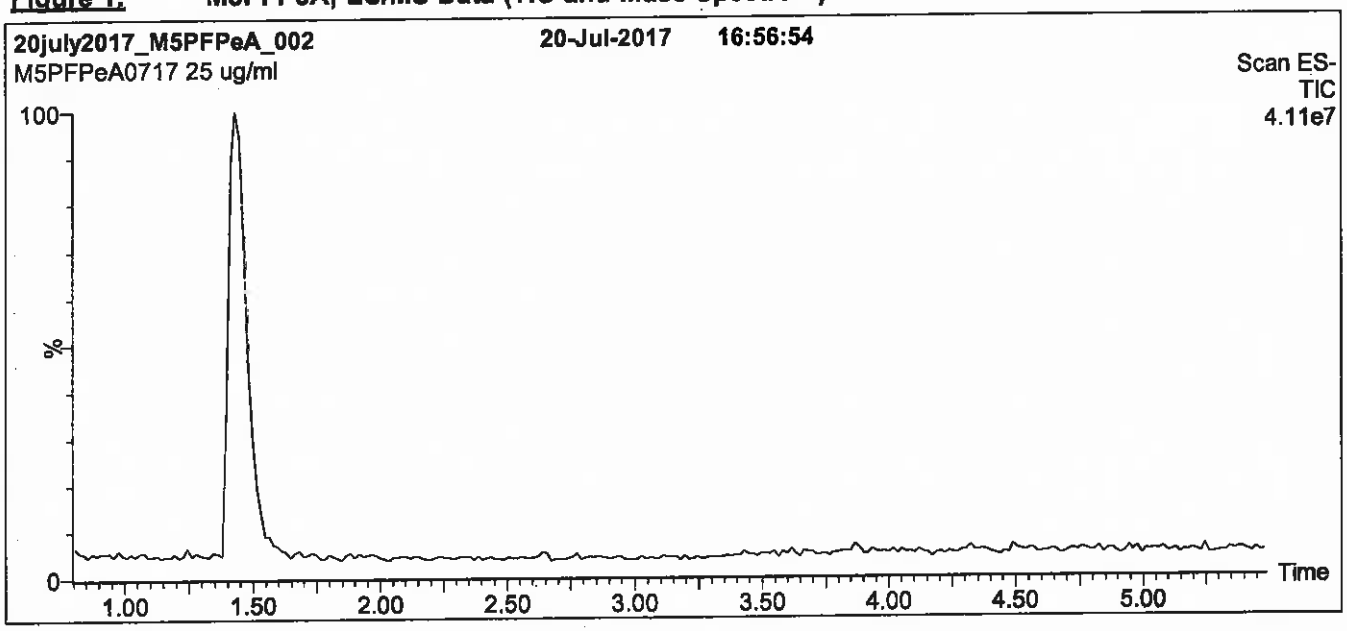
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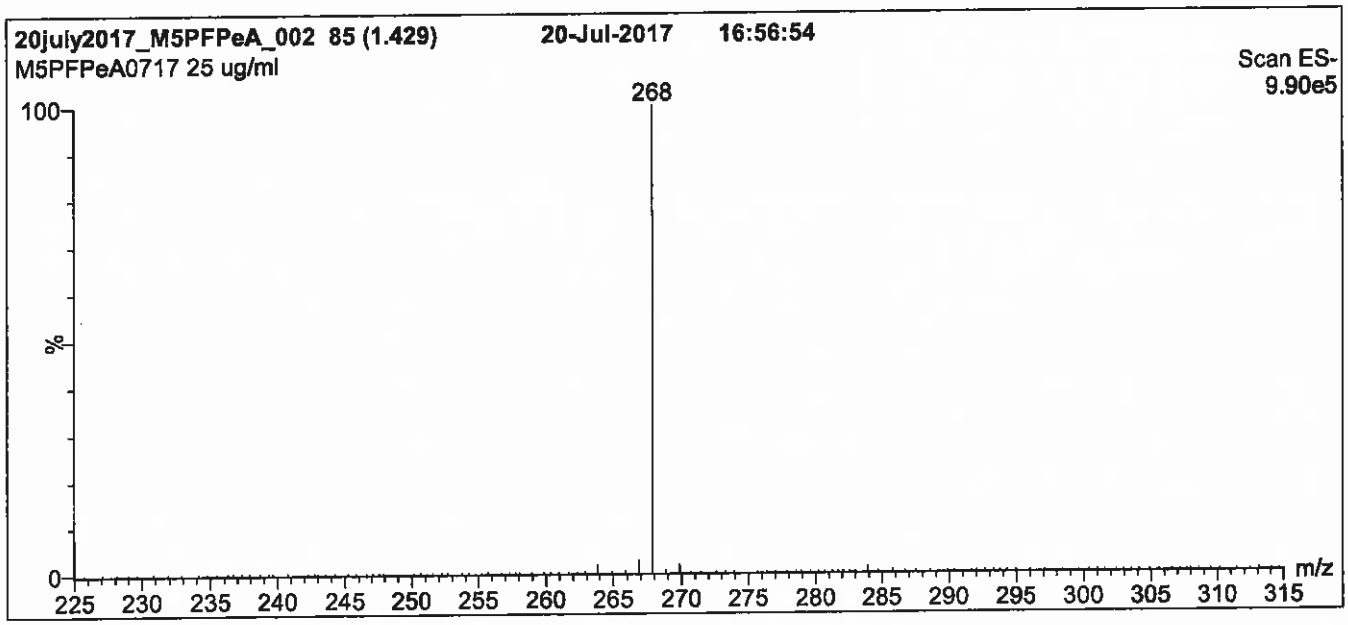
CALA

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

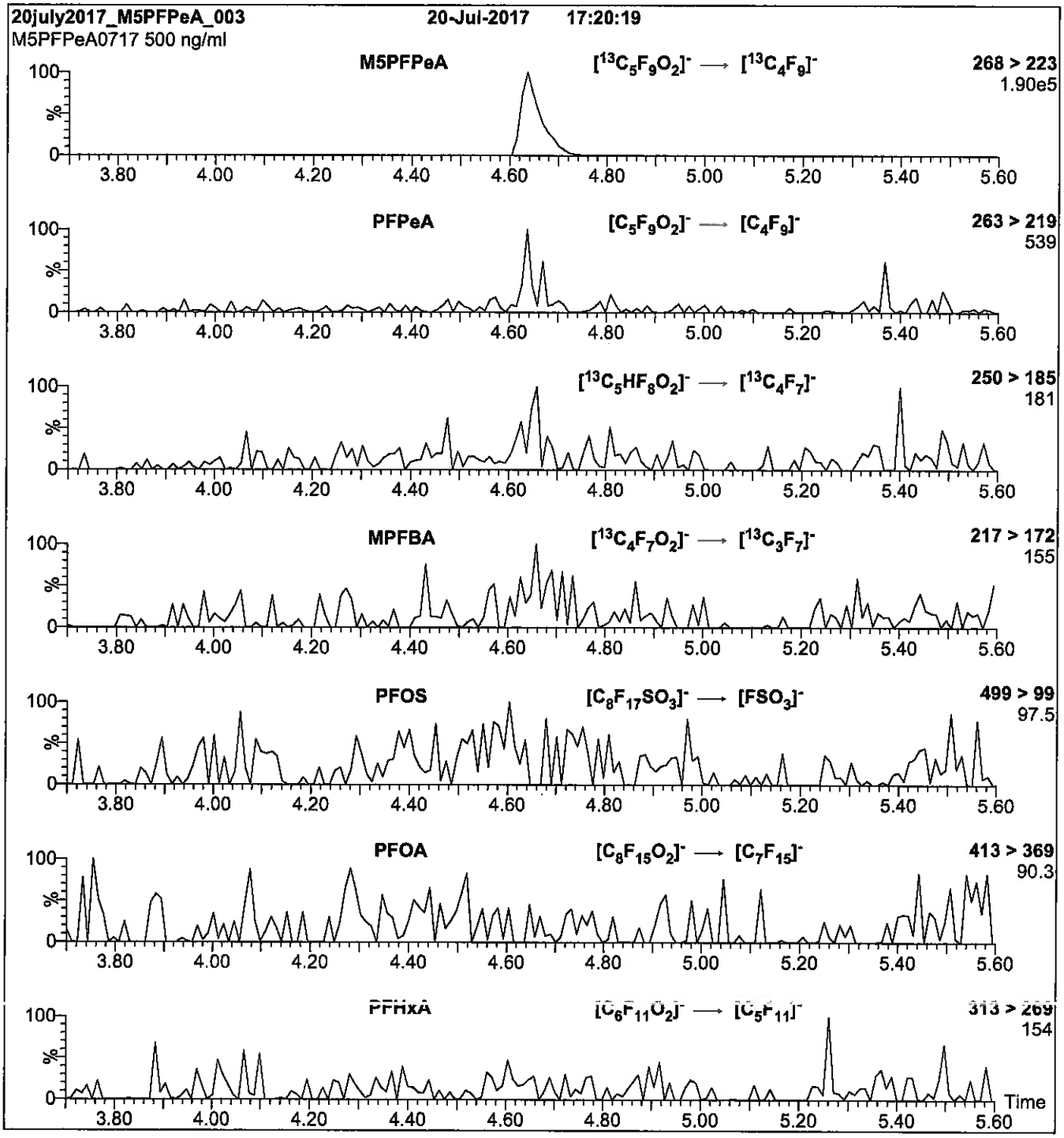
Flow: 300 µl/min

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

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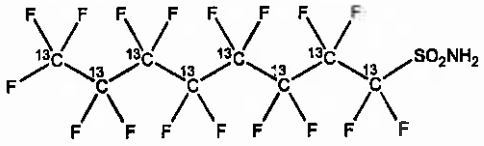
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

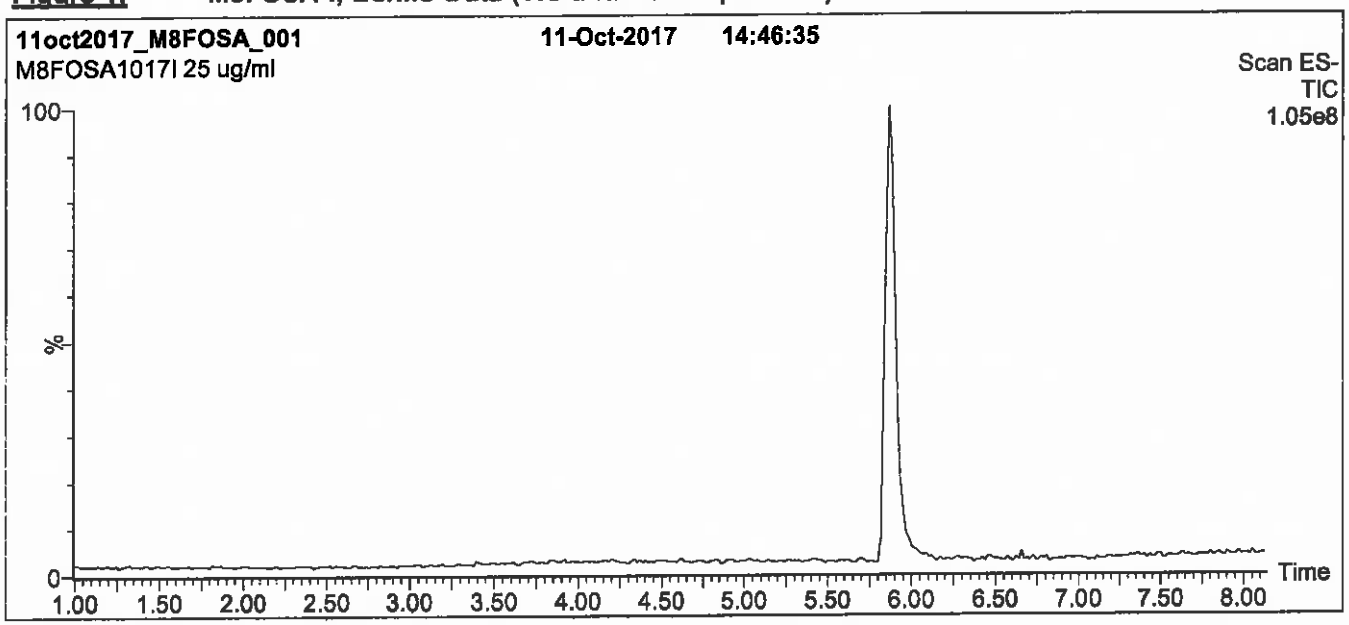
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

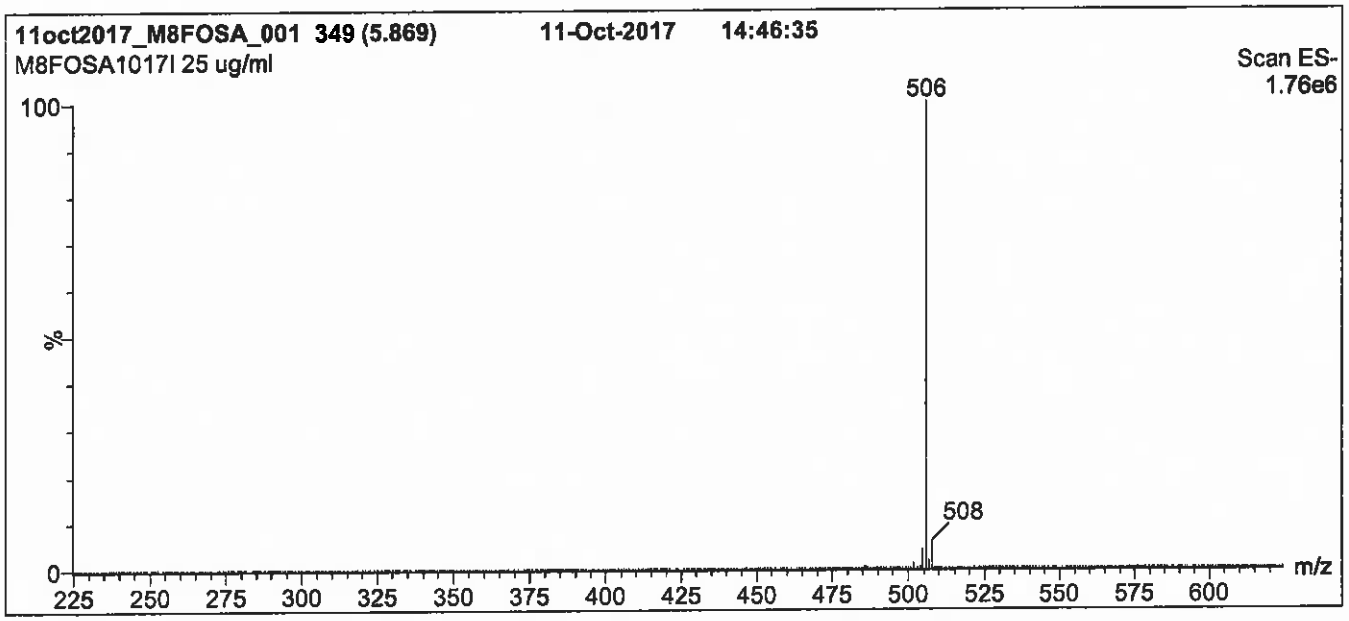
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

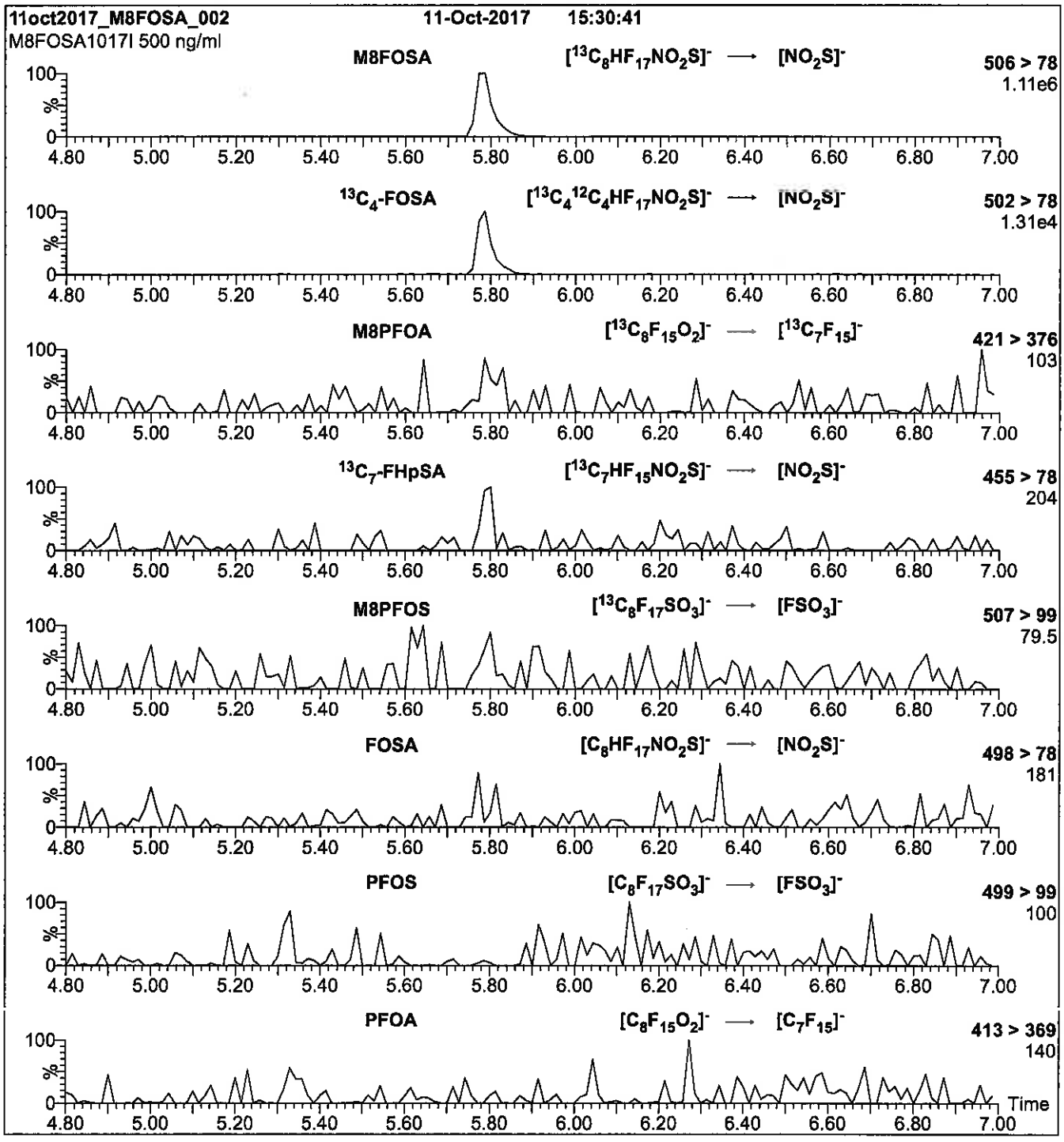
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

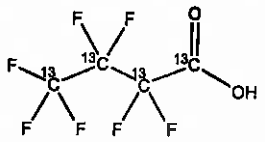
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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LIMITED WARRANTY:

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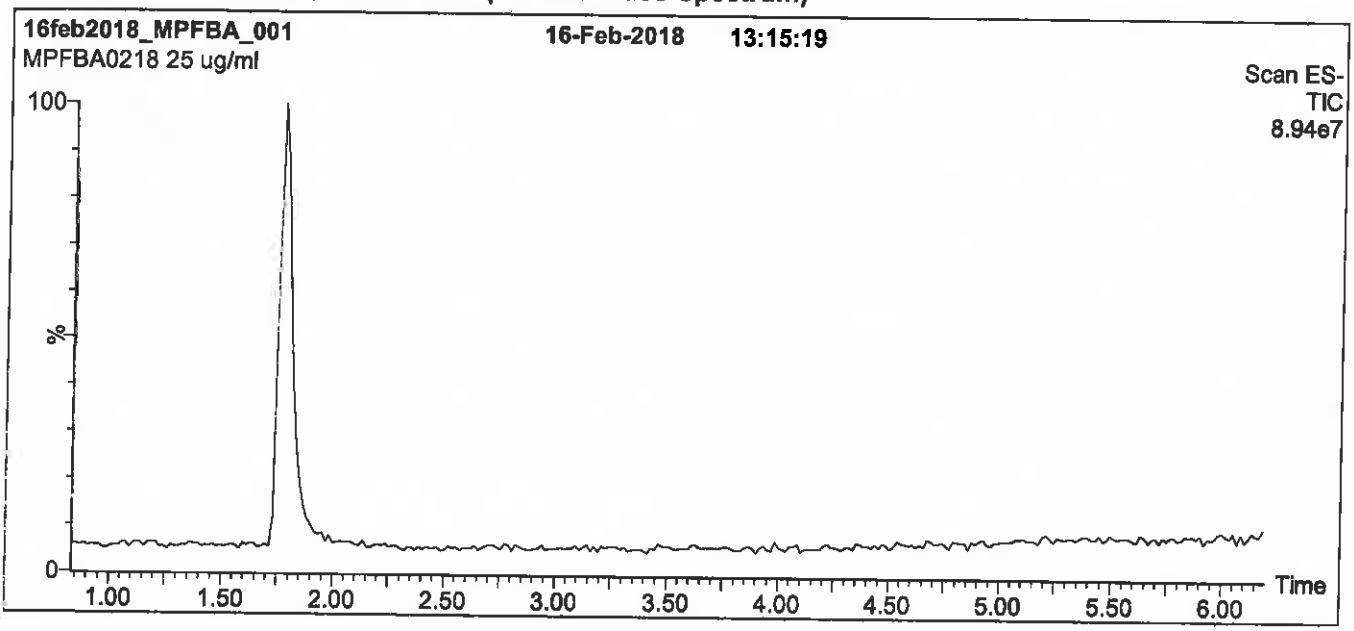
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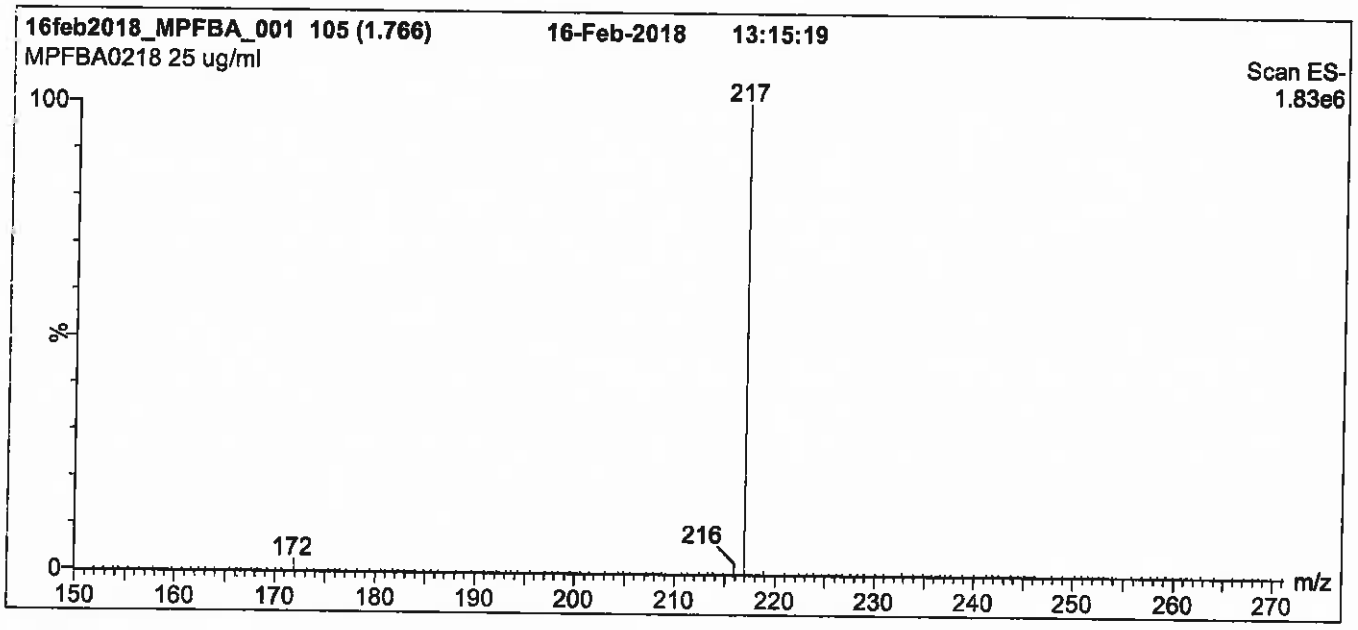
CALA

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

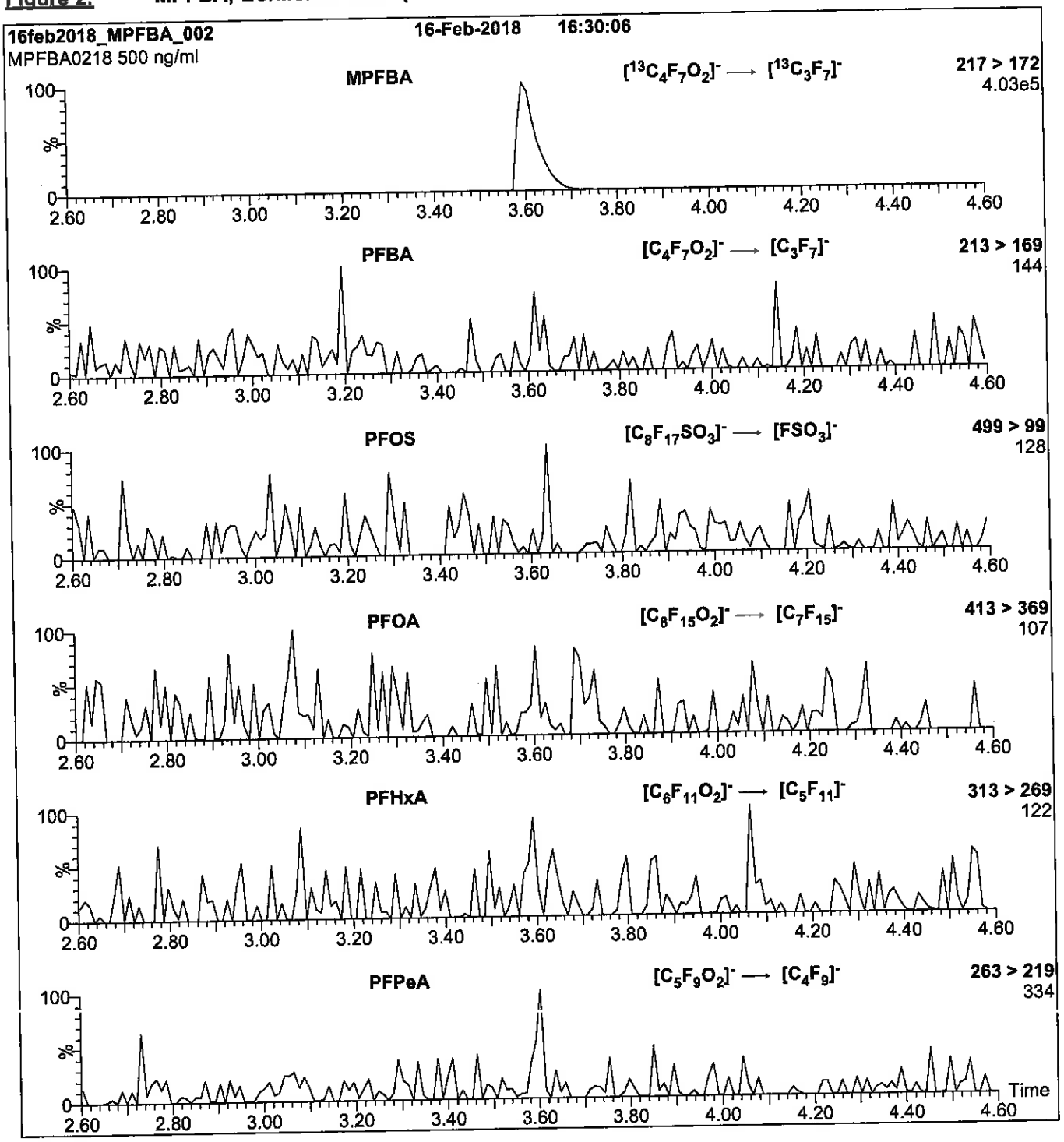
Flow: 300 µl/min

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

1287346
ID: LCMPFBS_00009
Exp:02/15/23 Prpd:CBW Opn:06/26/18
13C3-Perfluorobutanesulfo

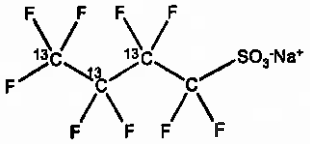
R-C/26/18 CBW

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

INTENDED USE:

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HANDLING:

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HOMOGENEITY:

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

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

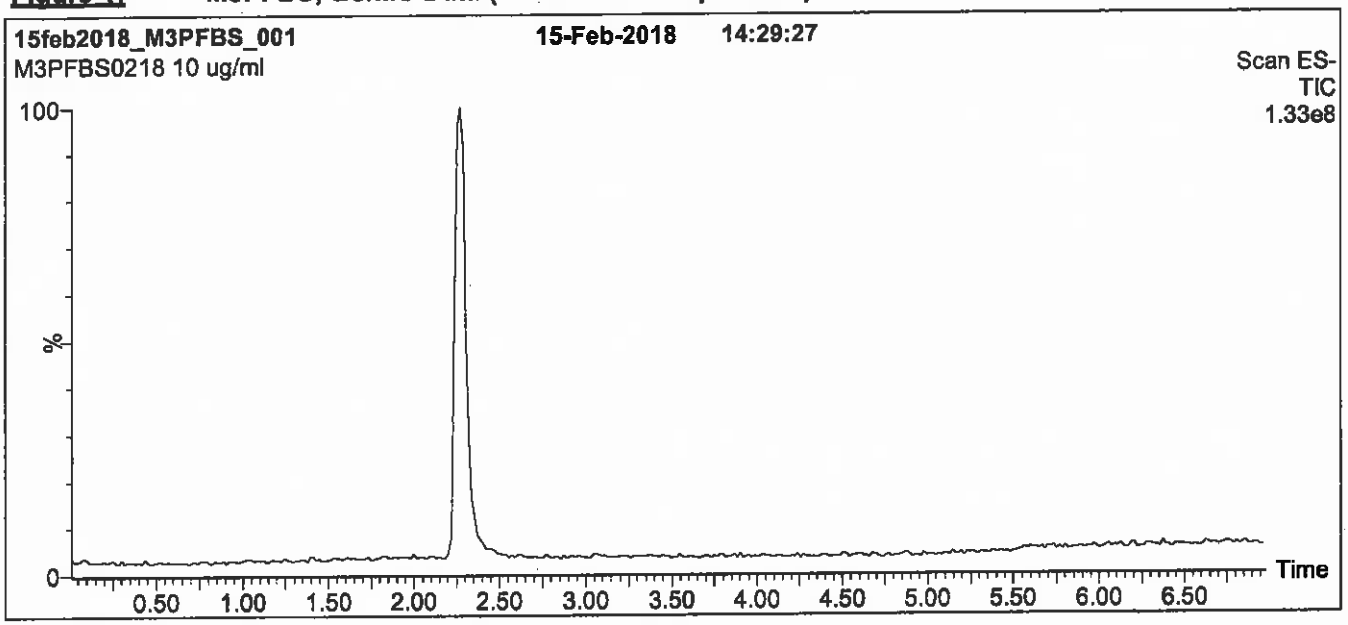
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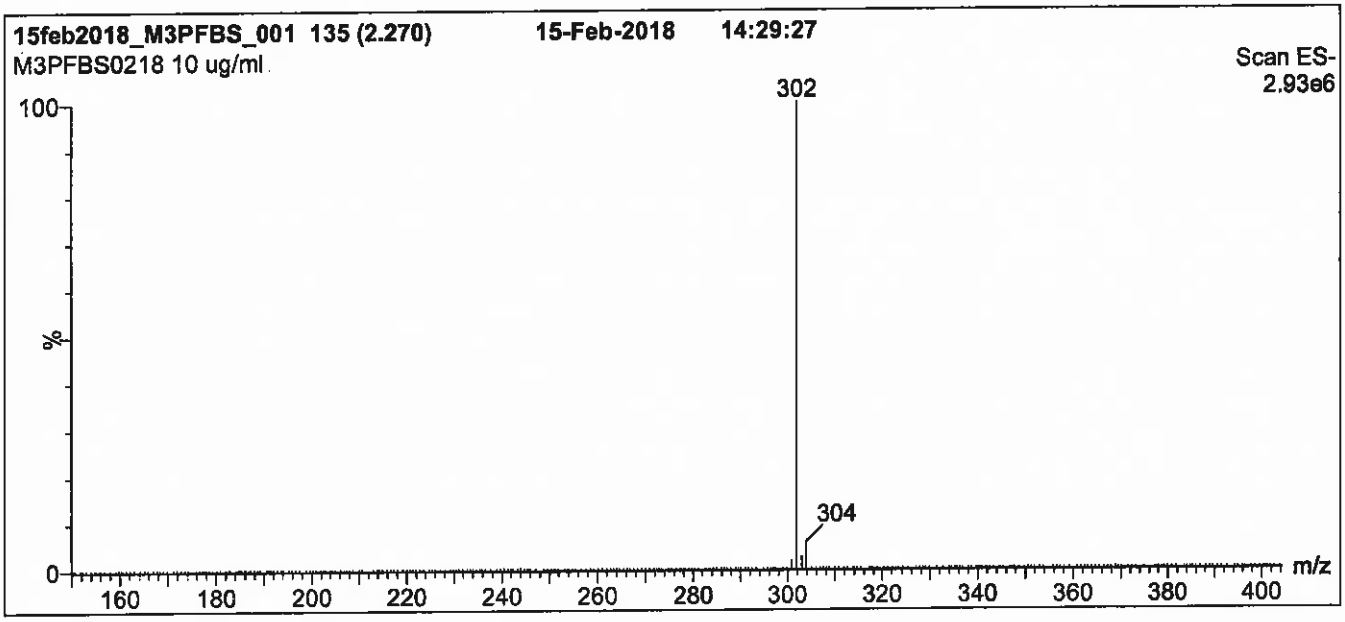
CALA

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

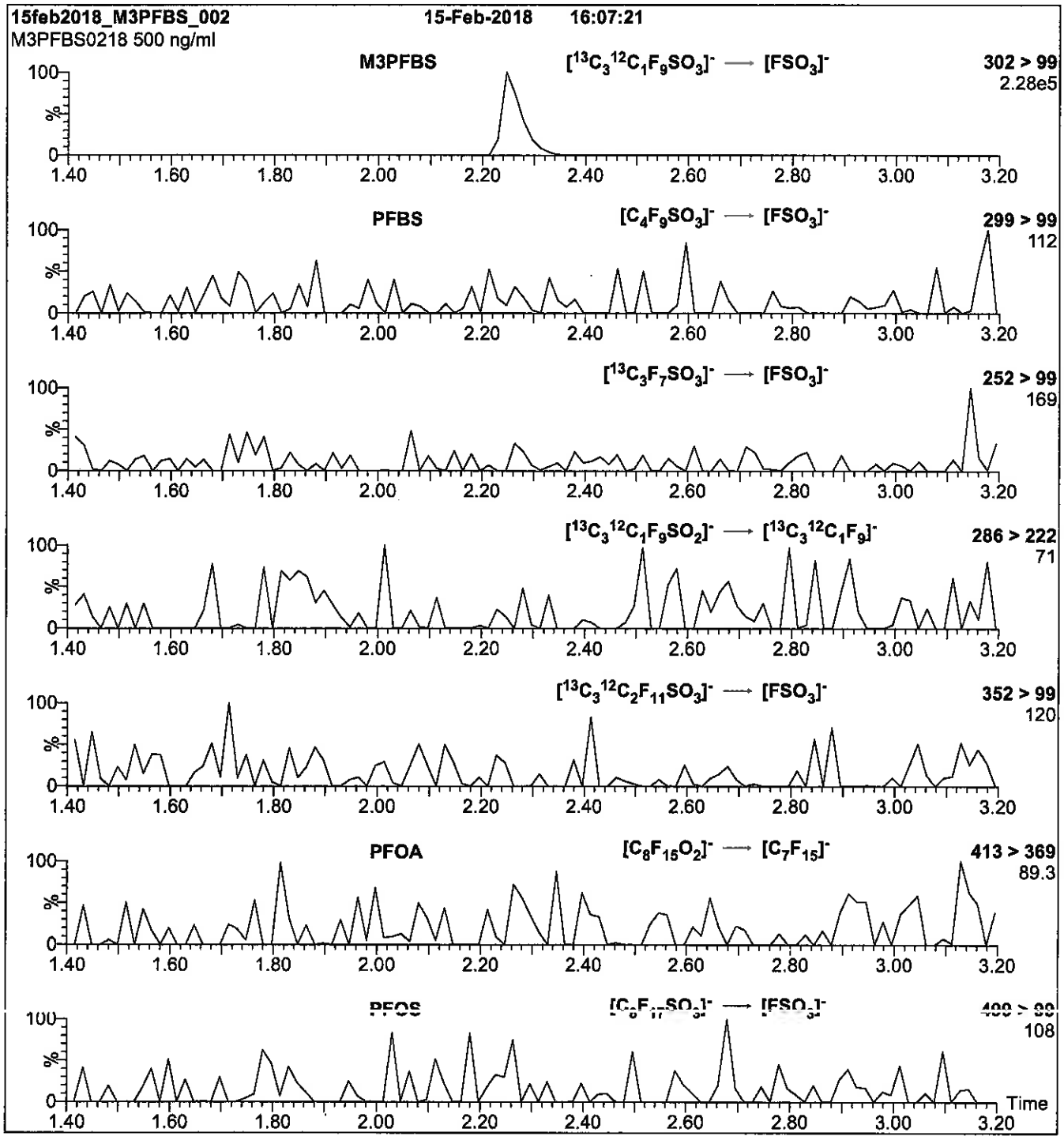
Flow: 300 µl/min

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

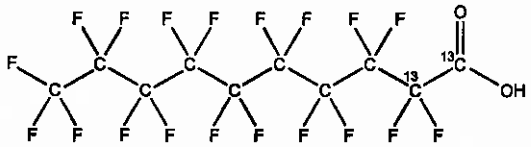
1287334
ID: LCMPFDA_00021
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C2-Perfluorodecanoic a

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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:

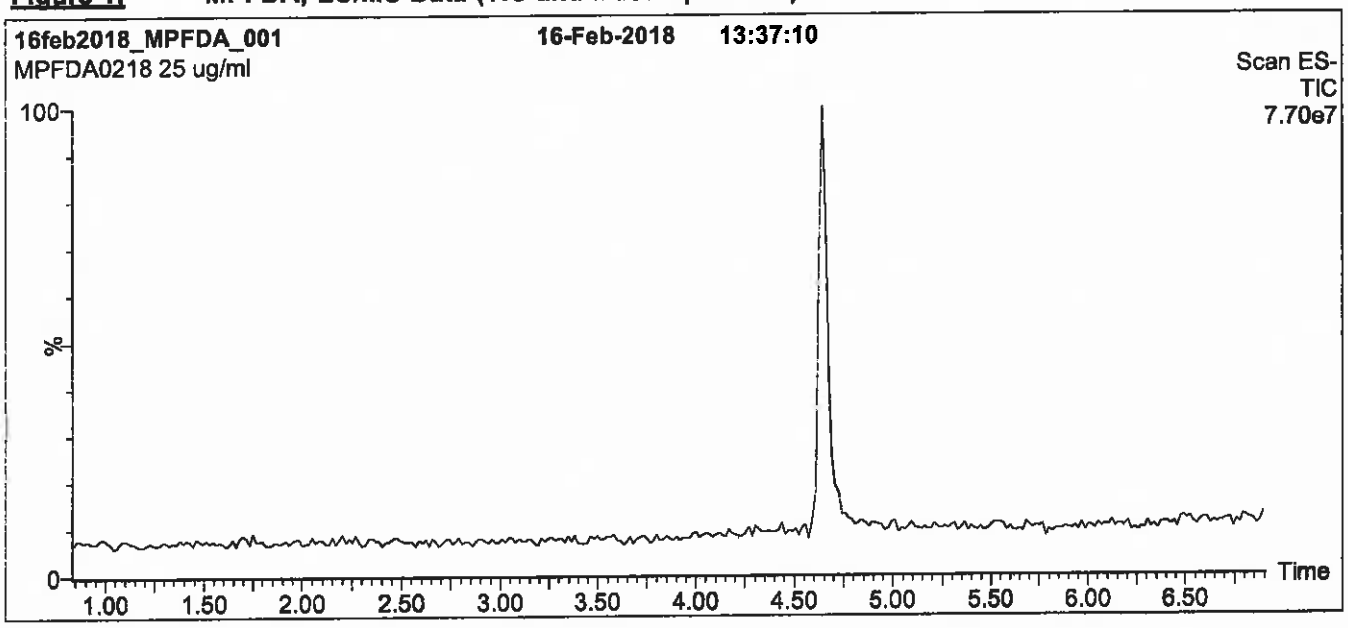
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

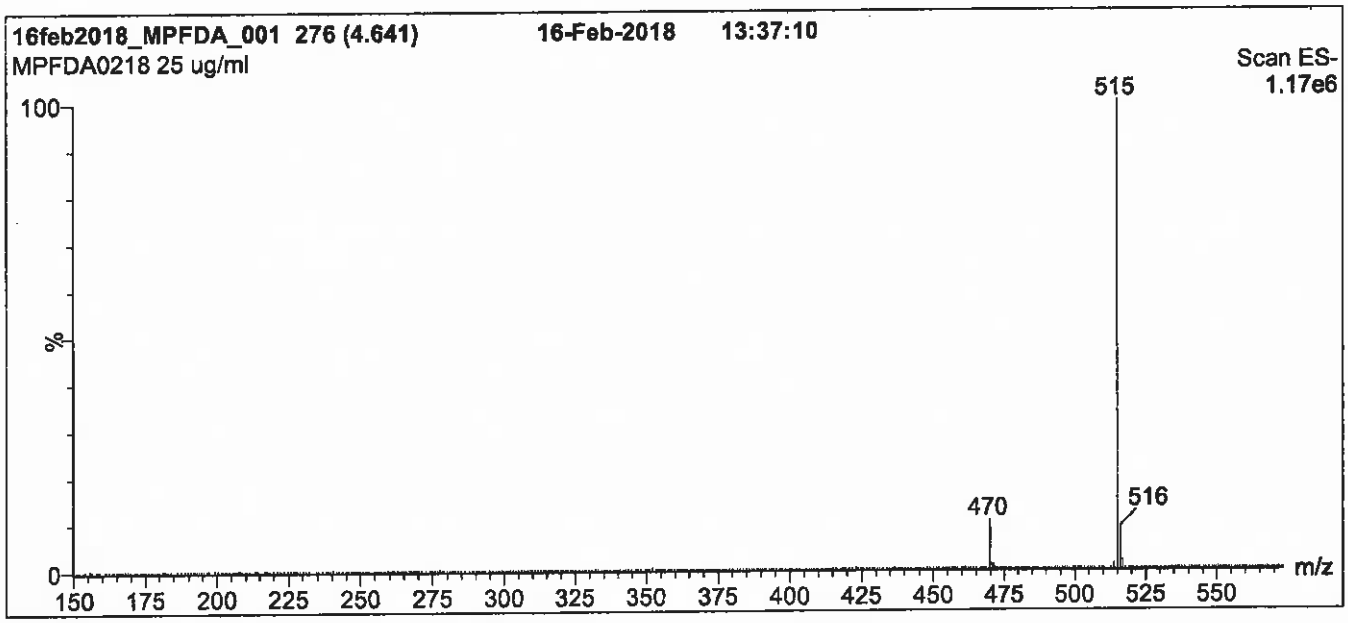
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

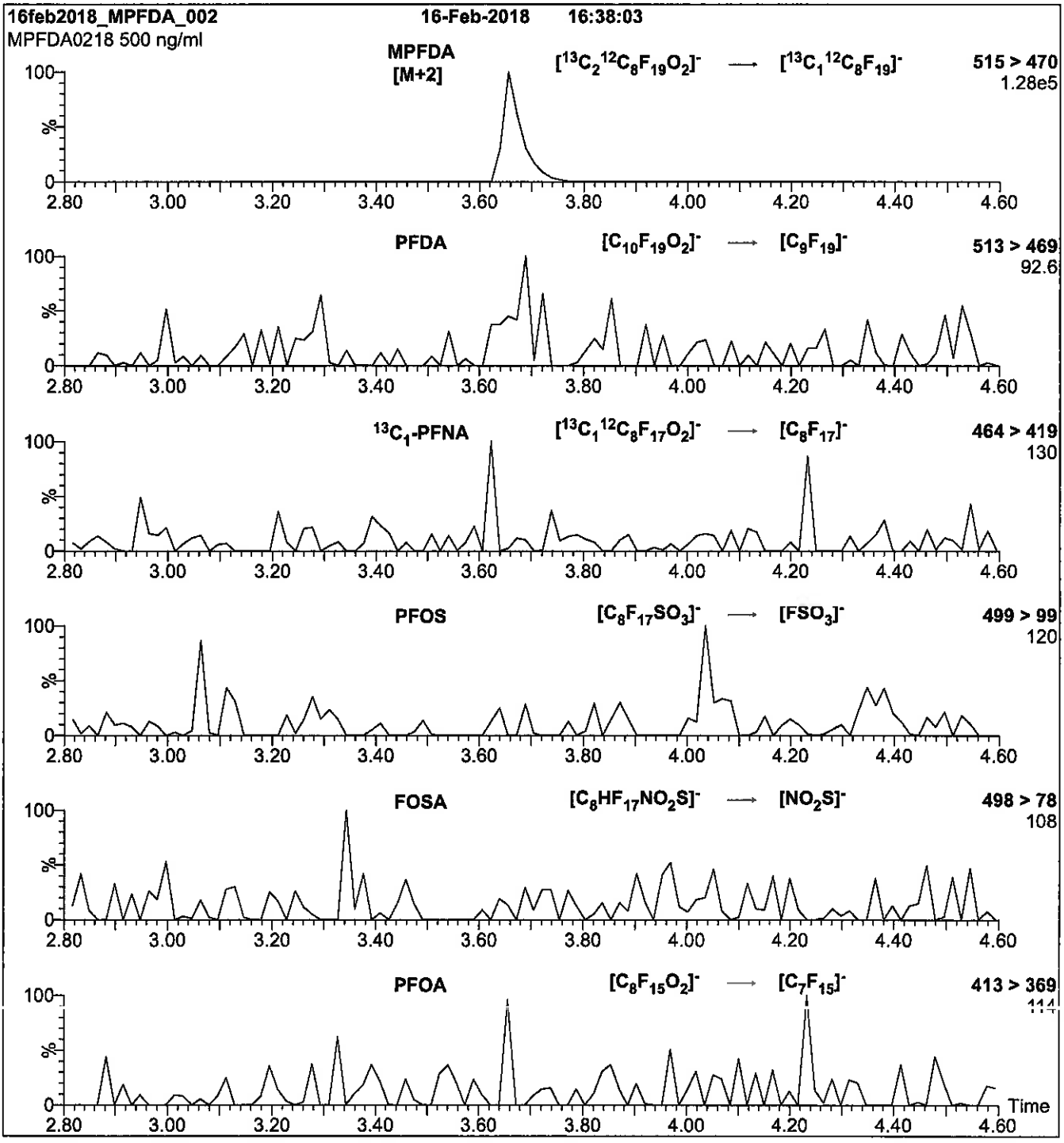
Flow: 300 µl/min

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

1287284
ID: LCMPFDoA_00016
Exp:02/16/23 Prpd:CBW Opn:06/26/18
13C2-Perfluorododecanoic

6/26/18 CBW

WELLINGTON LABORATORIES

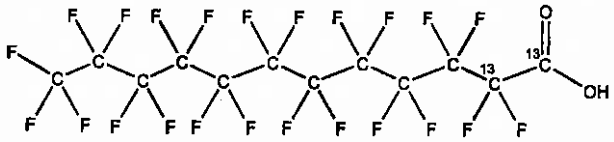
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFDoA0218

STRUCTURE:

CAS #: Not available



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

MOLECULAR WEIGHT: 616.08
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 ($1,2\text{-}^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/23/2018 (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:

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SYNTHESIS / CHARACTERIZATION:

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

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

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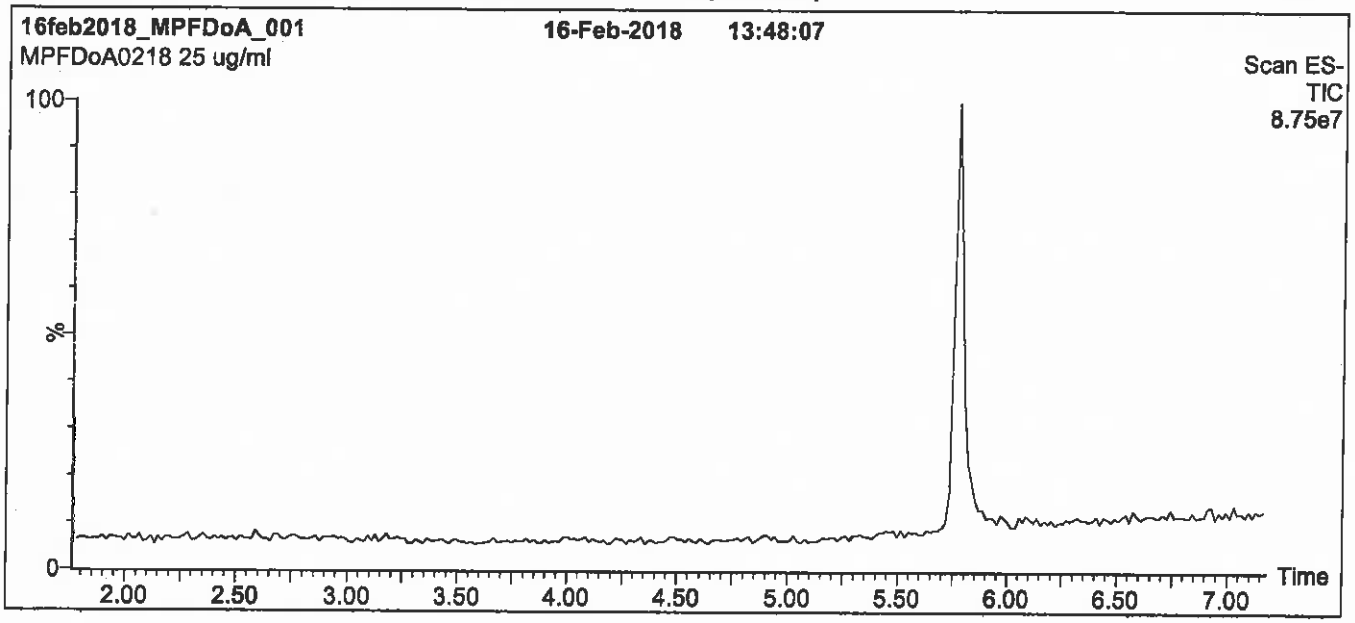
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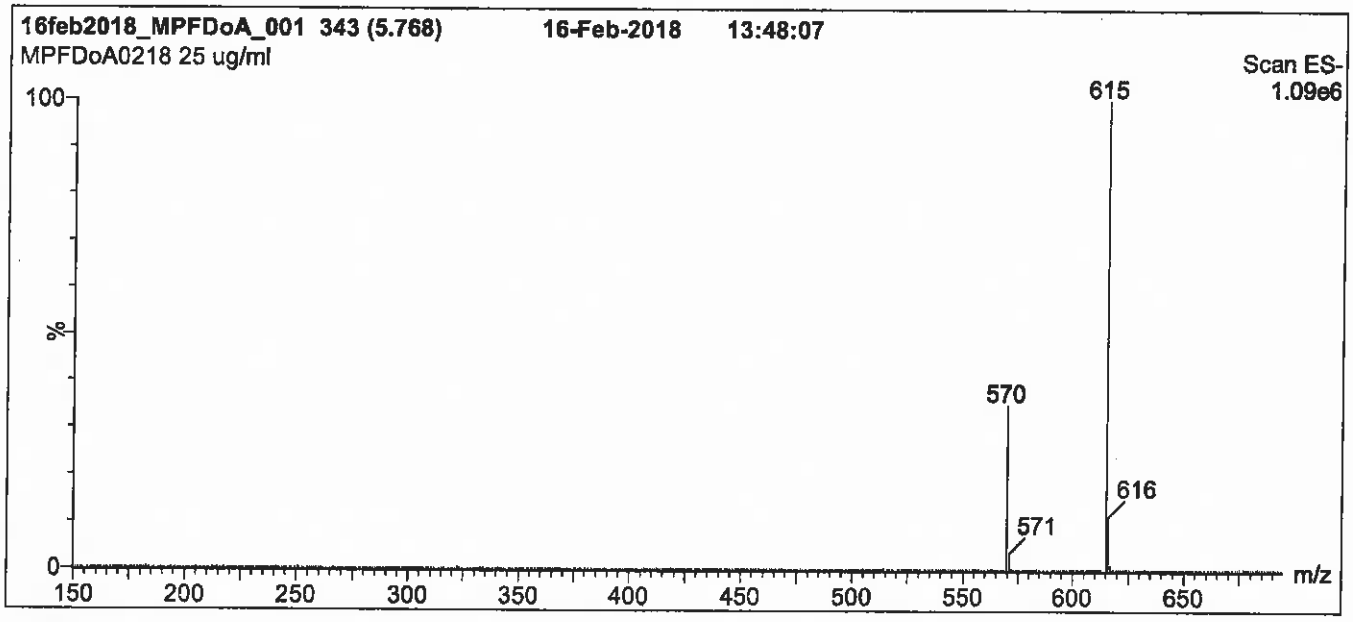
CALA

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

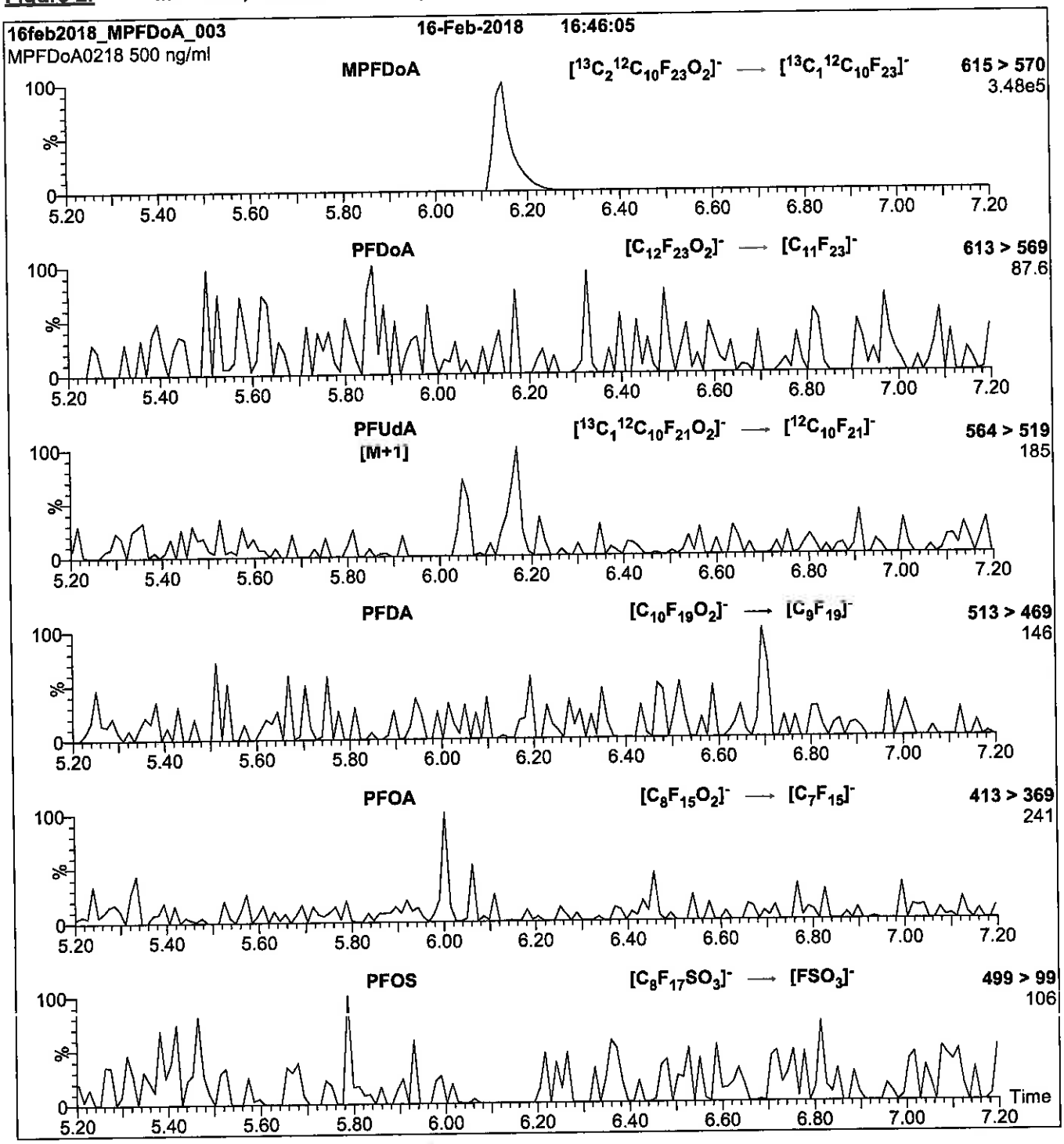
Flow: 300 µl/min

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

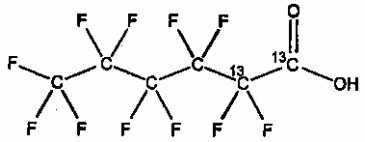
1287337
ID: LCMPFHxA_00023
Exp:10/27/22 Prpd:CBW Opn:06/26/18
13C2-Perfluorohexanoic ac

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 ($1,2\text{-}^{13}C_2$)
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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where x is expressed as a relative standard uncertainty of the individual parameter.

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

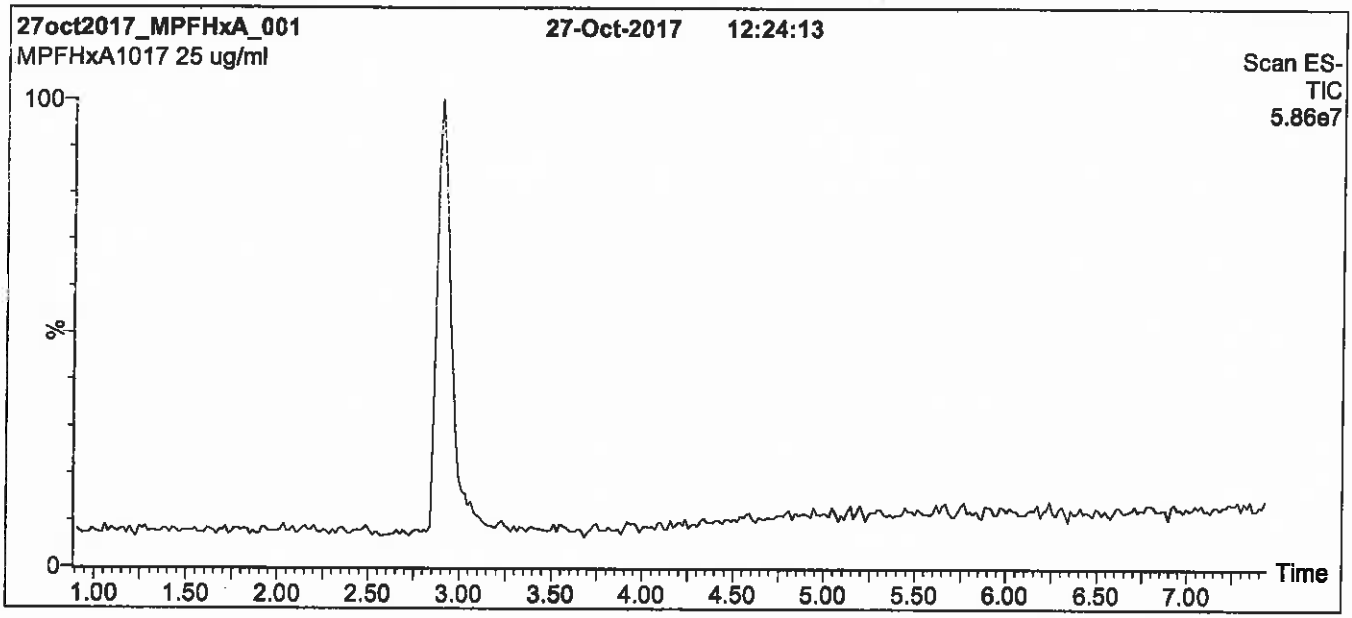
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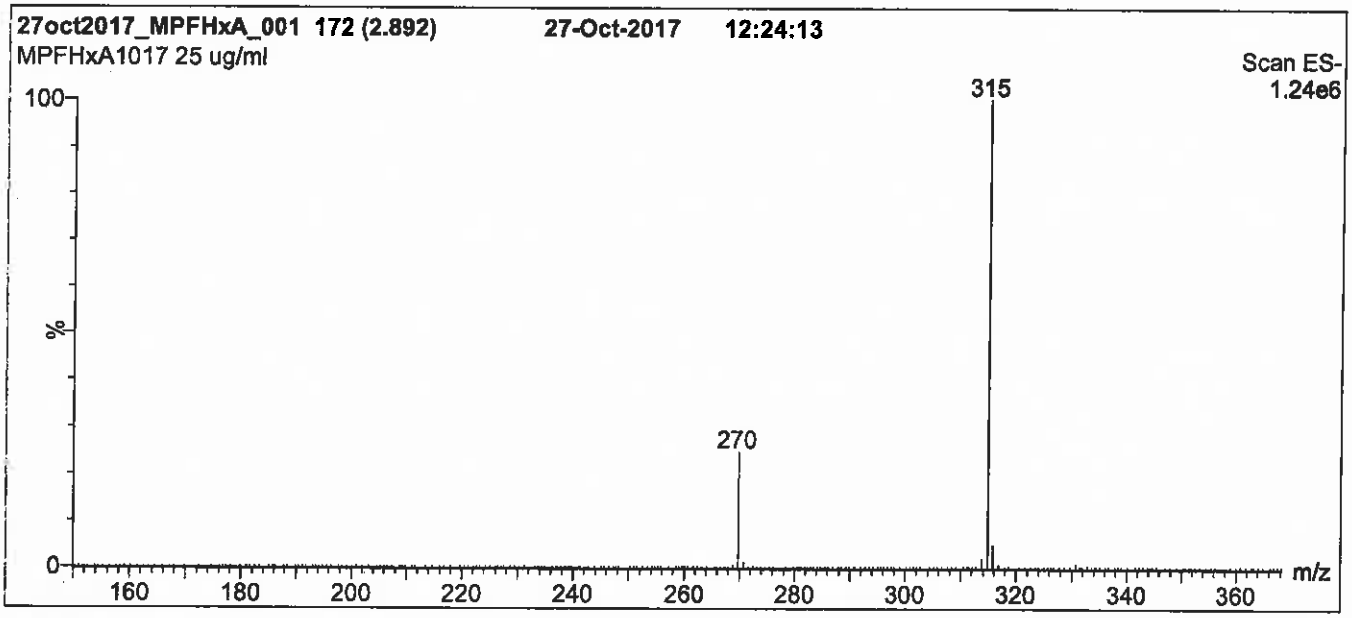
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

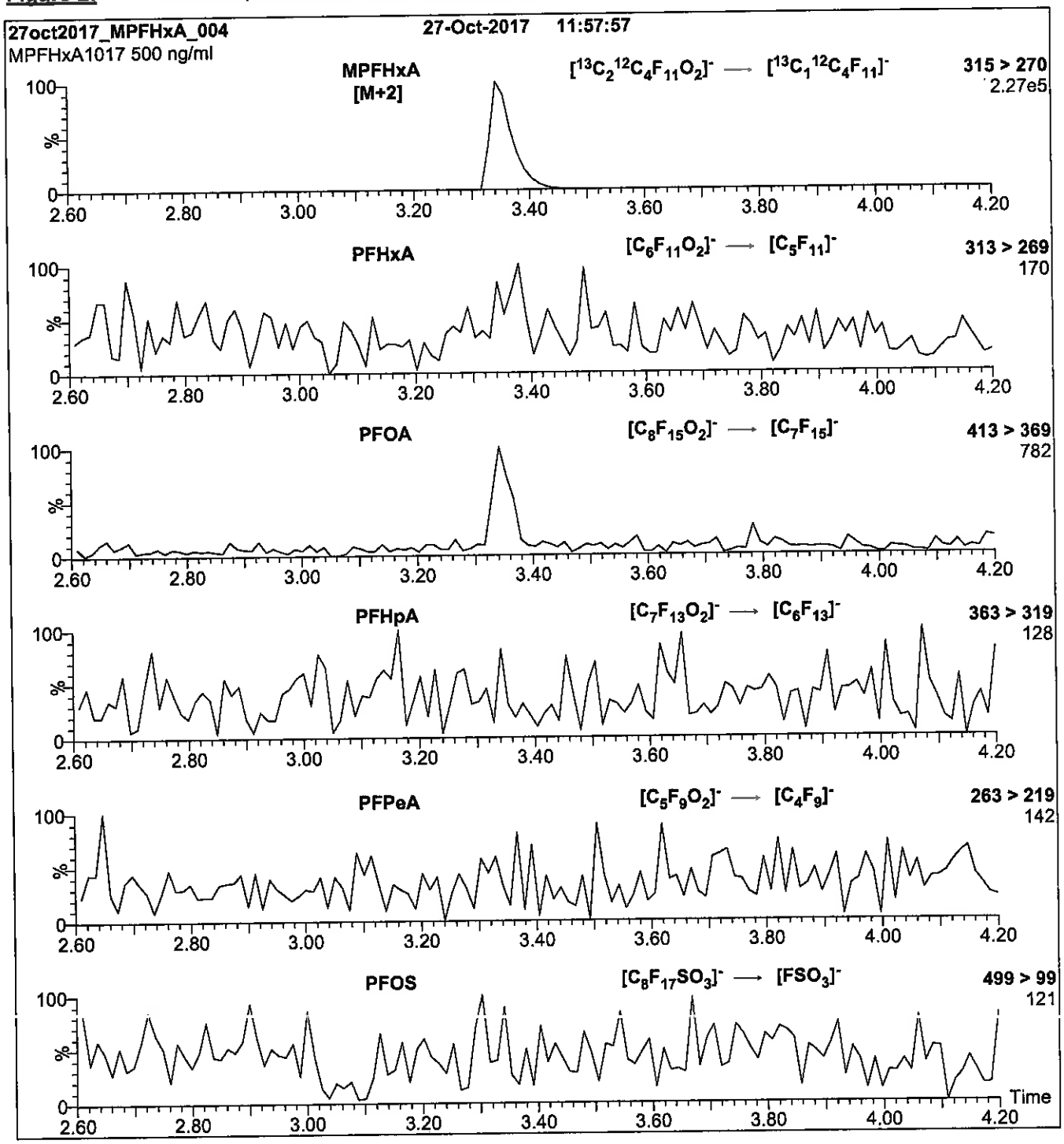
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxS_00016

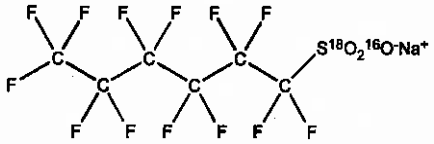
1287304
ID: LCMPFHxS_00016
Exp:03/22/23 Prpd:CBW Opn:06/26/18
18O2-Perfluorohexanesulfo

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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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:

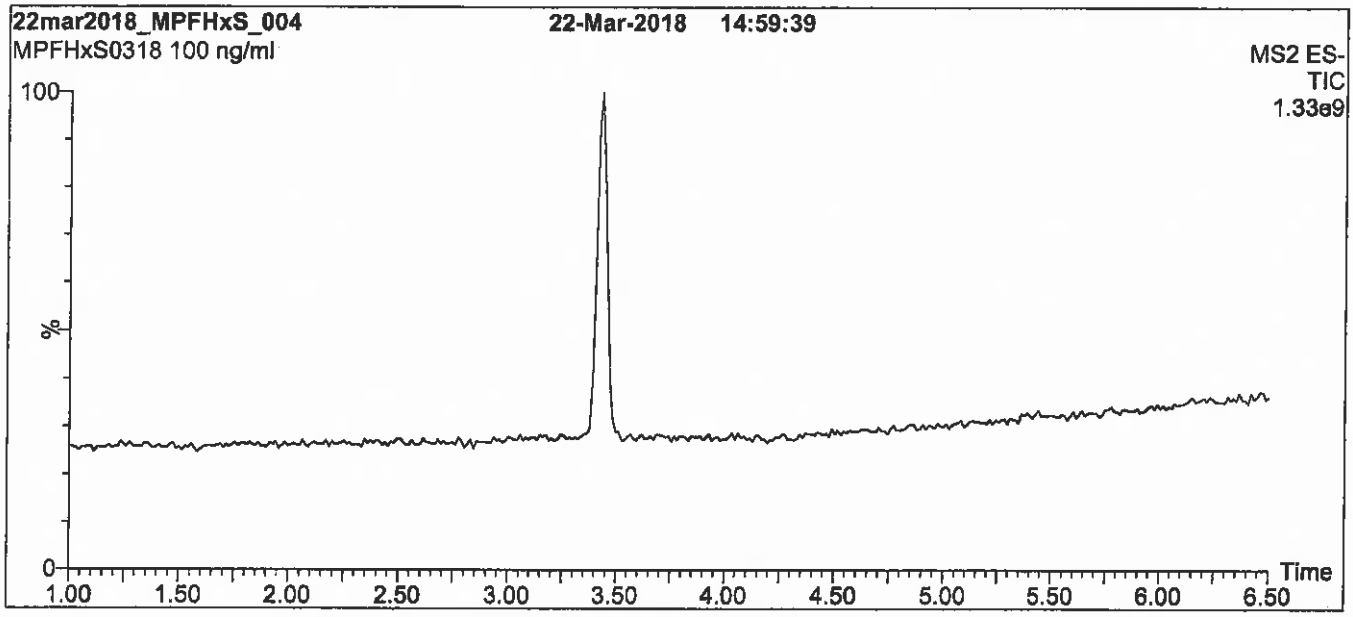
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

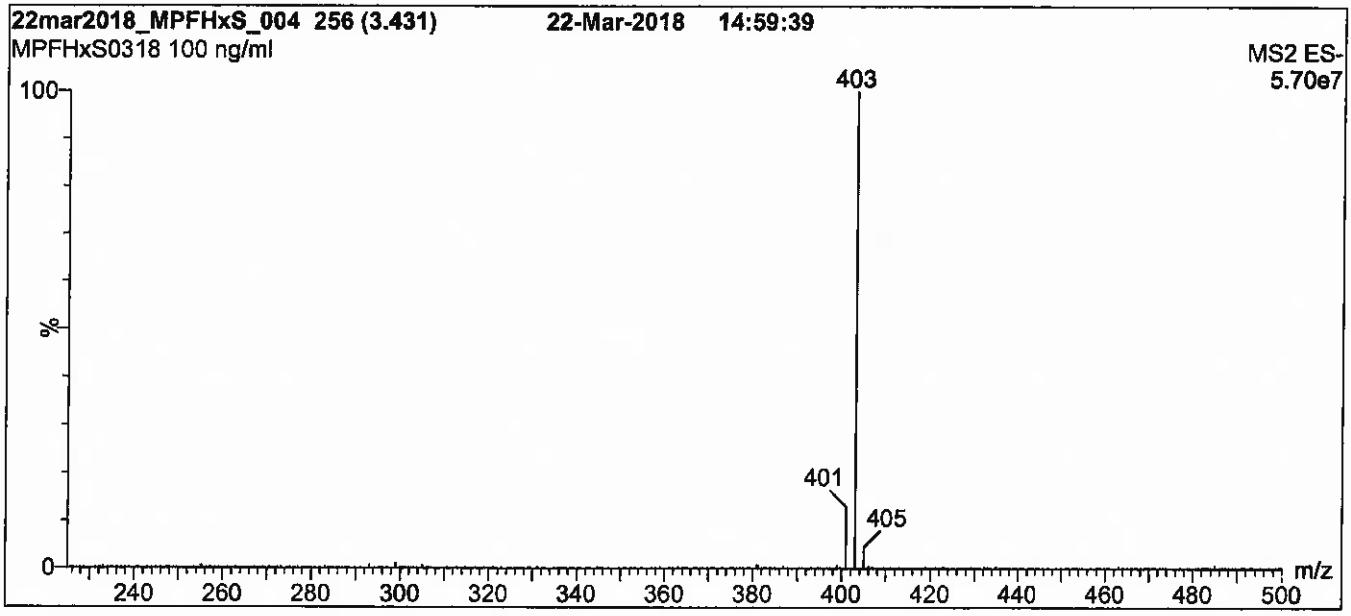
CALA

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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

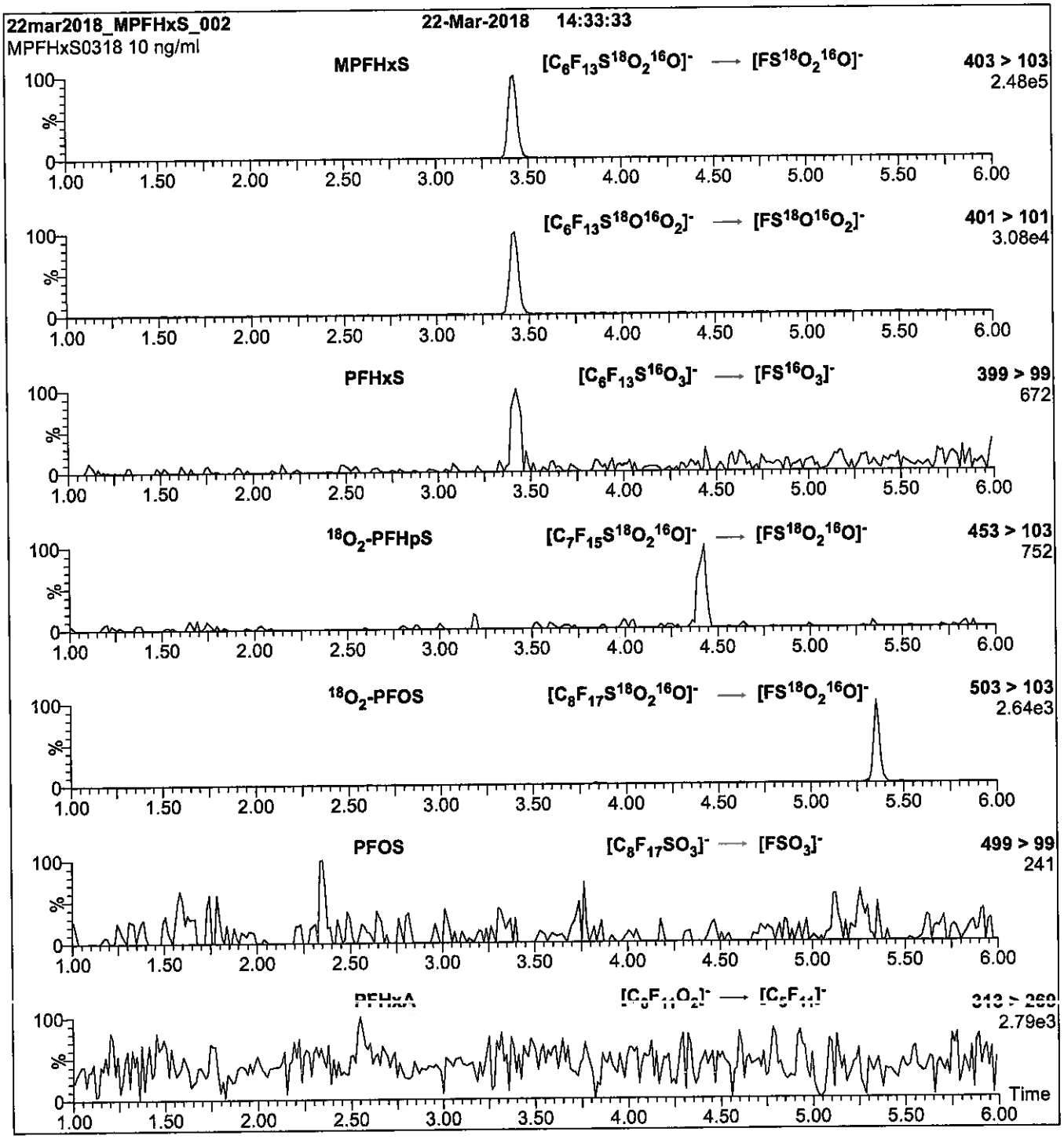
Flow: 300 µl/min

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 acid

R: 6/26/18 CBW

WELLINGTON LABORATORIES

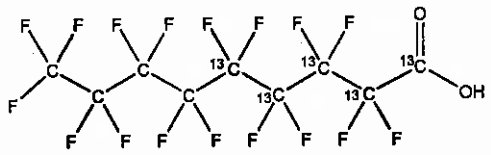
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

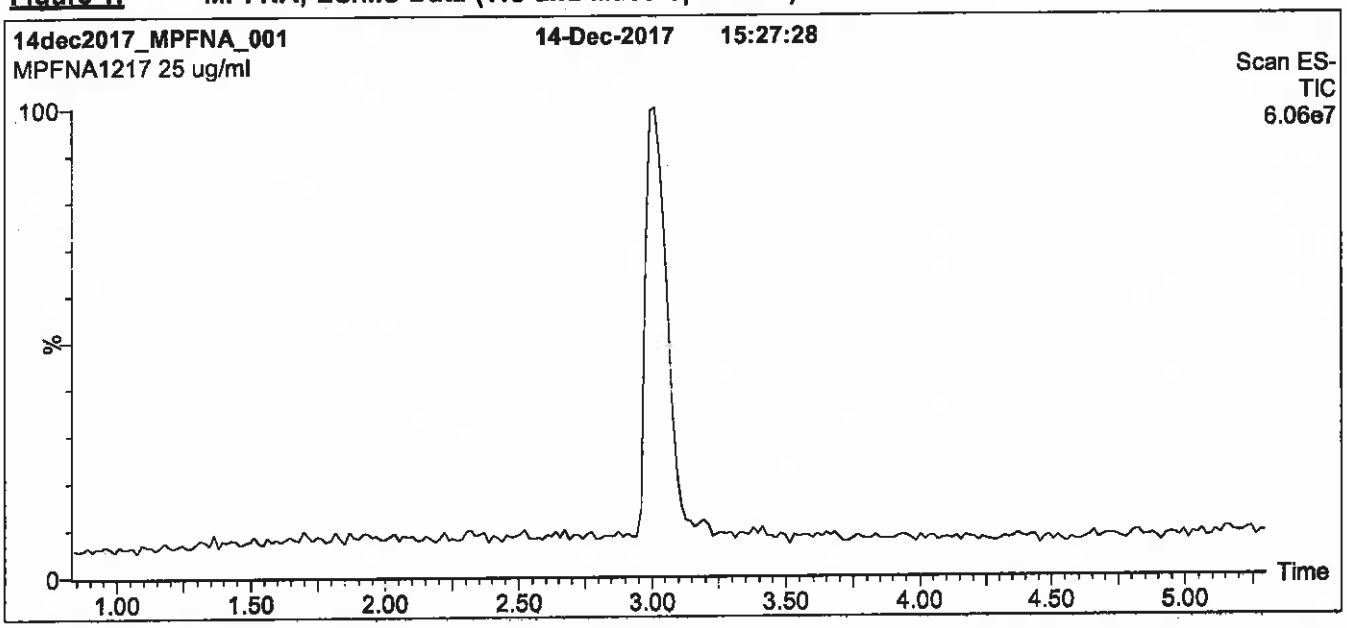
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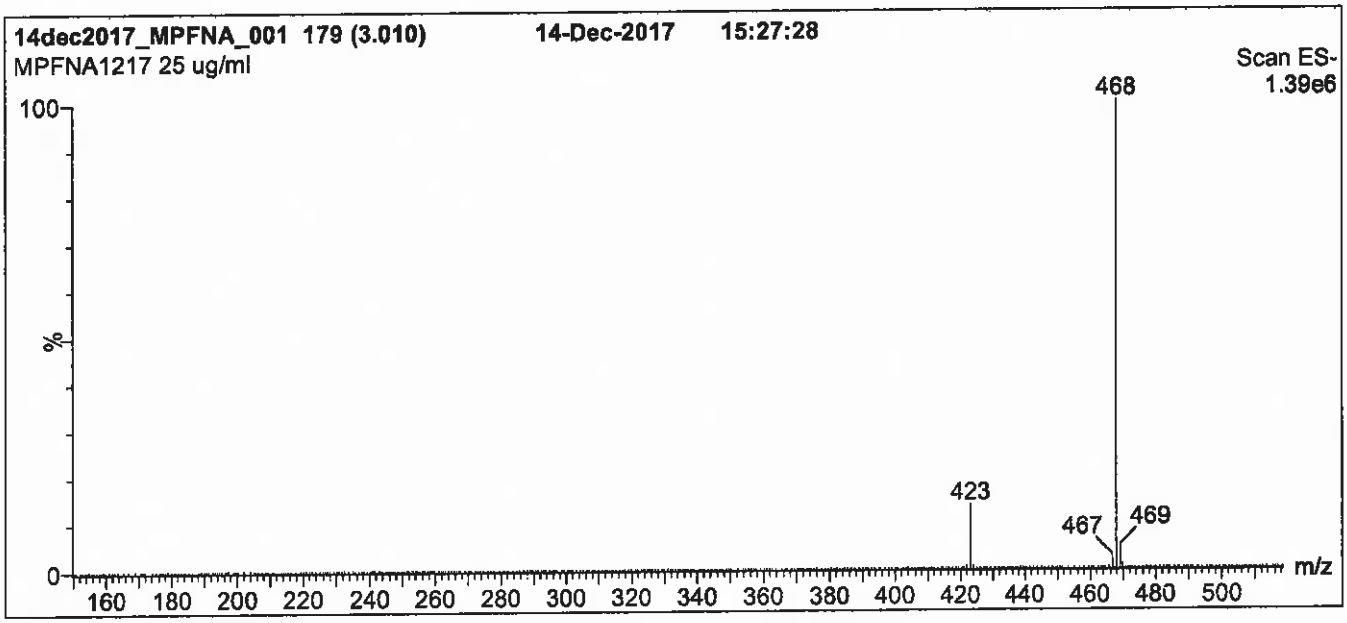
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

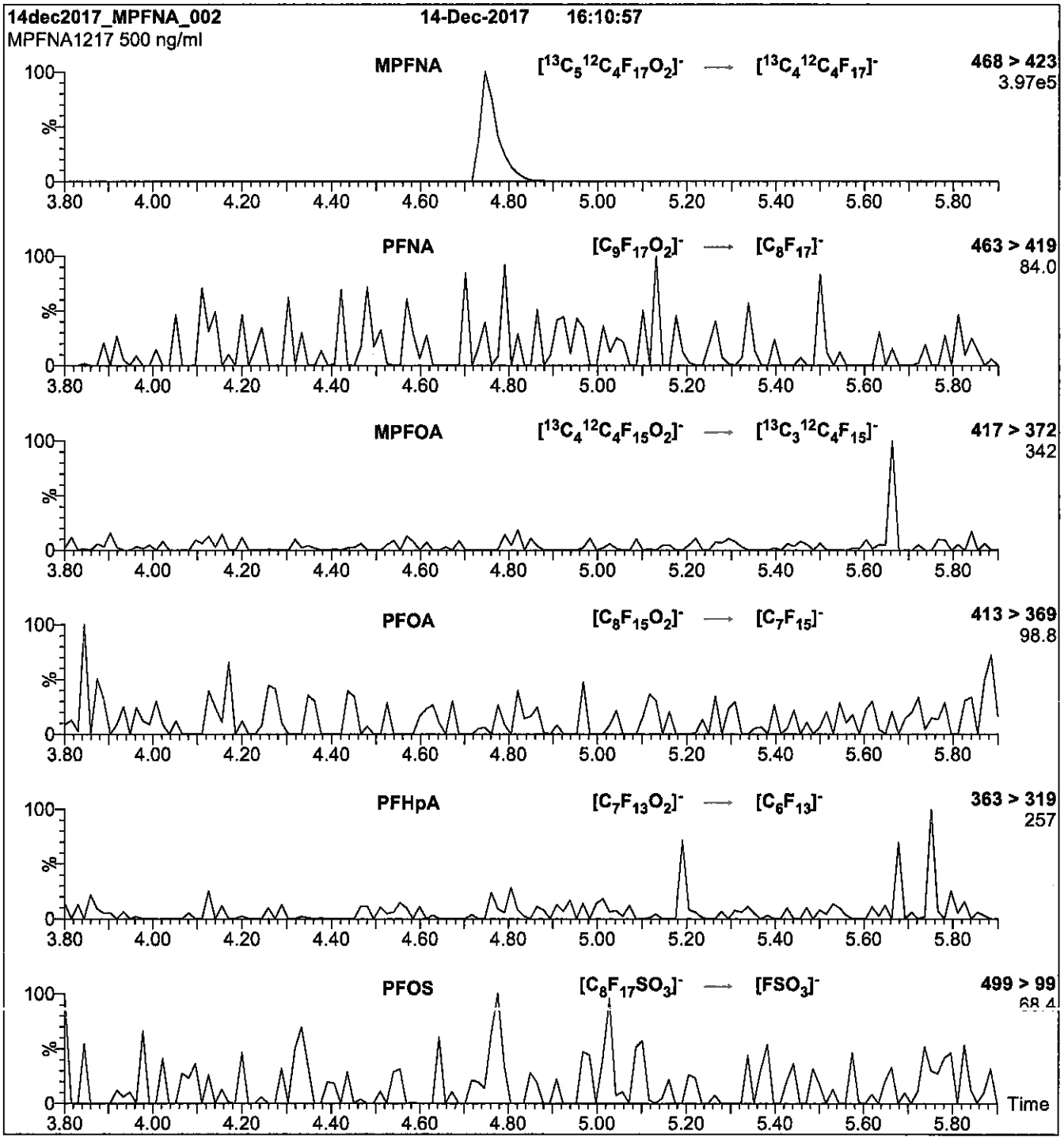
Flow: 300 µl/min

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

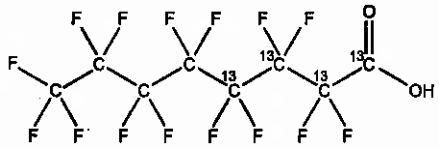
1287275
ID: LCMPFOA_00020
Exp:05/04/23 Prpd:CBW Opn:06/26/18
13C4-Perfluorooctanoic ac

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

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

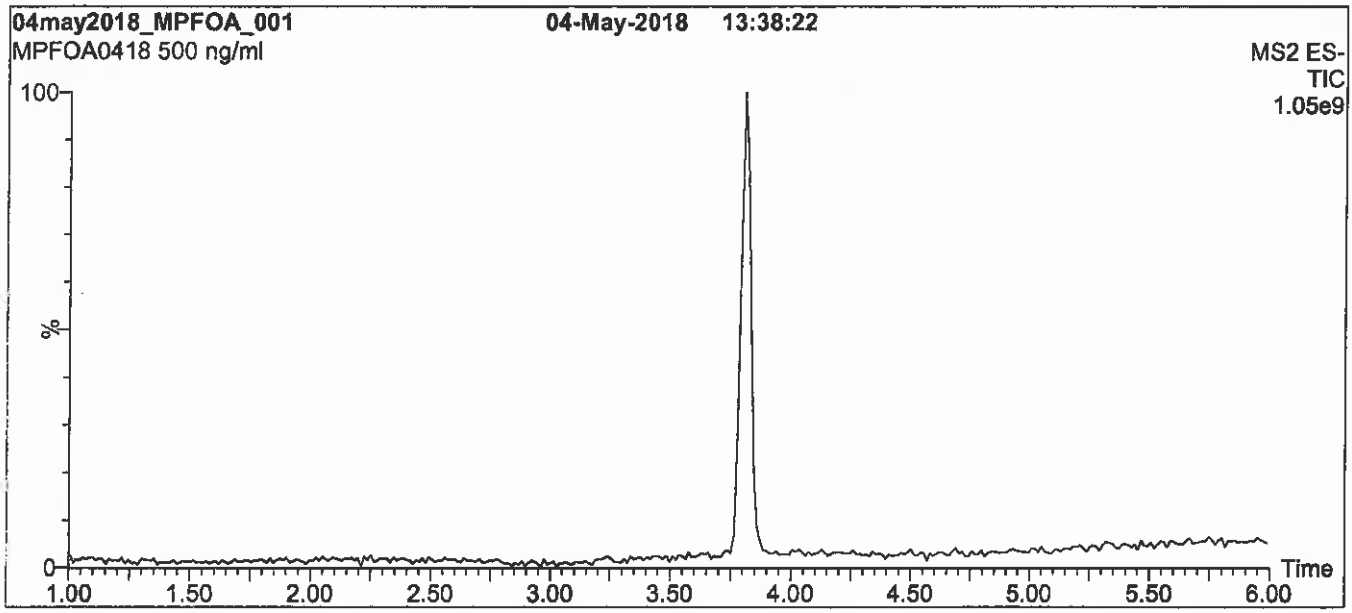
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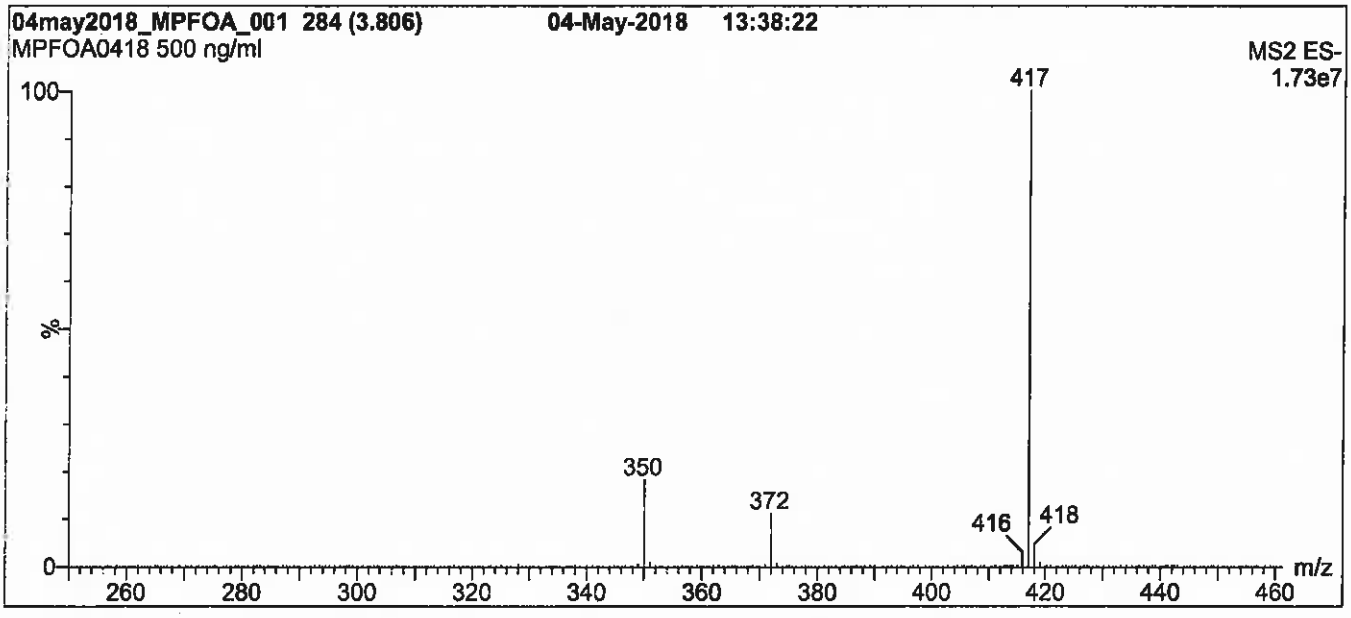
CALA

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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

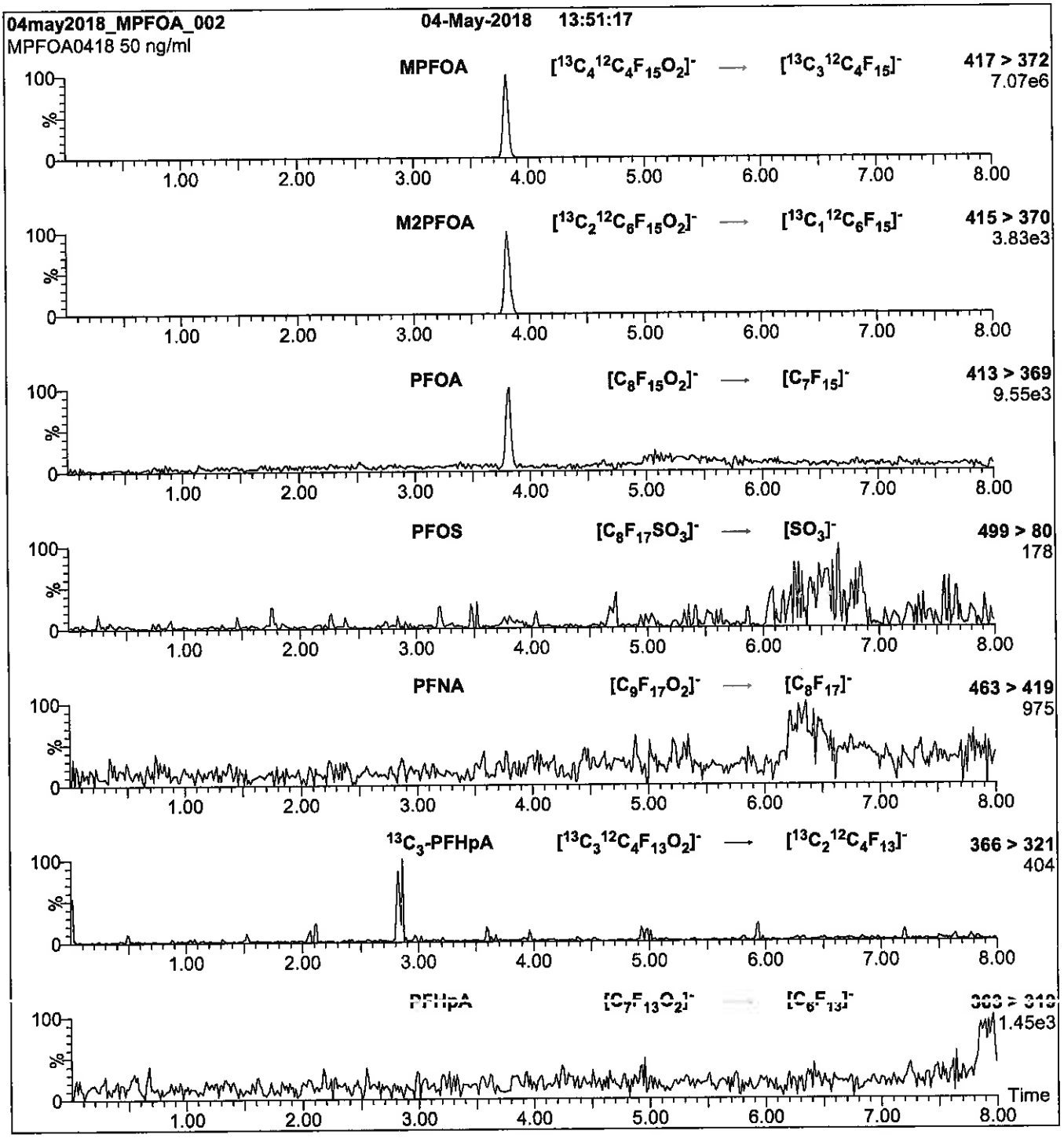
Flow: 300 µl/min

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

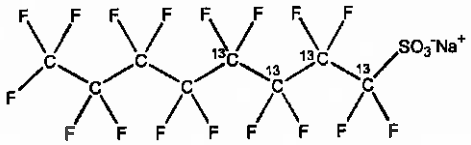
R=6/26/18 CBW

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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QUALITY MANAGEMENT:

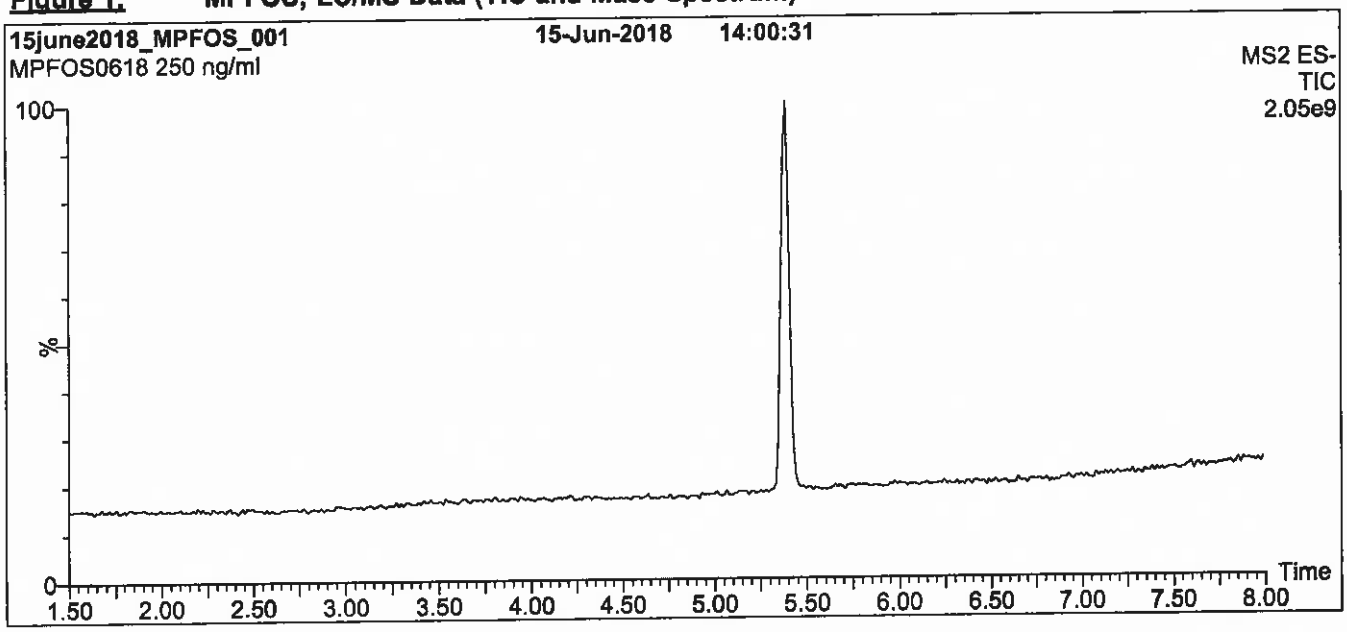
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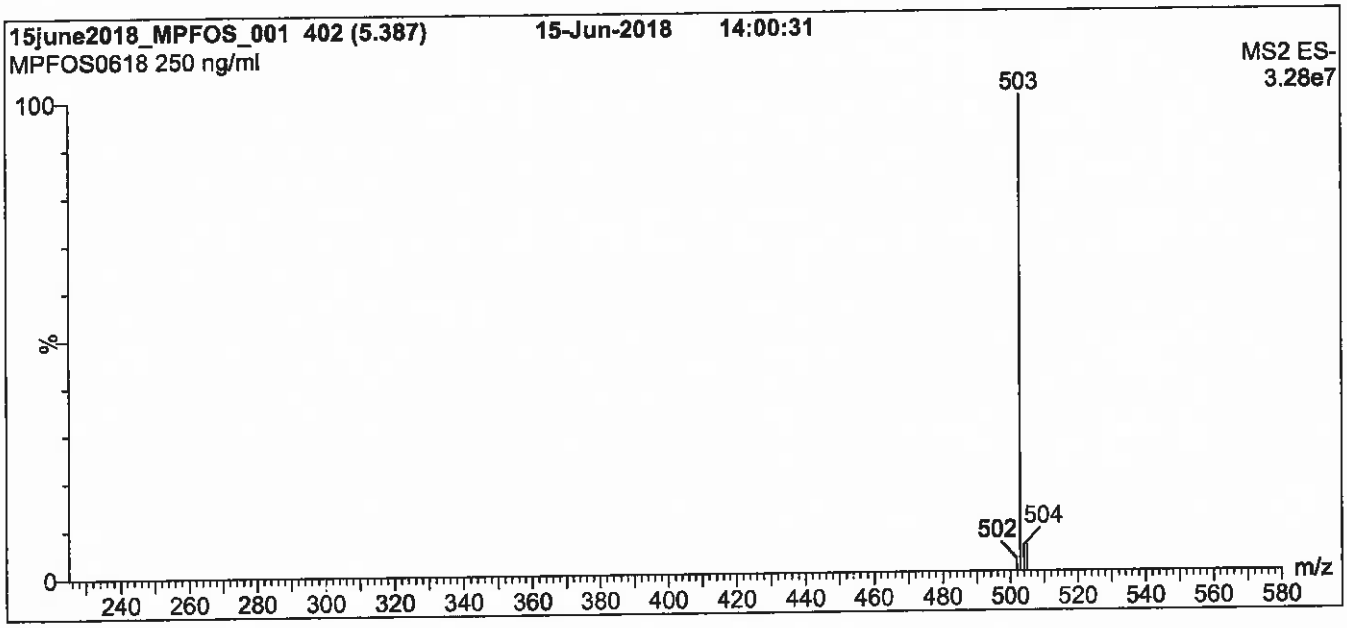
CALA

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





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: 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

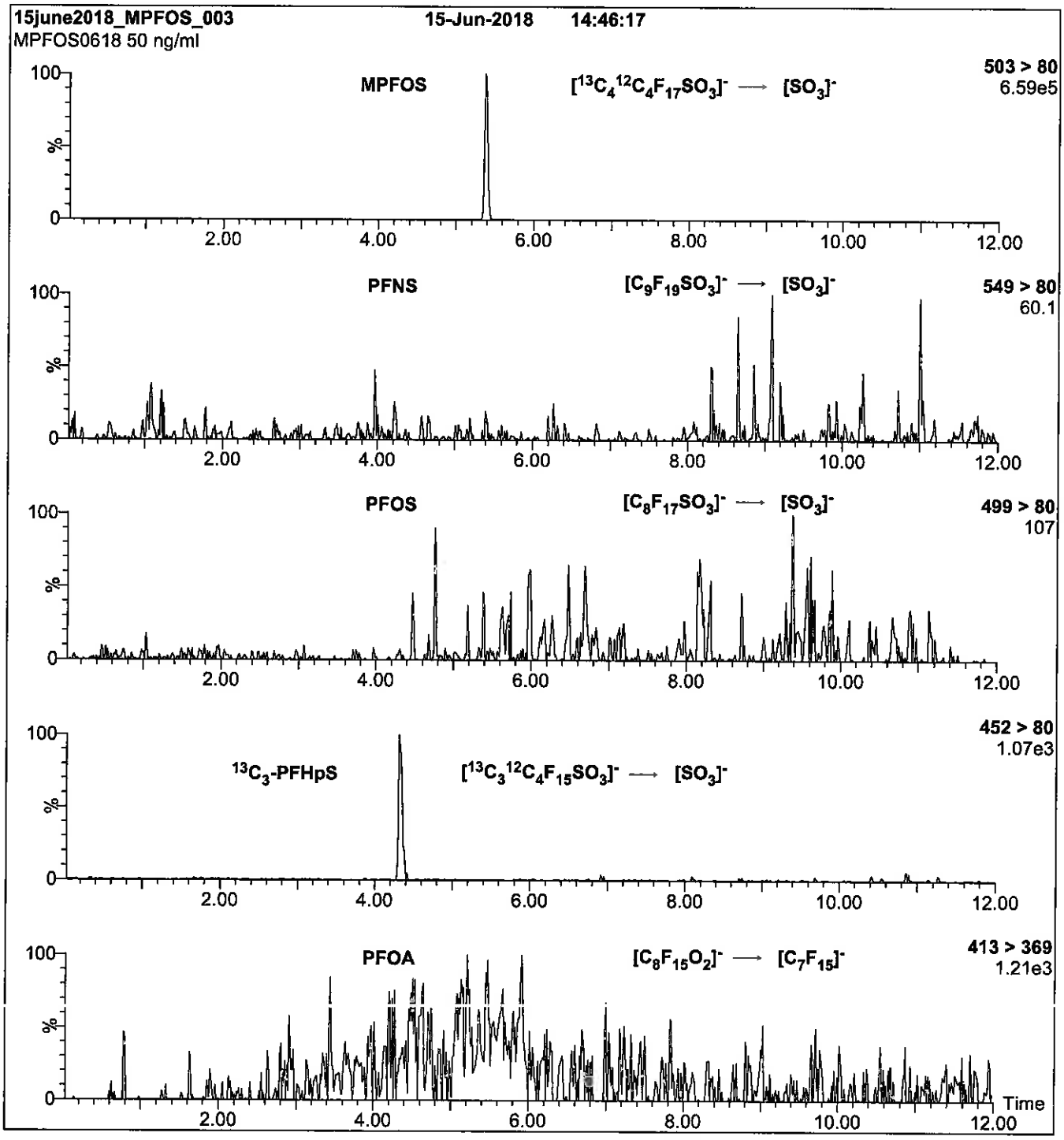
Flow: 300 µl/min

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

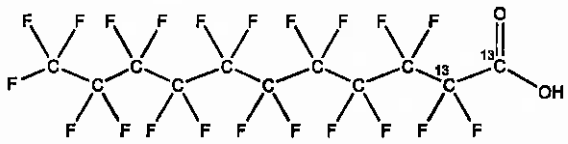
1287321
ID: LCMPFUdA_00018
Exp:05/11/23 Prpd:CBW Opn:06/26/18
13C2-Perfluoroundecanoic

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

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HANDLING:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly 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:

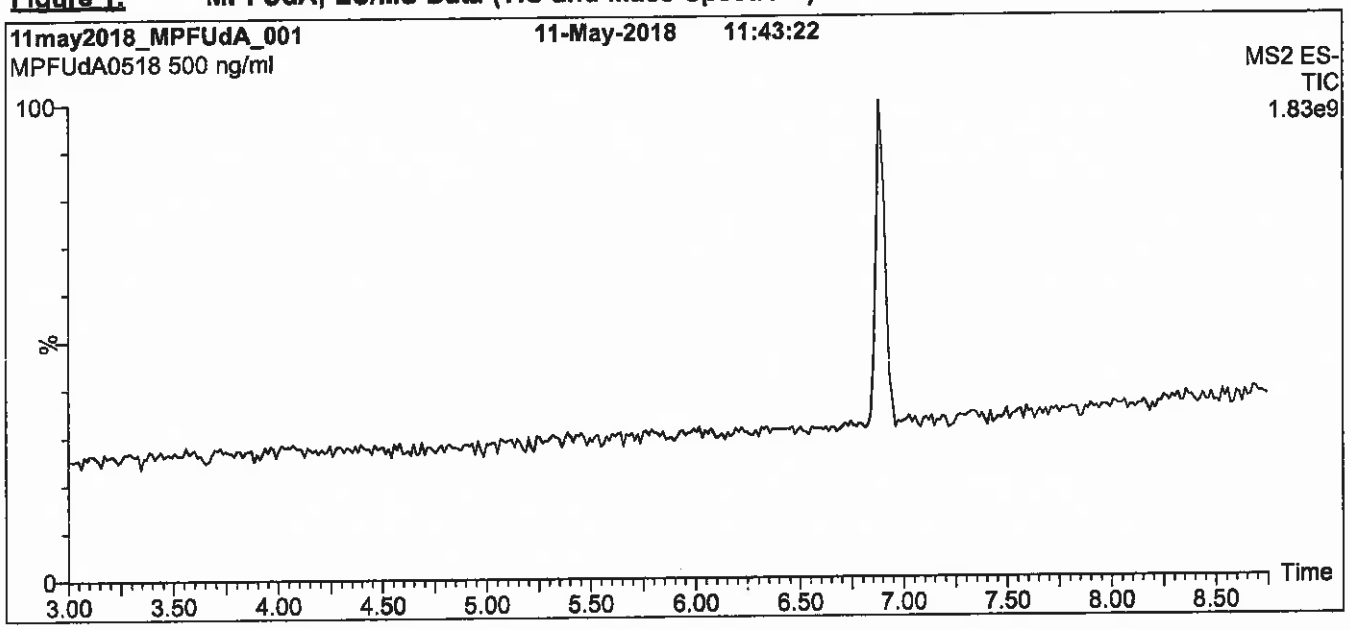
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

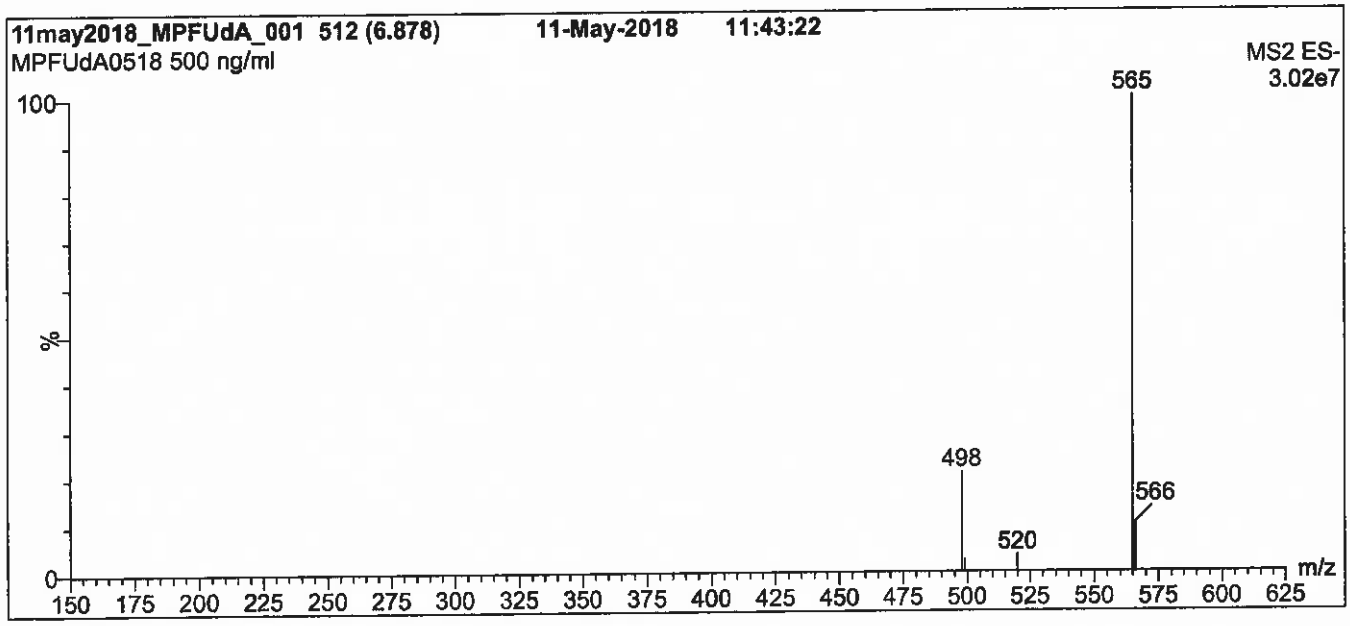
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Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: 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

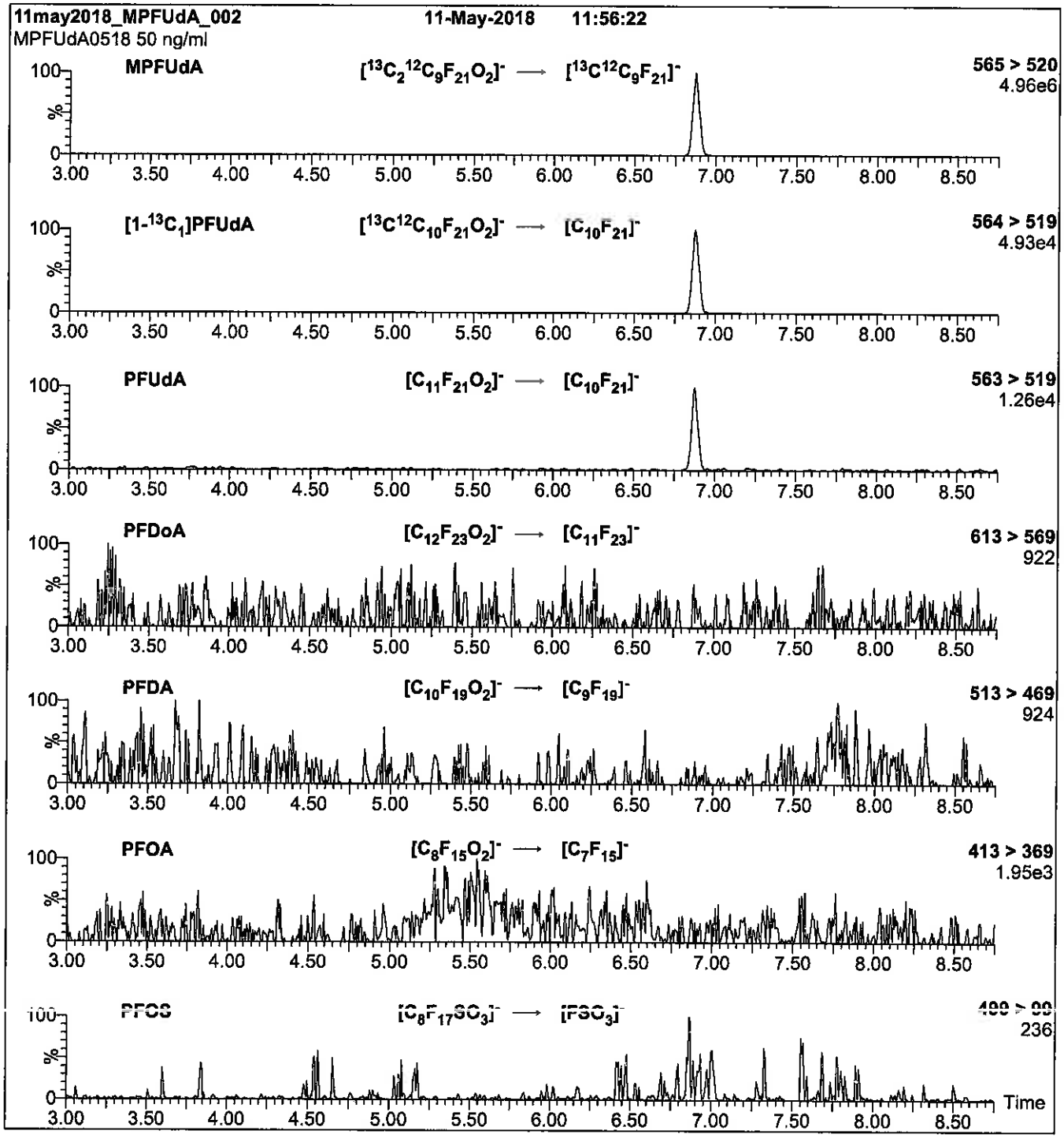
Flow: 300 µl/min

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

LCN-EtFOSA-M_00011

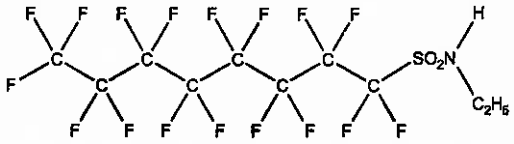
1307258
ID: LCN-EtFOSA-M_00011
Exp:05/31/23 Prpd:CBW Opn:07/19/18
N-EtFOSA-M

R: 7/19/18 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSA-M	**LOT NUMBER:**	NEtFOSA0518M
COMPOUND:	N-ethylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	4151-50-2



MOLECULAR FORMULA:	$C_{10}H_8F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2023		
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 ~ 0.5% branched isomers of N-ethylperfluorooctanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/12/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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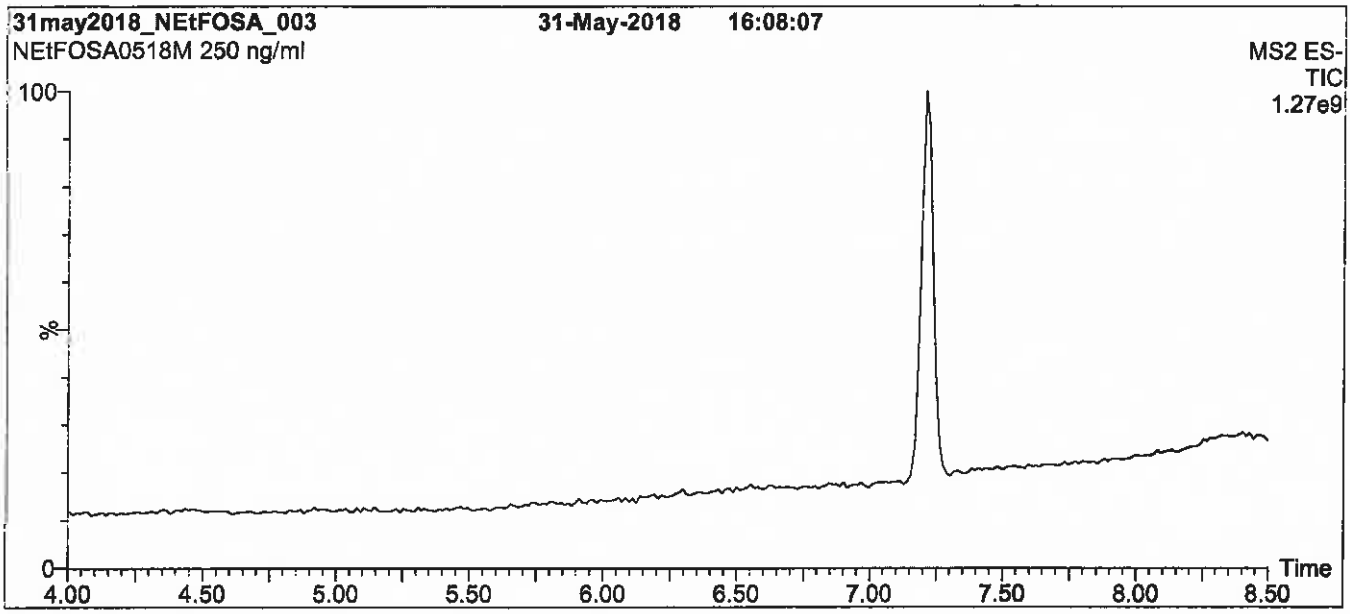
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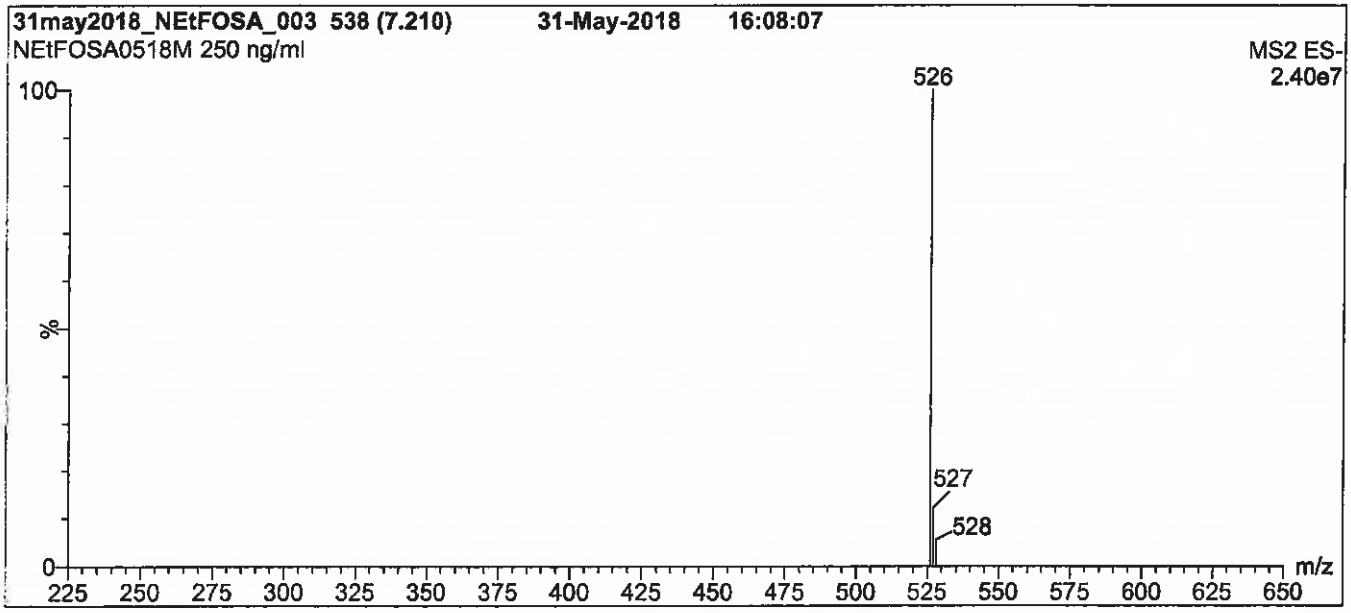
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Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH C_{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 85% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

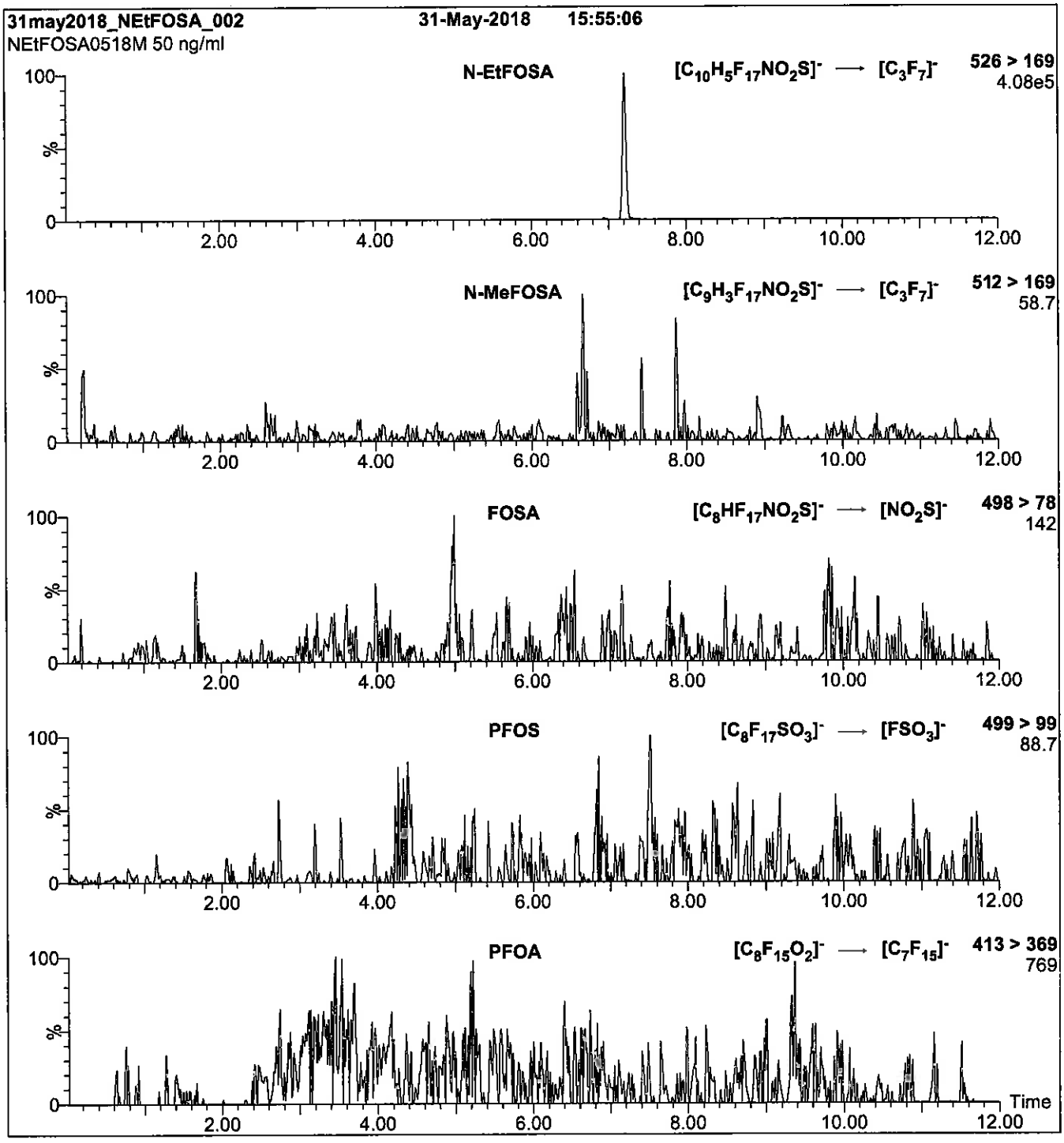
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (N-EtFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.37e-3
Collision Energy (eV) = 24

Reagent

LCN-MeFOSA-M_00010

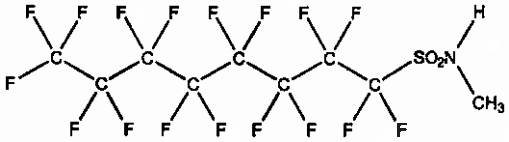
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Exp:05/31/23 Prpd:CSW Opn:07/19/18
N-MeFOSA-M

R: 7/19/18 CSW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-MeFOSA-M	**LOT NUMBER:**	NMeFOSA0518M
COMPOUND:	N-methylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	31506-32-8



MOLECULAR FORMULA:	$C_8H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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ADDITIONAL INFORMATION:

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Certified By: _____ **Date:** 06/07/2018 (mm/dd/yyyy)
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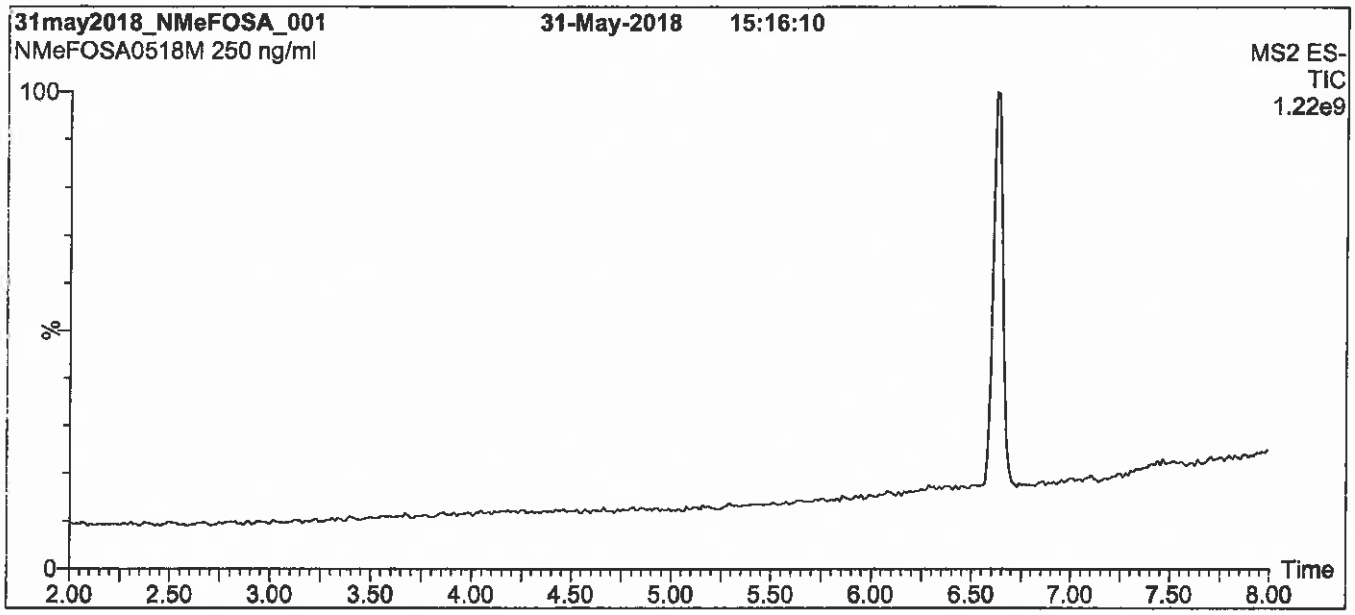
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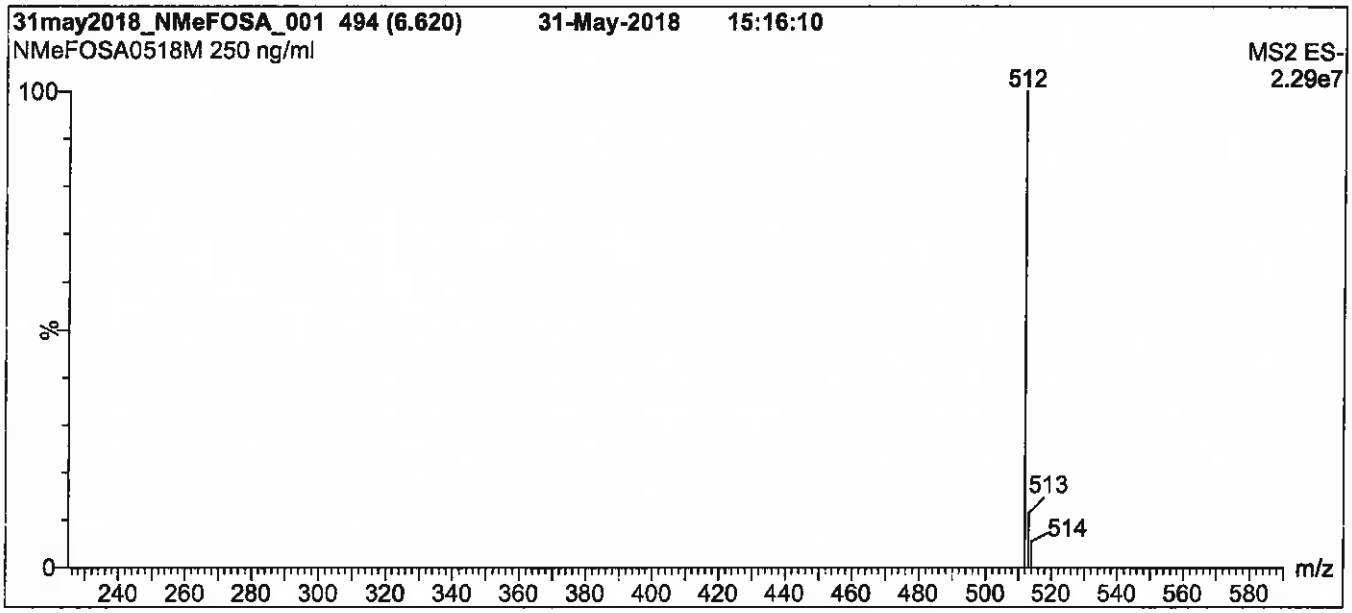
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Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH C_{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 85% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

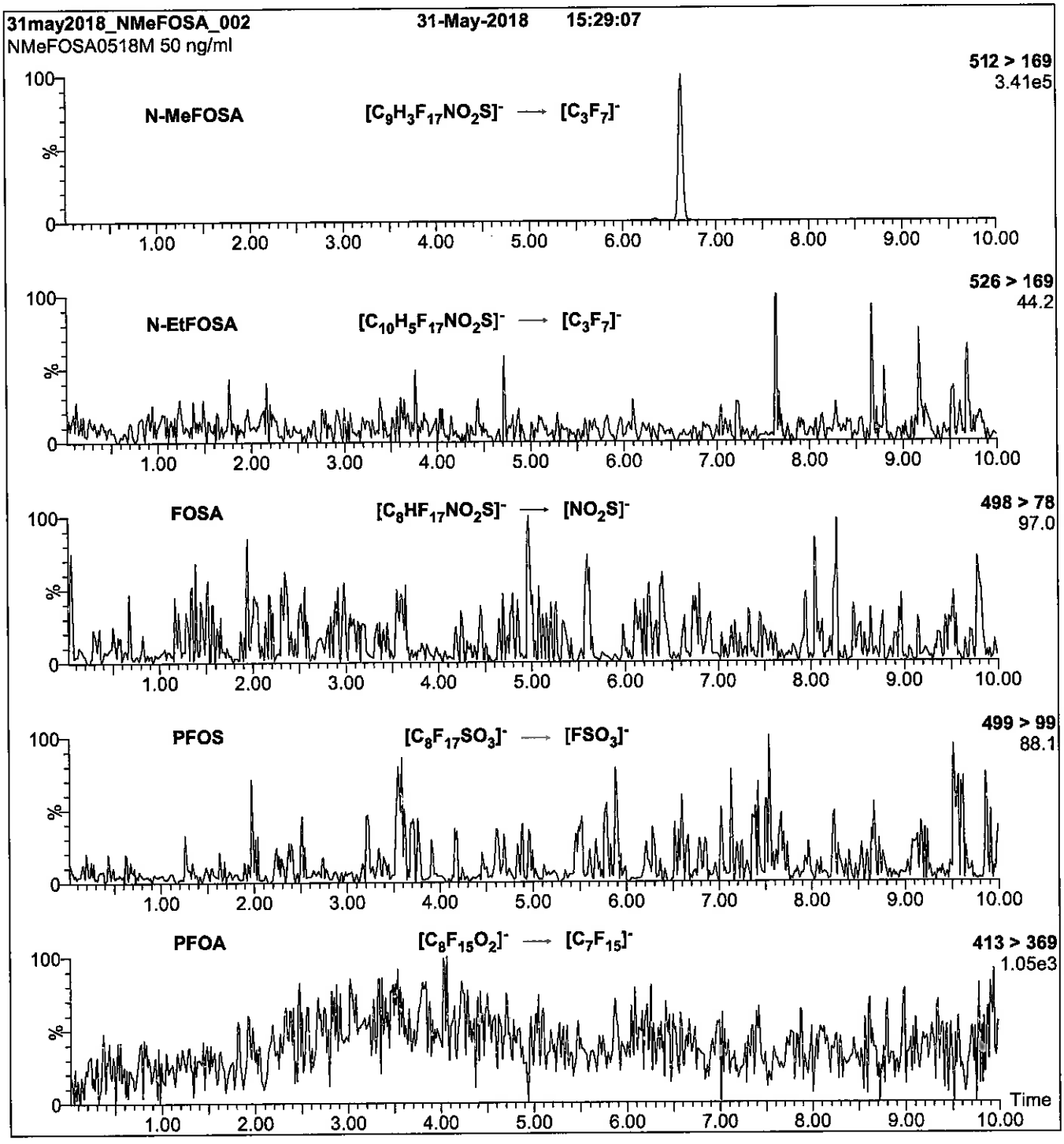
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (N-MeFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.37e-3
Collision Energy (eV) = 24

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.

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

INTENDED USE:

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

HANDLING:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

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

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

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

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

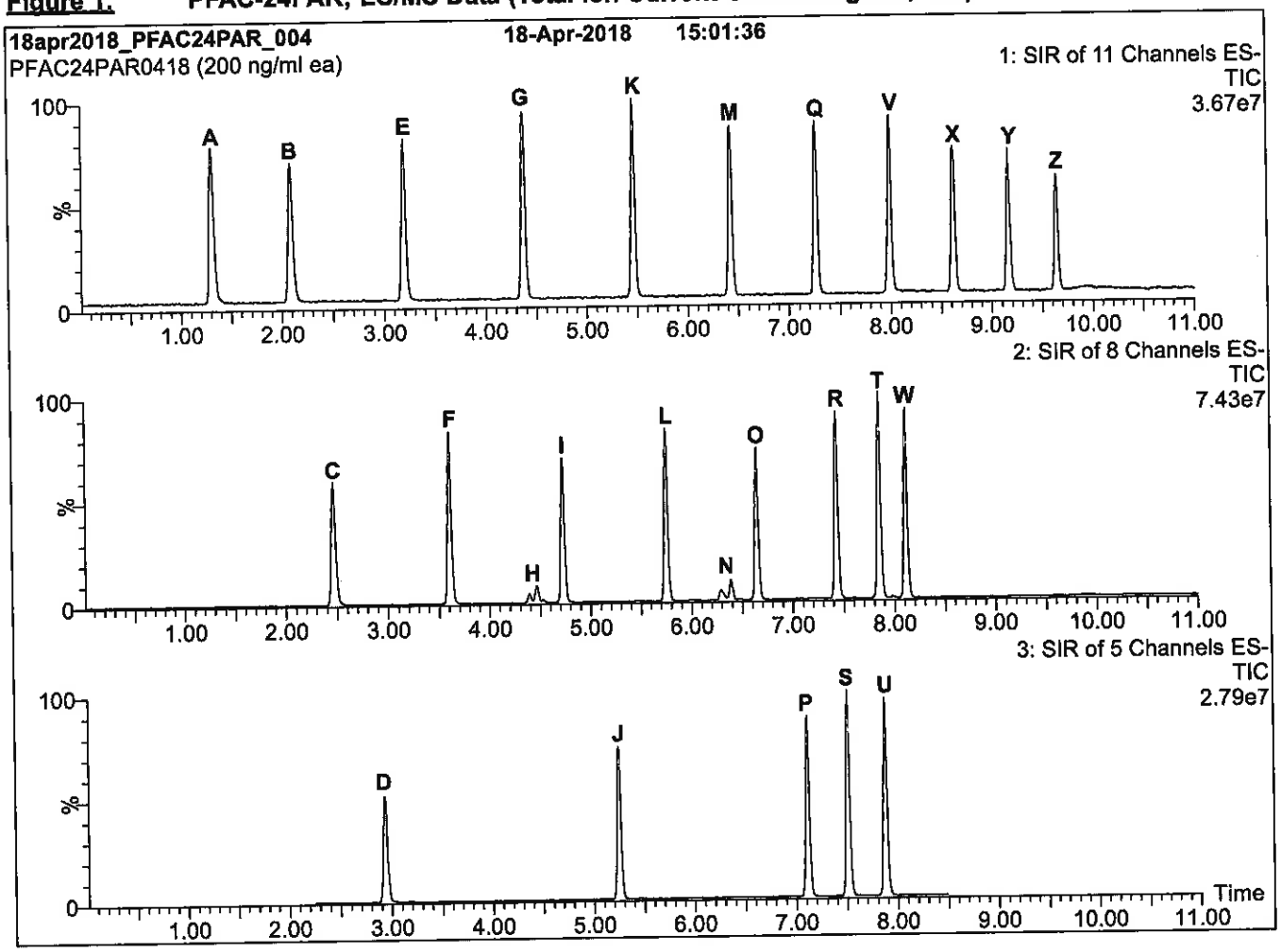
Table C: **PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

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)**

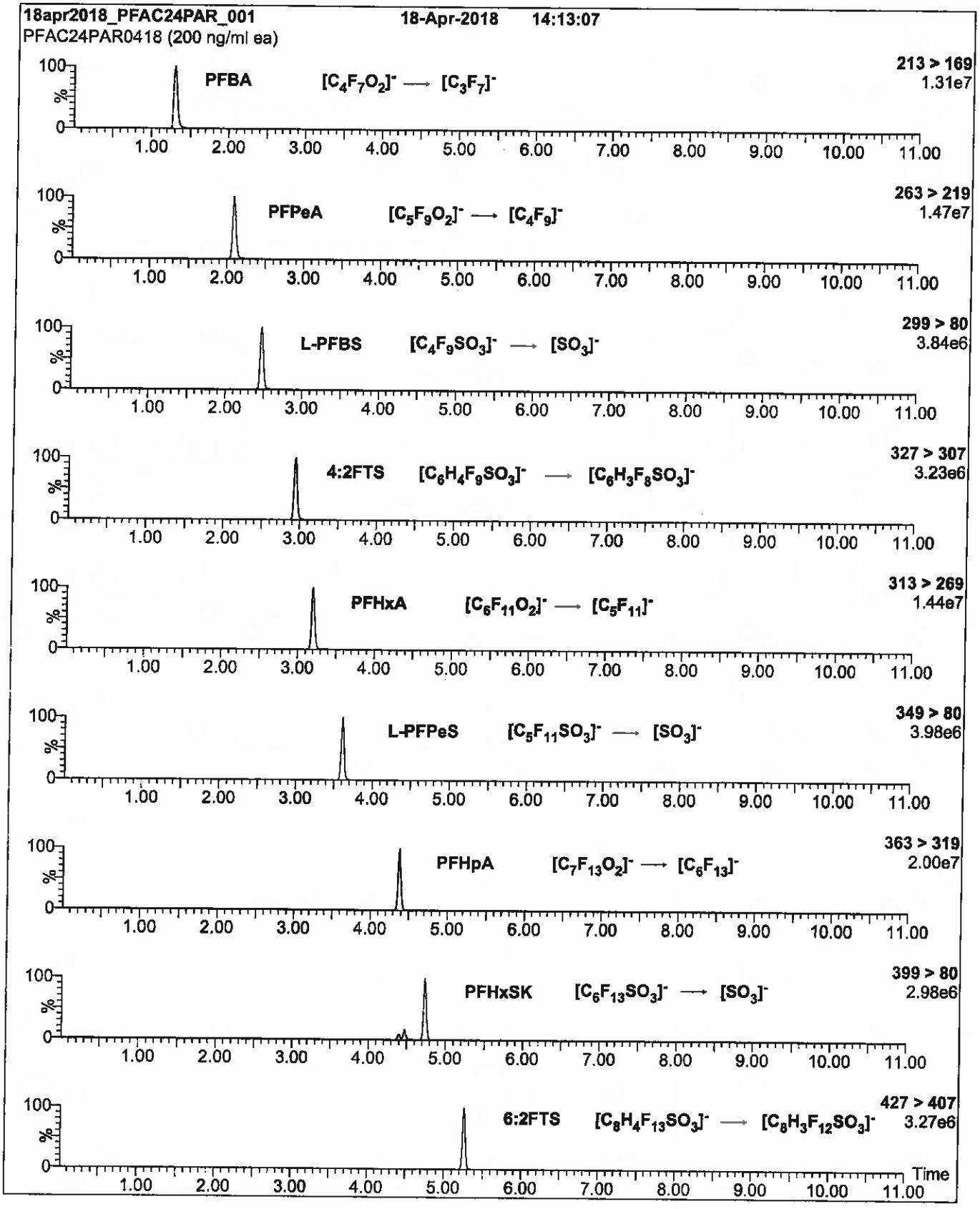


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**

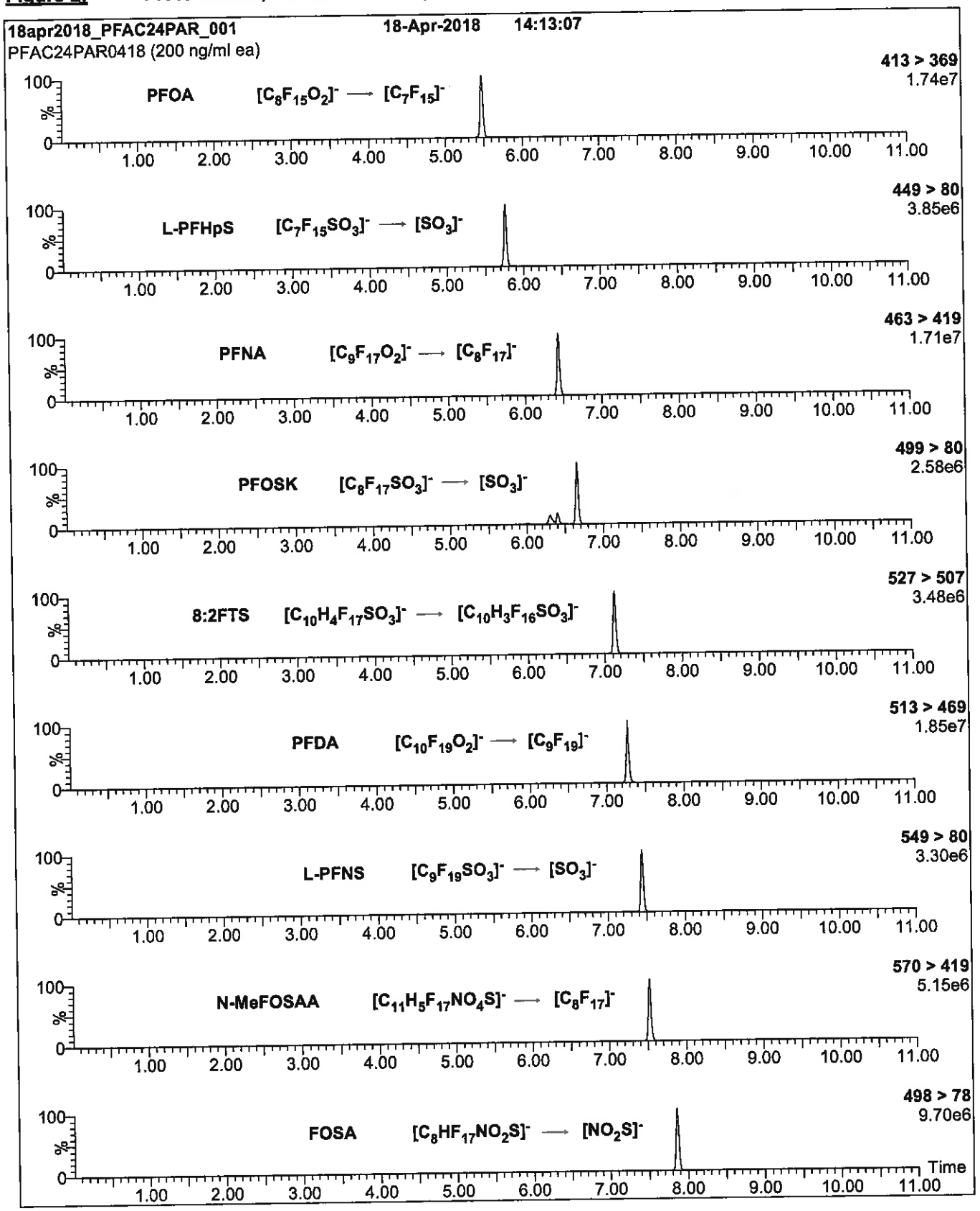
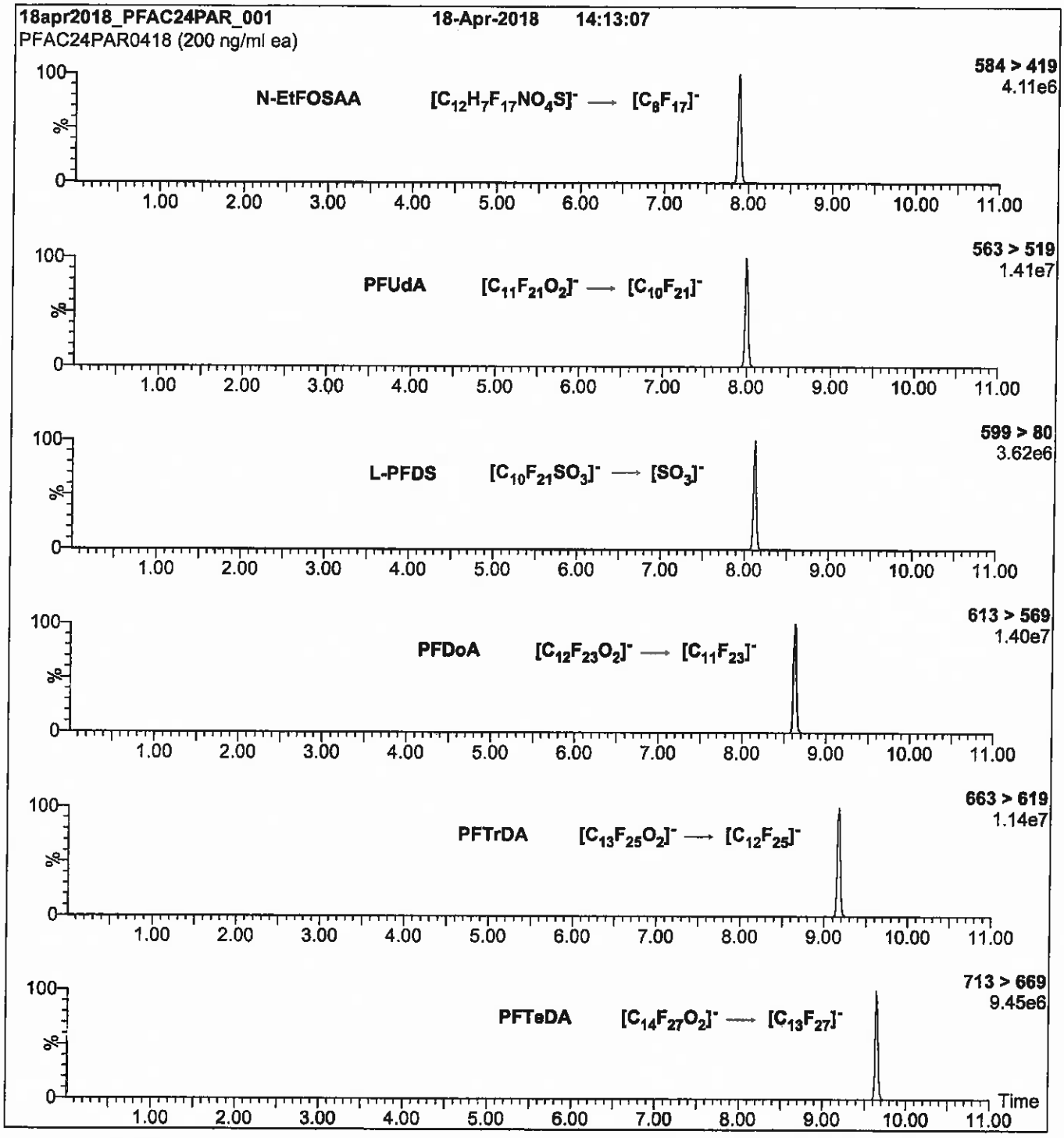


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**



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

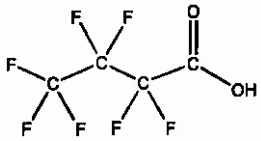
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P: 9/21/17 SKV

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:

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:

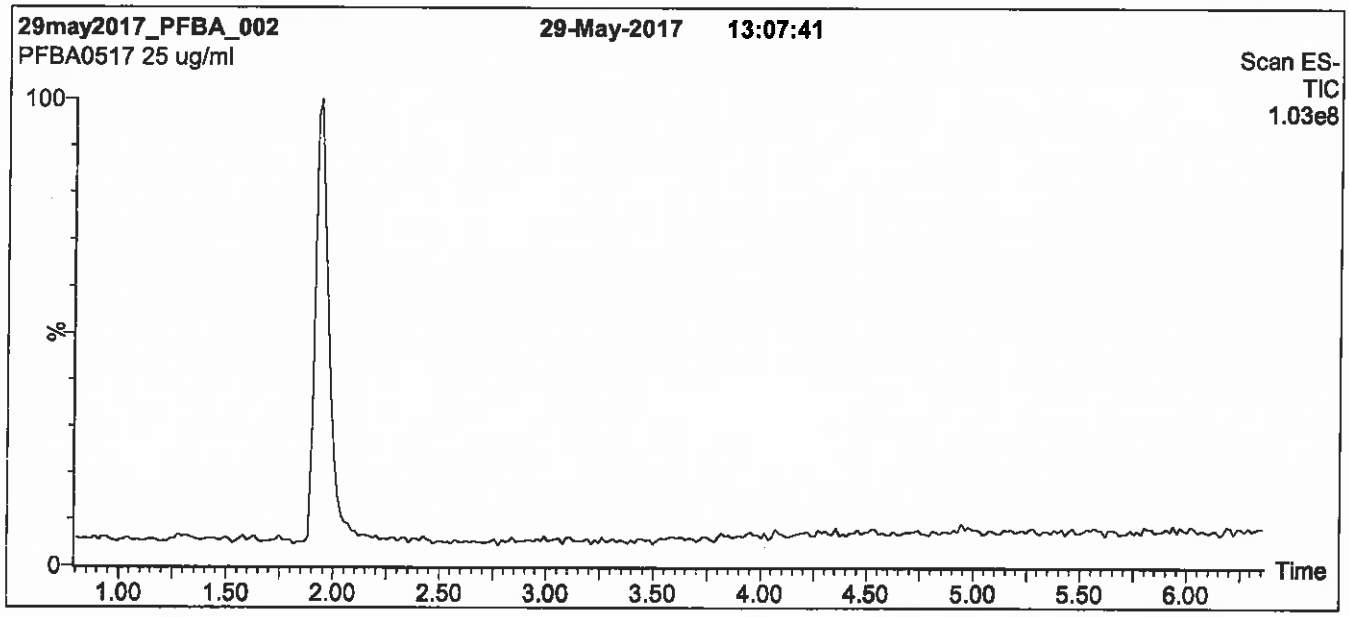
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

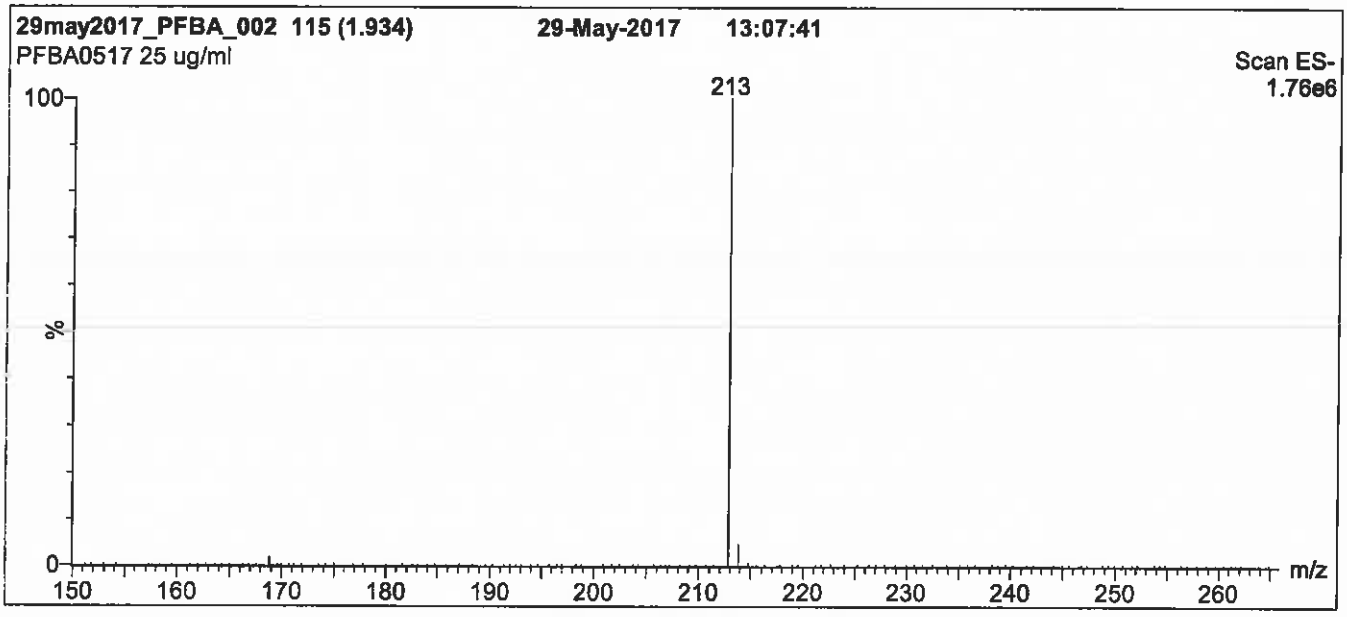
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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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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

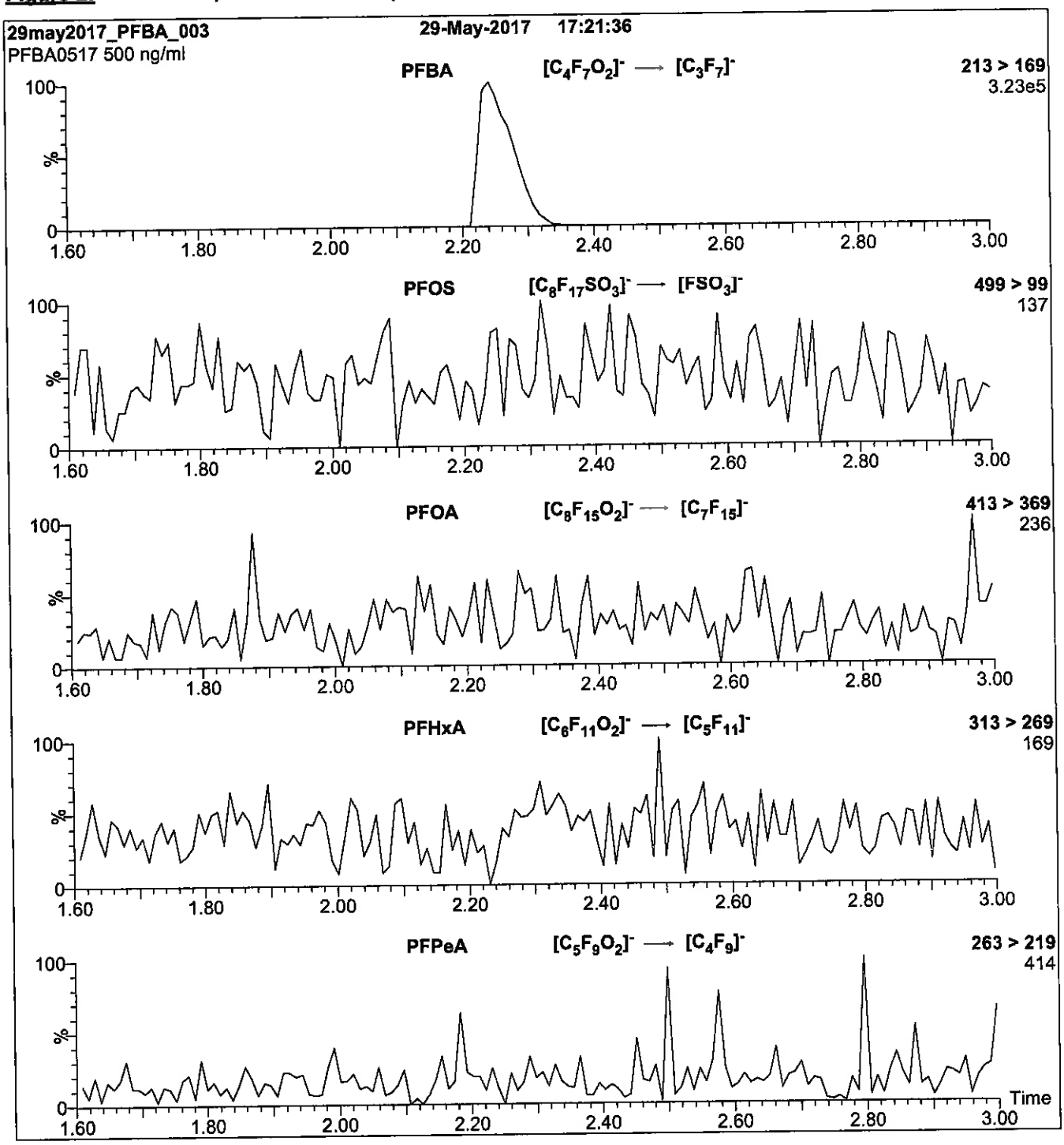
Flow: 300 µl/min

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

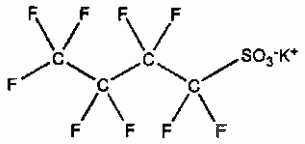
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
COMPOUND: Potassium perfluoro-1-butanesulfonate
LOT NUMBER: LPFBS0917

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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:

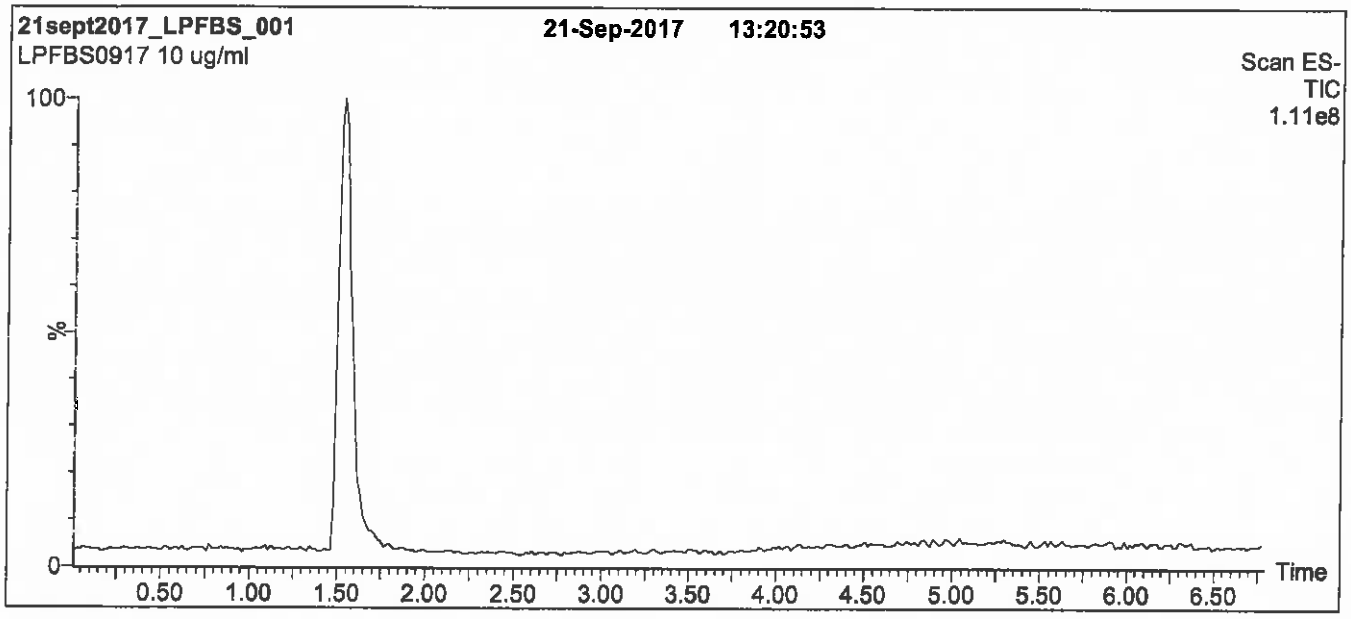
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

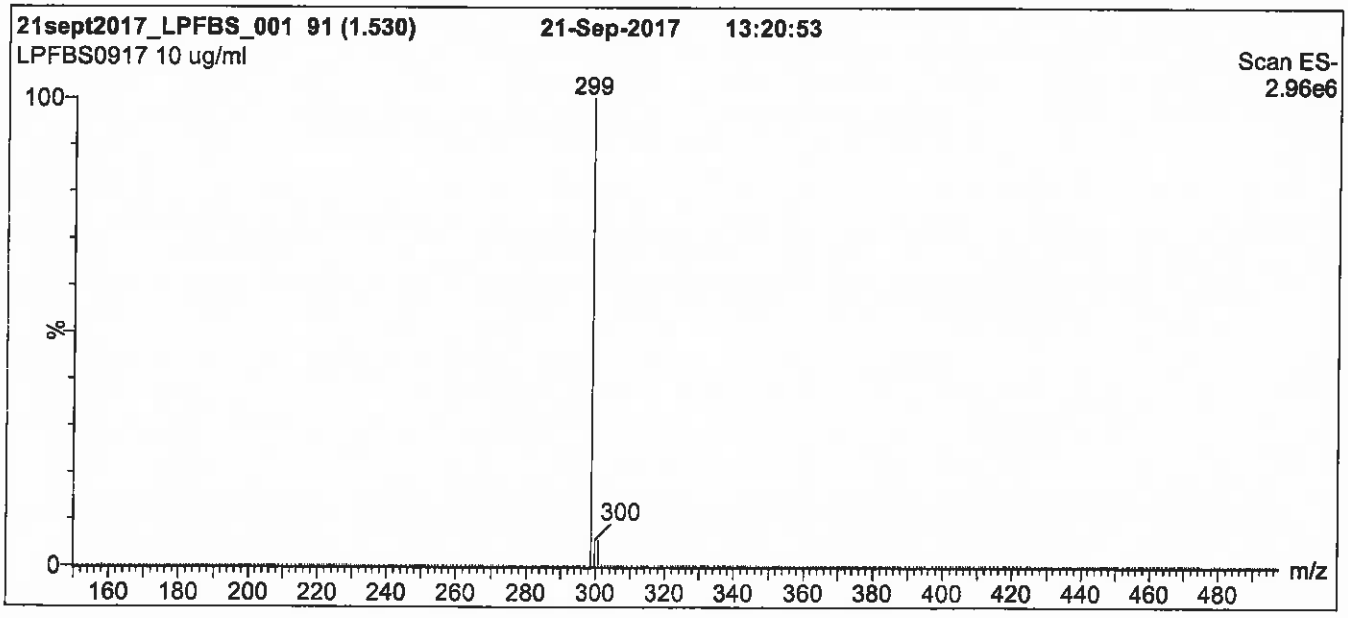
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

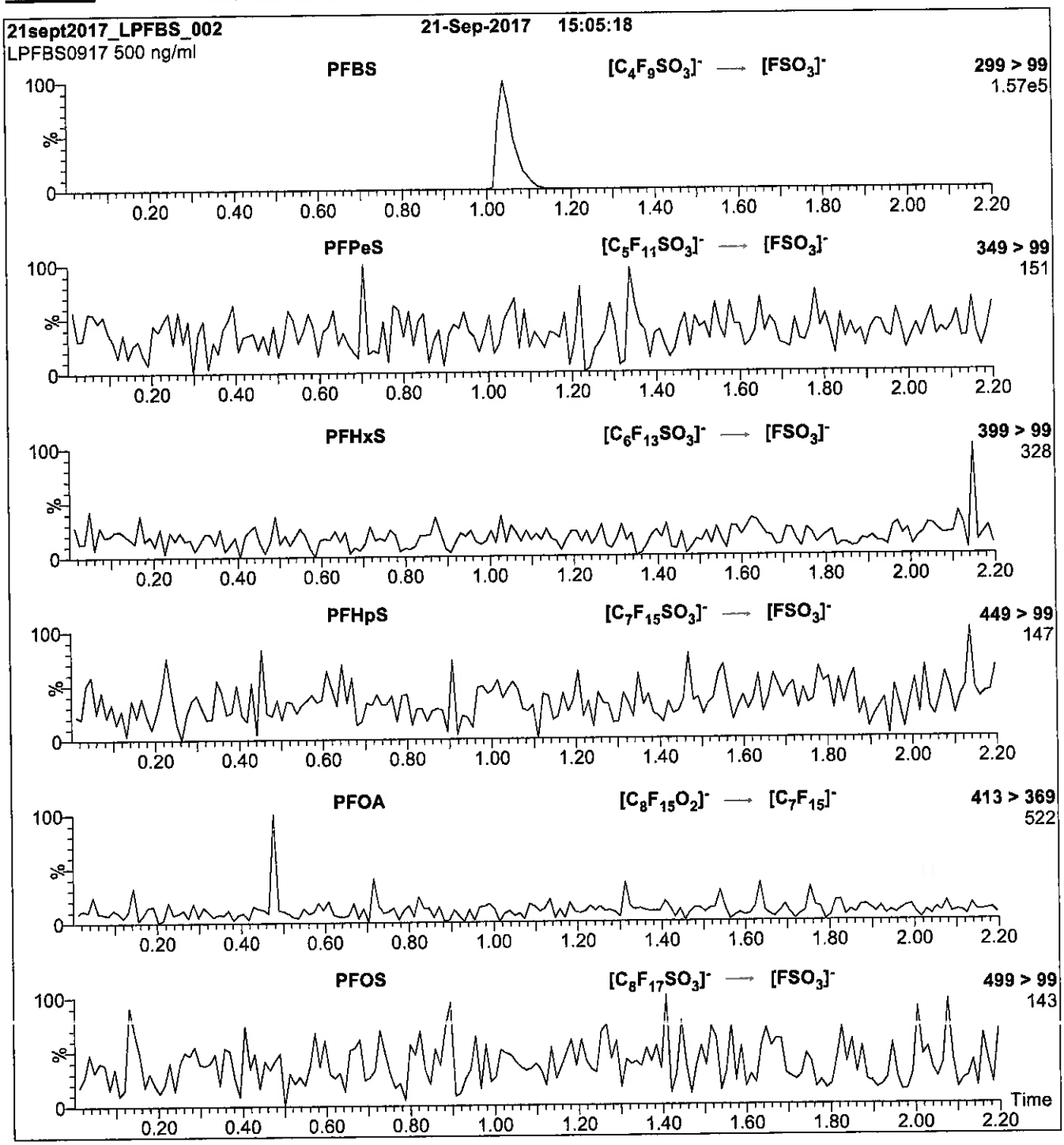
Flow: 300 µl/min

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

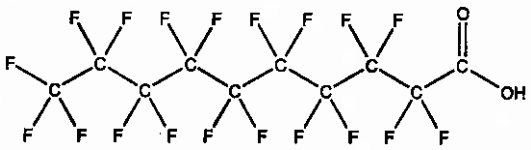
LCPFDA_00008

R: 9/21/17 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFDA	**LOT NUMBER:**	PFDA0517
COMPOUND:	Perfluoro-n-decanoic acid		
STRUCTURE:		**CAS #:**	335-76-2



MOLECULAR FORMULA:	$C_{10}HF_{19}O_2$	**MOLECULAR WEIGHT:**	514.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/29/2017		
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

INTENDED USE:

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

HAZARDS:

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

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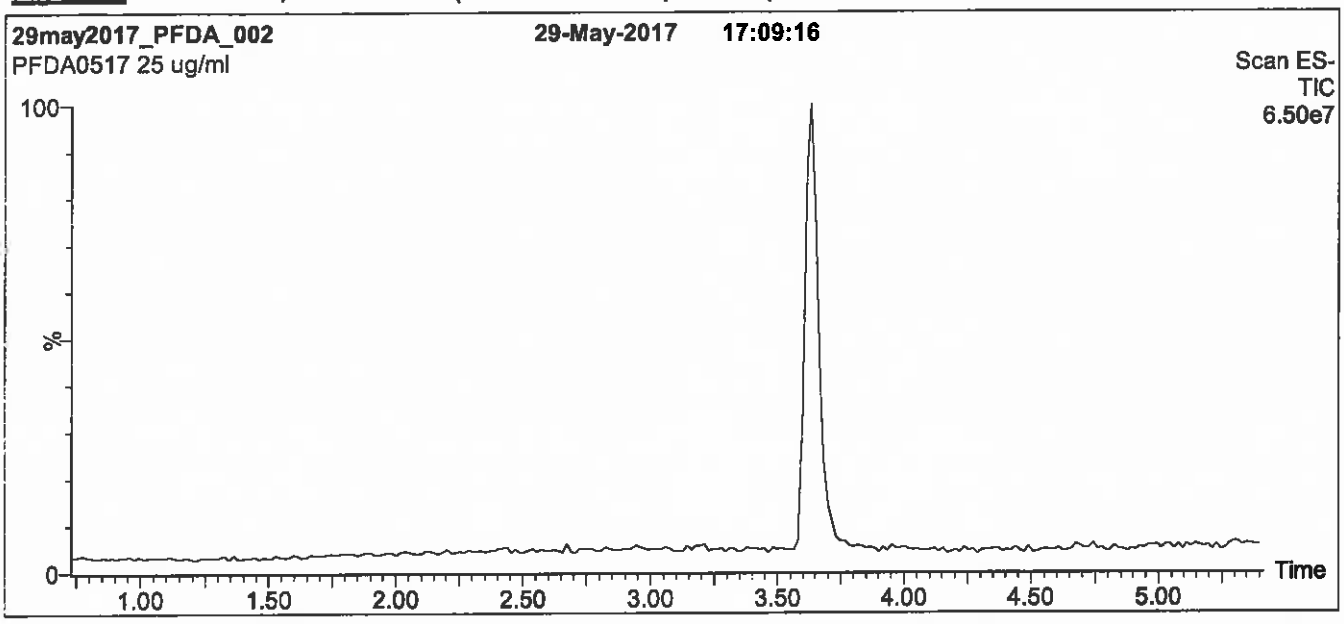
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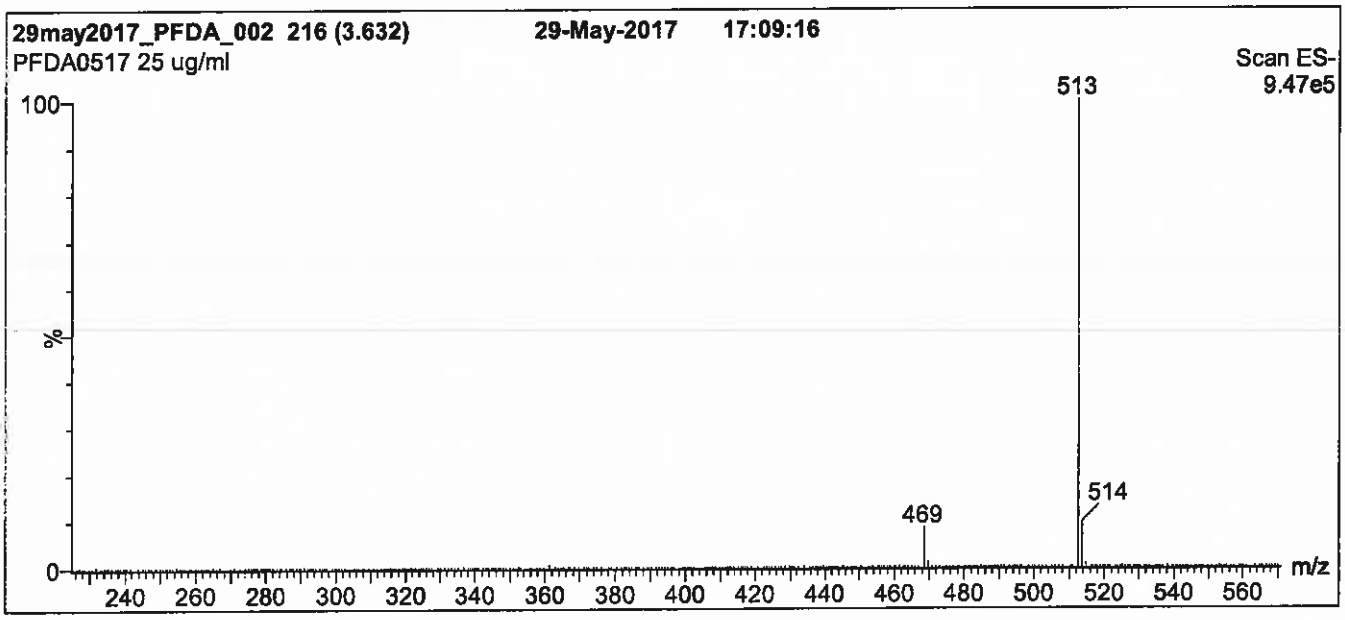
CALA

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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

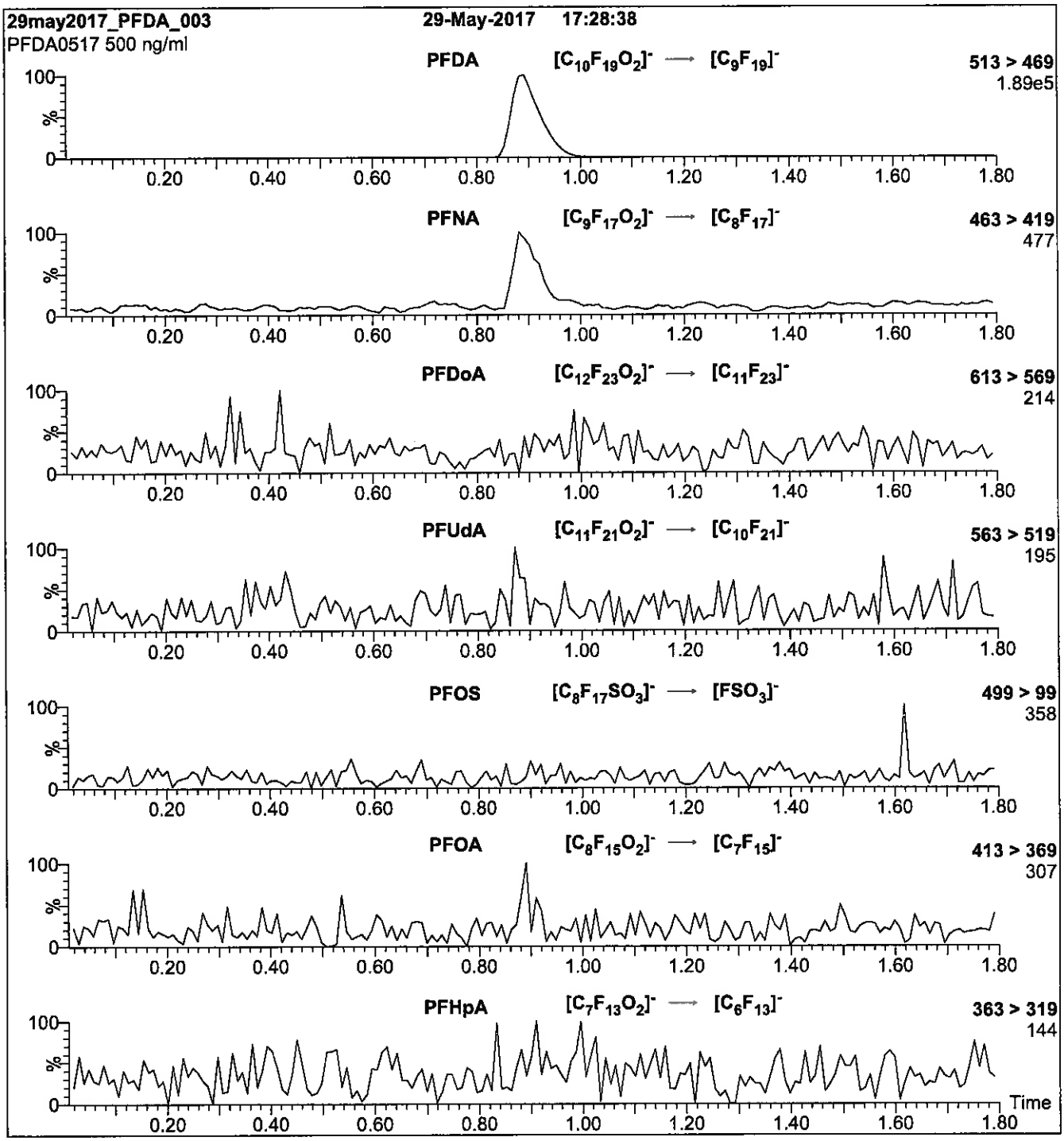
Flow: 300 µl/min

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

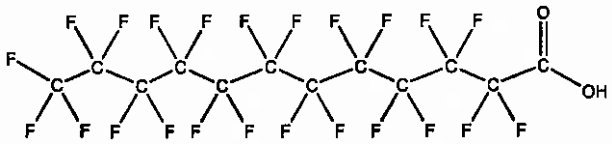
LCPFDoA_00010

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

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QUALITY MANAGEMENT:

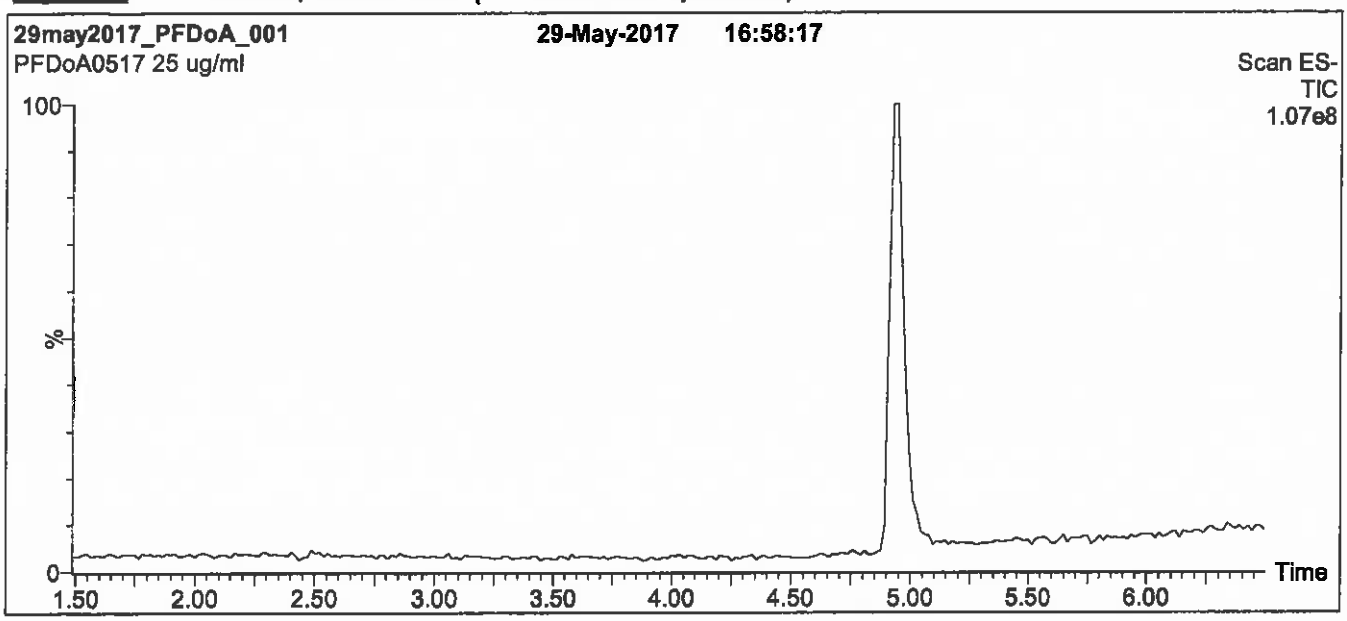
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

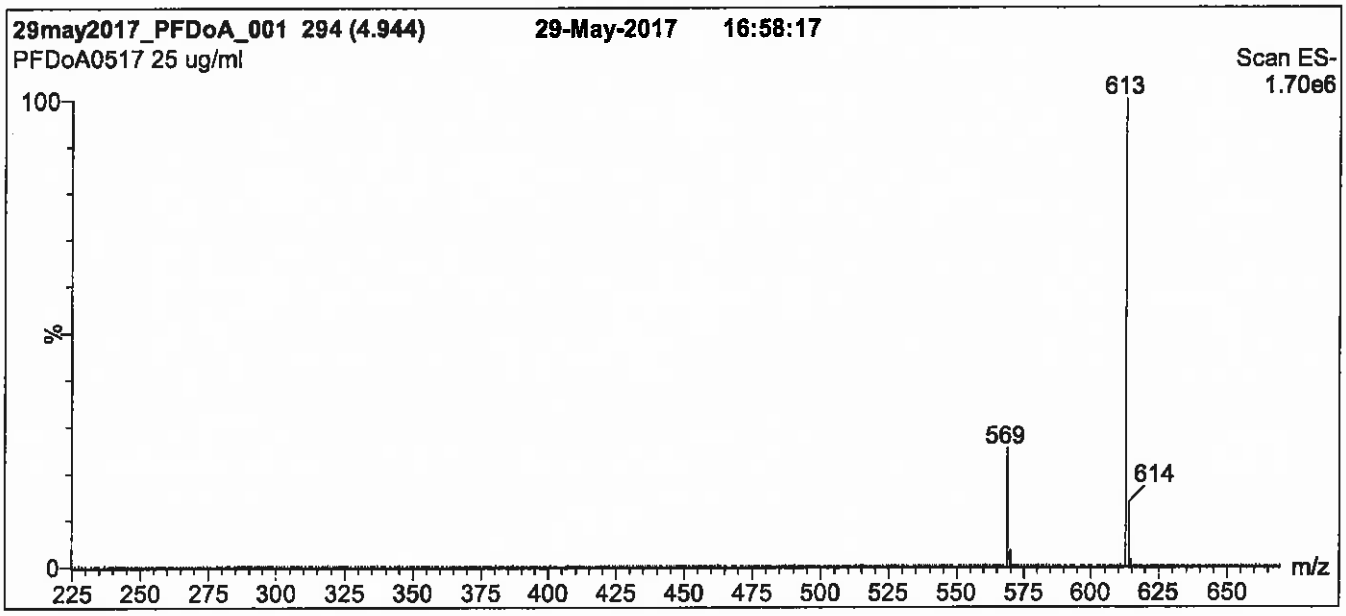
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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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

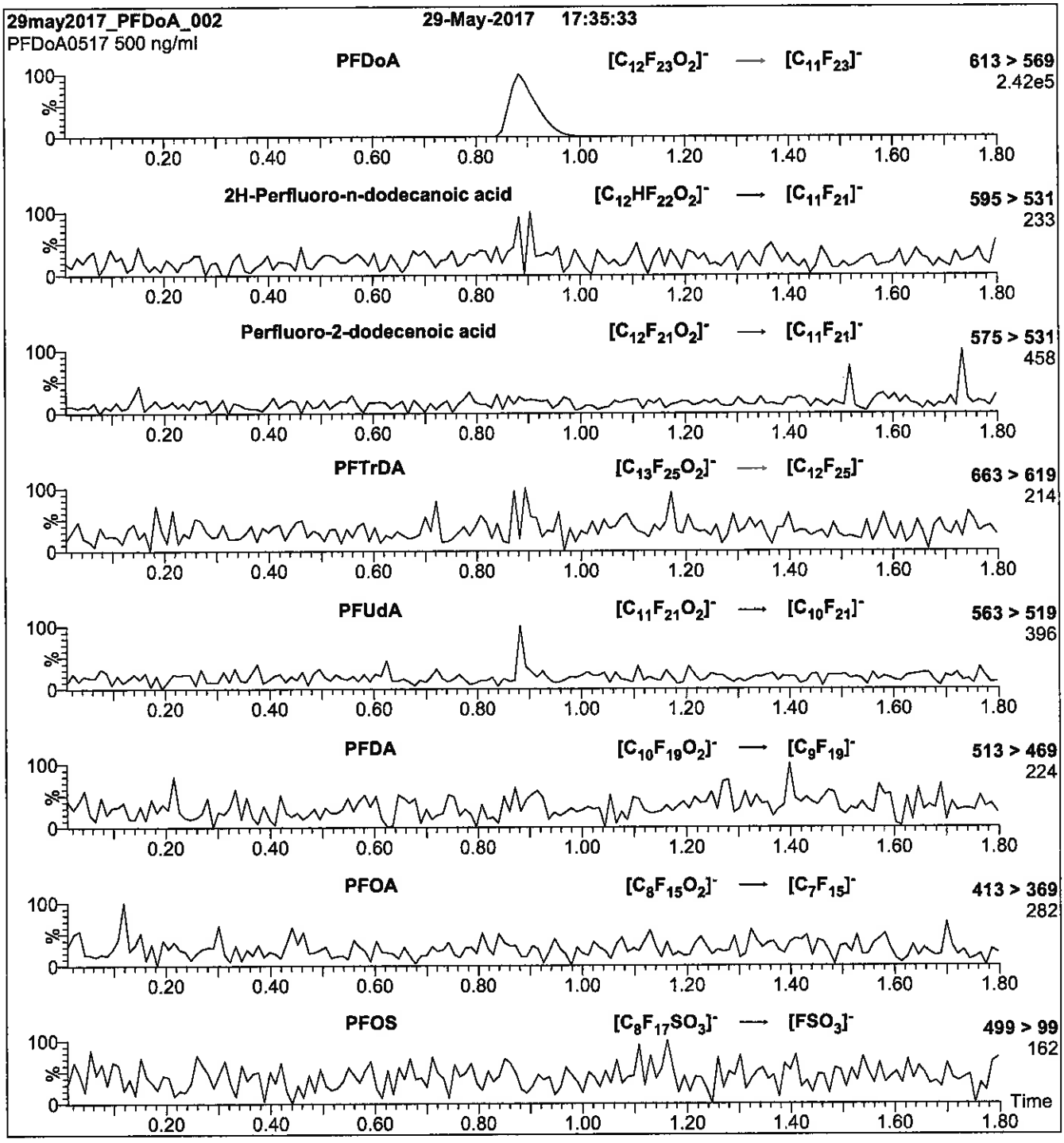
Flow: 300 µl/min

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

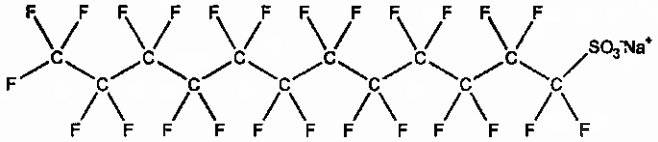
1307130
ID: LCPFDoS_00004
Exp:09/30/21 Prpd:CBW Opn:07/19/18
L-PFDoS at 48.4ug/mL

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
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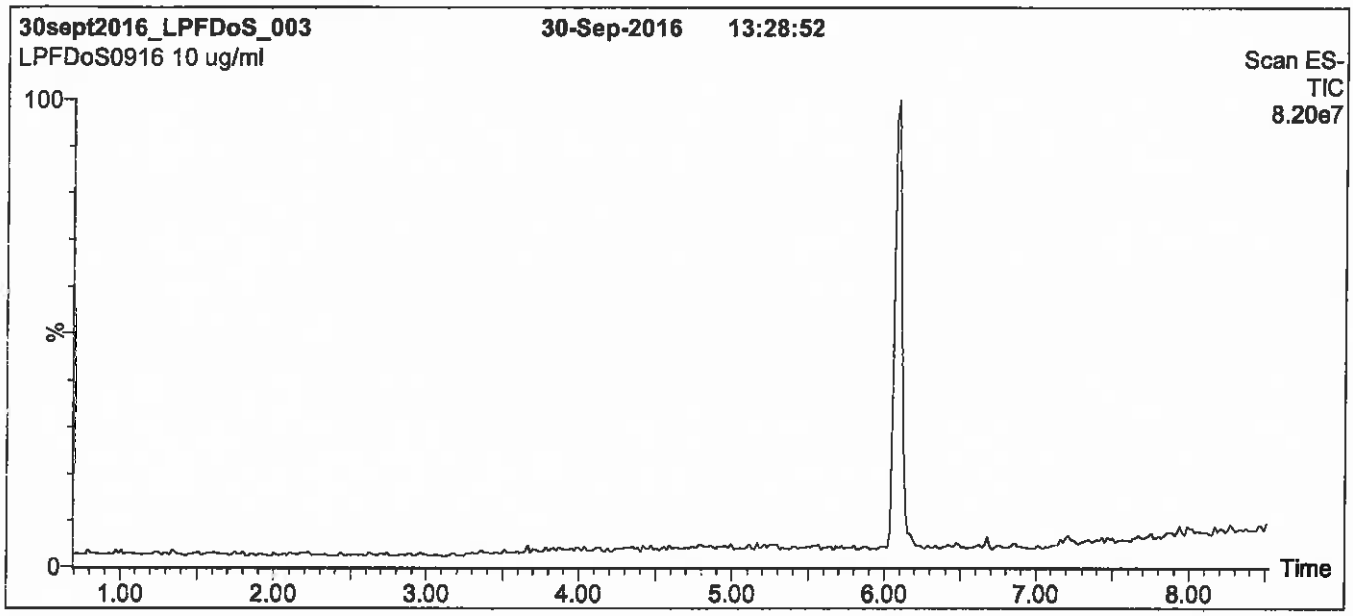
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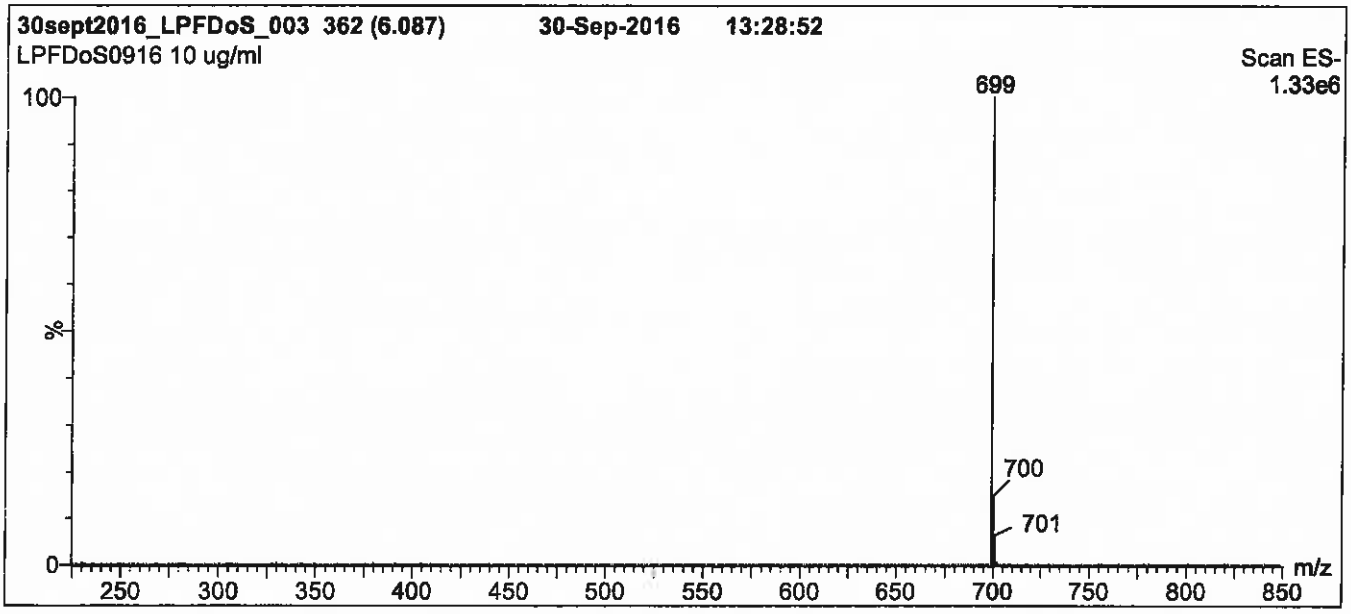
CALA

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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

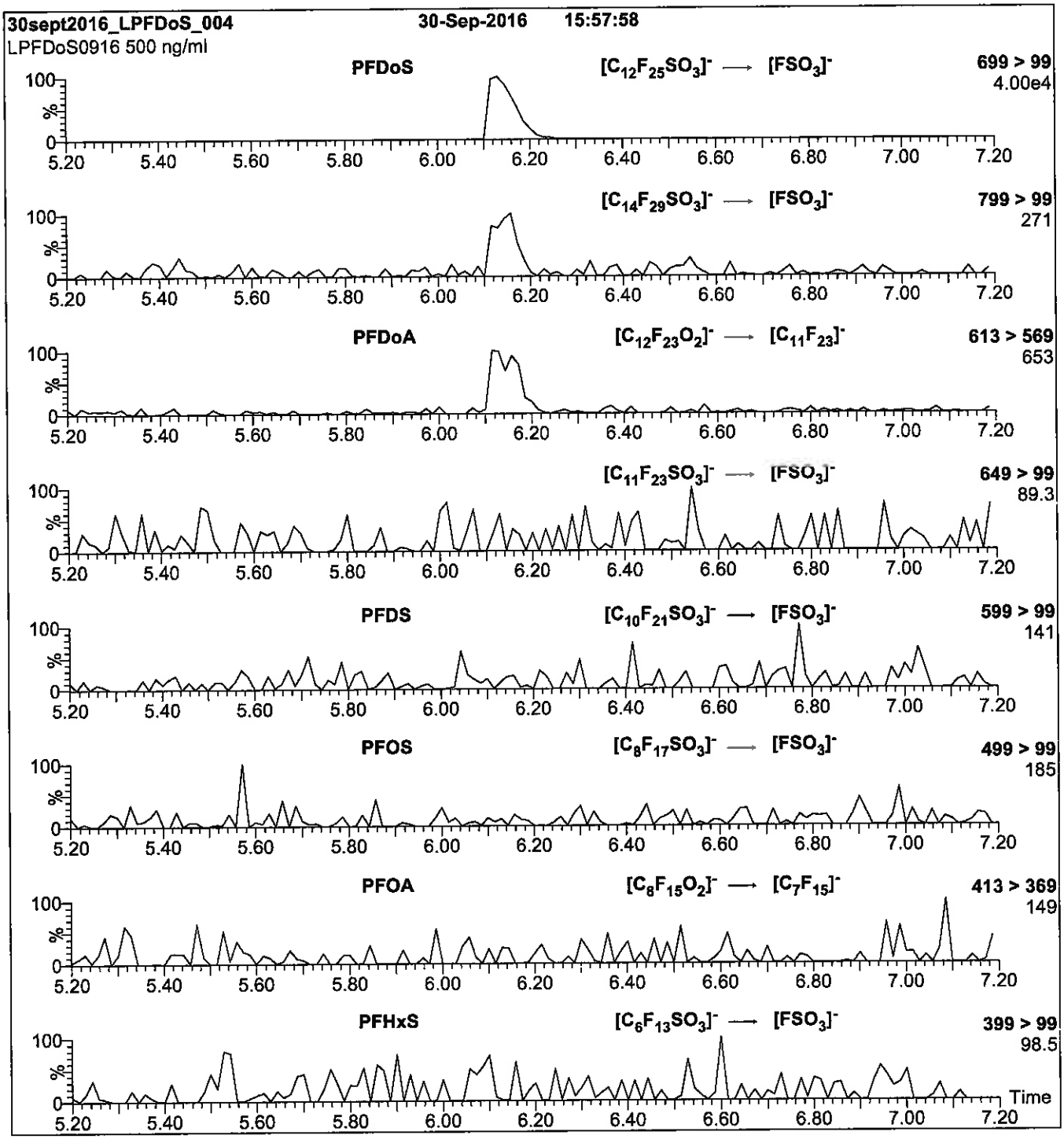
Flow: 300 µl/min

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

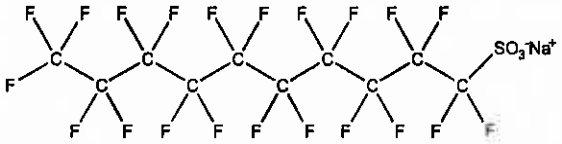
LCPFDS_00008

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
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:

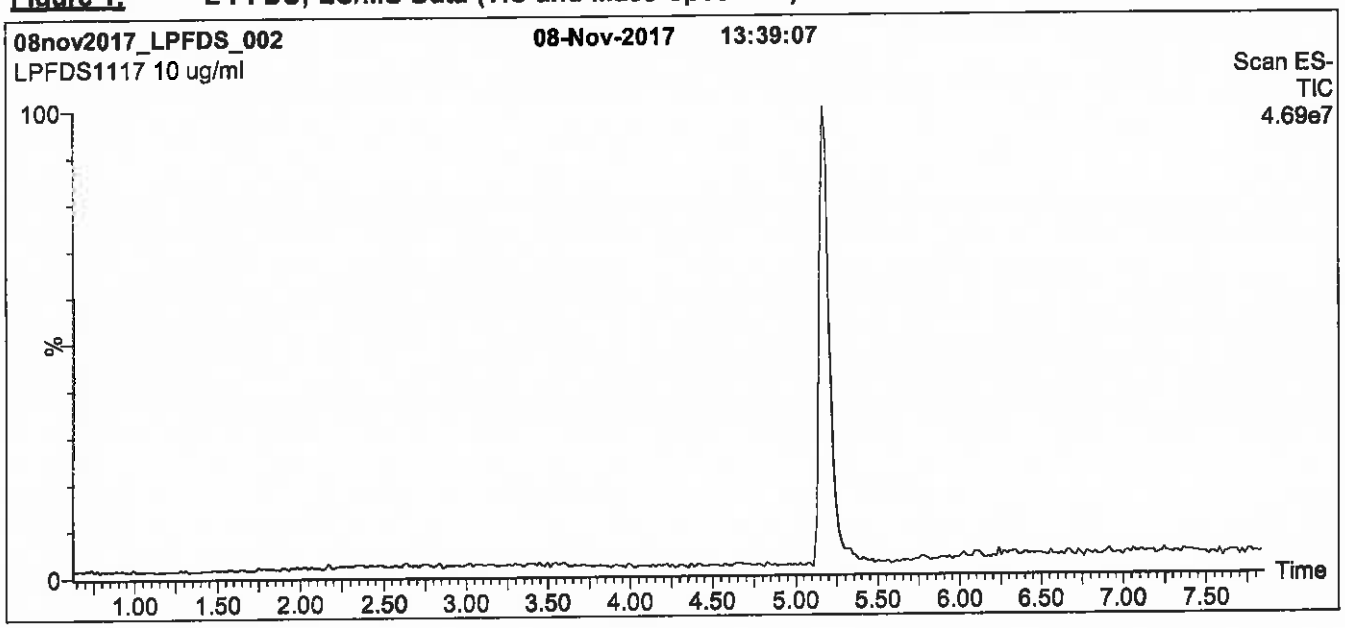
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

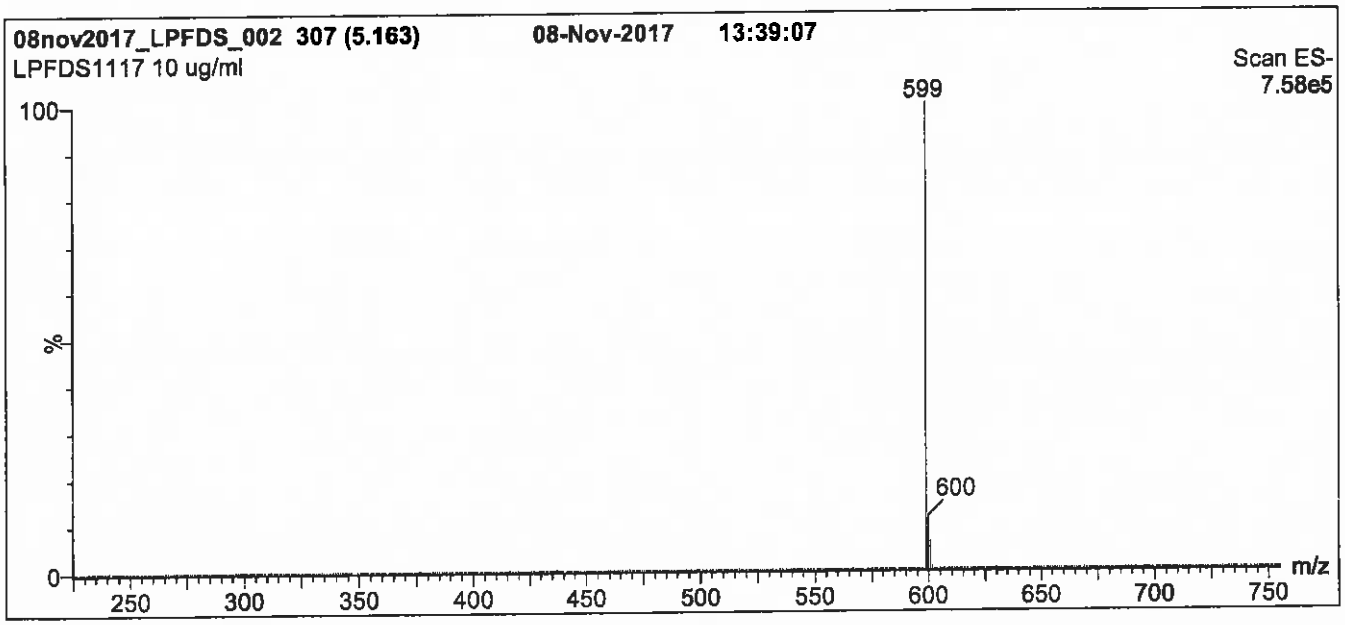
CALA

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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

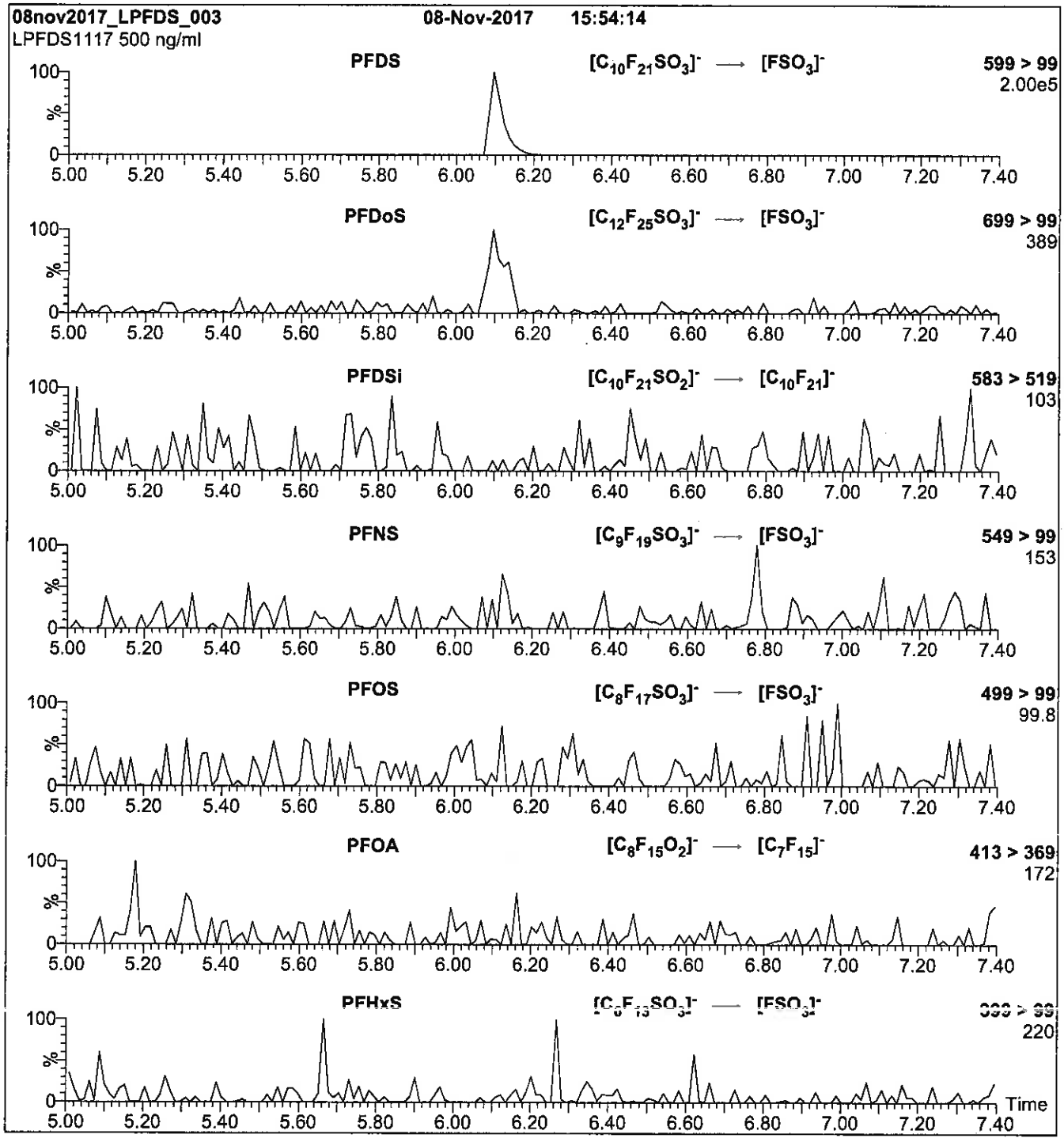
Flow: 300 µl/min

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

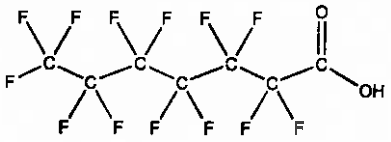
LCPFHpA_00011

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:

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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:

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

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:

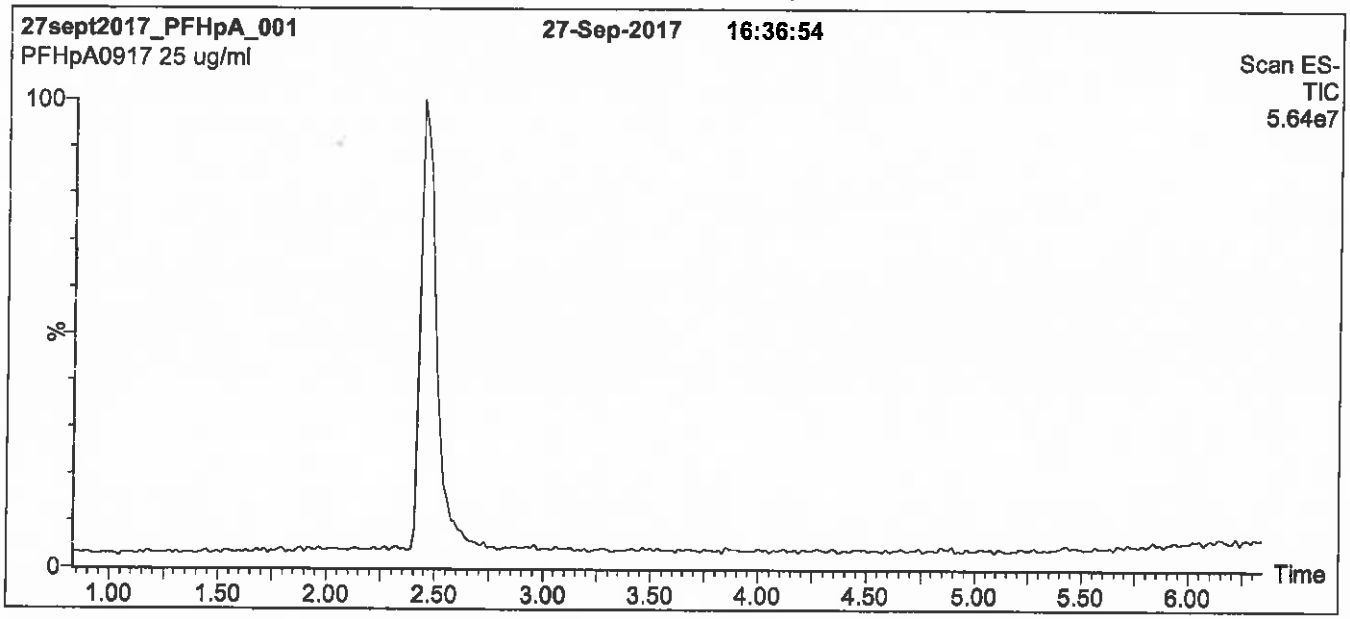
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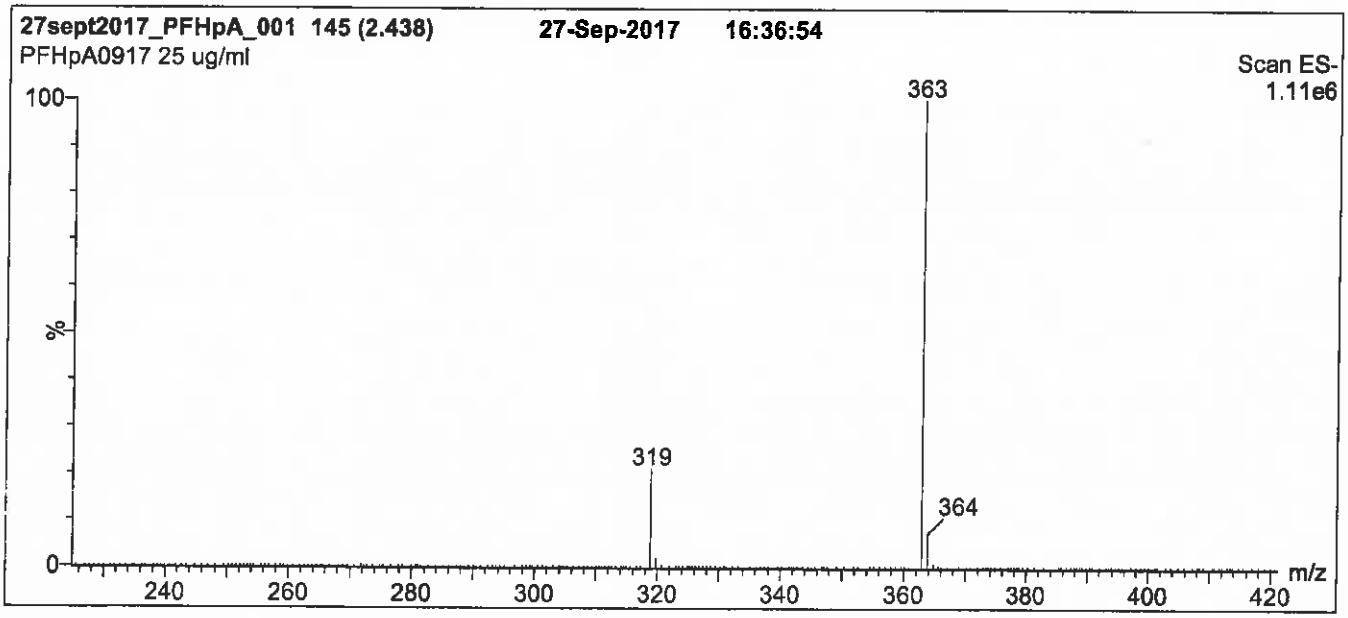
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

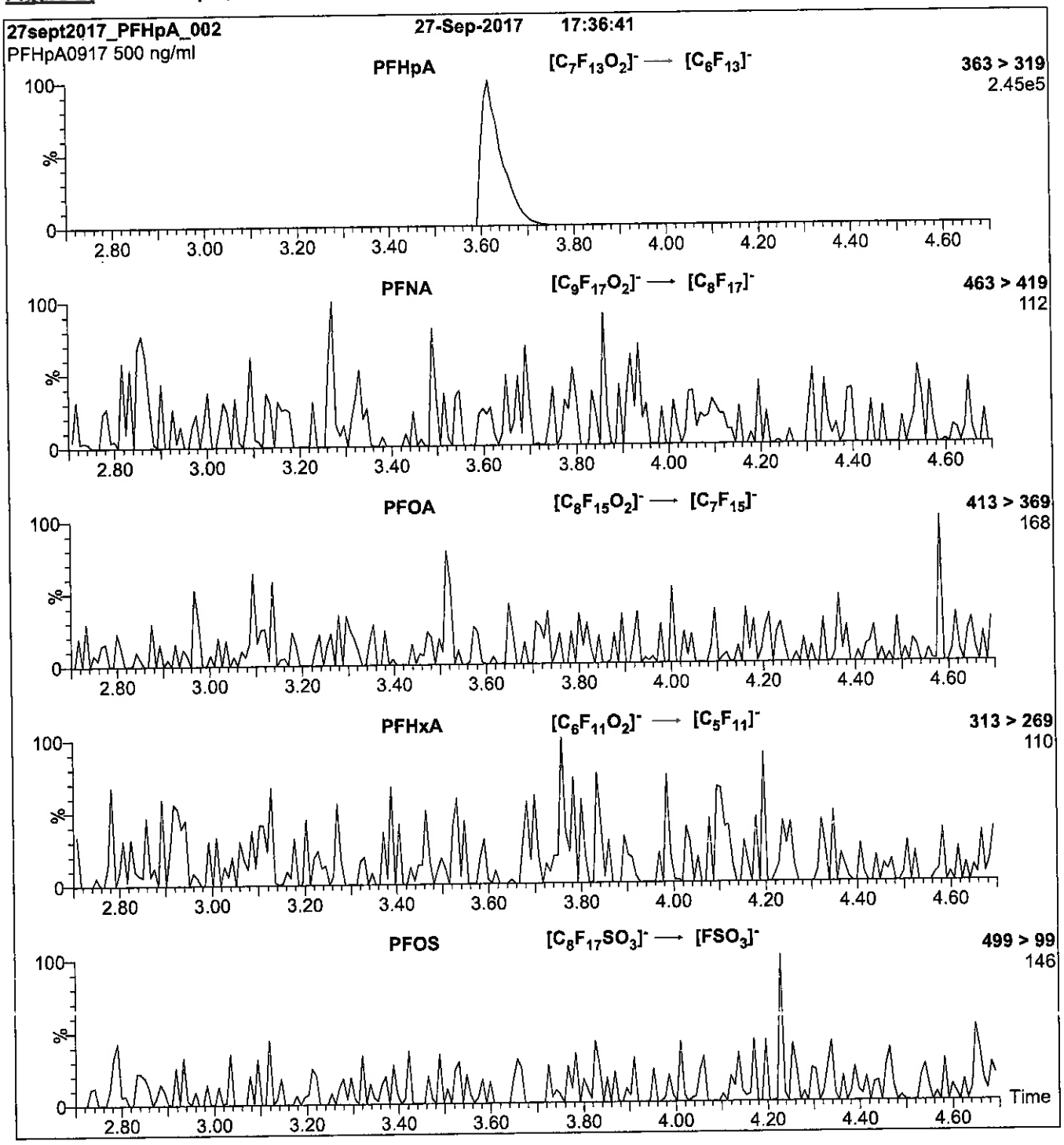
Flow: 300 µl/min

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

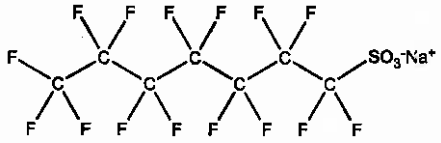
LCPFHpSA_00003

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) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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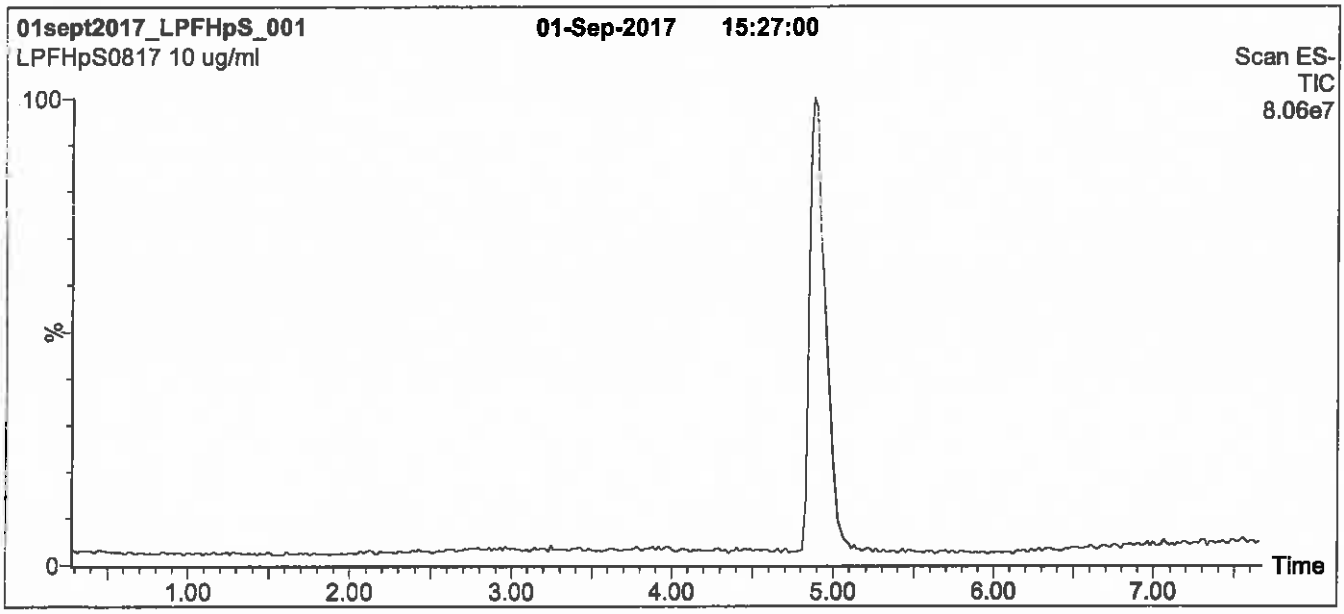
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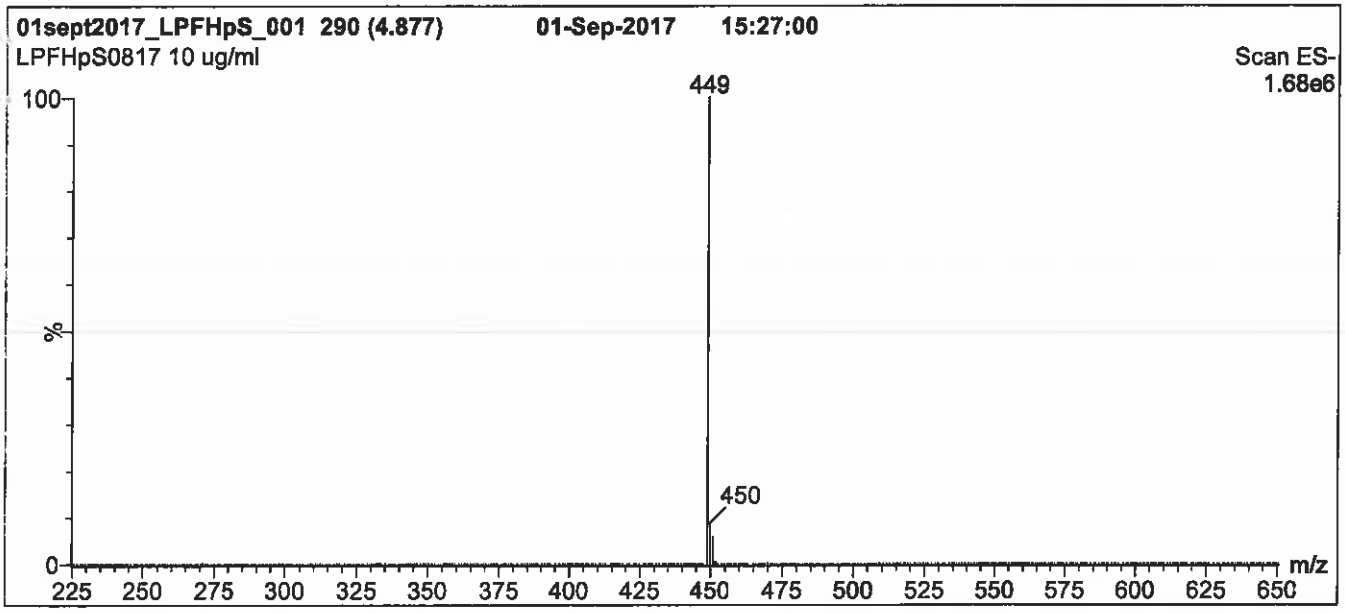
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

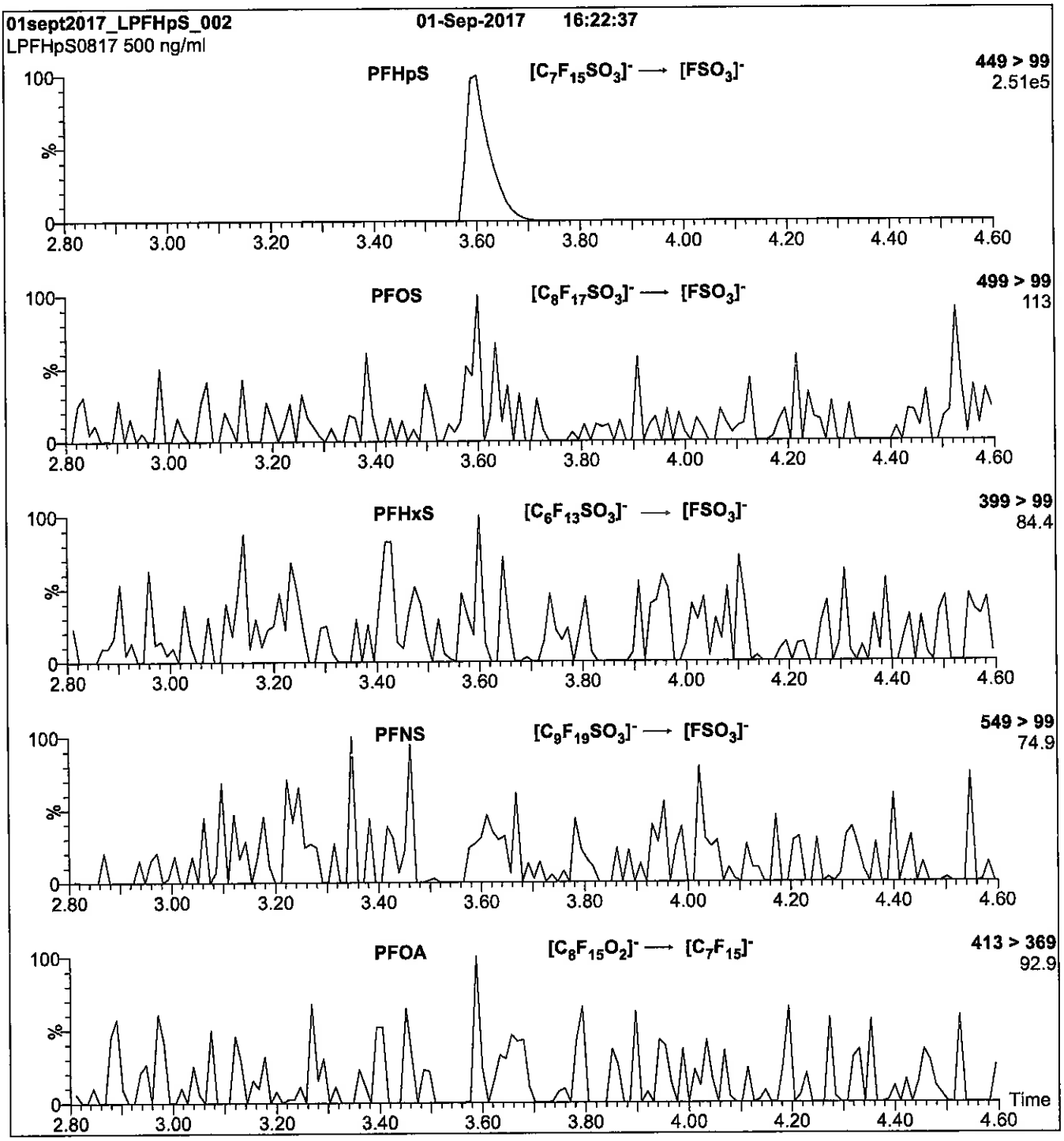
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCPFHxA_00010

r: 2/16/18 SK

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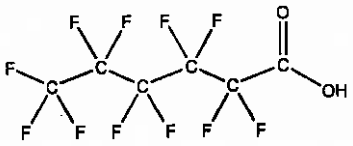
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

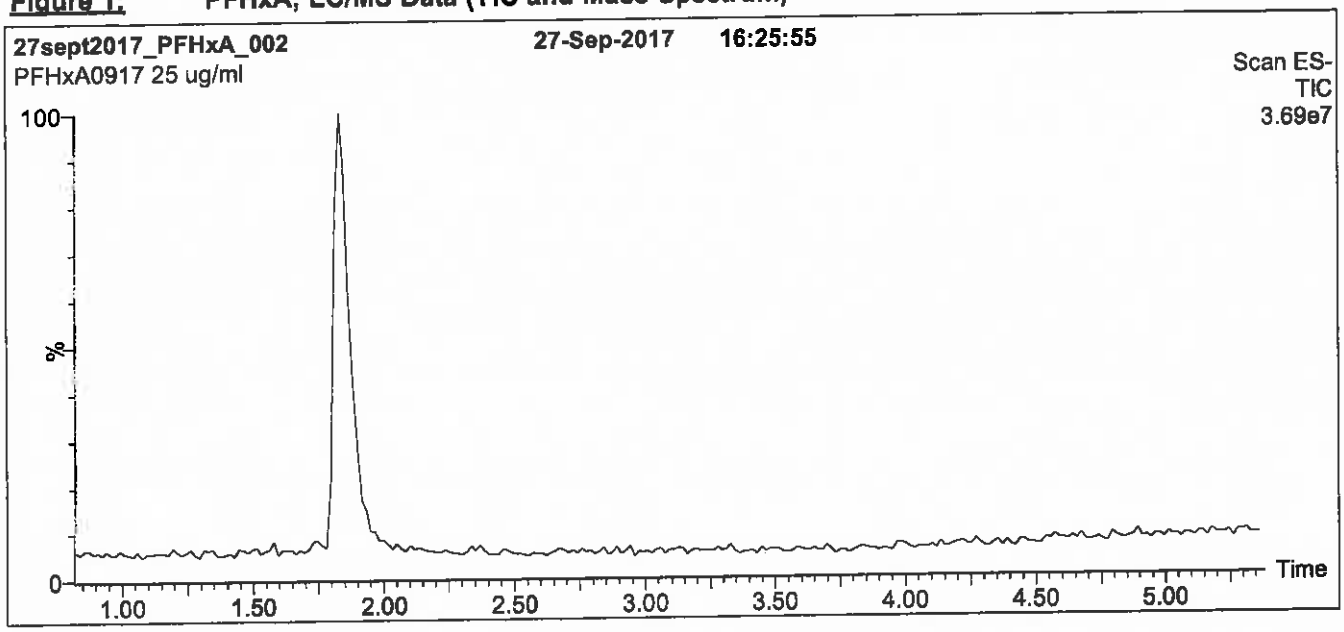
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

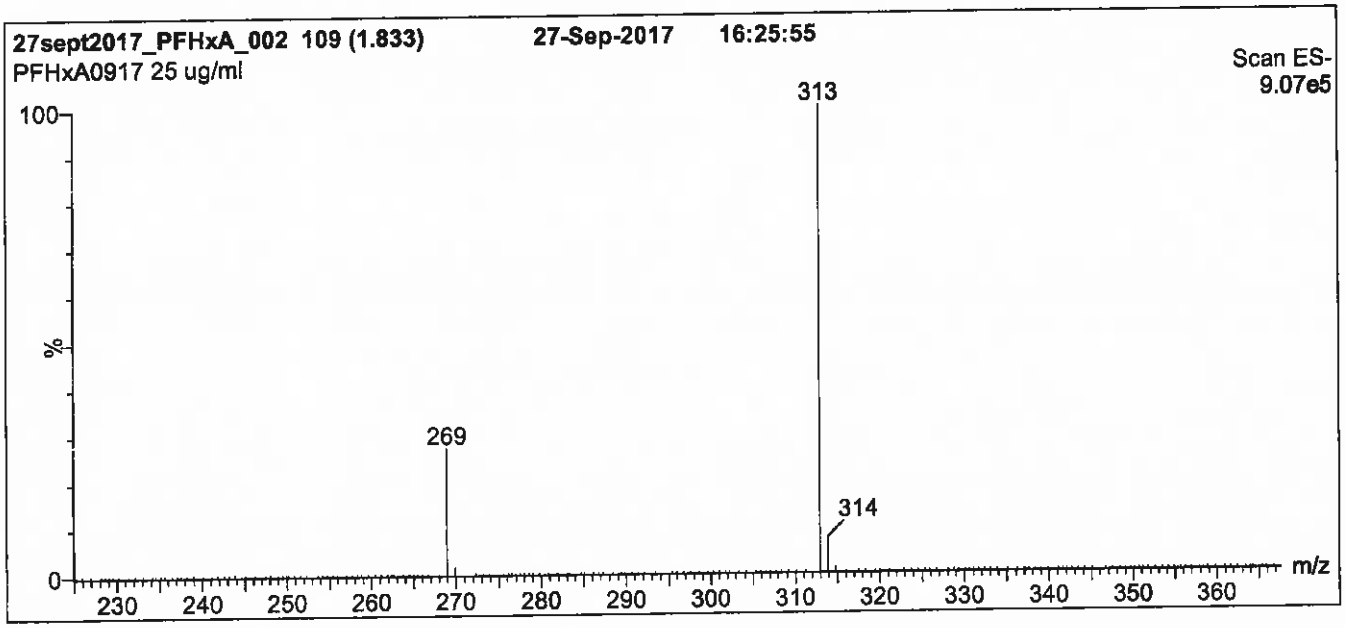
CALA

ANAB ACCREDITED

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

Figure 1: **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

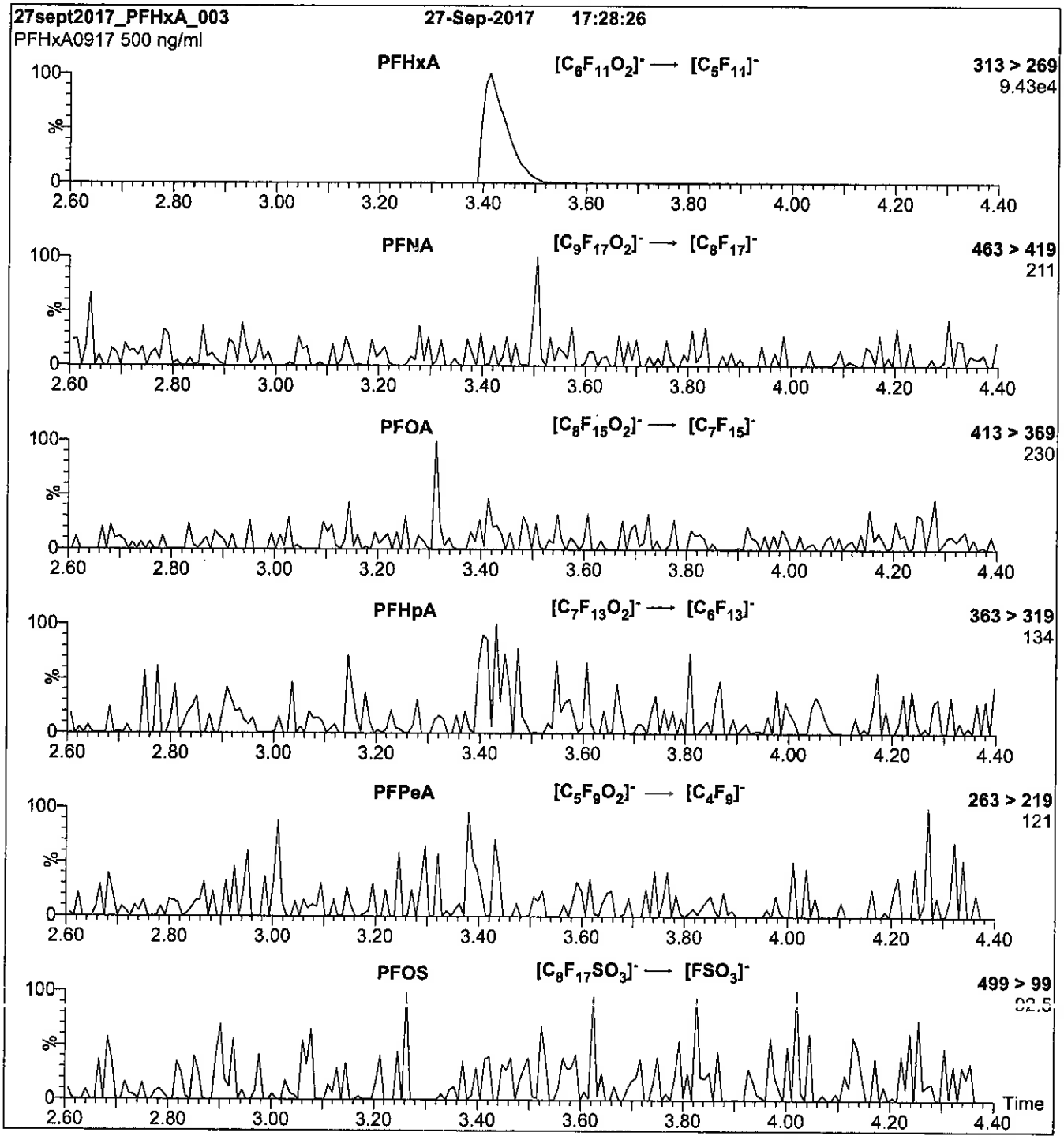
Flow: 300 µl/min

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

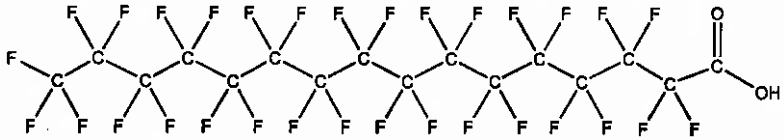
LCPFHxDA_00010

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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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

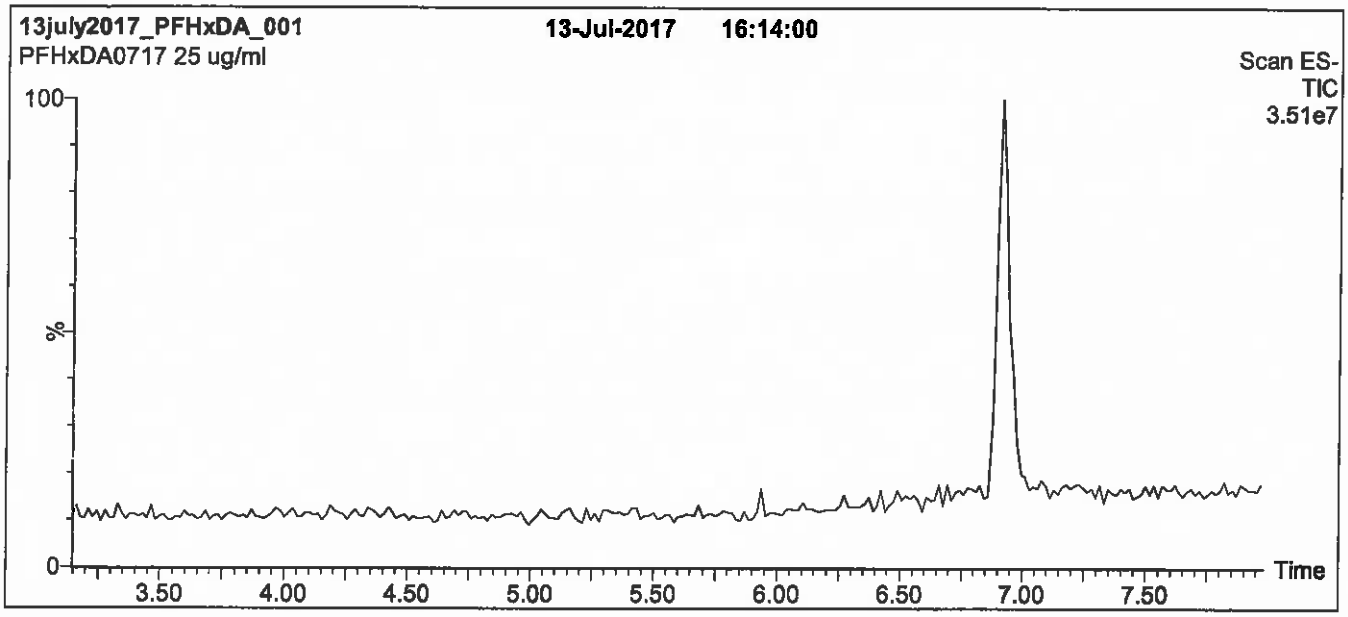
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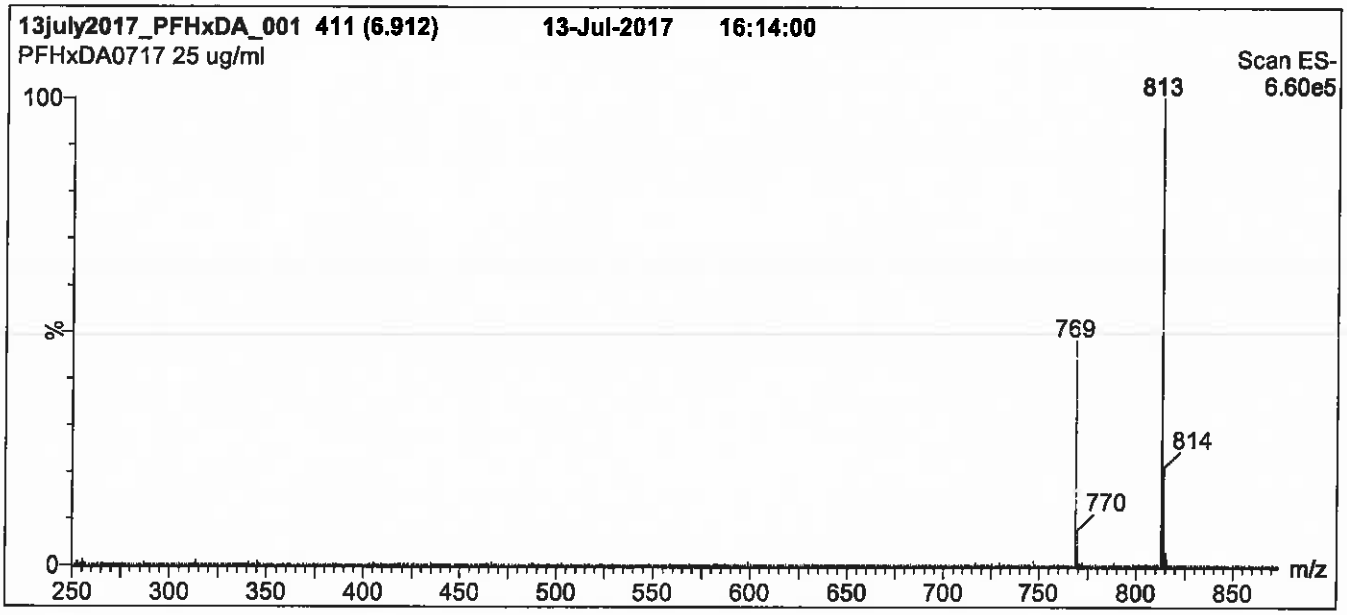
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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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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

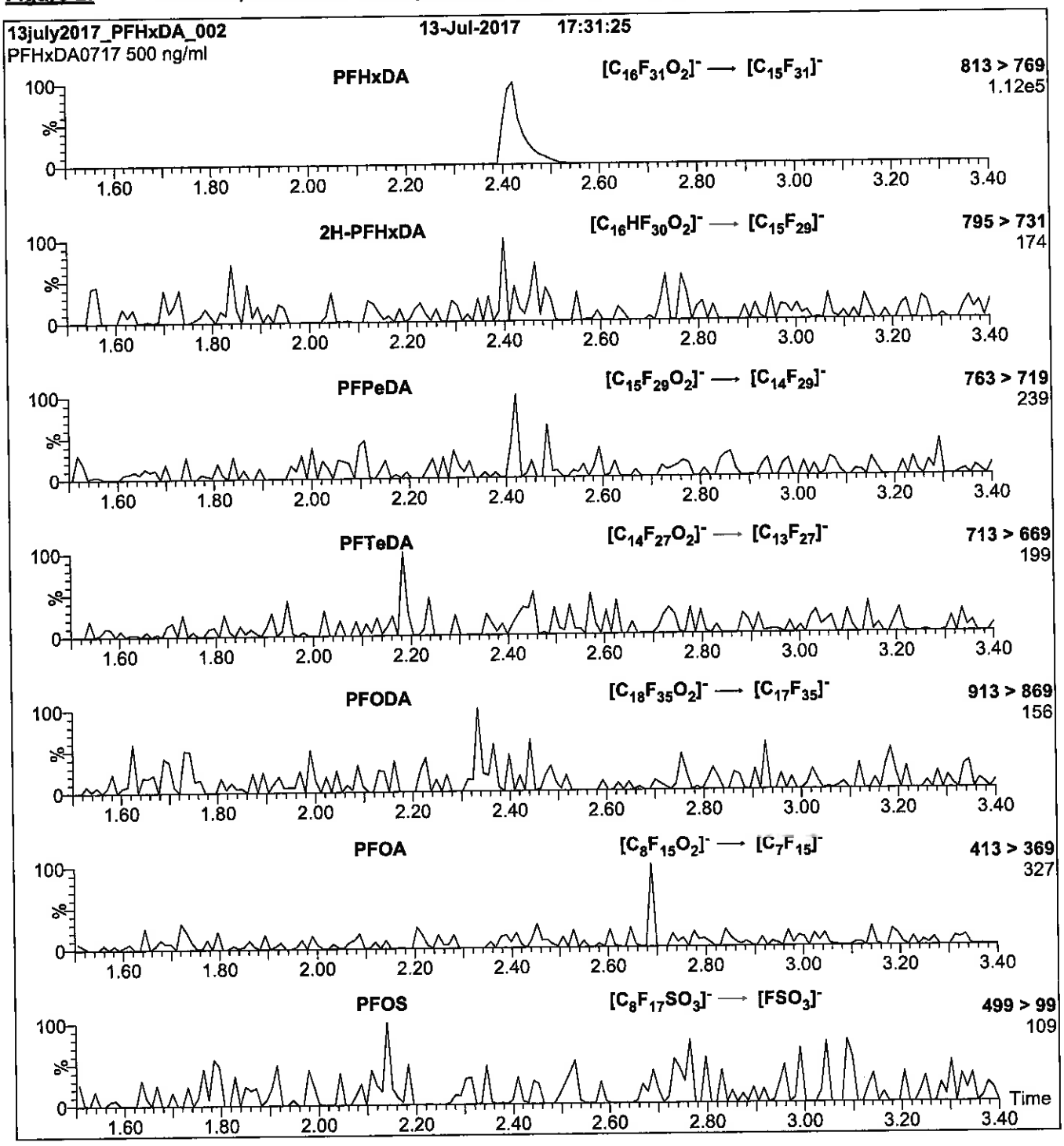
Flow: 300 µl/min

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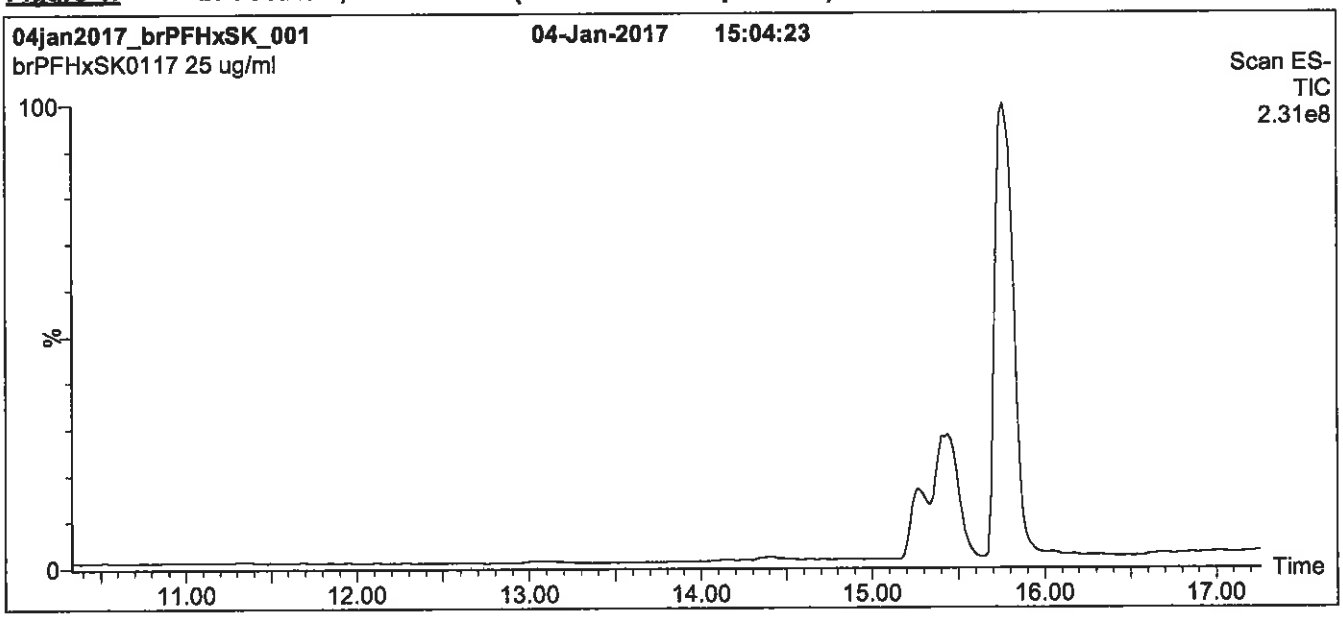
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

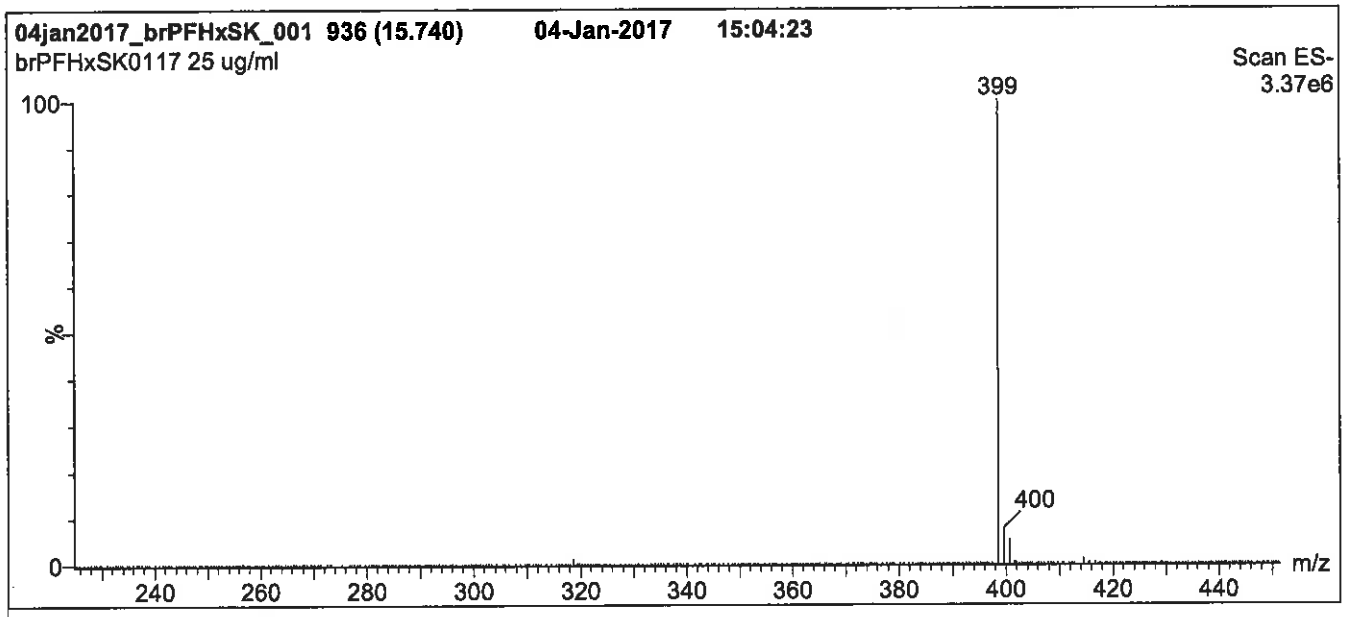
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	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

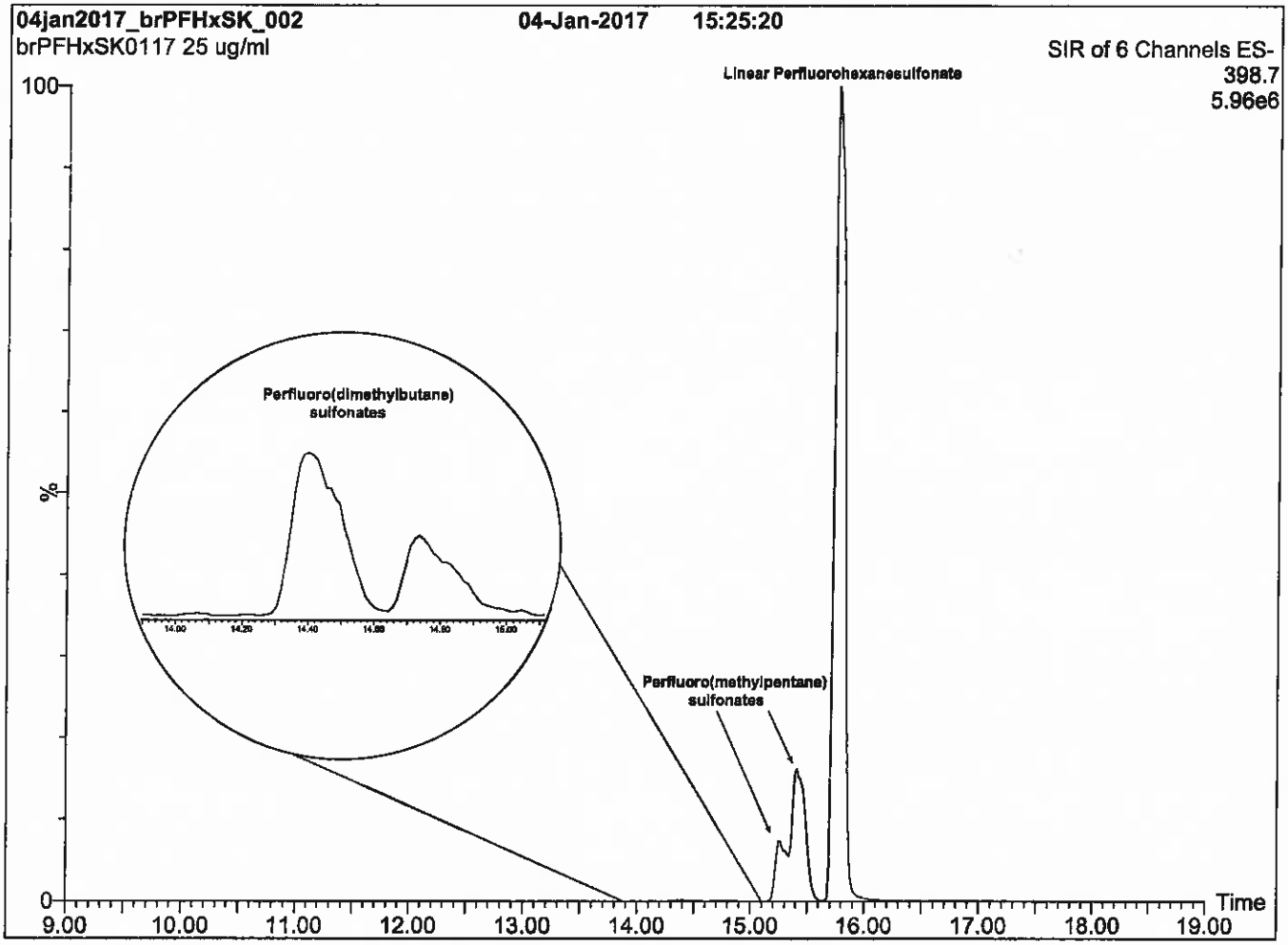
Flow: 300 µl/min

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

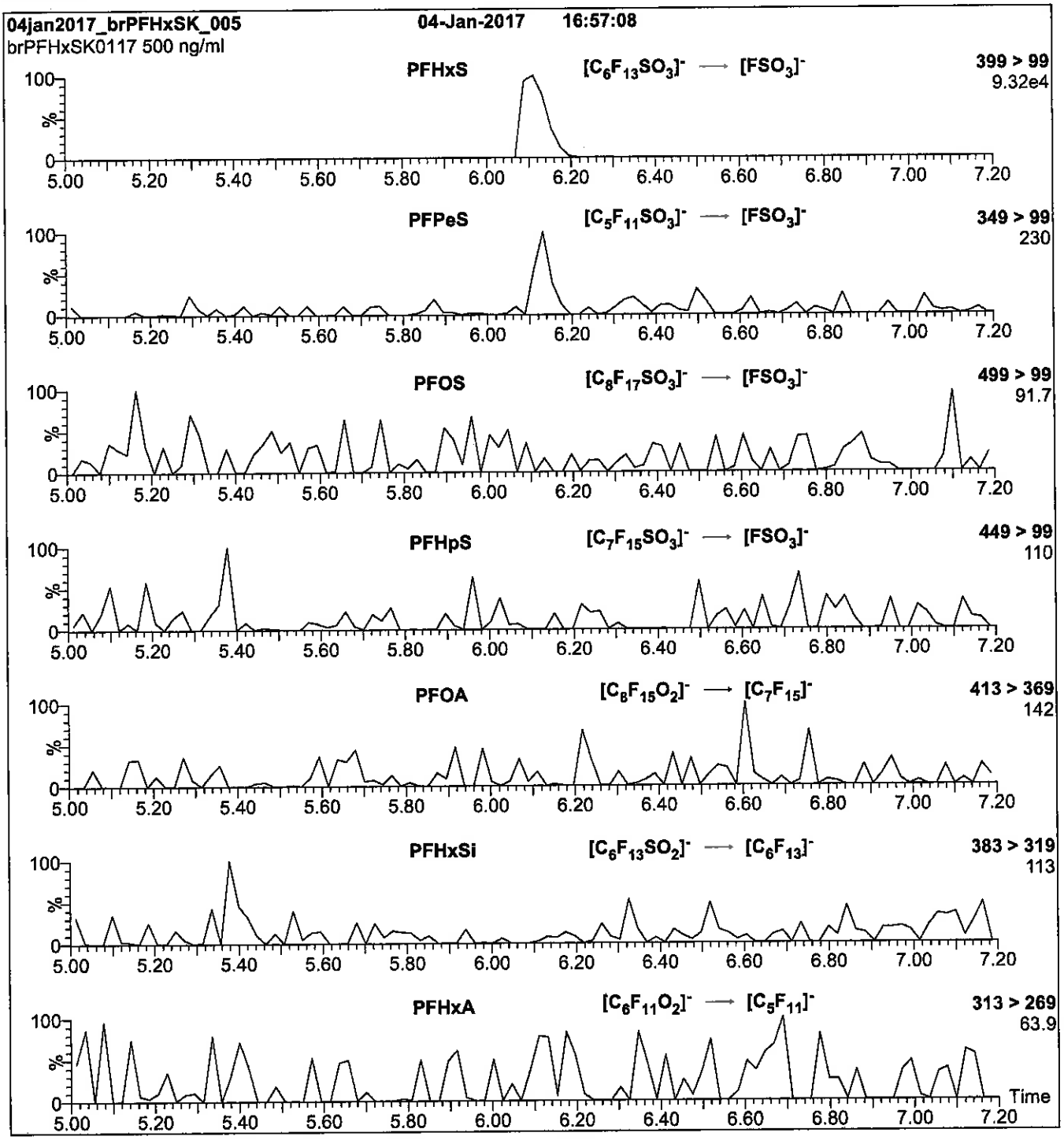
Flow: 300 µl/min

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

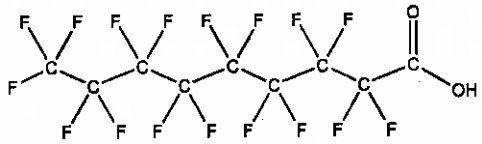
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

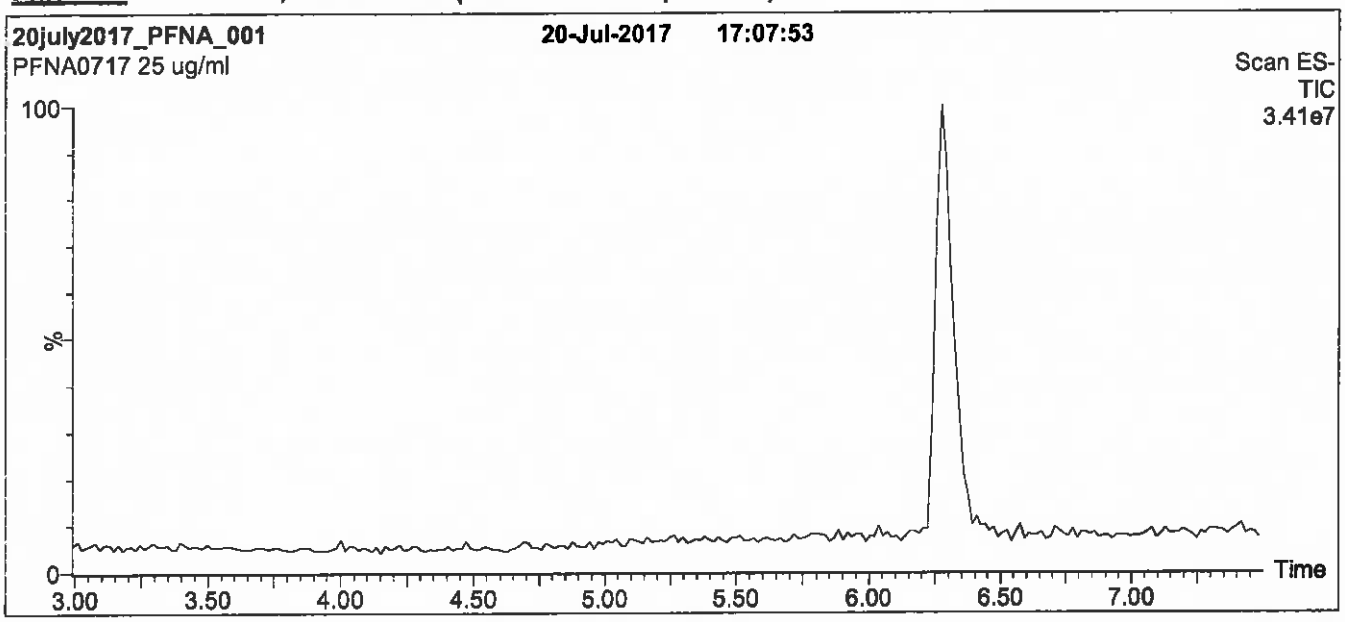
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

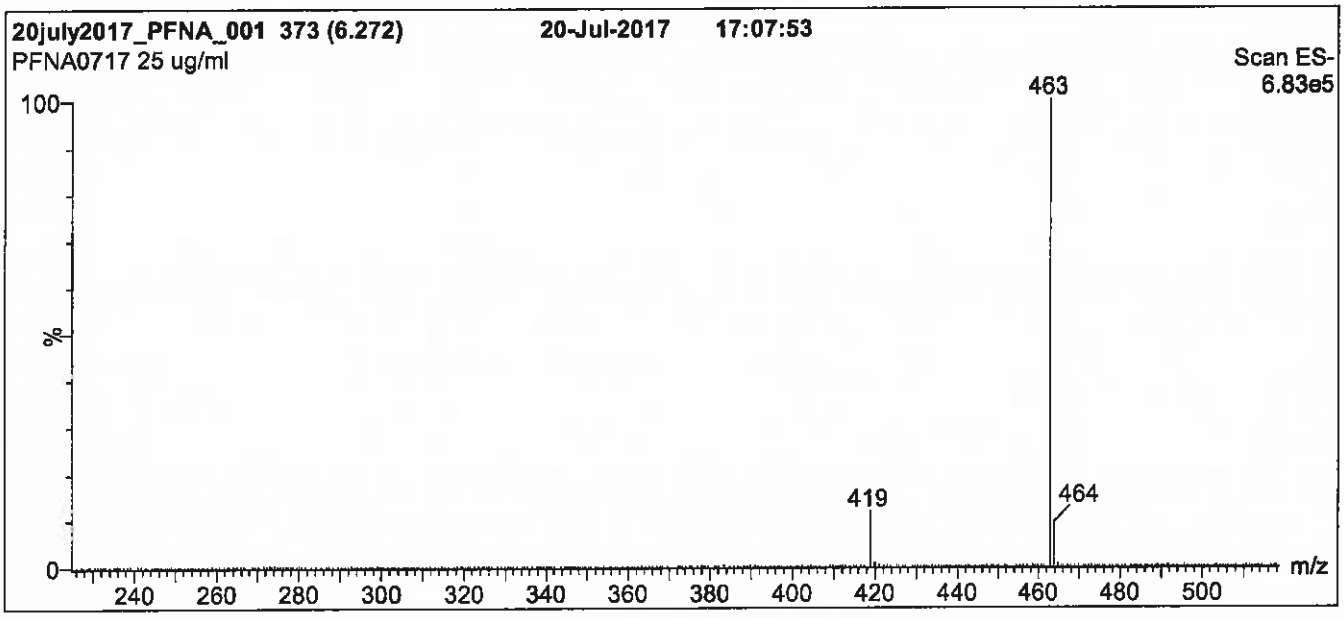
CALA

ANAB ACCREDITED

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

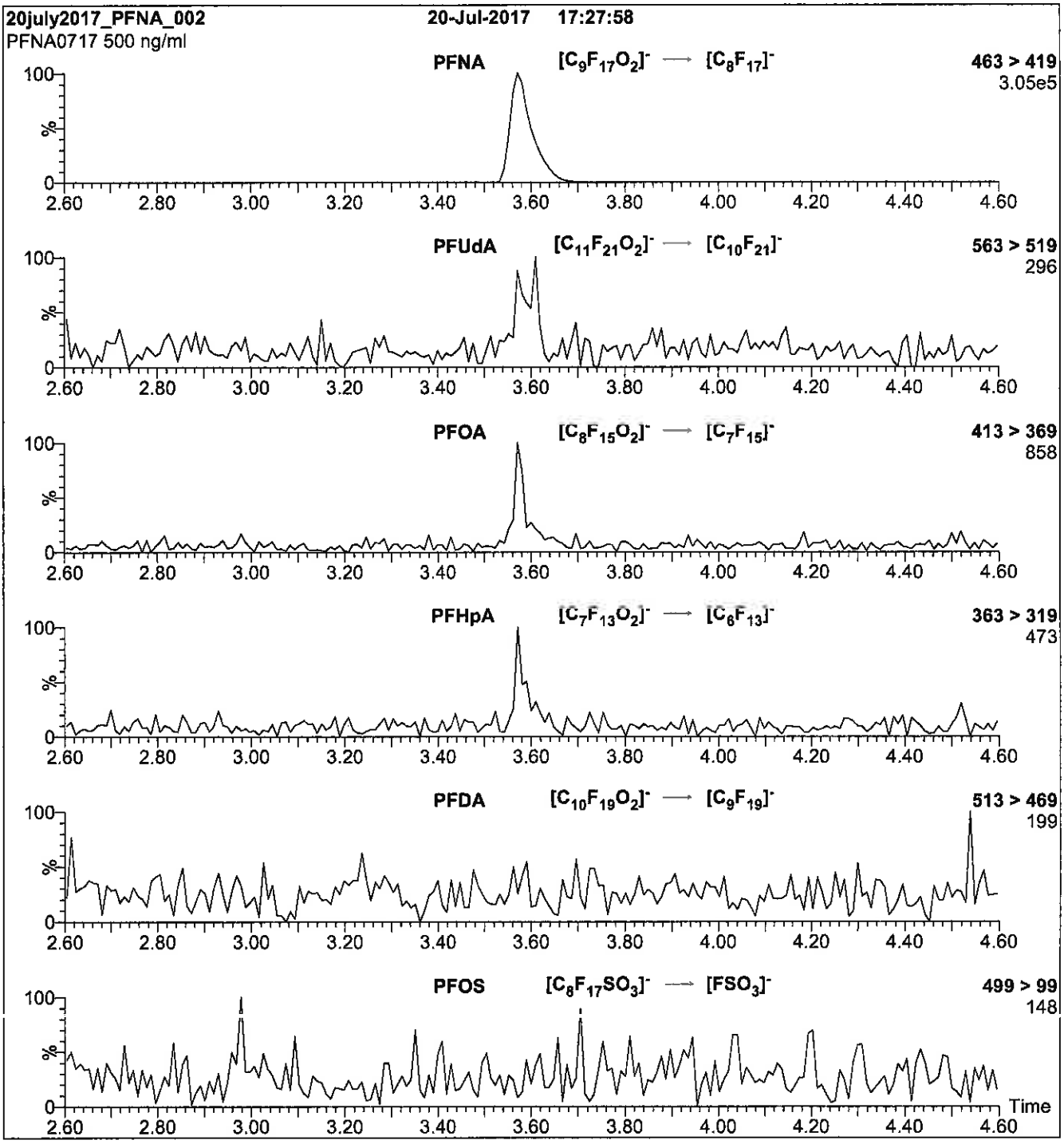
Flow: 300 µl/min

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

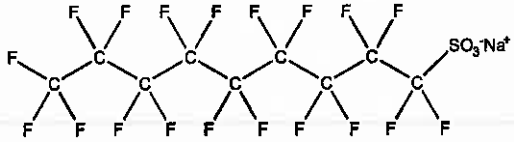
1106804
ID: LCPFNS_00003
Exp: 09/27/22 Prpd: SKV
L-PFNS at 48.0ug/mL

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:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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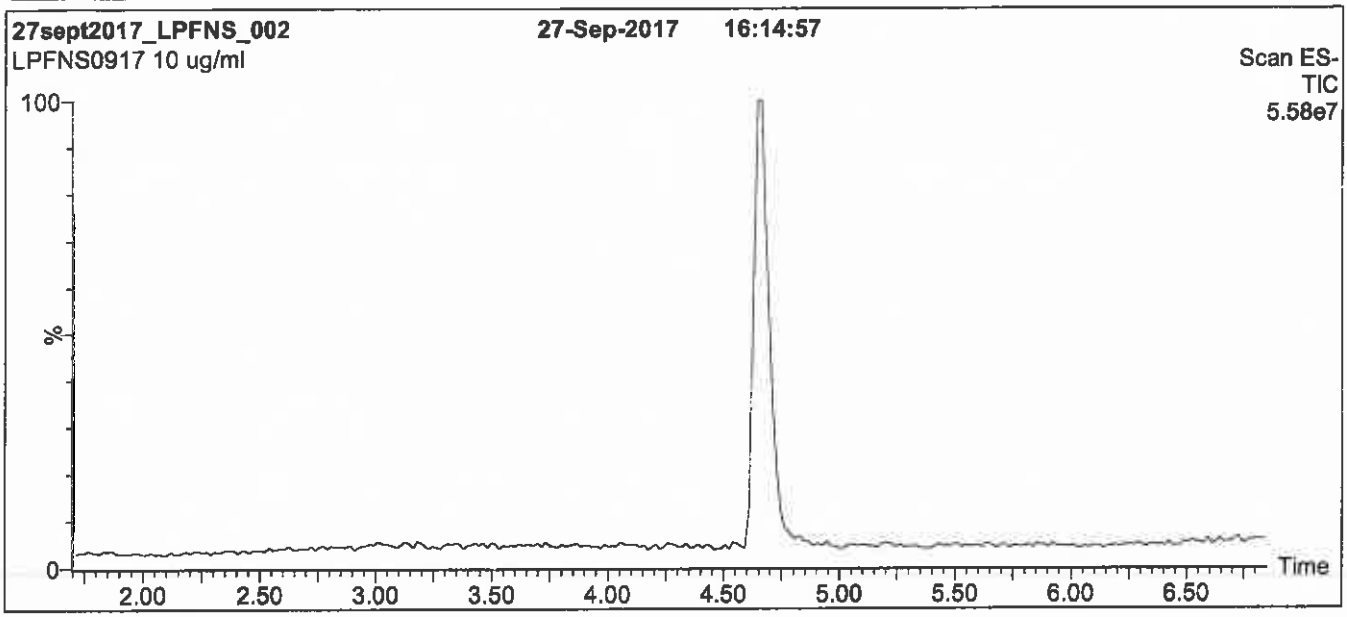
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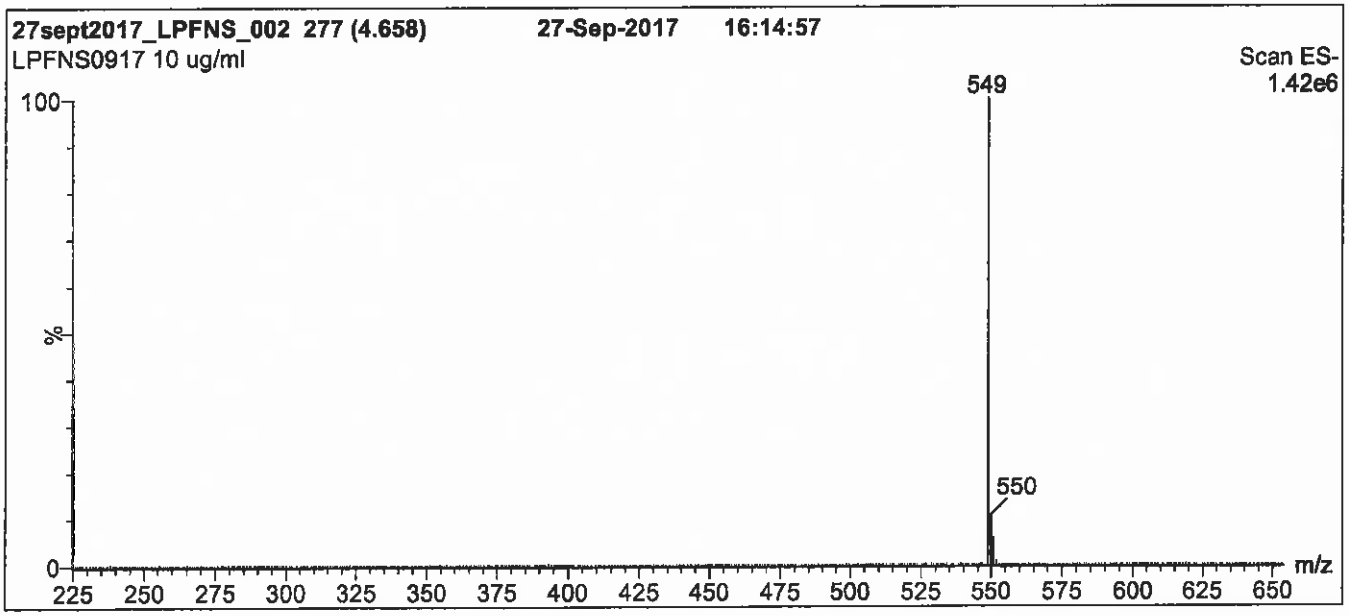
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Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





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

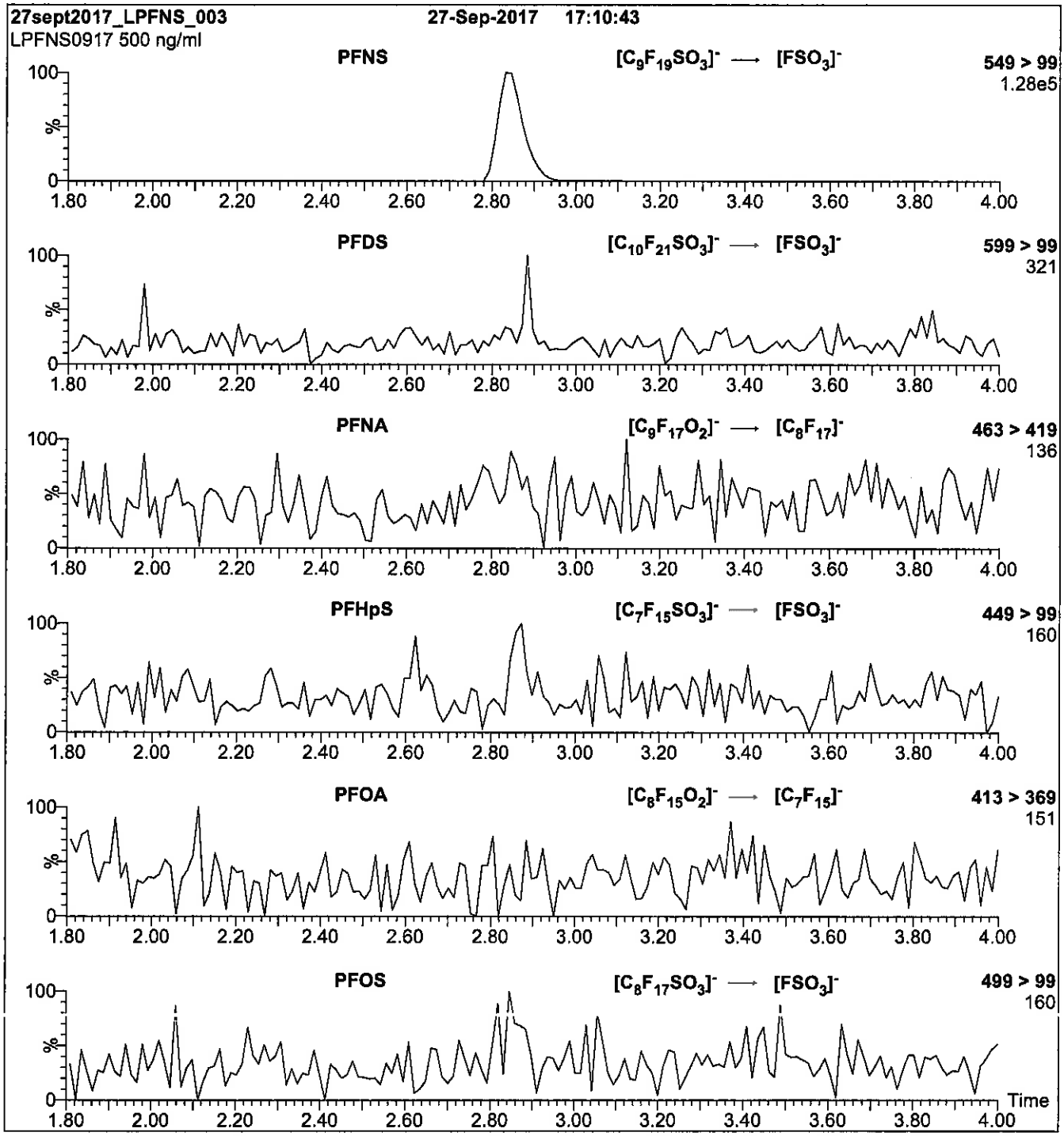
Flow: 300 µl/min

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

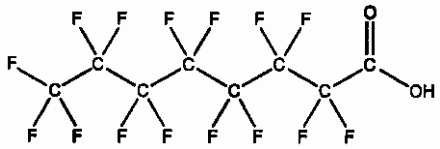
LCPFOA_00011

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

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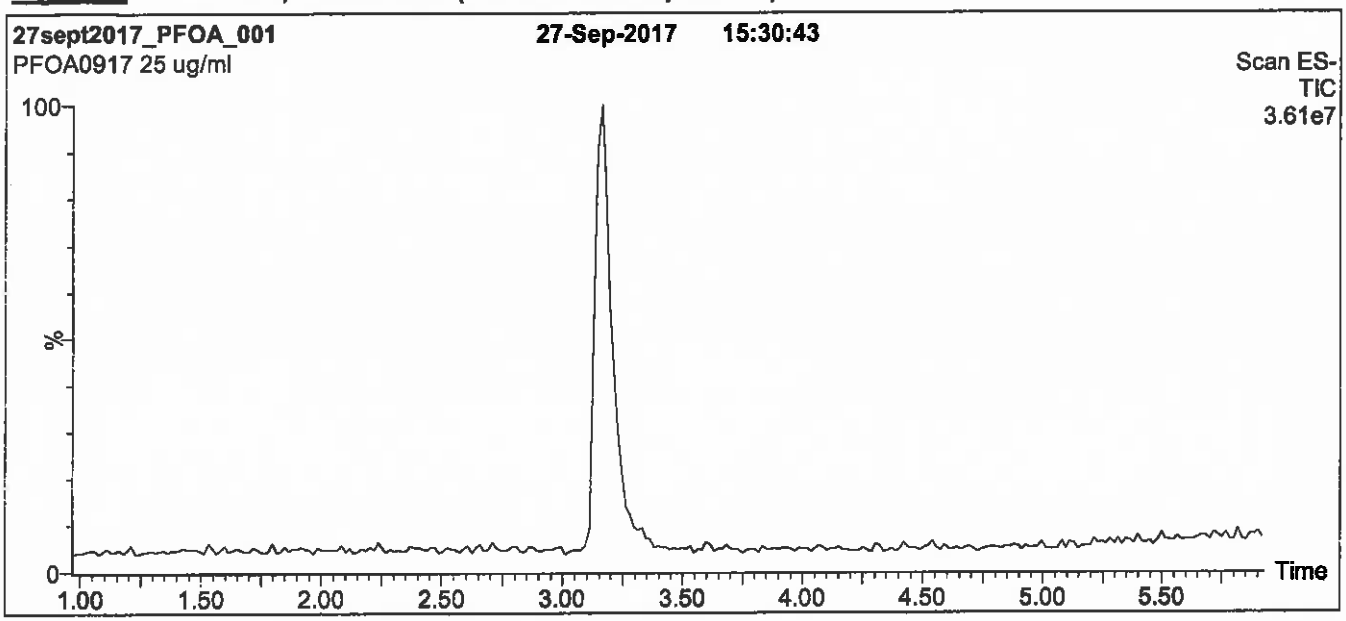
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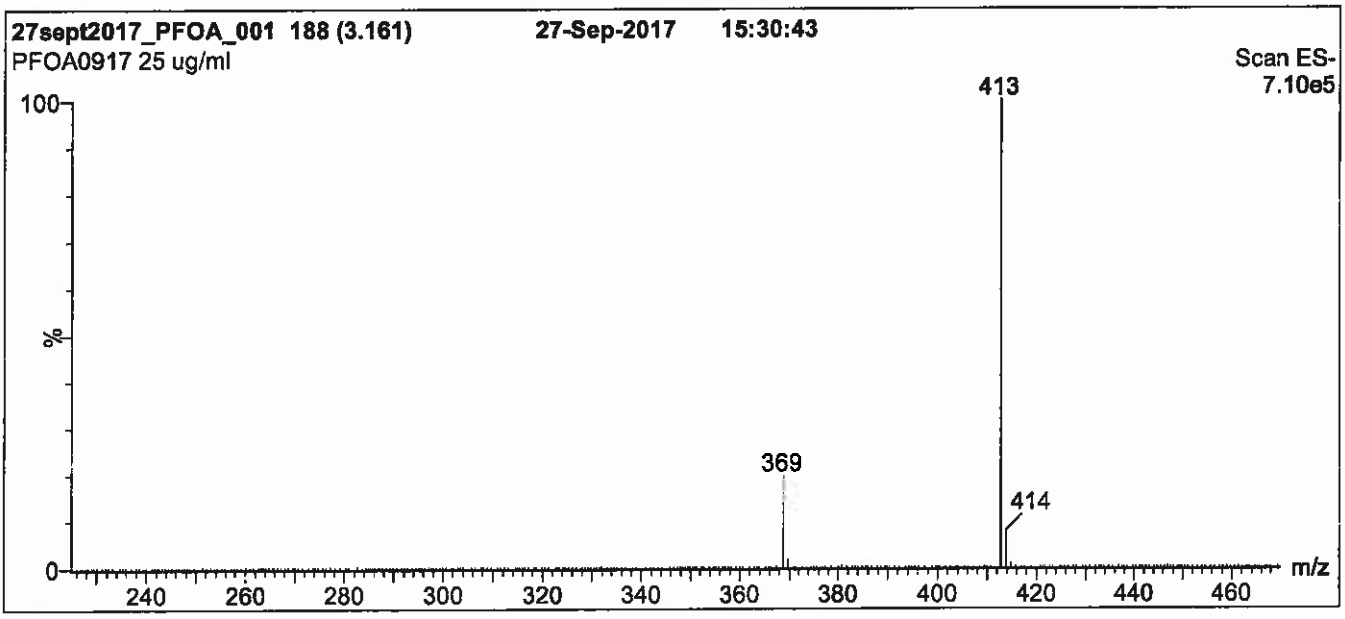
CALA

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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

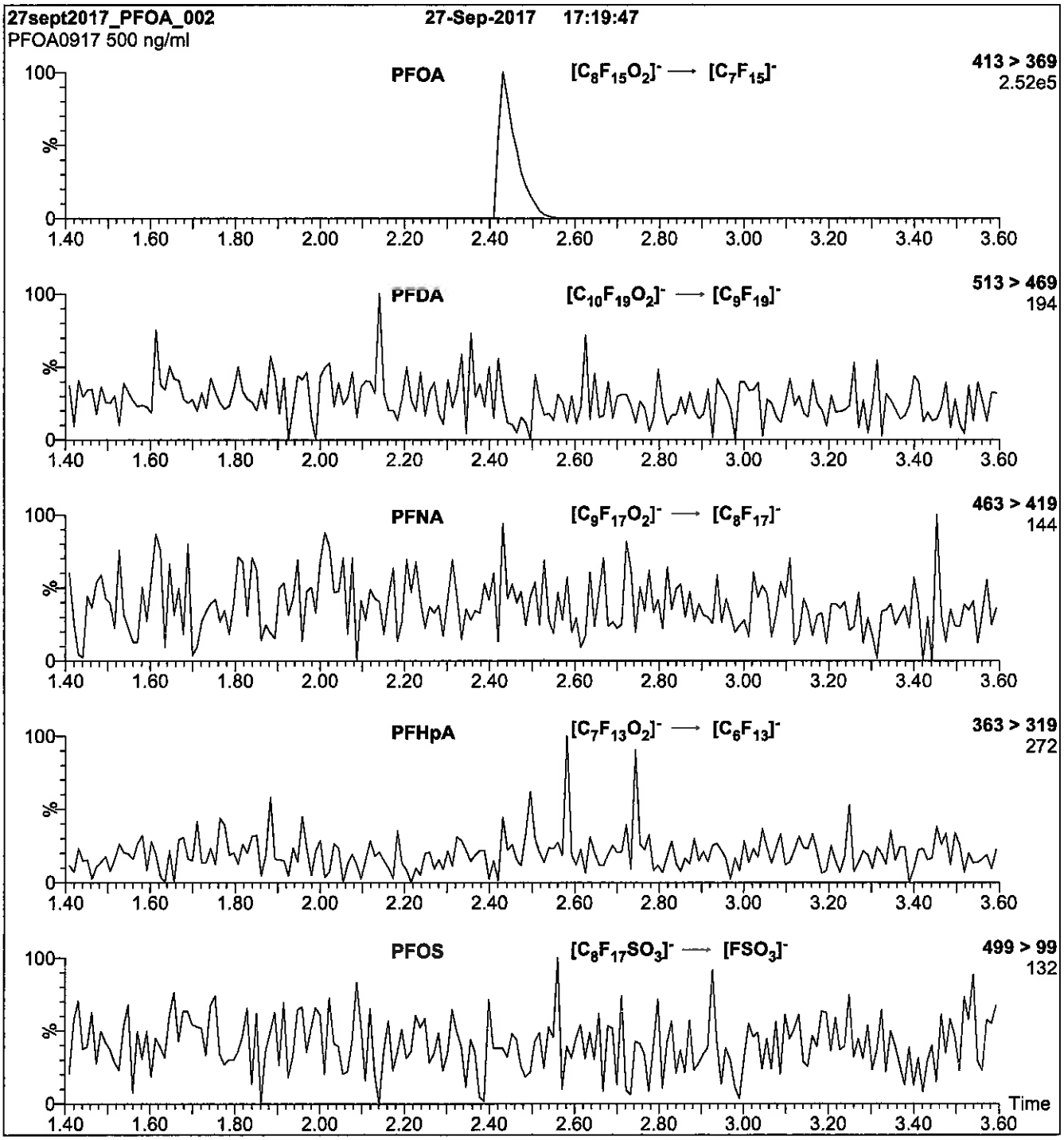
Flow: 300 µl/min

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

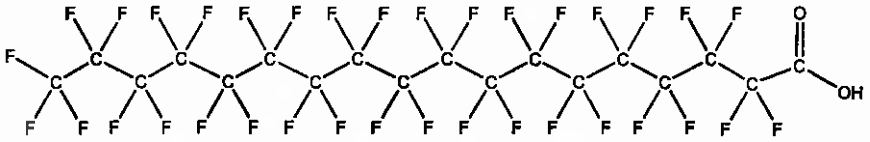
LCPFODA_00010

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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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.

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

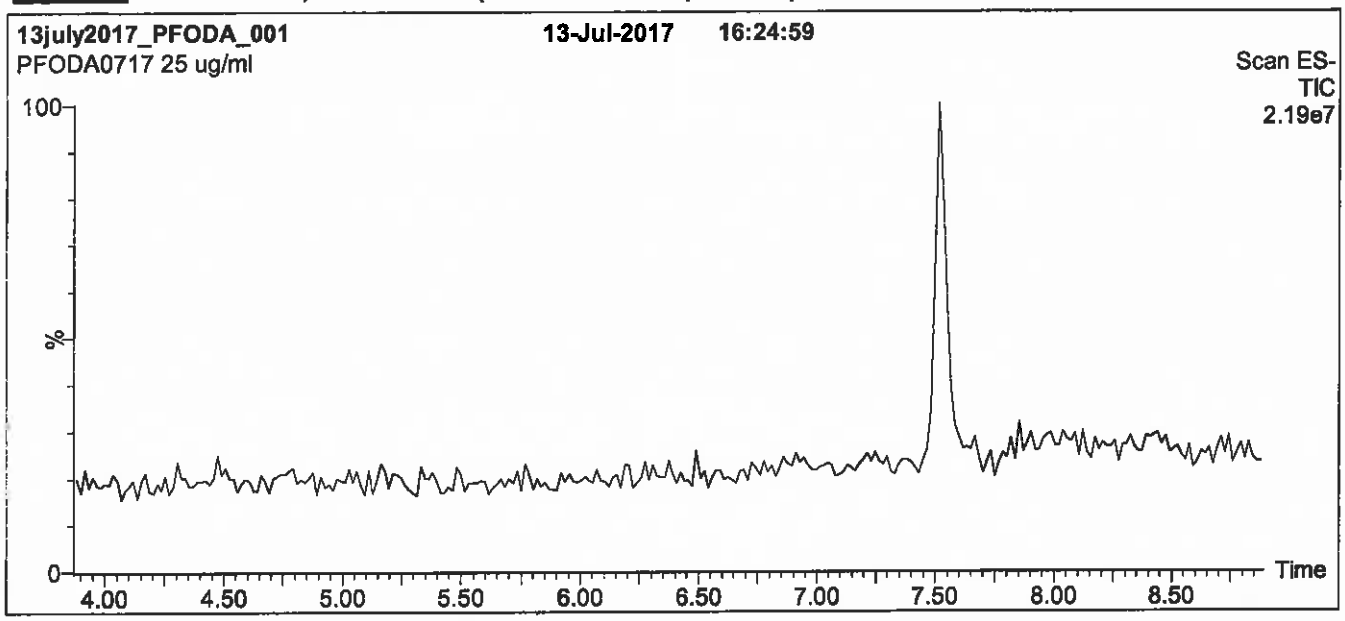
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

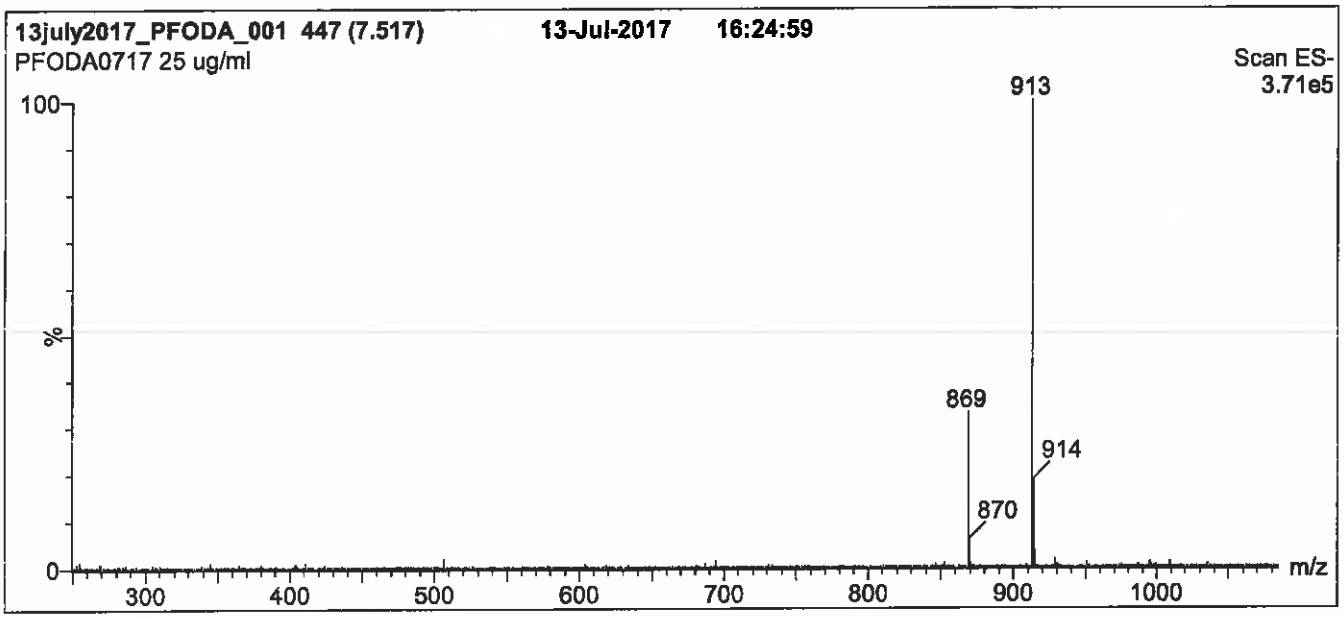
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Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





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

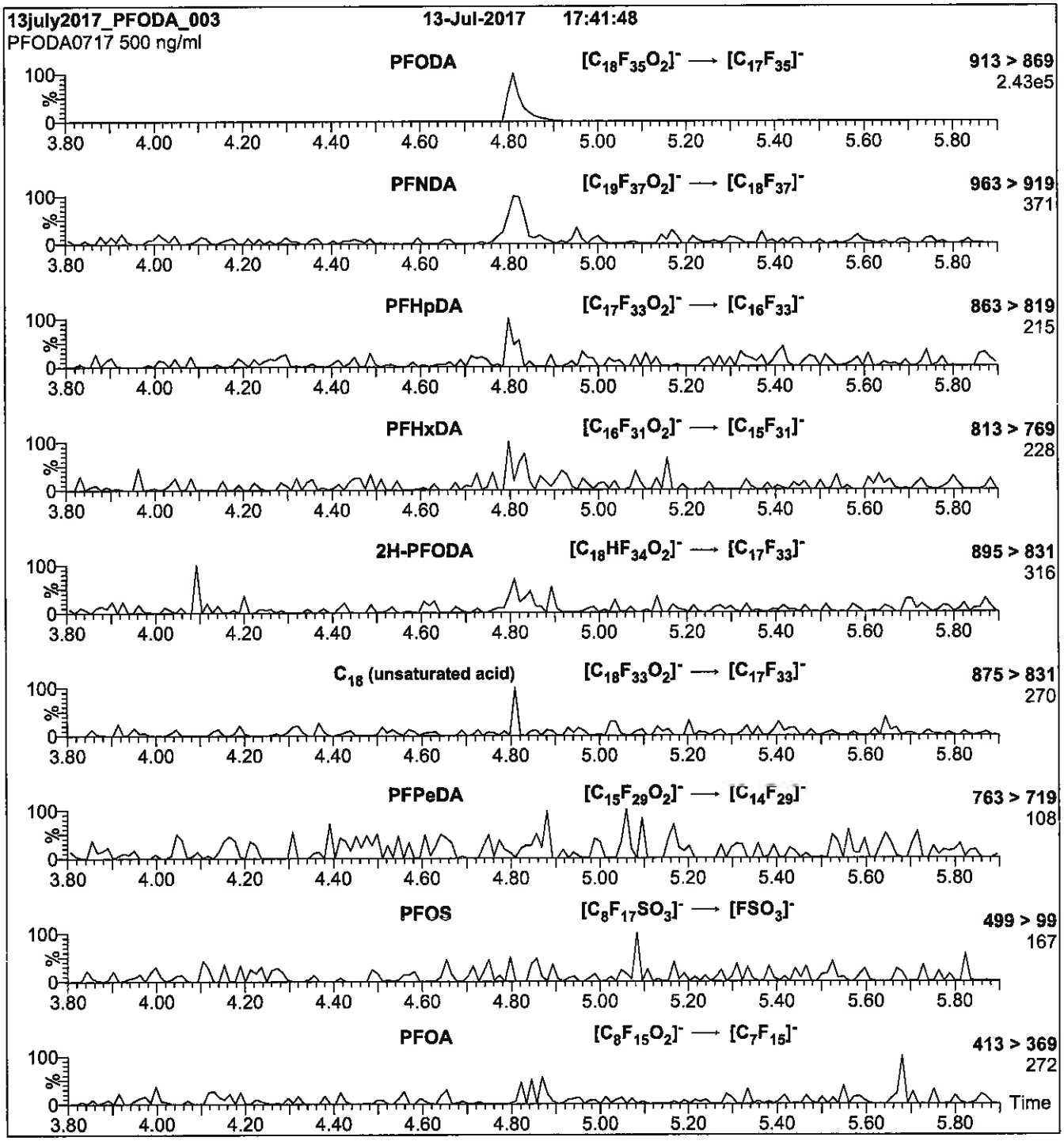
Flow: 300 µl/min

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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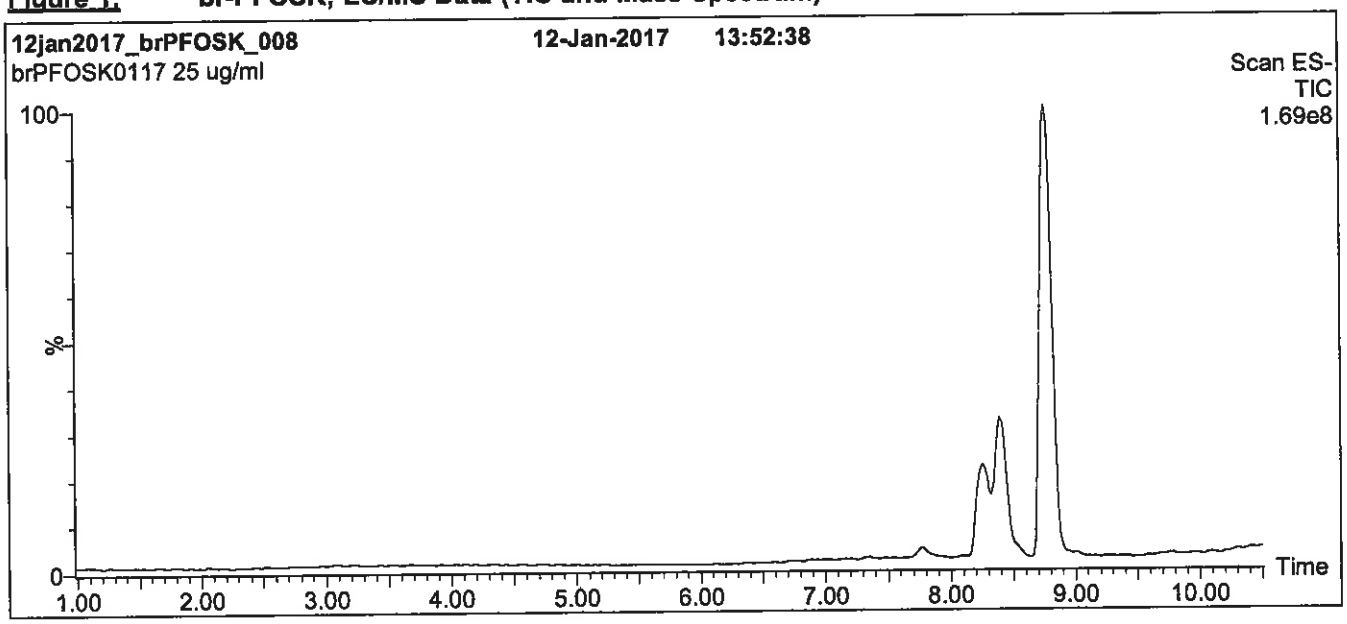
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

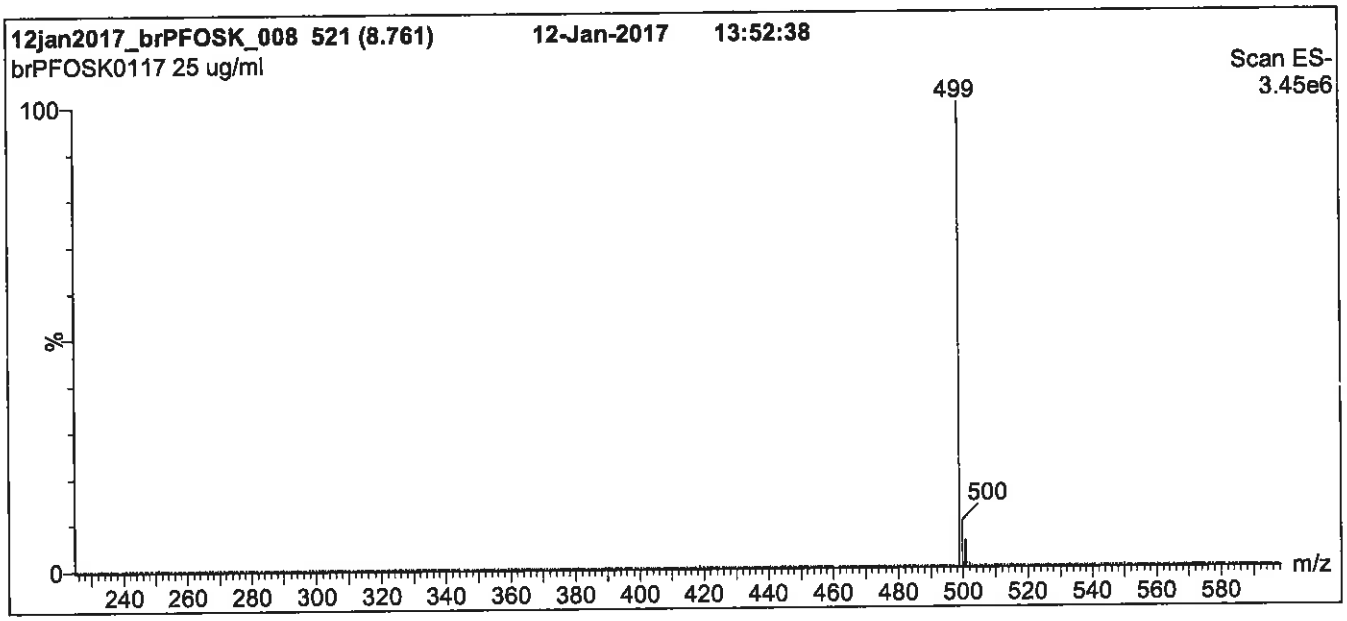
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	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	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07

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

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

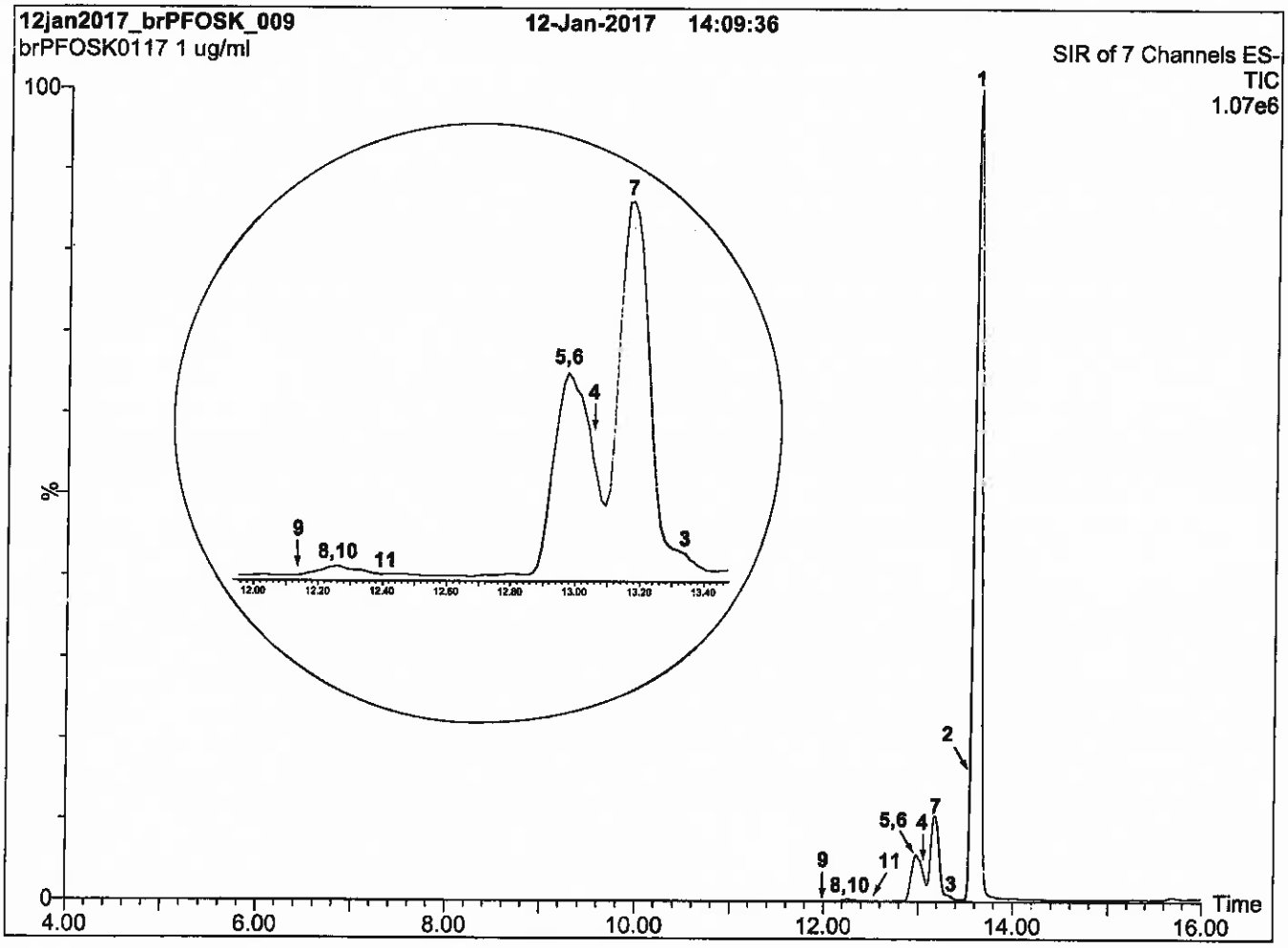
Flow: 300 µl/min

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

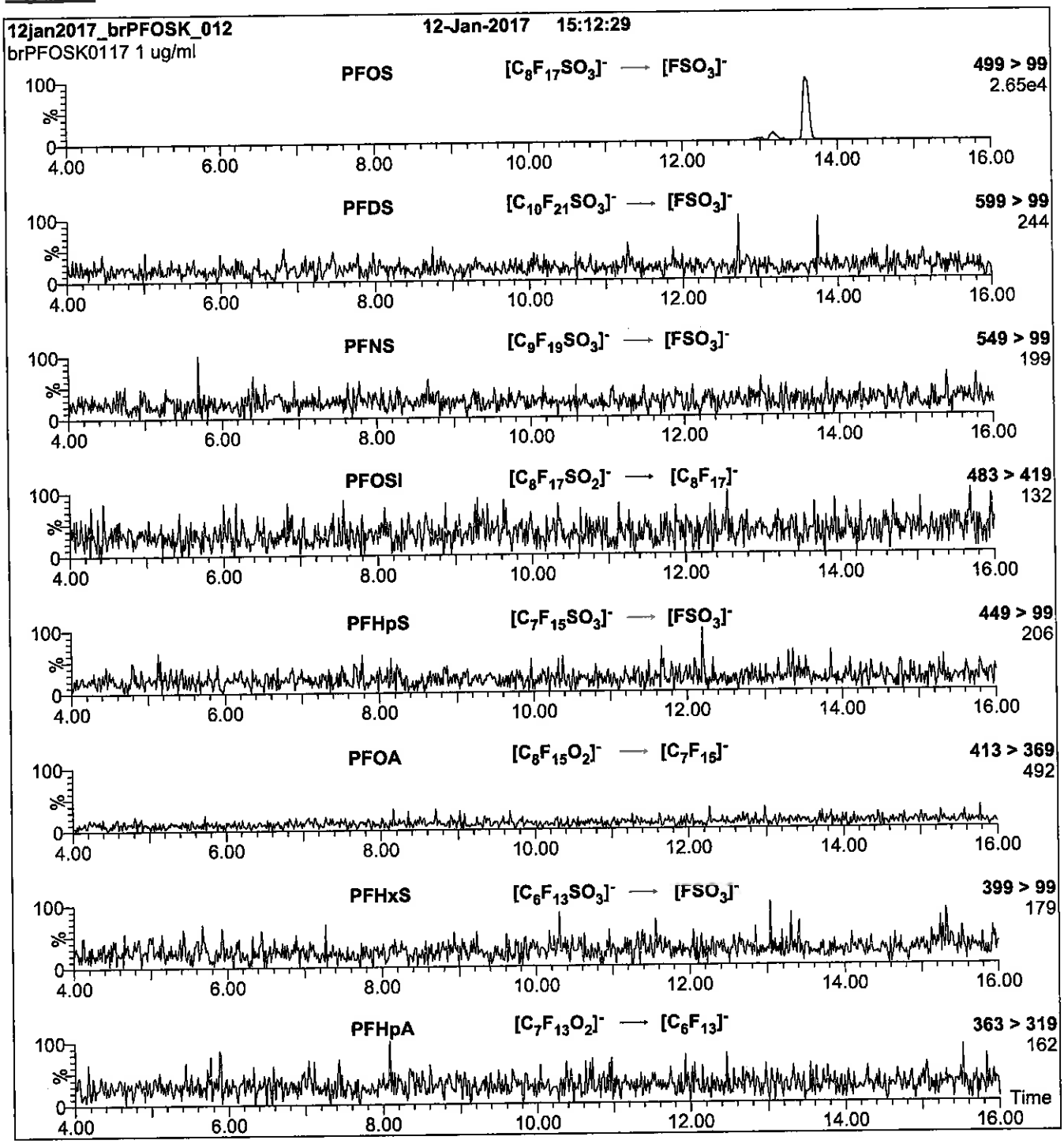
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

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

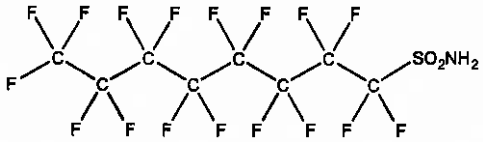
LCPFOSA_00013

R: 2/16/16 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

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QUALITY MANAGEMENT:

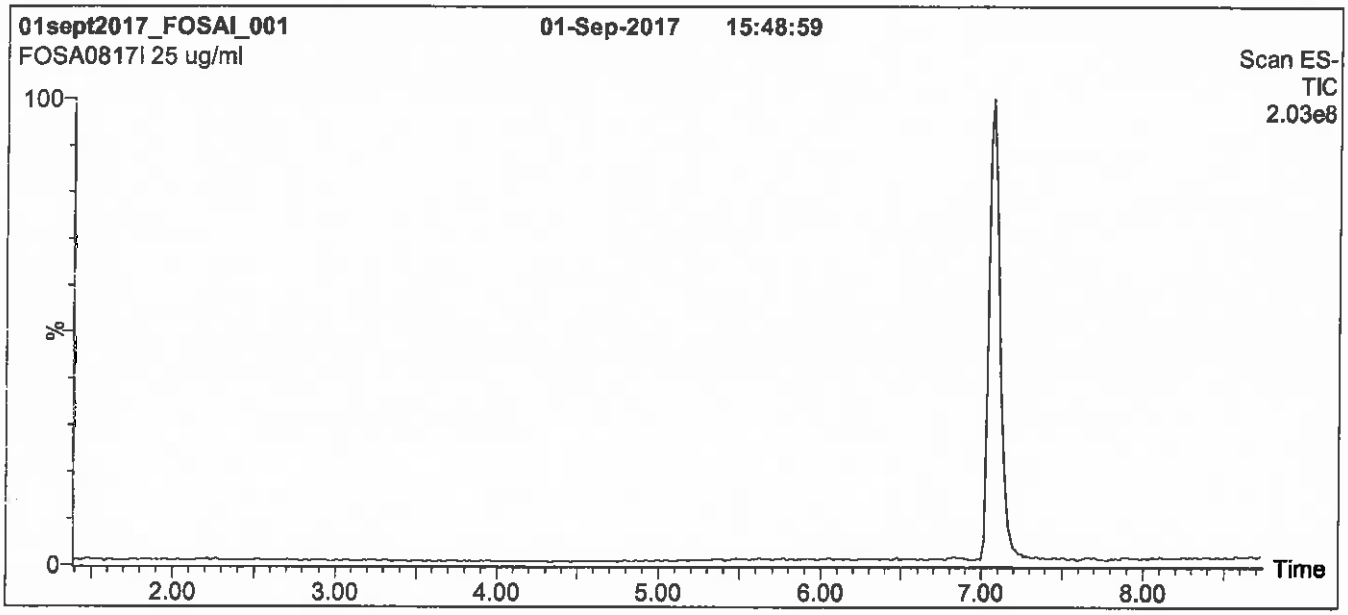
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

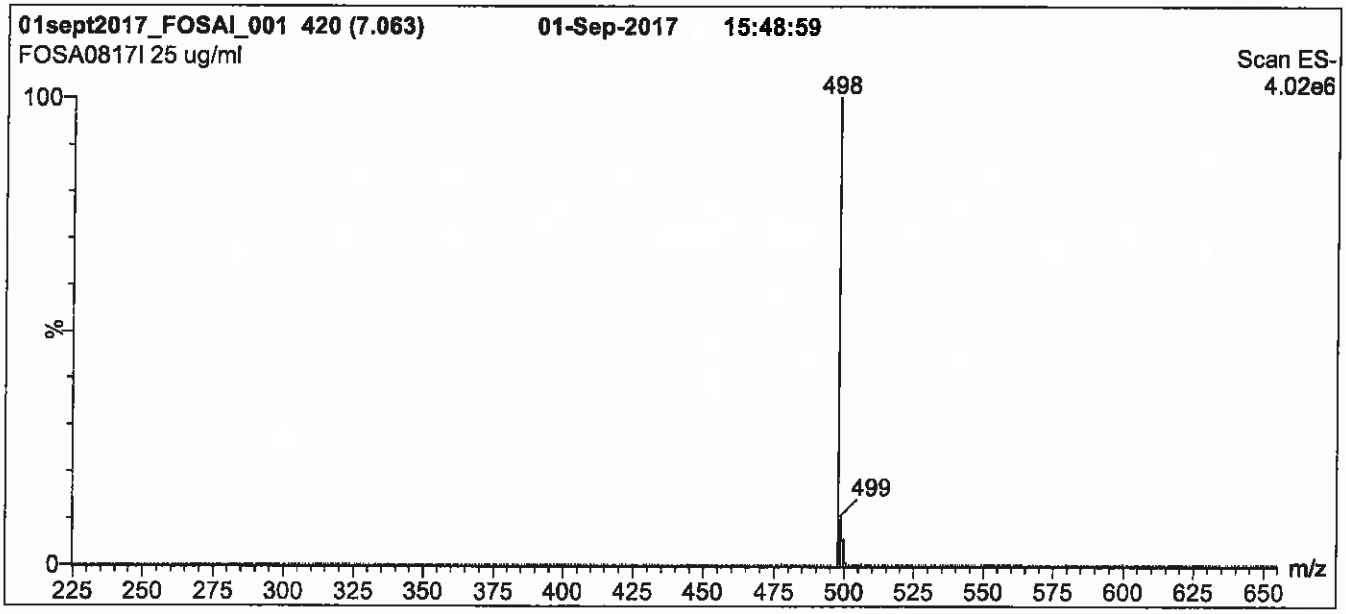
CALA

ANAB ACCREDITED

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Figure 1: **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

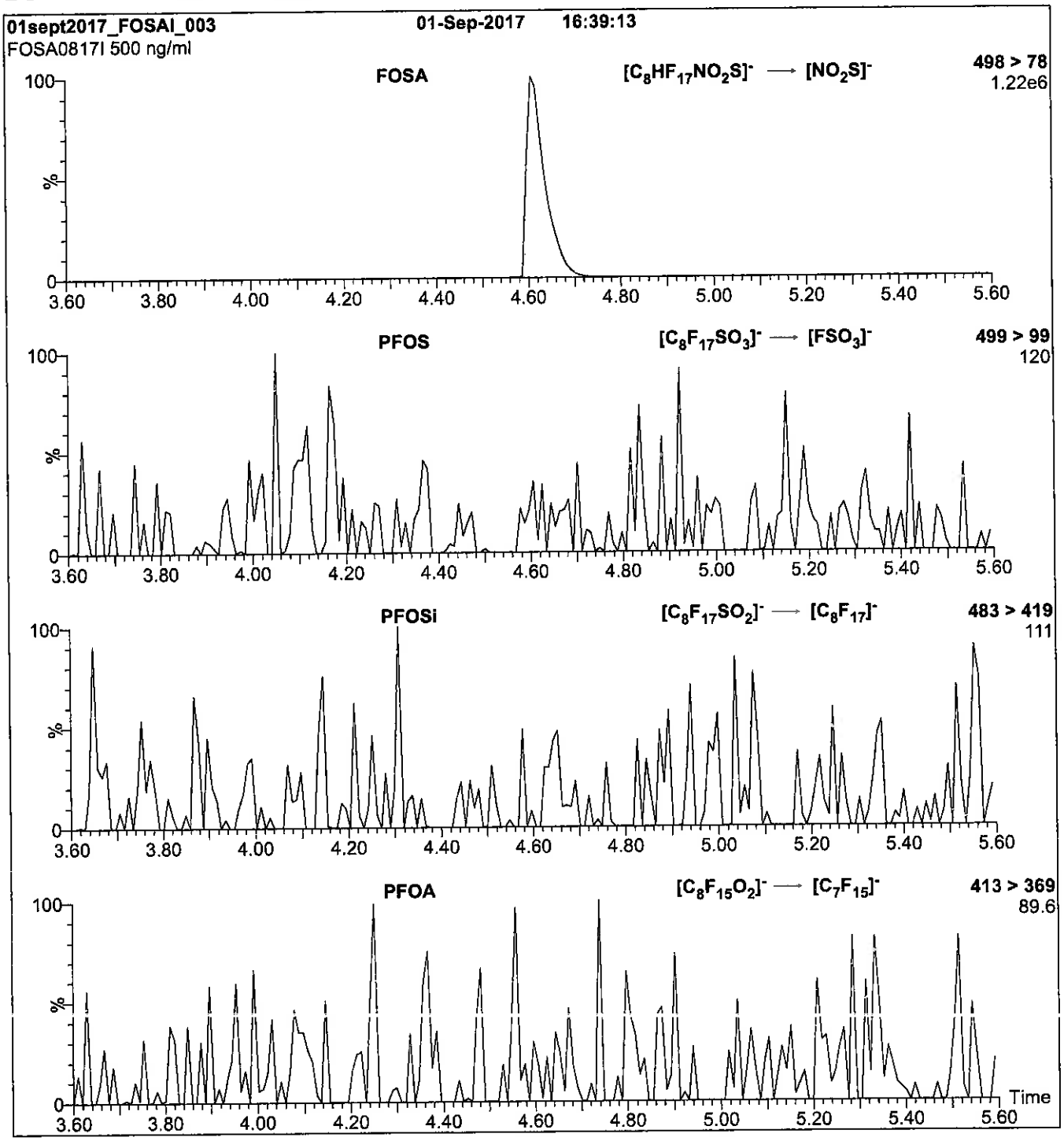
Flow: 300 µl/min

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

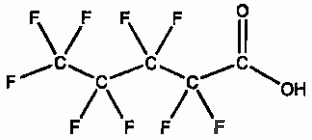
LCPFPeA_00010

P: 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

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:

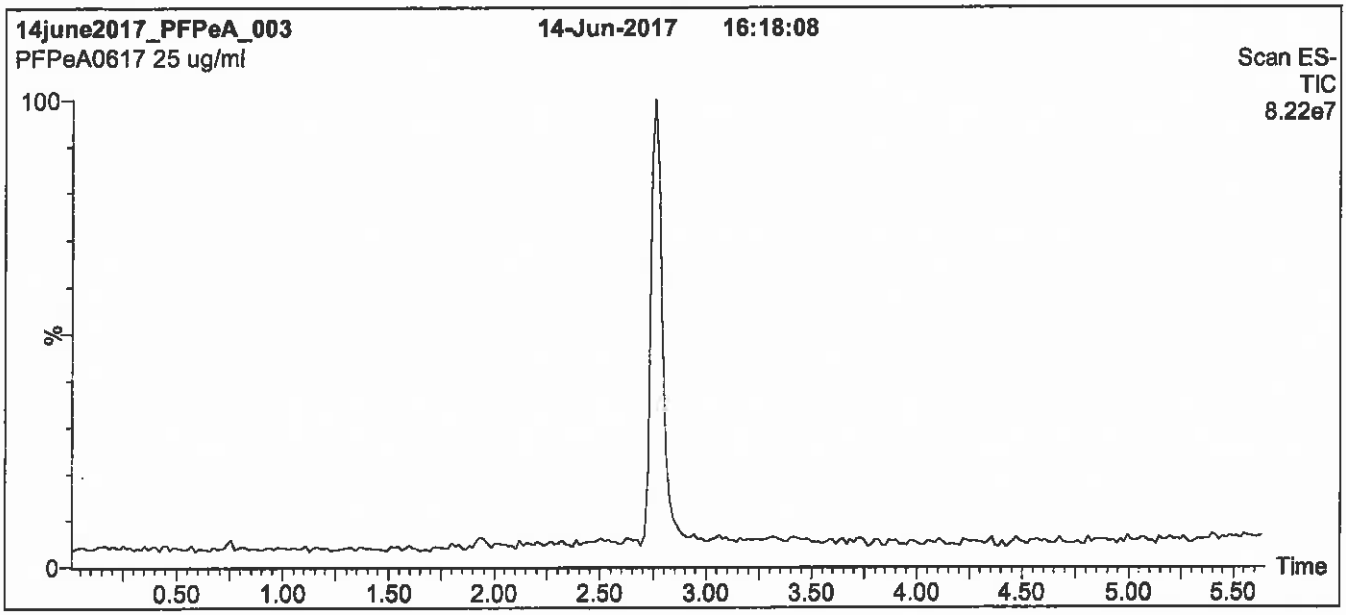
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

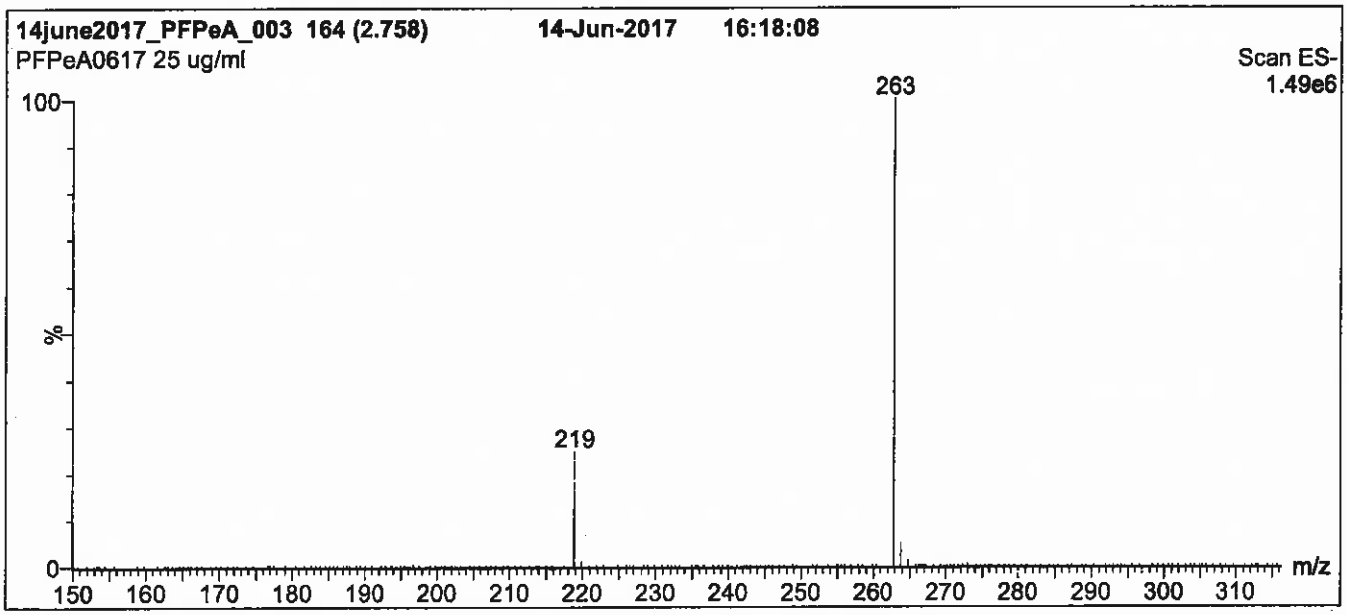
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

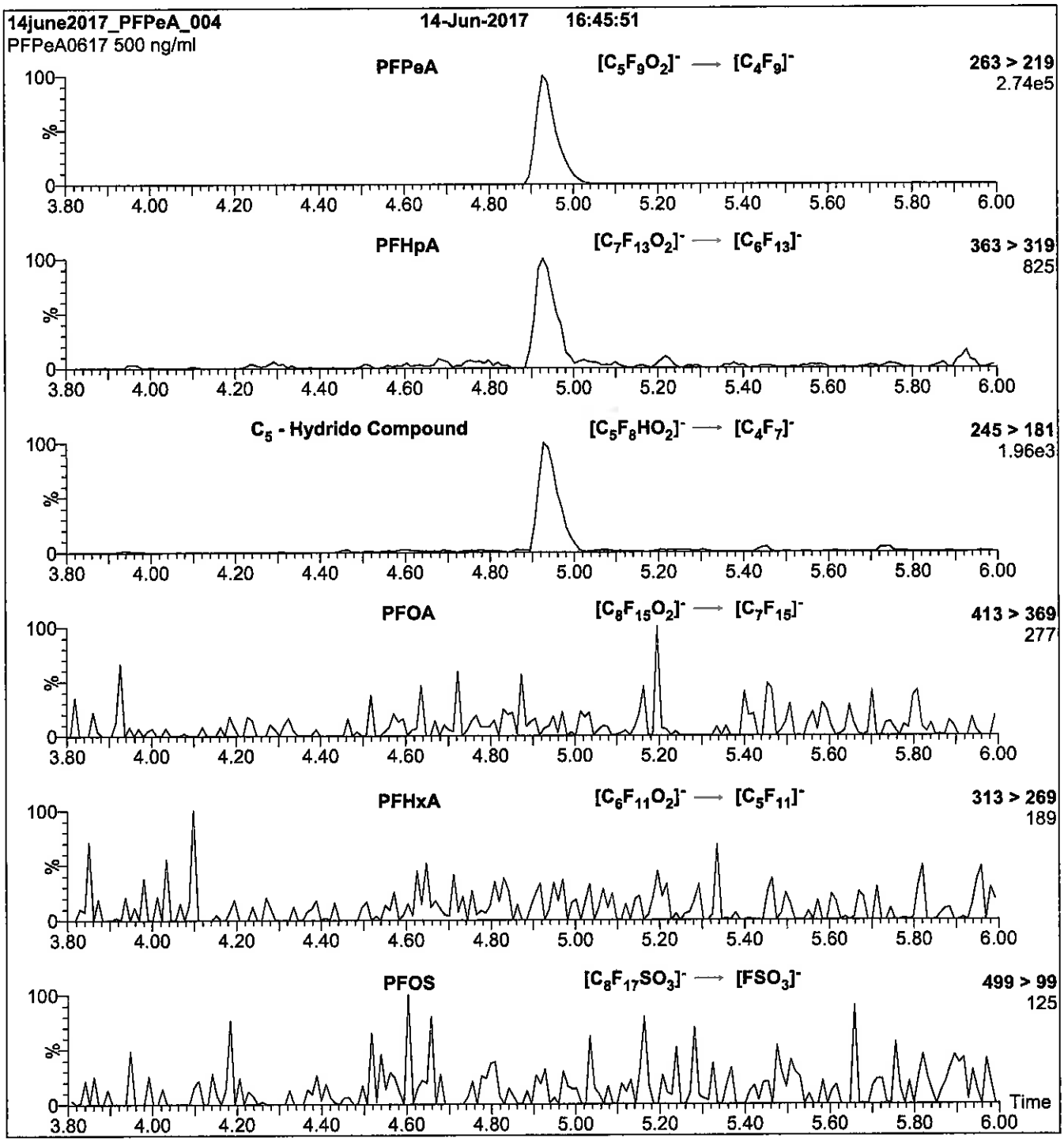
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-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

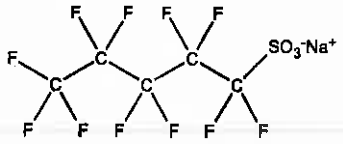
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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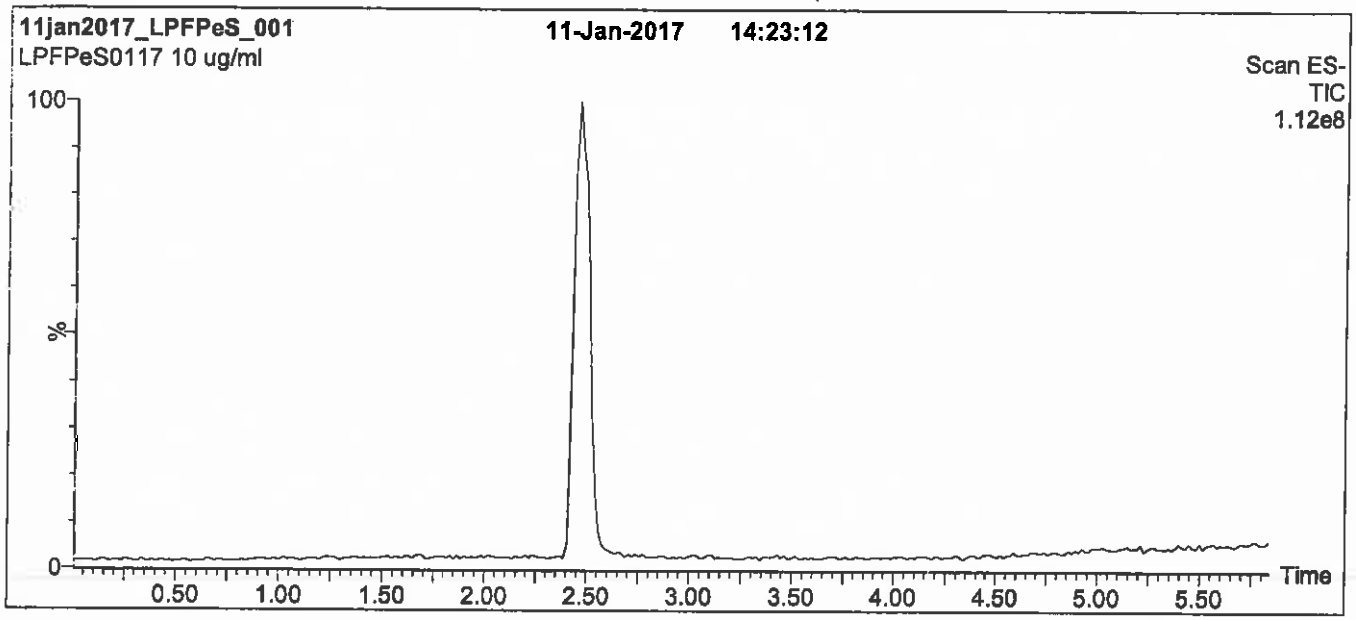
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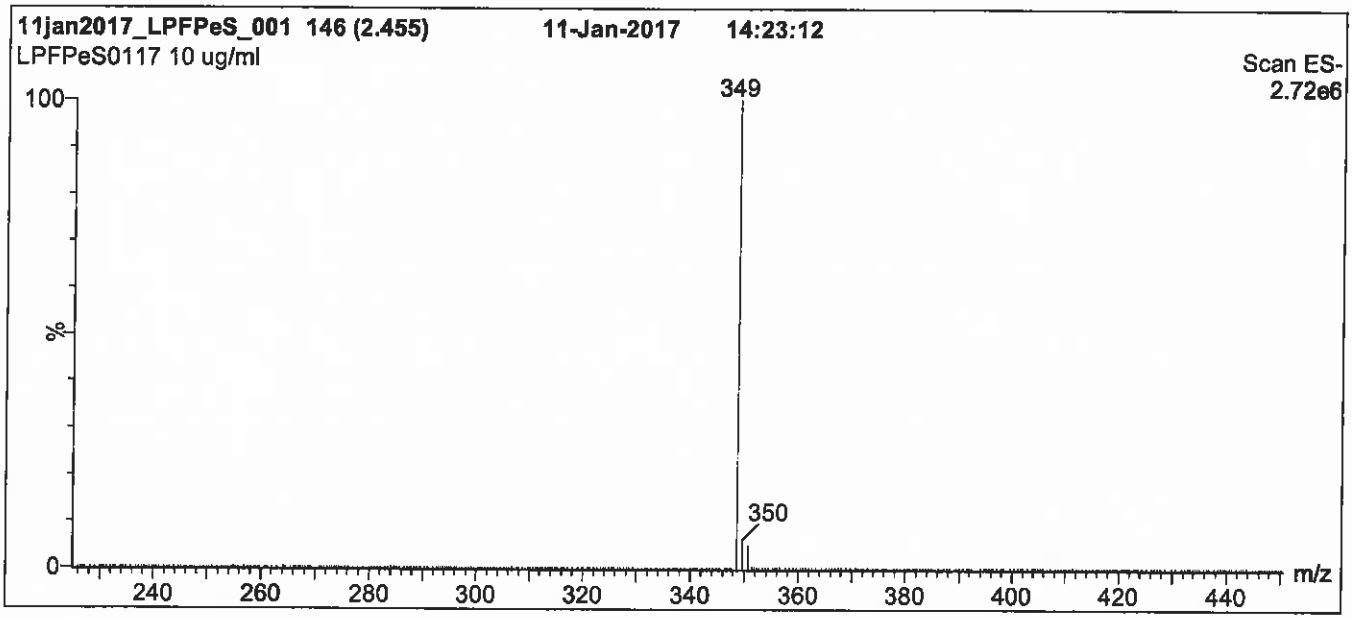
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Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





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

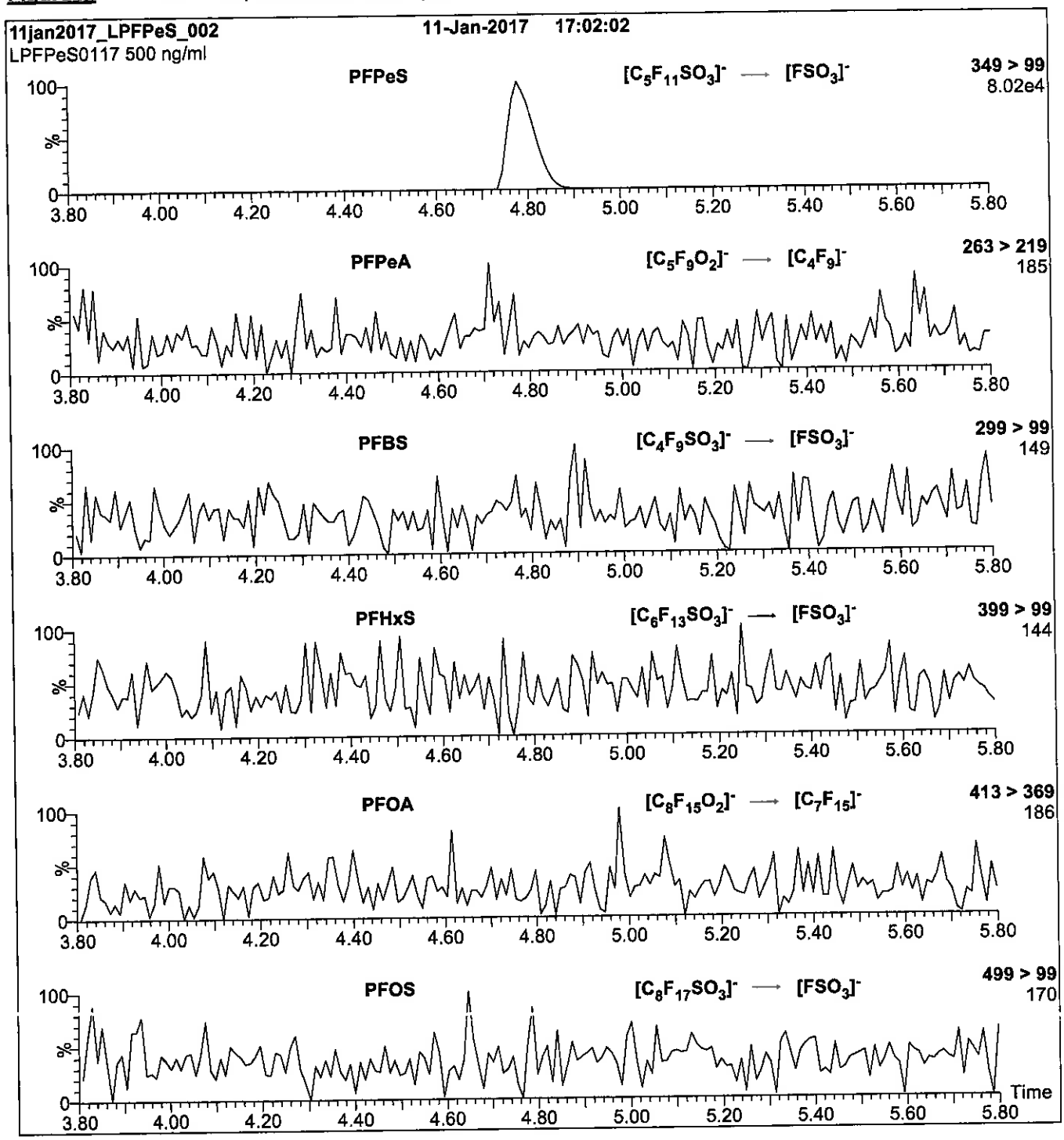
Flow: 300 µl/min

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

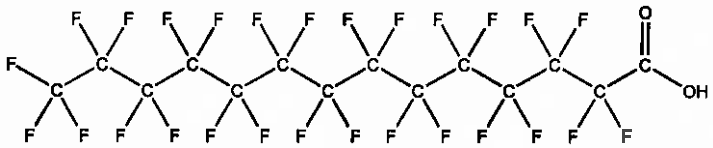
LCPFTeDA_00009

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HOMOGENEITY:

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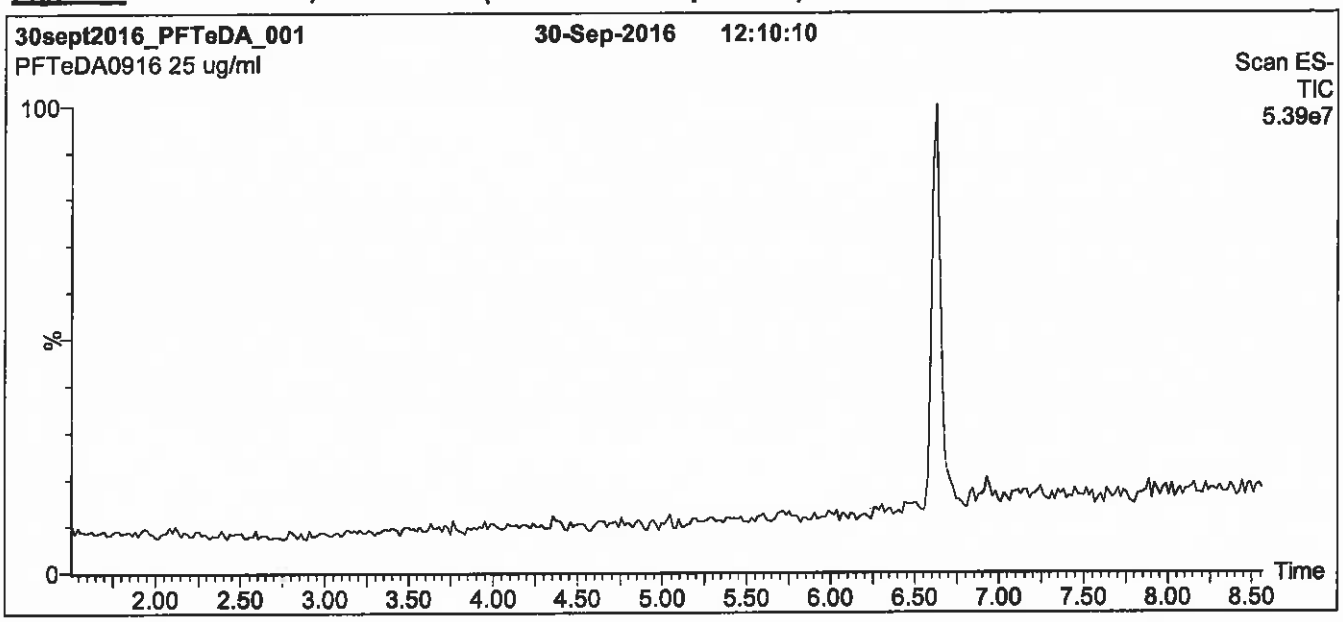
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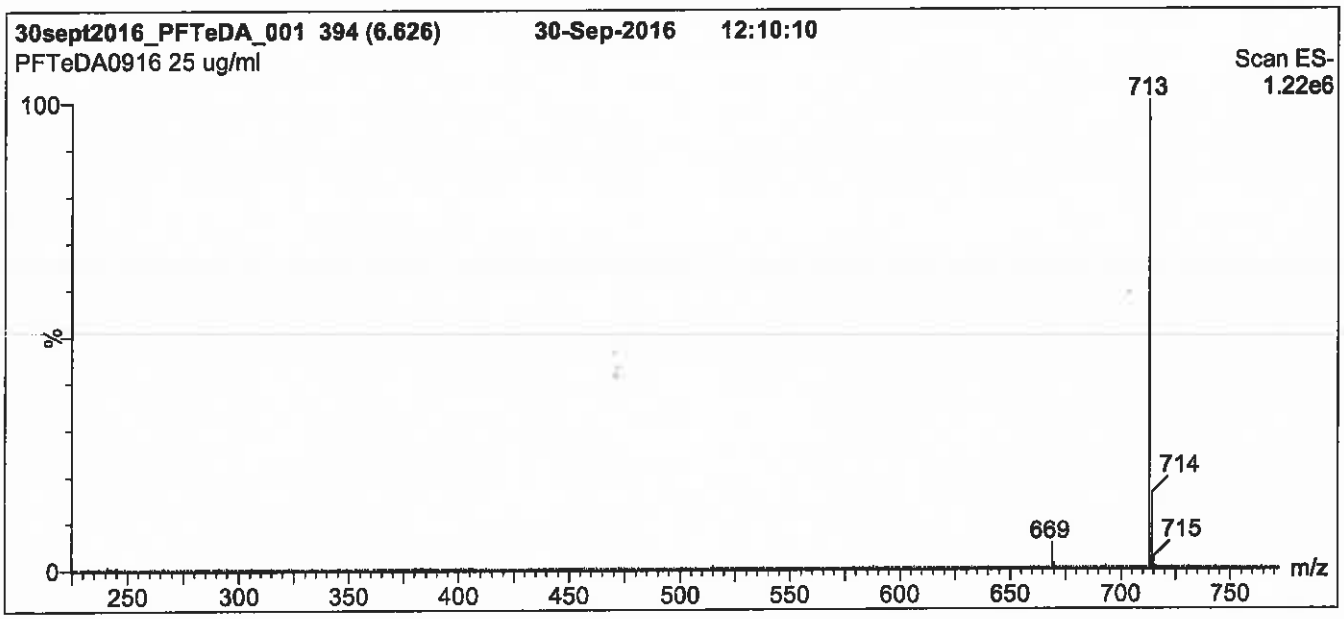
CALA

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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

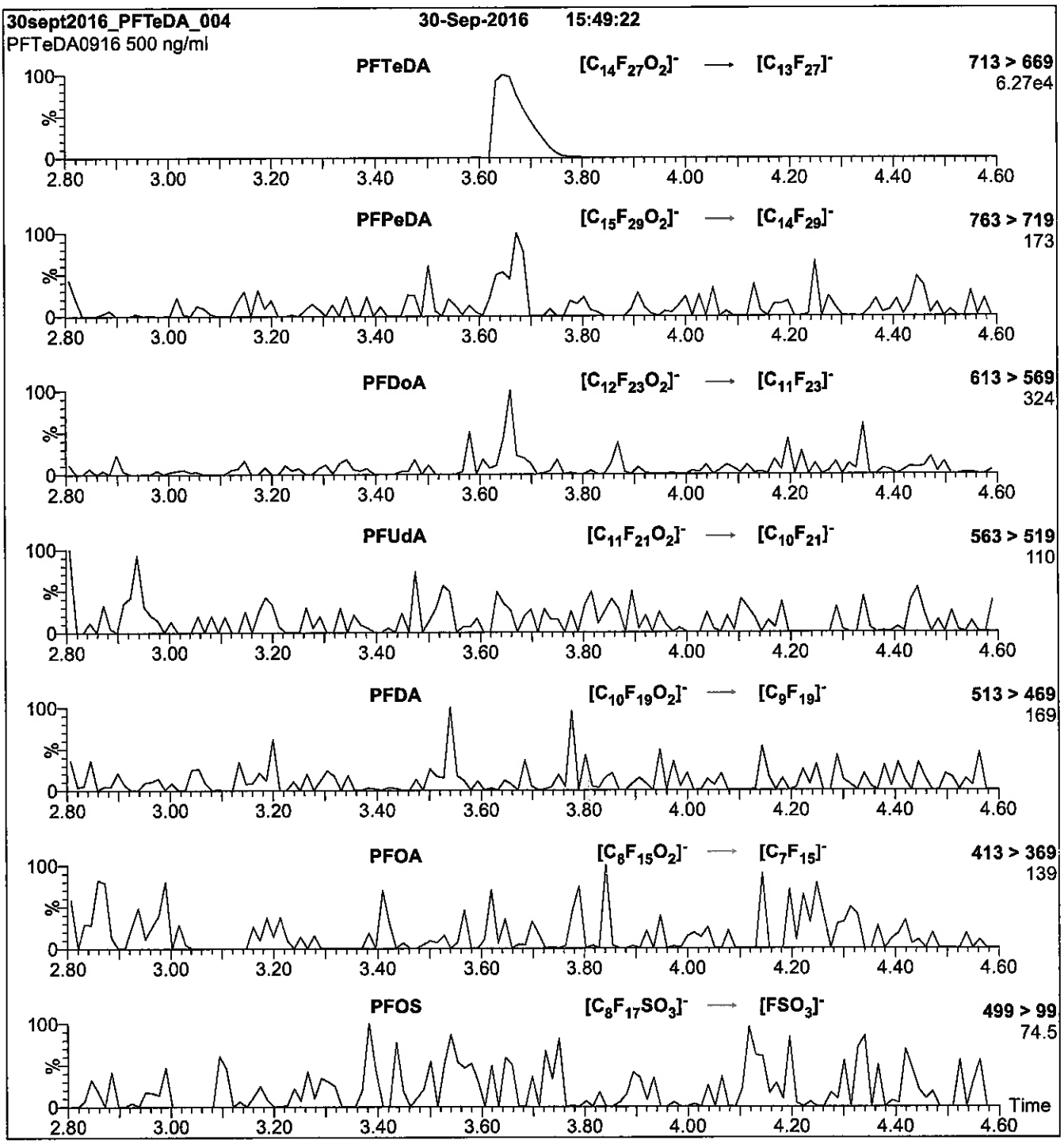
Flow: 300 µl/min

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

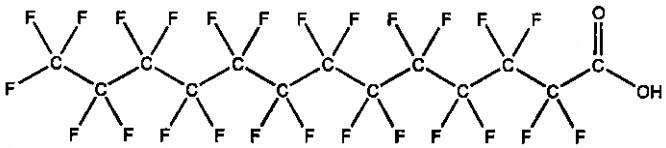
LCPFTrDA_00009

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
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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:

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:

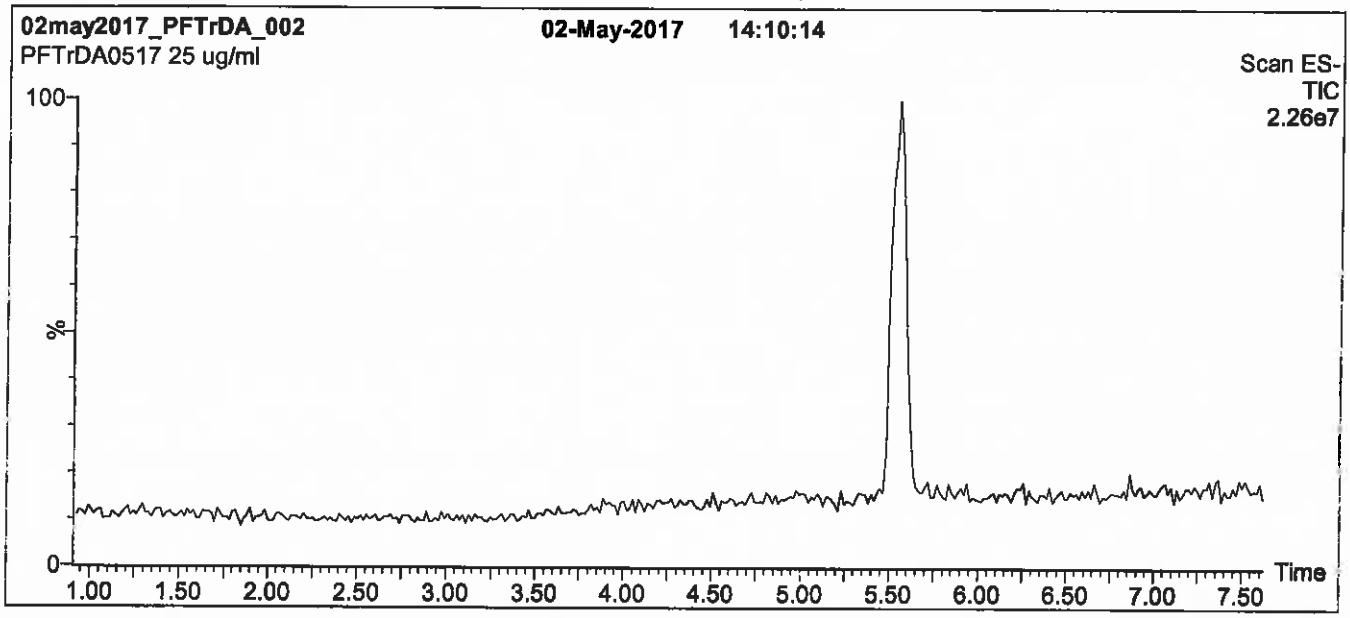
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

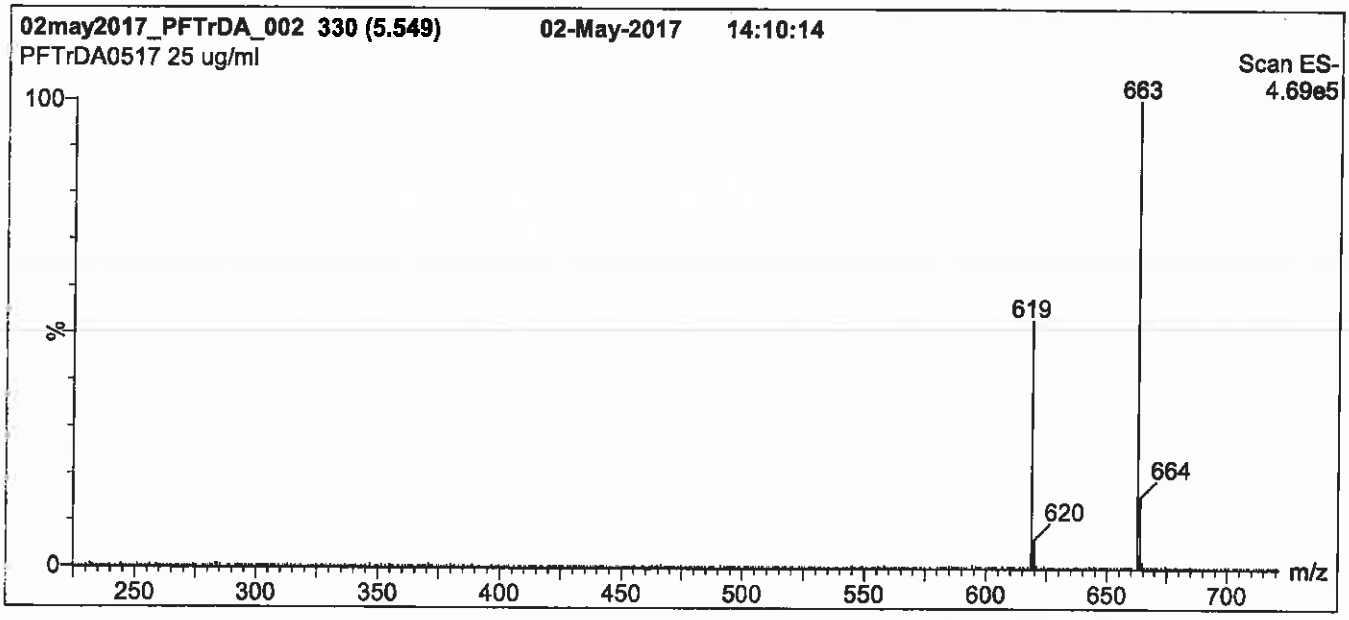
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

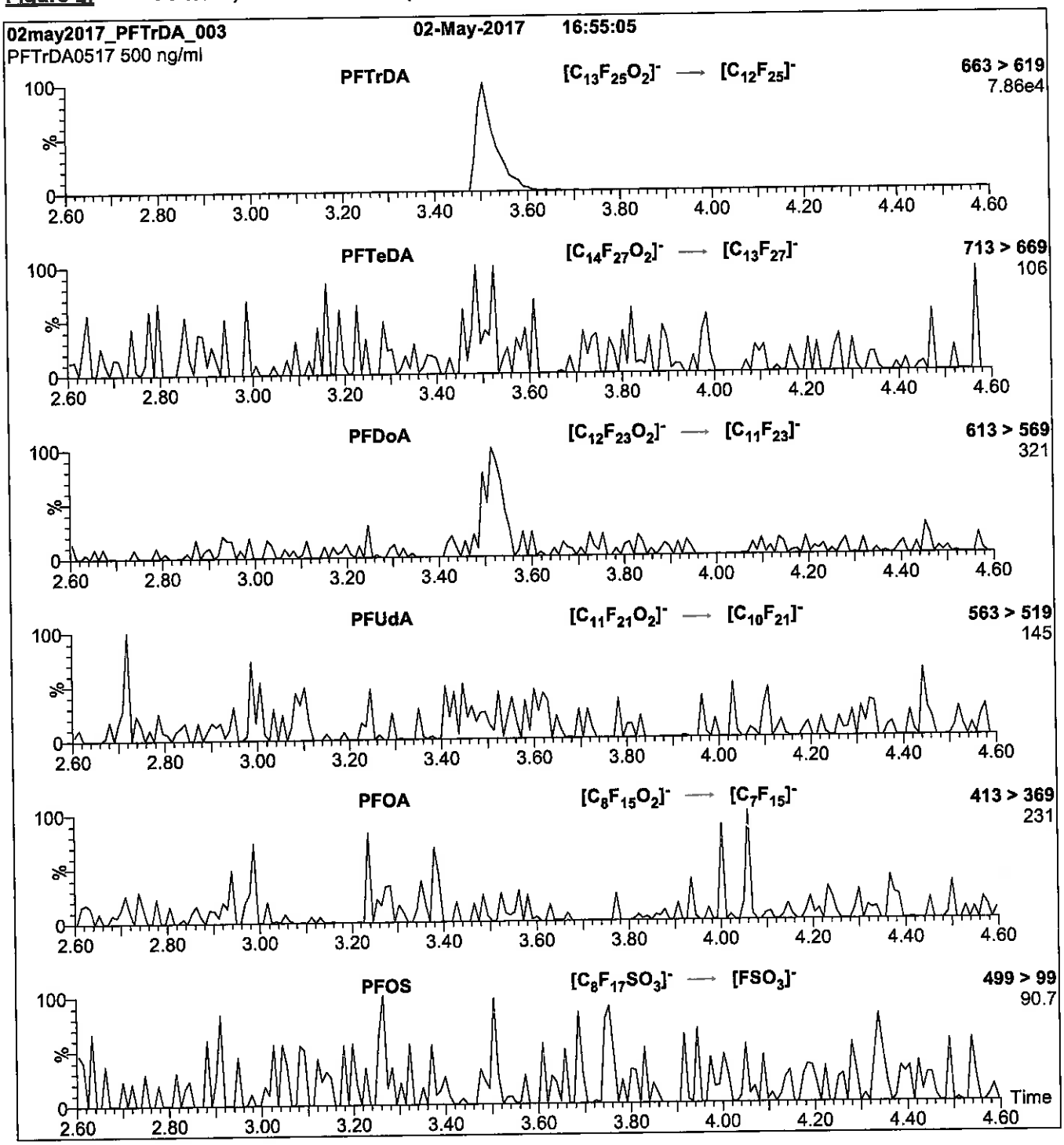
Flow: 300 µl/min .

MS Parameters

Experiment: Full Scan (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

LCPFUdA_00008

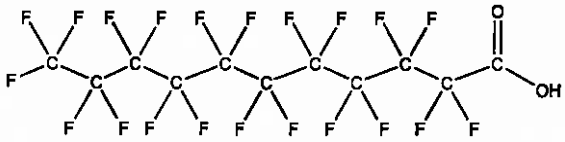
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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid
LOT NUMBER: PFUdA1016

STRUCTURE:
CAS #: 2058-94-8



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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/18/2016
EXPIRY DATE: (mm/dd/yyyy) 10/18/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

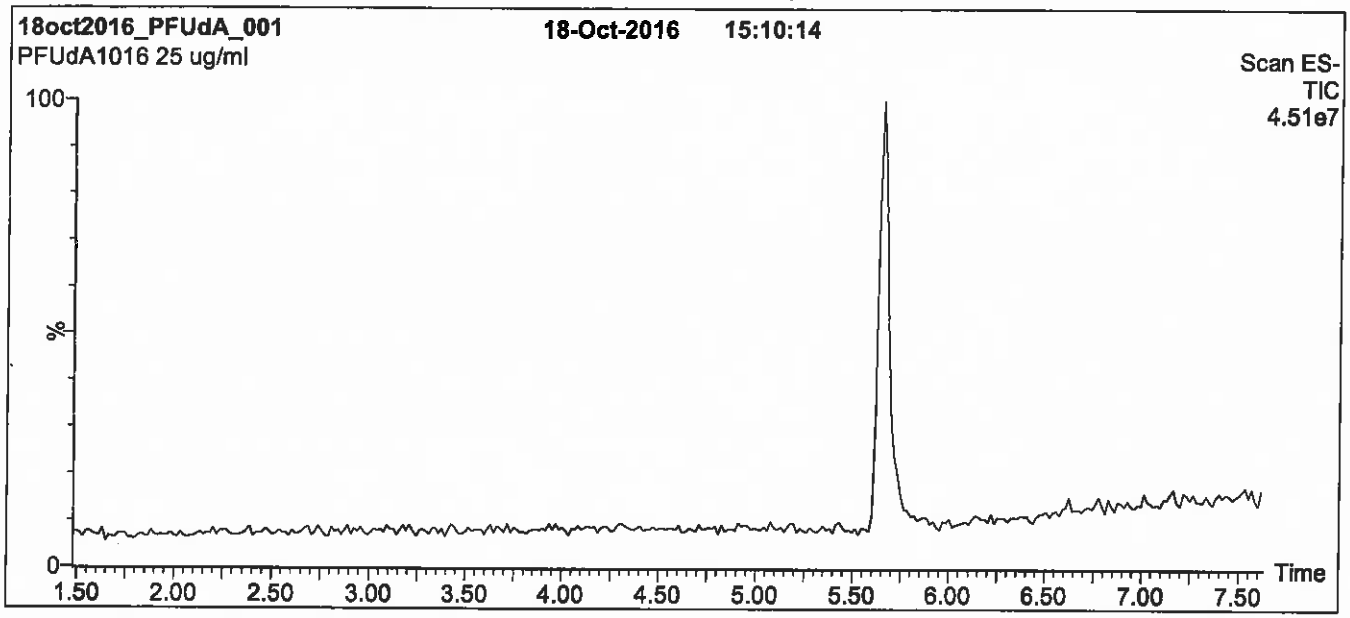
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

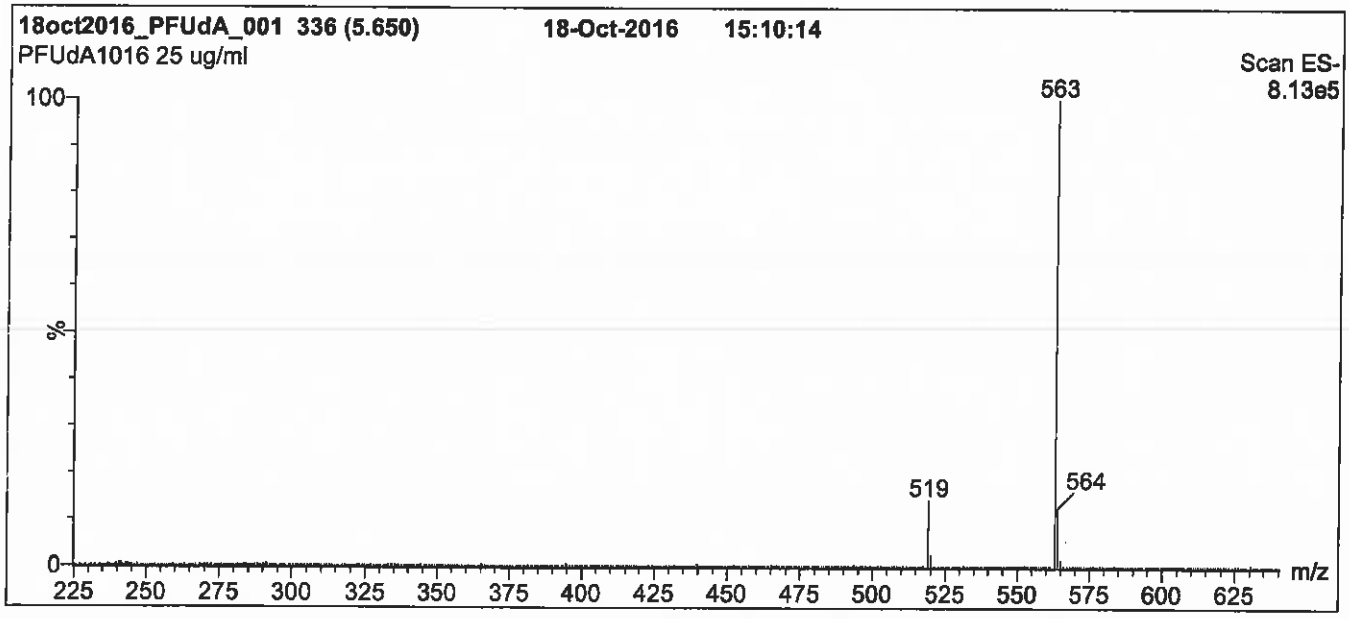
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

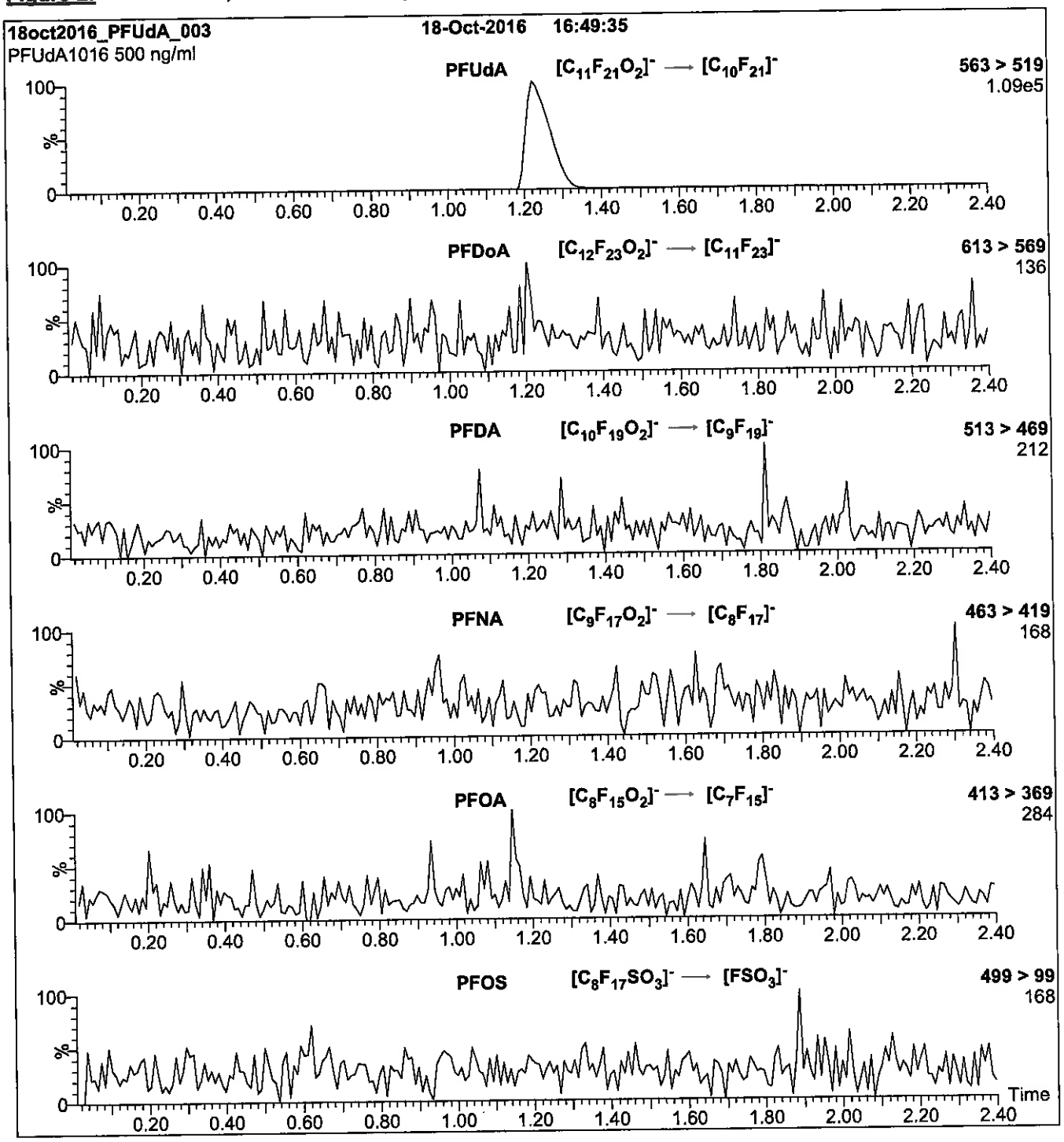
Flow: 300 µl/min

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.: 320-41998-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #	PFOS #	PFDA #
TW01S-20180713	320-41998-1	95	93	96	94	100	109	88	101
TW02S-20180713	320-41998-2	84	97	102	90	100	116	87	99
TW03S-20180713	320-41998-3	84	92	97	90	98	99	88	107
TW03S-20180713 DL	320-41998-3 DL	73	82	95	80	94	101	82	94
TW04S-20180713	320-41998-4	87	90	97	88	93	96	79	100
TW04S-20180713 DL	320-41998-4 DL	74	88	99	84	101	97	77	94
DUP02-20180713	320-41998-5	90	96	99	91	107	105	85	103
EB02-20180713	320-41998-6	76	84	88	75	99	103	82	97
I012MW07S-20180713	320-41998-7	124	75	56	73	67	85	70	93
I012MW07S-20180713 DL	320-41998-7 DL	94	67	57	60	66	69	63	68
	MB 320-239407/1-A	80	88	88	83	93	95	83	94
	LCS 320-239407/2-A	72	80	87	73	93	96	76	97
TW03S-20180713 MS	320-41998-3 MS	86	90	97	90	97	98	87	102
TW03S-20180713 MS DL	320-41998-3 MS DL	76	88	97	83	99	99	85	104
TW03S-20180713 MSD	320-41998-3 MSD	83	86	91	84	90	97	81	97
TW03S-20180713 MSD DL	320-41998-3 MSD DL	72	82	93	79	97	89	80	95

	QC LIMITS
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
PFOS = 13C4 PFOS	50-150
PFNA = 13C5 PFNA	50-150
PFDA = 13C2 PFDA	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.: 320-41998-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	d3NMFOS #	d5NEFOS #	PFUnA #	PFDoA #	PFTDA #
TW01S-20180713	320-41998-1	93	91	86	78	74
TW02S-20180713	320-41998-2	84	84	84	72	72
TW03S-20180713	320-41998-3	108	102	103	108	117
TW03S-20180713 DL	320-41998-3 DL	98	102	88	83	89
TW04S-20180713	320-41998-4	89	92	89	82	83
TW04S-20180713 DL	320-41998-4 DL	88	82	78	74	73
DUP02-20180713	320-41998-5	81	85	75	74	91
EB02-20180713	320-41998-6	99	97	98	95	93
I012MW07S-20180713	320-41998-7	106	99	89	88	89
I012MW07S-20180713 DL	320-41998-7 DL	92	104	63	55	63
	MB 320-239407/1-A	102	92	88	93	93
	LCS 320-239407/2-A	95	94	90	94	90
TW03S-20180713 MS	320-41998-3 MS	108	103	95	102	109
TW03S-20180713 MS DL	320-41998-3 MS DL	103	103	95	89	89
TW03S-20180713 MSD	320-41998-3 MSD	98	94	89	96	101
TW03S-20180713 MSD DL	320-41998-3 MSD DL	95	89	86	87	82

	QC LIMITS
d3NMFOS = d3-NMeFOSAA	50-150
d5NEFOS = d5-NEtFOSAA	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.: 320-41998-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.08.11LA9A_008.d

Lab ID: LCS 320-239407/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorohexanoic acid (PFHxA)	0.0400	0.0410	103	83-109	
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0424	106	80-113	
Perfluorooctanoic acid (PFOA)	0.0400	0.0381	95	80-107	
Perfluorononanoic acid (PFNA)	0.0400	0.0389	97	83-113	
Perfluorodecanoic acid (PFDA)	0.0400	0.0382	95	85-113	
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0380	95	76-105	
Perfluorododecanoic acid (PFDoA)	0.0400	0.0403	101	87-116	
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0379	95	75-129	
Perfluorotetradecanoic acid (PFTeA)	0.0400	0.0388	97	82-115	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0362	102	87-120	
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0358	98	81-106	M
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0366	99	82-112	
13C2 PFHxA	0.100	0.0803	80	50-150	
13C4-PFHpA	0.100	0.0871	87	50-150	
13C4 PFOA	0.100	0.0934	93	50-150	
13C5 PFNA	0.100	0.0959	96	50-150	
13C2 PFDA	0.100	0.0965	97	50-150	
13C2 PFUnA	0.100	0.0903	90	50-150	
13C2 PFDoA	0.100	0.0942	94	50-150	
18O2 PFHxS	0.0946	0.0686	73	50-150	
13C2-PFTeDA	0.100	0.0903	90	50-150	
13C4 PFOS	0.0956	0.0726	76	50-150	
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0400	0.0393	98	82-111	
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0400	0.0413	103	80-109	
13C3-PFBS	0.0930	0.0673	72	50-150	
d5-NEtFOSAA	0.100	0.0937	94	50-150	
d3-NMeFOSAA	0.100	0.0945	95	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.08.11LA9A_012.d

Lab ID: 320-41998-3 MS Client ID: TW03S-20180713 MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Perfluorohexanoic acid (PFHxA)	0.0377	0.23	0.260	75	83-109	H 4
Perfluoroheptanoic acid (PFHpA)	0.0377	0.084	0.119	93	80-113	H
Perfluorooctanoic acid (PFOA)	0.0377	0.41	0.433	62	80-107	H J1 4 M
Perfluorononanoic acid (PFNA)	0.0377	0.0035	0.0382	92	83-113	H
Perfluorodecanoic acid (PFDA)	0.0377	0.00089 U	0.0379	101	85-113	H
Perfluoroundecanoic acid (PFUnA)	0.0377	0.0013 U	0.0379	101	76-105	H
Perfluorododecanoic acid (PFDoA)	0.0377	0.0013 U	0.0389	103	87-116	H
Perfluorotridecanoic Acid (PFTriA)	0.0377	0.0027 U	0.0394	105	75-129	H
Perfluorotetradecanoic acid (PFTeA)	0.0377	0.0027 U	0.0353	94	82-115	H
Perfluorobutanesulfonic acid (PFBS)	0.0333	0.051	0.0823	94	87-120	H
Perfluorohexanesulfonic acid (PFHxS)	0.0343	0.22	0.247	86	81-106	H 4
Perfluorooctanesulfonic acid (PFOS)	0.0350	0.59	0.600	25	82-112	H J1 4
13C2 PFHxA	0.0942	0.082	0.0848	90	50-150	
13C4-PFHpA	0.0942	0.087	0.0913	97	50-150	
13C4 PFOA	0.0942	0.087	0.0912	97	50-150	
13C5 PFNA	0.0942	0.089	0.0926	98	50-150	
13C2 PFDA	0.0942	0.095	0.0959	102	50-150	
13C2 PFUnA	0.0942	0.092	0.0897	95	50-150	
13C2 PFDoA	0.0942	0.096	0.0962	102	50-150	
18O2 PFHxS	0.0891	0.076	0.0804	90	50-150	
13C2-PFTeDA	0.0942	0.10	0.102	109	50-150	
13C4 PFOS	0.0900	0.076	0.0784	87	50-150	
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0377	0.0089 U	0.0356	94	82-111	H
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0377	0.0089 U	0.0379	101	80-109	H
13C3-PFBS	0.0876	0.070	0.0756	86	50-150	
d5-NEtFOSAA	0.0942	0.092	0.0970	103	50-150	
d3-NMeFOSAA	0.0942	0.097	0.101	108	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.08.12LLA_010.d

Lab ID: 320-41998-3 MS DL Client ID: TW03S-20180713 MS DL

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Perfluorohexanoic acid (PFHxA)	0.0377	0.24	0.275	93	83-109	H 4 D
Perfluoroheptanoic acid (PFHpA)	0.0377	0.085	0.125	106	80-113	H D
Perfluorooctanoic acid (PFOA)	0.0377	0.47	0.516	112	80-107	H 4 D M
Perfluorononanoic acid (PFNA)	0.0377	0.0035 J	0.0417	101	83-113	H D
Perfluorodecanoic acid (PFDA)	0.0377	0.0045 U	0.0367	98	85-113	H D
Perfluoroundecanoic acid (PFUnA)	0.0377	0.0067 U	0.0356	95	76-105	H D
Perfluorododecanoic acid (PFDoA)	0.0377	0.0067 U	0.0401	106	87-116	H D
Perfluorotridecanoic Acid (PFTriA)	0.0377	0.013 U	0.0373	99	75-129	H D
Perfluorotetradecanoic acid (PFTeA)	0.0377	0.013 U	0.0383	102	82-115	H D
Perfluorobutanesulfonic acid (PFBS)	0.0333	0.051	0.0931	125	87-120	H J1 D
Perfluorohexanesulfonic acid (PFHxS)	0.0343	0.23	0.263	86	81-106	H 4 D
Perfluorooctanesulfonic acid (PFOS)	0.0350	0.67	0.681	18	82-112	H 4 D
13C2 PFHxA	0.0942	0.073	0.0825	88	50-150	
13C4-PFHpA	0.0942	0.085	0.0909	97	50-150	
13C4 PFOA	0.0942	0.084	0.0936	99	50-150	
13C5 PFNA	0.0942	0.091	0.0935	99	50-150	
13C2 PFDA	0.0942	0.084	0.0982	104	50-150	
13C2 PFUnA	0.0942	0.079	0.0895	95	50-150	
13C2 PFDoA	0.0942	0.074	0.0839	89	50-150	
18O2 PFHxS	0.0891	0.067	0.0742	83	50-150	
13C2-PFTeDA	0.0942	0.080	0.0837	89	50-150	
13C4 PFOS	0.0900	0.070	0.0766	85	50-150	
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0377	0.045 U	0.0374 J	99	82-111	H D
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0377	0.045 U	0.0402 J	107	80-109	H D
13C3-PFBS	0.0876	0.060	0.0662	76	50-150	
d5-NEtFOSAA	0.0942	0.092	0.0970	103	50-150	
d3-NMeFOSAA	0.0942	0.087	0.0970	103	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.08.11LA9A_013.d

Lab ID: 320-41998-3 MSD Client ID: TW03S-20180713 MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorohexanoic acid (PFHxA)	0.0367	0.247	43	5	30	83-109	H 4
Perfluoroheptanoic acid (PFHpA)	0.0367	0.117	89	2	30	80-113	H
Perfluorooctanoic acid (PFOA)	0.0367	0.453	117	4	30	80-107	H J1 4 M
Perfluorononanoic acid (PFNA)	0.0367	0.0388	96	2	30	83-113	H
Perfluorodecanoic acid (PFDA)	0.0367	0.0369	101	3	30	85-113	H
Perfluoroundecanoic acid (PFUnA)	0.0367	0.0364	99	4	30	76-105	H
Perfluorododecanoic acid (PFDoA)	0.0367	0.0382	104	2	30	87-116	H
Perfluorotridecanoic Acid (PFTriA)	0.0367	0.0370	101	6	30	75-129	H
Perfluorotetradecanoic acid (PFTeA)	0.0367	0.0327	89	7	30	82-115	H
Perfluorobutanesulfonic acid (PFBS)	0.0324	0.0805	91	2	30	87-120	H
Perfluorohexanesulfonic acid (PFHxS)	0.0334	0.244	82	1	30	81-106	H 4
Perfluorooctanesulfonic acid (PFOS)	0.0340	0.648	167	8	30	82-112	H J1 4
13C2 PFHxA	0.0917	0.0784	86			50-150	
13C4-PFHpA	0.0917	0.0832	91			50-150	
13C4 PFOA	0.0917	0.0822	90			50-150	
13C5 PFNA	0.0917	0.0893	97			50-150	
13C2 PFDA	0.0917	0.0893	97			50-150	
13C2 PFUnA	0.0917	0.0814	89			50-150	
13C2 PFDoA	0.0917	0.0877	96			50-150	
18O2 PFHxS	0.0868	0.0729	84			50-150	
13C2-PFTeDA	0.0917	0.0922	101			50-150	
13C4 PFOS	0.0877	0.0713	81			50-150	
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0367	0.0362	99	2	30	82-111	H M
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0367	0.0375	102	1	30	80-109	H
13C3-PFBS	0.0853	0.0710	83			50-150	
d5-NEtFOSAA	0.0917	0.0864	94			50-150	
d3-NMeFOSAA	0.0917	0.0895	98			50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.08.12LLA_011.d

Lab ID: 320-41998-3 MSD DL Client ID: TW03S-20180713 MSD DL

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorohexanoic acid (PFHxA)	0.0367	0.275	94	0	30	83-109	H 4 D
Perfluoroheptanoic acid (PFHpA)	0.0367	0.118	91	5	30	80-113	H D
Perfluorooctanoic acid (PFOA)	0.0367	0.509	95	1	30	80-107	H 4 D M
Perfluorononanoic acid (PFNA)	0.0367	0.0417	104	0	30	83-113	H D
Perfluorodecanoic acid (PFDA)	0.0367	0.0350	95	5	30	85-113	H D
Perfluoroundecanoic acid (PFUnA)	0.0367	0.0364	99	2	30	76-105	H D
Perfluorododecanoic acid (PFDoA)	0.0367	0.0397	108	1	30	87-116	H D
Perfluorotridecanoic Acid (PFTriA)	0.0367	0.0350	95	6	30	75-129	H D
Perfluorotetradecanoic acid (PFTeA)	0.0367	0.0346	94	10	30	82-115	H D
Perfluorobutanesulfonic acid (PFBS)	0.0324	0.0876	112	6	30	87-120	H D
Perfluorohexanesulfonic acid (PFHxS)	0.0334	0.265	95	1	30	81-106	H 4 D
Perfluorooctanesulfonic acid (PFOS)	0.0340	0.691	48	2	30	82-112	H 4 D
13C2 PFHxA	0.0917	0.0754	82			50-150	
13C4-PFHpA	0.0917	0.0851	93			50-150	
13C4 PFOA	0.0917	0.0888	97			50-150	
13C5 PFNA	0.0917	0.0816	89			50-150	
13C2 PFDA	0.0917	0.0876	95			50-150	
13C2 PFUnA	0.0917	0.0785	86			50-150	
13C2 PFDoA	0.0917	0.0797	87			50-150	
18O2 PFHxS	0.0868	0.0689	79			50-150	
13C2-PFTeDA	0.0917	0.0756	82			50-150	
13C4 PFOS	0.0877	0.0702	80			50-150	
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0367	0.0361 J	98	4	30	82-111	H D
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0367	0.0399 J	109	1	30	80-109	H D
13C3-PFBS	0.0853	0.0610	72			50-150	
d5-NEtFOSAA	0.0917	0.0821	89			50-150	
d3-NMeFOSAA	0.0917	0.0874	95			50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab File ID: 2018.08.11LA9A_007.d Lab Sample ID: MB 320-239407/1-A

Matrix: Water Date Extracted: 08/11/2018 09:18

Instrument ID: A9 Date Analyzed: 08/11/2018 20:44

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-239407/2-A	2018.08.11LA9A_008.d	08/11/2018 20:52
TW01S-20180713	320-41998-1	2018.08.11LA9A_009.d	08/11/2018 20:59
TW02S-20180713	320-41998-2	2018.08.11LA9A_010.d	08/11/2018 21:07
TW03S-20180713	320-41998-3	2018.08.11LA9A_011.d	08/11/2018 21:14
TW03S-20180713 MS	320-41998-3 MS	2018.08.11LA9A_012.d	08/11/2018 21:22
TW03S-20180713 MSD	320-41998-3 MSD	2018.08.11LA9A_013.d	08/11/2018 21:29
TW04S-20180713	320-41998-4	2018.08.11LA9A_014.d	08/11/2018 21:37
DUP02-20180713	320-41998-5	2018.08.11LA9A_015.d	08/11/2018 21:44
EB02-20180713	320-41998-6	2018.08.11LA9A_018.d	08/11/2018 22:07
TW03S-20180713 DL	320-41998-3 DL	2018.08.12LLA_009.d	08/12/2018 11:03
TW03S-20180713 MS DL	320-41998-3 MS DL	2018.08.12LLA_010.d	08/12/2018 11:10
TW03S-20180713 MSD DL	320-41998-3 MSD DL	2018.08.12LLA_011.d	08/12/2018 11:18
TW04S-20180713 DL	320-41998-4 DL	2018.08.12LLA_012.d	08/12/2018 11:25
I012MW07S-20180713 DL	320-41998-7 DL	2018.08.13LLA_028.d	08/13/2018 09:36
I012MW07S-20180713	320-41998-7	2018.08.13LLA_029.d	08/13/2018 09:44

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Sample No.: IC 320-237921/5 Date Analyzed: 08/03/2018 16:34

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

Lab File ID (Standard): 2018.08.03LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 40486

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		5673875	2.75				
UPPER LIMIT		8510813	2.95				
LOWER LIMIT		2836938	2.55				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-237921/9		5600406	2.75				
ICV 320-237921/10		5483729	2.75				
CCV 320-239432/3 CCVIS		7334991	2.77				
CCV 320-239460/3 CCVIS		7169189	2.77				
CCV 320-239481/3 CCVIS		7387068	2.78				

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.: 320-41998-1

SDG No.:

Sample No.: CCV 320-239432/3 Date Analyzed: 08/11/2018 20:37

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

Lab File ID (Standard): 2018.08.11LA9A_006. Heated Purge: (Y/N) N

Calibration ID: 40486

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		7334991	2.77				
UPPER LIMIT		11002487	2.97				
LOWER LIMIT		3667496	2.57				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-239432/1		7519014	2.78				
CCVL 320-239432/2		7521236	2.77				
MB 320-239407/1-A		7699444	2.77				
LCS 320-239407/2-A		4025409	2.78				
320-41998-1	TW01S-20180713	8391312	2.77				
320-41998-2	TW02S-20180713	7098673	2.75				
320-41998-3	TW03S-20180713	7095523	2.77				
320-41998-3 MS	TW03S-20180713 MS	7081441	2.75				
320-41998-3 MSD	TW03S-20180713 MSD	5720577	2.77				
320-41998-4	TW04S-20180713	7324785	2.75				
320-41998-5	DUP02-20180713	7385534	2.75				
CCV 320-239432/14		7036079	2.75				
320-41998-6	EB02-20180713	6116673	2.75				
CCV 320-239432/22		7360935	2.74				

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.: 320-41998-1

SDG No.:

Sample No.: CCV 320-239460/3 Date Analyzed: 08/12/2018 10:40

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

Lab File ID (Standard): 2018.08.12LLA_006.d Heated Purge: (Y/N) N

Calibration ID: 40486

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		7169189	2.77				
UPPER LIMIT		10753784	2.97				
LOWER LIMIT		3584595	2.57				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-239460/1		7376015	2.78				
CCVL 320-239460/2		7601858	2.77				
320-41998-3 DL	TW03S-20180713 DL	1883706Q	2.75				
320-41998-3 MS DL	TW03S-20180713 MS DL	1685840Q	2.75				
320-41998-3 MSD DL	TW03S-20180713 MSD DL	1753275Q	2.75				
320-41998-4 DL	TW04S-20180713 DL	1761677Q	2.75				
CCV 320-239460/16		7137578	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.: 320-41998-1

SDG No.:

Sample No.: CCV 320-239481/3 Date Analyzed: 08/13/2018 08:21

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

Lab File ID (Standard): 2018.08.13LLA_019.d Heated Purge: (Y/N) N

Calibration ID: 40486

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		7387068	2.78				
UPPER LIMIT		11080602	2.98				
LOWER LIMIT		3693534	2.58				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-239481/1		7810032	2.78				
CCVL 320-239481/2		7718423	2.78				
CCV 320-239523/1		7203377	2.75				
320-41998-7 DL	I012MW07S-20180713 DL	122853Q	2.75				
320-41998-7	I012MW07S-20180713	803403Q	2.75				
CCV 320-239523/5		7197958	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 I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW01S-20180713 | Lab Sample ID: 320-41998-1

Matrix: Water | Lab File ID: 2018.08.11LA9A_009.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 09:50

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 209.8(mL) | Date Analyzed: 08/11/2018 20:59

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.: 239432 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.18	H	0.0024	0.0012	0.00056
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.090	H	0.0024	0.0018	0.00073
335-67-1	Perfluorooctanoic acid (PFOA)	0.40	M H	0.0024	0.0018	0.00064
375-95-1	Perfluorononanoic acid (PFNA)	0.0043	M H	0.0024	0.0018	0.00062
335-76-2	Perfluorodecanoic acid (PFDA)	0.0012	U H	0.0024	0.0012	0.00057
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	U H	0.0024	0.0018	0.00086
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	U H	0.0024	0.0018	0.00062
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0036	U H	0.0048	0.0036	0.00091
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0036	U M H	0.0048	0.0036	0.00099
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.041	H	0.0024	0.0012	0.00055
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.16	H	0.0024	0.0012	0.00045
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.098	H	0.0048	0.0036	0.0013
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.012	U H	0.024	0.012	0.0036
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.012	U H	0.024	0.012	0.0033

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW01S-20180713 | Lab Sample ID: 320-41998-1

Matrix: Water | Lab File ID: 2018.08.11LA9A_009.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 09:50

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 209.8(mL) | Date Analyzed: 08/11/2018 20:59

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.: 239432 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	100		50-150
STL00995	13C5 PFNA	109		50-150
STL00996	13C2 PFDA	101		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	78		50-150
STL00994	18O2 PFHxS	94		50-150
STL02116	13C2-PFTeDA	74		50-150
STL00991	13C4 PFOS	88		50-150
STL02337	13C3-PFBS	95		50-150
STL02117	d5-NEtFOSAA	91		50-150
STL02118	d3-NMeFOSAA	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_009.d
Lims ID: 320-41998-A-1-D
Client ID: TW01S-20180713
Sample Type: Client
Inject. Date: 11-Aug-2018 20:59:37 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41998-a-1-d
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 07:39:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.790	1.797	-0.007	1.000	4403550	0.8687			240	
298.90 > 99.00	1.790	1.797	-0.007	1.000	1536699		2.87(1.35-4.05)		266	
D 47 13C3-PFBS										
301.90 > 83.00	1.790	1.805	-0.015	0.647	89001	1.71		94.5	202	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.038	2.048	-0.010	0.995	11206811	3.70			503	
313.00 > 119.00	2.038	2.048	-0.010	0.995	796430		14.07(6.96-20.87)		851	
D 7 13C2 PFHxA										
315.00 > 270.00	2.049	2.058	-0.009	0.740	6310947	1.81		93.0	7588	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	7384056	1.88			286	
363.00 > 169.00	2.387	2.387	0.0	1.000	1593199		4.63(2.17-6.52)		2334	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.863	7372920	1.87		95.7	10390	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.401	2.400	0.001	1.000	11790734	3.28			1746	
399.00 > 99.00	2.401	2.400	0.001	1.000	3038502		3.88(1.90-5.70)		1066	
D 11 18O2 PFHxS										
403.00 > 84.00	2.401	2.413	-0.012	0.867	5176600	1.74		94.3	8302	
* 62 13C2-PFOA										
415.00 > 370.00	2.768	2.751	0.017		8391312	2.50			14332	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.768	2.751	0.017	1.000	30219612	8.31			1915	
413.00 > 169.00	2.768	2.751	0.017	1.000	14512810		2.08(1.36-4.08)		2749	M
D 14 13C4 PFOA										
417.00 > 372.00	2.768	2.767	0.001	1.000	6469277	1.95		100	17257	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.155	3.136	0.019	1.000	6011966	2.06			1084	
499.00 > 99.00	3.155	3.136	0.019	1.000	1193754		5.04(2.04-6.12)		1360	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.155	3.136	0.019	1.000	291911	0.0894			41.7	M
463.00 > 169.00	3.155	3.136	0.019	1.000	59313		4.92(2.68-8.03)		106	
D 19 13C5 PFNA										
468.00 > 423.00	3.155	3.155	0.0	1.140	6033957	2.12		109	6839	
D 18 13C4 PFOS										
503.00 > 80.00	3.155	3.155	0.0	1.140	5079161	1.64		88.0	1745	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.514	3.498	0.016	1.000	16230	0.004616			3.6	R
513.00 > 169.00	3.529	3.498	0.031	1.004	2362		6.87(7.12-21.35)		4.2	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.529	-0.015	1.270	5577936	1.96		101	5334	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.671	3.657	0.014	1.004	2480	0.004794			2.1	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.321	998044	1.80		92.6	2325	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.825	3.841	-0.016	1.382	802182	1.77		90.6	1149	
D 30 13C2 PFUnA										
565.00 > 520.00	3.841	3.857	-0.016	1.388	3875188	1.69		86.4	8140	
D 36 13C2 PFDoA										
615.00 > 570.00	4.141	4.142	-0.001	1.496	3779010	1.52		78.2	3535	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.405	4.406	-0.001	1.064	11219	0.007714			3.6	
663.00 > 169.00	4.405	4.406	-0.001	1.064	2134		5.26(3.09-9.27)		8.9	
42 Perfluorotetradecanoic acid										M
713.00 > 169.00	4.645	4.645	0.0	1.000	1593	0.008490			7.6	M
713.00 > 219.00	4.645	4.645	0.0	1.000	1266		1.26(0.70-2.09)		7.5	M
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.661	-0.016	1.678	2271405	1.44		73.6	6640	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:37 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_009.d

Injection Date: 11-Aug-2018 20:59:37 Instrument ID: A9

Lims ID: 320-41998-A-1-D Lab Sample ID: 320-41998-1

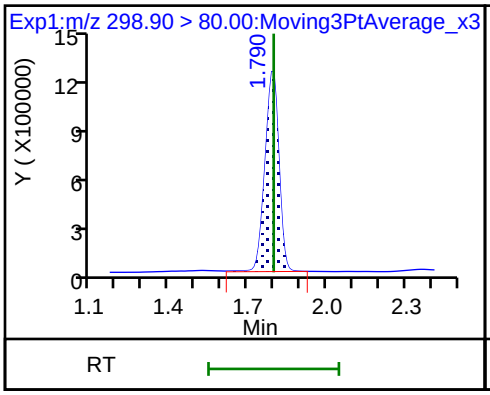
Client ID: TW01S-20180713

Operator ID: A9\Administrator ALS Bottle#: 3 Worklist Smp#: 6

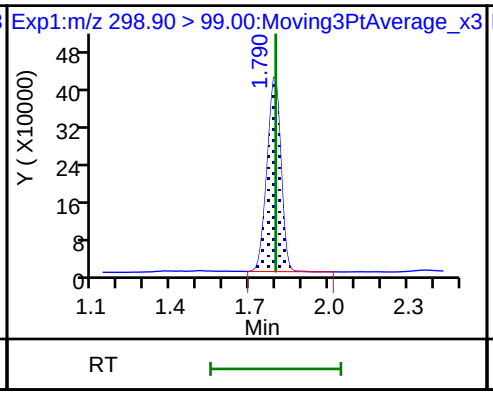
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

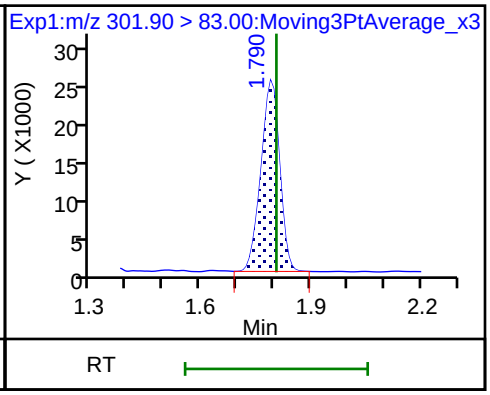
5 Perfluorobutanesulfonic acid



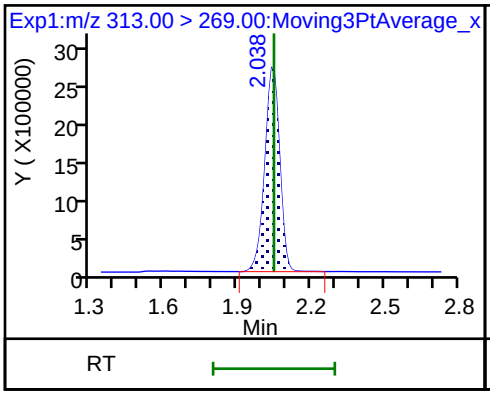
5 Perfluorobutanesulfonic acid



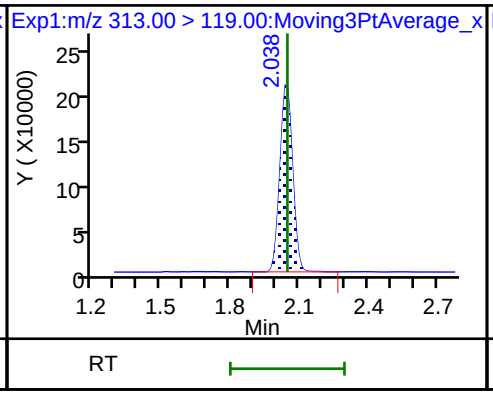
D 47 13C3-PFBS



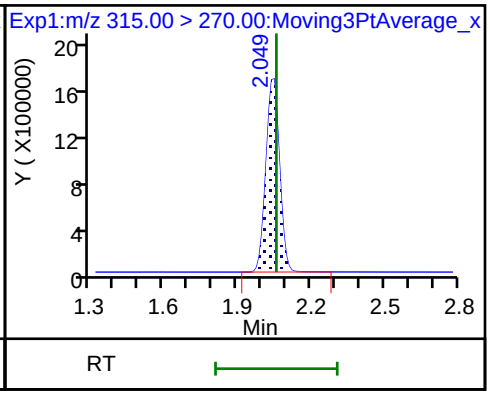
6 Perfluorohexanoic acid



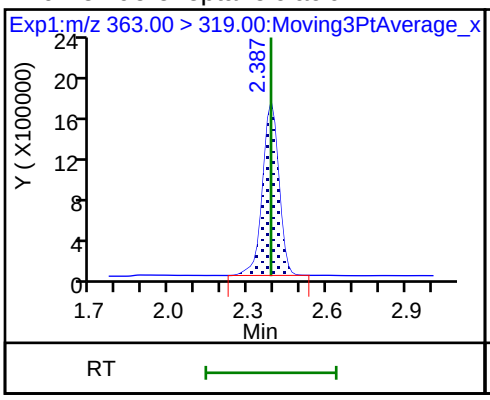
6 Perfluorohexanoic acid



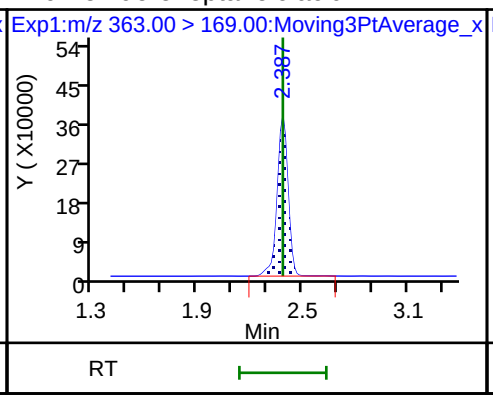
D 7 13C2 PFHxA



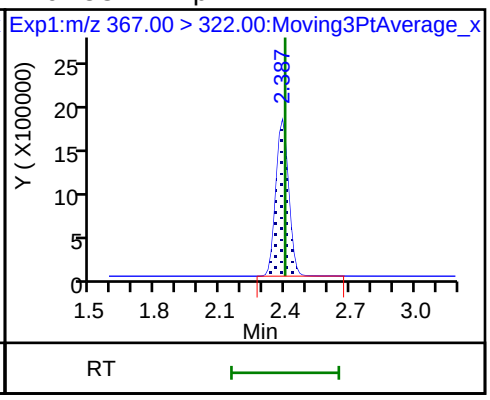
10 Perfluoroheptanoic acid



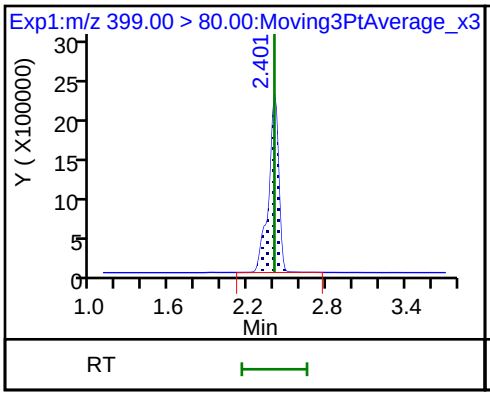
10 Perfluoroheptanoic acid



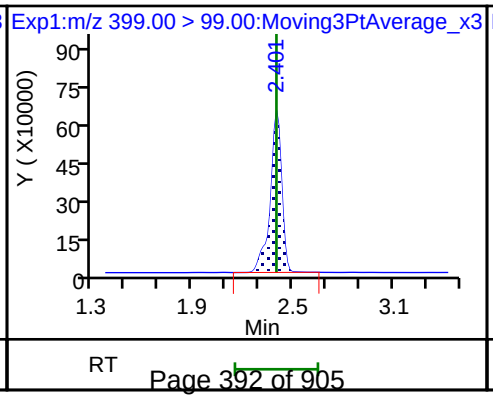
D 9 13C4-PFHpA



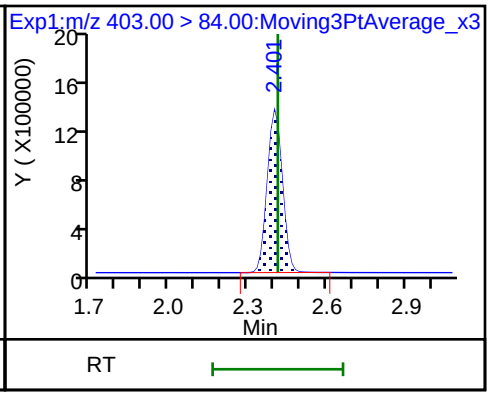
8 Perfluorohexanesulfonic acid



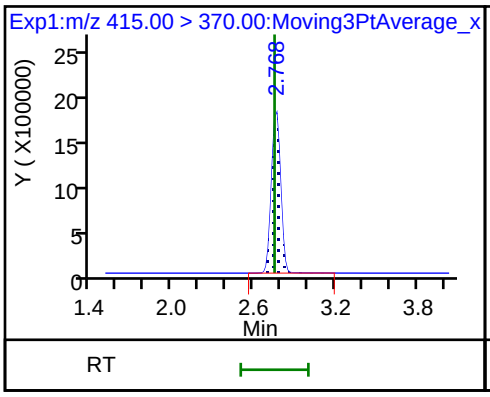
8 Perfluorohexanesulfonic acid



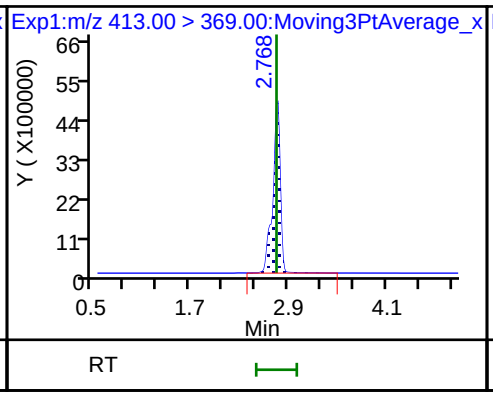
D 11 18O2 PFHxS



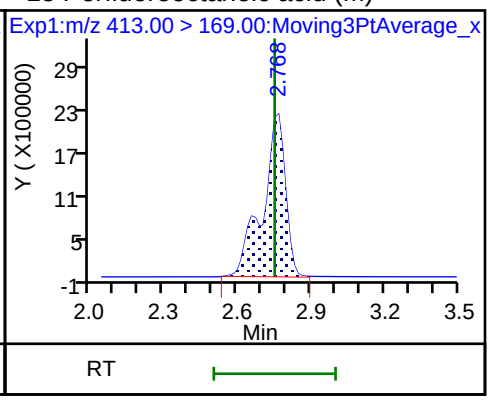
* 62 13C2-PFOA



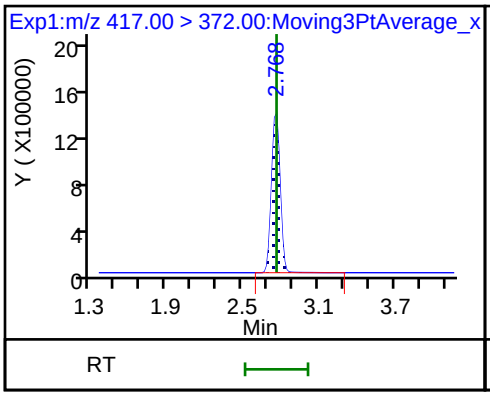
15 Perfluorooctanoic acid



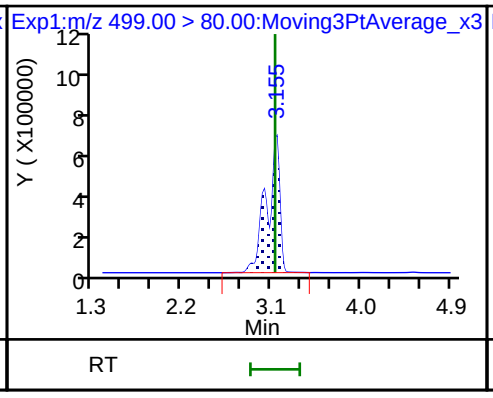
15 Perfluorooctanoic acid (M)



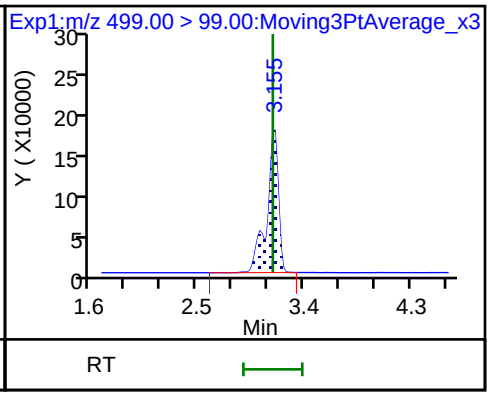
D 14 13C4 PFOA



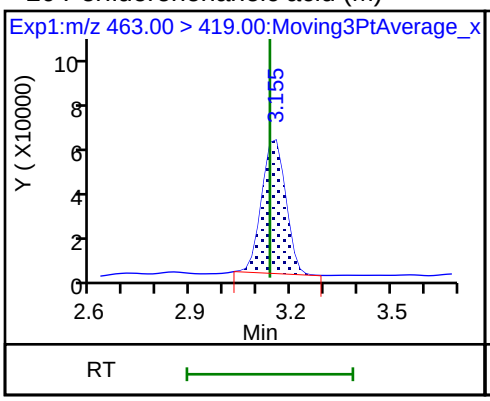
17 Perfluorooctane sulfonic acid



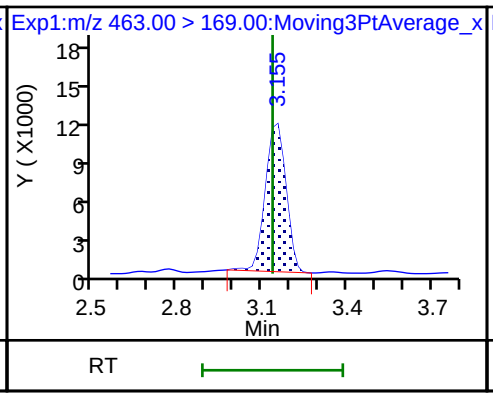
17 Perfluorooctane sulfonic acid



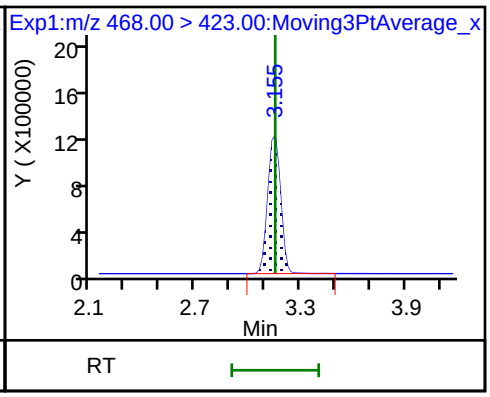
20 Perfluorononanoic acid (M)



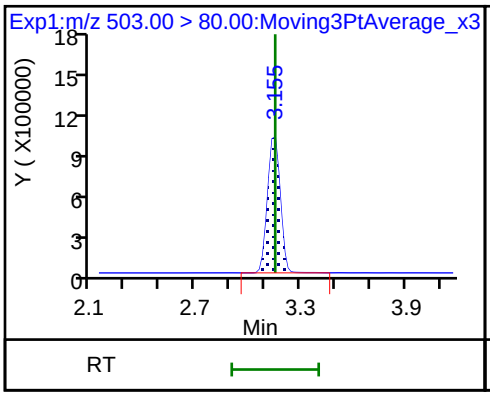
20 Perfluorononanoic acid



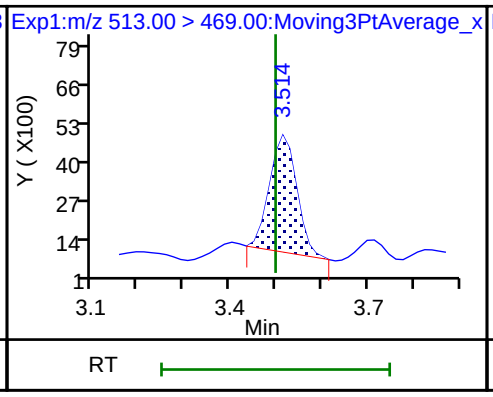
D 19 13C5 PFNA



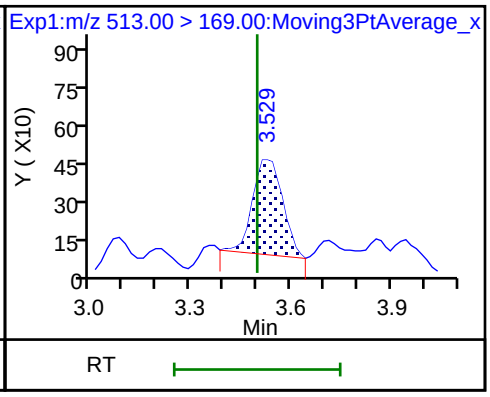
D 18 13C4 PFOS



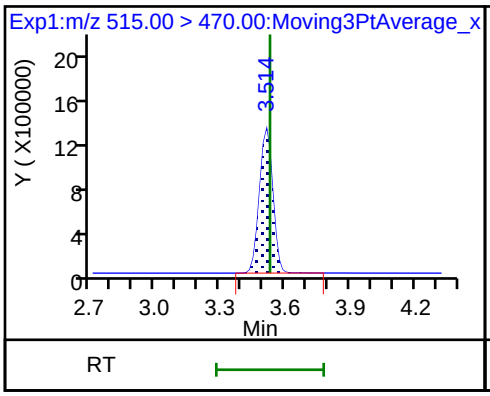
24 Perfluorodecanoic acid



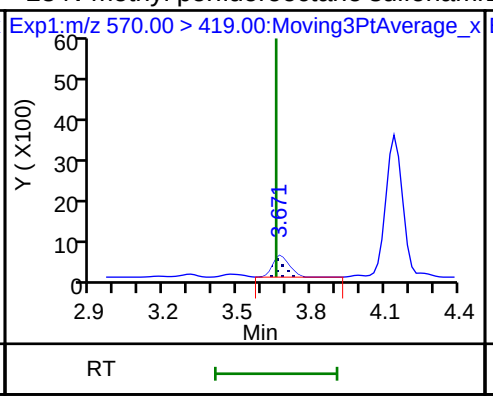
24 Perfluorodecanoic acid



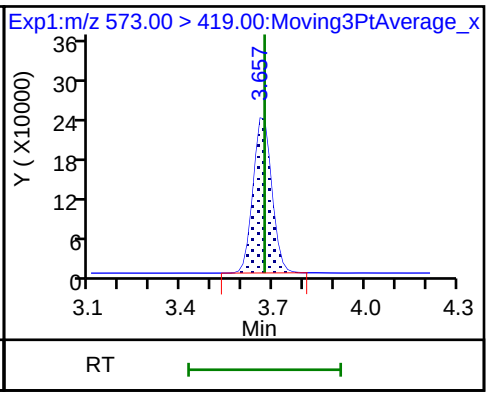
D 23 13C2 PFDA



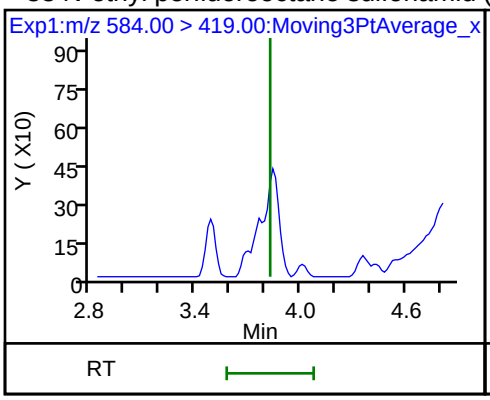
28 N-methyl perfluorooctane sulfonami



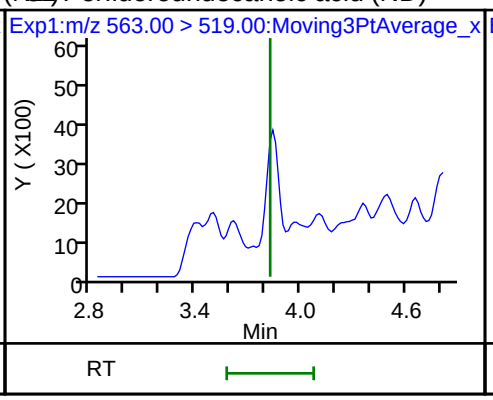
D 27 d3-NMeFOSAA



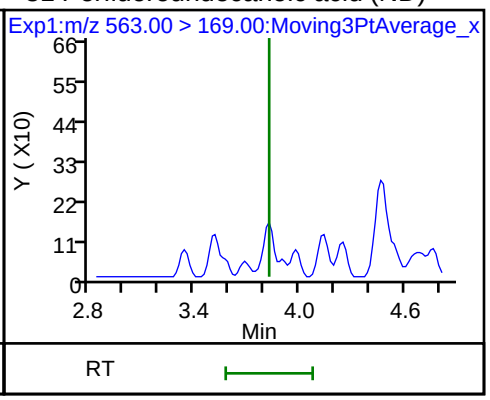
33 N-ethyl perfluorooctane sulfonamid (ND)



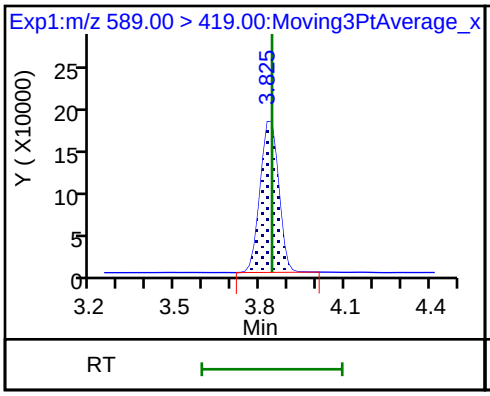
31 Perfluoroundecanoic acid (ND)



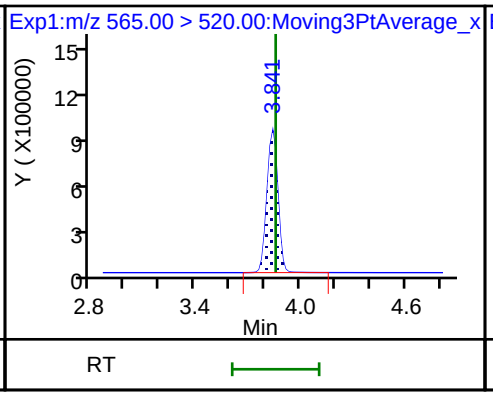
31 Perfluoroundecanoic acid (ND)



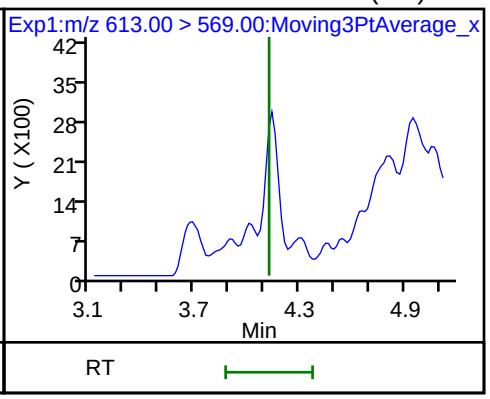
D 32 d5-NEtFOSAA



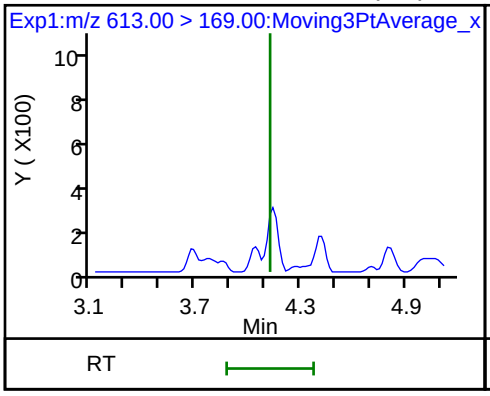
D 30 13C2 PFUnA



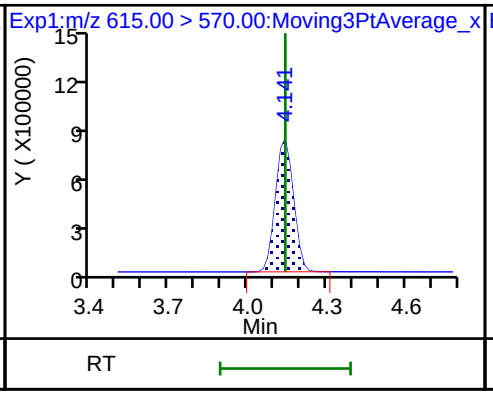
37 Perfluorododecanoic acid (ND)



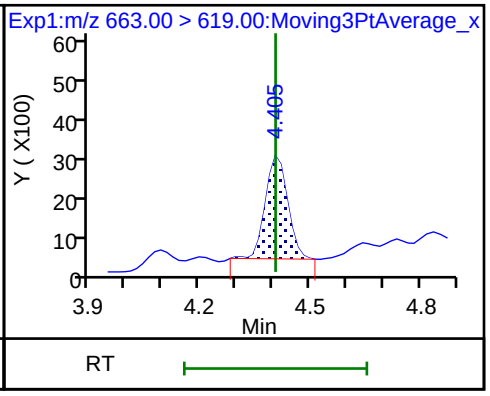
37 Perfluorododecanoic acid (ND)



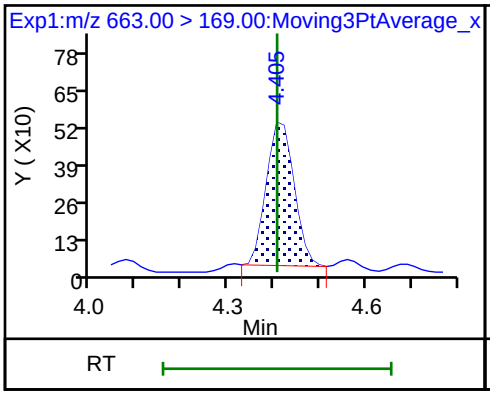
D 36 13C2 PFDoA



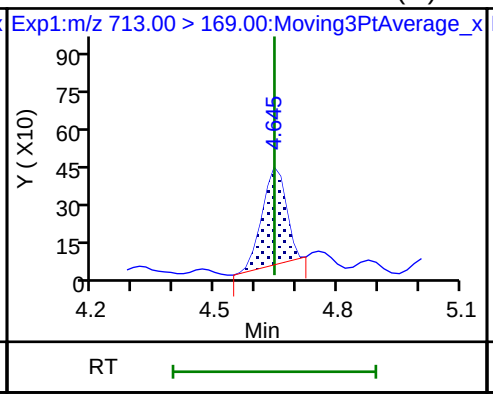
41 Perfluorotridecanoic acid



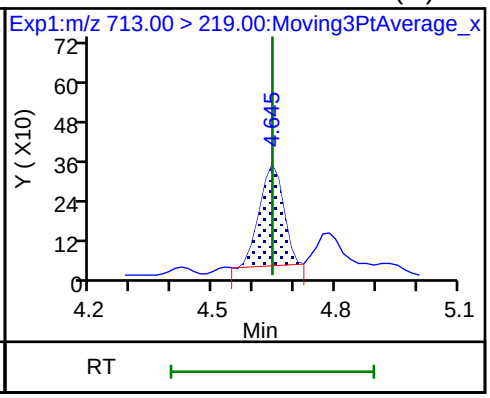
41 Perfluorotridecanoic acid



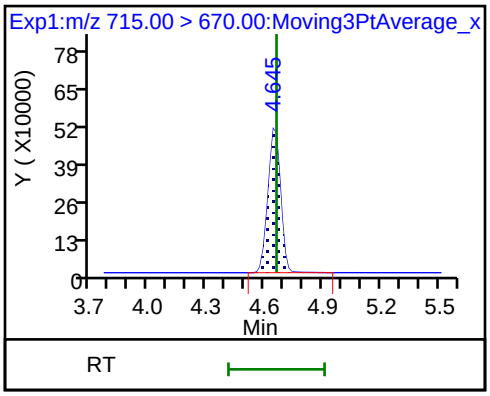
42 Perfluorotetradecanoic acid (M)



42 Perfluorotetradecanoic acid (M)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

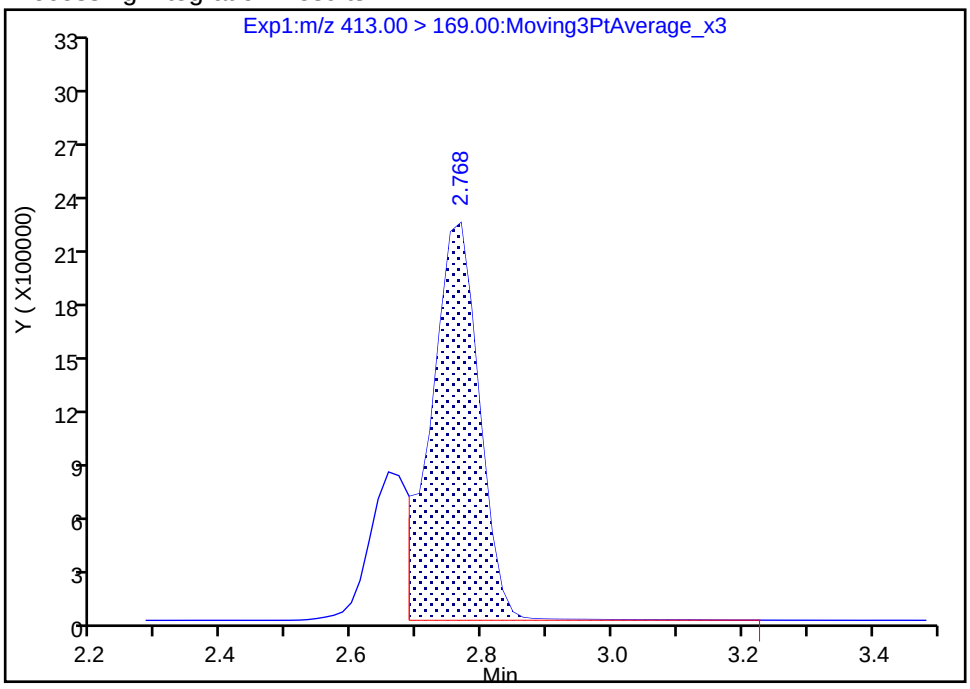
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_009.d				
Injection Date:	11-Aug-2018 20:59:37	Instrument ID:	A9		
Lims ID:	320-41998-A-1-D	Lab Sample ID:	320-41998-1		
Client ID:	TW01S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

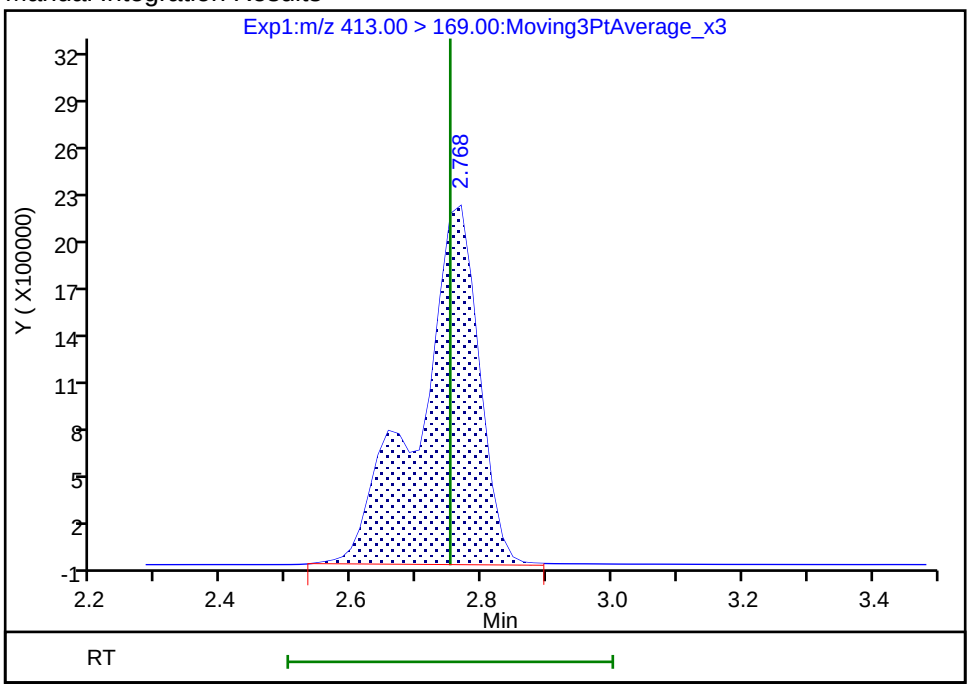
Processing Integration Results

RT: 2.77
Area: 11331382
Amount: 8.313957
Amount Units: ng/ml



Manual Integration Results

RT: 2.77
Area: 14512810
Amount: 8.313957
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:29:01

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

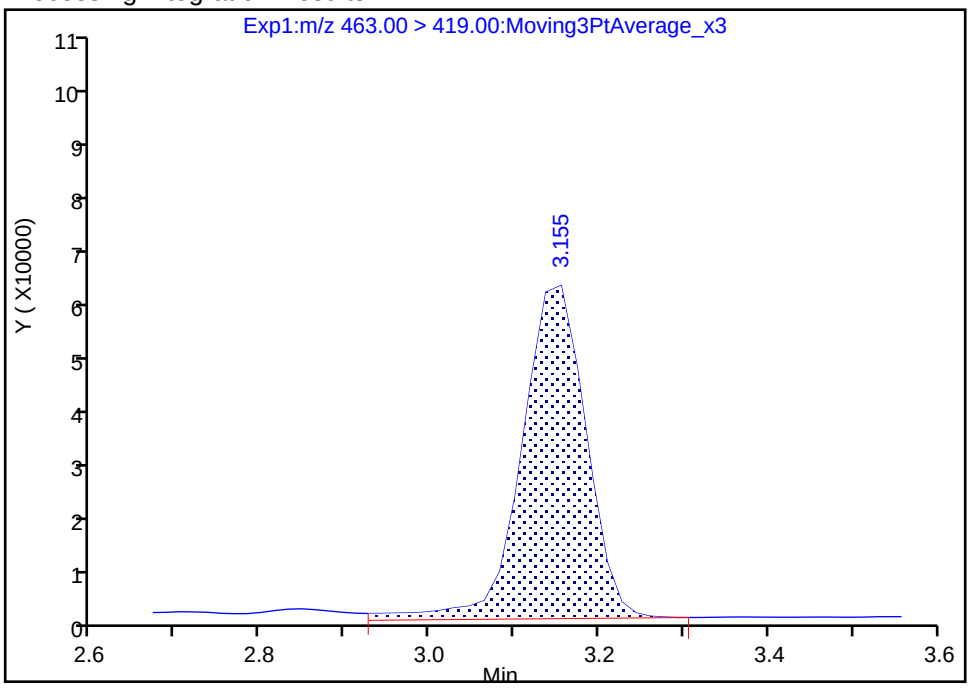
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_009.d				
Injection Date:	11-Aug-2018 20:59:37	Instrument ID:	A9		
Lims ID:	320-41998-A-1-D	Lab Sample ID:	320-41998-1		
Client ID:	TW01S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	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

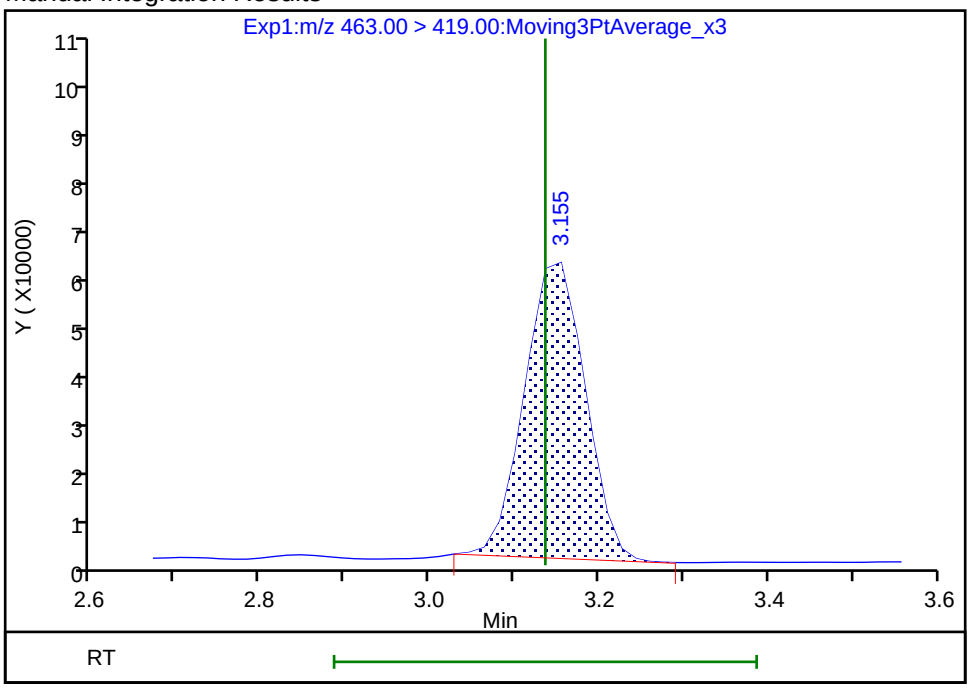
Processing Integration Results

RT: 3.16
Area: 315724
Amount: 0.096738
Amount Units: ng/ml



Manual Integration Results

RT: 3.16
Area: 291911
Amount: 0.089442
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:29:13

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

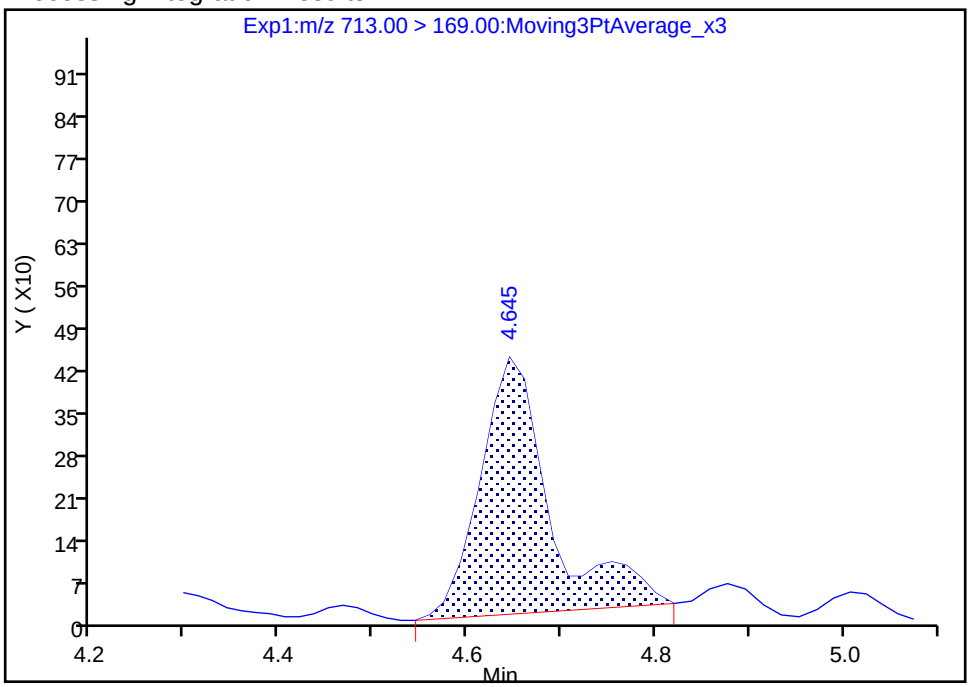
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_009.d				
Injection Date:	11-Aug-2018 20:59:37	Instrument ID:	A9		
Lims ID:	320-41998-A-1-D	Lab Sample ID:	320-41998-1		
Client ID:	TW01S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

42 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 1

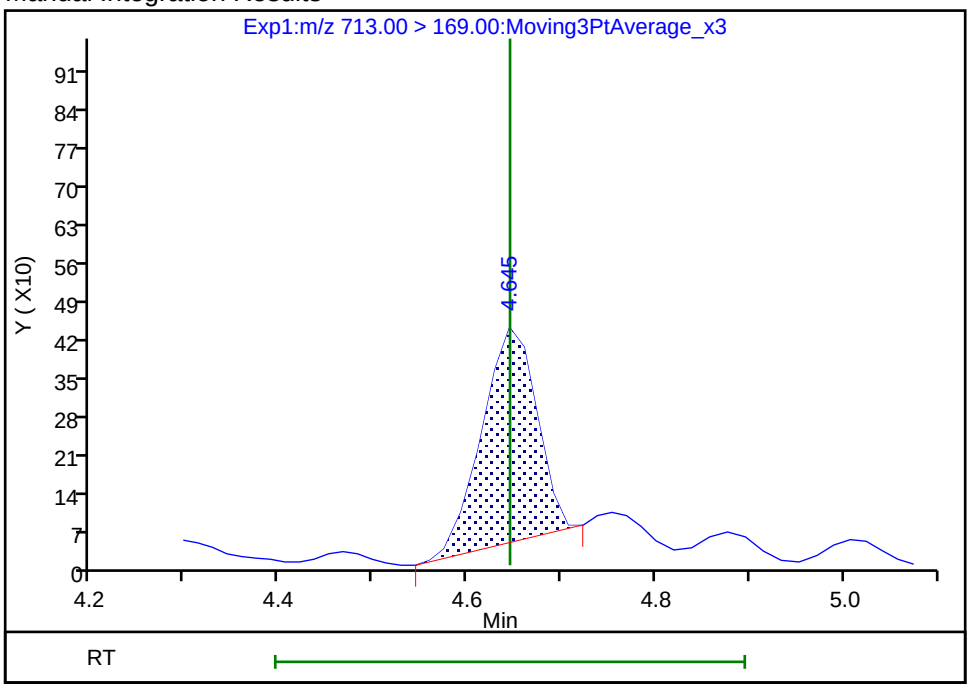
Processing Integration Results

RT: 4.64
Area: 2181
Amount: 0.011624
Amount Units: ng/ml



Manual Integration Results

RT: 4.64
Area: 1593
Amount: 0.008490
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:29:31

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

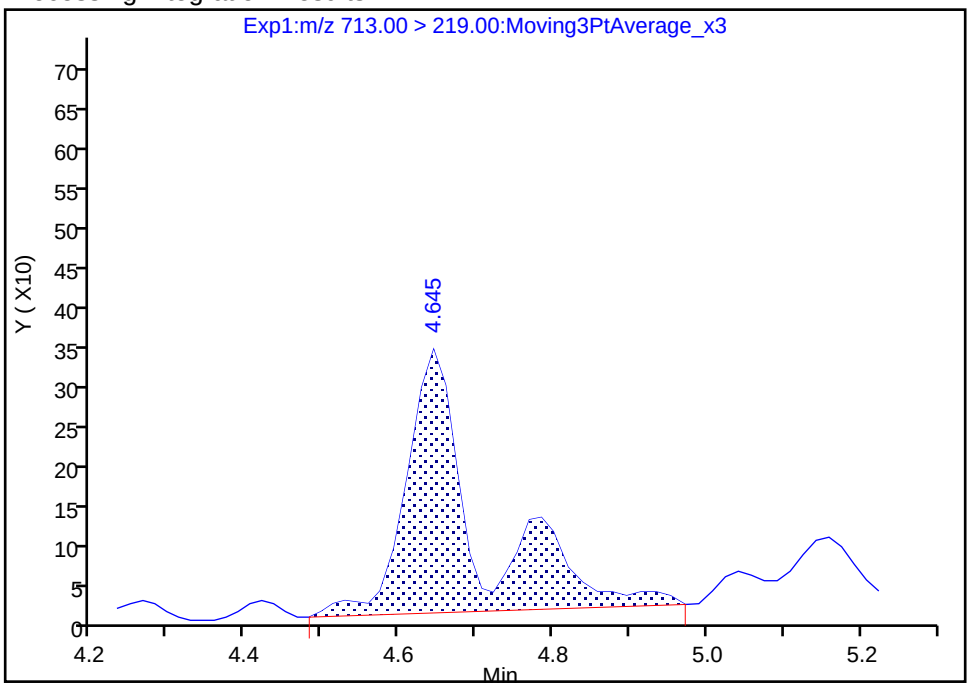
Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_009.d
Injection Date: 11-Aug-2018 20:59:37 Instrument ID: A9
Lims ID: 320-41998-A-1-D Lab Sample ID: 320-41998-1
Client ID: TW01S-20180713
Operator ID: A9\Administrator ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

42 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 2

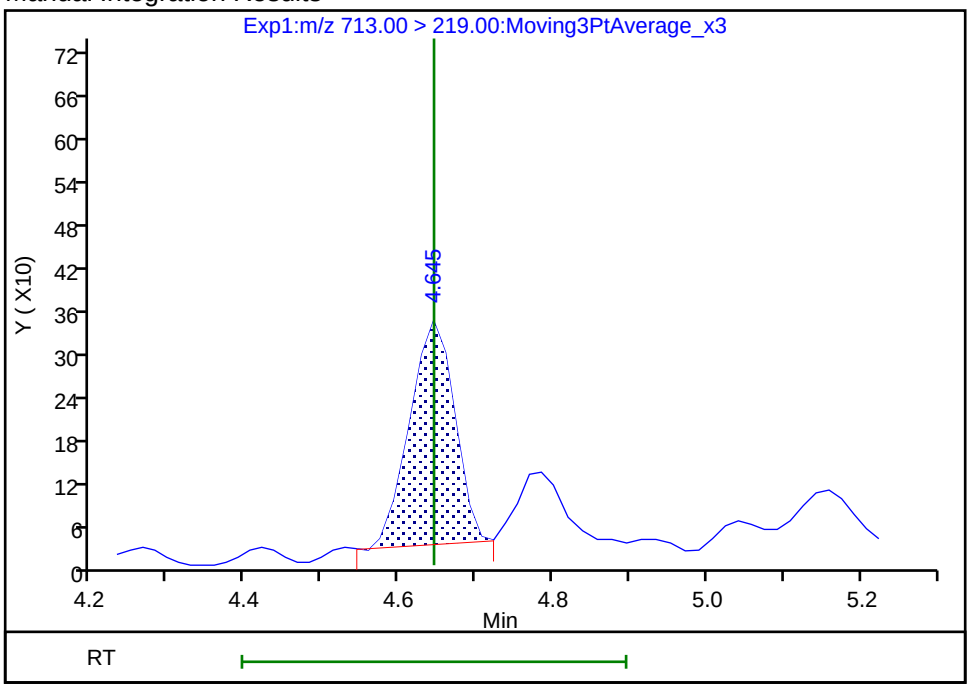
Processing Integration Results

RT: 4.64
Area: 2165
Amount: 0.011624
Amount Units: ng/ml



Manual Integration Results

RT: 4.64
Area: 1266
Amount: 0.008490
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:29:38
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW02S-20180713 Lab Sample ID: 320-41998-2

Matrix: Water Lab File ID: 2018.08.11LA9A_010.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 11:50

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 162.2(mL) Date Analyzed: 08/11/2018 21:07

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.: 239432 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.12	H	0.0031	0.0015	0.00072
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.039	H	0.0031	0.0023	0.00094
335-67-1	Perfluorooctanoic acid (PFOA)	0.59	M H	0.0031	0.0023	0.00083
375-95-1	Perfluorononanoic acid (PFNA)	0.0023	U M H	0.0031	0.0023	0.00080
335-76-2	Perfluorodecanoic acid (PFDA)	0.0015	U H	0.0031	0.0015	0.00074
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0023	U H	0.0031	0.0023	0.0011
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0023	U H	0.0031	0.0023	0.00080
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0046	U H	0.0062	0.0046	0.0012
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0046	U H	0.0062	0.0046	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.027	H	0.0031	0.0015	0.00071
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.078	H	0.0031	0.0015	0.00059
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.041	H	0.0062	0.0046	0.0017
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.015	U H	0.031	0.015	0.0046
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.015	U H	0.031	0.015	0.0043

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW02S-20180713 | Lab Sample ID: 320-41998-2

Matrix: Water | Lab File ID: 2018.08.11LA9A_010.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 11:50

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 162.2(mL) | Date Analyzed: 08/11/2018 21:07

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.: 239432 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		50-150
STL01892	13C4-PFHpA	102		50-150
STL00990	13C4 PFOA	100		50-150
STL00995	13C5 PFNA	116		50-150
STL00996	13C2 PFDA	99		50-150
STL00997	13C2 PFUnA	84		50-150
STL00998	13C2 PFDoA	72		50-150
STL00994	18O2 PFHxS	90		50-150
STL02116	13C2-PFTeDA	72		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	84		50-150
STL02117	d5-NEtFOSAA	84		50-150
STL02118	d3-NMeFOSAA	84		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_010.d
Lims ID: 320-41998-A-2-D
Client ID: TW02S-20180713
Sample Type: Client
Inject. Date: 11-Aug-2018 21:07:08 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41998-a-2-d
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 11-Aug-2018 21:30:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	1673282	0.4373			155	
298.90 > 99.00	1.797	1.797	0.0	1.000	588443		2.84(1.35-4.05)		151	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.805	-0.008	0.653	49953	1.14		84.3	107	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	5141372	1.92			367	
313.00 > 119.00	2.048	2.048	0.0	1.000	334326		15.38(6.96-20.87)		458	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.744	4151799	1.41		97.3	5516	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	2273282	0.6398			122	
363.00 > 169.00	2.387	2.387	0.0	1.000	497927		4.57(2.17-6.52)		849	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.868	4962030	1.48		102	16787	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	3675212	1.26			1062	
399.00 > 99.00	2.400	2.400	0.0	1.000	886349		4.15(1.90-5.70)		417	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	3120962	1.24		90.4	5674	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		7098673	2.50			7803	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.751	2.751	0.0	1.000	29432729	9.55			2045	
413.00 > 169.00	2.751	2.751	0.0	1.000	13787323		2.13(1.36-4.08)		2426	M
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	4079397	1.46		100	8793	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.009	3.136	-0.127	0.960	1629293	0.6692			516	
499.00 > 99.00	3.136	3.136	0.0	1.000	292002		5.58(2.04-6.12)		403	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.136	3.136	0.0	1.000	33890	0.0115			7.2	M
463.00 > 169.00	3.154	3.136	0.018	1.006	7396		4.58(2.68-8.03)		15.4	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.155	-0.019	1.140	4055069	1.69		116	9524	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.155	-0.019	1.140	3147217	1.20		86.7	2297	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.529	-0.015	1.278	3446595	1.43		98.8	3756	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.329	572536	1.22		84.4	1698	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.841	-0.015	1.391	465398	1.21		83.5	919	
D 30 13C2 PFUnA										
565.00 > 520.00	3.841	3.857	-0.016	1.396	2381538	1.22		84.5	3885	
D 36 13C2 PFDoA										
615.00 > 570.00	4.142	4.142	0.0	1.506	2178300	1.04		71.6	4376	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.649	4.661	-0.012	1.690	1402956	1.05		72.3	5977	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_010.d

Injection Date: 11-Aug-2018 21:07:08 Instrument ID: A9

Lims ID: 320-41998-A-2-D Lab Sample ID: 320-41998-2

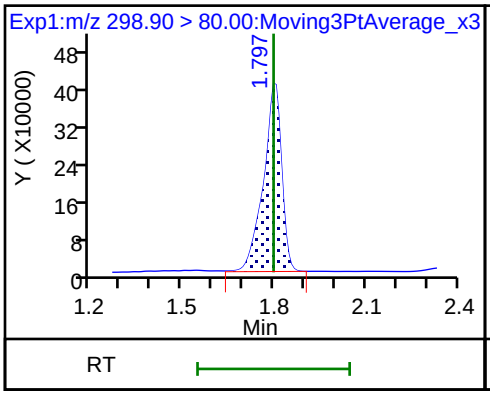
Client ID: TW02S-20180713

Operator ID: A9\Administrator ALS Bottle#: 4 Worklist Smp#: 7

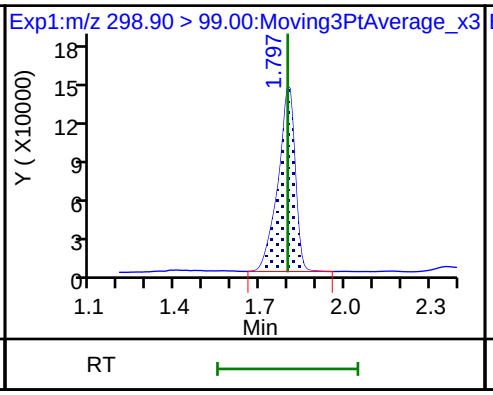
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

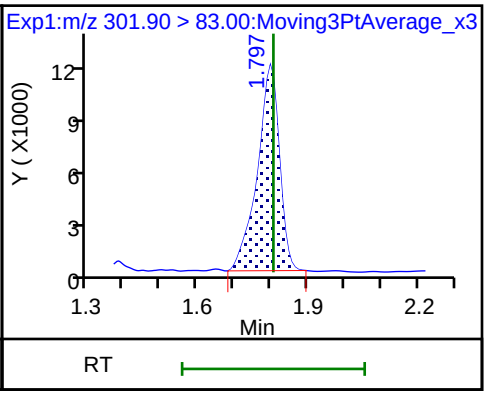
5 Perfluorobutanesulfonic acid



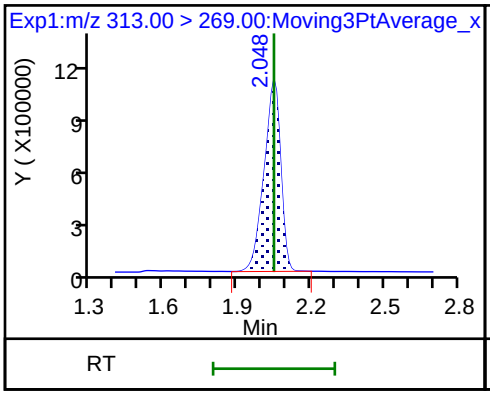
5 Perfluorobutanesulfonic acid



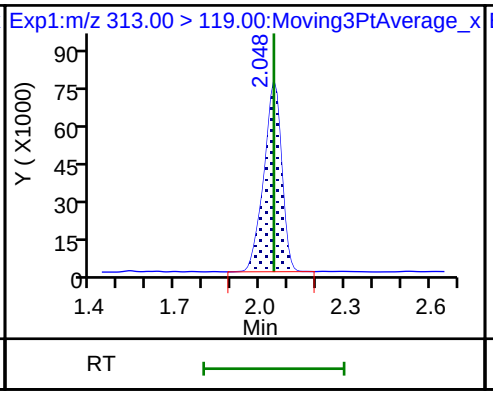
D 47 13C3-PFBS



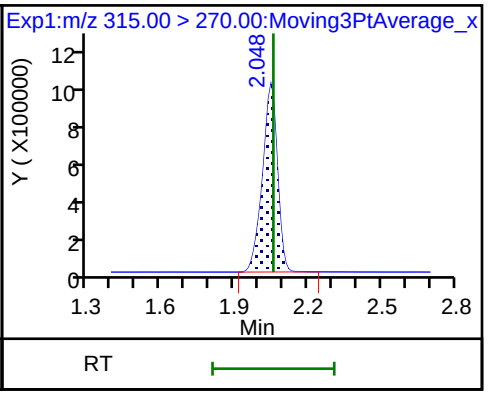
6 Perfluorohexanoic acid



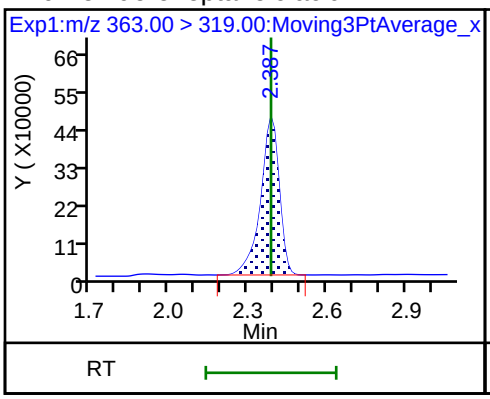
6 Perfluorohexanoic acid



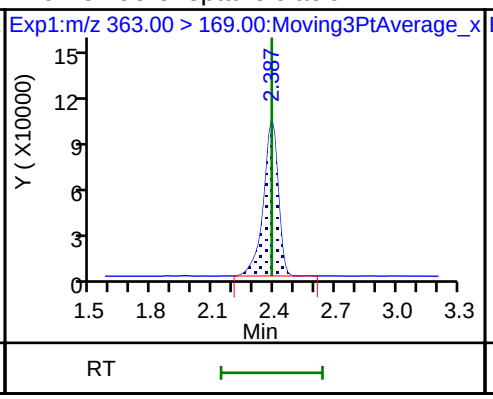
D 7 13C2 PFHxA



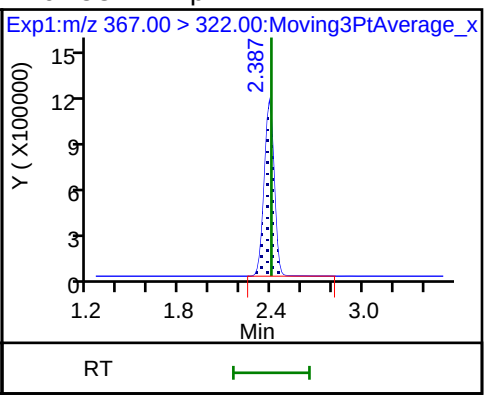
10 Perfluoroheptanoic acid



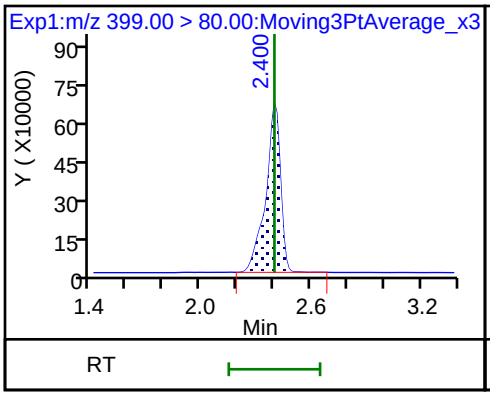
10 Perfluoroheptanoic acid



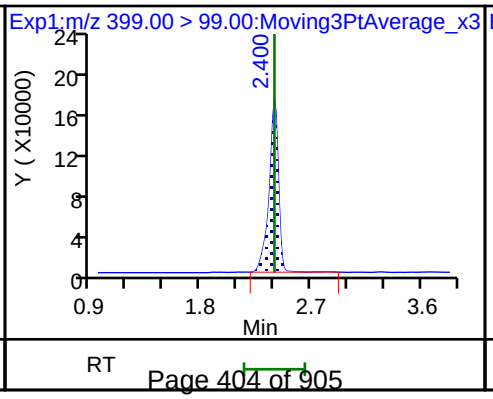
D 9 13C4-PFHpA



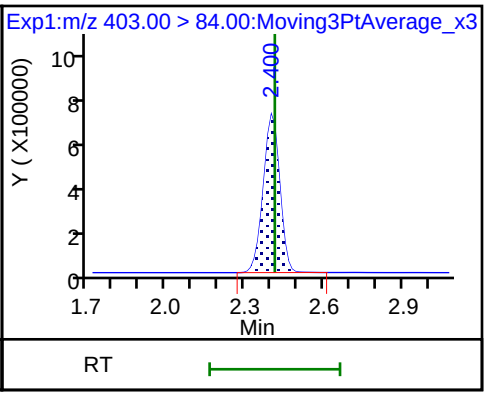
8 Perfluorohexanesulfonic acid



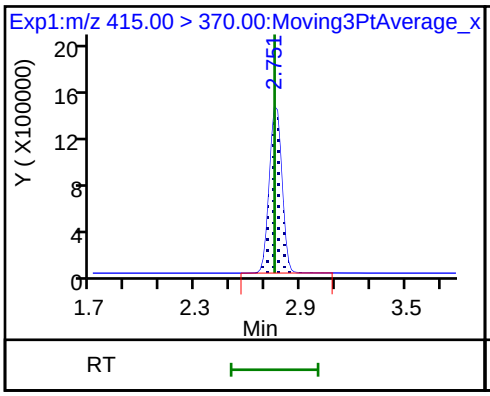
8 Perfluorohexanesulfonic acid



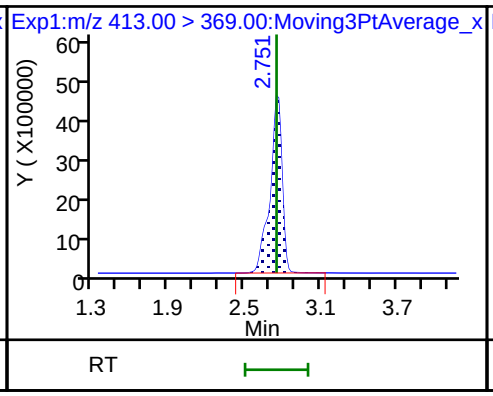
D 11 18O2 PFHxS



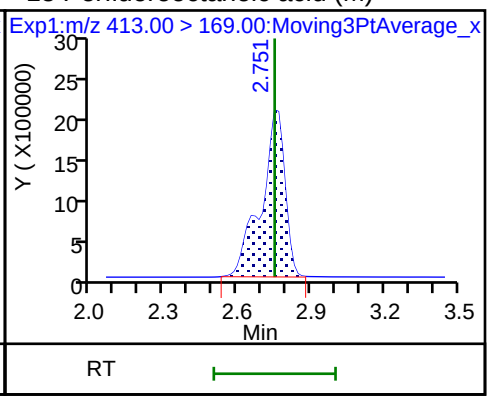
* 62 13C2-PFOA



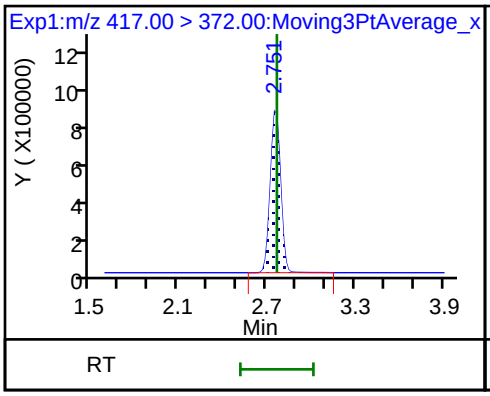
15 Perfluorooctanoic acid



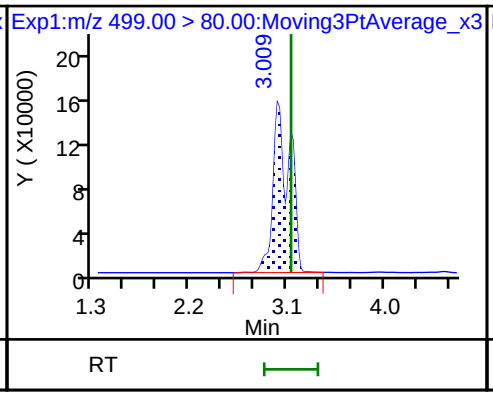
15 Perfluorooctanoic acid (M)



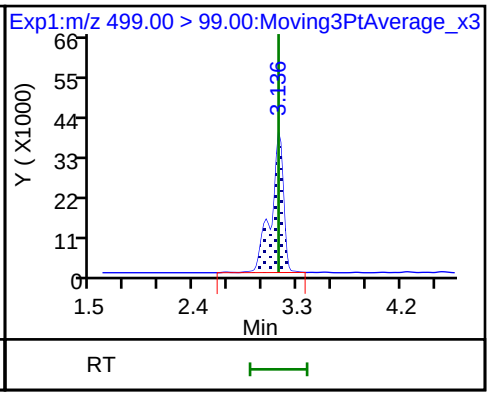
D 14 13C4 PFOA



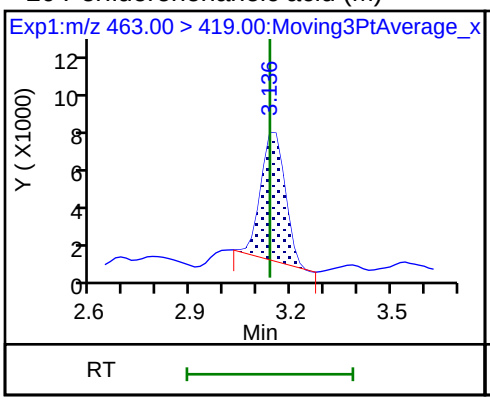
17 Perfluorooctane sulfonic acid



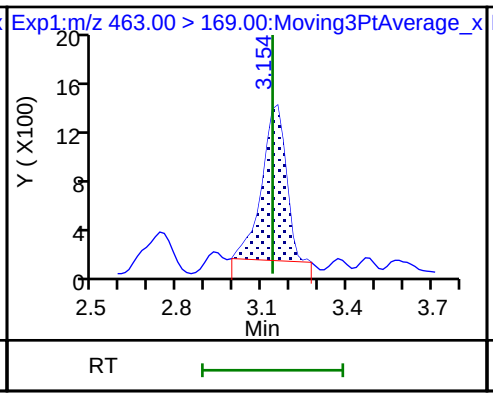
17 Perfluorooctane sulfonic acid



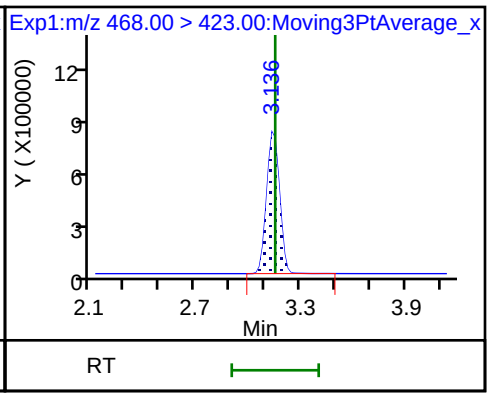
20 Perfluorononanoic acid (M)



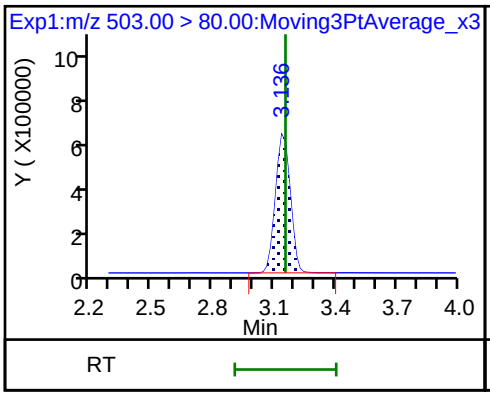
20 Perfluorononanoic acid



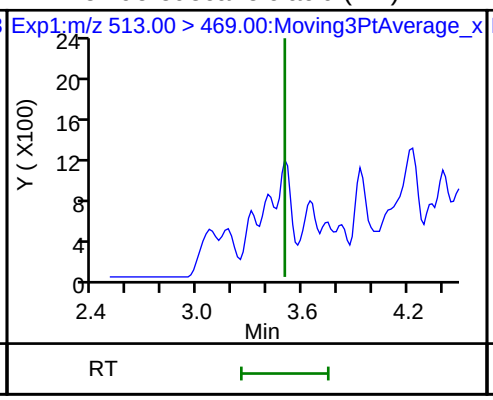
D 19 13C5 PFNA



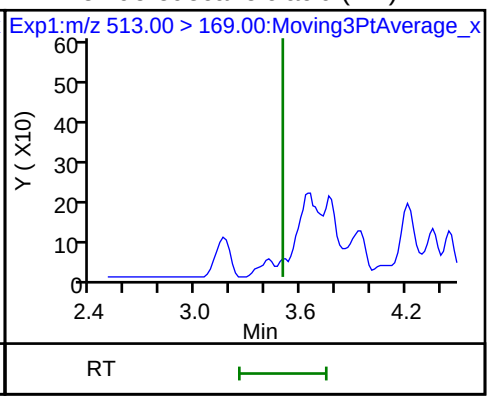
D 18 13C4 PFOS



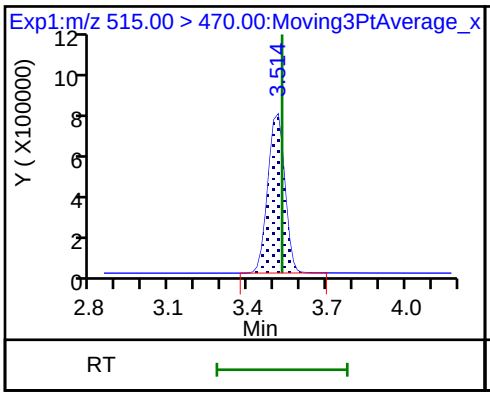
24 Perfluorodecanoic acid (ND)



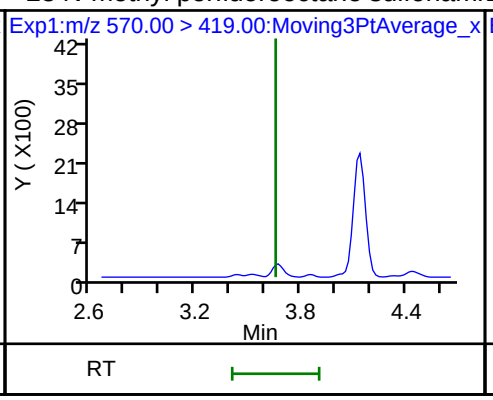
24 Perfluorodecanoic acid (ND)



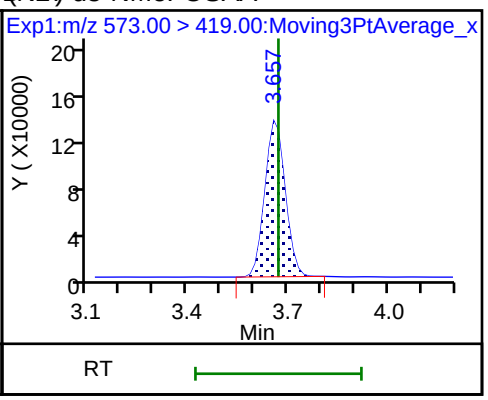
D 23 13C2 PFDA



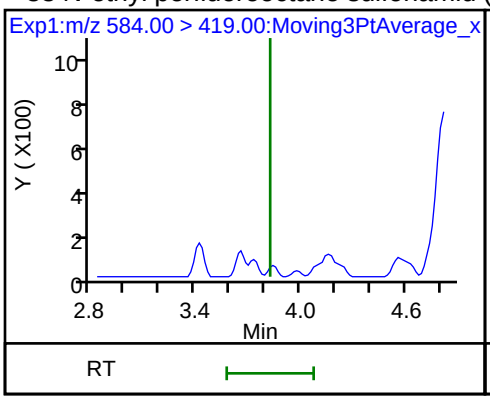
28 N-methyl perfluorooctane sulfonamid (ND)



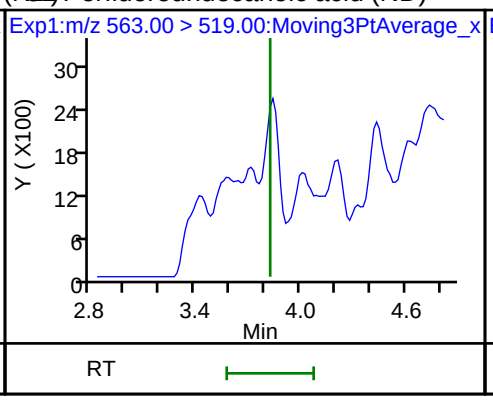
D 27 d3-NMeFOSAA



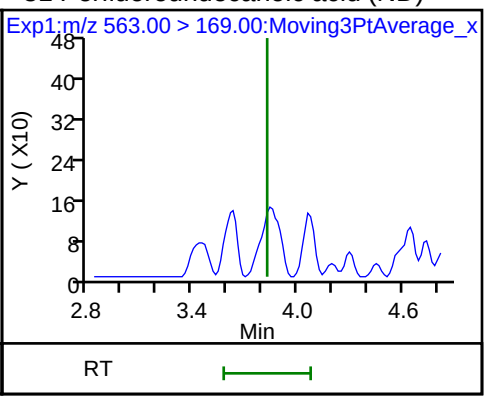
33 N-ethyl perfluorooctane sulfonamid (ND)



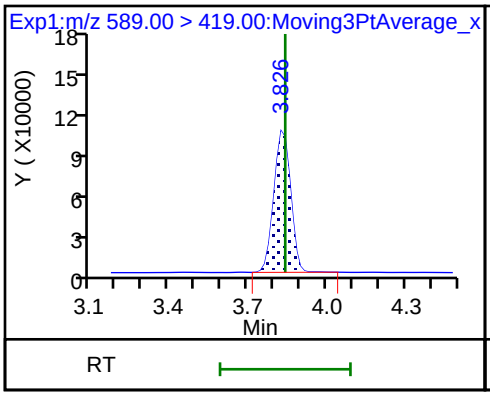
31 Perfluoroundecanoic acid (ND)



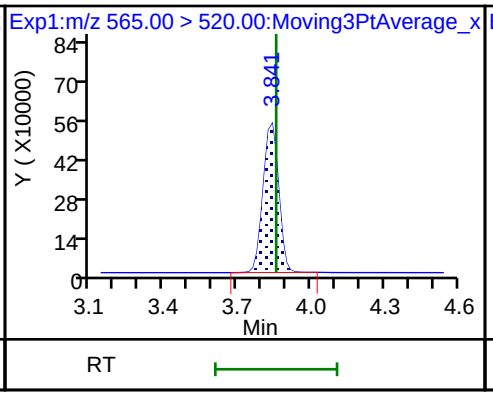
31 Perfluoroundecanoic acid (ND)



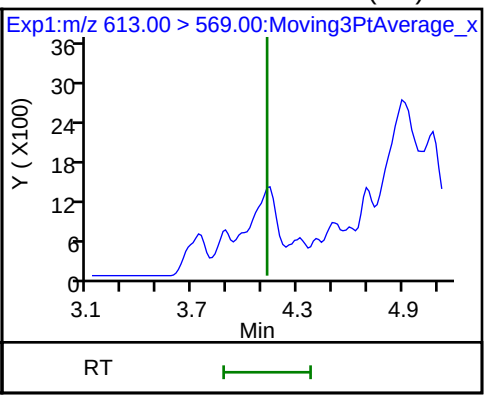
D 32 d5-NEtFOSAA



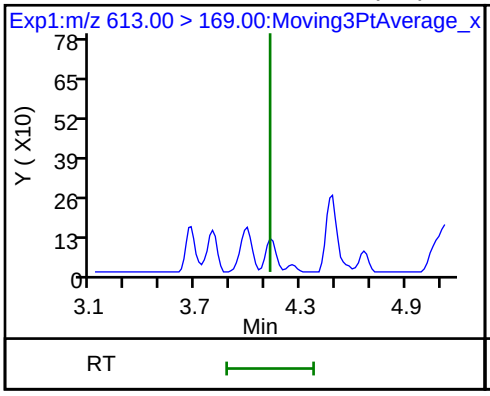
D 30 13C2 PFUnA



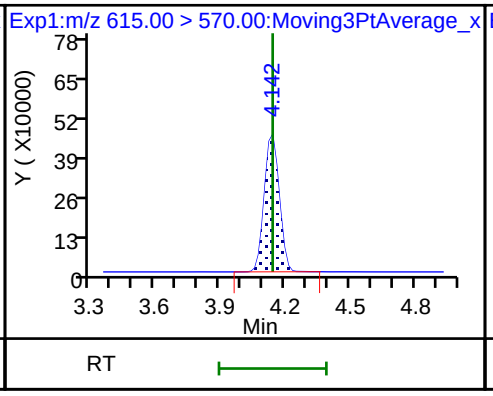
37 Perfluorododecanoic acid (ND)



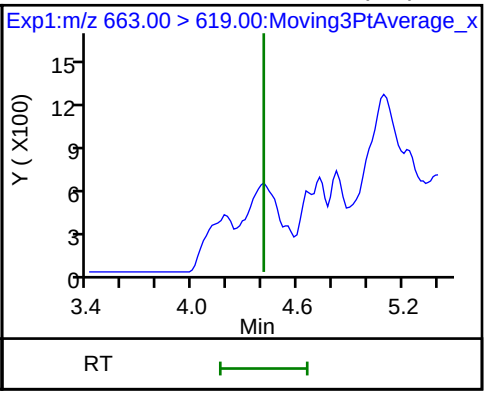
37 Perfluorododecanoic acid (ND)



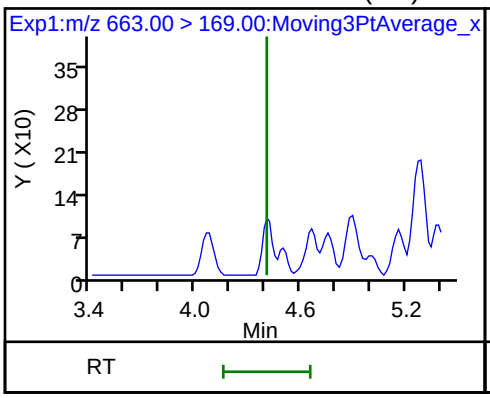
D 36 13C2 PFDoA



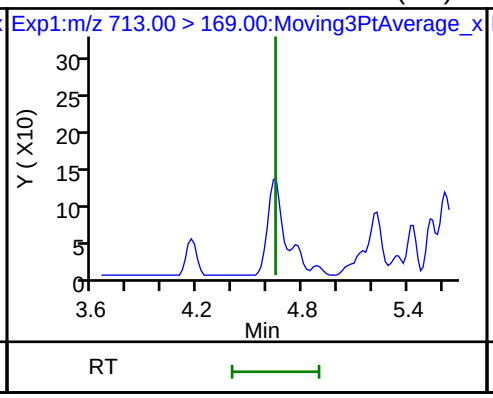
41 Perfluorotridecanoic acid (ND)



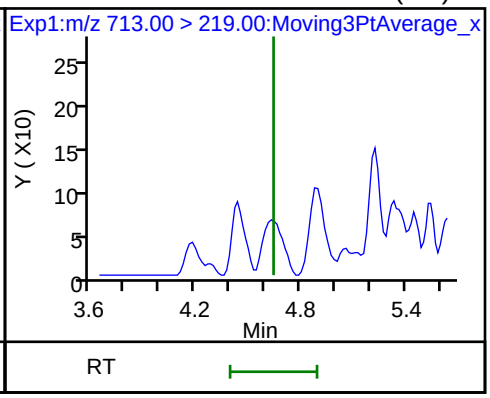
41 Perfluorotridecanoic acid (ND)



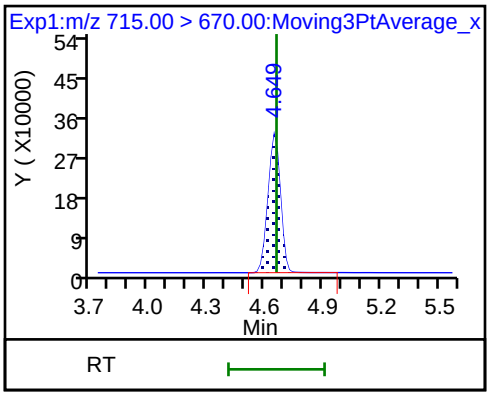
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

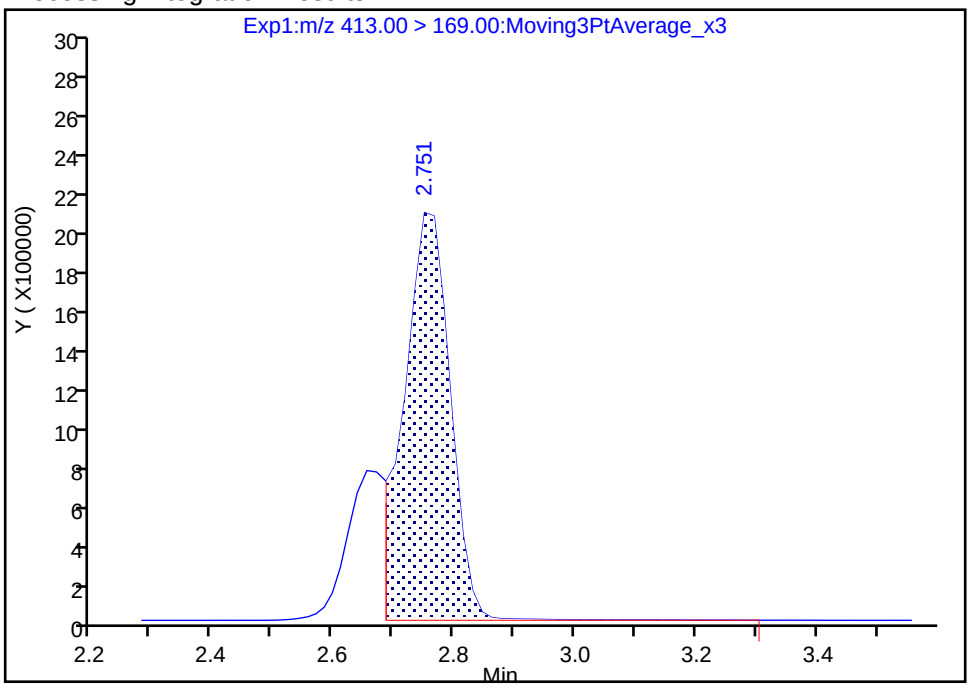
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_010.d				
Injection Date:	11-Aug-2018 21:07:08	Instrument ID:	A9		
Lims ID:	320-41998-A-2-D	Lab Sample ID:	320-41998-2		
Client ID:	TW02S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	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

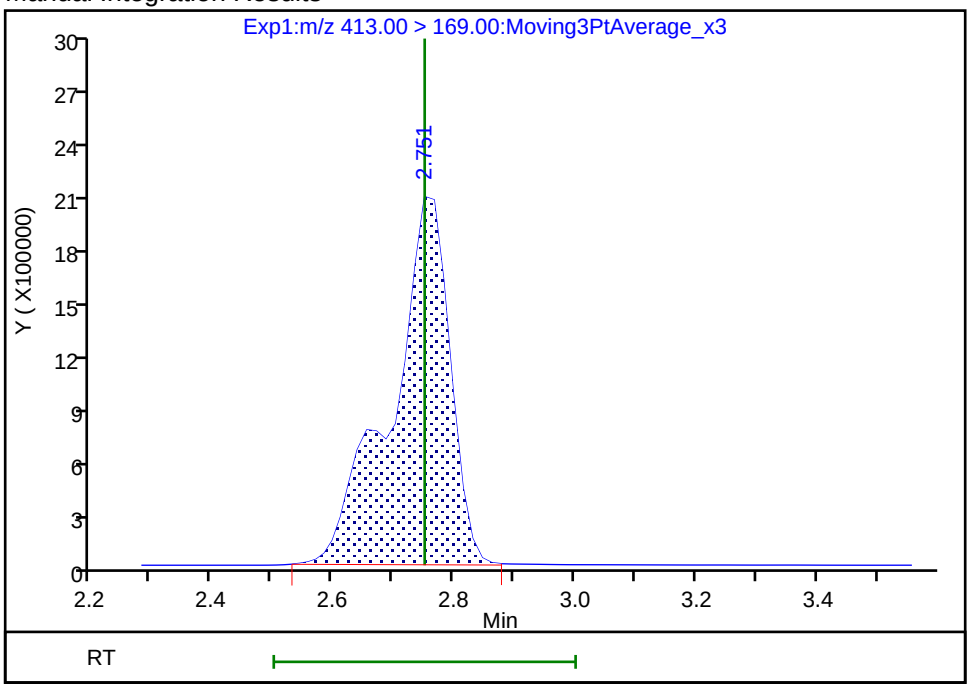
Processing Integration Results

RT: 2.75
Area: 10738564
Amount: 9.548663
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 13787323
Amount: 9.548663
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:30:25

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

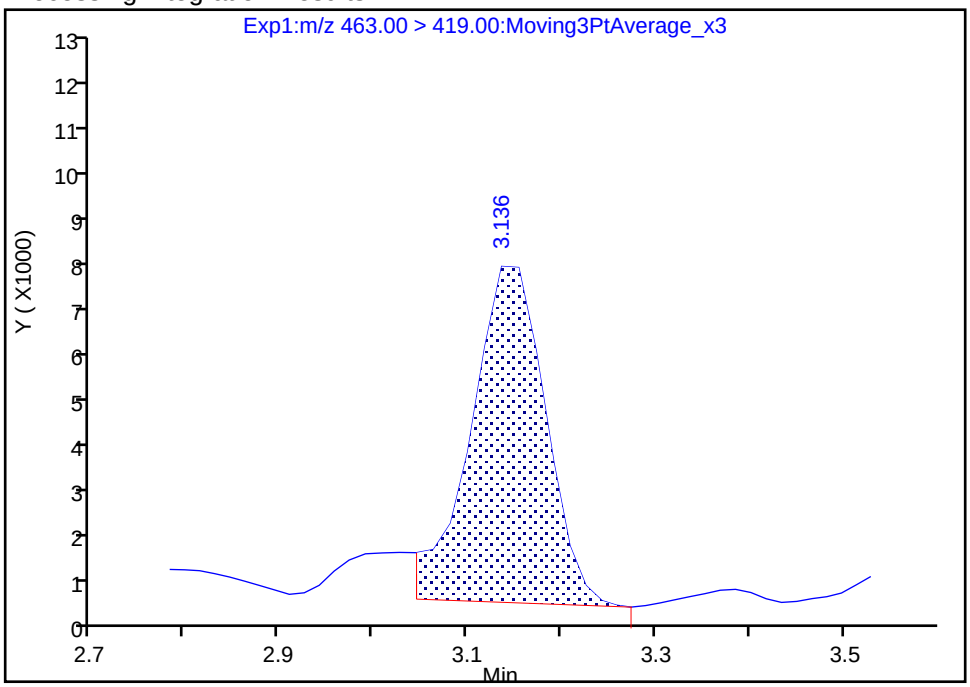
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_010.d				
Injection Date:	11-Aug-2018 21:07:08	Instrument ID:	A9		
Lims ID:	320-41998-A-2-D	Lab Sample ID:	320-41998-2		
Client ID:	TW02S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	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

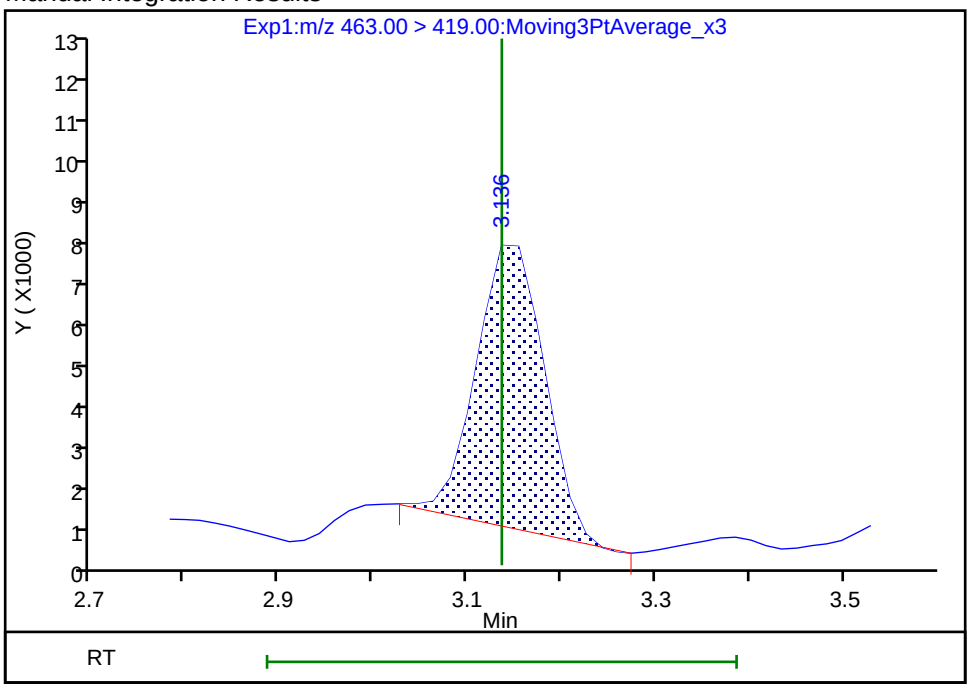
Processing Integration Results

RT: 3.14
Area: 40015
Amount: 0.013566
Amount Units: ng/ml



Manual Integration Results

RT: 3.14
Area: 33890
Amount: 0.011489
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:30:40

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 | Lab Sample ID: 320-41998-3

Matrix: Water | Lab File ID: 2018.08.11LA9A_011.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 13:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 279.5(mL) | Date Analyzed: 08/11/2018 21:14

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.: 239432 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.23	H J1 M	0.0018	0.00089	0.00042
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.084	H	0.0018	0.0013	0.00055
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.41*	*H J1 M*	*0.0018*	0.0013	*0.00048*
375-95-1	Perfluorononanoic acid (PFNA)	0.0035	H	0.0018	0.0013	0.00047
335-76-2	Perfluorodecanoic acid (PFDA)	0.00089	U H M	0.0018	0.00089	0.00043
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0013	U H	0.0018	0.0013	0.00064
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0013	U H	0.0018	0.0013	0.00047
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0036	0.0027	0.00068
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0036	0.0027	0.00074
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.051	H	0.0018	0.00089	0.00041
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.22	H	0.0018	0.00089	0.00034
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*0.59*	*H J1*	*0.0036*	0.0027	*0.00098*
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0089	U H M	0.018	0.0089	0.0027
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0089	U H	0.018	0.0089	0.0025

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 | Lab Sample ID: 320-41998-3

Matrix: Water | Lab File ID: 2018.08.11LA9A_011.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 13:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 279.5(mL) | Date Analyzed: 08/11/2018 21:14

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.: 239432 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		50-150
STL01892	13C4-PFHpA	97		50-150
STL00990	13C4 PFOA	98		50-150
STL00995	13C5 PFNA	99		50-150
STL00996	13C2 PFDA	107		50-150
STL00997	13C2 PFUnA	103		50-150
STL00998	13C2 PFDoA	108		50-150
STL00994	18O2 PFHxS	90		50-150
STL02116	13C2-PFTeDA	117		50-150
STL00991	13C4 PFOS	88		50-150
STL02337	13C3-PFBS	84		50-150
STL02117	d5-NEtFOSAA	102		50-150
STL02118	d3-NMeFOSAA	108		50-150

Report Date: 13-Aug-2018 07:40:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_011.d
Lims ID: 320-41998-A-3-D
Client ID: TW03S-20180713
Sample Type: Client
Inject. Date: 11-Aug-2018 21:14:40 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41998-a-3-d
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 11-Aug-2018 21:48:10

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	1.489	-0.001	1.000	6279761	2.50			481	
D 1 13C4 PFBA										
217.00 > 172.00	1.488	1.494	-0.006	0.538	6756494	2.13		85.2	15053	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.000	14438809	5.72			405	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.772	-0.008	0.637	6183284	2.18		87.3	5576	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	5449836	1.43			306	
298.90 > 99.00	1.797	1.797	0.0	1.000	1894354		2.88(1.35-4.05)		391	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.805	-0.008	0.650	85831	1.96		84.1	187	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.007	0.010	1.122	57484	0.0915			195	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.018	-0.011	0.725	737	NC			0.2	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.048	2.048	0.0	1.000	16380873	6.47			779	M
313.00 > 119.00	2.048	2.048	0.0	1.000	1220601		13.42(6.96-20.87)		1254	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.740	6770879	2.30		92.1	7548	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.069	-0.001	1.151	2428443	1.35			370	
349.00 > 99.00	2.068	2.069	-0.001	1.151	1103103		2.20(1.15-3.45)		328	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.140	2.150	-0.010	0.995	1847	NC			0.4	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.160	-0.010	0.777	757501	NC			2118	

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	2.386	2.387	-0.001	1.000	7972709	2.36			266	
363.00 > 169.00	2.386	2.387	-0.001	1.000	1857726		4.29(2.17-6.52)		2464	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.400	-0.014	0.863	8132218	2.43		97.4	6169	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	17528232	6.06			3205	
399.00 > 99.00	2.400	2.400	0.0	1.000	4794090		3.66(1.90-5.70)		1095	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.867	5343790	2.12		89.8	11326	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.719	0.016	1.000	5172591	7.27			3112	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.751	-0.016	0.988	791051	2.44		103	688	
* 62 13C2-PFOA										
415.00 > 370.00	2.766	2.751	0.015		7095523	2.50			19669	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.766	2.751	0.015	1.000	34329409	11.4			2233	E
413.00 > 169.00	2.766	2.751	0.015	1.000	15837828		2.17(1.36-4.08)		2815	M
D 14 13C4 PFOA										
417.00 > 372.00	2.766	2.767	-0.001	1.000	6843476	2.44		97.8	17226	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.766	2.767	-0.001	0.877	975398	0.4172			47.7	
449.00 > 99.00	2.766	2.767	-0.001	0.877	262600		3.71(1.84-5.53)		134	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.154	3.136	0.018	1.000	40995605	16.5			1774	E
499.00 > 99.00	3.154	3.136	0.018	1.000	9971210		4.11(2.04-6.12)		5253	
20 Perfluorononanoic acid										
463.00 > 419.00	3.154	3.136	0.018	1.000	246783	0.0981			36.2	
463.00 > 169.00	3.154	3.136	0.018	1.000	45745		5.39(2.68-8.03)		89.0	
D 19 13C5 PFNA										
468.00 > 423.00	3.154	3.155	-0.001	1.140	5962707	2.48		99.3	16726	
D 18 13C4 PFOS										
503.00 > 80.00	3.154	3.155	-0.001	1.140	5529054	2.11		88.4	1780	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.482	3.467	0.015	1.000	6265	0.001427			12.3	
D 21 13C8 FOSA										
506.00 > 78.00	3.482	3.483	-0.001	1.259	3573619	2.28		91.4	5277	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.514	3.498	0.016	1.000	5514	0.008610			27.3	
D 26 M2-8:2FTS										
529.00 > 81.00	3.514	3.514	0.0	1.270	109410	2.90		121	570	
D 23 13C2 PFDA										
515.00 > 470.00	3.529	3.529	0.0	1.276	6417357	2.67		107	6033	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.671	3.671	0.0	1.327	1261280	2.70		108	2544	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.841	3.841	0.0	1.388	983713	2.56		102	1886	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFUnA										
565.00 > 520.00	3.841	3.857	-0.016	1.388	4983862	2.56		103	4466	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.993	3.994	-0.001	1.266	2111	NC			9.3	
D 36 13C2 PFDoA										
615.00 > 570.00	4.141	4.142	-0.001	1.497	5646861	2.69		108	7071	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.644	4.661	-0.017	1.679	3900512	2.91		117	10330	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.075	5.059	0.016	1.000	21472	NC			1.8	
813.00 > 169.00	5.075	5.059	0.016	1.000	4584		4.68(2.77-8.32)		18.1	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.075	5.092	-0.017	1.834	2698251	2.20		87.9	4999	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:40 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_011.d

Injection Date: 11-Aug-2018 21:14:40 Instrument ID: A9

Lims ID: 320-41998-A-3-D Lab Sample ID: 320-41998-3

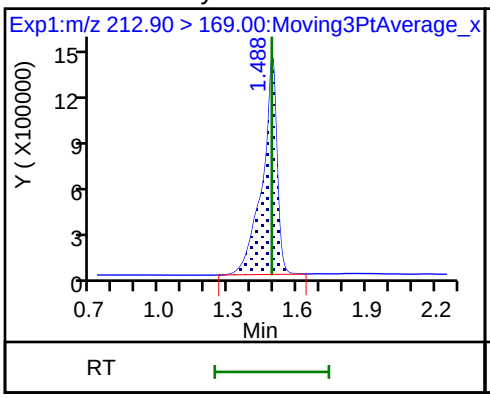
Client ID: TW03S-20180713

Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 8

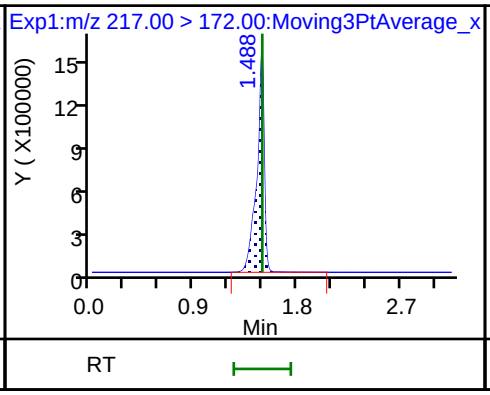
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

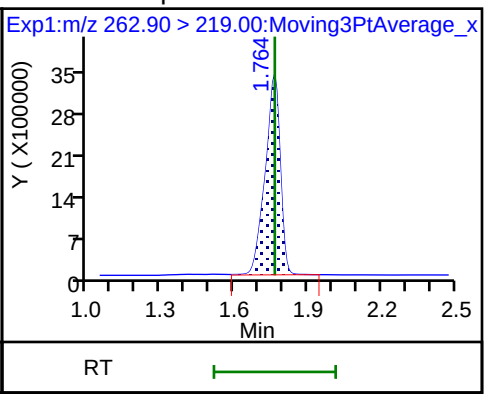
2 Perfluorobutyric acid



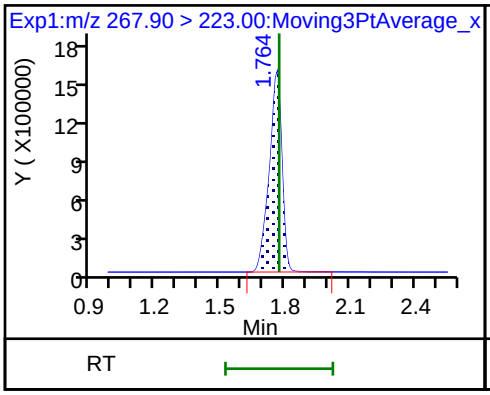
D 1 13C4 PFBA



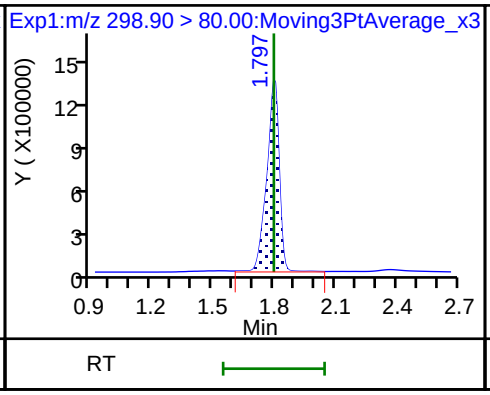
4 Perfluoropentanoic acid



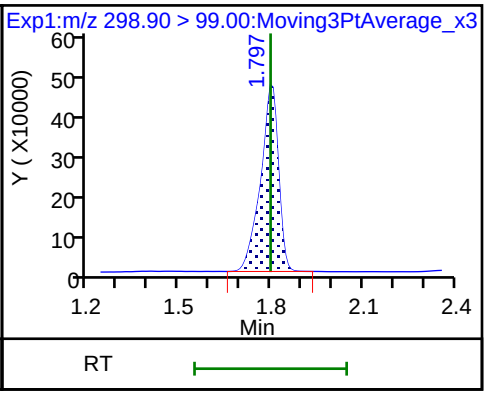
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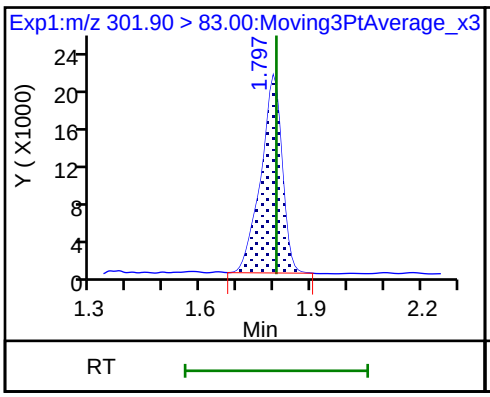
5 Perfluorobutanesulfonic acid



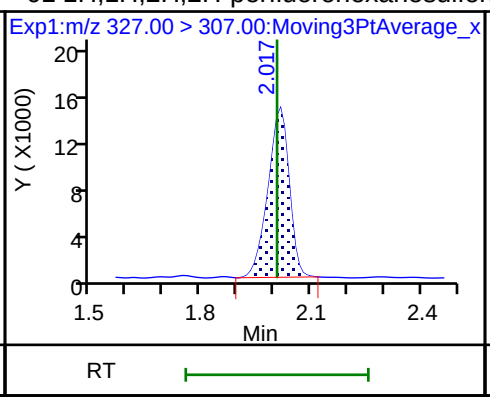
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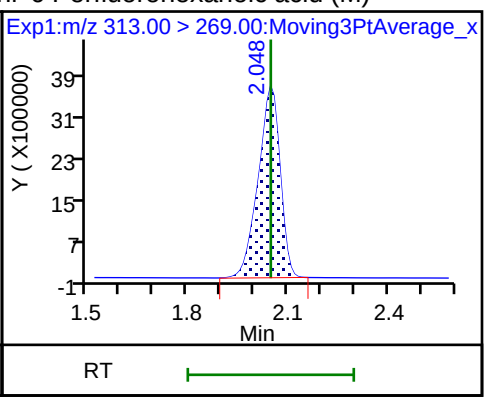
D 47 13C3-PFBS



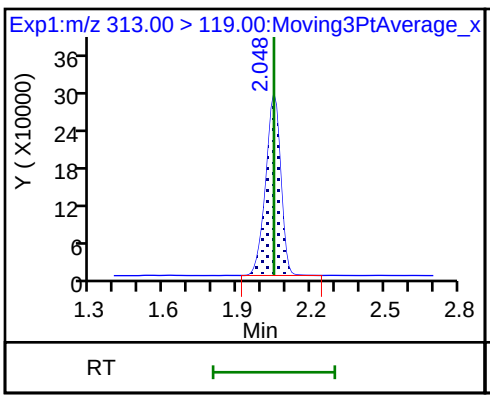
61 1H,1H,2H,2H-perfluorohexanesulfoni



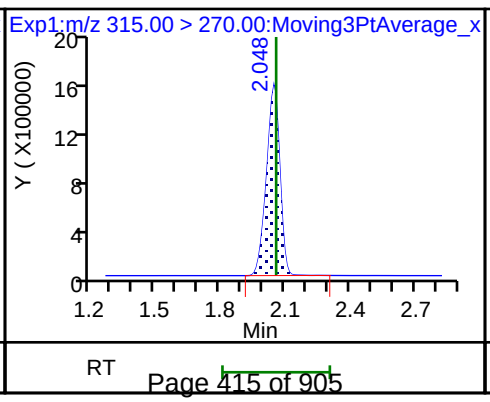
6 Perfluorohexanoic acid (M)



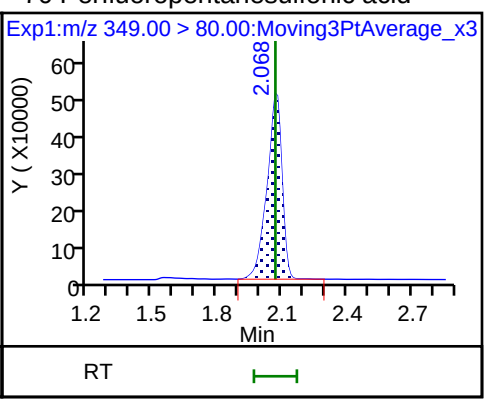
6 Perfluorohexanoic acid



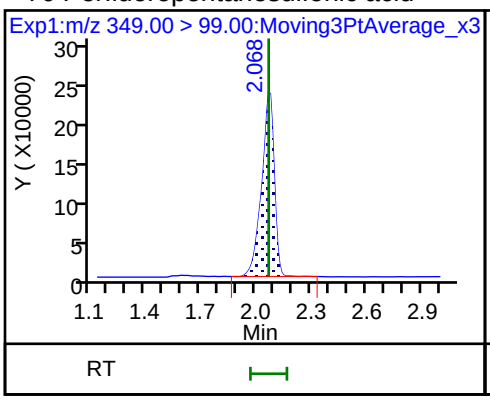
D 7 13C2 PFHxA



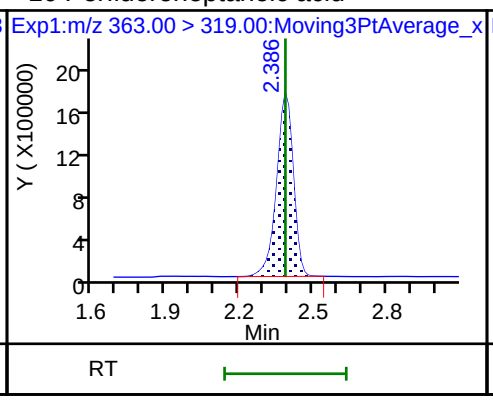
70 Perfluoropentanesulfonic acid



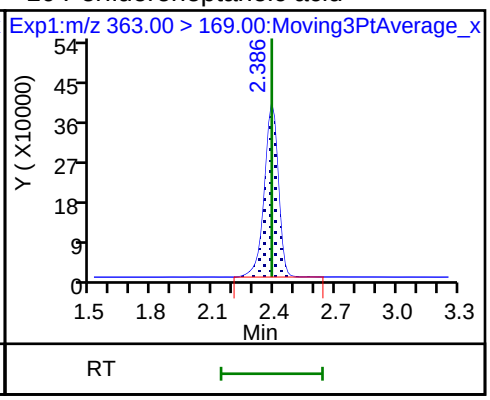
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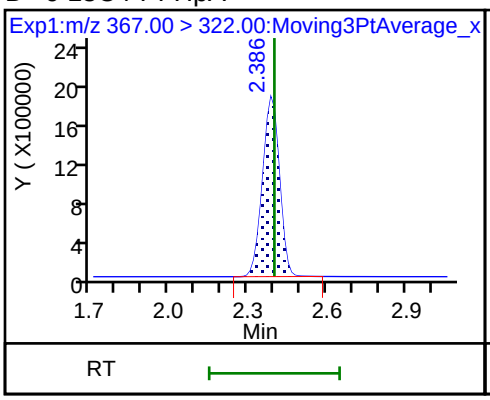
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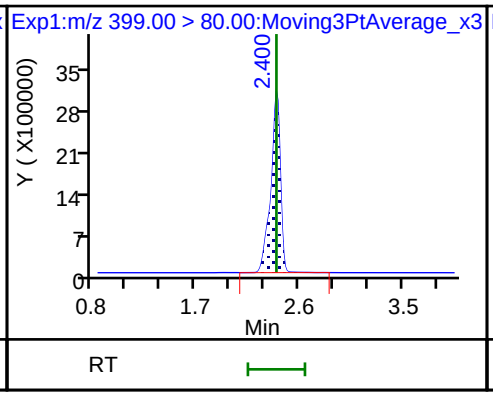
10 Perfluoroheptanoic acid



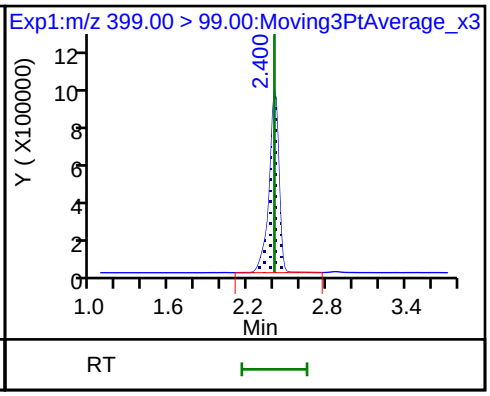
D 9 13C4-PFHpA



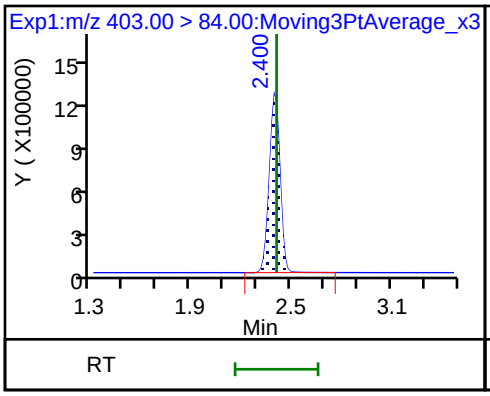
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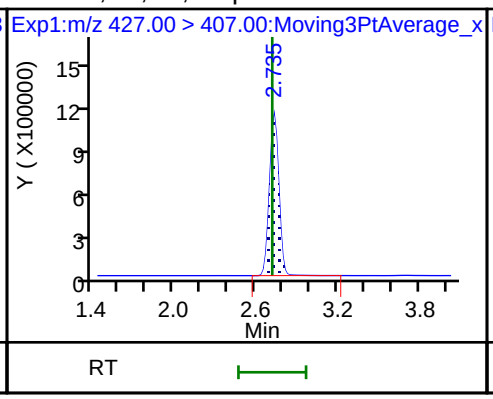
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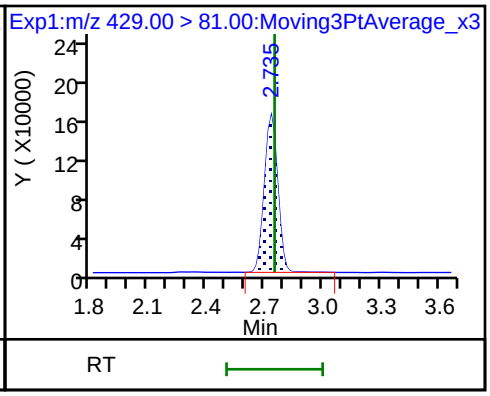
D 11 18O2 PFHxS



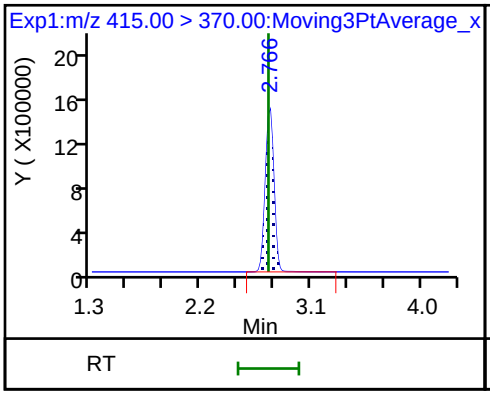
13 1H,1H,2H,2H-perfluorooctanesulfon



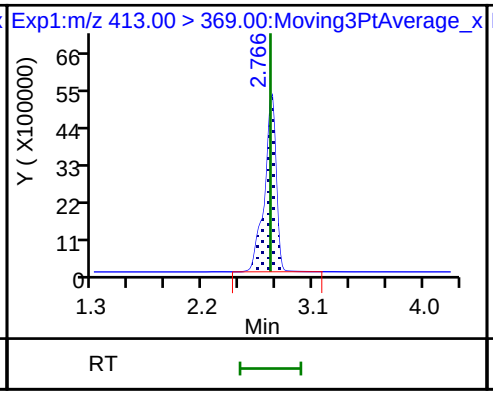
D 12 M2-6:2FTS



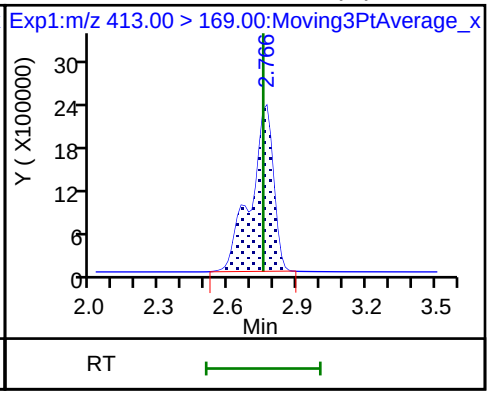
* 62 13C2-PFOA



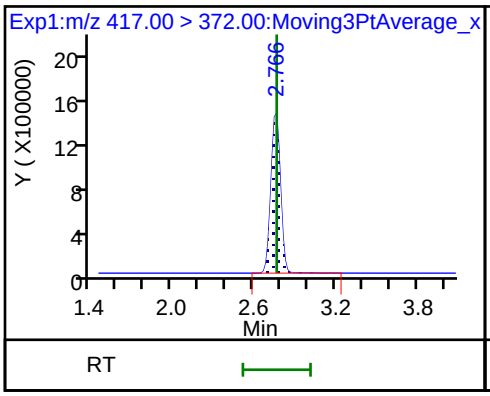
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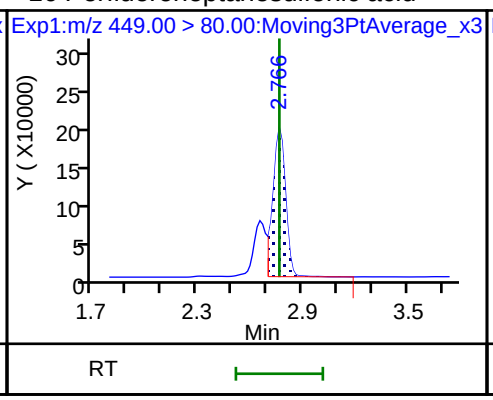
15 Perfluorooctanoic acid (M)



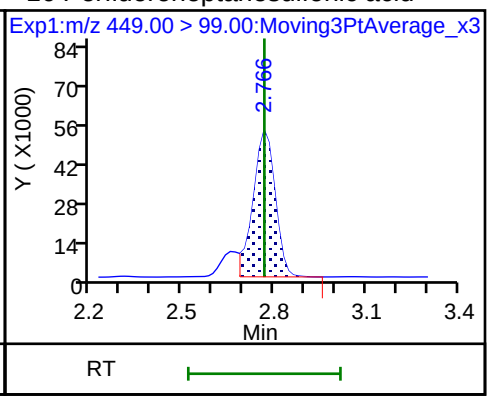
D 14 13C4 PFOA



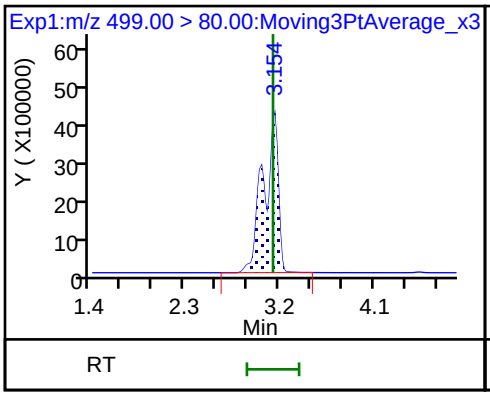
16 Perfluoroheptanesulfonic acid



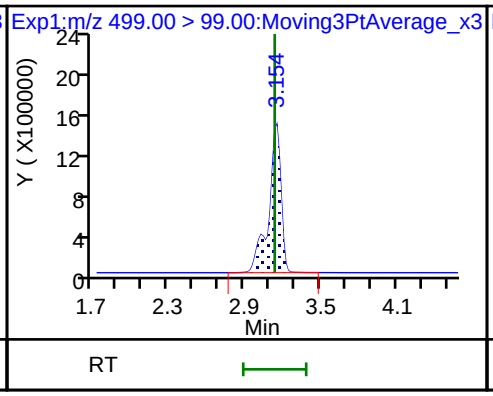
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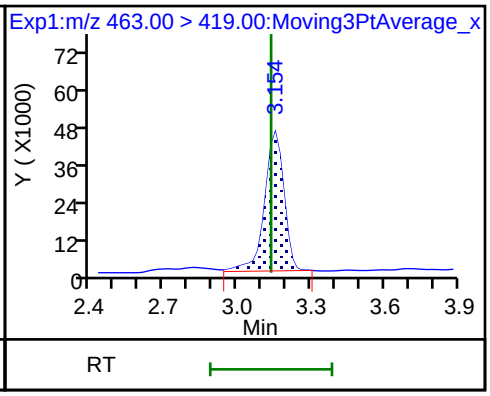
17 Perfluorooctane sulfonic acid



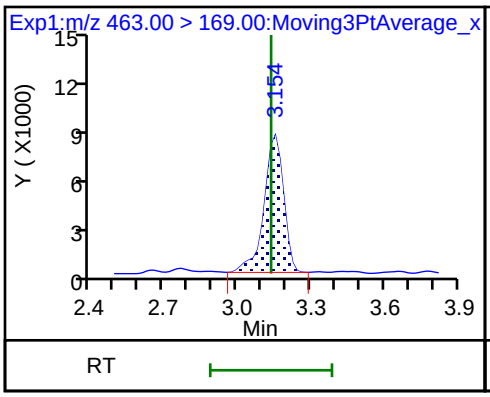
17 Perfluorooctane sulfonic acid



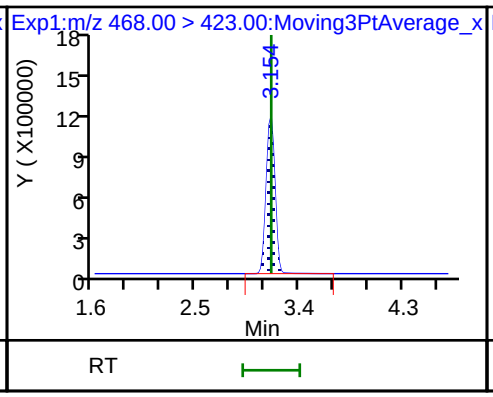
20 Perfluorononanoic acid



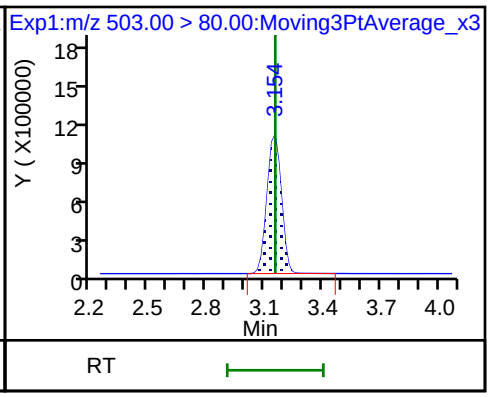
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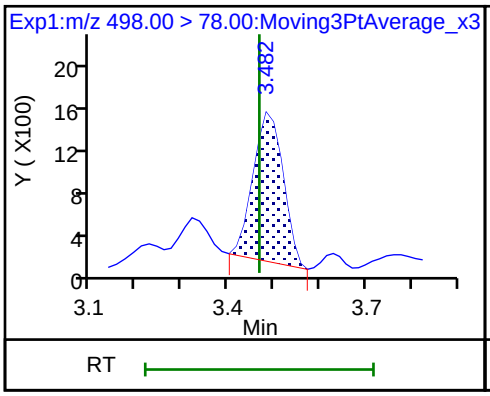
D 19 13C5 PFNA



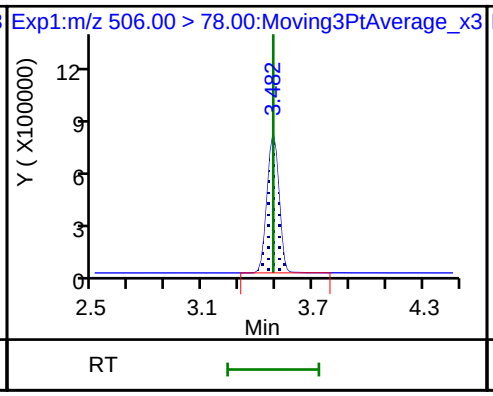
D 18 13C4 PFOS



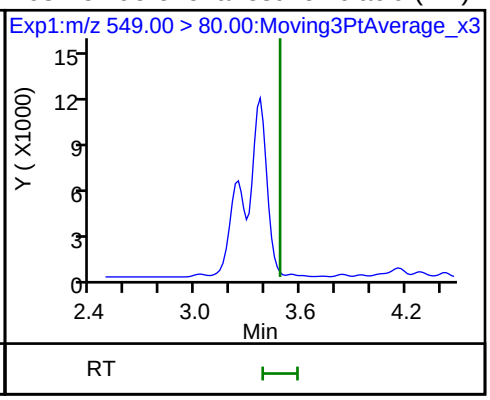
22 Perfluorooctane Sulfonamide



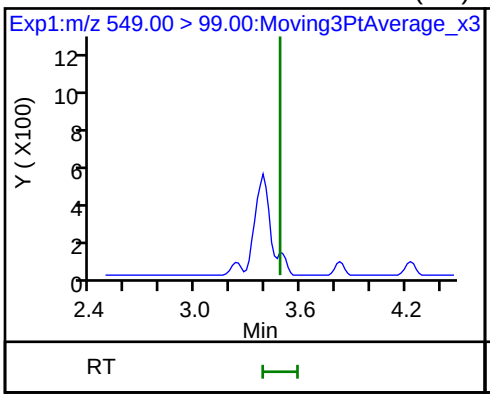
D 21 13C8 FOSA



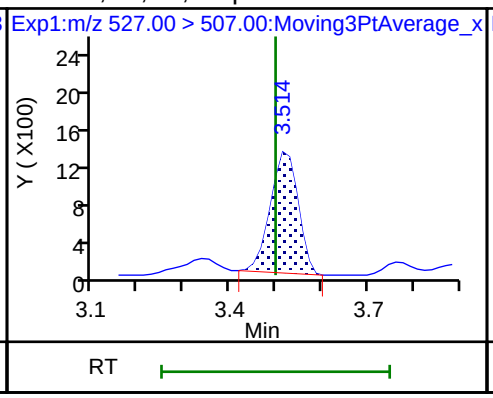
68 Perfluorononanesulfonic acid (ND)



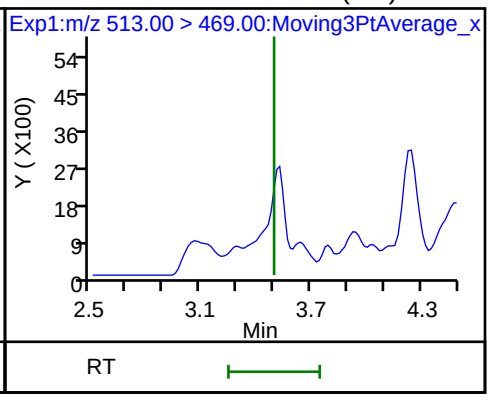
68 Perfluorononanesulfonic acid (ND)



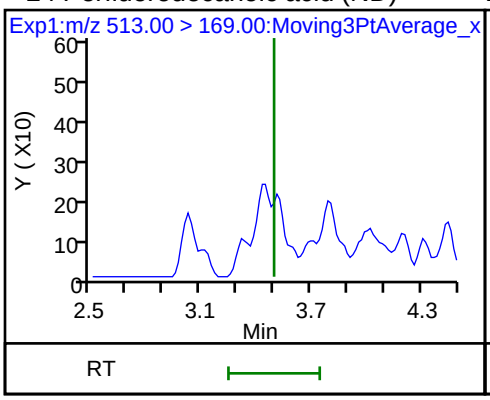
25 1H,1H,2H,2H-perfluorodecanesulfoni



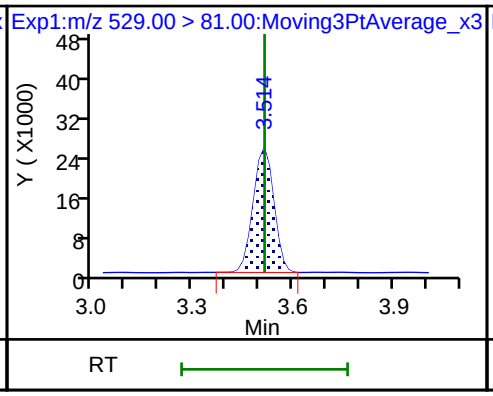
24 Perfluorodecanoic acid (ND)



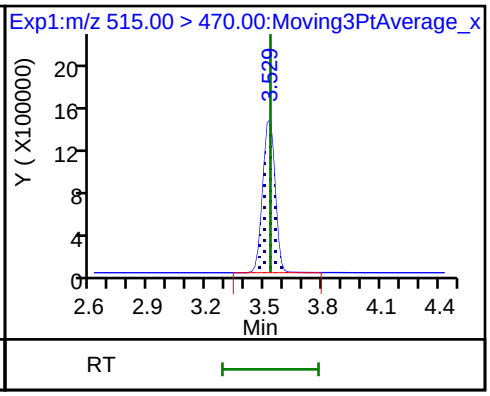
24 Perfluorodecanoic acid (ND)



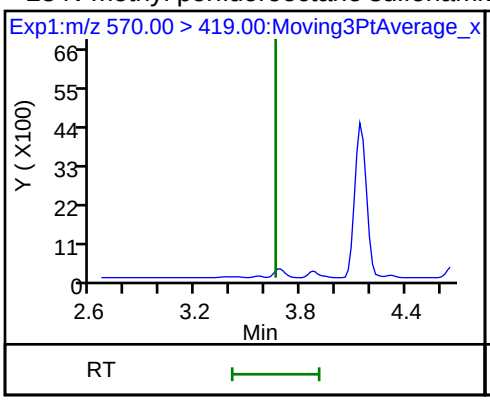
D 26 M2-8:2FTS



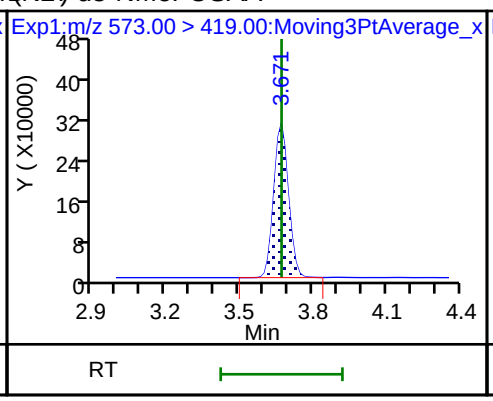
D 23 13C2 PFDA



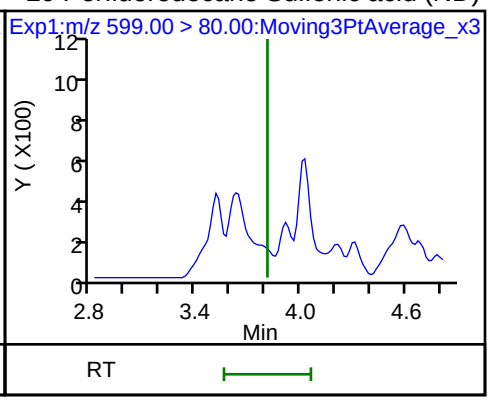
28 N-methyl perfluorooctane sulfonamid (ND)



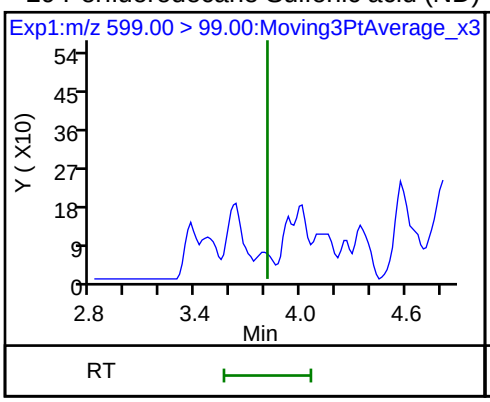
D 27 d3-NMeFOSAA



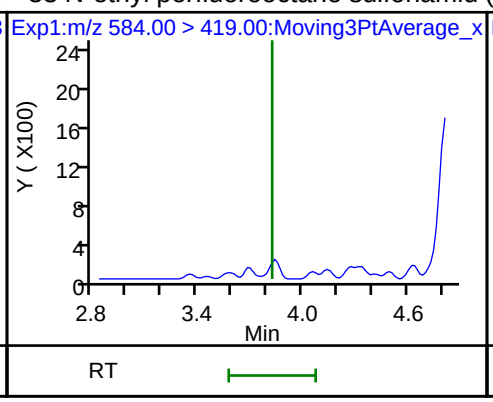
29 Perfluorodecane Sulfonic acid (ND)



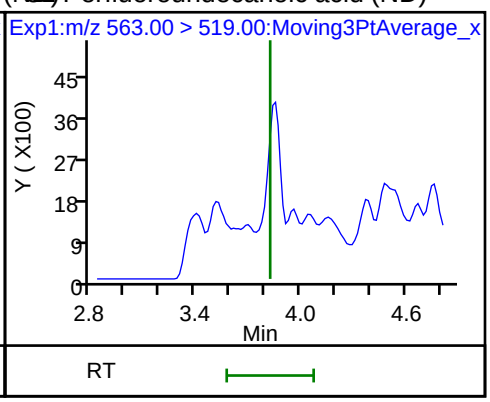
29 Perfluorodecane Sulfonic acid (ND)



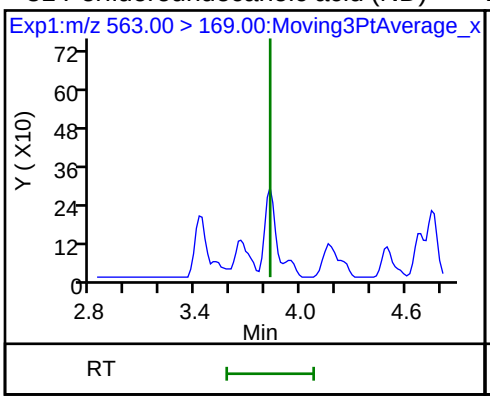
33 N-ethyl perfluorooctane sulfonamid (ND)



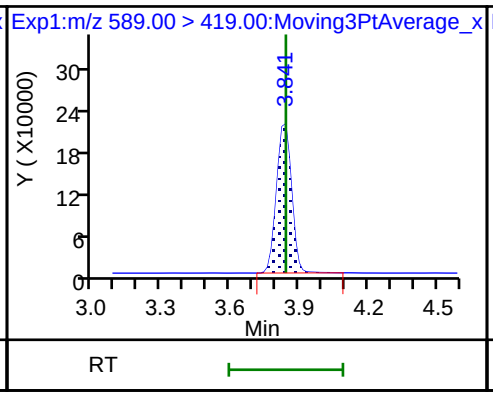
31 Perfluoroundecanoic acid (ND)



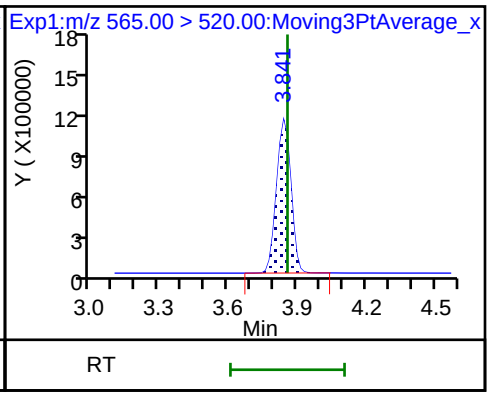
31 Perfluoroundecanoic acid (ND)



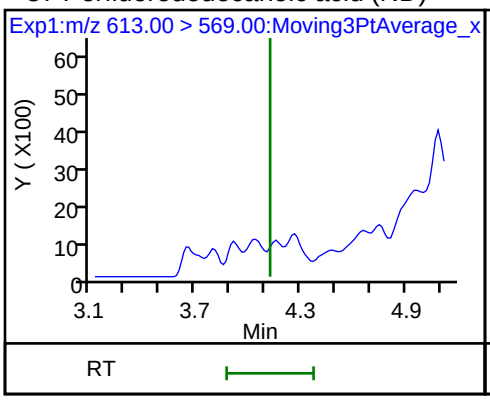
D 32 d5-NEtFOSAA



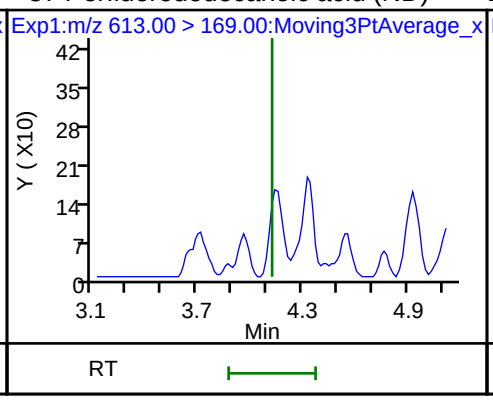
D 30 13C2 PFUnA



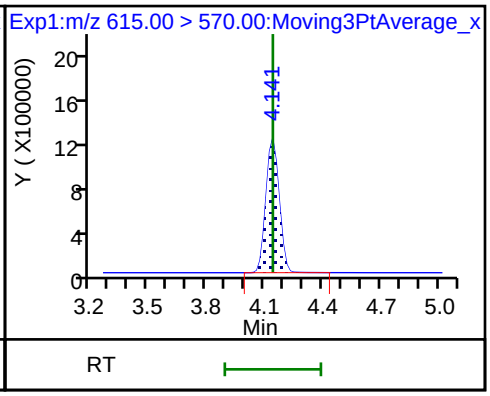
37 Perfluorododecanoic acid (ND)



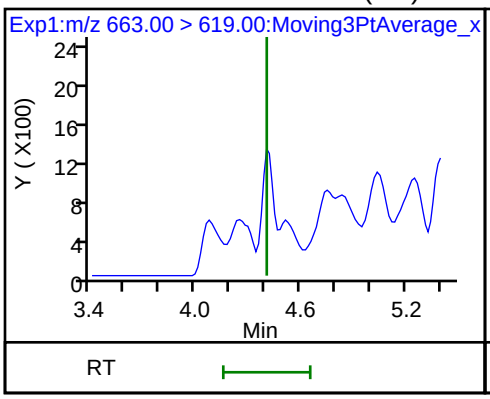
37 Perfluorododecanoic acid (ND)



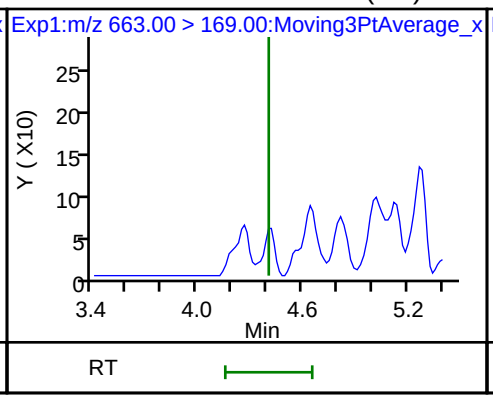
D 36 13C2 PFDoA



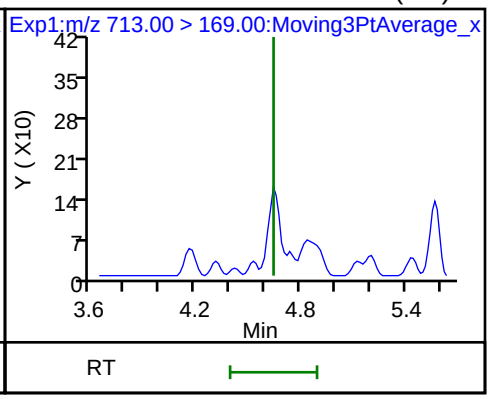
41 Perfluorotridecanoic acid (ND)



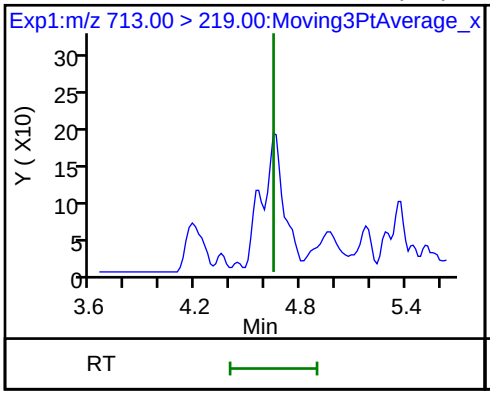
41 Perfluorotridecanoic acid (ND)



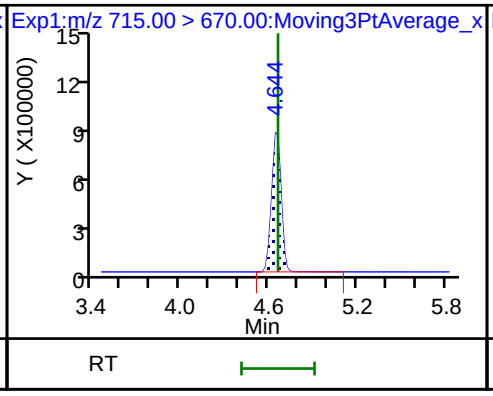
42 Perfluorotetradecanoic acid (ND)



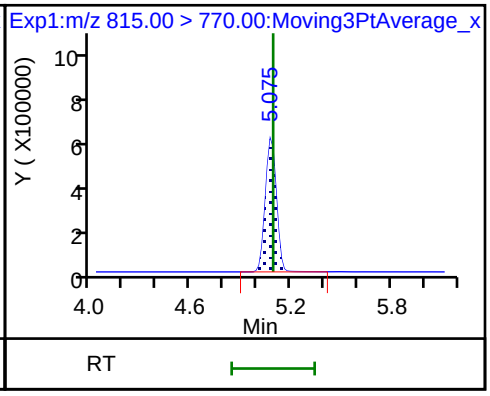
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

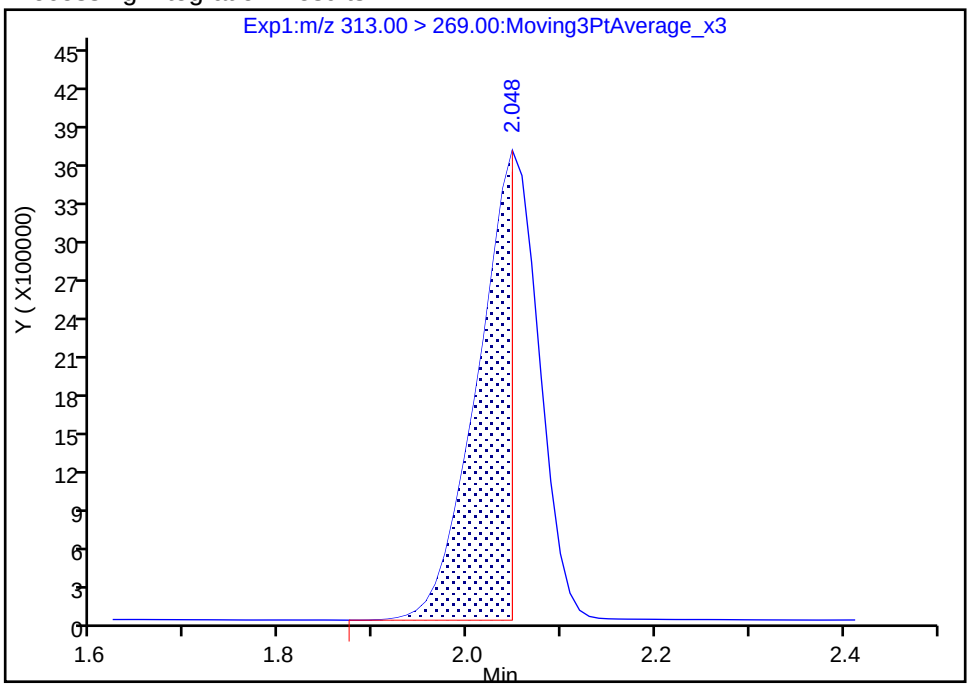
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_011.d				
Injection Date:	11-Aug-2018 21:14:40	Instrument ID:	A9		
Lims ID:	320-41998-A-3-D	Lab Sample ID:	320-41998-3		
Client ID:	TW03S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	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

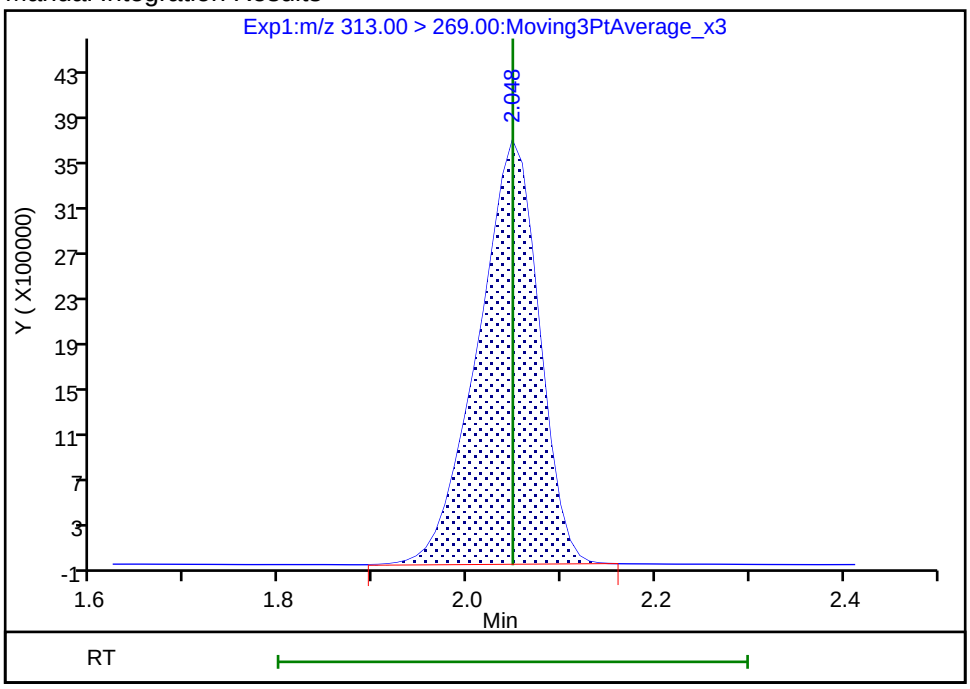
Processing Integration Results

RT: 2.05
Area: 9172509
Amount: 3.620368
Amount Units: ng/ml



Manual Integration Results

RT: 2.05
Area: 16380873
Amount: 6.465492
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:31:44

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

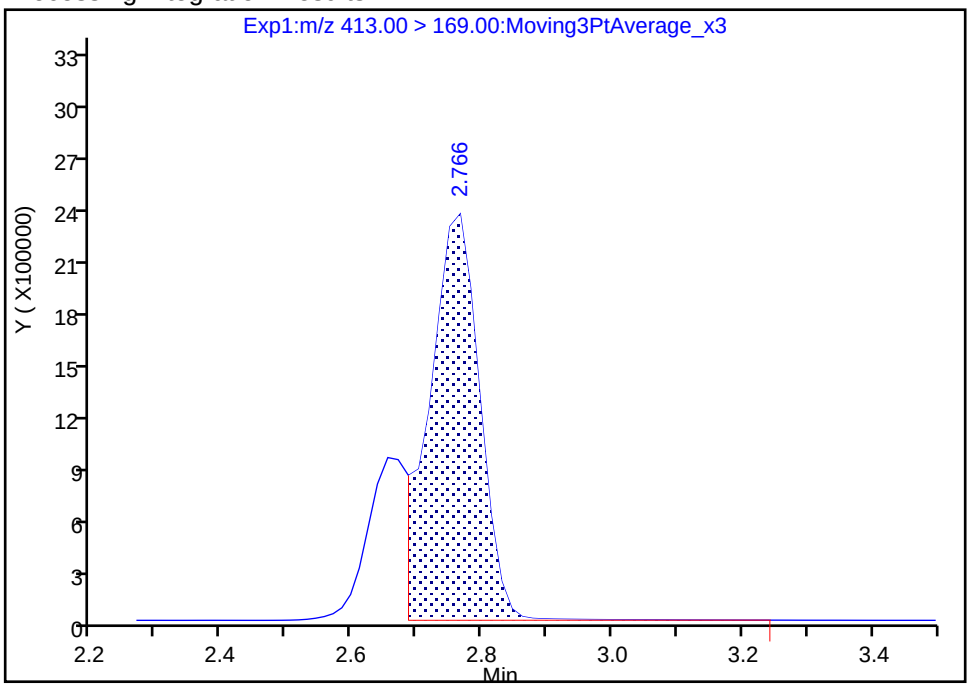
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_011.d				
Injection Date:	11-Aug-2018 21:14:40	Instrument ID:	A9		
Lims ID:	320-41998-A-3-D	Lab Sample ID:	320-41998-3		
Client ID:	TW03S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	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: 2

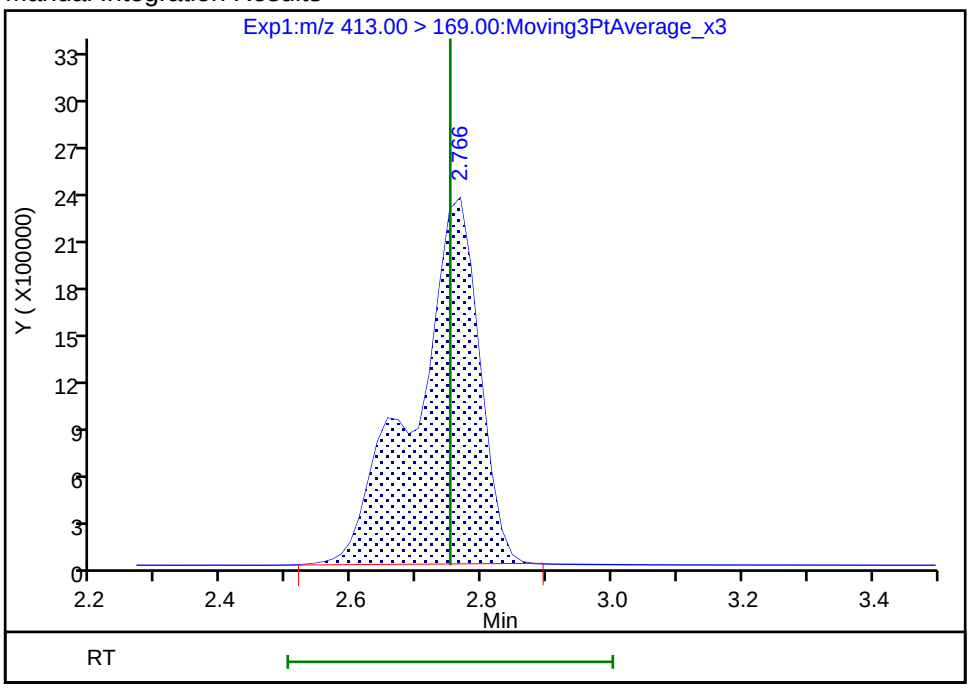
Processing Integration Results

RT: 2.77
Area: 12253838
Amount: 11.446418
Amount Units: ng/ml



Manual Integration Results

RT: 2.77
Area: 15837828
Amount: 11.446418
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:31:30

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 DL | Lab Sample ID: 320-41998-3 DL

Matrix: Water | Lab File ID: 2018.08.12LLA_009.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 13:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 279.5(mL) | Date Analyzed: 08/12/2018 11:03

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

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

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

Analysis Batch No.: 239460 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*0.24*	*H D*	*0.0089*	0.0045	*0.0021*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.085*	*H D*	*0.0089*	0.0067	*0.0027*
335-67-1	Perfluorooctanoic acid (PFOA)	0.47	J1 H D M	0.0089	0.0067	0.0024
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.0035*	*J H D*	*0.0089*	0.0067	*0.0023*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.0045*	*U H*	*0.0089*	0.0045	*0.0021*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*0.0067*	*U H*	*0.0089*	0.0067	*0.0032*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.0067*	*U H*	*0.0089*	0.0067	*0.0023*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*0.013*	*U H*	*0.018*	0.013	*0.0034*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*0.013*	*U H*	*0.018*	0.013	*0.0037*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.051*	*H D J1*	*0.0089*	0.0045	*0.0021*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*0.23*	*H D*	*0.0089*	0.0045	*0.0017*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.67	H J1 D	0.018	0.013	0.0049
2355-31-9	*N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)*	*0.045*	*U H*	*0.089*	0.045	*0.013*
2991-50-6	*N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)*	*0.045*	*U H*	*0.089*	0.045	*0.013*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 DL Lab Sample ID: 320-41998-3 DL

Matrix: Water Lab File ID: 2018.08.12LLA_009.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 13:30

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 279.5(mL) Date Analyzed: 08/12/2018 11:03

Con. Extract Vol.: 10.00(mL) Dilution Factor: 5

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

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

Analysis Batch No.: 239460 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		50-150
STL01892	13C4-PFHpA	95		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	101		50-150
STL00996	13C2 PFDA	94		50-150
STL00997	13C2 PFUnA	88		50-150
STL00998	13C2 PFDoA	83		50-150
STL00994	18O2 PFHxS	80		50-150
STL02116	13C2-PFTeDA	89		50-150
STL00991	13C4 PFOS	82		50-150
STL02337	13C3-PFBS	73		50-150
STL02117	d5-NEtFOSAA	102		50-150
STL02118	d3-NMeFOSAA	98		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_009.d
Lims ID: 320-41998-A-3-D
Client ID: TW03S-20180713
Sample Type: Client
Inject. Date: 12-Aug-2018 11:03:20 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 20.0 ul Dil. Factor: 5.0000
Sample Info: 320-41998-a-3-d 5X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 14:05:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 13:56:50

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	1.494	-0.005	0.541	1693985	0.4025		80.5	3434	
2 Perfluorobutyric acid										
212.90 > 169.00	1.489	1.494	-0.005	1.000	1556866	0.4945			63.5	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.756	1.764	-0.008	1.000	3585318	1.17			151	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.764	-0.008	0.638	1508251	0.4009		80.2	2612	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.798	1.806	-0.008	1.005	1256948	0.2874			174	
298.90 > 99.00	1.798	1.806	-0.008	1.005	447937		2.81(1.35-4.05)		130	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.806	-0.017	0.650	19688	0.3379		72.7	76.0	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.017	-0.010	1.122	12065	0.0167			70.0	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	4009950	1.34			528	
313.00 > 119.00	2.048	2.048	0.0	1.000	297089		13.50(6.96-20.87)		424	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.745	1597095	0.4090		81.8	3651	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.069	2.079	-0.010	1.156	556793	0.2689			301	
349.00 > 99.00	2.069	2.079	-0.010	1.156	268169		2.08(1.15-3.45)		136	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.140	2.161	-0.021	0.778	155869	NC			813	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.400	-0.013	1.000	2064875	0.4744			142	
363.00 > 169.00	2.387	2.400	-0.013	1.000	447420		4.62(2.17-6.52)		748	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.868	2095728	0.4726		94.5	4553	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.413	-0.013	1.000	4435861	1.31			2043	
399.00 > 99.00	2.400	2.413	-0.013	1.000	1136895		3.90(1.90-5.70)		248	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	1255703	0.3761		79.5	4432	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.735	0.0	1.006	1410595	1.42			978	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.735	-0.016	0.988	220105	0.5106		107	293	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.767	-0.016		1883706	0.5000			4639	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.882	228316	0.0795			44.0	
449.00 > 99.00	2.767	2.767	0.0	0.882	57905		3.94(1.84-5.53)		64.0	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.751	2.767	-0.016	1.000	10135006	2.65			896	
413.00 > 169.00	2.751	2.767	-0.016	1.000	4100620		2.47(1.36-4.08)		1909	M
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	1746556	0.4699		94.0	3812	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.155	-0.019	1.000	11495291	3.77			1636	
499.00 > 99.00	3.136	3.155	-0.019	1.000	2357012		4.88(2.04-6.12)		2239	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.155	-0.019	1.000	66429	0.0195			12.2	
463.00 > 169.00	3.136	3.155	-0.019	1.000	10949		6.07(2.68-8.03)		31.7	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.155	-0.019	1.140	1616307	0.5069		101	3717	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.155	-0.019	1.140	1358310	0.3909		81.8	1196	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.483	3.467	0.016	1.004	3099	0.000628			4.5	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.483	-0.016	1.260	803695	0.3870		77.4	1868	
D 26 M2-8:2FTS										
529.00 > 81.00	3.498	3.515	-0.017	1.272	28872	0.5766		120	164	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.530	-0.032	1.272	1496058	0.4686		93.7	3751	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.329	303342	0.4887		97.7	1246	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.842	-0.016	1.391	261016	0.5120		102	453	
D 30 13C2 PFUnA										
565.00 > 520.00	3.842	3.857	-0.015	1.396	1134763	0.4398		88.0	3146	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.160	-0.035	1.500	1147804	0.4126		82.5	2533	

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	4.649	4.677	-0.028	1.690	790723	0.4451		89.0	4784	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.079	5.093	-0.014	1.846	554377	0.3402		68.0	2063	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:42:06 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_009.d

Injection Date: 12-Aug-2018 11:03:20 Instrument ID: A9

Lims ID: 320-41998-A-3-D Lab Sample ID: 320-41998-3

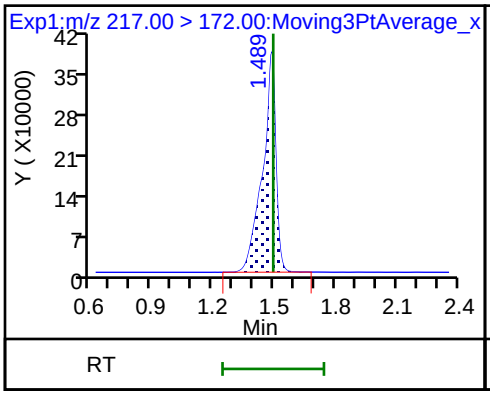
Client ID: TW03S-20180713

Operator ID: A9\Administrator ALS Bottle#: 3 Worklist Smp#: 6

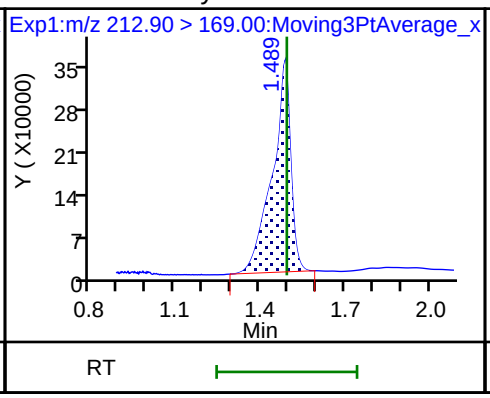
Injection Vol: 20.0 ul Dil. Factor: 5.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

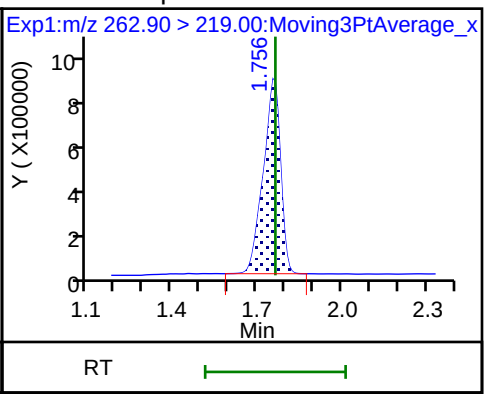
D 1 13C4 PFBA



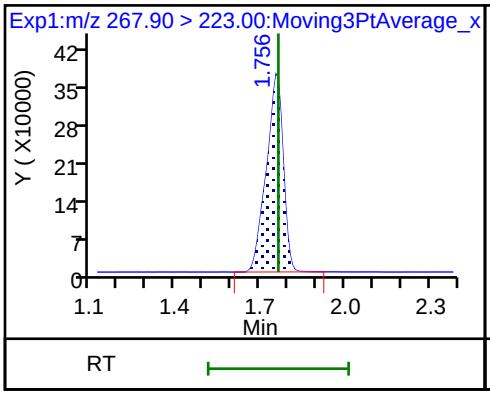
2 Perfluorobutyric acid



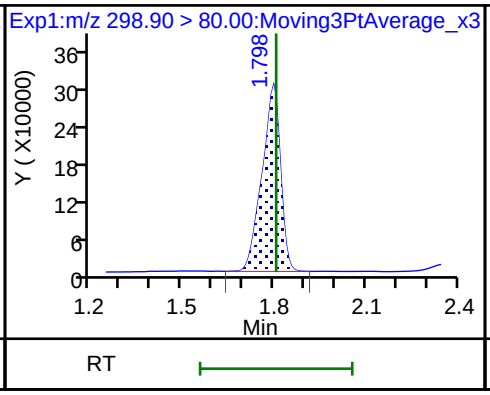
4 Perfluoropentanoic acid



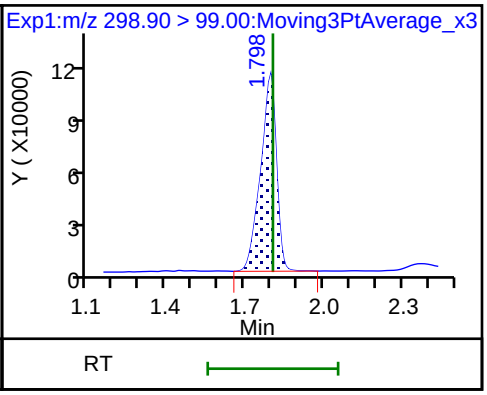
D 3 13C5-PFPeA



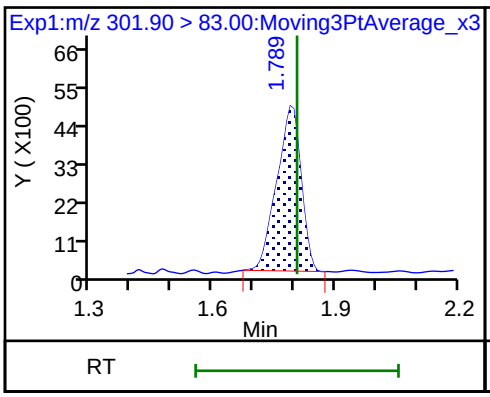
5 Perfluorobutanesulfonic acid



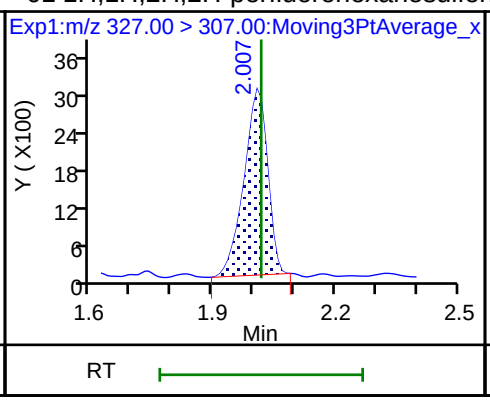
5 Perfluorobutanesulfonic acid



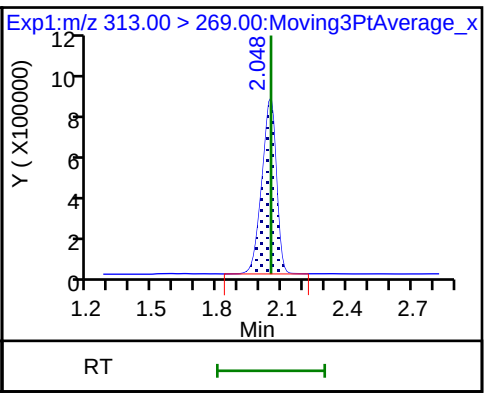
D 47 13C3-PFBS



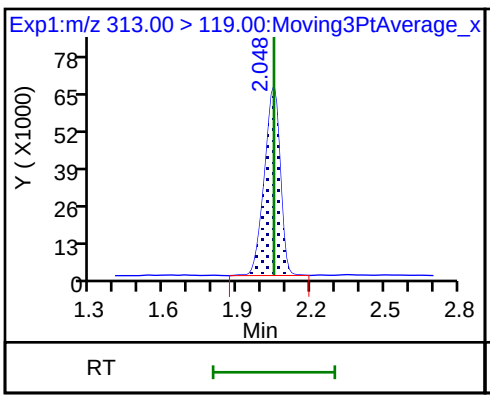
61 1H,1H,2H,2H-perfluorohexanesulfoni



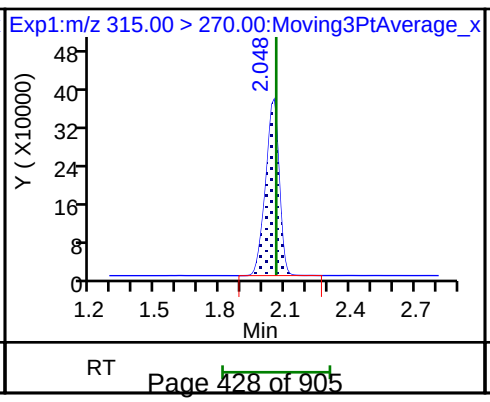
6 Perfluorohexanoic acid



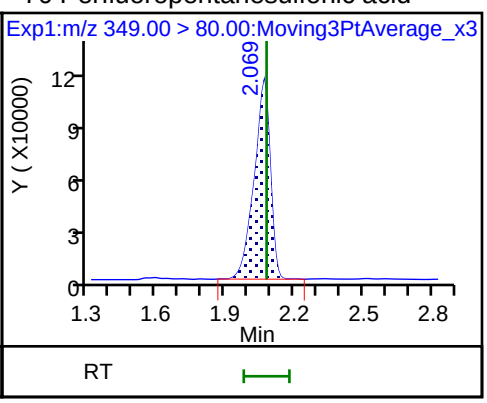
6 Perfluorohexanoic acid



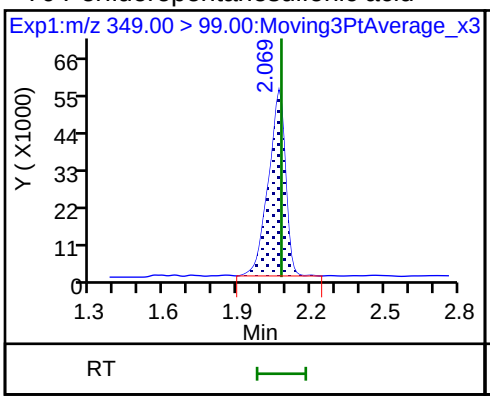
D 7 13C2 PFHxA



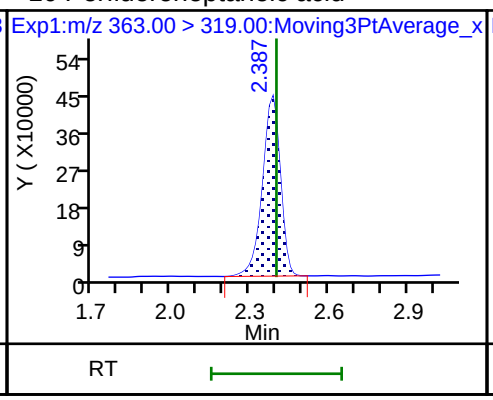
70 Perfluoropentanesulfonic acid



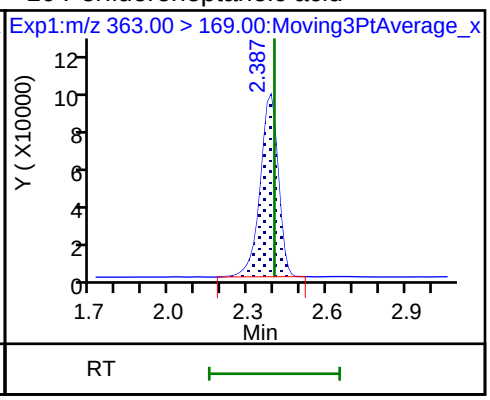
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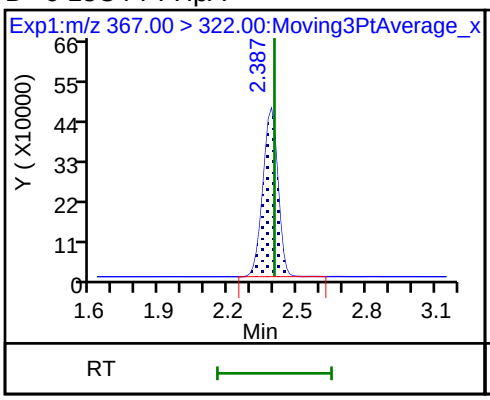
10 Perfluoroheptanoic acid



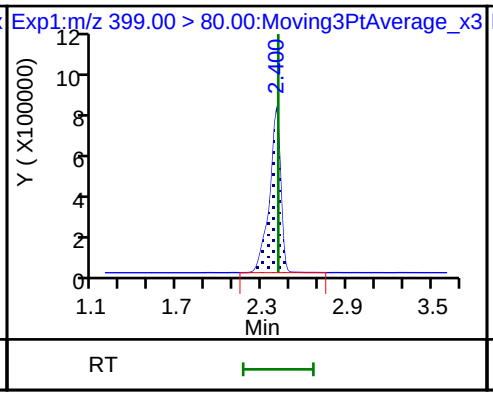
10 Perfluoroheptanoic acid



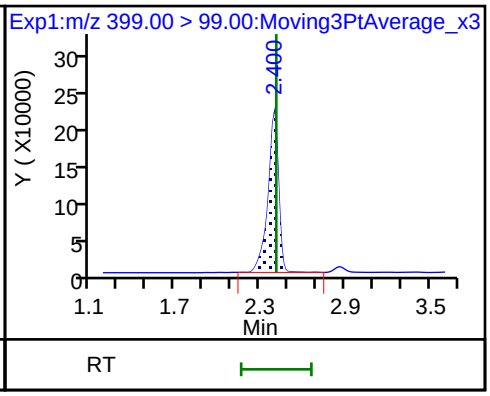
D 9 13C4-PFHpA



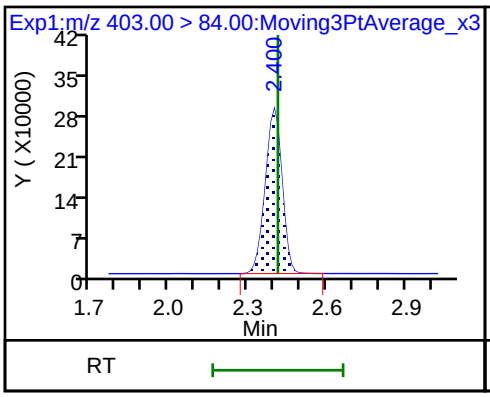
8 Perfluorohexanesulfonic acid



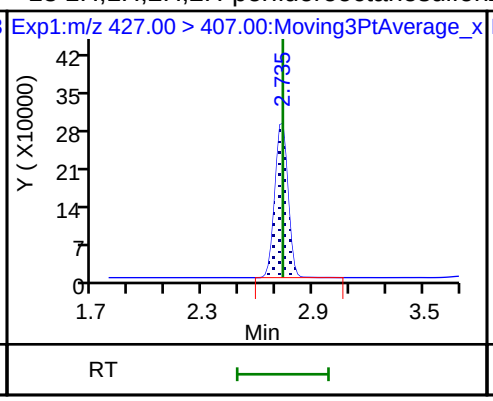
8 Perfluorohexanesulfonic acid



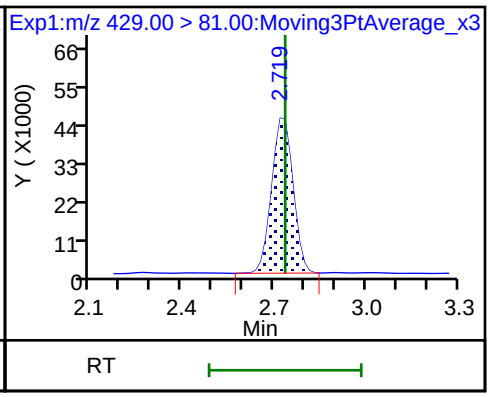
D 11 18O2 PFHxS



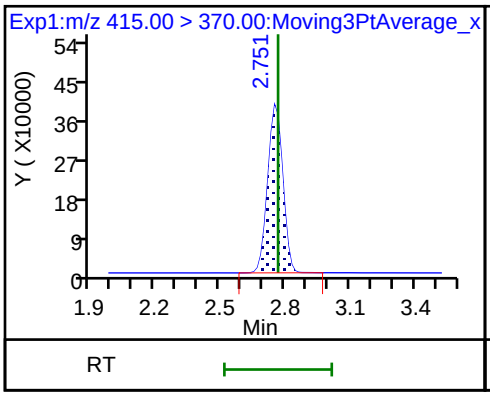
13 1H,1H,2H,2H-perfluorooctanesulfon



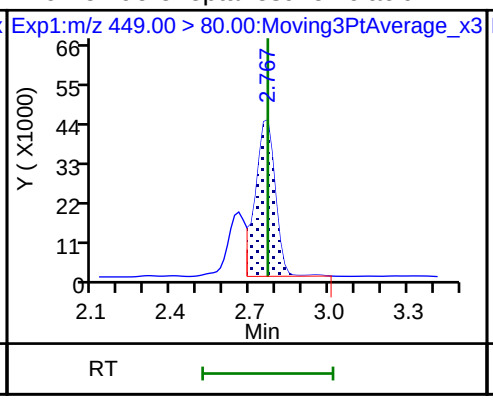
D 12 M2-6:2FTS



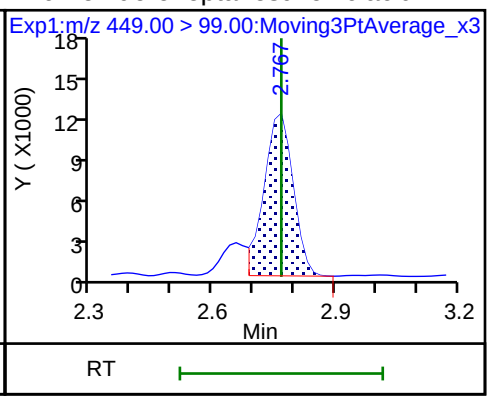
* 62 13C2-PFOA



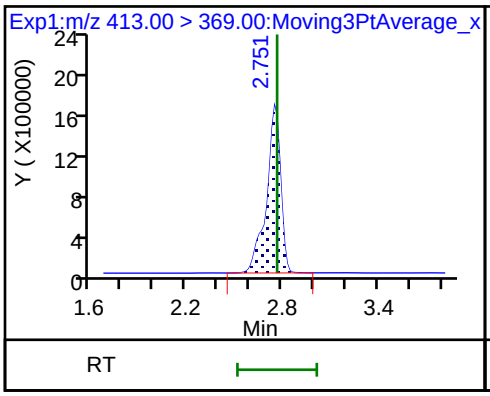
16 Perfluoroheptanesulfonic acid



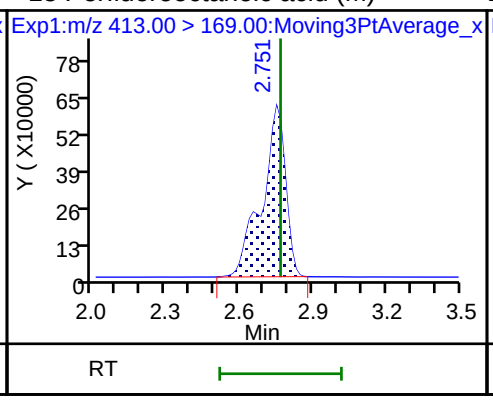
16 Perfluoroheptanesulfonic acid



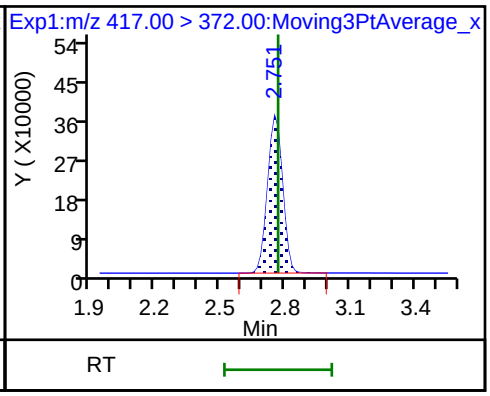
15 Perfluorooctanoic acid



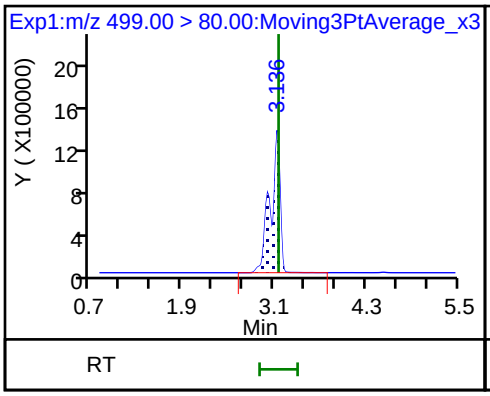
15 Perfluorooctanoic acid (M)



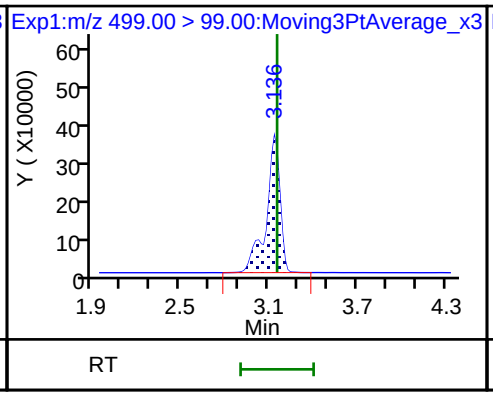
D 14 13C4 PFOA



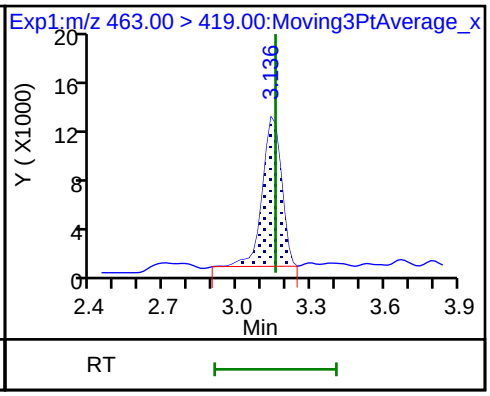
17 Perfluorooctane sulfonic acid



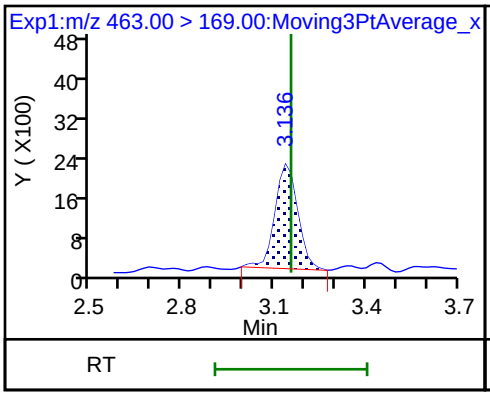
17 Perfluorooctane sulfonic acid



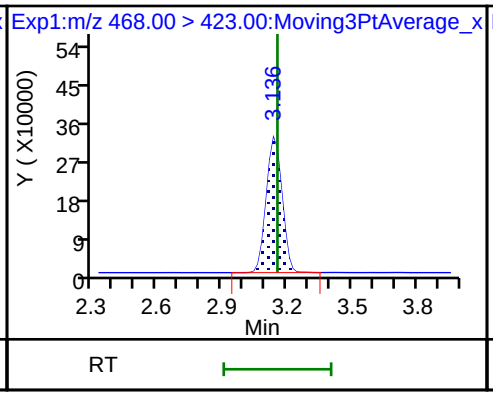
20 Perfluorononanoic acid



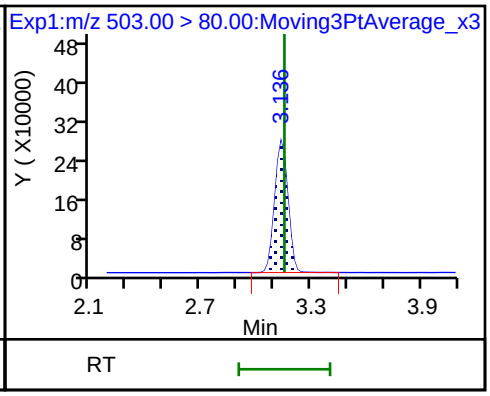
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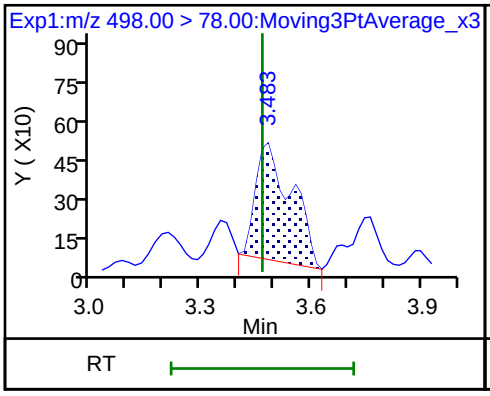
D 19 13C5 PFNA



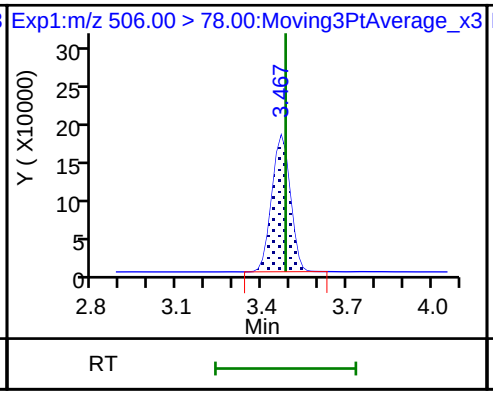
D 18 13C4 PFOS



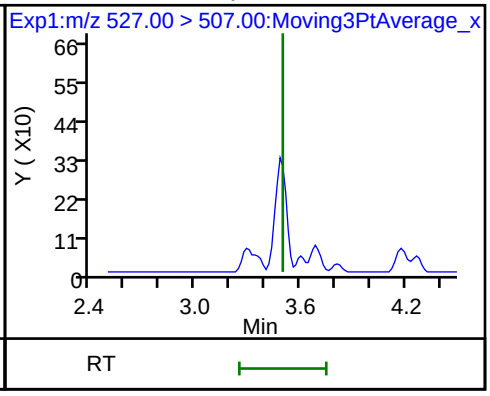
22 Perfluorooctane Sulfonamide



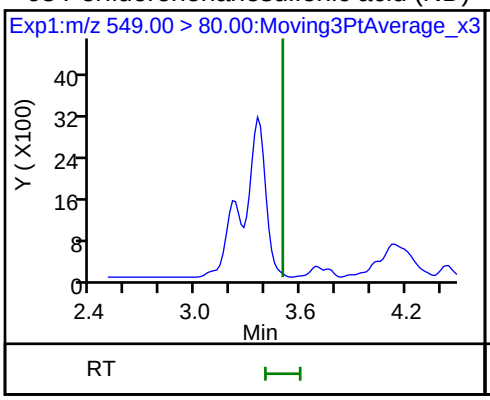
D 21 13C8 FOSA



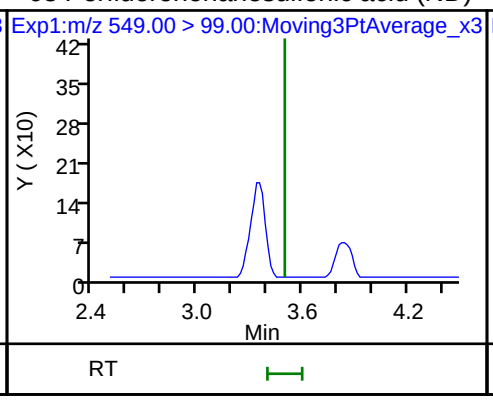
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



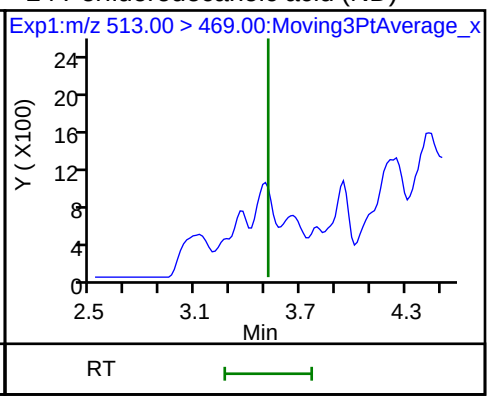
68 Perfluorononanesulfonic acid (ND)



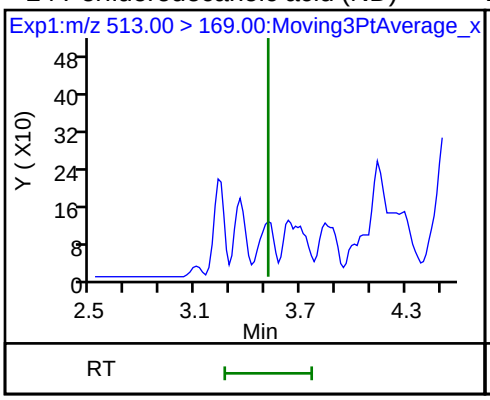
68 Perfluorononanesulfonic acid (ND)



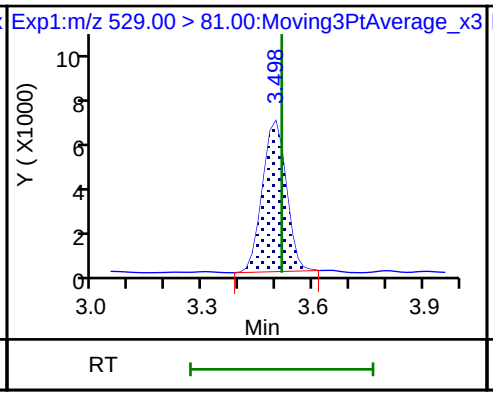
24 Perfluorodecanoic acid (ND)



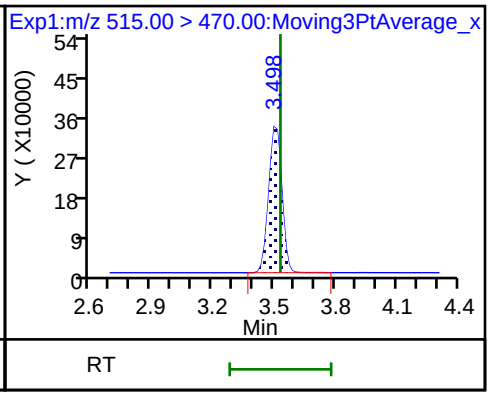
24 Perfluorodecanoic acid (ND)



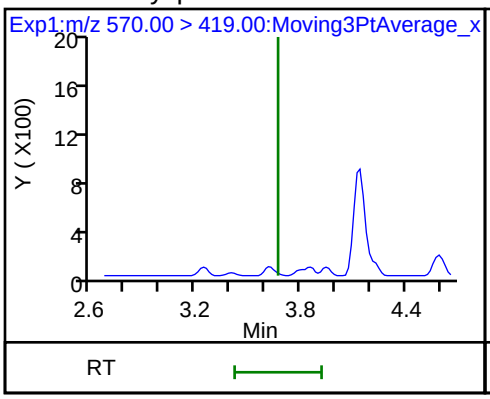
D 26 M2-8:2FTS



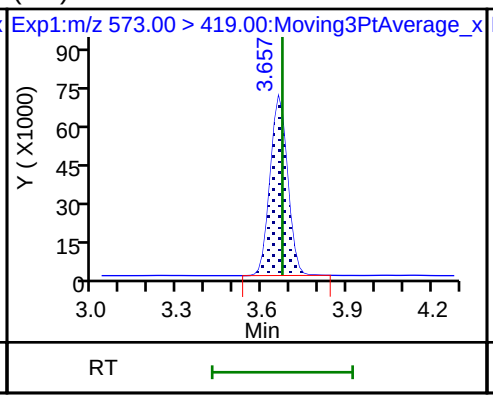
D 23 13C2 PFDA



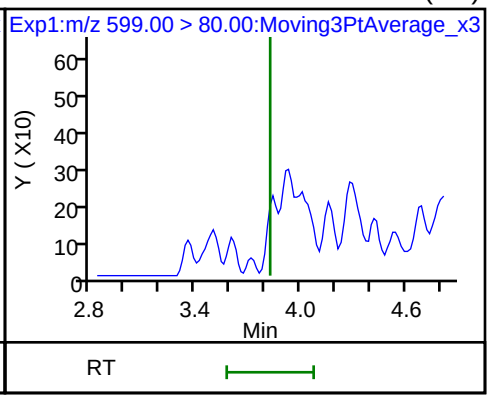
28 N-methyl perfluorooctane sulfonamid (ND)



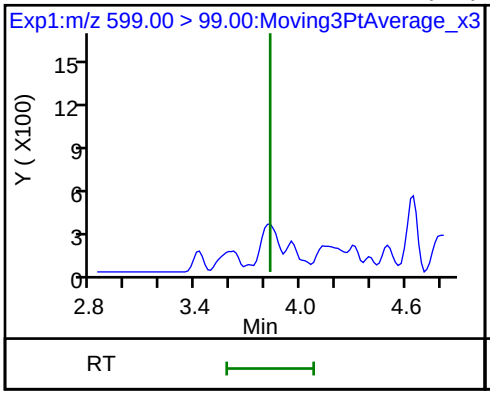
D 27 d3-NMeFOSAA



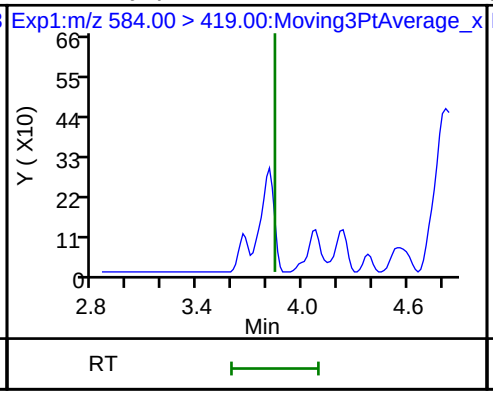
29 Perfluorodecane Sulfonic acid (ND)



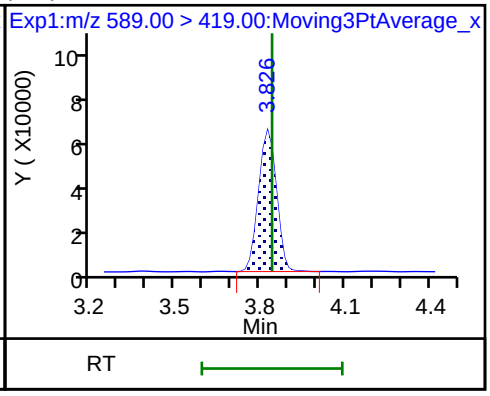
29 Perfluorodecane Sulfonic acid (ND)



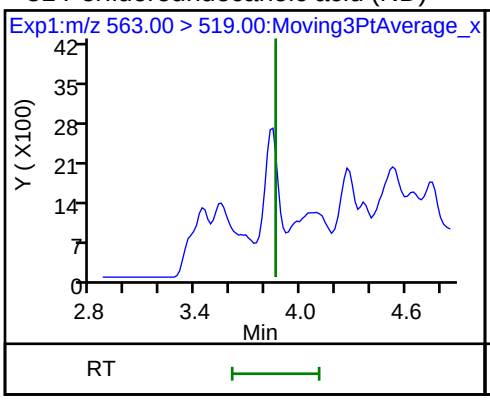
33 N-ethyl perfluorooctane sulfonamid (ND)



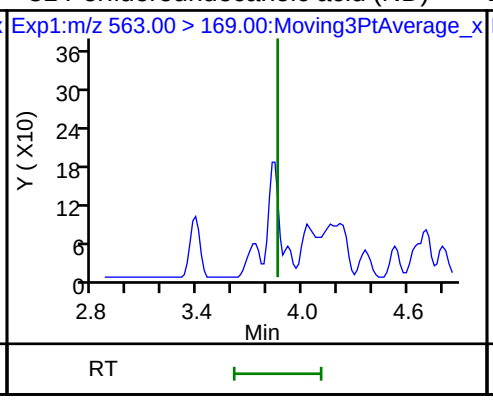
D 32 d5-NEtFOSAA



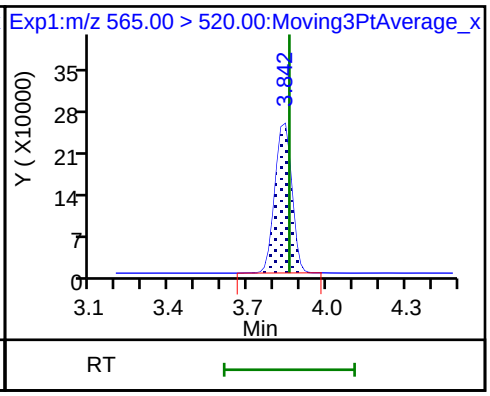
31 Perfluoroundecanoic acid (ND)



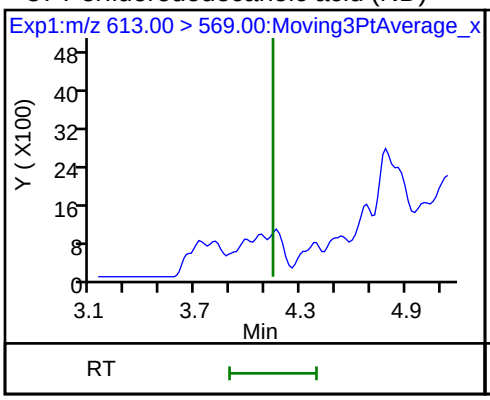
31 Perfluoroundecanoic acid (ND)



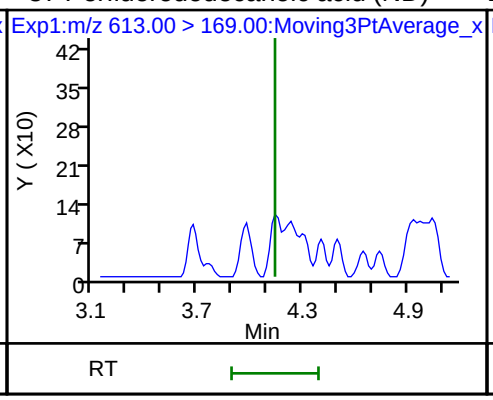
D 30 13C2 PFUnA



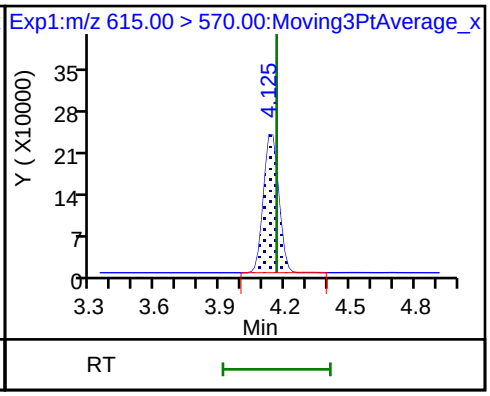
37 Perfluorododecanoic acid (ND)



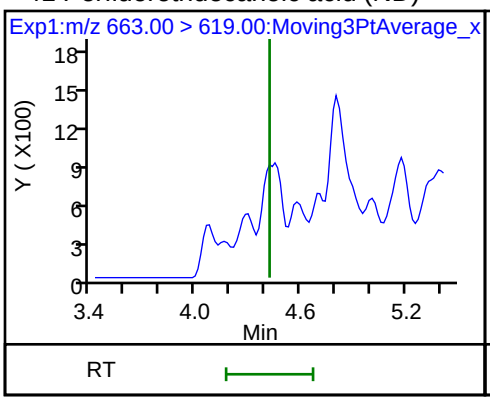
37 Perfluorododecanoic acid (ND)



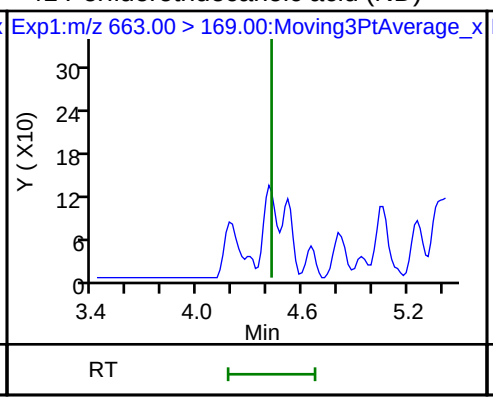
D 36 13C2 PFDoA



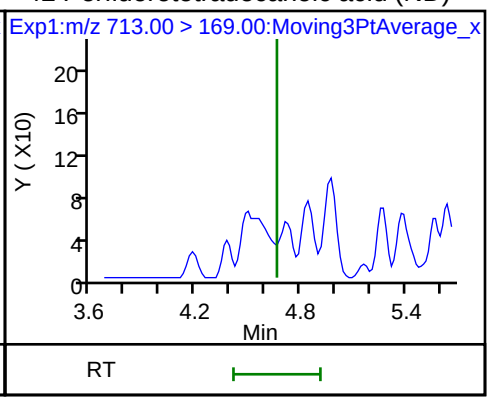
41 Perfluorotridecanoic acid (ND)



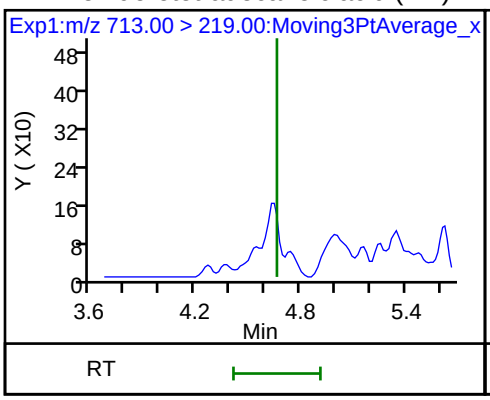
41 Perfluorotridecanoic acid (ND)



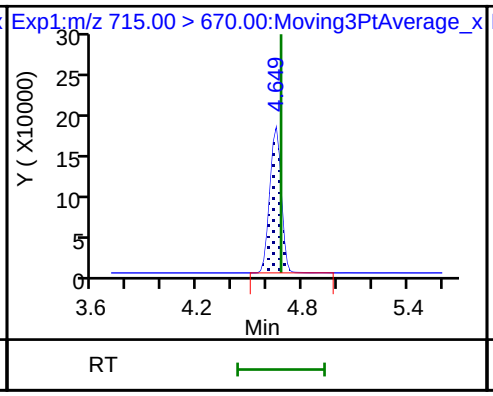
42 Perfluorotetradecanoic acid (ND)



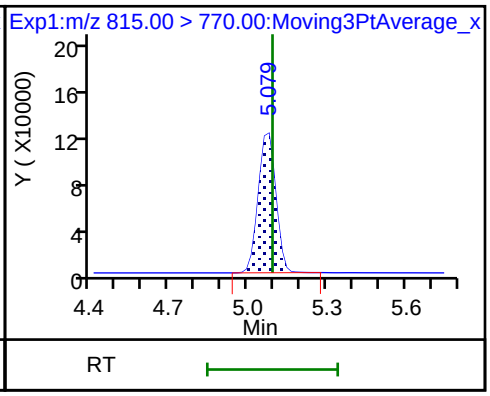
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

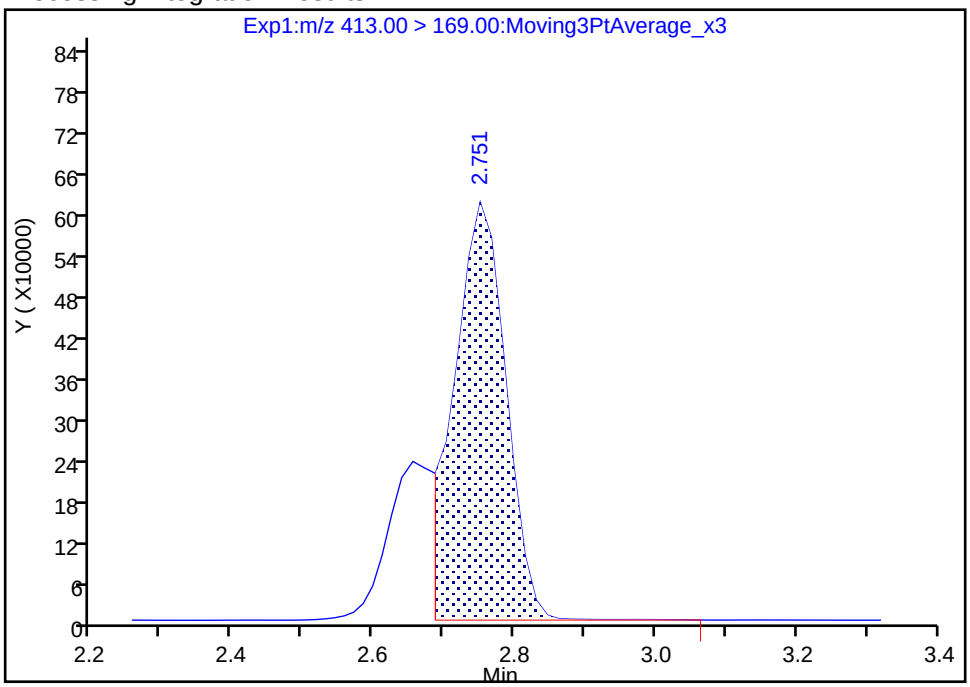
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Lims ID:	320-41998-A-3-D	Lab Sample ID:	320-41998-3		
Client ID:	TW03S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	3	Worklist Smp#:	6
Injection Vol:	20.0 ul	Dil. Factor:	5.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

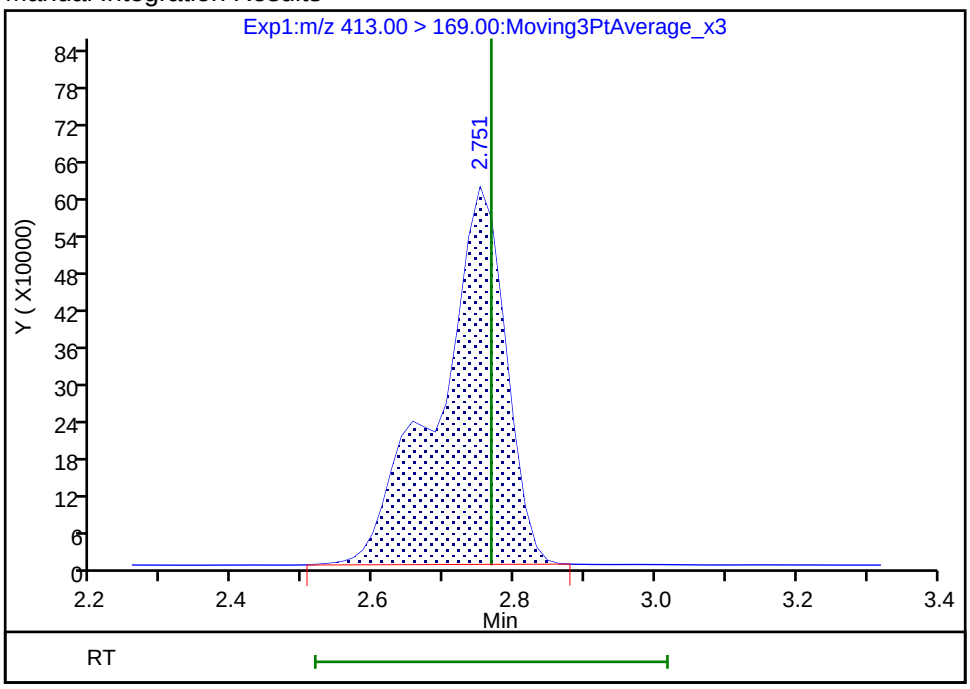
Processing Integration Results

RT: 2.75
Area: 3105589
Amount: 2.648204
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 4100620
Amount: 2.648204
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:54:20

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW04S-20180713 | Lab Sample ID: 320-41998-4

Matrix: Water | Lab File ID: 2018.08.11LA9A_014.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 14:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 220.9(mL) | Date Analyzed: 08/11/2018 21:37

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.: 239432 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.30	H	0.0023	0.0011	0.00053
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.12	H	0.0023	0.0017	0.00069
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.52*	*M J1 H*	*0.0023*	0.0017	*0.00061*
375-95-1	Perfluorononanoic acid (PFNA)	0.0056	M H	0.0023	0.0017	0.00059
335-76-2	Perfluorodecanoic acid (PFDA)	0.0011	U H	0.0023	0.0011	0.00054
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0017	U H	0.0023	0.0017	0.00081
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0017	U H	0.0023	0.0017	0.00059
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0034	U H	0.0045	0.0034	0.00086
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0034	U H	0.0045	0.0034	0.00094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.072	H	0.0023	0.0011	0.00052
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.37	H	0.0023	0.0011	0.00043
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*0.60*	*J1 H*	*0.0045*	0.0034	*0.0012*
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.011	U H	0.023	0.011	0.0034
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.011	U M H	0.023	0.011	0.0032

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW04S-20180713 Lab Sample ID: 320-41998-4

Matrix: Water Lab File ID: 2018.08.11LA9A_014.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 14:30

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 220.9(mL) Date Analyzed: 08/11/2018 21:37

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.: 239432 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		50-150
STL01892	13C4-PFHpA	97		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	96		50-150
STL00996	13C2 PFDA	100		50-150
STL00997	13C2 PFUnA	89		50-150
STL00998	13C2 PFDoA	82		50-150
STL00994	18O2 PFHxS	88		50-150
STL02116	13C2-PFTeDA	83		50-150
STL00991	13C4 PFOS	79		50-150
STL02337	13C3-PFBS	87		50-150
STL02117	d5-NEtFOSAA	92		50-150
STL02118	d3-NMeFOSAA	89		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_014.d
Lims ID: 320-41998-A-4-D
Client ID: TW04S-20180713
Sample Type: Client
Inject. Date: 11-Aug-2018 21:37:12 ALS Bottle#: 8 Worklist Smp#: 11
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41998-a-4-d
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 13:37:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.005	6473989	1.59			416	
298.90 > 99.00	1.797	1.797	0.0	1.005	2261691		2.86(1.35-4.05)		459	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.805	-0.016	0.650	76022	1.68		86.9	107	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.038	2.048	-0.010	1.000	17073229	6.65			1101	
313.00 > 119.00	2.048	2.048	0.0	1.005	1279370		13.35(6.96-20.87)		1720	
D 7 13C2 PFHxA										
315.00 > 270.00	2.038	2.058	-0.020	0.741	5694429	1.87		90.4	6342	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.006	9556642	2.75			510	
363.00 > 169.00	2.374	2.387	-0.013	1.000	2119237		4.51(2.17-6.52)		2317	
D 9 13C4-PFHpA										
367.00 > 322.00	2.374	2.400	-0.026	0.863	6944946	2.01		97.0	12043	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	23901751	8.22			4955	
399.00 > 99.00	2.400	2.400	0.0	1.000	6800476		3.51(1.90-5.70)		3128	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	4459879	1.72		87.5	11287	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		7324785	2.50			12303	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.751	2.751	0.0	1.000	34243979	11.6			2568	E
413.00 > 169.00	2.751	2.751	0.0	1.000	16216150		2.11(1.36-4.08)		3190	M
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	5596847	1.94		93.3	14538	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.137	3.136	0.001	1.000	30594059	13.3			3120	E
499.00 > 99.00	3.137	3.136	0.001	1.000	6954600		4.40(2.04-6.12)		3368	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.137	3.136	0.001	1.000	311872	0.1238			50.5	M
463.00 > 169.00	3.137	3.136	0.001	1.000	61944		5.03(2.68-8.03)		97.4	M
D 19 13C5 PFNA										
468.00 > 423.00	3.137	3.155	-0.018	1.140	4954387	2.00		96.3	7968	
D 18 13C4 PFOS										
503.00 > 80.00	3.137	3.155	-0.018	1.140	4246886	1.57		79.2	1985	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.515	3.498	0.017	1.005	14794	0.004864			3.3	
513.00 > 169.00	3.515	3.498	0.017	1.005	1675		8.83(7.12-21.35)		2.8	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.529	-0.031	1.272	5134119	2.07		99.7	7597	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.658	3.671	-0.013	1.329	891128	1.85		89.0	2567	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.841	-0.015	1.391	754029	1.90		91.7	1511	
D 30 13C2 PFUnA										
565.00 > 520.00	3.826	3.857	-0.031	1.391	3706302	1.85		89.0	5405	
D 36 13C2 PFDoA										
615.00 > 570.00	4.126	4.142	-0.016	1.500	3702923	1.71		82.5	4864	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.649	4.661	-0.012	1.690	2385062	1.73		83.2	6272	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:46 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_014.d

Injection Date: 11-Aug-2018 21:37:12 Instrument ID: A9

Lims ID: 320-41998-A-4-D Lab Sample ID: 320-41998-4

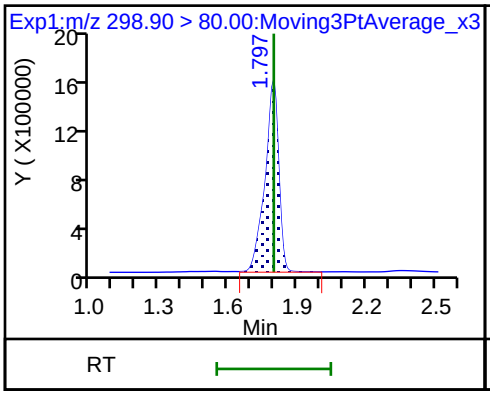
Client ID: TW04S-20180713

Operator ID: A9\Administrator ALS Bottle#: 8 Worklist Smp#: 11

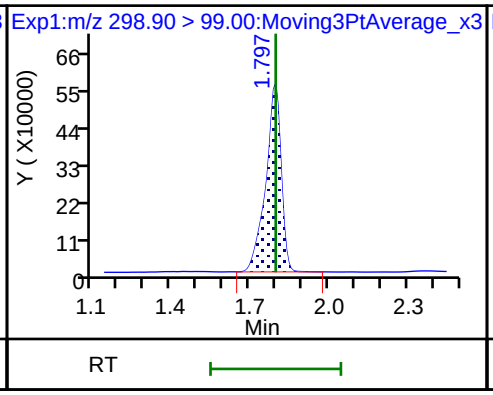
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

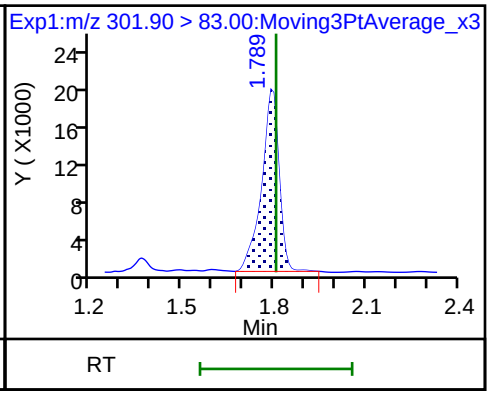
5 Perfluorobutanesulfonic acid



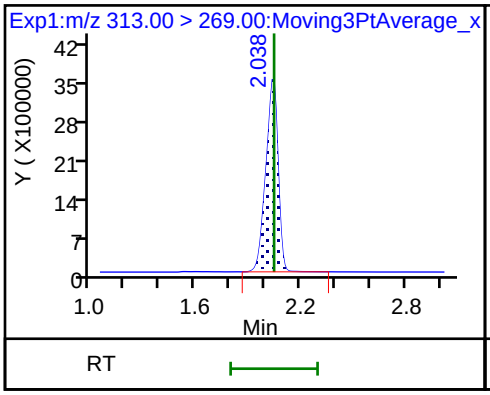
5 Perfluorobutanesulfonic acid



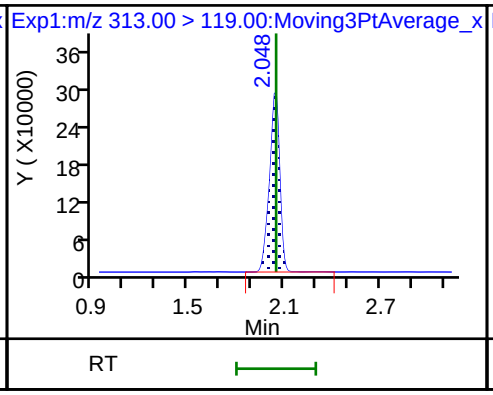
D 47 13C3-PFBS



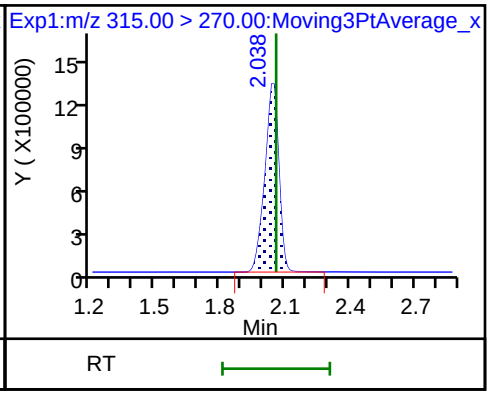
6 Perfluorohexanoic acid



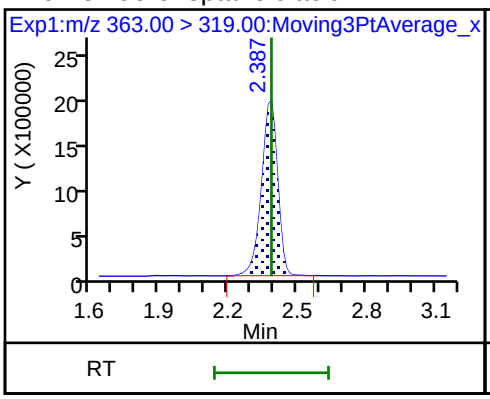
6 Perfluorohexanoic acid



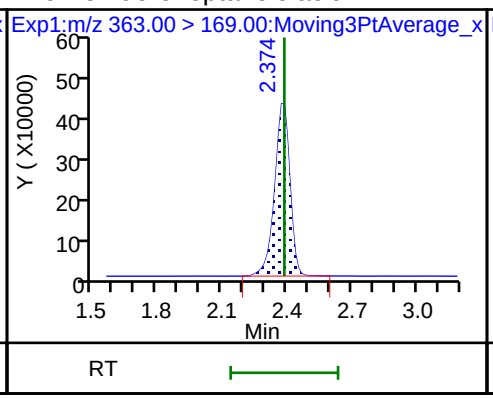
D 7 13C2 PFHxA



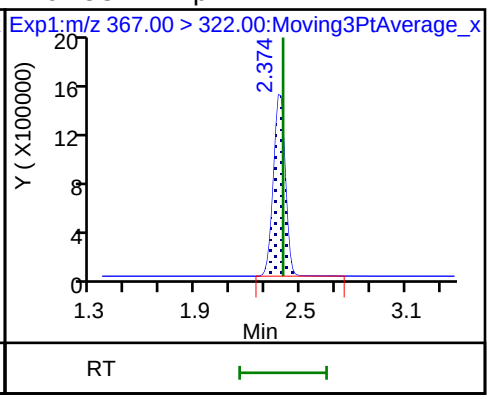
10 Perfluoroheptanoic acid



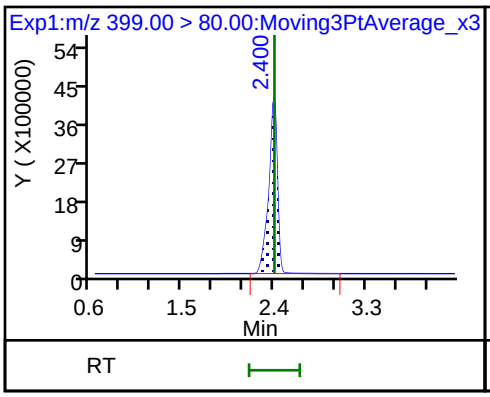
10 Perfluoroheptanoic acid



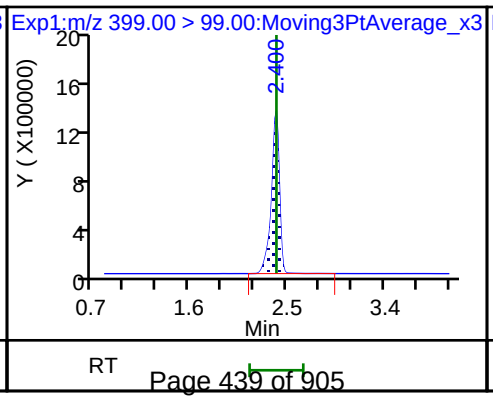
D 9 13C4-PFHpA



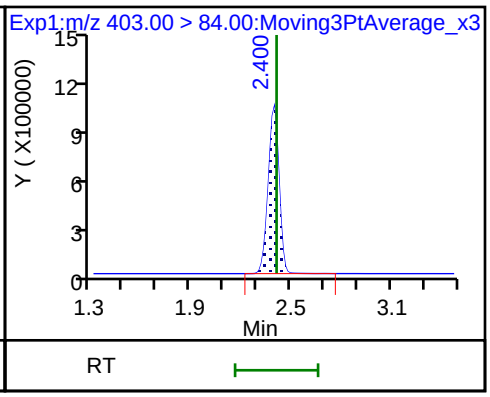
8 Perfluorohexanesulfonic acid



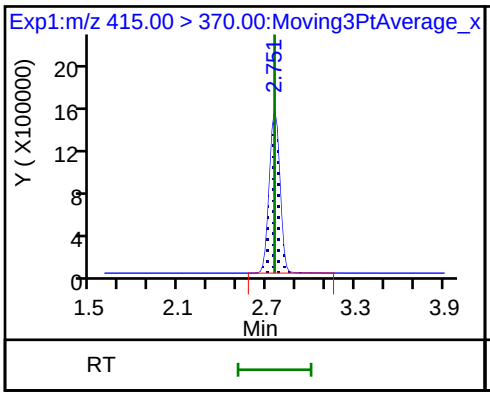
8 Perfluorohexanesulfonic acid



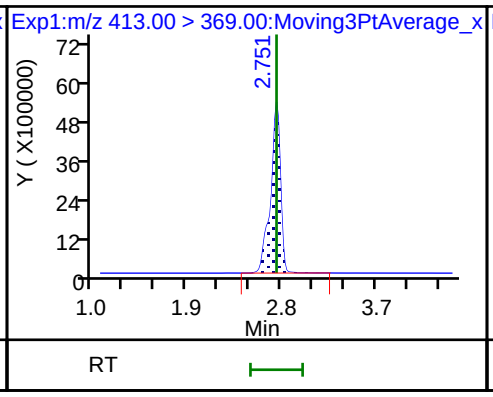
D 11 18O2 PFHxS



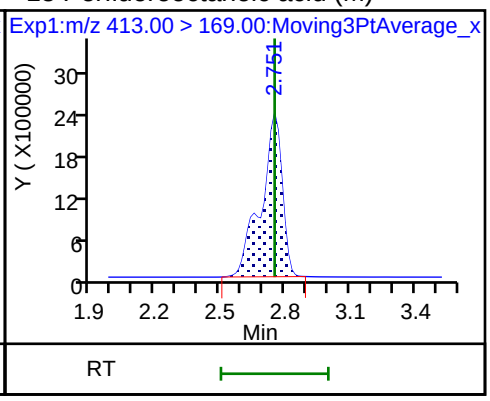
* 62 13C2-PFOA



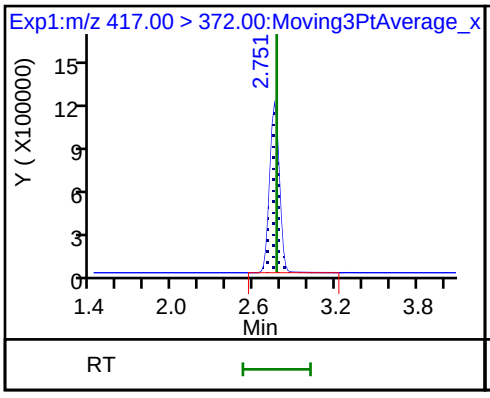
15 Perfluorooctanoic acid



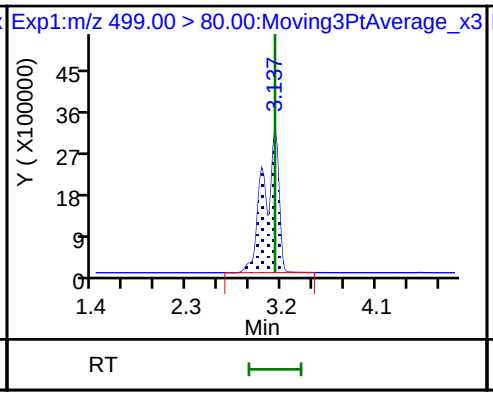
15 Perfluorooctanoic acid (M)



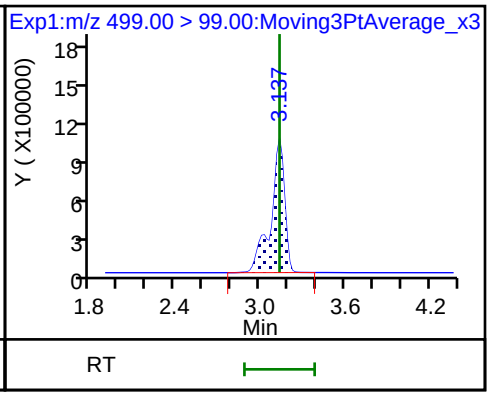
D 14 13C4 PFOA



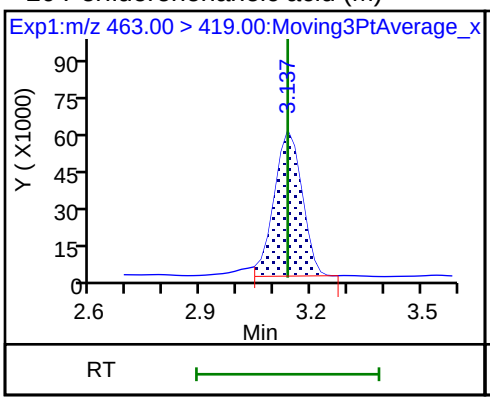
17 Perfluorooctane sulfonic acid



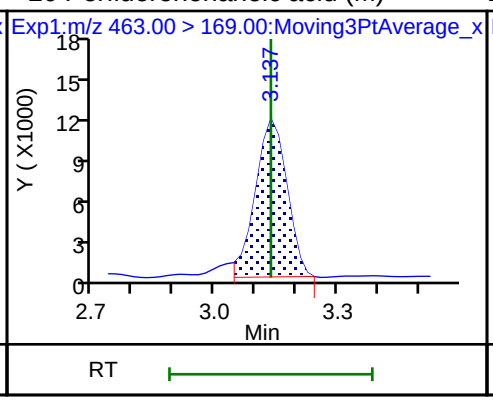
17 Perfluorooctane sulfonic acid



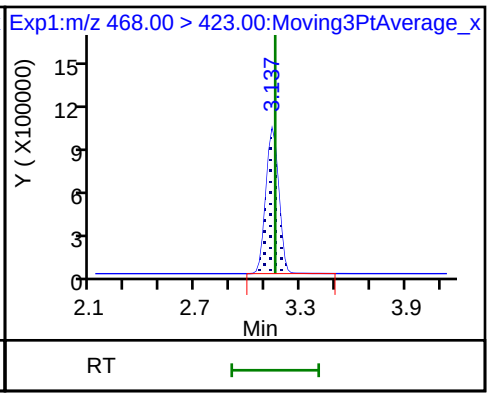
20 Perfluorononanoic acid (M)



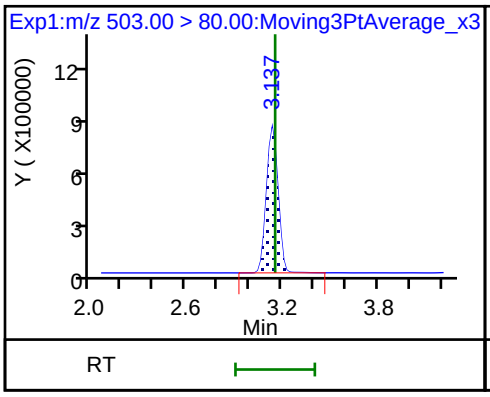
20 Perfluorononanoic acid (M)



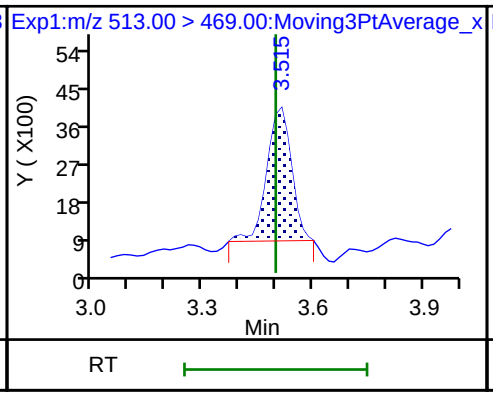
D 19 13C5 PFNA



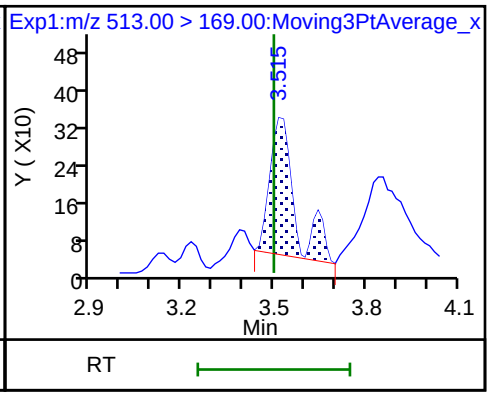
D 18 13C4 PFOS



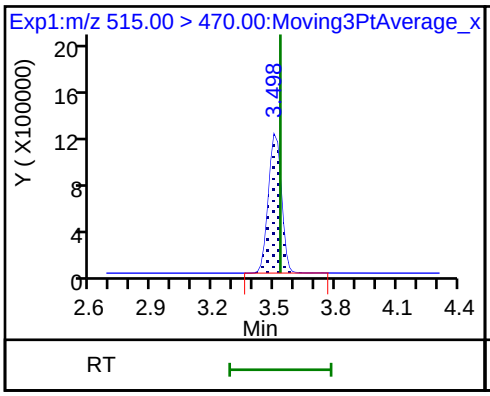
24 Perfluorodecanoic acid



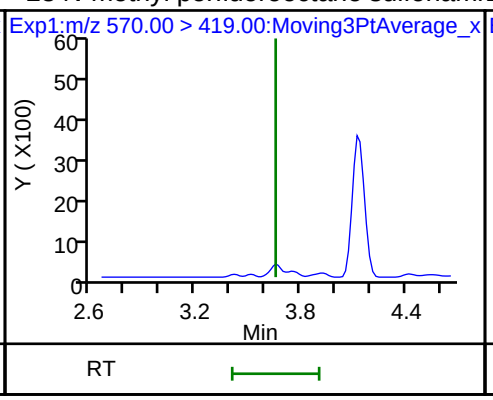
24 Perfluorodecanoic acid



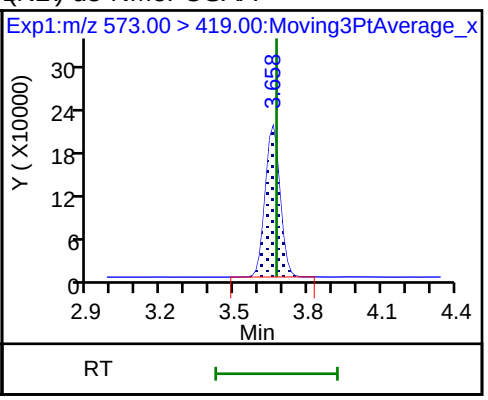
D 23 13C2 PFDA



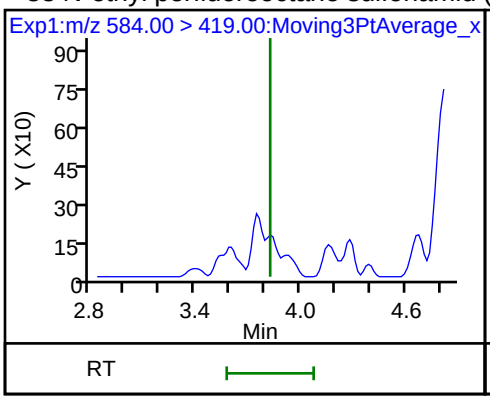
28 N-methyl perfluorooctane sulfonamid (ND)



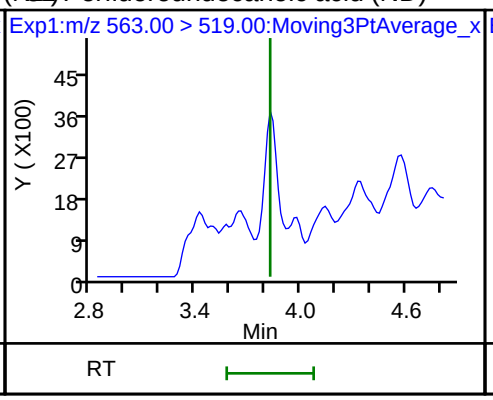
D 27 d3-NMeFOSAA



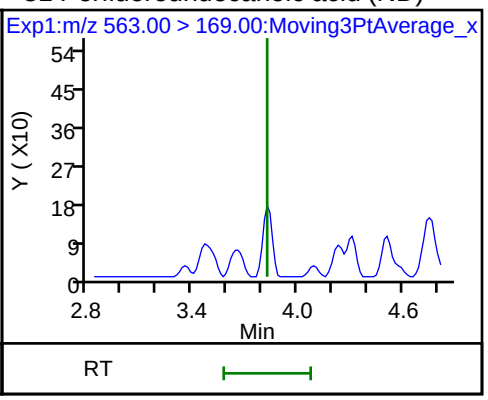
33 N-ethyl perfluorooctane sulfonamid (ND)



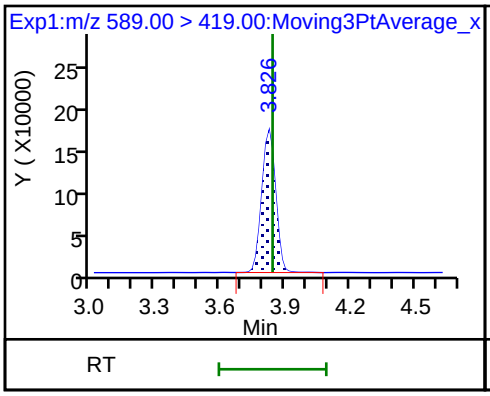
31 Perfluoroundecanoic acid (ND)



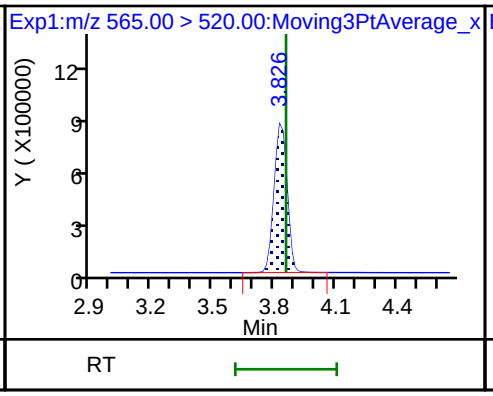
31 Perfluoroundecanoic acid (ND)



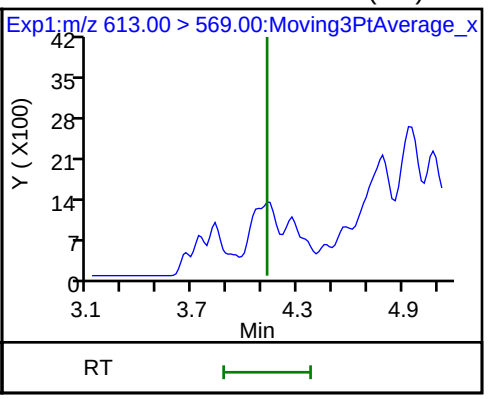
D 32 d5-NEtFOSAA



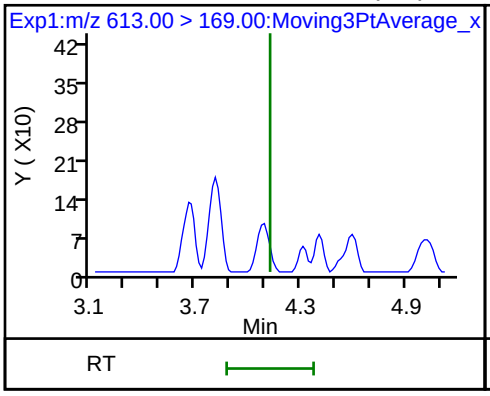
D 30 13C2 PFUnA



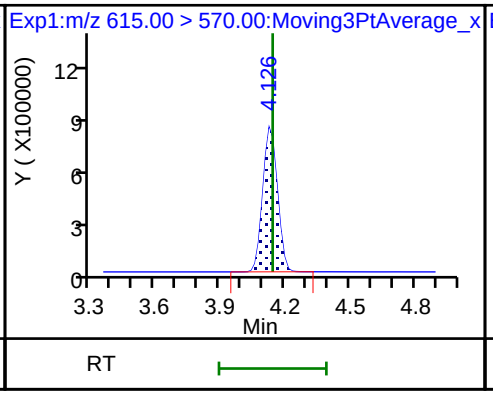
37 Perfluorododecanoic acid (ND)



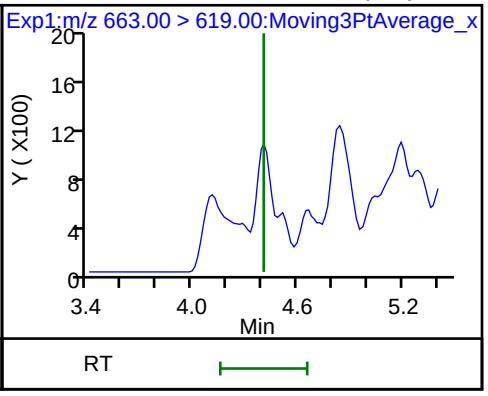
37 Perfluorododecanoic acid (ND)



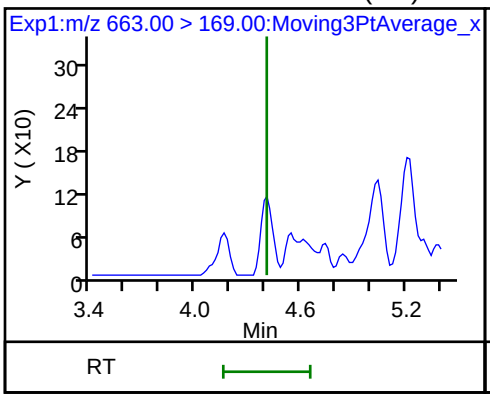
D 36 13C2 PFDoA



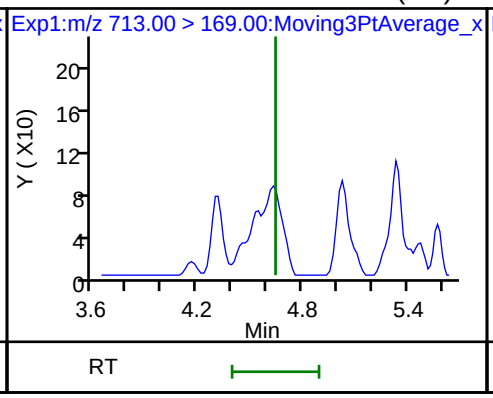
41 Perfluorotridecanoic acid (ND)



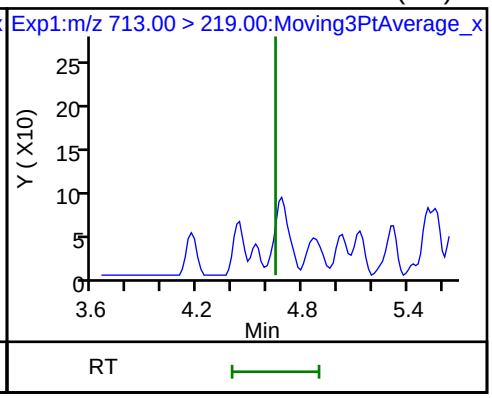
41 Perfluorotridecanoic acid (ND)



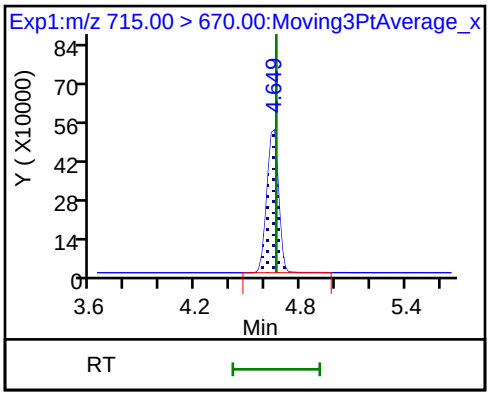
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

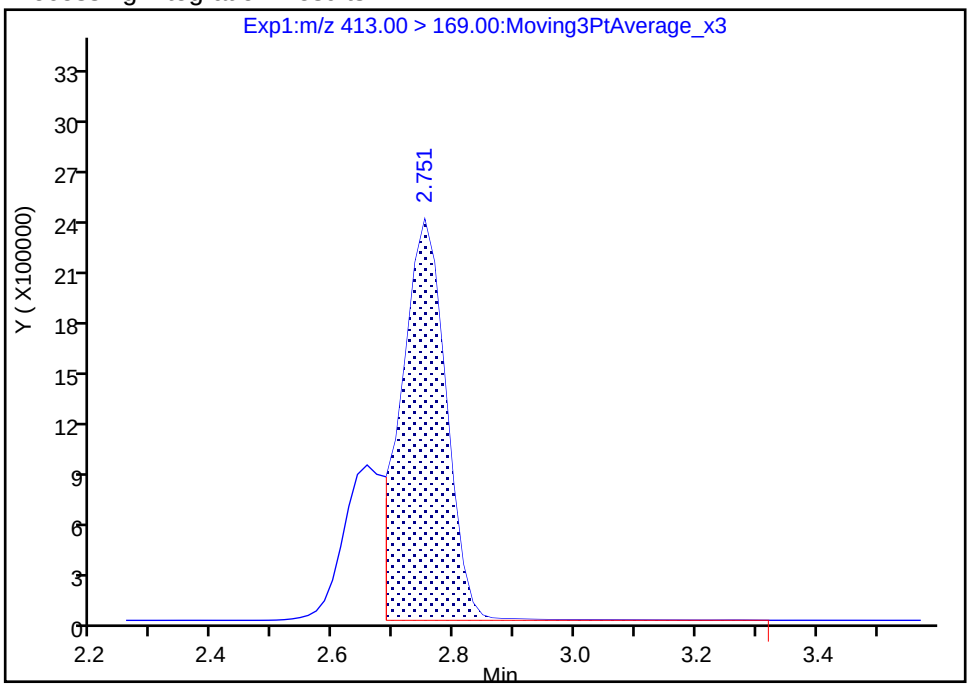
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_014.d				
Injection Date:	11-Aug-2018 21:37:12	Instrument ID:	A9		
Lims ID:	320-41998-A-4-D	Lab Sample ID:	320-41998-4		
Client ID:	TW04S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	8	Worklist Smp#:	11
Injection 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

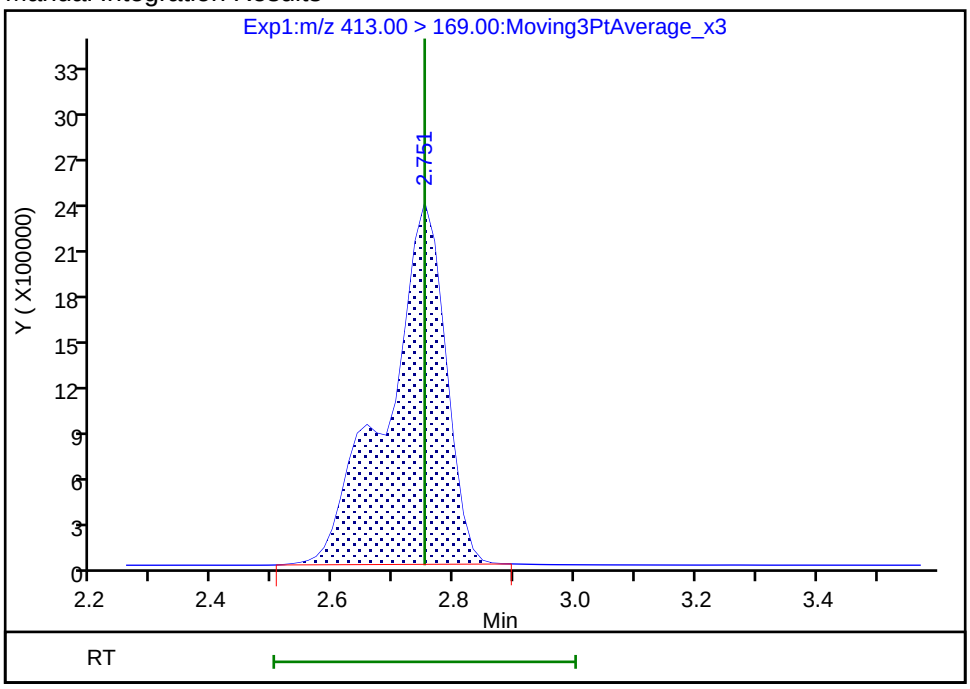
Processing Integration Results

RT: 2.75
Area: 12135431
Amount: 11.587744
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 16216150
Amount: 11.587744
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:36:20

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

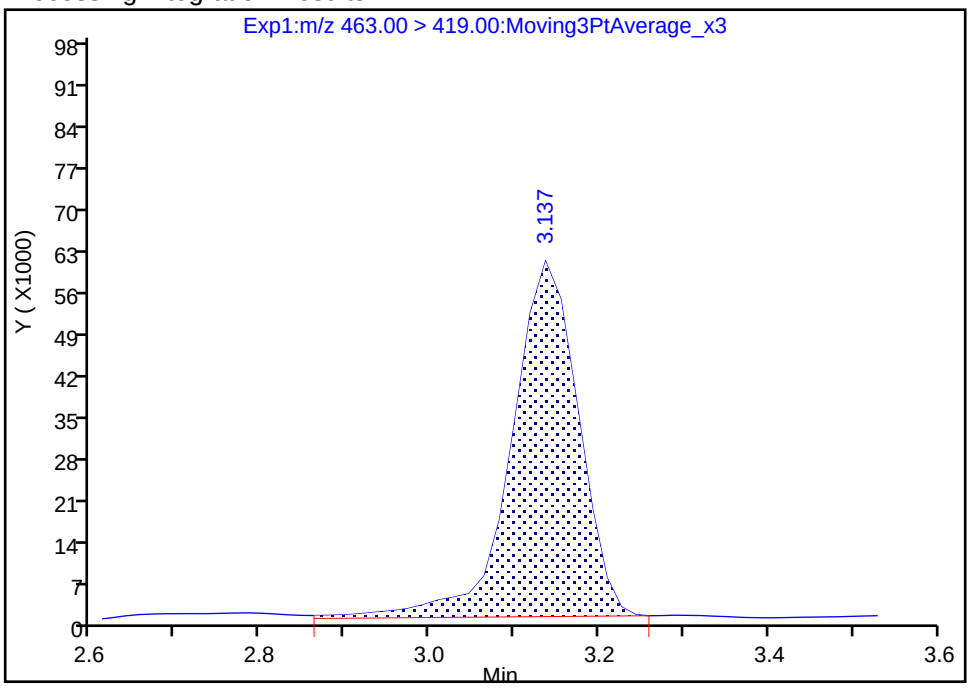
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_014.d				
Injection Date:	11-Aug-2018 21:37:12	Instrument ID:	A9		
Lims ID:	320-41998-A-4-D	Lab Sample ID:	320-41998-4		
Client ID:	TW04S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	8	Worklist Smp#:	11
Injection 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

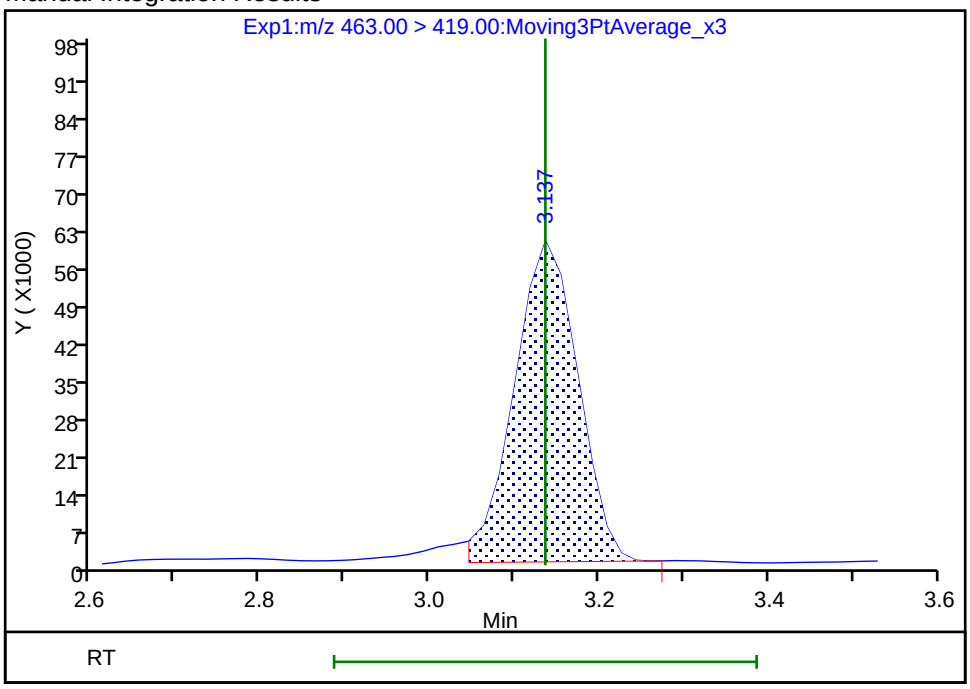
Processing Integration Results

RT: 3.14
Area: 329420
Amount: 0.130808
Amount Units: ng/ml



Manual Integration Results

RT: 3.14
Area: 311872
Amount: 0.123840
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:36:43

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

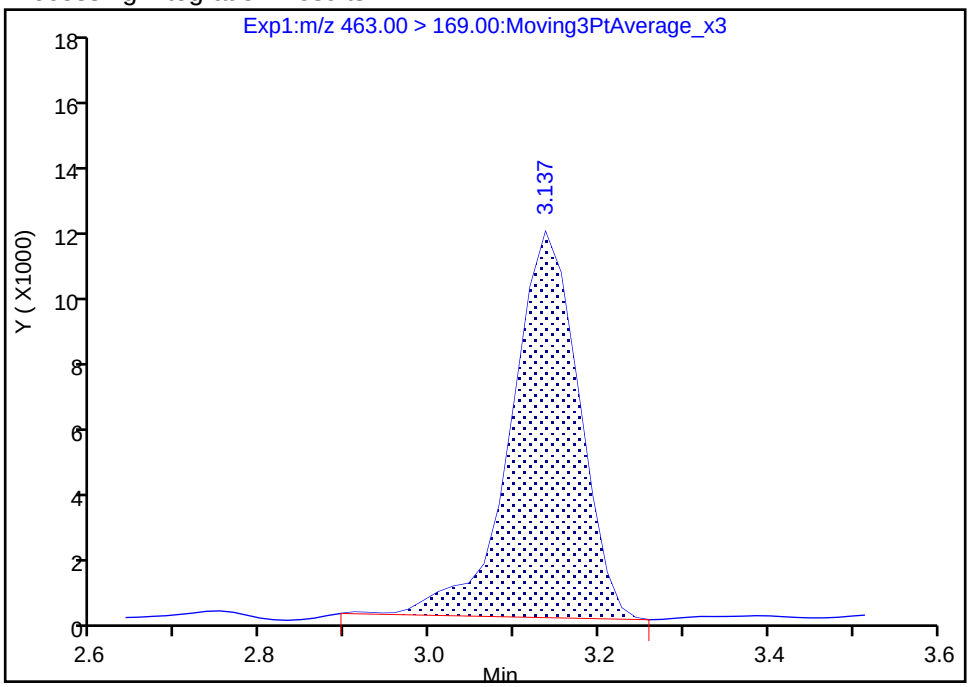
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_014.d				
Injection Date:	11-Aug-2018 21:37:12	Instrument ID:	A9		
Lims ID:	320-41998-A-4-D	Lab Sample ID:	320-41998-4		
Client ID:	TW04S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	8	Worklist Smp#:	11
Injection 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

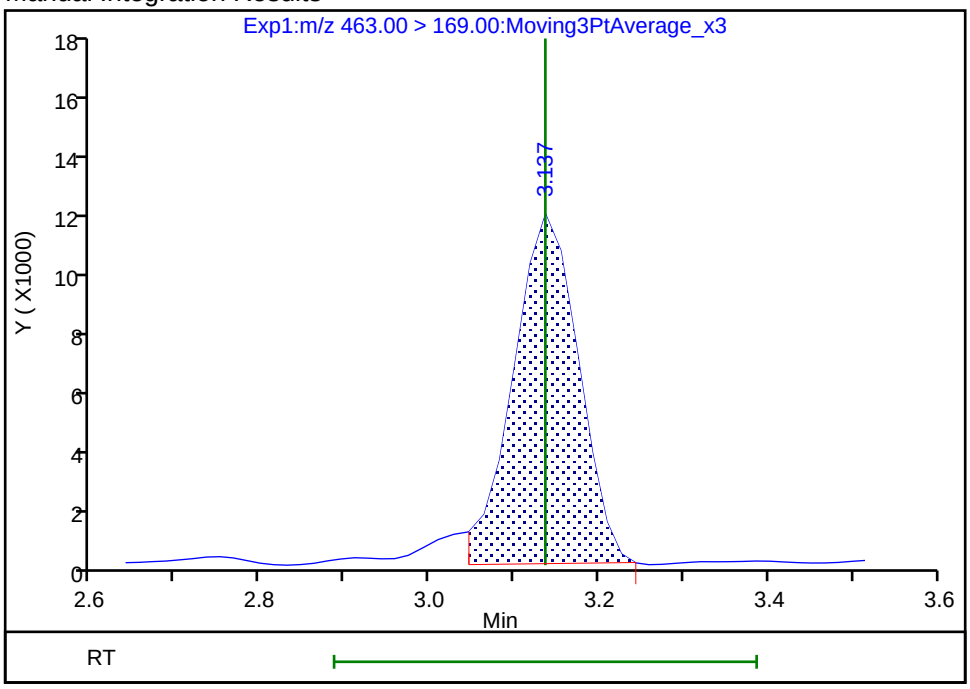
Processing Integration Results

RT: 3.14
Area: 64746
Amount: 0.130808
Amount Units: ng/ml



Manual Integration Results

RT: 3.14
Area: 61944
Amount: 0.123840
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:36:47

Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW04S-20180713 DL | Lab Sample ID: 320-41998-4 DL

Matrix: Water | Lab File ID: 2018.08.12LLA_012.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 14:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 220.9(mL) | Date Analyzed: 08/12/2018 11:25

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

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

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

Analysis Batch No.: 239460 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*0.32*	*H D*	*0.011*	0.0057	*0.0027*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.13*	*H D*	*0.011*	0.0085	*0.0035*
335-67-1	Perfluorooctanoic acid (PFOA)	0.60	H D M	0.011	0.0085	0.0031
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.0059*	*J H D M*	*0.011*	0.0085	*0.0029*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.0057*	*U H*	*0.011*	0.0057	*0.0027*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*0.0085*	*U H*	*0.011*	0.0085	*0.0041*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.0085*	*U H*	*0.011*	0.0085	*0.0029*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*0.017*	*U H*	*0.023*	0.017	*0.0043*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*0.017*	*U H*	*0.023*	0.017	*0.0047*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.078*	*H D*	*0.011*	0.0057	*0.0026*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*0.43*	*H D*	*0.011*	0.0057	*0.0022*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.65	H D	0.023	0.017	0.0062
2355-31-9	*N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)*	*0.057*	*U H*	*0.11*	0.057	*0.017*
2991-50-6	*N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)*	*0.057*	*U H*	*0.11*	0.057	*0.016*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW04S-20180713 DL | Lab Sample ID: 320-41998-4 DL

Matrix: Water | Lab File ID: 2018.08.12LLA_012.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 14:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 220.9(mL) | Date Analyzed: 08/12/2018 11:25

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

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

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

Analysis Batch No.: 239460 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	101		50-150
STL00995	13C5 PFNA	97		50-150
STL00996	13C2 PFDA	94		50-150
STL00997	13C2 PFUnA	78		50-150
STL00998	13C2 PFDoA	74		50-150
STL00994	18O2 PFHxS	84		50-150
STL02116	13C2-PFTeDA	73		50-150
STL00991	13C4 PFOS	77		50-150
STL02337	13C3-PFBS	74		50-150
STL02117	d5-NEtFOSAA	82		50-150
STL02118	d3-NMeFOSAA	88		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_012.d
Lims ID: 320-41998-A-4-D
Client ID: TW04S-20180713
Sample Type: Client
Inject. Date: 12-Aug-2018 11:25:52 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 20.0 ul Dil. Factor: 5.0000
Sample Info: 320-41998-a-4-d 5X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 14:05:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 14:00:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.805	1.806	-0.001	1.005	1437933	0.3465			212	
298.90 > 99.00	1.797	1.806	-0.009	1.000	532709		2.70(1.35-4.05)		166	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.806	-0.009	0.653	15508	0.2846		73.7	55.1	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	4193578	1.40			593	
313.00 > 119.00	2.048	2.048	0.0	1.000	295269		14.20(6.96-20.87)		460	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.744	1331704	0.3646		87.9	3067	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.400	-0.014	1.000	2349695	0.5527			188	
363.00 > 169.00	2.386	2.400	-0.014	1.000	533932		4.40(2.17-6.52)		790	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.400	-0.014	0.868	1699018	0.4097		98.7	5357	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.413	-0.014	1.000	6402339	1.90			2723	
399.00 > 99.00	2.399	2.413	-0.014	1.000	1561983		4.10(1.90-5.70)		602	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.413	-0.014	0.872	1033709	0.3311		84.3	2912	
* 62 13C2-PFOA										
415.00 > 370.00	2.750	2.767	-0.017		1761677	0.5000			5785	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.750	2.767	-0.017	1.000	10102600	2.63			900	
413.00 > 169.00	2.750	2.767	-0.017	1.000	3984885		2.54(1.36-4.08)		2118	M
D 14 13C4 PFOA										
417.00 > 372.00	2.750	2.767	-0.017	1.000	1452954	0.4180		101	3545	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.135	3.155	-0.020	1.000	7726344	2.87			1620	
499.00 > 99.00	3.135	3.155	-0.020	1.000	1603202		4.82(2.04-6.12)		1692	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.153	3.155	-0.002	1.006	79611	0.0261			17.2	M
463.00 > 169.00	3.135	3.155	-0.020	1.000	14981		5.31(2.68-8.03)		35.0	M
D 19 13C5 PFNA										
468.00 > 423.00	3.135	3.155	-0.020	1.140	1202245	0.4032		97.2	4094	
D 18 13C4 PFOS										
503.00 > 80.00	3.135	3.155	-0.020	1.140	995657	0.3064		77.2	856	
D 23 13C2 PFDA										
515.00 > 470.00	3.513	3.530	-0.018	1.277	1166123	0.3906		94.1	7027	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.655	3.671	-0.016	1.329	212295	0.3657		88.1	916	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.823	3.842	-0.019	1.390	161967	0.3397		81.9	555	
D 30 13C2 PFUnA										
565.00 > 520.00	3.839	3.857	-0.018	1.396	779546	0.3230		77.8	2742	
D 36 13C2 PFDoA										
615.00 > 570.00	4.140	4.160	-0.020	1.505	797531	0.3065		73.9	2577	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.677	-0.032	1.689	506240	0.3047		73.4	2406	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:42:13 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_012.d

Injection Date: 12-Aug-2018 11:25:52 Instrument ID: A9

Lims ID: 320-41998-A-4-D Lab Sample ID: 320-41998-4

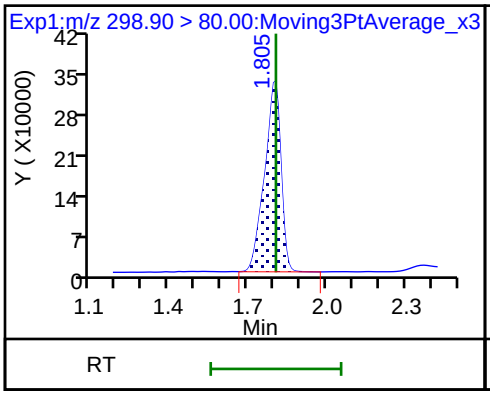
Client ID: TW04S-20180713

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

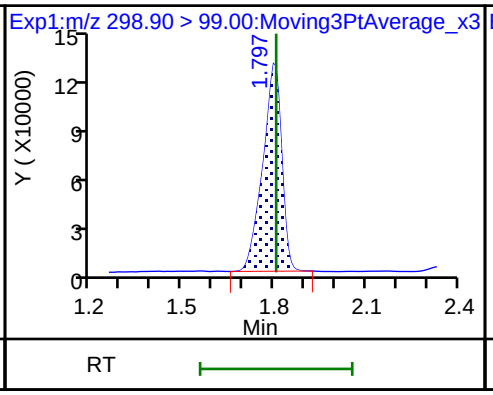
Injection Vol: 20.0 ul Dil. Factor: 5.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

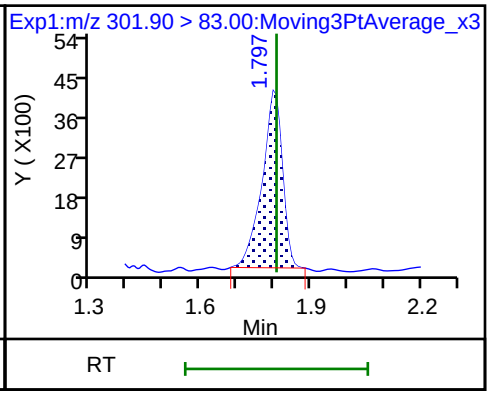
5 Perfluorobutanesulfonic acid



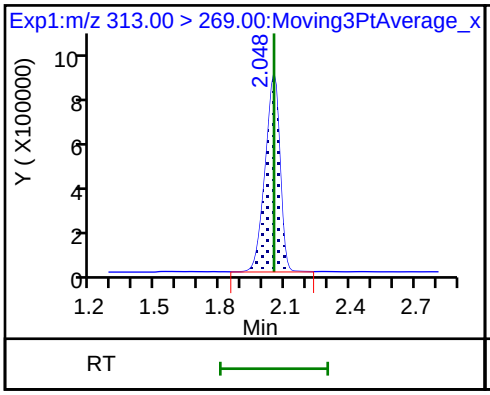
5 Perfluorobutanesulfonic acid



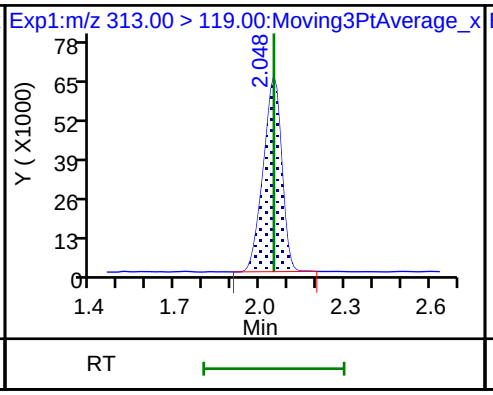
D 47 13C3-PFBS



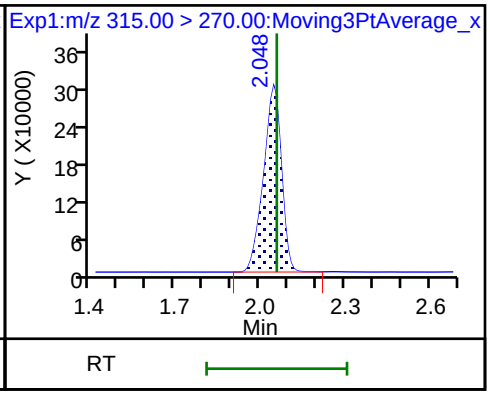
6 Perfluorohexanoic acid



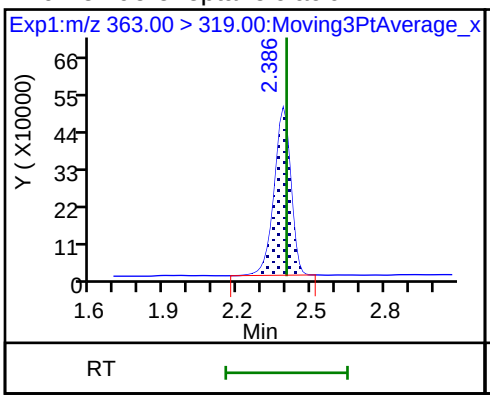
6 Perfluorohexanoic acid



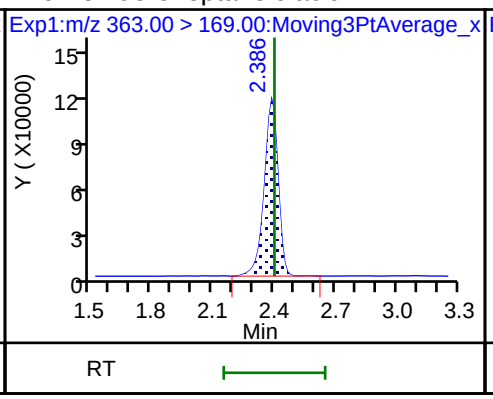
D 7 13C2 PFHxA



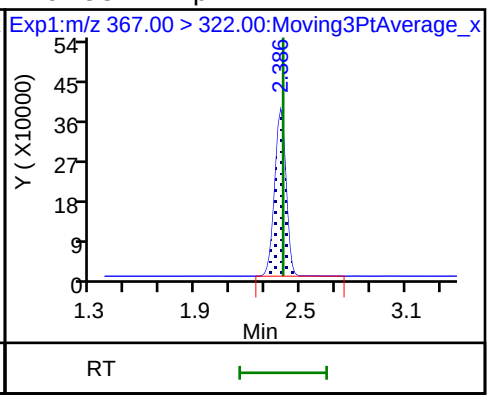
10 Perfluoroheptanoic acid



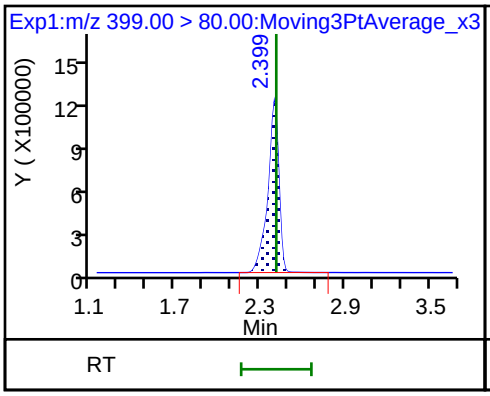
10 Perfluoroheptanoic acid



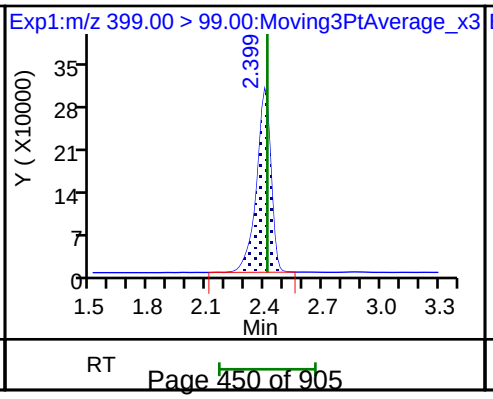
D 9 13C4-PFHpA



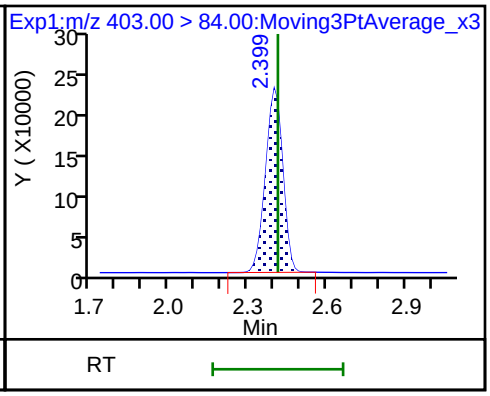
8 Perfluorohexanesulfonic acid



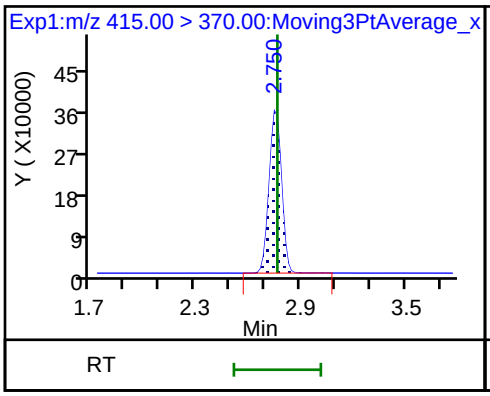
8 Perfluorohexanesulfonic acid



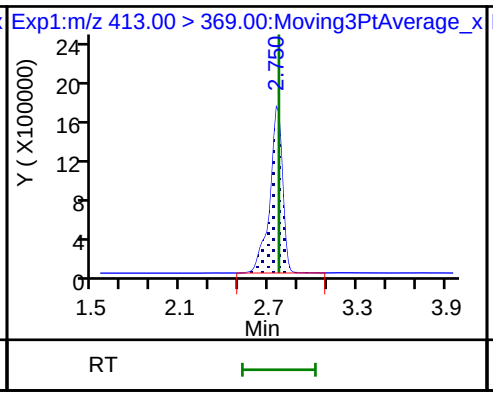
D 11 18O2 PFHxS



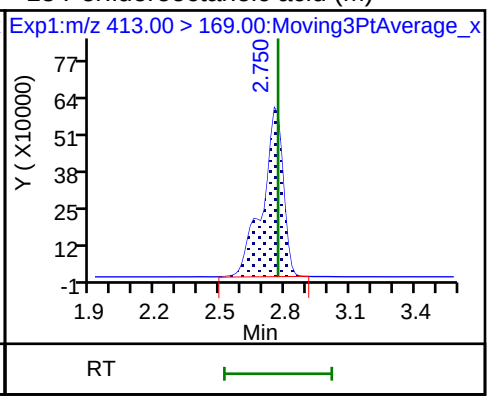
* 62 13C2-PFOA



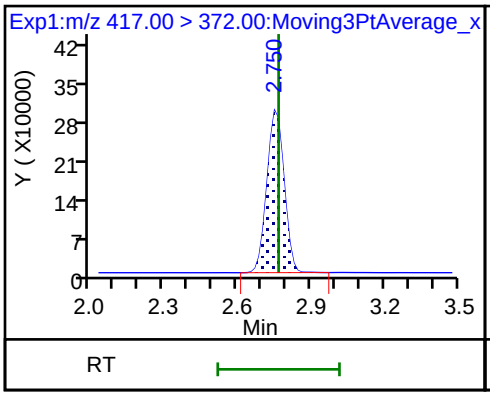
15 Perfluorooctanoic acid



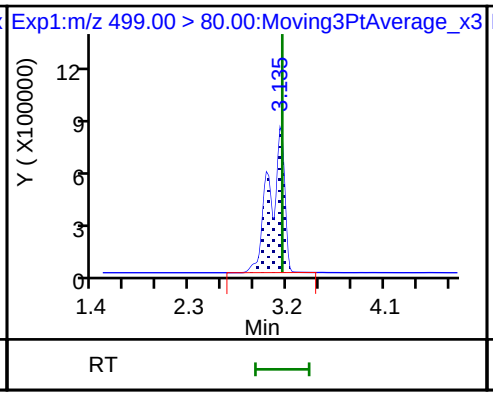
15 Perfluorooctanoic acid (M)



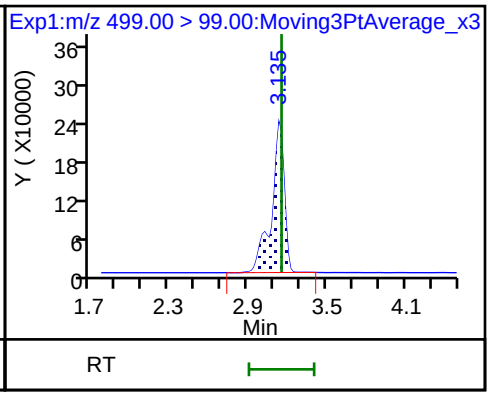
D 14 13C4 PFOA



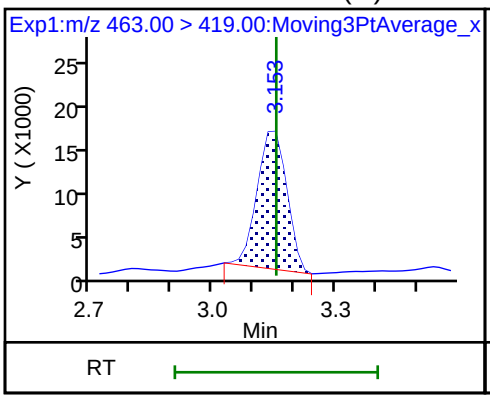
17 Perfluorooctane sulfonic acid



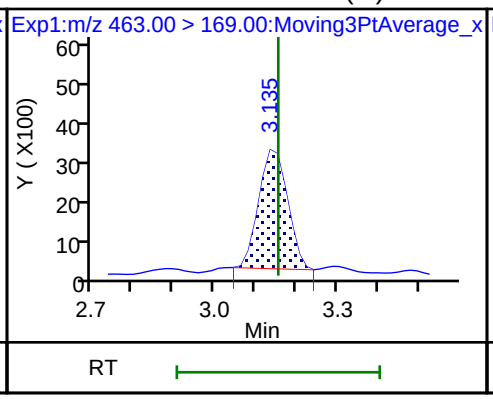
17 Perfluorooctane sulfonic acid



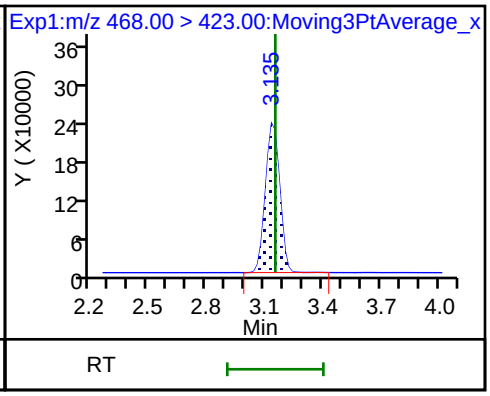
20 Perfluorononanoic acid (M)



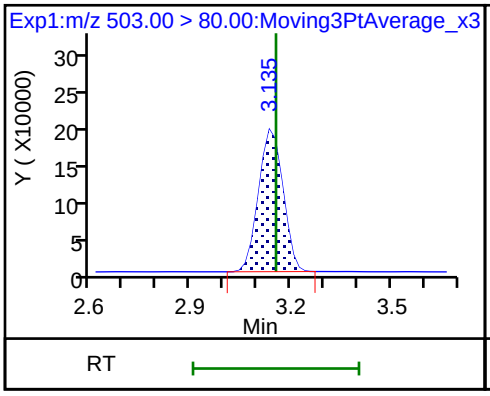
20 Perfluorononanoic acid (M)



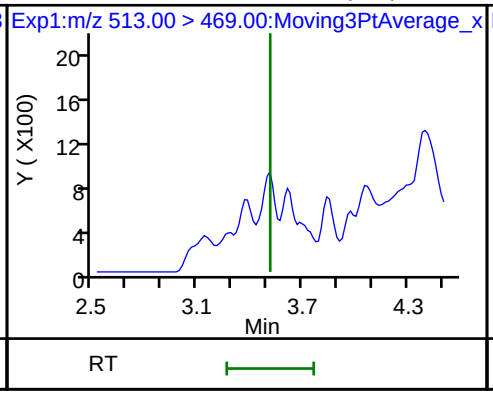
D 19 13C5 PFNA



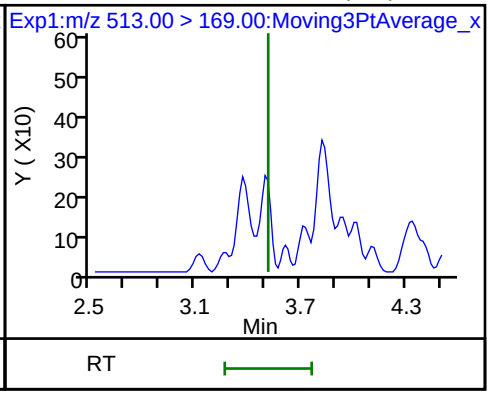
D 18 13C4 PFOS



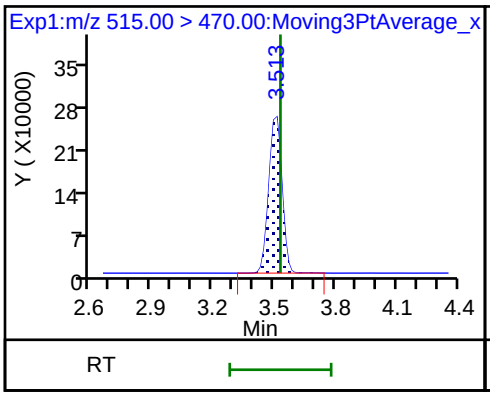
24 Perfluorodecanoic acid (ND)



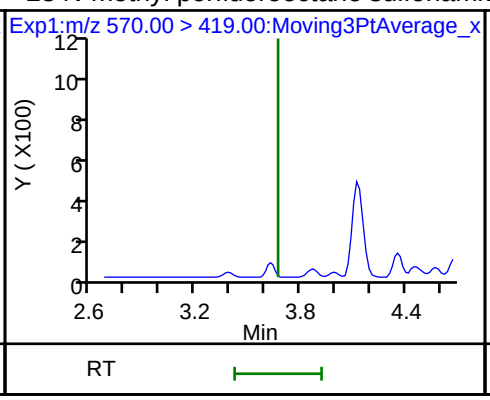
24 Perfluorodecanoic acid (ND)



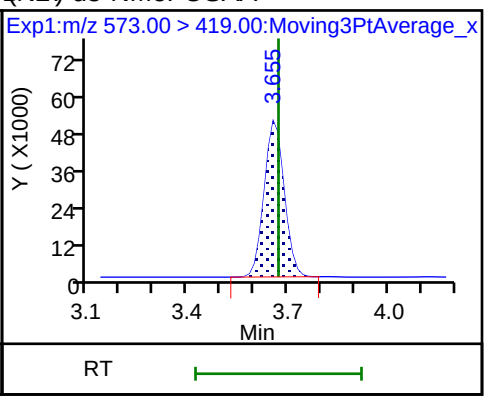
D 23 13C2 PFDA



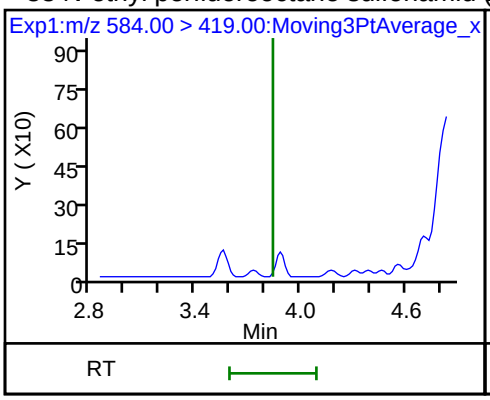
28 N-methyl perfluorooctane sulfonamid (ND)



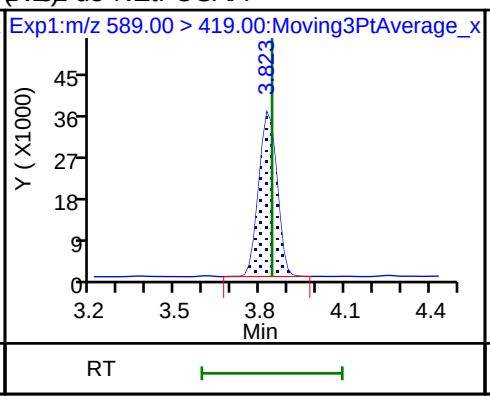
D 27 d3-NMeFOSAA



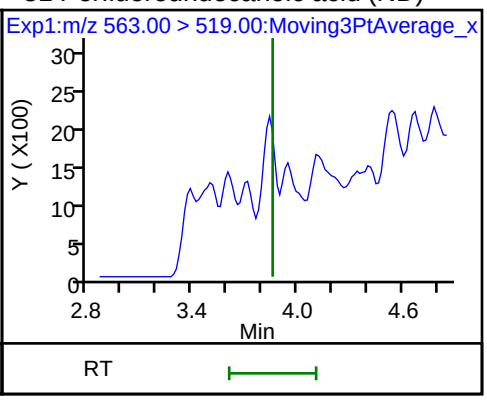
33 N-ethyl perfluorooctane sulfonamid (ND)



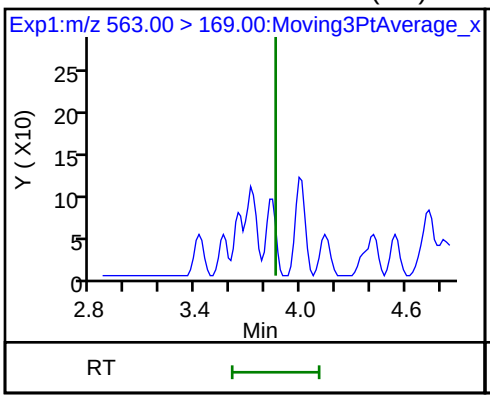
D 32 d5-NEtFOSAA



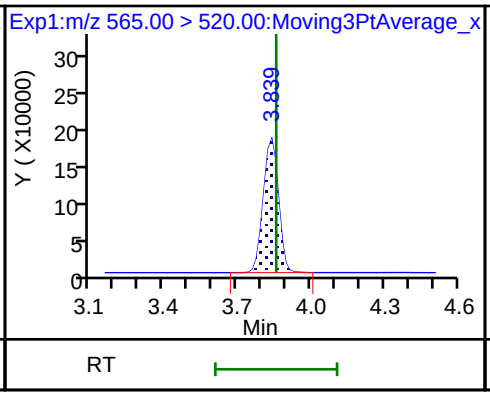
31 Perfluoroundecanoic acid (ND)



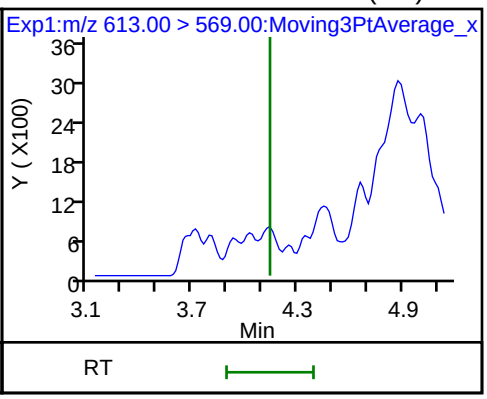
31 Perfluoroundecanoic acid (ND)



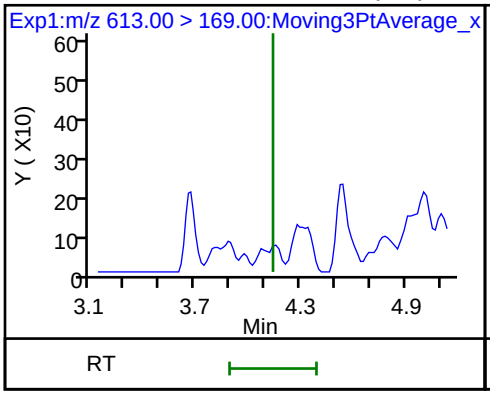
D 30 13C2 PFUnA



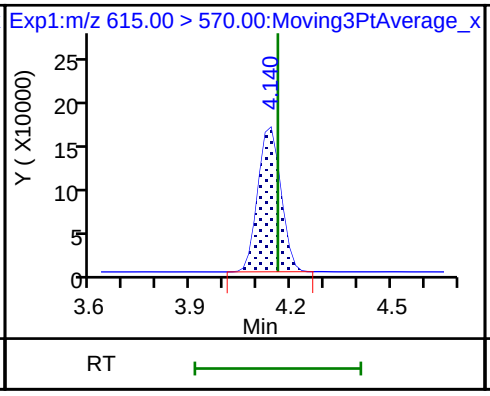
37 Perfluorododecanoic acid (ND)



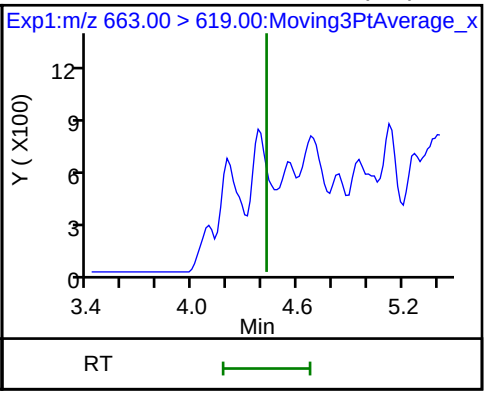
37 Perfluorododecanoic acid (ND)



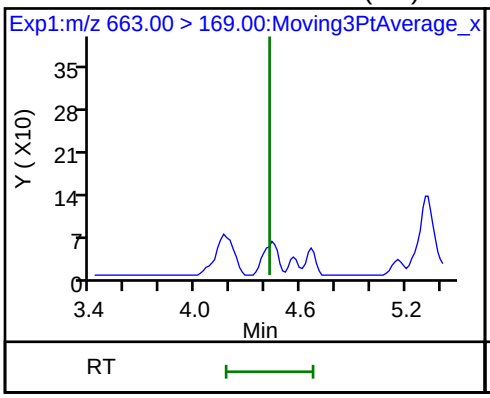
D 36 13C2 PFDoA



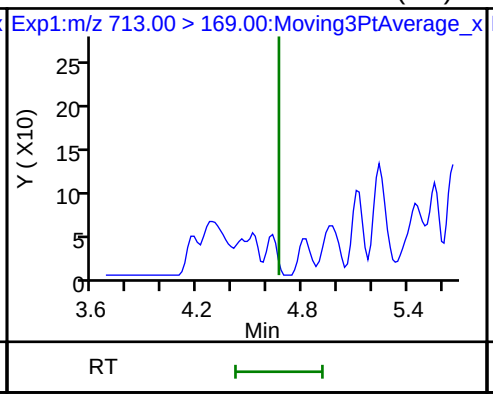
41 Perfluorotridecanoic acid (ND)



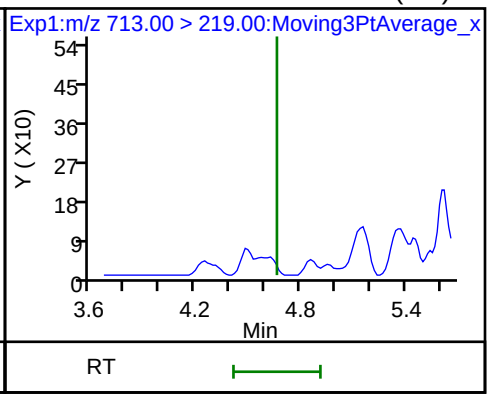
41 Perfluorotridecanoic acid (ND)



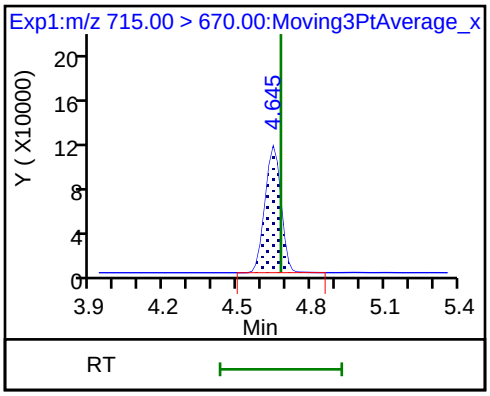
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

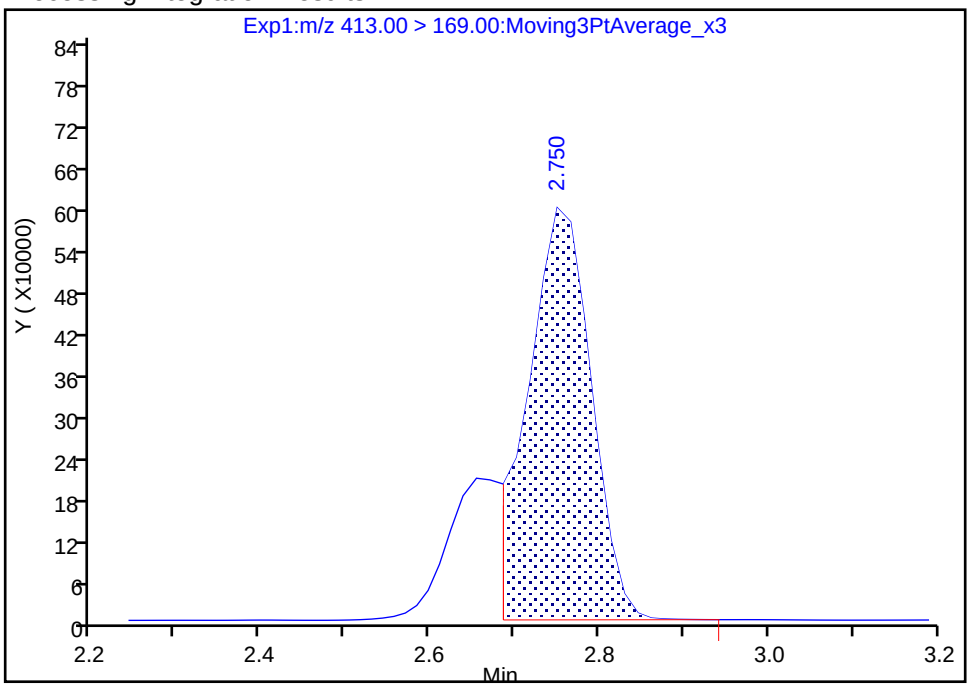
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_012.d				
Injection Date:	12-Aug-2018 11:25:52	Instrument ID:	A9		
Lims ID:	320-41998-A-4-D	Lab Sample ID:	320-41998-4		
Client ID:	TW04S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	5.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

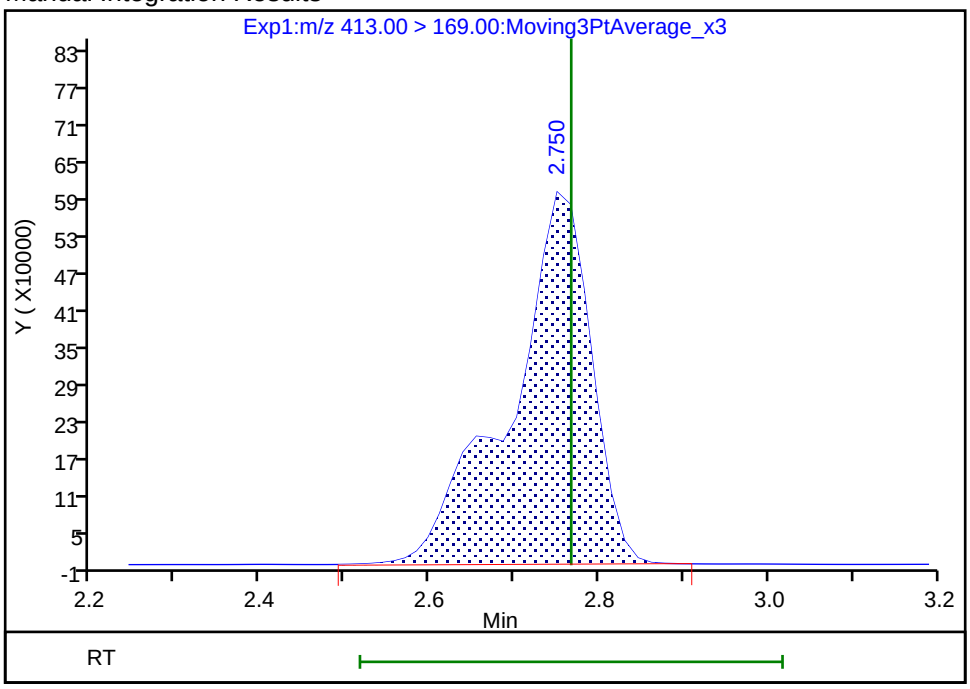
Processing Integration Results

RT: 2.75
Area: 3083779
Amount: 2.633719
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 3984885
Amount: 2.633719
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:59:53

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

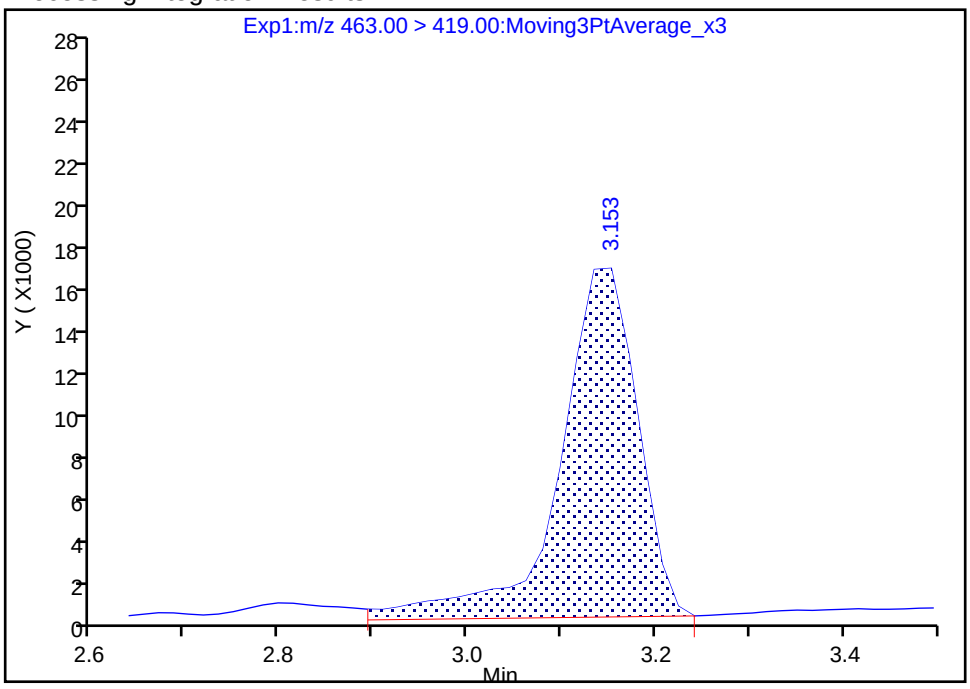
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_012.d				
Injection Date:	12-Aug-2018 11:25:52	Instrument ID:	A9		
Lims ID:	320-41998-A-4-D	Lab Sample ID:	320-41998-4		
Client ID:	TW04S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	5.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

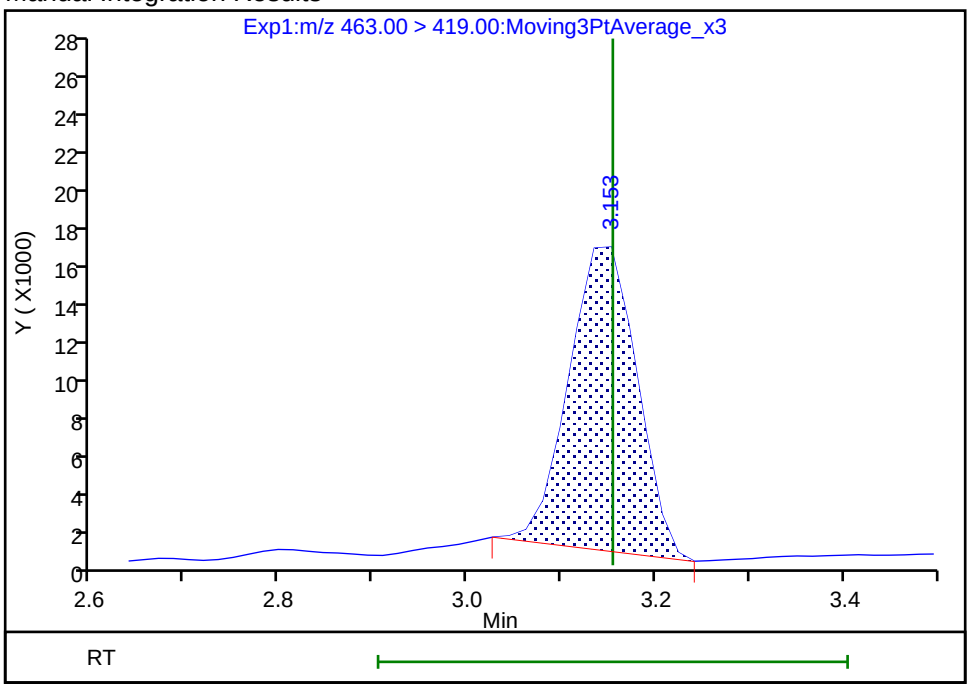
Processing Integration Results

RT: 3.15
Area: 95028
Amount: 0.031100
Amount Units: ng/ml



Manual Integration Results

RT: 3.15
Area: 79611
Amount: 0.026055
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 14:00:22

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

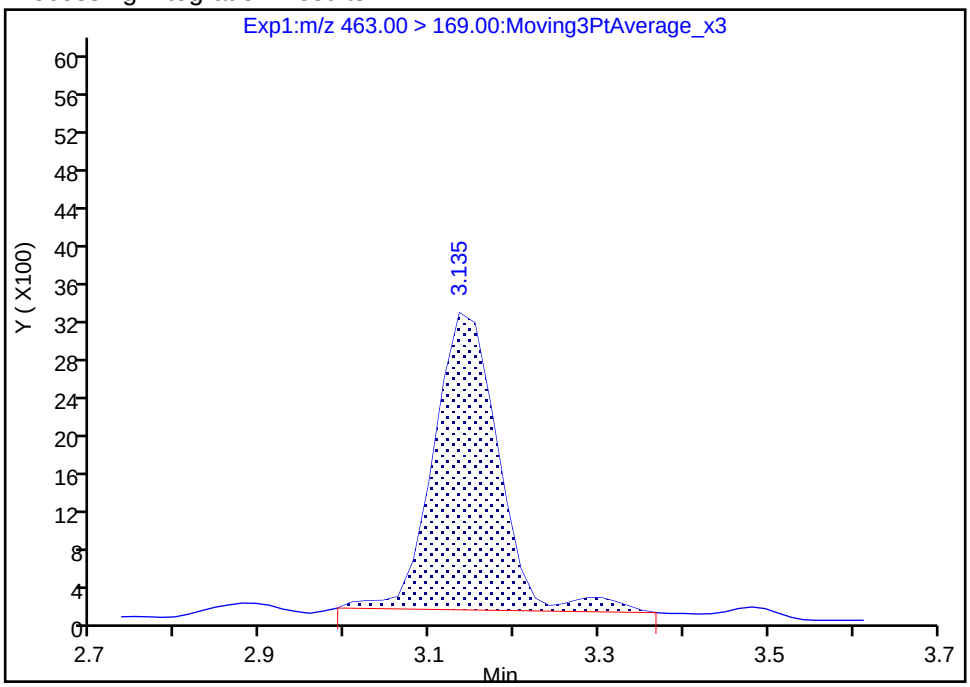
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_012.d				
Injection Date:	12-Aug-2018 11:25:52	Instrument ID:	A9		
Lims ID:	320-41998-A-4-D	Lab Sample ID:	320-41998-4		
Client ID:	TW04S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	5.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 2

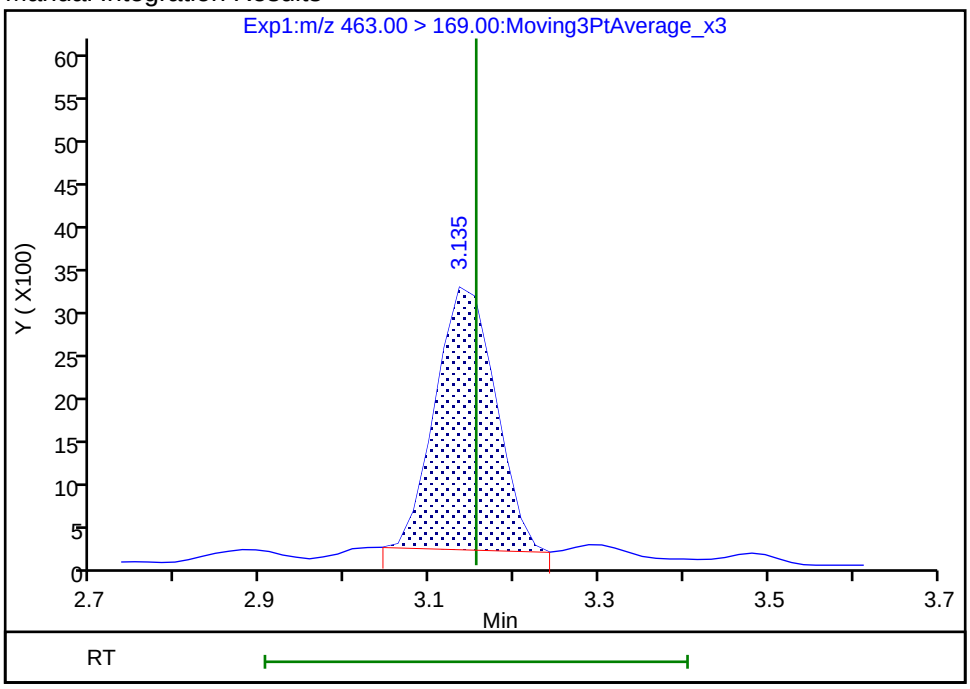
Processing Integration Results

RT: 3.13
Area: 16652
Amount: 0.031100
Amount Units: ng/ml



Manual Integration Results

RT: 3.13
Area: 14981
Amount: 0.026055
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 14:00:30
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: DUP02-20180713 | Lab Sample ID: 320-41998-5

Matrix: Water | Lab File ID: 2018.08.11LA9A_015.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 00:00

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 167.8(mL) | Date Analyzed: 08/11/2018 21:44

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.: 239432 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.12	H	0.0030	0.0015	0.00070
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.038	H	0.0030	0.0022	0.00091
335-67-1	Perfluorooctanoic acid (PFOA)	0.53	M H	0.0030	0.0022	0.00080
375-95-1	Perfluorononanoic acid (PFNA)	0.00093	J M H	0.0030	0.0022	0.00077
335-76-2	Perfluorodecanoic acid (PFDA)	0.0015	U H	0.0030	0.0015	0.00072
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0022	U H	0.0030	0.0022	0.0011
307-55-1	Perfluorododecanoic acid (PFDoA)	0.00088	J H	0.0030	0.0022	0.00077
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0045	U H	0.0060	0.0045	0.0011
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0015	J H	0.0060	0.0045	0.0012
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.025	H	0.0030	0.0015	0.00069
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.078	H	0.0030	0.0015	0.00057
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	H	0.0060	0.0045	0.0016
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.015	U H	0.030	0.015	0.0045
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.015	U M H	0.030	0.015	0.0042

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: DUP02-20180713 | Lab Sample ID: 320-41998-5

Matrix: Water | Lab File ID: 2018.08.11LA9A_015.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 00:00

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 167.8(mL) | Date Analyzed: 08/11/2018 21:44

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.: 239432 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	107		50-150
STL00995	13C5 PFNA	105		50-150
STL00996	13C2 PFDA	103		50-150
STL00997	13C2 PFUnA	75		50-150
STL00998	13C2 PFDoA	74		50-150
STL00994	18O2 PFHxS	91		50-150
STL02116	13C2-PFTeDA	91		50-150
STL00991	13C4 PFOS	85		50-150
STL02337	13C3-PFBS	90		50-150
STL02117	d5-NEtFOSAA	85		50-150
STL02118	d3-NMeFOSAA	81		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_015.d
Lims ID: 320-41998-A-5-D
Client ID: DUP02-20180713
Sample Type: Client
Inject. Date: 11-Aug-2018 21:44:41 ALS Bottle#: 9 Worklist Smp#: 12
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41998-a-5-d
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 13:39:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.005	1770178	0.4182			145	
298.90 > 99.00	1.797	1.797	0.0	1.005	647514		2.73(1.35-4.05)		135	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.805	-0.016	0.650	60027	1.31		89.7	101	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	5748292	2.09			346	
313.00 > 119.00	2.048	2.048	0.0	1.000	384881		14.94(6.96-20.87)		488	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.744	4631819	1.51		96.0	6712	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.387	-0.001	1.000	2275595	0.6346			92.8	
363.00 > 169.00	2.386	2.387	-0.001	1.000	534507		4.26(2.17-6.52)		803	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.400	-0.014	0.868	5439420	1.56		99.3	6090	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	4001952	1.31			894	
399.00 > 99.00	2.400	2.400	0.0	1.000	1047540		3.82(1.90-5.70)		269	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	3561566	1.36		91.3	4591	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		7385534	2.50			6843	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.751	2.751	0.0	1.000	30490967	8.93			1623	
413.00 > 169.00	2.751	2.751	0.0	1.000	14313286		2.13(1.36-4.08)		2703	M
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	4908409	1.68		107	10043	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.009	3.136	-0.127	0.960	1674075	0.6736			218	
499.00 > 99.00	3.136	3.136	0.0	1.000	308745		5.42(2.04-6.12)		540	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.136	3.136	0.0	1.000	43171	0.0156			6.4	M
463.00 > 169.00	3.136	3.136	0.0	1.000	7664		5.63(2.68-8.03)		13.7	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.155	-0.019	1.140	4121447	1.65		105	5051	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.155	-0.019	1.140	3489080	1.28		85.0	1961	
D 23 13C2 PFDA										
515.00 > 470.00	3.529	3.529	0.0	1.283	4051132	1.62		103	5015	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.671	3.671	0.0	1.335	618866	1.27		80.7	1989	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.841	3.826	0.015	1.004	2605	0.008541			3.9	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.825	3.841	-0.016	1.391	535575	1.34		85.1	803	
D 30 13C2 PFUnA										
565.00 > 520.00	3.825	3.857	-0.032	1.391	2379763	1.18		74.7	3423	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.125	4.125	0.0	1.000	23663	0.0148			2.0	
613.00 > 169.00	4.125	4.125	0.0	1.000	2491		9.50(4.68-14.05)		7.8	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.142	-0.017	1.500	2558269	1.17		74.5	3025	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.390	4.406	-0.016	1.064	21047	0.0173			6.9	
663.00 > 169.00	4.390	4.406	-0.016	1.064	3916		5.37(3.09-9.27)		14.0	
42 Perfluorotetradecanoic acid										R
713.00 > 169.00	4.645	4.645	0.0	1.000	5091	0.0250			24.4	R
713.00 > 219.00	4.629	4.645	-0.016	0.997	2174		2.34(0.70-2.09)		9.2	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.661	-0.016	1.689	1991634	1.43		90.8	4358	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:47 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_015.d

Injection Date: 11-Aug-2018 21:44:41 Instrument ID: A9

Lims ID: 320-41998-A-5-D Lab Sample ID: 320-41998-5

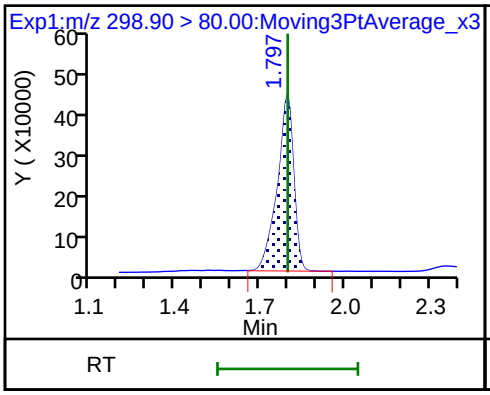
Client ID: DUP02-20180713

Operator ID: A9\Administrator ALS Bottle#: 9 Worklist Smp#: 12

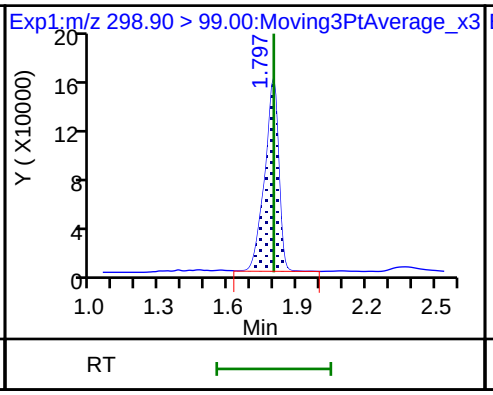
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

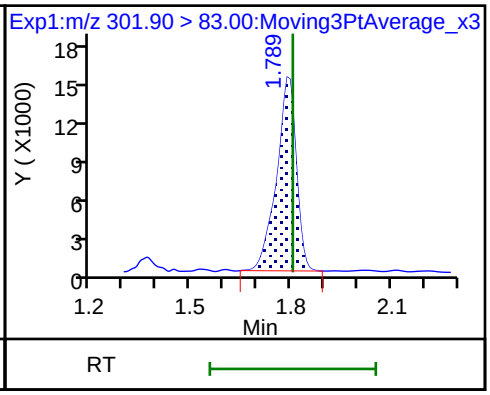
5 Perfluorobutanesulfonic acid



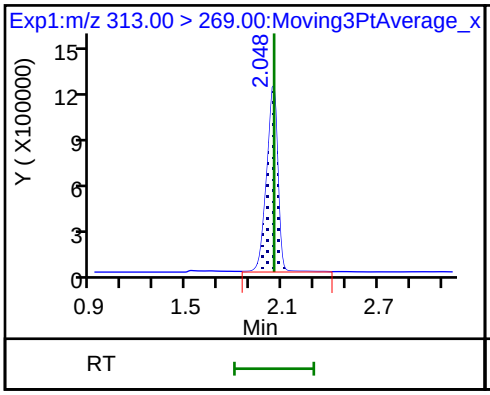
5 Perfluorobutanesulfonic acid



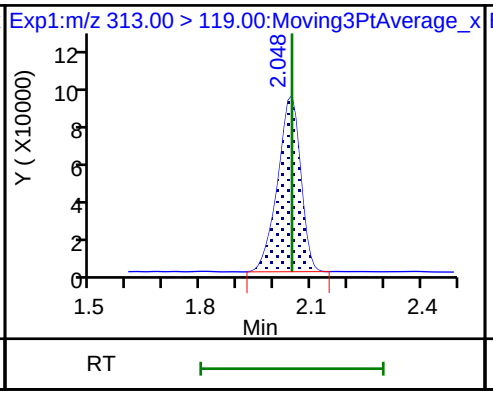
D 47 13C3-PFBS



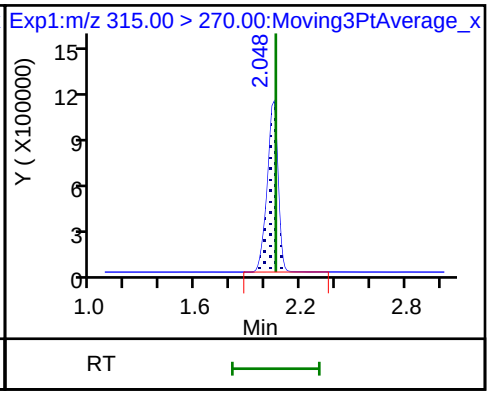
6 Perfluorohexanoic acid



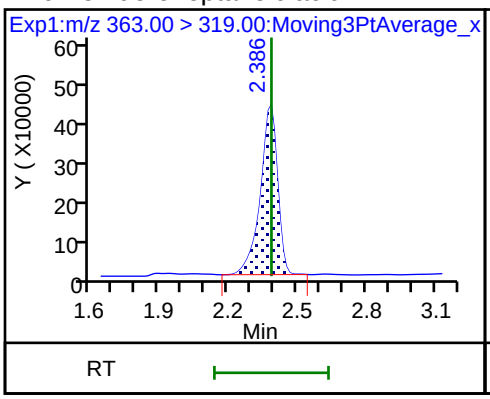
6 Perfluorohexanoic acid



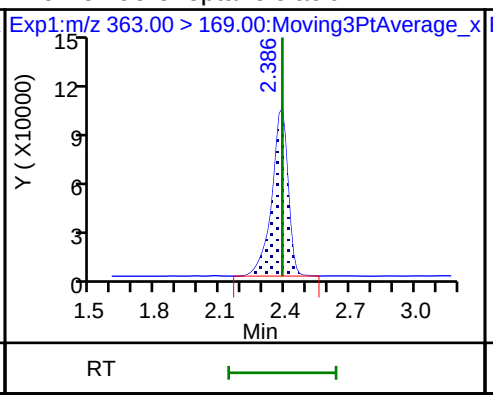
D 7 13C2 PFHxA



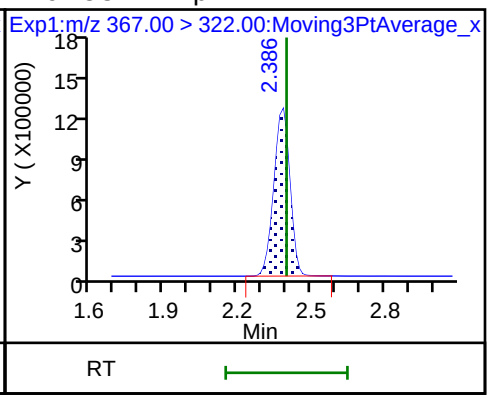
10 Perfluoroheptanoic acid



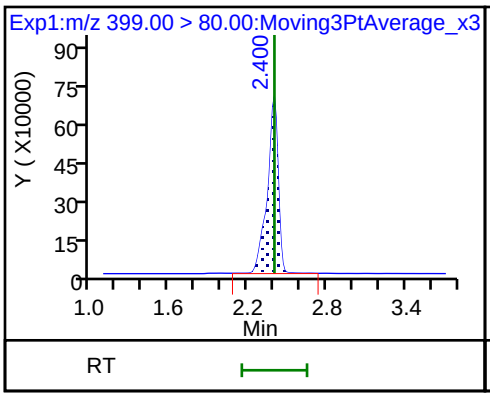
10 Perfluoroheptanoic acid



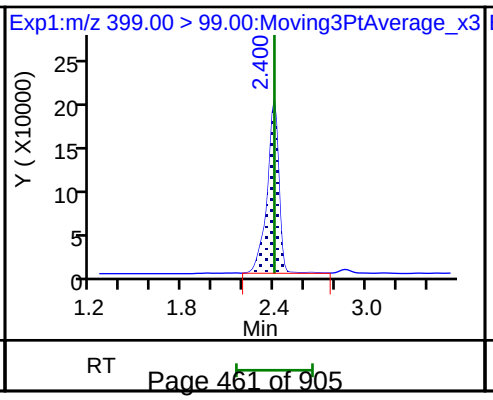
D 9 13C4-PFHpA



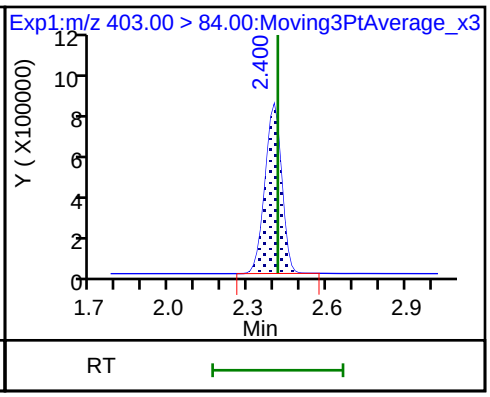
8 Perfluorohexanesulfonic acid



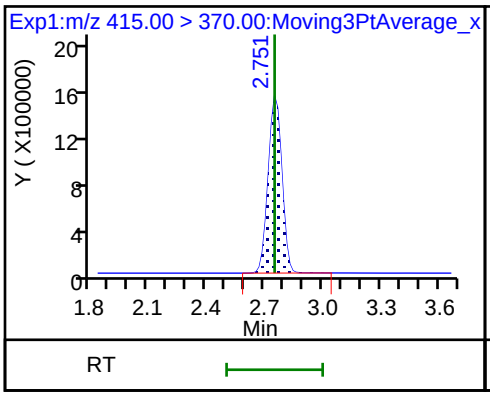
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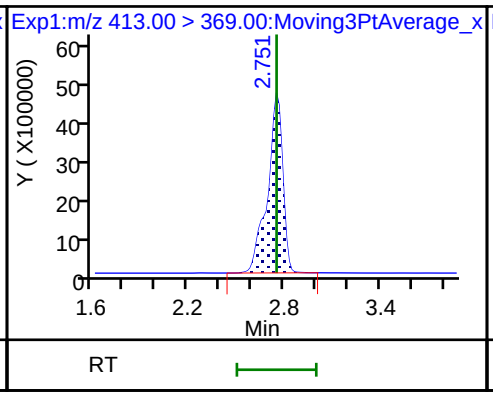
D 11 18O2 PFHxS



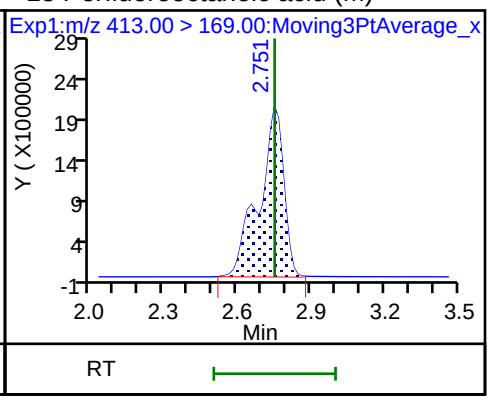
* 62 13C2-PFOA



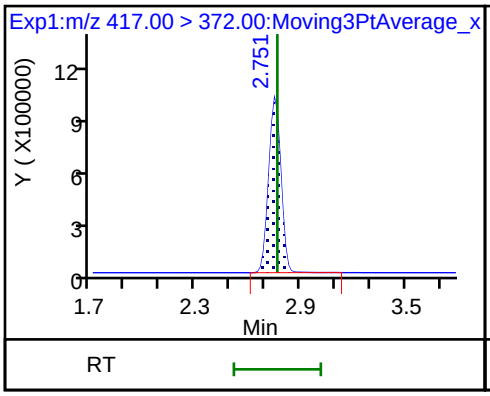
15 Perfluorooctanoic acid



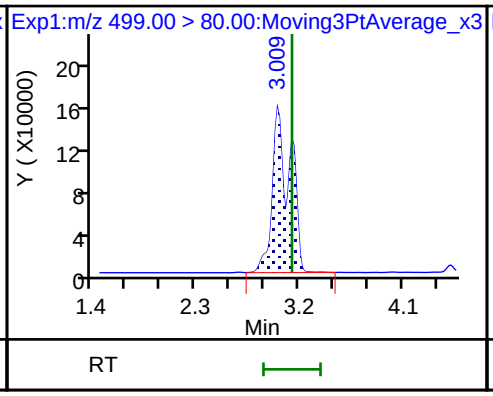
15 Perfluorooctanoic acid (M)



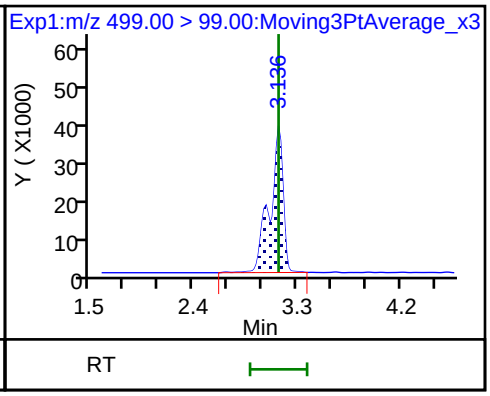
D 14 13C4 PFOA



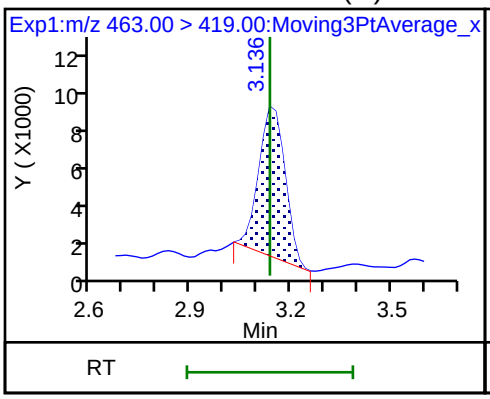
17 Perfluorooctane sulfonic acid



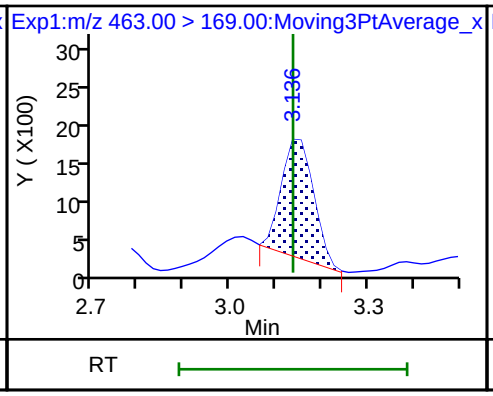
17 Perfluorooctane sulfonic acid



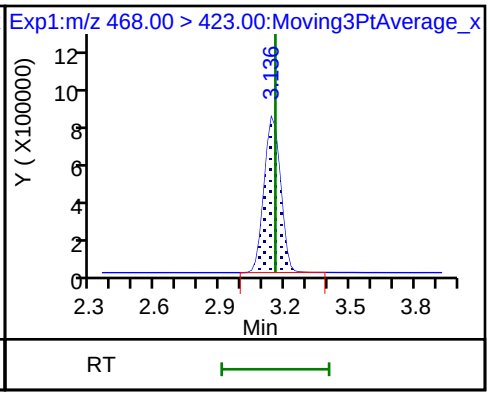
20 Perfluorononanoic acid (M)



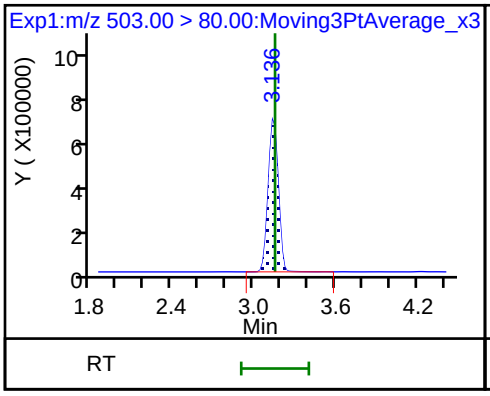
20 Perfluorononanoic acid



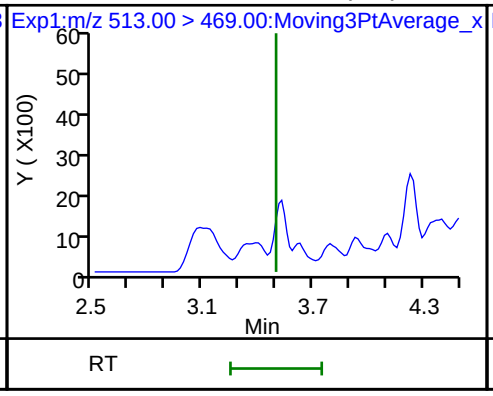
D 19 13C5 PFNA



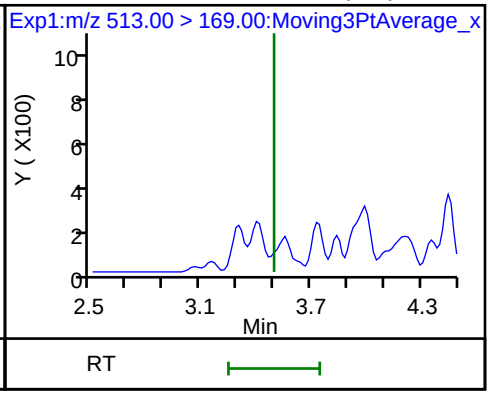
D 18 13C4 PFOS



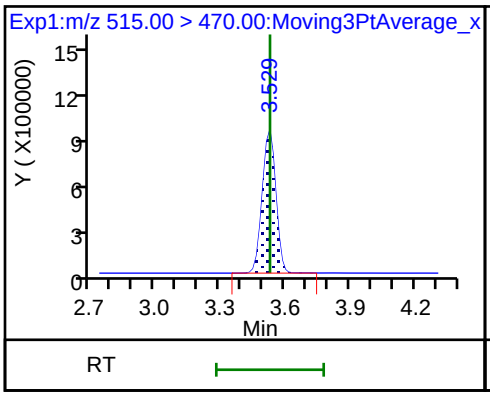
24 Perfluorodecanoic acid (ND)



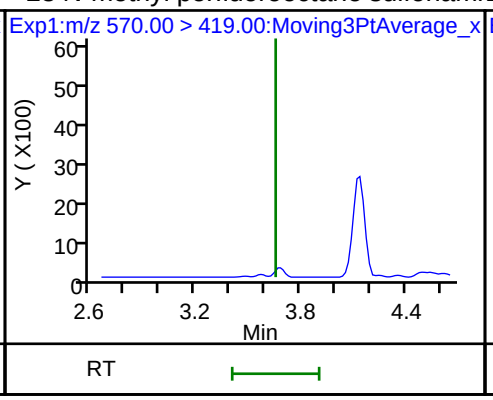
24 Perfluorodecanoic acid (ND)



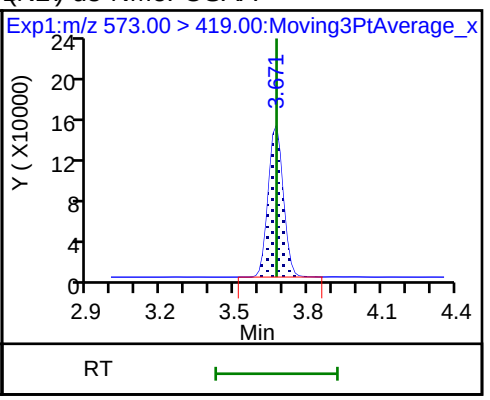
D 23 13C2 PFDA



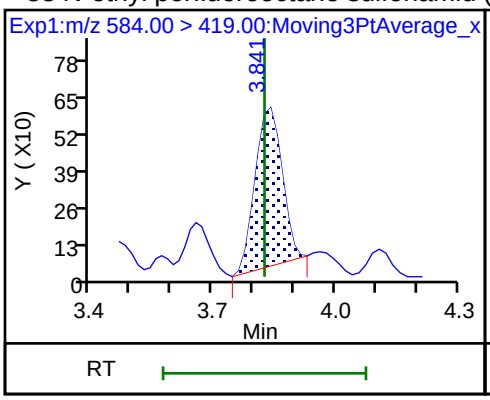
28 N-methyl perfluorooctane sulfonamid (ND)



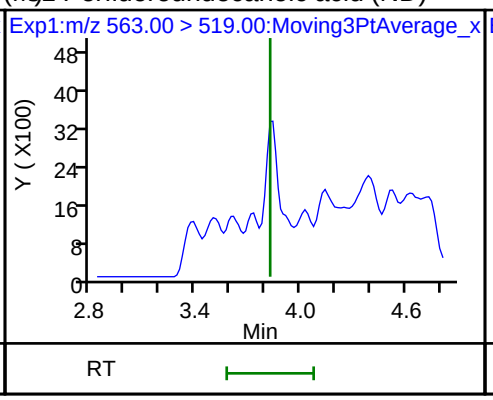
D 27 d3-NMeFOSAA



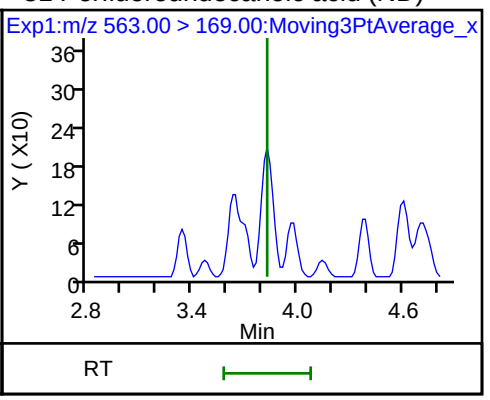
33 N-ethyl perfluorooctane sulfonamid (ND)



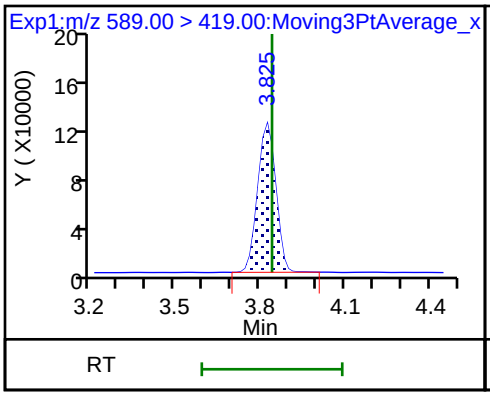
31 Perfluoroundecanoic acid (ND)



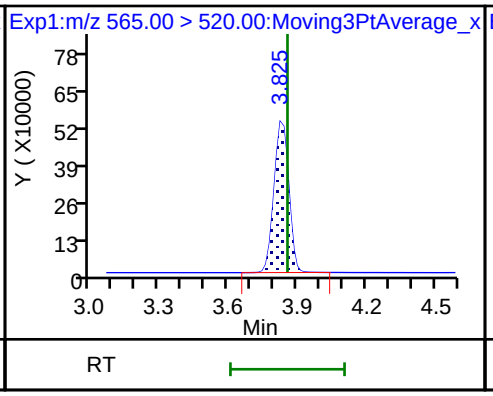
31 Perfluoroundecanoic acid (ND)



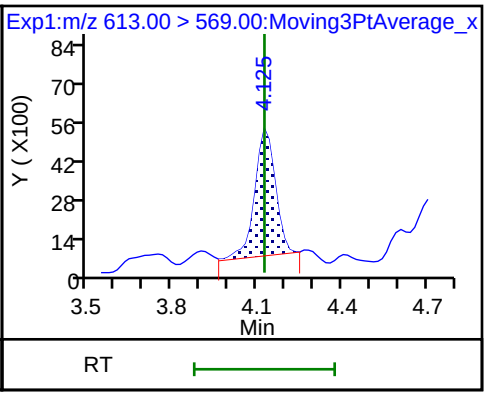
D 32 d5-NEtFOSAA



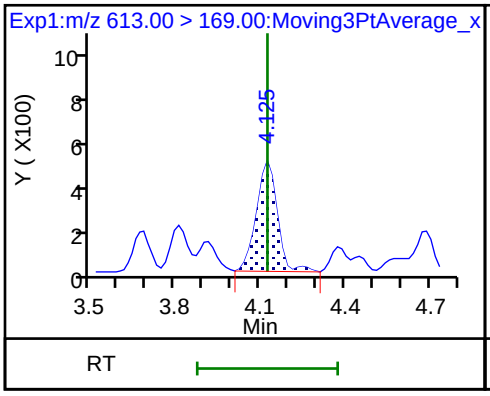
D 30 13C2 PFUnA



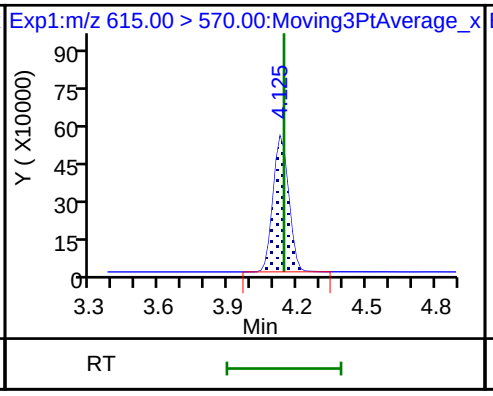
37 Perfluorododecanoic acid



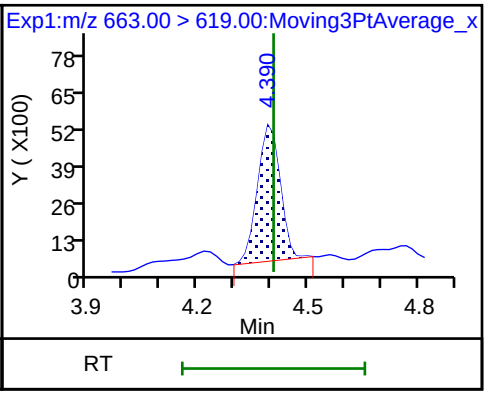
37 Perfluorododecanoic acid



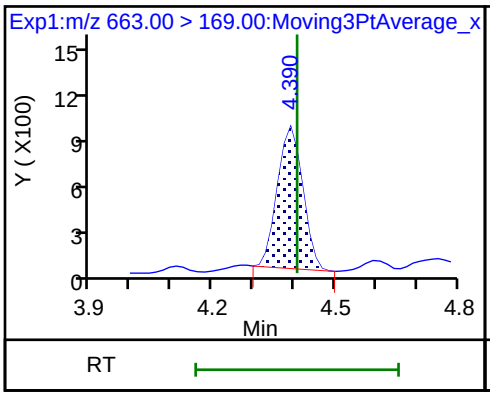
D 36 13C2 PFDoA



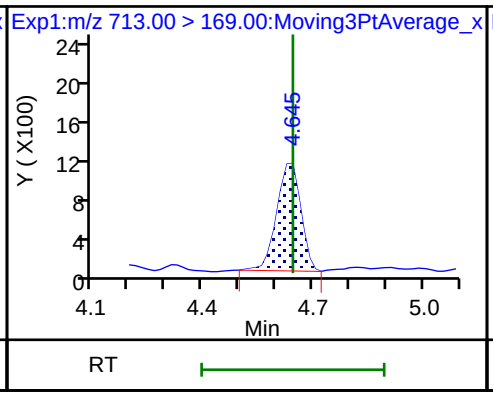
41 Perfluorotridecanoic acid



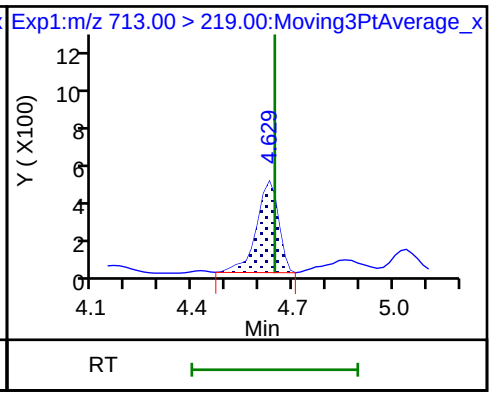
41 Perfluorotridecanoic acid



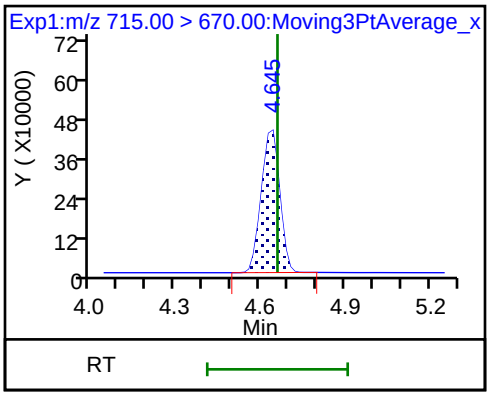
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

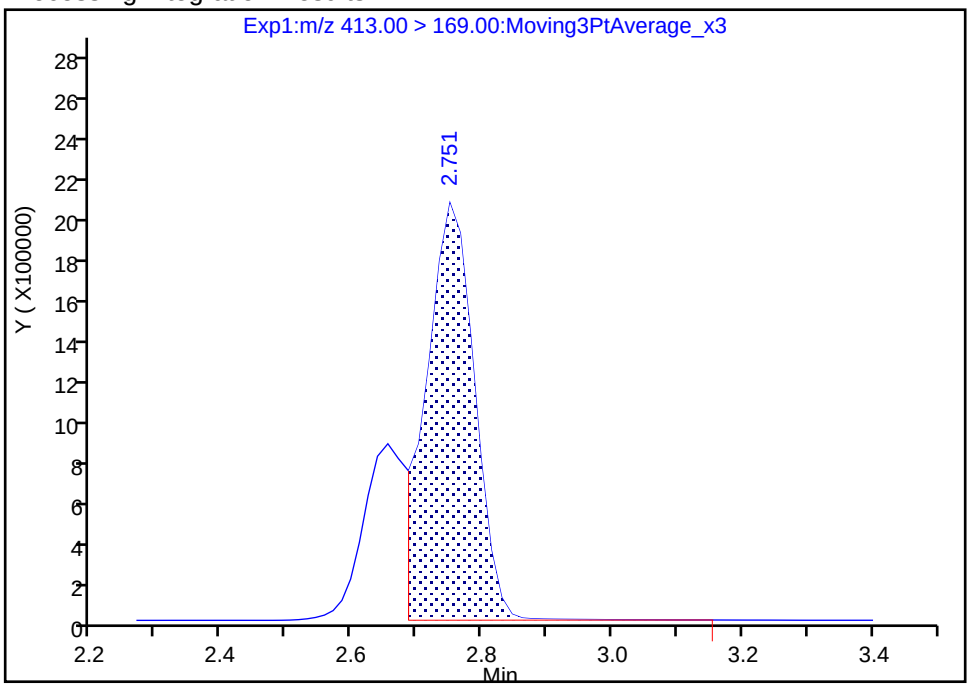
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_015.d				
Injection Date:	11-Aug-2018 21:44:41	Instrument ID:	A9		
Lims ID:	320-41998-A-5-D	Lab Sample ID:	320-41998-5		
Client ID:	DUP02-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	12
Injection 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

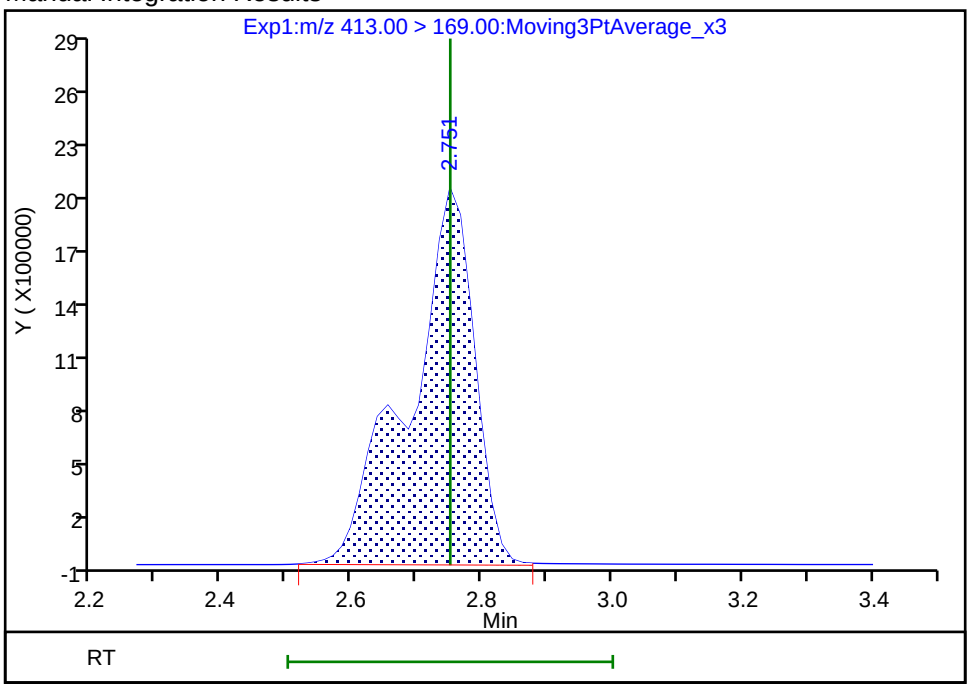
Processing Integration Results

RT: 2.75
Area: 10484146
Amount: 8.929991
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 14313286
Amount: 8.929991
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:37:43

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

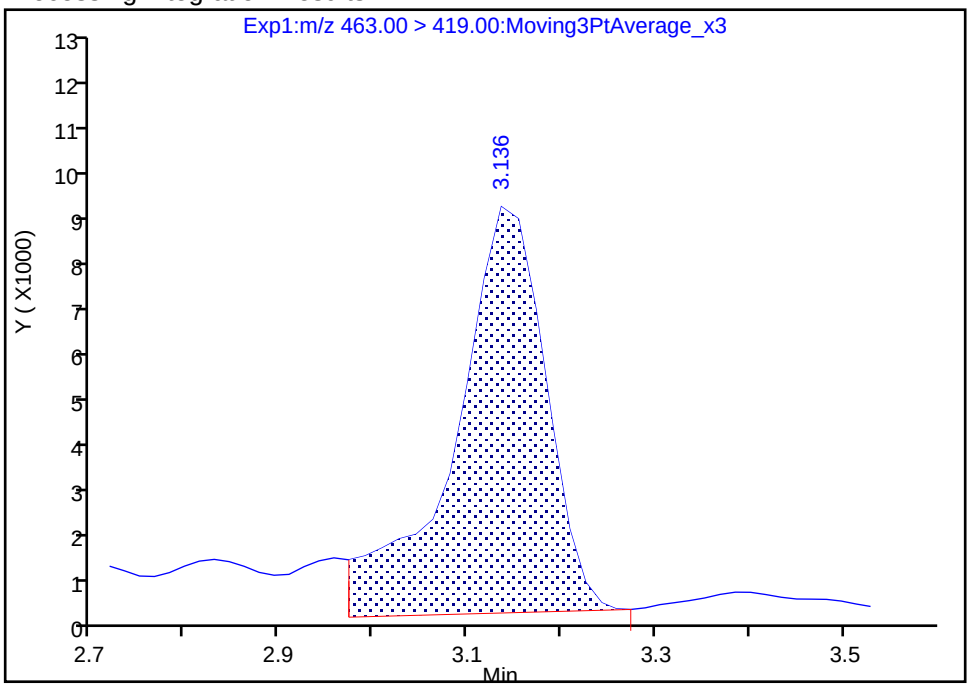
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_015.d				
Injection Date:	11-Aug-2018 21:44:41	Instrument ID:	A9		
Lims ID:	320-41998-A-5-D	Lab Sample ID:	320-41998-5		
Client ID:	DUP02-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	12
Injection 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

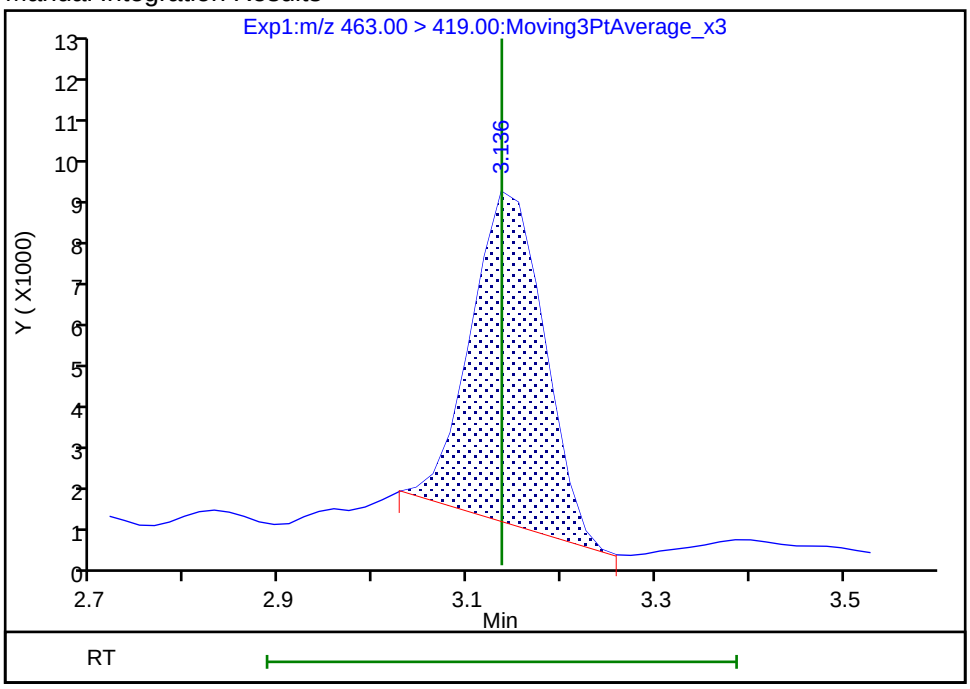
Processing Integration Results

RT: 3.14
Area: 59328
Amount: 0.021496
Amount Units: ng/ml



Manual Integration Results

RT: 3.14
Area: 43171
Amount: 0.015642
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:37:59

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

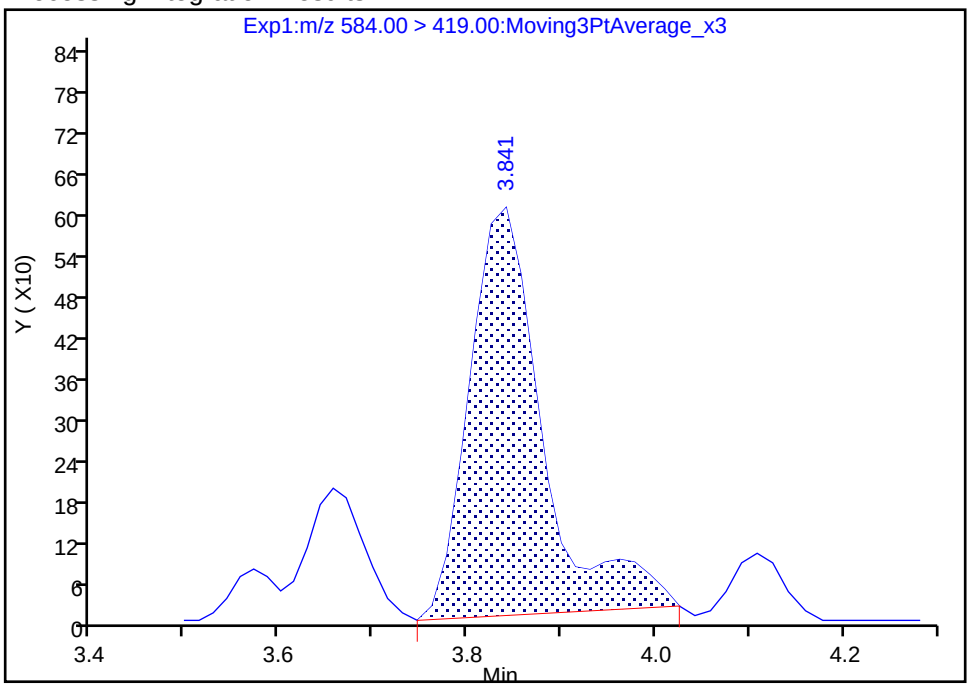
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_015.d				
Injection Date:	11-Aug-2018 21:44:41	Instrument ID:	A9		
Lims ID:	320-41998-A-5-D	Lab Sample ID:	320-41998-5		
Client ID:	DUP02-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	9	Worklist Smp#:	12
Injection 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

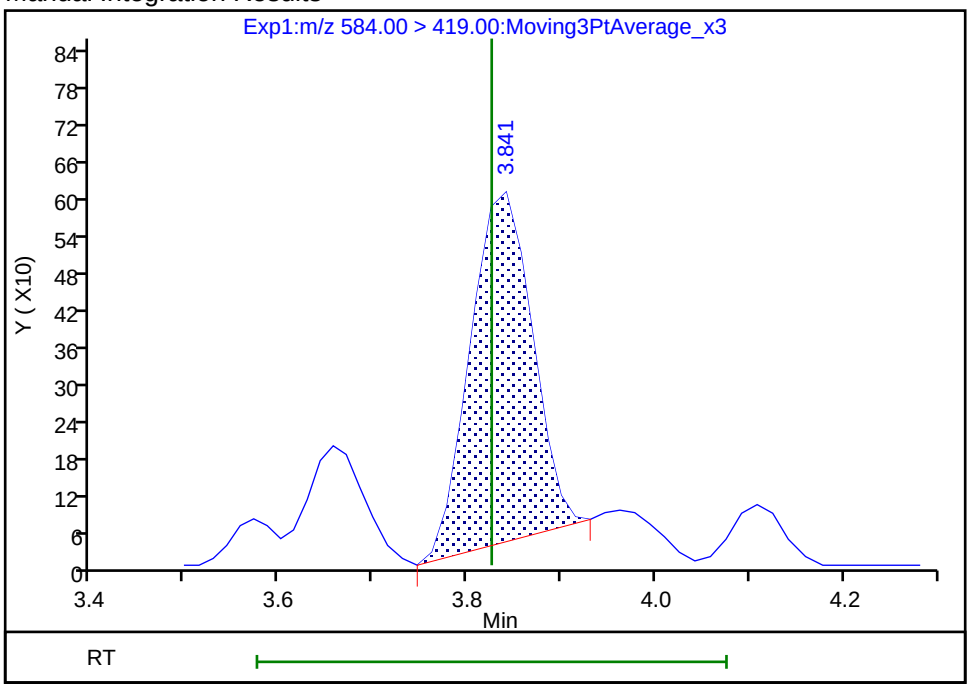
Processing Integration Results

RT: 3.84
Area: 3236
Amount: 0
Amount Units: ng/ml



Manual Integration Results

RT: 3.84
Area: 2605
Amount: 0.008541
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:38:56

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: EB02-20180713 | Lab Sample ID: 320-41998-6

Matrix: Water | Lab File ID: 2018.08.11LA9A_018.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 15:45

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 273.7(mL) | Date Analyzed: 08/11/2018 22:07

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.: 239432 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.00091	U H	0.0018	0.00091	0.00043
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0014	U H	0.0018	0.0014	0.00056
335-67-1	Perfluorooctanoic acid (PFOA)	0.0014	U M H	0.0018	0.0014	0.00049
375-95-1	Perfluorononanoic acid (PFNA)	0.0014	U H	0.0018	0.0014	0.00047
335-76-2	Perfluorodecanoic acid (PFDA)	0.00091	U H	0.0018	0.00091	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0014	U H	0.0018	0.0014	0.00066
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0014	U H	0.0018	0.0014	0.00047
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0027	U H	0.0037	0.0027	0.00069
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0027	U H	0.0037	0.0027	0.00076
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00091	U H	0.0018	0.00091	0.00042
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00091	U M H	0.0018	0.00091	0.00035
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0027	U H	0.0037	0.0027	0.0010
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0091	U H	0.018	0.0091	0.0027
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0091	U H	0.018	0.0091	0.0026

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: EB02-20180713 Lab Sample ID: 320-41998-6

Matrix: Water Lab File ID: 2018.08.11LA9A_018.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 15:45

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 273.7(mL) Date Analyzed: 08/11/2018 22:07

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.: 239432 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		50-150
STL01892	13C4-PFHpA	88		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	103		50-150
STL00996	13C2 PFDA	97		50-150
STL00997	13C2 PFUnA	98		50-150
STL00998	13C2 PFDoA	95		50-150
STL00994	18O2 PFHxS	75		50-150
STL02116	13C2-PFTeDA	93		50-150
STL00991	13C4 PFOS	82		50-150
STL02337	13C3-PFBS	76		50-150
STL02117	d5-NEtFOSAA	97		50-150
STL02118	d3-NMeFOSAA	99		50-150

Report Date: 13-Aug-2018 07:40:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_018.d
Lims ID: 320-41998-A-6-D
Client ID: EB02-20180713
Sample Type: Client
Inject. Date: 11-Aug-2018 22:07:12 ALS Bottle#: 10 Worklist Smp#: 15
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41998-a-6-d
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 13:41:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										R
298.90 > 80.00	1.797	1.797	0.0	1.000	2008	0.000678			0.7	R
298.90 > 99.00	1.831	1.797	0.034	1.019	26024		0.08(1.35-4.05)		13.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.805	-0.008	0.653	66695	1.76		75.8	409	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.744	5347664	2.11		84.3	8415	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.374	2.387	-0.013	0.995	5443	0.002061			0.7	
363.00 > 169.00	2.387	2.387	0.0	1.000	1675		3.25(2.17-6.52)		4.2	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.868	6359777	2.21		88.3	17474	
8 Perfluorohexanesulfonic acid										RM
399.00 > 80.00	2.400	2.400	0.0	1.000	19317	0.009290			33.1	R
399.00 > 99.00	2.400	2.400	0.0	1.000	3215		6.01(1.90-5.70)		2.1	M
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	3844156	1.77		75.0	6443	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		6116673	2.50			16464	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.751	2.751	0.0	1.000	30244	0.0115			4.5	M
413.00 > 169.00	2.751	2.751	0.0	1.000	10724		2.82(1.36-4.08)		15.7	M
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	5992902	2.48		99.3	11817	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	51951	0.0261			21.7	
499.00 > 99.00	3.136	3.136	0.0	1.000	10372		5.01(2.04-6.12)		21.4	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.155	-0.019	1.140	5357855	2.59		103	8841	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.155	-0.019	1.140	4435670	1.97		82.2	5376	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.529	-0.031	1.272	5002339	2.41		96.5	9354	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.657	0.0	1.000	4874	0.0120			2.5	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.329	1002558	2.49		99.5	2898	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.841	3.826	0.015	1.004	4211	0.0146			6.0	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.841	-0.015	1.391	805807	2.43		97.3	1291	
D 30 13C2 PFUnA										
565.00 > 520.00	3.826	3.857	-0.031	1.391	4099397	2.45		97.9	6685	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.142	-0.017	1.500	4290195	2.37		95.0	9347	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.630	4.661	-0.031	1.683	2686754	2.33		93.2	12327	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_018.d

Injection Date: 11-Aug-2018 22:07:12 Instrument ID: A9

Lims ID: 320-41998-A-6-D Lab Sample ID: 320-41998-6

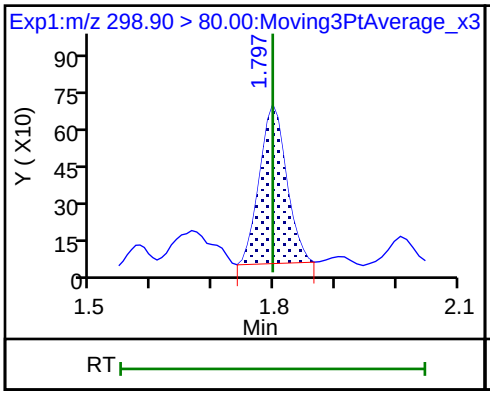
Client ID: EB02-20180713

Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 15

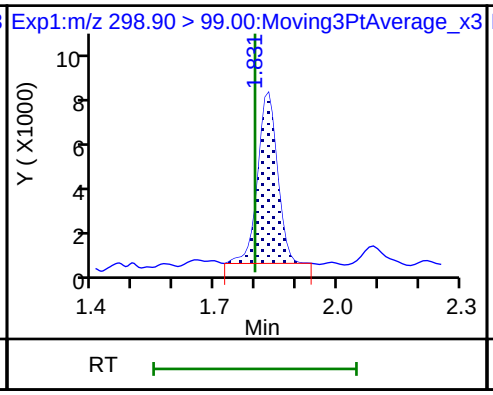
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

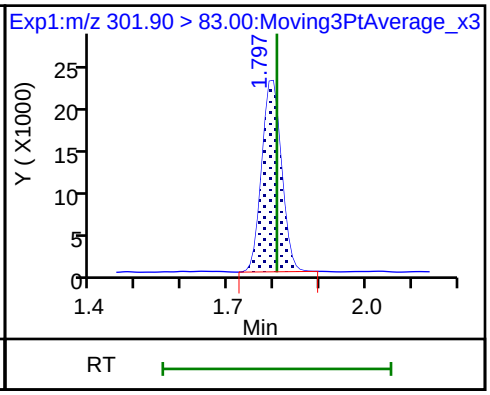
5 Perfluorobutanesulfonic acid



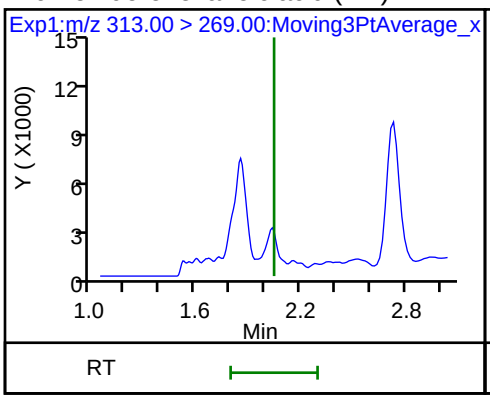
5 Perfluorobutanesulfonic acid



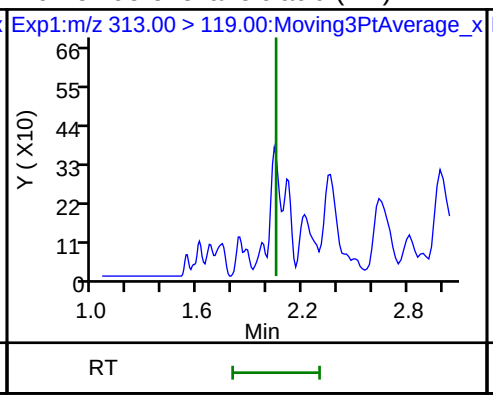
D 47 13C3-PFBS



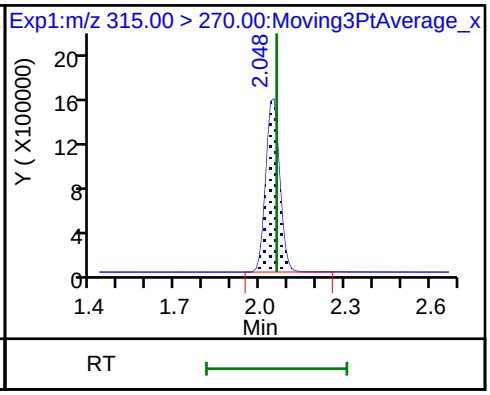
6 Perfluorohexanoic acid (ND)



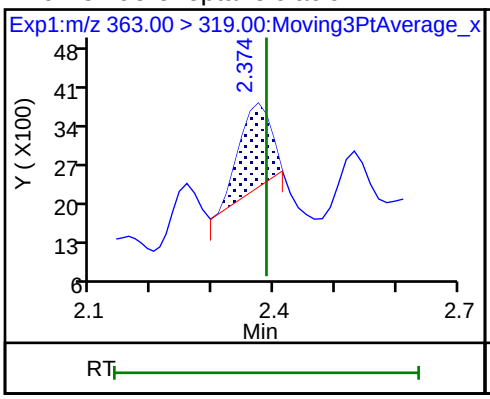
6 Perfluorohexanoic acid (ND)



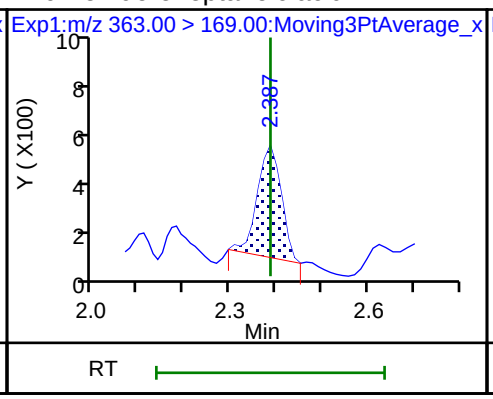
D 7 13C2 PFHxA



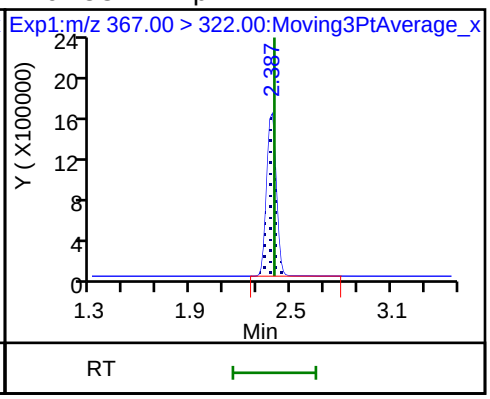
10 Perfluoroheptanoic acid



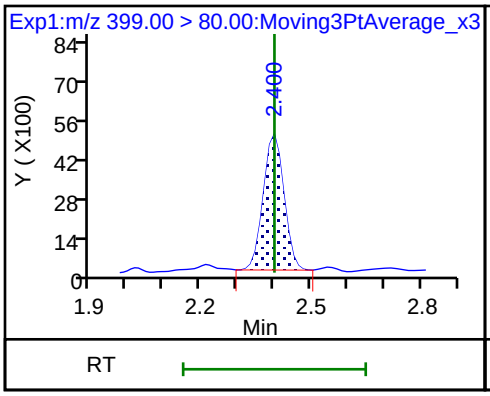
10 Perfluoroheptanoic acid



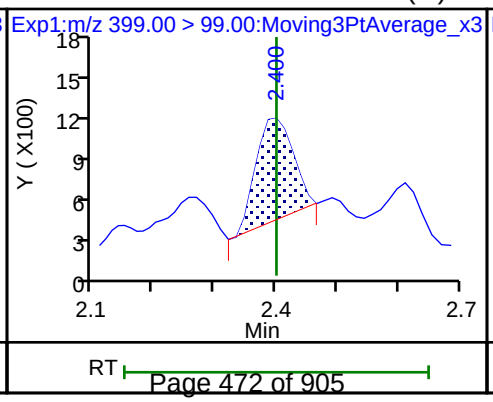
D 9 13C4-PFHpA



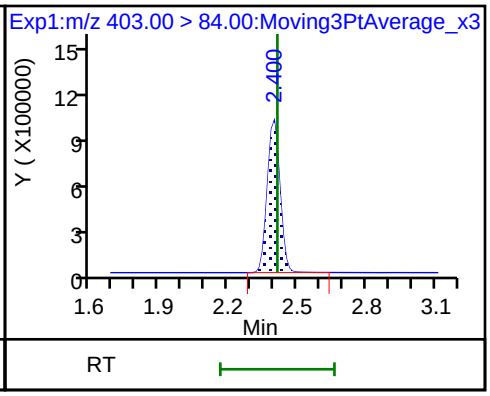
8 Perfluorohexanesulfonic acid



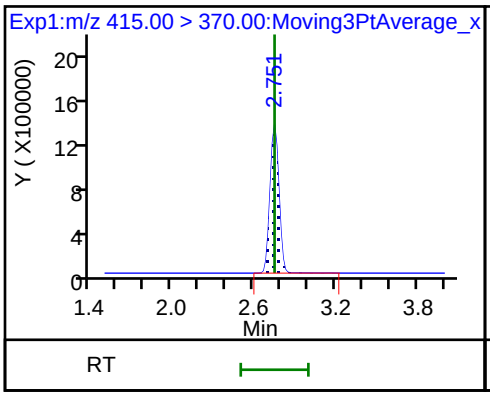
8 Perfluorohexanesulfonic acid (M)



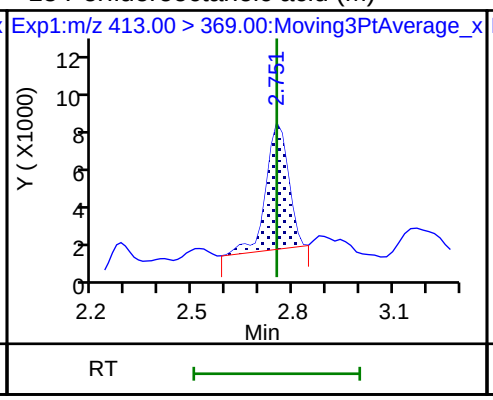
D 11 18O2 PFHxS



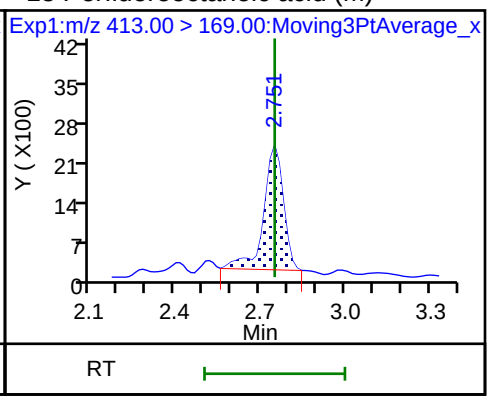
* 62 13C2-PFOA



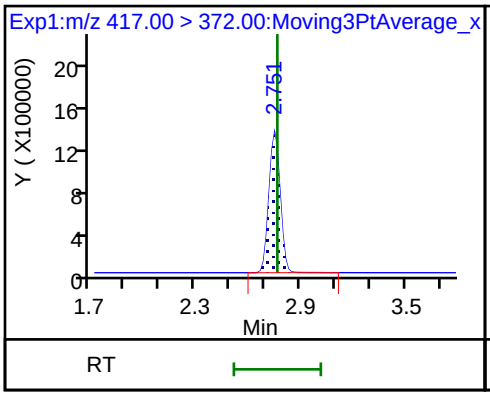
15 Perfluorooctanoic acid (M)



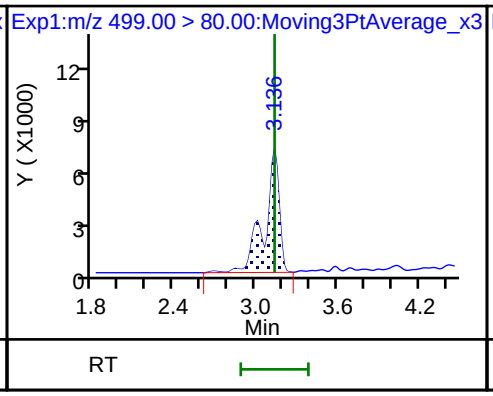
15 Perfluorooctanoic acid (M)



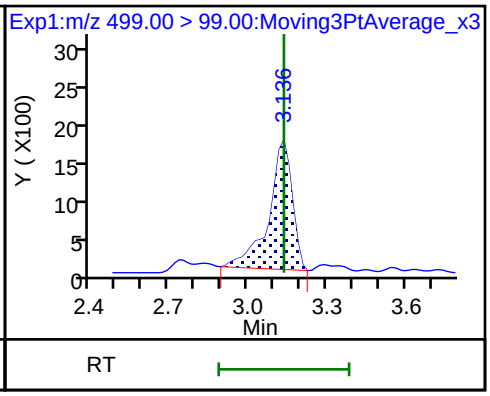
D 14 13C4 PFOA



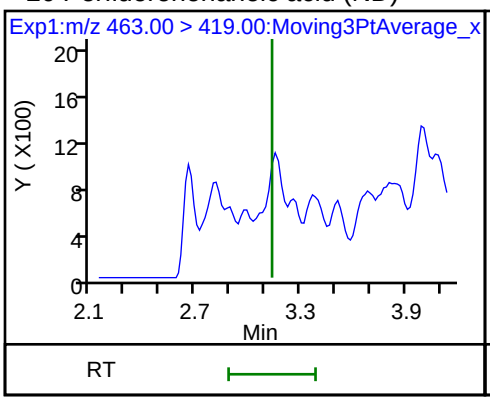
17 Perfluorooctane sulfonic acid



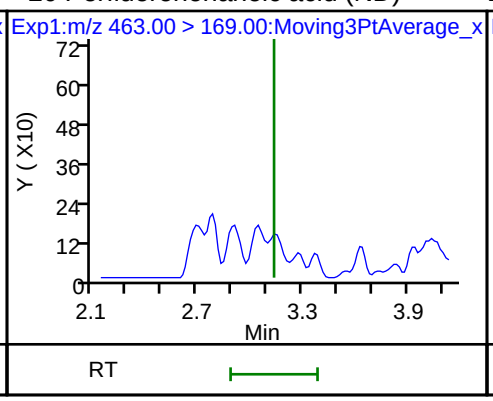
17 Perfluorooctane sulfonic acid



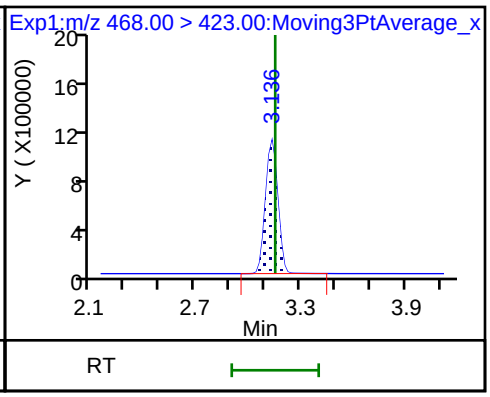
20 Perfluorononanoic acid (ND)



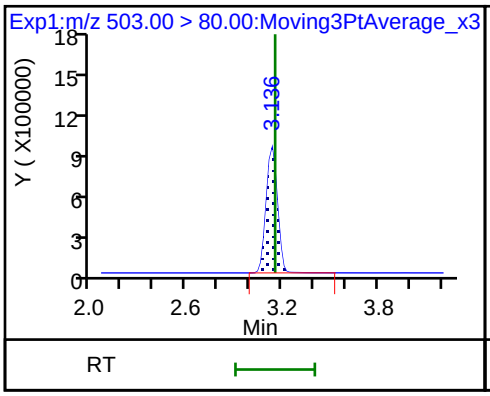
20 Perfluorononanoic acid (ND)



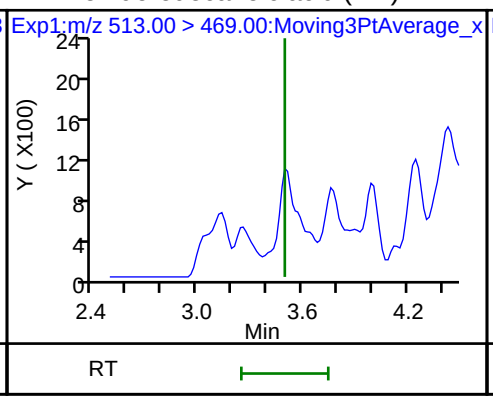
D 19 13C5 PFNA



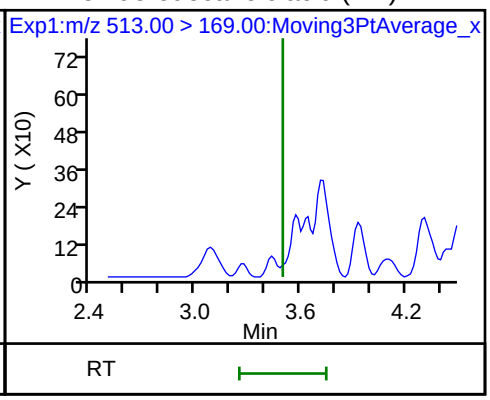
D 18 13C4 PFOS



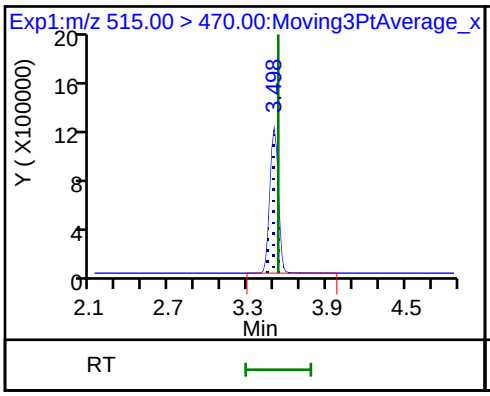
24 Perfluorodecanoic acid (ND)



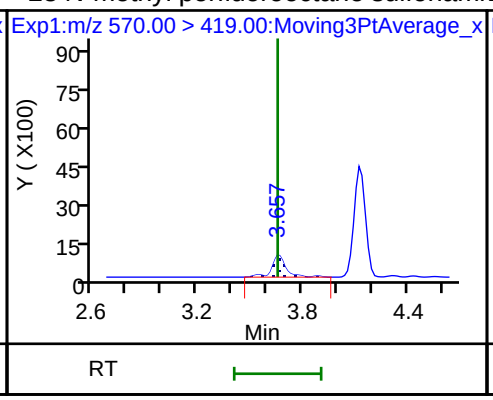
24 Perfluorodecanoic acid (ND)



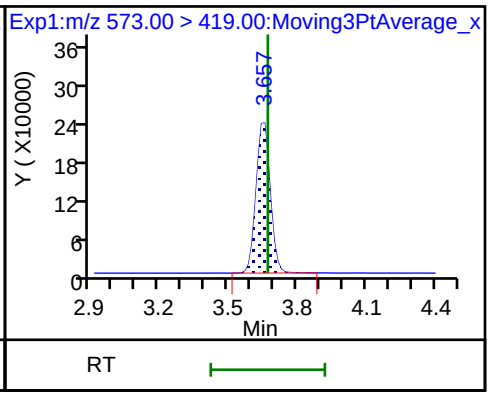
D 23 13C2 PFDA



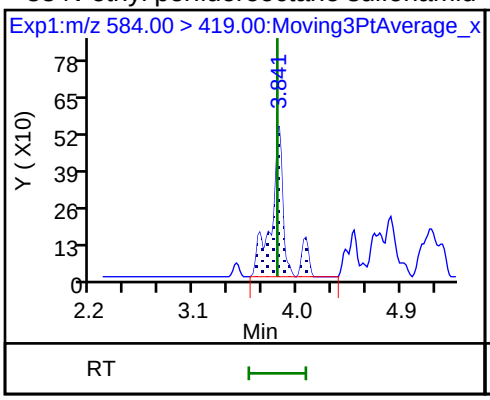
28 N-methyl perfluorooctane sulfonami



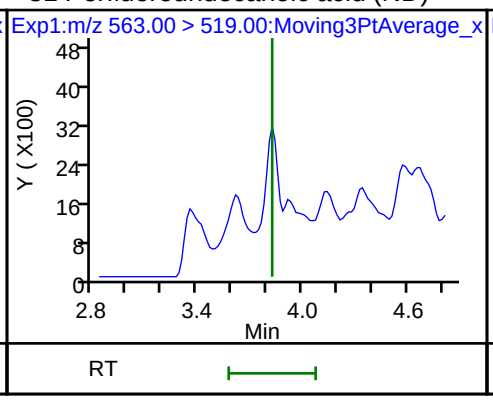
D 27 d3-NMeFOSAA



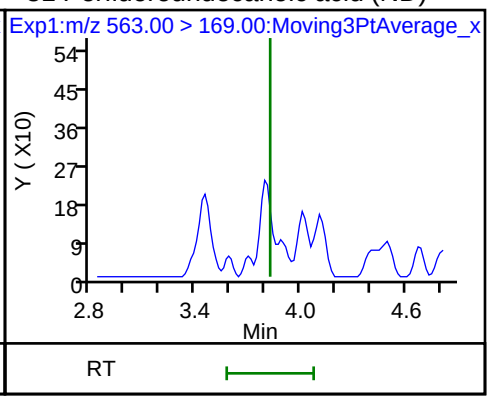
33 N-ethyl perfluorooctane sulfonamid



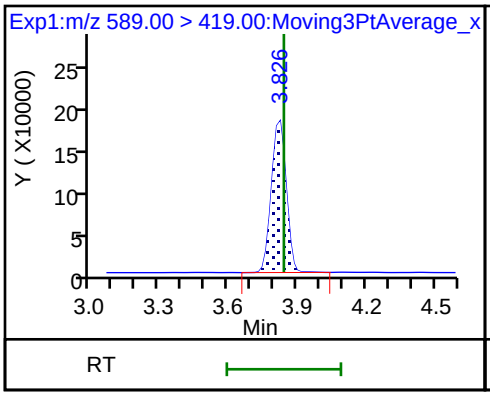
31 Perfluoroundecanoic acid (ND)



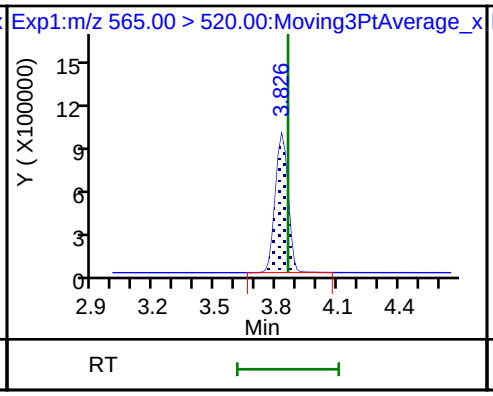
31 Perfluoroundecanoic acid (ND)



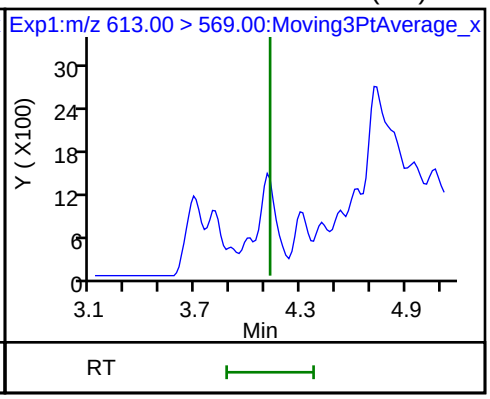
D 32 d5-NEtFOSAA



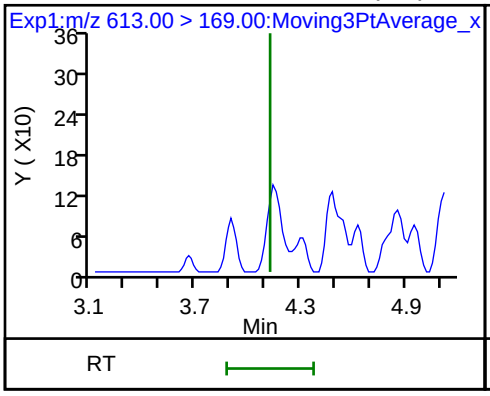
D 30 13C2 PFUnA



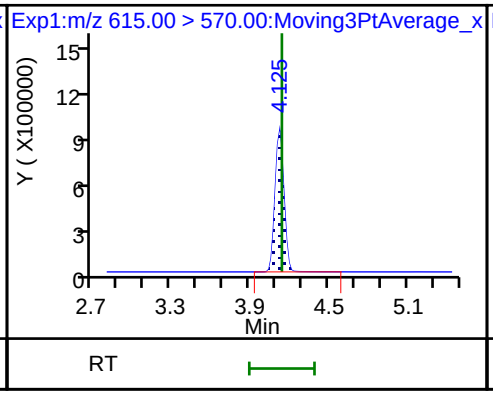
37 Perfluorododecanoic acid (ND)



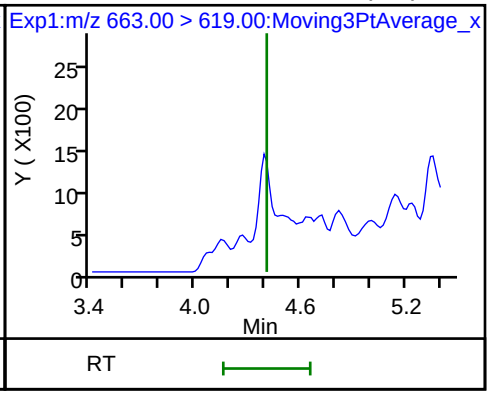
37 Perfluorododecanoic acid (ND)



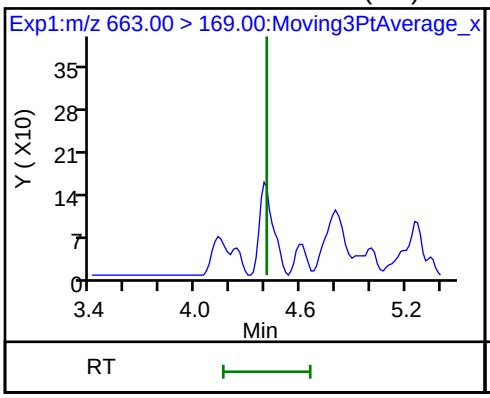
D 36 13C2 PFDoA



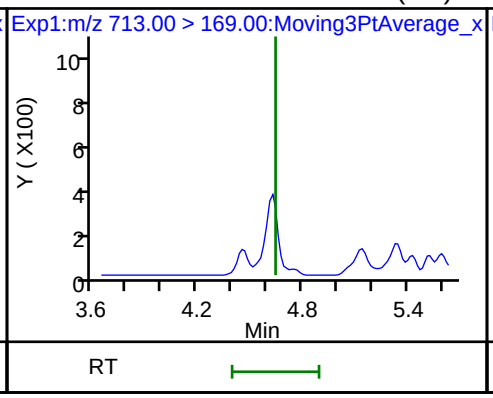
41 Perfluorotridecanoic acid (ND)



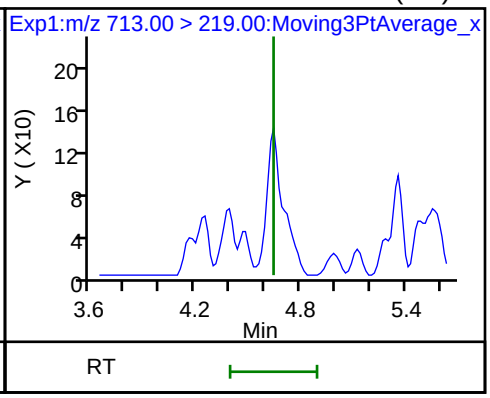
41 Perfluorotridecanoic acid (ND)



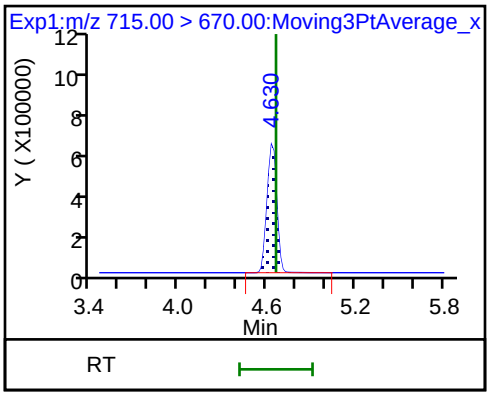
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

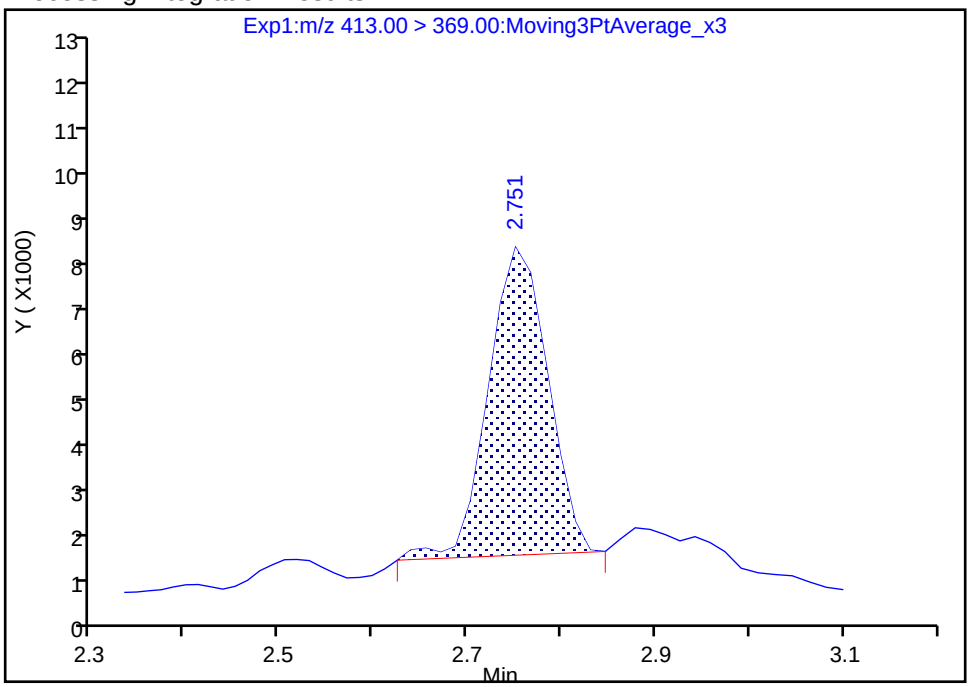
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_018.d				
Injection Date:	11-Aug-2018 22:07:12	Instrument ID:	A9		
Lims ID:	320-41998-A-6-D	Lab Sample ID:	320-41998-6		
Client ID:	EB02-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	15
Injection 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

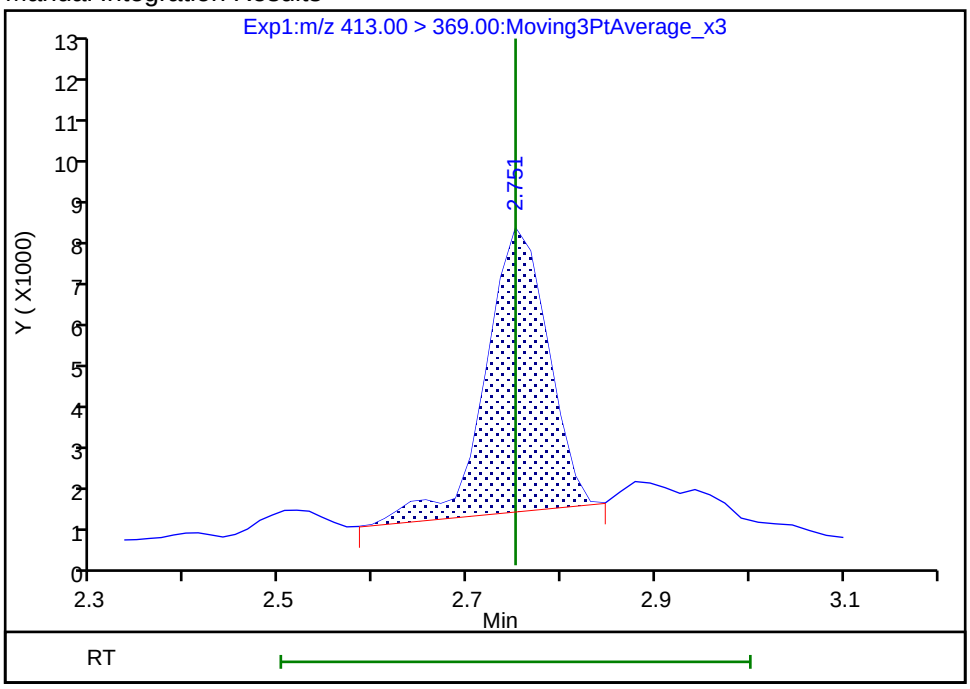
Processing Integration Results

RT: 2.75
Area: 28019
Amount: 0.010668
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 30244
Amount: 0.011515
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:41:03

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

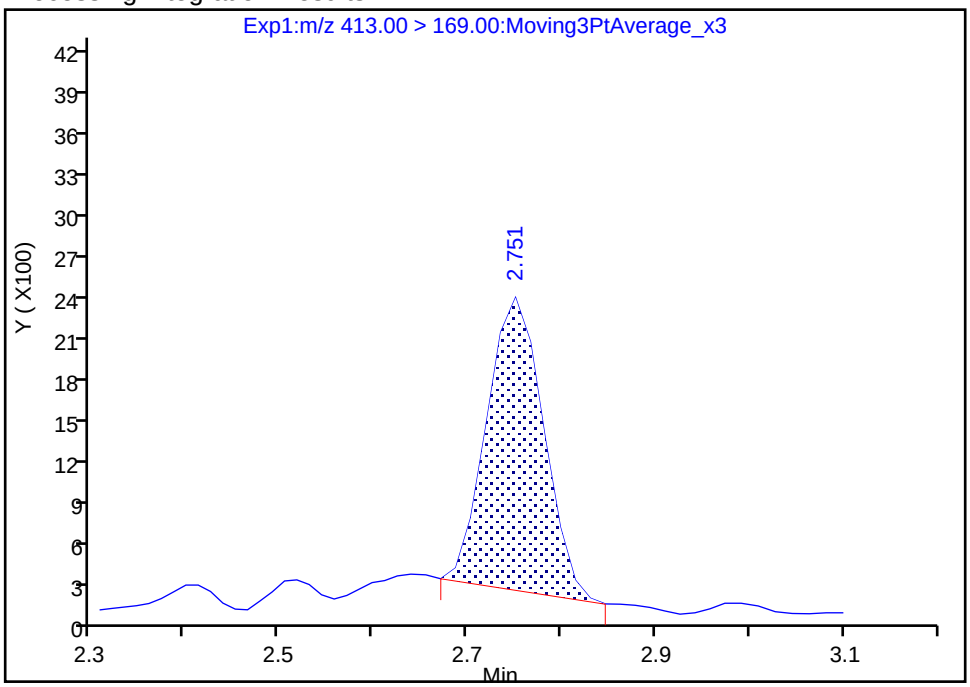
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_018.d				
Injection Date:	11-Aug-2018 22:07:12	Instrument ID:	A9		
Lims ID:	320-41998-A-6-D	Lab Sample ID:	320-41998-6		
Client ID:	EB02-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	15
Injection 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

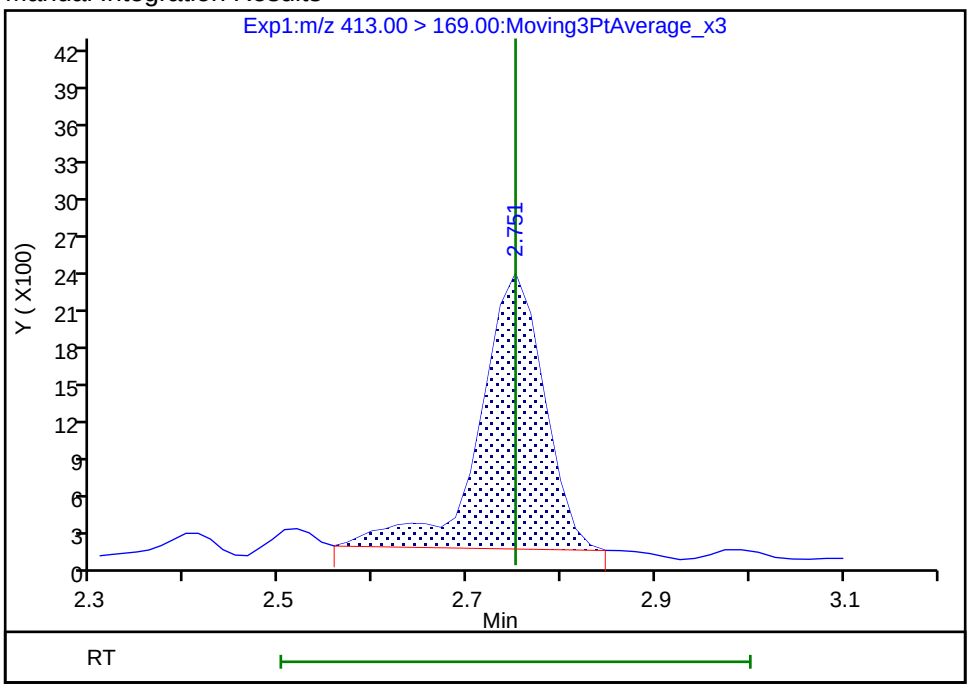
Processing Integration Results

RT: 2.75
Area: 8984
Amount: 0.010668
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 10724
Amount: 0.011515
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:41:10

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

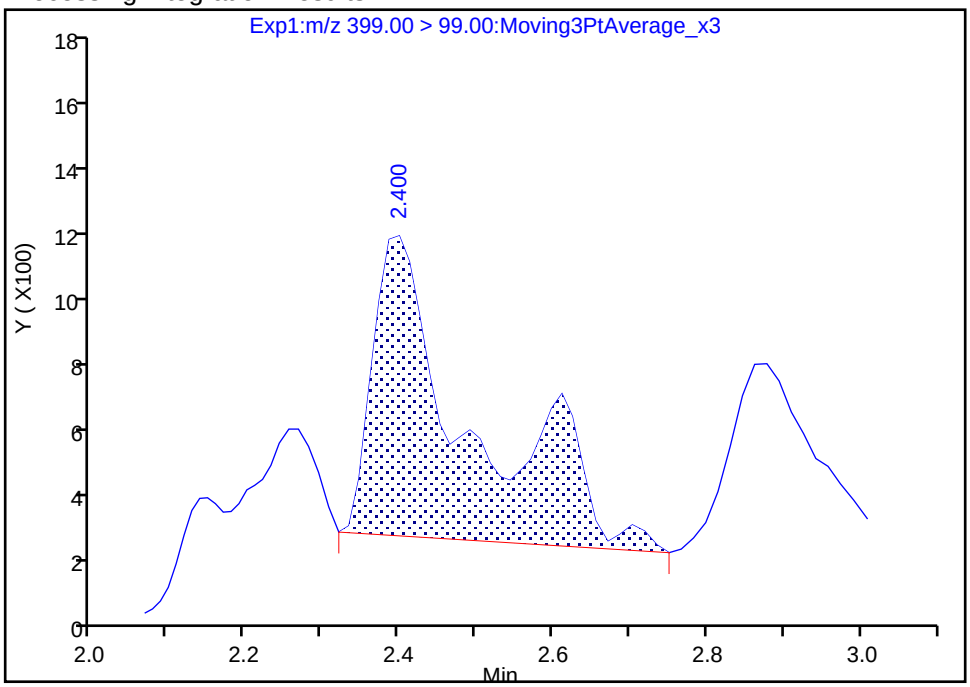
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_018.d				
Injection Date:	11-Aug-2018 22:07:12	Instrument ID:	A9		
Lims ID:	320-41998-A-6-D	Lab Sample ID:	320-41998-6		
Client ID:	EB02-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	15
Injection 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

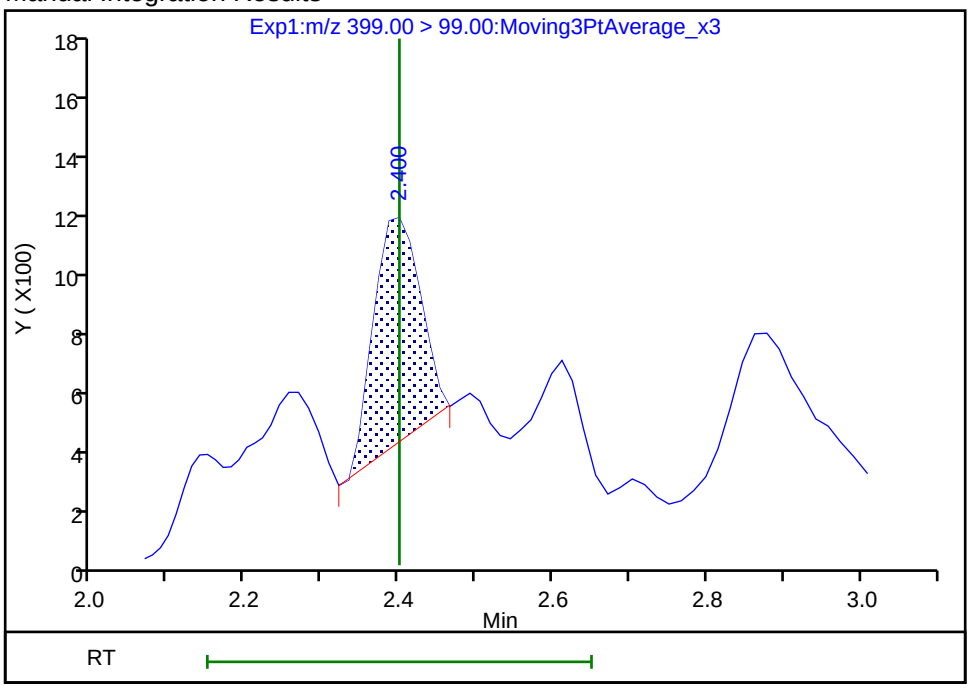
Processing Integration Results

RT: 2.40
Area: 8075
Amount: 0.009290
Amount Units: ng/ml



Manual Integration Results

RT: 2.40
Area: 3215
Amount: 0.009290
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:40:43

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: I012MW07S-20180713 | Lab Sample ID: 320-41998-7

Matrix: Water | Lab File ID: 2018.08.13LLA_029.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 15:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 282.8(mL) | Date Analyzed: 08/13/2018 09:44

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.: 239523 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*12*	*H J1 D*	*0.018*	0.0088	*0.0042*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*4.4*	*H J1 D*	*0.018*	0.013	*0.0054*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*17*	*H J1 D M*	*0.018*	0.013	*0.0048*
375-95-1	Perfluorononanoic acid (PFNA)	0.054	H D M	0.018	0.013	0.0046
335-76-2	Perfluorodecanoic acid (PFDA)	0.0088	U H	0.018	0.0088	0.0042
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.013	U H	0.018	0.013	0.0064
307-55-1	Perfluorododecanoic acid (PFDoA)	0.013	U H	0.018	0.013	0.0046
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.027	U H	0.035	0.027	0.0067
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.027	U H	0.035	0.027	0.0073
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*3.3*	*H J1 D*	*0.018*	0.0088	*0.0041*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*17*	*H J1 D*	*0.018*	0.0088	*0.0034*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*13*	*H J1 D*	*0.035*	0.027	*0.0097*
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.088	U H	0.18	0.088	0.027
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.088	U H	0.18	0.088	0.025

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: I012MW07S-20180713 Lab Sample ID: 320-41998-7

Matrix: Water Lab File ID: 2018.08.13LLA_029.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 15:30

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 282.8(mL) Date Analyzed: 08/13/2018 09:44

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.: 239523 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	75		50-150
STL01892	13C4-PFHpA	56		50-150
STL00990	13C4 PFOA	67		50-150
STL00995	13C5 PFNA	85		50-150
STL00996	13C2 PFDA	93		50-150
STL00997	13C2 PFUnA	89		50-150
STL00998	13C2 PFDoA	88		50-150
STL00994	18O2 PFHxS	73		50-150
STL02116	13C2-PFTeDA	89		50-150
STL00991	13C4 PFOS	70		50-150
STL02337	13C3-PFBS	124		50-150
STL02117	d5-NEtFOSAA	99		50-150
STL02118	d3-NMeFOSAA	106		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_029.d
Lims ID: 320-41998-A-7-D
Client ID: I012MW07S-20180713
Sample Type: Client
Inject. Date: 13-Aug-2018 09:44:05 ALS Bottle#: 14 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 10.0000
Sample Info: 320-41998-a-7-d 10X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 13-Aug-2018 10:05:21 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 10:03:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										E
298.90 > 80.00	1.797	1.797	0.0	1.000	59481106	9.34			5261	E
298.90 > 99.00	1.797	1.797	0.0	1.000	26774820		2.22(1.35-4.05)		5226	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.798	-0.001	0.653	14329	0.2883		124	18.8	
6 Perfluorohexanoic acid										E
313.00 > 269.00	2.037	2.048	-0.011	0.995	77461255	33.1			3039	E
313.00 > 119.00	2.048	2.048	0.0	1.000	9319751		8.31(6.96-20.87)		6479	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.744	625522	0.1878		75.1	1746	
10 Perfluoroheptanoic acid										E
363.00 > 319.00	2.373	2.386	-0.013	1.000	27488476	12.4			1446	E
363.00 > 169.00	2.386	2.386	0.0	1.006	7152571		3.84(2.17-6.52)		3736	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.387	-0.014	0.863	531836	0.1406		56.2	1359	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.400	2.400	0.0	1.000	130367141	49.2			12732	E
399.00 > 99.00	2.400	2.400	0.0	1.000	52016012		2.51(1.90-5.70)		11862	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	489460	0.1719		72.7	1854	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.751	2.750	0.001	1.000	110793555	47.7			5696	E
413.00 > 169.00	2.751	2.750	0.001	1.000	74673806		1.48(1.36-4.08)		1947	M
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.750	0.001		803403	0.2500			2881	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	529987	0.1672		66.9	1423	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.135	3.135	0.0	1.000	82690316	37.2			2890	E
499.00 > 99.00	3.135	3.135	0.0	1.000	20366657		4.06(2.04-6.12)		5054	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.135	3.135	0.0	1.000	372584	0.1529			36.8	M
463.00 > 169.00	3.135	3.135	0.0	1.000	66467		5.61(2.68-8.03)		30.8	
D 19 13C5 PFNA										
468.00 > 423.00	3.135	3.154	-0.019	1.140	577550	0.2124		84.9	2157	
D 18 13C4 PFOS										
503.00 > 80.00	3.135	3.154	-0.019	1.140	495234	0.1671		69.9	352	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.513	3.513	0.0	1.000	33117	0.0106			7.0	
513.00 > 169.00	3.513	3.513	0.0	1.000	3374		9.82(7.12-21.35)		5.0	
D 23 13C2 PFDA										
515.00 > 470.00	3.513	3.514	-0.001	1.277	633831	0.2328		93.1	1682	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.669	3.669	0.0	1.004	2124	0.003731			2.7	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.656	3.671	-0.015	1.329	140815	0.2660		106	762	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.824	3.841	-0.017	1.390	107887	0.2481		99.2	250	
D 30 13C2 PFUnA										
565.00 > 520.00	3.840	3.841	-0.001	1.396	492161	0.2236		89.4	2352	
D 36 13C2 PFDoA										
615.00 > 570.00	4.140	4.142	-0.002	1.505	524285	0.2209		88.4	3040	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.644	4.661	-0.017	1.688	338439	0.2234		89.3	2046	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 10:05:27 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_029.d

Injection Date: 13-Aug-2018 09:44:05 Instrument ID: A9

Lims ID: 320-41998-A-7-D Lab Sample ID: 320-41998-7

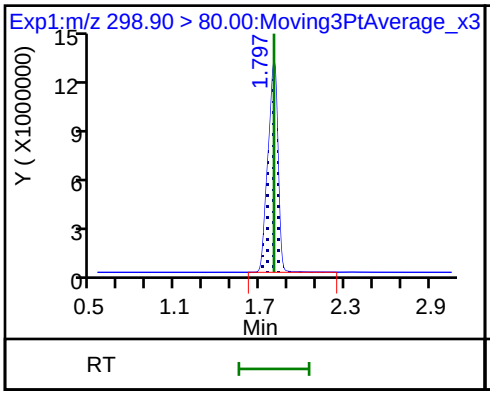
Client ID: I012MW07S-20180713

Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 3

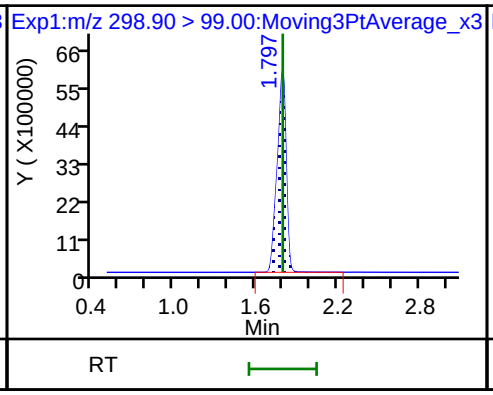
Injection Vol: 20.0 ul Dil. Factor: 10.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

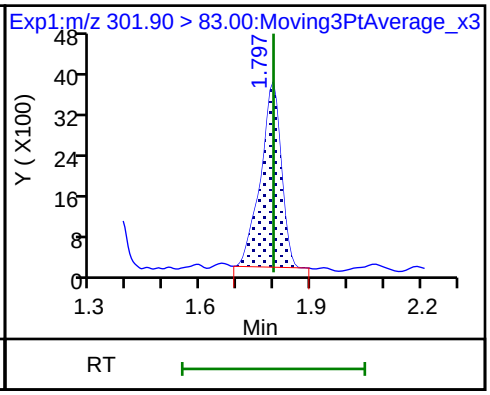
5 Perfluorobutanesulfonic acid



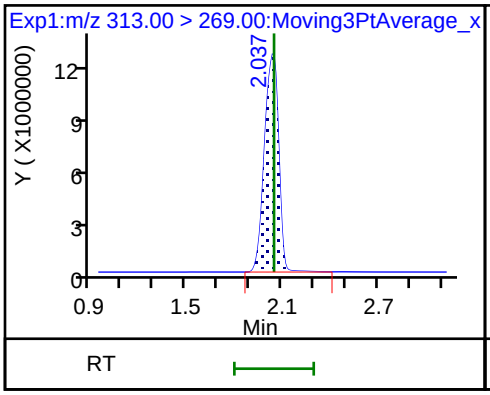
5 Perfluorobutanesulfonic acid



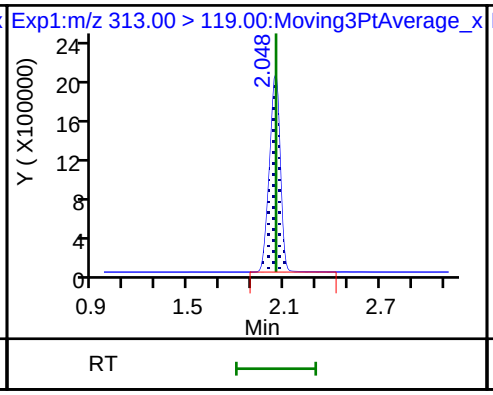
D 47 13C3-PFBS



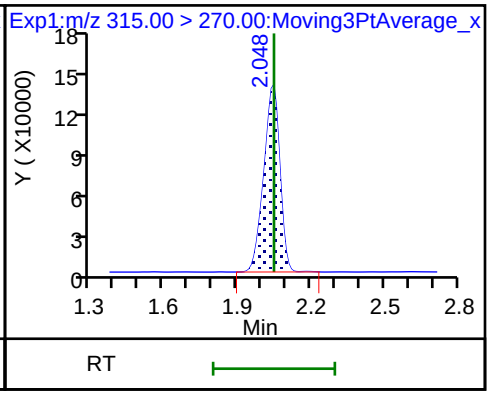
6 Perfluorohexanoic acid



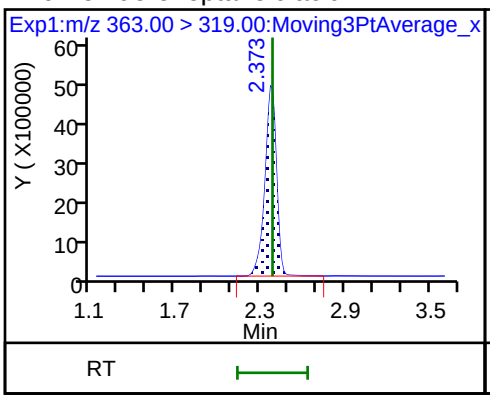
6 Perfluorohexanoic acid



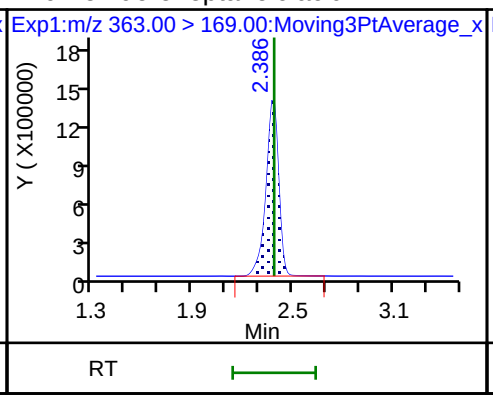
D 7 13C2 PFHxA



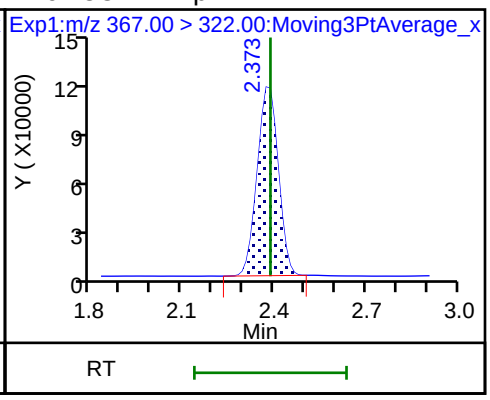
10 Perfluoroheptanoic acid



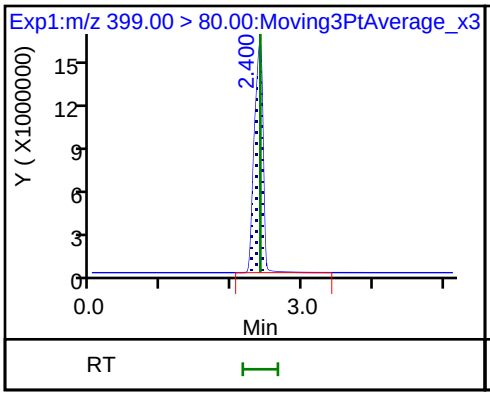
10 Perfluoroheptanoic acid



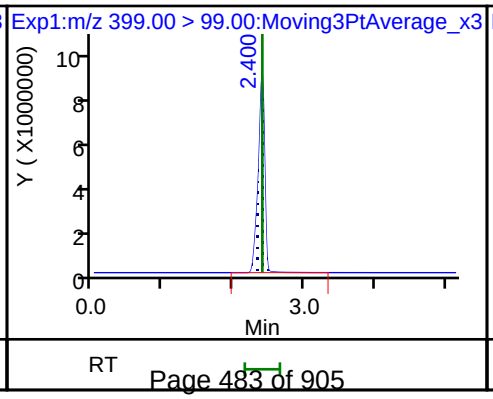
D 9 13C4-PFHpA



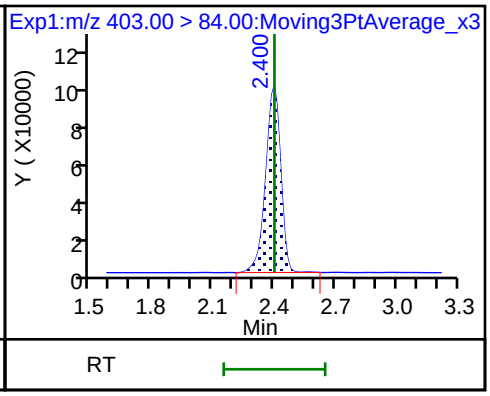
8 Perfluorohexanesulfonic acid



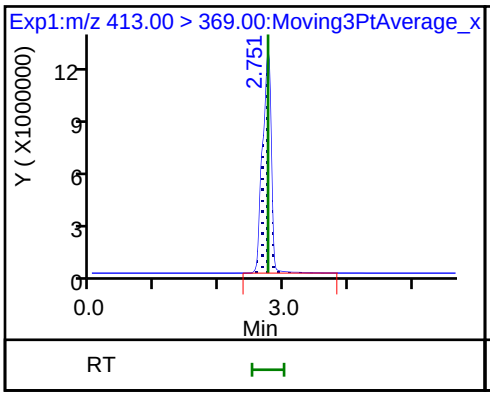
8 Perfluorohexanesulfonic acid



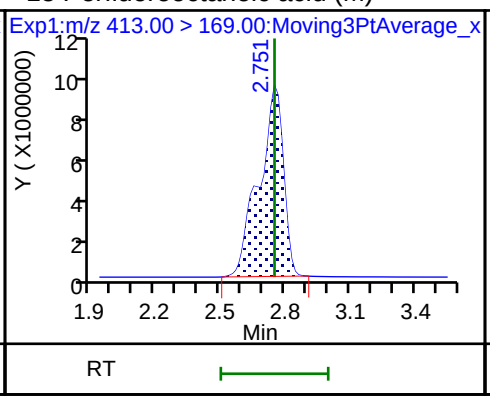
D 11 18O2 PFHxS



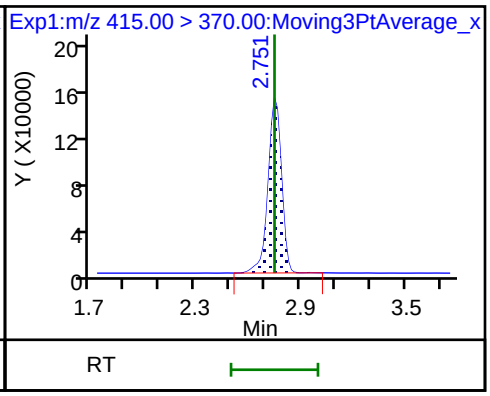
15 Perfluorooctanoic acid



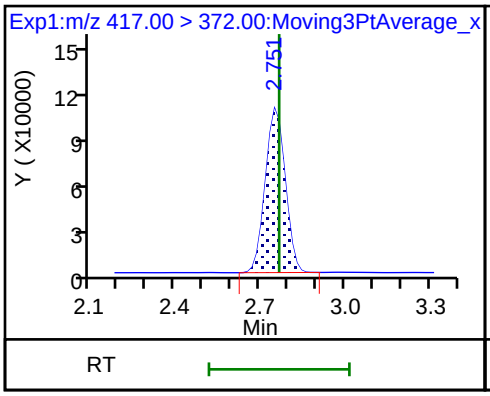
15 Perfluorooctanoic acid (M)



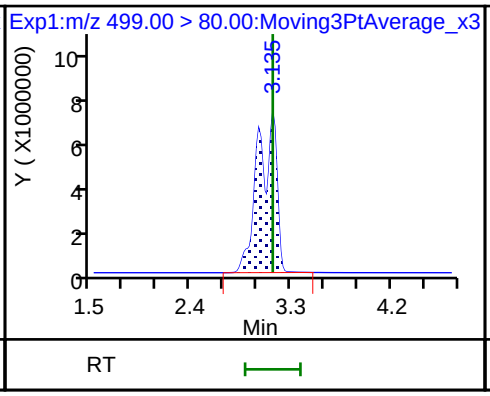
* 62 13C2-PFOA



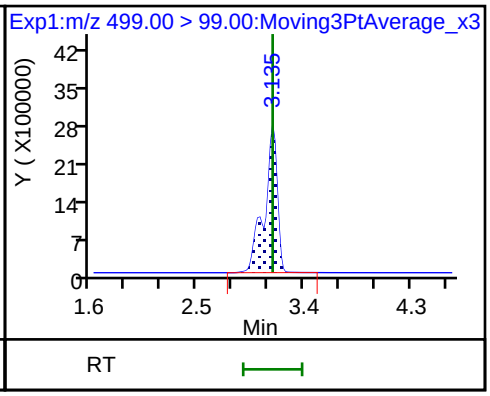
D 14 13C4 PFOA



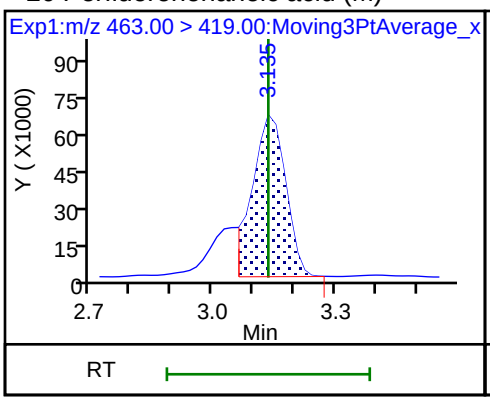
17 Perfluorooctane sulfonic acid



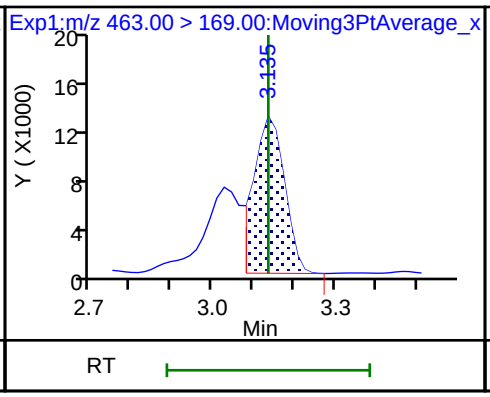
17 Perfluorooctane sulfonic acid



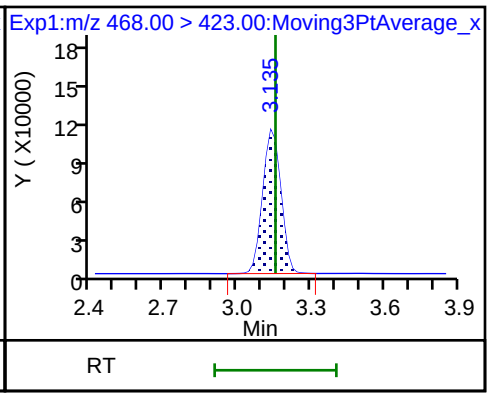
20 Perfluorononanoic acid (M)



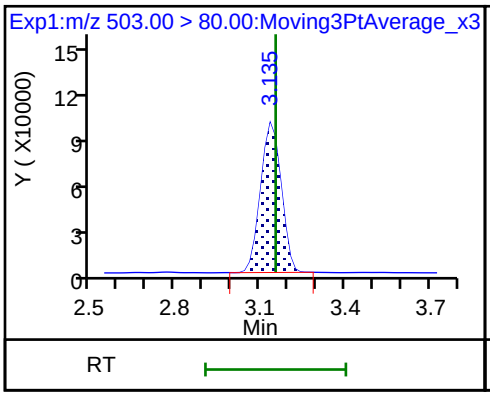
20 Perfluorononanoic acid



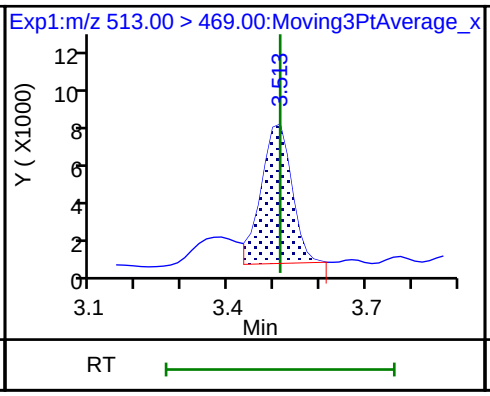
D 19 13C5 PFNA



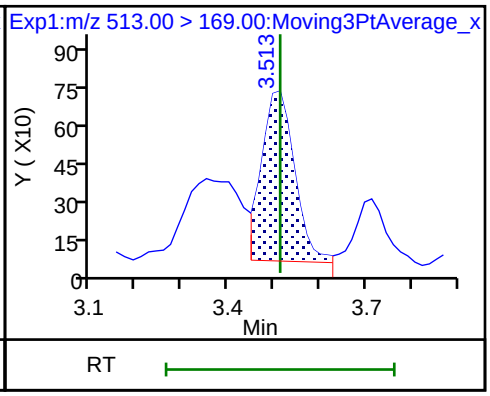
D 18 13C4 PFOS



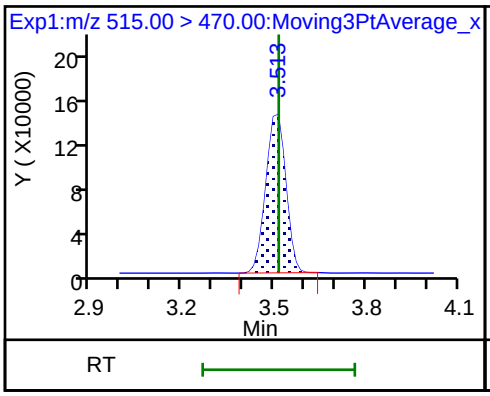
24 Perfluorodecanoic acid



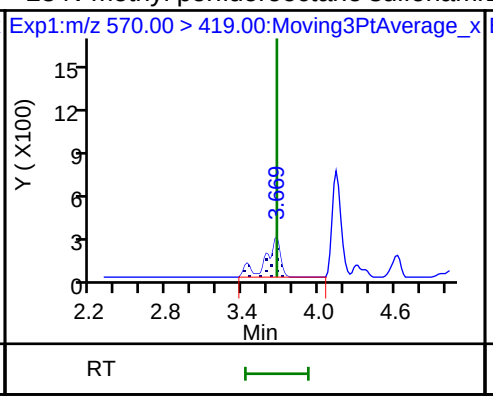
24 Perfluorodecanoic acid



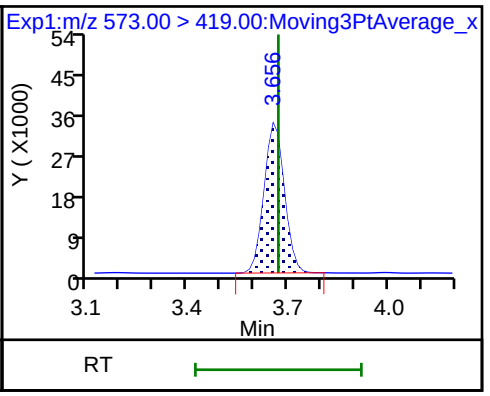
D 23 13C2 PFDA



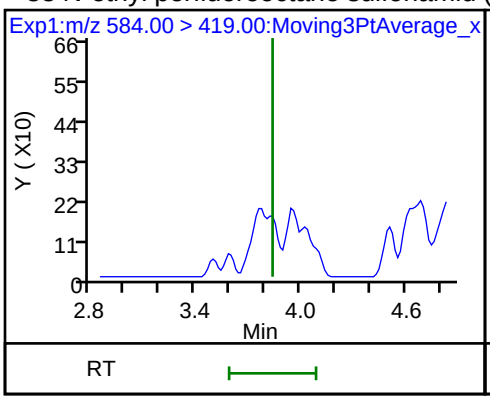
28 N-methyl perfluorooctane sulfonami



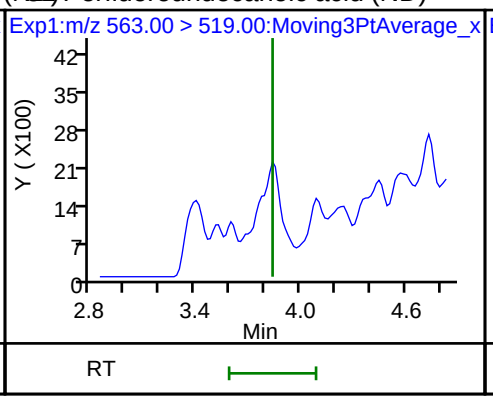
D 27 d3-NMeFOSAA



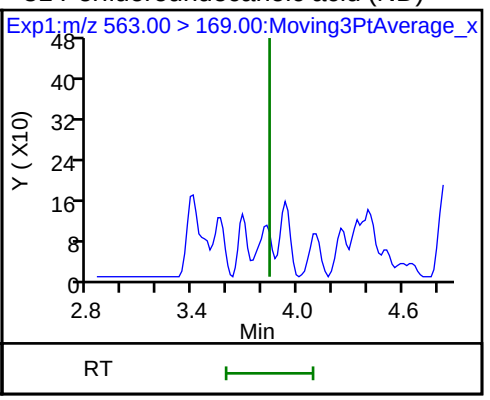
33 N-ethyl perfluorooctane sulfonamid (N



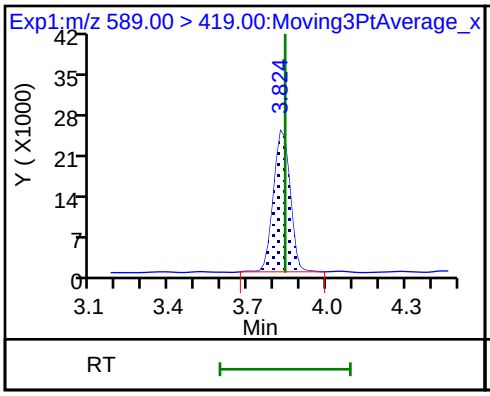
31 Perfluoroundecanoic acid (ND)



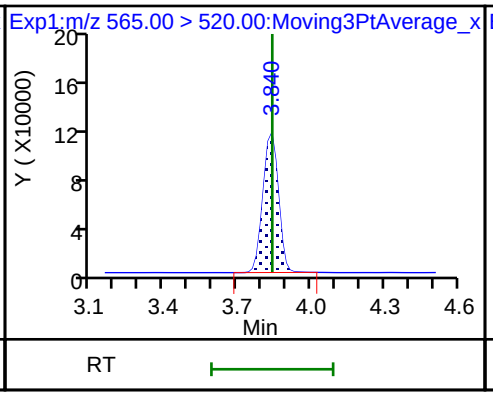
31 Perfluoroundecanoic acid (ND)



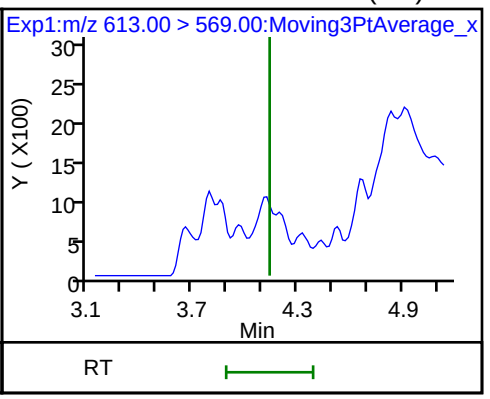
D 32 d5-NEtFOSAA



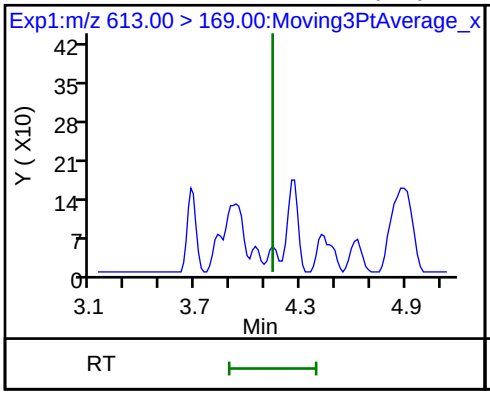
D 30 13C2 PFUnA



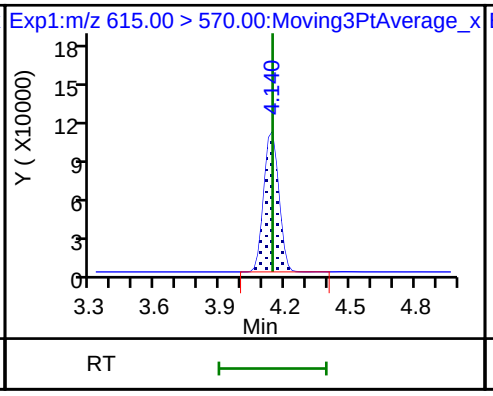
37 Perfluorododecanoic acid (ND)



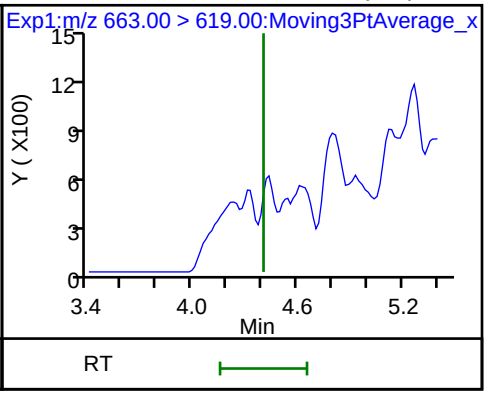
37 Perfluorododecanoic acid (ND)



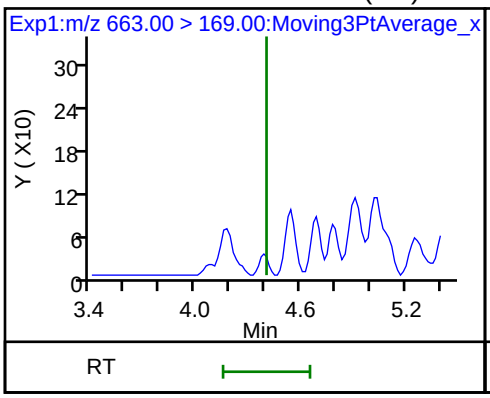
D 36 13C2 PFDoA



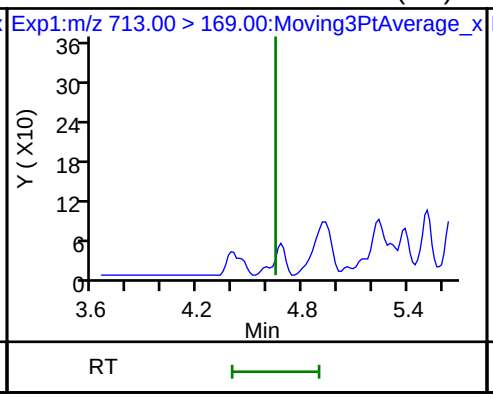
41 Perfluorotridecanoic acid (ND)



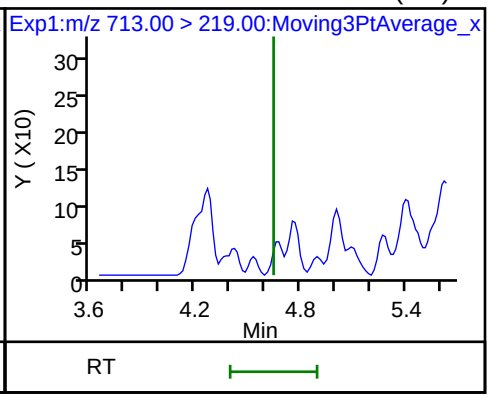
41 Perfluorotridecanoic acid (ND)



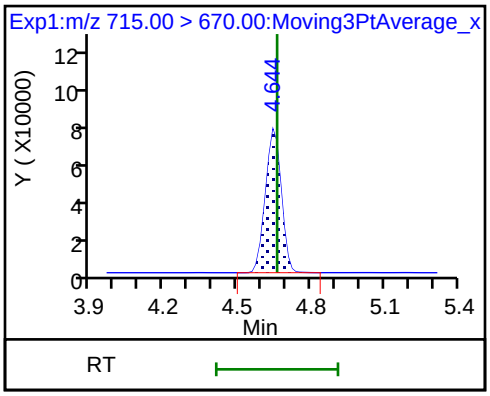
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

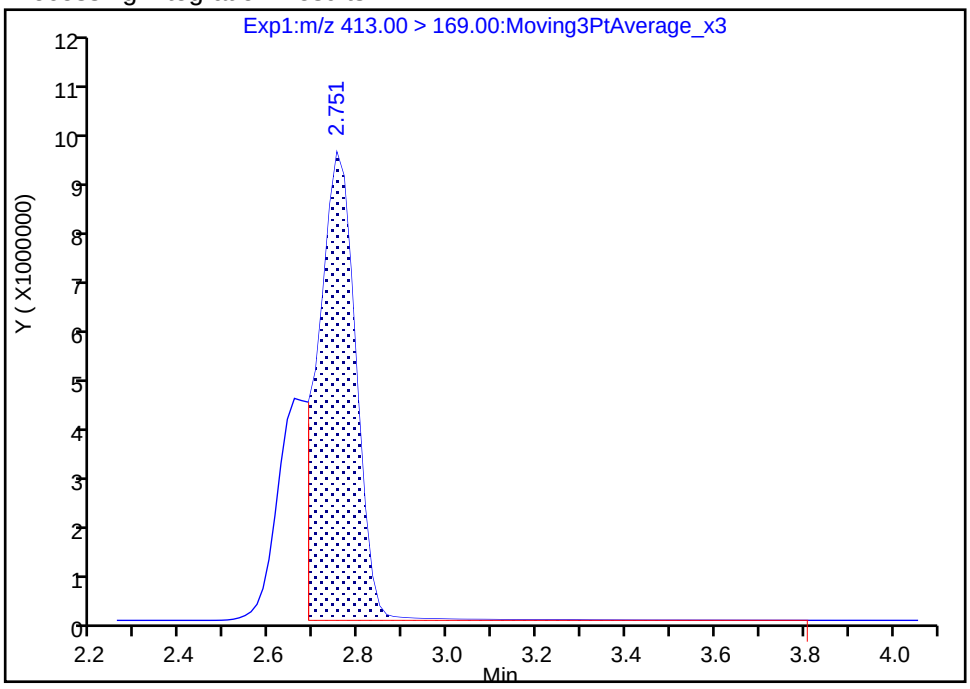
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Injection Date:	13-Aug-2018 09:44:05	Instrument ID:	A9		
Lims ID:	320-41998-A-7-D	Lab Sample ID:	320-41998-7		
Client ID:	I012MW07S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	14	Worklist Smp#:	3
Injection Vol:	20.0 ul	Dil. Factor:	10.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

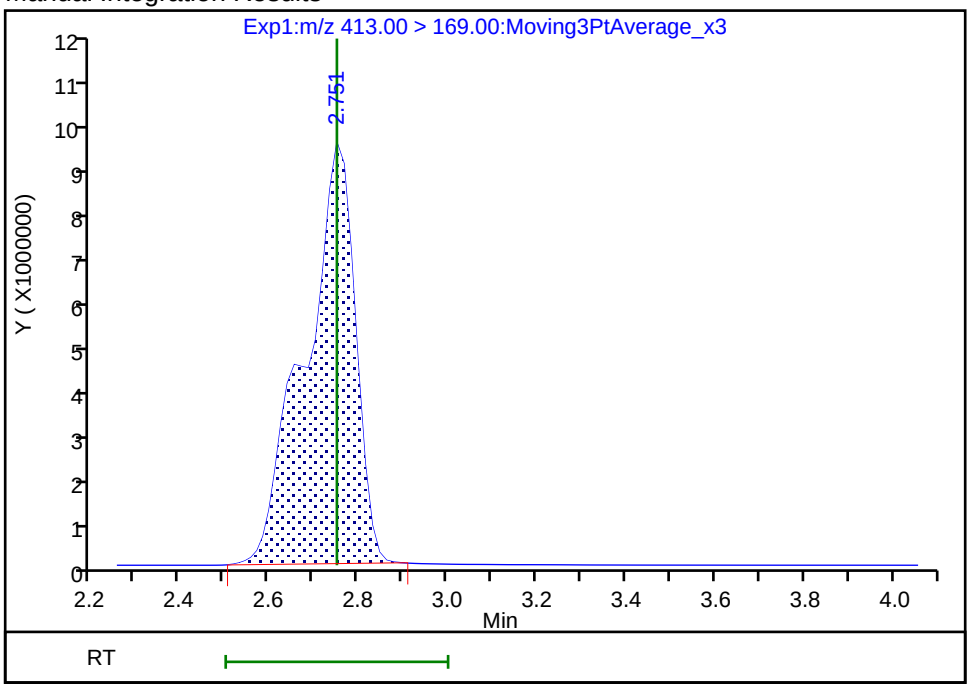
Processing Integration Results

RT: 2.75
Area: 54836398
Amount: 47.701199
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 74673806
Amount: 47.701199
Amount Units: ng/ml



Reviewer: roycea, 13-Aug-2018 10:02:36

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

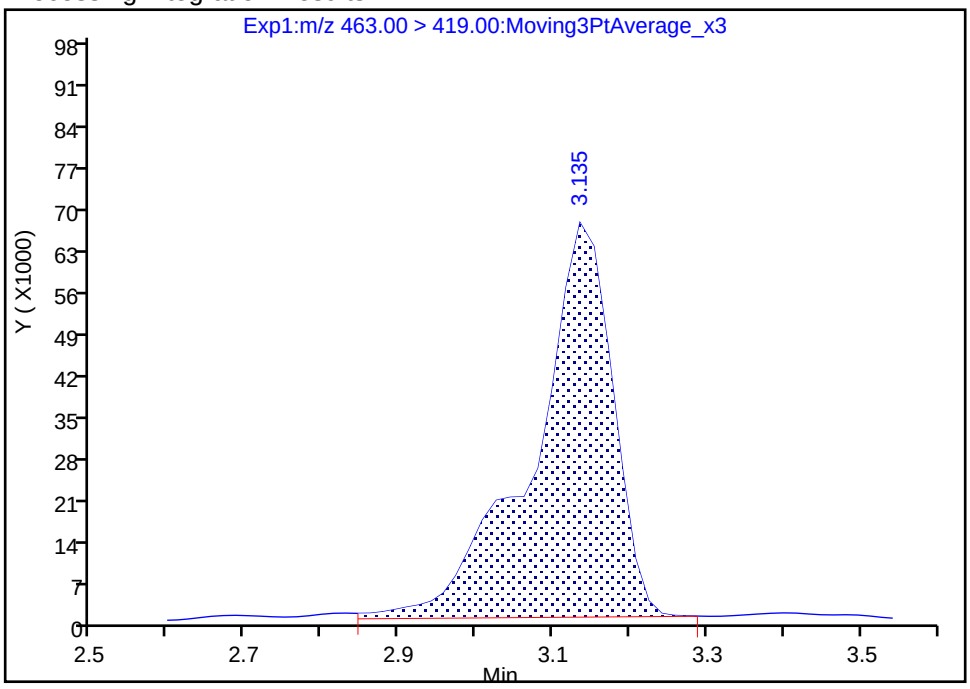
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_029.d				
Injection Date:	13-Aug-2018 09:44:05	Instrument ID:	A9		
Lims ID:	320-41998-A-7-D	Lab Sample ID:	320-41998-7		
Client ID:	I012MW07S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	14	Worklist Smp#:	3
Injection 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: 1

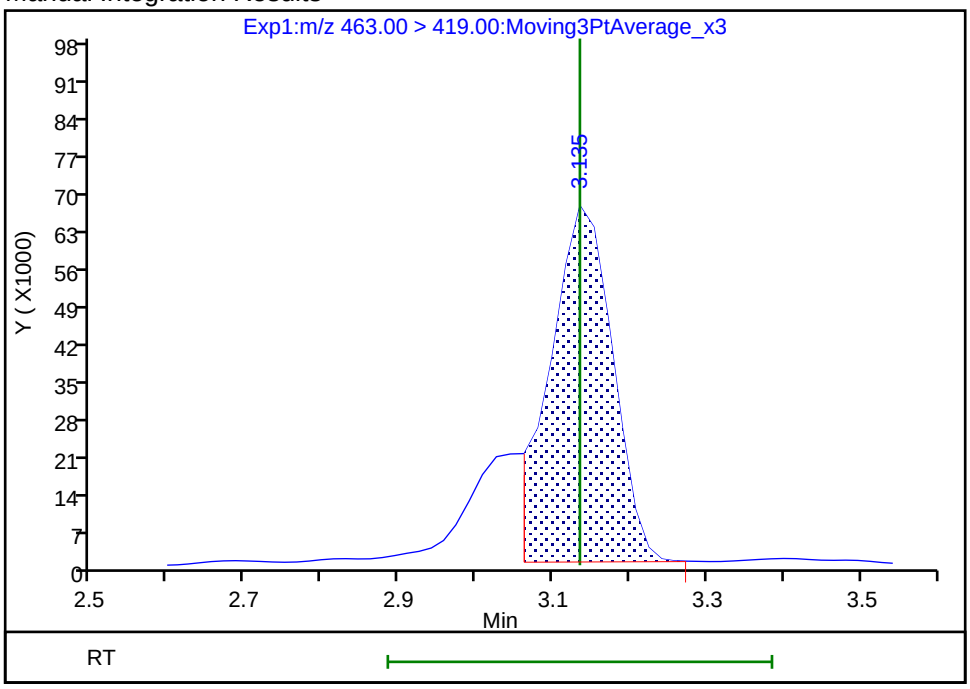
Processing Integration Results

RT: 3.14
Area: 479481
Amount: 0.196779
Amount Units: ng/ml



Manual Integration Results

RT: 3.14
Area: 372584
Amount: 0.152909
Amount Units: ng/ml



Reviewer: roycea, 13-Aug-2018 10:02:49

Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: I012MW07S-20180713 DL | Lab Sample ID: 320-41998-7 DL

Matrix: Water | Lab File ID: 2018.08.13LLA_028.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 15:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 282.8(mL) | Date Analyzed: 08/13/2018 09:36

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 100

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

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

Analysis Batch No.: 239523 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	18	H D	0.18	0.088	0.042
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.9	H D	0.18	0.13	0.054
335-67-1	Perfluorooctanoic acid (PFOA)	33	H D M	0.18	0.13	0.048
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.057*	*J H D*	*0.18*	0.13	*0.046*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.088*	*U H*	*0.18*	0.088	*0.042*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*0.13*	*U H*	*0.18*	0.13	*0.064*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.13*	*U H*	*0.18*	0.13	*0.046*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*0.27*	*U H*	*0.35*	0.27	*0.067*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*0.27*	*U H*	*0.35*	0.27	*0.073*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.8	H D	0.18	0.088	0.041
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	31	H D	0.18	0.088	0.034
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13	H D	0.35	0.27	0.097
2355-31-9	*N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)*	*0.88*	*U H*	*1.8*	0.88	*0.27*
2991-50-6	*N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)*	*0.88*	*U H M*	*1.8*	0.88	*0.25*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: I012MW07S-20180713 DL Lab Sample ID: 320-41998-7 DL

Matrix: Water Lab File ID: 2018.08.13LLA_028.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 15:30

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 282.8(mL) Date Analyzed: 08/13/2018 09:36

Con. Extract Vol.: 10.00(mL) Dilution Factor: 100

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

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

Analysis Batch No.: 239523 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	67		50-150
STL01892	13C4-PFHpA	57		50-150
STL00990	13C4 PFOA	66		50-150
STL00995	13C5 PFNA	69		50-150
STL00996	13C2 PFDA	68		50-150
STL00997	13C2 PFUnA	63		50-150
STL00998	13C2 PFDoA	55		50-150
STL00994	18O2 PFHxS	60		50-150
STL02116	13C2-PFTeDA	63		50-150
STL00991	13C4 PFOS	63		50-150
STL02337	13C3-PFBS	94		50-150
STL02117	d5-NEtFOSAA	104		50-150
STL02118	d3-NMeFOSAA	92		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_028.d
Lims ID: 320-41998-A-7-D
Client ID: I012MW07S-20180713
Sample Type: Client
Inject. Date: 13-Aug-2018 09:36:35 ALS Bottle#: 13 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 100.0000
Sample Info: 320-41998-a-7-d 100X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 13-Aug-2018 10:05:21 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 09:51:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.009	9973354	1.35			1844	
298.90 > 99.00	1.797	1.797	0.0	1.009	3624534		2.75(1.35-4.05)		1162	
D 47 13C3-PFBS										
301.90 > 83.00	1.780	1.798	-0.018	0.647	1661	0.0219		94.0	7.2	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.037	2.048	-0.011	0.995	16390330	5.11			2383	
313.00 > 119.00	2.048	2.048	0.0	1.000	1191205		13.76(6.96-20.87)		1812	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.744	85768	0.0168		67.3	415	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.386	0.0	1.000	4738757	1.37			387	
363.00 > 169.00	2.386	2.386	0.0	1.000	1068340		4.44(2.17-6.52)		1406	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.387	-0.001	0.868	83047	0.0144		57.4	384	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	29807274	8.89			15340	
399.00 > 99.00	2.400	2.400	0.0	1.000	8491964		3.51(1.90-5.70)		2859	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	61973	0.0142		60.2	405	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.751	2.750	0.001	1.000	32949888	9.39			2753	
413.00 > 169.00	2.751	2.750	0.001	1.000	15244420		2.16(1.36-4.08)		3216	M
* 62 13C2-PFOA										s
415.00 > 370.00	2.751	2.750	0.001		122853	0.0250			652	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	80048	0.0165		66.0	368	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.135	0.001	1.000	11389183	3.73			2454	
499.00 > 99.00	3.136	3.135	0.001	1.000	2266393		5.03(2.04-6.12)		1941	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.135	0.001	1.000	48377	0.0160			9.4	
463.00 > 169.00	3.136	3.135	0.001	1.000	8136		5.95(2.68-8.03)		11.3	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.154	-0.018	1.140	71546	0.0172		68.8	315	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.154	-0.018	1.140	67979	0.0150		62.8	101	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.514	-0.016	1.272	70340	0.0169		67.6	401	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.671	3.669	0.002	1.004	4446	0.005901			25.7	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.330	18637	0.0230		92.1	87.9	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.825	3.839	-0.014	1.000	2965	0.004792			5.5	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.825	3.841	-0.016	1.391	17248	0.0259		104	48.6	
D 30 13C2 PFUnA										
565.00 > 520.00	3.825	3.841	-0.016	1.391	53311	0.0158		63.4	339	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.142	-0.017	1.500	50074	0.0138		55.2	256	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.661	-0.016	1.689	36574	0.0158		63.1	191	

QC Flag Legend

Processing Flags

s - Failed ISTD Recovery Test

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 10:05:25 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_028.d

Injection Date: 13-Aug-2018 09:36:35 Instrument ID: A9

Lims ID: 320-41998-A-7-D Lab Sample ID:

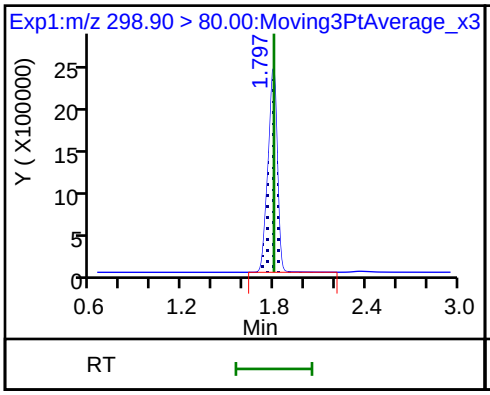
Client ID: I012MW07S-20180713

Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 2

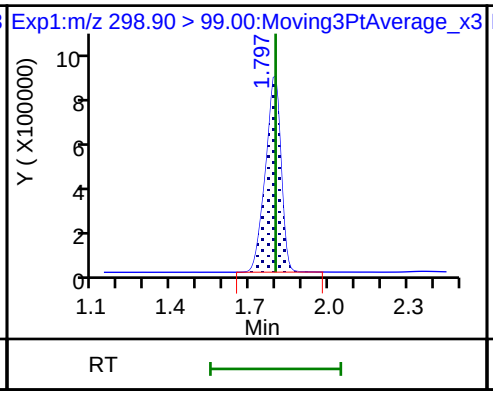
Injection Vol: 20.0 ul Dil. Factor: 100.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

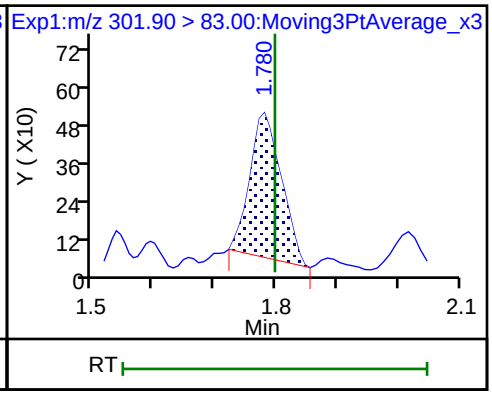
5 Perfluorobutanesulfonic acid



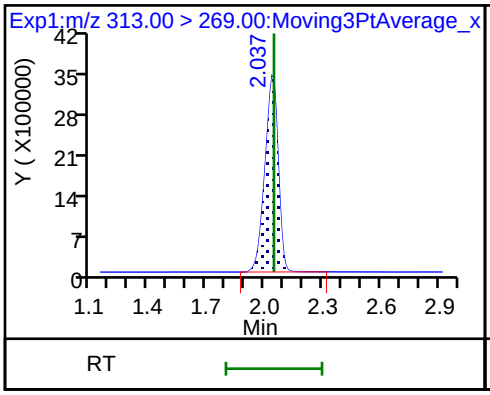
5 Perfluorobutanesulfonic acid



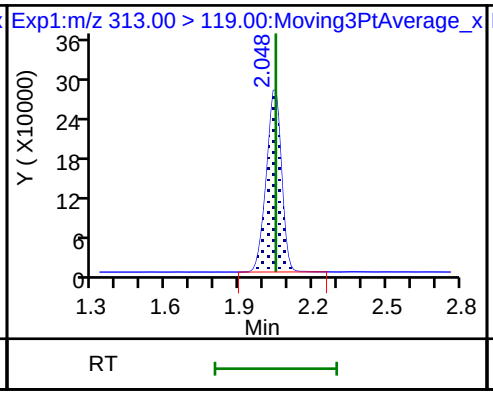
D 47 13C3-PFBS



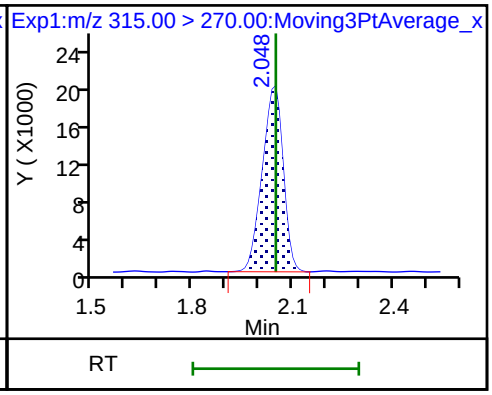
6 Perfluorohexanoic acid



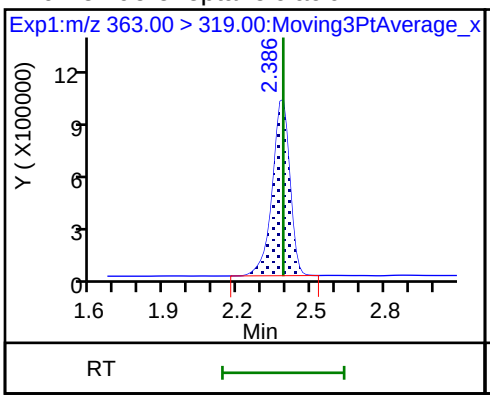
6 Perfluorohexanoic acid



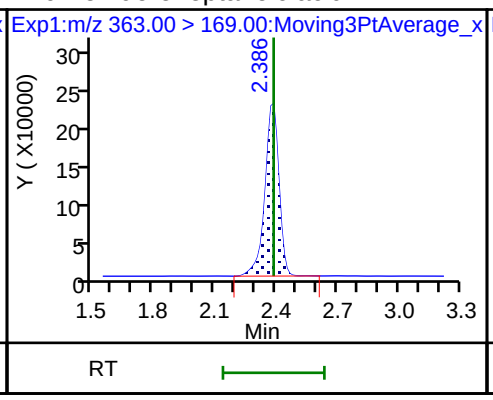
D 7 13C2 PFHxA



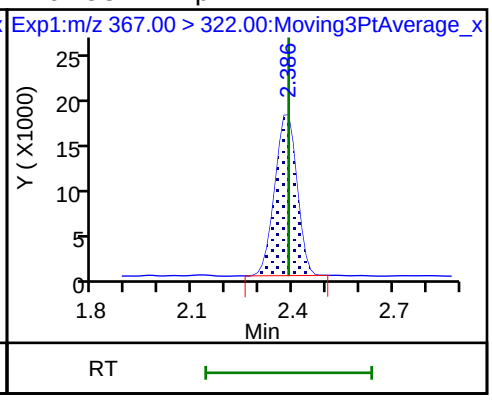
10 Perfluoroheptanoic acid



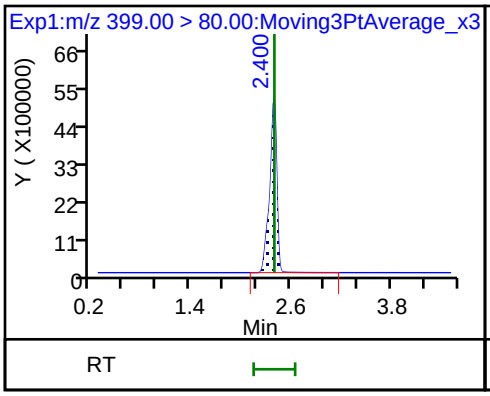
10 Perfluoroheptanoic acid



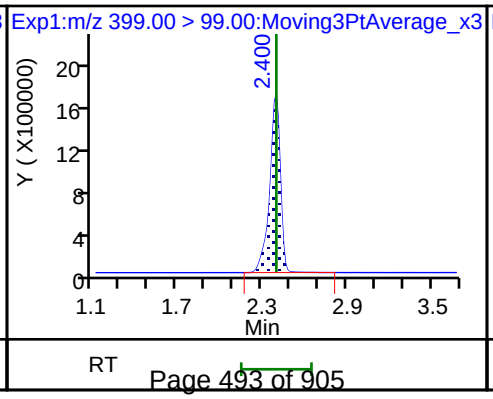
D 9 13C4-PFHpA



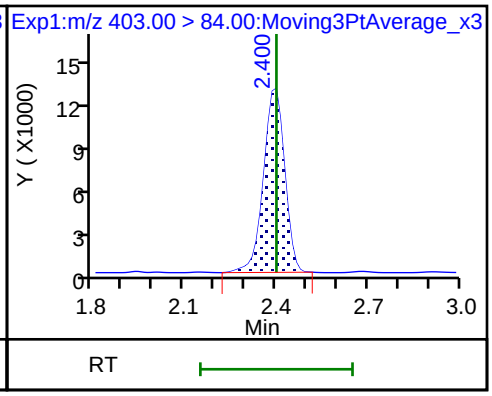
8 Perfluorohexanesulfonic acid



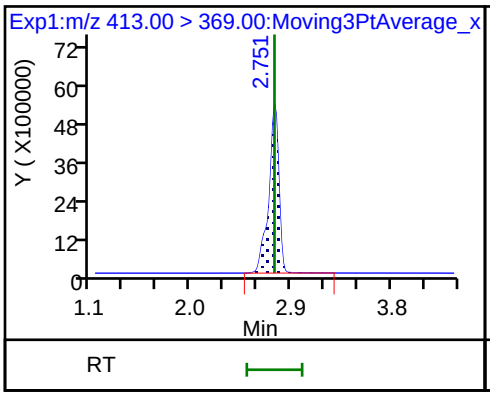
8 Perfluorohexanesulfonic acid



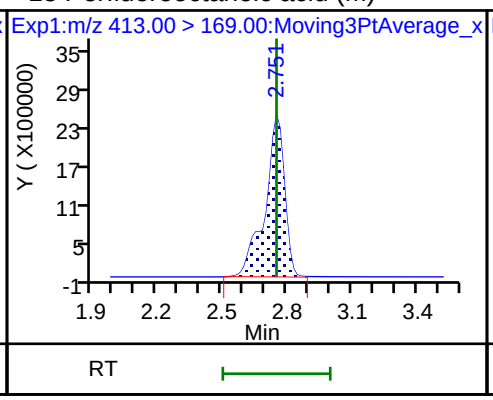
D 11 18O2 PFHxS



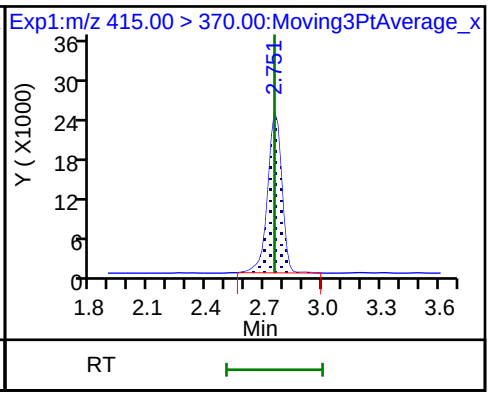
15 Perfluorooctanoic acid



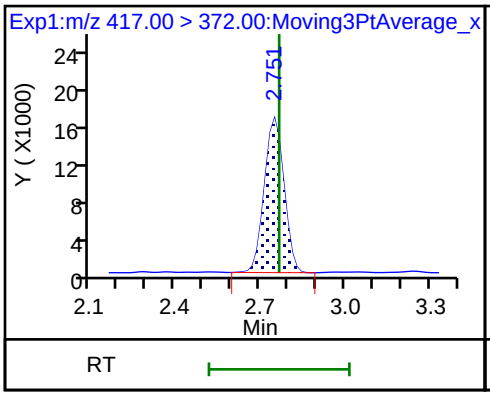
15 Perfluorooctanoic acid (M)



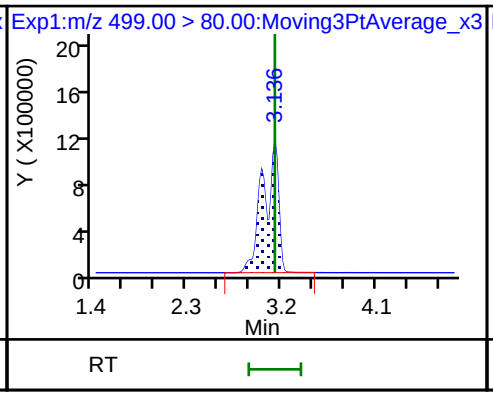
* 62 13C2-PFOA



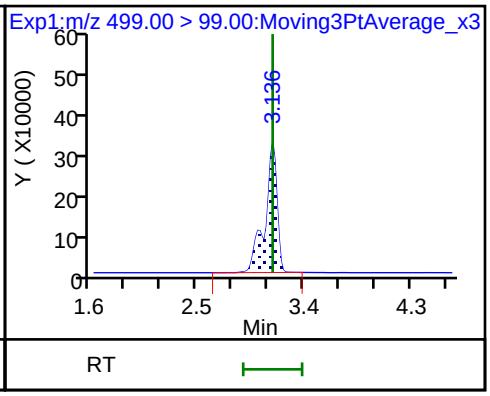
D 14 13C4 PFOA



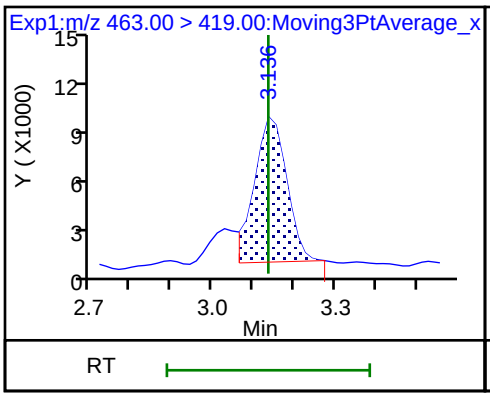
17 Perfluorooctane sulfonic acid



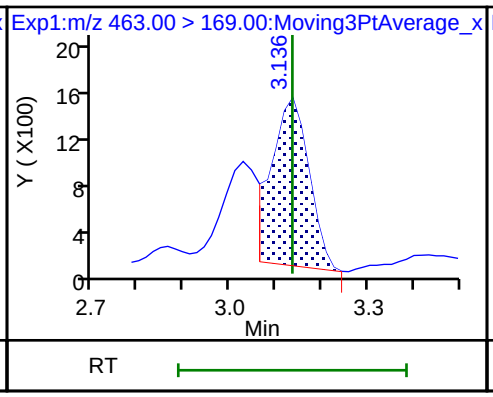
17 Perfluorooctane sulfonic acid



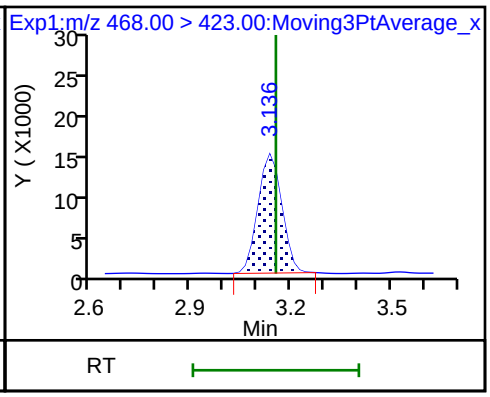
20 Perfluorononanoic acid



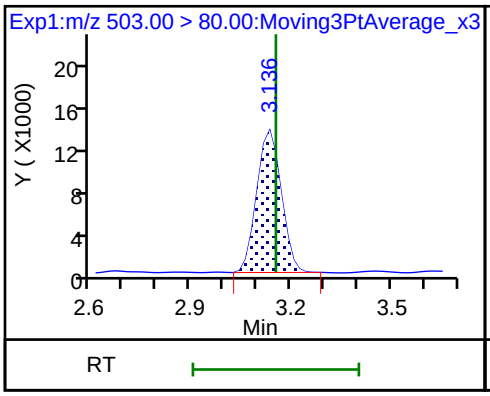
20 Perfluorononanoic acid



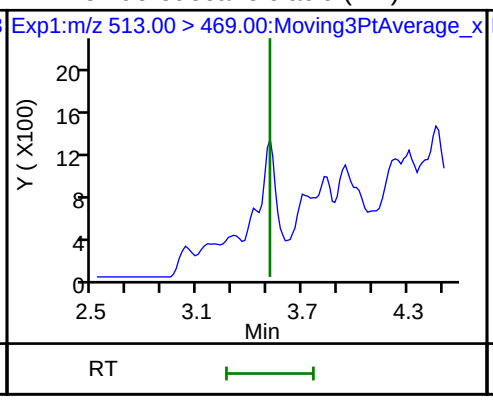
D 19 13C5 PFNA



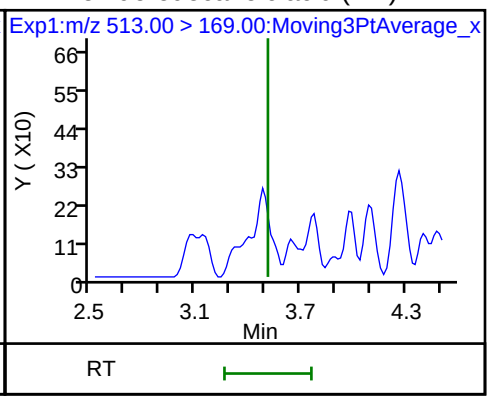
D 18 13C4 PFOS



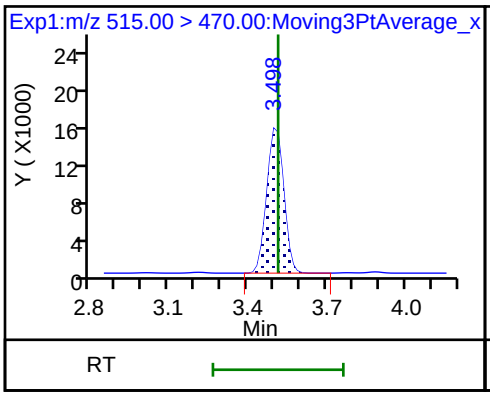
24 Perfluorodecanoic acid (ND)



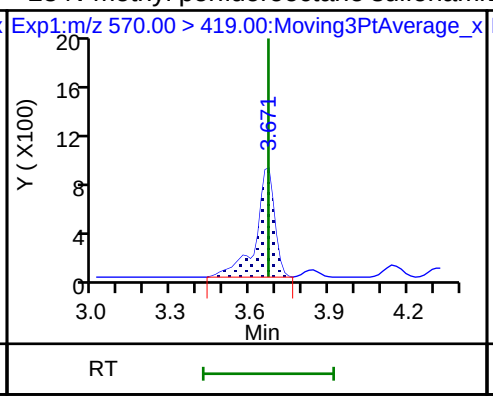
24 Perfluorodecanoic acid (ND)



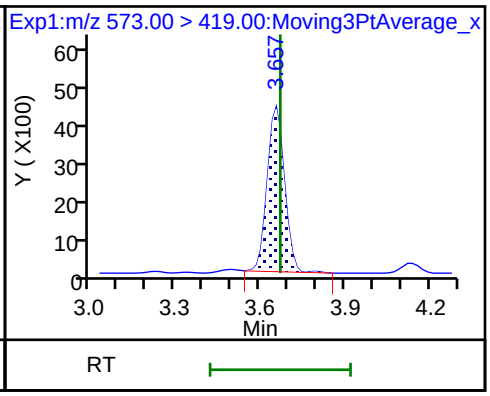
D 23 13C2 PFDA



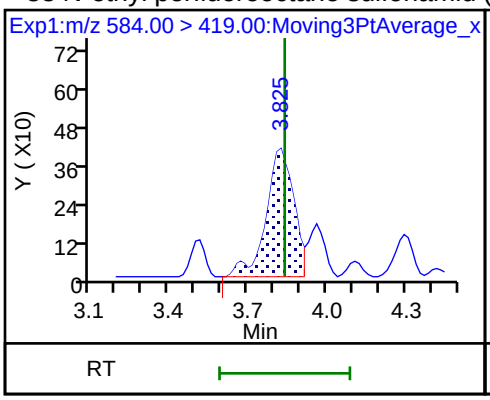
28 N-methyl perfluorooctane sulfonami



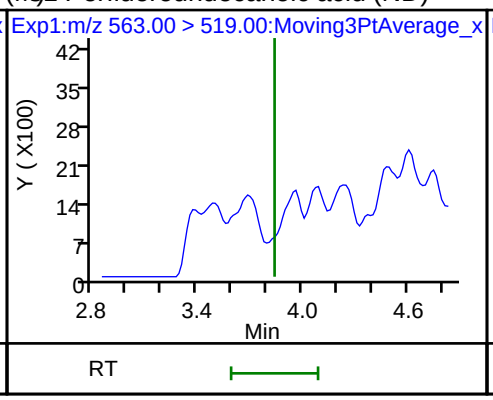
D 27 d3-NMeFOSAA



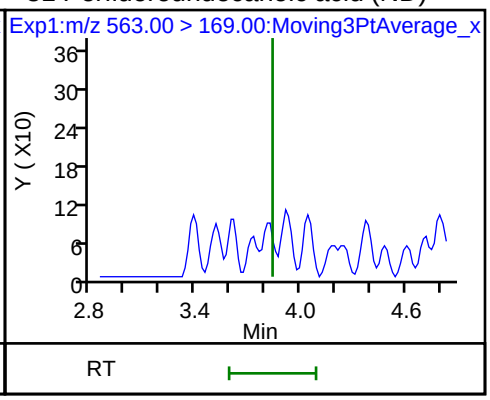
33 N-ethyl perfluorooctane sulfonamid (M)



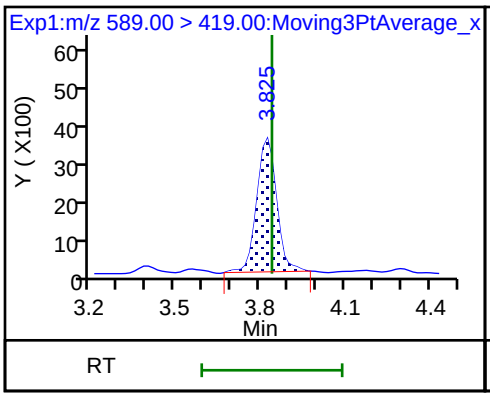
31 Perfluoroundecanoic acid (ND)



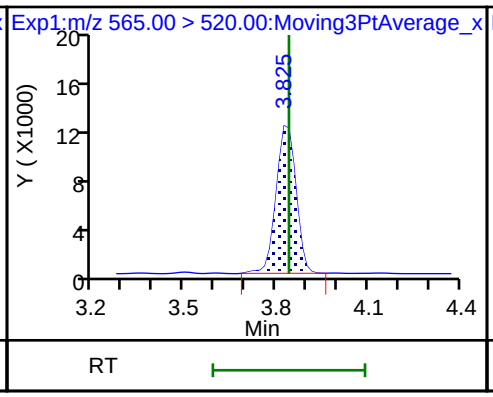
31 Perfluoroundecanoic acid (ND)



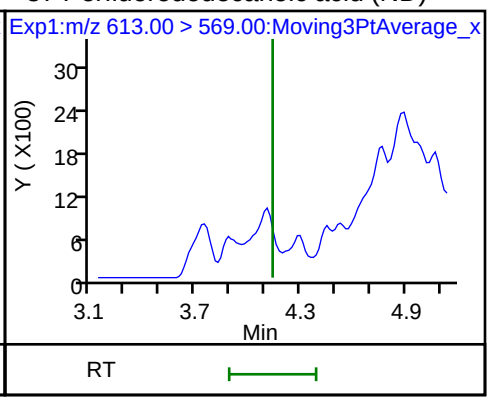
D 32 d5-NEtFOSAA



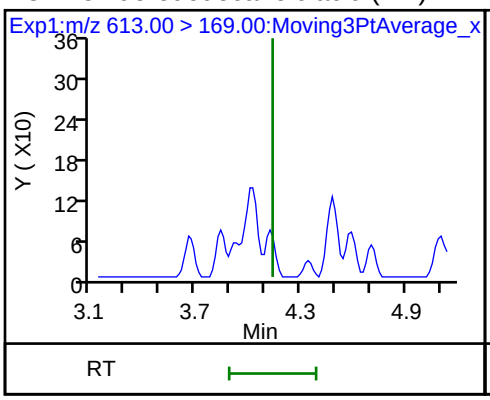
D 30 13C2 PFUnA



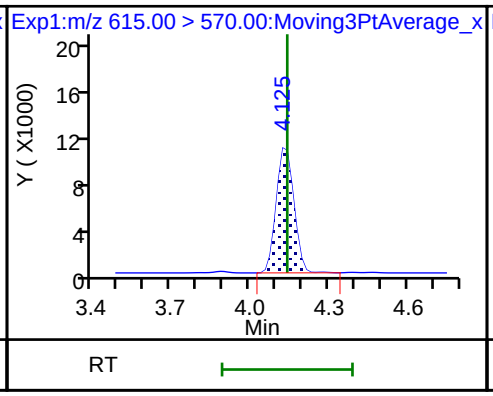
37 Perfluorododecanoic acid (ND)



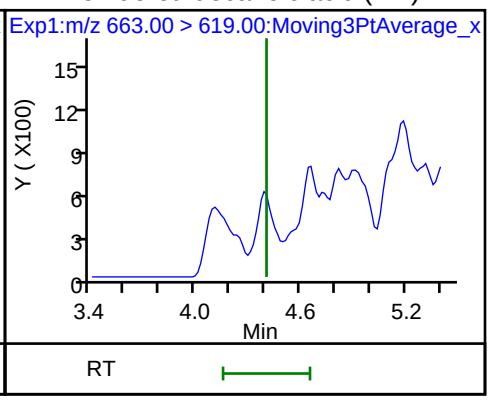
37 Perfluorododecanoic acid (ND)



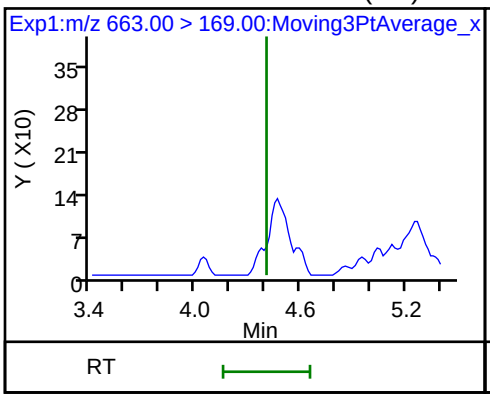
D 36 13C2 PFDoA



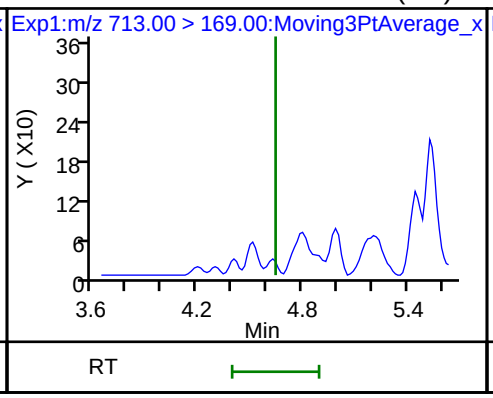
41 Perfluorotridecanoic acid (ND)



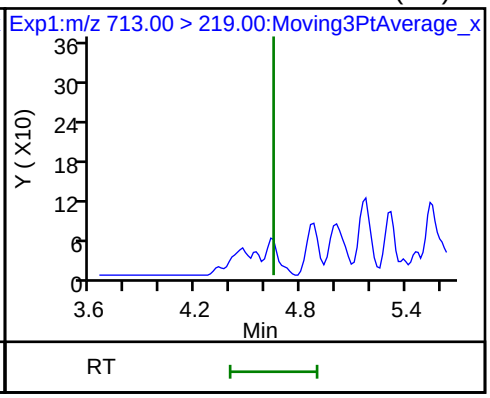
41 Perfluorotridecanoic acid (ND)



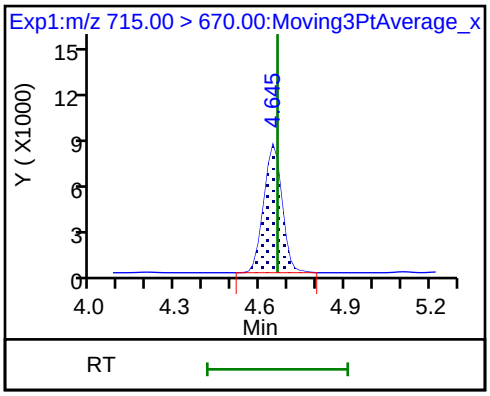
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

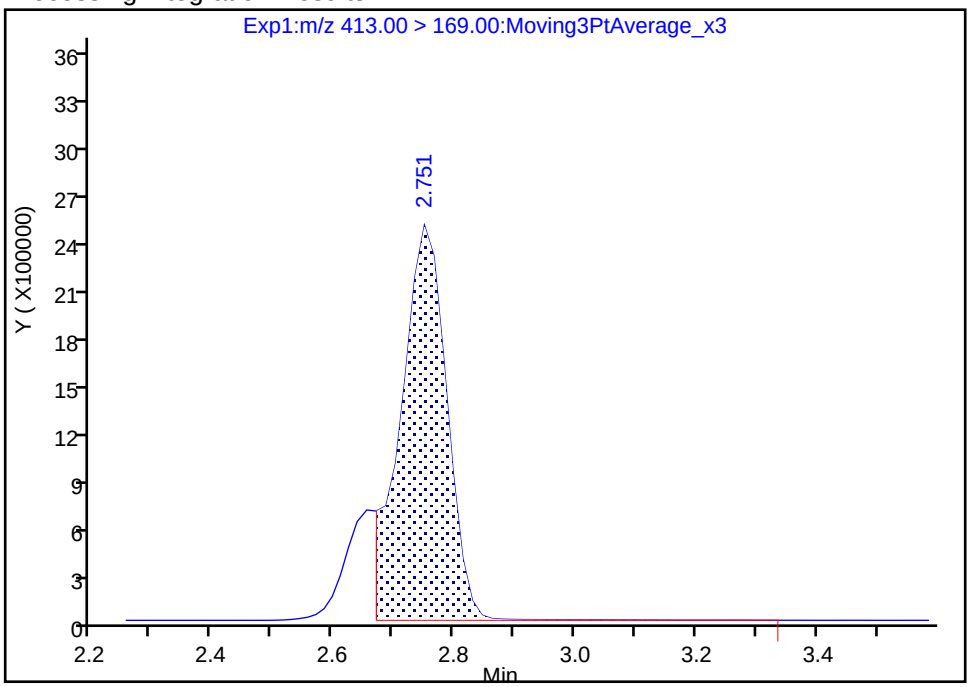
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_028.d				
Injection Date:	13-Aug-2018 09:36:35	Instrument ID:	A9		
Lims ID:	320-41998-A-7-D	Lab Sample ID:			
Client ID:	I012MW07S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	13	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	100.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

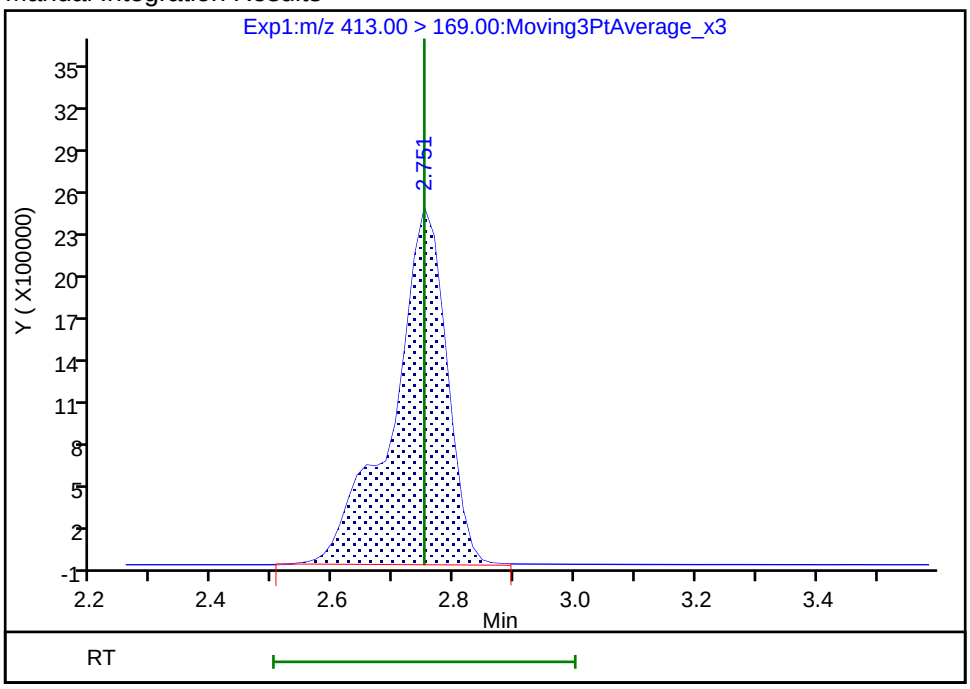
Processing Integration Results

RT: 2.75
Area: 12932494
Amount: 9.392549
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 15244420
Amount: 9.392549
Amount Units: ng/ml



Reviewer: roycea, 13-Aug-2018 09:51:01

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

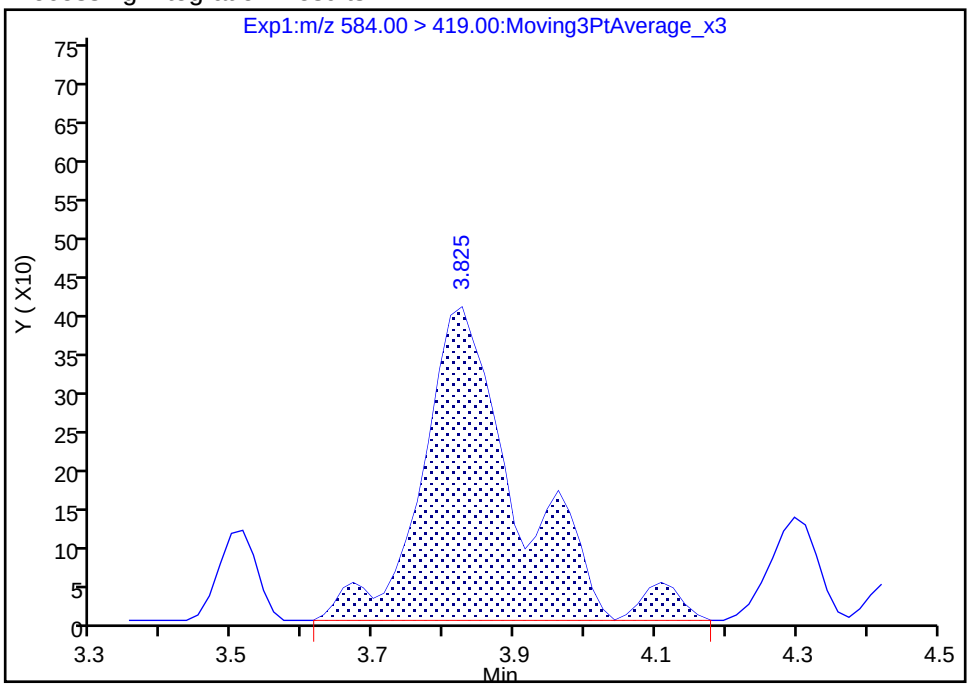
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_028.d				
Injection Date:	13-Aug-2018 09:36:35	Instrument ID:	A9		
Lims ID:	320-41998-A-7-D	Lab Sample ID:			
Client ID:	I012MW07S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	13	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	100.0000		
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

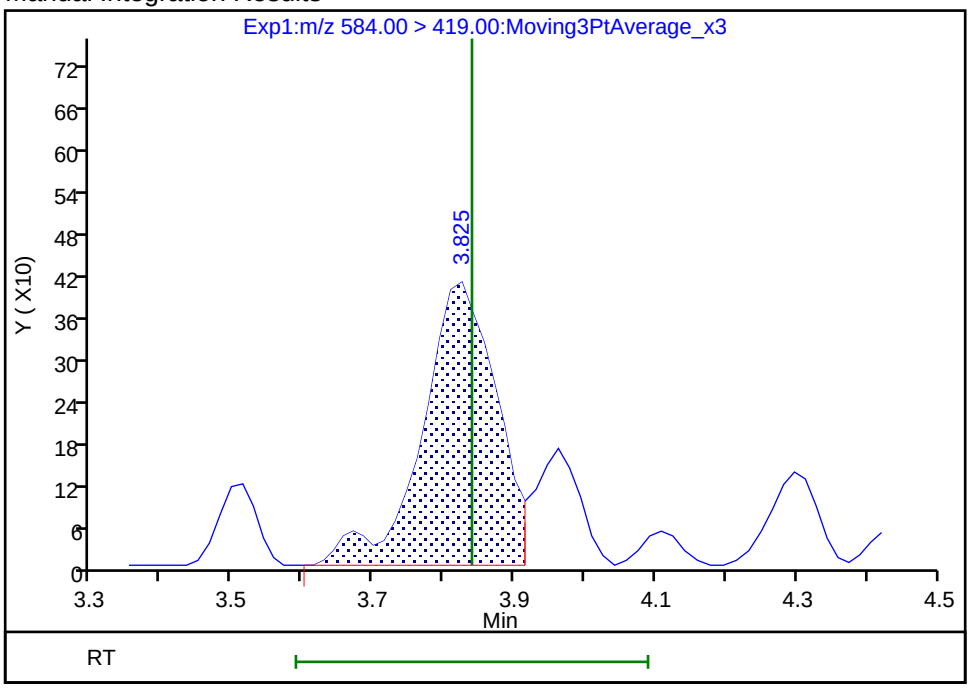
Processing Integration Results

RT: 3.83
Area: 3877
Amount: 0.006266
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 2965
Amount: 0.004792
Amount Units: ng/ml



Reviewer: roycea, 13-Aug-2018 09:51:17

Audit Action: Manually Integrated Audit Reason: Baseline

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

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1 Analy Batch No.: 237921

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2018 16:12 Calibration End Date: 08/03/2018 16:57 Calibration ID: 40486

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237921/2	2018.08.03LLICAL_005.d
Level 2	IC 320-237921/3	2018.08.03LLICAL_006.d
Level 3	IC 320-237921/4	2018.08.03LLICAL_007.d
Level 4	IC 320-237921/5	2018.08.03LLICAL_008.d
Level 5	IC 320-237921/6	2018.08.03LLICAL_009.d
Level 6	IC 320-237921/7	2018.08.03LLICAL_010.d
Level 7	IC 320-237921/8	2018.08.03LLICAL_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)	0.9302 0.9633	0.9070 0.8682	0.9200	0.9450	0.9713	AveID		0.9293				3.8		20.0			
Perfluoropentanoic acid (PFPeA)	1.1968 0.9699	1.0682 0.9164	1.0398	0.9776	0.9725	AveID		1.0202				9.1		20.0			
Perfluorobutanesulfonic acid (PFBS)	107.26 99.171	102.64 90.988	101.14	111.54	110.31	AveID		103.29				6.9		20.0			
4:2 FTS	19.730 16.792	15.486 15.586	16.160	17.333	18.072	AveID		17.023				8.9		20.0			
Perfluorohexanoic acid (PFHxA)	1.0991 0.9178	0.9496 0.8546	0.9037	0.9170	0.9065	AveID		0.9355				8.3		20.0			
Perfluoropentanesulfonic acid	47.817 50.392	47.776 47.268	47.251	50.854	50.991	AveID		48.907				3.6		20.0			
Perfluoroheptanoic acid (PFHpA)	1.1086 1.0022	1.1043 0.9095	1.0391	1.1050	0.9999	AveID		1.0384				7.2		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6052 1.2292	1.3464 1.1362	1.2202	1.2093	1.2084	AveID		1.2793				12.2		20.0			
6:2 FTS	2.6202 2.0867	2.1081 1.9121	2.1713	2.0615	1.9969	AveID		2.1367				10.7		20.0			
Perfluorooctanoic acid (PFOA)	1.3580 0.9799	1.1724 0.9281	1.1007	1.0623	1.0679	AveID		1.0956				12.8		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	0.9171 1.0840	0.9941 0.9514	1.0471	1.0619	1.0187	AveID		1.0106				6.0		20.0			
Perfluorononanoic acid (PFNA)	1.0419 0.9561	1.1933 0.9460	1.0588	1.1154	1.0716	AveID		1.0547				8.2		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.0808 1.1086	1.0366 1.0289	1.0685	1.0832	1.1005	AveID		1.0724				2.8		20.0			
Perfluorononanesulfonic acid	0.6230 0.7062	0.6185 0.5740	0.7116	0.6588	0.6915	AveID		0.6548				7.9		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1 Analy Batch No.: 237921

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2018 16:12 Calibration End Date: 08/03/2018 16:57 Calibration ID: 40486

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								
Perfluorooctane Sulfonamide (PFOSA)	3.0339 2.8667	3.0912 2.6738	3.1605	3.4085	3.2648	AveID		3.0714				8.0		20.0			
8:2 FTS	15.860 13.820	14.456 13.585	13.653	13.139	13.618	AveID		14.019				6.4		20.0			
Perfluorodecanoic acid (PFDA)	1.3256 1.1544	1.3362 1.0481	1.2845	1.2331	1.2227	AveID		1.2292				8.3		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9808 0.9767	1.1209 0.9638	1.0321	1.0443	0.9560	AveID		1.0107				5.8		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.7835 0.8355	0.8480 0.7331	0.8766	0.8739	0.8832	AveID		0.8334				6.7		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.8729 0.9862	0.8019 0.9623	0.8871	0.8637	0.9040	AveID		0.8969				6.9		20.0			
Perfluoroundecanoic acid (PFUnA)	0.7971 0.8280	0.8855 0.7737	0.8531	0.8863	0.8701	AveID		0.8420				5.2		20.0			
Perfluorododecanoic acid (PFDoA)	0.9320 0.9442	1.1044 0.8729	0.9621	1.0460	1.0223	AveID		0.9834				8.0		20.0			
Perfluorotridecanoic Acid (PFTriA)	0.7952 0.7278	0.7292 0.6976	0.7294	0.8027	0.7715	AveID		0.7505				5.3		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.1616 0.1742	0.1556 0.1629	0.1453	0.1621	0.1660	AveID		0.1611				5.6		20.0			
13C4 PFBA	1.0662 1.1913	1.0422 1.2377	1.0367	1.1129	1.1322	Ave		1.1170				6.8		20.0			
13C5-PFPeA	1.0098 1.0621	0.9616 1.0265	0.9385	0.9850	1.0062	Ave		0.9985				4.1		20.0			
13C3-PFBS	0.0146 0.0166	0.0149 0.0171	0.0148	0.0150	0.0153	Ave		0.0155				6.3		20.0			
13C2 PFHxA	1.0447 1.0704	1.0186 1.0507	0.9721	1.0549	1.0448	Ave		1.0366				3.1		20.0			
13C4-PFHpA	1.1727 1.2067	1.1157 1.1893	1.1513	1.1706	1.2335	Ave		1.1771				3.2		20.0			
18O2 PFHxS	0.8240 0.9444	0.8171 0.9925	0.8304	0.8693	0.9259	Ave		0.8862				7.7		20.0			
M2-6:2FTS	0.1189 0.1110	0.1150 0.1112	0.1056	0.1209	0.1185	Ave		0.1144				4.8		20.0			
13C4 PFOA	1.0029 1.0323	0.9799 0.9866	0.9233	1.0154	0.9650	Ave		0.9865				3.6		20.0			
13C4 PFOS	0.8950 0.9600	0.8778 1.0308	0.8413	0.9382	0.9134	Ave		0.9223				6.7		20.0			
13C5 PFNA	0.8451 0.8739	0.8457 0.8283	0.8045	0.8511	0.8757	Ave		0.8463				2.9		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1 Analy Batch No.: 237921

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2018 16:12 Calibration End Date: 08/03/2018 16:57 Calibration ID: 40486

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	0.5313 0.5701	0.5475 0.5494	0.5428	0.5513	0.5661	Ave		0.5512				2.4		20.0			
M2-8:2FTS	0.0139 0.0127	0.0131 0.0119	0.0130	0.0145	0.0140	Ave		0.0133				6.7		20.0			
13C2 PFDA	0.8485 0.8499	0.8624 0.8082	0.8392	0.8595	0.8640	Ave		0.8474				2.3		20.0			
d3-NMeFOSAA	0.1600 0.1764	0.1508 0.1899	0.1428	0.1601	0.1732	Ave		0.1647				9.8		20.0			
d5-NEtFOSAA	0.1264 0.1380	0.1372 0.1388	0.1305	0.1398	0.1366	Ave		0.1353				3.7		20.0			
13C2 PFUnA	0.7179 0.6934	0.6924 0.6649	0.6597	0.6940	0.6719	Ave		0.6849				3.0		20.0			
13C2 PFDoA	0.6859 0.7849	0.7318 0.7383	0.7342	0.7294	0.7643	Ave		0.7384				4.2		20.0			
13C2-PFTeDA	0.4584 0.4719	0.4560 0.4944	0.4587	0.4753	0.4857	Ave		0.4715				3.1		20.0			
13C2-PFHxDA	0.4110 0.4421	0.4054 0.4565	0.4117	0.4453	0.4558	Ave		0.4325				5.2		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.: 320-41998-1 Analy Batch No.: 237921

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2018 16:12 Calibration End Date: 08/03/2018 16:57 Calibration ID: 40486

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237921/2	2018.08.03LLICAL_005.d
Level 2	IC 320-237921/3	2018.08.03LLICAL_006.d
Level 3	IC 320-237921/4	2018.08.03LLICAL_007.d
Level 4	IC 320-237921/5	2018.08.03LLICAL_008.d
Level 5	IC 320-237921/6	2018.08.03LLICAL_009.d
Level 6	IC 320-237921/7	2018.08.03LLICAL_010.d
Level 7	IC 320-237921/8	2018.08.03LLICAL_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	59849 12603718	113801 22190566	587057	2386844	5937685	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	72932 11314842	123668 19426688	600625	2185438	5283276	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	83599 16018083	162604 28367522	813836	3350358	8055489	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	16248 2865640	25922 5133972	137395	550071	1394366	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	69288 10791075	116451 18541720	540737	2195434	5113515	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	39547 8636453	80313 15637004	403451	1620789	3951171	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	78450 13282534	148328 22336263	736383	2935816	6659148	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	72636 11602279	120529 21190483	567484	2171268	5497093	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	17816 2412122	27660 4160680	133796	536402	1210888	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	82270 11122158	138455 18927627	626191	2450512	5569567	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	47155 10881371	100013 19279404	516142	2152553	4782579	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	53134 9176653	121498 16180234	524304	2154625	5067037	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	54170 10846850	101664 20323268	513415	2140357	5036535	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanesulfonic acid		AveID	32302 7148701	62749 11730197	353704	1346579	3273769	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
Perfluorooctane Sulfonamide (PFOSA)		AveID	97270 17949426	203734 30333745	1055835	4264515	9979434	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1 Analy Batch No.: 237921

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2018 16:12 Calibration End Date: 08/03/2018 16:57 Calibration ID: 40486

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	12727 1847076	21801 3196523	104586	413075	988723	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	67874 10776223	138721 17490817	663493	2405357	5703670	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	9469 1892335	20353 3779673	90688	379517	894063	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	40791 8492671	86393 15042348	437557	1793635	4198724	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	6656 1494790	13246 2757725	71271	274140	666629	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	34534 6306082	73811 10624244	346386	1396013	3156582	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	38579 8139691	97295 13309612	434793	1731609	4218718	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	32917 6273910	64240 10635642	329625	1328828	3183456	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	4471 902731	8543 1662766	41015	174884	435218	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	6433939 6541983	6273415 6389618	6381009	6314247	6112850	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5-PFPeA	13PF OA	Ave	6093776 5832978	5788542 5299526	5776616	5588563	5432869	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	82000 84962	83335 81999	84657	78999	76827	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	6304069 5878468	6131410 5424292	5983609	5985637	5640948	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	7076705 6626960	6715731 6139851	7086577	6641878	6660043	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	4703926 4906340	4652927 4846975	4834908	4666163	4729117	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	681382 579189	657438 545128	617490	651860	607653	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	6052329 5669239	5898675 5093432	5683176	5761212	5210338	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	5163172 5039962	5051590 5087246	4950130	5088829	4714686	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	5099845 4799148	5090764 4275948	4951980	4829107	4728270	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	3206073 3130628	3295383 2836181	3340672	3127842	3056647	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	80247 66824	75406 58823	76604	78595	72605	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.: 320-41998-1 Analy Batch No.: 237921

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2018 16:12 Calibration End Date: 08/03/2018 16:57 Calibration ID: 40486

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	5120170 4667480	5190946 4172222	5165264	4876594	4664987	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	965422 968788	907888 980371	878656	908545	935170	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	762525 757844	825934 716421	803397	793459	737400	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	4332288 3808061	4167691 3432823	4060489	3937669	3627913	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	4139411 4310482	4405021 3811691	4519004	4138570	4126518	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	2766432 2591620	2744799 2552499	2823583	2697006	2622464	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	2480005 2427794	2440530 2356463	2534296	2526670	2460813	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.: 320-41998-1 Analy Batch No.: 237921

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2018 16:12 Calibration End Date: 08/03/2018 16:57 Calibration ID: 40486

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-237921/2	2018.08.03LLICAL_005.d
Level 2	IC 320-237921/3	2018.08.03LLICAL_006.d
Level 3	IC 320-237921/4	2018.08.03LLICAL_007.d
Level 4	IC 320-237921/5	2018.08.03LLICAL_008.d
Level 5	IC 320-237921/6	2018.08.03LLICAL_009.d
Level 6	IC 320-237921/7	2018.08.03LLICAL_010.d
Level 7	IC 320-237921/8	2018.08.03LLICAL_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)	0.1 -6.6	-2.4	-1.0	1.7	4.5	3.7	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	17.3 -10.2	4.7	1.9	-4.2	-4.7	-4.9	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	3.8 -11.9	-0.6	-2.1	8.0	6.8	-4.0	30 30	30	30	30	30	30
4:2 FTS	15.9 -8.4	-9.0	-5.1	1.8	6.2	-1.4	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	17.5 -8.6	1.5	-3.4	-2.0	-3.1	-1.9	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-2.2 -3.4	-2.3	-3.4	4.0	4.3	3.0	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	6.8 -12.4	6.4	0.1	6.4	-3.7	-3.5	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	25.5 -11.2	5.3	-4.6	-5.5	-5.5	-3.9	30 30	30	30	30	30	30
6:2 FTS	22.6 -10.5	-1.3	1.6	-3.5	-6.5	-2.3	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	23.9 -15.3	7.0	0.5	-3.0	-2.5	-10.6	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-9.3 -5.9	-1.6	3.6	5.1	0.8	7.3	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-1.2 -10.3	13.1	0.4	5.8	1.6	-9.4	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	0.8 -4.1	-3.3	-0.4	1.0	2.6	3.4	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-4.9 -12.3	-5.5	8.7	0.6	5.6	7.9	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (PFOSA)	-1.2 -12.9	0.6	2.9	11.0	6.3	-6.7	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1 Analy Batch No.: 237921

SDG No.:

Instrument ID: A9 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/03/2018 16:12 Calibration End Date: 08/03/2018 16:57 Calibration ID: 40486

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	13.1 -3.1	3.1	-2.6	-6.3	-2.9	-1.4	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	7.8 -14.7	8.7	4.5	0.3	-0.5	-6.1	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-3.0 -4.6	10.9	2.1	3.3	-5.4	-3.4	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-6.0 -12.0	1.8	5.2	4.9	6.0	0.3	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	-2.7 7.3	-10.6	-1.1	-3.7	0.8	10.0	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	-5.3 -8.1	5.2	1.3	5.3	3.3	-1.7	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	-5.2 -11.2	12.3	-2.2	6.4	4.0	-4.0	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	6.0 -7.0	-2.8	-2.8	7.0	2.8	-3.0	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	0.3 1.1	-3.4	-9.8	0.6	3.0	8.1	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 03-Aug-2018 16:12:27 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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:17:16 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:16:30

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.485	1.485	0.0	0.537	6433939	2.39		95.4	9300	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.485	1.486	-0.001	1.000	59849	0.0250		100	1.3	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.753	1.753	0.0	0.634	6093776	2.53		101	9268	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.761	1.754	0.007	1.005	72932	0.0293		117	2.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.795	1.792	0.003	0.649	82000	2.20		94.5	251	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.795	1.794	0.001	1.000	83599	0.0229		104	32.5	
298.90 > 99.00	1.795	1.794	0.001	1.000	34037		2.46(1.35-4.05)	104	10.4	
D 60 M2-4:2FTS										
329.00 > 81.00	2.006	2.006	0.0	0.726	605018	NC			412	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.016	2.009	0.007	1.123	16248	0.0271		116	79.5	
6 Perfluorohexanoic acid										RM
313.00 > 269.00	2.047	2.044	0.003	1.000	69288	0.0294		117	6.8	RM
313.00 > 119.00	2.047	2.044	0.003	1.000	2754		25.16(6.96-20.87)	117	3.1	M
D 7 13C2 PFHxA										
315.00 > 270.00	2.047	2.046	0.001	0.740	6304069	2.52		101	7078	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.078	2.069	0.009	1.158	39547	0.0229		97.8	101	
349.00 > 99.00	2.078	2.069	0.009	1.158	18467		2.14(1.15-3.45)	97.8	10.3	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.146	0.004	0.778	514626	NC			1751	

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	2.150	2.147	0.003	1.000	11880	NC			4.5	
D 9 13C4-PFHpA										
367.00 > 322.00	2.384	2.384	0.0	0.862	7076705	2.49		99.6	15822	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.384	2.384	0.0	1.000	78450	0.0267		107	5.8	
363.00 > 169.00	2.397	2.384	0.013	1.005	19752		3.97(2.17-6.52)	107	20.2	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.397	2.398	-0.001	0.995	72636	0.0285		125	71.9	
399.00 > 99.00	2.410	2.398	0.012	1.000	21289		3.41(1.90-5.70)	125	6.8	M
D 11 18O2 PFHxS										
403.00 > 84.00	2.410	2.400	0.010	0.872	4703926	2.20		93.0	6316	
65 ADONA										
377.00 > 251.00	2.435	2.435	0.0	0.776	116832	NC			168	
377.00 > 85.00	2.435	2.435	0.0	0.776	47672		2.45(1.05-3.16)		21.6	
D 12 M2-6:2FTS										
429.00 > 81.00	2.733	2.732	0.001	0.988	681382	2.47		104	920	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.733	2.732	0.001	1.000	17816	0.0291		123	80.8	
* 62 13C2-PFOA										
415.00 > 370.00	2.765	2.755	0.010		6034591	2.50			7992	
D 14 13C4 PFOA										
417.00 > 372.00	2.765	2.757	0.008	1.000	6052329	2.54		102	5589	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.765	2.757	0.008	1.000	82270	0.0310		124	7.7	
413.00 > 169.00	2.765	2.757	0.008	1.000	29433		2.80(1.36-4.08)	124	21.7	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.765	2.767	-0.002	0.881	47155	0.0216		90.7	77.6	
449.00 > 99.00	2.765	2.767	-0.002	0.881	12808		3.68(1.84-5.53)	90.7	24.5	
D 19 13C5 PFNA										
468.00 > 423.00	3.138	3.140	-0.002	1.135	5099845	2.50		99.9	5153	
D 18 13C4 PFOS										
503.00 > 80.00	3.138	3.140	-0.002	1.135	5163172	2.32		97.0	6374	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.138	3.140	-0.002	1.000	54170	0.0234		101	59.2	
499.00 > 99.00	3.138	3.140	-0.002	1.000	13179		4.11(2.04-6.12)	101	25.0	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.138	3.140	-0.002	1.000	53134	0.0247		98.8	7.7	M
463.00 > 169.00	3.138	3.140	-0.002	1.000	11817		4.50(2.68-8.03)	98.8	19.6	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.346	3.348	-0.002	1.066	58586	NC			81.5	
D 21 13C8 FOSA										
506.00 > 78.00	3.492	3.485	0.007	1.263	3206073	2.41		96.4	3862	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.492	3.492	0.0	1.113	32302	0.0228		95.1	63.4	
549.00 > 99.00	3.492	3.492	0.0	1.113	5822		5.55(3.02-9.05)	95.1	37.8	
D 26 M2-8:2FTS										
529.00 > 81.00	3.492	3.492	0.0	1.263	80247	2.50		104	319	

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	3.492	3.492	0.0	1.000	97270	0.0247		98.8	120	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.492	3.494	-0.002	1.000	12727	0.0271		113	108	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.508	3.505	0.003	1.000	67874	0.0270		108	8.8	
513.00 > 169.00	3.492	3.505	-0.013	0.995	3795		17.89(7.12-21.35)	108	6.0	
D 23 13C2 PFDA										
515.00 > 470.00	3.508	3.505	0.003	1.269	5120170	2.50		100	5615	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.650	3.650	0.0	1.320	965422	2.43		97.1	2901	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.664	3.662	0.002	1.004	9469	0.0243		97.0	5.9	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.816	3.816	0.0	1.216	40791	0.0227		94.0	102	
599.00 > 99.00	3.816	3.816	0.0	1.216	8450		4.83(2.14-6.43)	94.0	15.5	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.831	3.825	0.006	1.386	762525	2.33		93.4	1622	
D 30 13C2 PFUnA										
565.00 > 520.00	3.831	3.831	0.0	1.386	4332288	2.62		105	6676	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.831	3.831	0.0	1.000	34534	0.0237		94.7	7.4	
563.00 > 169.00	3.831	3.831	0.0	1.000	4816		7.17(5.24-15.72)	94.7	10.3	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.831	3.831	0.0	1.000	6656	0.0243		97.3	17.8	M
35 MeFOSA										M
512.00 > 169.00	3.966	3.971	-0.005		10399	NC			30.4	M
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.997	3.993	0.004	1.274	64287	NC			279	
D 36 13C2 PFDoA										
615.00 > 570.00	4.126	4.127	-0.001	1.492	4139411	2.32		92.9	6427	
37 Perfluorododecanoic acid										M
613.00 > 569.00	4.126	4.127	-0.001	1.000	38579	0.0237		94.8	8.0	M
613.00 > 169.00	4.126	4.127	-0.001	1.000	7418		5.20(4.68-14.05)	94.8	30.7	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.126	4.127	-0.001	1.182	4650	NC			18.0	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.361	4.361	0.0	1.390	3615	NC			28.3	
699.00 > 99.00	4.361	4.361	0.0	1.390	6678		0.54(0.28-0.83)		30.7	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.392	4.392	0.0	1.064	32917	0.0265		106	9.5	
663.00 > 169.00	4.392	4.392	0.0	1.064	6027		5.46(3.09-9.27)	106	14.0	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.635	4.635	0.0	1.676	2766432	2.43		97.2	6765	
42 Perfluorotetradecanoic acid										M
713.00 > 169.00	4.635	4.635	0.0	1.000	4471	0.0251		100	17.6	
713.00 > 219.00	4.635	4.635	0.0	1.000	2613		1.71(0.70-2.09)	100	10.1	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.050	5.049	0.001	1.827	2480005	2.38		95.0	4466	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.050	5.049	0.001	1.000	45692	NC			5.9	
813.00 > 169.00	5.050	5.049	0.001	1.000	8248		5.54(2.77-8.32)		36.2	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.412	5.401	0.011	1.072	19919	NC			19.6	
913.00 > 169.00	5.398	5.401	-0.003	1.069	3914		5.09(2.55-7.64)		40.9	

QC Flag Legend

Processing Flags
- NC - Not Calibrated
- R - Failed Signal Ratio Test

Review Flags
- M - Manually Integrated

Reagents:

LCPFC_LL1_00007 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 18:17:19 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d

Injection Date: 03-Aug-2018 16:12:27 Instrument ID: A9

Lims ID: IC L1 Full

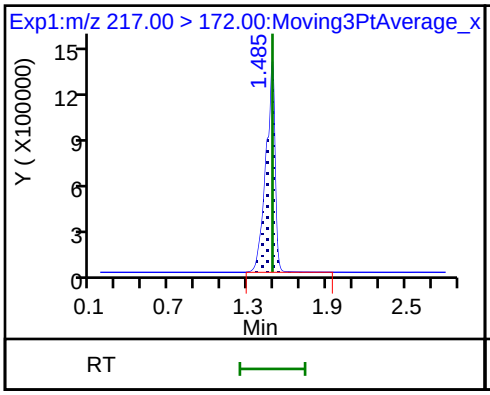
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2

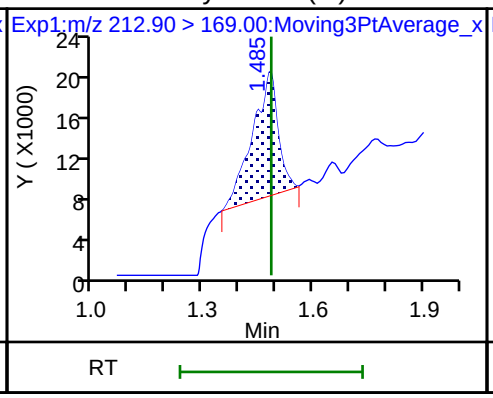
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

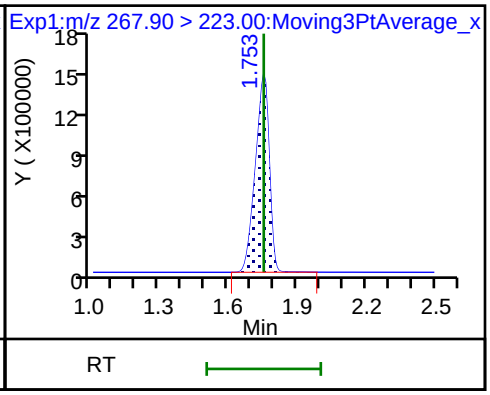
D 1 13C4 PFBA



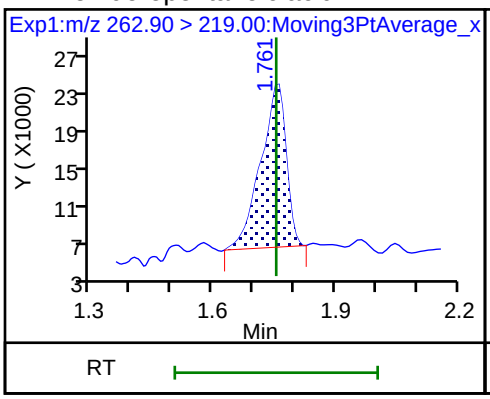
2 Perfluorobutyric acid (M)



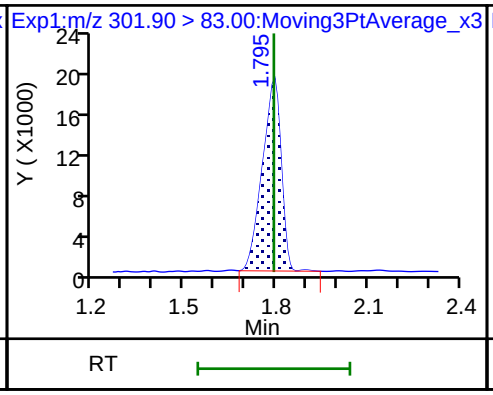
D 3 13C5-PFPeA



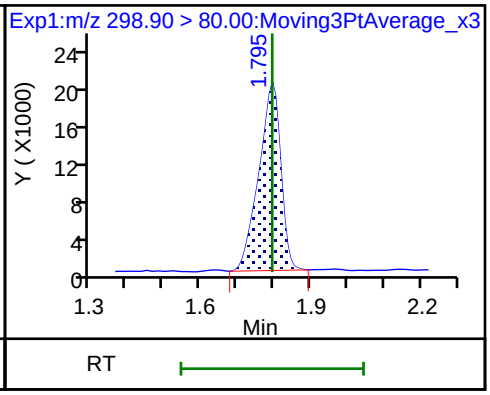
4 Perfluoropentanoic acid



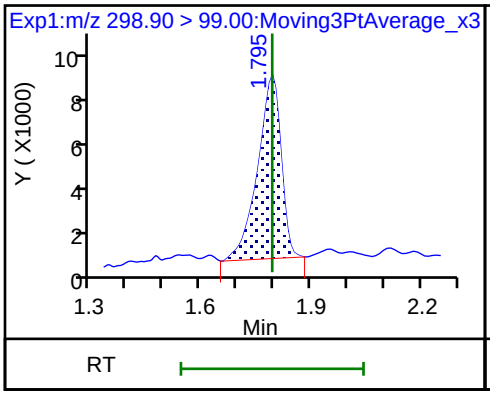
D 47 13C3-PFBS



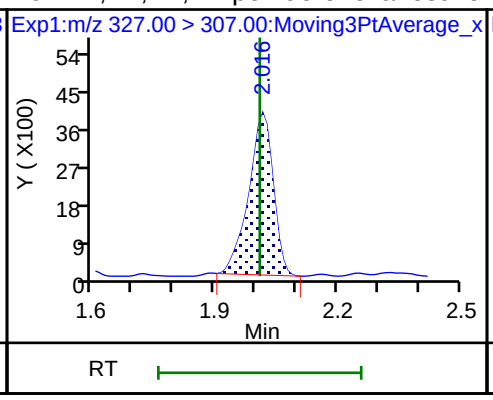
5 Perfluorobutanesulfonic acid



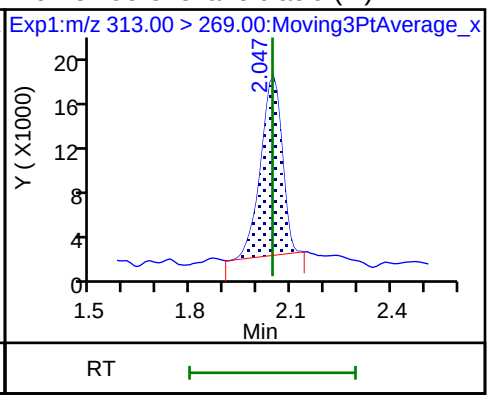
5 Perfluorobutanesulfonic acid



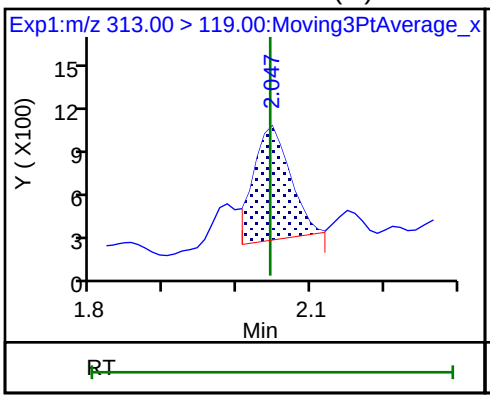
61 1H,1H,2H,2H-perfluorohexanesulfoni



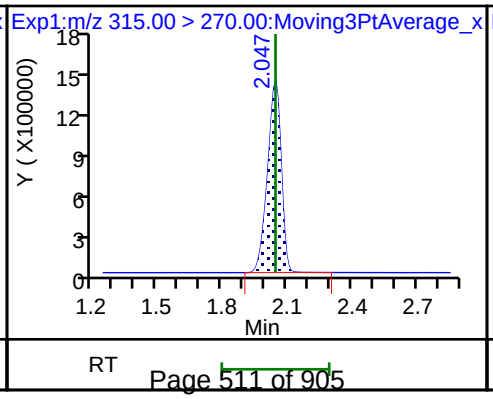
6 Perfluorohexanoic acid (M)



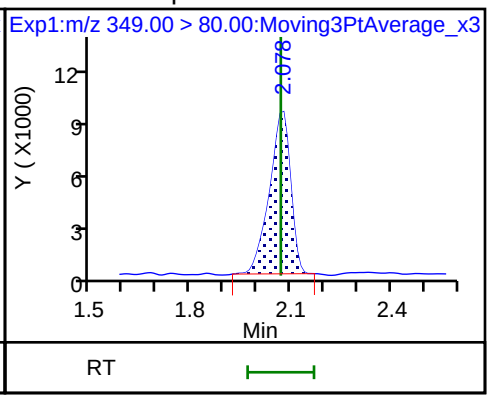
6 Perfluorohexanoic acid (M)



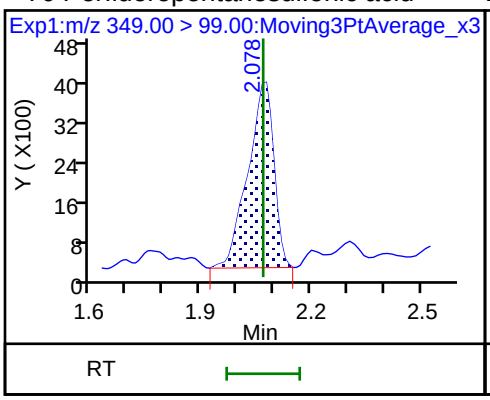
D 7 13C2 PFHxA



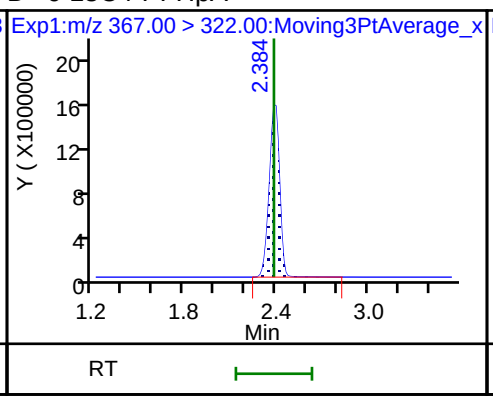
70 Perfluoropentanesulfonic acid



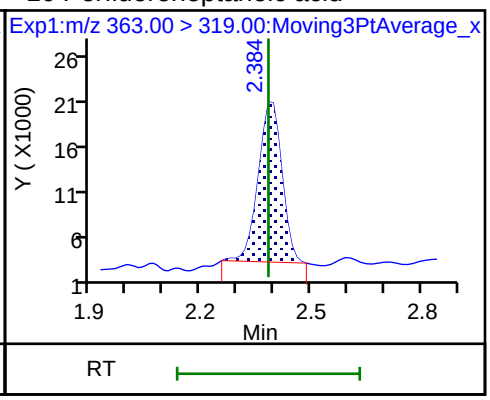
70 Perfluoropentanesulfonic acid



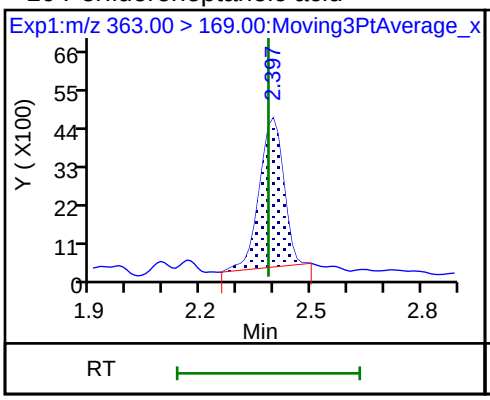
D 9 13C4-PFHpA



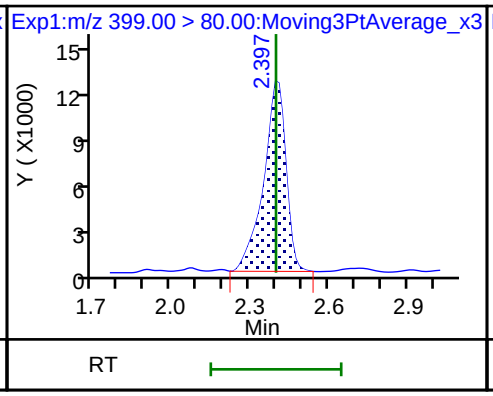
10 Perfluoroheptanoic acid



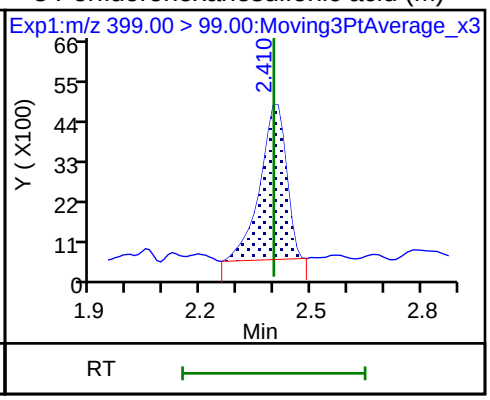
10 Perfluoroheptanoic acid



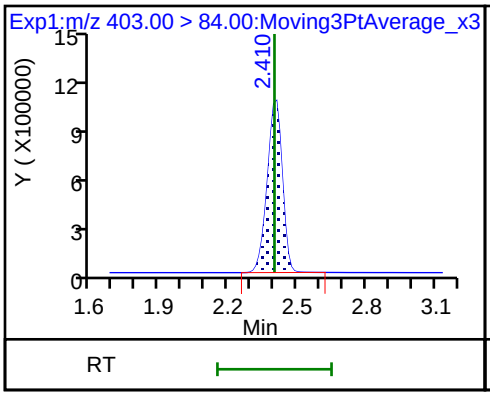
8 Perfluorohexanesulfonic acid



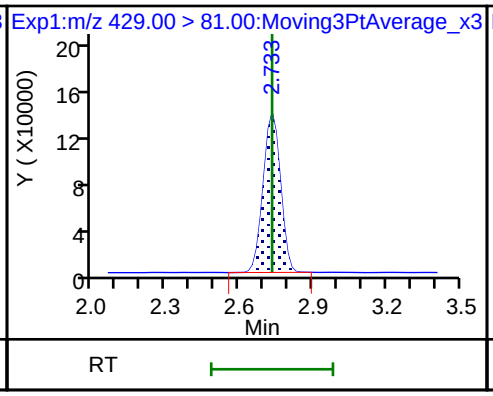
8 Perfluorohexanesulfonic acid (M)



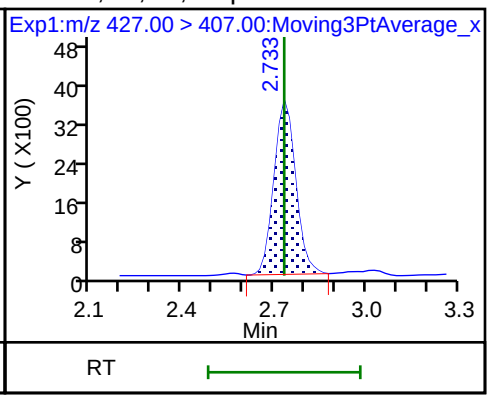
D 11 18O2 PFHxS



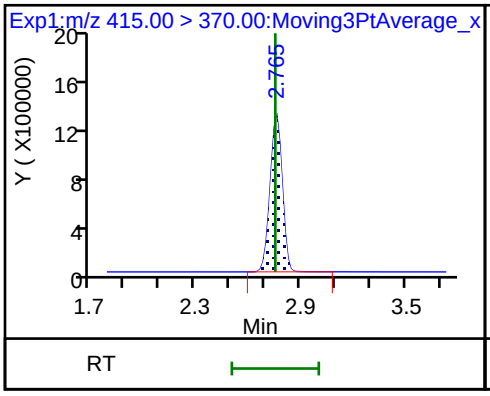
D 12 M2-6:2FTS



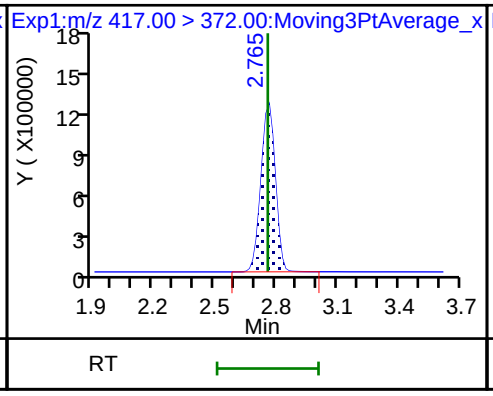
13 1H,1H,2H,2H-perfluorooctanesulfoni



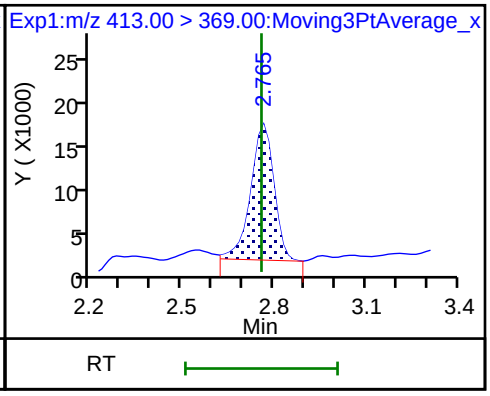
* 62 13C2-PFOA



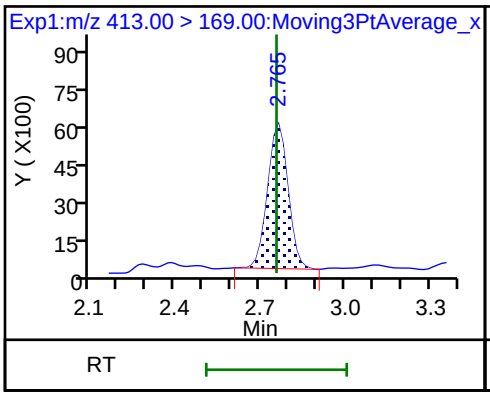
D 14 13C4 PFOA



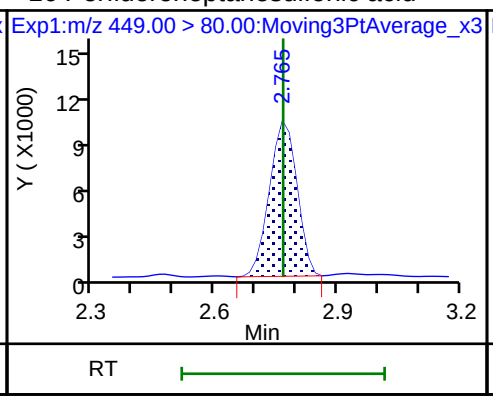
15 Perfluorooctanoic acid



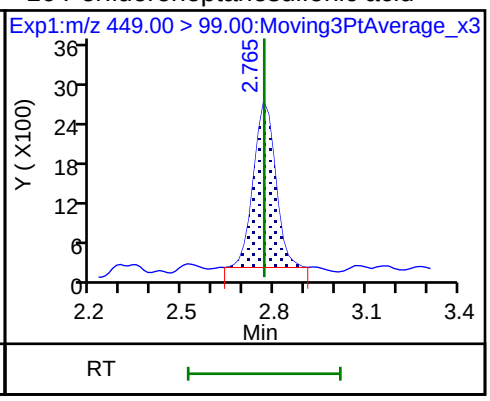
15 Perfluorooctanoic acid



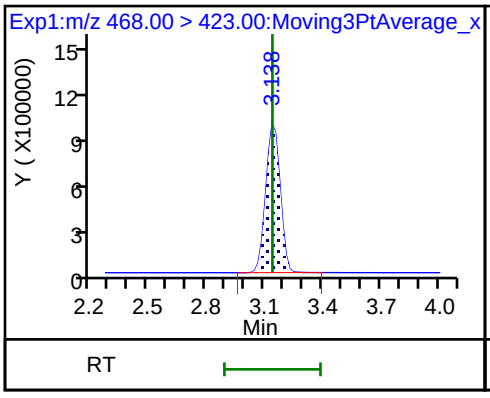
16 Perfluoroheptanesulfonic acid



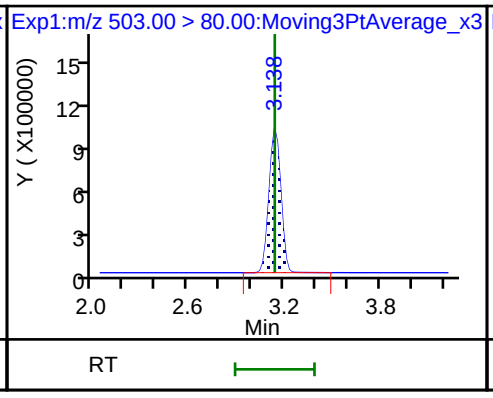
16 Perfluoroheptanesulfonic acid



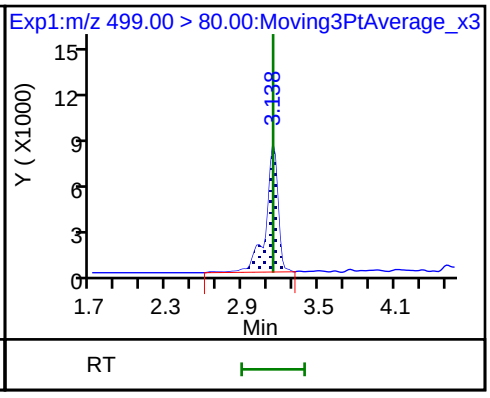
D 19 13C5 PFNA



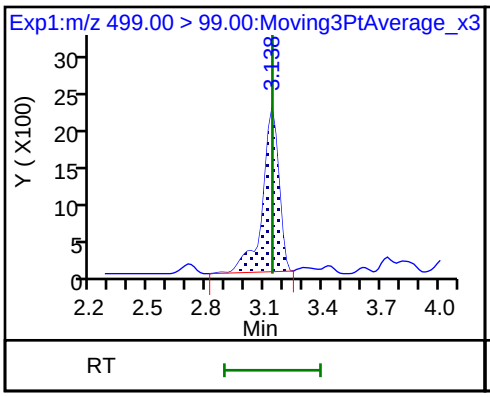
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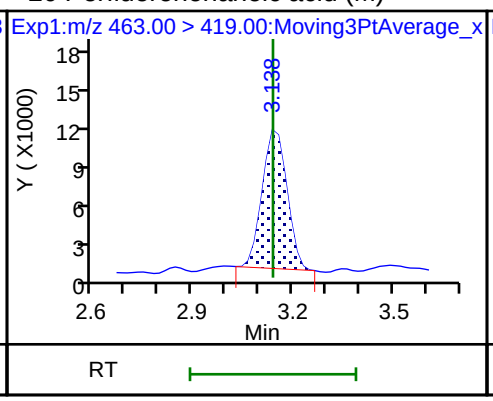
17 Perfluorooctane sulfonic acid



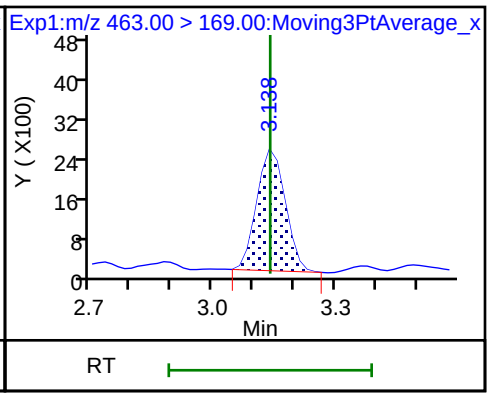
17 Perfluorooctane sulfonic acid



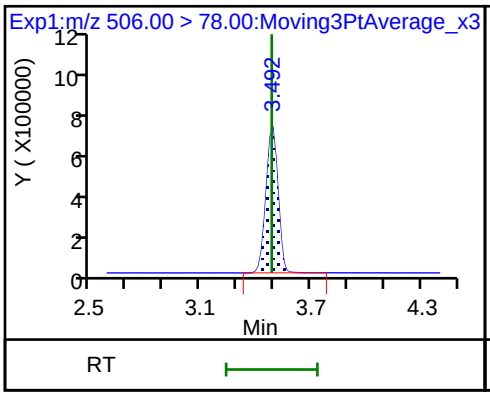
20 Perfluorononanoic acid (M)



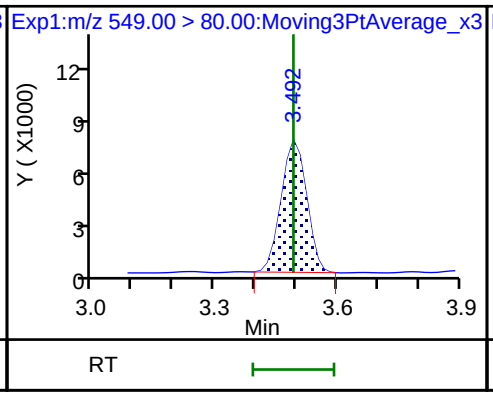
20 Perfluorononanoic acid



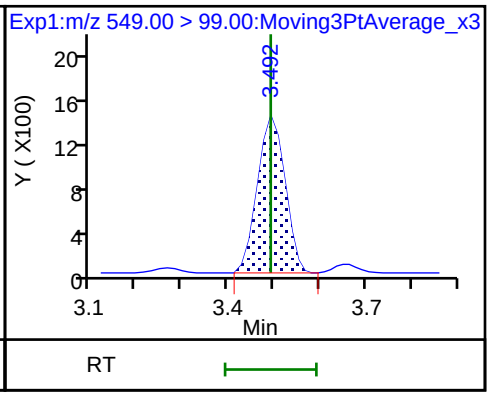
D 21 13C8 FOSA



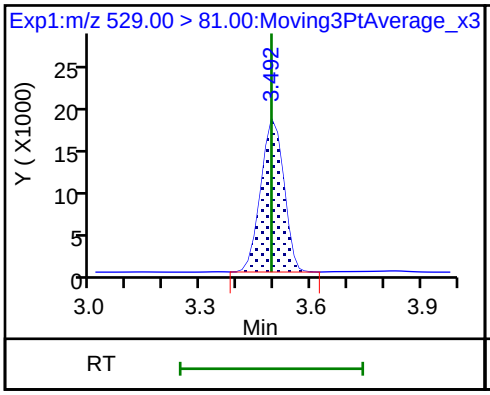
68 Perfluorononanesulfonic acid



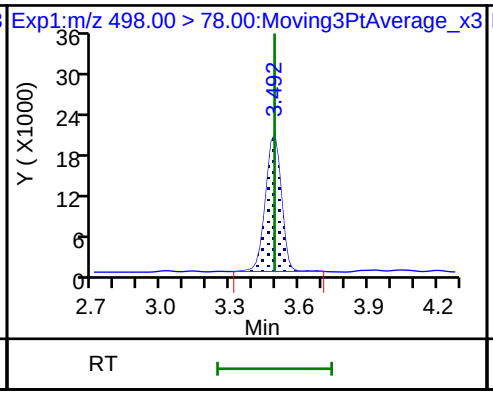
68 Perfluorononanesulfonic acid



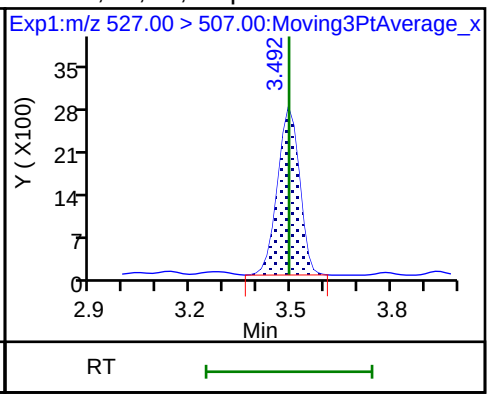
D 26 M2-8:2FTS



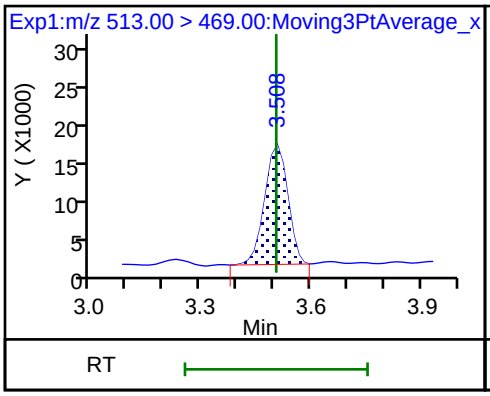
22 Perfluorooctane Sulfonamide



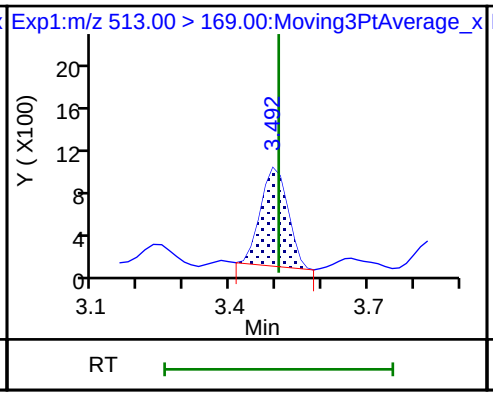
25 1H,1H,2H,2H-perfluorodecanesulfoni



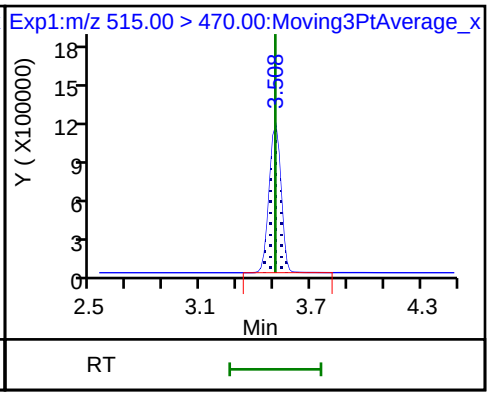
24 Perfluorodecanoic acid



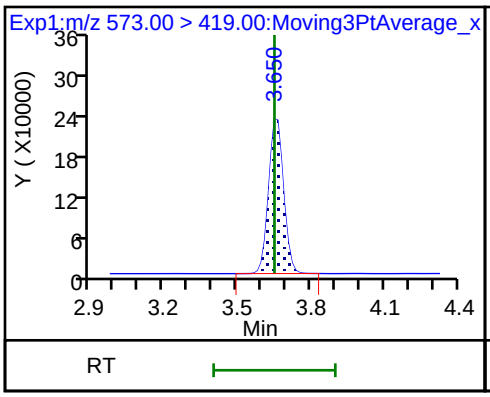
24 Perfluorodecanoic acid



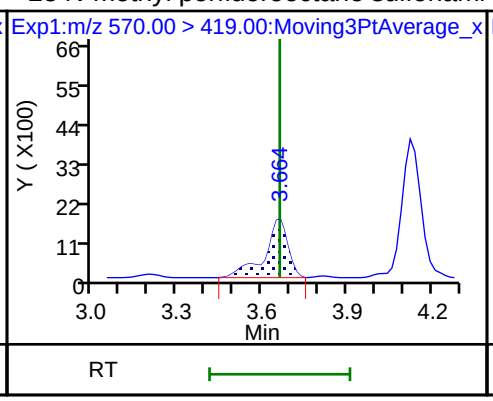
D 23 13C2 PFDA



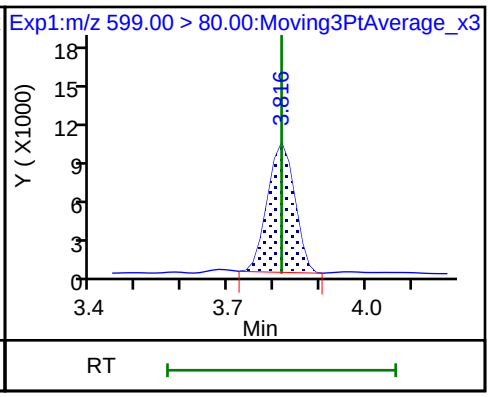
D 27 d3-NMeFOSAA



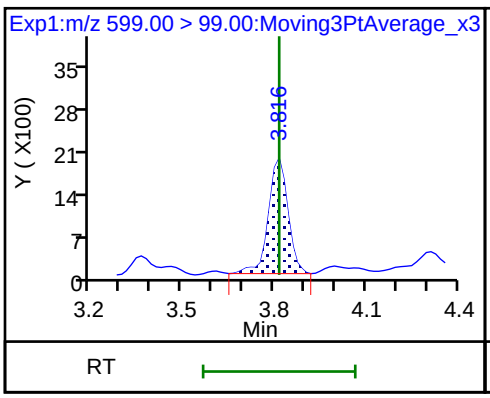
28 N-methyl perfluorooctane sulfonami



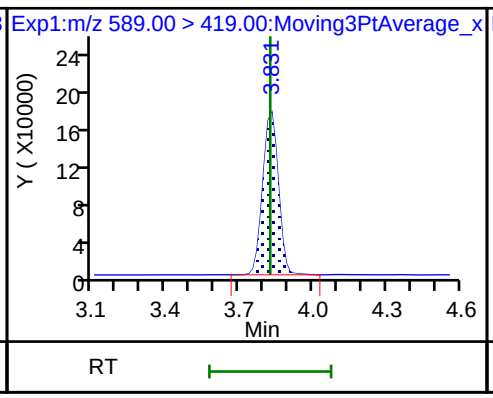
29 Perfluorodecane Sulfonic acid



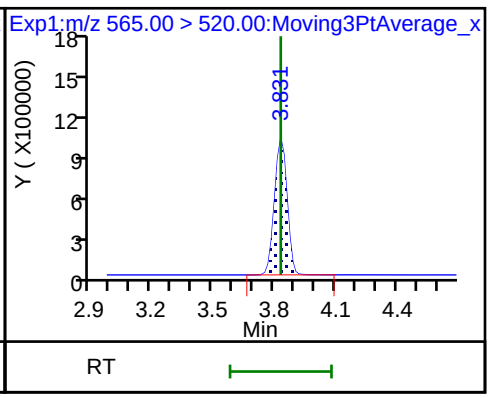
29 Perfluorodecane Sulfonic acid



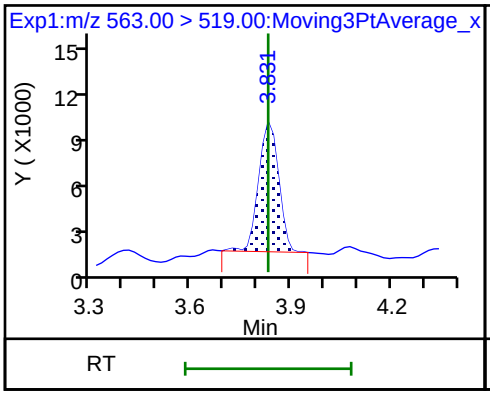
D 32 d5-NEtFOSAA



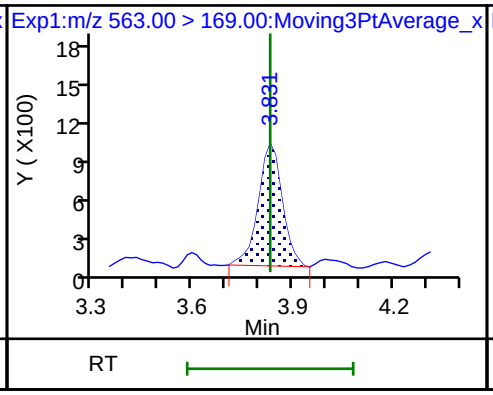
D 30 13C2 PFUnA



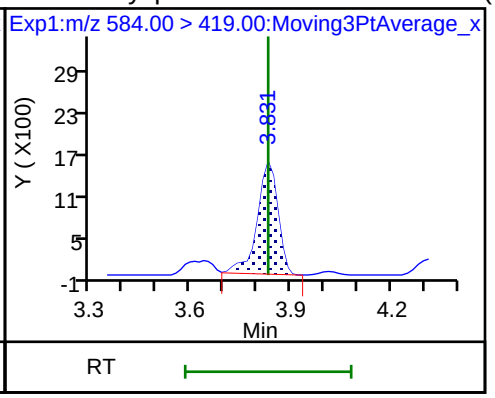
31 Perfluoroundecanoic acid



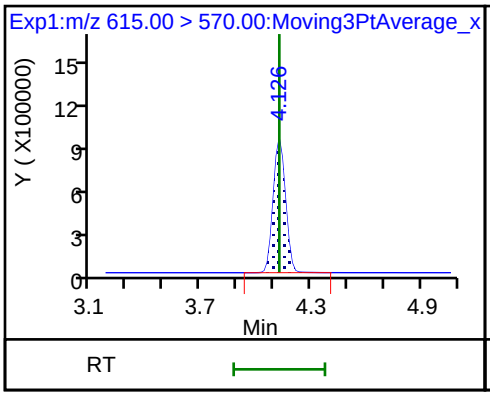
31 Perfluoroundecanoic acid



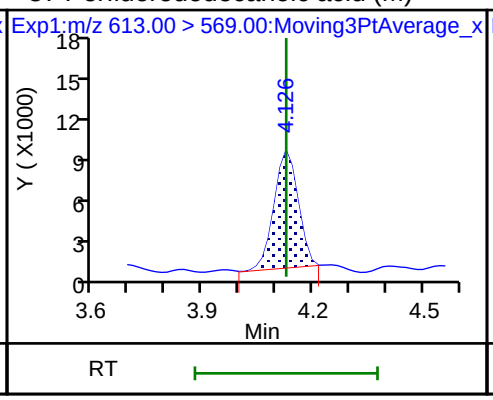
33 N-ethyl perfluorooctane sulfonamid (M)



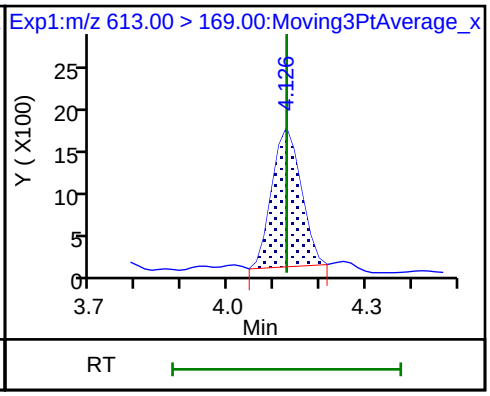
D 36 13C2 PFDoA



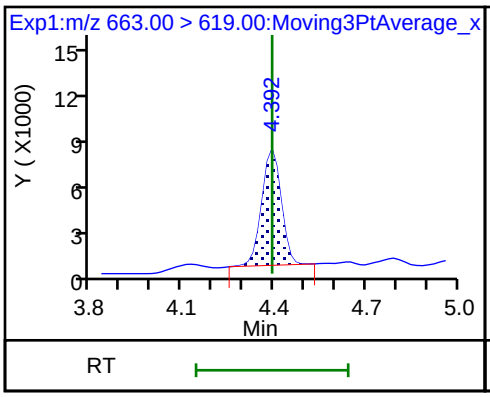
37 Perfluorododecanoic acid (M)



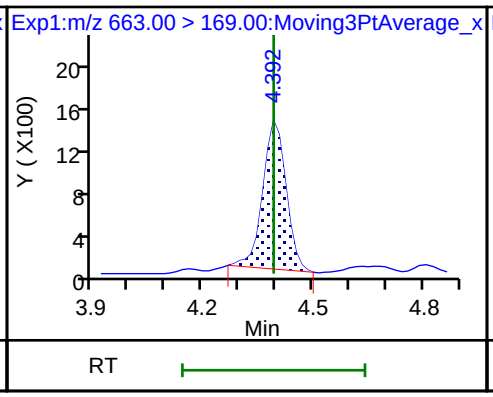
37 Perfluorododecanoic acid



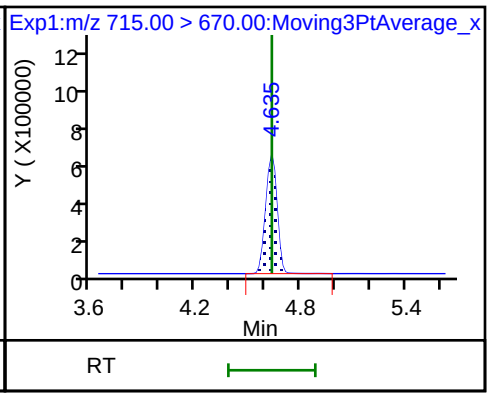
41 Perfluorotridecanoic acid



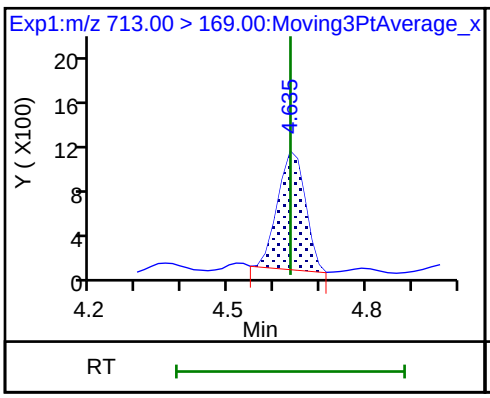
41 Perfluorotridecanoic acid



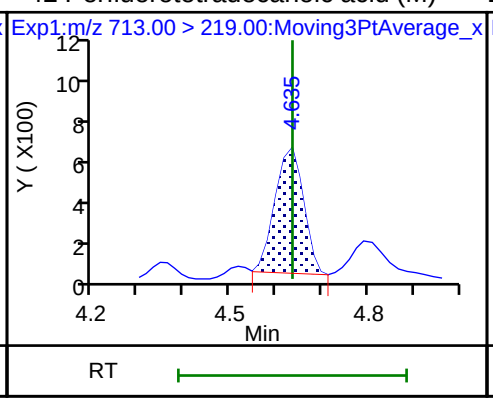
D 43 13C2-PFTeDA



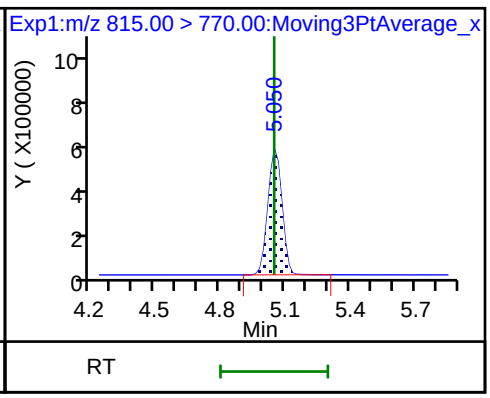
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid (M)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

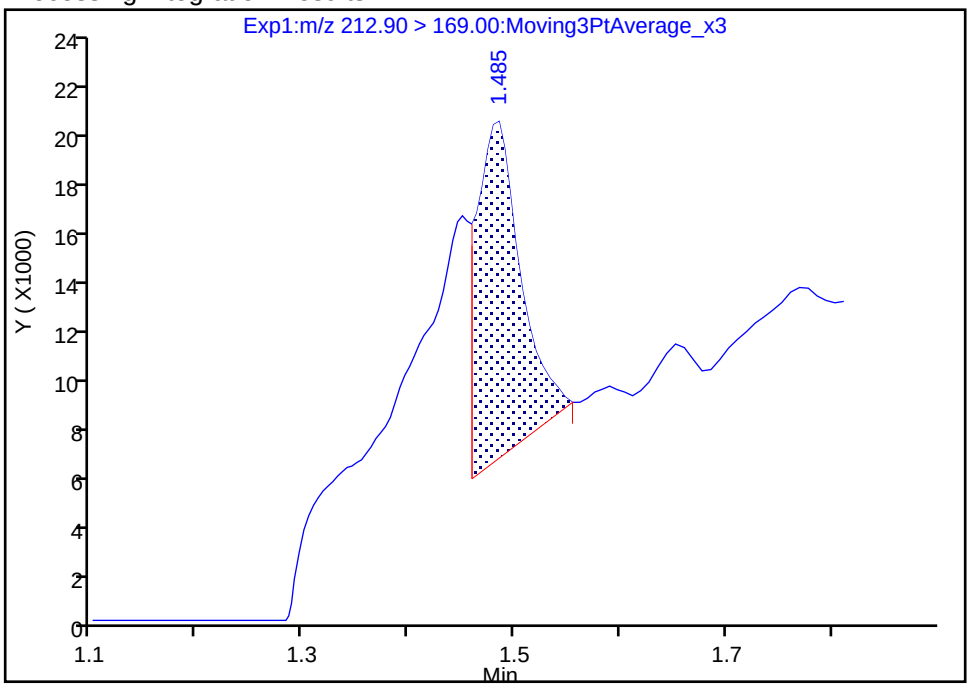
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d
Injection Date: 03-Aug-2018 16:12:27 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

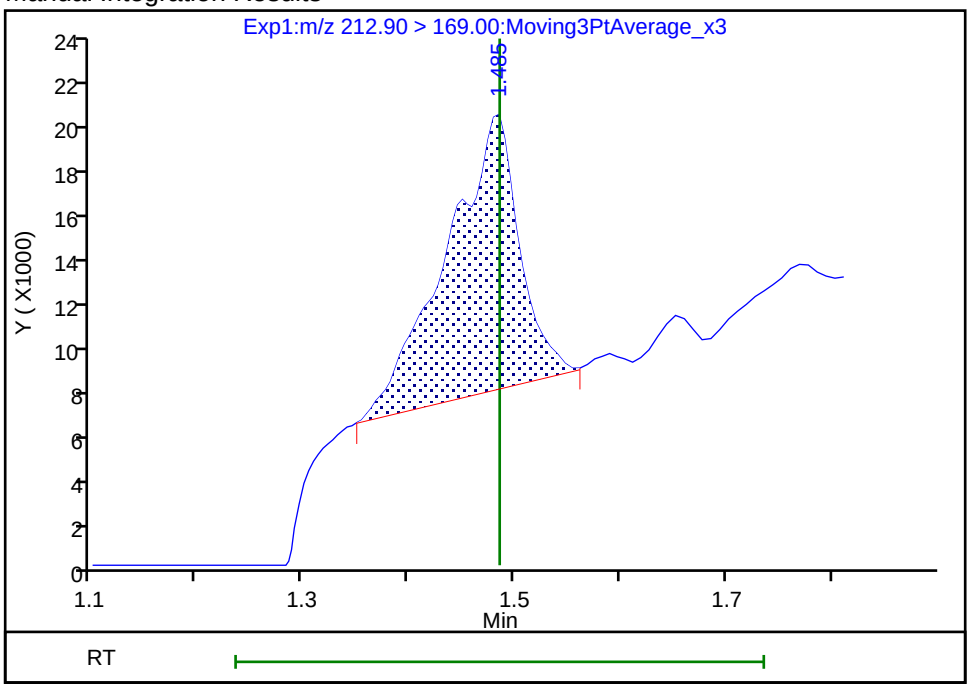
Processing Integration Results

RT: 1.49
Area: 38682
Amount: 0.017177
Amount Units: ng/ml



Manual Integration Results

RT: 1.49
Area: 59849
Amount: 0.025024
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:12:02
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

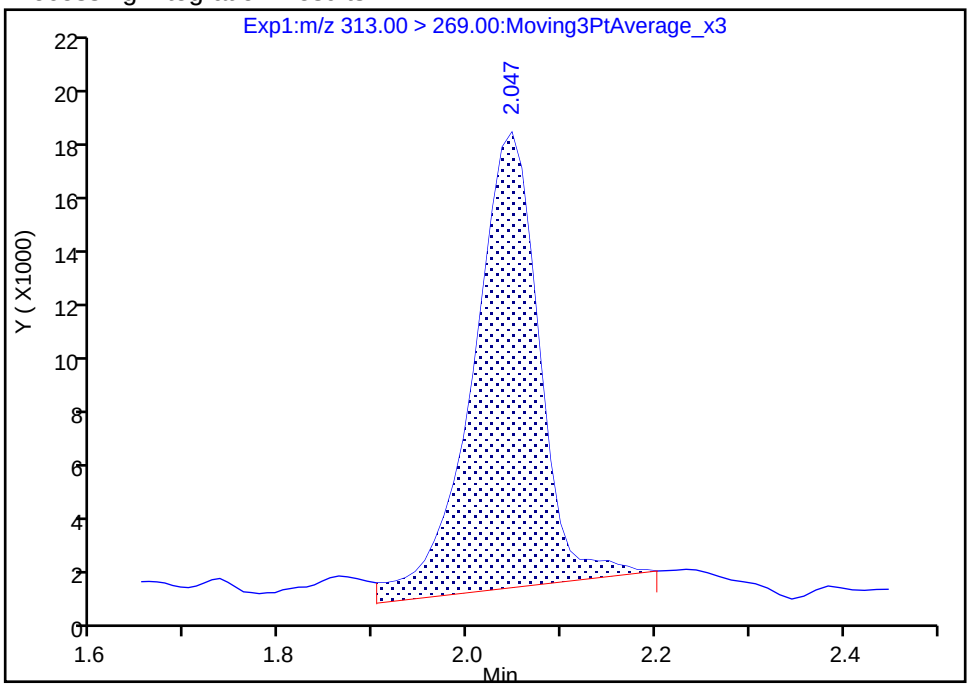
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d
Injection Date: 03-Aug-2018 16:12:27 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

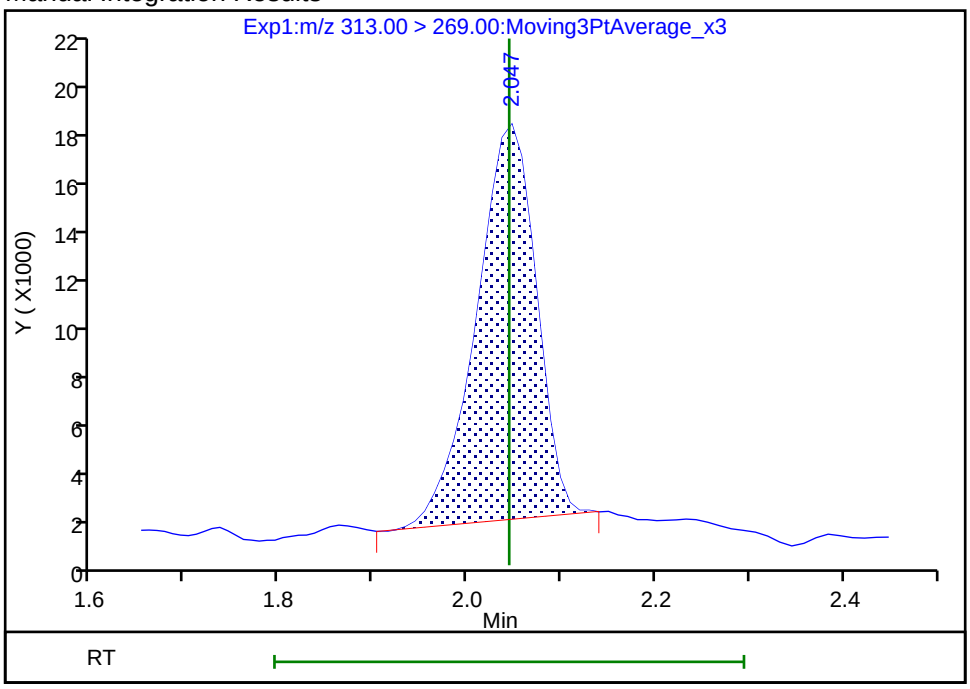
Processing Integration Results

RT: 2.05
Area: 79766
Amount: 0.032978
Amount Units: ng/ml



Manual Integration Results

RT: 2.05
Area: 69288
Amount: 0.029373
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:12:20
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

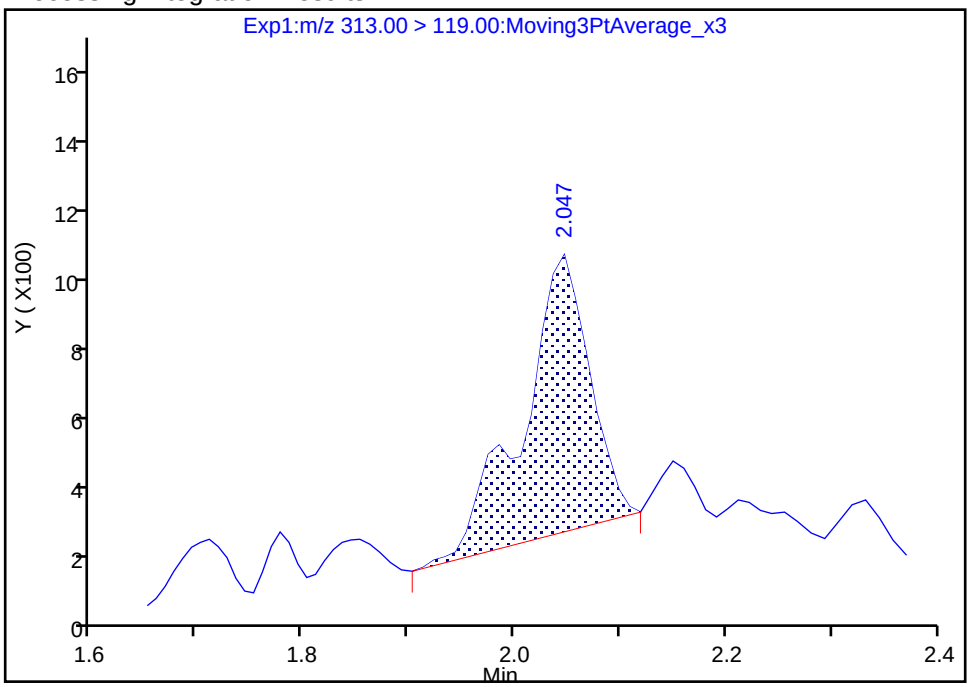
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d				
Injection Date:	03-Aug-2018 16:12:27	Instrument ID:	A9		
Lims ID:	IC L1 Full				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	10	Worklist Smp#:	2
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

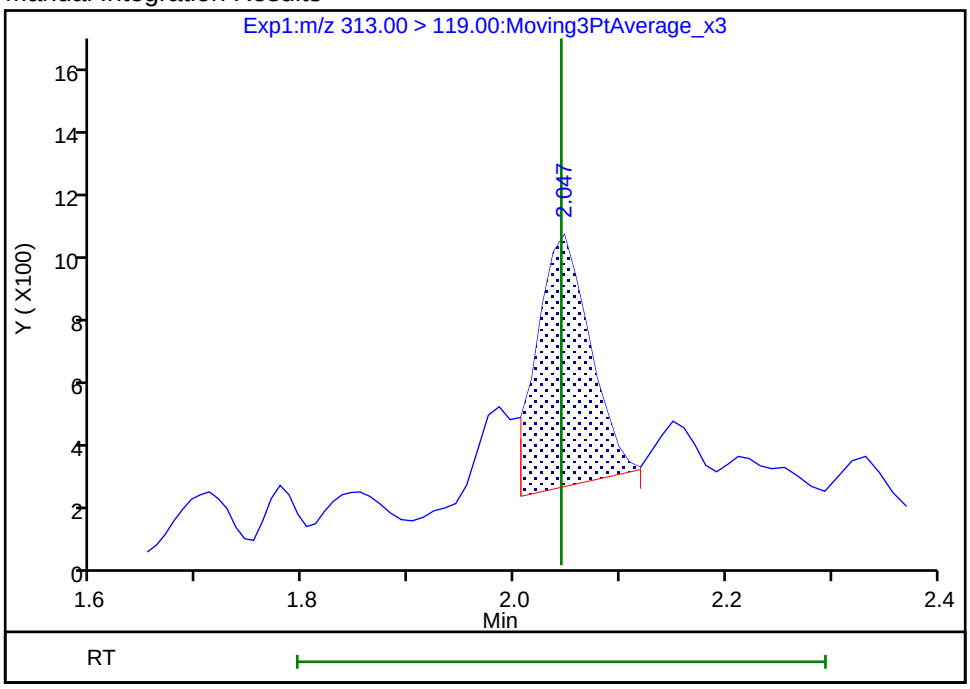
Processing Integration Results

RT: 2.05
Area: 3495
Amount: 0.032978
Amount Units: ng/ml



Manual Integration Results

RT: 2.05
Area: 2754
Amount: 0.029373
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:12:39
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

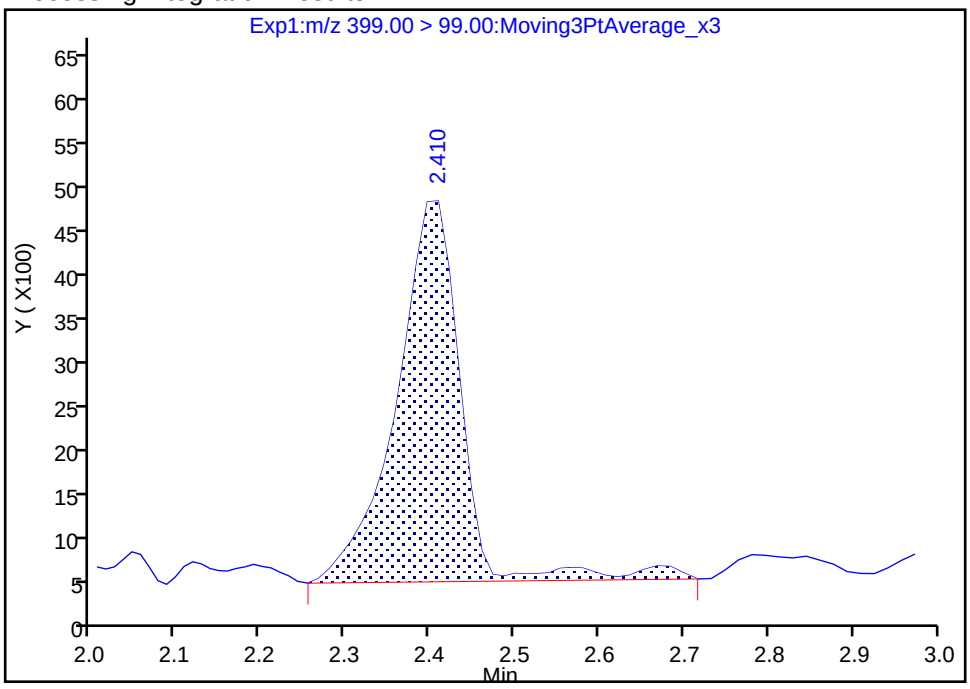
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d
Injection Date: 03-Aug-2018 16:12:27 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

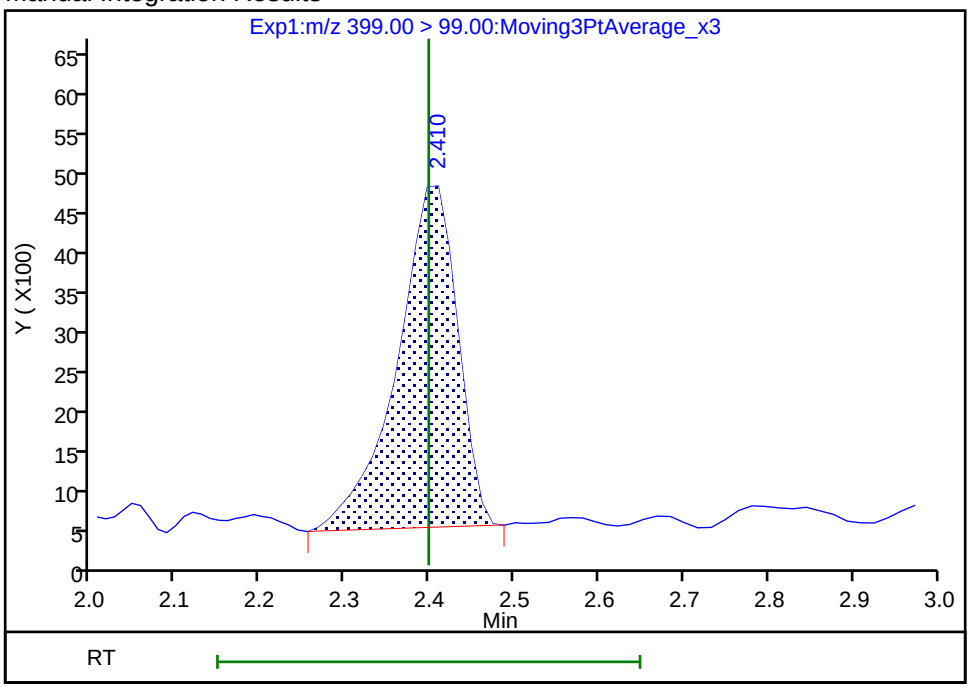
Processing Integration Results

RT: 2.41
Area: 23005
Amount: 0.028547
Amount Units: ng/ml



Manual Integration Results

RT: 2.41
Area: 21289
Amount: 0.028547
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:12:52
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

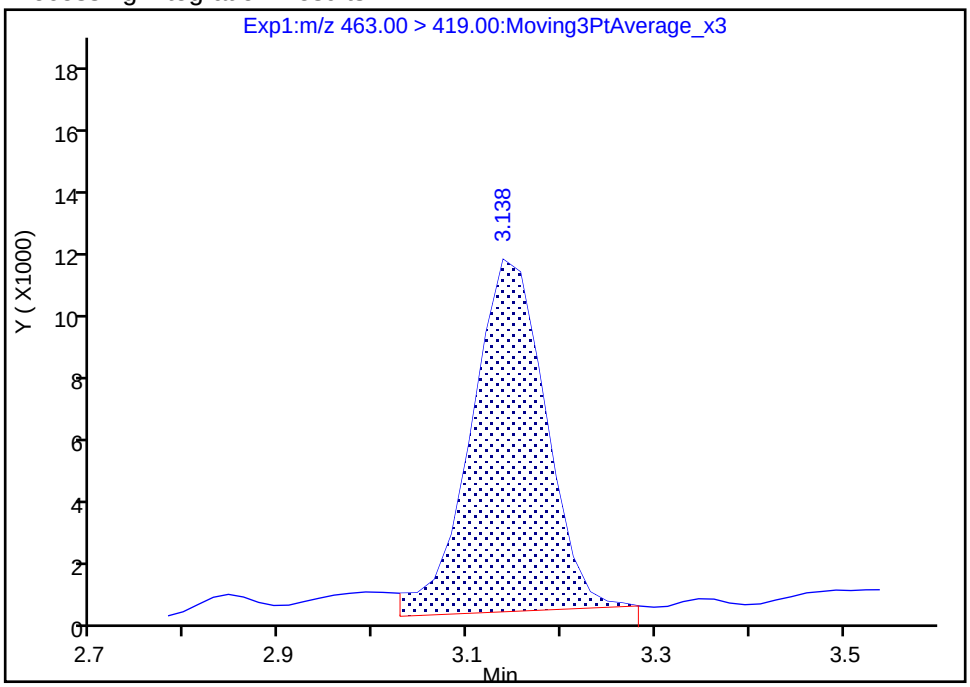
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d
Injection Date: 03-Aug-2018 16:12:27 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

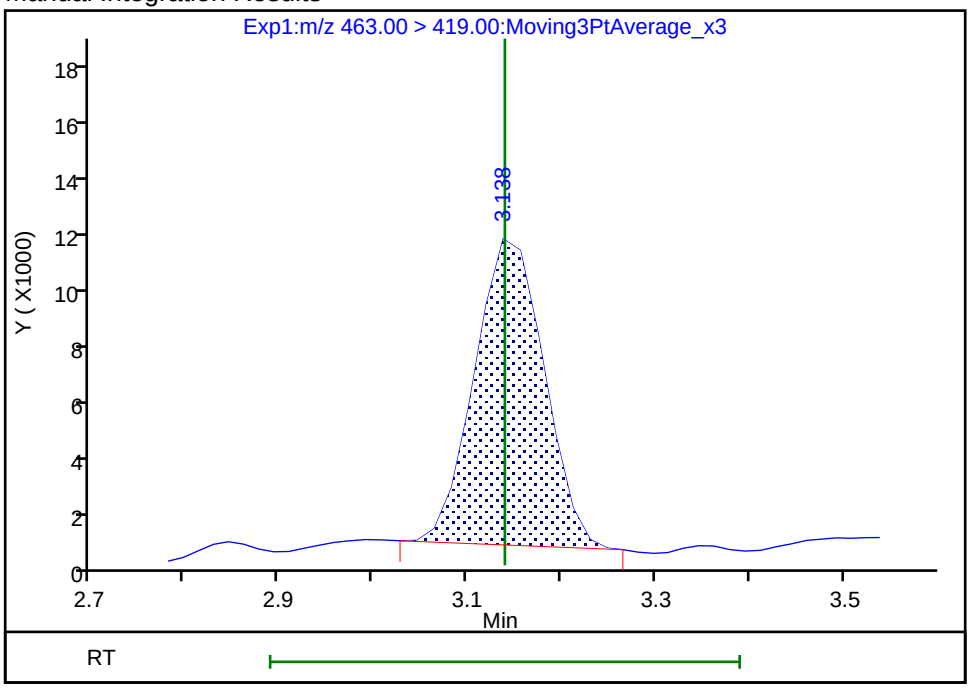
Processing Integration Results

RT: 3.14
Area: 58921
Amount: 0.026970
Amount Units: ng/ml



Manual Integration Results

RT: 3.14
Area: 53134
Amount: 0.024695
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:13:04
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

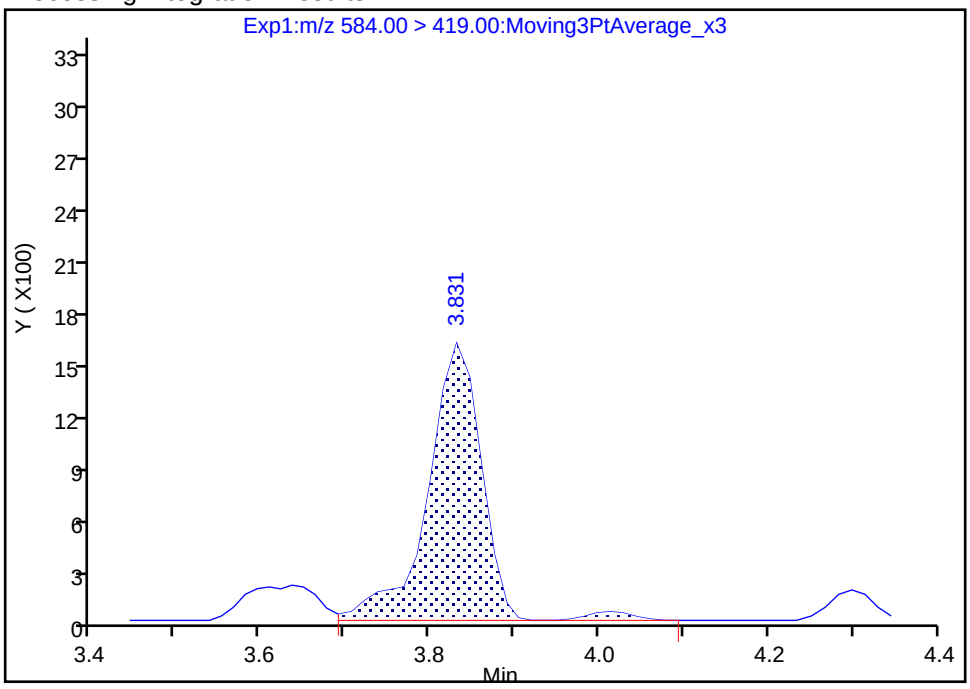
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d
Injection Date: 03-Aug-2018 16:12:27 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

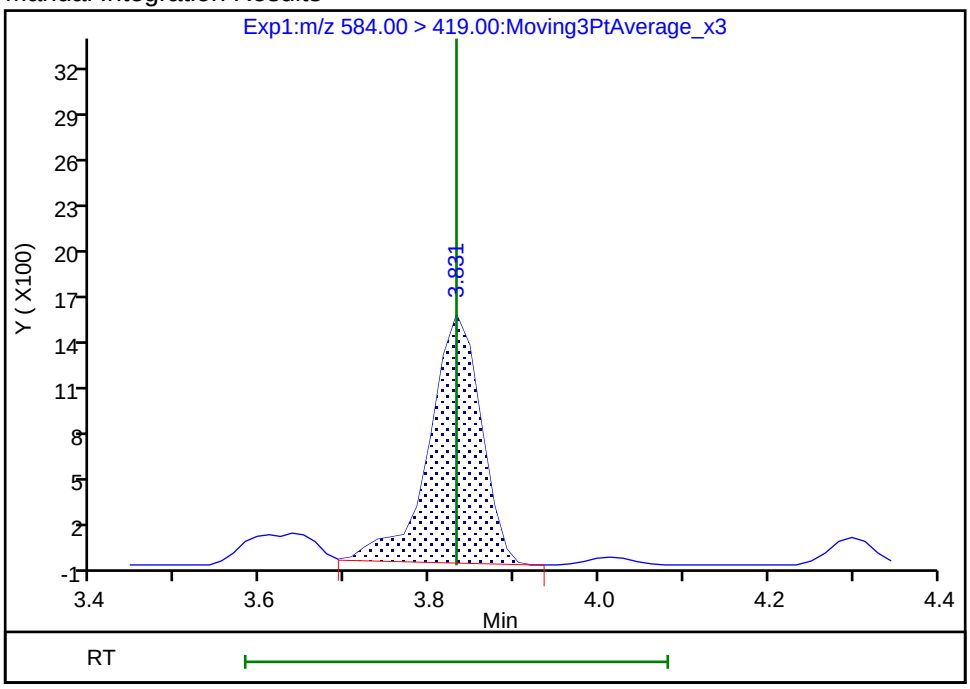
Processing Integration Results

RT: 3.83
Area: 7038
Amount: 0.025524
Amount Units: ng/ml



Manual Integration Results

RT: 3.83
Area: 6656
Amount: 0.024331
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:13:22
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

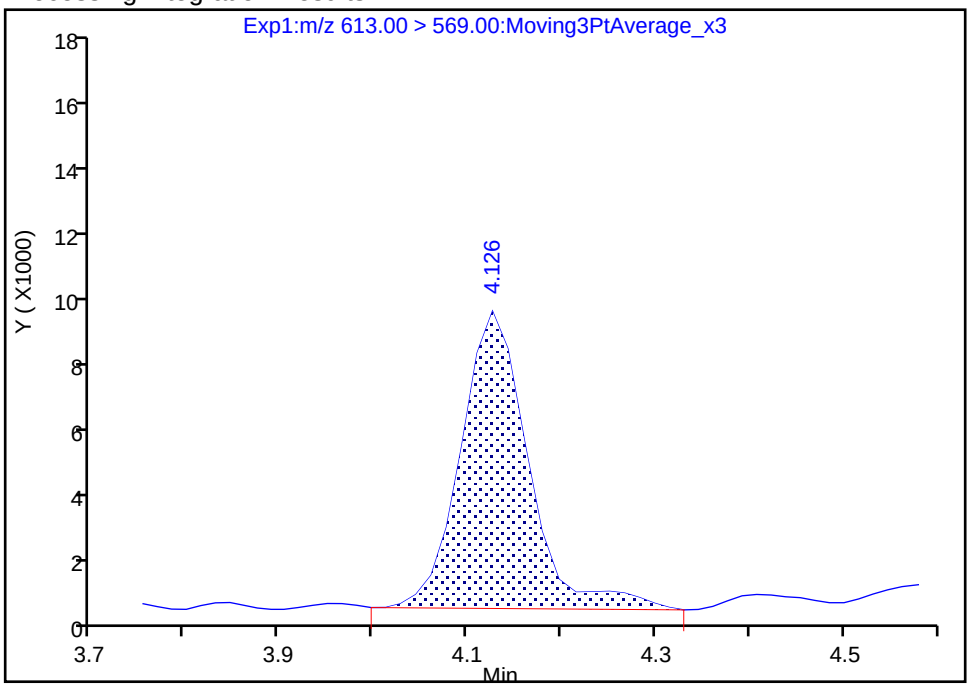
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d
Injection Date: 03-Aug-2018 16:12:27 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

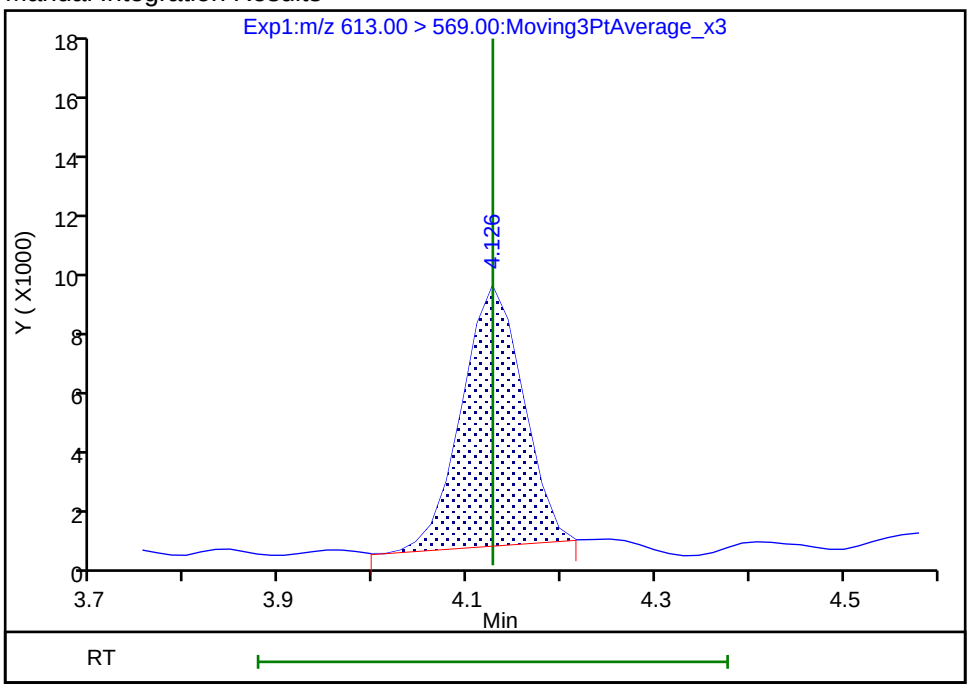
Processing Integration Results

RT: 4.13
Area: 43905
Amount: 0.026469
Amount Units: ng/ml



Manual Integration Results

RT: 4.13
Area: 38579
Amount: 0.023692
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:13:42
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

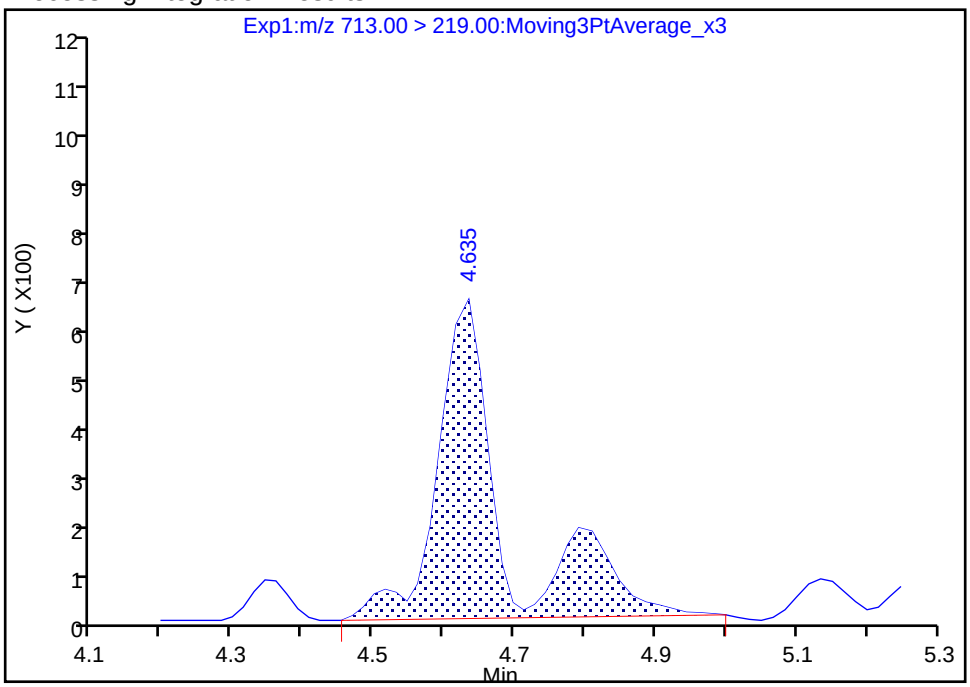
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_005.d
Injection Date: 03-Aug-2018 16:12:27 Instrument ID: A9
Lims ID: IC L1 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

42 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 2

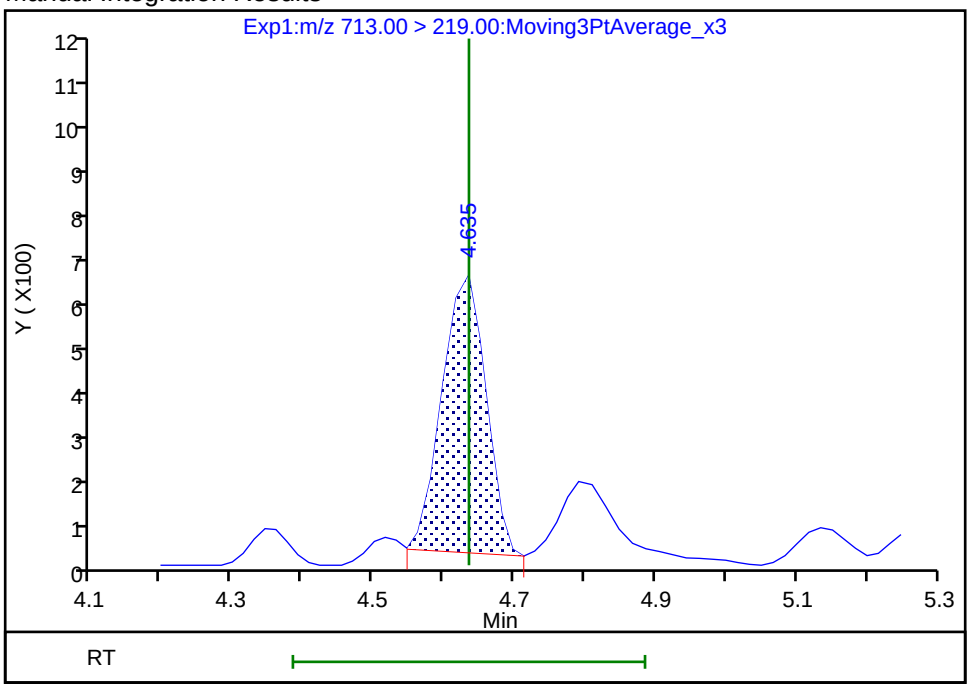
Processing Integration Results

RT: 4.63
Area: 4073
Amount: 0.025083
Amount Units: ng/ml



Manual Integration Results

RT: 4.63
Area: 2613
Amount: 0.025083
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:13:55
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_006.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 03-Aug-2018 16:19:58 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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:17:22 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:51:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.485	1.485	0.0	0.537	6273415	2.33		93.3	5326	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.491	1.486	0.005	1.004	113801	0.0488		97.6	2.8	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.753	1.753	0.0	0.634	5788542	2.41		96.3	9412	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.753	1.754	-0.001	1.000	123668	0.0524		105	5.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.795	1.792	0.003	0.649	83335	2.24		96.2	290	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.795	1.794	0.001	1.000	162604	0.0439		99.4	154	
298.90 > 99.00	1.795	1.794	0.001	1.000	55514		2.93(1.35-4.05)	99.4	17.6	
D 60 M2-4:2FTS										
329.00 > 81.00	2.006	2.006	0.0	0.726	555044	NC			365	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.006	2.009	-0.003	1.118	25922	0.0425		91.0	136	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.047	2.044	0.003	1.000	116451	0.0508		102	10.4	
313.00 > 119.00	2.047	2.044	0.003	1.000	10685		10.90(6.96-20.87)	102	10.0	M
D 7 13C2 PFHxA										
315.00 > 270.00	2.047	2.046	0.001	0.740	6131410	2.46		98.3	9222	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.069	-0.001	1.152	80313	0.0458		97.7	218	
349.00 > 99.00	2.068	2.069	-0.001	1.152	39507		2.03(1.15-3.45)	97.7	19.1	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.146	0.004	0.778	549410	NC			1415	

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	2.150	2.147	0.003	1.000	19803	NC			6.0	
D 9 13C4-PFHpA										
367.00 > 322.00	2.384	2.384	0.0	0.862	6715731	2.37		94.8	9957	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.384	2.384	0.0	1.000	148328	0.0532		106	11.0	
363.00 > 169.00	2.384	2.384	0.0	1.000	37904		3.91(2.17-6.52)	106	33.2	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.397	2.398	-0.001	1.000	120529	0.0479		105	150	
399.00 > 99.00	2.397	2.398	-0.001	1.000	26753		4.51(1.90-5.70)	105	9.2	M
D 11 18O2 PFHxS										
403.00 > 84.00	2.397	2.400	-0.003	0.867	4652927	2.18		92.2	8159	
65 ADONA										
377.00 > 251.00	2.435	2.435	0.0	0.776	209386	NC			315	
377.00 > 85.00	2.435	2.435	0.0	0.776	90202		2.32(1.05-3.16)		40.6	
D 12 M2-6:2FTS										
429.00 > 81.00	2.733	2.732	0.001	0.988	657438	2.39		100	915	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.733	2.732	0.001	1.000	27660	0.0468		98.7	74.5	
* 62 13C2-PFOA										
415.00 > 370.00	2.765	2.755	0.010		6019497	2.50			6167	
D 14 13C4 PFOA										
417.00 > 372.00	2.765	2.757	0.008	1.000	5898675	2.48		99.3	9425	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.765	2.757	0.008	1.000	138455	0.0536		107	14.1	
413.00 > 169.00	2.765	2.757	0.008	1.000	49438		2.80(1.36-4.08)	107	34.3	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.765	2.767	-0.002	0.881	100013	0.0468		98.4	155	
449.00 > 99.00	2.765	2.767	-0.002	0.881	22674		4.41(1.84-5.53)	98.4	52.2	
D 19 13C5 PFNA										
468.00 > 423.00	3.138	3.140	-0.002	1.135	5090764	2.50		99.9	7662	
D 18 13C4 PFOS										
503.00 > 80.00	3.138	3.140	-0.002	1.135	5051590	2.27		95.2	5920	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.138	3.140	-0.002	1.000	101664	0.0449		96.7	127	
499.00 > 99.00	3.138	3.140	-0.002	1.000	22561		4.51(2.04-6.12)	96.7	40.7	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.138	3.140	-0.002	1.000	121498	0.0566		113	17.2	
463.00 > 169.00	3.138	3.140	-0.002	1.000	18668		6.51(2.68-8.03)	113	25.7	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.346	3.348	-0.002	1.066	120294	NC			164	
D 21 13C8 FOSA										
506.00 > 78.00	3.492	3.485	0.007	1.263	3295383	2.48		99.3	3470	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.492	3.492	0.0	1.113	62749	0.0453		94.5	149	
549.00 > 99.00	3.492	3.492	0.0	1.113	12606		4.98(3.02-9.05)	94.5	221	
D 26 M2-8:2FTS										
529.00 > 81.00	3.492	3.492	0.0	1.263	75406	2.36		98.4	332	

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	3.492	3.492	0.0	1.000	203734	0.0503		101	242	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.492	3.494	-0.002	1.000	21801	0.0494		103	144	
24 Perfluorodecanoic acid										M
513.00 > 469.00	3.508	3.505	0.003	1.000	138721	0.0544		109	16.2	
513.00 > 169.00	3.508	3.505	0.003	1.000	10789		12.86(7.12-21.35)	109	15.0	M
D 23 13C2 PFDA										
515.00 > 470.00	3.508	3.505	0.003	1.269	5190946	2.54		102	9688	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.650	3.650	0.0	1.320	907888	2.29		91.6	2014	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.664	3.662	0.002	1.004	20353	0.0555		111	14.0	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.816	3.816	0.0	1.216	86393	0.0490		102	263	
599.00 > 99.00	3.816	3.816	0.0	1.216	16795		5.14(2.14-6.43)	102	29.4	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.831	3.825	0.006	1.386	825934	2.53		101	1874	
D 30 13C2 PFUnA										
565.00 > 520.00	3.831	3.831	0.0	1.386	4167691	2.53		101	5625	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.831	3.831	0.0	1.000	73811	0.0526		105	17.2	
563.00 > 169.00	3.831	3.831	0.0	1.000	13455		5.49(5.24-15.72)	105	32.3	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.831	3.831	0.0	1.000	13246	0.0447		89.4	29.6	
35 MeFOSA										
512.00 > 169.00	3.983	3.971	0.012		23081	NC			90.6	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.998	3.993	0.005	1.274	122627	NC			696	
D 36 13C2 PFDoA										
615.00 > 570.00	4.128	4.127	0.001	1.493	4405021	2.48		99.1	5735	
37 Perfluorododecanoic acid										M
613.00 > 569.00	4.128	4.127	0.001	1.000	97295	0.0561		112	24.0	
613.00 > 169.00	4.128	4.127	0.001	1.000	9798		9.93(4.68-14.05)	112	34.2	M
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.128	4.127	0.001	1.182	10978	NC			48.9	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.362	4.361	0.001	1.390	6843	NC			38.6	
699.00 > 99.00	4.362	4.361	0.001	1.390	12704		0.54(0.28-0.83)		39.0	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.393	4.392	0.001	1.064	64240	0.0486		97.2	20.0	
663.00 > 169.00	4.393	4.392	0.001	1.064	12853		5.00(3.09-9.27)	97.2	26.7	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.636	4.635	0.001	1.677	2744799	2.42		96.7	5725	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.636	4.635	0.001	1.000	8543	0.0483		96.6	33.4	
713.00 > 219.00	4.636	4.635	0.001	1.000	7000		1.22(0.70-2.09)	96.6	23.8	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.051	5.049	0.002	1.827	2440530	2.34		93.7	5924	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.051	5.049	0.002	1.000	68430	NC			9.5	
813.00 > 169.00	5.051	5.049	0.002	1.000	13393		5.11(2.77-8.32)		55.8	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.398	5.401	-0.003	1.069	32618	NC			34.6	
913.00 > 169.00	5.398	5.401	-0.003	1.069	7087		4.60(2.55-7.64)		61.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 18:17:26 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_006.d

Injection Date: 03-Aug-2018 16:19:58 Instrument ID: A9

Lims ID: IC L2 Full

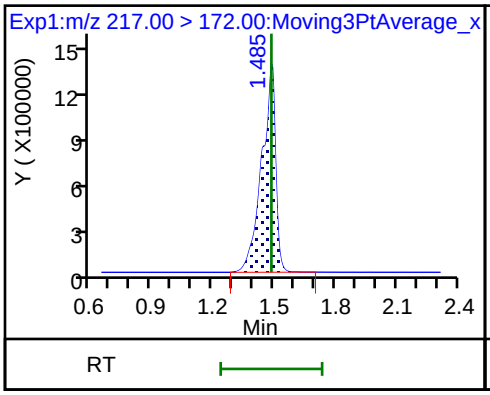
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3

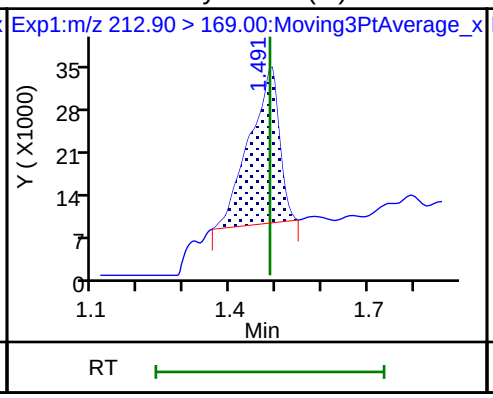
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

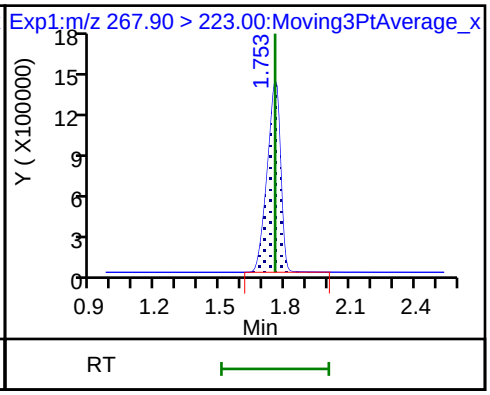
D 1 13C4 PFBA



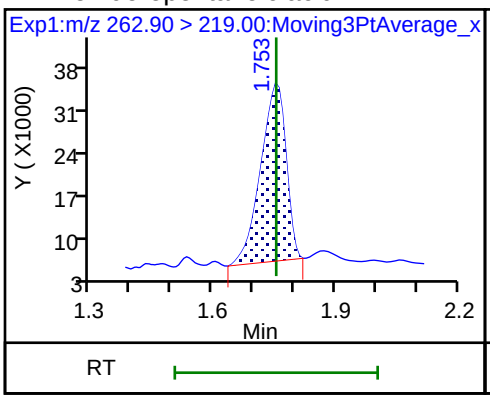
2 Perfluorobutyric acid (M)



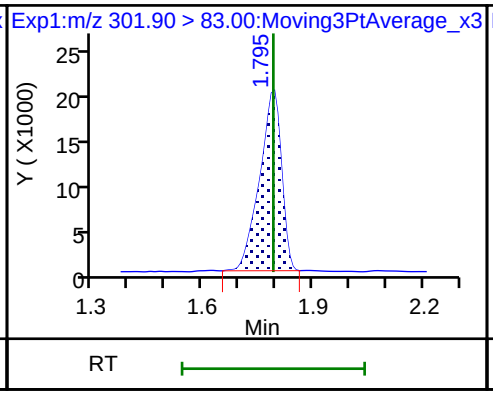
D 3 13C5-PFPeA



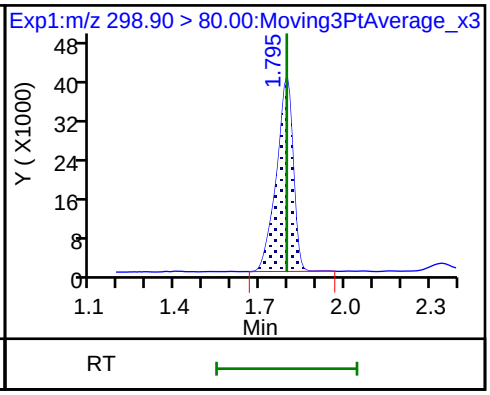
4 Perfluoropentanoic acid



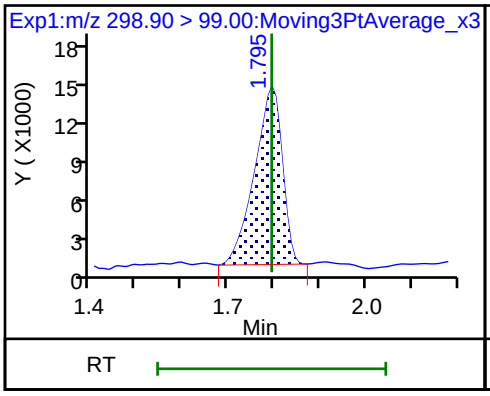
D 47 13C3-PFBS



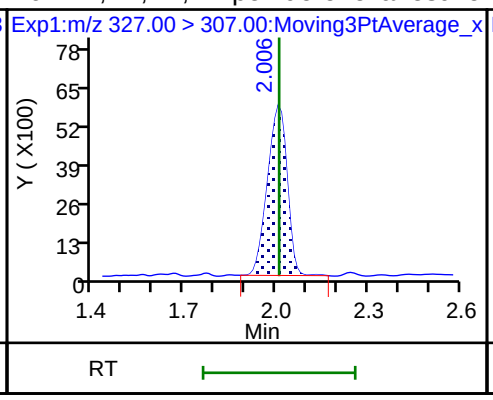
5 Perfluorobutanesulfonic acid



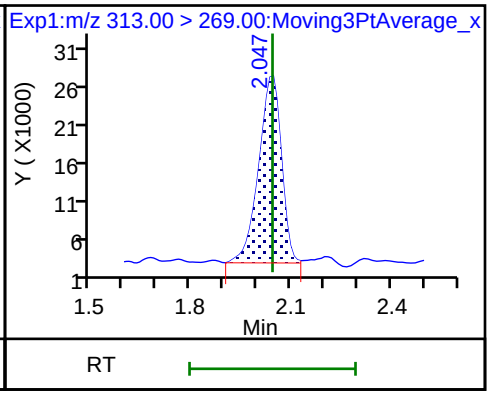
5 Perfluorobutanesulfonic acid



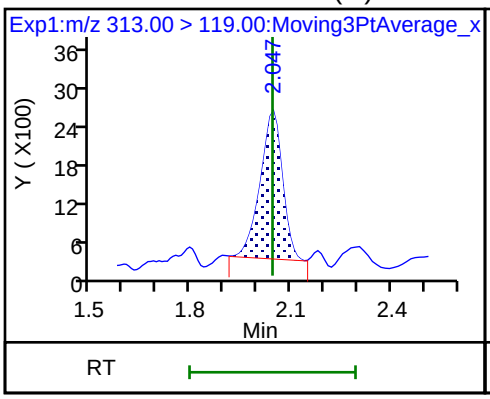
61 1H,1H,2H,2H-perfluorohexanesulfoni



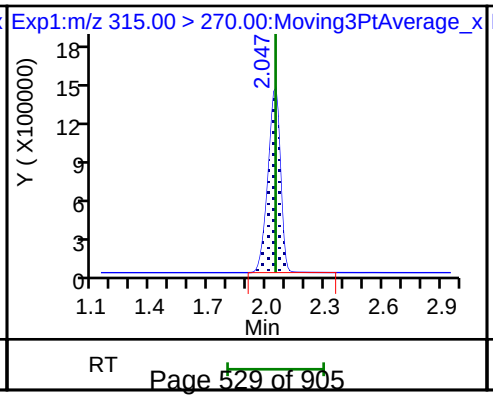
6 Perfluorohexanoic acid



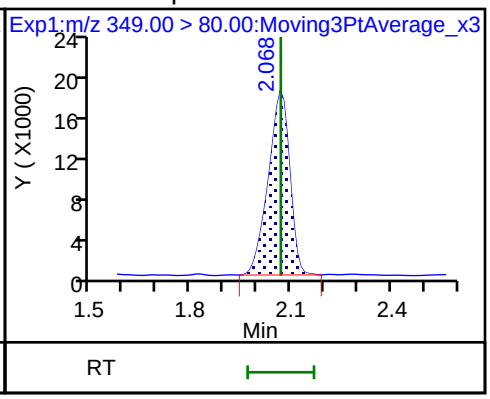
6 Perfluorohexanoic acid (M)



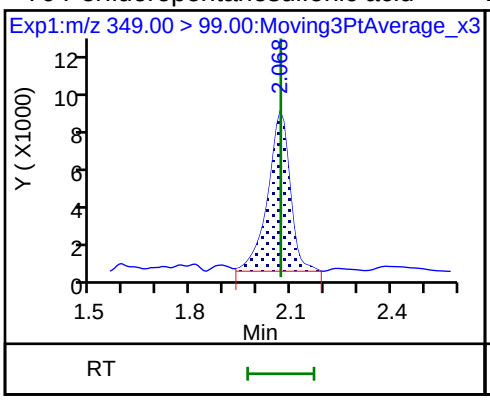
D 7 13C2 PFHxA



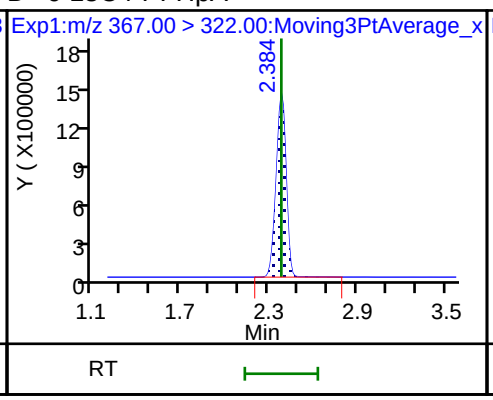
70 Perfluoropentanesulfonic acid



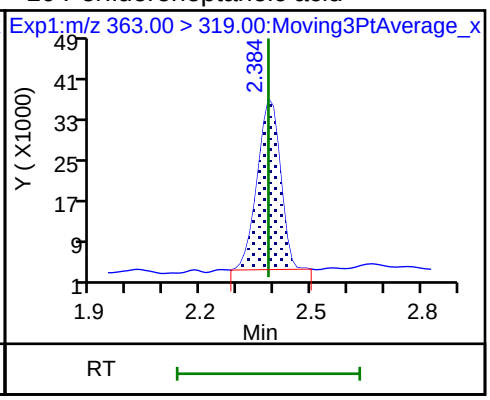
70 Perfluoropentanesulfonic acid



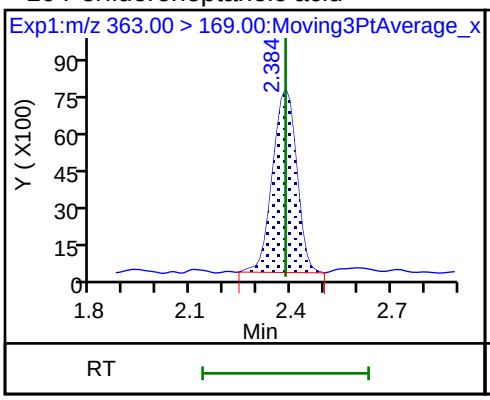
D 9 13C4-PFHpA



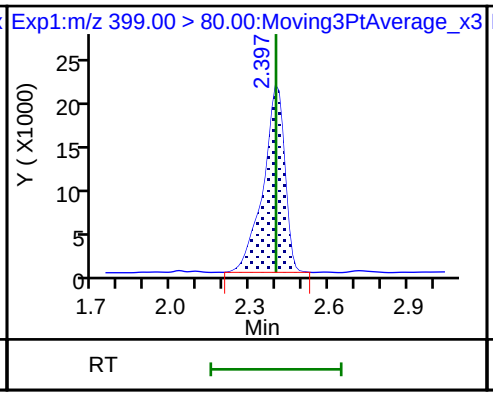
10 Perfluoroheptanoic acid



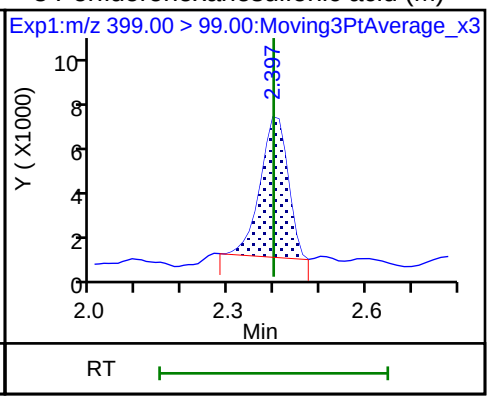
10 Perfluoroheptanoic acid



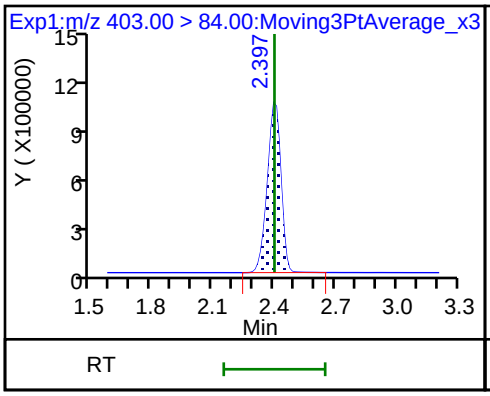
8 Perfluorohexanesulfonic acid



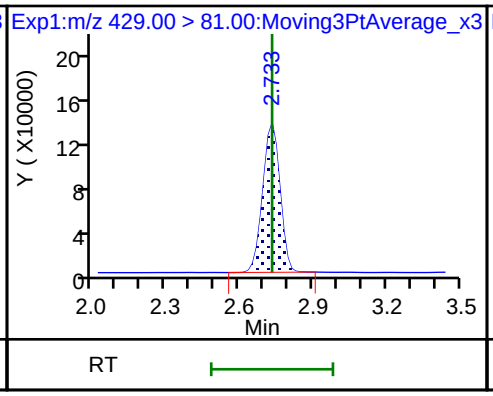
8 Perfluorohexanesulfonic acid (M)



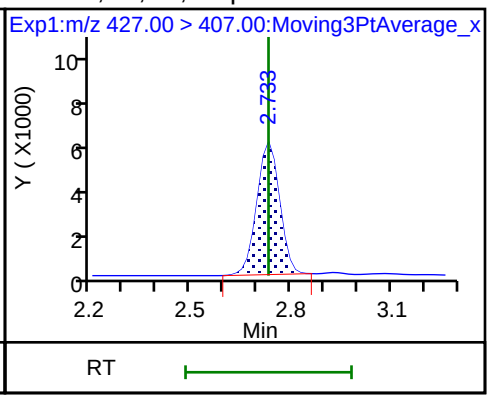
D 11 18O2 PFHxS



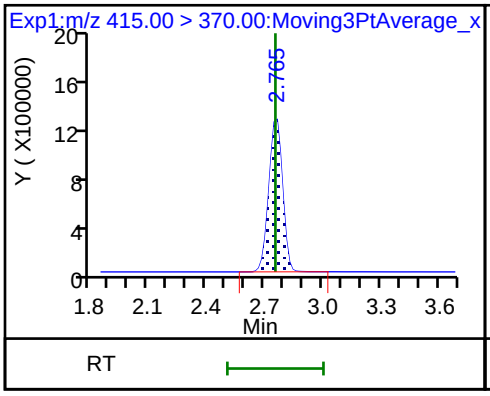
D 12 M2-6:2FTS



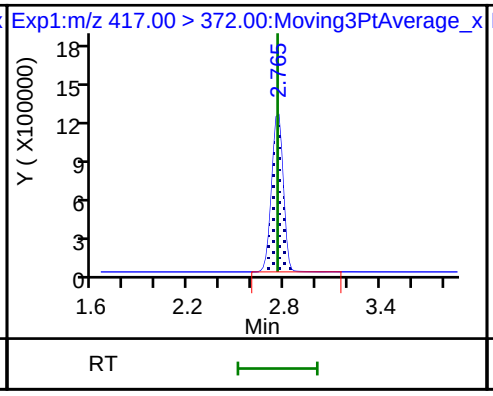
13 1H,1H,2H,2H-perfluorooctanesulfoni



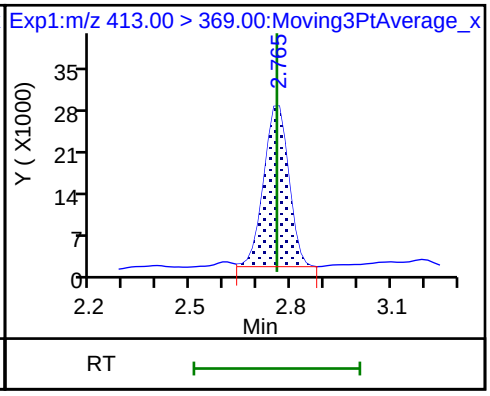
* 62 13C2-PFOA



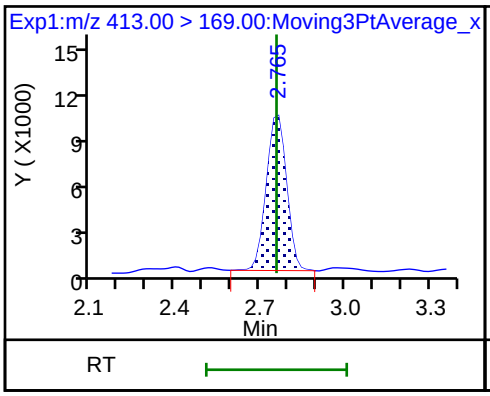
D 14 13C4 PFOA



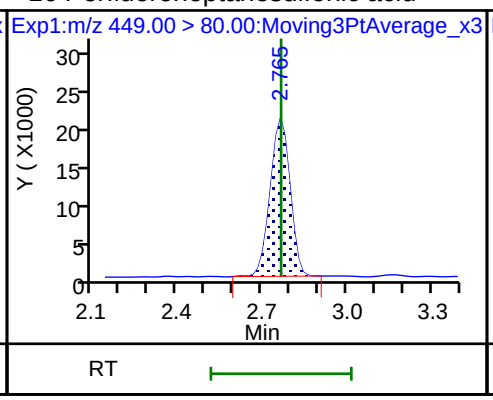
15 Perfluorooctanoic acid



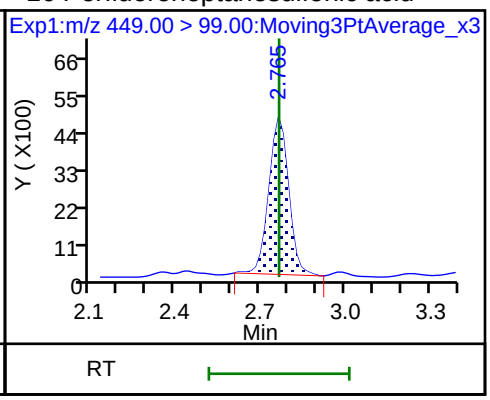
15 Perfluorooctanoic acid



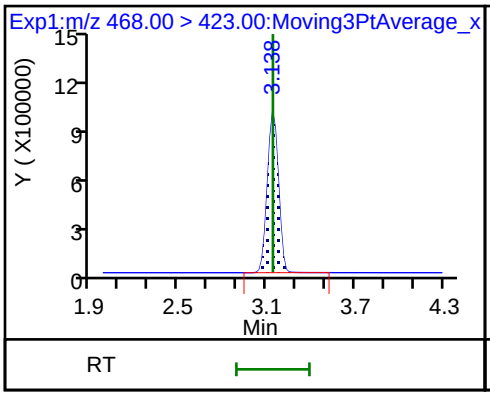
16 Perfluoroheptanesulfonic acid



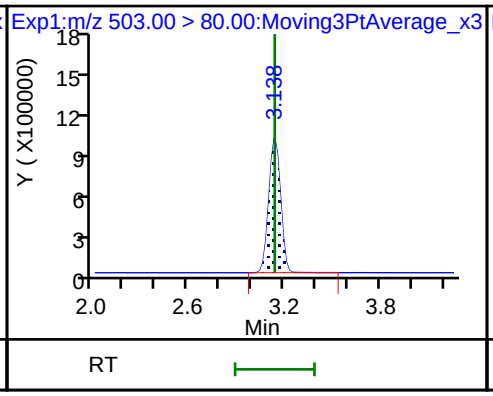
16 Perfluoroheptanesulfonic acid



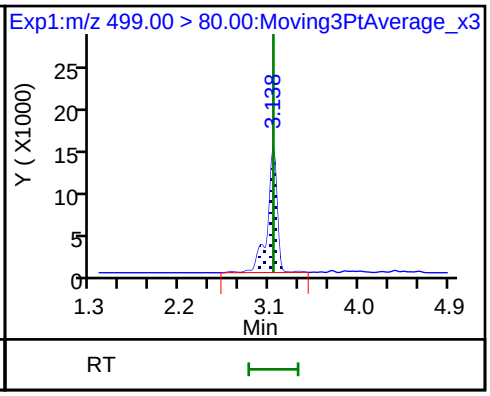
D 19 13C5 PFNA



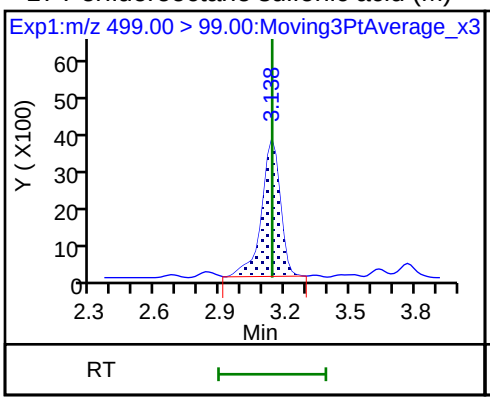
D 18 13C4 PFOS



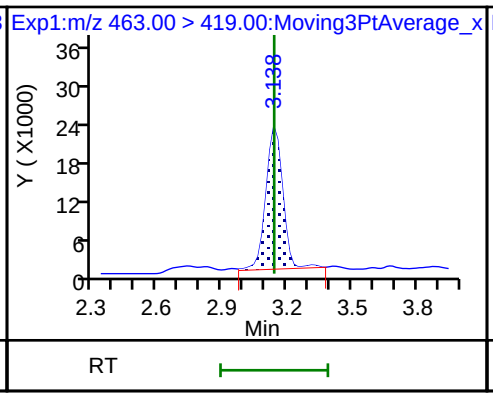
17 Perfluorooctane sulfonic acid



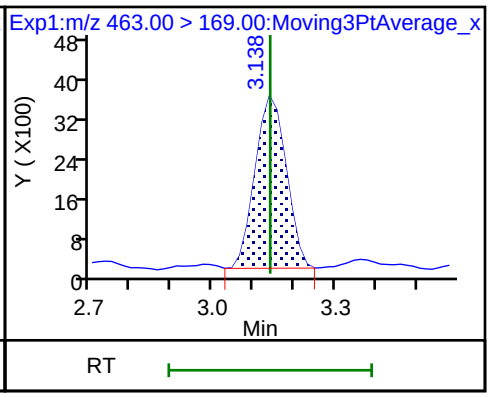
17 Perfluorooctane sulfonic acid (M)



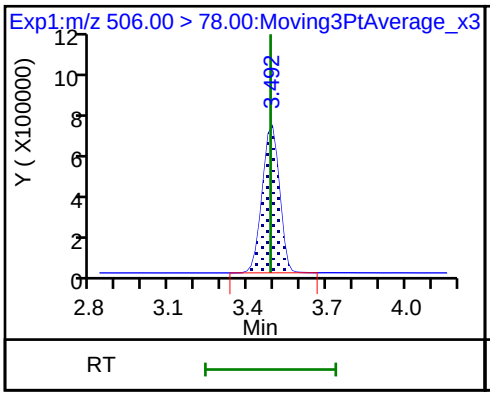
20 Perfluorononanoic acid



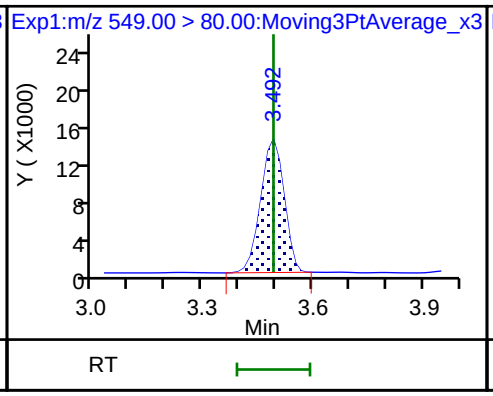
20 Perfluorononanoic acid



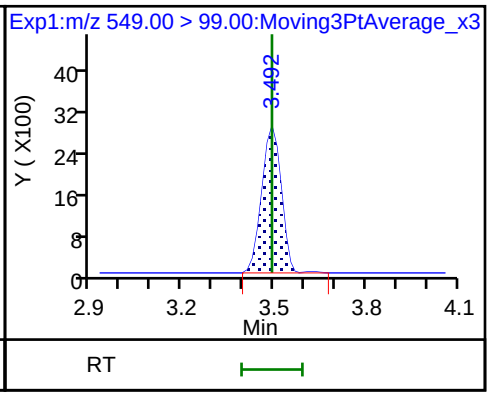
D 21 13C8 FOSA



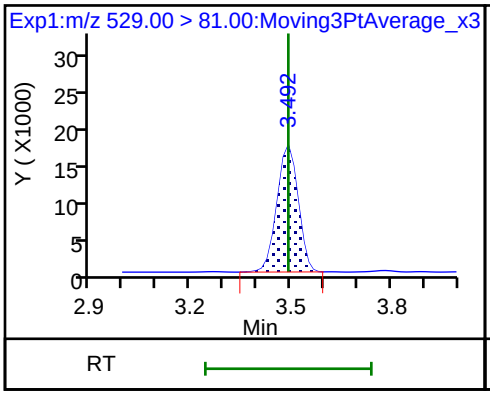
68 Perfluorononanesulfonic acid



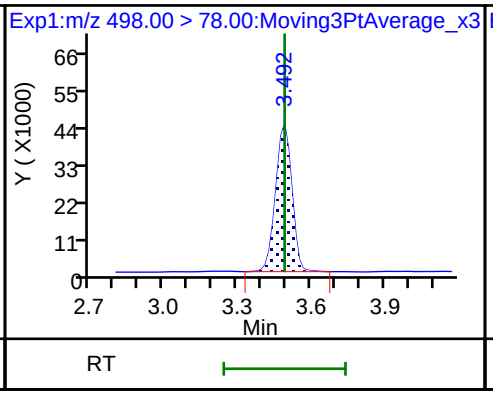
68 Perfluorononanesulfonic acid



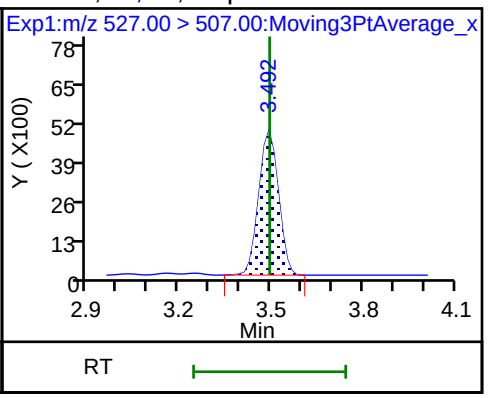
D 26 M2-8:2FTS



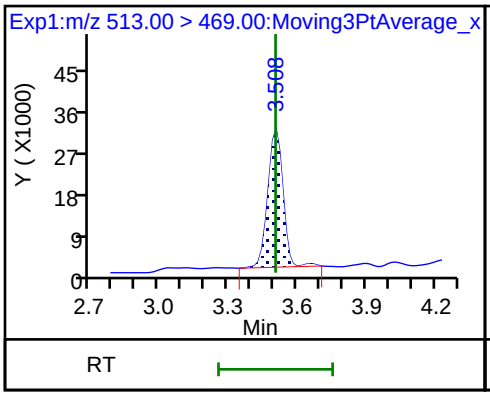
22 Perfluorooctane Sulfonamide



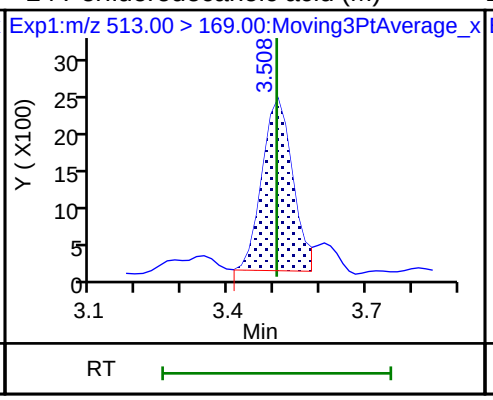
25 1H,1H,2H,2H-perfluorodecanesulfoni



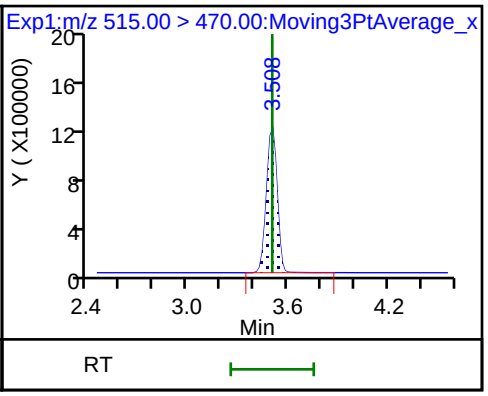
24 Perfluorodecanoic acid



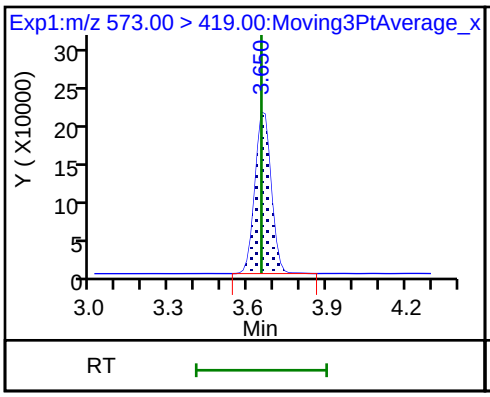
24 Perfluorodecanoic acid (M)



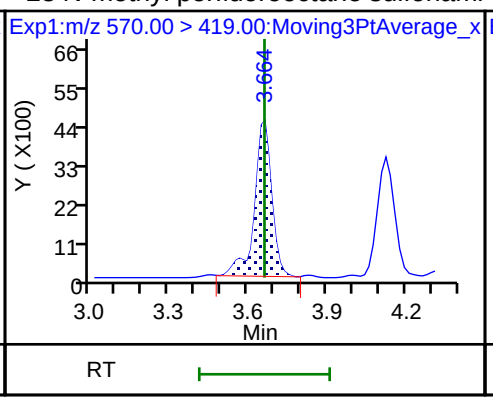
D 23 13C2 PFDA



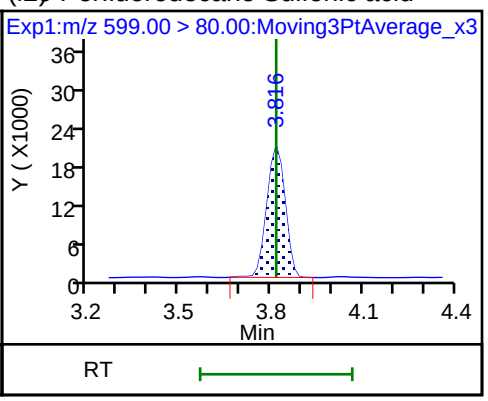
D 27 d3-NMeFOSAA



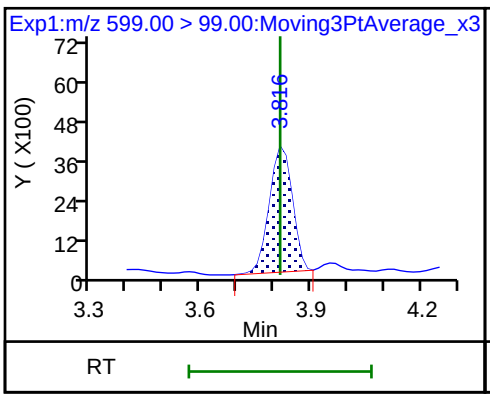
28 N-methyl perfluorooctane sulfonami (M)



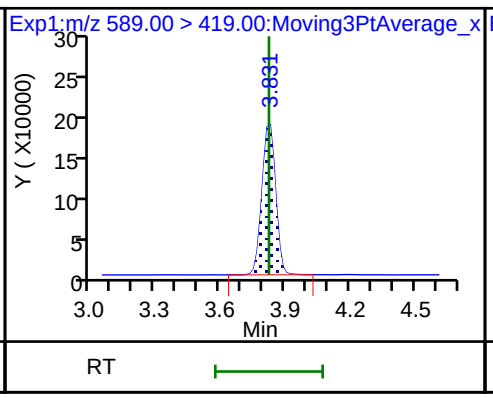
29 Perfluorodecane Sulfonic acid



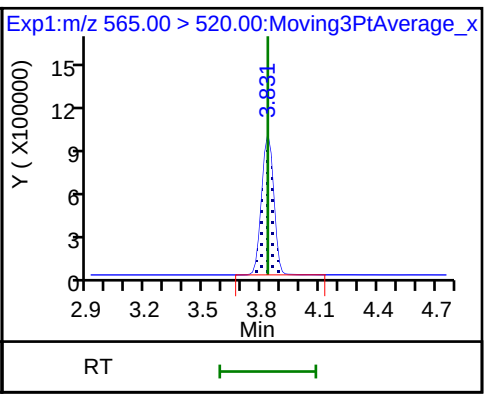
29 Perfluorodecane Sulfonic acid



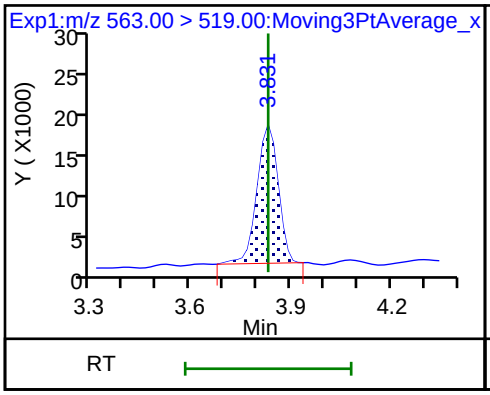
D 32 d5-NEtFOSAA



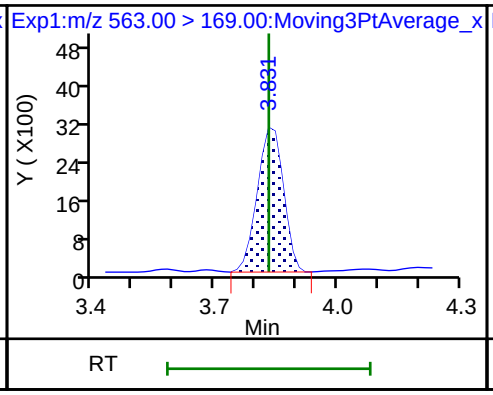
D 30 13C2 PFUnA



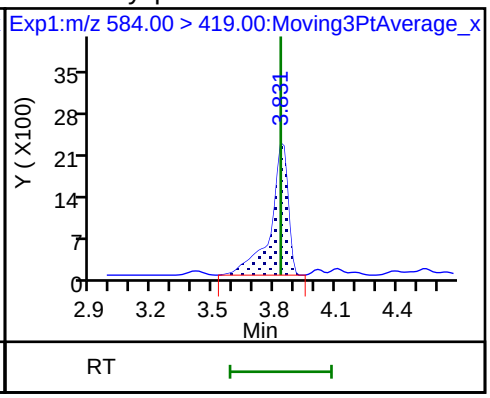
31 Perfluoroundecanoic acid



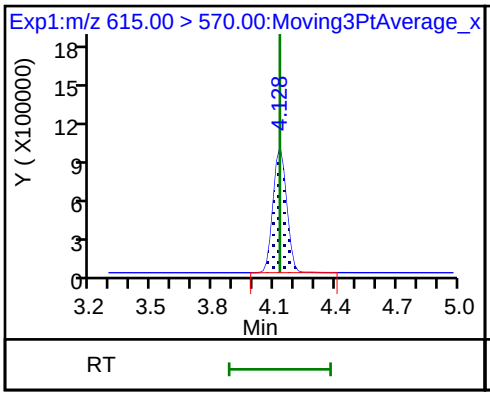
31 Perfluoroundecanoic acid



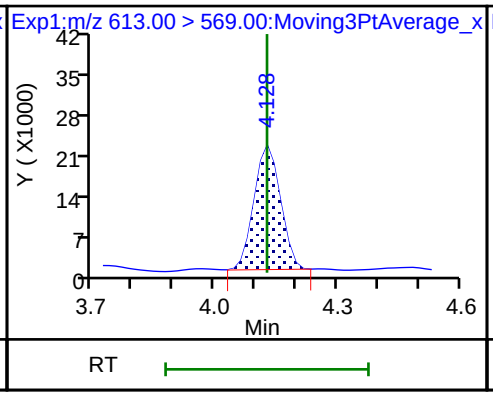
33 N-ethyl perfluorooctane sulfonamid



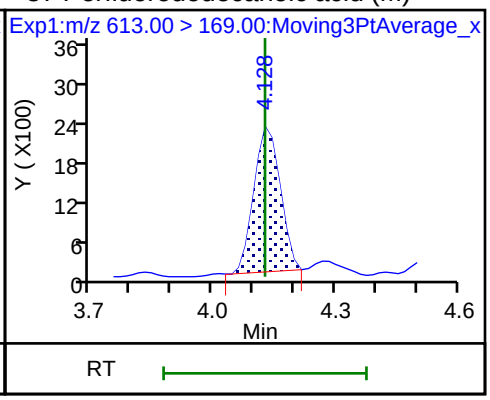
D 36 13C2 PFDoA



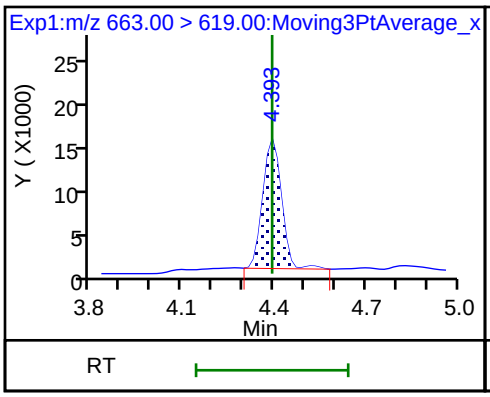
37 Perfluorododecanoic acid



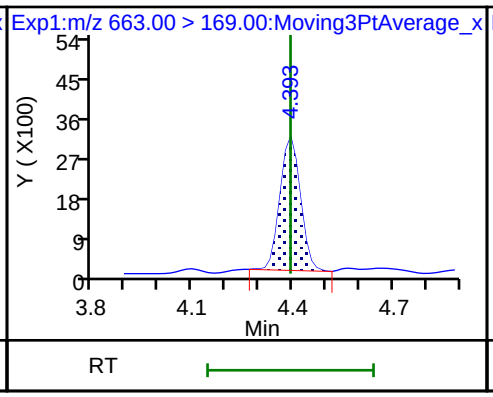
37 Perfluorododecanoic acid (M)



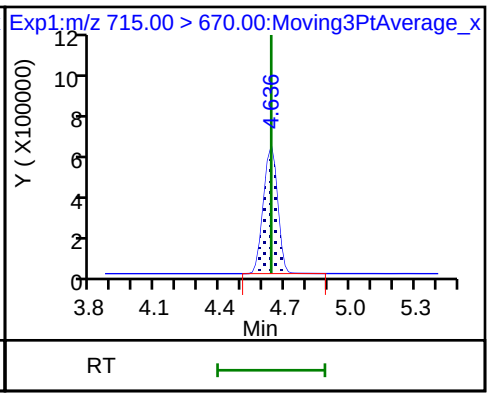
41 Perfluorotridecanoic acid



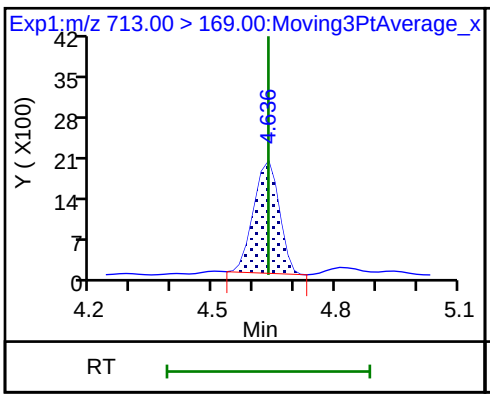
41 Perfluorotridecanoic acid



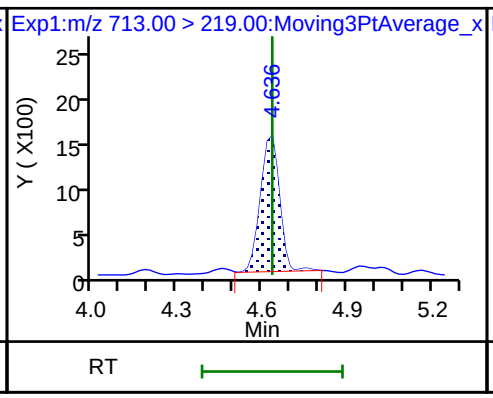
D 43 13C2-PFTeDA



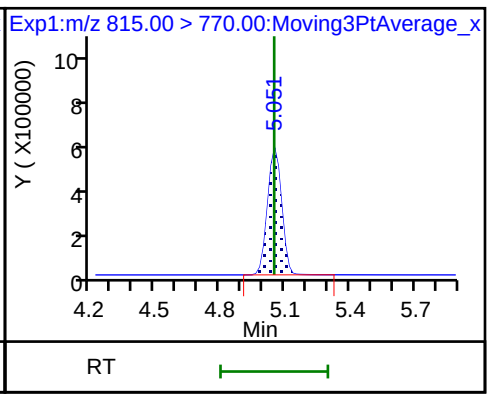
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

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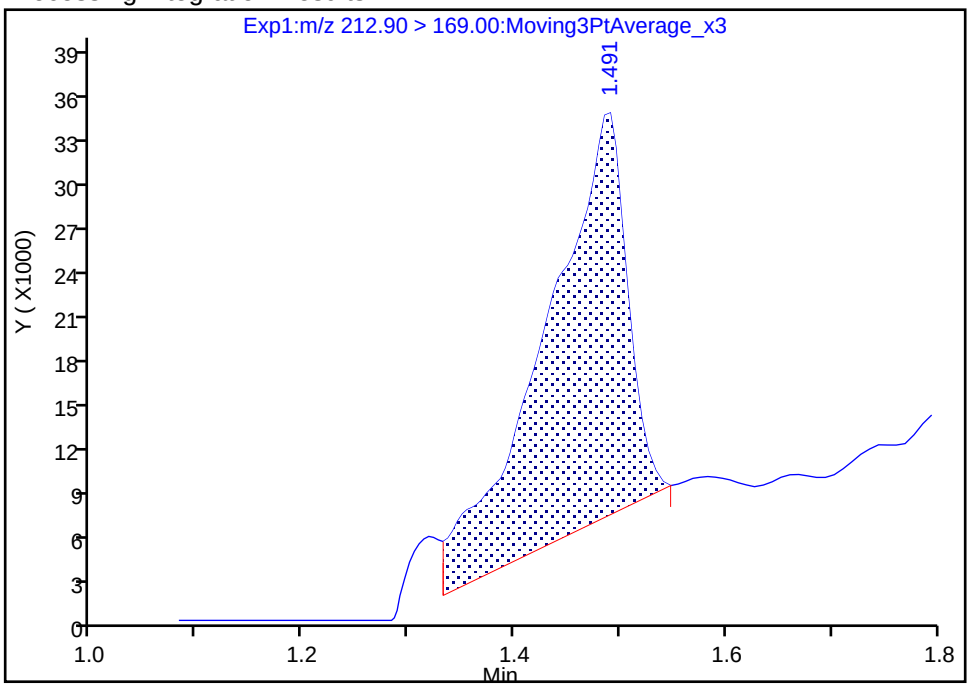
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Injection Date: 03-Aug-2018 16:19:58 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

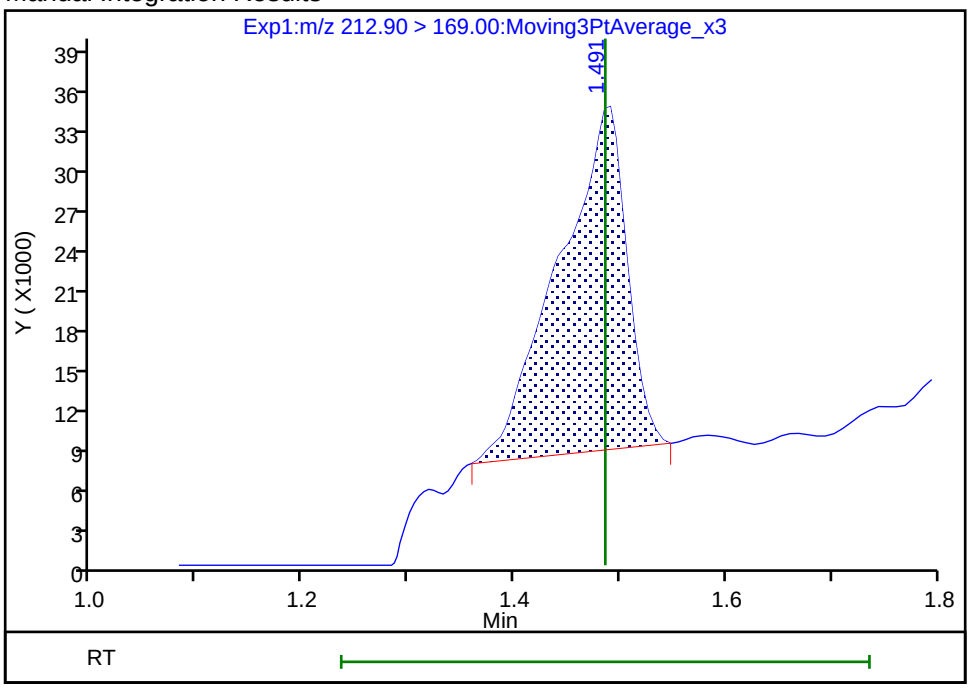
Processing Integration Results

RT: 1.49
Area: 148820
Amount: 0.064321
Amount Units: ng/ml



Manual Integration Results

RT: 1.49
Area: 113801
Amount: 0.048801
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:49:53
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

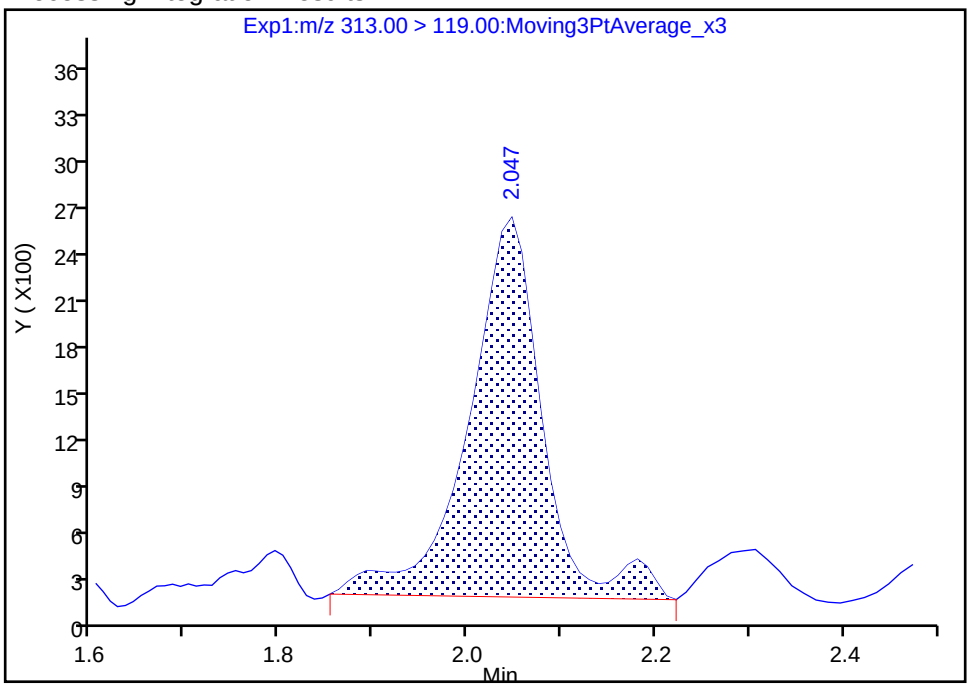
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_006.d
Injection Date: 03-Aug-2018 16:19:58 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

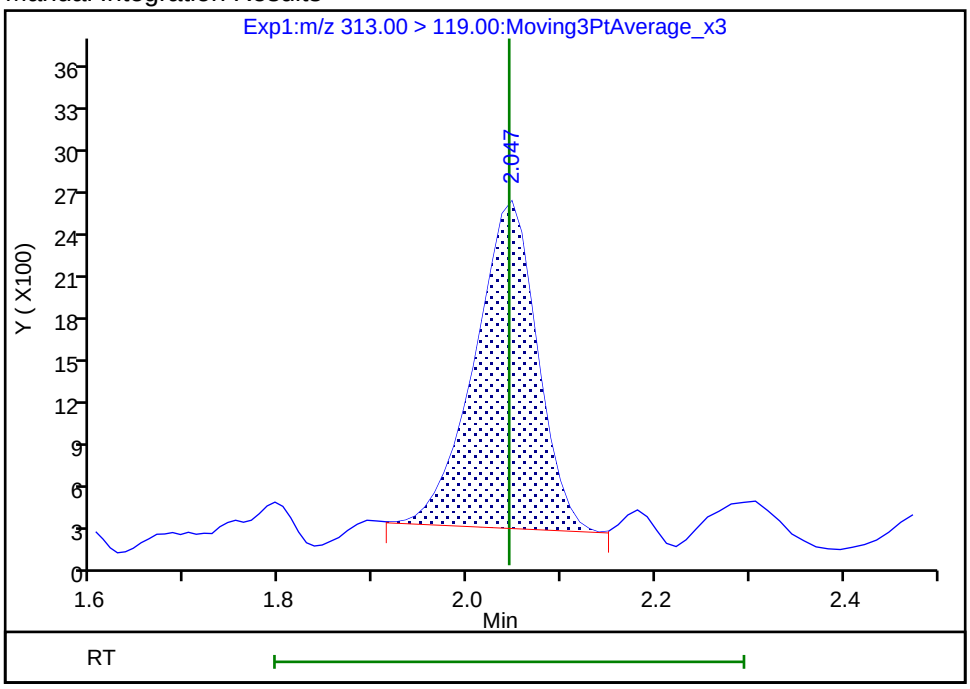
Processing Integration Results

RT: 2.05
Area: 13294
Amount: 0.050757
Amount Units: ng/ml



Manual Integration Results

RT: 2.05
Area: 10685
Amount: 0.050757
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:50:03
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

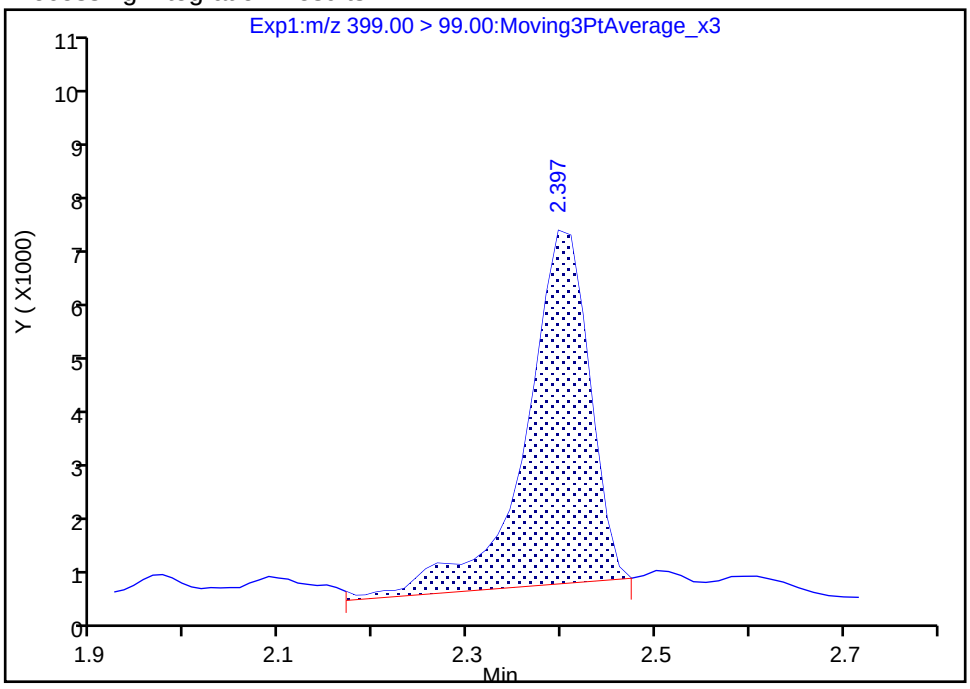
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_006.d
Injection Date: 03-Aug-2018 16:19:58 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

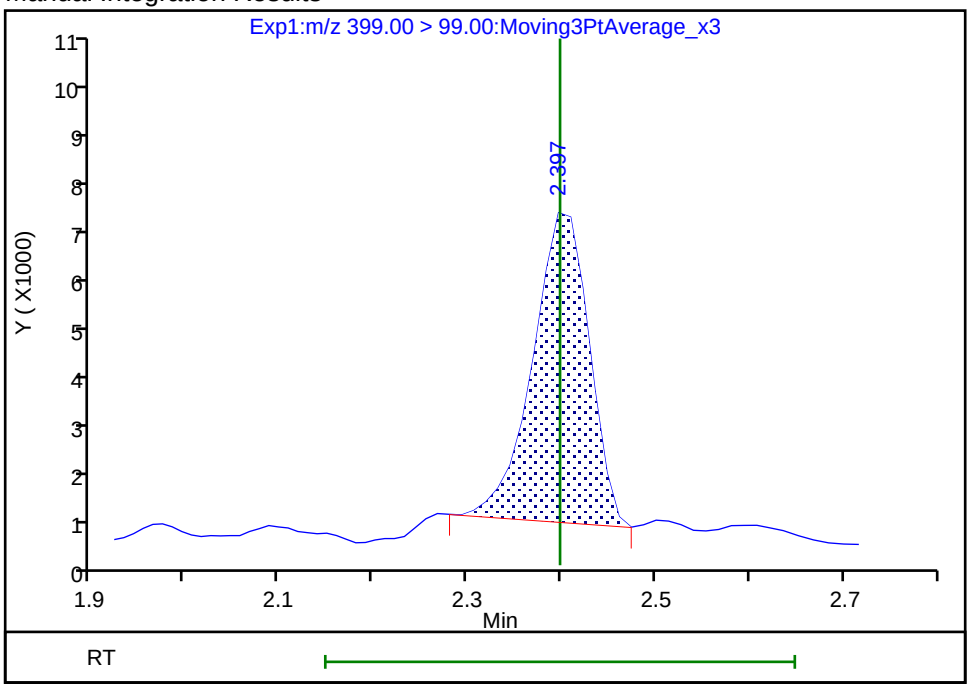
Processing Integration Results

RT: 2.40
Area: 31377
Amount: 0.047889
Amount Units: ng/ml



Manual Integration Results

RT: 2.40
Area: 26753
Amount: 0.047889
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:50:14
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

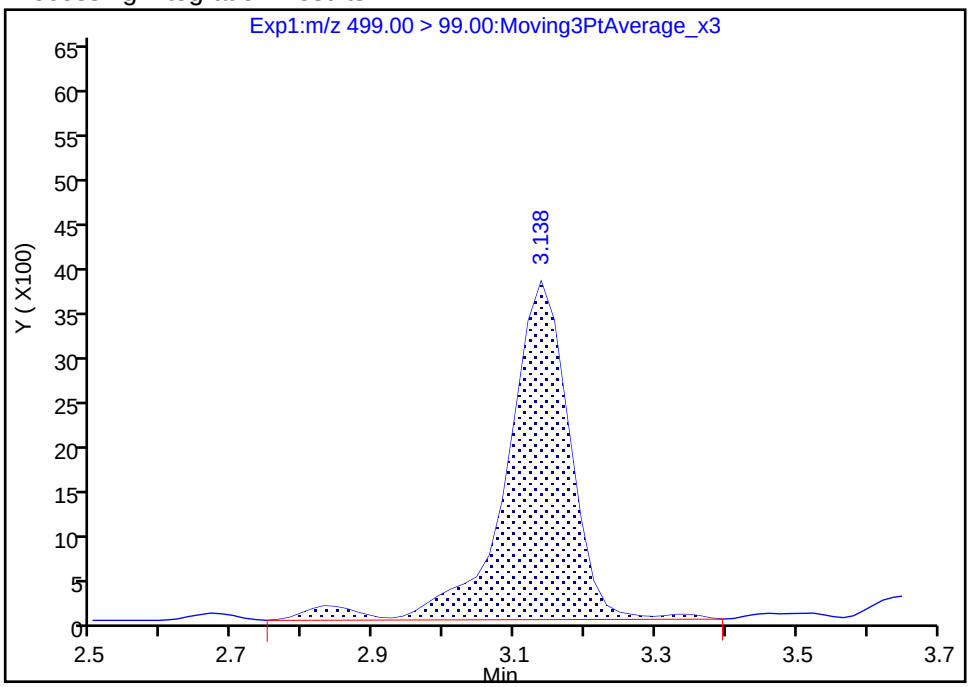
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_006.d
Injection Date: 03-Aug-2018 16:19:58 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

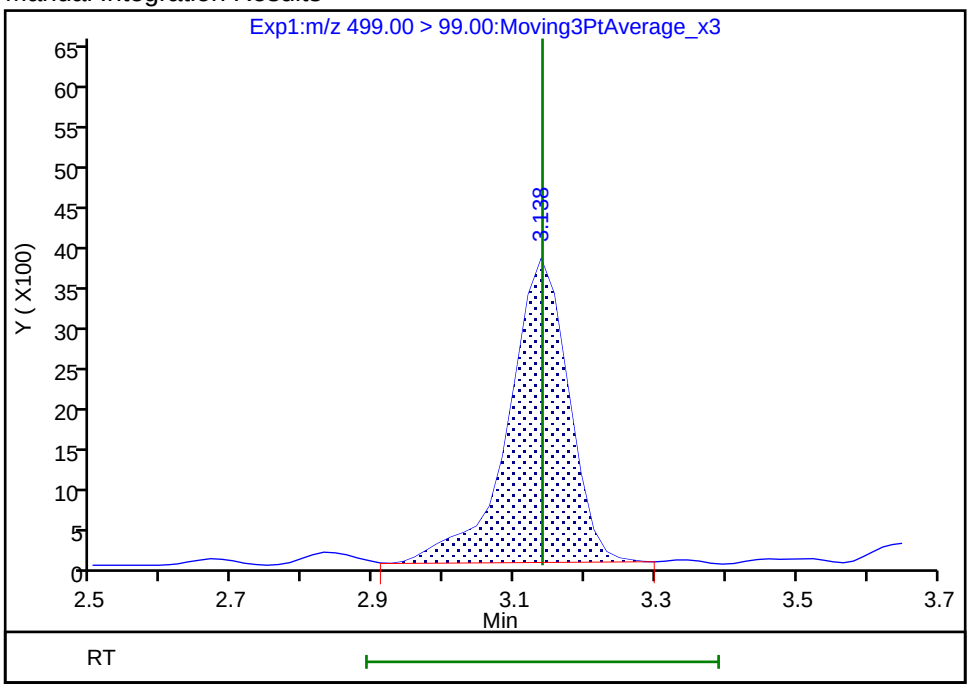
Processing Integration Results

RT: 3.14
Area: 24160
Amount: 0.044850
Amount Units: ng/ml



Manual Integration Results

RT: 3.14
Area: 22561
Amount: 0.044850
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:50:24
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

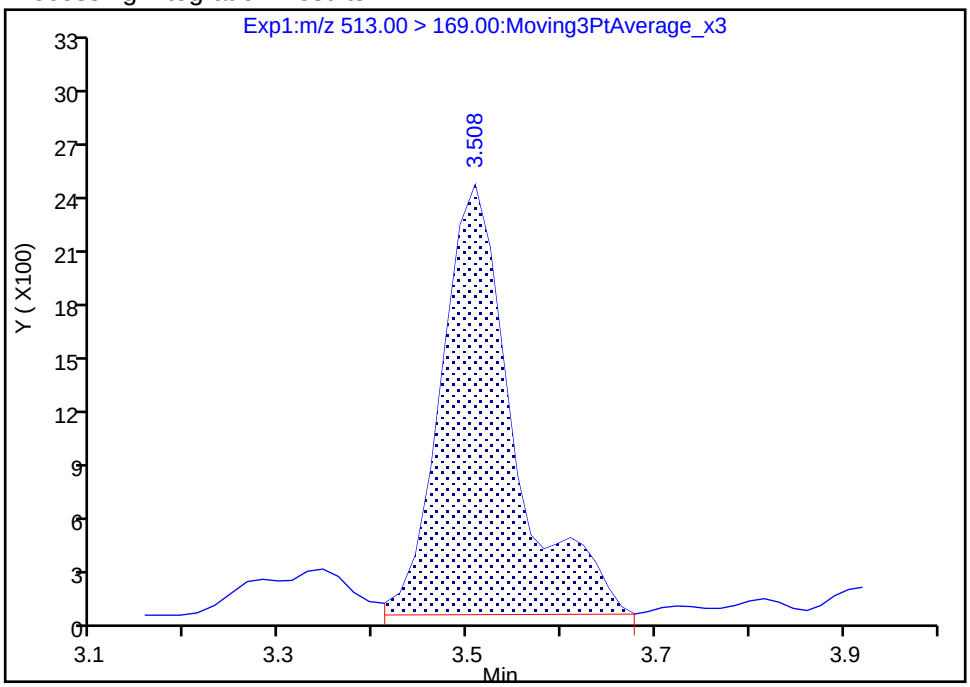
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_006.d
Injection Date: 03-Aug-2018 16:19:58 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 2

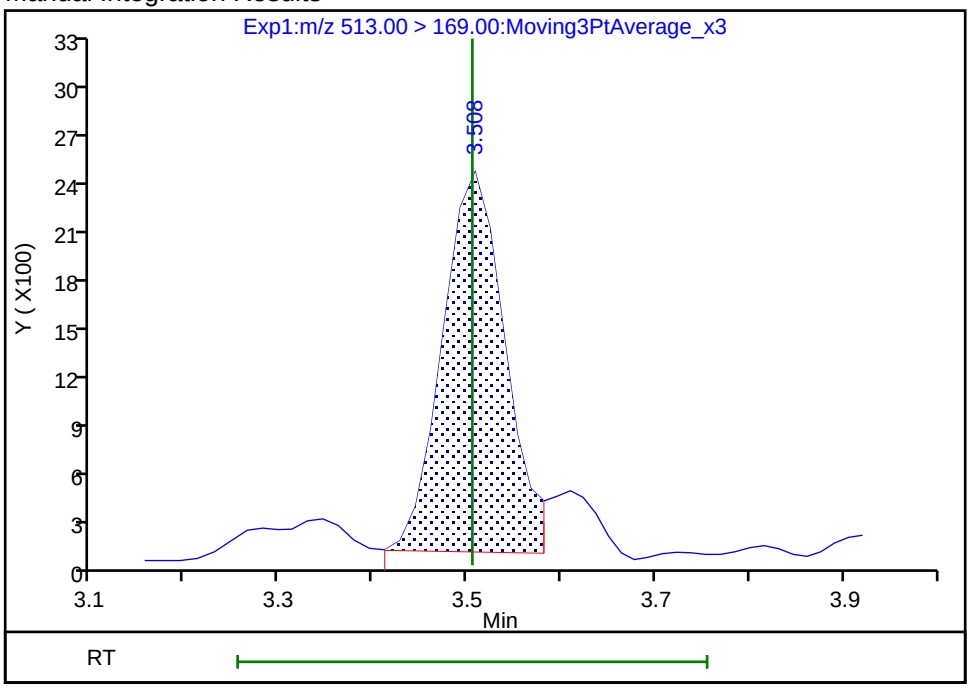
Processing Integration Results

RT: 3.51
Area: 12850
Amount: 0.054351
Amount Units: ng/ml



Manual Integration Results

RT: 3.51
Area: 10789
Amount: 0.054351
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:50:39
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

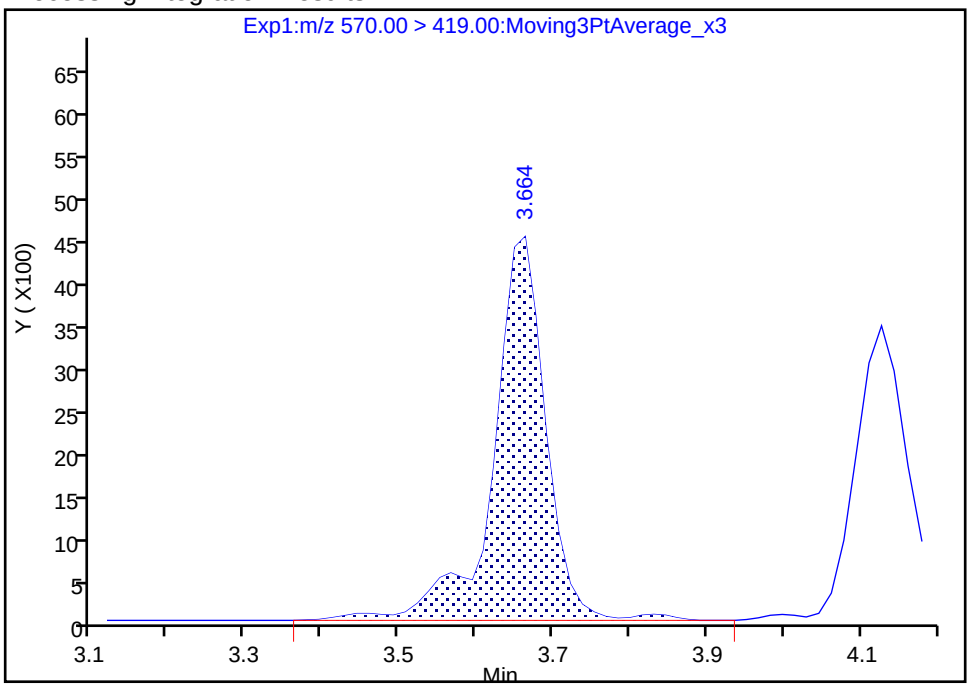
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Injection Date: 03-Aug-2018 16:19:58 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

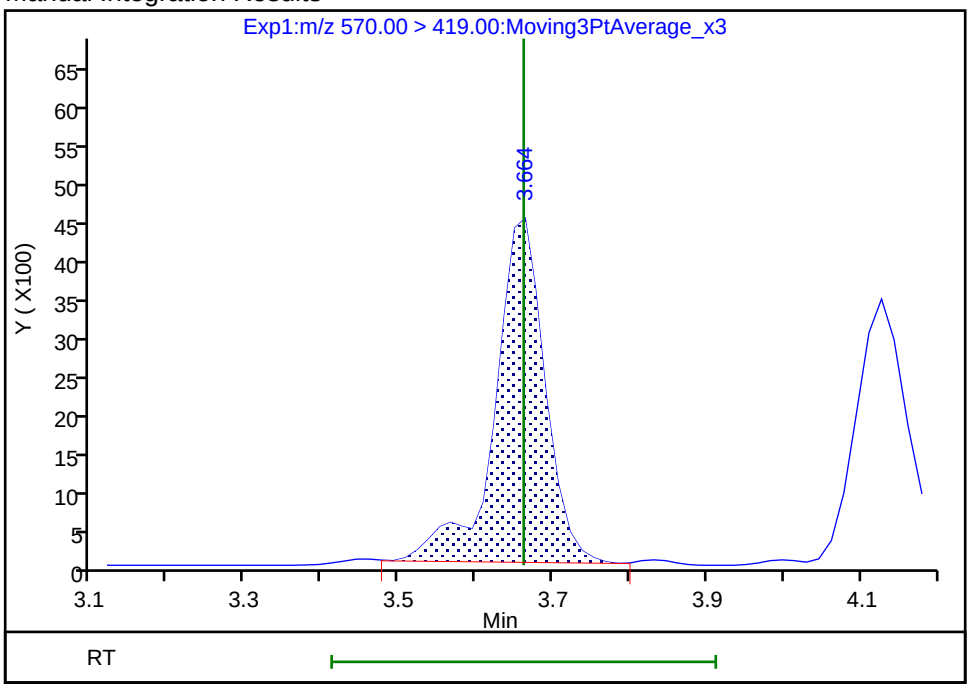
Processing Integration Results

RT: 3.66
Area: 21638
Amount: 0.058371
Amount Units: ng/ml



Manual Integration Results

RT: 3.66
Area: 20353
Amount: 0.055453
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:50:48
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

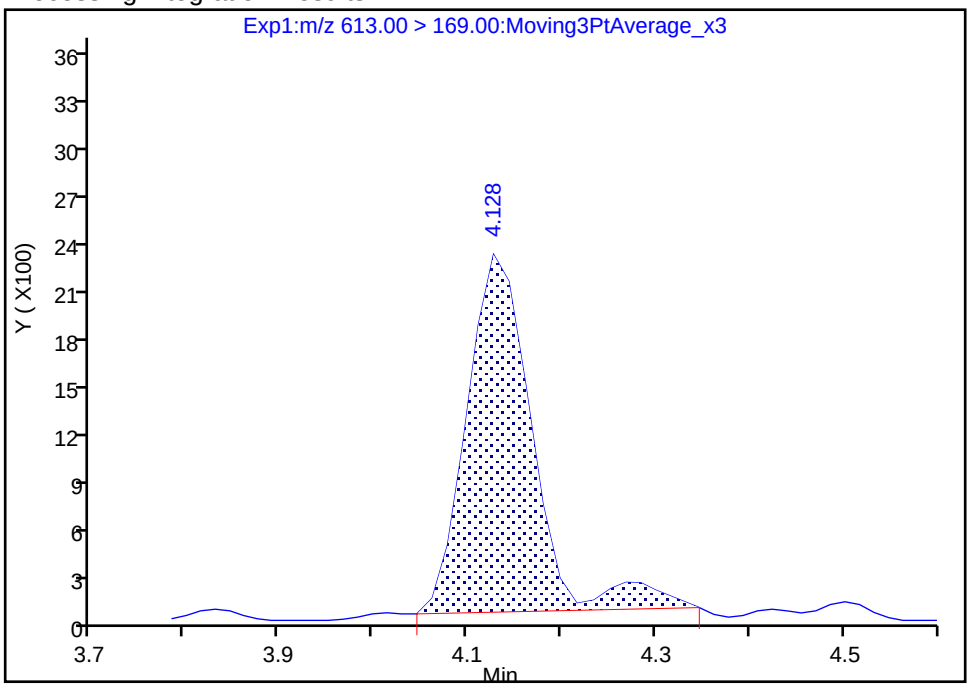
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_006.d
Injection Date: 03-Aug-2018 16:19:58 Instrument ID: A9
Lims ID: IC L2 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 2

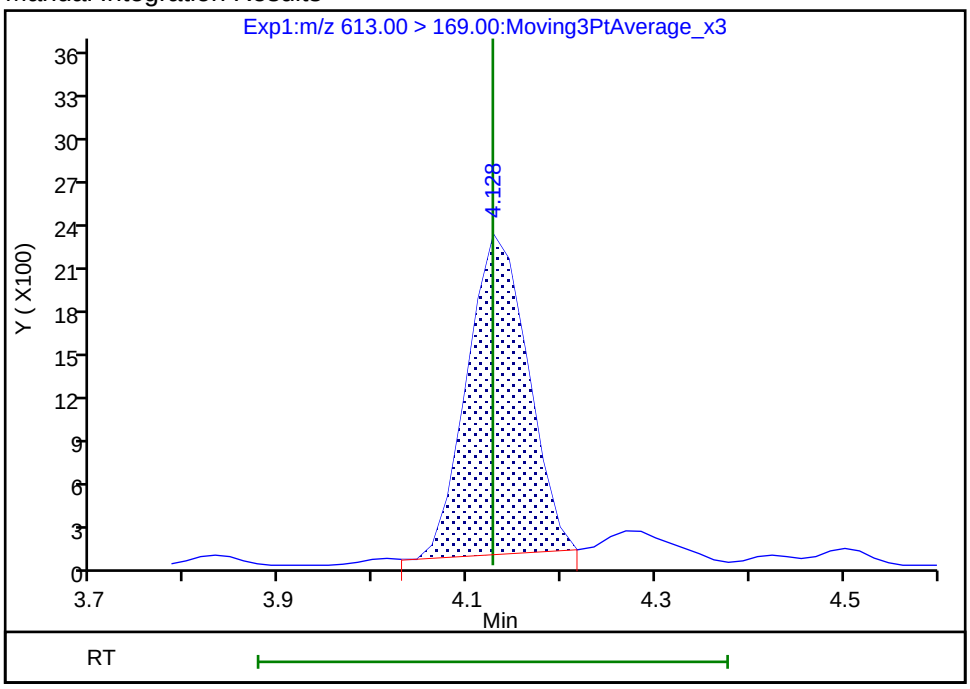
Processing Integration Results

RT: 4.13
Area: 10774
Amount: 0.056149
Amount Units: ng/ml



Manual Integration Results

RT: 4.13
Area: 9798
Amount: 0.056149
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:50:59
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_007.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 03-Aug-2018 16:27:29 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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:17:31 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:52:51

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	1.486	1.485	0.001	0.540	6381009	2.32		92.8	6416	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.486	1.486	0.0	1.000	587057	0.2475		99.0	13.1	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.753	0.002	0.638	5776616	2.35		94.0	9315	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.754	0.001	1.000	600625	0.2548		102	26.6	
D 47 13C3-PFBS										
301.90 > 83.00	1.788	1.792	-0.004	0.650	84657	2.22		95.6	249	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.794	0.003	1.005	813836	0.2164		97.9	639	
298.90 > 99.00	1.797	1.794	0.003	1.005	299311		2.72(1.35-4.05)	97.9	98.9	
D 60 M2-4:2FTS										
329.00 > 81.00	2.008	2.006	0.002	0.730	570224	NC			338	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.008	2.009	-0.001	1.123	137395	0.2217		94.9	570	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.039	2.044	-0.005	0.995	540737	0.2415		96.6	49.5	
313.00 > 119.00	2.049	2.044	0.005	1.000	41947		12.89(6.96-20.87)	96.6	34.5	
D 7 13C2 PFHxA										
315.00 > 270.00	2.049	2.046	0.003	0.745	5983609	2.34		93.8	5772	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.070	2.069	0.001	1.157	403451	0.2266		96.6	1243	
349.00 > 99.00	2.070	2.069	0.001	1.157	187921		2.15(1.15-3.45)	96.6	105	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.152	2.146	0.006	0.782	490263	NC			1528	

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	2.142	2.147	-0.005	0.995	119832	NC			38.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.384	0.002	0.867	7086577	2.45		97.8	9339	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.384	0.002	1.000	736383	0.2502		100	49.4	
363.00 > 169.00	2.386	2.384	0.002	1.000	169669		4.34(2.17-6.52)	100	152	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.398	0.001	1.000	567484	0.2170		95.4	654	
399.00 > 99.00	2.399	2.398	0.001	1.000	148745		3.82(1.90-5.70)	95.4	41.7	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.400	-0.001	0.872	4834908	2.22		93.7	8456	
65 ADONA										
377.00 > 251.00	2.438	2.435	0.003	0.776	1141401	NC			1515	
377.00 > 85.00	2.438	2.435	0.003	0.776	459439		2.48(1.05-3.16)		204	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.732	0.003	0.994	617490	2.19		92.3	894	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.732	0.003	1.000	133796	0.2408		102	581	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.755	-0.004		6155062	2.50			9778	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.757	-0.006	1.000	5683176	2.34		93.6	8449	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.757	-0.006	1.000	626191	0.2514		100	61.1	
413.00 > 169.00	2.751	2.757	-0.006	1.000	235691		2.66(1.36-4.08)	100	168	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.881	516142	0.2466		104	682	
449.00 > 99.00	2.767	2.767	0.0	0.881	129463		3.99(1.84-5.53)	104	266	
D 19 13C5 PFNA										
468.00 > 423.00	3.140	3.140	0.0	1.141	4951980	2.38		95.1	4991	
D 18 13C4 PFOS										
503.00 > 80.00	3.140	3.140	0.0	1.141	4950130	2.18		91.2	5227	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.140	3.140	0.0	1.000	513415	0.2311		99.6	429	
499.00 > 99.00	3.140	3.140	0.0	1.000	117750		4.36(2.04-6.12)	99.6	200	
20 Perfluorononanoic acid										
463.00 > 419.00	3.140	3.140	0.0	1.000	524304	0.2510		100	76.9	
463.00 > 169.00	3.140	3.140	0.0	1.000	108494		4.83(2.68-8.03)	100	153	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.348	3.348	0.0	1.066	580044	NC			792	
D 21 13C8 FOSA										
506.00 > 78.00	3.479	3.485	-0.006	1.265	3340672	2.46		98.5	3592	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.494	3.492	0.002	1.113	353704	0.2608		109	745	
549.00 > 99.00	3.494	3.492	0.002	1.113	57339		6.17(3.02-9.05)	109	324	
D 26 M2-8:2FTS										
529.00 > 81.00	3.494	3.492	0.002	1.270	76604	2.34		97.7	461	

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	3.494	3.492	0.002	1.004	1055835	0.2573		103	941	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.494	3.494	0.0	1.000	104586	0.2332		97.4	532	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.509	3.505	0.004	1.000	663493	0.2612		104	79.1	
513.00 > 169.00	3.509	3.505	0.004	1.000	46893		14.15(7.12-21.35)	104	66.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.509	3.505	0.004	1.276	5165264	2.48		99.0	8513	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.650	3.650	0.0	1.327	878656	2.17		86.7	1827	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.663	3.662	0.001	1.004	90688	0.2553		102	53.0	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.815	3.816	-0.001	1.215	437557	0.2535		105	951	
599.00 > 99.00	3.815	3.816	-0.001	1.215	87751		4.99(2.14-6.43)	105	156	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.831	3.825	0.006	1.392	803397	2.41		96.5	1664	
D 30 13C2 PFUnA										
565.00 > 520.00	3.831	3.831	0.0	1.392	4060489	2.41		96.3	6789	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.831	3.831	0.0	1.000	346386	0.2533		101	70.5	
563.00 > 169.00	3.831	3.831	0.0	1.000	31214		11.10(5.24-15.72)	101	74.2	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.831	3.831	0.0	1.000	71271	0.2473		98.9	159	
35 MeFOSA										
512.00 > 169.00	3.965	3.971	-0.006		134737	NC			341	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.997	3.993	0.004	1.273	639205	NC			2191	
D 36 13C2 PFDoA										
615.00 > 570.00	4.126	4.127	-0.001	1.500	4519004	2.49		99.4	5597	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.126	4.127	-0.001	1.000	434793	0.2446		97.8	97.4	
613.00 > 169.00	4.126	4.127	-0.001	1.000	45472		9.56(4.68-14.05)	97.8	115	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.126	4.127	-0.001	1.181	58035	NC			322	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.360	4.361	-0.001	1.389	45649	NC			242	
699.00 > 99.00	4.360	4.361	-0.001	1.389	75939		0.60(0.28-0.83)		333	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.391	4.392	-0.001	1.064	329625	0.2430		97.2	93.3	
663.00 > 169.00	4.391	4.392	-0.001	1.064	53186		6.20(3.09-9.27)	97.2	121	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.634	4.635	-0.001	1.684	2823583	2.43		97.3	6689	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.634	4.635	-0.001	1.000	41015	0.2254		90.2	177	
713.00 > 219.00	4.634	4.635	-0.001	1.000	29011		1.41(0.70-2.09)	90.2	111	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.046	5.049	-0.003	1.834	2534296	2.38		95.2	4734	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.046	5.049	-0.003	1.000	262895	NC			34.1	
813.00 > 169.00	5.046	5.049	-0.003	1.000	46447		5.66(2.77-8.32)		153	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.409	5.401	0.008	1.072	180156	NC			186	
913.00 > 169.00	5.395	5.401	-0.006	1.069	34023		5.30(2.55-7.64)		271	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL3_00006 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 18:17:33 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_007.d

Injection Date: 03-Aug-2018 16:27:29 Instrument ID: A9

Lims ID: IC L3 Full

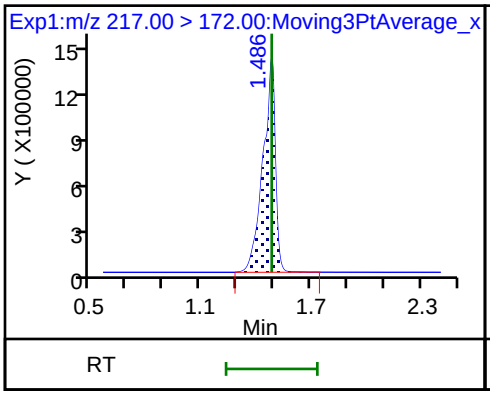
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 12 Worklist Smp#: 4

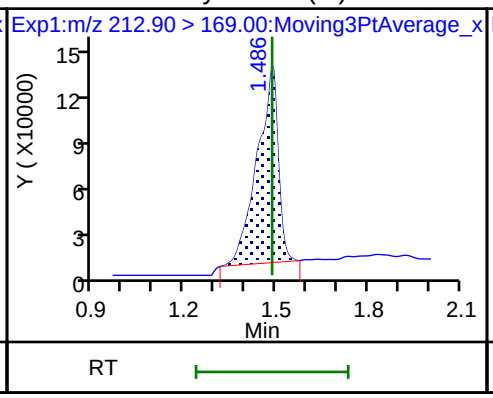
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

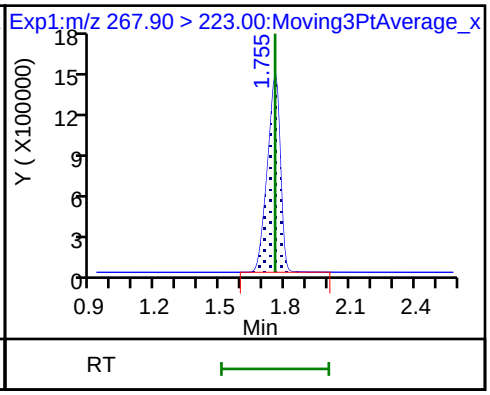
D 1 13C4 PFBA



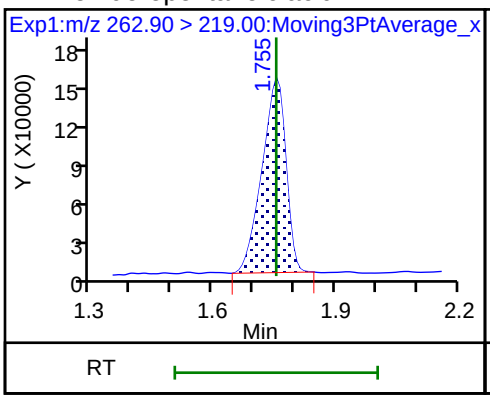
2 Perfluorobutyric acid (M)



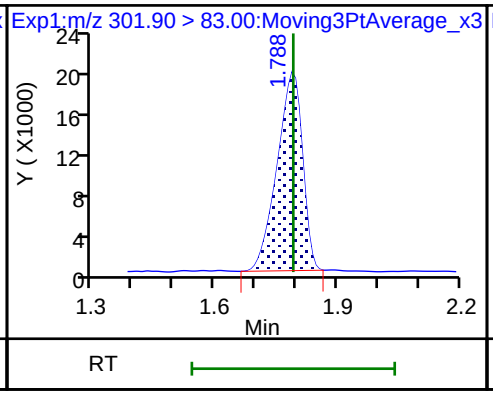
D 3 13C5-PFPeA



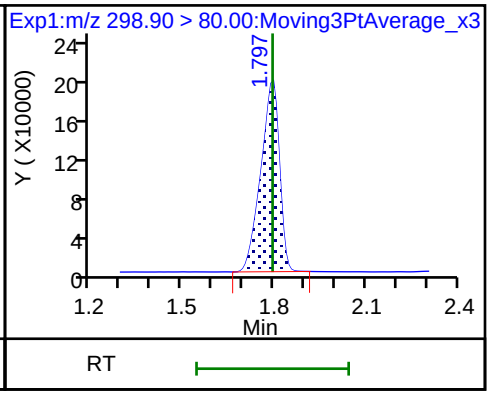
4 Perfluoropentanoic acid



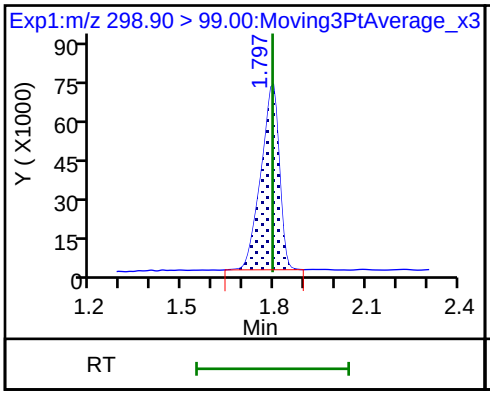
D 47 13C3-PFBS



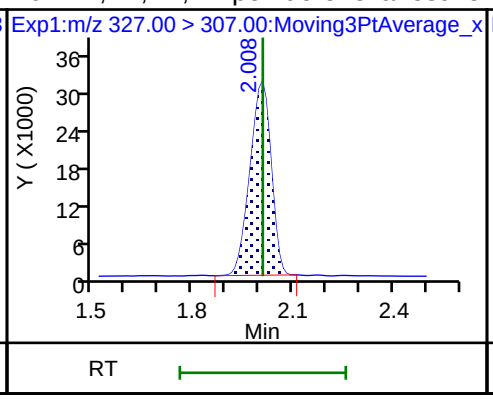
5 Perfluorobutanesulfonic acid



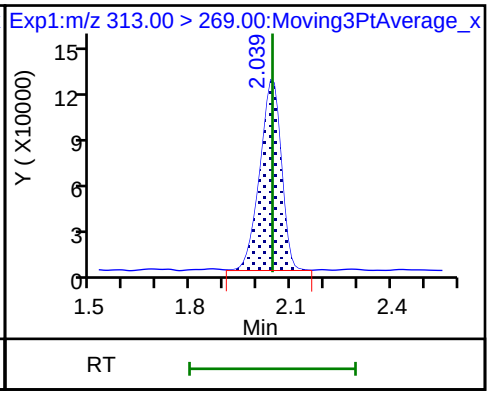
5 Perfluorobutanesulfonic acid



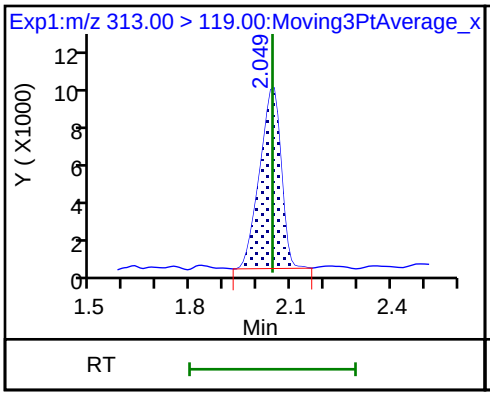
61 1H,1H,2H,2H-perfluorohexanesulfoni



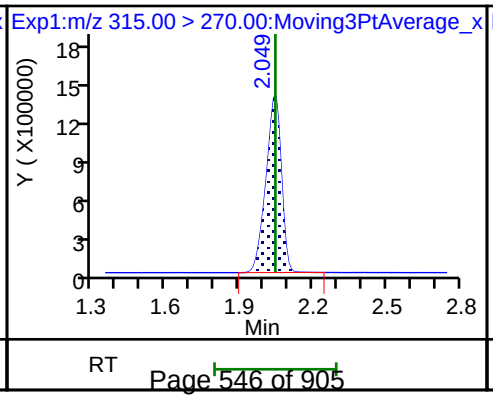
6 Perfluorohexanoic acid



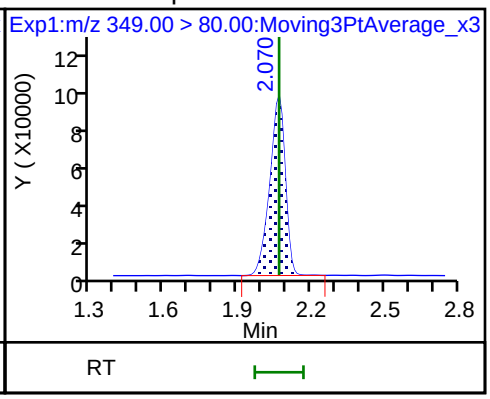
6 Perfluorohexanoic acid



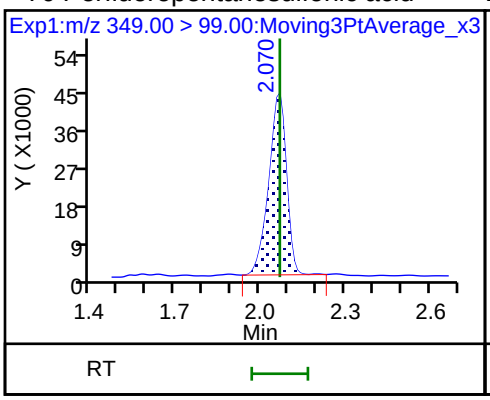
D 7 13C2 PFHxA



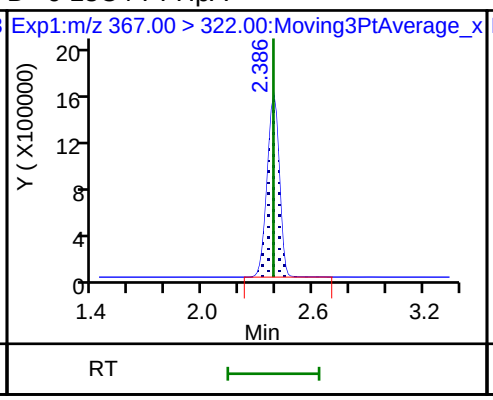
70 Perfluoropentanesulfonic acid



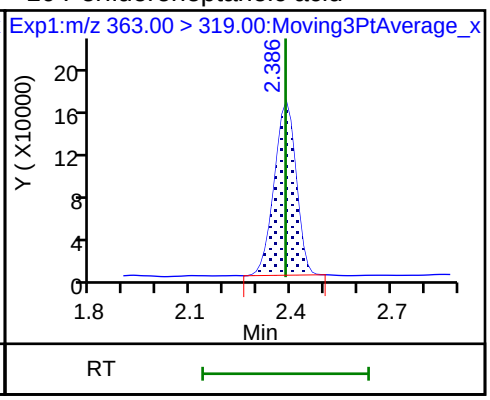
70 Perfluoropentanesulfonic acid



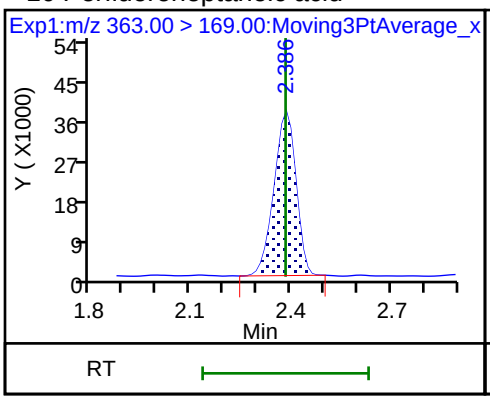
D 9 13C4-PFHpA



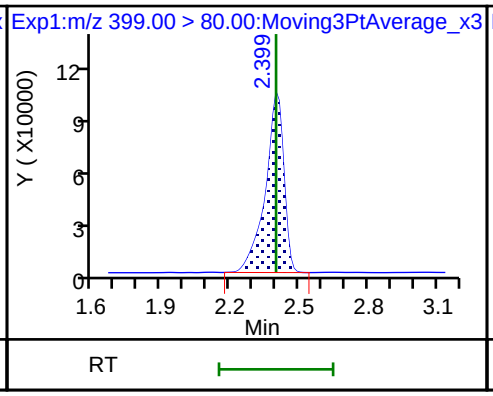
10 Perfluoroheptanoic acid



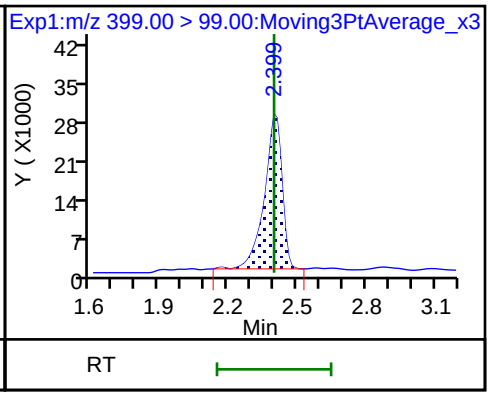
10 Perfluoroheptanoic acid



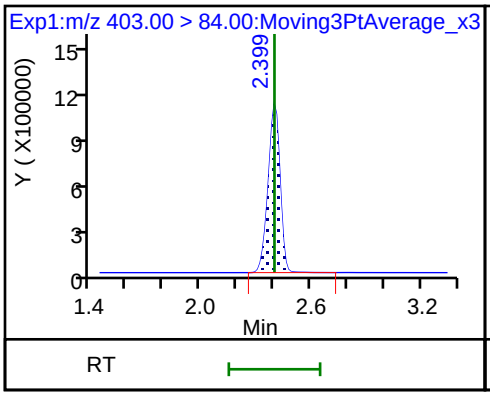
8 Perfluorohexanesulfonic acid



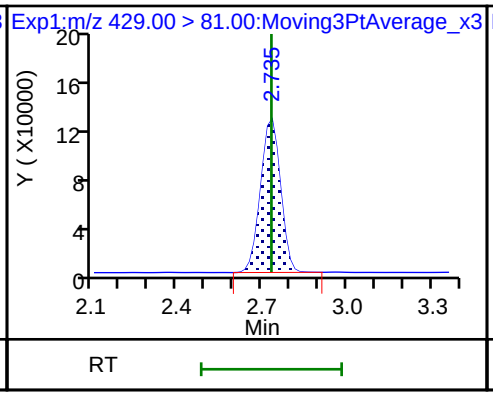
8 Perfluorohexanesulfonic acid



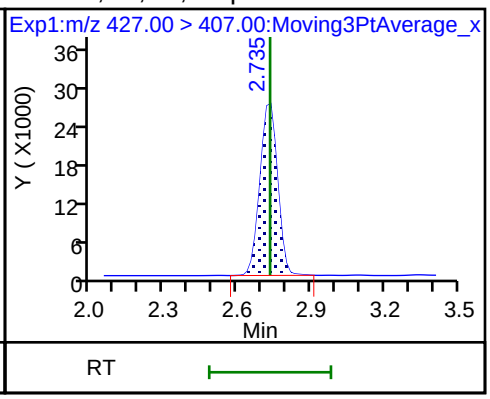
D 11 18O2 PFHxS



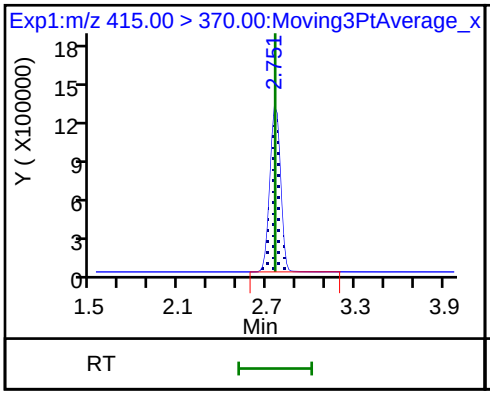
D 12 M2-6:2FTS



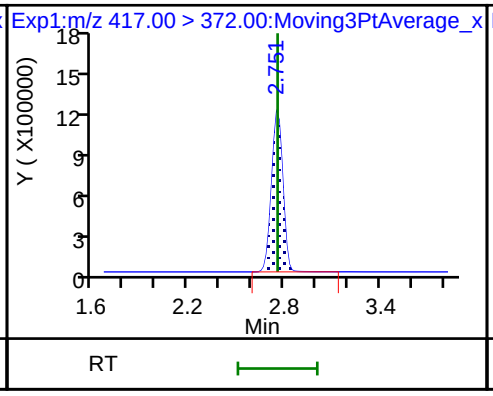
13 1H,1H,2H,2H-perfluorooctanesulfoni



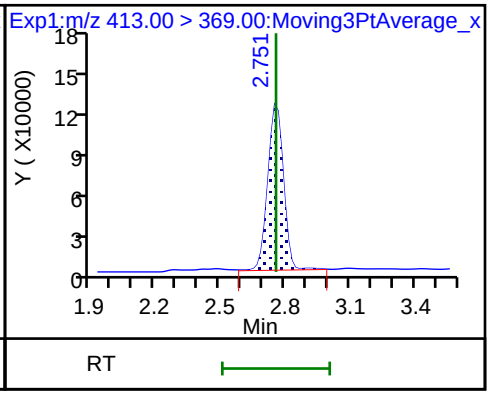
* 62 13C2-PFOA



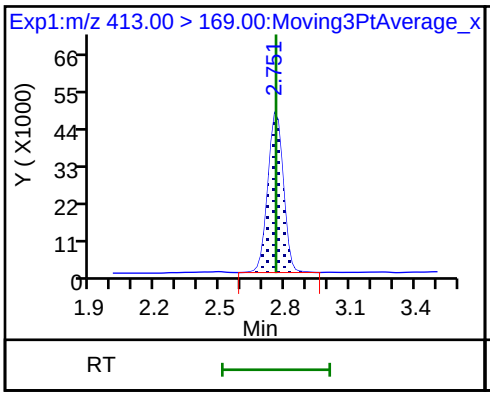
D 14 13C4 PFOA



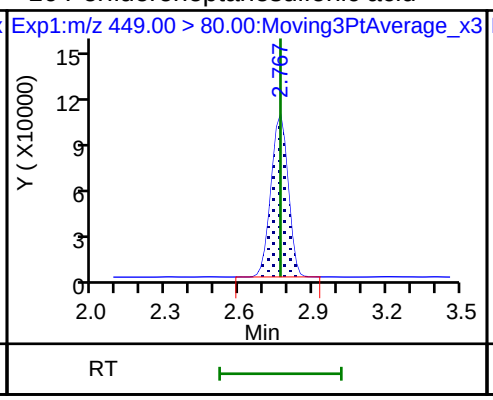
15 Perfluorooctanoic acid



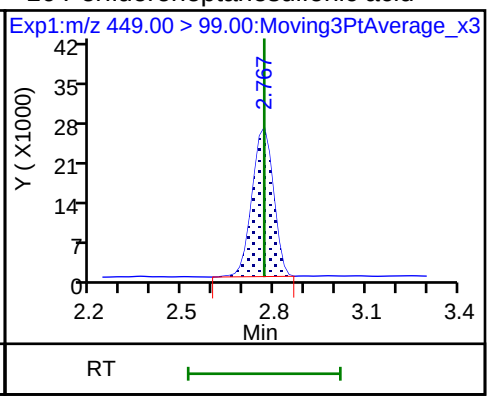
15 Perfluorooctanoic acid



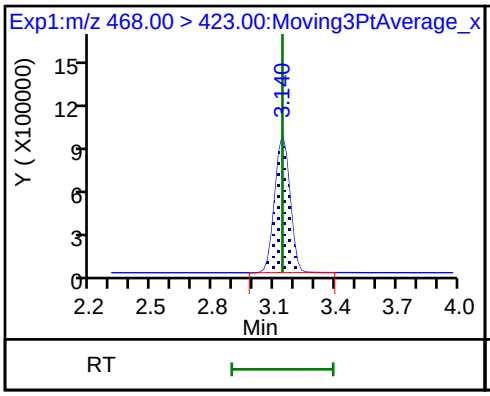
16 Perfluoroheptanesulfonic acid



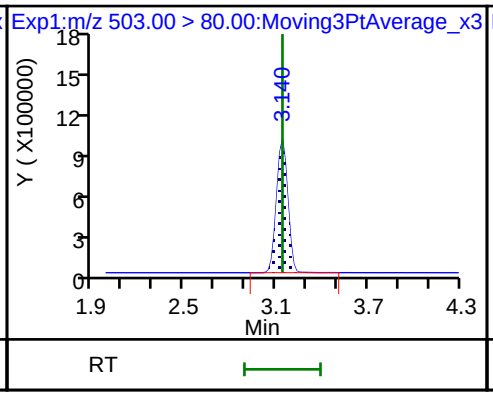
16 Perfluoroheptanesulfonic acid



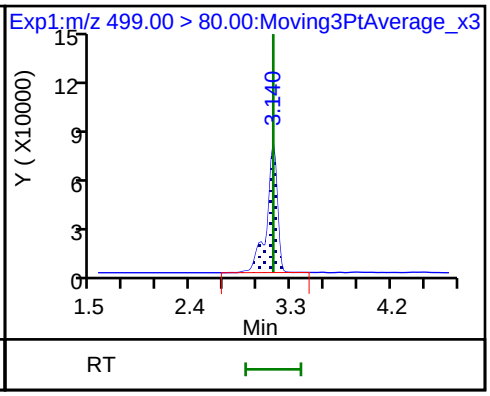
D 19 13C5 PFNA



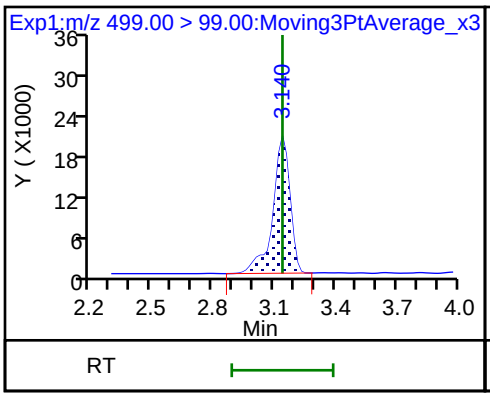
D 18 13C4 PFOS



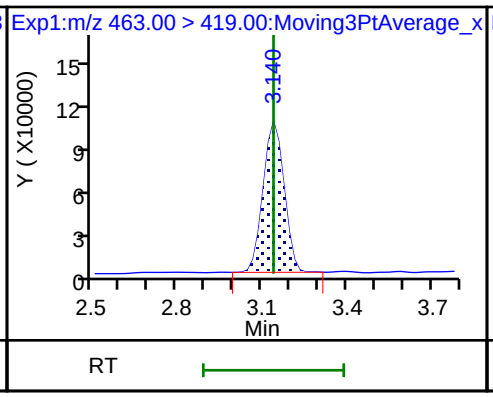
17 Perfluorooctane sulfonic acid



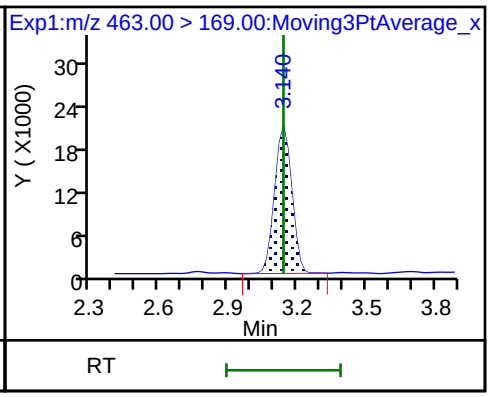
17 Perfluorooctane sulfonic acid



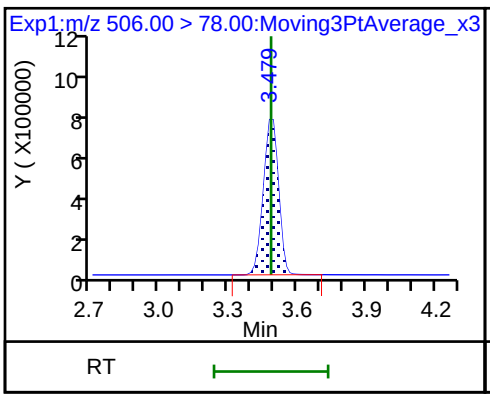
20 Perfluorononanoic acid



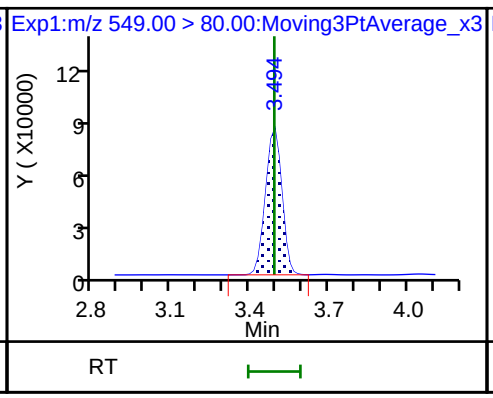
20 Perfluorononanoic acid



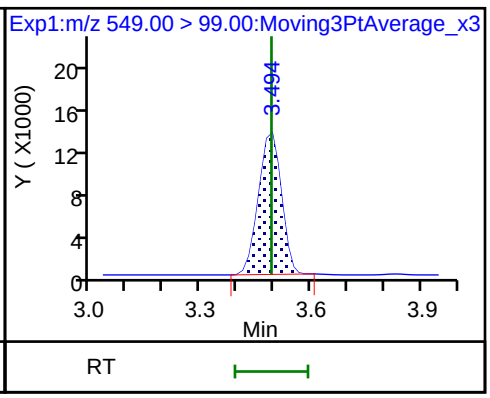
D 21 13C8 FOSA



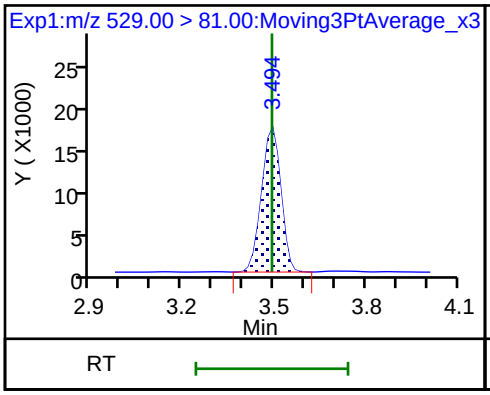
68 Perfluorononanesulfonic acid



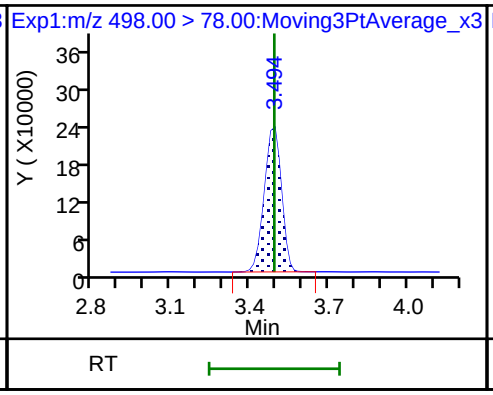
68 Perfluorononanesulfonic acid



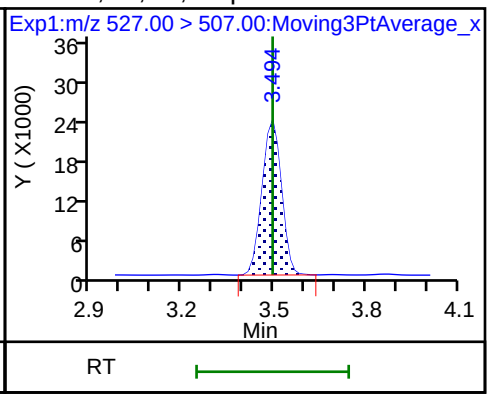
D 26 M2-8:2FTS



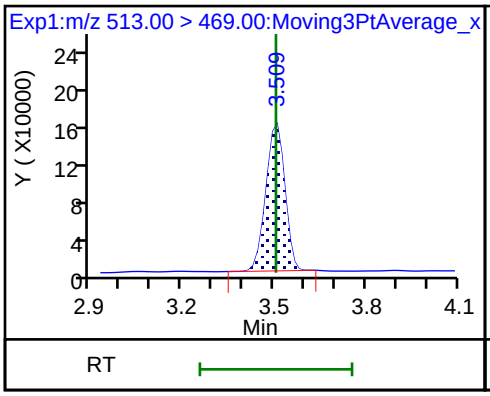
22 Perfluorooctane Sulfonamide



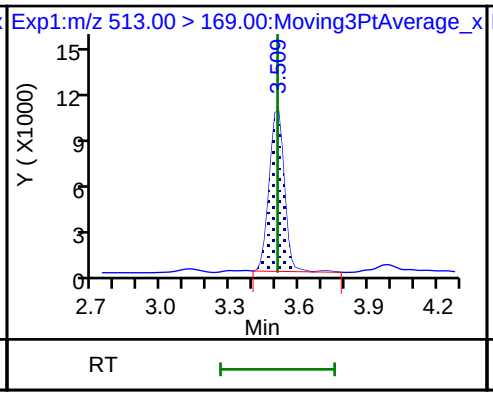
25 1H,1H,2H,2H-perfluorodecanesulfoni



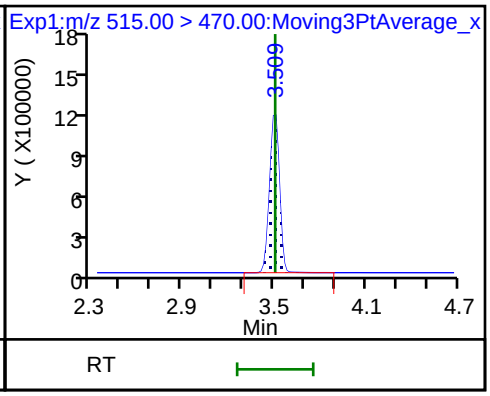
24 Perfluorodecanoic acid



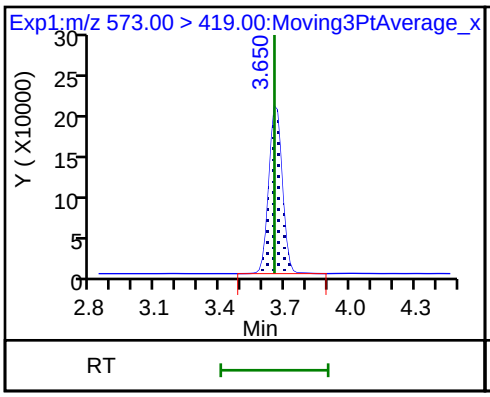
24 Perfluorodecanoic acid



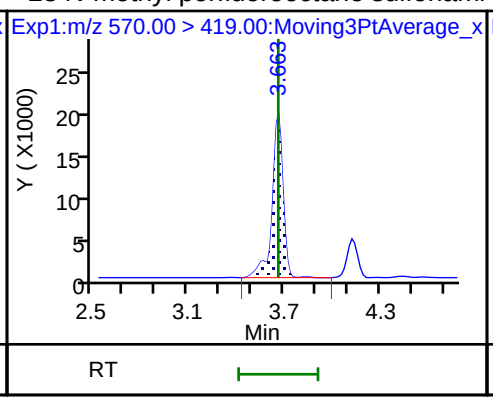
D 23 13C2 PFDA



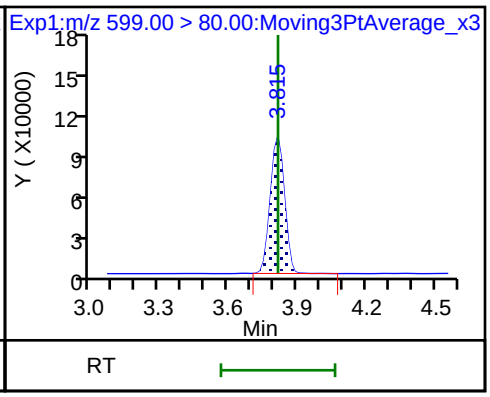
D 27 d3-NMeFOSAA



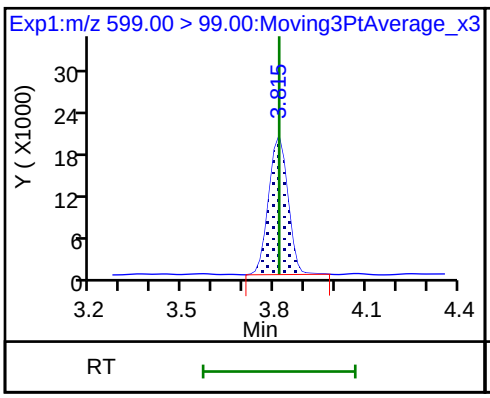
28 N-methyl perfluorooctane sulfonami



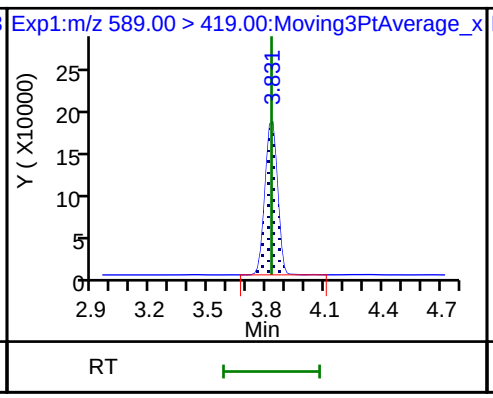
29 Perfluorodecane Sulfonic acid



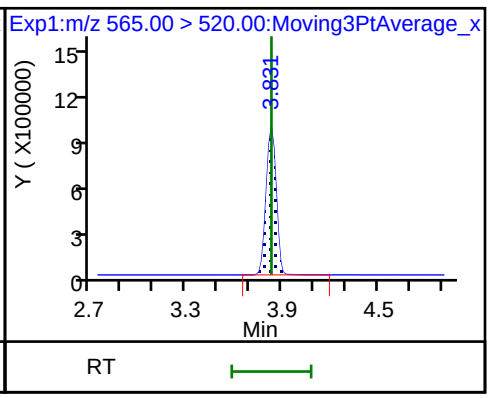
29 Perfluorodecane Sulfonic acid



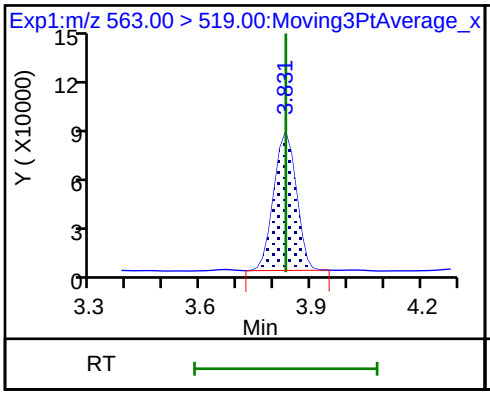
D 32 d5-NEtFOSAA



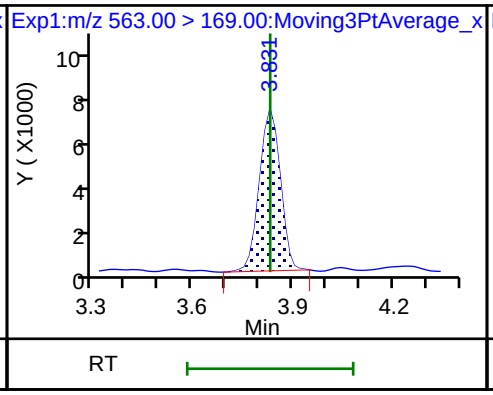
D 30 13C2 PFUnA



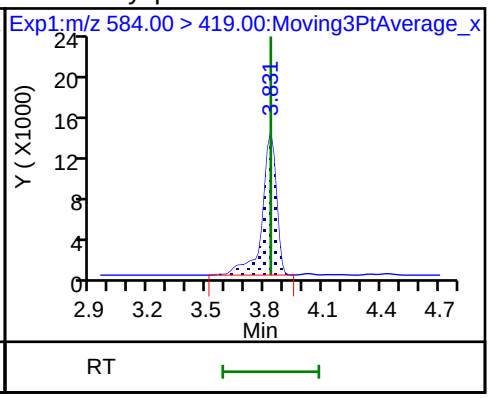
31 Perfluoroundecanoic acid



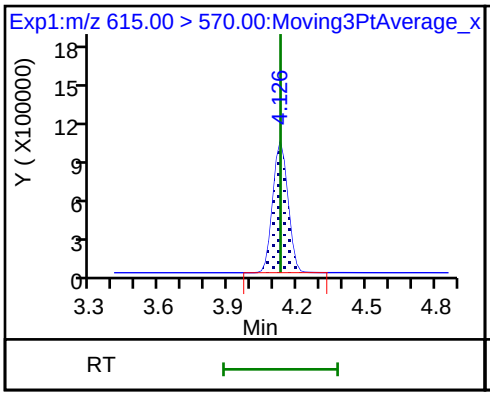
31 Perfluoroundecanoic acid



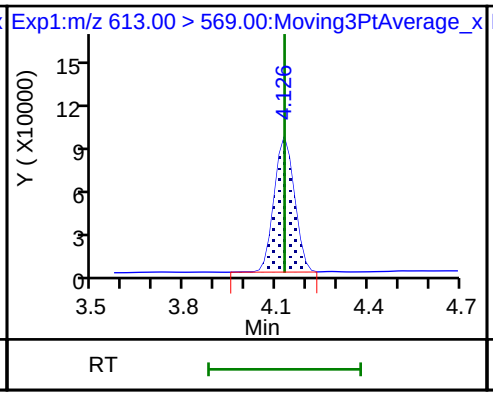
33 N-ethyl perfluorooctane sulfonamid



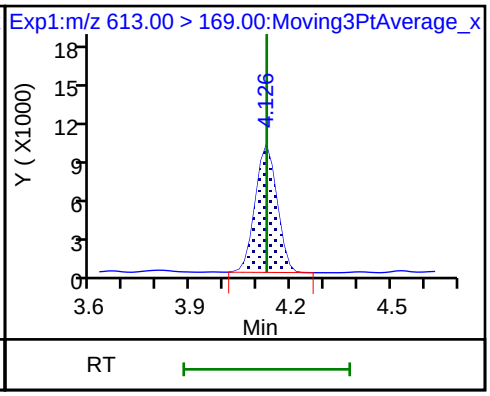
D 36 13C2 PFDoA



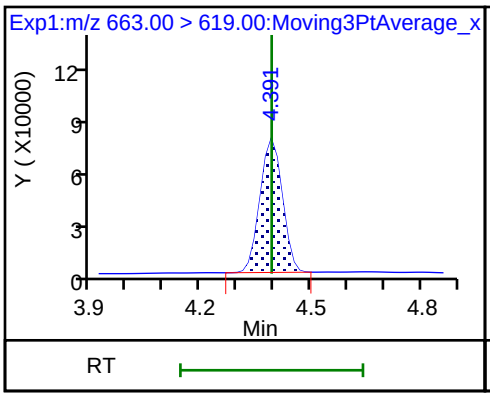
37 Perfluorododecanoic acid



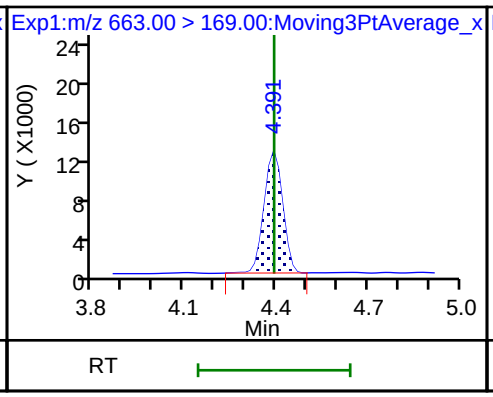
37 Perfluorododecanoic acid



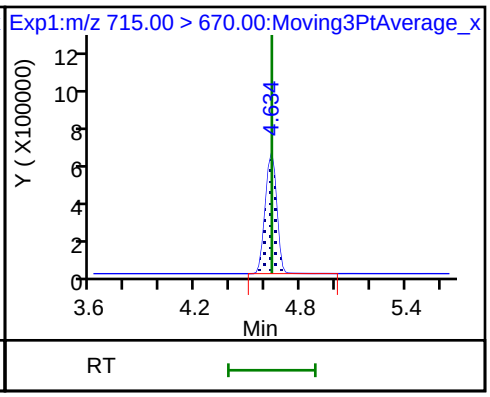
41 Perfluorotridecanoic acid



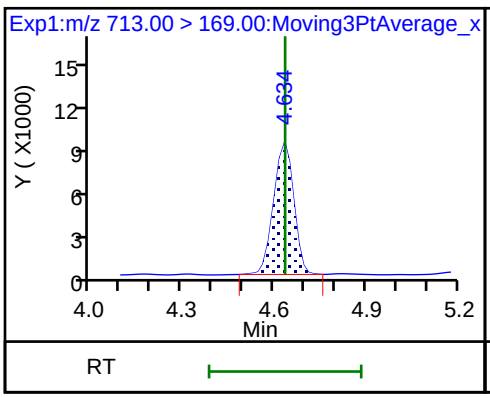
41 Perfluorotridecanoic acid



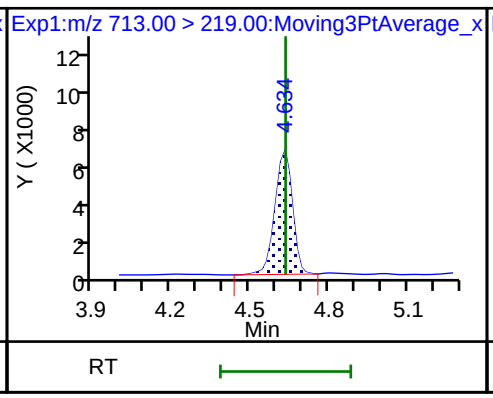
D 43 13C2-PFTeDA



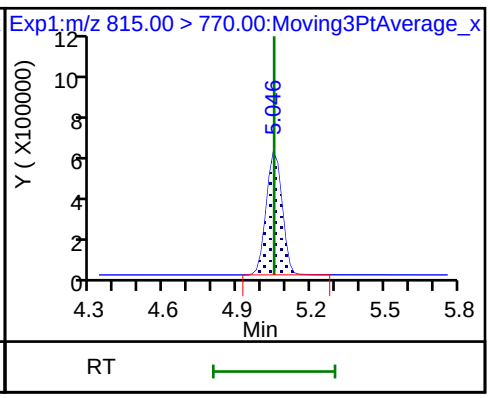
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

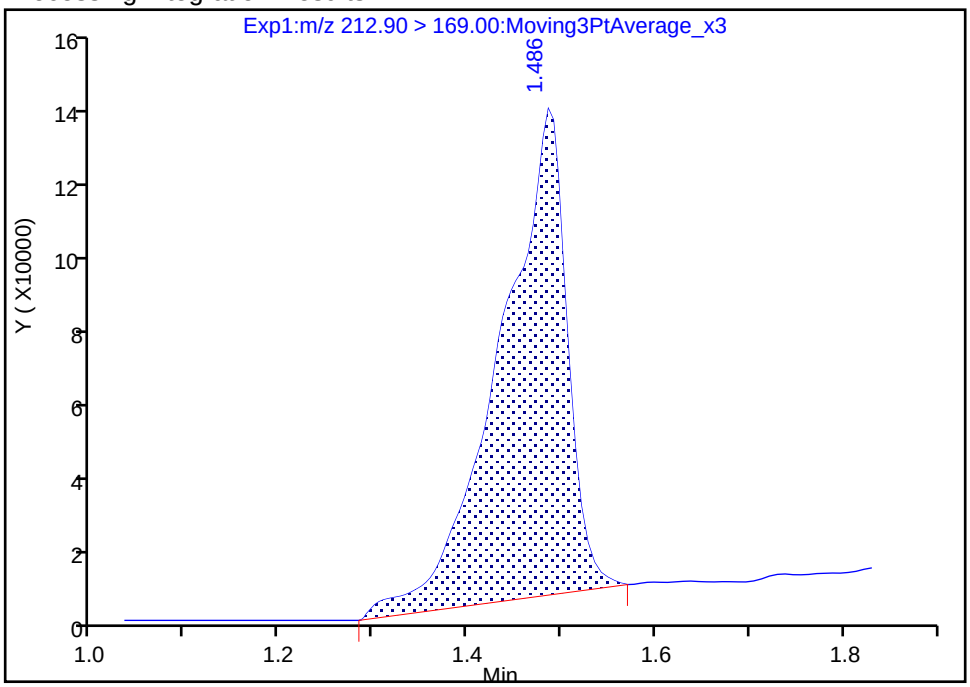
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_007.d
Injection Date: 03-Aug-2018 16:27:29 Instrument ID: A9
Lims ID: IC L3 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

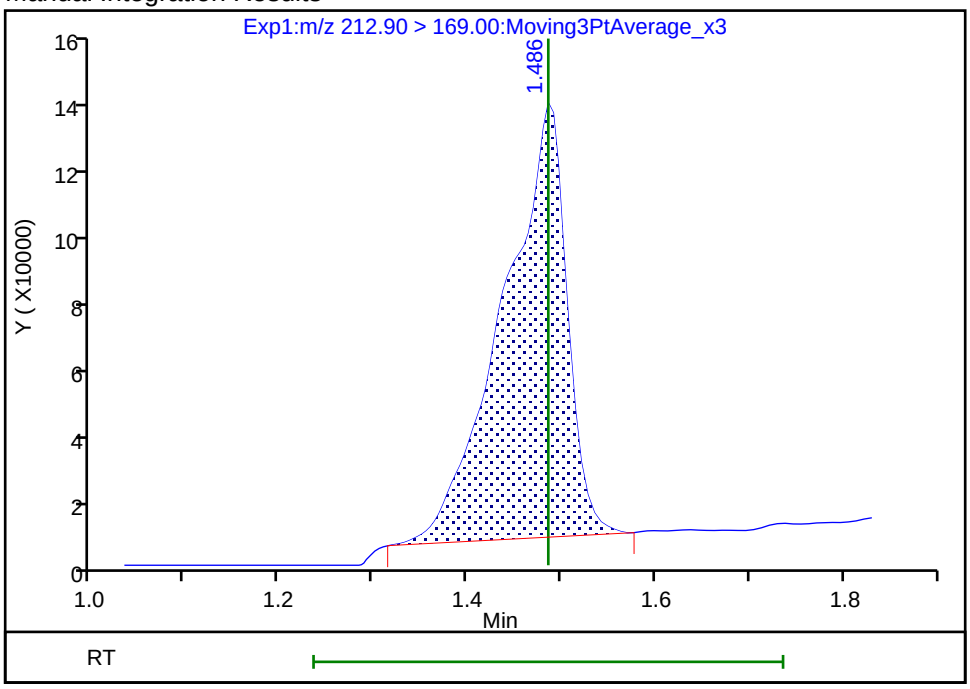
Processing Integration Results

RT: 1.49
Area: 627297
Amount: 0.278600
Amount Units: ng/ml



Manual Integration Results

RT: 1.49
Area: 587057
Amount: 0.247499
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:52:16
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_008.d
Lims ID: IC L4 Full
Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 03-Aug-2018 16:34:58 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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:17:36 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:53:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.486	1.485	0.001	0.540	6314247	2.49		99.6	9480	
2 Perfluorobutyric acid										
212.90 > 169.00	1.486	1.486	0.0	1.000	2386844	1.02		102	49.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.753	0.002	0.638	5588563	2.47		98.6	8819	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.754	0.001	1.000	2185438	0.9583		95.8	93.8	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.792	0.005	0.653	78999	2.25		96.8	287	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.794	0.003	1.000	3350358	0.9546		108	2523	
298.90 > 99.00	1.797	1.794	0.003	1.000	1171432		2.86(1.35-4.05)	108	395	
D 60 M2-4:2FTS										
329.00 > 81.00	2.008	2.006	0.002	0.730	539553	NC			331	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.008	2.009	-0.001	1.118	550071	0.9510		102	1668	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.049	2.044	0.005	1.000	2195434	0.9802		98.0	201	
313.00 > 119.00	2.049	2.044	0.005	1.000	160466		13.68(6.96-20.87)	98.0	123	
D 7 13C2 PFHxA										
315.00 > 270.00	2.049	2.046	0.003	0.745	5985637	2.54		102	8358	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.070	2.069	0.001	1.152	1620789	0.9753		104	2752	
349.00 > 99.00	2.070	2.069	0.001	1.152	725110		2.24(1.15-3.45)	104	368	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.142	2.146	-0.004	0.779	527888	NC			1877	

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	2.152	2.147	0.005	1.005	422442	NC			137	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.384	0.002	0.867	6641878	2.49		99.4	10816	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.384	0.002	1.000	2935816	1.06		106	186	
363.00 > 169.00	2.386	2.384	0.002	1.000	655684		4.48(2.17-6.52)	106	510	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.398	0.001	1.000	2171268	0.8602		94.5	1889	
399.00 > 99.00	2.399	2.398	0.001	1.000	572541		3.79(1.90-5.70)	94.5	139	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.400	-0.001	0.872	4666163	2.32		98.1	8321	
65 ADONA										
377.00 > 251.00	2.438	2.435	0.003	0.776	4537801	NC			4438	
377.00 > 85.00	2.438	2.435	0.003	0.776	1754054		2.59(1.05-3.16)		683	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.732	0.003	0.994	651860	2.51		106	975	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.732	0.003	1.000	536402	0.9146		96.5	1245	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.755	-0.004		5673875	2.50			9458	
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.757	0.010	1.006	5761212	2.57		103	7321	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.767	2.757	0.010	1.000	2450512	0.9706		97.0	249	
413.00 > 169.00	2.767	2.757	0.010	1.000	887911		2.76(1.36-4.08)	97.0	571	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.881	2152553	1.00		105	2630	
449.00 > 99.00	2.767	2.767	0.0	0.881	526243		4.09(1.84-5.53)	105	820	
D 19 13C5 PFNA										
468.00 > 423.00	3.141	3.140	0.001	1.141	4829107	2.51		101	7281	
D 18 13C4 PFOS										
503.00 > 80.00	3.141	3.140	0.001	1.141	5088829	2.43		102	4351	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.141	3.140	0.001	1.000	2140357	0.9373		101	2589	
499.00 > 99.00	3.141	3.140	0.001	1.000	487086		4.39(2.04-6.12)	101	979	
20 Perfluorononanoic acid										
463.00 > 419.00	3.141	3.140	0.001	1.000	2154625	1.06		106	293	
463.00 > 169.00	3.141	3.140	0.001	1.000	400316		5.38(2.68-8.03)	106	487	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.349	3.348	0.001	1.066	2498276	NC			2413	
D 21 13C8 FOSA										
506.00 > 78.00	3.480	3.485	-0.005	1.265	3127842	2.50		100	3628	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.495	3.492	0.003	1.113	1346579	0.9658		101	1915	
549.00 > 99.00	3.495	3.492	0.003	1.113	233042		5.78(3.02-9.05)	101	1196	
D 26 M2-8:2FTS										
529.00 > 81.00	3.495	3.492	0.003	1.270	78595	2.61		109	327	

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	3.495	3.492	0.003	1.004	4264515	1.11		111	3081	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.495	3.494	0.001	1.000	413075	0.8979		93.7	2093	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.510	3.505	0.005	1.000	2405357	1.00		100	270	
513.00 > 169.00	3.510	3.505	0.005	1.000	166101		14.48(7.12-21.35)	100	192	
D 23 13C2 PFDA										
515.00 > 470.00	3.510	3.505	0.005	1.276	4876594	2.54		101	8462	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.651	3.650	0.001	1.327	908545	2.43		97.2	2591	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.664	3.662	0.002	1.004	379517	1.03		103	227	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.816	3.816	0.0	1.215	1793635	1.01		105	2391	
599.00 > 99.00	3.816	3.816	0.0	1.215	380202		4.72(2.14-6.43)	105	688	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.832	3.825	0.007	1.393	793459	2.58		103	2024	
D 30 13C2 PFUnA										
565.00 > 520.00	3.832	3.831	0.001	1.393	3937669	2.53		101	9080	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.832	3.831	0.001	1.000	1396013	1.05		105	279	
563.00 > 169.00	3.832	3.831	0.001	1.000	124491		11.21(5.24-15.72)	105	307	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.832	3.831	0.001	1.000	274140	0.9631		96.3	484	
35 MeFOSA										
512.00 > 169.00	3.968	3.971	-0.003		548680	NC			924	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.999	3.993	0.006	1.273	2814480	NC			5390	
D 36 13C2 PFDoA										
615.00 > 570.00	4.128	4.127	0.001	1.500	4138570	2.47		98.8	6359	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.128	4.127	0.001	1.000	1731609	1.06		106	388	
613.00 > 169.00	4.128	4.127	0.001	1.000	184832		9.37(4.68-14.05)	106	574	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.128	4.127	0.001	1.181	246912	NC			800	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.363	4.361	0.002	1.389	180099	NC			1080	
699.00 > 99.00	4.363	4.361	0.002	1.389	275623		0.65(0.28-0.83)		734	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.394	4.392	0.002	1.064	1328828	1.07		107	370	
663.00 > 169.00	4.394	4.392	0.002	1.064	211451		6.28(3.09-9.27)	107	416	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.636	4.635	0.001	1.685	2697006	2.52		101	7165	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.636	4.635	0.001	1.000	174884	1.01		101	744	
713.00 > 219.00	4.636	4.635	0.001	1.000	121127		1.44(0.70-2.09)	101	411	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.052	5.049	0.003	1.836	2526670	2.57		103	5456	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.052	5.049	0.003	1.000	962190	NC			132	
813.00 > 169.00	5.052	5.049	0.003	1.000	172625		5.57(2.77-8.32)		617	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.399	5.401	-0.002	1.069	723135	NC			647	
913.00 > 169.00	5.399	5.401	-0.002	1.069	146097		4.95(2.55-7.64)		1008	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 18:17:39 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_008.d

Injection Date: 03-Aug-2018 16:34:58 Instrument ID: A9

Lims ID: IC L4 Full

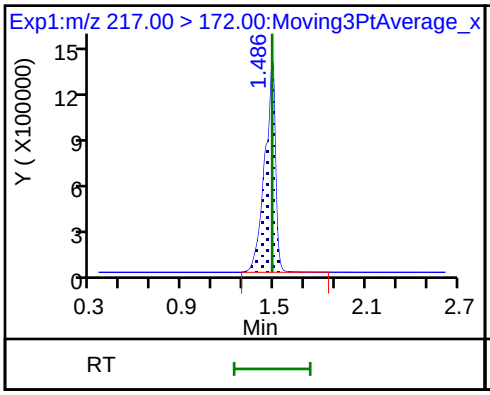
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Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 5

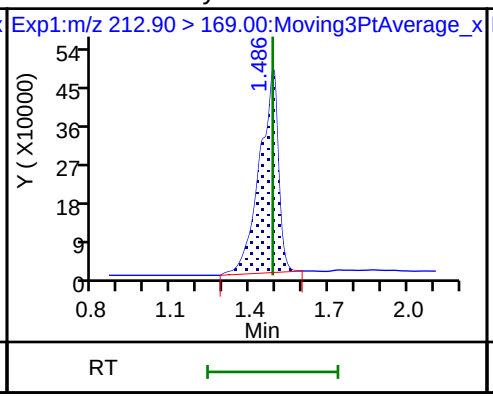
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

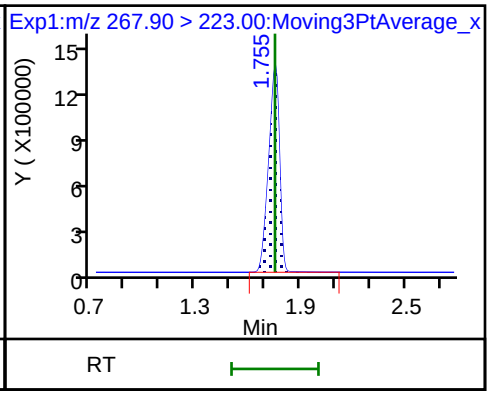
D 1 13C4 PFBA



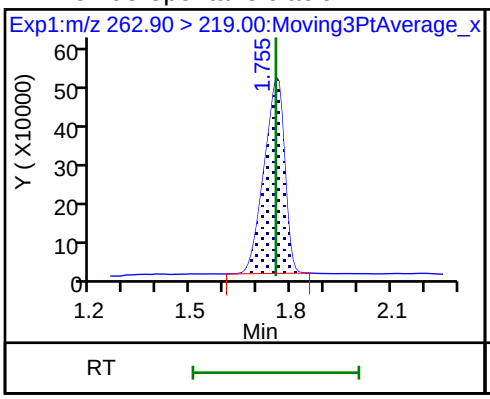
2 Perfluorobutyric acid



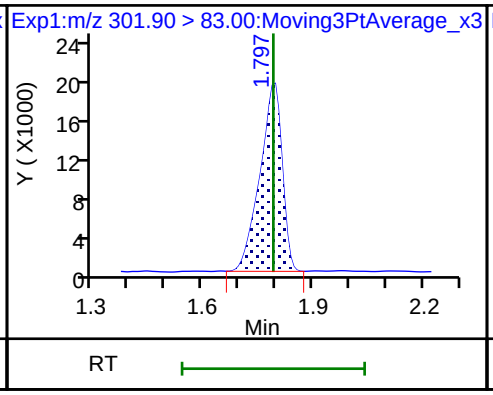
D 3 13C5-PFPeA



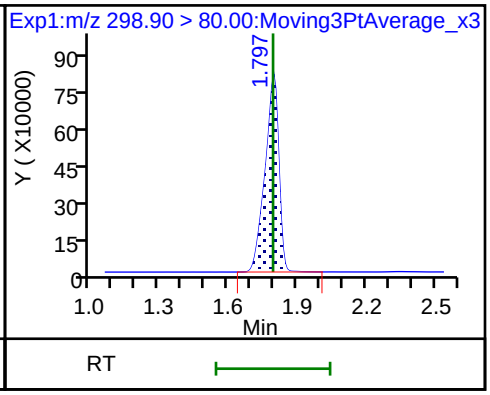
4 Perfluoropentanoic acid



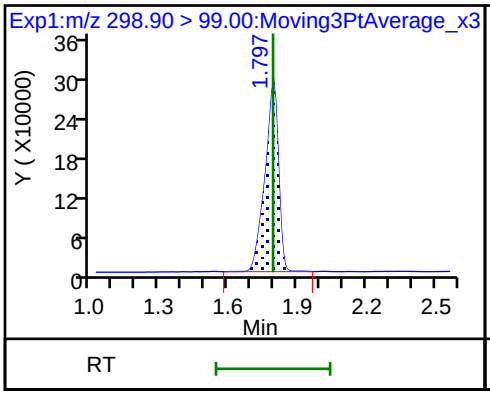
D 47 13C3-PFBS



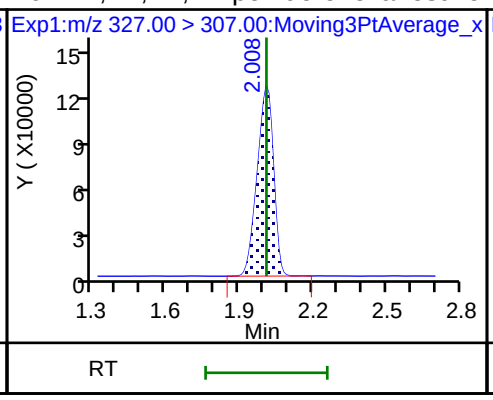
5 Perfluorobutanesulfonic acid



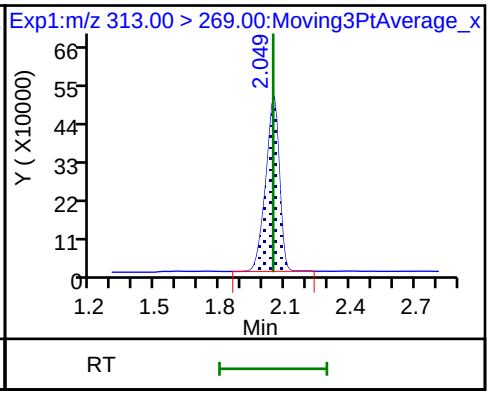
5 Perfluorobutanesulfonic acid



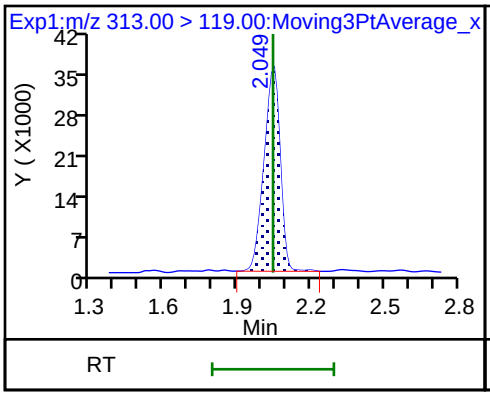
61 1H,1H,2H,2H-perfluorohexanesulfoni



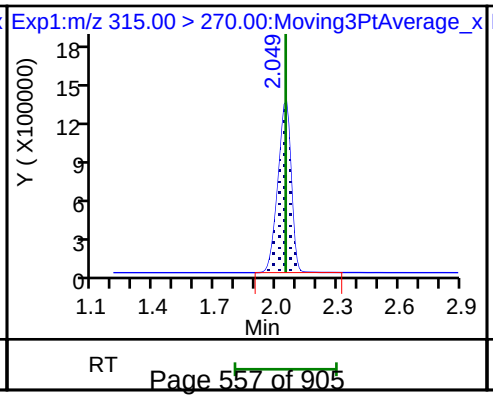
6 Perfluorohexanoic acid



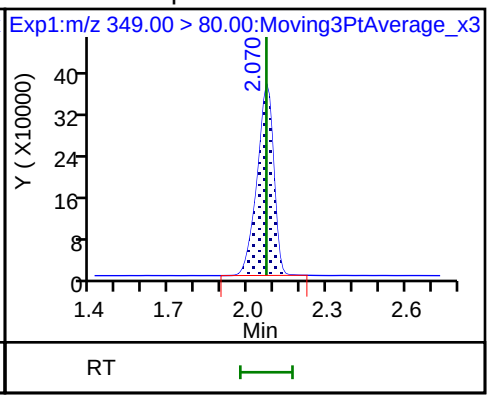
6 Perfluorohexanoic acid



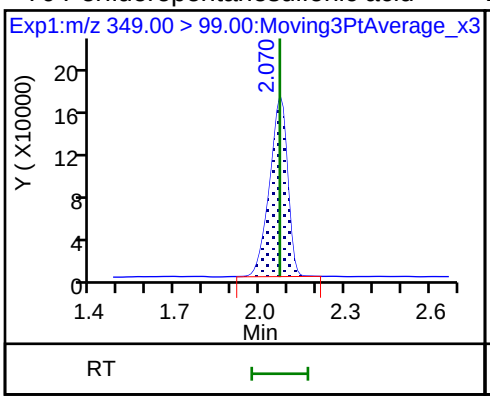
D 7 13C2 PFHxA



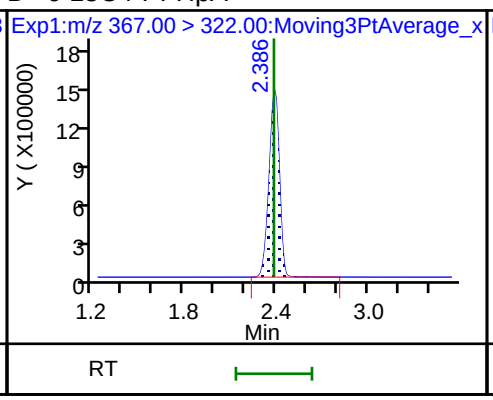
70 Perfluoropentanesulfonic acid



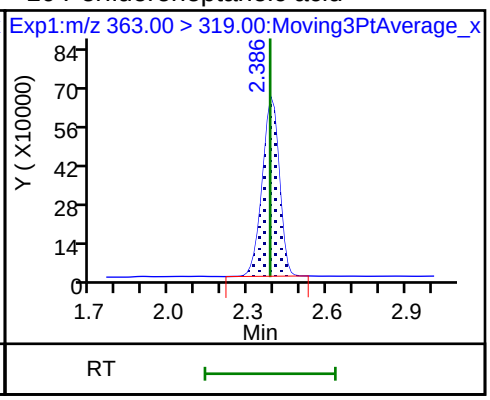
70 Perfluoropentanesulfonic acid



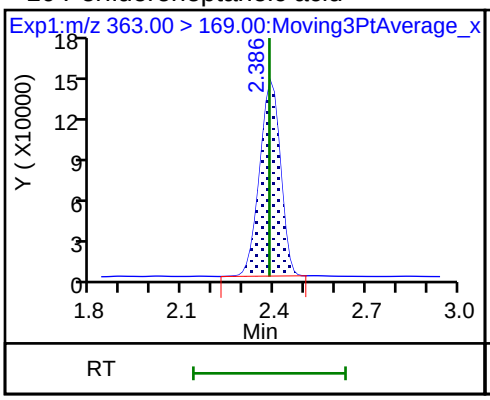
D 9 13C4-PFHpA



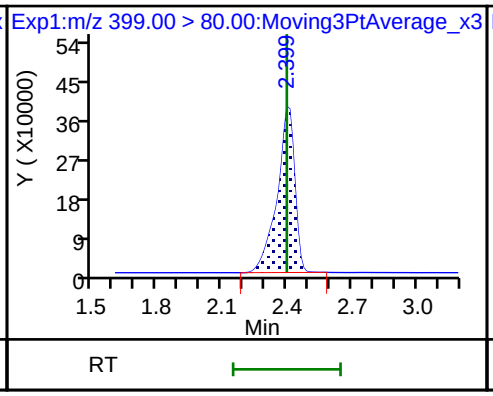
10 Perfluoroheptanoic acid



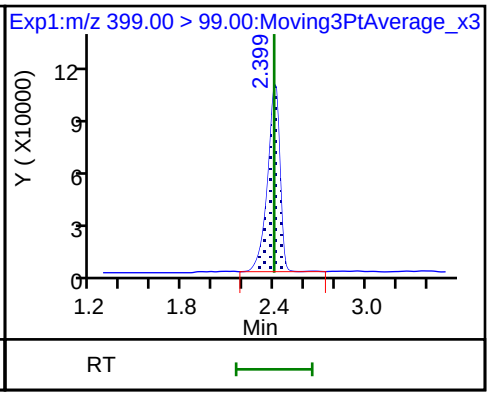
10 Perfluoroheptanoic acid



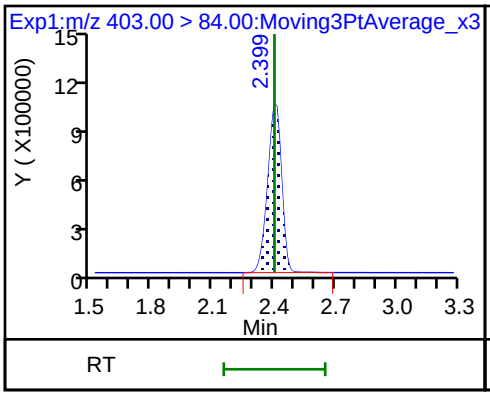
8 Perfluorohexanesulfonic acid



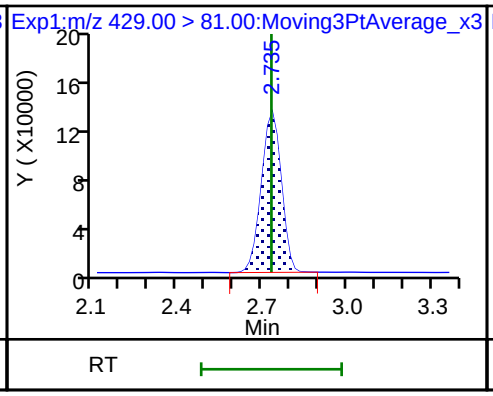
8 Perfluorohexanesulfonic acid



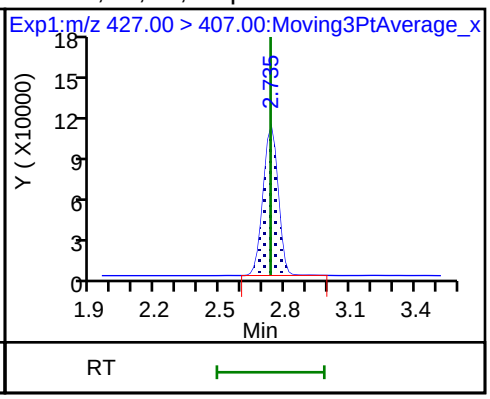
D 11 18O2 PFHxS



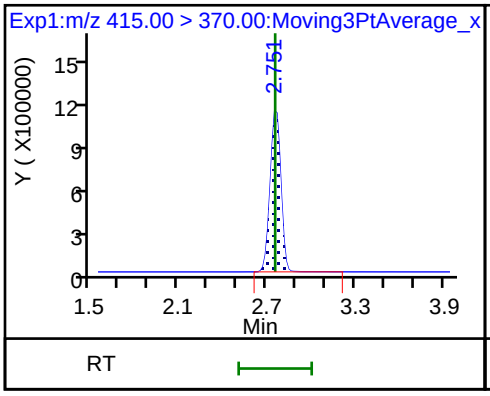
D 12 M2-6:2FTS



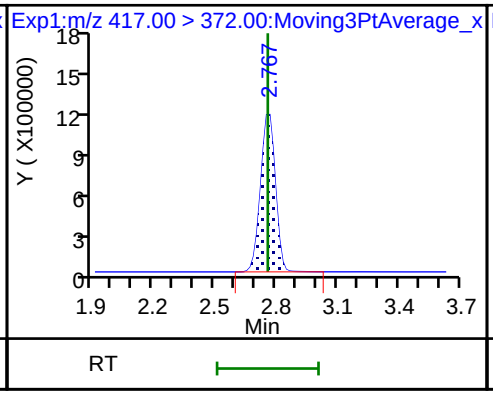
13 1H,1H,2H,2H-perfluorooctanesulfoni



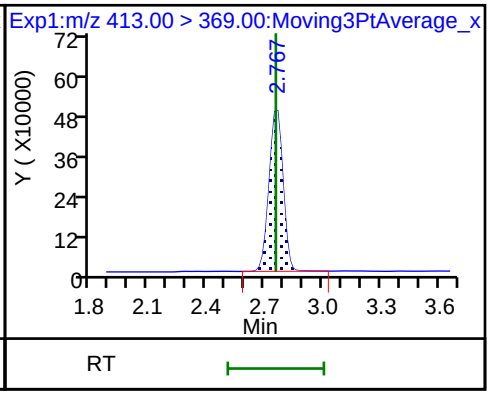
* 62 13C2-PFOA



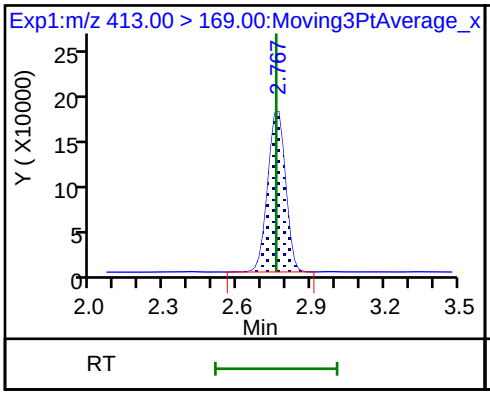
D 14 13C4 PFOA



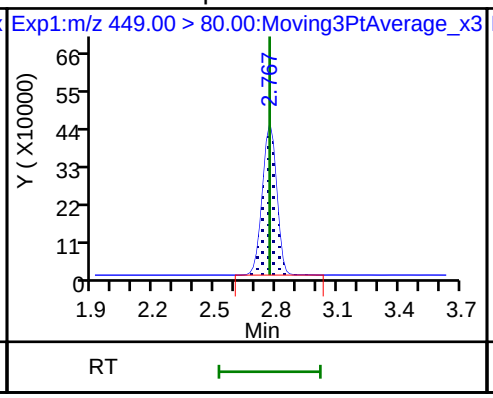
15 Perfluorooctanoic acid



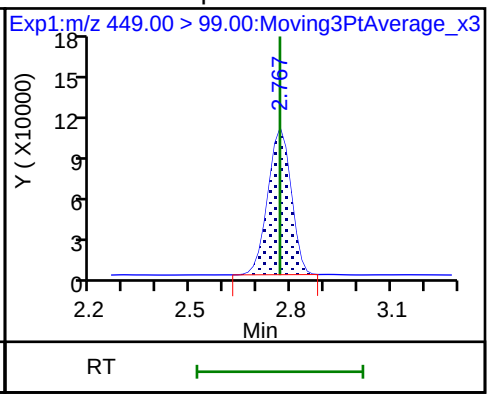
15 Perfluorooctanoic acid



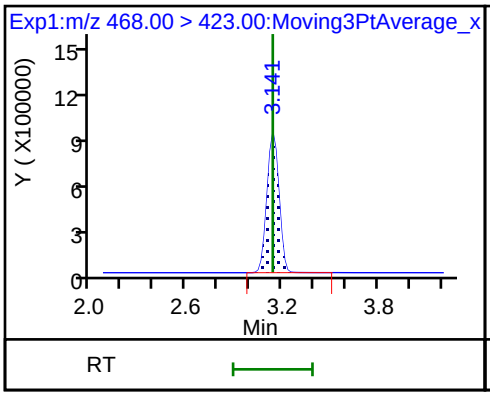
16 Perfluoroheptanesulfonic acid



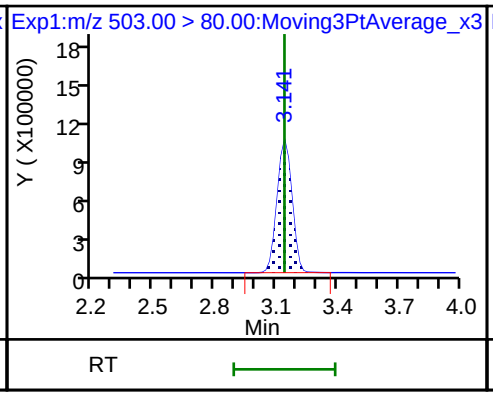
16 Perfluoroheptanesulfonic acid



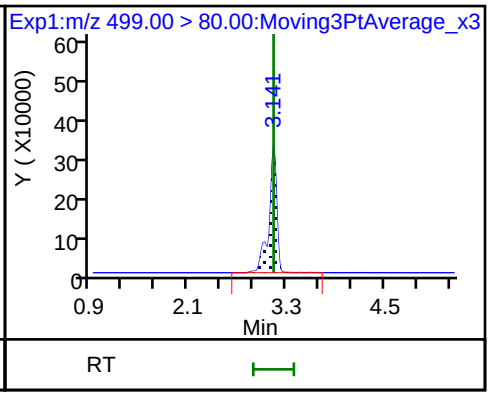
D 19 13C5 PFNA



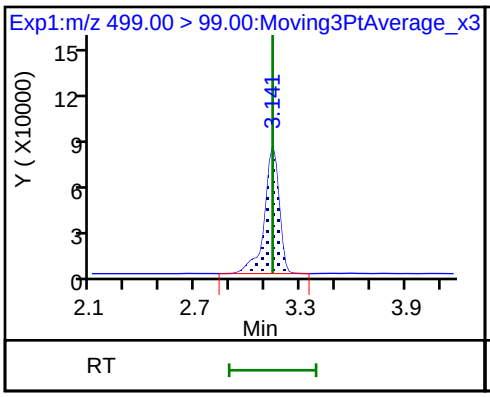
D 18 13C4 PFOS



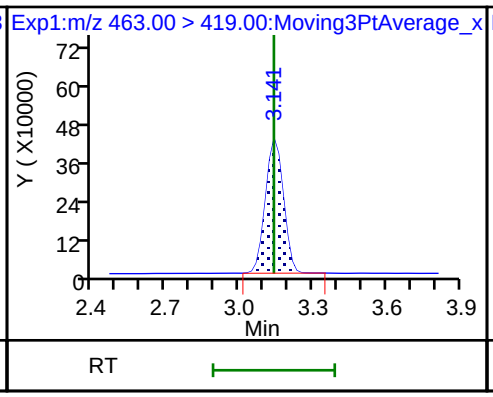
17 Perfluorooctane sulfonic acid



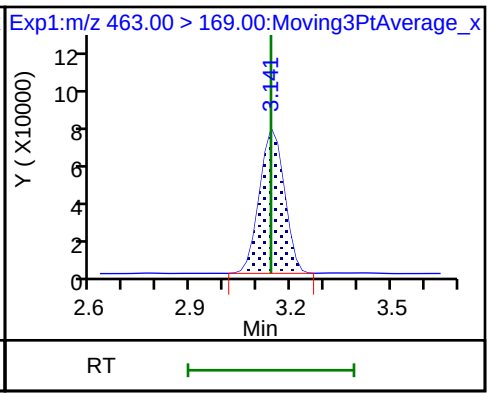
17 Perfluorooctane sulfonic acid



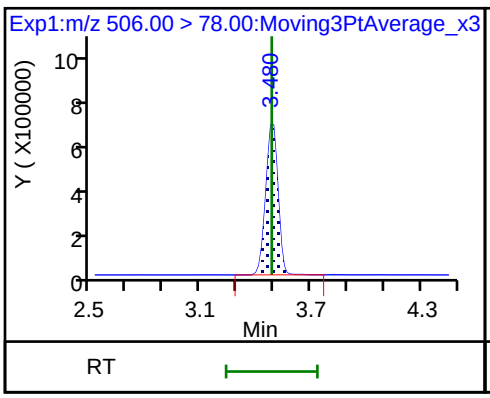
20 Perfluorononanoic acid



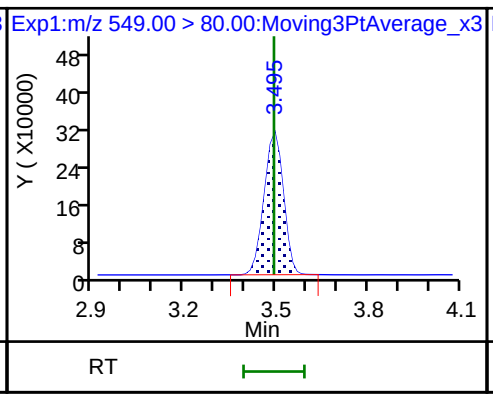
20 Perfluorononanoic acid



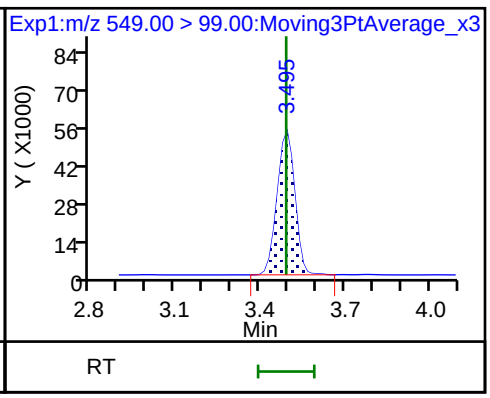
D 21 13C8 FOSA



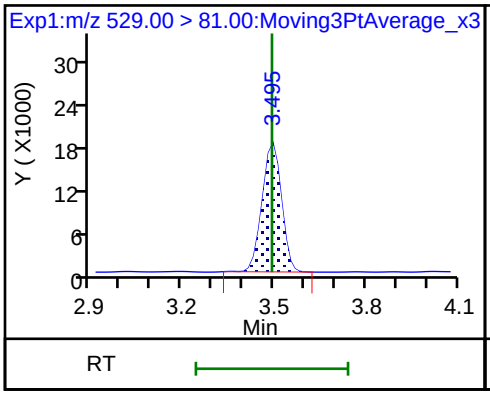
68 Perfluorononanesulfonic acid



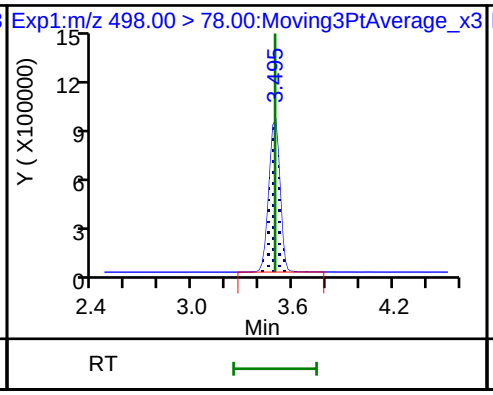
68 Perfluorononanesulfonic acid



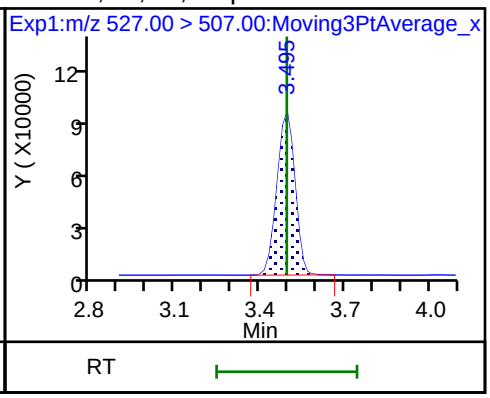
D 26 M2-8:2FTS



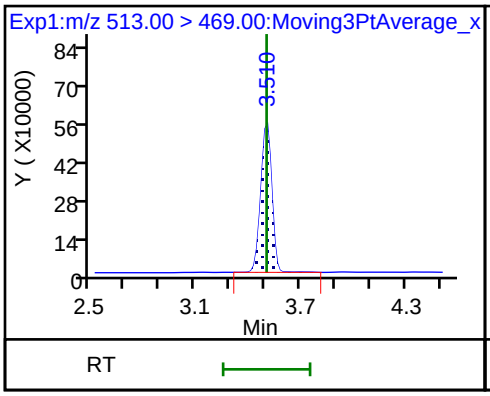
22 Perfluorooctane Sulfonamide



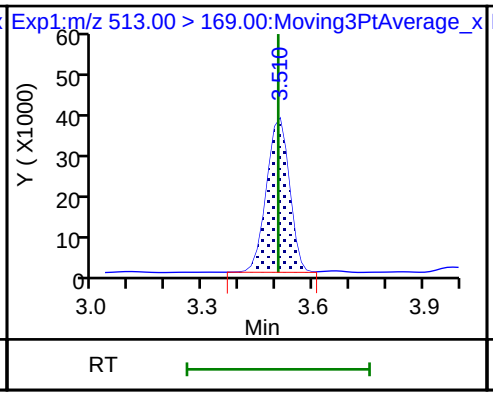
25 1H,1H,2H,2H-perfluorodecanesulfoni



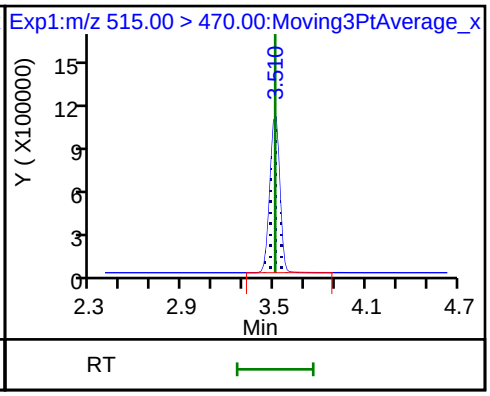
24 Perfluorodecanoic acid



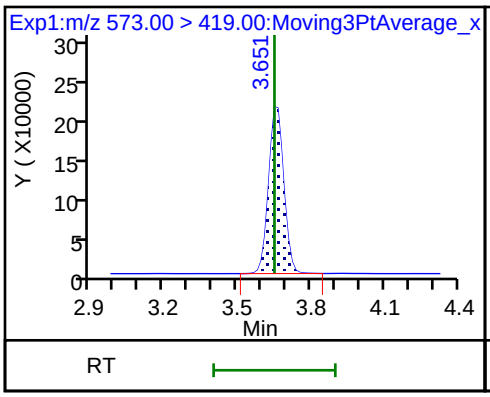
24 Perfluorodecanoic acid



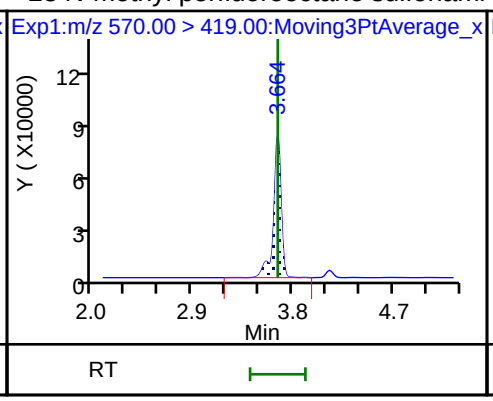
D 23 13C2 PFDA



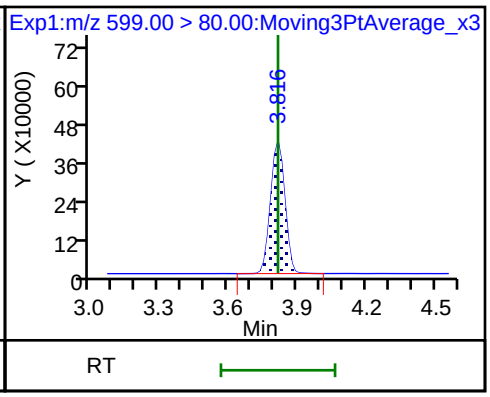
D 27 d3-NMeFOSAA



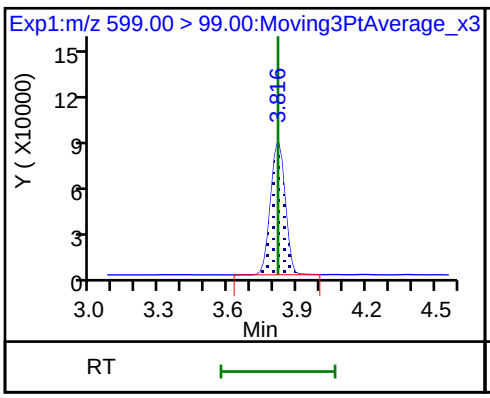
28 N-methyl perfluorooctane sulfonami



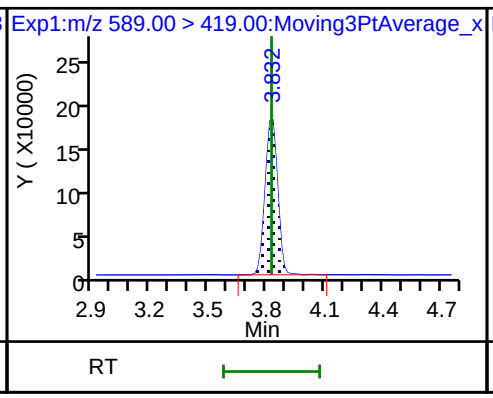
29 Perfluorodecane Sulfonic acid



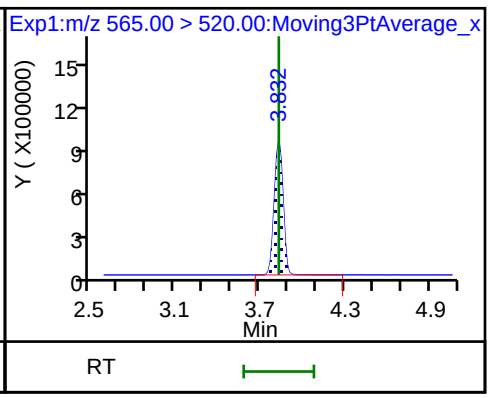
29 Perfluorodecane Sulfonic acid



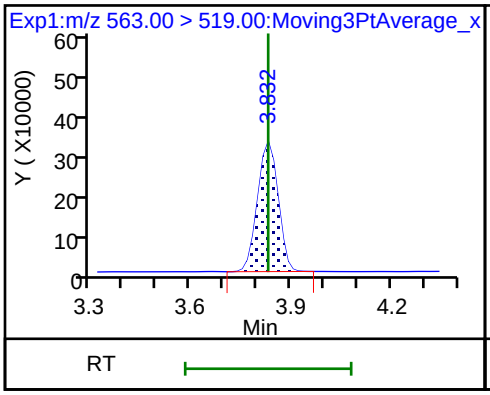
D 32 d5-NEtFOSAA



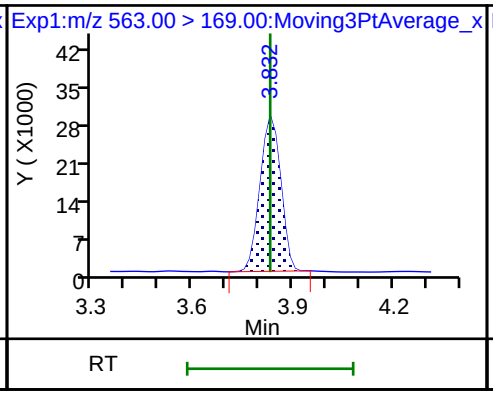
D 30 13C2 PFUnA



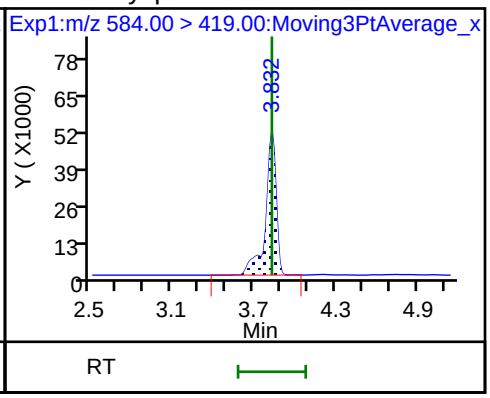
31 Perfluoroundecanoic acid



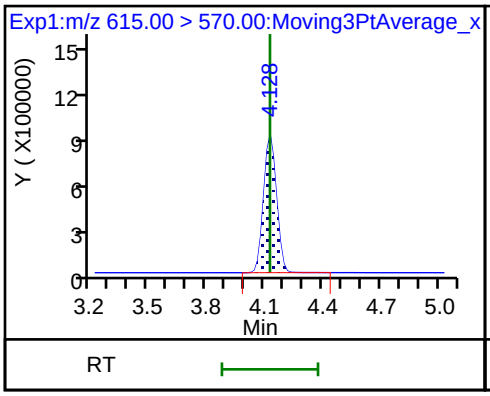
31 Perfluoroundecanoic acid



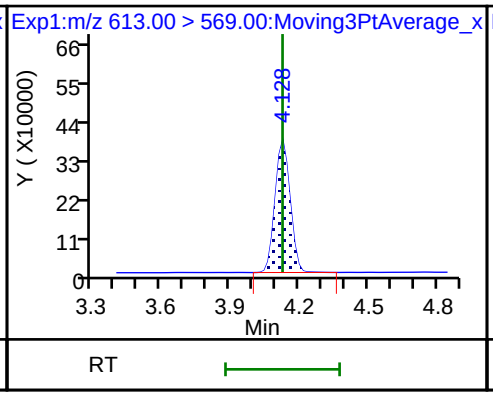
33 N-ethyl perfluorooctane sulfonamid



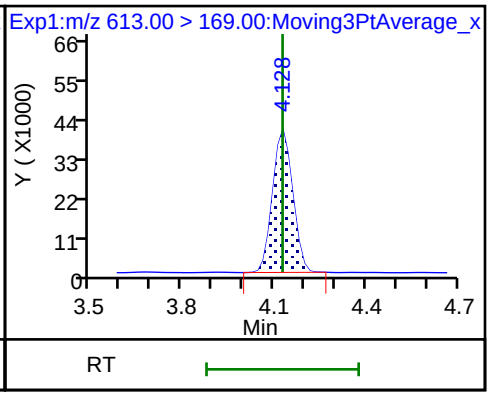
D 36 13C2 PFDoA



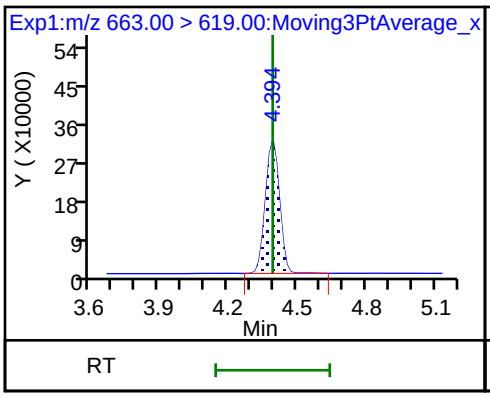
37 Perfluorododecanoic acid



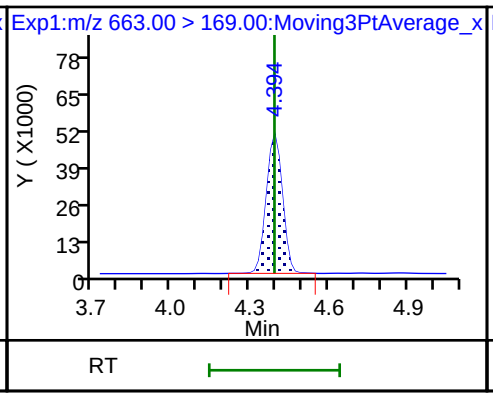
37 Perfluorododecanoic acid



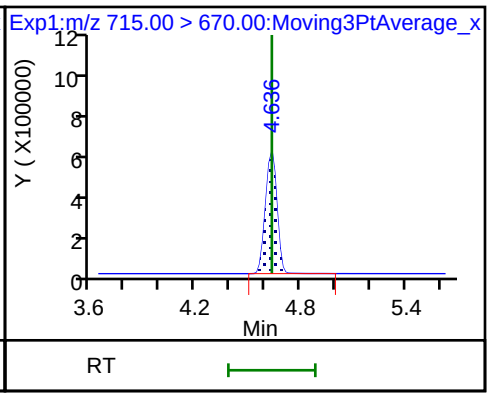
41 Perfluorotridecanoic acid



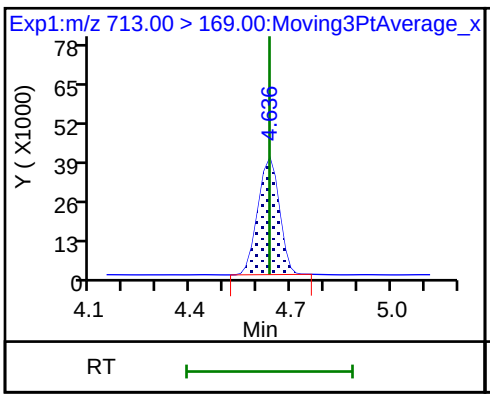
41 Perfluorotridecanoic acid



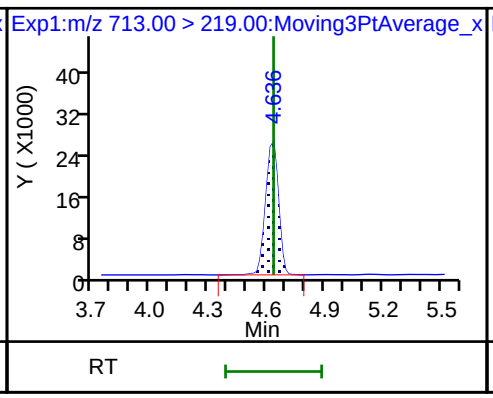
D 43 13C2-PFTeDA



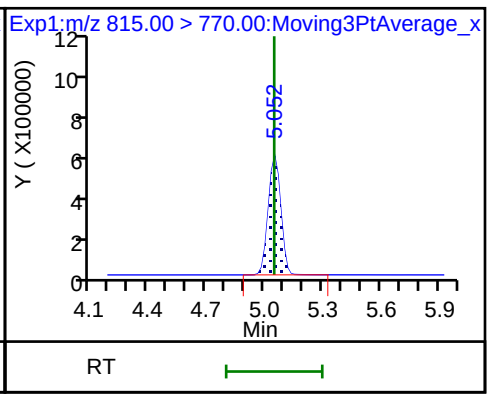
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_009.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 03-Aug-2018 16:42:29 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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:17:41 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:54:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.486	1.485	0.001	0.540	6112850	2.53		101	6038	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.486	1.486	0.0	1.000	5937685	2.61		105	130	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.753	0.002	0.638	5432869	2.52		101	8378	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.754	0.001	1.000	5283276	2.38		95.3	215	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.792	-0.003	0.650	76827	2.30		98.9	259	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.794	0.003	1.005	8055489	2.36		107	5091	
298.90 > 99.00	1.789	1.794	-0.005	1.000	2823944		2.85(1.35-4.05)	107	790	
D 60 M2-4:2FTS										
329.00 > 81.00	2.008	2.006	0.002	0.730	538018	NC			343	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.008	2.009	-0.001	1.123	1394366	2.48		106	4213	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.039	2.044	-0.005	1.000	5113515	2.42		96.9	462	
313.00 > 119.00	2.039	2.044	-0.005	1.000	364030		14.05(6.96-20.87)	96.9	262	
D 7 13C2 PFHxA										
315.00 > 270.00	2.039	2.046	-0.007	0.741	5640948	2.52		101	7753	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.070	2.069	0.001	1.157	3951171	2.44		104	4936	
349.00 > 99.00	2.070	2.069	0.001	1.157	1779954		2.22(1.15-3.45)	104	844	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.142	2.146	-0.004	0.779	453541	NC			1754	

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	2.142	2.147	-0.005	1.000	1064398	NC			346	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.384	0.002	0.867	6660043	2.62		105	8848	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.384	0.002	1.000	6659148	2.41		96.3	429	
363.00 > 169.00	2.386	2.384	0.002	1.000	1577218		4.22(2.17-6.52)	96.3	1235	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.398	0.001	1.000	5497093	2.15		94.5	4187	
399.00 > 99.00	2.399	2.398	0.001	1.000	1438857		3.82(1.90-5.70)	94.5	382	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.400	-0.001	0.872	4729117	2.47		104	7873	
65 ADONA										
377.00 > 251.00	2.438	2.435	0.003	0.776	10684495	NC			10473	
377.00 > 85.00	2.438	2.435	0.003	0.776	4554648		2.35(1.05-3.16)		1778	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.732	0.003	0.994	607653	2.46		104	812	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.732	0.003	1.000	1210888	2.21		93.5	1150	
* 62 13C2-PFOA										
415.00 > 370.00	2.752	2.755	-0.003		5399296	2.50			7822	
D 14 13C4 PFOA										
417.00 > 372.00	2.752	2.757	-0.005	1.000	5210338	2.45		97.8	12940	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.752	2.757	-0.005	1.000	5569567	2.44		97.5	533	
413.00 > 169.00	2.752	2.757	-0.005	1.000	2186956		2.55(1.36-4.08)	97.5	1409	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.768	2.767	0.001	0.881	4782579	2.40		101	5372	
449.00 > 99.00	2.768	2.767	0.001	0.881	1267120		3.77(1.84-5.53)	101	1902	
D 19 13C5 PFNA										
468.00 > 423.00	3.141	3.140	0.001	1.141	4728270	2.59		103	7338	
D 18 13C4 PFOS										
503.00 > 80.00	3.141	3.140	0.001	1.141	4714686	2.37		99.0	4063	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.141	3.140	0.001	1.000	5036535	2.38		103	2607	
499.00 > 99.00	3.141	3.140	0.001	1.000	1192726		4.22(2.04-6.12)	103	1774	
20 Perfluorononanoic acid										
463.00 > 419.00	3.141	3.140	0.001	1.000	5067037	2.54		102	628	
463.00 > 169.00	3.141	3.140	0.001	1.000	917503		5.52(2.68-8.03)	102	1244	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.349	3.348	0.001	1.066	5751276	NC			4551	
D 21 13C8 FOSA										
506.00 > 78.00	3.480	3.485	-0.005	1.265	3056647	2.57		103	5309	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.495	3.492	0.003	1.113	3273769	2.53		106	2823	
549.00 > 99.00	3.495	3.492	0.003	1.113	560356		5.84(3.02-9.05)	106	5055	
D 26 M2-8:2FTS										
529.00 > 81.00	3.495	3.492	0.003	1.270	72605	2.53		106	262	

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	3.495	3.492	0.003	1.004	9979434	2.66		106	3332	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.495	3.494	0.001	1.000	988723	2.33		97.1	3684	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.495	3.505	-0.010	1.000	5703670	2.49		99.5	618	
513.00 > 169.00	3.495	3.505	-0.010	1.000	391848		14.56(7.12-21.35)	99.5	254	
D 23 13C2 PFDA										
515.00 > 470.00	3.495	3.505	-0.010	1.270	4664987	2.55		102	5748	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.651	3.650	0.001	1.327	935170	2.63		105	2120	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.664	3.662	0.002	1.004	894063	2.36		94.6	630	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.816	3.816	0.0	1.215	4198724	2.55		106	5898	
599.00 > 99.00	3.816	3.816	0.0	1.215	831821		5.05(2.14-6.43)	106	1186	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.816	3.825	-0.009	1.387	737400	2.52		101	1389	
D 30 13C2 PFUnA										
565.00 > 520.00	3.832	3.831	0.001	1.393	3627913	2.45		98.1	7063	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.832	3.831	0.001	1.000	3156582	2.58		103	568	
563.00 > 169.00	3.832	3.831	0.001	1.000	311310		10.14(5.24-15.72)	103	625	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.832	3.831	0.001	1.004	666629	2.52		101	1051	
35 MeFOSA										
512.00 > 169.00	3.968	3.971	-0.003		1349625	NC			1186	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.983	3.993	-0.010	1.268	6293388	NC			9426	
D 36 13C2 PFDoA										
615.00 > 570.00	4.128	4.127	0.001	1.500	4126518	2.59		104	6138	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.128	4.127	0.001	1.000	4218718	2.60		104	788	
613.00 > 169.00	4.128	4.127	0.001	1.000	466237		9.05(4.68-14.05)	104	1580	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.128	4.127	0.001	1.181	529680	NC			1885	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.363	4.361	0.002	1.389	394353	NC			2254	
699.00 > 99.00	4.363	4.361	0.002	1.389	646161		0.61(0.28-0.83)		1731	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.394	4.392	0.002	1.064	3183456	2.57		103	837	
663.00 > 169.00	4.394	4.392	0.002	1.064	514227		6.19(3.09-9.27)	103	1016	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.636	4.635	0.001	1.685	2622464	2.58		103	6437	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.636	4.635	0.001	1.000	435218	2.58		103	1443	
713.00 > 219.00	4.636	4.635	0.001	1.000	292533		1.49(0.70-2.09)	103	988	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.051	5.049	0.002	1.836	2460813	2.63		105	4565	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.051	5.049	0.002	1.000	2195568	NC			292	
813.00 > 169.00	5.051	5.049	0.002	1.000	409391		5.36(2.77-8.32)		1275	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.399	5.401	-0.002	1.069	1661947	NC			1382	
913.00 > 169.00	5.399	5.401	-0.002	1.069	326432		5.09(2.55-7.64)		1835	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL5_00006 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 18:17:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_009.d

Injection Date: 03-Aug-2018 16:42:29 Instrument ID: A9

Lims ID: IC L5 Full

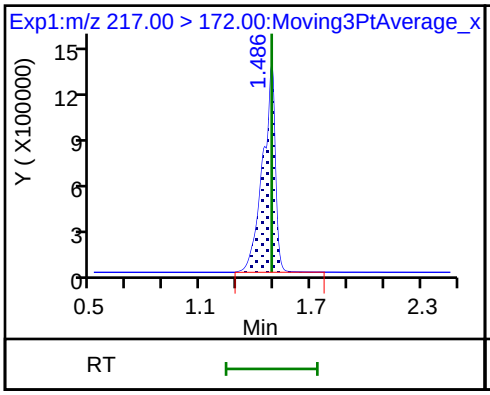
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 6

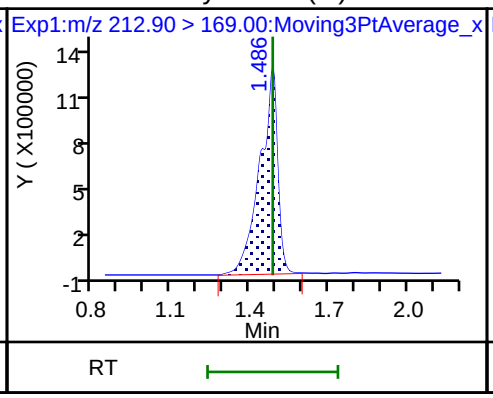
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

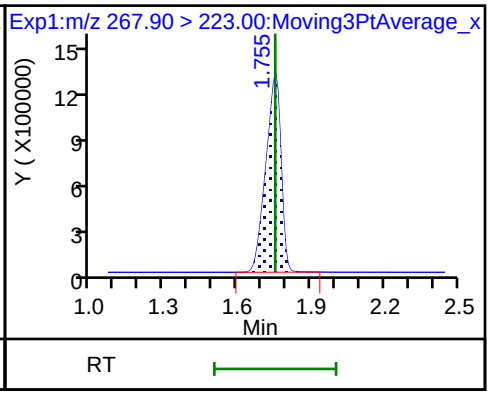
D 1 13C4 PFBA



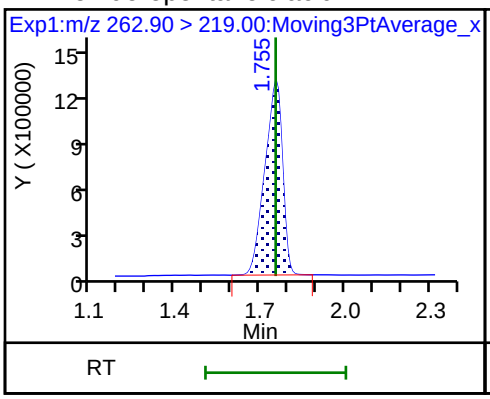
2 Perfluorobutyric acid (M)



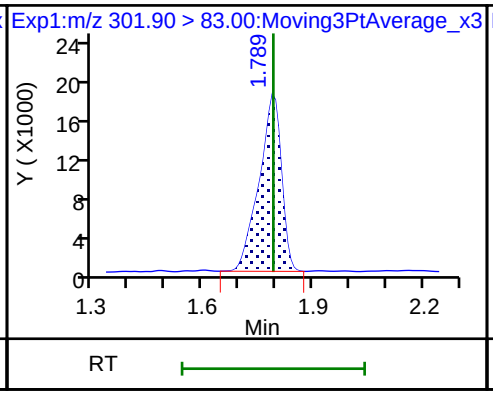
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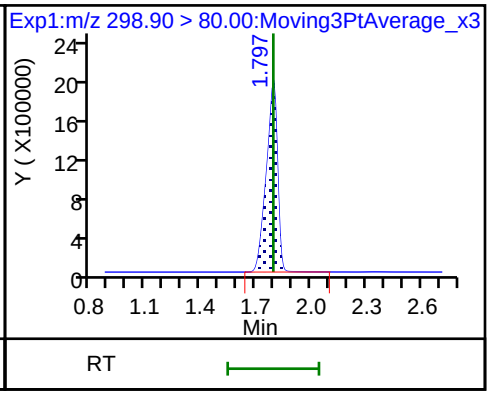
4 Perfluoropentanoic acid



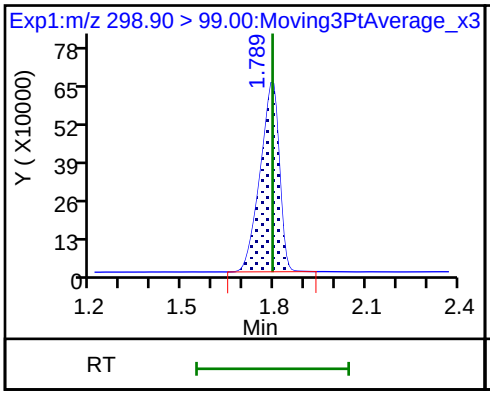
D 47 13C3-PFBS



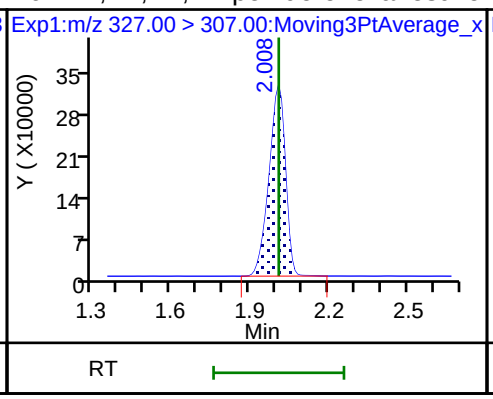
5 Perfluorobutanesulfonic acid



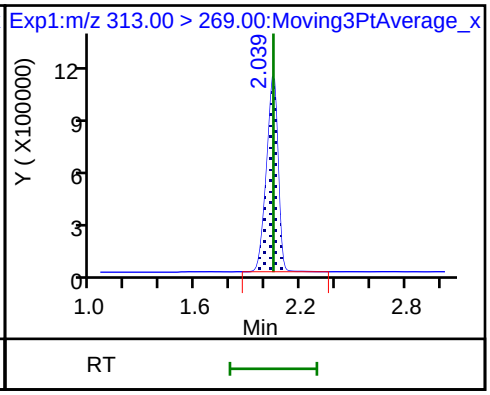
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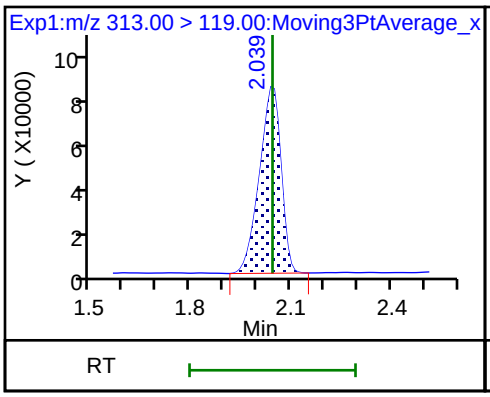
61 1H,1H,2H,2H-perfluorohexanesulfoni



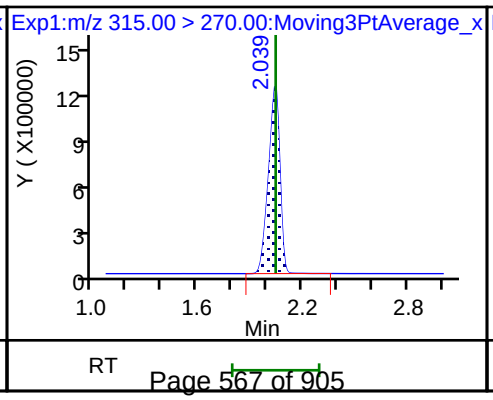
6 Perfluorohexanoic acid



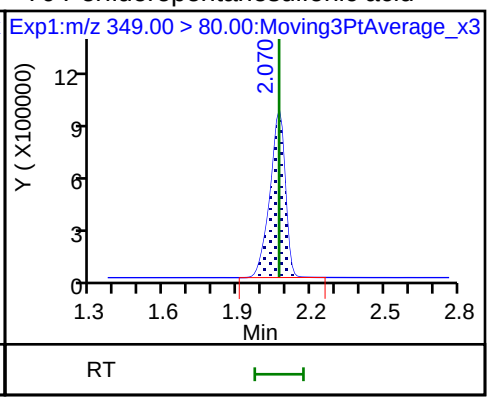
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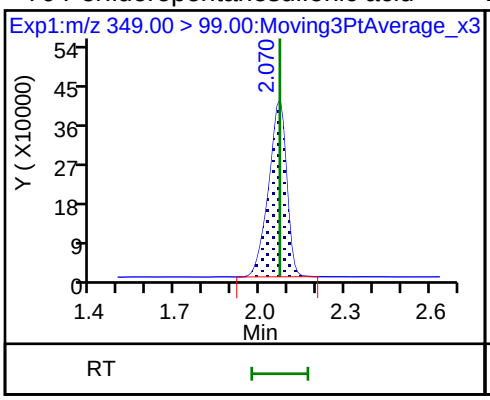
D 7 13C2 PFHxA



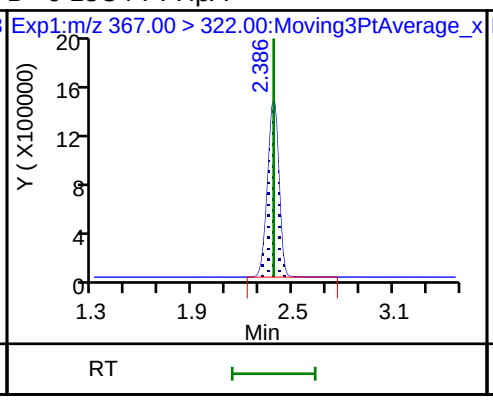
70 Perfluoropentanesulfonic acid



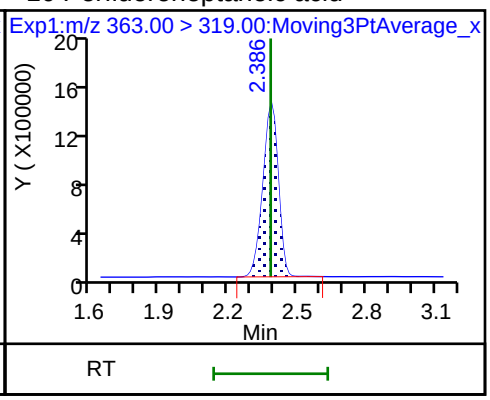
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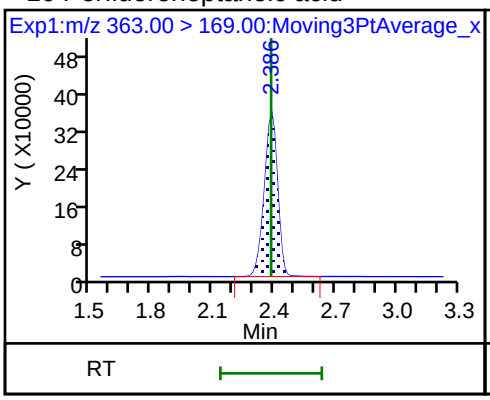
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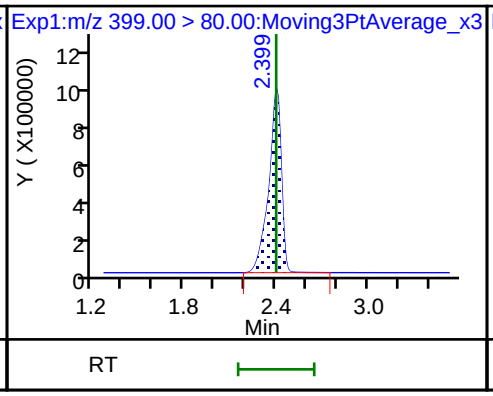
10 Perfluoroheptanoic acid



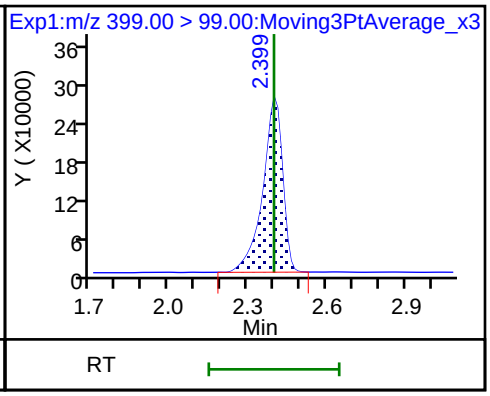
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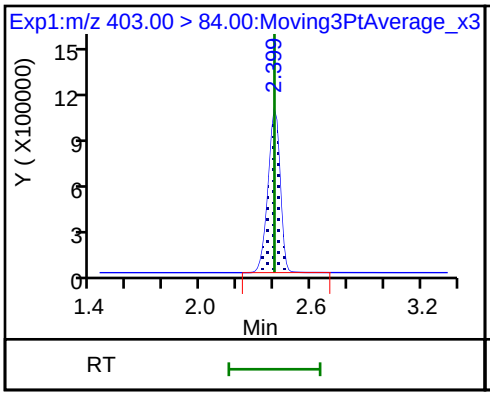
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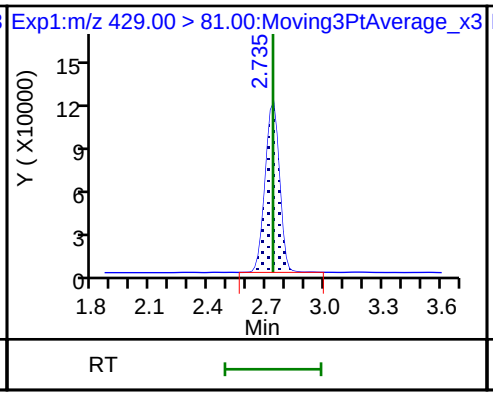
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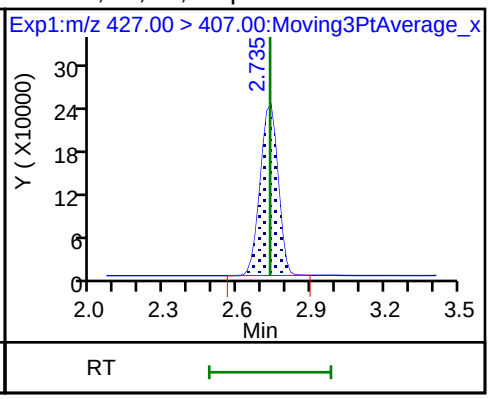
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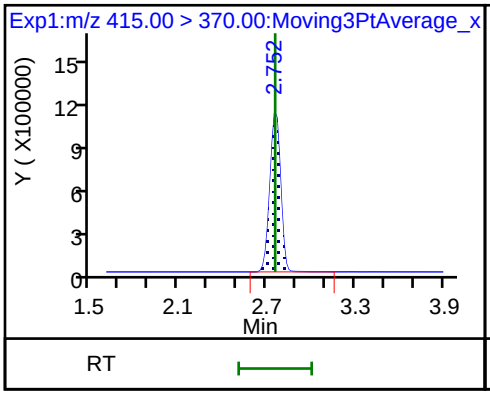
D 12 M2-6:2FTS



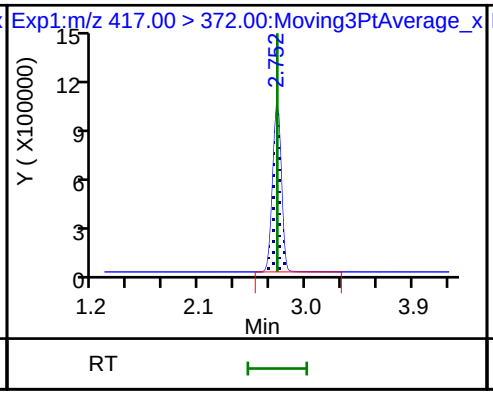
13 1H,1H,2H,2H-perfluorooctanesulfoni



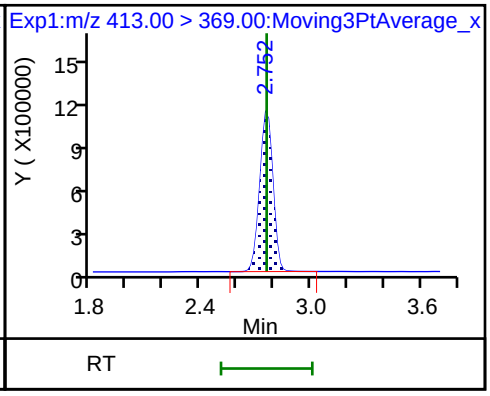
* 62 13C2-PFOA



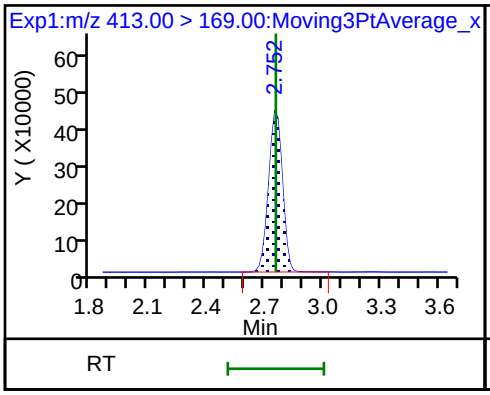
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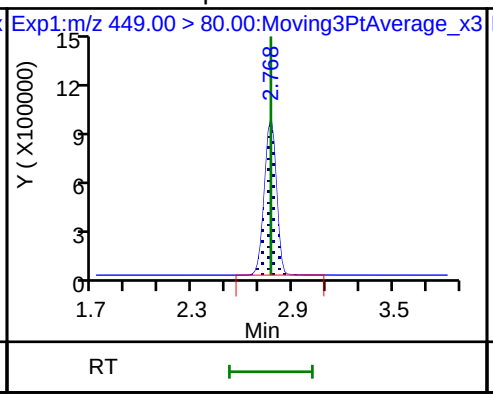
15 Perfluorooctanoic acid



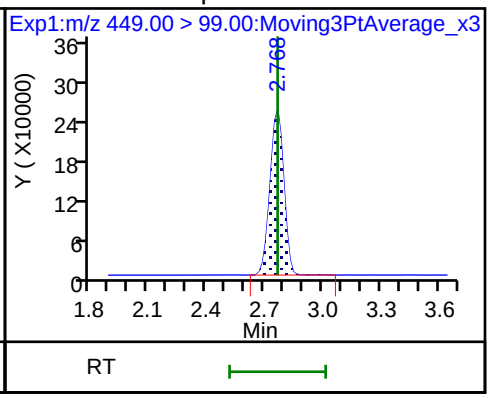
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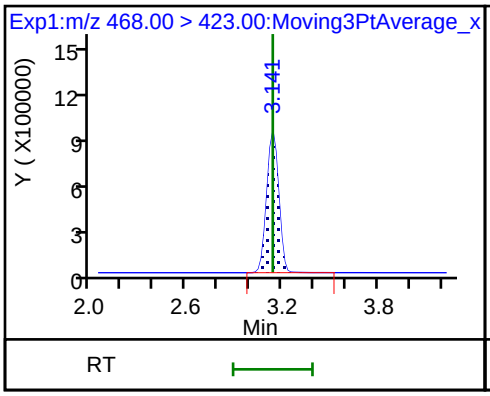
16 Perfluoroheptanesulfonic acid



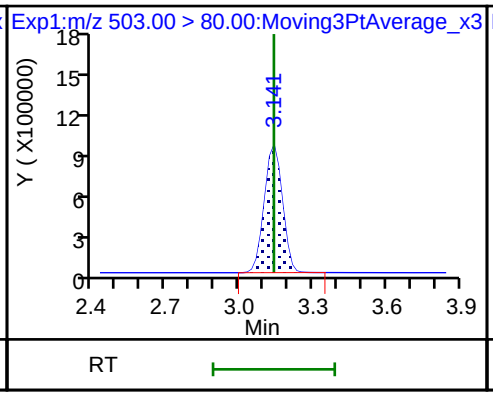
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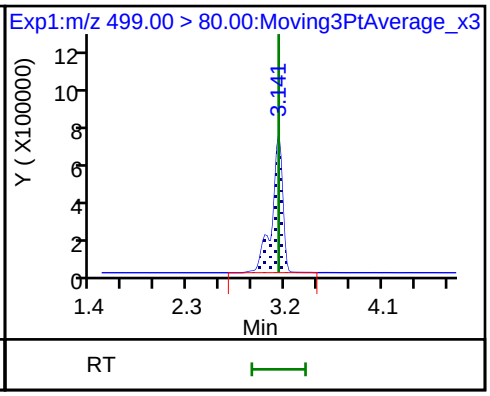
D 19 13C5 PFNA



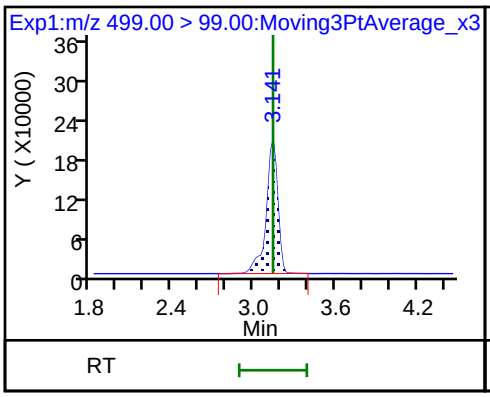
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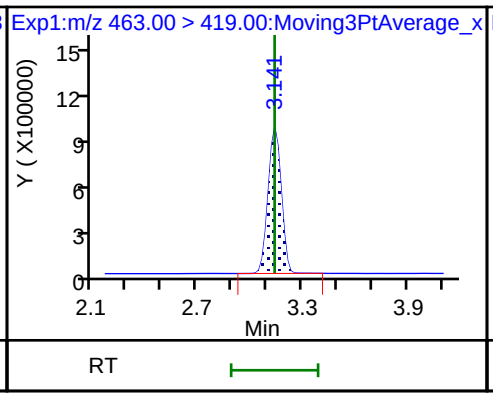
17 Perfluorooctane sulfonic acid



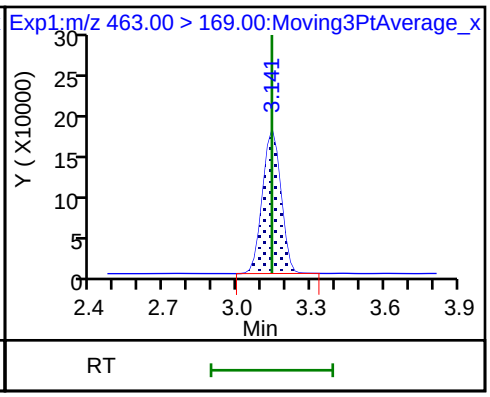
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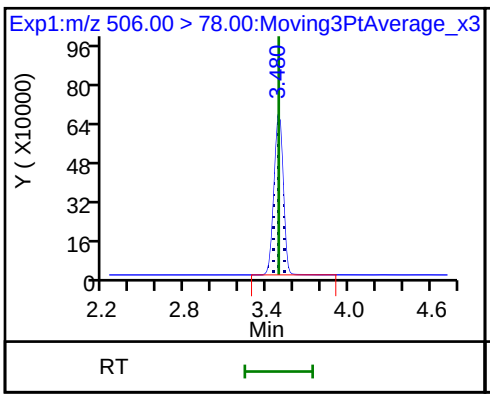
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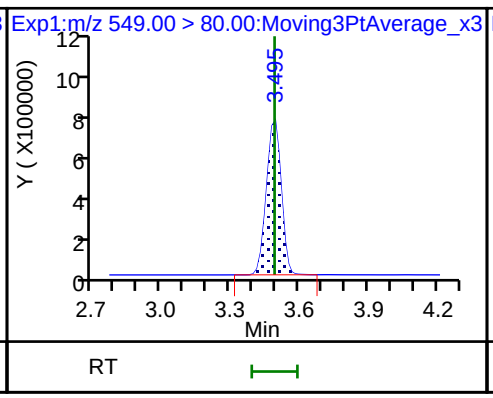
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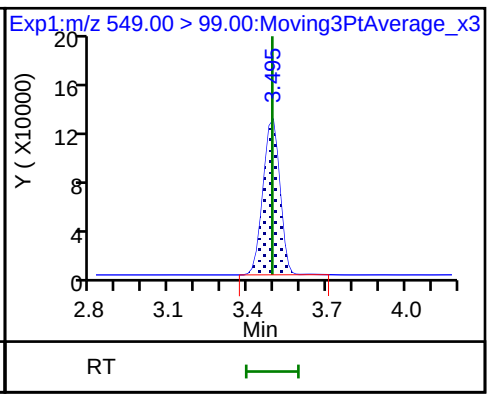
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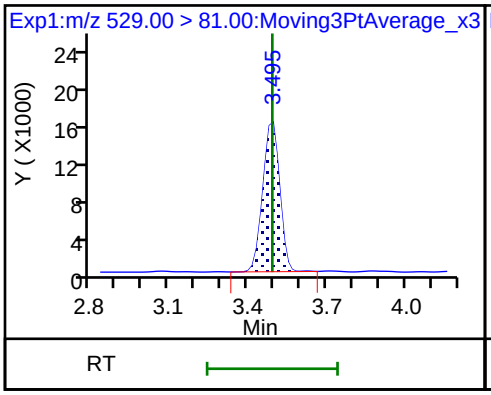
68 Perfluorononanesulfonic acid



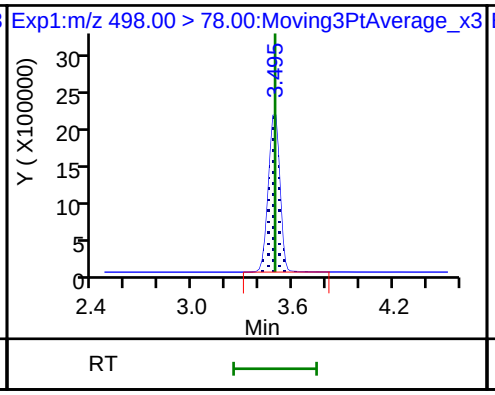
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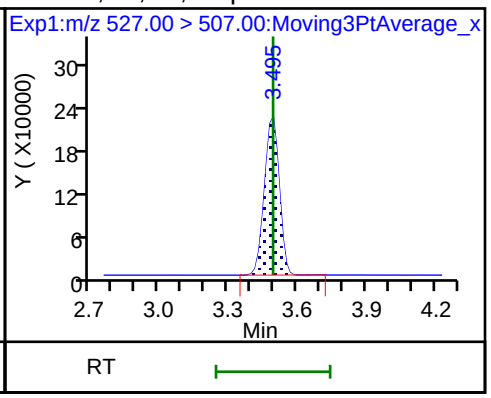
D 26 M2-8:2FTS



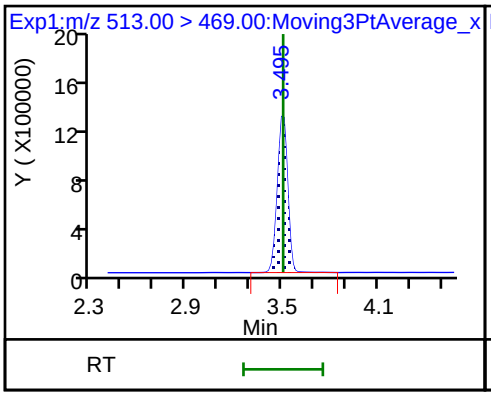
22 Perfluorooctane Sulfonamide



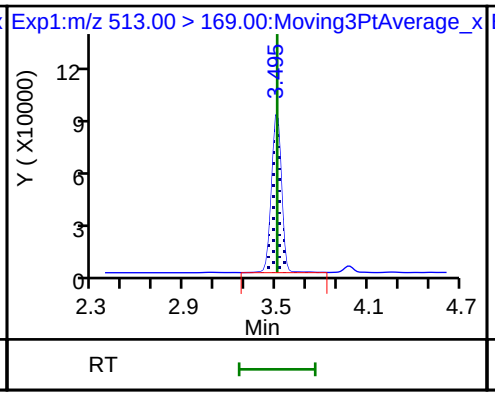
25 1H,1H,2H,2H-perfluorodecanesulfoni



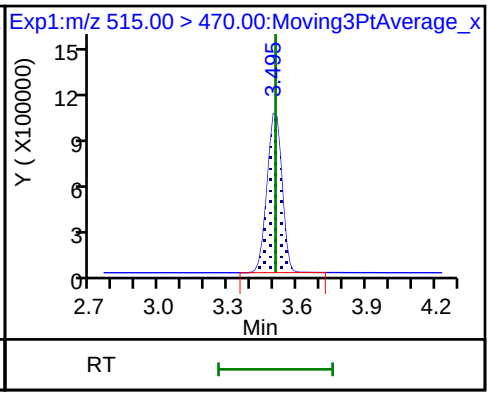
24 Perfluorodecanoic acid



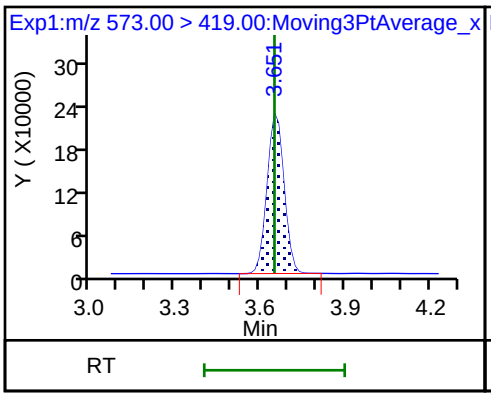
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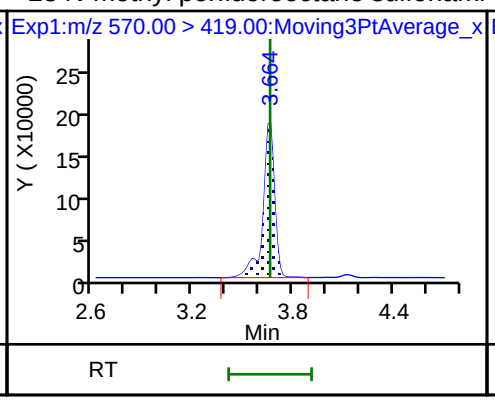
D 23 13C2 PFDA



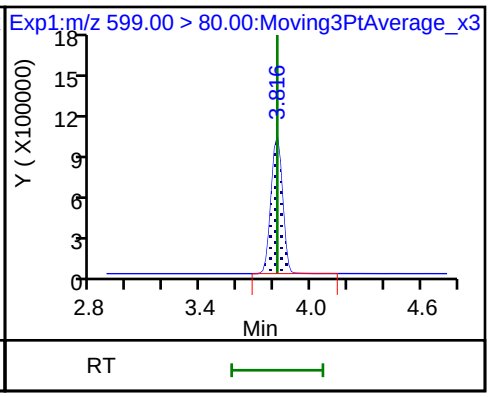
D 27 d3-NMeFOSAA



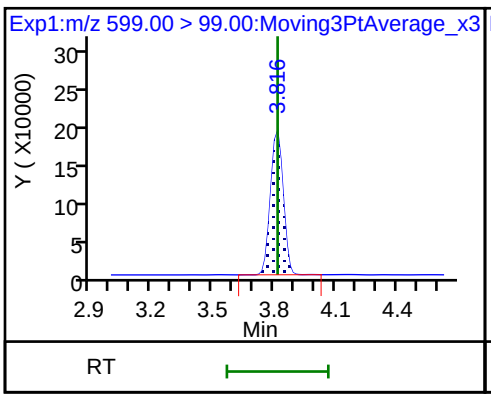
28 N-methyl perfluorooctane sulfonami



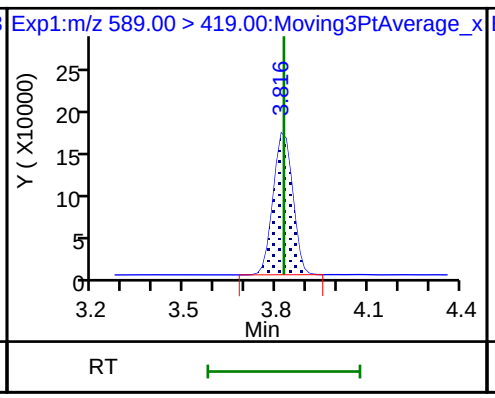
29 Perfluorodecane Sulfonic acid



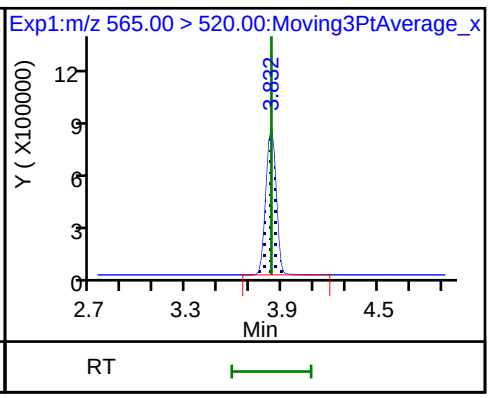
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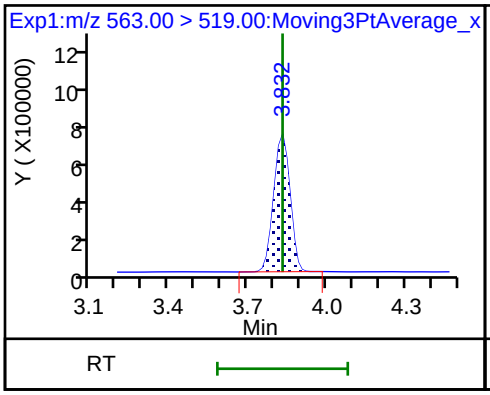
D 32 d5-NEtFOSAA



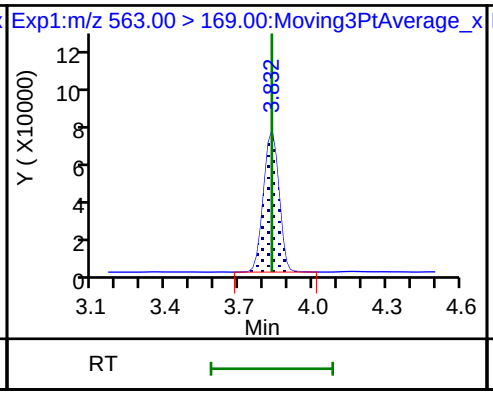
D 30 13C2 PFUnA



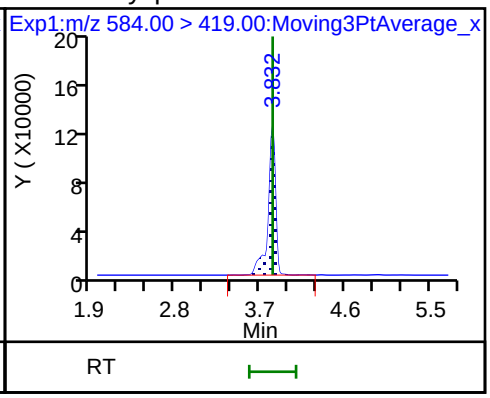
31 Perfluoroundecanoic acid



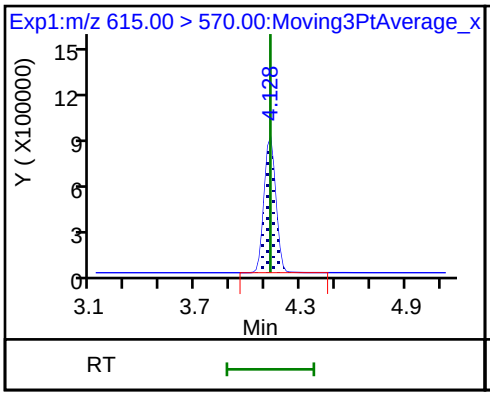
31 Perfluoroundecanoic acid



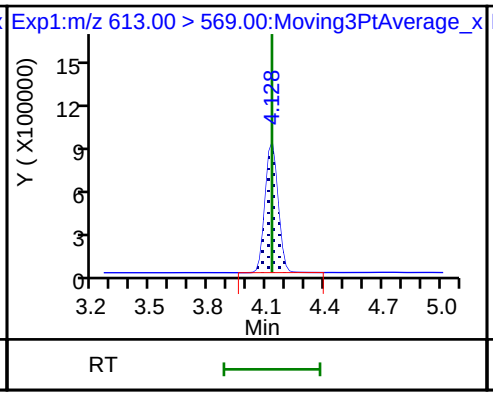
33 N-ethyl perfluorooctane sulfonamid



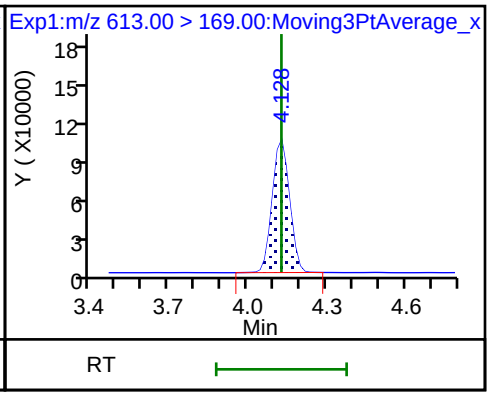
D 36 13C2 PFDoA



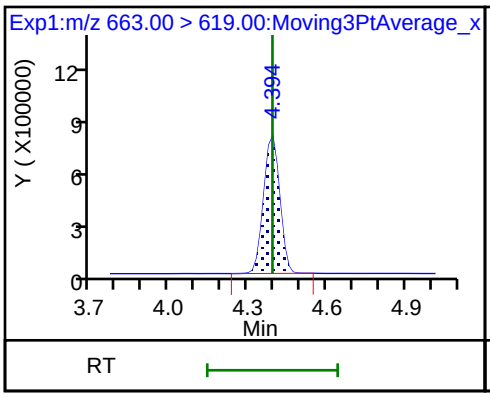
37 Perfluorododecanoic acid



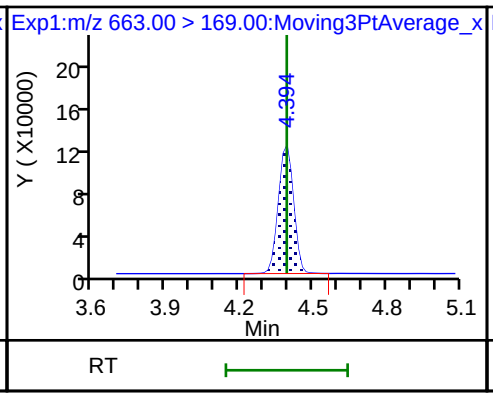
37 Perfluorododecanoic acid



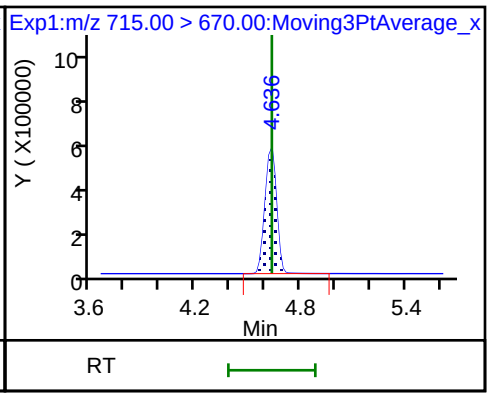
41 Perfluorotridecanoic acid



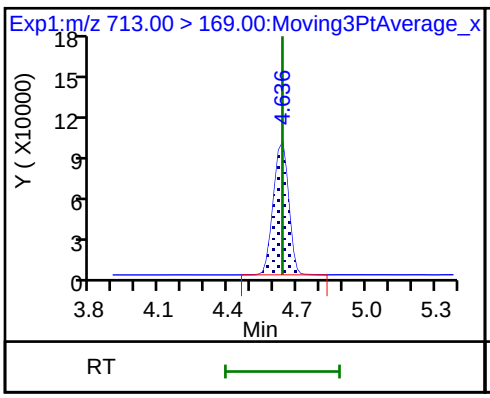
41 Perfluorotridecanoic acid



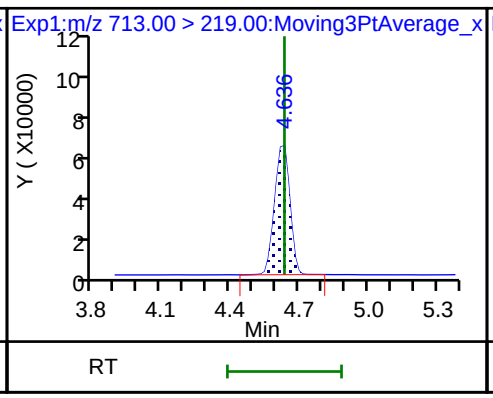
D 43 13C2-PFTeDA



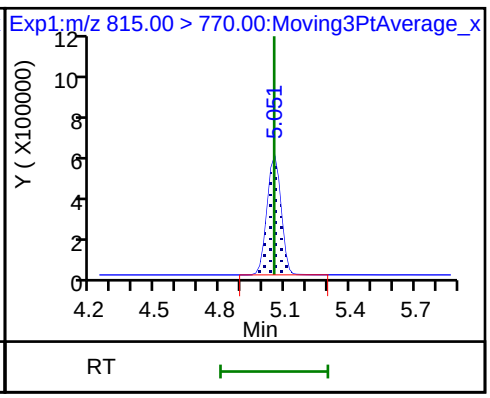
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

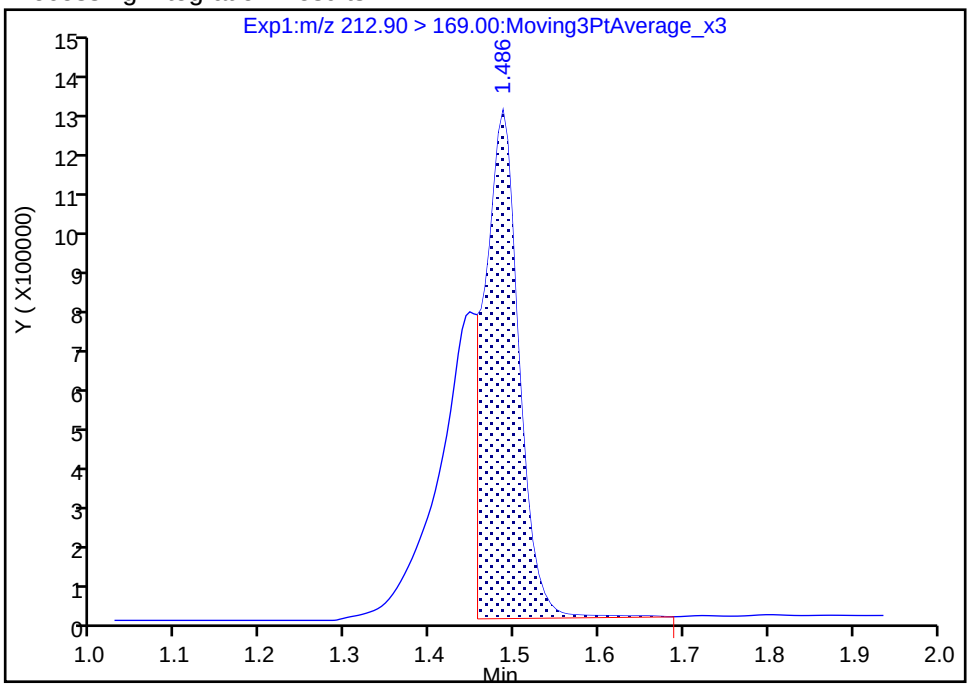
Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_009.d
Injection Date: 03-Aug-2018 16:42:29 Instrument ID: A9
Lims ID: IC L5 Full
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

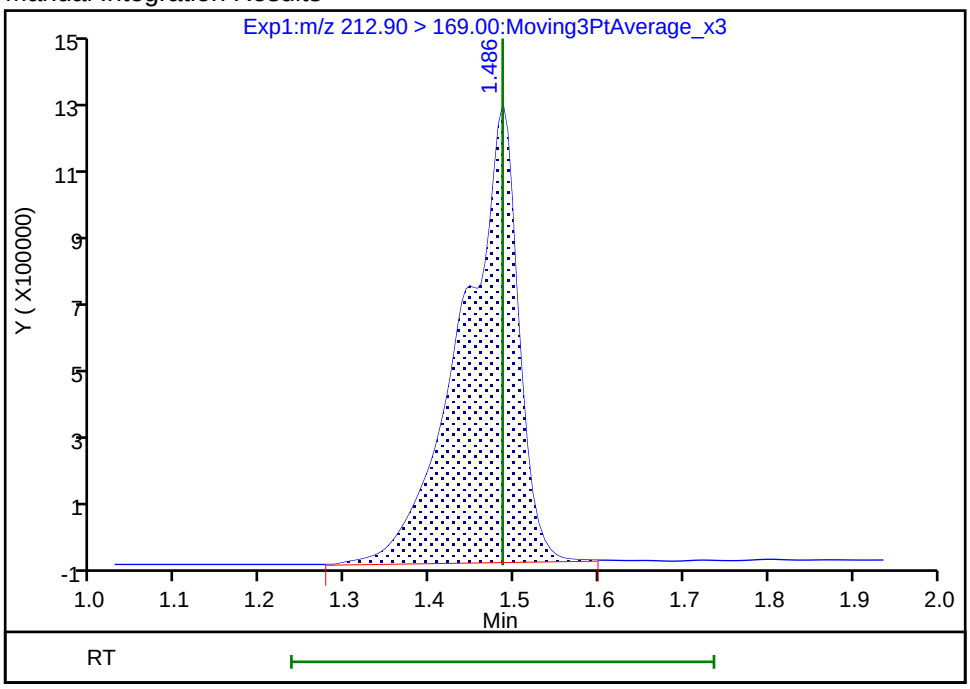
Processing Integration Results

RT: 1.49
Area: 3534540
Amount: 1.655560
Amount Units: ng/ml



Manual Integration Results

RT: 1.49
Area: 5937685
Amount: 2.613103
Amount Units: ng/ml



Reviewer: roycea, 03-Aug-2018 17:54:09
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_010.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 03-Aug-2018 16:50:01 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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:17:45 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:55:33

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	1.486	1.485	0.001	0.540	6541983	2.67		107	8530	
2 Perfluorobutyric acid										
212.90 > 169.00	1.486	1.486	0.0	1.000	12603718	5.18		104	259	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.753	0.002	0.638	5832978	2.66		106	8912	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.754	0.001	1.000	11314842	4.75		95.1	459	
D 47 13C3-PFBS										
301.90 > 83.00	1.788	1.792	-0.004	0.650	84962	2.50		108	256	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.788	1.794	-0.006	1.000	16018083	4.24		96.0	7684	
298.90 > 99.00	1.788	1.794	-0.006	1.000	6232269		2.57(1.35-4.05)	96.0	1810	
D 60 M2-4:2FTS										
329.00 > 81.00	2.008	2.006	0.002	0.730	598286	NC			394	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.008	2.009	-0.001	1.123	2865640	4.61		98.6	7006	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.049	2.044	0.005	1.000	10791075	4.91		98.1	857	
313.00 > 119.00	2.049	2.044	0.005	1.000	804320		13.42(6.96-20.87)	98.1	741	
D 7 13C2 PFHxA										
315.00 > 270.00	2.049	2.046	0.003	0.745	5878468	2.58		103	6088	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.070	2.069	0.001	1.157	8636453	4.83		103	9595	
349.00 > 99.00	2.070	2.069	0.001	1.157	3947341		2.19(1.15-3.45)	103	1888	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.142	2.146	-0.004	0.778	497113	NC			2001	

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	2.152	2.147	0.005	1.005	2285140	NC			724	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.384	0.002	0.867	6626960	2.56		103	12049	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.384	0.002	1.000	13282534	4.83		96.5	751	
363.00 > 169.00	2.386	2.384	0.002	1.000	3253794		4.08(2.17-6.52)	96.5	1850	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.398	0.001	1.000	11602279	4.37		96.1	8421	
399.00 > 99.00	2.399	2.398	0.001	1.000	3173103		3.66(1.90-5.70)	96.1	816	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.400	-0.001	0.872	4906340	2.52		107	9501	
65 ADONA										
377.00 > 251.00	2.438	2.435	0.003	0.776	19896553	NC			10232	
377.00 > 85.00	2.438	2.435	0.003	0.776	9227938		2.16(1.05-3.16)		3485	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.732	0.003	0.994	579189	2.30		97.0	709	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.732	0.003	1.000	2412122	4.63		97.7	3704	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.755	-0.004		5491691	2.50			8197	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.757	-0.006	1.000	5669239	2.62		105	7134	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.757	-0.006	1.000	11122158	4.48		89.4	934	
413.00 > 169.00	2.751	2.757	-0.006	1.000	4237582		2.62(1.36-4.08)	89.4	2130	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.881	10881371	5.11		107	8477	
449.00 > 99.00	2.767	2.767	0.0	0.881	2750325		3.96(1.84-5.53)	107	4020	
D 19 13C5 PFNA										
468.00 > 423.00	3.140	3.140	0.0	1.141	4799148	2.58		103	4797	
D 18 13C4 PFOS										
503.00 > 80.00	3.140	3.140	0.0	1.141	5039962	2.49		104	4493	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.140	3.140	0.0	1.000	10846850	4.80		103	6910	
499.00 > 99.00	3.140	3.140	0.0	1.000	2597888		4.18(2.04-6.12)	103	2641	
20 Perfluorononanoic acid										
463.00 > 419.00	3.140	3.140	0.0	1.000	9176653	4.53		90.6	1068	
463.00 > 169.00	3.140	3.140	0.0	1.000	1956007		4.69(2.68-8.03)	90.6	2172	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.348	3.348	0.0	1.066	11613434	NC			5095	
D 21 13C8 FOSA										
506.00 > 78.00	3.495	3.485	0.010	1.270	3130628	2.59		103	4904	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.495	3.492	0.003	1.113	7148701	5.18		108	4781	
549.00 > 99.00	3.495	3.492	0.003	1.113	1169271		6.11(3.02-9.05)	108	4585	
D 26 M2-8:2FTS										
529.00 > 81.00	3.495	3.492	0.003	1.270	66824	2.29		95.6	291	

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	3.495	3.492	0.003	1.000	17949426	4.67		93.3	4722	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.495	3.494	0.001	1.000	1847076	4.72		98.6	3644	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.509	3.505	0.004	1.000	10776223	4.70		93.9	1049	
513.00 > 169.00	3.509	3.505	0.004	1.000	810665		13.29(7.12-21.35)	93.9	337	
D 23 13C2 PFDA										
515.00 > 470.00	3.509	3.505	0.004	1.276	4667480	2.51		100	6729	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.650	3.650	0.0	1.327	968788	2.68		107	1904	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.663	3.662	0.001	1.004	1892335	4.83		96.6	1283	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.815	3.816	-0.001	1.215	8492671	4.83		100	10916	
599.00 > 99.00	3.815	3.816	-0.001	1.215	1845378		4.60(2.14-6.43)	100	2211	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.815	3.825	-0.010	1.387	757844	2.55		102	1447	
D 30 13C2 PFUnA										
565.00 > 520.00	3.831	3.831	0.0	1.392	3808061	2.53		101	7476	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.831	3.831	0.0	1.000	6306082	4.92		98.3	1159	
563.00 > 169.00	3.831	3.831	0.0	1.000	587672		10.73(5.24-15.72)	98.3	1432	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.831	3.831	0.0	1.004	1494790	5.50		110	2181	
35 MeFOSA										
512.00 > 169.00	3.981	3.971	0.010		2925684	NC			1857	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.997	3.993	0.004	1.273	11903789	NC			12021	
D 36 13C2 PFDoA										
615.00 > 570.00	4.126	4.127	-0.001	1.500	4310482	2.66		106	5503	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.126	4.127	-0.001	1.000	8139691	4.80		96.0	1097	
613.00 > 169.00	4.126	4.127	-0.001	1.000	906848		8.98(4.68-14.05)	96.0	2618	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.126	4.127	-0.001	1.181	1128569	NC			3154	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.360	4.361	-0.001	1.389	852398	NC			4042	
699.00 > 99.00	4.360	4.361	-0.001	1.389	1606737		0.53(0.28-0.83)		3252	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.392	4.392	0.0	1.064	6273910	4.85		97.0	1535	
663.00 > 169.00	4.392	4.392	0.0	1.064	1149600		5.46(3.09-9.27)	97.0	1722	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.562	4.547	0.015		5406	NC			0.0	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.634	4.635	-0.001	1.684	2591620	2.50		100	4696	

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	4.634	4.635	-0.001	1.000	902731	5.41		108	2262	
713.00 > 219.00	4.634	4.635	-0.001	1.000	598166		1.51(0.70-2.09)	108	1942	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.046	5.049	-0.003	1.834	2427794	2.56		102	4766	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.046	5.049	-0.003	1.000	4463963	NC			602	
813.00 > 169.00	5.046	5.049	-0.003	1.000	861053		5.18(2.77-8.32)		1892	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.394	5.401	-0.007	1.069	3505499	NC			2299	
913.00 > 169.00	5.394	5.401	-0.007	1.069	709466		4.94(2.55-7.64)		2750	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00007 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 18:17:48 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_010.d

Injection Date: 03-Aug-2018 16:50:01 Instrument ID: A9

Lims ID: IC L6 Full

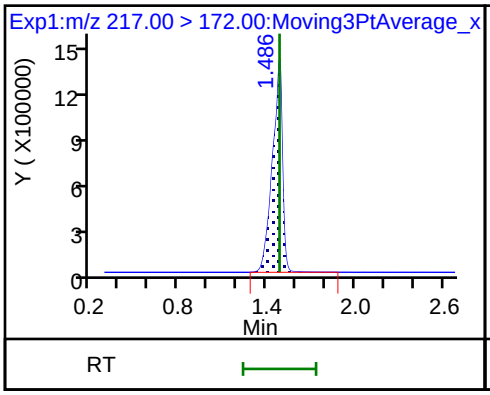
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 15 Worklist Smp#: 7

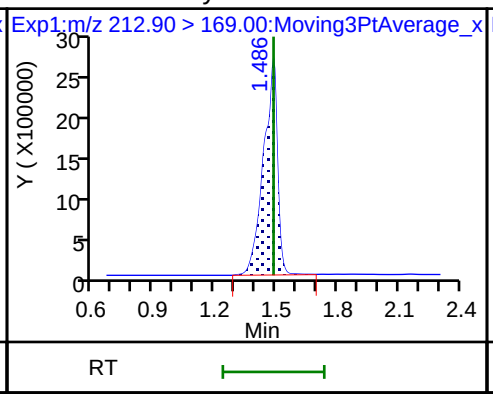
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

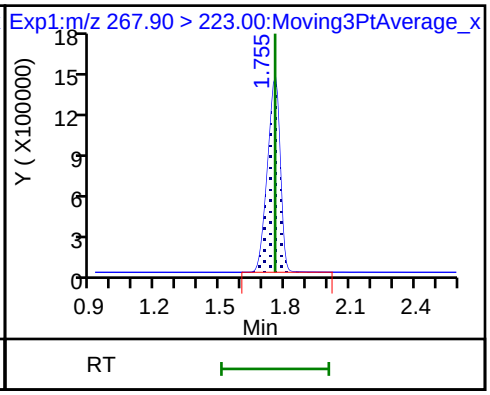
D 1 13C4 PFBA



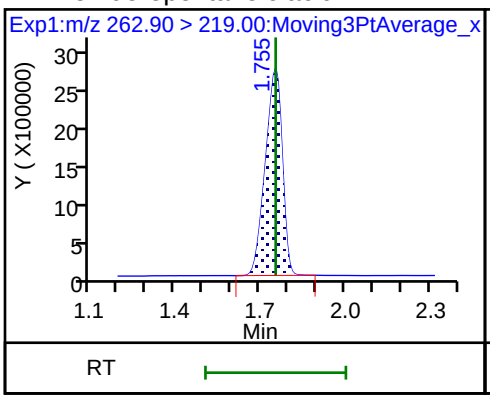
2 Perfluorobutyric acid



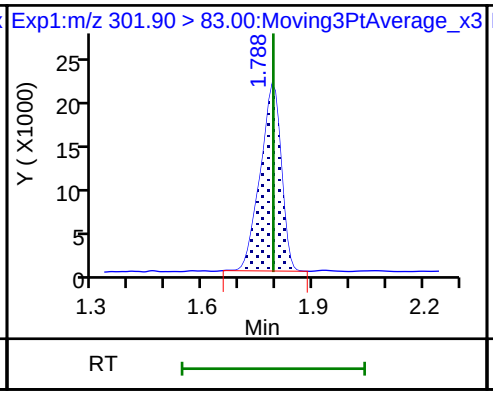
D 3 13C5-PFPeA



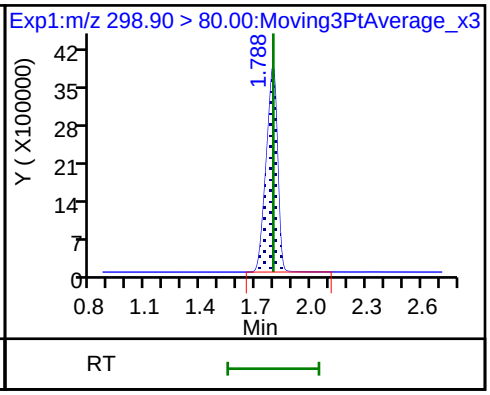
4 Perfluoropentanoic acid



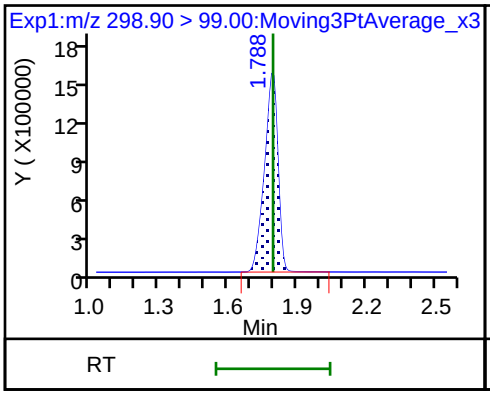
D 47 13C3-PFBS



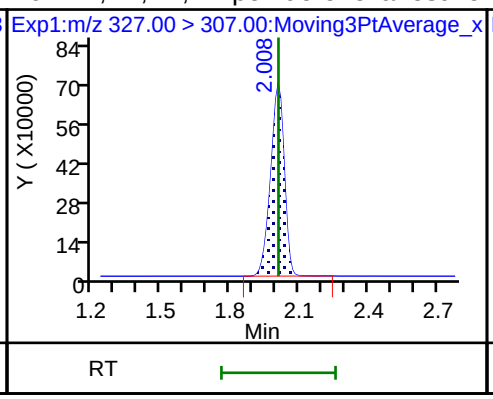
5 Perfluorobutanesulfonic acid



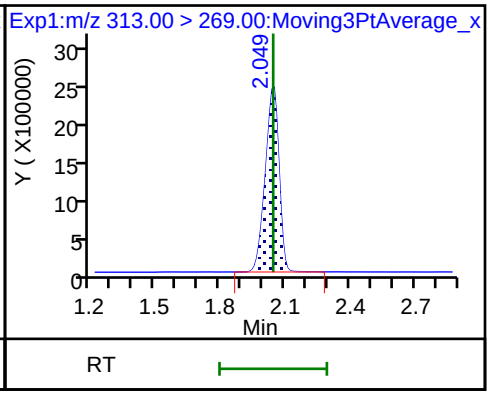
5 Perfluorobutanesulfonic acid



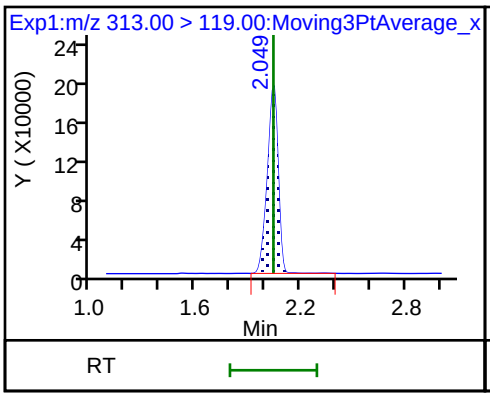
61 1H,1H,2H,2H-perfluorohexanesulfoni



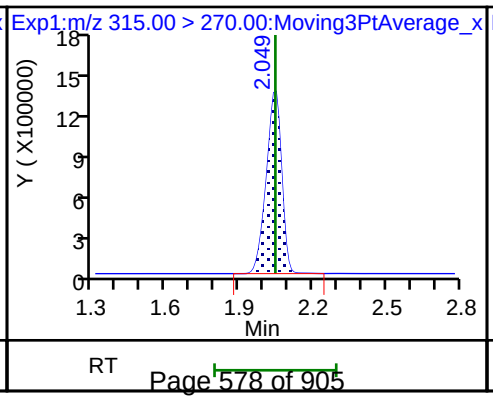
6 Perfluorohexanoic acid



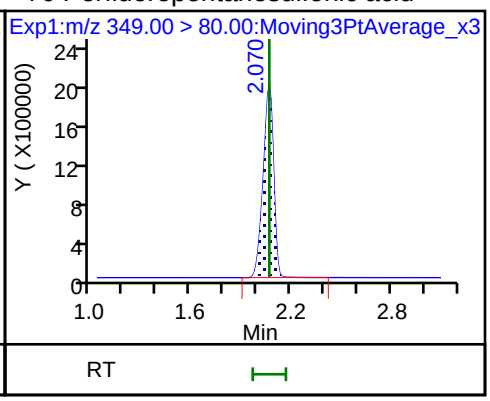
6 Perfluorohexanoic acid



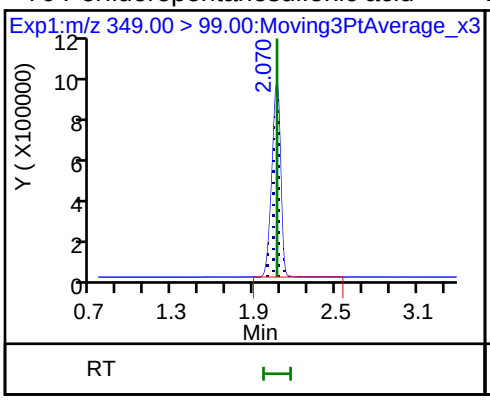
D 7 13C2 PFHxA



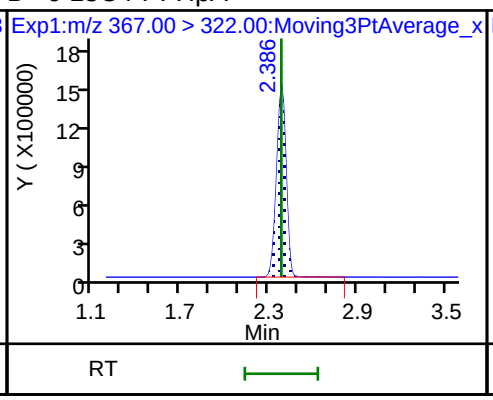
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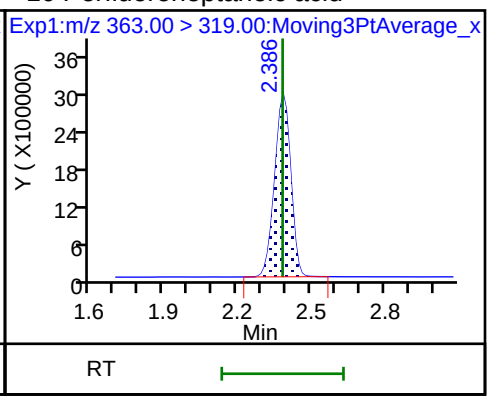
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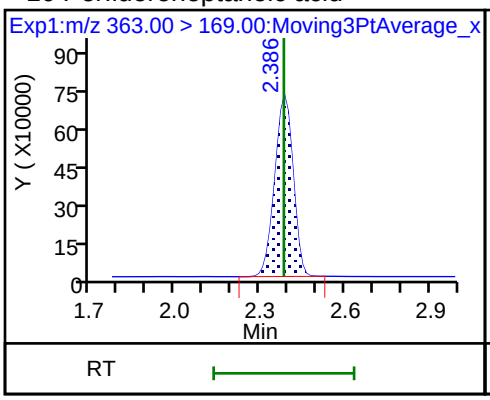
D 9 13C4-PFHpA



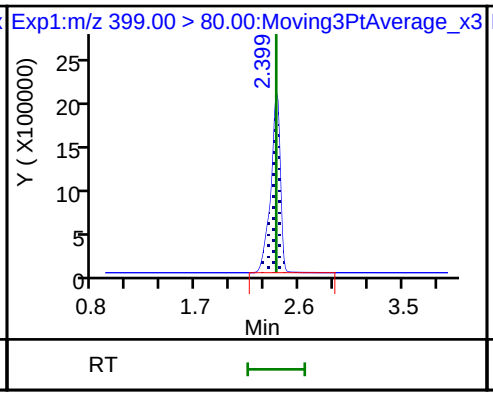
10 Perfluoroheptanoic acid



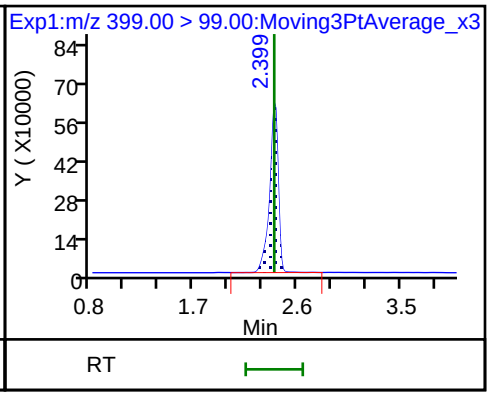
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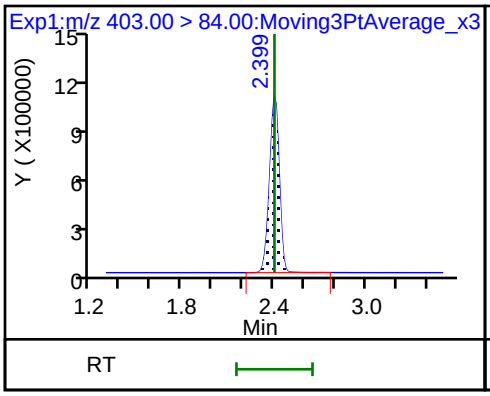
8 Perfluorohexanesulfonic acid



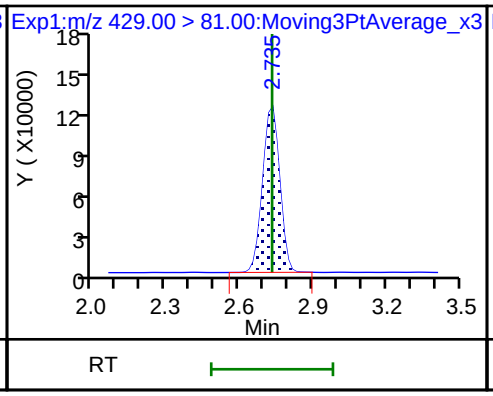
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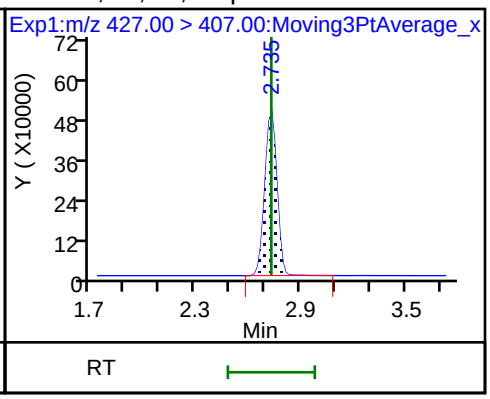
D 11 18O2 PFHxS



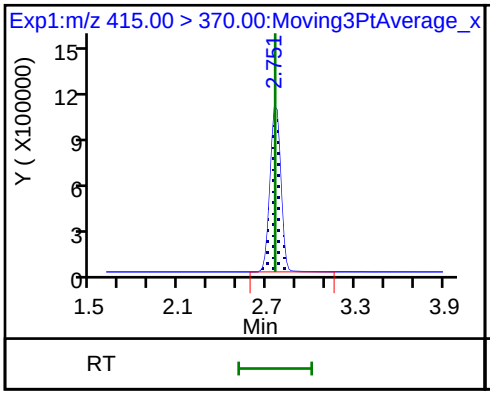
D 12 M2-6:2FTS



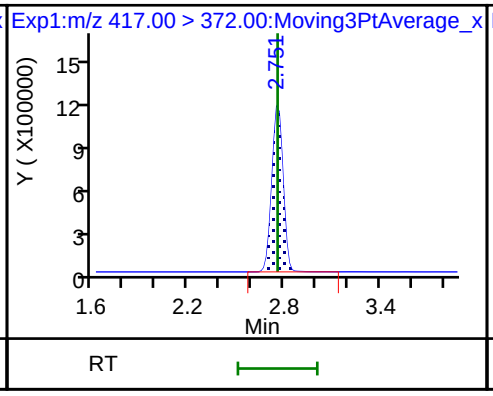
13 1H,1H,2H,2H-perfluorooctanesulfoni



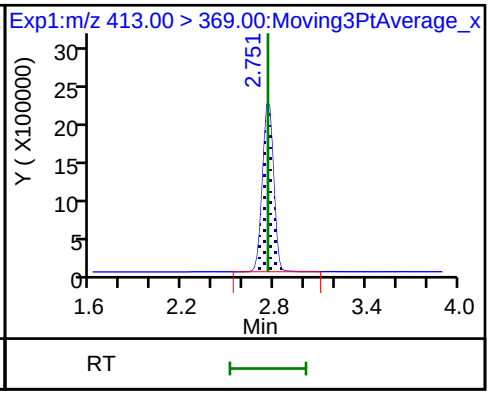
* 62 13C2-PFOA



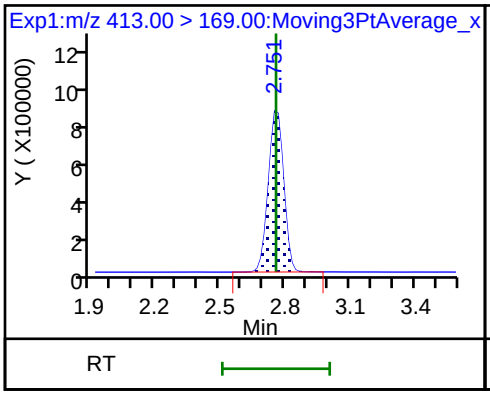
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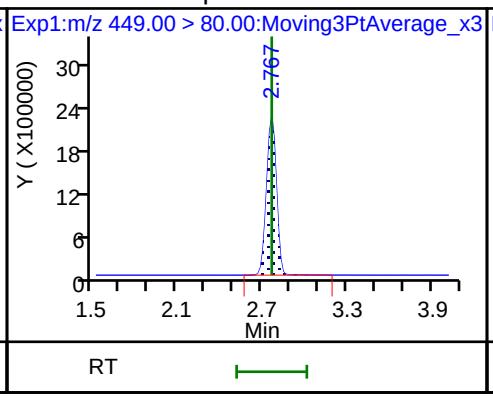
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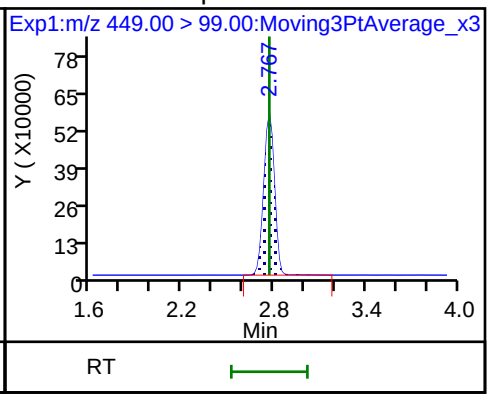
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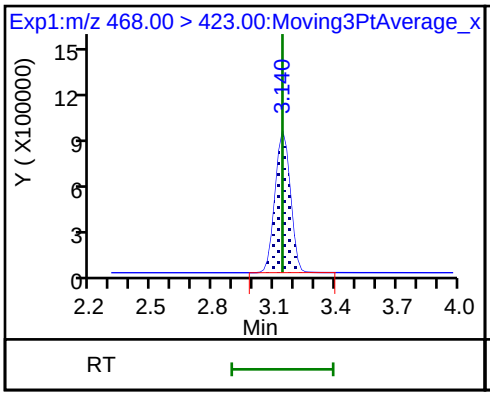
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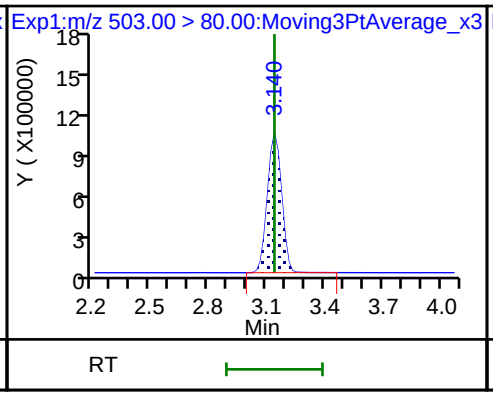
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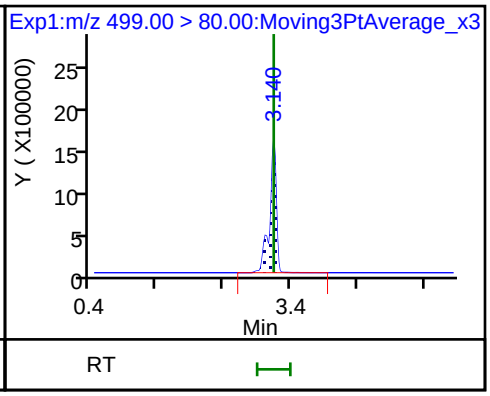
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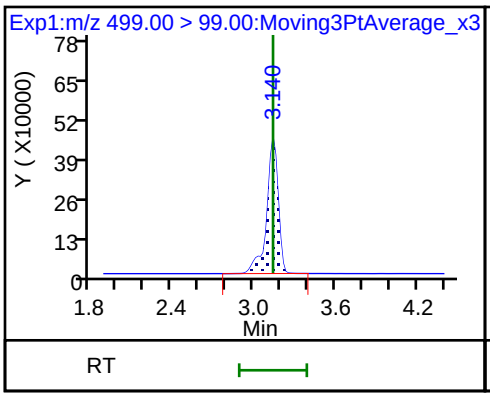
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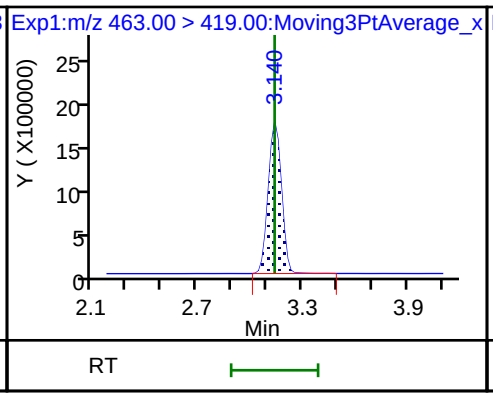
17 Perfluorooctane sulfonic acid



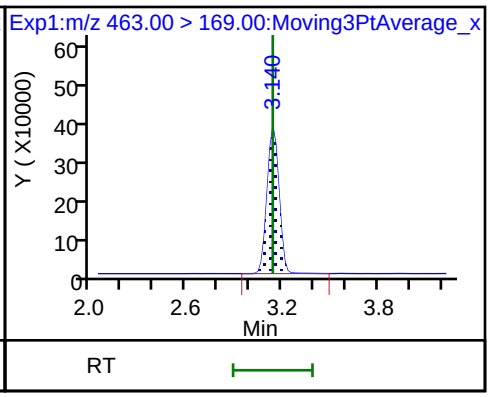
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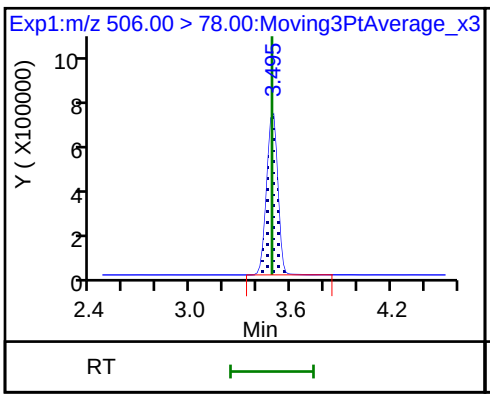
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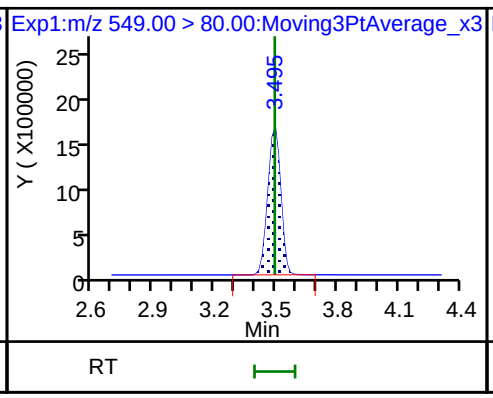
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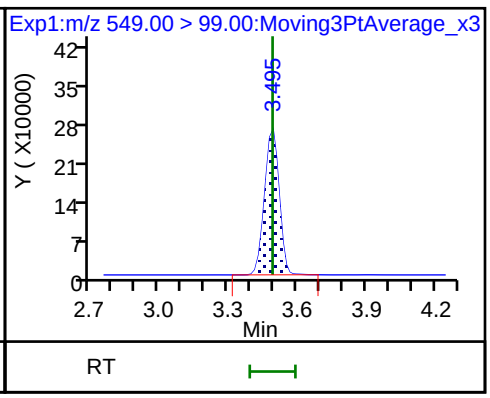
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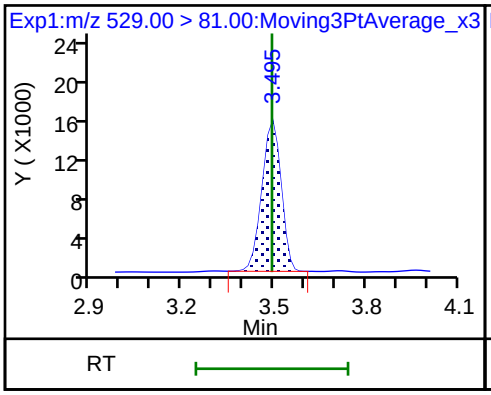
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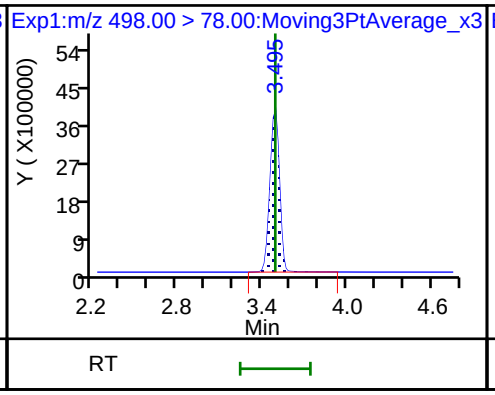
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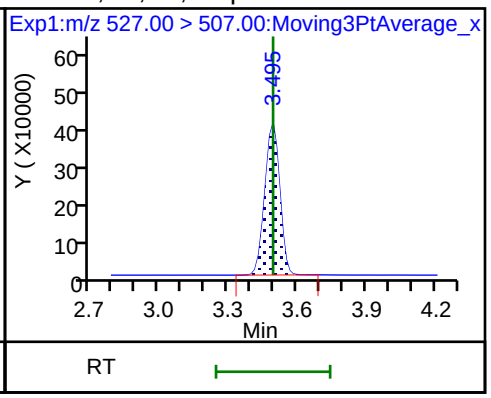
D 26 M2-8:2FTS



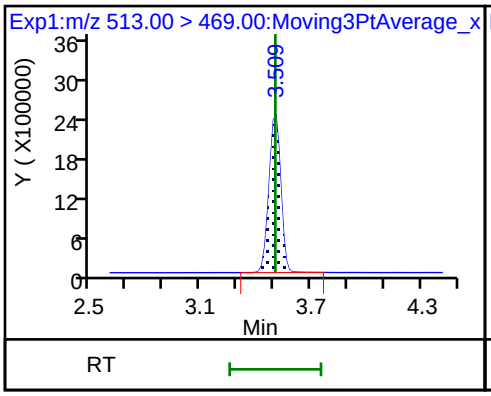
22 Perfluorooctane Sulfonamide



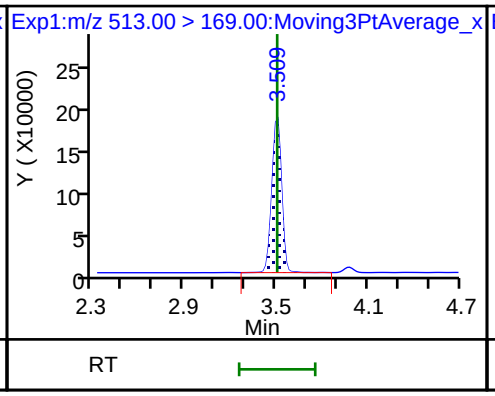
25 1H,1H,2H,2H-perfluorodecanesulfoni



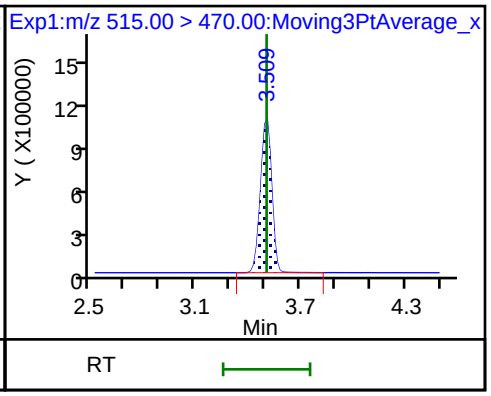
24 Perfluorodecanoic acid



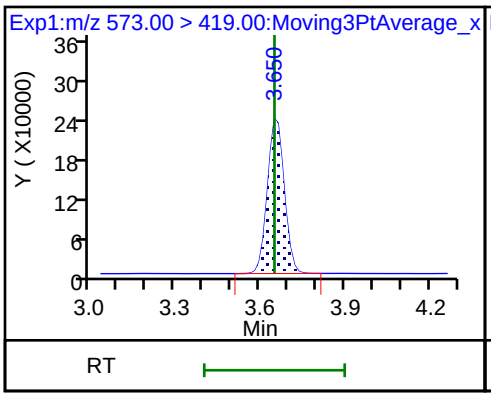
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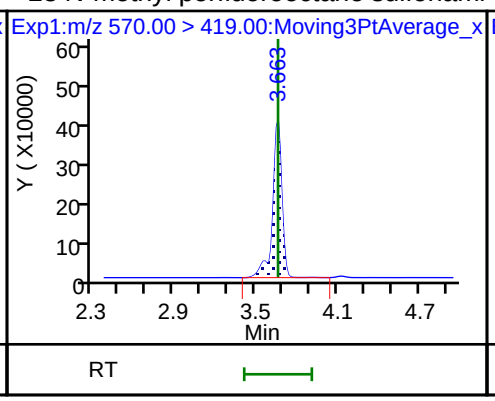
D 23 13C2 PFDA



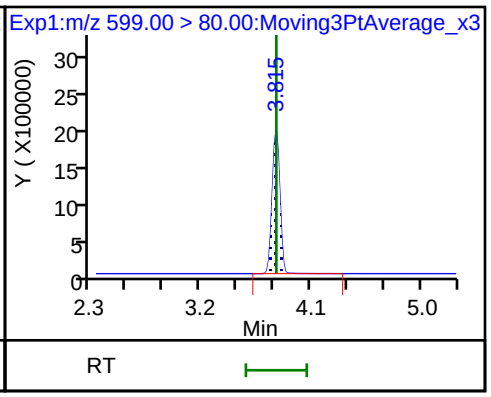
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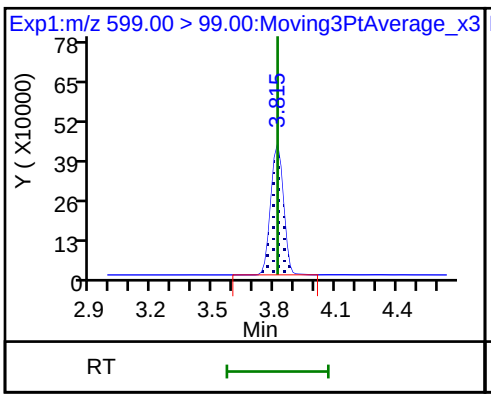
28 N-methyl perfluorooctane sulfonami



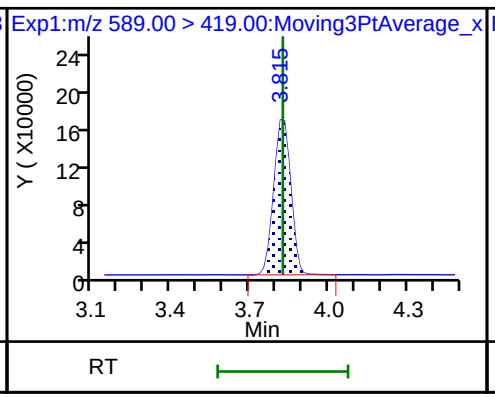
29 Perfluorodecane Sulfonic acid



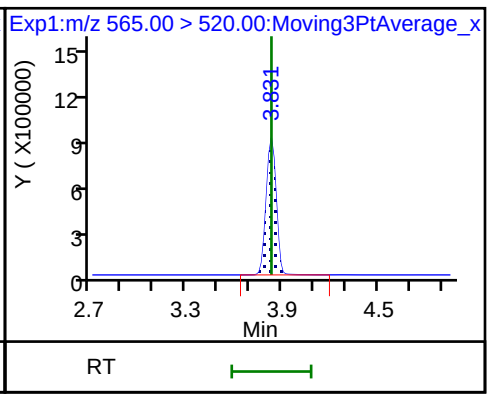
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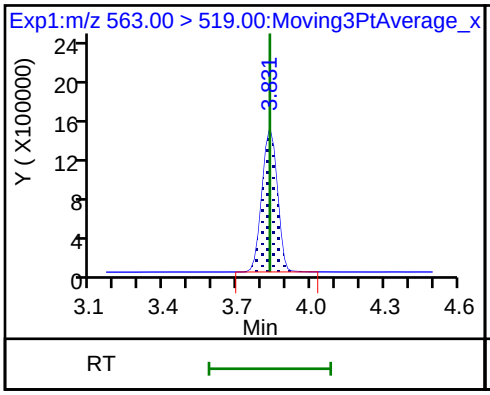
D 32 d5-NEtFOSAA



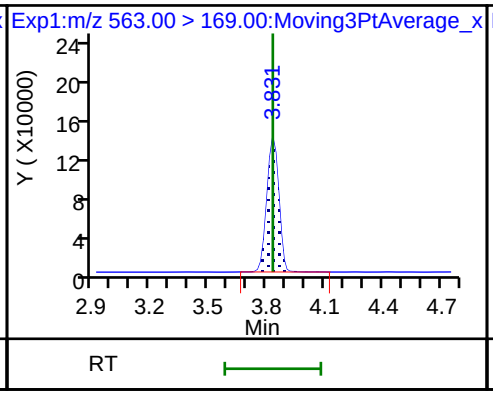
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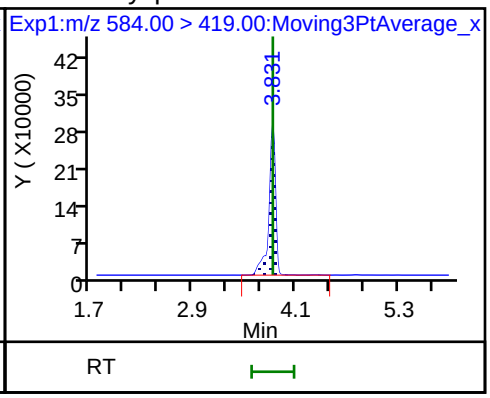
31 Perfluoroundecanoic acid



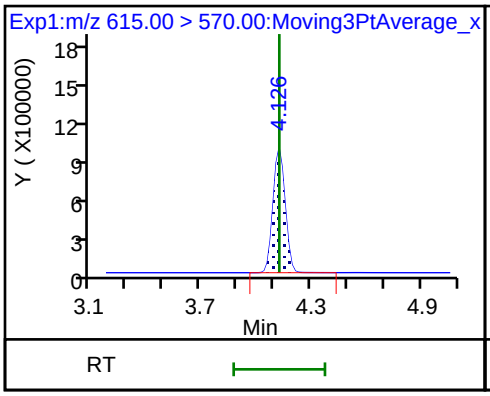
31 Perfluoroundecanoic acid



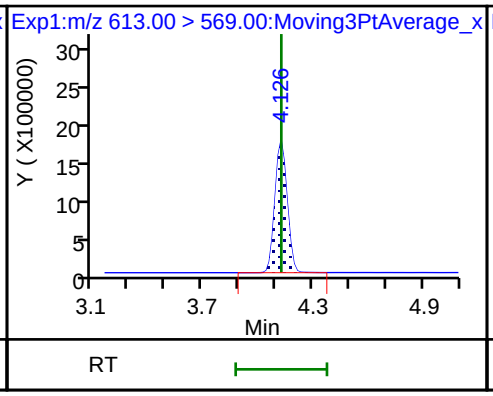
33 N-ethyl perfluorooctane sulfonamid



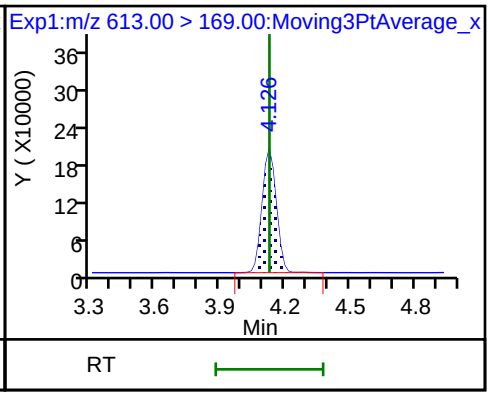
D 36 13C2 PFDoA



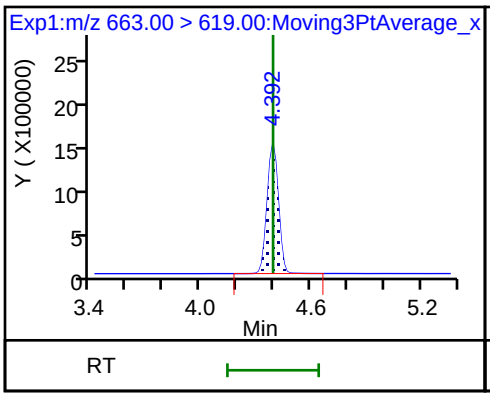
37 Perfluorododecanoic acid



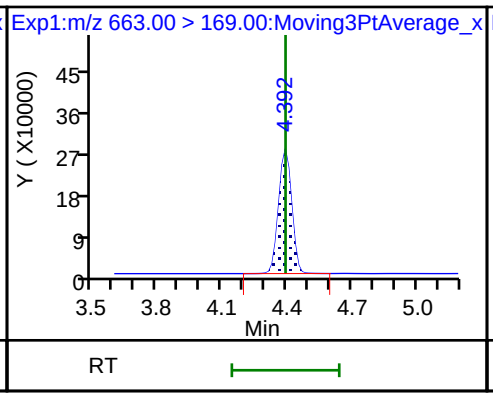
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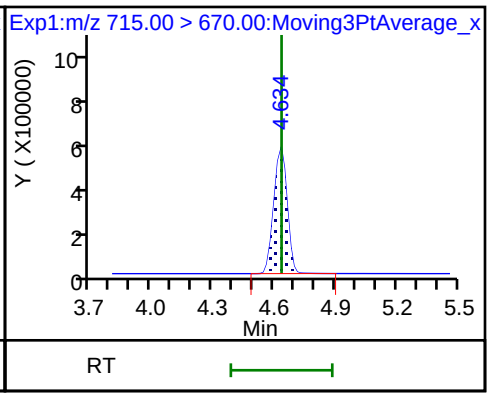
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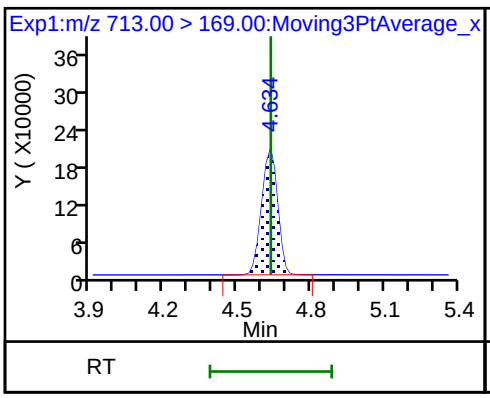
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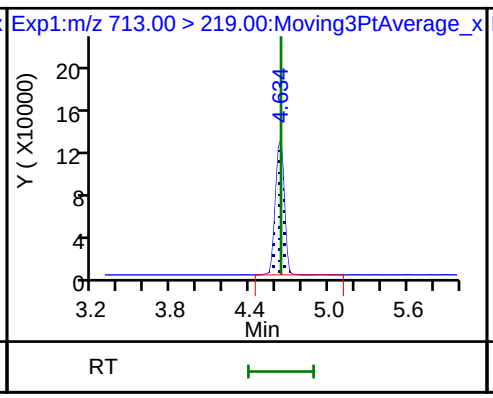
D 43 13C2-PFTeDA



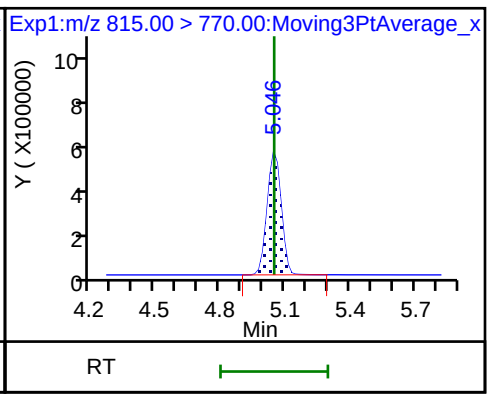
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 03-Aug-2018 16:57:30 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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:17:52 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:56:21

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	1.481	1.485	-0.004	0.538	6389618	2.77		111	10673	
2 Perfluorobutyric acid										
212.90 > 169.00	1.481	1.486	-0.005	1.000	22190566	9.34		93.4	395	
D 3 13C5-PFPeA										
267.90 > 223.00	1.747	1.753	-0.006	0.635	5299526	2.57		103	7345	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.747	1.754	-0.007	1.000	19426688	8.98		89.8	694	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.792	-0.003	0.650	81999	2.57		110	264	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.789	1.794	-0.005	1.000	28367522	7.79		88.1	12332	
298.90 > 99.00	1.789	1.794	-0.005	1.000	11602722		2.44(1.35-4.05)	88.1	2915	
D 60 M2-4:2FTS										
329.00 > 81.00	1.998	2.006	-0.008	0.726	510976	NC			336	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.008	2.009	-0.001	1.123	5133972	8.55		91.6	5723	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.039	2.044	-0.005	1.000	18541720	9.14		91.4	1471	
313.00 > 119.00	2.039	2.044	-0.005	1.000	1466504		12.64(6.96-20.87)	91.4	970	
D 7 13C2 PFHxA										
315.00 > 270.00	2.039	2.046	-0.007	0.741	5424292	2.53		101	6827	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.060	2.069	-0.009	1.152	15637004	9.07		96.6	8225	
349.00 > 99.00	2.060	2.069	-0.009	1.152	7694253		2.03(1.15-3.45)	96.6	3055	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.142	2.146	-0.004	0.778	499092	NC			1442	

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	2.142	2.147	-0.005	1.000	4459473	NC			1317	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.384	-0.011	0.863	6139851	2.53		101	8105	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.373	2.384	-0.011	1.000	22336263	8.76		87.6	1107	
363.00 > 169.00	2.386	2.384	0.002	1.005	5996606		3.72(2.17-6.52)	87.6	3802	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.398	0.001	1.000	21190483	8.08		88.8	10664	
399.00 > 99.00	2.399	2.398	0.001	1.000	6058552		3.50(1.90-5.70)	88.8	1358	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.400	-0.001	0.872	4846975	2.65		112	9586	
65 ADONA										
377.00 > 251.00	2.425	2.435	-0.010	0.772	32954362	NC			11938	
377.00 > 85.00	2.425	2.435	-0.010	0.772	16139119		2.04(1.05-3.16)		5721	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.732	-0.013	0.988	545128	2.31		97.1	784	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.732	-0.013	1.000	4160680	8.48		89.5	2457	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.755	-0.004		5162538	2.50			5349	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.757	-0.006	1.000	5093432	2.50		100	8251	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.757	-0.006	1.000	18927627	8.48		84.7	1618	
413.00 > 169.00	2.751	2.757	-0.006	1.000	7976014		2.37(1.36-4.08)	84.7	4374	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.881	19279404	8.96		94.1	17385	
449.00 > 99.00	2.767	2.767	0.0	0.881	5426206		3.55(1.84-5.53)	94.1	8463	
D 19 13C5 PFNA										
468.00 > 423.00	3.140	3.140	0.0	1.141	4275948	2.45		97.9	8469	
D 18 13C4 PFOS										
503.00 > 80.00	3.140	3.140	0.0	1.141	5087246	2.67		112	4120	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.140	3.140	0.0	1.000	20323268	8.90		95.9	8981	
499.00 > 99.00	3.140	3.140	0.0	1.000	5140497		3.95(2.04-6.12)	95.9	3345	
20 Perfluorononanoic acid										
463.00 > 419.00	3.140	3.140	0.0	1.000	16180234	8.97		89.7	1683	
463.00 > 169.00	3.140	3.140	0.0	1.000	3390408		4.77(2.68-8.03)	89.7	2829	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.348	3.348	0.0	1.066	19597962	NC			8782	
D 21 13C8 FOSA										
506.00 > 78.00	3.479	3.485	-0.006	1.265	2836181	2.49		99.7	4069	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.479	3.492	-0.013	1.108	11730197	8.42		87.7	4528	
549.00 > 99.00	3.479	3.492	-0.013	1.108	2255764		5.20(3.02-9.05)	87.7	5332	
D 26 M2-8:2FTS										
529.00 > 81.00	3.479	3.492	-0.013	1.265	58823	2.14		89.5	181	

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	3.479	3.492	-0.013	1.000	30333745	8.71		87.1	3491	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.495	3.494	0.001	1.004	3196523	9.28		96.9	4249	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.495	3.505	-0.010	1.000	17490817	8.53		85.3	1579	
513.00 > 169.00	3.495	3.505	-0.010	1.000	1410250		12.40(7.12-21.35)	85.3	380	
D 23 13C2 PFDA										
515.00 > 470.00	3.495	3.505	-0.010	1.270	4172222	2.38		95.4	5685	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.650	3.650	0.0	1.327	980371	2.88		115	2858	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.650	3.662	-0.012	1.000	3779673	9.54		95.4	2074	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.815	3.816	-0.001	1.215	15042348	8.48		88.0	9051	
599.00 > 99.00	3.800	3.816	-0.016	1.210	3670491		4.10(2.14-6.43)	88.0	4285	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.815	3.825	-0.010	1.387	716421	2.56		103	1487	
D 30 13C2 PFUnA										
565.00 > 520.00	3.831	3.831	0.0	1.392	3432823	2.43		97.1	5892	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.831	3.831	0.0	1.000	10624244	9.19		91.9	1602	
563.00 > 169.00	3.831	3.831	0.0	1.000	1137229		9.34(5.24-15.72)	91.9	2229	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.831	3.831	0.0	1.004	2757725	10.7		107	3008	
35 MeFOSA										
512.00 > 169.00	3.966	3.971	-0.005		5607041	NC			1770	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.981	3.993	-0.012	1.268	19963188	NC			14573	
D 36 13C2 PFDoA										
615.00 > 570.00	4.126	4.127	-0.001	1.500	3811691	2.50		100	5493	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.126	4.127	-0.001	1.000	13309612	8.88		88.8	1750	
613.00 > 169.00	4.126	4.127	-0.001	1.000	1728821		7.70(4.68-14.05)	88.8	2624	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.126	4.127	-0.001	1.186	2272763	NC			5871	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.361	4.361	0.0	1.389	1696460	NC			5623	
699.00 > 99.00	4.361	4.361	0.0	1.389	2936663		0.58(0.28-0.83)		4081	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.392	4.392	0.0	1.064	10635642	9.30		93.0	2179	
663.00 > 169.00	4.392	4.392	0.0	1.064	2019559		5.27(3.09-9.27)	93.0	3100	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.531	4.547	-0.016		8415	NC			0.0	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.634	4.635	-0.001	1.684	2552499	2.62		105	5884	

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	4.634	4.635	-0.001	1.000	1662766	10.1		101	3865	
713.00 > 219.00	4.616	4.635	-0.019	0.996	1223656		1.36(0.70-2.09)	101	2523	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.046	5.049	-0.003	1.834	2356463	2.64		106	5489	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.046	5.049	-0.003	1.000	8500467	NC			1114	
813.00 > 169.00	5.046	5.049	-0.003	1.000	1709925		4.97(2.77-8.32)		3224	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.394	5.401	-0.007	1.069	6355971	NC			3453	
913.00 > 169.00	5.394	5.401	-0.007	1.069	1389603		4.57(2.55-7.64)		4199	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00006 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 18:17:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Injection Date: 03-Aug-2018 16:57:30 Instrument ID: A9

Lims ID: IC L7 Full

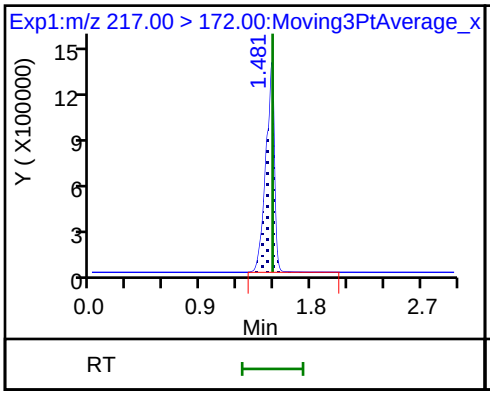
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 16 Worklist Smp#: 8

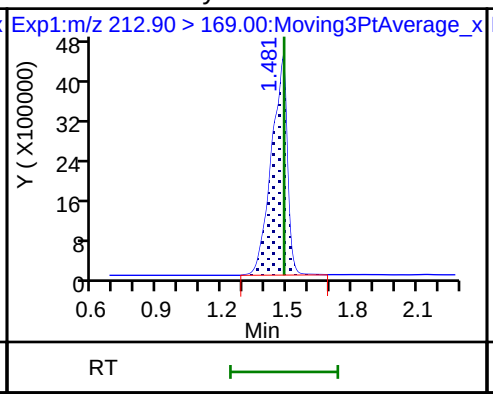
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

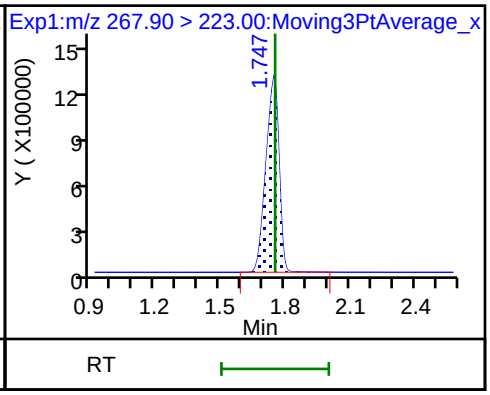
D 1 13C4 PFBA



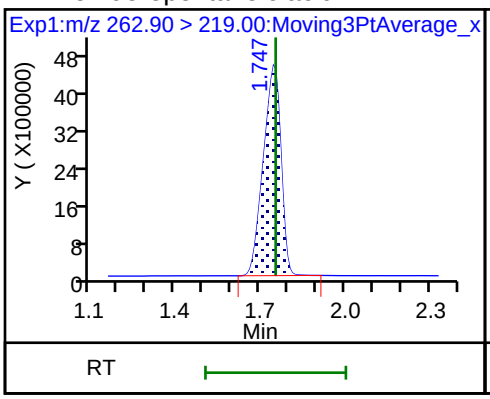
2 Perfluorobutyric acid



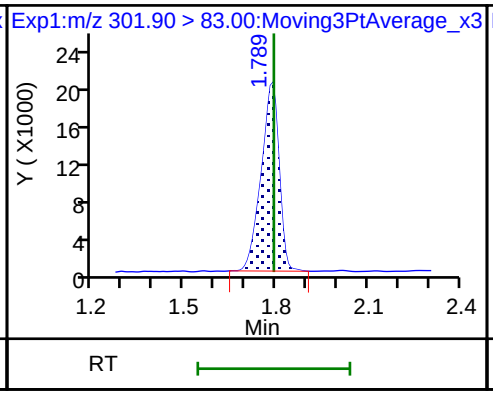
D 3 13C5-PFPeA



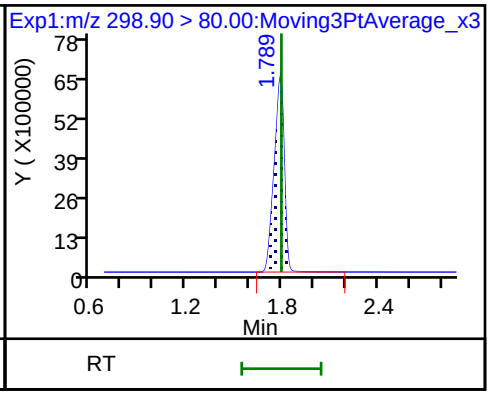
4 Perfluoropentanoic acid



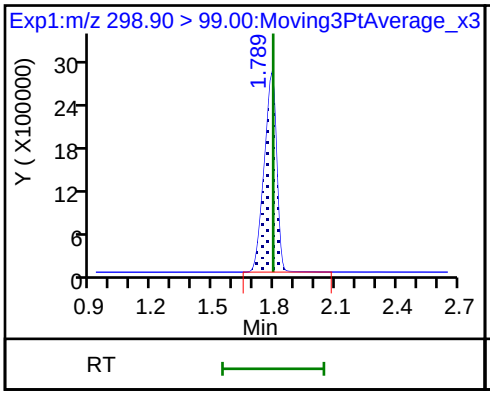
D 47 13C3-PFBS



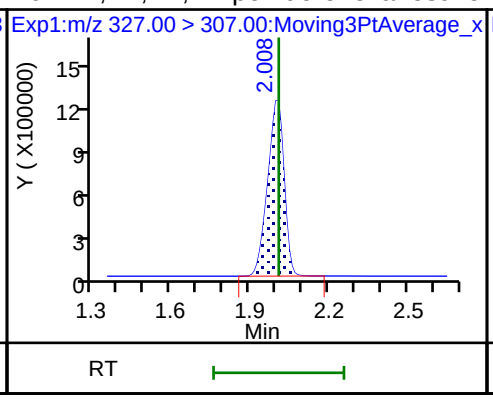
5 Perfluorobutanesulfonic acid



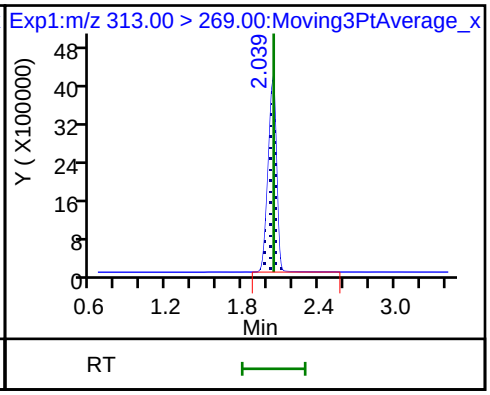
5 Perfluorobutanesulfonic acid



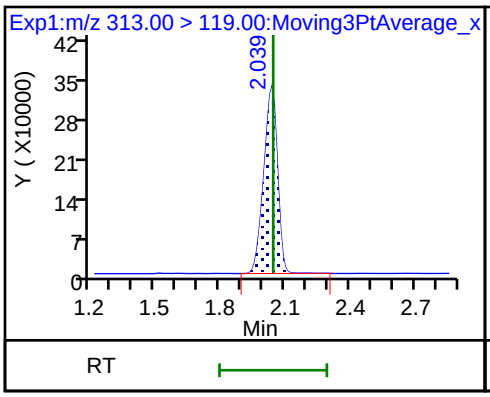
61 1H,1H,2H,2H-perfluorohexanesulfoni



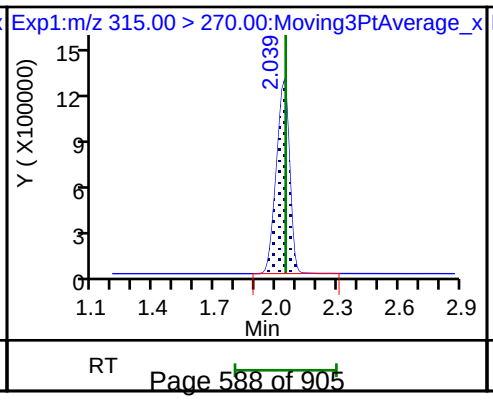
6 Perfluorohexanoic acid



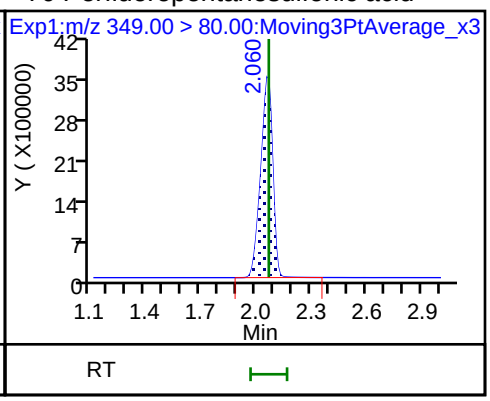
6 Perfluorohexanoic acid



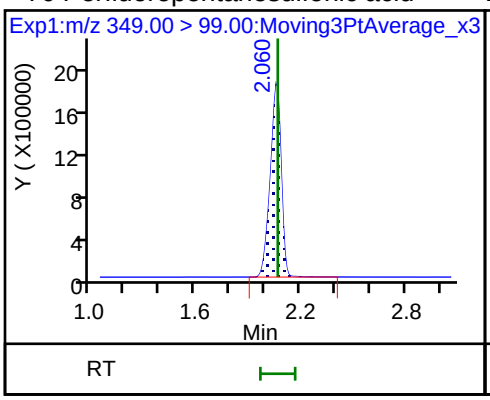
D 7 13C2 PFHxA



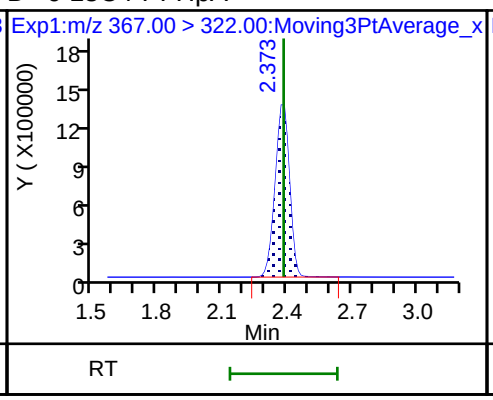
70 Perfluoropentanesulfonic acid



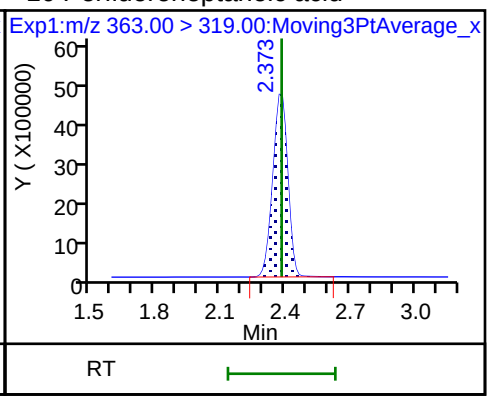
70 Perfluoropentanesulfonic acid



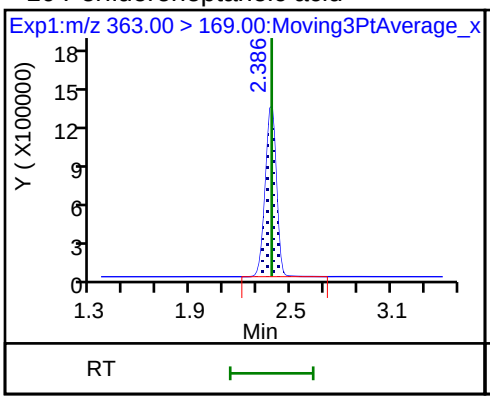
D 9 13C4-PFHpA



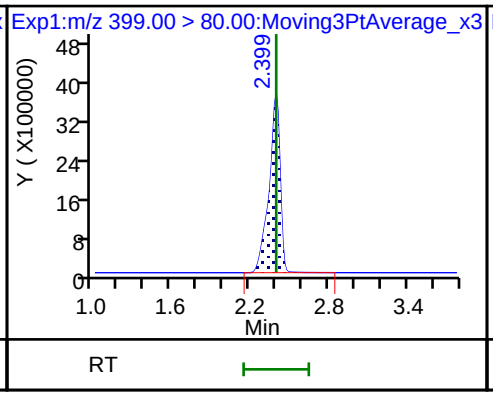
10 Perfluoroheptanoic acid



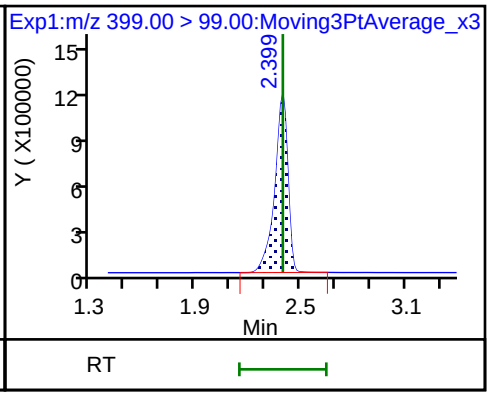
10 Perfluoroheptanoic acid



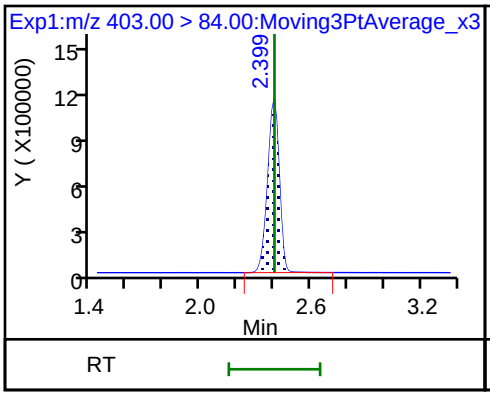
8 Perfluorohexanesulfonic acid



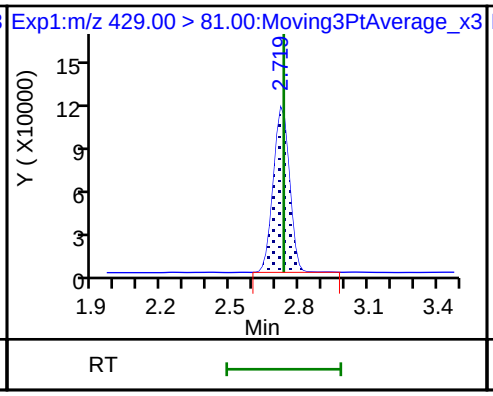
8 Perfluorohexanesulfonic acid



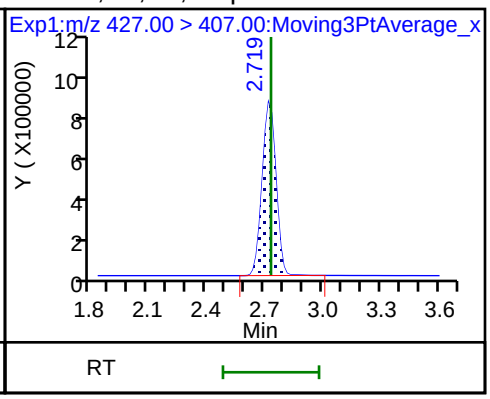
D 11 18O2 PFHxS



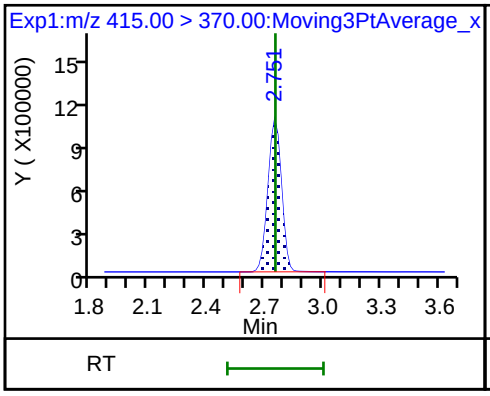
D 12 M2-6:2FTS



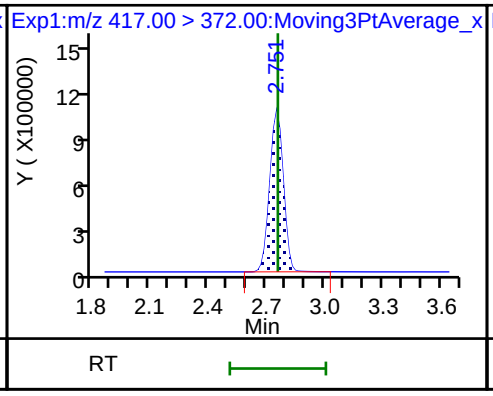
13 1H,1H,2H,2H-perfluorooctanesulfoni



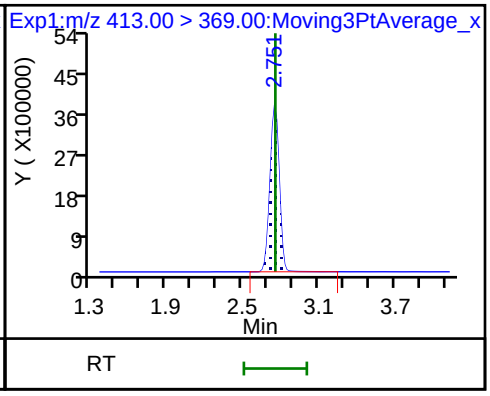
* 62 13C2-PFOA



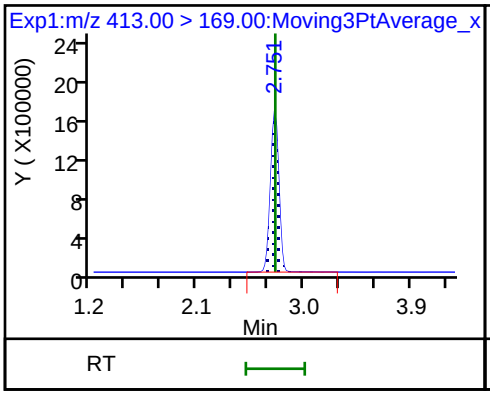
D 14 13C4 PFOA



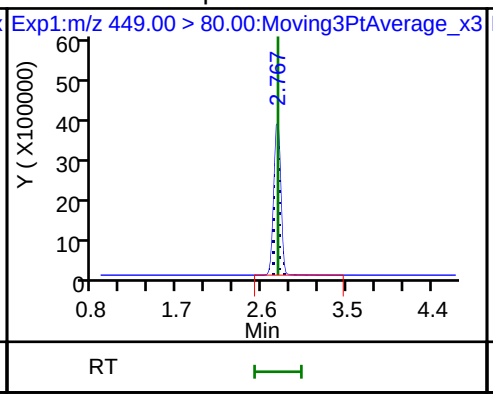
15 Perfluorooctanoic acid



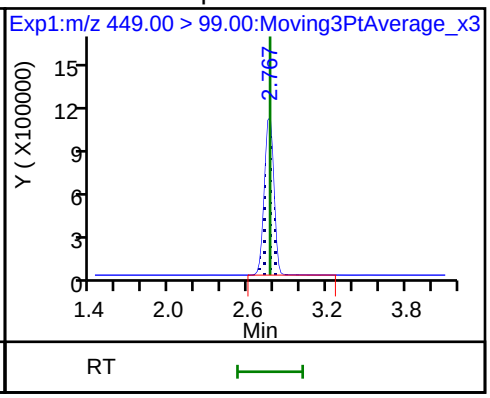
15 Perfluorooctanoic acid



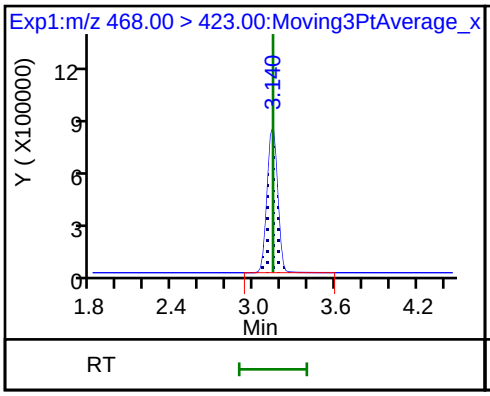
16 Perfluoroheptanesulfonic acid



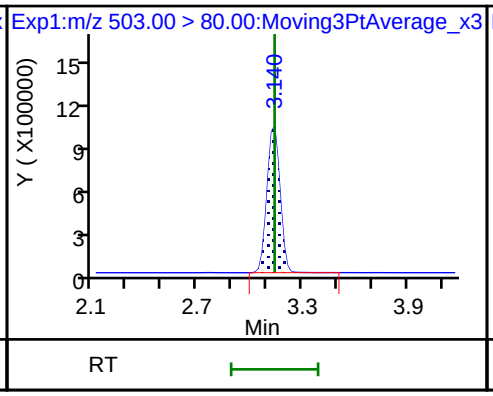
16 Perfluoroheptanesulfonic acid



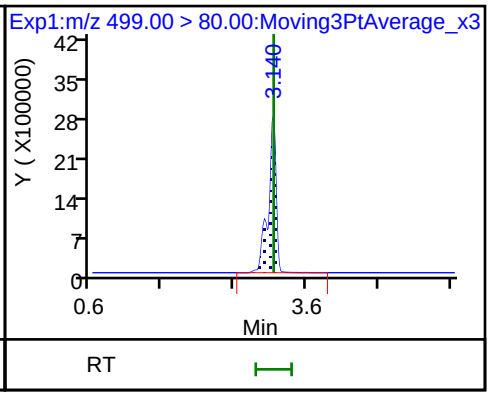
D 19 13C5 PFNA



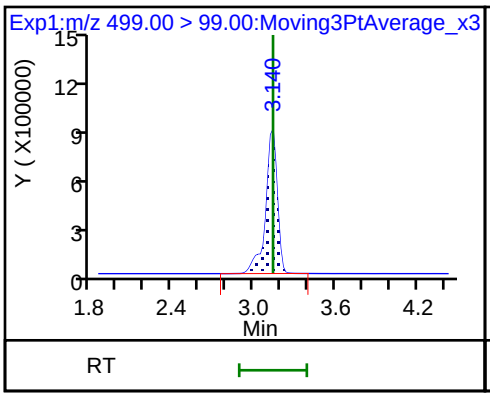
D 18 13C4 PFOS



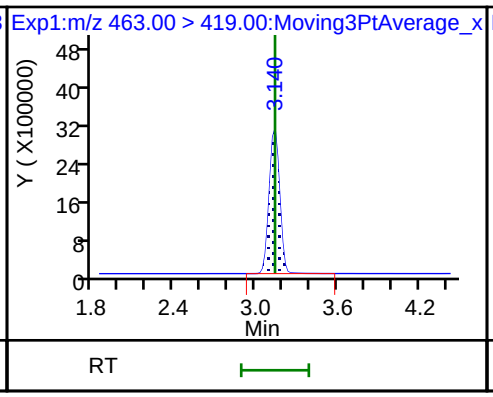
17 Perfluorooctane sulfonic acid



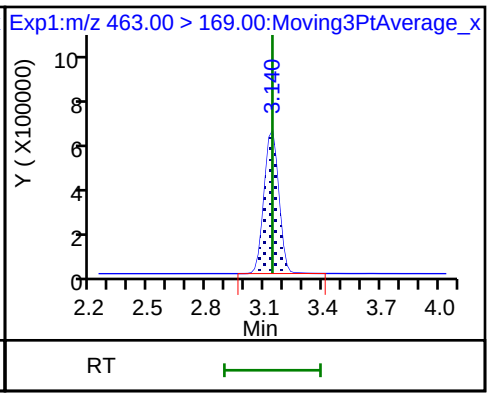
17 Perfluorooctane sulfonic acid



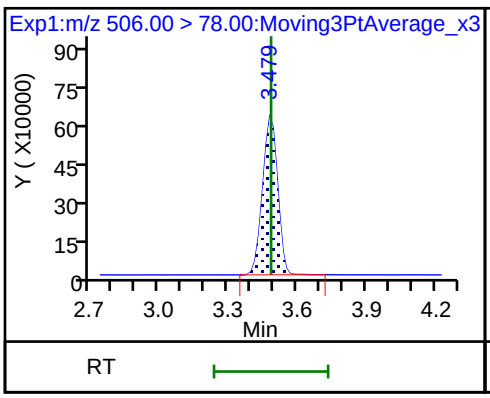
20 Perfluorononanoic acid



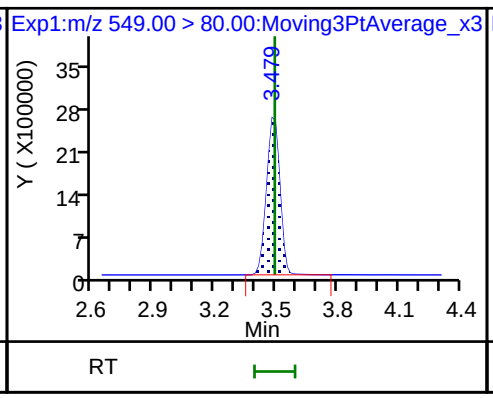
20 Perfluorononanoic acid



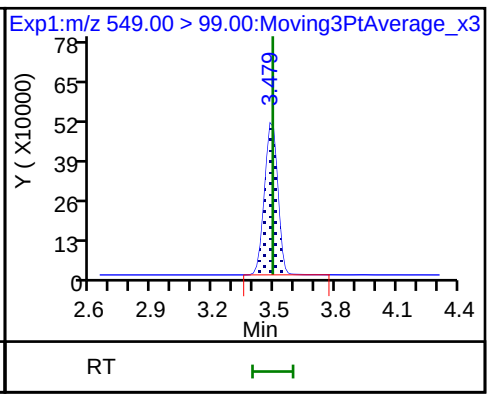
D 21 13C8 FOSA



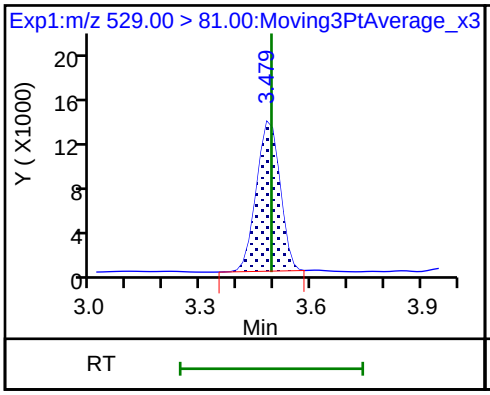
68 Perfluorononanesulfonic acid



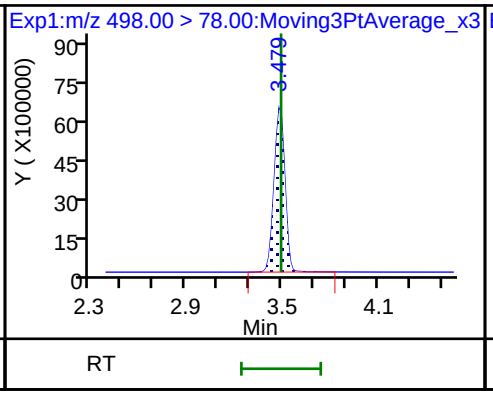
68 Perfluorononanesulfonic acid



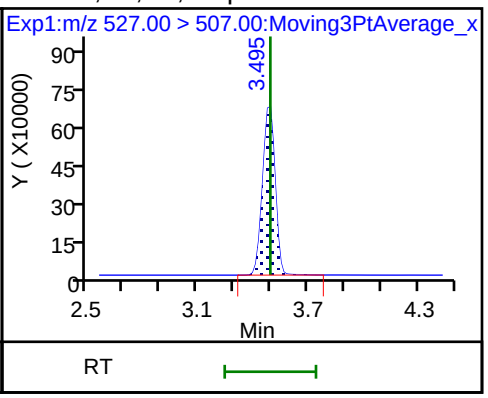
D 26 M2-8:2FTS



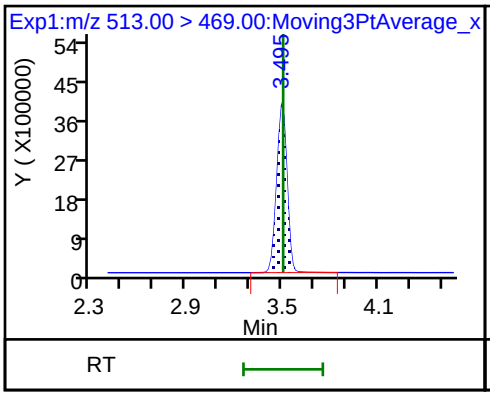
22 Perfluorooctane Sulfonamide



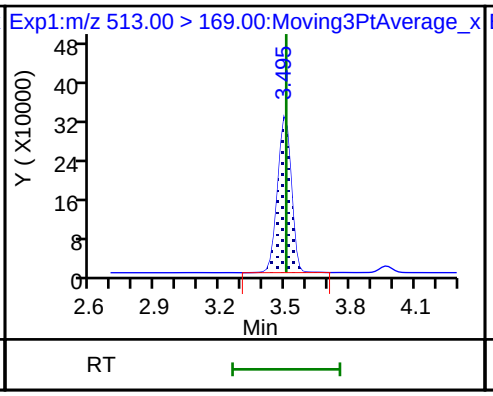
25 1H,1H,2H,2H-perfluorodecanesulfoni



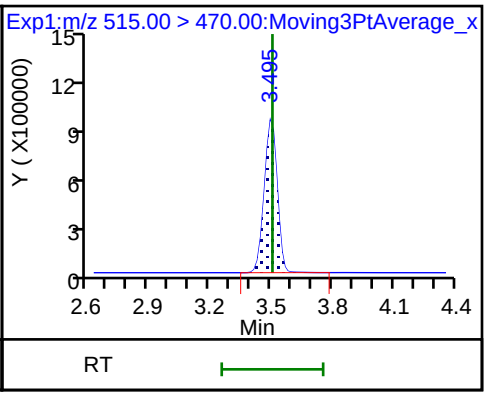
24 Perfluorodecanoic acid



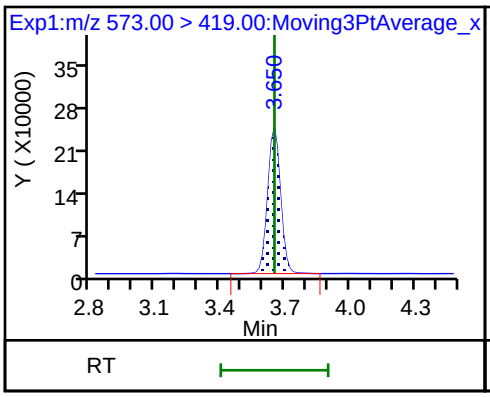
24 Perfluorodecanoic acid



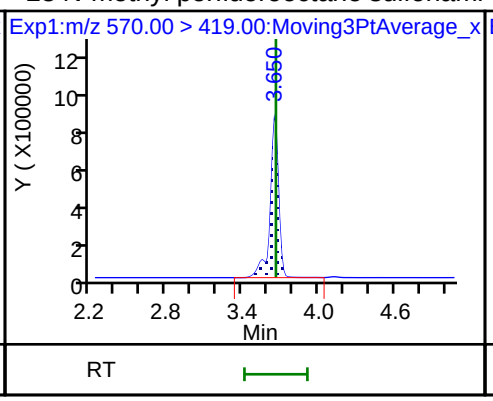
D 23 13C2 PFDA



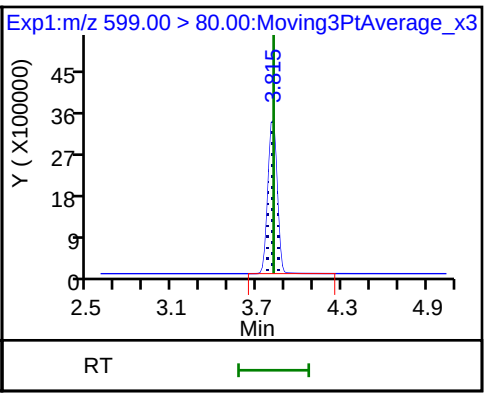
D 27 d3-NMeFOSAA



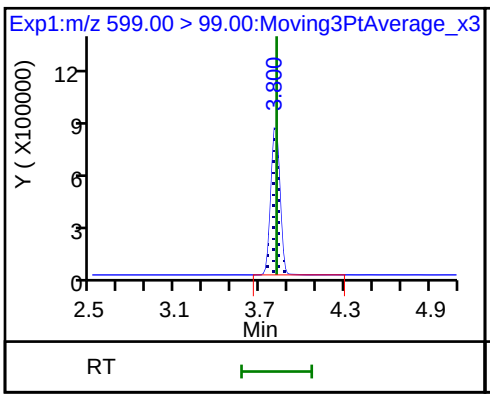
28 N-methyl perfluorooctane sulfonami



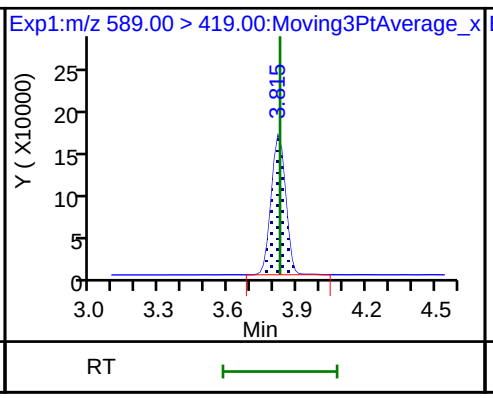
29 Perfluorodecane Sulfonic acid



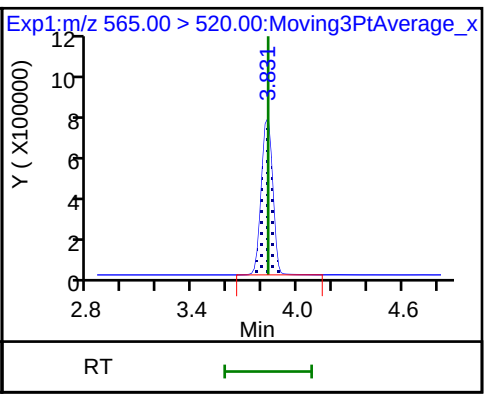
29 Perfluorodecane Sulfonic acid



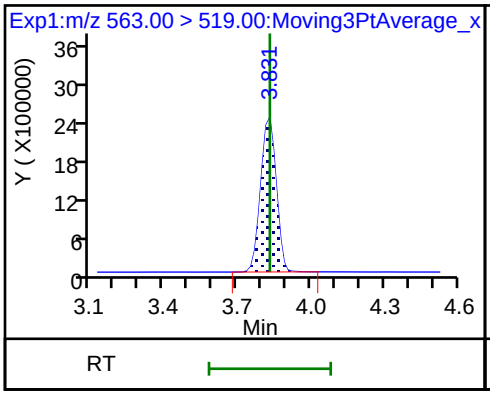
D 32 d5-NEtFOSAA



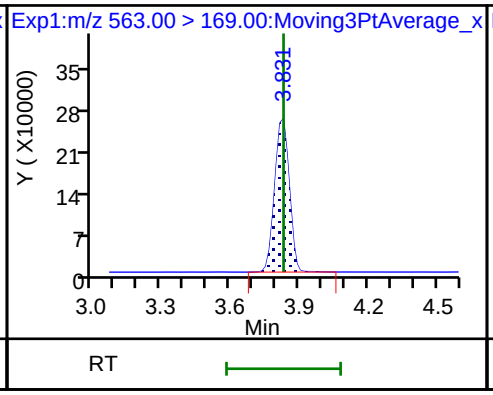
D 30 13C2 PFUnA



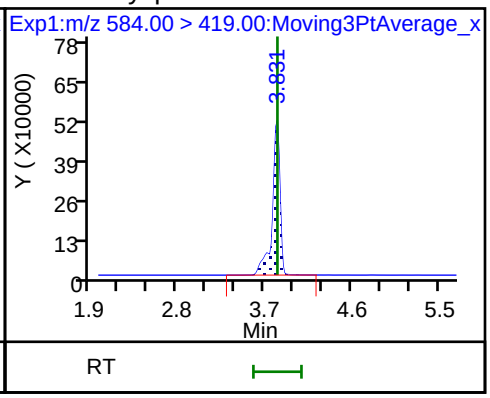
31 Perfluoroundecanoic acid



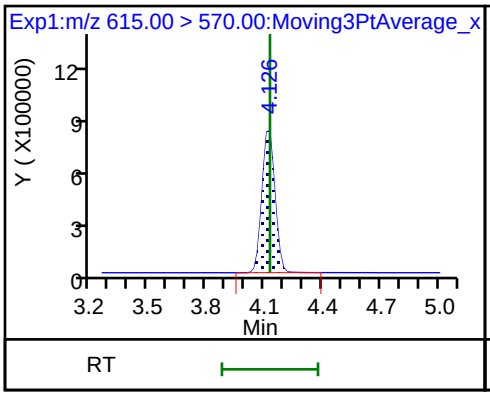
31 Perfluoroundecanoic acid



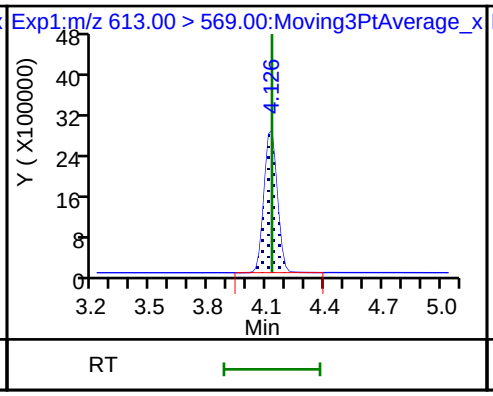
33 N-ethyl perfluorooctane sulfonamid



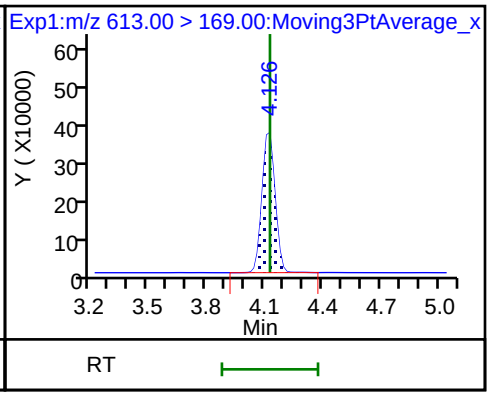
D 36 13C2 PFDoA



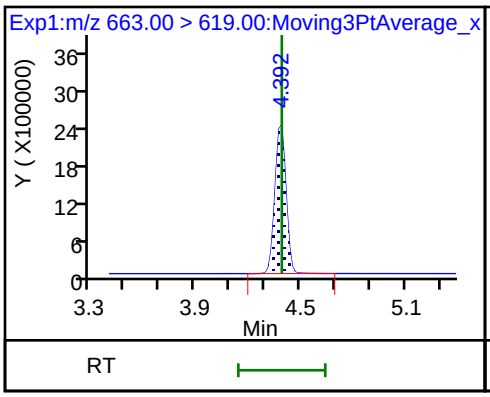
37 Perfluorododecanoic acid



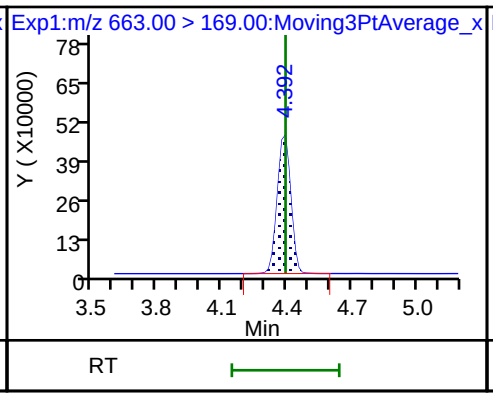
37 Perfluorododecanoic acid



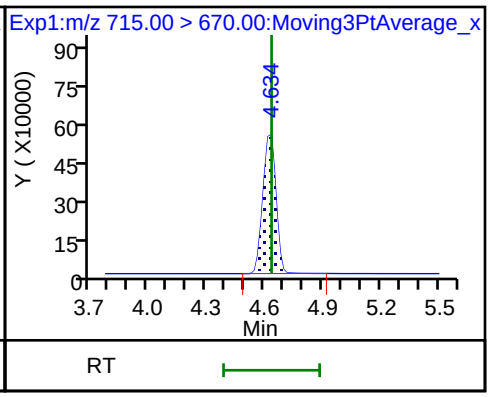
41 Perfluorotridecanoic acid



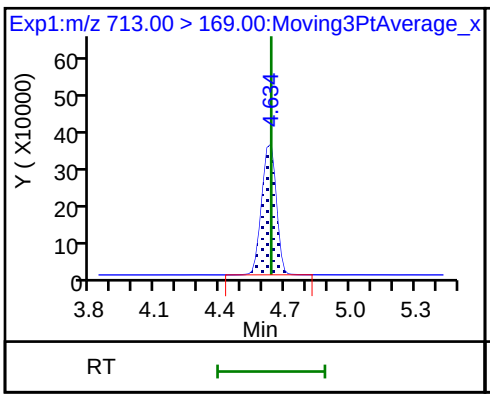
41 Perfluorotridecanoic acid



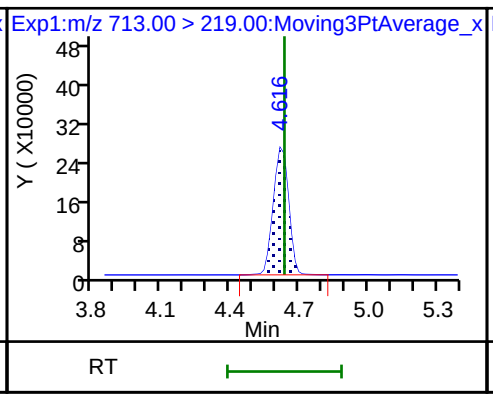
D 43 13C2-PFTeDA



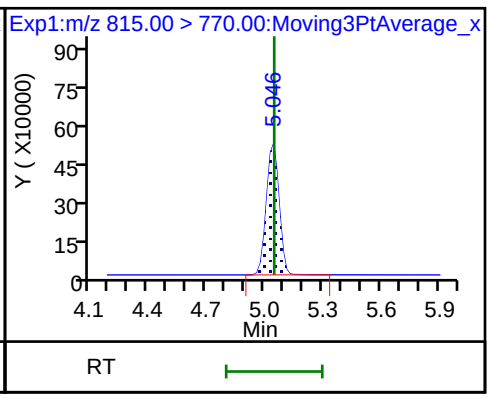
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

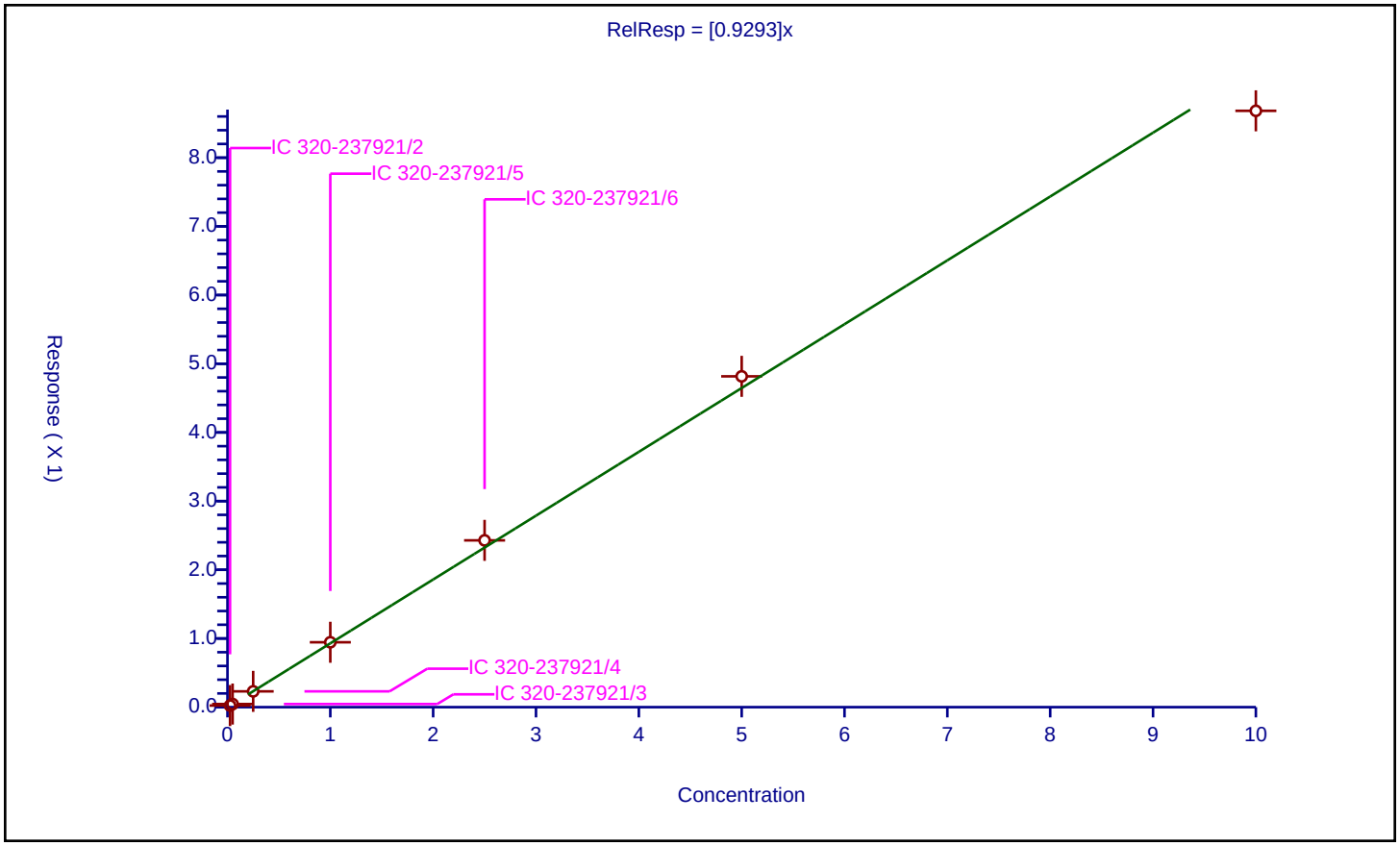
Curve Coefficients

Intercept:	0
Slope:	0.9293

Error Coefficients

Standard Error:	10700000
Relative Standard Error:	3.8
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.023255	2.5	6433939.0	0.930208	Y
2	IC 320-237921/3	0.05	0.04535	2.5	6273415.0	0.90701	Y
3	IC 320-237921/4	0.25	0.230002	2.5	6381009.0	0.920007	Y
4	IC 320-237921/5	1.0	0.945023	2.5	6314247.0	0.945023	Y
5	IC 320-237921/6	2.5	2.428362	2.5	6112850.0	0.971345	Y
6	IC 320-237921/7	5.0	4.816475	2.5	6541983.0	0.963295	Y
7	IC 320-237921/8	10.0	8.682274	2.5	6389618.0	0.868227	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

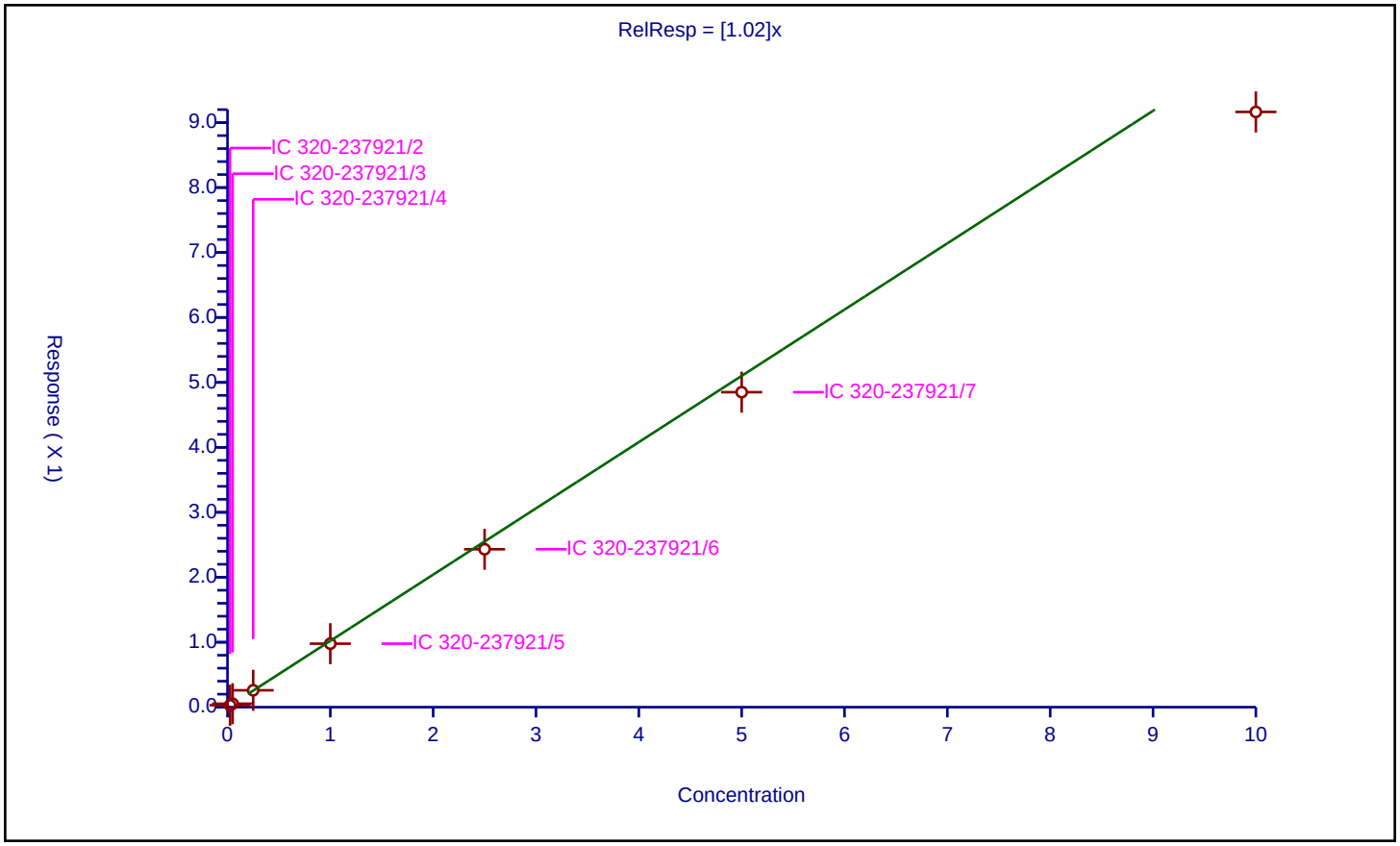
Curve Coefficients

Intercept:	0
Slope:	1.02

Error Coefficients

Standard Error:	9470000
Relative Standard Error:	9.1
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.989

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.029921	2.5	6093776.0	1.196828	Y
2	IC 320-237921/3	0.05	0.053411	2.5	5788542.0	1.068214	Y
3	IC 320-237921/4	0.25	0.259938	2.5	5776616.0	1.039752	Y
4	IC 320-237921/5	1.0	0.977639	2.5	5588563.0	0.977639	Y
5	IC 320-237921/6	2.5	2.431163	2.5	5432869.0	0.972465	Y
6	IC 320-237921/7	5.0	4.849513	2.5	5832978.0	0.969903	Y
7	IC 320-237921/8	10.0	9.164352	2.5	5299526.0	0.916435	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

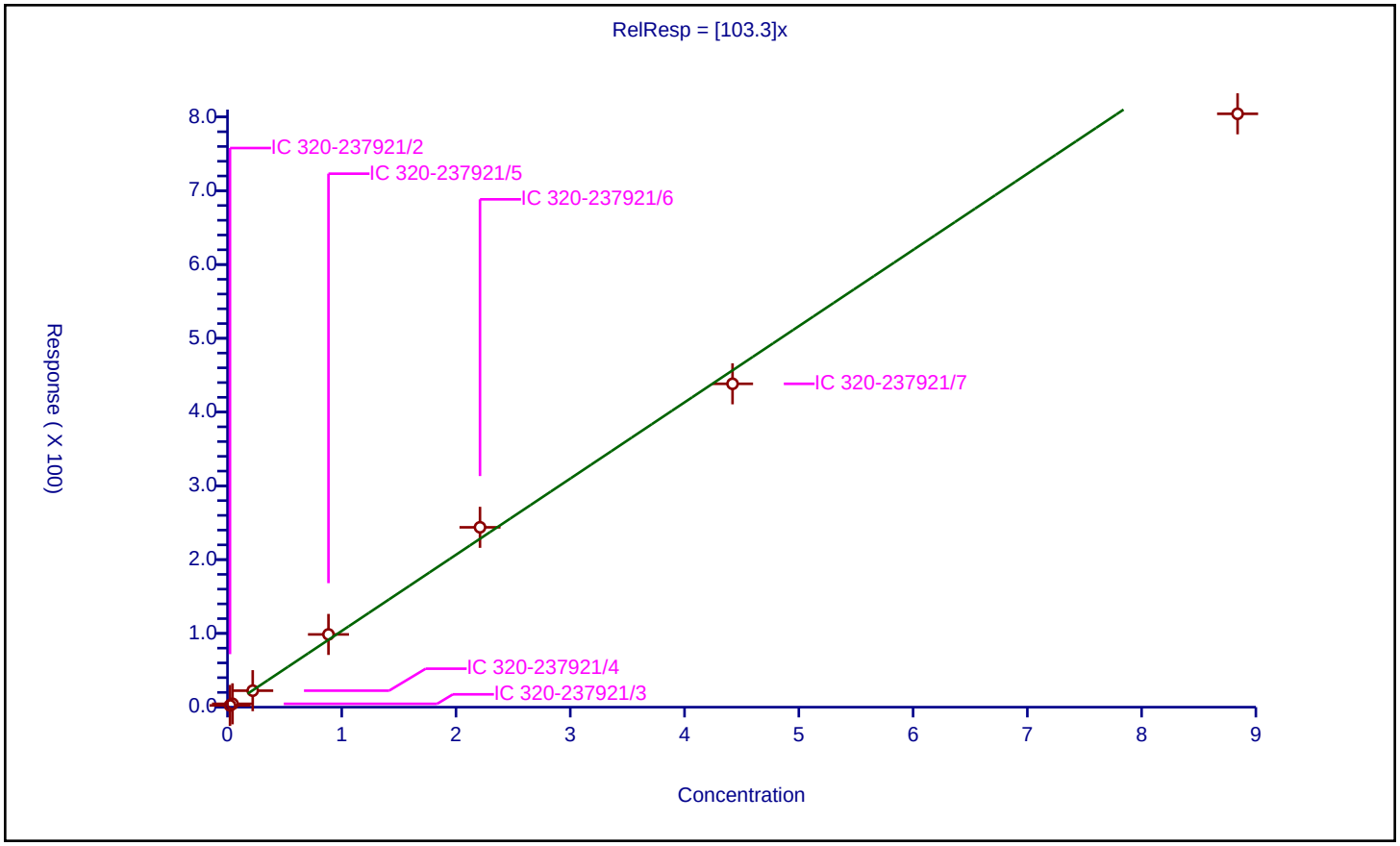
Curve Coefficients

Intercept:	0
Slope:	103.3

Error Coefficients

Standard Error:	13800000
Relative Standard Error:	6.9
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.0221	2.370338	2.325	82000.0	107.25509	Y
2	IC 320-237921/3	0.0442	4.536561	2.325	83335.0	102.637124	Y
3	IC 320-237921/4	0.221	22.351001	2.325	84657.0	101.135752	Y
4	IC 320-237921/5	0.884	98.603556	2.325	78999.0	111.542485	Y
5	IC 320-237921/6	2.21	243.781638	2.325	76827.0	110.308434	Y
6	IC 320-237921/7	4.42	438.337645	2.325	84962.0	99.171413	Y
7	IC 320-237921/8	8.84	804.332841	2.325	81999.0	90.987878	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

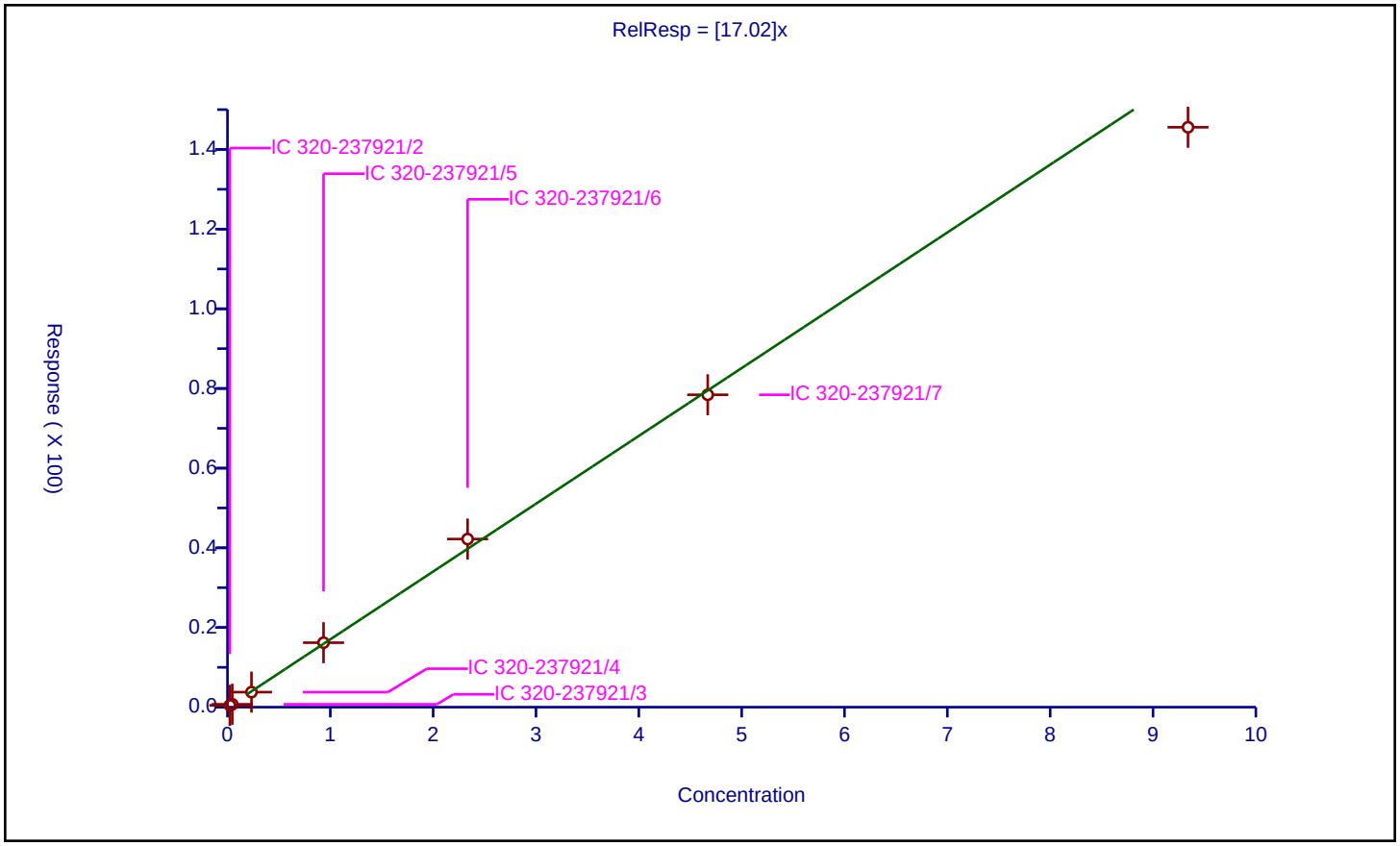
Curve Coefficients

Intercept:	0
Slope:	17.02

Error Coefficients

Standard Error:	2480000
Relative Standard Error:	8.9
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.02335	0.46069	2.325	82000.0	19.729775	Y
2	IC 320-237921/3	0.0467	0.723209	2.325	83335.0	15.486281	Y
3	IC 320-237921/4	0.2335	3.773384	2.325	84657.0	16.160103	Y
4	IC 320-237921/5	0.934	16.189003	2.325	78999.0	17.33298	Y
5	IC 320-237921/6	2.335	42.197417	2.325	76827.0	18.071699	Y
6	IC 320-237921/7	4.67	78.41874	2.325	84962.0	16.792021	Y
7	IC 320-237921/8	9.34	145.568664	2.325	81999.0	15.58551	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

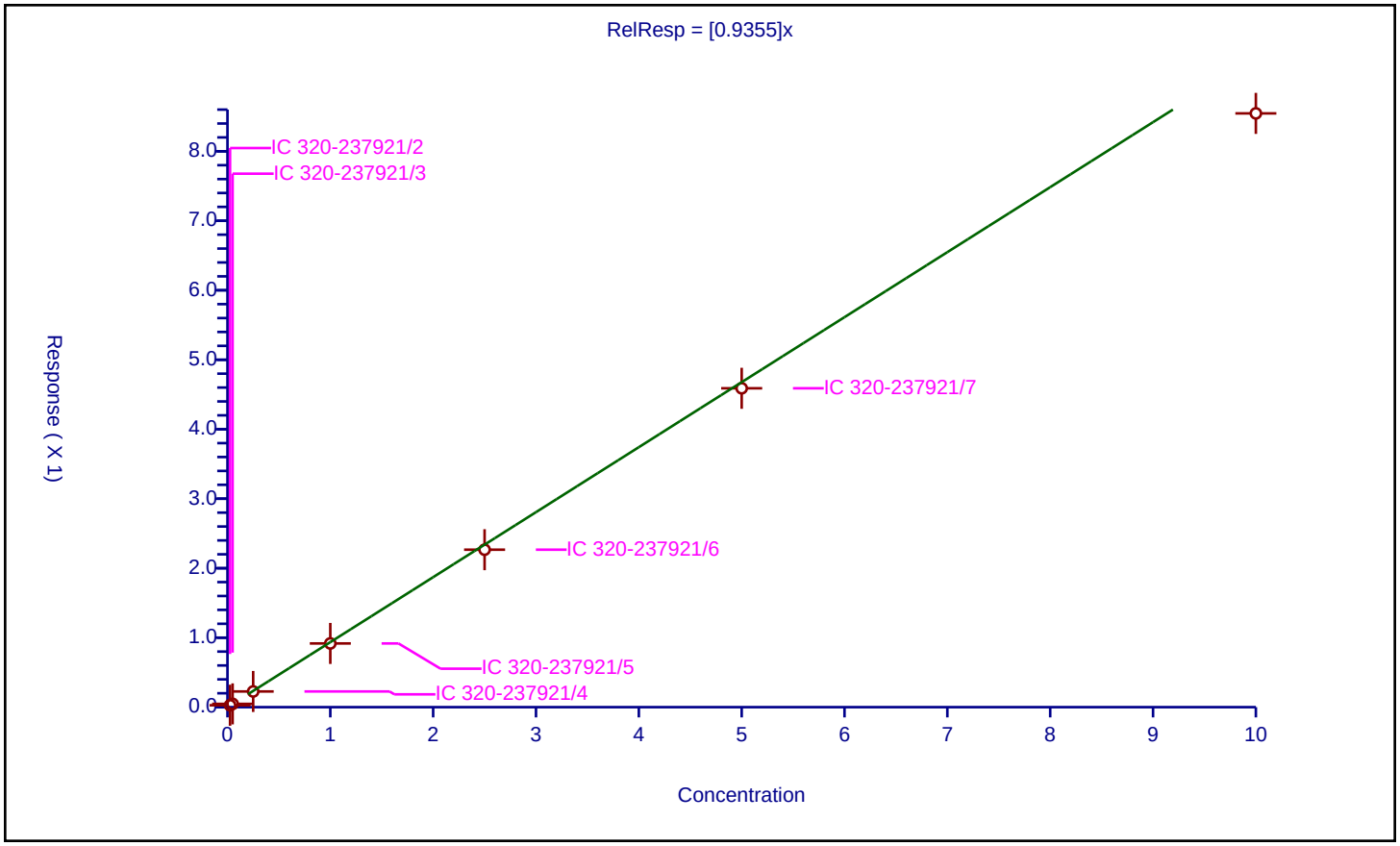
Curve Coefficients

Intercept:	0
Slope:	0.9355

Error Coefficients

Standard Error:	9050000
Relative Standard Error:	8.3
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.027477	2.5	6304069.0	1.0991	Y
2	IC 320-237921/3	0.05	0.047481	2.5	6131410.0	0.949627	Y
3	IC 320-237921/4	0.25	0.225924	2.5	5983609.0	0.903697	Y
4	IC 320-237921/5	1.0	0.916959	2.5	5985637.0	0.916959	Y
5	IC 320-237921/6	2.5	2.266248	2.5	5640948.0	0.906499	Y
6	IC 320-237921/7	5.0	4.589238	2.5	5878468.0	0.917848	Y
7	IC 320-237921/8	10.0	8.545687	2.5	5424292.0	0.854569	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

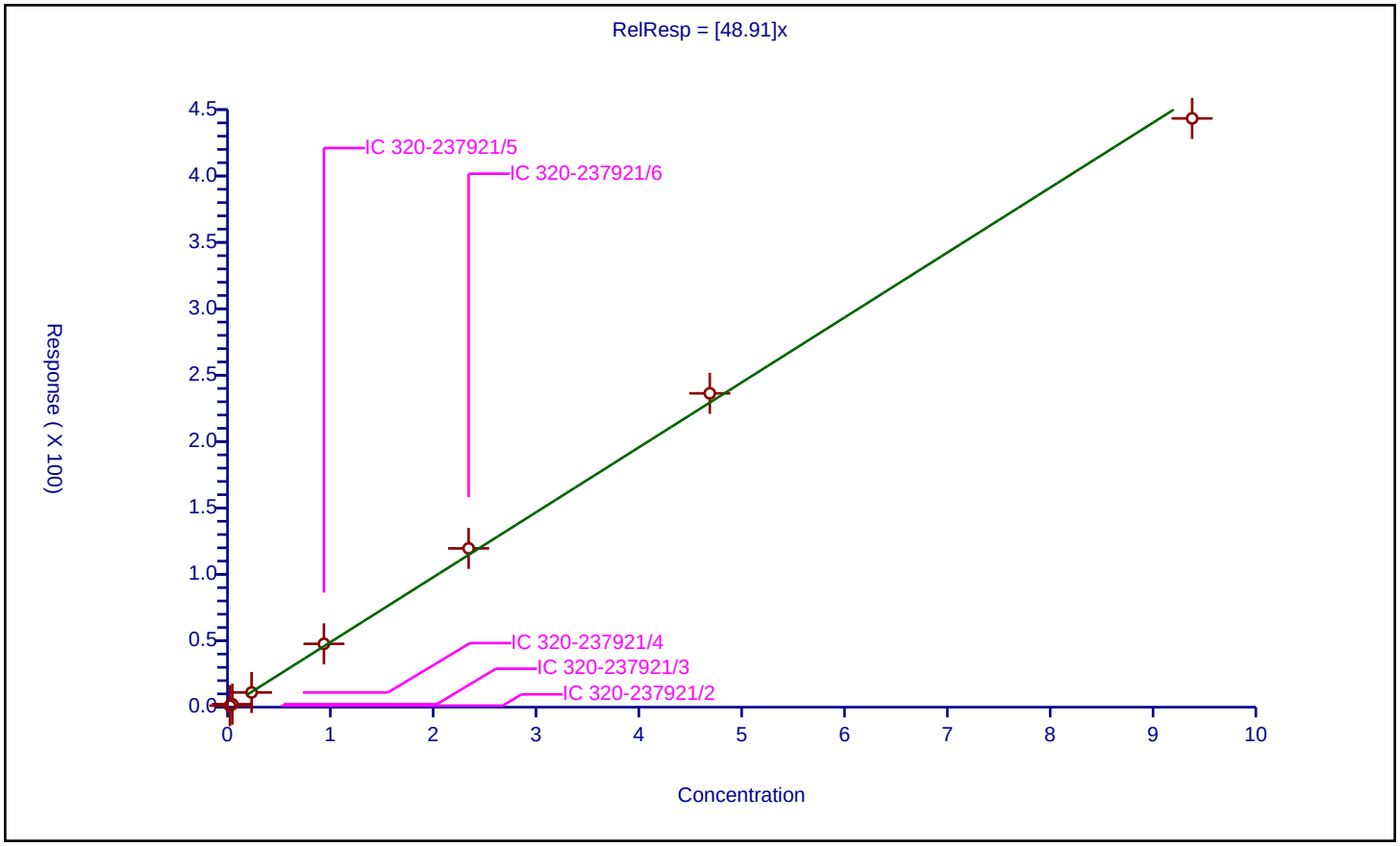
Curve Coefficients

Intercept:	0
Slope:	48.91

Error Coefficients

Standard Error:	7500000
Relative Standard Error:	3.6
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.02345	1.121302	2.325	82000.0	47.816722	Y
2	IC 320-237921/3	0.0469	2.240688	2.325	83335.0	47.775861	Y
3	IC 320-237921/4	0.2345	11.080284	2.325	84657.0	47.250677	Y
4	IC 320-237921/5	0.938	47.70104	2.325	78999.0	50.853987	Y
5	IC 320-237921/6	2.345	119.573491	2.325	76827.0	50.990828	Y
6	IC 320-237921/7	4.69	236.338048	2.325	84962.0	50.391908	Y
7	IC 320-237921/8	9.38	443.371679	2.325	81999.0	47.26777	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

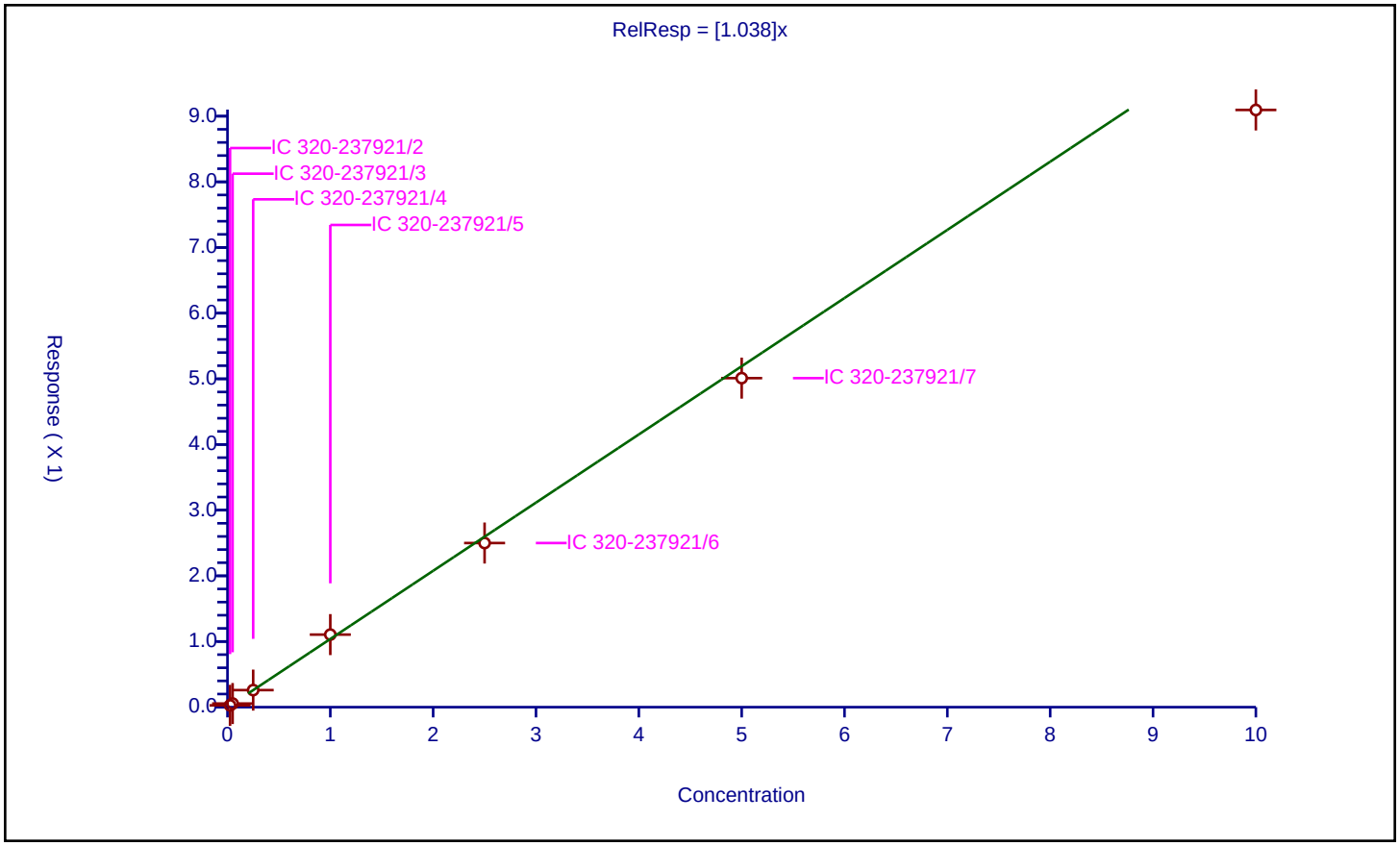
Curve Coefficients

Intercept:	0
Slope:	1.038

Error Coefficients

Standard Error:	11000000
Relative Standard Error:	7.2
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.027714	2.5	7076705.0	1.108567	Y
2	IC 320-237921/3	0.05	0.055217	2.5	6715731.0	1.104332	Y
3	IC 320-237921/4	0.25	0.259781	2.5	7086577.0	1.039124	Y
4	IC 320-237921/5	1.0	1.10504	2.5	6641878.0	1.10504	Y
5	IC 320-237921/6	2.5	2.499664	2.5	6660043.0	0.999866	Y
6	IC 320-237921/7	5.0	5.010795	2.5	6626960.0	1.002159	Y
7	IC 320-237921/8	10.0	9.09479	2.5	6139851.0	0.909479	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

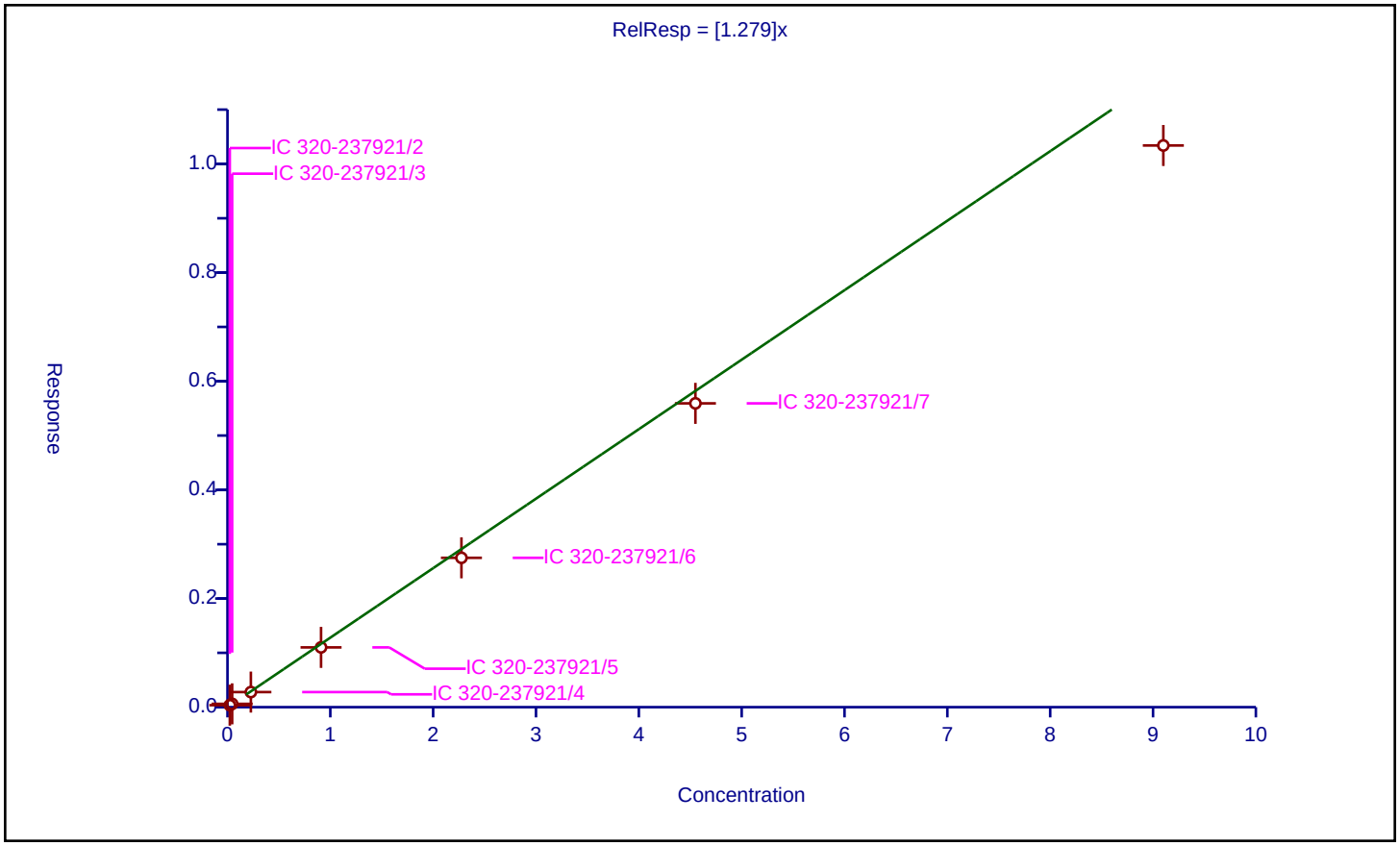
Curve Coefficients

Intercept:	0
Slope:	1.279

Error Coefficients

Standard Error:	10200000
Relative Standard Error:	12.2
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.978

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.02275	0.036519	2.365	4703926.0	1.605244	Y
2	IC 320-237921/3	0.0455	0.061263	2.365	4652927.0	1.346434	Y
3	IC 320-237921/4	0.2275	0.277585	2.365	4834908.0	1.220155	Y
4	IC 320-237921/5	0.91	1.100486	2.365	4666163.0	1.209326	Y
5	IC 320-237921/6	2.275	2.74906	2.365	4729117.0	1.208378	Y
6	IC 320-237921/7	4.55	5.592639	2.365	4906340.0	1.229151	Y
7	IC 320-237921/8	9.1	10.33954	2.365	4846975.0	1.136213	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

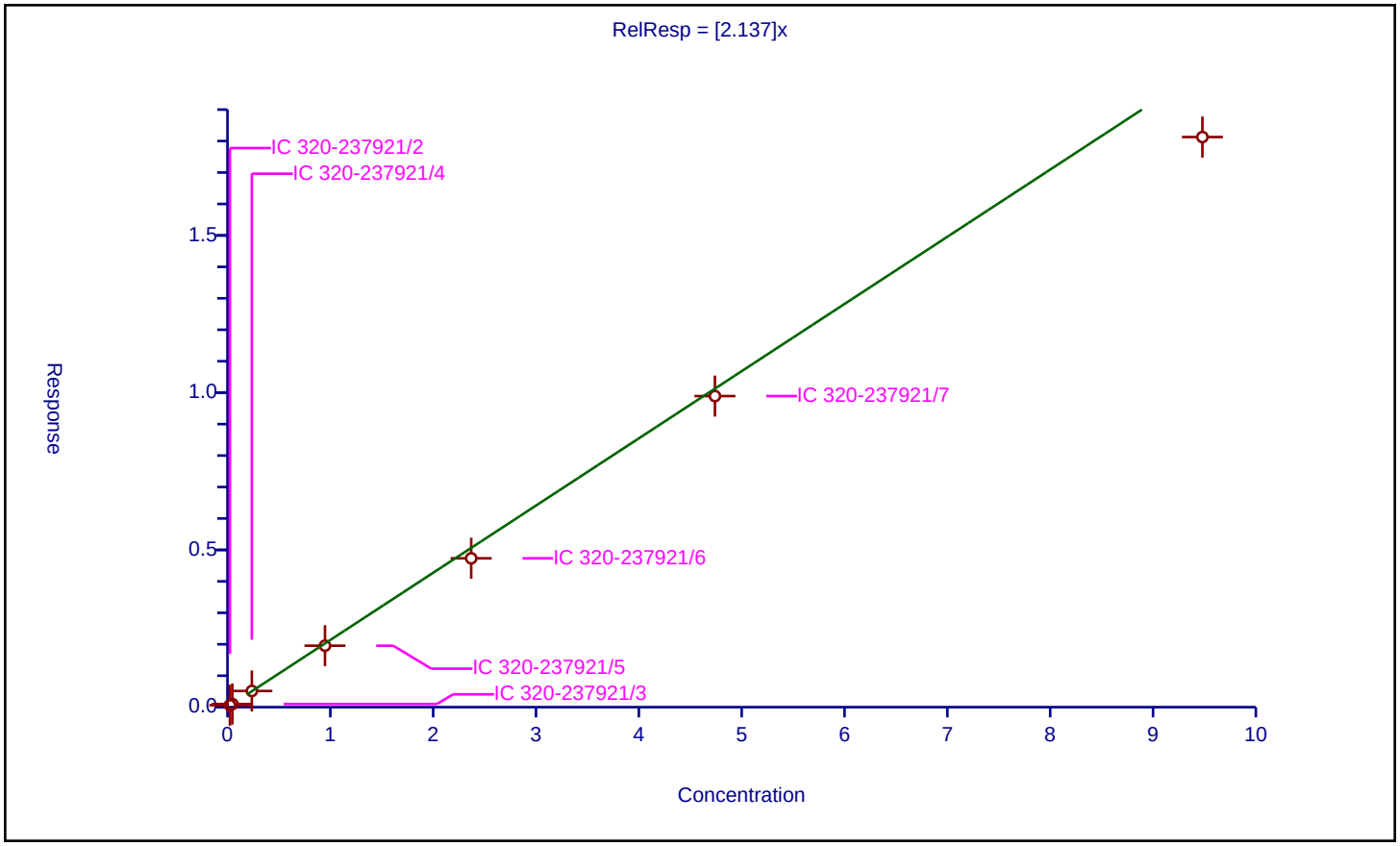
Curve Coefficients

Intercept:	0
Slope:	2.137

Error Coefficients

Standard Error:	2040000
Relative Standard Error:	10.7
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.984

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.0237	0.062099	2.375	681382.0	2.620202	Y
2	IC 320-237921/3	0.0474	0.099922	2.375	657438.0	2.108058	Y
3	IC 320-237921/4	0.237	0.514608	2.375	617490.0	2.171343	Y
4	IC 320-237921/5	0.948	1.954338	2.375	651860.0	2.061538	Y
5	IC 320-237921/6	2.37	4.732732	2.375	607653.0	1.996933	Y
6	IC 320-237921/7	4.74	9.891054	2.375	579189.0	2.08672	Y
7	IC 320-237921/8	9.48	18.127146	2.375	545128.0	1.912146	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

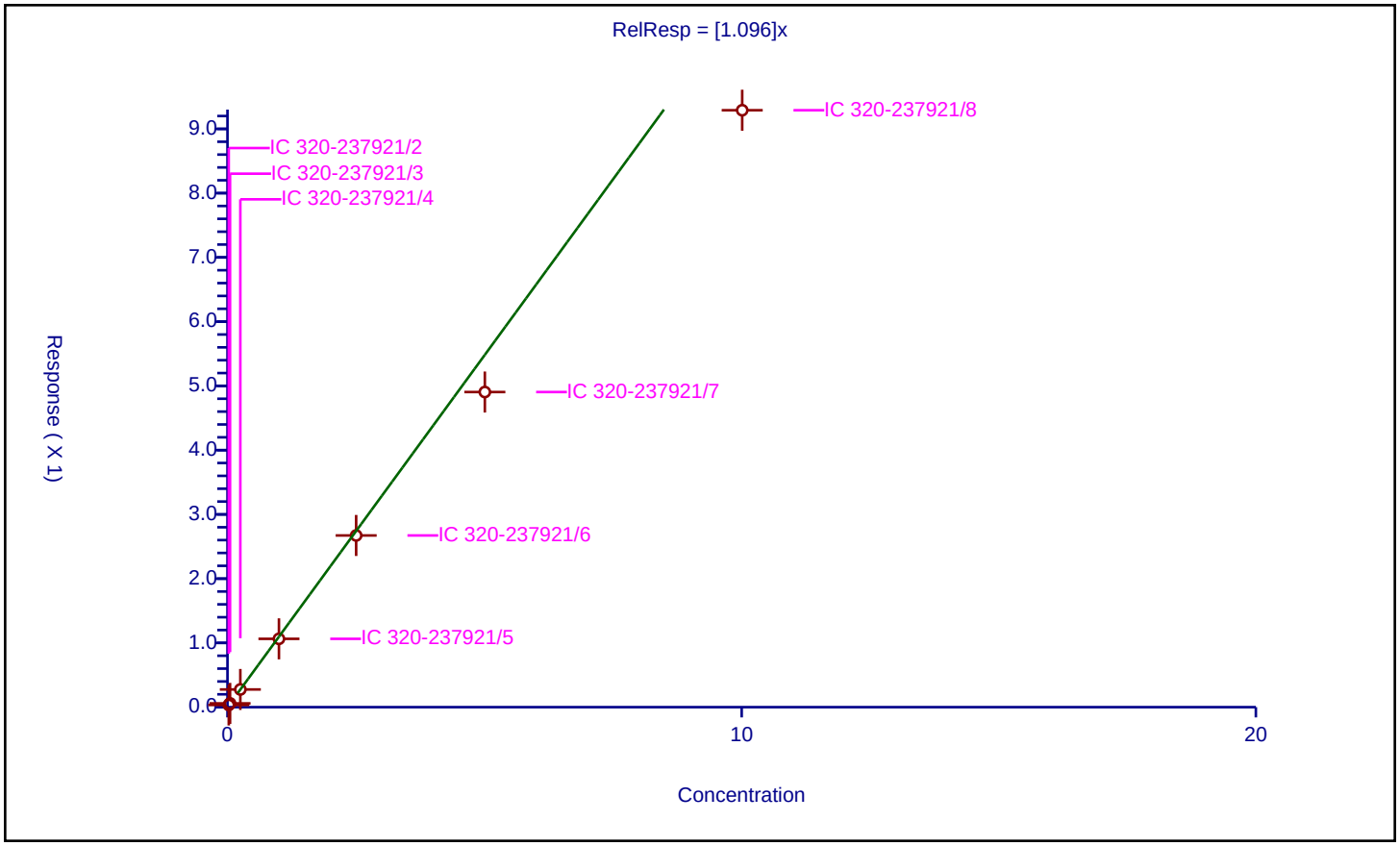
Curve Coefficients

Intercept:	0
Slope:	1.096

Error Coefficients

Standard Error:	9300000
Relative Standard Error:	12.8
Correlation Coefficient:	0.993
Coefficient of Determination (Adjusted):	0.977

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025025	0.033983	2.5	6052329.0	1.357953	Y
2	IC 320-237921/3	0.05005	0.058681	2.5	5898675.0	1.172439	Y
3	IC 320-237921/4	0.25025	0.275458	2.5	5683176.0	1.100732	Y
4	IC 320-237921/5	1.001	1.063367	2.5	5761212.0	1.062304	Y
5	IC 320-237921/6	2.5025	2.672364	2.5	5210338.0	1.067878	Y
6	IC 320-237921/7	5.005	4.904608	2.5	5669239.0	0.979942	Y
7	IC 320-237921/8	10.01	9.290213	2.5	5093432.0	0.928093	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

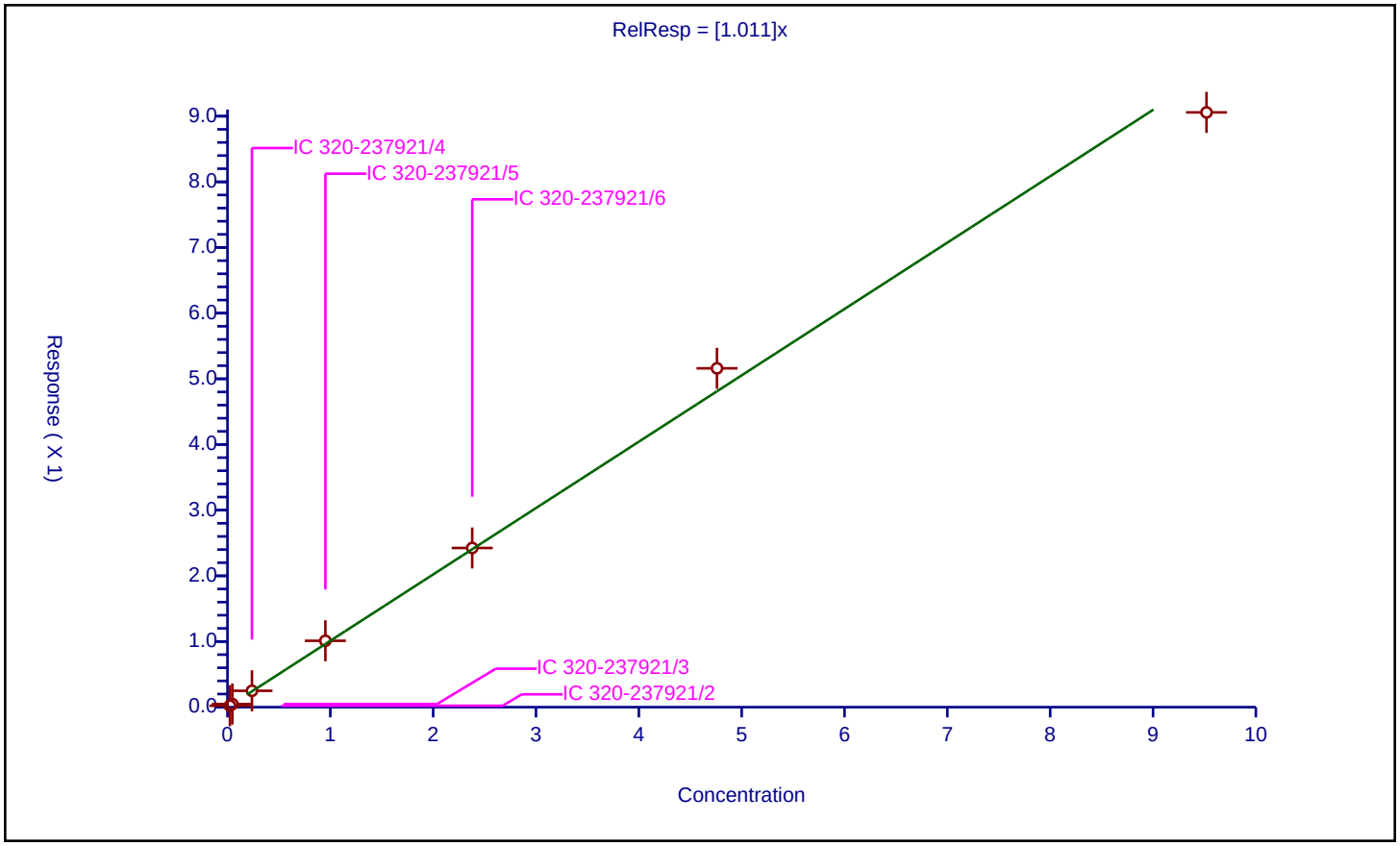
Curve Coefficients

Intercept:	0
Slope:	1.011

Error Coefficients

Standard Error:	9290000
Relative Standard Error:	6.0
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.0238	0.021828	2.39	5163172.0	0.917133	Y
2	IC 320-237921/3	0.0476	0.047318	2.39	5051590.0	0.994075	Y
3	IC 320-237921/4	0.238	0.249201	2.39	4950130.0	1.047065	Y
4	IC 320-237921/5	0.952	1.01096	2.39	5088829.0	1.061933	Y
5	IC 320-237921/6	2.38	2.424417	2.39	4714686.0	1.018663	Y
6	IC 320-237921/7	4.76	5.160054	2.39	5039962.0	1.084045	Y
7	IC 320-237921/8	9.52	9.057509	2.39	5087246.0	0.951419	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

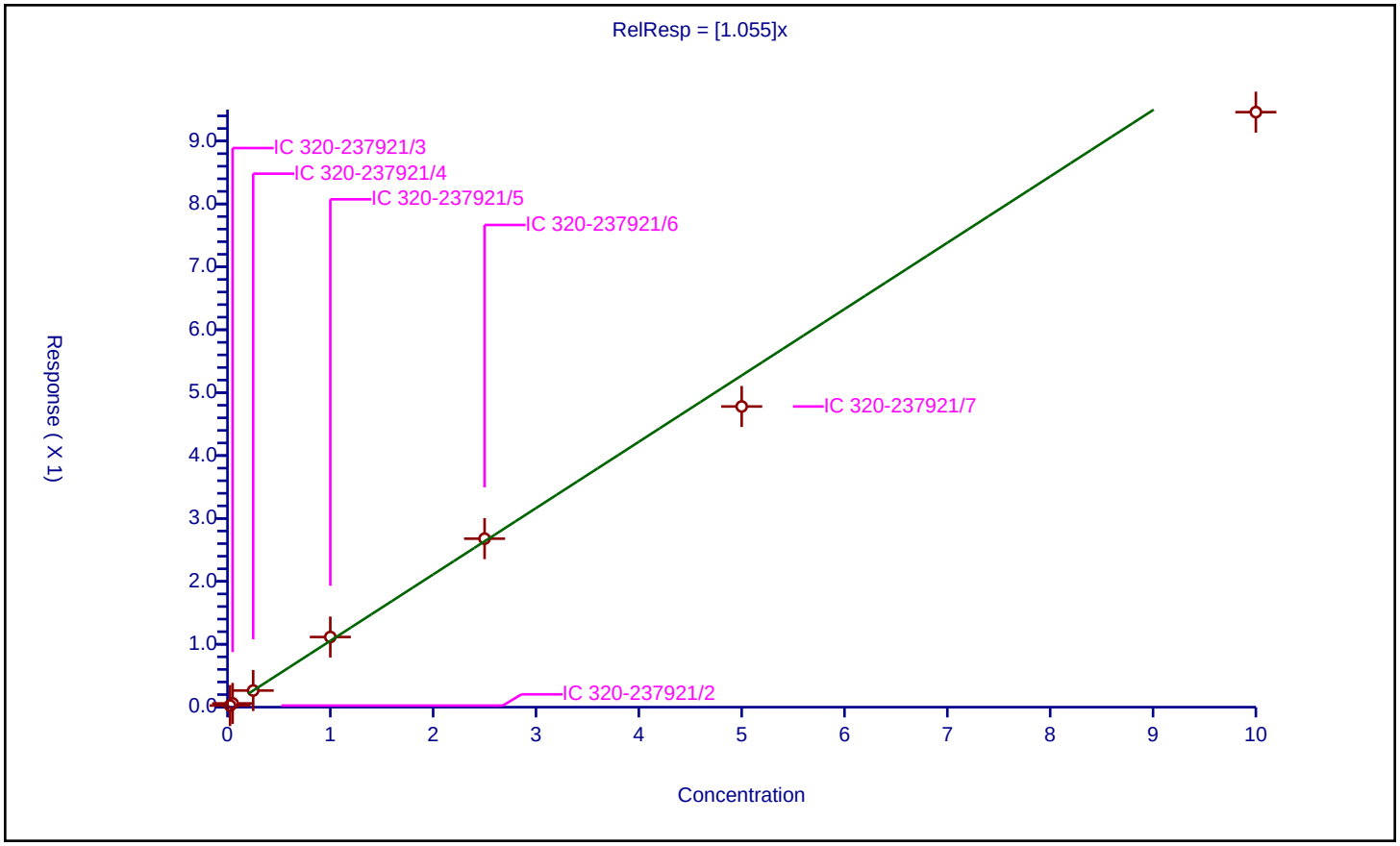
Curve Coefficients

Intercept:	0
Slope:	1.055

Error Coefficients

Standard Error:	7920000
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 320-237921/2	0.025	0.026047	2.5	5099845.0	1.041875	Y
2	IC 320-237921/3	0.05	0.059666	2.5	5090764.0	1.193318	Y
3	IC 320-237921/4	0.25	0.264694	2.5	4951980.0	1.058776	Y
4	IC 320-237921/5	1.0	1.115437	2.5	4829107.0	1.115437	Y
5	IC 320-237921/6	2.5	2.679118	2.5	4728270.0	1.071647	Y
6	IC 320-237921/7	5.0	4.780355	2.5	4799148.0	0.956071	Y
7	IC 320-237921/8	10.0	9.460027	2.5	4275948.0	0.946003	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

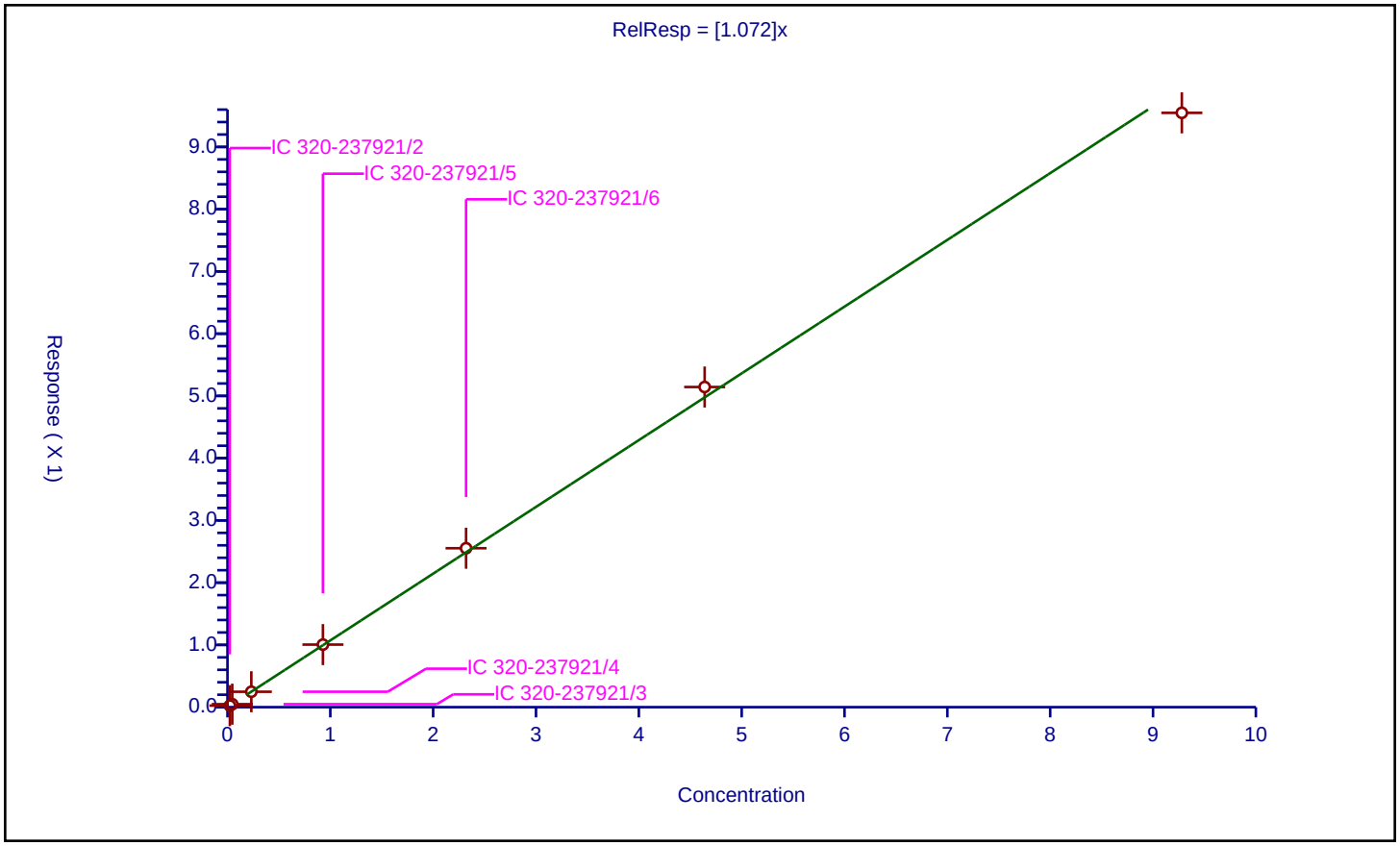
Curve Coefficients

Intercept:	0
Slope:	1.072

Error Coefficients

Standard Error:	9670000
Relative Standard Error:	2.8
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.0232	0.025075	2.39	5163172.0	1.080817	Y
2	IC 320-237921/3	0.0464	0.048099	2.39	5051590.0	1.036619	Y
3	IC 320-237921/4	0.232	0.247885	2.39	4950130.0	1.068469	Y
4	IC 320-237921/5	0.928	1.005232	2.39	5088829.0	1.083224	Y
5	IC 320-237921/6	2.32	2.553154	2.39	4714686.0	1.100497	Y
6	IC 320-237921/7	4.64	5.143684	2.39	5039962.0	1.108553	Y
7	IC 320-237921/8	9.28	9.547919	2.39	5087246.0	1.028871	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

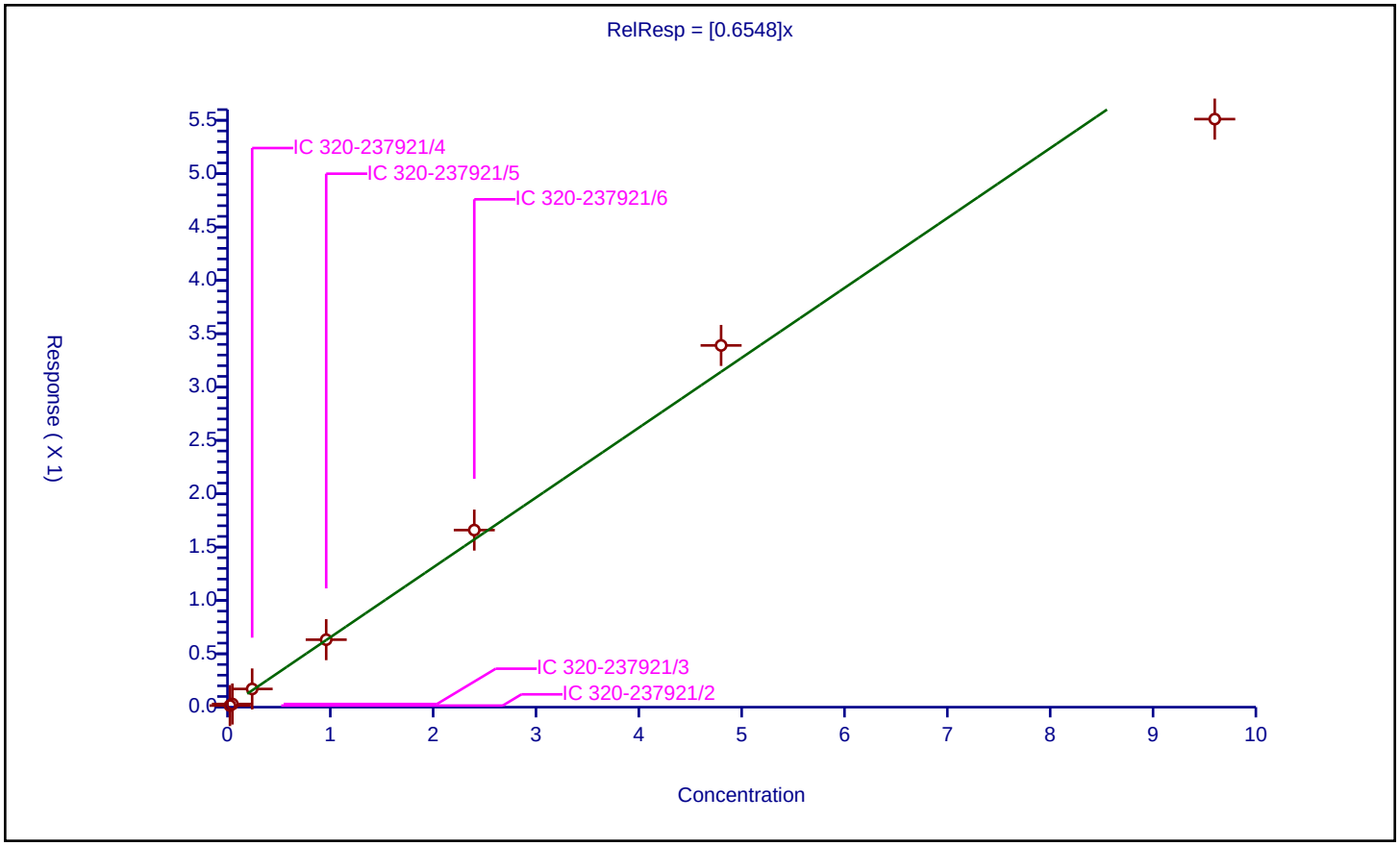
Curve Coefficients

Intercept:	0
Slope:	0.6548

Error Coefficients

Standard Error:	5790000
Relative Standard Error:	7.9
Correlation Coefficient:	0.990
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.024	0.014952	2.39	5163172.0	0.623016	Y
2	IC 320-237921/3	0.048	0.029688	2.39	5051590.0	0.618494	Y
3	IC 320-237921/4	0.24	0.170774	2.39	4950130.0	0.711558	Y
4	IC 320-237921/5	0.96	0.632429	2.39	5088829.0	0.65878	Y
5	IC 320-237921/6	2.4	1.659561	2.39	4714686.0	0.691484	Y
6	IC 320-237921/7	4.8	3.389985	2.39	5039962.0	0.706247	Y
7	IC 320-237921/8	9.6	5.510874	2.39	5087246.0	0.574049	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

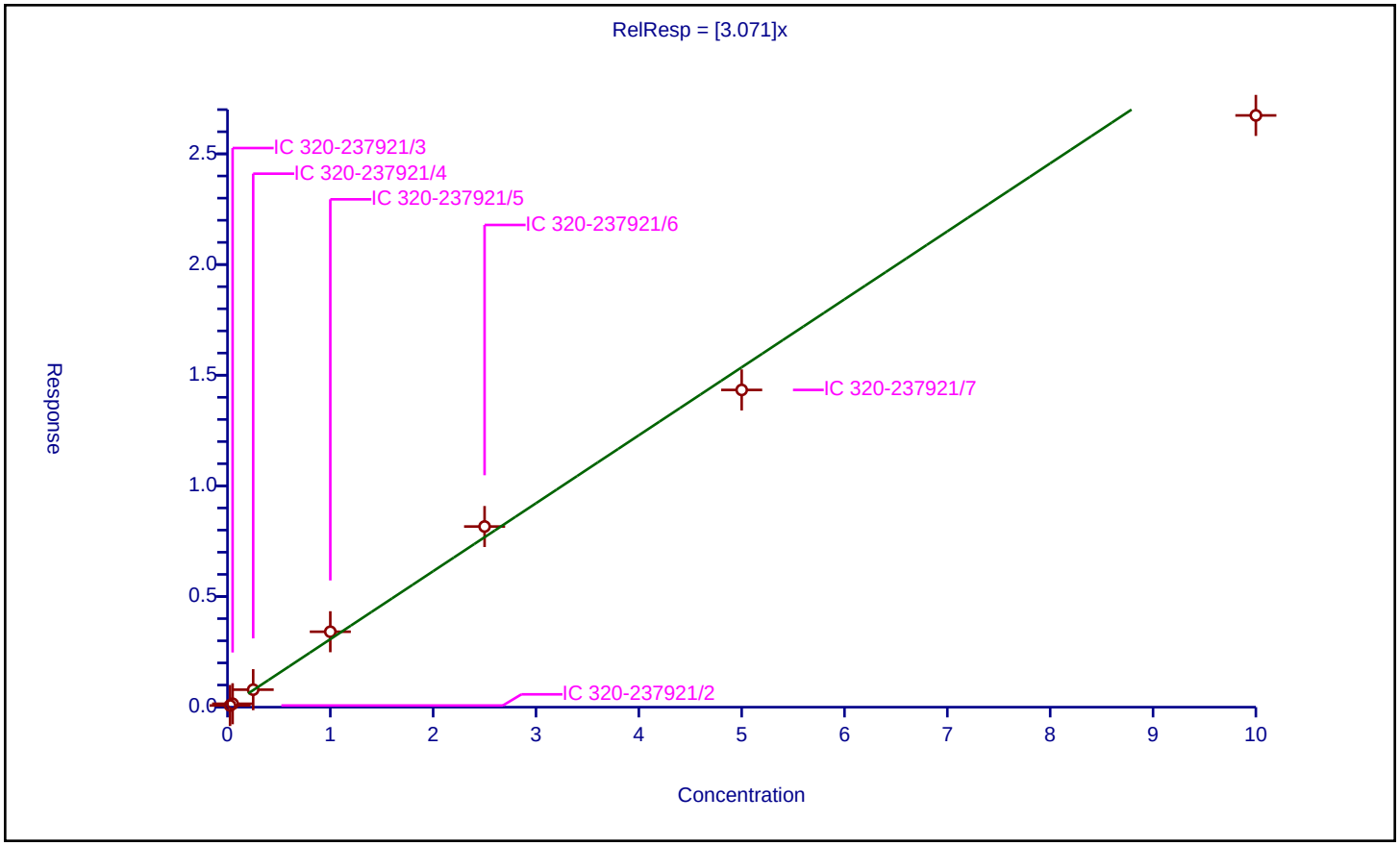
Curve Coefficients

Intercept:	0
Slope:	3.071

Error Coefficients

Standard Error:	15100000
Relative Standard Error:	8.0
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.075848	2.5	3206073.0	3.03393	Y
2	IC 320-237921/3	0.05	0.15456	2.5	3295383.0	3.091204	Y
3	IC 320-237921/4	0.25	0.790137	2.5	3340672.0	3.160547	Y
4	IC 320-237921/5	1.0	3.408512	2.5	3127842.0	3.408512	Y
5	IC 320-237921/6	2.5	8.162076	2.5	3056647.0	3.26483	Y
6	IC 320-237921/7	5.0	14.333726	2.5	3130628.0	2.866745	Y
7	IC 320-237921/8	10.0	26.738196	2.5	2836181.0	2.67382	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

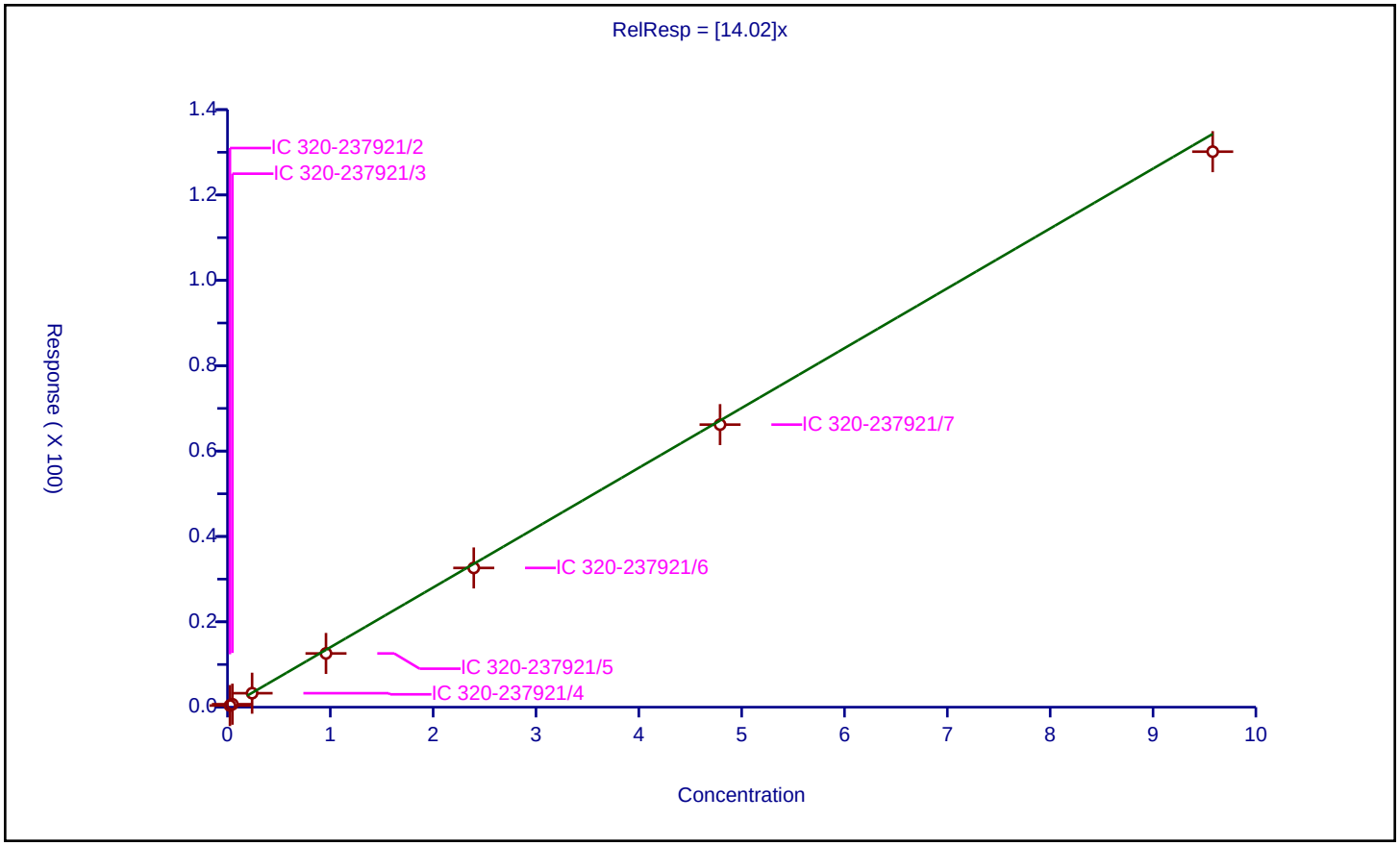
Curve Coefficients

Intercept:	0
Slope:	14.02

Error Coefficients

Standard Error:	1570000
Relative Standard Error:	6.4
Correlation Coefficient:	0.993
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.02395	0.379842	2.395	80247.0	15.859783	Y
2	IC 320-237921/3	0.0479	0.69243	2.395	75406.0	14.455746	Y
3	IC 320-237921/4	0.2395	3.269848	2.395	76604.0	13.652812	Y
4	IC 320-237921/5	0.958	12.587501	2.395	78595.0	13.139354	Y
5	IC 320-237921/6	2.395	32.614718	2.395	72605.0	13.617836	Y
6	IC 320-237921/7	4.79	66.199973	2.395	66824.0	13.820454	Y
7	IC 320-237921/8	9.58	130.147605	2.395	58823.0	13.585345	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

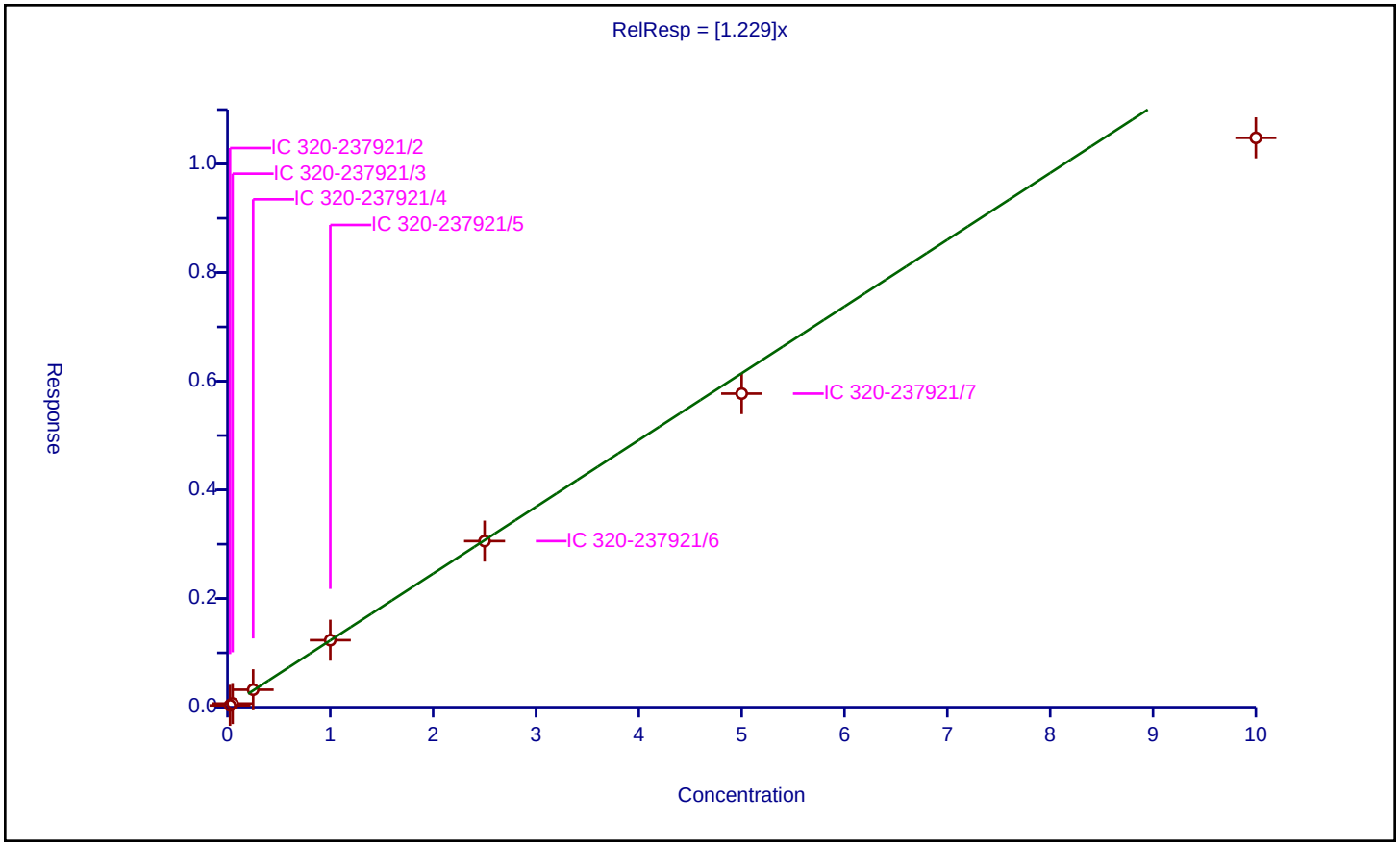
Curve Coefficients

Intercept:	0
Slope:	1.229

Error Coefficients

Standard Error:	8760000
Relative Standard Error:	8.3
Correlation Coefficient:	0.986
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.033141	2.5	5120170.0	1.32562	Y
2	IC 320-237921/3	0.05	0.066809	2.5	5190946.0	1.336182	Y
3	IC 320-237921/4	0.25	0.321132	2.5	5165264.0	1.284529	Y
4	IC 320-237921/5	1.0	1.233113	2.5	4876594.0	1.233113	Y
5	IC 320-237921/6	2.5	3.056638	2.5	4664987.0	1.222655	Y
6	IC 320-237921/7	5.0	5.771971	2.5	4667480.0	1.154394	Y
7	IC 320-237921/8	10.0	10.480517	2.5	4172222.0	1.048052	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

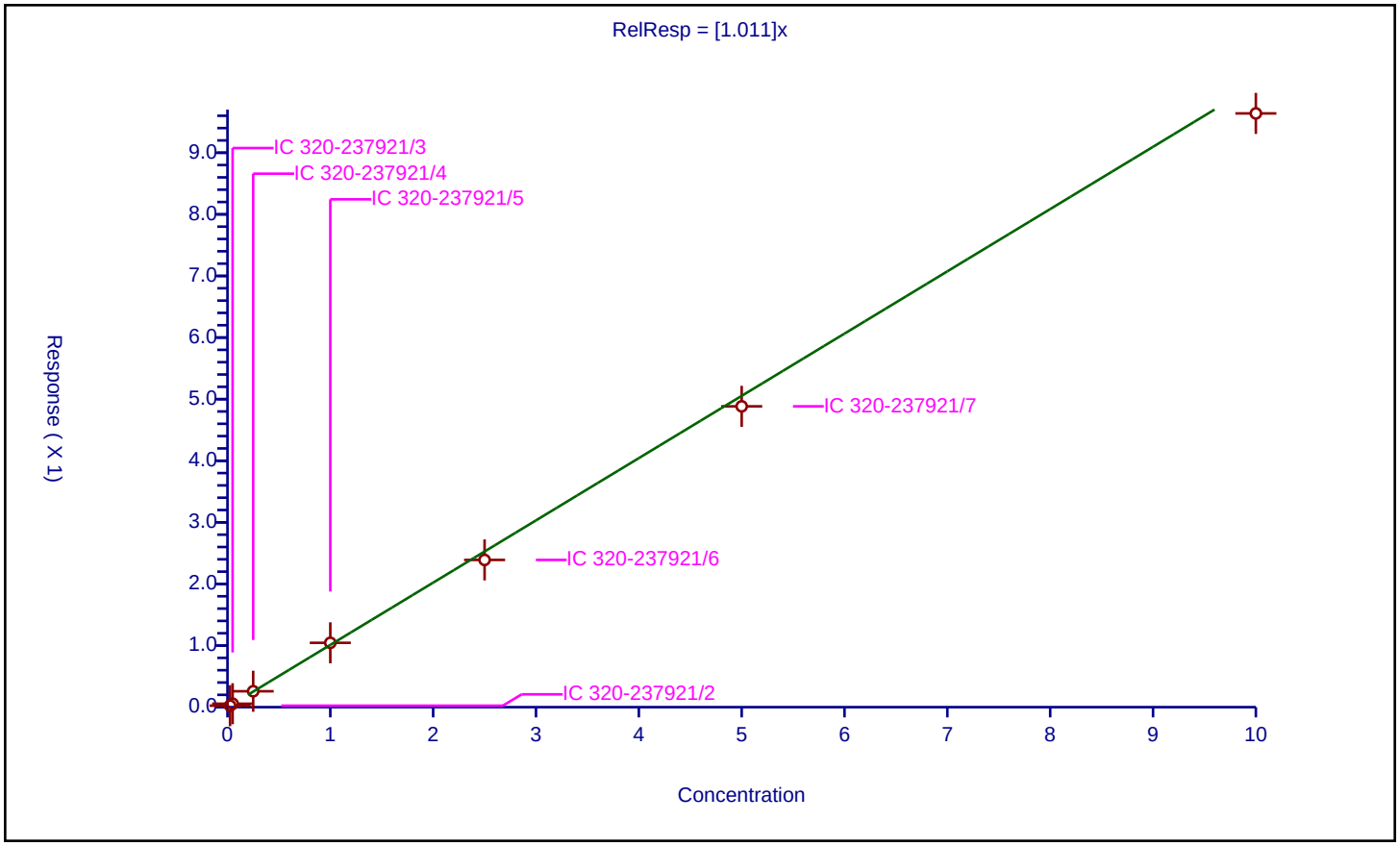
Curve Coefficients

Intercept:	0
Slope:	1.011

Error Coefficients

Standard Error:	1770000
Relative Standard Error:	5.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.02452	2.5	965422.0	0.980815	Y
2	IC 320-237921/3	0.05	0.056045	2.5	907888.0	1.120898	Y
3	IC 320-237921/4	0.25	0.25803	2.5	878656.0	1.032122	Y
4	IC 320-237921/5	1.0	1.044299	2.5	908545.0	1.044299	Y
5	IC 320-237921/6	2.5	2.390108	2.5	935170.0	0.956043	Y
6	IC 320-237921/7	5.0	4.883254	2.5	968788.0	0.976651	Y
7	IC 320-237921/8	10.0	9.638374	2.5	980371.0	0.963837	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

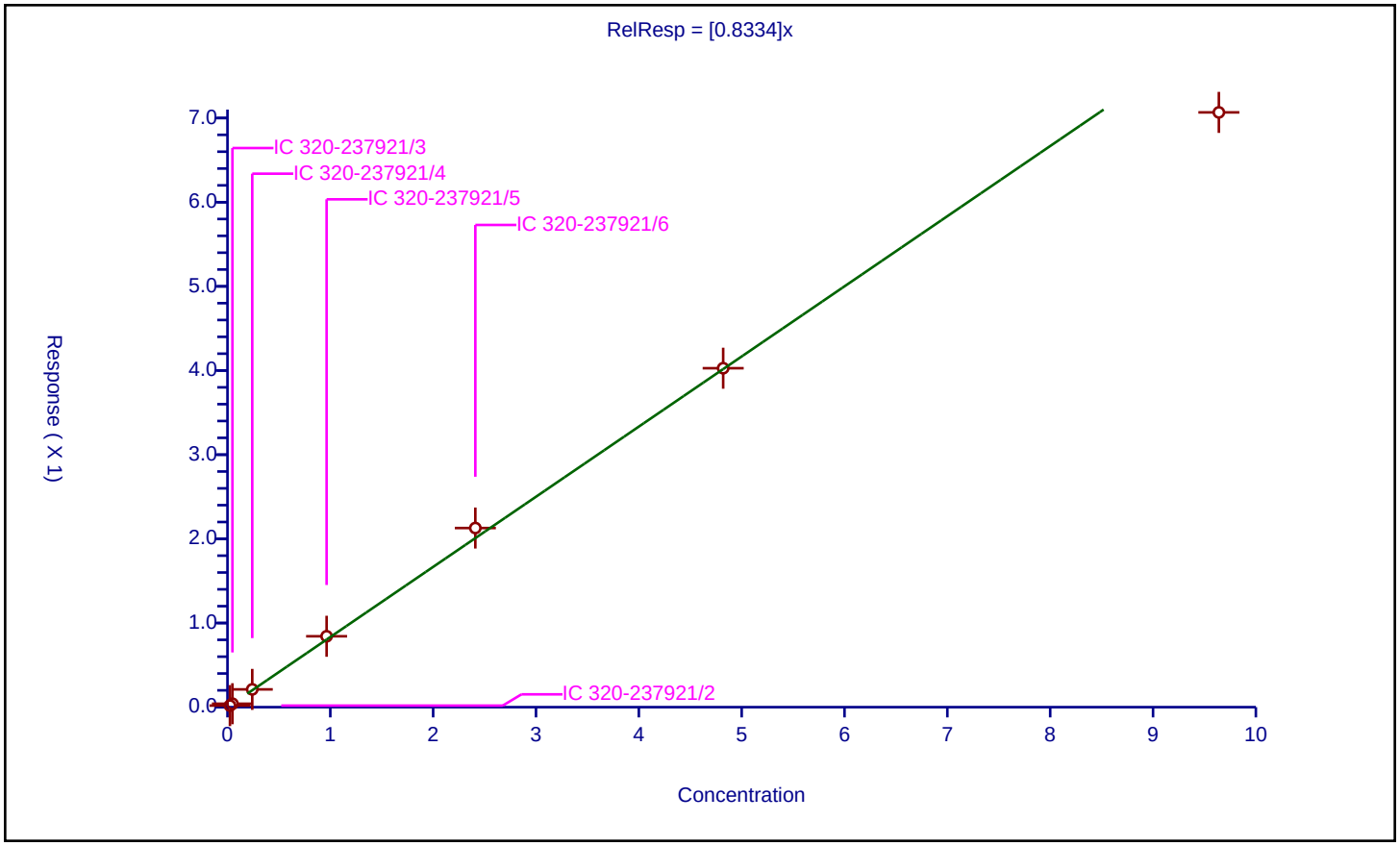
Curve Coefficients

Intercept:	0
Slope:	0.8334

Error Coefficients

Standard Error:	7300000
Relative Standard Error:	6.7
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.0241	0.018882	2.39	5163172.0	0.783481	Y
2	IC 320-237921/3	0.0482	0.040874	2.39	5051590.0	0.848011	Y
3	IC 320-237921/4	0.241	0.211259	2.39	4950130.0	0.876595	Y
4	IC 320-237921/5	0.964	0.842392	2.39	5088829.0	0.87385	Y
5	IC 320-237921/6	2.41	2.128445	2.39	4714686.0	0.883172	Y
6	IC 320-237921/7	4.82	4.027309	2.39	5039962.0	0.835541	Y
7	IC 320-237921/8	9.64	7.06693	2.39	5087246.0	0.733084	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

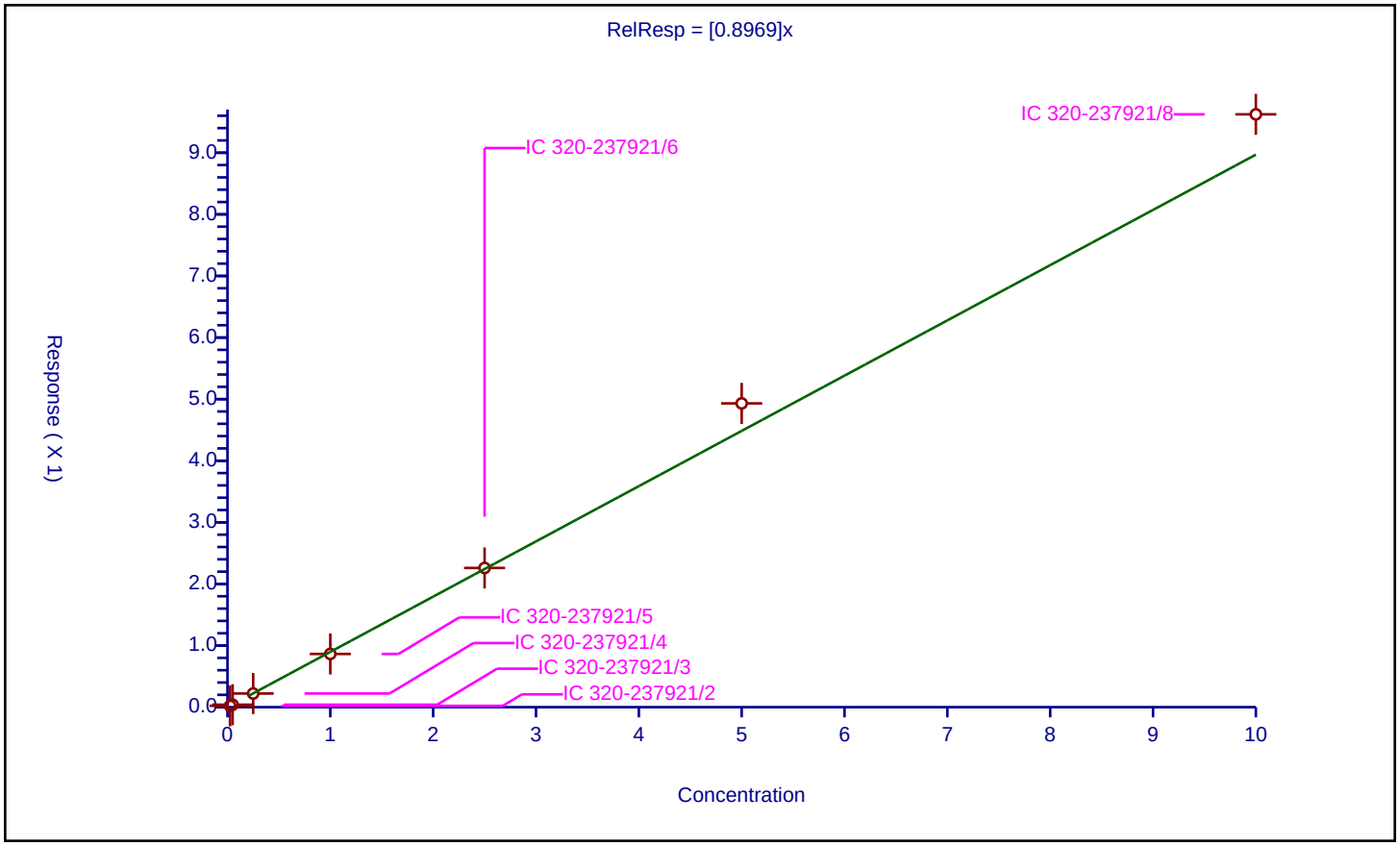
Curve Coefficients

Intercept:	0
Slope:	0.8969

Error Coefficients

Standard Error:	1310000
Relative Standard Error:	6.9
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.021822	2.5	762525.0	0.872889	Y
2	IC 320-237921/3	0.05	0.040094	2.5	825934.0	0.80188	Y
3	IC 320-237921/4	0.25	0.22178	2.5	803397.0	0.887121	Y
4	IC 320-237921/5	1.0	0.86375	2.5	793459.0	0.86375	Y
5	IC 320-237921/6	2.5	2.260066	2.5	737400.0	0.904026	Y
6	IC 320-237921/7	5.0	4.931061	2.5	757844.0	0.986212	Y
7	IC 320-237921/8	10.0	9.62327	2.5	716421.0	0.962327	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

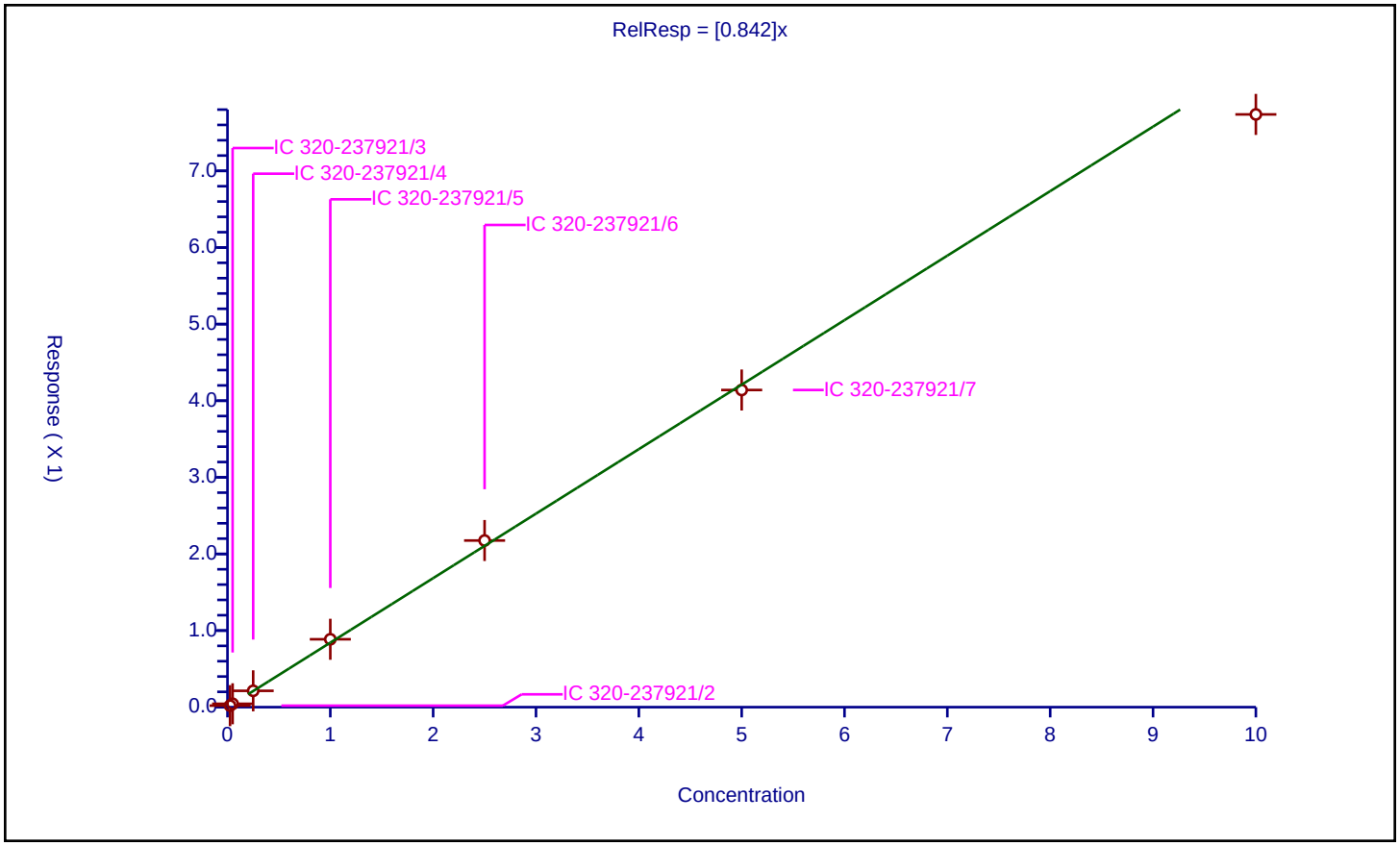
Curve Coefficients

Intercept:	0
Slope:	0.842

Error Coefficients

Standard Error:	5240000
Relative Standard Error:	5.2
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.019928	2.5	4332288.0	0.797131	Y
2	IC 320-237921/3	0.05	0.044276	2.5	4167691.0	0.885514	Y
3	IC 320-237921/4	0.25	0.213266	2.5	4060489.0	0.853065	Y
4	IC 320-237921/5	1.0	0.886319	2.5	3937669.0	0.886319	Y
5	IC 320-237921/6	2.5	2.175205	2.5	3627913.0	0.870082	Y
6	IC 320-237921/7	5.0	4.139956	2.5	3808061.0	0.827991	Y
7	IC 320-237921/8	10.0	7.73725	2.5	3432823.0	0.773725	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

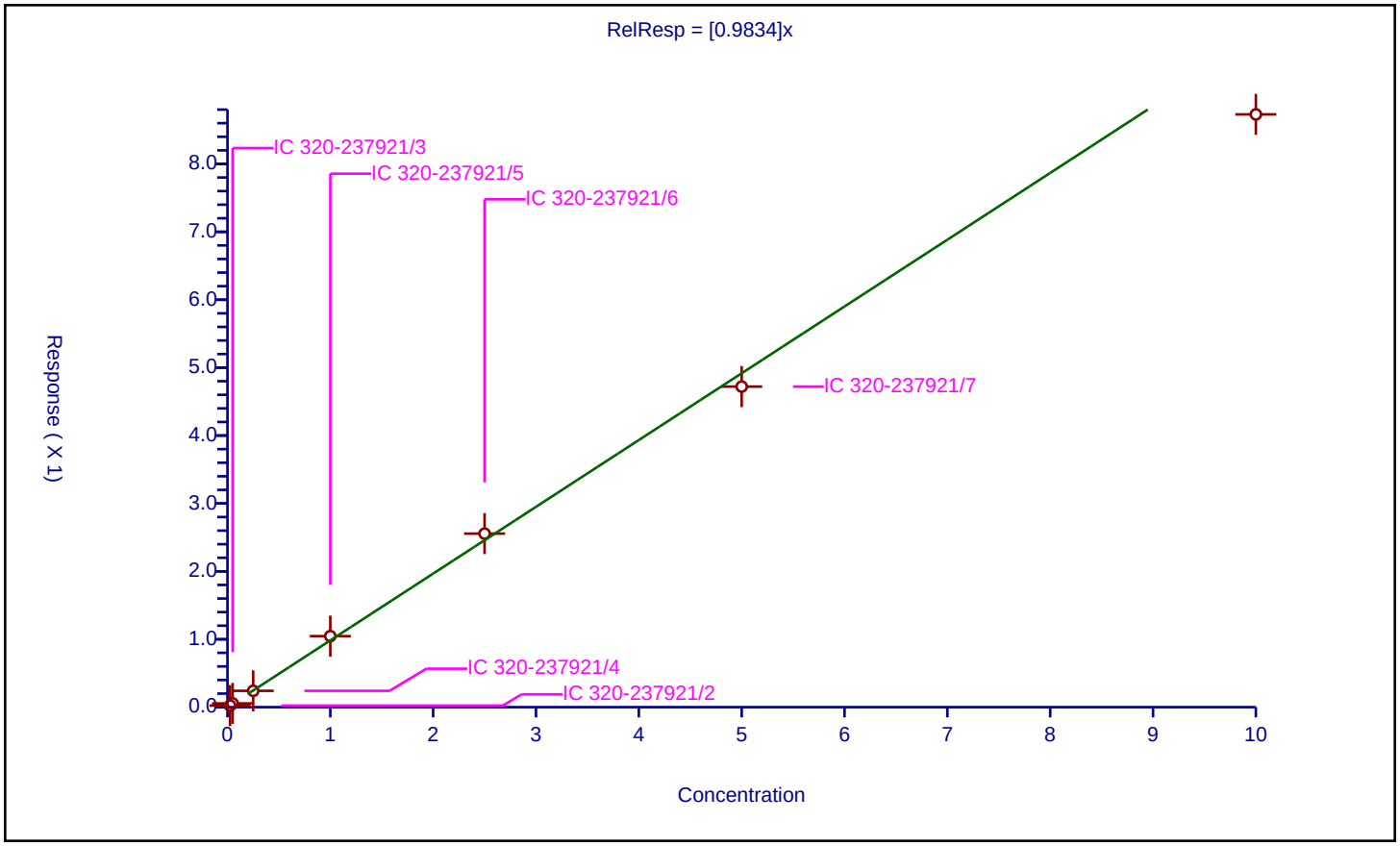
Curve Coefficients

Intercept:	0
Slope:	0.9834

Error Coefficients

Standard Error:	6640000
Relative Standard Error:	8.0
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.0233	2.5	4139411.0	0.931992	Y
2	IC 320-237921/3	0.05	0.055218	2.5	4405021.0	1.104365	Y
3	IC 320-237921/4	0.25	0.240536	2.5	4519004.0	0.962143	Y
4	IC 320-237921/5	1.0	1.046019	2.5	4138570.0	1.046019	Y
5	IC 320-237921/6	2.5	2.555858	2.5	4126518.0	1.022343	Y
6	IC 320-237921/7	5.0	4.720871	2.5	4310482.0	0.944174	Y
7	IC 320-237921/8	10.0	8.729467	2.5	3811691.0	0.872947	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

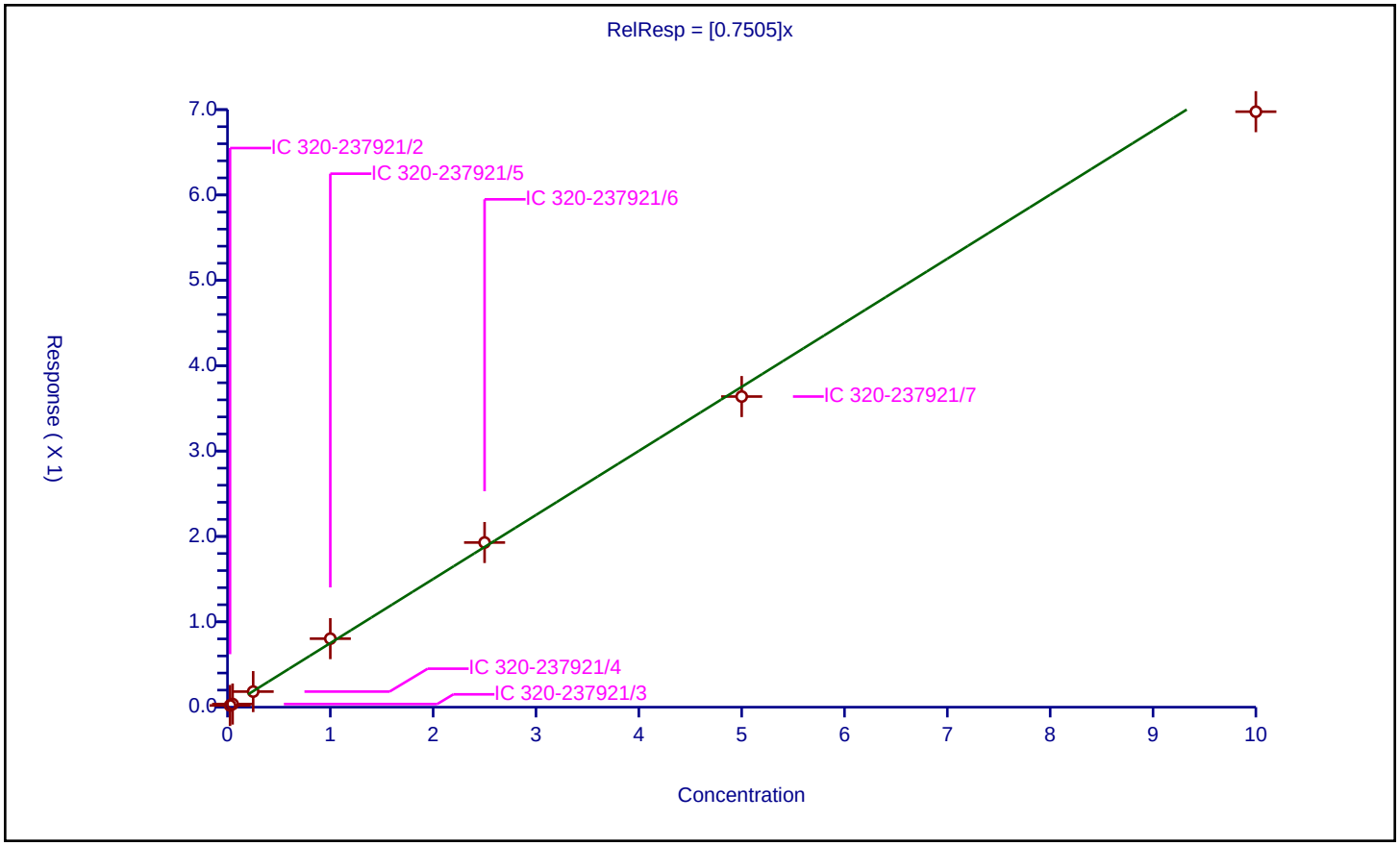
Curve Coefficients

Intercept:	0
Slope:	0.7505

Error Coefficients

Standard Error:	5240000
Relative Standard Error:	5.3
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.01988	2.5	4139411.0	0.79521	Y
2	IC 320-237921/3	0.05	0.036458	2.5	4405021.0	0.729168	Y
3	IC 320-237921/4	0.25	0.182355	2.5	4519004.0	0.72942	Y
4	IC 320-237921/5	1.0	0.80271	2.5	4138570.0	0.80271	Y
5	IC 320-237921/6	2.5	1.928658	2.5	4126518.0	0.771463	Y
6	IC 320-237921/7	5.0	3.638752	2.5	4310482.0	0.72775	Y
7	IC 320-237921/8	10.0	6.975672	2.5	3811691.0	0.697567	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

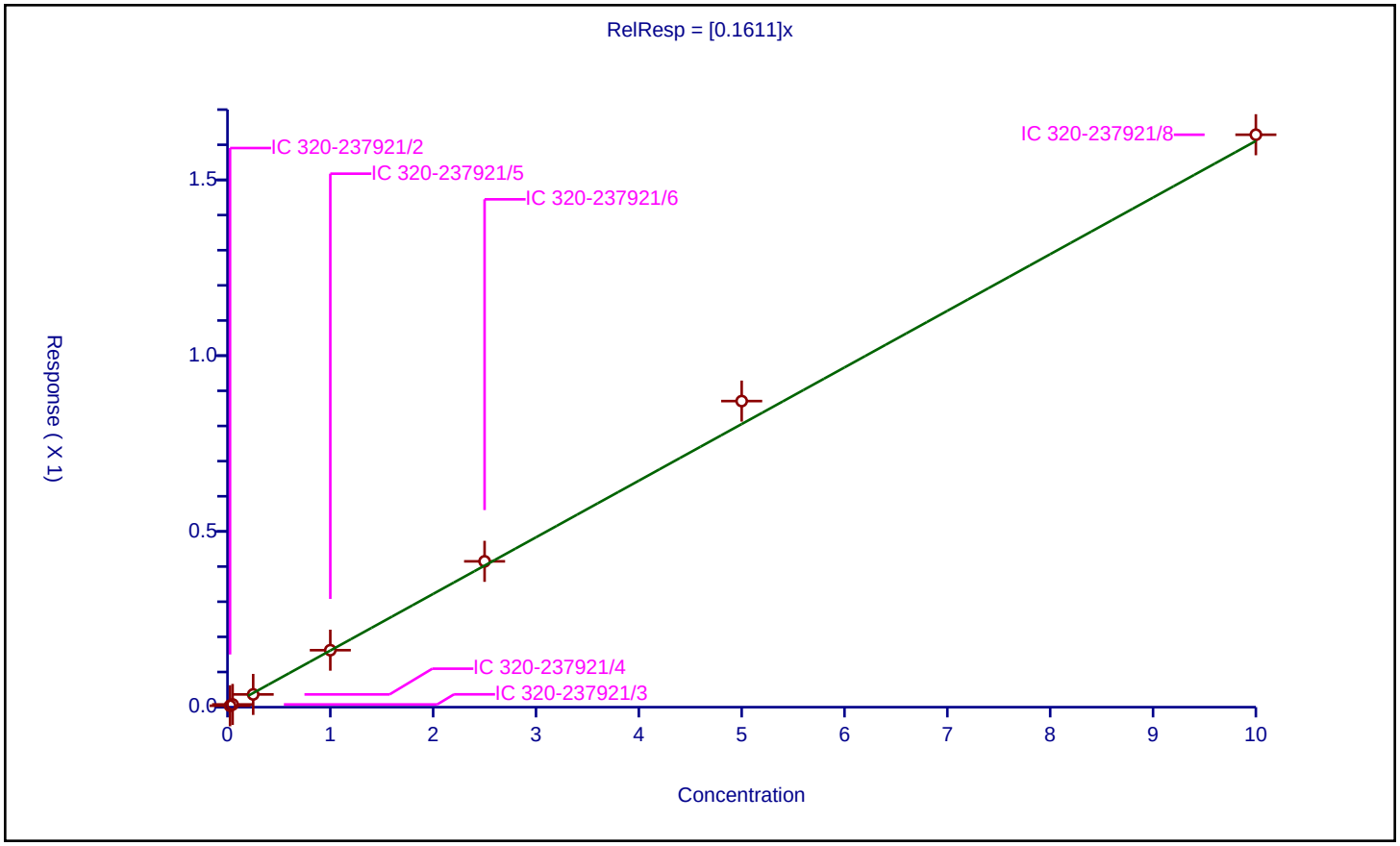
Curve Coefficients

Intercept:	0
Slope:	0.1611

Error Coefficients

Standard Error:	796000
Relative Standard Error:	5.6
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-237921/2	0.025	0.00404	2.5	2766432.0	0.161616	Y
2	IC 320-237921/3	0.05	0.007781	2.5	2744799.0	0.155622	Y
3	IC 320-237921/4	0.25	0.036315	2.5	2823583.0	0.145259	Y
4	IC 320-237921/5	1.0	0.162109	2.5	2697006.0	0.162109	Y
5	IC 320-237921/6	2.5	0.414894	2.5	2622464.0	0.165958	Y
6	IC 320-237921/7	5.0	0.870817	2.5	2591620.0	0.174163	Y
7	IC 320-237921/8	10.0	1.628567	2.5	2552499.0	0.162857	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: ICV 320-237921/10 Calibration Date: 08/03/2018 17:12

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.03LLICAL_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	0.9293	0.9479		2.55	2.50	2.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.007		2.47	2.50	-1.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	109.5		2.35	2.21	6.0	30.0
4:2 FTS	AveID	17.02	16.76		2.30	2.34	-1.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.9172		2.45	2.50	-1.9	30.0
Perfluoropentanesulfonic acid	AveID	48.91	52.28		2.51	2.35	6.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.088		2.62	2.50	4.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.195		2.13	2.28	-6.6	30.0
6:2 FTS	AveID	2.137	2.109		2.34	2.38	-1.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.040		2.37	2.50	-5.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.166		2.74	2.38	15.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	0.9934		2.35	2.50	-5.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.093		2.36	2.31	1.9	30.0
8:2 FTS	AveID	14.02	14.62		2.50	2.40	4.3	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.7374		2.70	2.40	12.6	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	3.311		2.69	2.50	7.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.181		2.40	2.50	-3.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	1.130		2.79	2.50	11.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.9212		2.67	2.41	10.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	1.049		2.92	2.50	16.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.7968		2.37	2.50	-5.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.069		2.72	2.50	8.7	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.8383		2.79	2.50	11.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1476		2.29	2.50	-8.4	30.0
13C4 PFBA	Ave	1.117	1.102		2.47	2.50	-1.4	30.0
13C5-PFPeA	Ave	0.999	1.000		2.50	2.50	0.2	30.0
13C3-PFBS	Ave	0.0155	0.0152		2.28	2.33	-2.0	30.0
13C2 PFHxA	Ave	1.037	1.022		2.46	2.50	-1.4	30.0
13C4-PFHpA	Ave	1.177	1.130		2.40	2.50	-4.0	30.0
18O2 PFHxS	Ave	0.8862	0.8996		2.40	2.37	1.5	30.0
M2-6:2FTS	Ave	0.1144	0.1131		2.35	2.38	-1.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: ICV 320-237921/10 Calibration Date: 08/03/2018 17:12

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.03LLICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	1.010		2.56	2.50	2.4	30.0
13C4 PFOS	Ave	0.9223	0.8972		2.32	2.39	-2.7	30.0
13C5 PFNA	Ave	0.8463	0.8515		2.52	2.50	0.6	30.0
13C2 PFDA	Ave	0.8474	0.8599		2.54	2.50	1.5	30.0
13C8 FOSA	Ave	0.5512	0.5716		2.59	2.50	3.7	30.0
M2-8:2FTS	Ave	0.0133	0.0130		2.34	2.40	-2.1	30.0
d3-NMeFOSAA	Ave	0.1647	0.1565		2.37	2.50	-5.0	30.0
d5-NEtFOSAA	Ave	0.1353	0.1412		2.61	2.50	4.3	30.0
13C2 PFUnA	Ave	0.6849	0.6756		2.47	2.50	-1.4	30.0
13C2 PFDoA	Ave	0.7384	0.6756		2.29	2.50	-8.5	30.0
13C2-PFTeDA	Ave	0.4715	0.4924		2.61	2.50	4.4	30.0
13C2-PFHxDA	Ave	0.4325	0.4290		2.48	2.50	-0.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_013.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 03-Aug-2018 17:12:28 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\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:16:42 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:58:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.486	1.485	0.001	0.540	6041779	2.47		98.6	6070	
2 Perfluorobutyric acid										
212.90 > 169.00	1.486	1.486	0.0	1.000	5727114	2.55			107	
D 3 13C5-PFPeA										
267.90 > 223.00	1.753	1.753	0.0	0.638	5486390	2.50		100	7354	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.753	1.754	-0.001	1.000	5522443	2.47			206	
D 47 13C3-PFBS										
301.90 > 83.00	1.787	1.792	-0.005	0.650	77315	2.28		98.0	270	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.795	1.794	0.001	1.005	8055428	2.35			5065	
298.90 > 99.00	1.787	1.794	-0.007	1.000	2841969		2.83(1.35-4.05)		765	
D 60 M2-4:2FTS										
329.00 > 81.00	2.006	2.006	0.0	0.730	513519	NC			321	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.006	2.009	-0.003	1.123	1302896	2.30			4344	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.037	2.044	-0.007	1.000	5140529	2.45			387	
313.00 > 119.00	2.037	2.044	-0.007	1.000	373141		13.78(6.96-20.87)		259	
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.046	-0.009	0.741	5604405	2.46		98.6	6822	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.069	-0.001	1.157	4085598	2.51			5139	
349.00 > 99.00	2.068	2.069	-0.001	1.157	1890840		2.16(1.15-3.45)		734	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.140	2.146	-0.006	0.778	469410	NC			1517	

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	2.147	-0.007	1.000	1016128	NC			269	
D 9 13C4-PFHpA										
367.00 > 322.00	2.384	2.384	0.0	0.867	6196682	2.40		96.0	8077	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.384	2.384	0.0	1.000	6740712	2.62			379	
363.00 > 169.00	2.384	2.384	0.0	1.000	1519780		4.44(2.17-6.52)		1095	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.397	2.398	-0.001	1.000	5374811	2.13			3767	
399.00 > 99.00	2.397	2.398	-0.001	1.000	1409278		3.81(1.90-5.70)		361	
D 11 18O2 PFHxS										
403.00 > 84.00	2.397	2.400	-0.003	0.872	4666935	2.40		102	7459	
65 ADONA										
377.00 > 251.00	2.436	2.435	0.001	0.776	10765824	NC			7409	
377.00 > 85.00	2.436	2.435	0.001	0.776	4411435		2.44(1.05-3.16)		1606	
D 12 M2-6:2FTS										
429.00 > 81.00	2.733	2.732	0.001	0.994	589398	2.35		98.9	681	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.733	2.732	0.001	1.000	1242765	2.34			2045	
* 62 13C2-PFOA										
415.00 > 370.00	2.749	2.755	-0.006		5483729	2.50			13538	
D 14 13C4 PFOA										
417.00 > 372.00	2.749	2.757	-0.008	1.000	5538192	2.56		102	5087	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.749	2.757	-0.008	1.000	5758083	2.37			527	
413.00 > 169.00	2.749	2.757	-0.008	1.000	2075858		2.77(1.36-4.08)		1033	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.766	2.767	-0.001	0.881	5448213	2.74			6270	
449.00 > 99.00	2.766	2.767	-0.001	0.881	1267468		4.30(1.84-5.53)		1792	
D 19 13C5 PFNA										
468.00 > 423.00	3.139	3.140	-0.001	1.142	4669513	2.52		101	5555	
D 18 13C4 PFOS										
503.00 > 80.00	3.139	3.140	-0.001	1.142	4703282	2.32		97.3	5180	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.139	3.140	-0.001	1.000	4976226	2.36			3755	
499.00 > 99.00	3.139	3.140	-0.001	1.000	1124775		4.42(2.04-6.12)		1278	
20 Perfluorononanoic acid										
463.00 > 419.00	3.139	3.140	-0.001	1.000	4638610	2.35			519	
463.00 > 169.00	3.139	3.140	-0.001	1.000	866766		5.35(2.68-8.03)		966	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.347	3.348	-0.001	1.066	5833805	NC			4066	
D 21 13C8 FOSA										
506.00 > 78.00	3.493	3.485	0.008	1.270	3134561	2.59		104	3718	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.493	3.492	0.001	1.113	3482909	2.70			3769	
549.00 > 99.00	3.493	3.492	0.001	1.113	604699		5.76(3.02-9.05)		2534	
D 26 M2-8:2FTS										
529.00 > 81.00	3.493	3.492	0.001	1.270	68330	2.34		97.9	232	

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	3.493	3.492	0.001	1.000	10377049	2.69			2751	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.493	3.494	-0.001	1.000	1000981	2.50			5378	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.508	3.505	0.003	1.004	5569297	2.40			566	
513.00 > 169.00	3.493	3.505	-0.012	1.000	374850		14.86(7.12-21.35)		442	
D 23 13C2 PFDA										
515.00 > 470.00	3.493	3.505	-0.012	1.270	4715650	2.54		101	12412	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.649	3.650	-0.001	1.327	857903	2.37		95.0	1804	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.662	3.662	0.0	1.004	969177	2.79			762	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.813	3.816	-0.003	1.215	4373252	2.67			6040	
599.00 > 99.00	3.813	3.816	-0.003	1.215	887182		4.93(2.14-6.43)		1300	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.813	3.825	-0.012	1.387	774216	2.61		104	1529	
D 30 13C2 PFUnA										
565.00 > 520.00	3.828	3.831	-0.003	1.392	3704545	2.47		98.6	9101	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.828	3.831	-0.003	1.000	2951672	2.37			524	
563.00 > 169.00	3.828	3.831	-0.003	1.000	303791		9.72(5.24-15.72)		849	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.828	3.831	-0.003	1.004	812049	2.92			1419	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.979	3.993	-0.014	1.268	6552822	NC			8965	
D 36 13C2 PFDoA										
615.00 > 570.00	4.124	4.127	-0.003	1.500	3704792	2.29		91.5	6862	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.124	4.127	-0.003	1.000	3959122	2.72			771	
613.00 > 169.00	4.124	4.127	-0.003	1.000	414687		9.55(4.68-14.05)		1057	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.124	4.127	-0.003	1.181	581958	NC			2912	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.359	4.361	-0.002	1.389	413127	NC			2389	
699.00 > 99.00	4.359	4.361	-0.002	1.389	719350		0.57(0.28-0.83)		1705	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.390	4.392	-0.002	1.064	3105723	2.79			791	
663.00 > 169.00	4.390	4.392	-0.002	1.064	510772		6.08(3.09-9.27)		1097	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.630	4.635	-0.005	1.684	2700289	2.61		104	6302	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.630	4.635	-0.005	1.000	398628	2.29			1085	
713.00 > 219.00	4.630	4.635	-0.005	1.000	291985		1.37(0.70-2.09)		1078	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.042	5.049	-0.007	1.834	2352290	2.48		99.2	5187	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.042	5.049	-0.007	1.000	2209749	NC			312	
813.00 > 169.00	5.042	5.049	-0.007	1.000	423681		5.22(2.77-8.32)		1115	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.391	5.401	-0.010	1.069	1577565	NC			1279	
913.00 > 169.00	5.391	5.401	-0.010	1.069	316379		4.99(2.55-7.64)		1932	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00013 Amount Added: 1.00 Units: mL

Report Date: 03-Aug-2018 18:16:43 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_013.d

Injection Date: 03-Aug-2018 17:12:28 Instrument ID: A9

Lims ID: ICV Full

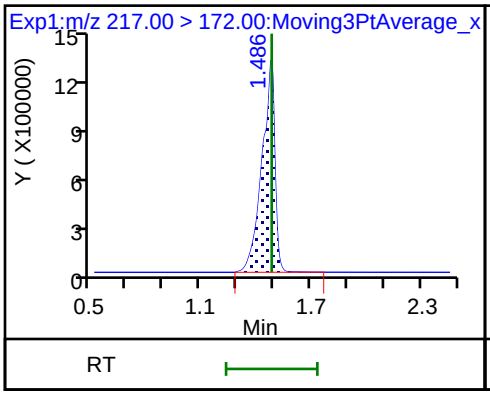
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 17 Worklist Smp#: 10

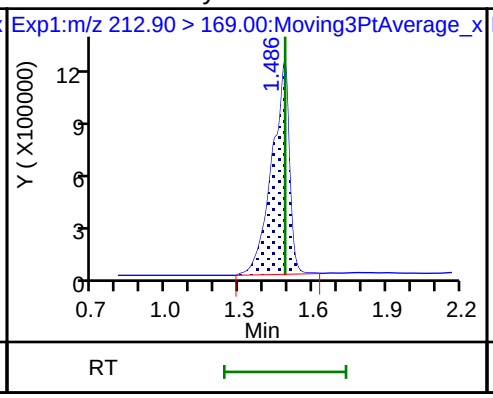
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

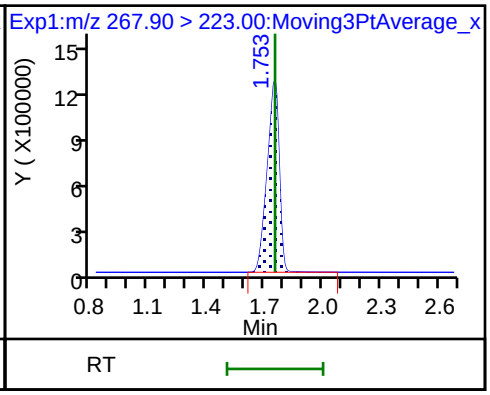
D 1 13C4 PFBA



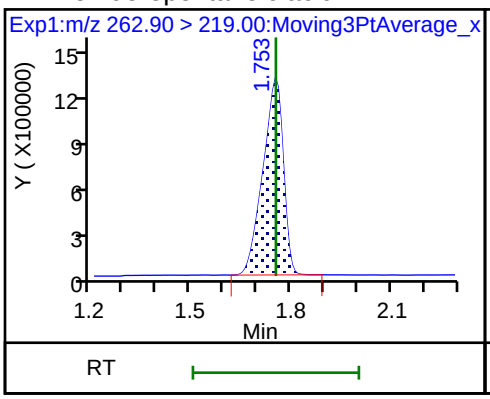
2 Perfluorobutyric acid



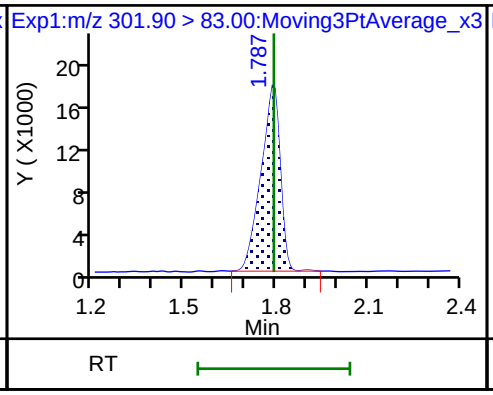
D 3 13C5-PFPeA



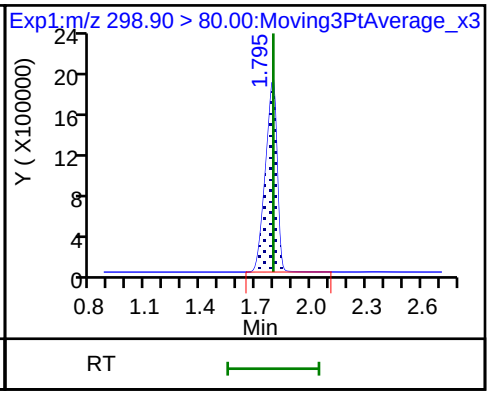
4 Perfluoropentanoic acid



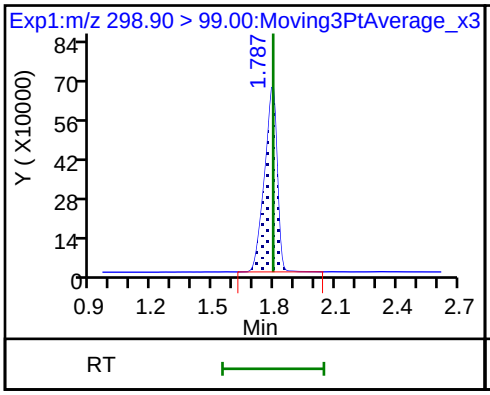
D 47 13C3-PFBS



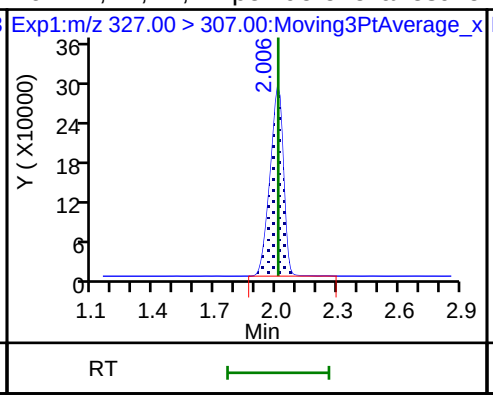
5 Perfluorobutanesulfonic acid



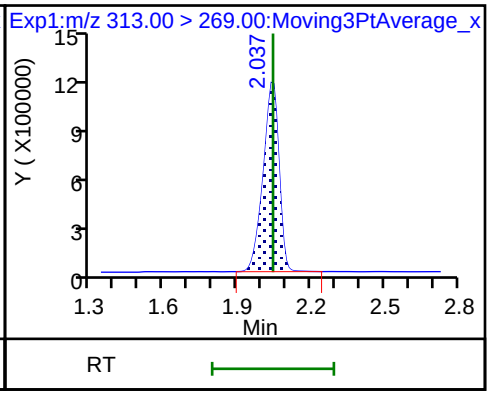
5 Perfluorobutanesulfonic acid



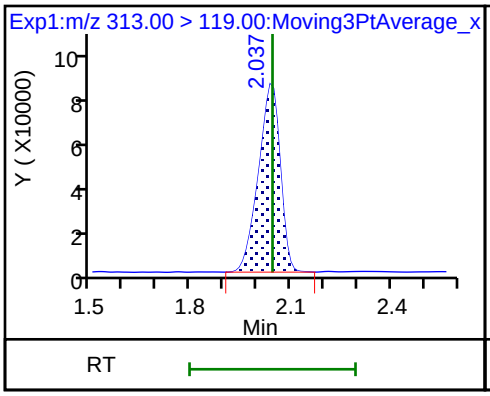
61 1H,1H,2H,2H-perfluorohexanesulfoni



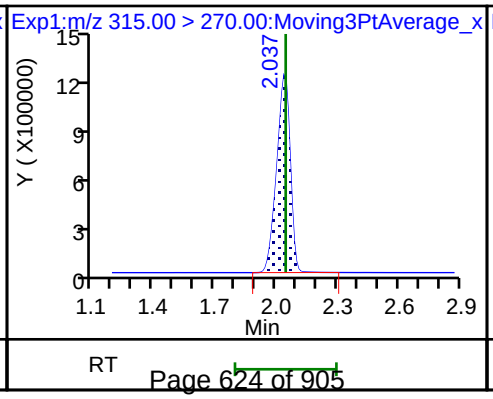
6 Perfluorohexanoic acid



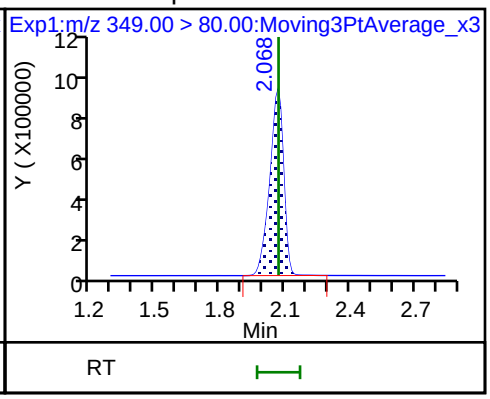
6 Perfluorohexanoic acid



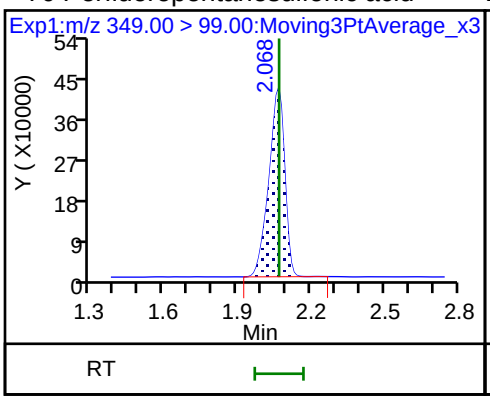
D 7 13C2 PFHxA



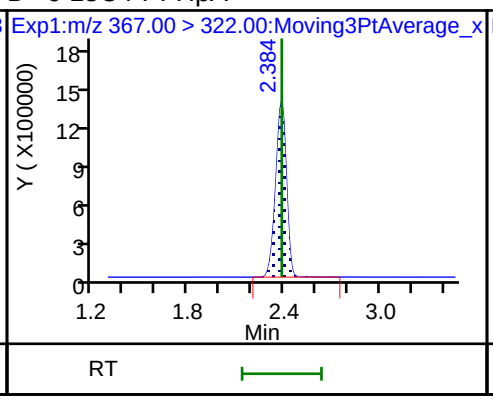
70 Perfluoropentanesulfonic acid



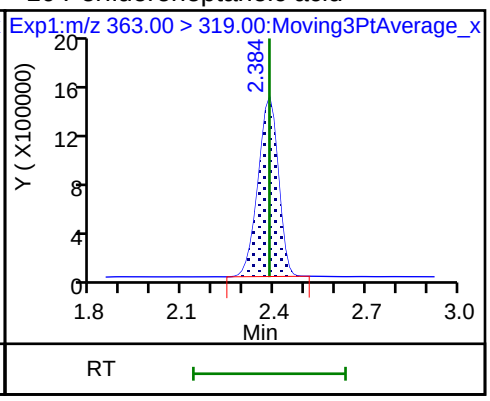
70 Perfluoropentanesulfonic acid



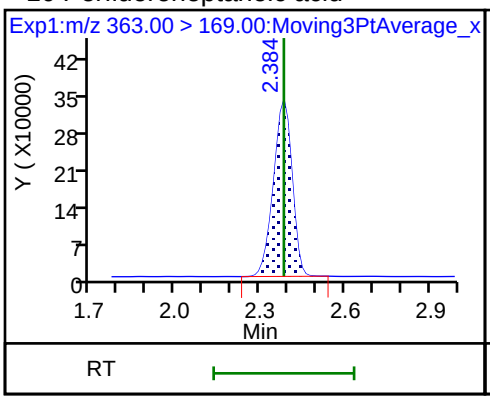
D 9 13C4-PFHpA



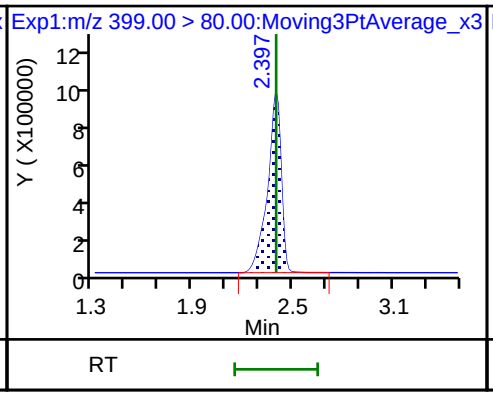
10 Perfluoroheptanoic acid



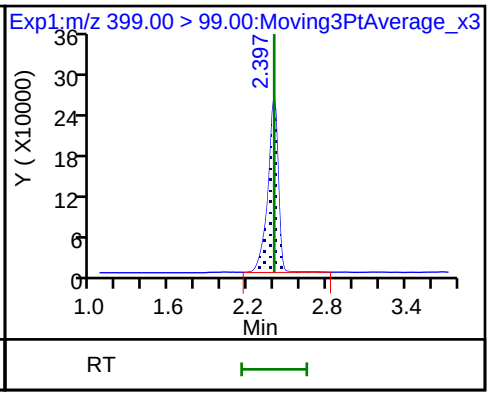
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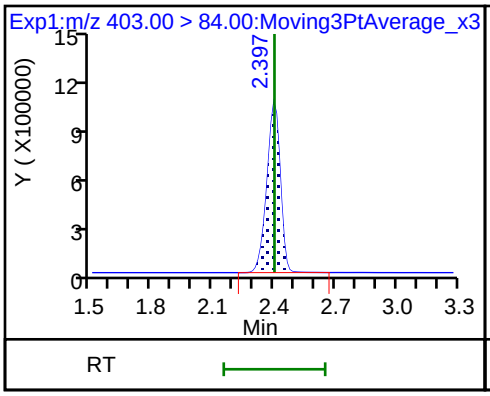
8 Perfluorohexanesulfonic acid



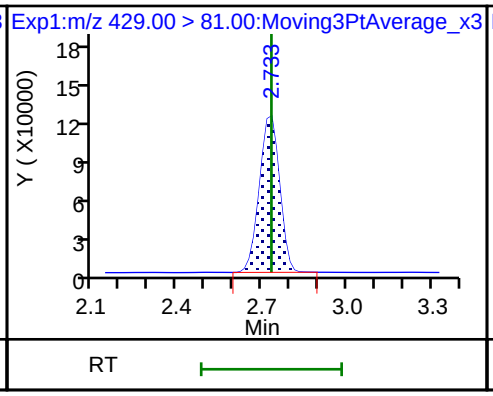
8 Perfluorohexanesulfonic acid



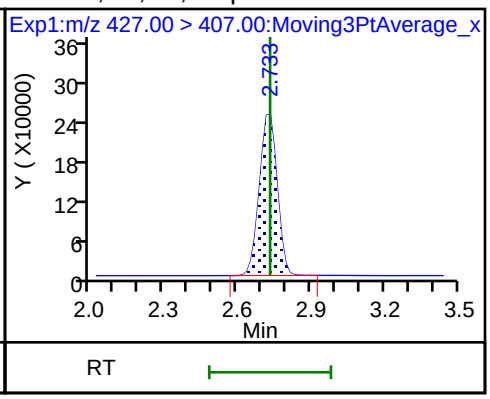
D 11 18O2 PFHxS



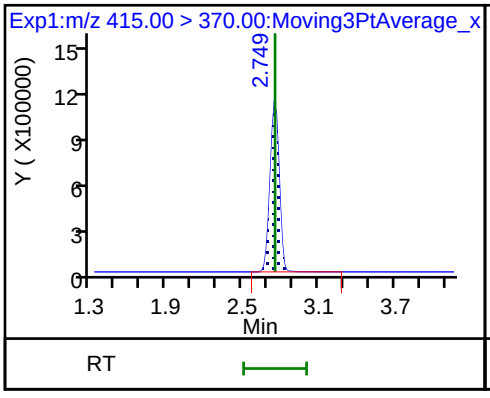
D 12 M2-6:2FTS



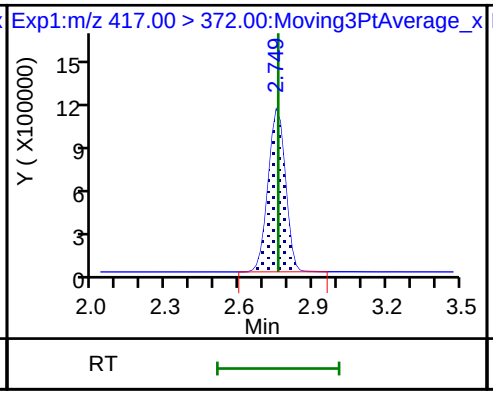
13 1H,1H,2H,2H-perfluorooctanesulfoni



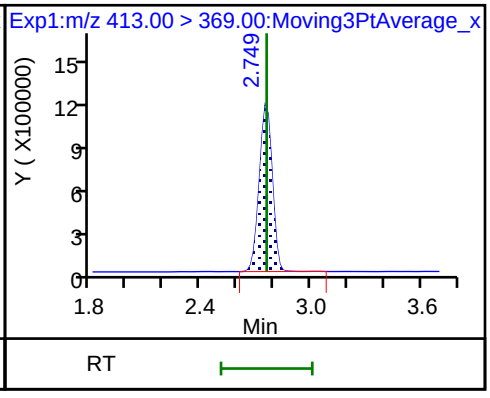
* 62 13C2-PFOA



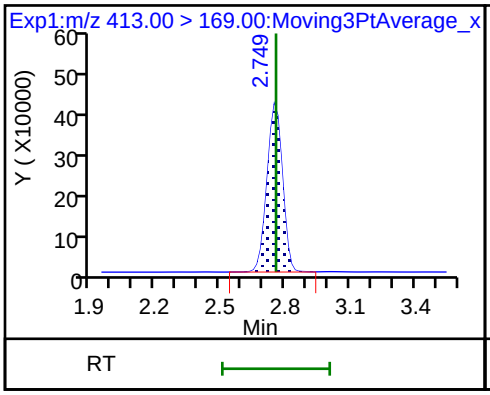
D 14 13C4 PFOA



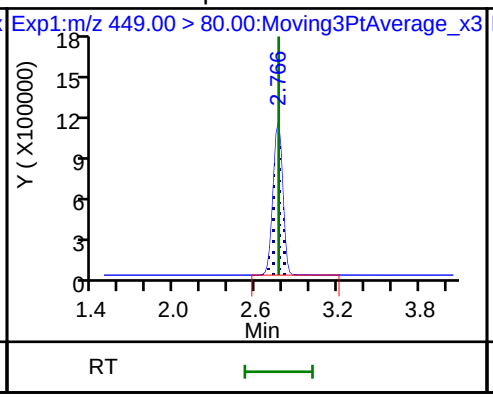
15 Perfluorooctanoic acid



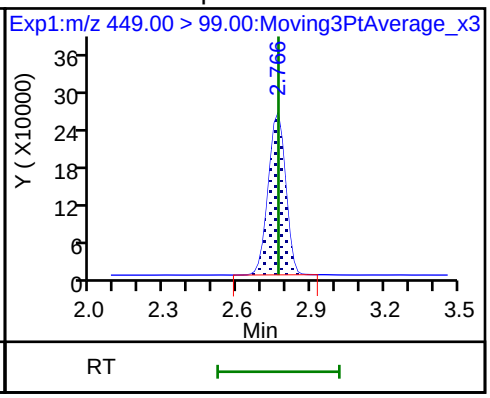
15 Perfluorooctanoic acid



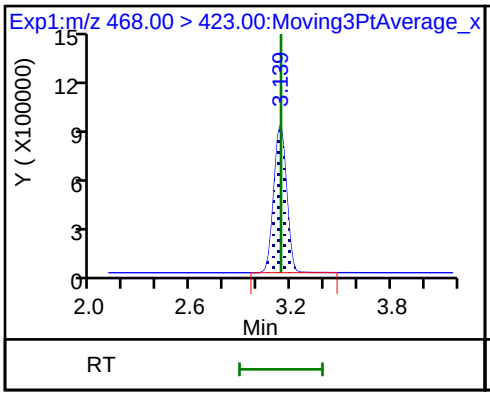
16 Perfluoroheptanesulfonic acid



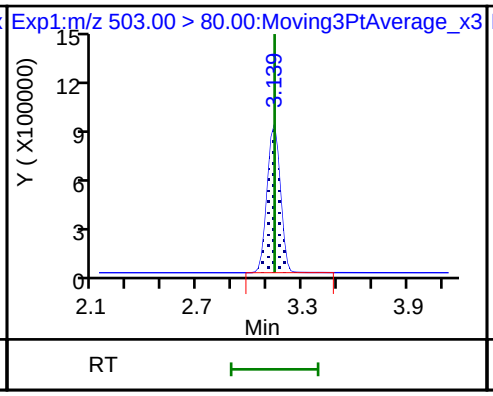
16 Perfluoroheptanesulfonic acid



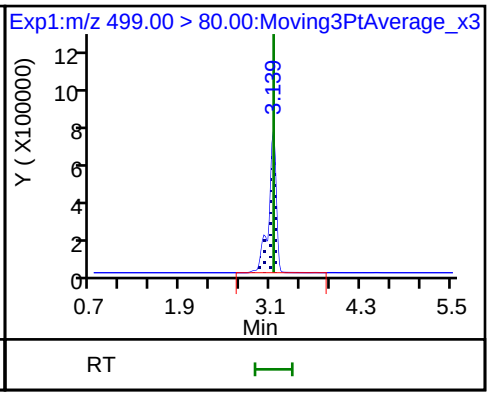
D 19 13C5 PFNA



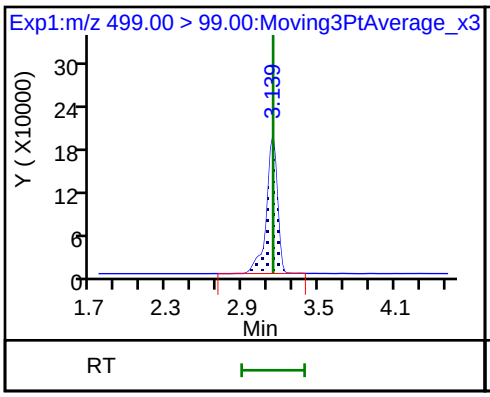
D 18 13C4 PFOS



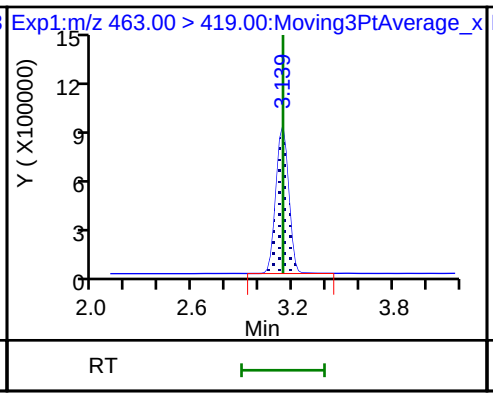
17 Perfluorooctane sulfonic acid



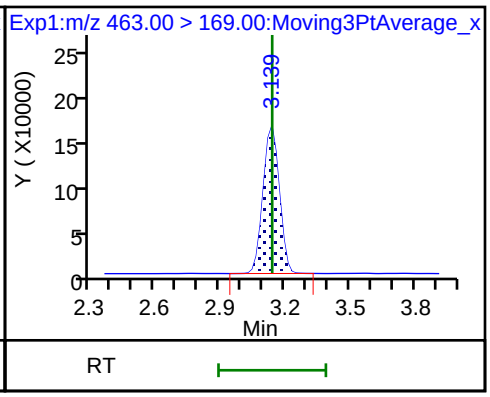
17 Perfluorooctane sulfonic acid



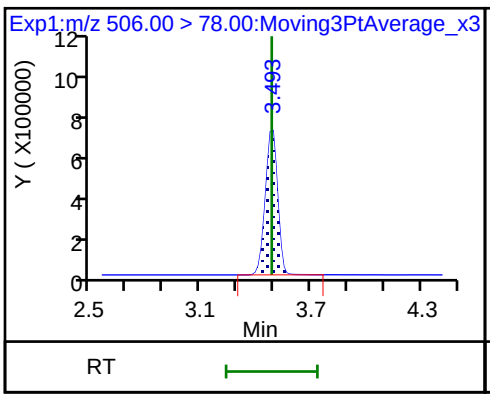
20 Perfluorononanoic acid



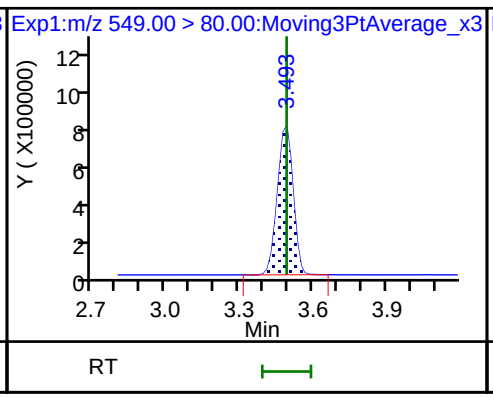
20 Perfluorononanoic acid



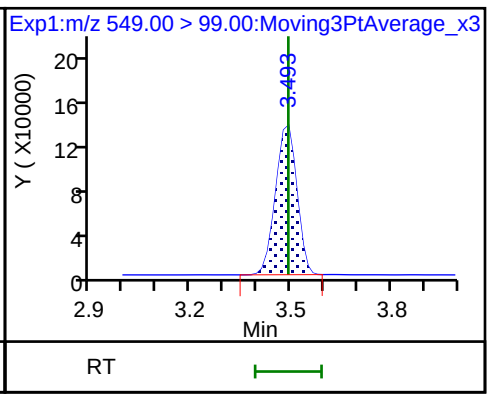
D 21 13C8 FOSA



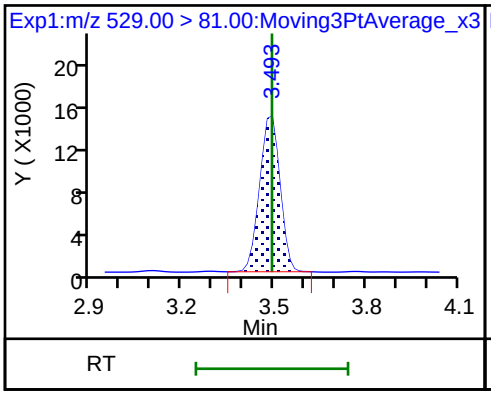
68 Perfluorononanesulfonic acid



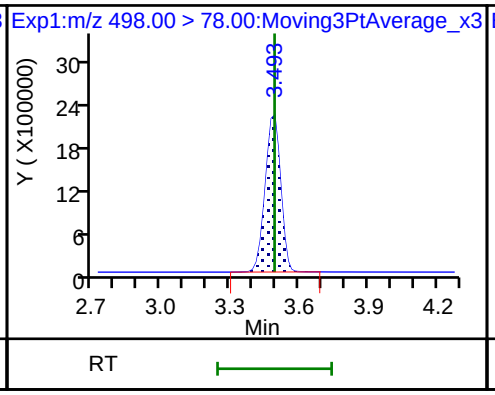
68 Perfluorononanesulfonic acid



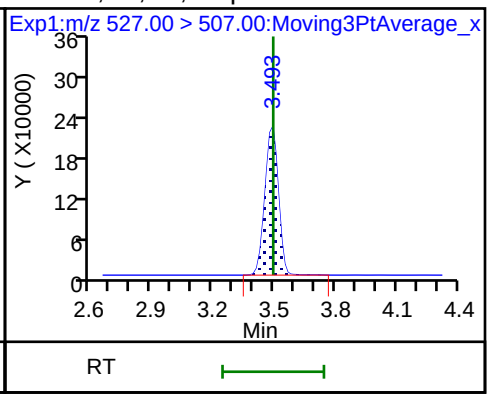
D 26 M2-8:2FTS



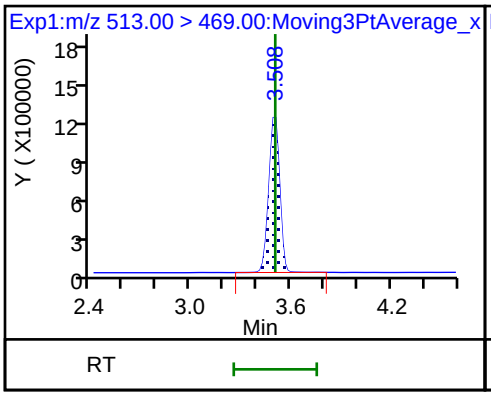
22 Perfluorooctane Sulfonamide



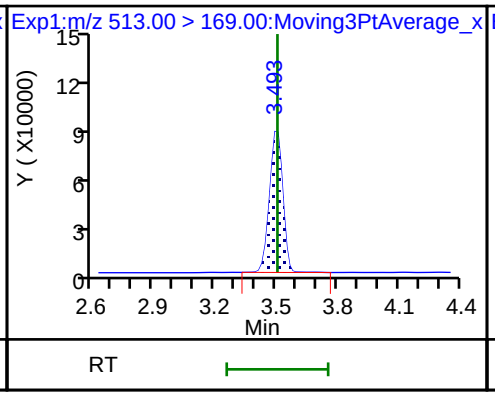
25 1H,1H,2H,2H-perfluorodecanesulfoni



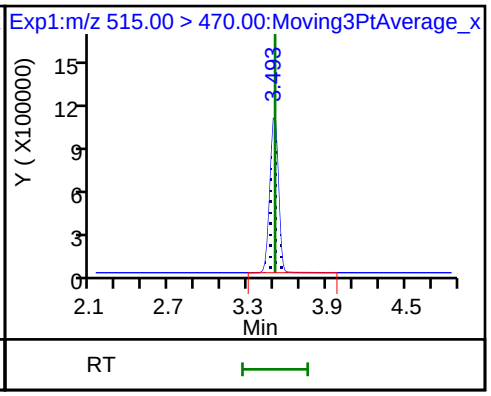
24 Perfluorodecanoic acid



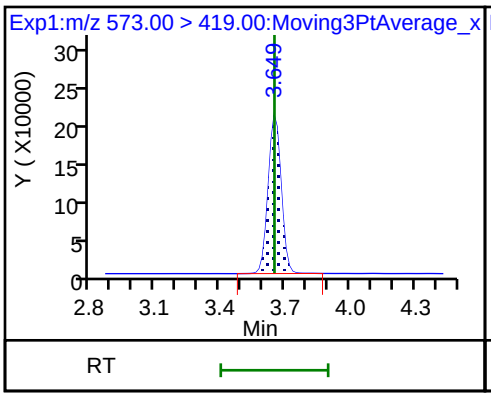
24 Perfluorodecanoic acid



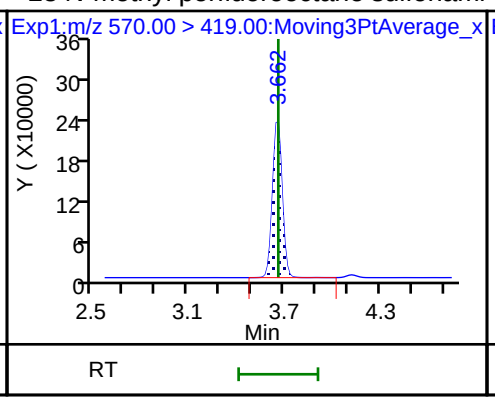
D 23 13C2 PFDA



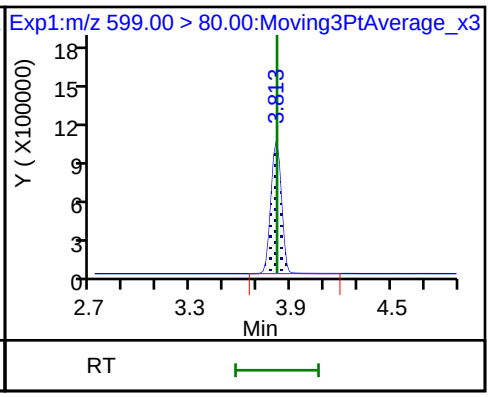
D 27 d3-NMeFOSAA



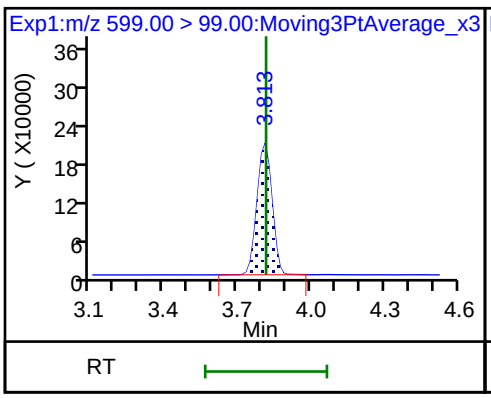
28 N-methyl perfluorooctane sulfonami



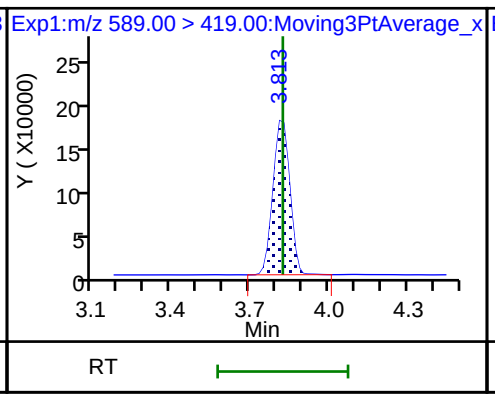
29 Perfluorodecane Sulfonic acid



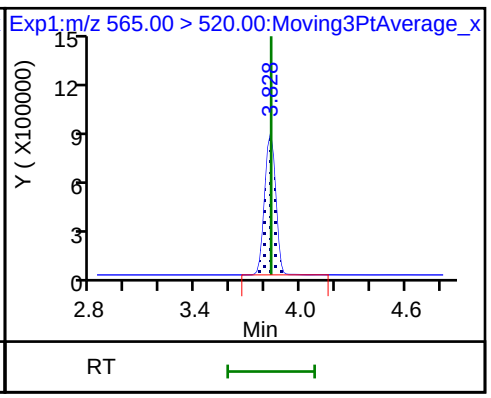
29 Perfluorodecane Sulfonic acid



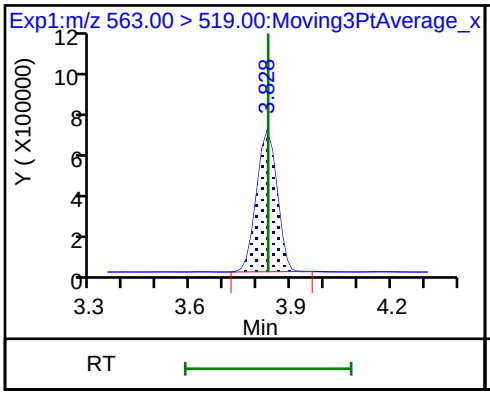
D 32 d5-NEtFOSAA



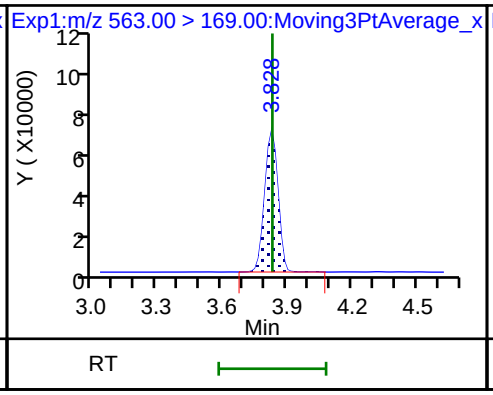
D 30 13C2 PFUnA



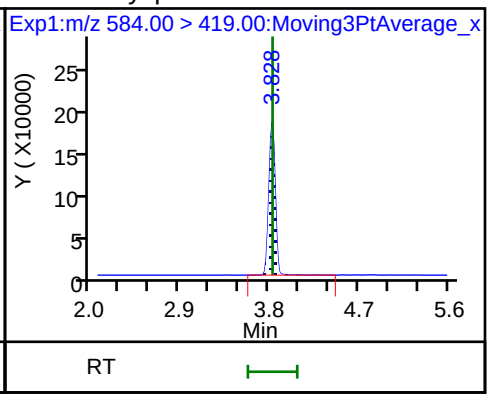
31 Perfluoroundecanoic acid



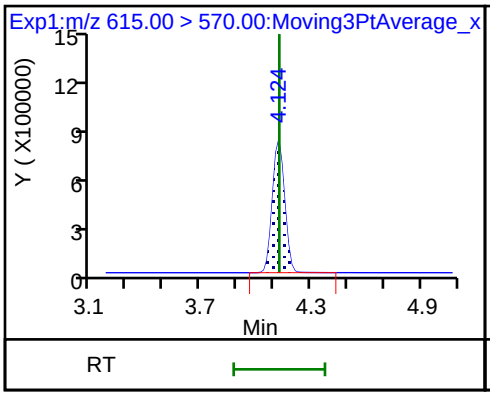
31 Perfluoroundecanoic acid



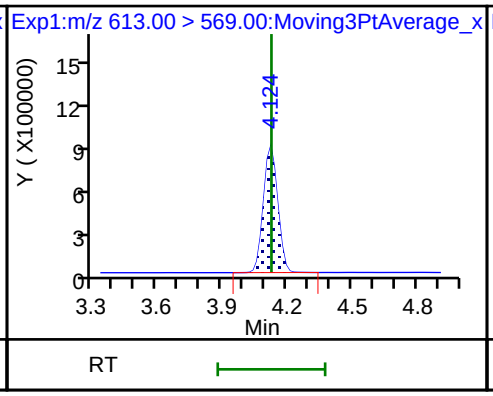
33 N-ethyl perfluorooctane sulfonamid



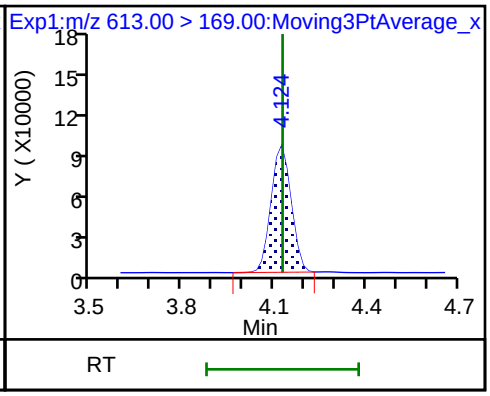
D 36 13C2 PFDoA



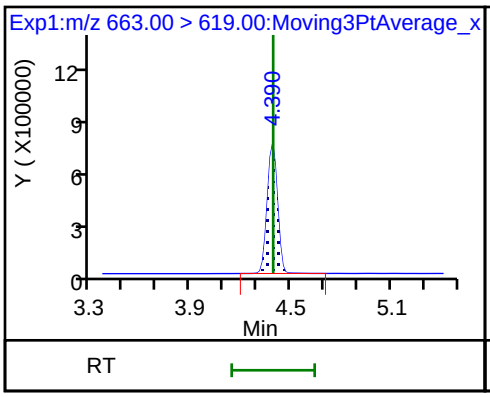
37 Perfluorododecanoic acid



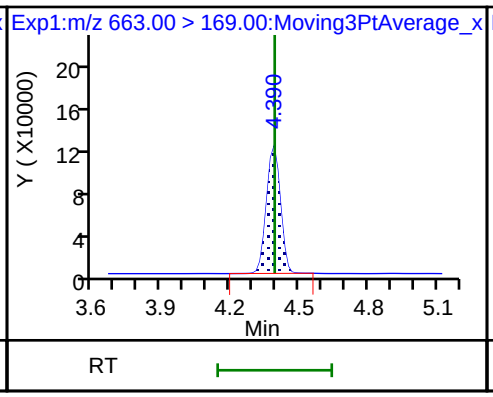
37 Perfluorododecanoic acid



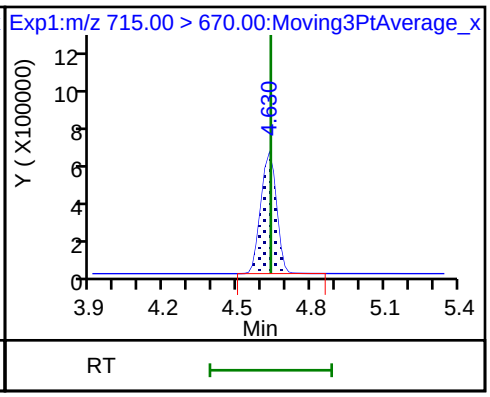
41 Perfluorotridecanoic acid



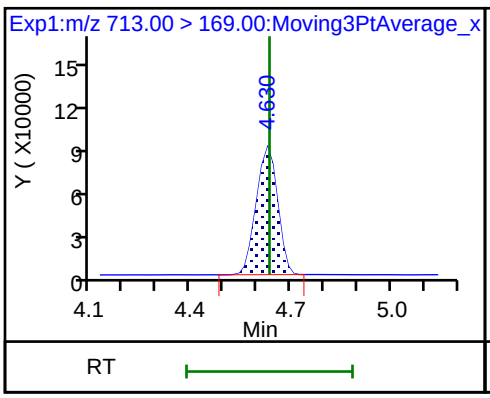
41 Perfluorotridecanoic acid



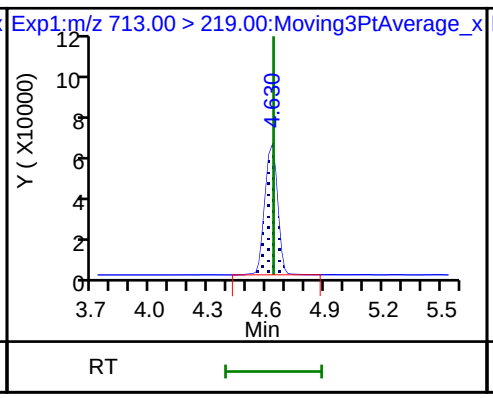
D 43 13C2-PFTeDA



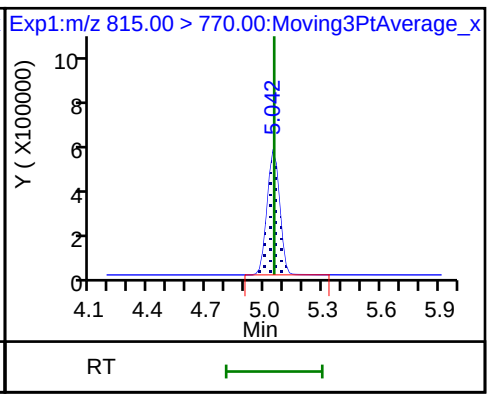
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCVL 320-239432/2 Calibration Date: 08/11/2018 20:29

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.11LA9A_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	0.9293	0.8587		0.0462	0.0500	-7.6	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.082		0.0531	0.0500	6.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	98.62		0.0422	0.0442	-4.5	30.0
4:2 FTS	AveID	17.02	15.51		0.400	0.0467	-8.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.9206		0.0492	0.0500	-1.6	30.0
Perfluoropentanesulfonic acid	AveID	48.91	49.61		0.0476	0.0469	1.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.048		0.0504	0.0500	0.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.330		0.0473	0.0455	3.9	30.0
6:2 FTS	AveID	2.137	1.975		0.400	0.0474	-7.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.251		0.0571	0.0501	14.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.060		0.0499	0.0476	4.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.009		0.0478	0.0500	-4.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.023		0.0443	0.0464	-4.6	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	2.965		0.0483	0.0500	-3.5	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.7035		0.0516	0.0480	7.4	30.0
8:2 FTS	AveID	14.02	14.48		0.400	0.0479	3.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.205		0.0490	0.0500	-2.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	1.122		0.400	0.0500	11.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.9299		0.0538	0.0482	11.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	1.162		0.0648	0.0500	29.5	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.9015		0.0535	0.0500	7.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	0.9375		0.0477	0.0500	-4.7	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.7543		0.0503	0.0500	0.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1571		0.0488	0.0500	-2.5	30.0
13C4 PFBA	Ave	1.117	0.9835		2.20	2.50	-12.0	30.0
13C5-PFPeA	Ave	0.999	0.8649		2.17	2.50	-13.4	30.0
13C3-PFBS	Ave	0.0155	0.0131		1.97	2.33	-15.3	30.0
13C2 PFHxA	Ave	1.037	0.9468		2.28	2.50	-8.7	30.0
13C4-PFHpA	Ave	1.177	1.117		2.37	2.50	-5.1	30.0
18O2 PFHxS	Ave	0.8862	0.7690		2.05	2.37	-13.2	30.0
M2-6:2FTS	Ave	0.1144	0.1323		2.75	2.38	15.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCVL 320-239432/2 Calibration Date: 08/11/2018 20:29

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.11LA9A_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	1.007		2.55	2.50	2.1	30.0
13C4 PFOS	Ave	0.9223	0.7762		2.01	2.39	-15.8	30.0
13C5 PFNA	Ave	0.8463	0.9153		2.70	2.50	8.1	30.0
13C8 FOSA	Ave	0.5512	0.5013		2.27	2.50	-9.0	30.0
M2-8:2FTS	Ave	0.0133	0.0141		2.54	2.40	6.2	30.0
13C2 PFDA	Ave	0.8474	0.8802		2.60	2.50	3.9	30.0
d3-NMeFOSAA	Ave	0.1647	0.1734		2.63	2.50	5.3	30.0
13C2 PFUnA	Ave	0.6849	0.6977		2.55	2.50	1.9	30.0
d5-NEtFOSAA	Ave	0.1353	0.1382		2.55	2.50	2.2	30.0
13C2 PFDoA	Ave	0.7384	0.7563		2.56	2.50	2.4	30.0
13C2-PFTeDA	Ave	0.4715	0.5303		2.81	2.50	12.5	30.0
13C2-PFHxDA	Ave	0.4325	0.4408		2.55	2.50	1.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 11-Aug-2018 20:29:34 ALS Bottle#: 21 Worklist Smp#: 2
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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 09:25:13 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: phomsophat Date: 11-Aug-2018 21:28:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.488	1.488	0.0	0.538	7397018	2.20		88.0	6464	
2 Perfluorobutyric acid										
212.90 > 169.00	1.488	1.488	0.0	1.000	127037	0.0462		92.4	10.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.764	0.0	0.637	6504728	2.17		86.6	9172	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.000	140822	0.0531		106	8.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.797	0.0	0.649	91649	1.97		84.7	458	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	171827	0.0422		95.5	43.2	
298.90 > 99.00	1.797	1.797	0.0	1.000	61847		2.78(1.35-4.05)		28.3	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.017	0.0	0.729	571034	NC			696	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.017	0.0	1.123	28560	0.0426		91.1	195	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.740	7121405	2.28		91.3	12887	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.058	2.058	0.0	1.005	131118	0.0492		98.4	47.5	
313.00 > 119.00	2.058	2.058	0.0	1.005	10957		11.97(6.96-20.87)		28.5	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.078	2.078	0.0	1.157	91715	0.0476		101	246	
349.00 > 99.00	2.078	2.078	0.0	1.157	44820		2.05(1.15-3.45)		32.9	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.150	0.0	0.777	814123	NC			2016	

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	2.160	2.160	0.0	1.005	27779	NC			23.0	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.400	0.0	0.867	8400362	2.37		94.9	26709	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.400	2.400	0.0	1.000	175997	0.0504		101	16.9	
363.00 > 169.00	2.387	2.400	-0.014	0.995	45326		3.88(2.17-6.52)		78.6	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.413	0.0	0.872	5471782	2.05		86.8	11170	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.413	2.413	0.0	1.000	139981	0.0473		104	170	
399.00 > 99.00	2.413	2.413	0.0	1.000	38250		3.66(1.90-5.70)		21.5	M
65 ADONA										
377.00 > 251.00	2.439	2.439	0.0	0.773	270993	NC			680	
377.00 > 85.00	2.439	2.439	0.0	0.773	116215		2.33(1.05-3.16)		93.6	
D 12 M2-6:2FTS										
429.00 > 81.00	2.751	2.751	0.0	0.994	945089	2.75		116	1577	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.751	2.751	0.0	1.000	37259	0.0438		92.4	30.1	
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.767	0.0	1.000	7572426	2.55		102	6861	
* 62 13C2-PFOA										
415.00 > 370.00	2.767	2.767	0.0		7521236	2.50			7226	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.767	2.767	0.0	1.000	189602	0.0571		114	29.5	
413.00 > 169.00	2.767	2.767	0.0	1.000	60530		3.13(1.36-4.08)		83.3	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.782	2.782	0.0	0.882	117810	0.0499		105	135	
449.00 > 99.00	2.782	2.782	0.0	0.882	25543		4.61(1.84-5.53)		55.9	
D 18 13C4 PFOS										
503.00 > 80.00	3.154	3.154	0.0	1.140	5580852	2.01		84.2	3954	
D 19 13C5 PFNA										
468.00 > 423.00	3.154	3.154	0.0	1.140	6883942	2.70		108	10805	
20 Perfluorononanoic acid										
463.00 > 419.00	3.154	3.154	0.0	1.000	138909	0.0478		95.7	34.3	
463.00 > 169.00	3.154	3.154	0.0	1.000	25094		5.54(2.68-8.03)		71.6	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.154	3.154	0.0	1.000	110832	0.0443		95.4	73.4	
499.00 > 99.00	3.154	3.154	0.0	1.000	30346		3.65(2.04-6.12)		68.0	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.369	3.369	0.0	1.068	129731	NC			172	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.253	3770542	2.27		91.0	6015	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	223570	0.0483		96.5	574	
D 26 M2-8:2FTS										
529.00 > 81.00	3.514	3.514	0.0	1.270	101710	2.54		106	505	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.514	3.514	0.0	1.114	78849	0.0516		107	169	
549.00 > 99.00	3.514	3.514	0.0	1.114	13208		5.97(3.02-9.05)		118	
D 23 13C2 PFDA										
515.00 > 470.00	3.529	3.529	0.0	1.276	6620391	2.60		104	7467	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.529	3.529	0.0	1.004	29457	0.0495		103	162	
24 Perfluorodecanoic acid										RM
513.00 > 469.00	3.529	3.529	0.0	1.000	159558	0.0490		98.0	40.3	R
513.00 > 169.00	3.529	3.529	0.0	1.000	6318		25.25(7.12-21.35)		10.2	M
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.685	3.685	0.0	1.332	1304404	2.63		105	3922	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.685	3.685	0.0	1.000	29264	0.0555		111	19.4	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.841	3.841	0.0	1.218	104662	0.0538		112	223	
599.00 > 99.00	3.841	3.841	0.0	1.218	24526		4.27(2.14-6.43)		49.9	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.857	3.857	0.0	1.394	1039753	2.55		102	1663	
D 30 13C2 PFUnA										
565.00 > 520.00	3.857	3.857	0.0	1.394	5247441	2.55		102	7740	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.857	3.857	0.0	1.000	24159	0.0648		130	66.8	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.857	3.857	0.0	1.000	94614	0.0535		107	15.8	
563.00 > 169.00	3.857	3.857	0.0	1.000	9388		10.08(5.24-15.72)		54.9	
35 MeFOSA										
512.00 > 169.00	3.962	3.962	0.0		32032	NC			152	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.025	4.025	0.0	1.276	166704	NC			782	
D 36 13C2 PFDoA										
615.00 > 570.00	4.160	4.160	0.0	1.504	5687966	2.56		102	3663	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.160	4.160	0.0	1.184	12146	NC			32.6	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.160	4.160	0.0	1.000	106644	0.0477		95.3	25.3	
613.00 > 169.00	4.160	4.160	0.0	1.000	12578		8.48(4.68-14.05)		40.5	
75 Perfluorododecanesulfonic acid (PF										M
699.00 > 80.00	4.406	4.406	0.0	1.397	7016	NC			30.9	M
699.00 > 99.00	4.406	4.406	0.0	1.397	17503		0.40(0.28-0.83)		45.1	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.421	4.421	0.0	1.063	85807	0.0503		101	27.6	
663.00 > 169.00	4.437	4.421	0.016	1.067	13435		6.39(3.09-9.27)		44.6	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.676	4.676	0.0	1.690	3988256	2.81		112	10839	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.676	4.676	0.0	1.000	12533	0.0488		97.5	53.2	
713.00 > 219.00	4.676	4.676	0.0	1.000	10455		1.20(0.70-2.09)		39.3	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.109	5.109	0.0	1.847	3315230	2.55		102	5321	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.109	5.109	0.0	1.000	87866	NC			7.0	
813.00 > 169.00	5.109	5.109	0.0	1.000	15000		5.86(2.77-8.32)		52.4	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.490	5.490	0.0	1.074	45769	NC			28.3	
913.00 > 169.00	5.490	5.490	0.0	1.074	8561		5.35(2.55-7.64)		78.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 12-Aug-2018 09:25:16 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_005.d

Injection Date: 11-Aug-2018 20:29:34 Instrument ID: A9

Lims ID: CCVL

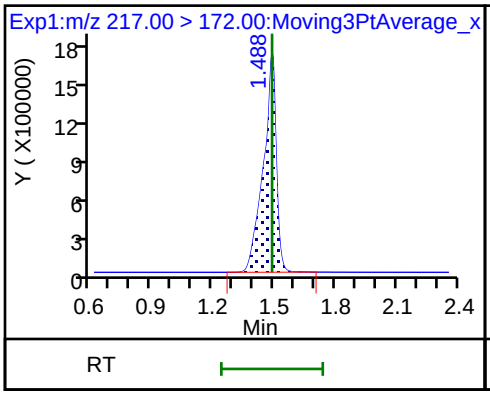
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2

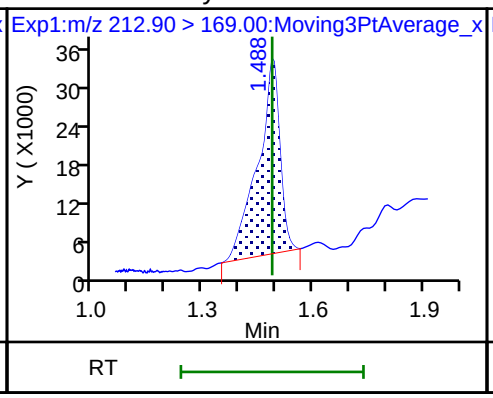
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

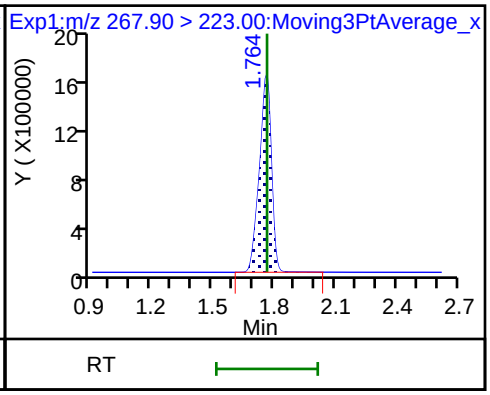
D 1 13C4 PFBA



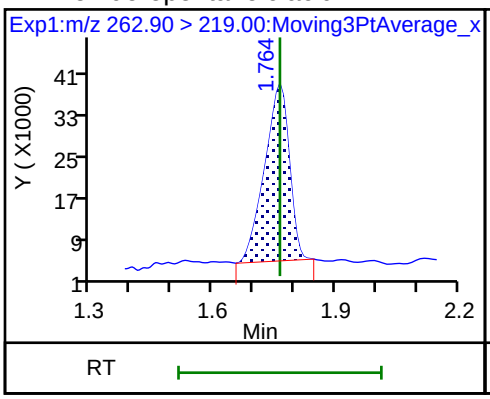
2 Perfluorobutyric acid



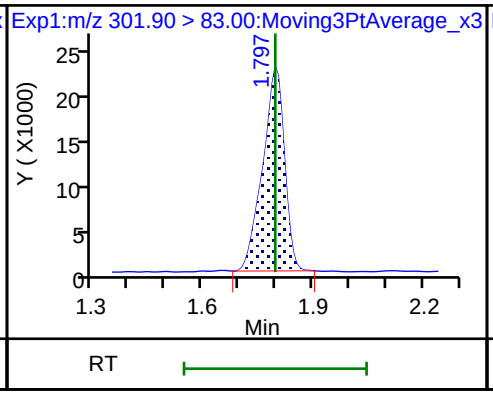
D 3 13C5-PFPeA



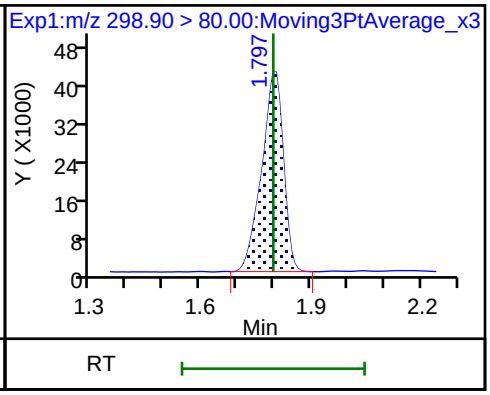
4 Perfluoropentanoic acid



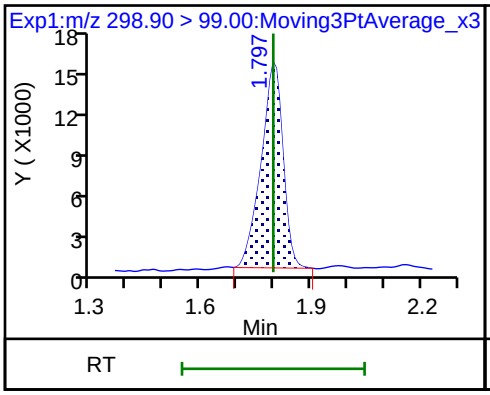
D 47 13C3-PFBS



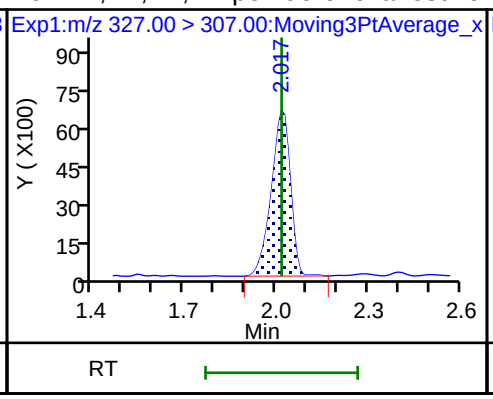
5 Perfluorobutanesulfonic acid



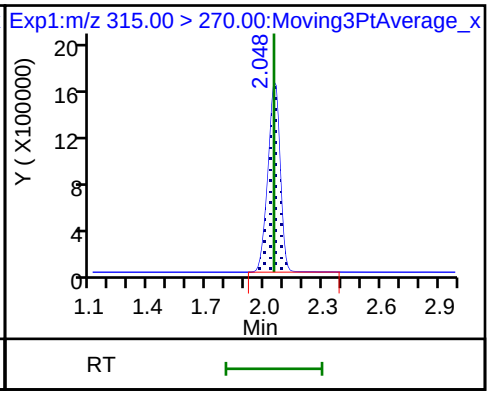
5 Perfluorobutanesulfonic acid



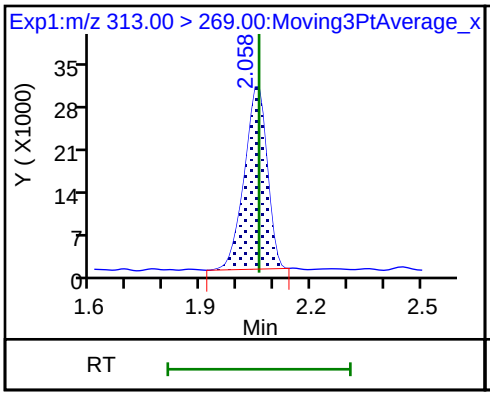
61 1H,1H,2H,2H-perfluorohexanesulfon



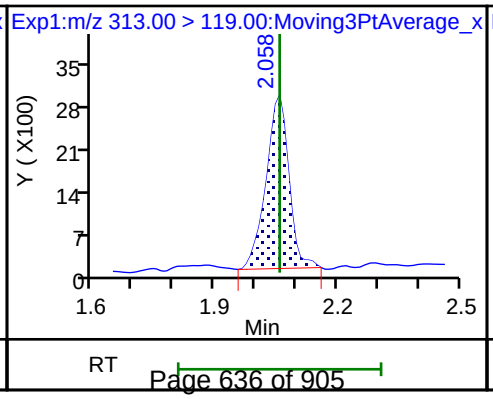
D 7 13C2 PFHxA



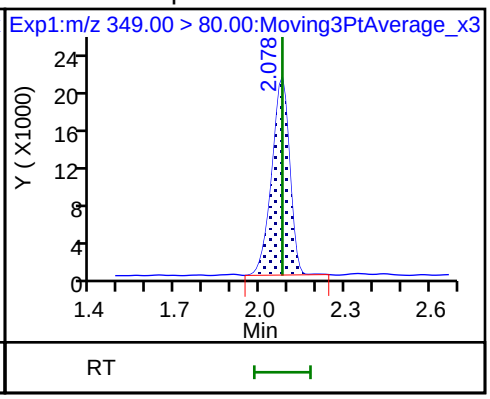
6 Perfluorohexanoic acid



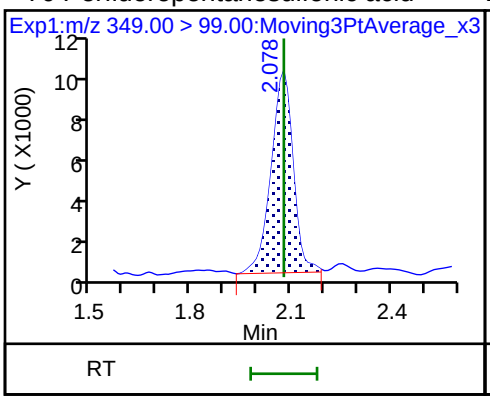
6 Perfluorohexanoic acid



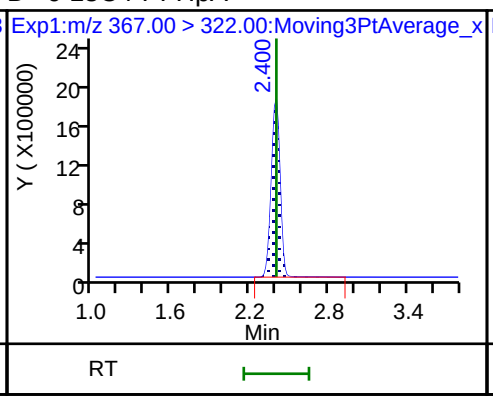
70 Perfluoropentanesulfonic acid



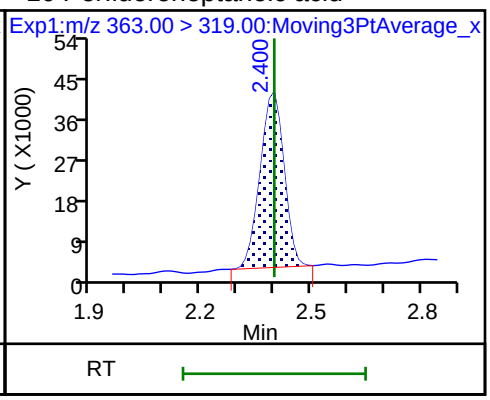
70 Perfluoropentanesulfonic acid



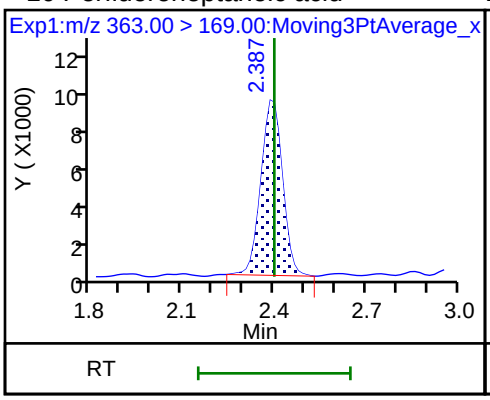
D 9 13C4-PFHpA



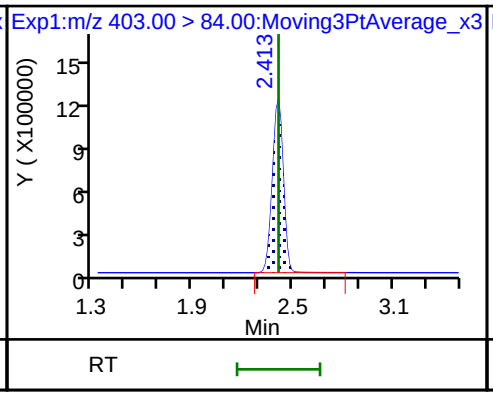
10 Perfluoroheptanoic acid



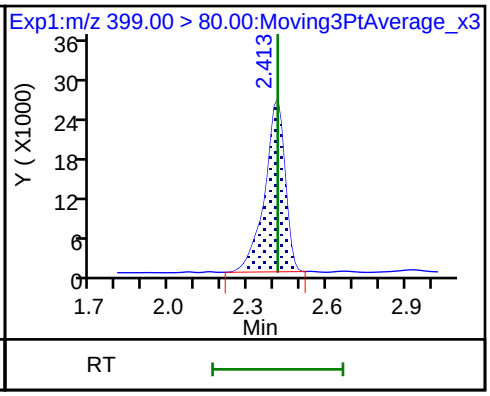
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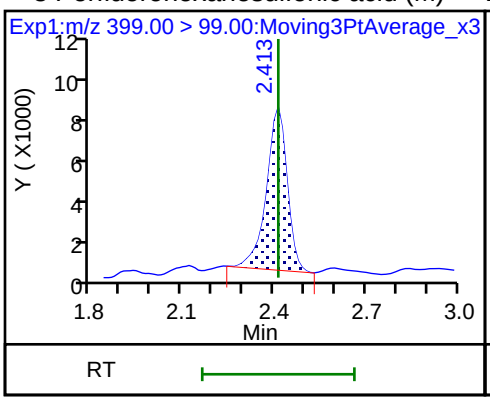
D 11 18O2 PFHxS



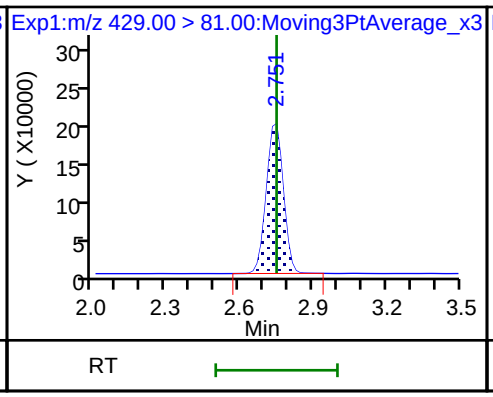
8 Perfluorohexanesulfonic acid



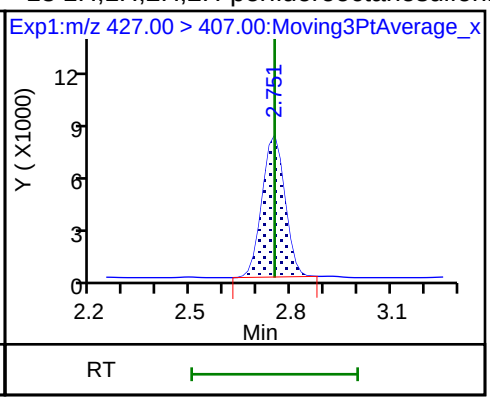
8 Perfluorohexanesulfonic acid (M)



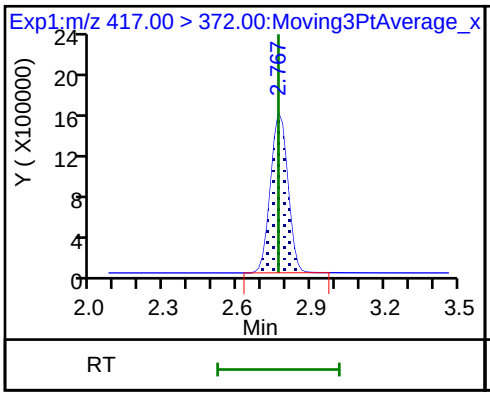
D 12 M2-6:2FTS



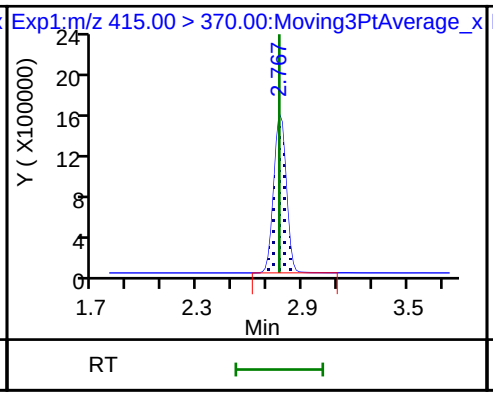
13 1H,1H,2H,2H-perfluorooctanesulfoni



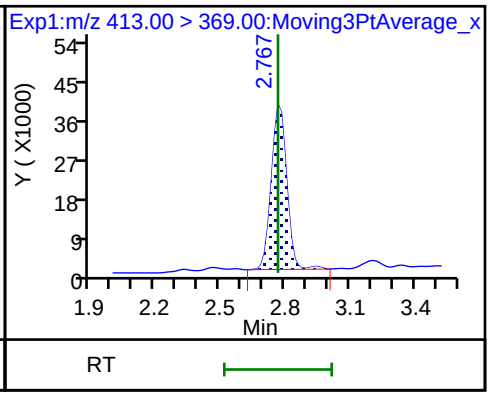
D 14 13C4 PFOA



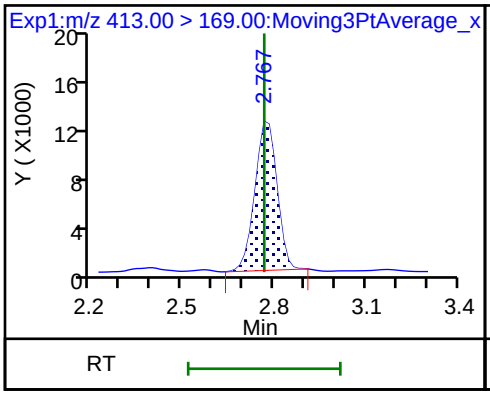
* 62 13C2-PFOA



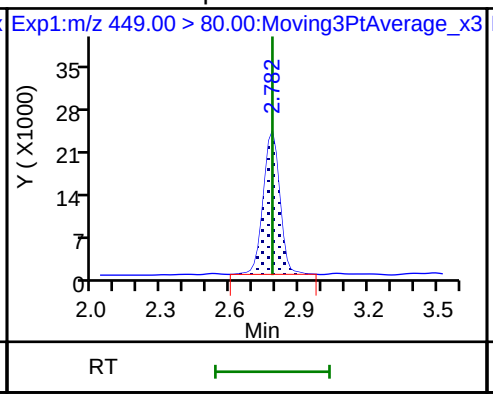
15 Perfluorooctanoic acid



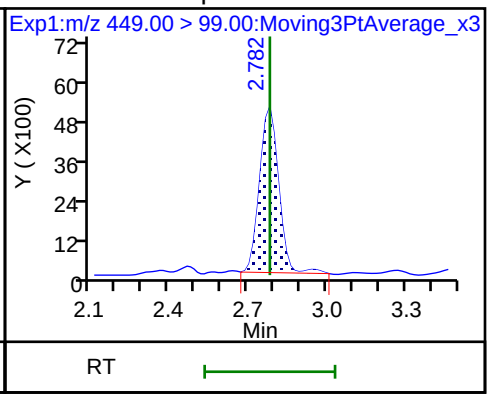
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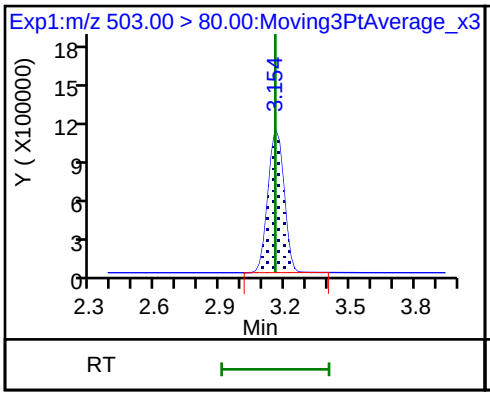
16 Perfluoroheptanesulfonic acid



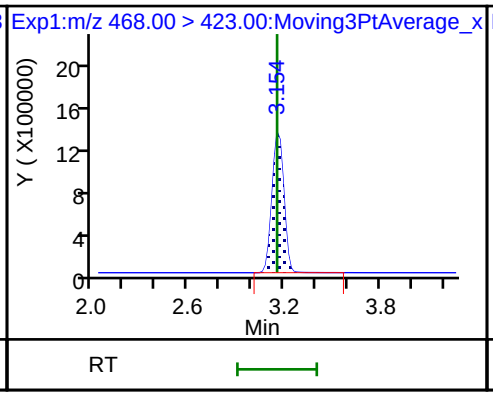
16 Perfluoroheptanesulfonic acid



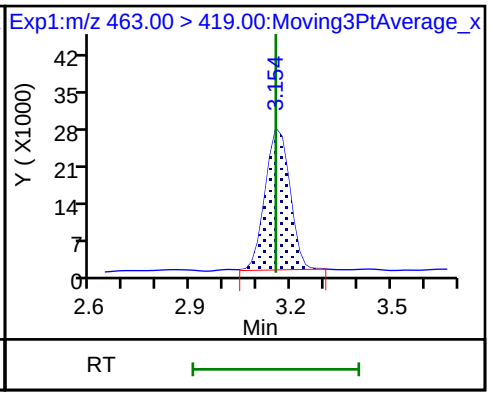
D 18 13C4 PFOS



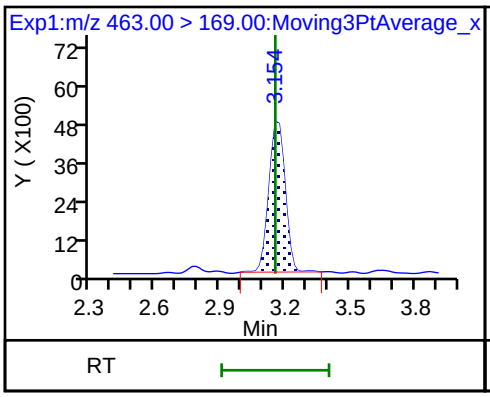
D 19 13C5 PFNA



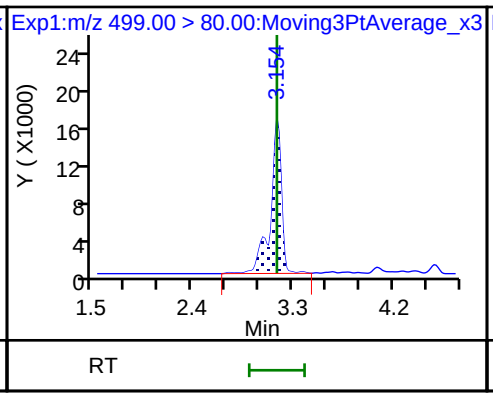
20 Perfluorononanoic acid



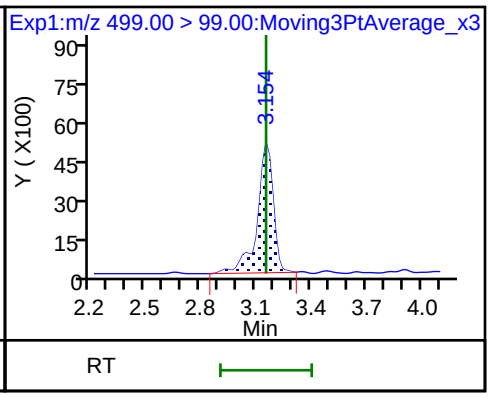
20 Perfluorononanoic acid



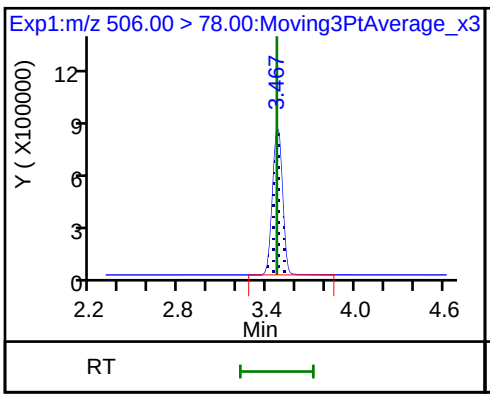
17 Perfluorooctane sulfonic acid



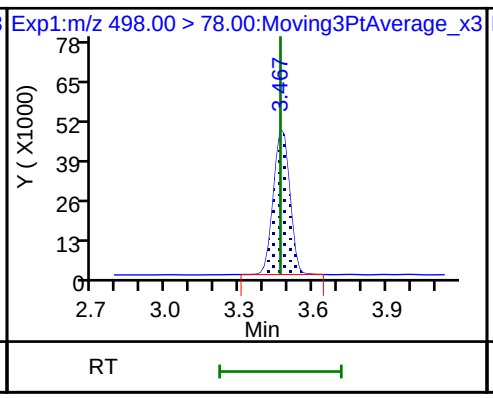
17 Perfluorooctane sulfonic acid



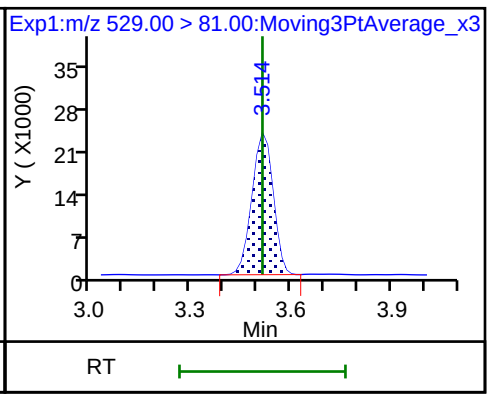
D 21 13C8 FOSA



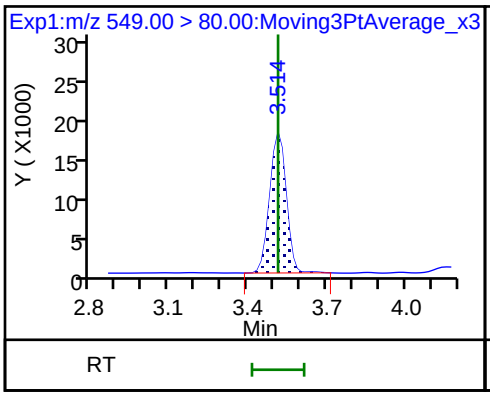
22 Perfluorooctane Sulfonamide



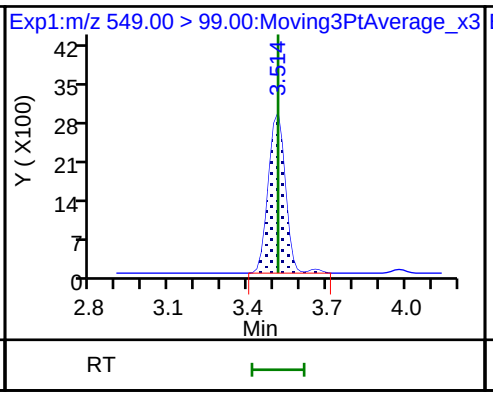
D 26 M2-8:2FTS



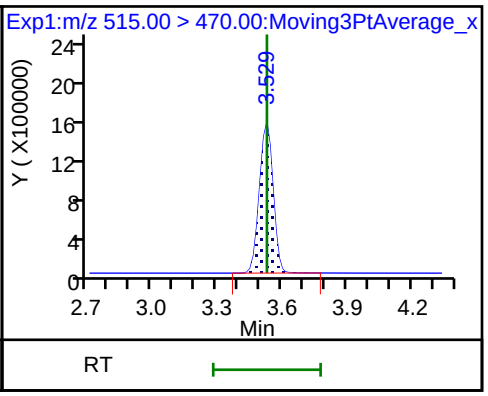
68 Perfluorononanesulfonic acid



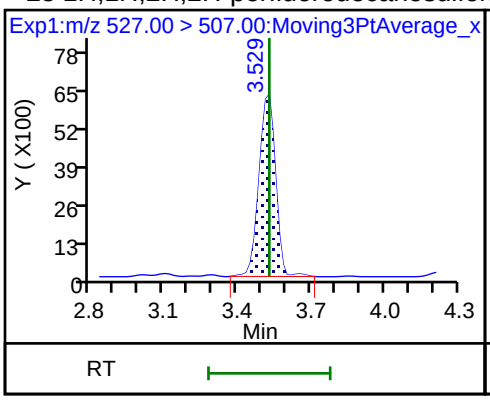
68 Perfluorononanesulfonic acid



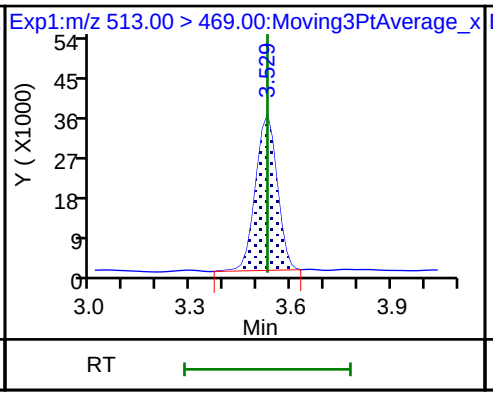
D 23 13C2 PFDA



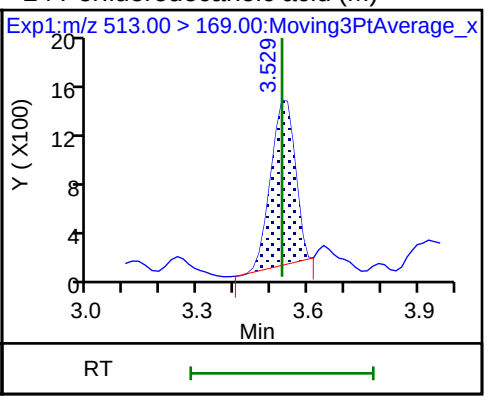
25 1H,1H,2H-perfluorodecanesulfoni



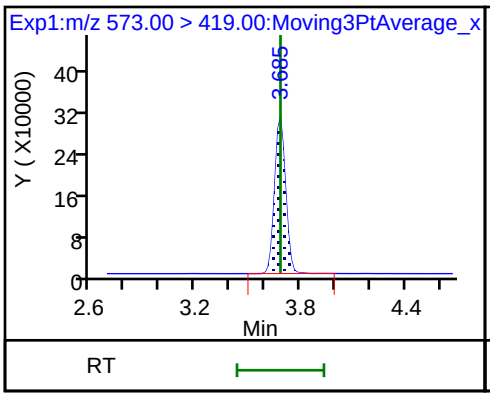
24 Perfluorodecanoic acid



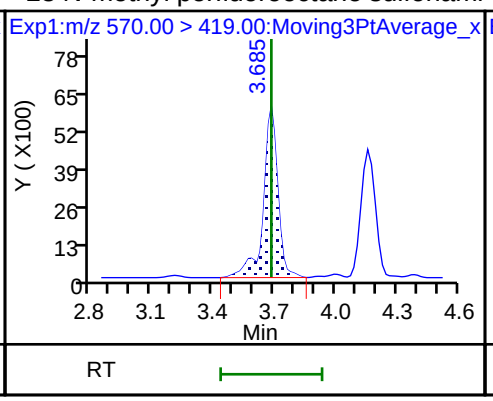
24 Perfluorodecanoic acid (M)



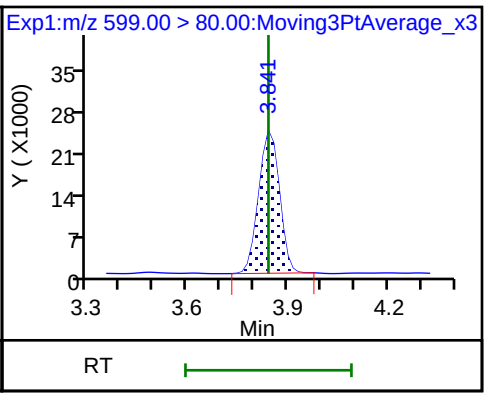
D 27 d3-NMeFOSAA



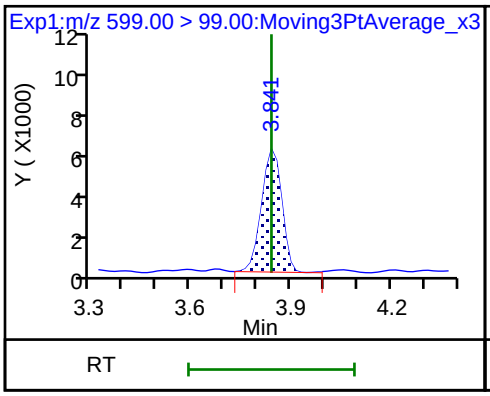
28 N-methyl perfluorooctane sulfonami



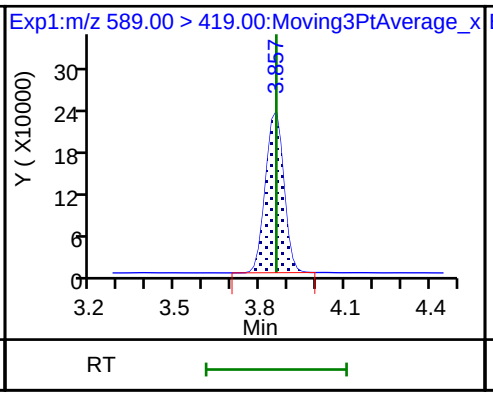
29 Perfluorodecane Sulfonic acid



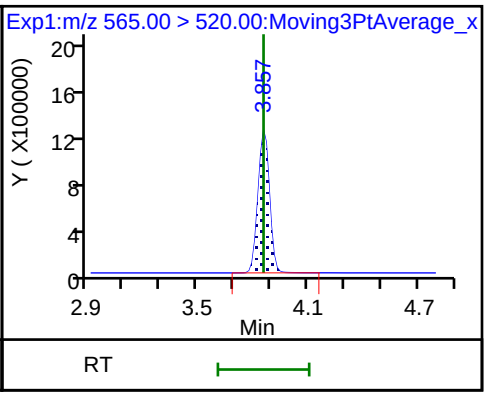
29 Perfluorodecane Sulfonic acid



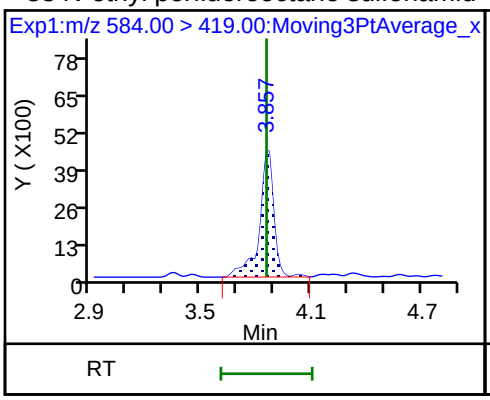
D 32 d5-NEtFOSAA



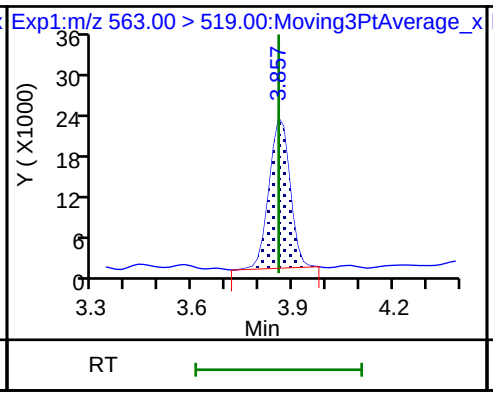
D 30 13C2 PFUnA



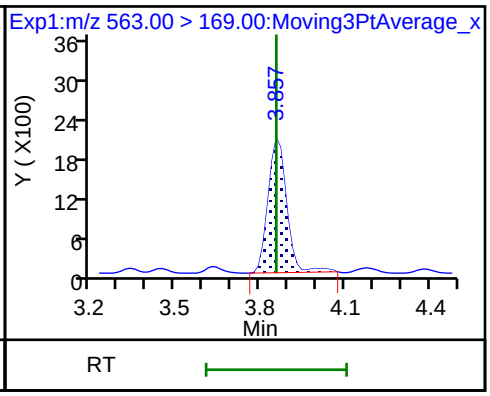
33 N-ethyl perfluorooctane sulfonamid



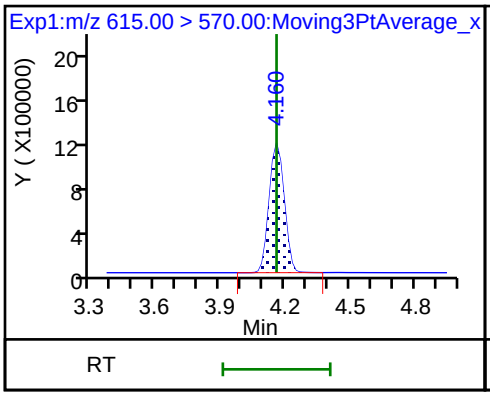
31 Perfluoroundecanoic acid



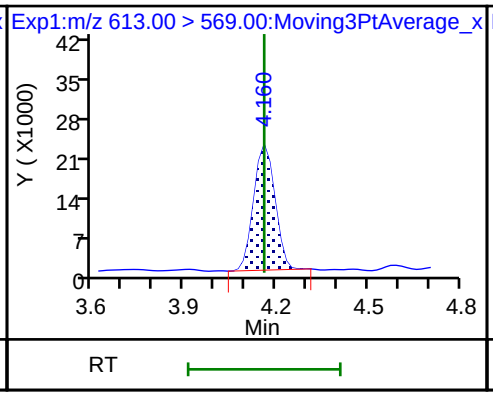
31 Perfluoroundecanoic acid



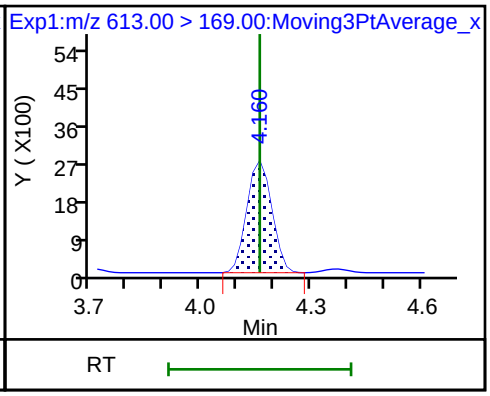
D 36 13C2 PFDoA



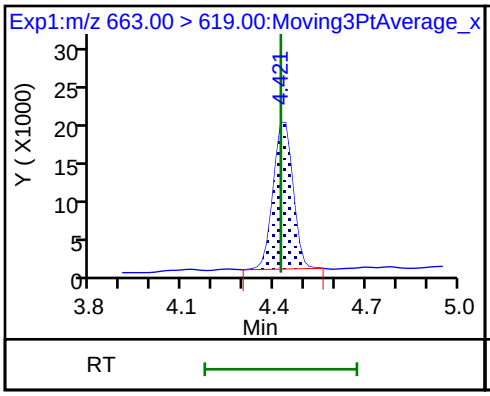
37 Perfluorododecanoic acid



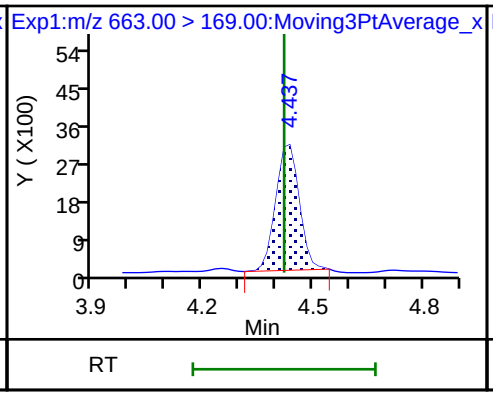
37 Perfluorododecanoic acid



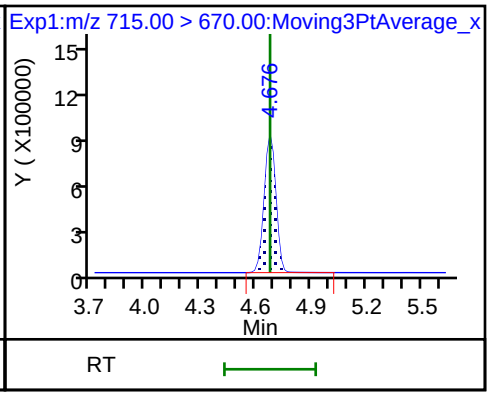
41 Perfluorotridecanoic acid



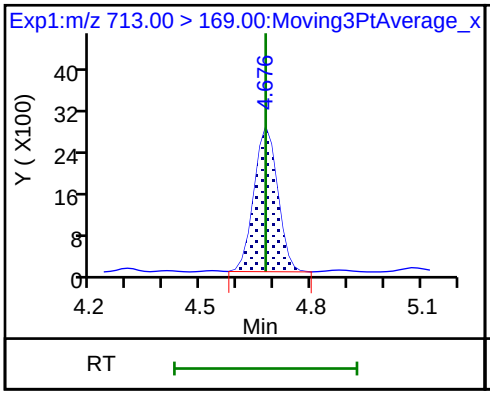
41 Perfluorotridecanoic acid



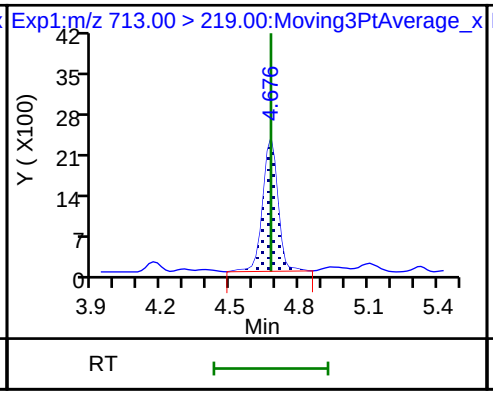
D 43 13C2-PFTeDA



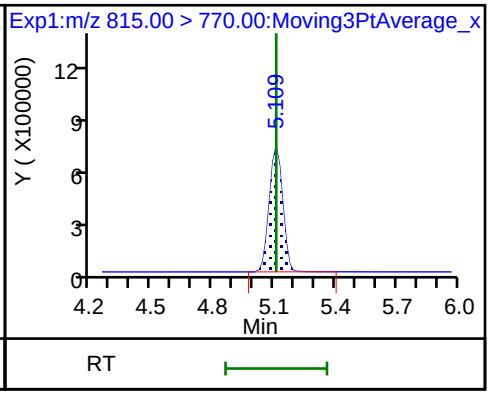
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

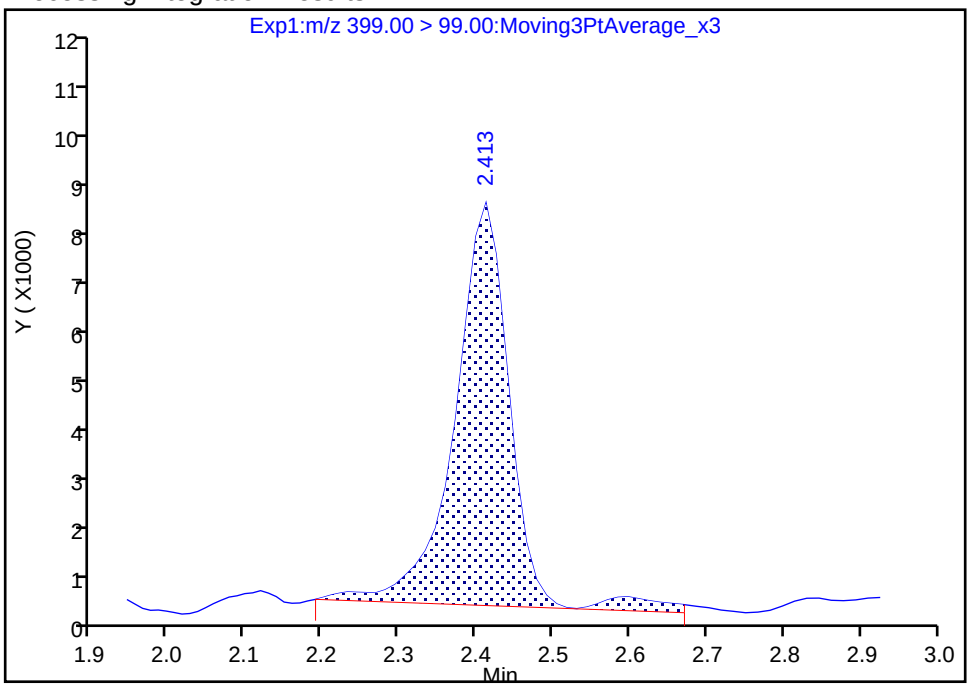
Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_005.d
Injection Date: 11-Aug-2018 20:29:34 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

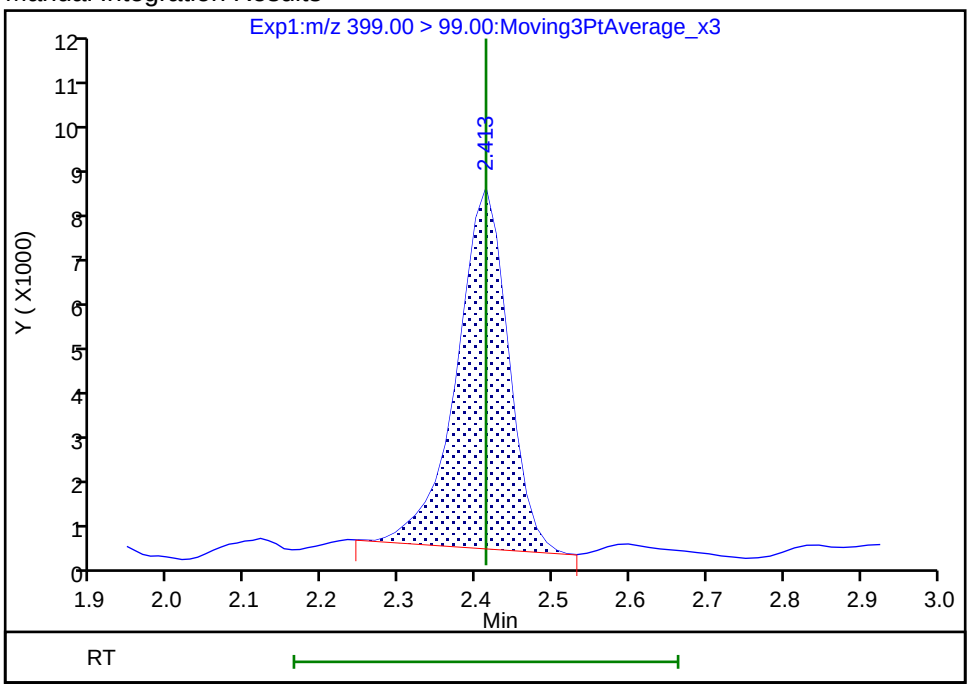
Processing Integration Results

RT: 2.41
Area: 41579
Amount: 0.047294
Amount Units: ng/ml



Manual Integration Results

RT: 2.41
Area: 38250
Amount: 0.047294
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 09:22:27
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

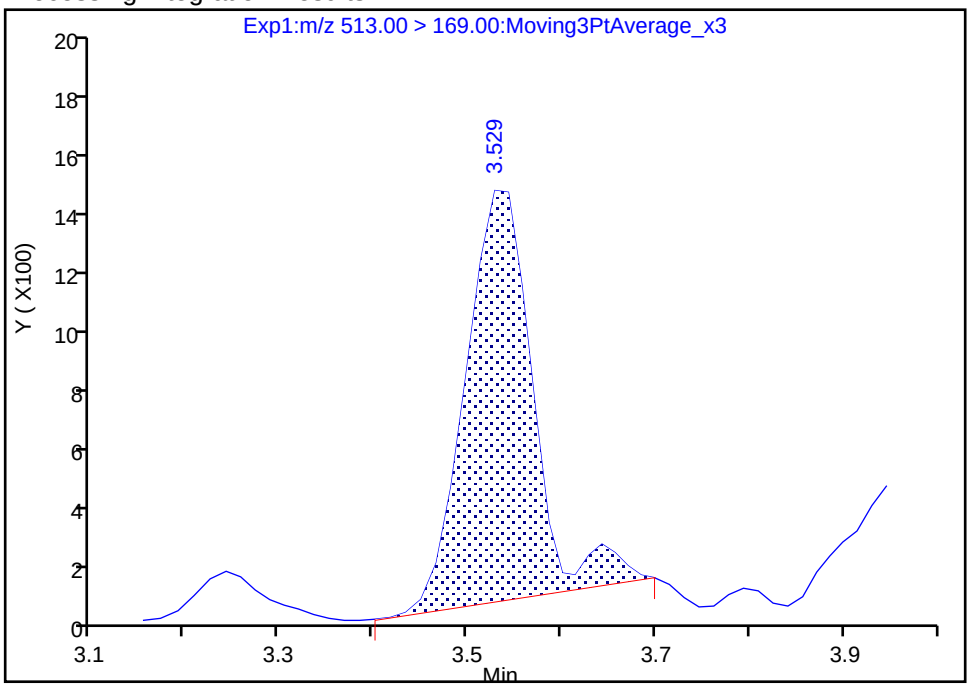
Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_005.d
Injection Date: 11-Aug-2018 20:29:34 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 2

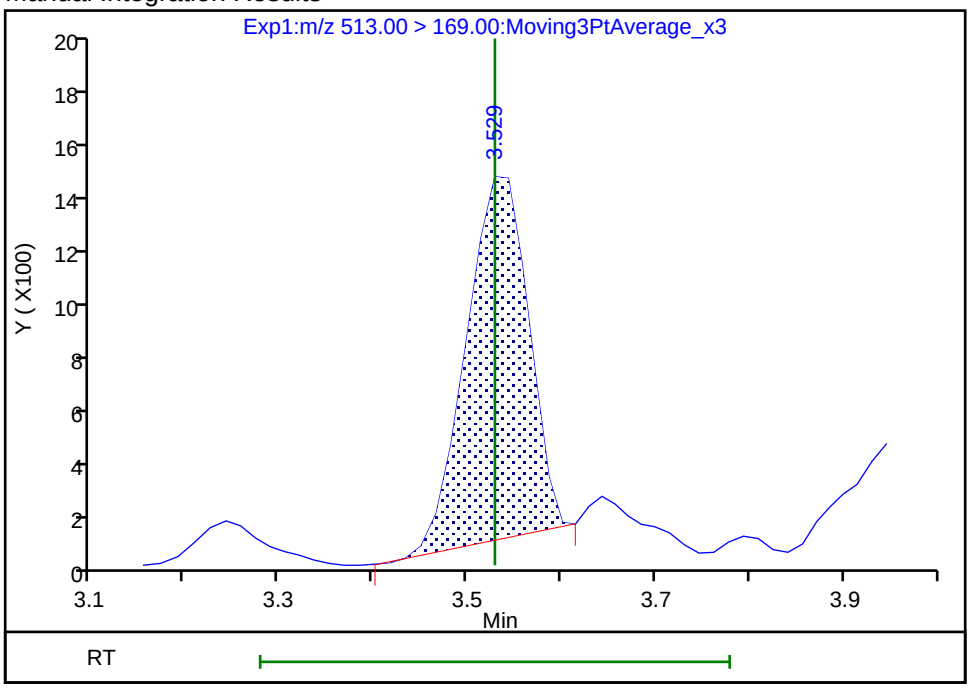
Processing Integration Results

RT: 3.53
Area: 7050
Amount: 0.049017
Amount Units: ng/ml



Manual Integration Results

RT: 3.53
Area: 6318
Amount: 0.049017
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 09:22:43
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239432/3 Calibration Date: 08/11/2018 20:37

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.11LA9A_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	0.9293	0.9194		0.989	1.00	-1.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.038		1.02	1.00	1.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	110.3		0.944	0.884	6.7	30.0
4:2 FTS	AveID	17.02	16.16		0.887	0.934	-5.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.8780		0.939	1.00	-6.1	30.0
Perfluoropentanesulfonic acid	AveID	48.91	48.86		0.937	0.938	-0.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.106		1.07	1.00	6.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.148		0.816	0.910	-10.3	30.0
6:2 FTS	AveID	2.137	1.876		0.832	0.948	-12.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.035		0.975	0.952	2.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.075		0.982	1.00	-1.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.049		0.994	1.00	-0.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.052		0.910	0.928	-1.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	3.219		1.05	1.00	4.8	30.0
8:2 FTS	AveID	14.02	13.68		0.935	0.958	-2.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.191		0.969	1.00	-3.1	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.7044		1.03	0.960	7.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	1.023		1.01	1.00	1.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.8485		0.981	0.964	1.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.9179		1.02	1.00	2.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.8335		0.990	1.00	-1.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.036		1.05	1.00	5.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.7902		1.05	1.00	5.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1639		1.02	1.00	1.7	30.0
13C4 PFBA	Ave	1.117	1.010		2.26	2.50	-9.5	30.0
13C5-PFPeA	Ave	0.999	0.8867		2.22	2.50	-11.2	30.0
13C3-PFBS	Ave	0.0155	0.0136		2.04	2.33	-12.3	30.0
13C2 PFHxA	Ave	1.037	1.007		2.43	2.50	-2.8	30.0
13C4-PFHpA	Ave	1.177	1.149		2.44	2.50	-2.3	30.0
18O2 PFHxS	Ave	0.8862	0.8038		2.15	2.37	-9.3	30.0
M2-6:2FTS	Ave	0.1144	0.1310		2.72	2.38	14.5	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239432/3 Calibration Date: 08/11/2018 20:37

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.11LA9A_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	1.000		2.53	2.50	1.4	30.0
13C4 PFOS	Ave	0.9223	0.8646		2.24	2.39	-6.3	30.0
13C5 PFNA	Ave	0.8463	0.8445		2.49	2.50	-0.2	30.0
13C8 FOSA	Ave	0.5512	0.5135		2.33	2.50	-6.8	30.0
13C2 PFDA	Ave	0.8474	0.9007		2.66	2.50	6.3	30.0
M2-8:2FTS	Ave	0.0133	0.0147		2.65	2.40	10.6	30.0
d3-NMeFOSAA	Ave	0.1647	0.1731		2.63	2.50	5.1	30.0
d5-NEtFOSAA	Ave	0.1353	0.1471		2.72	2.50	8.7	30.0
13C2 PFUnA	Ave	0.6849	0.6962		2.54	2.50	1.7	30.0
13C2 PFDoA	Ave	0.7384	0.7758		2.63	2.50	5.1	30.0
13C2-PFTeDA	Ave	0.4715	0.5030		2.67	2.50	6.7	30.0
13C2-PFHxDA	Ave	0.4325	0.4795		2.77	2.50	10.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 11-Aug-2018 20:37:06 ALS Bottle#: 13 Worklist Smp#: 3
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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:28:25 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: phomsophat Date: 11-Aug-2018 21:29:17

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	1.489	1.489	0.0	0.538	7411479	2.26		90.5	14812	
2 Perfluorobutyric acid										
212.90 > 169.00	1.489	1.489	0.0	1.000	2725599	0.9893		98.9	202	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.756	0.0	0.635	6504005	2.22		88.8	9536	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.005	2699977	1.02		102	155	
D 47 13C3-PFBS										
301.90 > 83.00	1.798	1.798	0.0	0.650	92566	2.04		87.7	463	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.798	1.798	0.0	1.000	3880369	0.9436		107	859	
298.90 > 99.00	1.798	1.798	0.0	1.000	1300751		2.98(1.35-4.05)		567	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.018	2.018	0.0	1.122	601073	0.8869		95.0	2237	
D 60 M2-4:2FTS										
329.00 > 81.00	2.018	2.018	0.0	0.729	614540	NC			694	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.740	7389665	2.43		97.2	16647	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	2595317	0.9386		93.9	820	
313.00 > 119.00	2.048	2.048	0.0	1.000	191954		13.52(6.96-20.87)		445	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.069	2.069	0.0	1.151	1824780	0.9372		99.9	2842	
349.00 > 99.00	2.069	2.069	0.0	1.151	830495		2.20(1.15-3.45)		590	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.151	2.151	0.0	0.777	776411	NC			2183	

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	2.151	2.151	0.0	1.000	579545	NC			462	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	3730845	1.07		107	344	
363.00 > 169.00	2.387	2.387	0.0	1.000	814035		4.58(2.17-6.52)		1491	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.863	8431469	2.44		97.7	10822	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	2462853	0.8163		89.7	1982	
399.00 > 99.00	2.400	2.413	-0.013	0.995	689171		3.57(1.90-5.70)		332	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.413	0.0	0.872	5577613	2.15		90.7	11994	
65 ADONA										
377.00 > 251.00	2.440	2.440	0.0	0.773	5790388	NC			7819	
377.00 > 85.00	2.440	2.440	0.0	0.773	2357729		2.46(1.05-3.16)		1716	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.735	0.0	1.000	683725	0.8324		87.8	671	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.735	0.0	0.988	912990	2.72		115	1431	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.767	2.767	0.0	1.000	3157896	0.9824		98.1	456	
413.00 > 169.00	2.767	2.767	0.0	1.000	1142657		2.76(1.36-4.08)		1560	
* 62 13C2-PFOA										
415.00 > 370.00	2.767	2.767	0.0		7334991	2.50			13090	
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.767	0.0	1.000	7335079	2.53		101	14500	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.877	2499804	0.9751		102	2484	
449.00 > 99.00	2.767	2.767	0.0	0.877	606585		4.12(1.84-5.53)		1541	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.155	3.155	0.0	1.000	2475371	0.9099		98.1	1917	
499.00 > 99.00	3.155	3.155	0.0	1.000	571040		4.33(2.04-6.12)		1068	
20 Perfluorononanoic acid										
463.00 > 419.00	3.155	3.155	0.0	1.000	2599011	0.99		99.4	623	
463.00 > 169.00	3.155	3.155	0.0	1.000	475493		5.47(2.68-8.03)		1048	
D 19 13C5 PFNA										
468.00 > 423.00	3.155	3.155	0.0	1.140	6194548	2.49		99.8	13749	
D 18 13C4 PFOS										
503.00 > 80.00	3.155	3.155	0.0	1.140	6062758	2.24		93.7	4725	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.369	3.369	0.0	1.068	2691225	NC			2531	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.253	3766742	2.33		93.2	5045	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	4849836	1.05		105	3640	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.515	3.515	0.0	1.114	1715349	1.03		108	1684	
549.00 > 99.00	3.515	3.515	0.0	1.114	296709		5.78(3.02-9.05)		1566	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.515	3.515	0.0	1.000	3148270	0.9692		96.9	724	
513.00 > 169.00	3.515	3.515	0.0	1.000	191448		16.44(7.12-21.35)		240	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.515	3.515	0.0	1.000	565451	0.9349		97.6	1914	
D 26 M2-8:2FTS										
529.00 > 81.00	3.515	3.515	0.0	1.270	103331	2.65		111	409	
D 23 13C2 PFDA										
515.00 > 470.00	3.515	3.515	0.0	1.270	6606769	2.66		106	16239	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.686	3.686	0.0	1.004	519445	1.01		101	232	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.671	3.671	0.0	1.327	1269764	2.63		105	2052	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.842	3.842	0.0	1.218	2074790	0.9814		102	1985	
599.00 > 99.00	3.842	3.842	0.0	1.218	438283		4.73(2.14-6.43)		659	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.858	3.858	0.0	1.000	1702537	0.9899		99.0	264	
563.00 > 169.00	3.858	3.858	0.0	1.000	179580		9.48(5.24-15.72)		728	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.858	3.858	0.0	1.004	396200	1.02		102	736	
D 30 13C2 PFUnA										
565.00 > 520.00	3.858	3.858	0.0	1.394	5106911	2.54		102	12892	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.842	3.842	0.0	1.388	1079135	2.72		109	1488	
35 MeFOSA										
512.00 > 169.00	3.947	3.947	0.0		619139	NC			1092	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.010	4.010	0.0	1.271	3334577	NC			5084	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.161	4.161	0.0	1.184	325932	NC			663	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.161	4.161	0.0	1.000	2357476	1.05		105	448	
613.00 > 169.00	4.161	4.161	0.0	1.000	227052		10.38(4.68-14.05)		623	
D 36 13C2 PFDoA										
615.00 > 570.00	4.161	4.161	0.0	1.503	5690588	2.63		105	8306	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.391	4.391	0.0	1.392	197506	NC			779	
699.00 > 99.00	4.391	4.391	0.0	1.392	365978		0.54(0.28-0.83)		811	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.422	4.422	0.0	1.063	1798752	1.05		105	540	
663.00 > 169.00	4.422	4.422	0.0	1.063	297152		6.05(3.09-9.27)		814	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.664	4.664	0.0	1.000	241826	1.02		102	882	
713.00 > 219.00	4.664	4.664	0.0	1.000	172129		1.40(0.70-2.09)		599	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.664	4.664	0.0	1.685	3689290	2.67		107	8737	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.096	5.096	0.0	1.000	1263945	NC			93.7	
813.00 > 169.00	5.096	5.096	0.0	1.000	208249		6.07(2.77-8.32)		753	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.096	5.096	0.0	1.841	3517222	2.77		111	4727	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.479	5.479	0.0	1.075	917991	NC			445	
913.00 > 169.00	5.479	5.479	0.0	1.075	171394		5.36(2.55-7.64)		967	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 12-Aug-2018 13:28:29 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_006.d

Injection Date: 11-Aug-2018 20:37:06 Instrument ID: A9

Lims ID: CCV L4

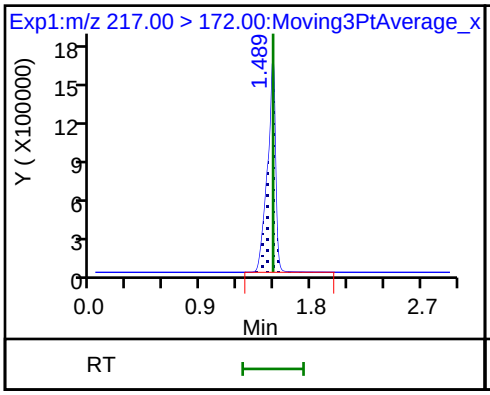
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Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 3

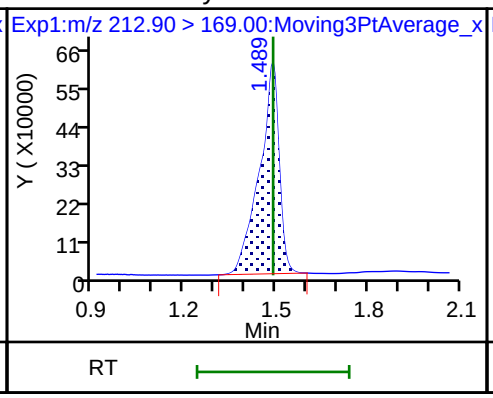
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

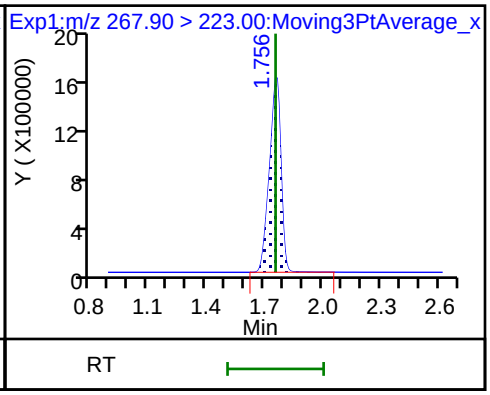
D 1 13C4 PFBA



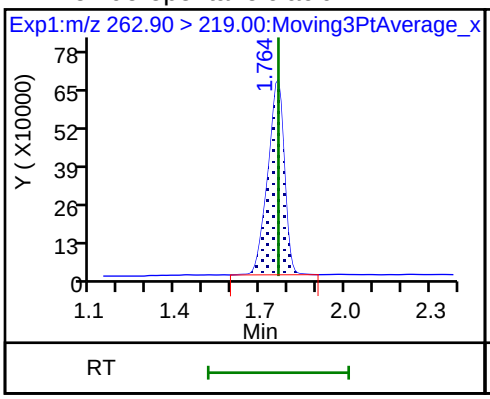
2 Perfluorobutyric acid



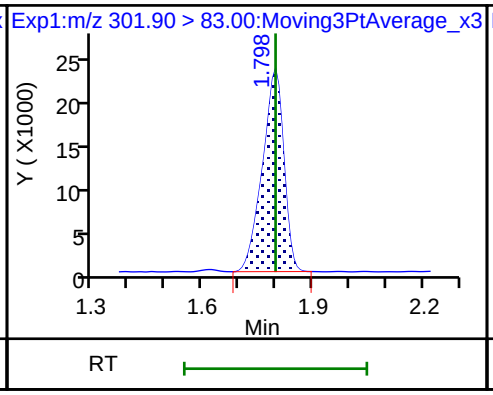
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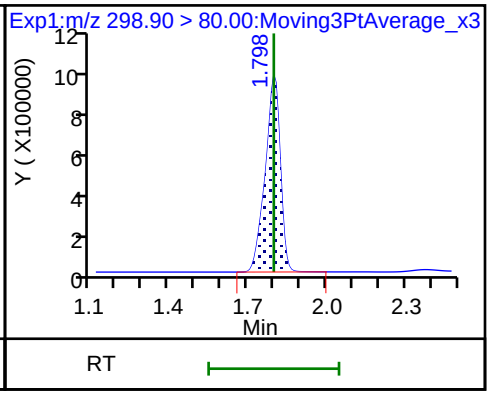
4 Perfluoropentanoic acid



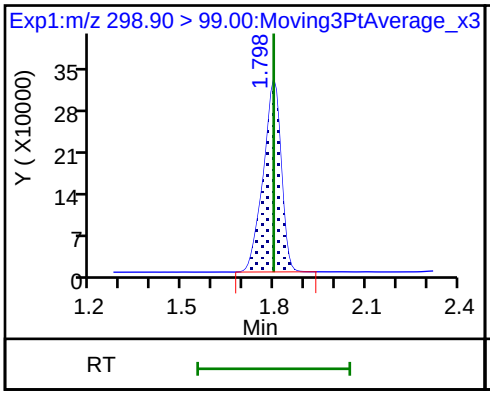
D 47 13C3-PFBS



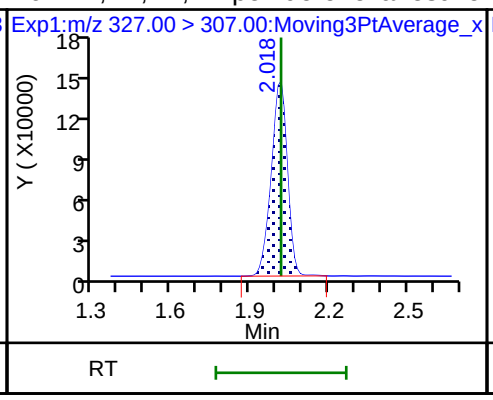
5 Perfluorobutanesulfonic acid



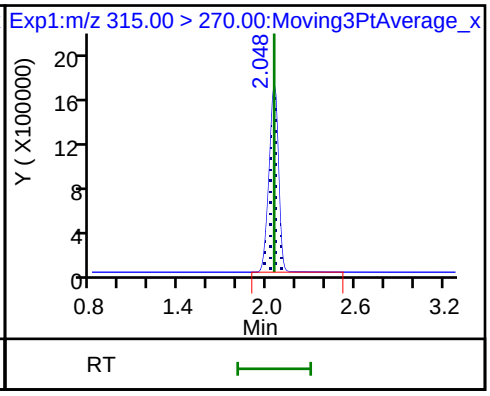
5 Perfluorobutanesulfonic acid



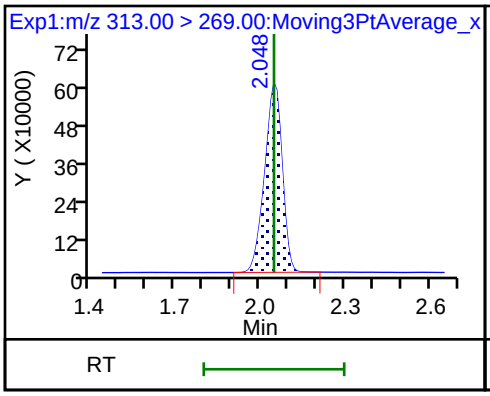
61 1H,1H,2H,2H-perfluorohexanesulfon



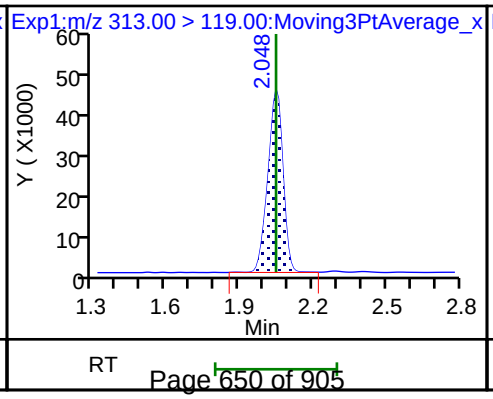
D 7 13C2 PFHxA



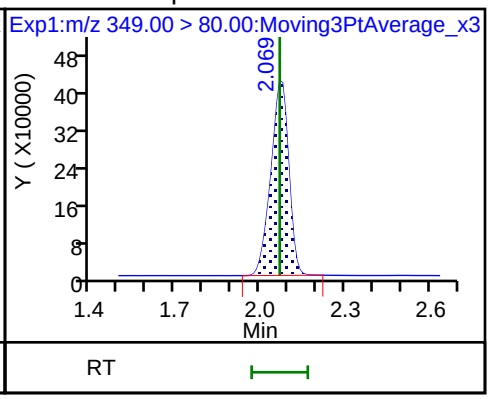
6 Perfluorohexanoic acid



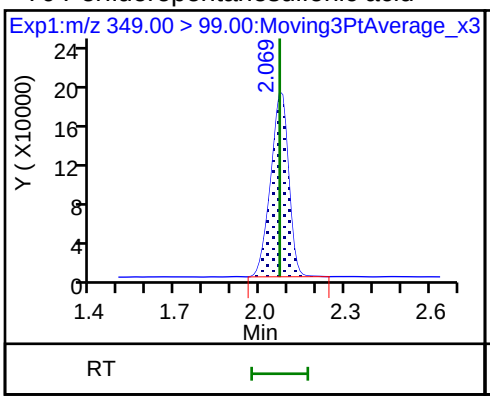
6 Perfluorohexanoic acid



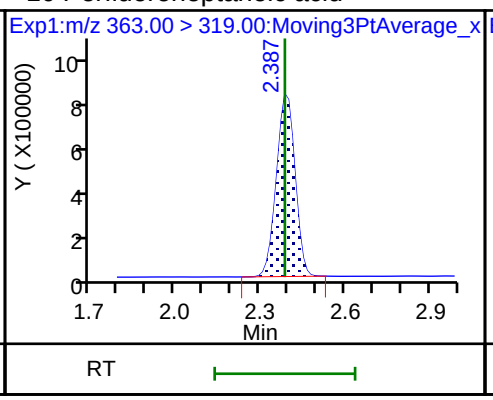
70 Perfluoropentanesulfonic acid



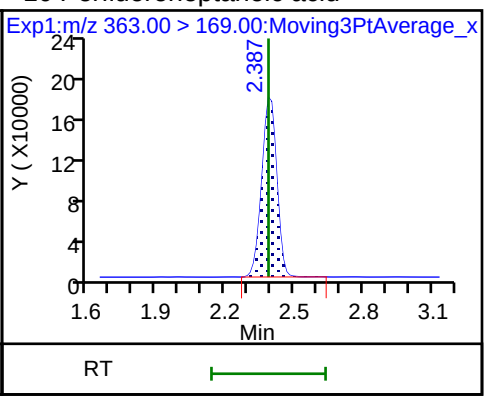
70 Perfluoropentanesulfonic acid



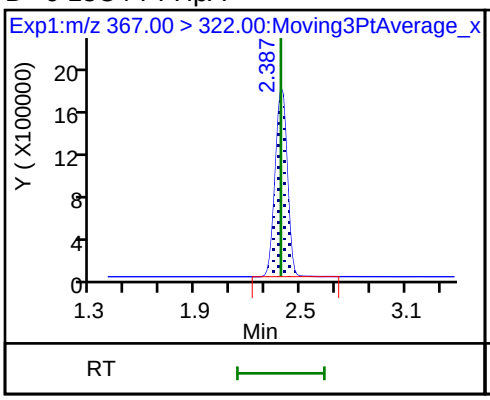
10 Perfluoroheptanoic acid



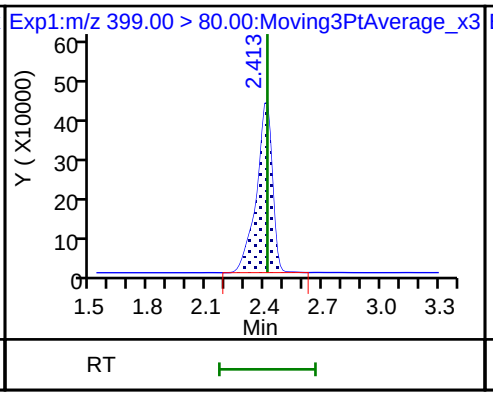
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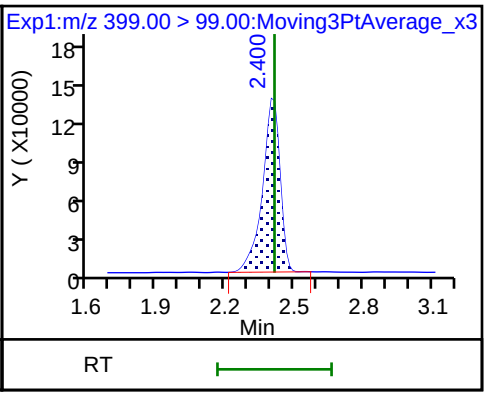
D 9 13C4-PFHpA



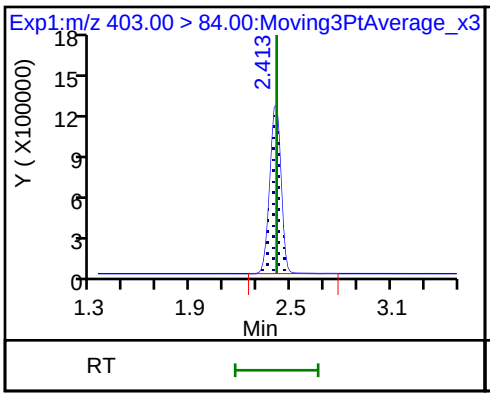
8 Perfluorohexanesulfonic acid



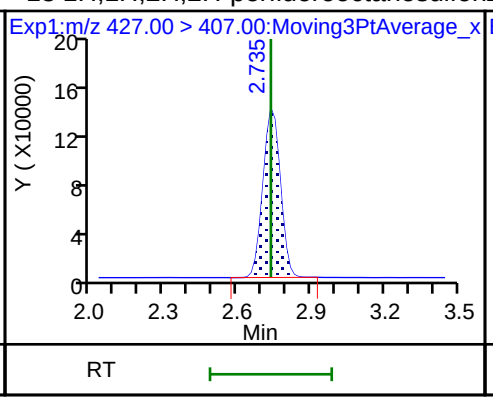
8 Perfluorohexanesulfonic acid



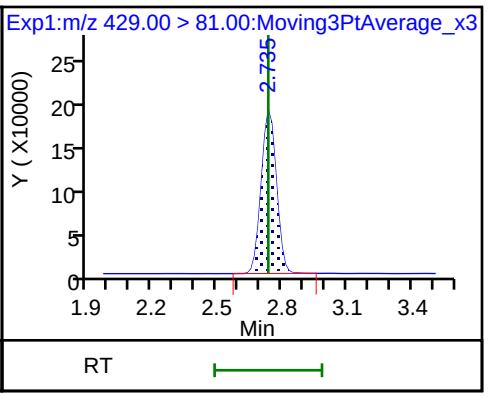
D 11 18O2 PFHxS



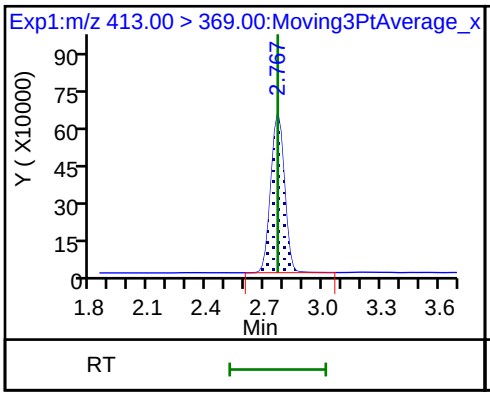
13 1H,1H,2H,2H-perfluorooctanesulfon



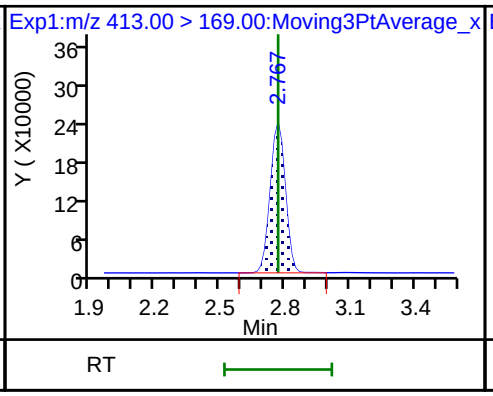
D 12 M2-6:2FTS



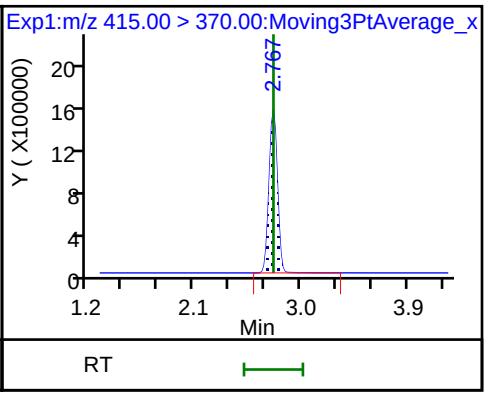
15 Perfluorooctanoic acid



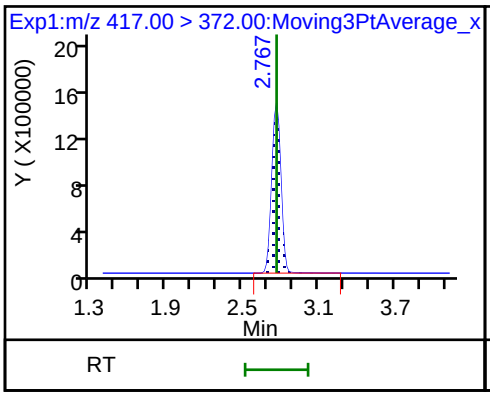
15 Perfluorooctanoic acid



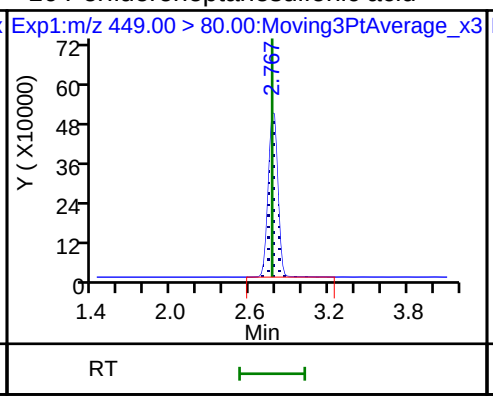
* 62 13C2-PFOA



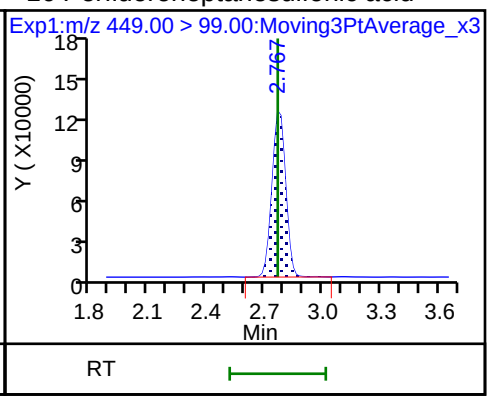
D 14 13C4 PFOA



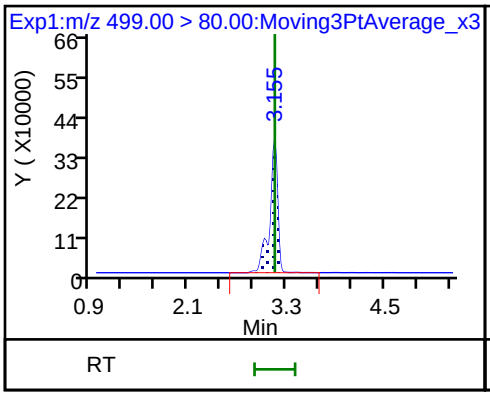
16 Perfluoroheptanesulfonic acid



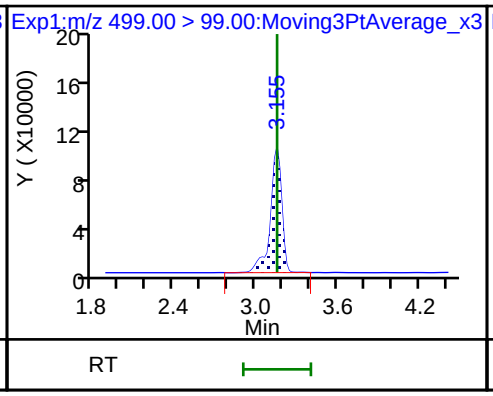
16 Perfluoroheptanesulfonic acid



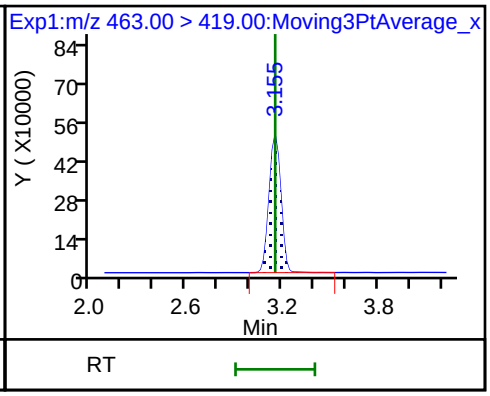
17 Perfluorooctane sulfonic acid



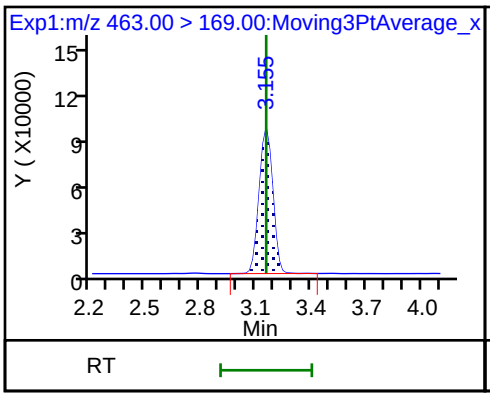
17 Perfluorooctane sulfonic acid



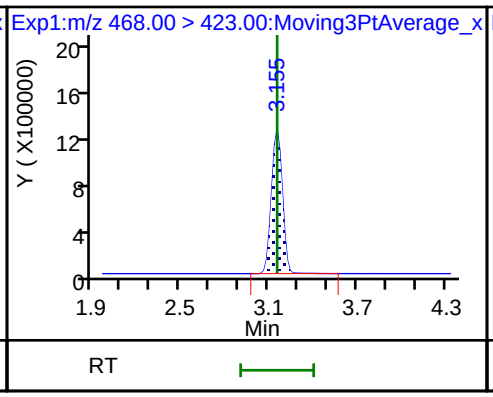
20 Perfluorononanoic acid



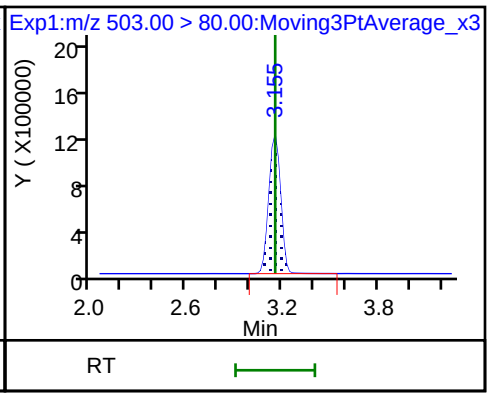
20 Perfluorononanoic acid



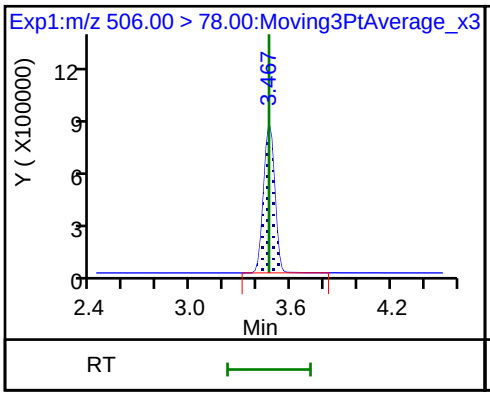
D 19 13C5 PFNA



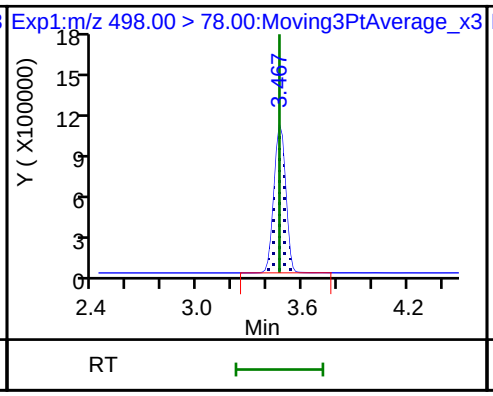
D 18 13C4 PFOS



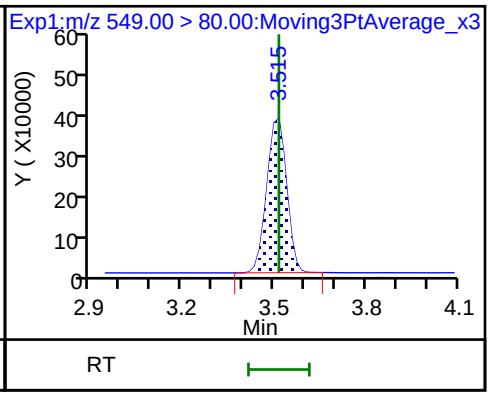
D 21 13C8 FOSA



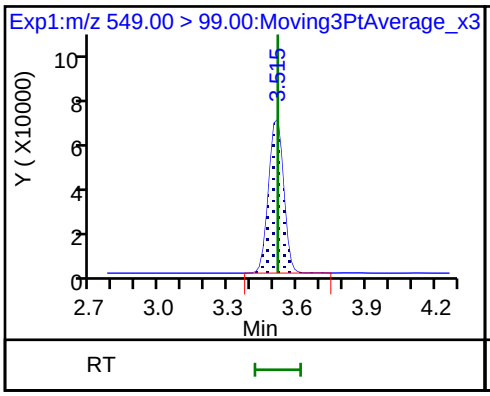
22 Perfluorooctane Sulfonamide



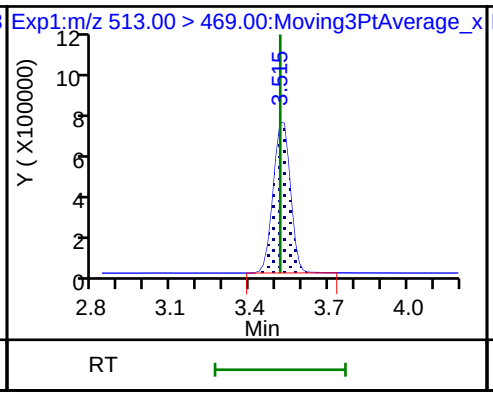
68 Perfluorononanesulfonic acid



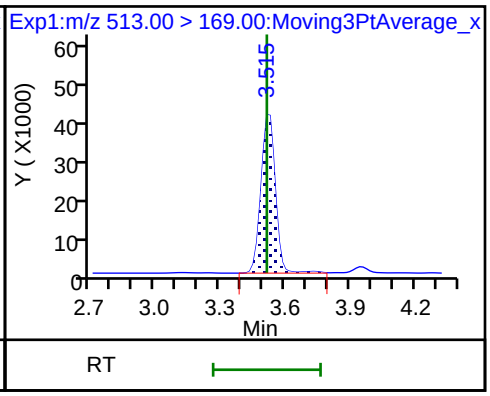
68 Perfluorononanesulfonic acid



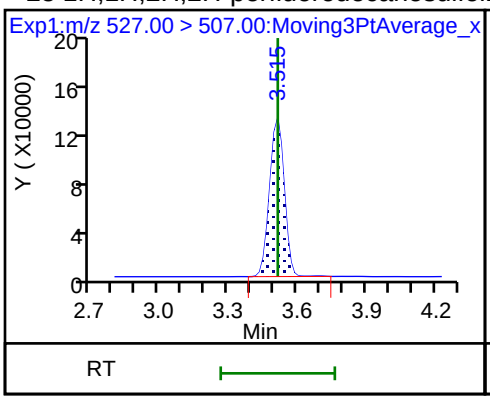
24 Perfluorodecanoic acid



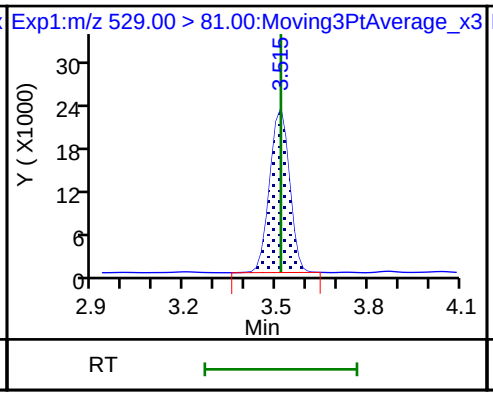
24 Perfluorodecanoic acid



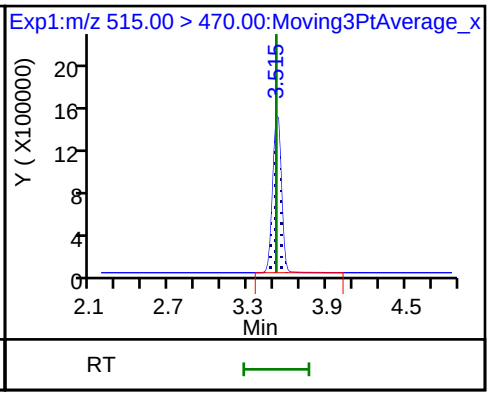
25 1H,1H,2H,2H-perfluorodecanesulfon



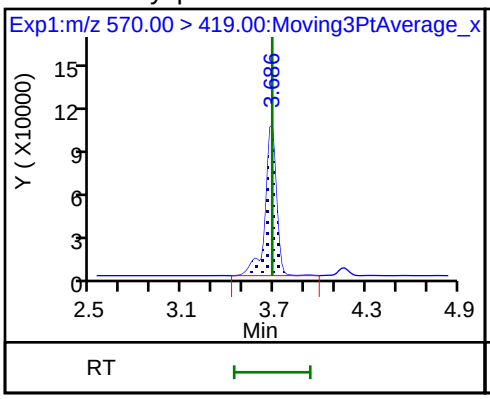
D 26 M2-8:2FTS



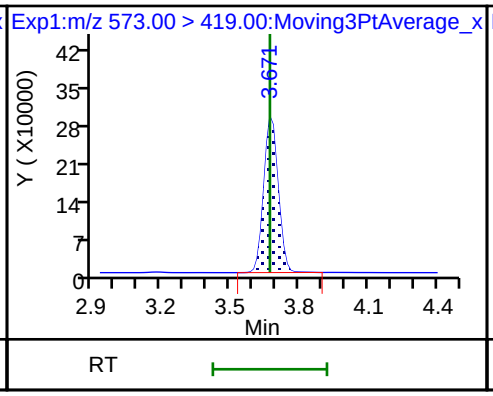
D 23 13C2 PFDA



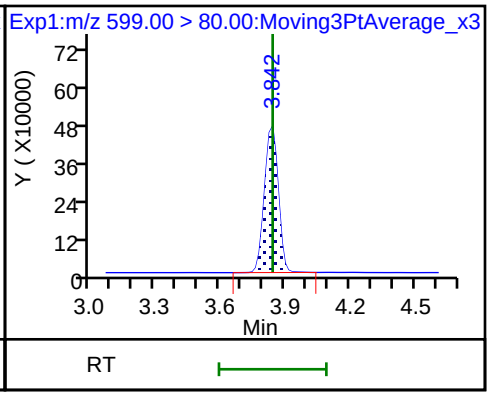
28 N-methyl perfluorooctane sulfonami



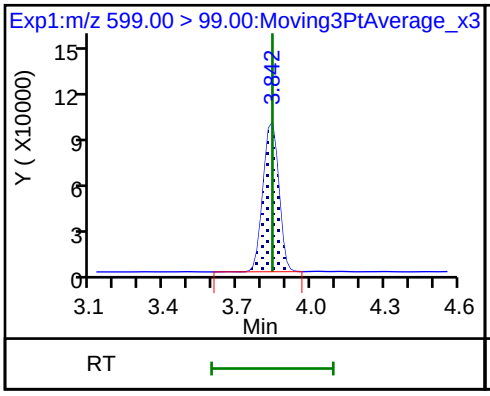
D 27 d3-NMeFOSAA



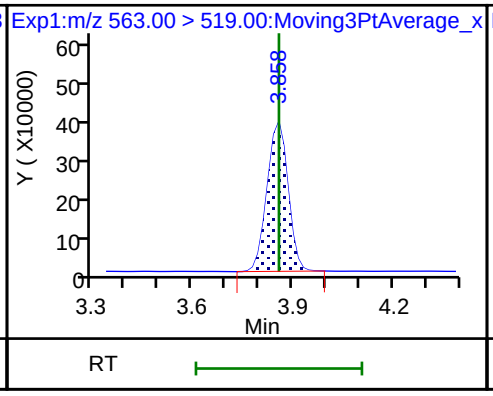
29 Perfluorodecane Sulfonic acid



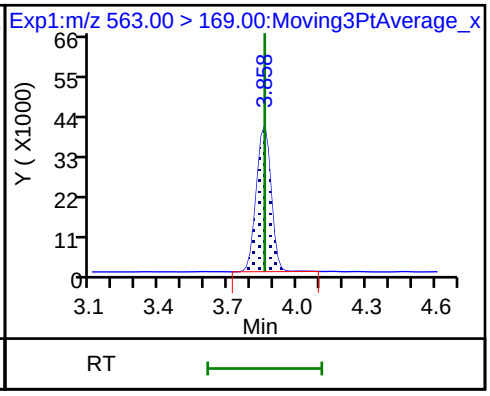
29 Perfluorodecane Sulfonic acid



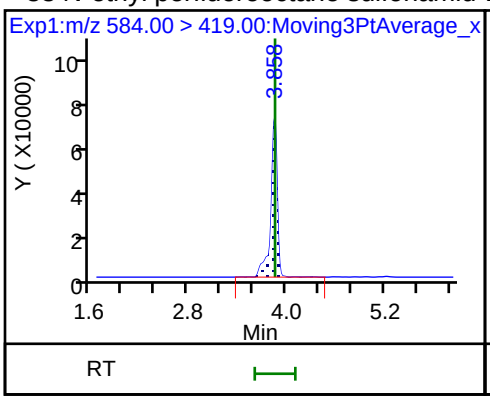
31 Perfluoroundecanoic acid



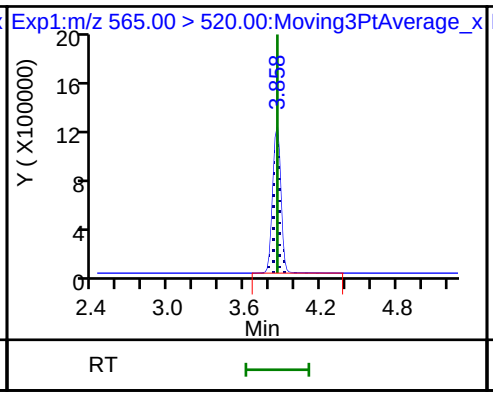
31 Perfluoroundecanoic acid



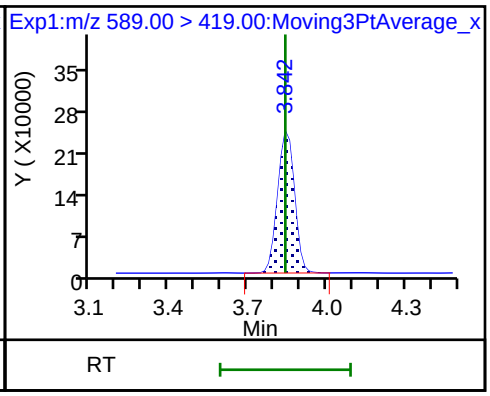
33 N-ethyl perfluorooctane sulfonamid



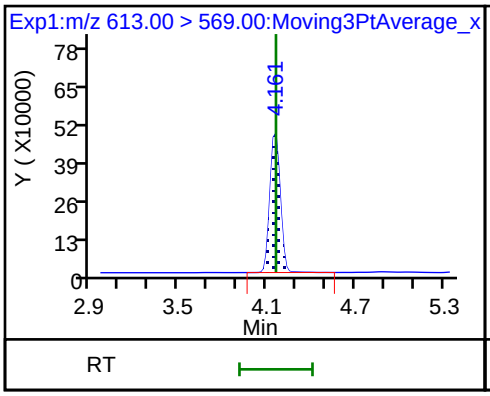
D 30 13C2 PFUnA



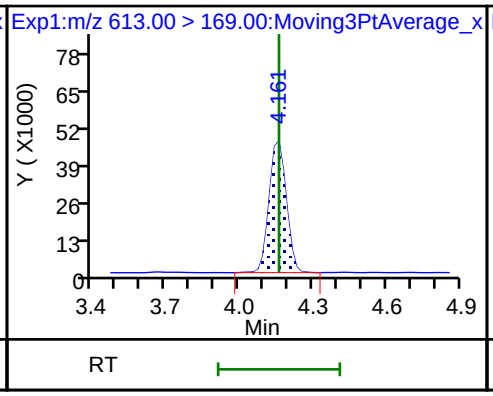
D 32 d5-NEtFOSAA



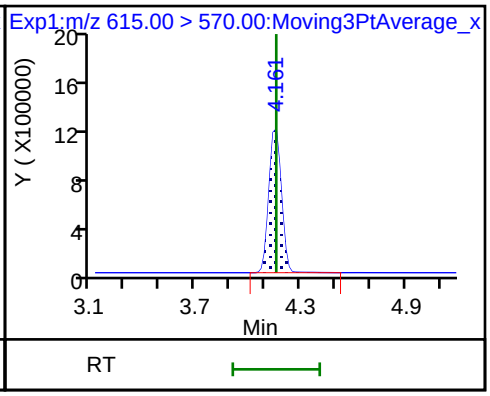
37 Perfluorododecanoic acid



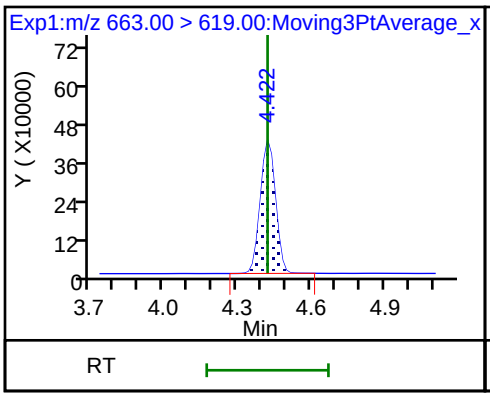
37 Perfluorododecanoic acid



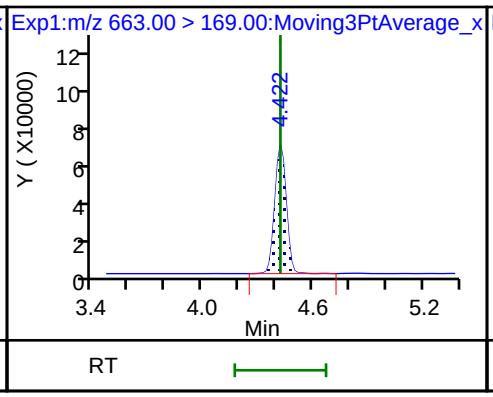
D 36 13C2 PFDoA



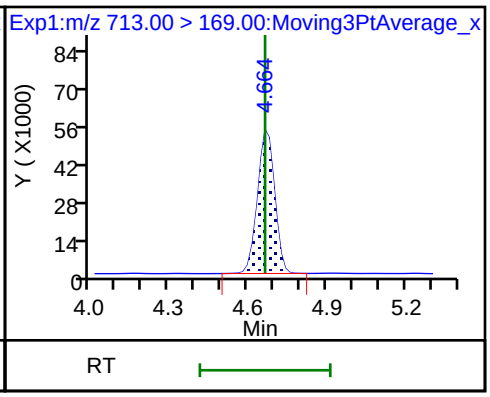
41 Perfluorotridecanoic acid



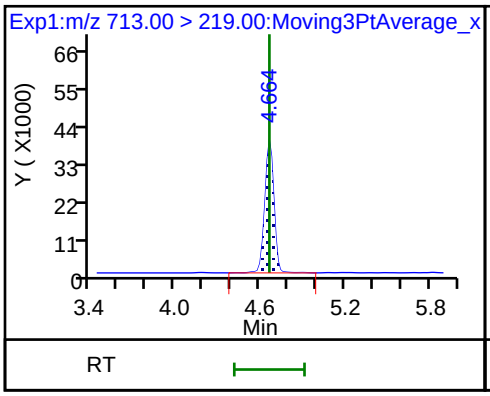
41 Perfluorotridecanoic acid



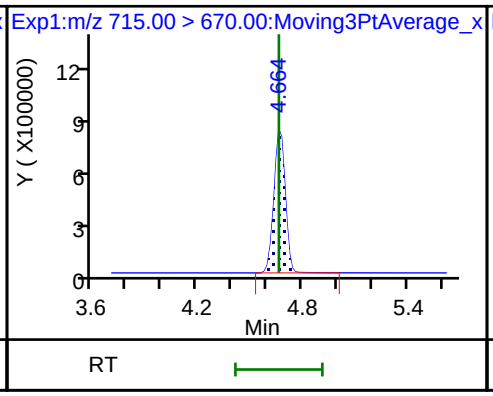
42 Perfluorotetradecanoic acid



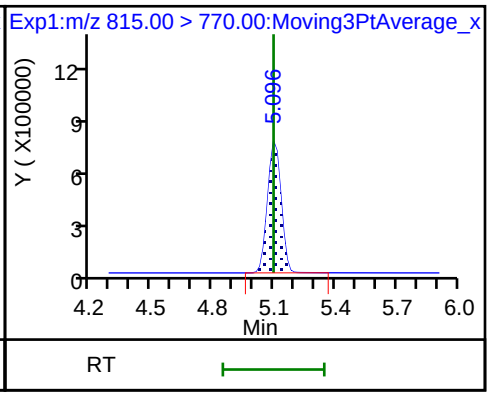
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239432/14 Calibration Date: 08/11/2018 21:59

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.11LA9A_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9293	0.9493		2.55	2.50	2.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.029		2.52	2.50	0.9	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	107.0		2.29	2.21	3.5	30.0
4:2 FTS	AveID	17.02	15.77		2.16	2.34	-7.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.8875		2.37	2.50	-5.1	30.0
Perfluoropentanesulfonic acid	AveID	48.91	50.76		2.43	2.35	3.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.098		2.64	2.50	5.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.254		2.23	2.28	-1.9	30.0
6:2 FTS	AveID	2.137	2.315		2.57	2.37	8.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.068		2.44	2.50	-2.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.069		2.52	2.38	5.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.029		2.44	2.50	-2.4	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.109		2.40	2.32	3.4	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	3.047		2.48	2.50	-0.8	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.7066		2.59	2.40	7.9	30.0
8:2 FTS	AveID	14.02	13.55		2.32	2.40	-3.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.204		2.45	2.50	-2.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	0.9866		2.44	2.50	-2.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.8435		2.44	2.41	1.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.9351		2.61	2.50	4.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.7924		2.35	2.50	-5.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.004		2.55	2.50	2.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.7770		2.59	2.50	3.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1572		2.44	2.50	-2.4	30.0
13C4 PFBA	Ave	1.117	1.027		2.30	2.50	-8.1	30.0
13C5-PFPeA	Ave	0.999	0.8822		2.21	2.50	-11.7	30.0
13C3-PFBS	Ave	0.0155	0.0137		2.06	2.33	-11.5	30.0
13C2 PFHxA	Ave	1.037	0.9713		2.34	2.50	-6.3	30.0
13C4-PFHpA	Ave	1.177	1.144		2.43	2.50	-2.8	30.0
18O2 PFHxS	Ave	0.8862	0.8025		2.14	2.37	-9.5	30.0
M2-6:2FTS	Ave	0.1144	0.1206		2.50	2.38	5.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239432/14 Calibration Date: 08/11/2018 21:59

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.11LA9A_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	0.9811		2.49	2.50	-0.6	30.0
13C4 PFOS	Ave	0.9223	0.8550		2.22	2.39	-7.3	30.0
13C5 PFNA	Ave	0.8463	0.8952		2.64	2.50	5.8	30.0
13C8 FOSA	Ave	0.5512	0.4954		2.25	2.50	-10.1	30.0
M2-8:2FTS	Ave	0.0133	0.0147		2.65	2.40	10.7	30.0
13C2 PFDA	Ave	0.8474	0.8669		2.56	2.50	2.3	30.0
d3-NMeFOSAA	Ave	0.1647	0.1827		2.77	2.50	10.9	30.0
13C2 PFUnA	Ave	0.6849	0.7167		2.62	2.50	4.6	30.0
d5-NEtFOSAA	Ave	0.1353	0.1455		2.69	2.50	7.5	30.0
13C2 PFDoA	Ave	0.7384	0.7904		2.68	2.50	7.0	30.0
13C2-PFTeDA	Ave	0.4715	0.5255		2.79	2.50	11.4	30.0
13C2-PFHxDA	Ave	0.4325	0.5117		2.96	2.50	18.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_017.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 11-Aug-2018 21:59:41 ALS Bottle#: 14 Worklist Smp#: 14
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\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:39:55 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: roycea Date: 12-Aug-2018 13:39:55

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	1.489	1.494	-0.005	0.541	7223569	2.30		91.9	10016	
2 Perfluorobutyric acid										
212.90 > 169.00	1.489	1.489	0.0	1.000	6857228	2.55		102	551	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.772	-0.008	0.641	6207203	2.21		88.3	7018	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.000	6389874	2.52		101	374	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.805	-0.008	0.653	89616	2.06		88.5	550	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	9110835	2.29		104	1667	
298.90 > 99.00	1.797	1.797	0.0	1.000	3201777		2.85(1.35-4.05)		1259	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.018	-0.011	0.730	559635	NC			670	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.007	0.0	1.117	1419718	2.16		92.7	2840	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.744	6833900	2.34		93.7	8027	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	6064781	2.37		94.9	1840	
313.00 > 119.00	2.048	2.048	0.0	1.000	458895		13.22(6.96-20.87)		1066	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.069	2.069	0.0	1.151	4587892	2.43		104	5774	
349.00 > 99.00	2.069	2.069	0.0	1.151	2072554		2.21(1.15-3.45)		1458	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.160	-0.010	0.782	758963	NC			2408	

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	2.150	2.150	0.0	1.000	1404272	NC			1012	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	8838696	2.64		106	852	
363.00 > 169.00	2.387	2.387	0.0	1.000	2012687		4.39(2.17-6.52)		4256	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.868	8048477	2.43		97.2	19039	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	5341187	2.14		90.5	8586	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	6445227	2.23		98.1	4150	
399.00 > 99.00	2.400	2.400	0.0	1.000	1724213		3.74(1.90-5.70)		868	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.719	0.0	1.000	1861846	2.57		108	1458	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.751	-0.032	0.988	805969	2.50		105	1232	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	6902939	2.49		99.4	9705	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		7036079	2.50			17813	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	7377672	2.44		97.5	1050	
413.00 > 169.00	2.751	2.751	0.0	1.000	2786222		2.65(1.36-4.08)		3392	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.882	6121034	2.52		106	4790	
449.00 > 99.00	2.767	2.767	0.0	0.882	1555474		3.94(1.84-5.53)		2710	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.155	-0.019	1.140	5751195	2.22		92.7	3945	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.155	-0.019	1.140	6298950	2.64		106	6628	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	6483774	2.44		97.6	1219	
463.00 > 169.00	3.136	3.136	0.0	1.000	1206630		5.37(2.68-8.03)		2819	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	6190175	2.40		103	3056	
499.00 > 99.00	3.136	3.136	0.0	1.000	1379803		4.49(2.04-6.12)		1830	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.353	3.353	0.0	1.069	6266236	NC			3726	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.483	-0.016	1.260	3485732	2.25		89.9	5185	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	10619542	2.48		99.2	5905	
D 26 M2-8:2FTS										
529.00 > 81.00	3.483	3.514	-0.031	1.266	99220	2.65		111	401	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.498	3.498	0.0	1.004	1344917	2.32		96.7	3245	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.483	3.483	0.0	1.110	4080616	2.59		108	2962	
549.00 > 99.00	3.483	3.483	0.0	1.110	676128		6.04(3.02-9.05)		1768	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.498	0.0	1.000	7342308	2.45		97.9	1477	
513.00 > 169.00	3.498	3.498	0.0	1.000	487862		15.05(7.12-21.35)		387	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.529	-0.031	1.272	6099395	2.56		102	7490	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.329	1285239	2.77		111	2698	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.657	0.0	1.000	1267972	2.44		97.6	523	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.810	3.810	0.0	1.215	4891436	2.44		101	3395	
599.00 > 99.00	3.810	3.810	0.0	1.215	1013824		4.82(2.14-6.43)		1322	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.841	-0.015	1.391	1023746	2.69		108	1991	
D 30 13C2 PFUnA										
565.00 > 520.00	3.826	3.857	-0.031	1.391	5042822	2.62		105	9612	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.826	3.826	0.0	1.000	957324	2.61		104	1732	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.826	3.826	0.0	1.000	3995713	2.35		94.1	553	
563.00 > 169.00	3.826	3.826	0.0	1.000	389481		10.26(5.24-15.72)		1368	
35 MeFOSA										
512.00 > 169.00	3.962	3.962	0.0		1593193	NC			1415	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.994	3.994	0.0	1.273	7306785	NC			13328	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.142	-0.017	1.500	5561348	2.68		107	6277	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.125	4.125	0.0	1.000	5585280	2.55		102	1209	
613.00 > 169.00	4.125	4.125	0.0	1.000	624430		8.94(4.68-14.05)		1309	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.125	4.125	0.0	1.185	825951	NC			3030	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.375	4.375	0.0	1.395	490664	NC			1620	
699.00 > 99.00	4.375	4.375	0.0	1.395	894130		0.55(0.28-0.83)		1708	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.406	4.406	0.0	1.068	4321000	2.59		104	1100	
663.00 > 169.00	4.390	4.406	-0.016	1.064	751860		5.75(3.09-9.27)		2645	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.645	4.645	0.0	1.000	581225	2.44		97.6	2861	
713.00 > 219.00	4.645	4.645	0.0	1.000	405859		1.43(0.70-2.09)		1424	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.661	-0.016	1.689	3697128	2.79		111	6824	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.059	0.0	1.000	3230441	NC			231	
813.00 > 169.00	5.059	5.059	0.0	1.000	576191		5.61(2.77-8.32)		1755	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.059	5.092	-0.033	1.839	3600650	2.96		118	5219	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.433	5.433	0.0	1.074	2444138	NC			971	
913.00 > 169.00	5.433	5.433	0.0	1.074	429795		5.69(2.55-7.64)		2105	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00009 Amount Added: 1.00 Units: mL

Report Date: 12-Aug-2018 13:39:59 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_017.d

Injection Date: 11-Aug-2018 21:59:41 Instrument ID: A9

Lims ID: CCV L5

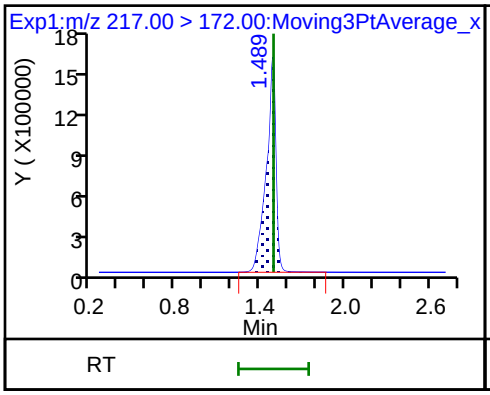
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Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 14

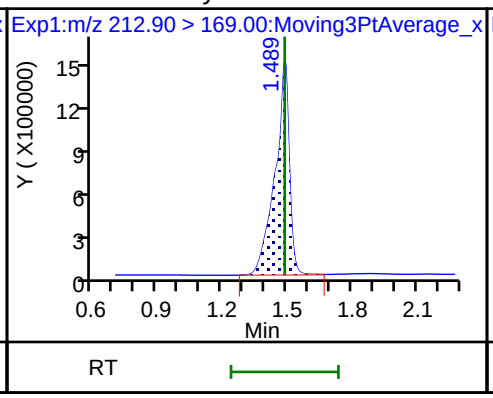
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Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

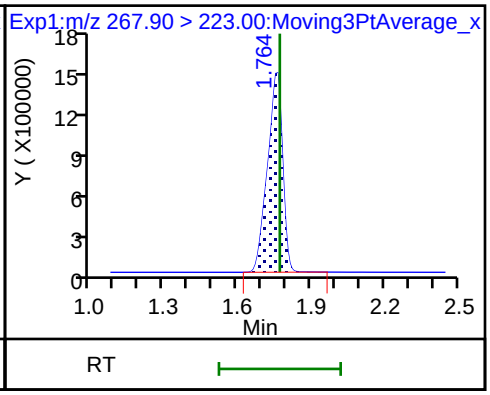
D 1 13C4 PFBA



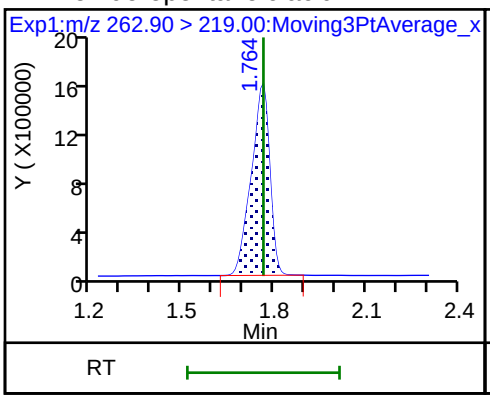
2 Perfluorobutyric acid



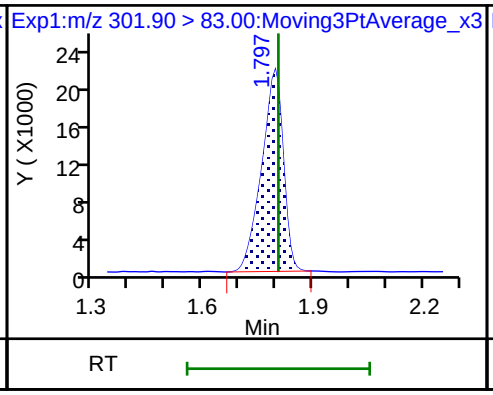
D 3 13C5-PFPeA



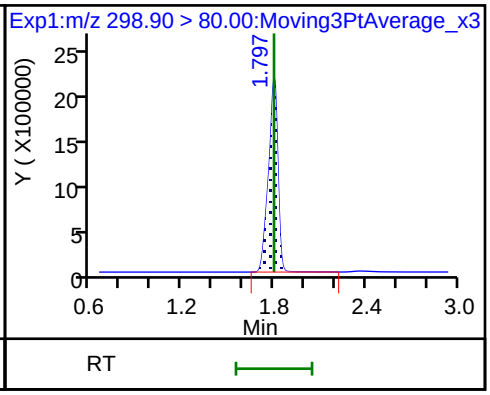
4 Perfluoropentanoic acid



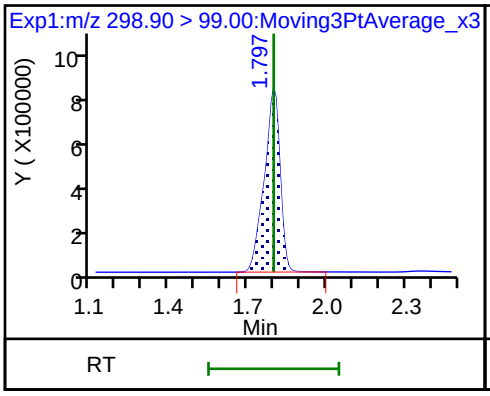
D 47 13C3-PFBS



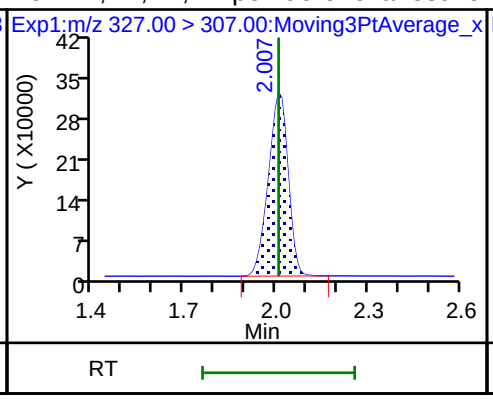
5 Perfluorobutanesulfonic acid



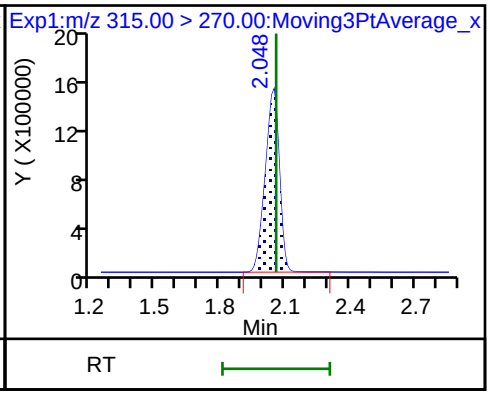
5 Perfluorobutanesulfonic acid



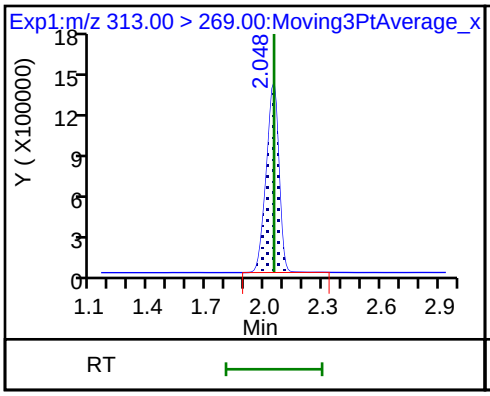
61 1H,1H,2H,2H-perfluorohexanesulfon



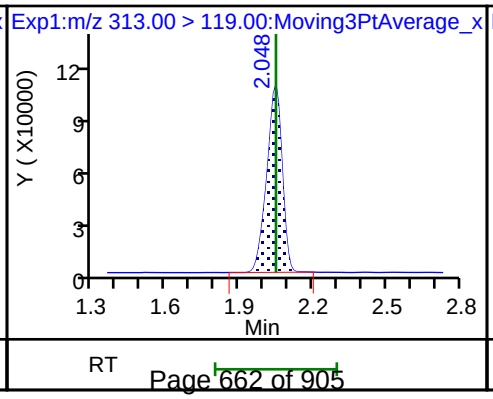
D 7 13C2 PFHxA



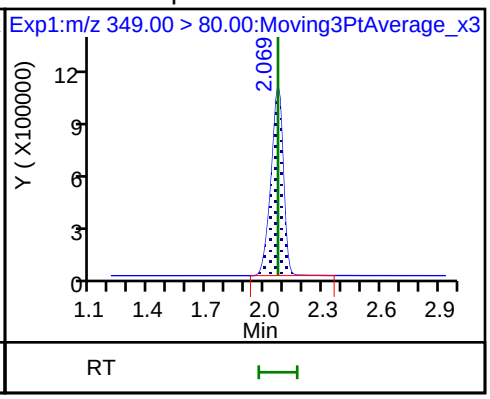
6 Perfluorohexanoic acid



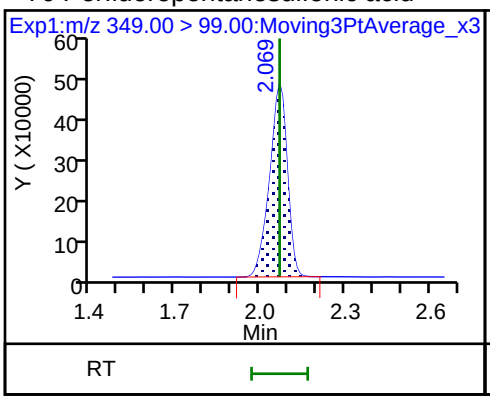
6 Perfluorohexanoic acid



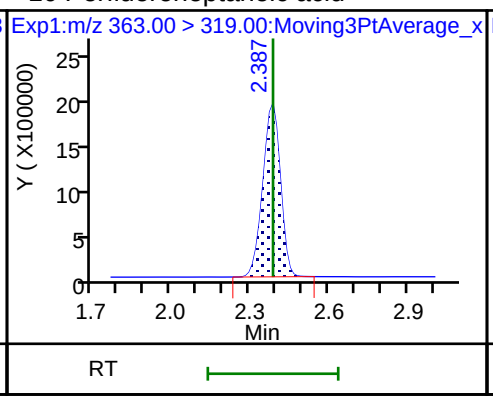
70 Perfluoropentanesulfonic acid



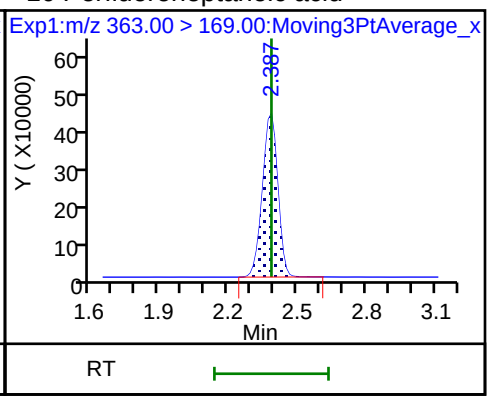
70 Perfluoropentanesulfonic acid



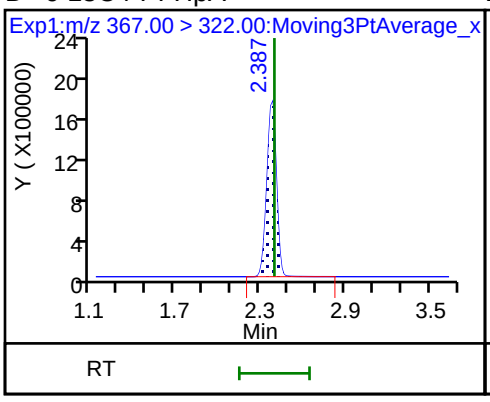
10 Perfluoroheptanoic acid



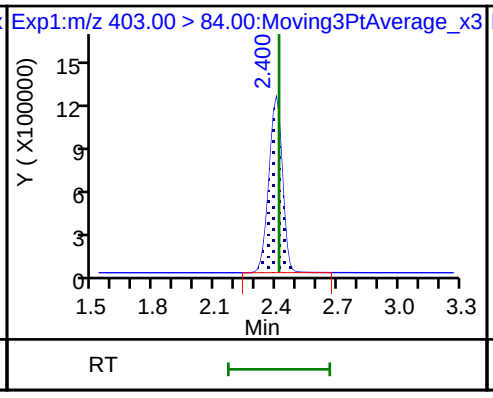
10 Perfluoroheptanoic acid



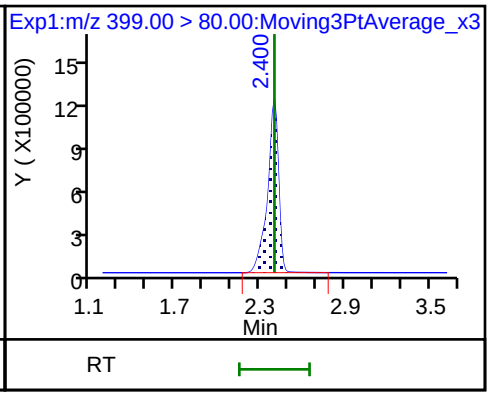
D 9 13C4-PFHpA



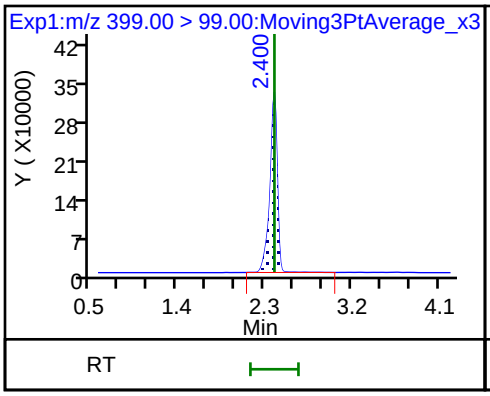
D 11 18O2 PFHxS



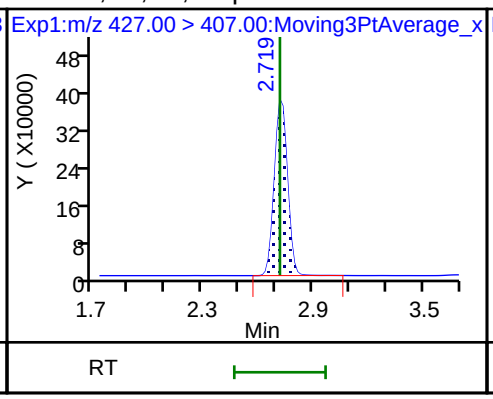
8 Perfluorohexanesulfonic acid



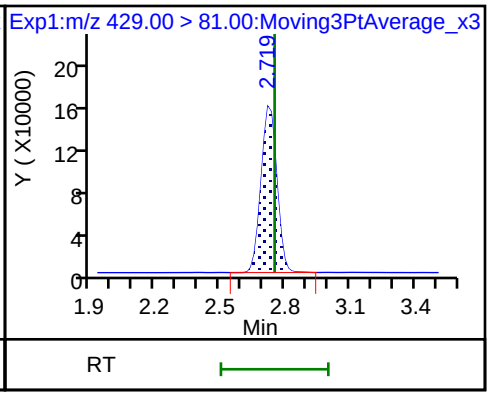
8 Perfluorohexanesulfonic acid



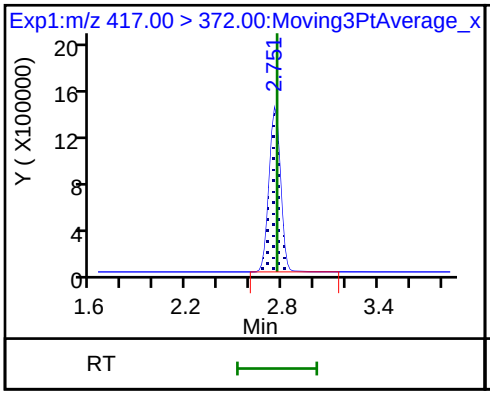
13 1H,1H,2H,2H-perfluorooctanesulfon



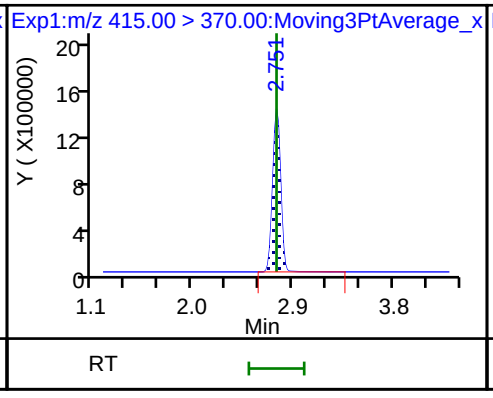
D 12 M2-6:2FTS



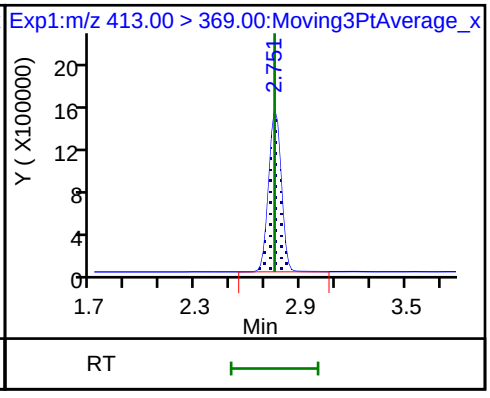
D 14 13C4 PFOA



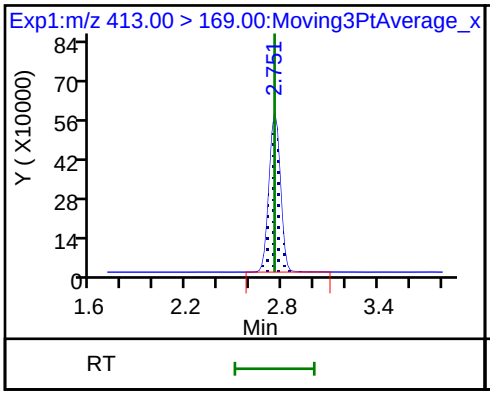
* 62 13C2-PFOA



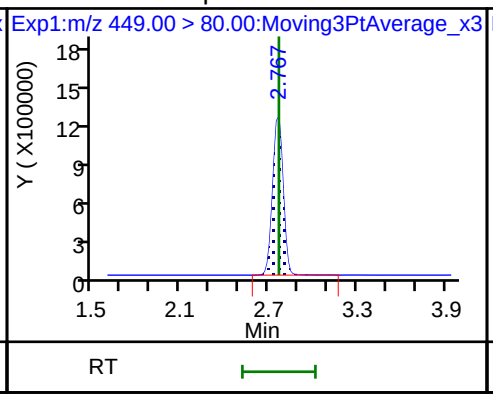
15 Perfluorooctanoic acid



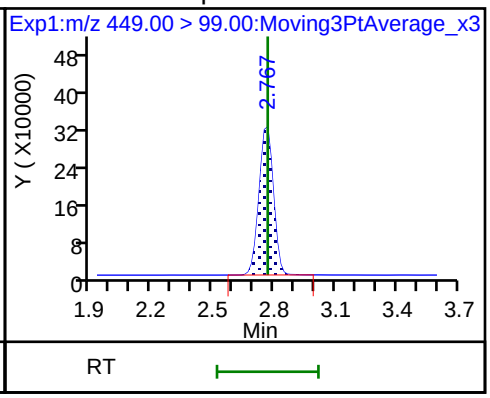
15 Perfluorooctanoic acid



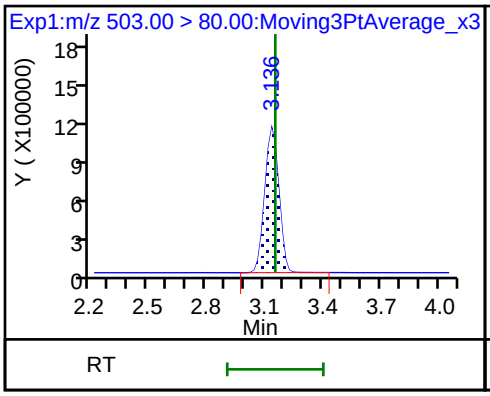
16 Perfluoroheptanesulfonic acid



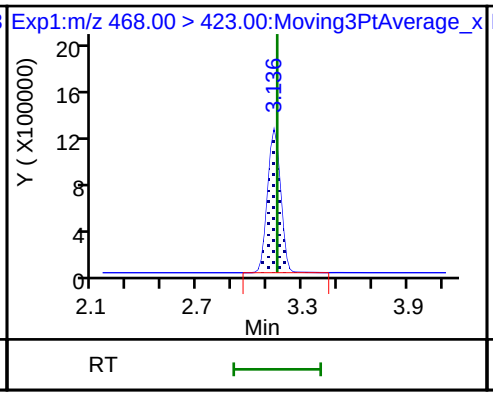
16 Perfluoroheptanesulfonic acid



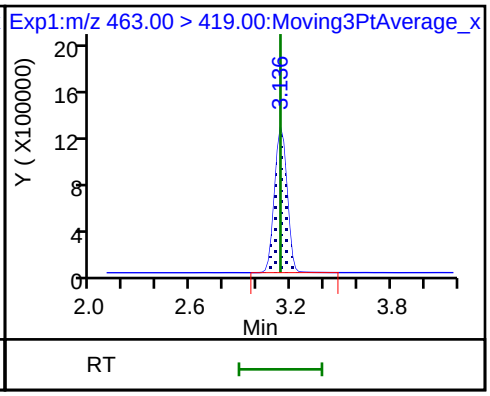
D 18 13C4 PFOS



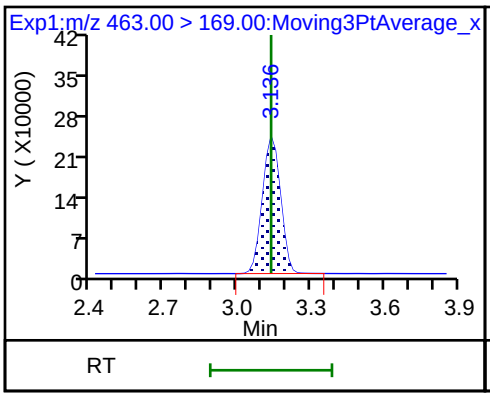
D 19 13C5 PFNA



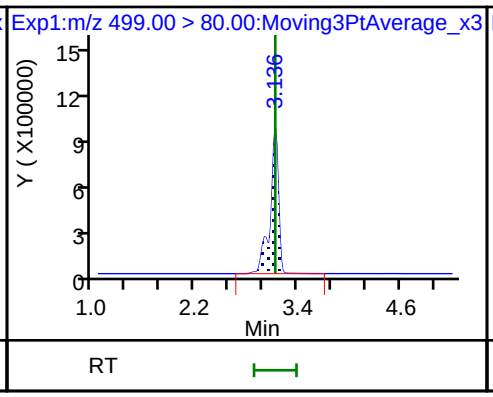
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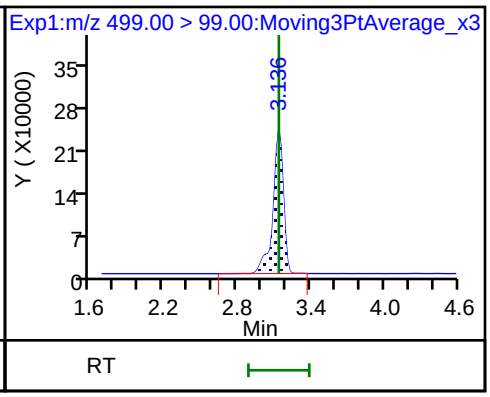
20 Perfluorononanoic acid



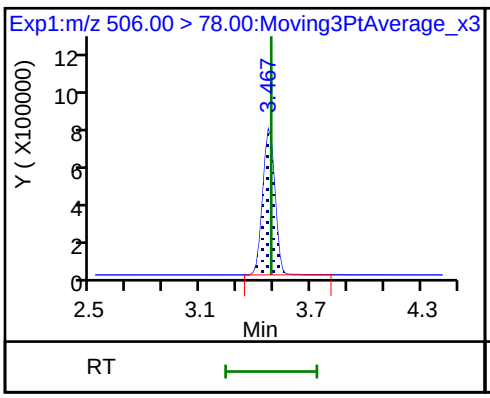
17 Perfluorooctane sulfonic acid



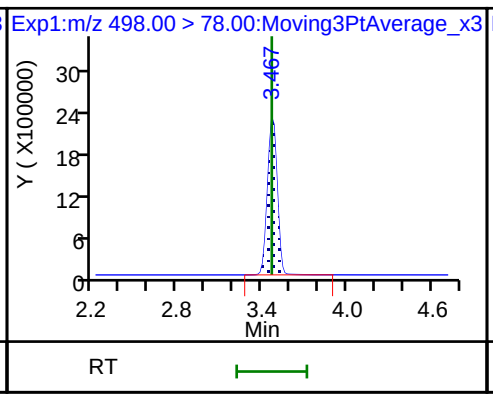
17 Perfluorooctane sulfonic acid



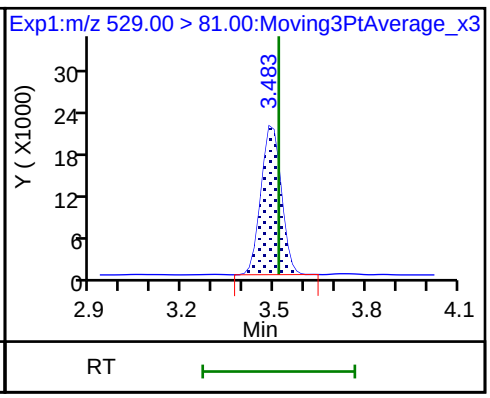
D 21 13C8 FOSA



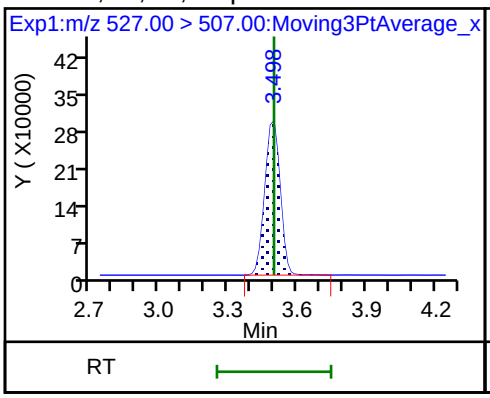
22 Perfluorooctane Sulfonamide



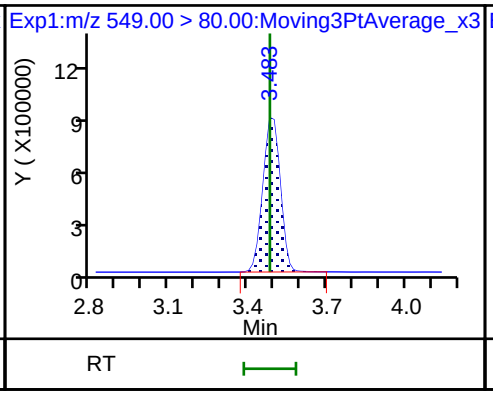
D 26 M2-8:2FTS



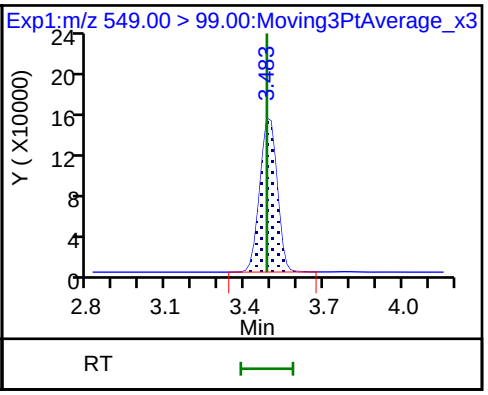
25 1H,1H,2H,2H-perfluorodecanesulfoni



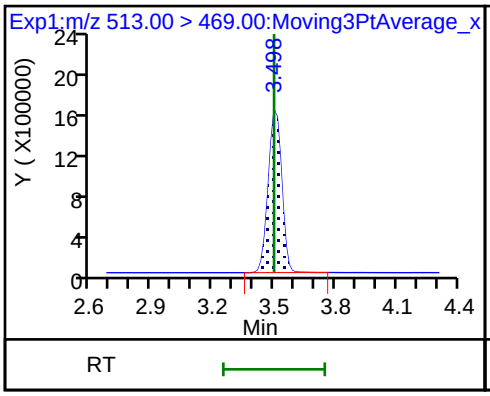
68 Perfluorononanesulfonic acid



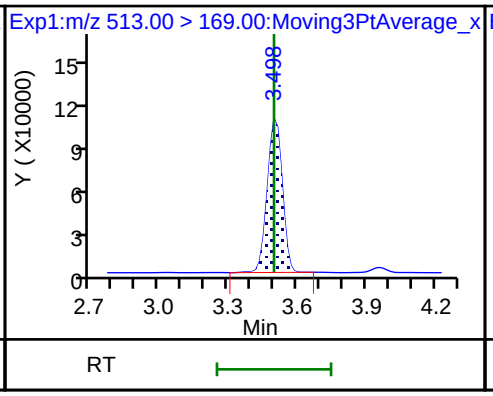
68 Perfluorononanesulfonic acid



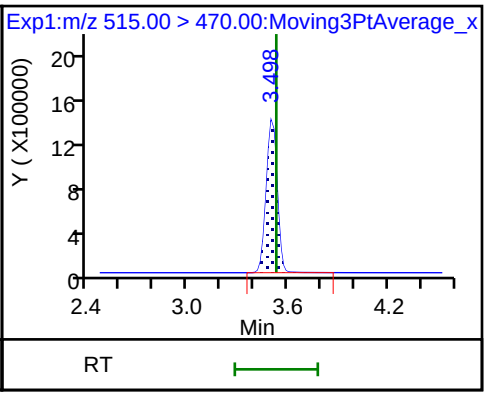
24 Perfluorodecanoic acid



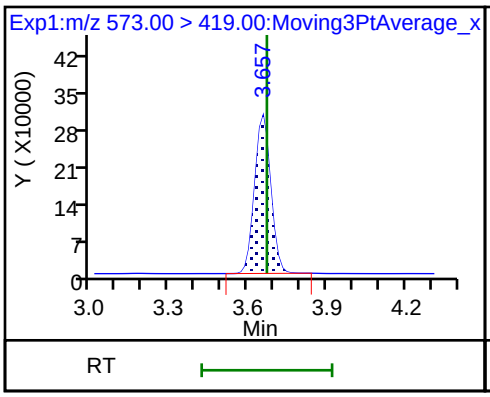
24 Perfluorodecanoic acid



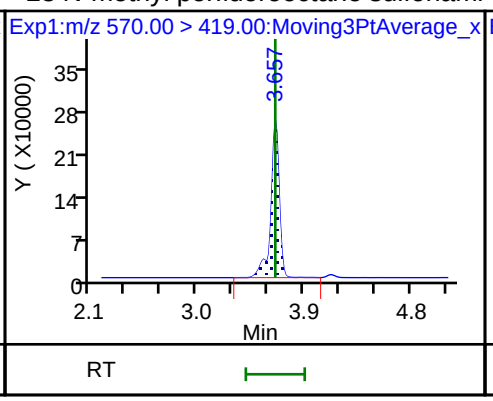
D 23 13C2 PFDA



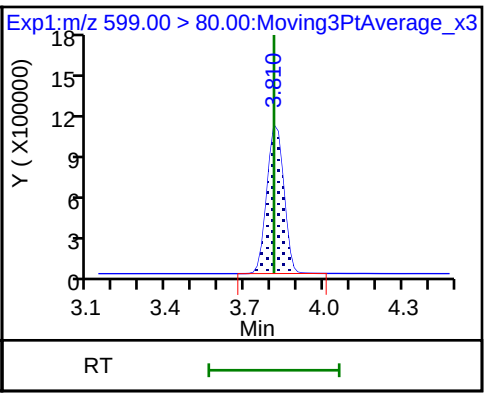
D 27 d3-NMeFOSAA



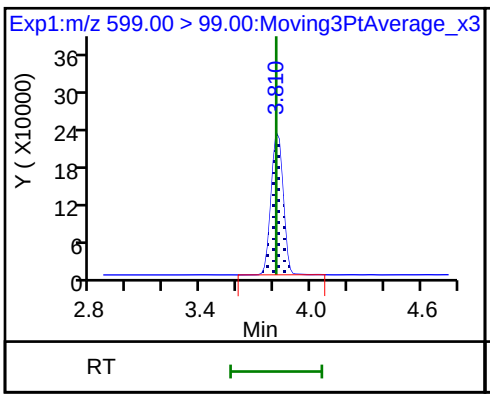
28 N-methyl perfluorooctane sulfonami



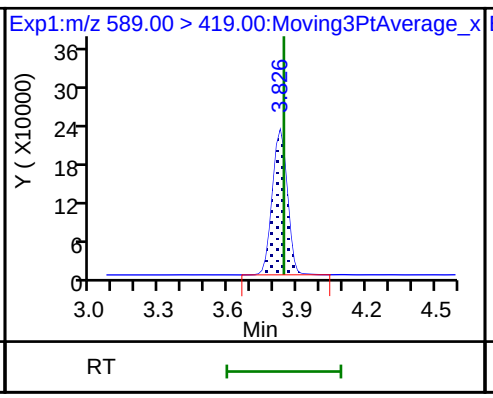
29 Perfluorodecane Sulfonic acid



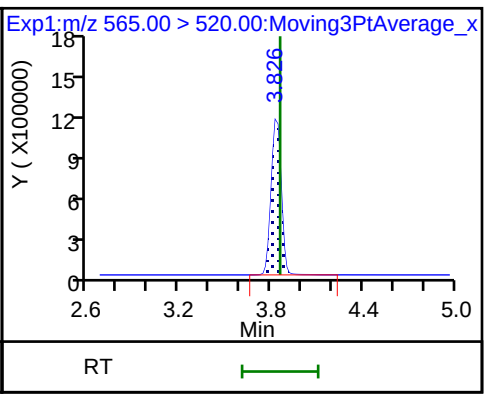
29 Perfluorodecane Sulfonic acid



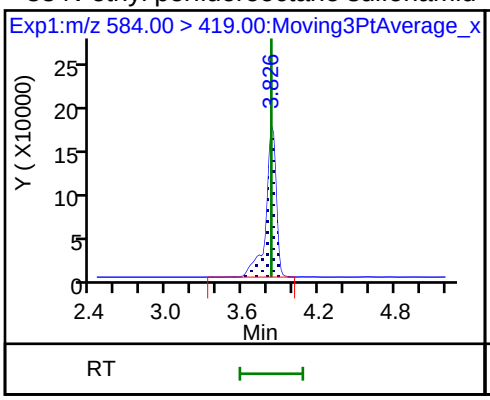
D 32 d5-NEtFOSAA



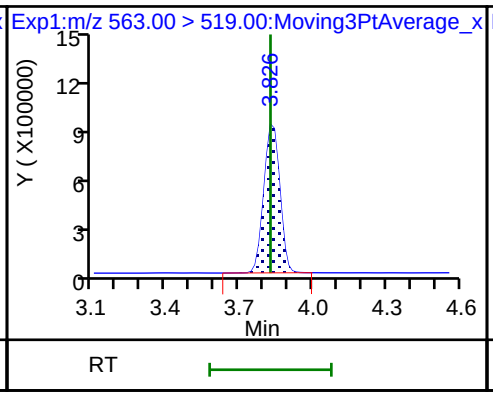
D 30 13C2 PFUnA



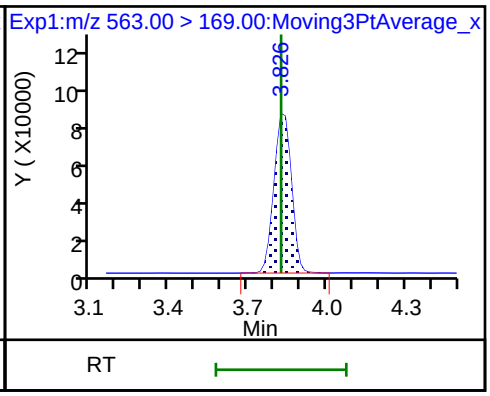
33 N-ethyl perfluorooctane sulfonamid



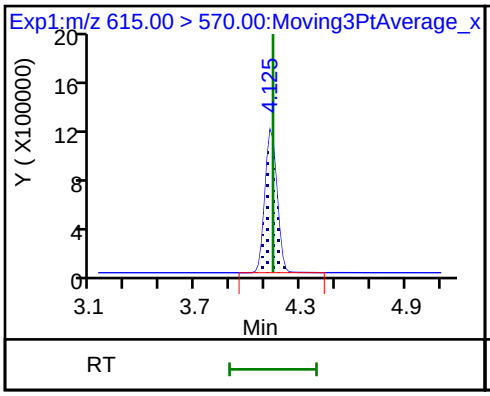
31 Perfluoroundecanoic acid



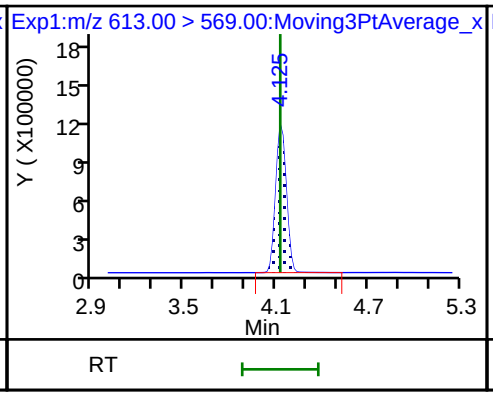
31 Perfluoroundecanoic acid



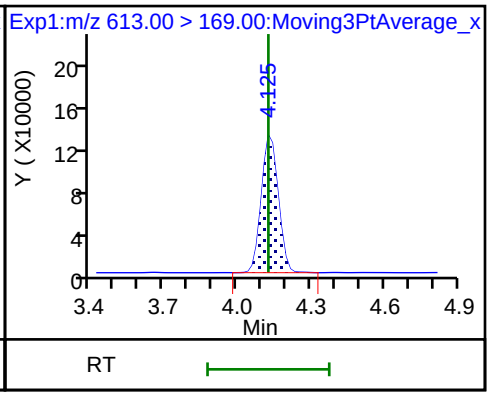
D 36 13C2 PFDoA



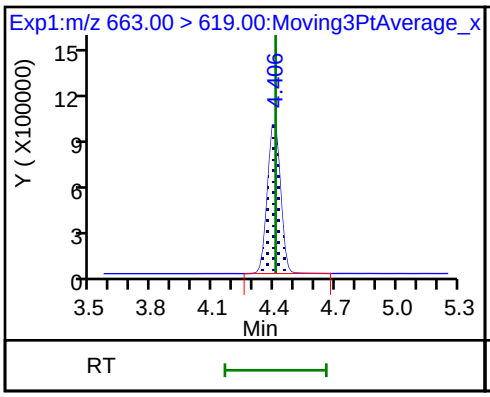
37 Perfluorododecanoic acid



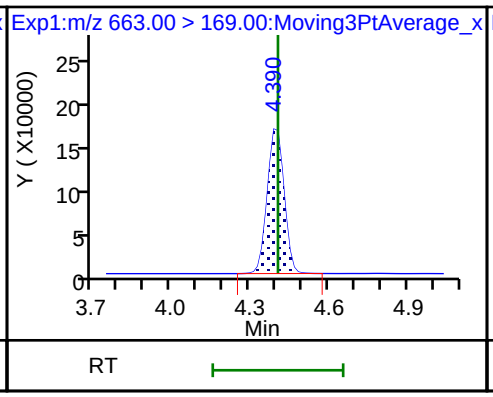
37 Perfluorododecanoic acid



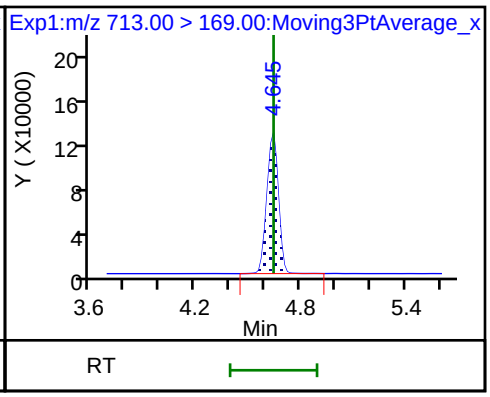
41 Perfluorotridecanoic acid



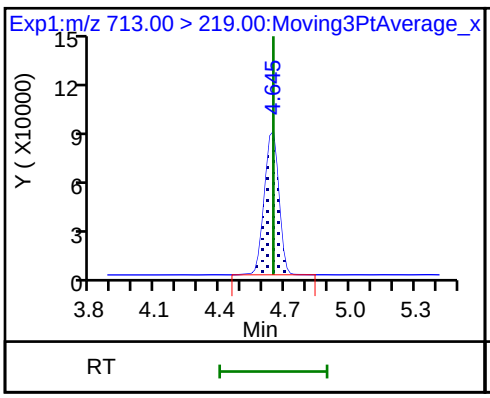
41 Perfluorotridecanoic acid



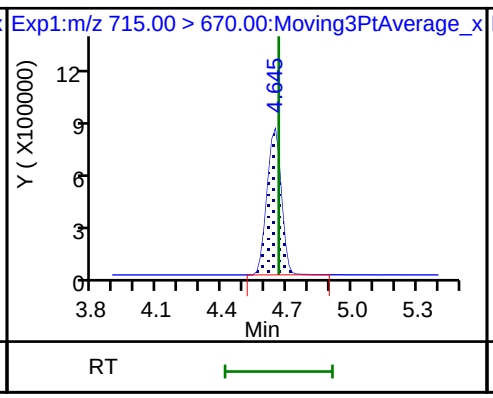
42 Perfluorotetradecanoic acid



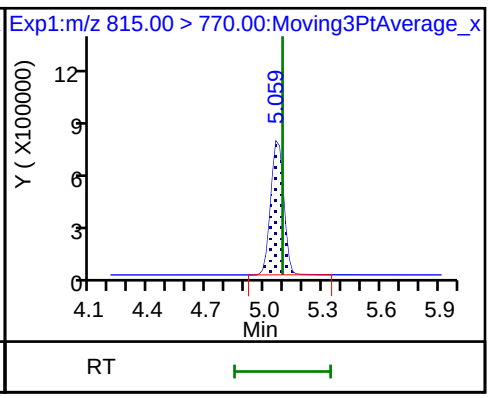
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239432/22 Calibration Date: 08/11/2018 22:59

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.11LA9A_021.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9293	0.9425		1.01	1.00	1.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.003		0.983	1.00	-1.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	115.3		0.987	0.884	11.6	30.0
4:2 FTS	AveID	17.02	16.80		0.922	0.934	-1.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.9099		0.973	1.00	-2.7	30.0
Perfluoropentanesulfonic acid	AveID	48.91	52.06		0.998	0.938	6.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.136		1.09	1.00	9.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.156		0.823	0.910	-9.6	30.0
6:2 FTS	AveID	2.137	2.018		0.895	0.948	-5.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.119		1.02	1.00	2.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	0.9888		0.931	0.952	-2.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.075		1.02	1.00	1.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.010		0.874	0.928	-5.9	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	3.306		1.08	1.00	7.6	30.0
8:2 FTS	AveID	14.02	15.24		1.04	0.958	8.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.234		1.00	1.00	0.4	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.6957		1.02	0.960	6.2	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	0.9799		0.970	1.00	-3.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.8080		0.935	0.964	-3.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.9887		1.10	1.00	10.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.7916		0.940	1.00	-6.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.062		1.08	1.00	8.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.8232		1.10	1.00	9.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1541		0.956	1.00	-4.4	30.0
13C4 PFBA	Ave	1.117	0.9929		2.22	2.50	-11.1	30.0
13C5-PFPeA	Ave	0.999	0.8805		2.20	2.50	-11.8	30.0
13C3-PFBS	Ave	0.0155	0.0126		1.90	2.33	-18.5	30.0
13C2 PFHxA	Ave	1.037	0.9842		2.37	2.50	-5.1	30.0
13C4-PFHpA	Ave	1.177	1.105		2.35	2.50	-6.1	30.0
18O2 PFHxS	Ave	0.8862	0.7779		2.08	2.37	-12.2	30.0
M2-6:2FTS	Ave	0.1144	0.1215		2.52	2.38	6.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239432/22 Calibration Date: 08/11/2018 22:59

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.11LA9A_021.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	0.9713		2.46	2.50	-1.5	30.0
13C4 PFOS	Ave	0.9223	0.8702		2.25	2.39	-5.6	30.0
13C5 PFNA	Ave	0.8463	0.8646		2.55	2.50	2.2	30.0
13C8 FOSA	Ave	0.5512	0.4953		2.25	2.50	-10.1	30.0
13C2 PFDA	Ave	0.8474	0.8857		2.61	2.50	4.5	30.0
M2-8:2FTS	Ave	0.0133	0.0124		2.24	2.40	-6.5	30.0
d3-NMeFOSAA	Ave	0.1647	0.1775		2.69	2.50	7.8	30.0
13C2 PFUnA	Ave	0.6849	0.6886		2.51	2.50	0.5	30.0
d5-NEtFOSAA	Ave	0.1353	0.1428		2.64	2.50	5.5	30.0
13C2 PFDoA	Ave	0.7384	0.7551		2.56	2.50	2.3	30.0
13C2-PFTeDA	Ave	0.4715	0.4956		2.63	2.50	5.1	30.0
13C2-PFHxDA	Ave	0.4325	0.4970		2.87	2.50	14.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_021.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 11-Aug-2018 22:59:47 ALS Bottle#: 13 Worklist Smp#: 22
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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: roycea Date: 12-Aug-2018 13:44:51

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	1.489	-0.006	1.000	2755376	1.01		101	249	
D 1 13C4 PFBA										
217.00 > 172.00	1.483	1.494	-0.011	0.542	7308390	2.22		88.9	16024	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.764	-0.009	1.005	2599041	0.9827		98.3	147	
D 3 13C5-PFPeA										
267.90 > 223.00	1.747	1.772	-0.025	0.639	6481189	2.20		88.2	7061	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.789	1.797	-0.008	1.000	3784920	0.9867		112	867	
298.90 > 99.00	1.789	1.797	-0.008	1.000	1266858		2.99(1.35-4.05)		534	
D 47 13C3-PFBS										
301.90 > 83.00	1.789	1.805	-0.016	0.654	86345	1.90		81.5	553	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.997	2.007	-0.010	1.116	582818	0.9219		98.7	2476	
D 60 M2-4:2FTS										
329.00 > 81.00	1.997	2.018	-0.021	0.730	590489	NC			723	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.038	2.048	-0.010	1.000	2636766	0.9727		97.3	880	
313.00 > 119.00	2.038	2.048	-0.010	1.000	185711		14.20(6.96-20.87)		314	
D 7 13C2 PFHxA										
315.00 > 270.00	2.038	2.058	-0.020	0.745	7244621	2.37		94.9	11568	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.058	2.069	-0.011	1.151	1813486	1.00		106	2572	
349.00 > 99.00	2.058	2.069	-0.011	1.151	840885		2.16(1.15-3.45)		586	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.140	2.150	-0.010	1.000	588266	NC			470	

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	2.160	-0.020	0.782	827886	NC			3334	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.374	2.387	-0.013	1.000	3694027	1.09		109	359	
363.00 > 169.00	2.374	2.387	-0.013	1.000	801152		4.61(2.17-6.52)		1198	
D 9 13C4-PFHpA										
367.00 > 322.00	2.374	2.400	-0.026	0.868	8132162	2.35		93.9	11151	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.387	2.400	-0.013	1.000	2410396	0.8226		90.4	2124	
399.00 > 99.00	2.387	2.400	-0.013	1.000	695724		3.46(1.90-5.70)		364	
D 11 18O2 PFHxS										
403.00 > 84.00	2.387	2.413	-0.026	0.873	5417122	2.08		87.8	13426	
65 ADONA										
377.00 > 251.00	2.413	2.413	0.0	0.774	5654232	NC			11235	
377.00 > 85.00	2.413	2.413	0.0	0.774	2439715		2.32(1.05-3.16)		1606	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.719	0.0	1.000	684451	0.8952		94.4	621	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.751	-0.032	0.994	849876	2.52		106	1217	
* 62 13C2-PFOA										
415.00 > 370.00	2.735	2.751	-0.016		7360935	2.50			9043	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.735	2.751	-0.016	1.000	3204465	1.02		102	483	
413.00 > 169.00	2.735	2.751	-0.016	1.000	1122579		2.85(1.36-4.08)		1364	
D 14 13C4 PFOA										
417.00 > 372.00	2.735	2.767	-0.032	1.000	7149962	2.46		98.5	7439	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.751	2.767	-0.016	0.882	2412028	0.9315		97.8	2148	
449.00 > 99.00	2.751	2.767	-0.016	0.882	580448		4.16(1.84-5.53)		1573	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.118	3.136	-0.018	1.000	2400449	0.8736		94.1	2209	
499.00 > 99.00	3.118	3.136	-0.018	1.000	551735		4.35(2.04-6.12)		912	
20 Perfluorononanoic acid										
463.00 > 419.00	3.118	3.136	-0.018	1.000	2737320	1.02		102	477	
463.00 > 169.00	3.118	3.136	-0.018	1.000	478410		5.72(2.68-8.03)		933	
D 19 13C5 PFNA										
468.00 > 423.00	3.118	3.155	-0.037	1.140	6364438	2.55		102	6343	
D 18 13C4 PFOS										
503.00 > 80.00	3.118	3.155	-0.037	1.140	6123831	2.25		94.4	5654	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.336	3.353	-0.017	1.070	2526303	NC			2357	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	4820712	1.08		108	4468	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.483	-0.016	1.268	3645788	2.25		89.9	3941	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.482	3.483	-0.001	1.117	1711205	1.02		106	2208	
549.00 > 99.00	3.467	3.483	-0.016	1.112	277178		6.17(3.02-9.05)		1504	

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	3.482	3.498	-0.016	1.000	534176	1.04		109	1600	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.482	3.498	-0.016	1.000	3217990	1.00		100	679	
513.00 > 169.00	3.482	3.498	-0.016	1.000	202727		15.87(7.12-21.35)		312	
D 26 M2-8:2FTS										
529.00 > 81.00	3.482	3.514	-0.032	1.273	87635	2.24		93.5	449	
D 23 13C2 PFDA										
515.00 > 470.00	3.482	3.529	-0.047	1.273	6519858	2.61		105	8780	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.643	3.657	-0.014	1.000	512156	0.9696		97.0	222	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.643	3.671	-0.028	1.332	1306664	2.69		108	3569	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.794	3.810	-0.016	1.217	1995770	0.9346		97.0	2551	
599.00 > 99.00	3.794	3.810	-0.016	1.217	396260		5.04(2.14-6.43)		449	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.810	3.826	-0.016	1.000	415716	1.10		110	888	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.810	3.826	-0.016	1.000	1604990	0.9402		94.0	225	
563.00 > 169.00	3.810	3.826	-0.016	1.000	164543		9.75(5.24-15.72)		774	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.810	3.841	-0.031	1.393	1051135	2.64		106	1864	
D 30 13C2 PFUnA										
565.00 > 520.00	3.810	3.857	-0.047	1.393	5068796	2.51		101	8349	
35 MeFOSA										
512.00 > 169.00	3.947	3.962	-0.015		637576	NC			1098	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.978	3.994	-0.016	1.276	3009045	NC			7833	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.109	4.125	-0.016	1.000	2361956	1.08		108	486	
613.00 > 169.00	4.109	4.125	-0.016	1.000	234608		10.07(4.68-14.05)		939	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.109	4.125	-0.016	1.180	341375	NC			1215	
D 36 13C2 PFDoA										
615.00 > 570.00	4.109	4.142	-0.033	1.502	5558475	2.56		102	6234	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.344	4.375	-0.031	1.393	196870	NC			900	
699.00 > 99.00	4.360	4.375	-0.015	1.398	349206		0.56(0.28-0.83)		882	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.375	4.406	-0.031	1.065	1830339	1.10		110	502	
663.00 > 169.00	4.375	4.406	-0.031	1.065	299114		6.12(3.09-9.27)		1293	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.630	4.645	-0.015	1.000	224815	0.9565		95.6	1308	
713.00 > 219.00	4.611	4.645	-0.034	0.996	168450		1.33(0.70-2.09)		844	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.630	4.661	-0.031	1.693	3647808	2.63		105	6641	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.042	5.059	-0.017	1.000	1405345	NC			105	
813.00 > 169.00	5.042	5.059	-0.017	1.000	235704		5.96(2.77-8.32)		781	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.042	5.092	-0.050	1.843	3658077	2.87		115	4609	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.404	5.433	-0.029	1.072	1007024	NC			451	
913.00 > 169.00	5.404	5.433	-0.029	1.072	175018		5.75(2.55-7.64)		1044	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 12-Aug-2018 13:44:55 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_021.d

Injection Date: 11-Aug-2018 22:59:47 Instrument ID: A9

Lims ID: CCV L4

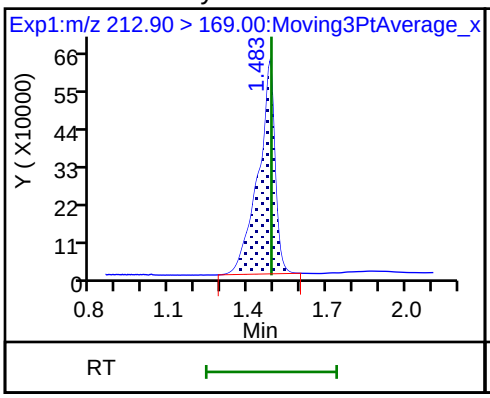
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 22

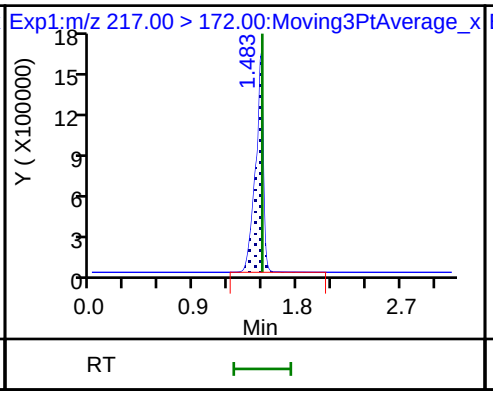
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

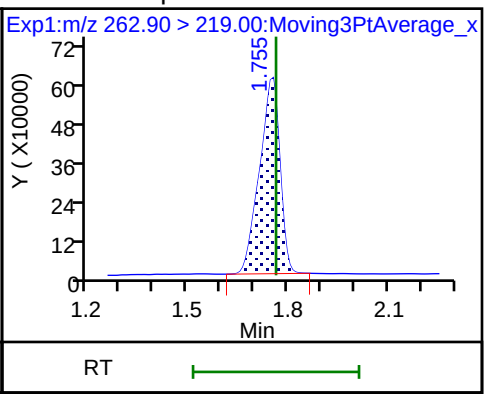
2 Perfluorobutyric acid



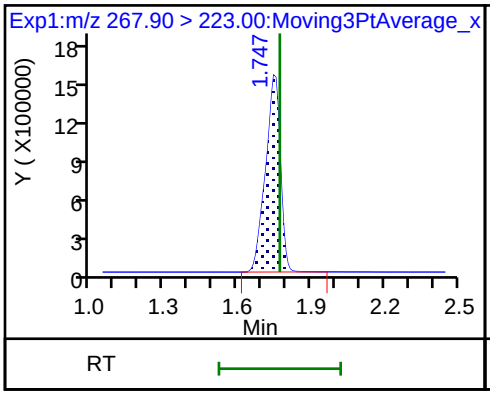
D 1 13C4 PFBA



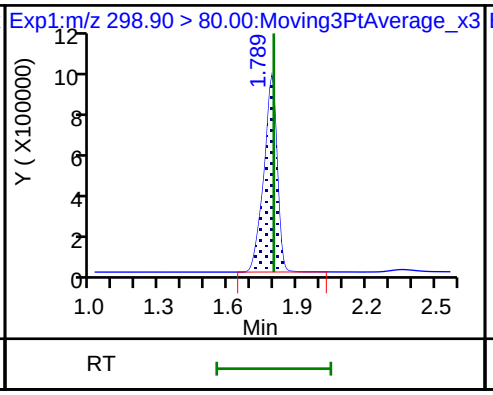
4 Perfluoropentanoic acid



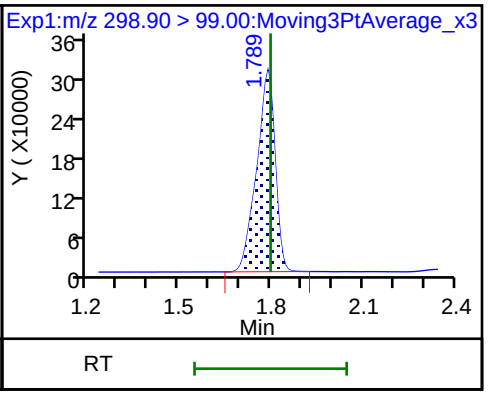
D 3 13C5-PFPeA



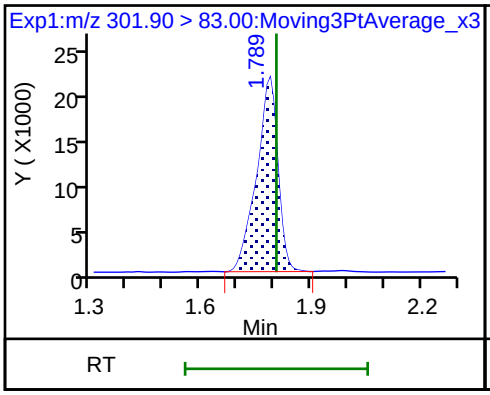
5 Perfluorobutanesulfonic acid



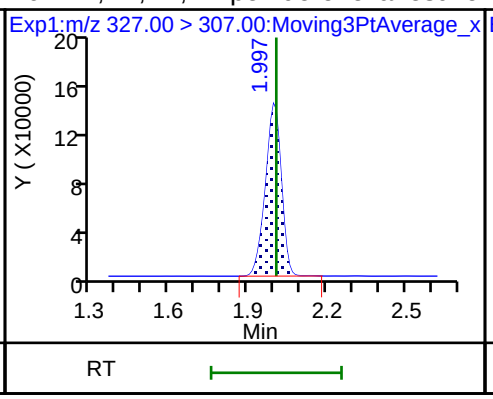
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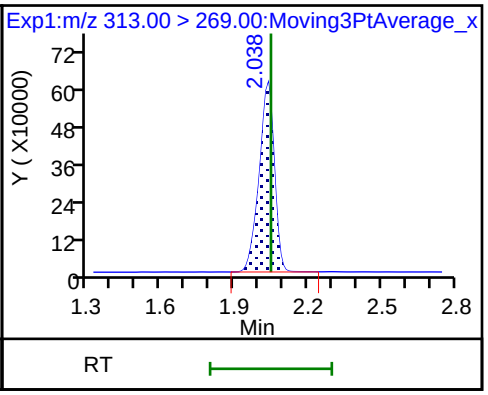
D 47 13C3-PFBS



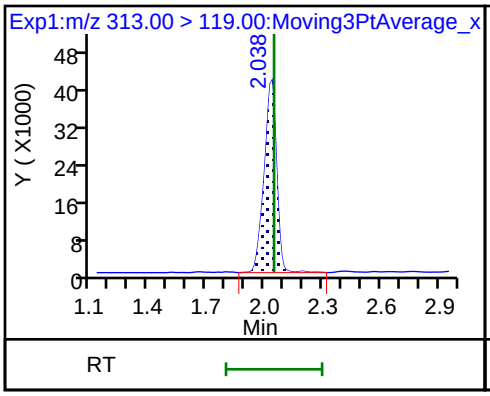
61 1H,1H,2H,2H-perfluorohexanesulfoni



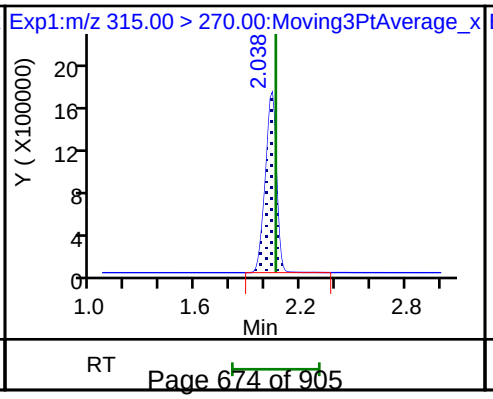
6 Perfluorohexanoic acid



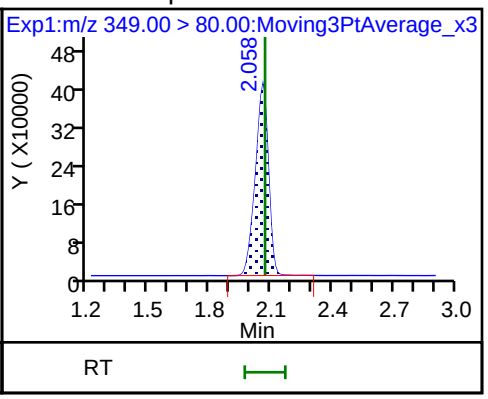
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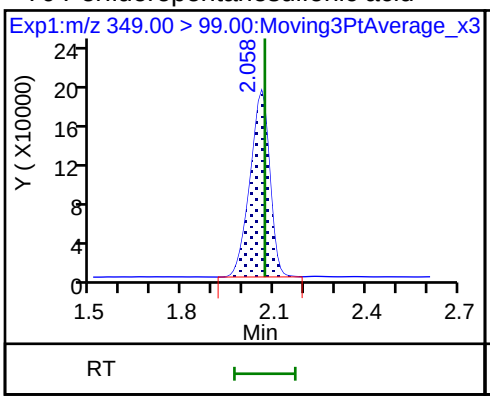
D 7 13C2 PFHxA



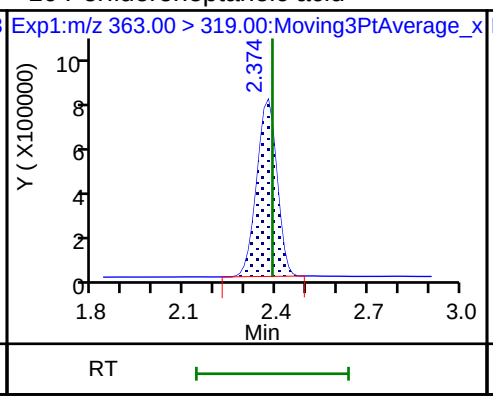
70 Perfluoropentanesulfonic acid



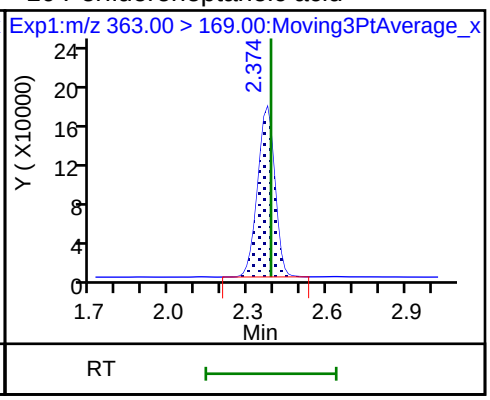
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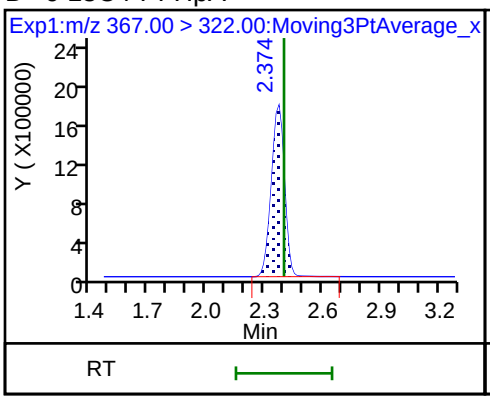
10 Perfluoroheptanoic acid



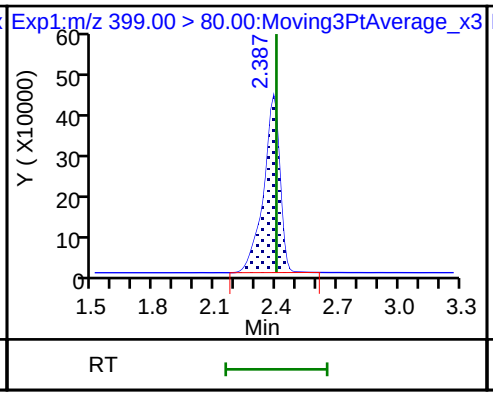
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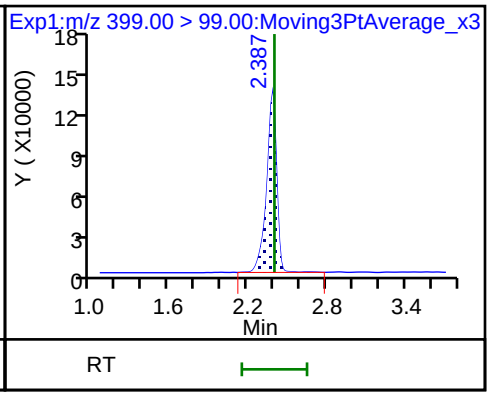
D 9 13C4-PFHpA



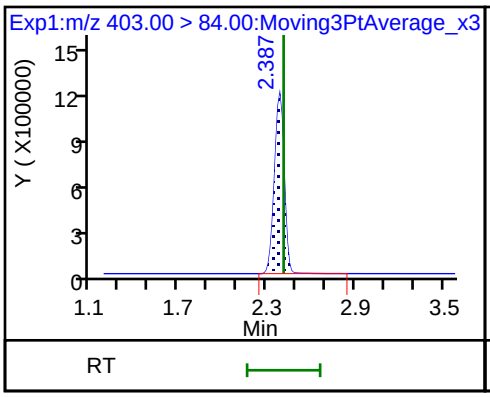
8 Perfluorohexanesulfonic acid



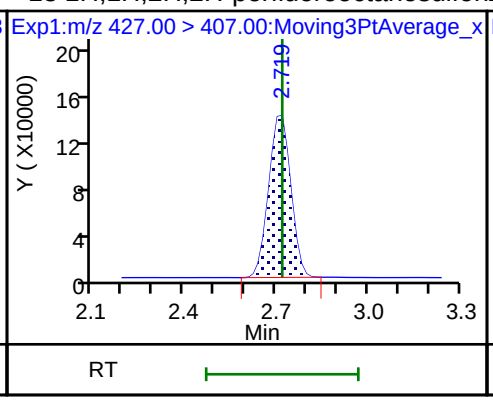
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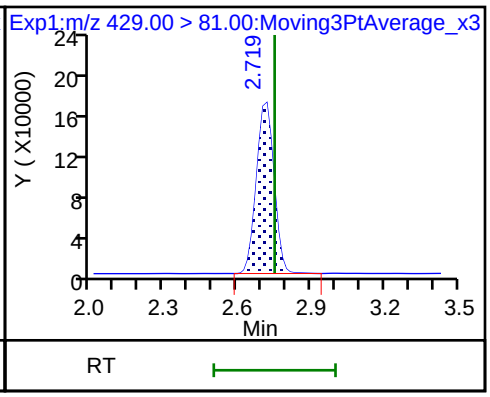
D 11 18O2 PFHxS



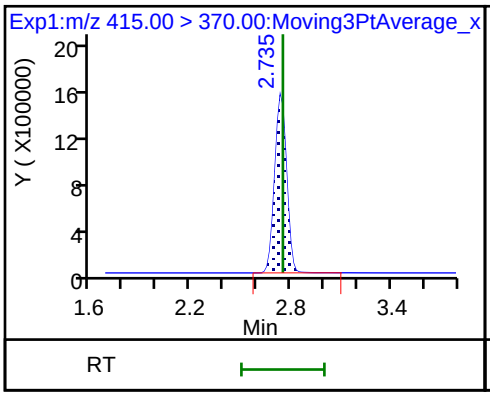
13 1H,1H,2H,2H-perfluorooctanesulfon



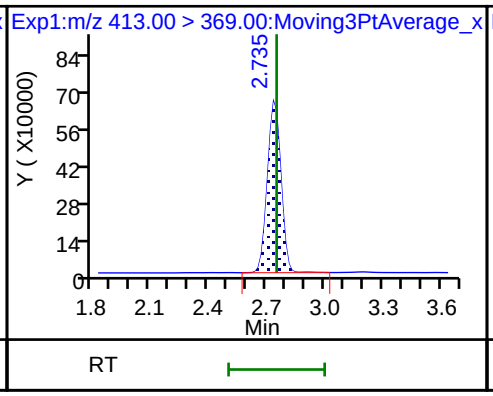
D 12 M2-6:2FTS



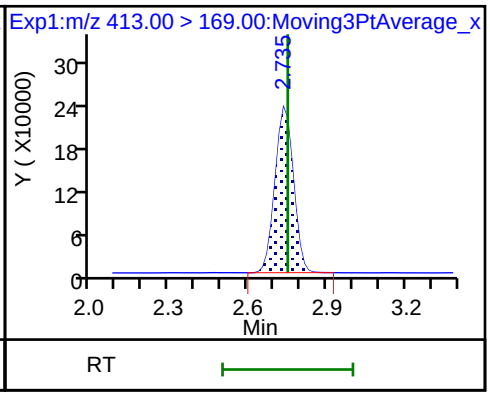
* 62 13C2-PFOA



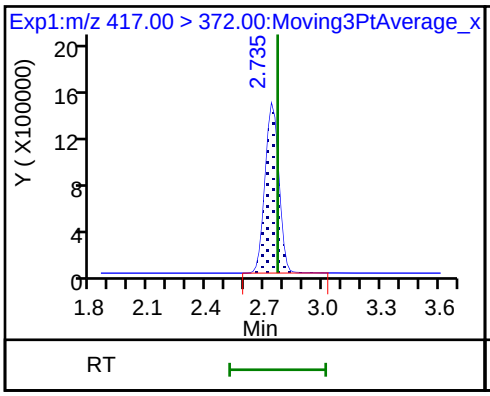
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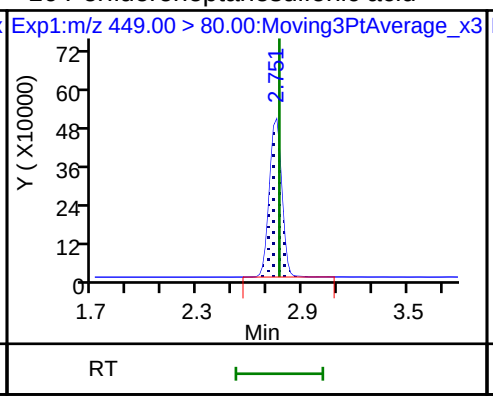
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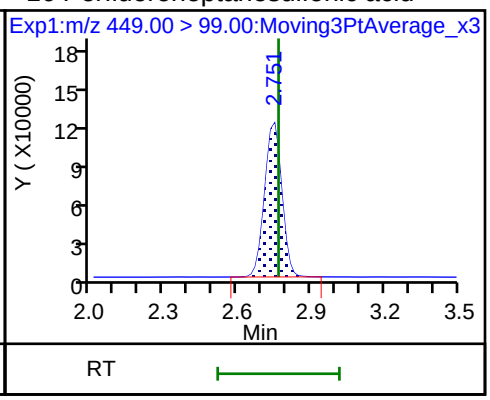
D 14 13C4 PFOA



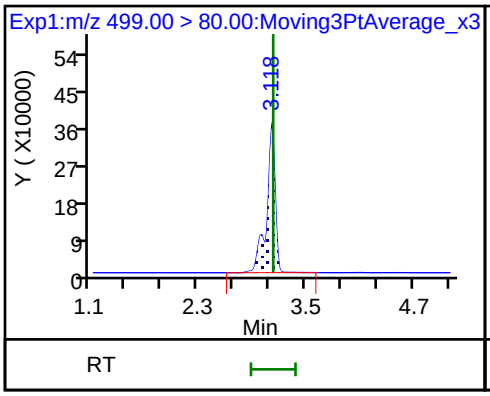
16 Perfluoroheptanesulfonic acid



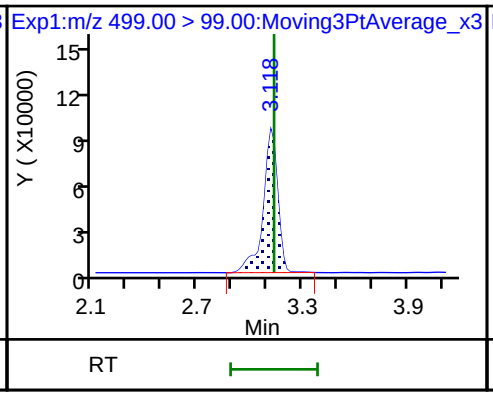
16 Perfluoroheptanesulfonic acid



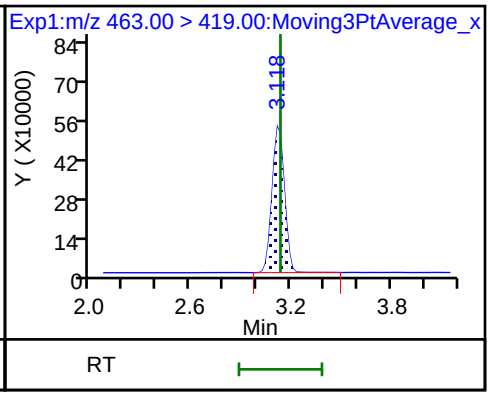
17 Perfluorooctane sulfonic acid



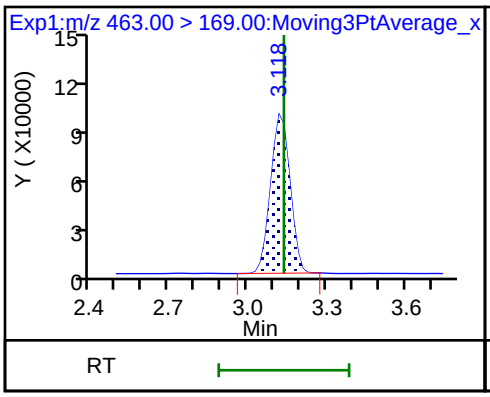
17 Perfluorooctane sulfonic acid



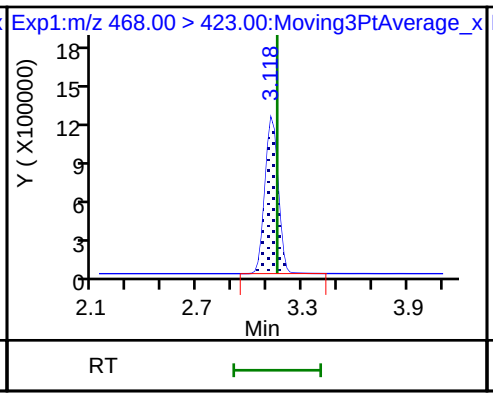
20 Perfluorononanoic acid



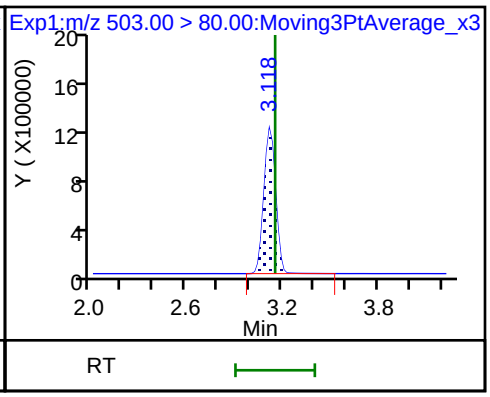
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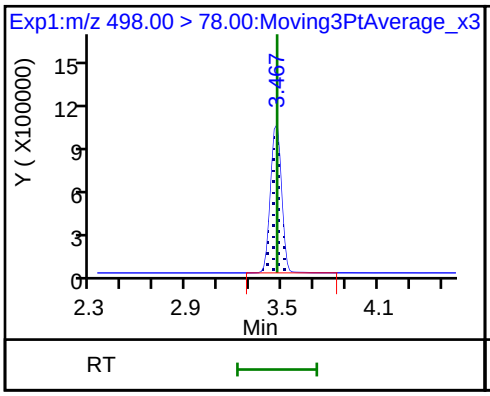
D 19 13C5 PFNA



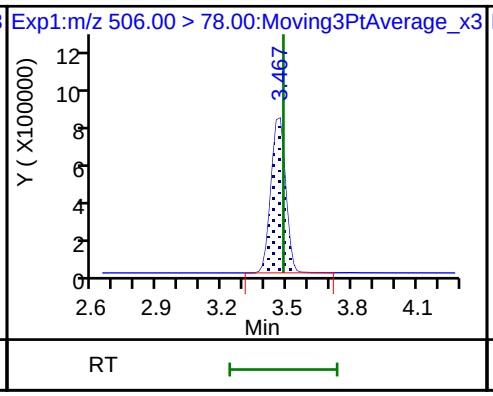
D 18 13C4 PFOS



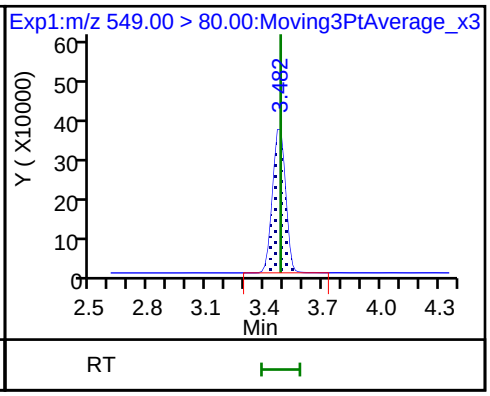
22 Perfluorooctane Sulfonamide



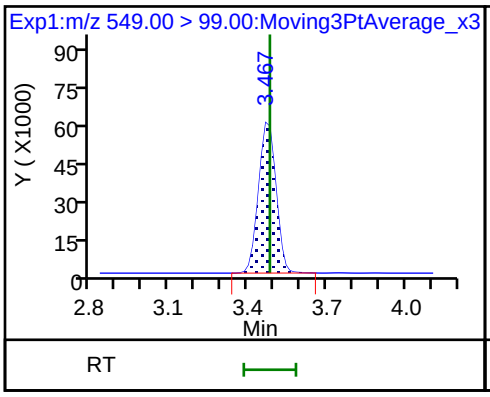
D 21 13C8 FOSA



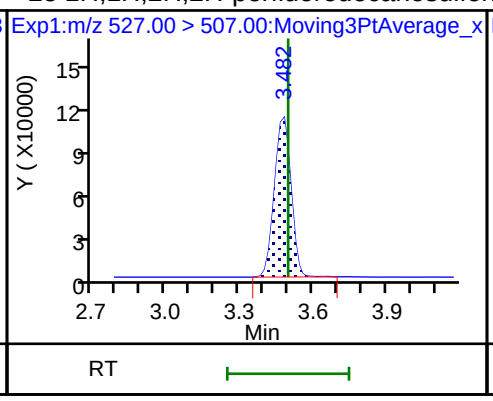
68 Perfluorononanesulfonic acid



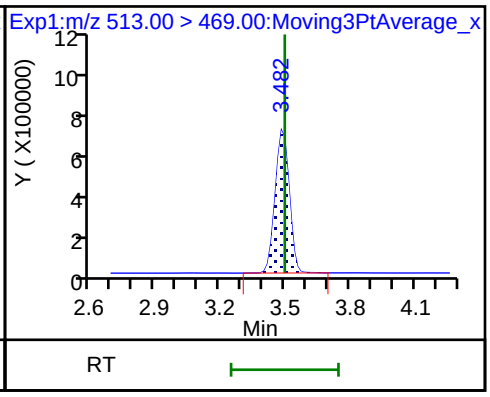
68 Perfluorononanesulfonic acid



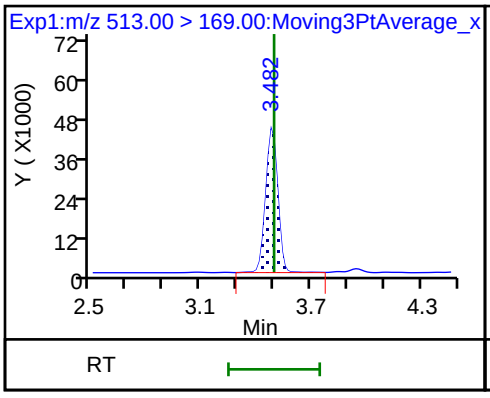
25 1H,1H,2H,2H-perfluorodecanesulfoni



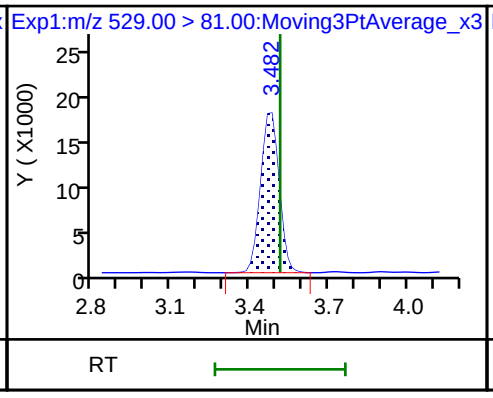
24 Perfluorodecanoic acid



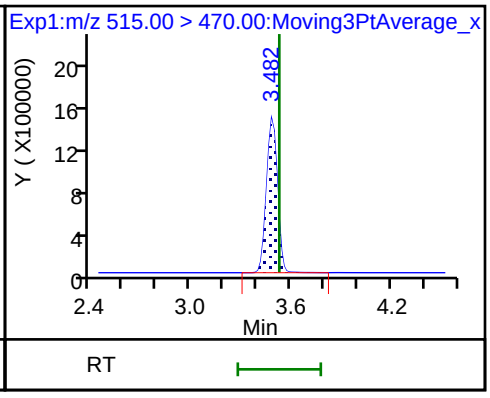
24 Perfluorodecanoic acid



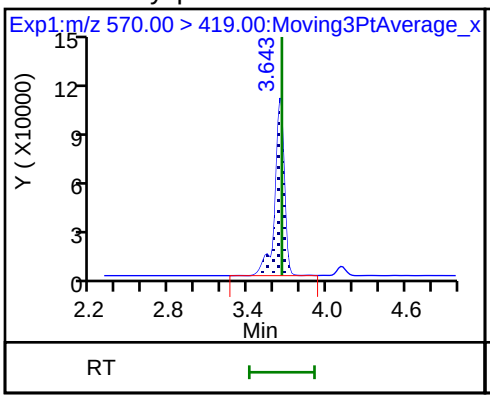
D 26 M2-8:2FTS



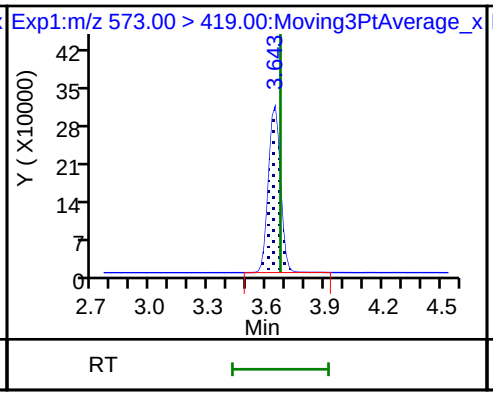
D 23 13C2 PFDA



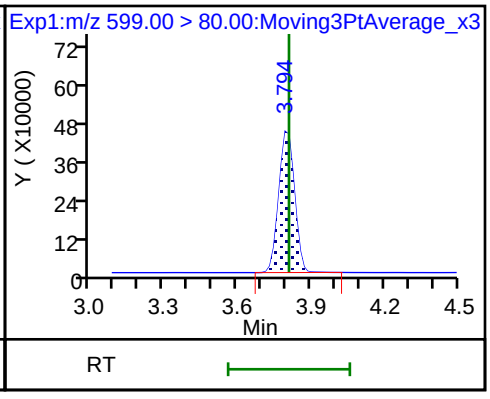
28 N-methyl perfluorooctane sulfonami



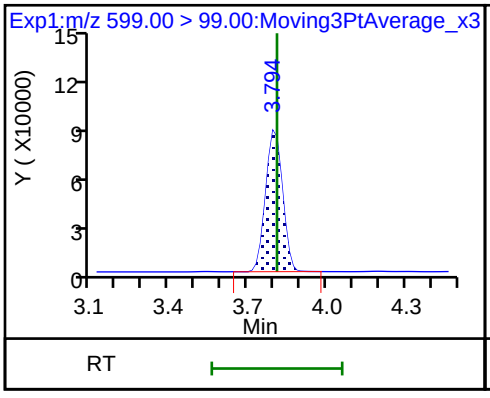
D 27 d3-NMeFOSAA



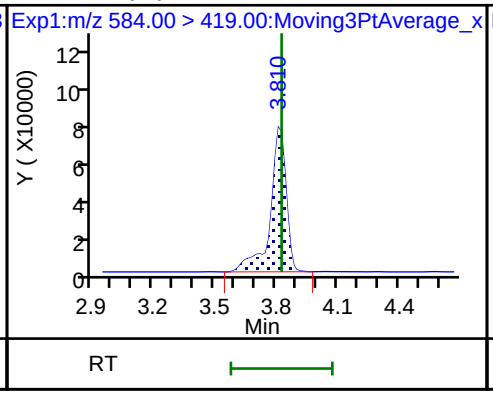
29 Perfluorodecane Sulfonic acid



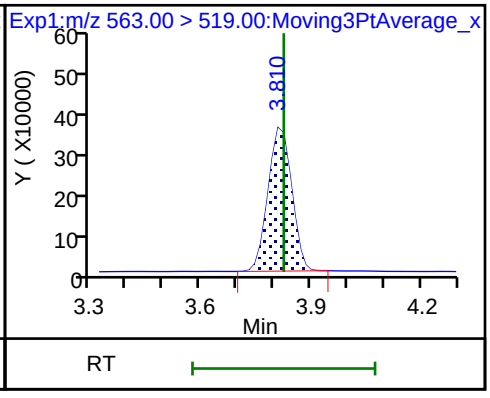
29 Perfluorodecane Sulfonic acid



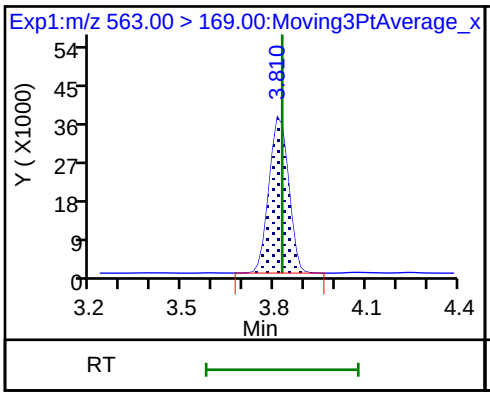
33 N-ethyl perfluorooctane sulfonamid



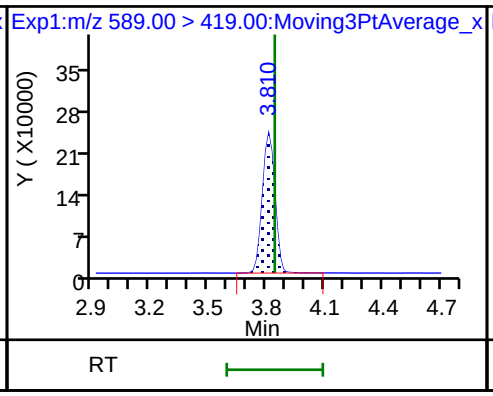
31 Perfluoroundecanoic acid



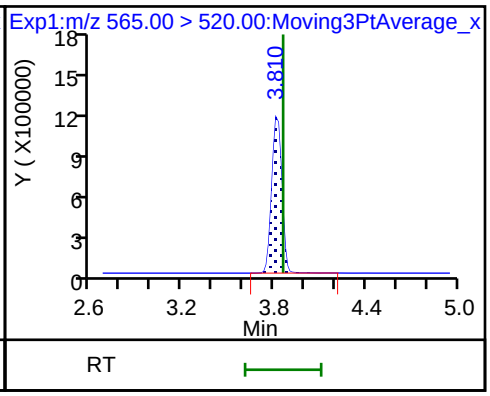
31 Perfluoroundecanoic acid



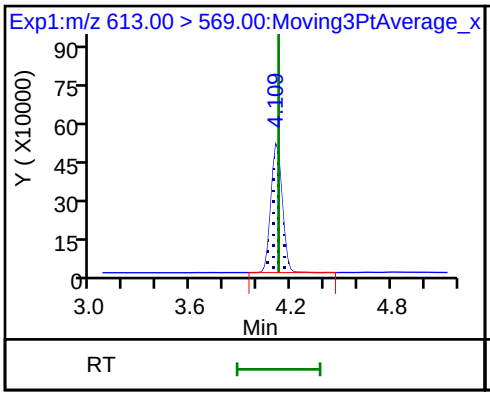
D 32 d5-NEtFOSAA



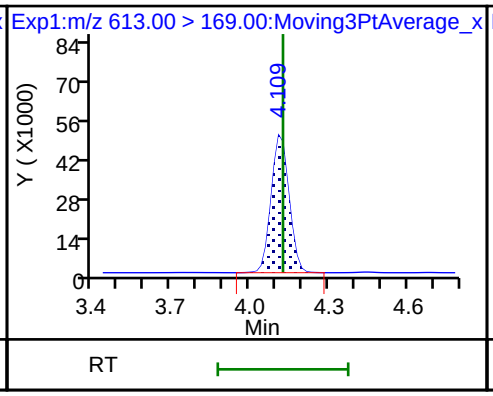
D 30 13C2 PFUnA



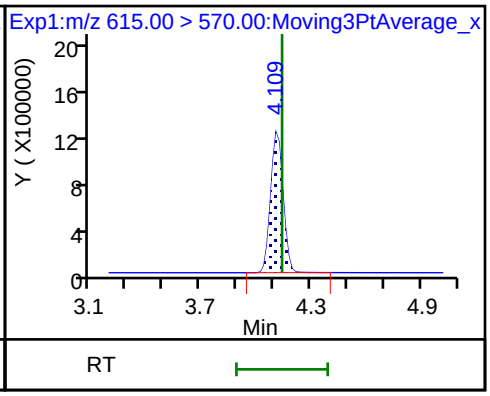
37 Perfluorododecanoic acid



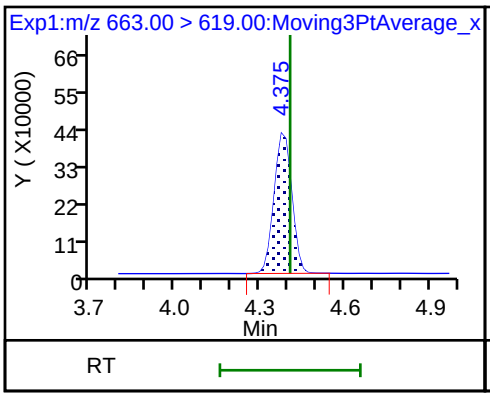
37 Perfluorododecanoic acid



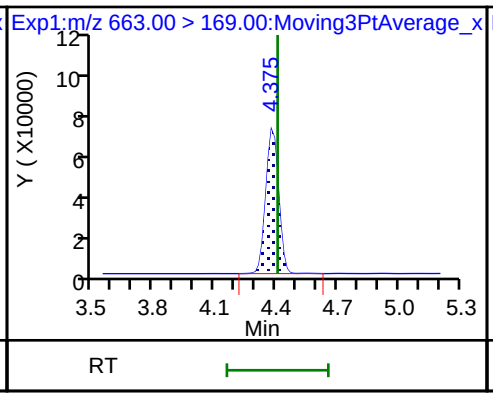
D 36 13C2 PFDoA



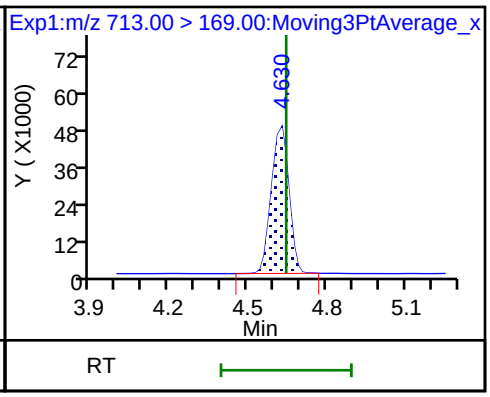
41 Perfluorotridecanoic acid



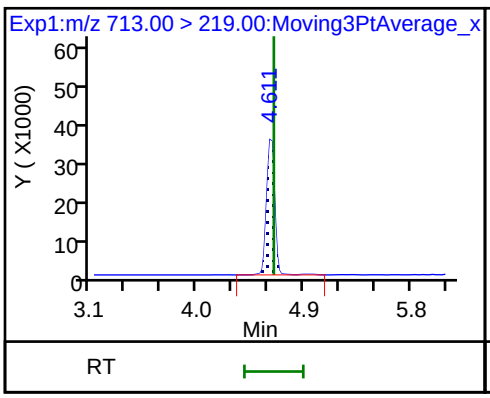
41 Perfluorotridecanoic acid



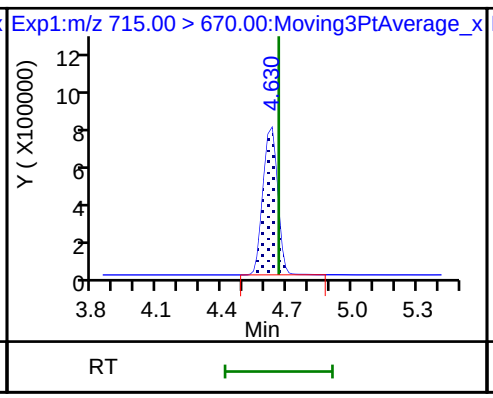
42 Perfluorotetradecanoic acid



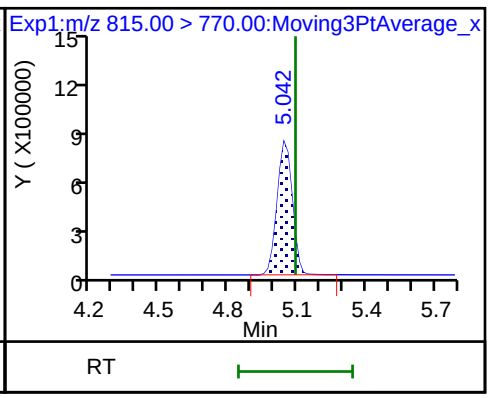
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCVL 320-239460/2 Calibration Date: 08/12/2018 10:33

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.12LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9293	0.8316		0.0447	0.0500	-10.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.082		0.0530	0.0500	6.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	112.6		0.0482	0.0442	9.0	30.0
4:2 FTS	AveID	17.02	15.03		0.400	0.0467	-11.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	1.003		0.0536	0.0500	7.2	30.0
Perfluoropentanesulfonic acid	AveID	48.91	52.51		0.0504	0.0469	7.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.018		0.0490	0.0500	-2.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.422		0.0506	0.0455	11.2	30.0
6:2 FTS	AveID	2.137	2.191		0.400	0.0474	2.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.152		0.0526	0.0501	5.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.005		0.0473	0.0476	-0.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.015		0.0481	0.0500	-3.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	0.9584		0.0415	0.0464	-10.6	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	3.171		0.0516	0.0500	3.2	30.0
8:2 FTS	AveID	14.02	13.62		0.400	0.0479	-2.9	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.6061		0.0444	0.0480	-7.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.167		0.0475	0.0500	-5.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	0.9389		0.400	0.0500	-7.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.7437		0.0430	0.0482	-10.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.9525		0.0531	0.0500	6.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.9016		0.0535	0.0500	7.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.136		0.0578	0.0500	15.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.7725		0.0515	0.0500	2.9	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1683		0.0522	0.0500	4.5	30.0
13C4 PFBA	Ave	1.117	0.9571		2.14	2.50	-14.3	30.0
13C5-PFPeA	Ave	0.999	0.8325		2.08	2.50	-16.6	30.0
13C3-PFBS	Ave	0.0155	0.0120		1.80	2.33	-22.7	30.0
13C2 PFHxA	Ave	1.037	0.8866		2.14	2.50	-14.5	30.0
13C4-PFHpA	Ave	1.177	1.074		2.28	2.50	-8.8	30.0
18O2 PFHxS	Ave	0.8862	0.7597		2.03	2.37	-14.3	30.0
M2-6:2FTS	Ave	0.1144	0.1104		2.29	2.38	-3.5	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCVL 320-239460/2 Calibration Date: 08/12/2018 10:33

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.12LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	0.9815		2.49	2.50	-0.5	30.0
13C4 PFOS	Ave	0.9223	0.8032		2.08	2.39	-12.9	30.0
13C5 PFNA	Ave	0.8463	0.8517		2.52	2.50	0.6	30.0
13C8 FOSA	Ave	0.5512	0.4828		2.19	2.50	-12.4	30.0
M2-8:2FTS	Ave	0.0133	0.0132		2.38	2.40	-0.5	30.0
13C2 PFDA	Ave	0.8474	0.8407		2.48	2.50	-0.8	30.0
d3-NMeFOSAA	Ave	0.1647	0.1655		2.51	2.50	0.5	30.0
d5-NEtFOSAA	Ave	0.1353	0.1487		2.75	2.50	9.9	30.0
13C2 PFUnA	Ave	0.6849	0.6330		2.31	2.50	-7.6	30.0
13C2 PFDoA	Ave	0.7384	0.7143		2.42	2.50	-3.3	30.0
13C2-PFTeDA	Ave	0.4715	0.4698		2.49	2.50	-0.4	30.0
13C2-PFHxDA	Ave	0.4325	0.4295		2.48	2.50	-0.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 12-Aug-2018 10:33:17 ALS Bottle#: 21 Worklist Smp#: 2
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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:50:54 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: roycea Date: 12-Aug-2018 13:50:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.494	0.0	0.540	7276078	2.14		85.7	15237	
2 Perfluorobutyric acid										
212.90 > 169.00	1.494	1.494	0.0	1.000	121011	0.0447		89.5	5.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.764	0.0	0.638	6328717	2.08		83.4	7782	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.764	1.764	0.0	1.000	136914	0.0530		106	7.6	M
D 47 13C3-PFBS										
301.90 > 83.00	1.806	1.806	0.0	0.653	84575	1.80		77.3	498	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.806	1.806	0.0	1.000	180980	0.0482		109	42.7	
298.90 > 99.00	1.806	1.806	0.0	1.000	58484		3.09(1.35-4.05)		23.6	
D 60 M2-4:2FTS										
329.00 > 81.00	2.018	2.018	0.0	0.729	494473	NC			536	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.018	2.018	0.0	1.117	25534	0.0412		88.3	184	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.058	0.0	0.744	6740117	2.14		85.5	9425	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.058	2.058	0.0	1.000	135148	0.0536		107	43.0	
313.00 > 119.00	2.058	2.058	0.0	1.000	9072		14.90(6.96-20.87)		19.2	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.079	2.079	0.0	1.151	89592	0.0504		107	213	
349.00 > 99.00	2.079	2.079	0.0	1.151	42939		2.09(1.15-3.45)		40.0	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.161	2.161	0.0	0.781	835127	NC			4346	

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	2.161	2.161	0.0	1.000	30522	NC			29.2	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.400	0.0	0.867	8160947	2.28		91.2	4847	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.413	0.0	0.872	5463509	2.03		85.7	6448	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.400	2.400	0.0	1.000	166111	0.0490		98.0	17.7	
363.00 > 169.00	2.400	2.400	0.0	1.000	40905		4.06(2.17-6.52)		103	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	149514	0.0506		111	221	
399.00 > 99.00	2.413	2.413	0.0	1.000	38748		3.86(1.90-5.70)		16.0	
65 ADONA										
377.00 > 251.00	2.440	2.440	0.0	0.773	266856	NC			508	
377.00 > 85.00	2.440	2.440	0.0	0.773	105963		2.52(1.05-3.16)		74.5	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.735	0.0	0.988	797447	2.29		96.5	1190	
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.767	0.0	1.000	7461242	2.49		99.5	6936	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.735	0.0	1.000	34872	0.0486		103	31.1	
* 62 13C2-PFOA										
415.00 > 370.00	2.767	2.767	0.0		7601858	2.50			7712	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.767	2.767	0.0	1.000	172059	0.0526		105	25.9	
413.00 > 169.00	2.767	2.767	0.0	1.000	66626		2.58(1.36-4.08)		85.3	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.783	2.783	0.0	0.882	116868	0.0473		99.5	132	
449.00 > 99.00	2.783	2.783	0.0	0.882	25322		4.62(1.84-5.53)		76.3	
D 18 13C4 PFOS										
503.00 > 80.00	3.155	3.155	0.0	1.140	5836999	2.08		87.1	5601	
D 19 13C5 PFNA										
468.00 > 423.00	3.155	3.155	0.0	1.140	6474505	2.52		101	8454	
20 Perfluorononanoic acid										
463.00 > 419.00	3.155	3.155	0.0	1.000	131389	0.0481		96.2	32.3	
463.00 > 169.00	3.155	3.155	0.0	1.000	22646		5.80(2.68-8.03)		45.8	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.155	3.155	0.0	1.000	108608	0.0415		89.4	86.8	
499.00 > 99.00	3.155	3.155	0.0	1.000	31507		3.45(2.04-6.12)		66.9	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.369	3.369	0.0	1.068	124595	NC			192	
D 21 13C8 FOSA										
506.00 > 78.00	3.483	3.483	0.0	1.259	3670058	2.19		87.6	4495	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.483	3.483	0.0	1.000	232753	0.0516		103	360	
D 23 13C2 PFDA										
515.00 > 470.00	3.530	3.530	0.0	1.276	6391005	2.48		99.2	9679	

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	3.515	3.515	0.0	1.270	96306	2.38		99.5	271	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.515	3.515	0.0	1.114	71050	0.0444		92.6	122	
549.00 > 99.00	3.515	3.515	0.0	1.114	13172		5.39(3.02-9.05)		113	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.515	3.515	0.0	1.000	26228	0.0465		97.1	159	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.530	3.530	0.0	1.000	149164	0.0475		94.9	38.5	
513.00 > 169.00	3.515	3.530	-0.015	0.996	12336		12.09(7.12-21.35)		23.4	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.671	3.671	0.0	1.327	1258280	2.51		100	3416	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.685	3.685	0.0	1.004	23629	0.0465		92.9	14.3	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.842	3.842	0.0	1.388	1130523	2.75		110	1928	
D 30 13C2 PFUnA										
565.00 > 520.00	3.857	3.857	0.0	1.394	4811750	2.31		92.4	7333	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.842	3.842	0.0	1.218	87549	0.0430		89.2	160	
599.00 > 99.00	3.842	3.842	0.0	1.218	22425		3.90(2.14-6.43)		52.1	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.857	3.857	0.0	1.004	21537	0.0531		106	54.3	M
31 Perfluoroundecanoic acid										M
563.00 > 519.00	3.857	3.857	0.0	1.000	86766	0.0535		107	14.1	
563.00 > 169.00	3.857	3.857	0.0	1.000	9826		8.83(5.24-15.72)		37.5	M
35 MeFOSA										
512.00 > 169.00	3.963	3.963	0.0		30845	NC			143	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.010	4.010	0.0	1.271	142385	NC			752	
D 36 13C2 PFDoA										
615.00 > 570.00	4.160	4.160	0.0	1.503	5429976	2.42		96.7	5101	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.160	4.160	0.0	1.000	123395	0.0578		116	28.3	
613.00 > 169.00	4.142	4.160	-0.018	0.996	13060		9.45(4.68-14.05)		53.0	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.160	4.160	0.0	1.184	15451	NC			50.2	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.391	4.391	0.0	1.392	7603	NC			40.0	
699.00 > 99.00	4.391	4.391	0.0	1.392	15085		0.50(0.28-0.83)		49.2	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.422	4.422	0.0	1.063	83896	0.0515		103	29.2	
663.00 > 169.00	4.422	4.422	0.0	1.063	13622		6.16(3.09-9.27)		42.9	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.677	4.677	0.0	1.690	3571593	2.49		99.6	10640	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.677	4.677	0.0	1.000	12019	0.0522		104	55.1	
713.00 > 219.00	4.661	4.677	-0.016	0.997	11073		1.09(0.70-2.09)		37.0	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.093	5.093	0.0	1.840	3265197	2.48		99.3	7308	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.093	5.093	0.0	1.000	81813	NC			6.6	
813.00 > 169.00	5.093	5.093	0.0	1.000	13779		5.94(2.77-8.32)		38.7	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.476	5.476	0.0	1.075	45116	NC			24.5	
913.00 > 169.00	5.476	5.476	0.0	1.075	7970		5.66(2.55-7.64)		78.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 12-Aug-2018 13:50:57 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_005.d

Injection Date: 12-Aug-2018 10:33:17 Instrument ID: A9

Lims ID: CCVL

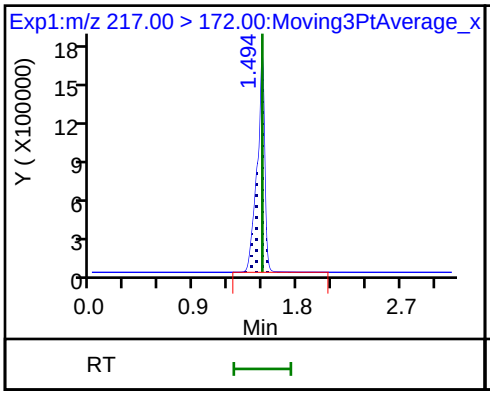
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2

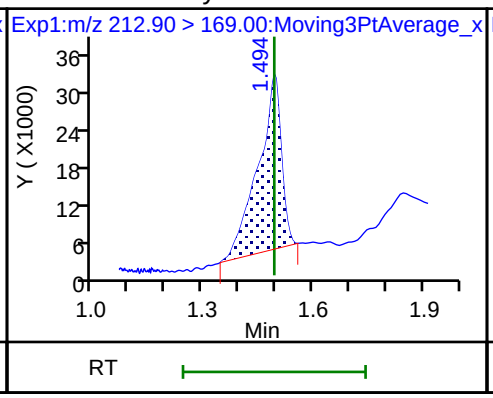
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

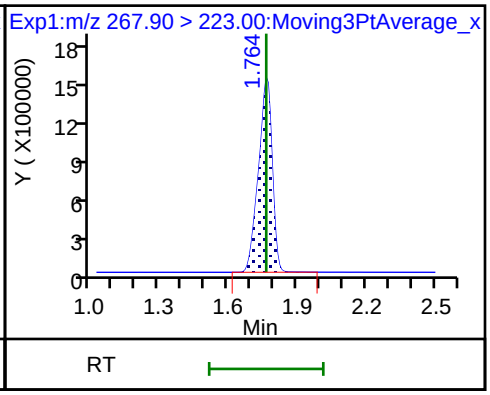
D 1 13C4 PFBA



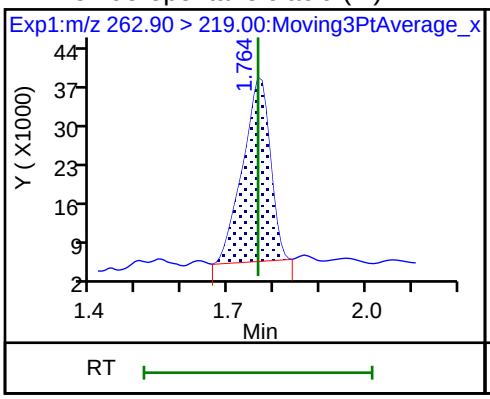
2 Perfluorobutyric acid



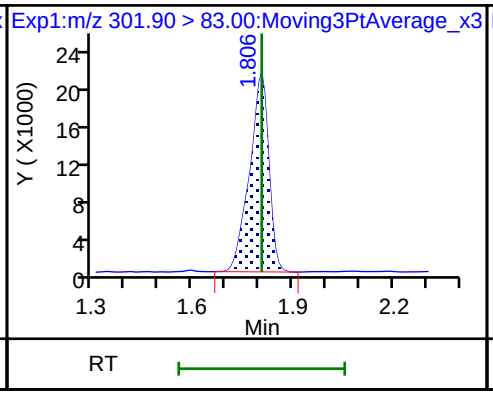
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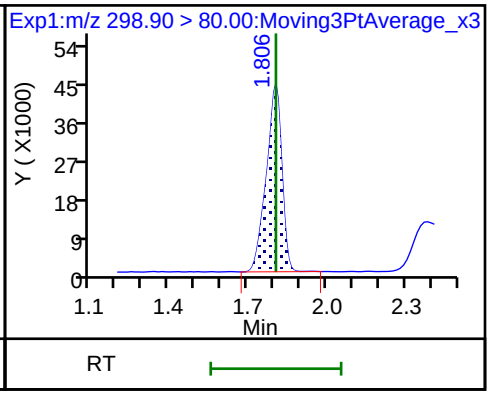
4 Perfluoropentanoic acid (M)



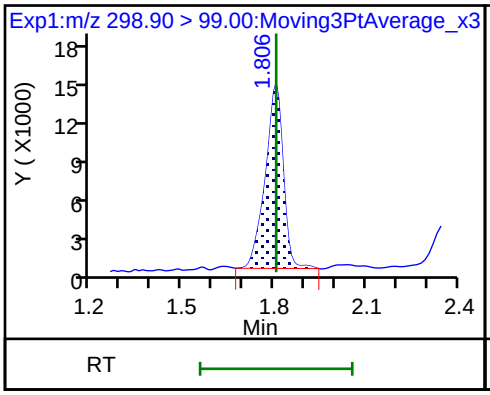
D 47 13C3-PFBS



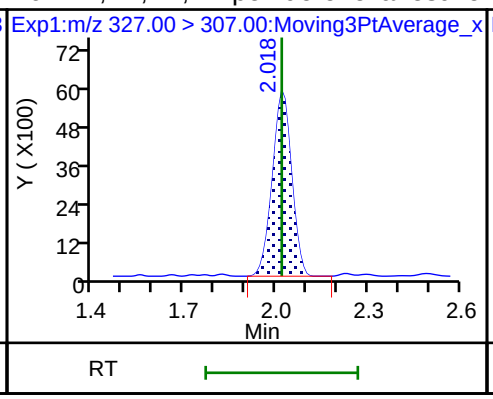
5 Perfluorobutanesulfonic acid



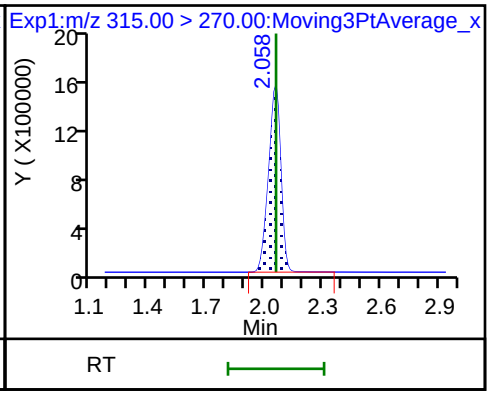
5 Perfluorobutanesulfonic acid



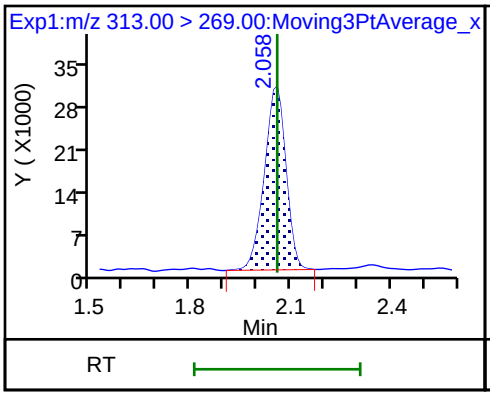
61 1H,1H,2H,2H-perfluorohexanesulfon



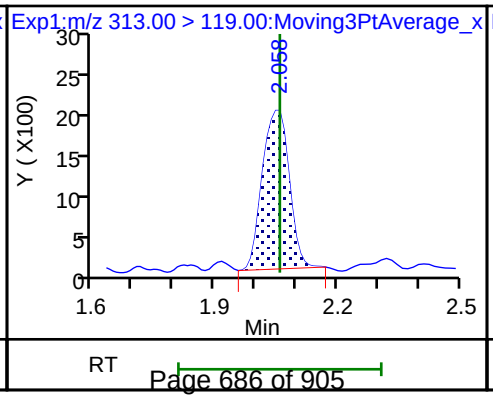
D 7 13C2 PFHxA



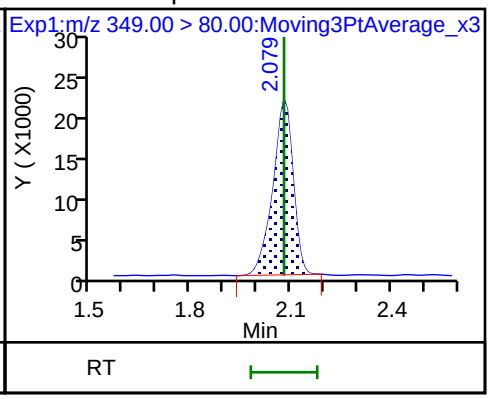
6 Perfluorohexanoic acid



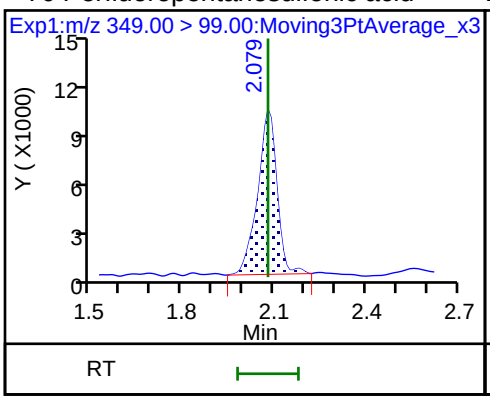
6 Perfluorohexanoic acid



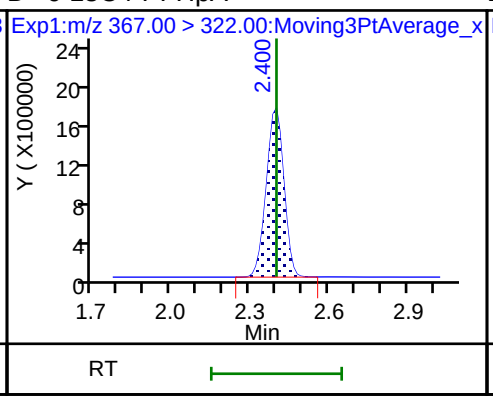
70 Perfluoropentanesulfonic acid



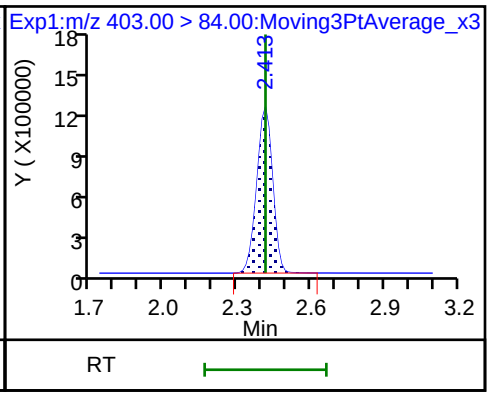
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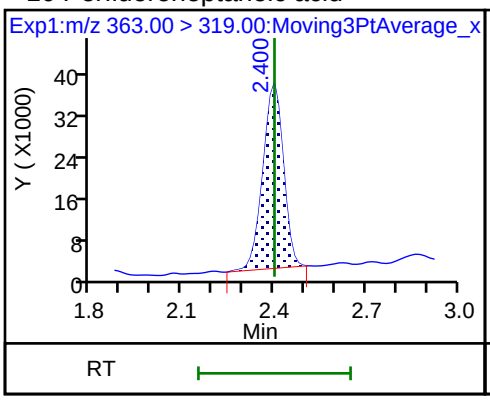
D 9 13C4-PFHpA



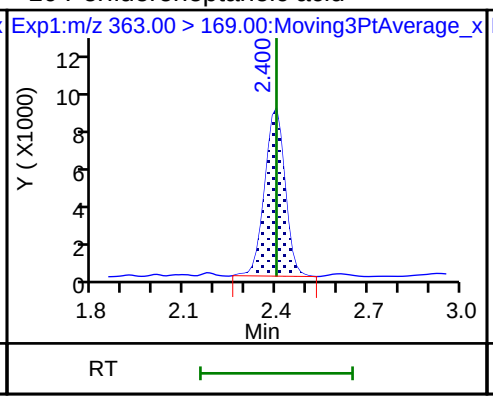
D 11 18O2 PFHxS



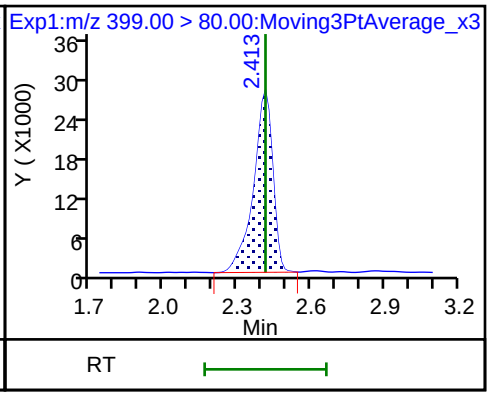
10 Perfluoroheptanoic acid



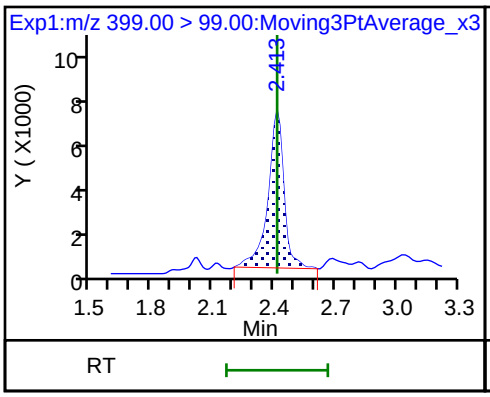
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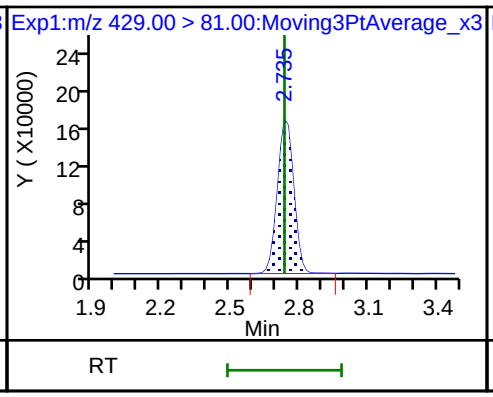
8 Perfluorohexanesulfonic acid



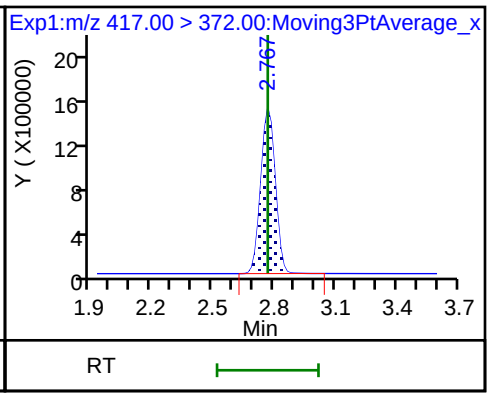
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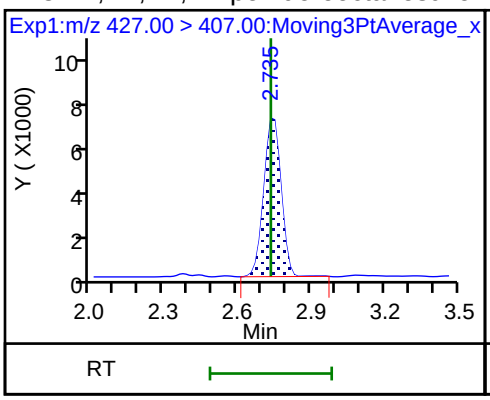
D 12 M2-6:2FTS

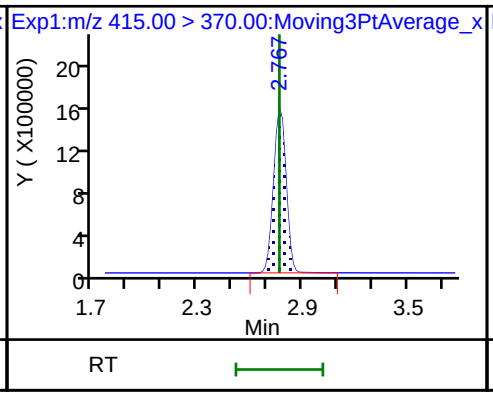


D 14 13C4 PFOA

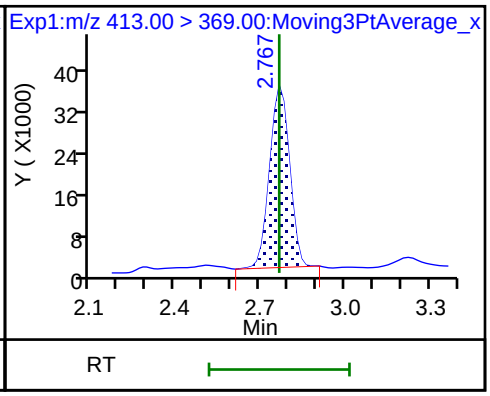


13 1H,1H,2H,2H-perfluorooctanesulfonf 62 13C2-PFOA

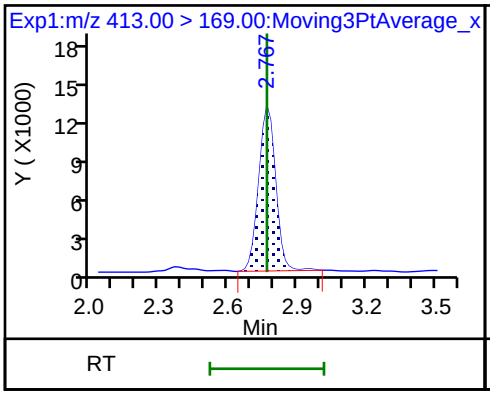




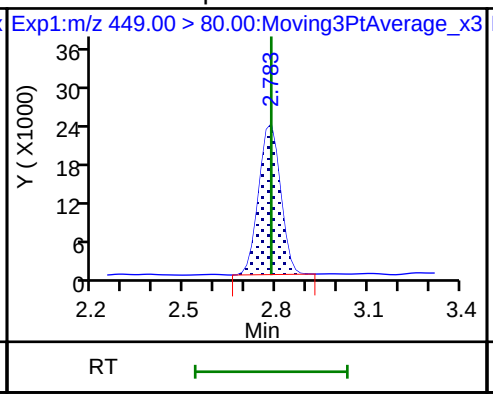
15 Perfluorooctanoic acid



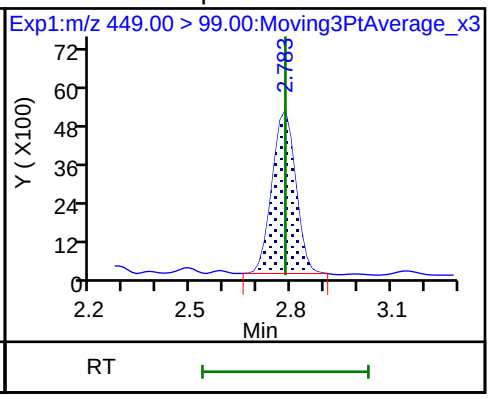
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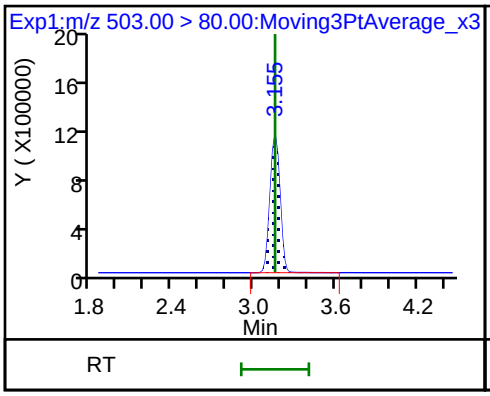
16 Perfluoroheptanesulfonic acid



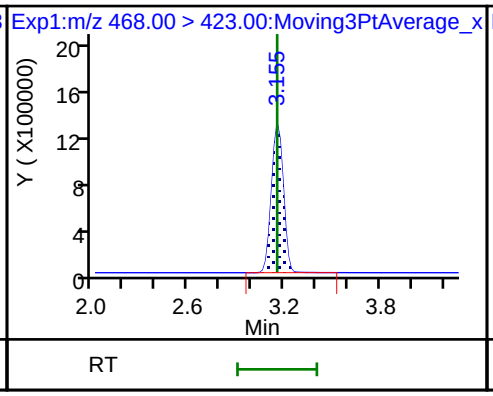
16 Perfluoroheptanesulfonic acid



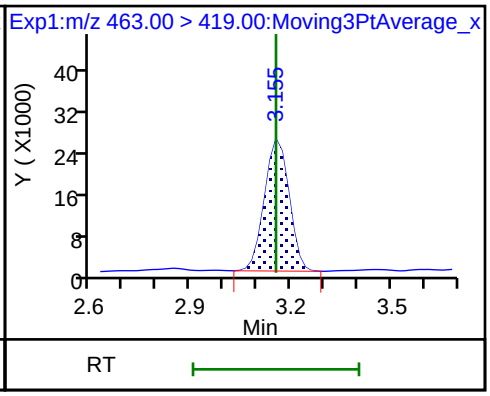
D 18 13C4 PFOS



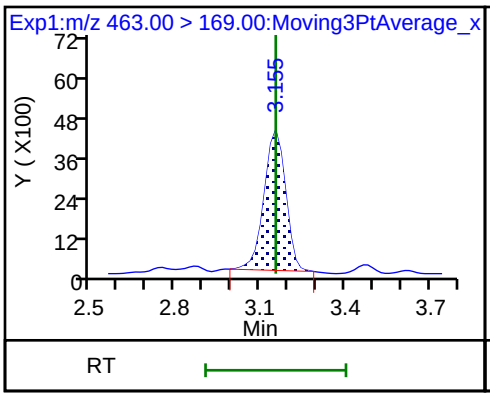
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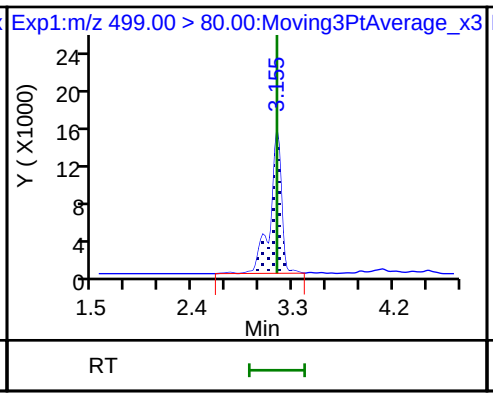
20 Perfluorononanoic acid



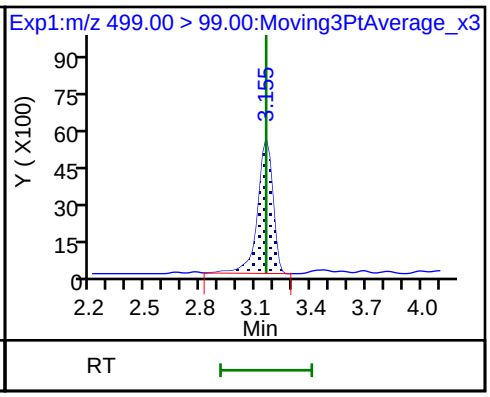
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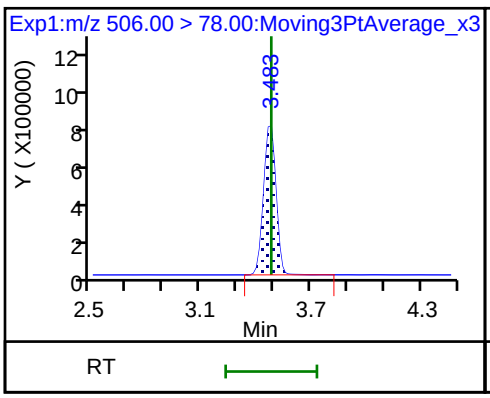
17 Perfluorooctane sulfonic acid



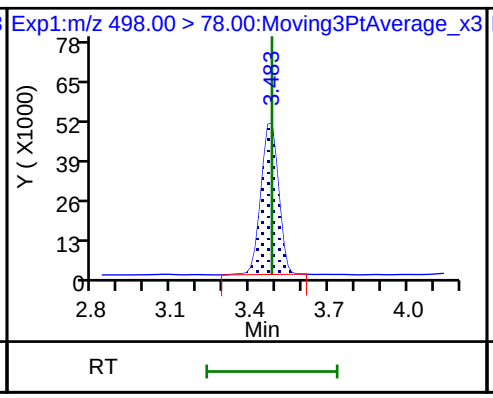
17 Perfluorooctane sulfonic acid



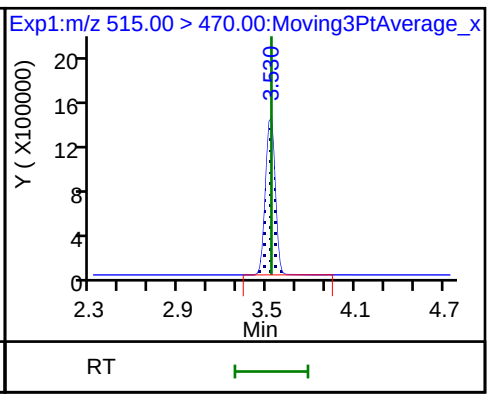
D 21 13C8 FOSA



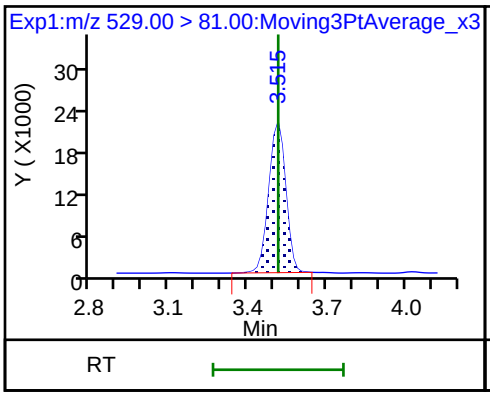
22 Perfluorooctane Sulfonamide



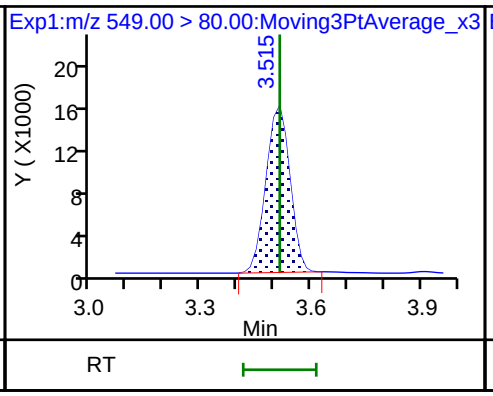
D 23 13C2 PFDA



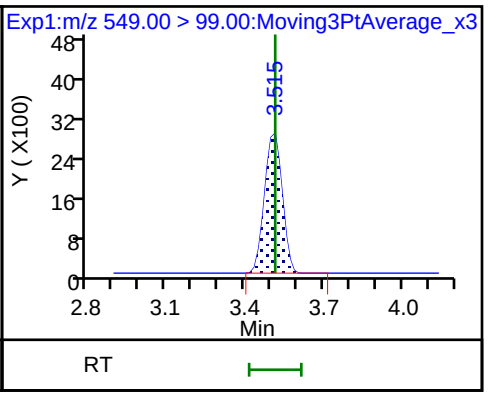
D 26 M2-8:2FTS



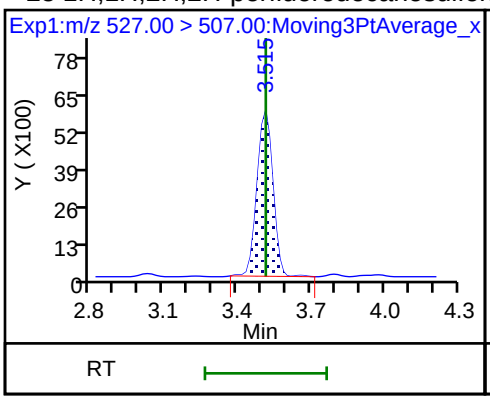
68 Perfluorononanesulfonic acid



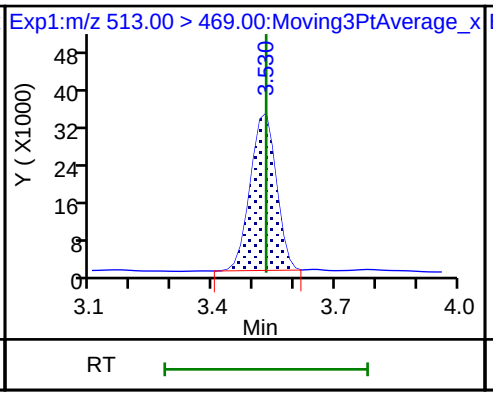
68 Perfluorononanesulfonic acid



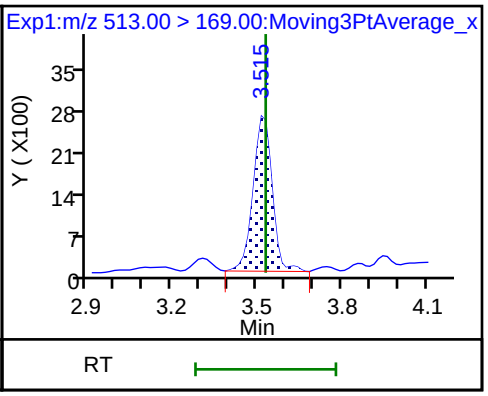
25 1H,1H,2H,2H-perfluorodecanesulfoni



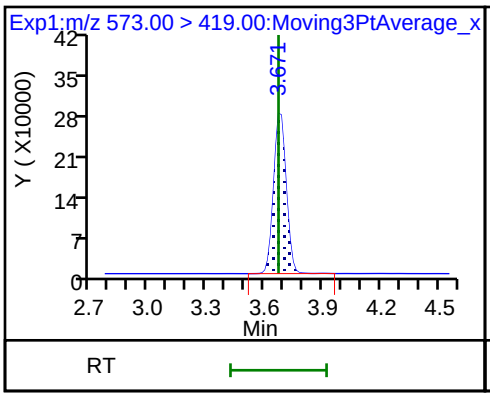
24 Perfluorodecanoic acid



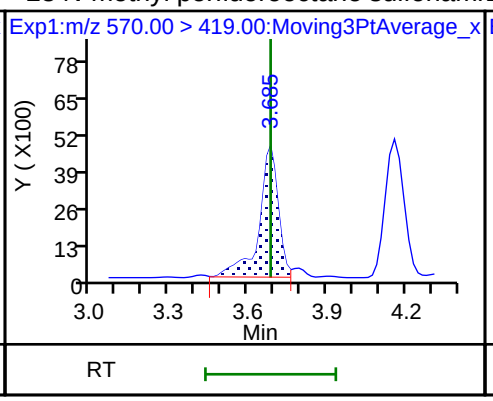
24 Perfluorodecanoic acid



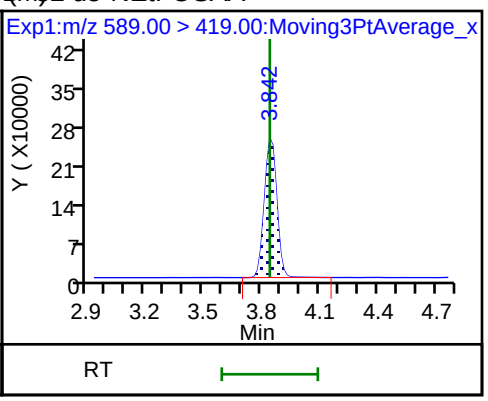
D 27 d3-NMeFOSAA



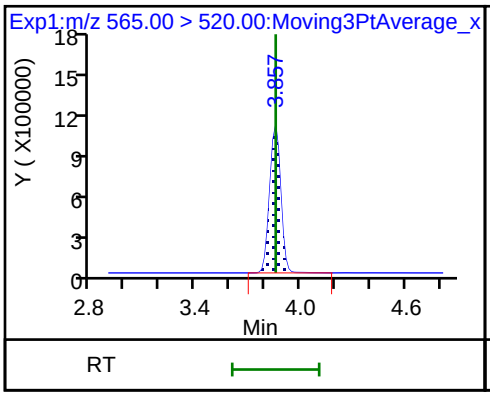
28 N-methyl perfluorooctane sulfonamid



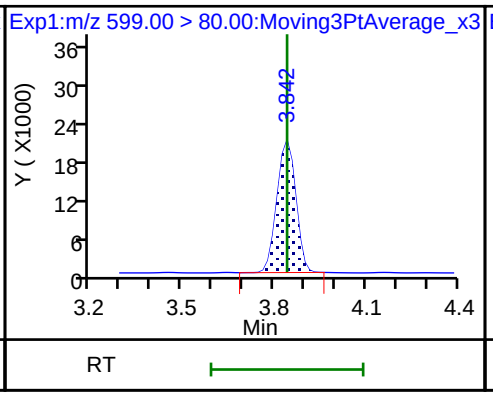
D 32 d5-NEtFOSAA



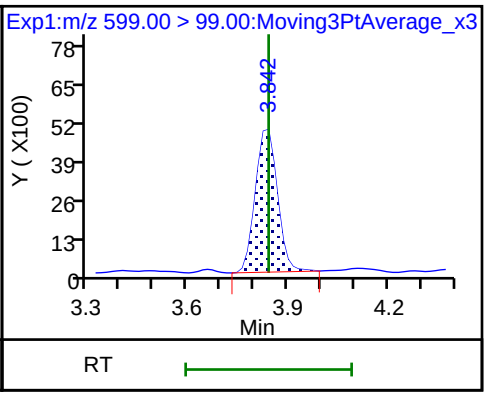
D 30 13C2 PFUnA



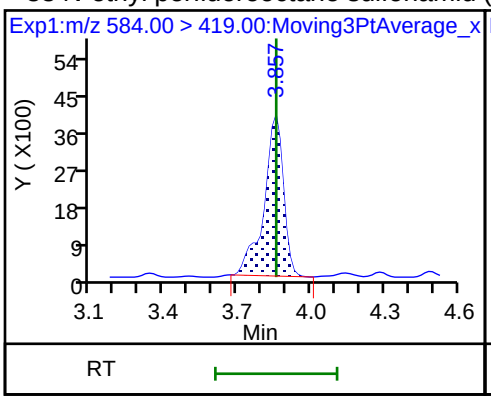
29 Perfluorodecane Sulfonic acid



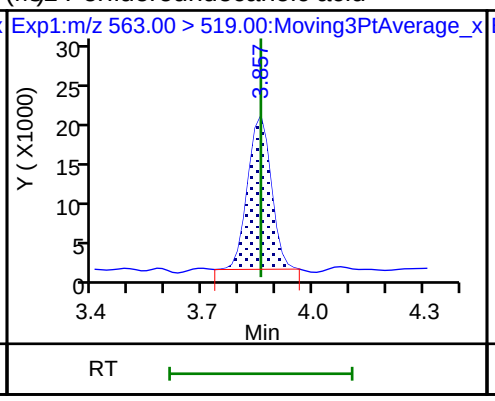
29 Perfluorodecane Sulfonic acid



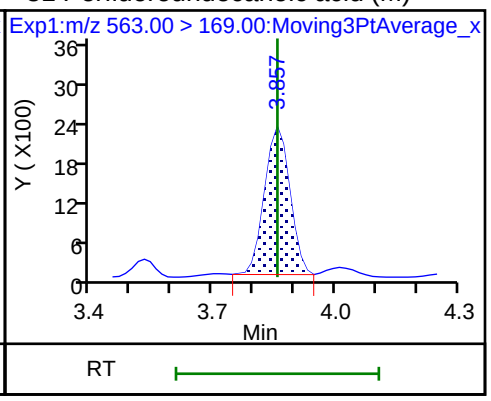
33 N-ethyl perfluorooctane sulfonamid (M)



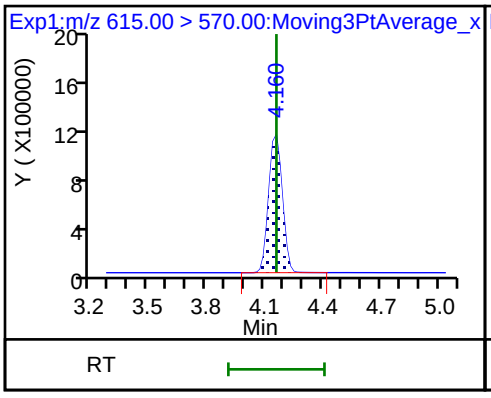
31 Perfluoroundecanoic acid



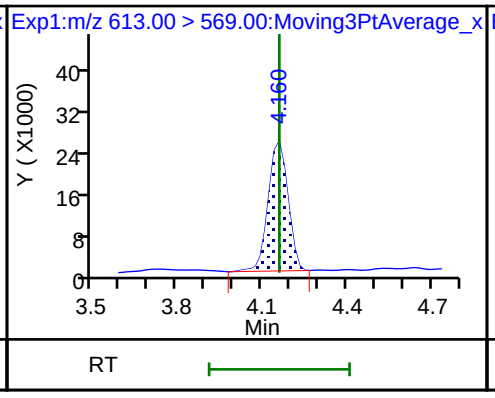
31 Perfluoroundecanoic acid (M)



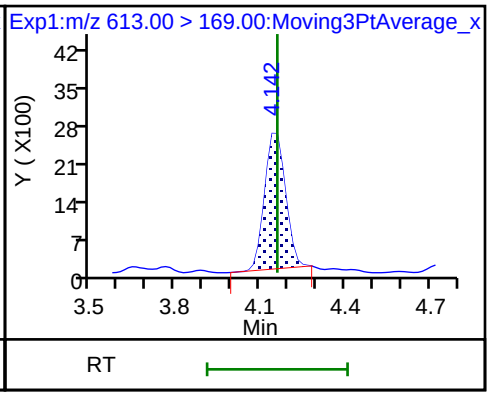
D 36 13C2 PFDoA



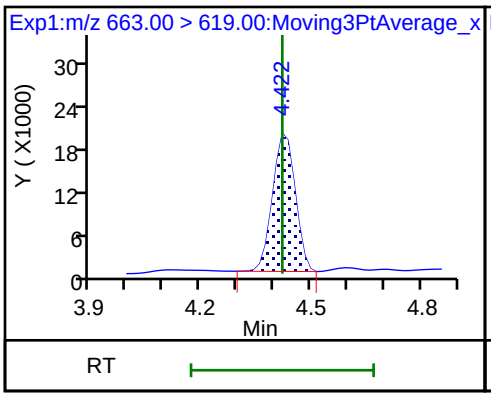
37 Perfluorododecanoic acid



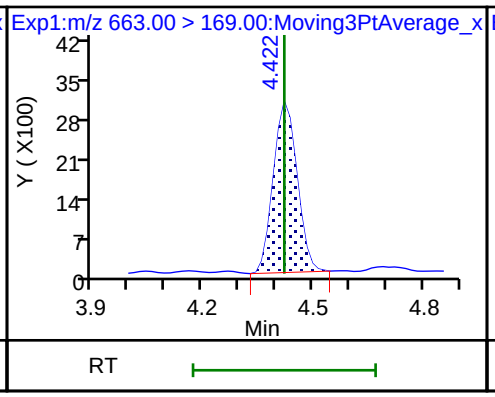
37 Perfluorododecanoic acid



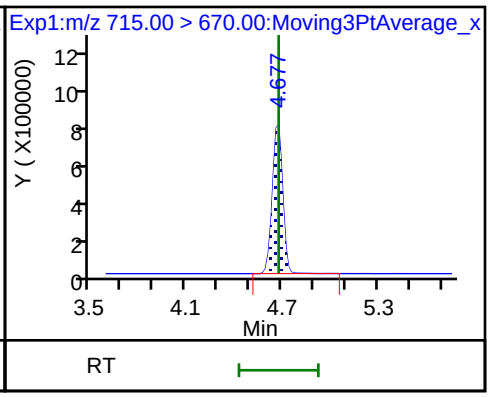
41 Perfluorotridecanoic acid



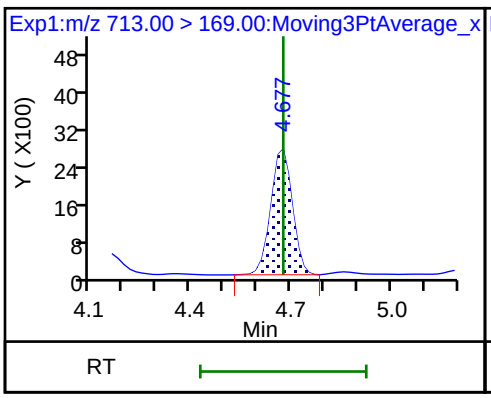
41 Perfluorotridecanoic acid



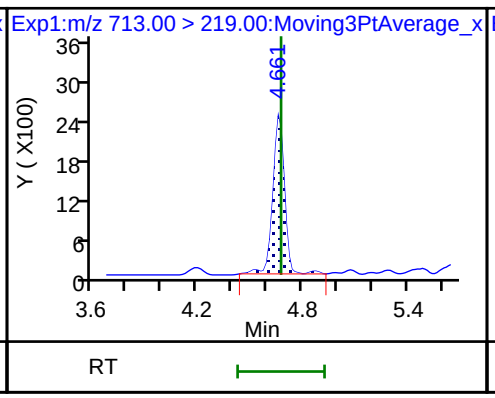
D 43 13C2-PFTeDA



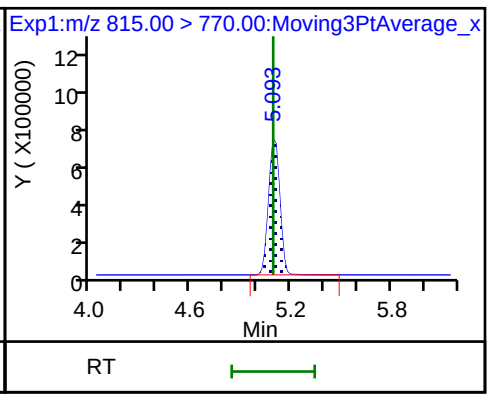
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

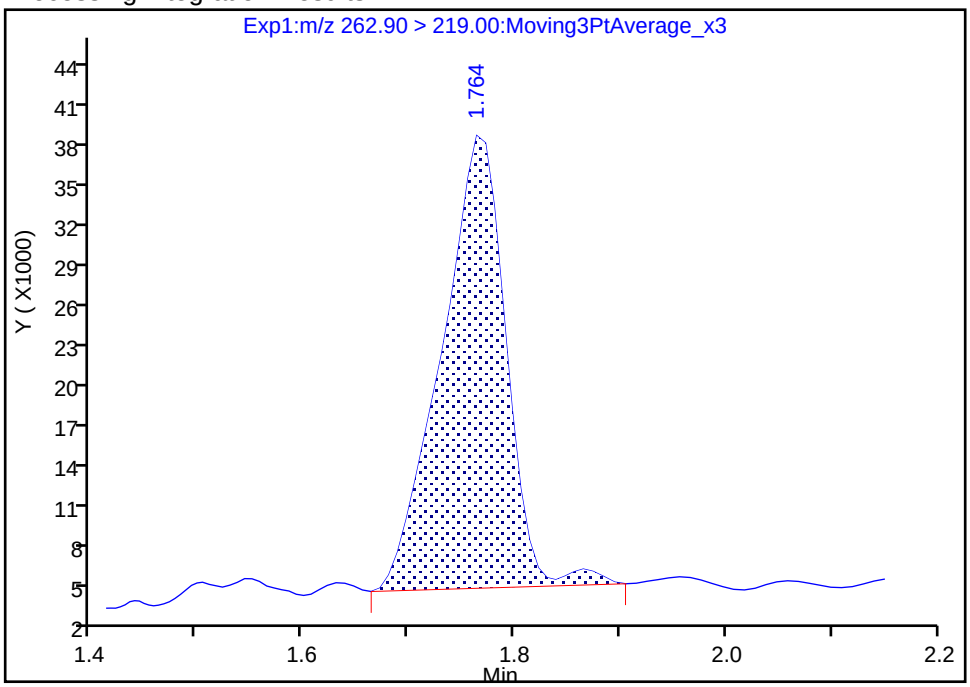
Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_005.d
Injection Date: 12-Aug-2018 10:33:17 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

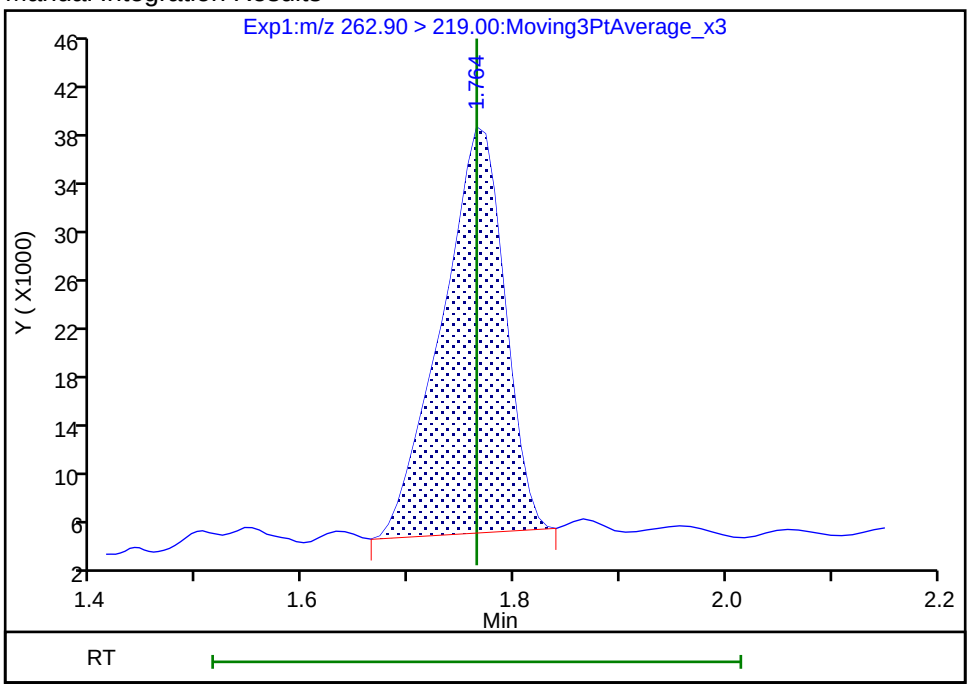
Processing Integration Results

RT: 1.76
Area: 141934
Amount: 0.054959
Amount Units: ng/ml



Manual Integration Results

RT: 1.76
Area: 136914
Amount: 0.053015
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:49:58
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

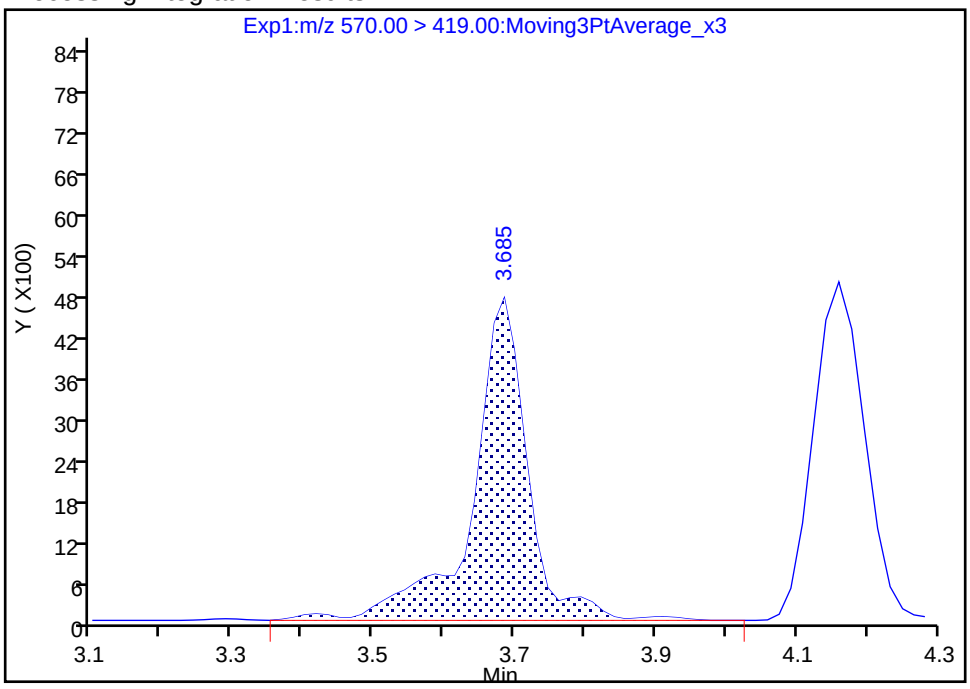
Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_005.d
Injection Date: 12-Aug-2018 10:33:17 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

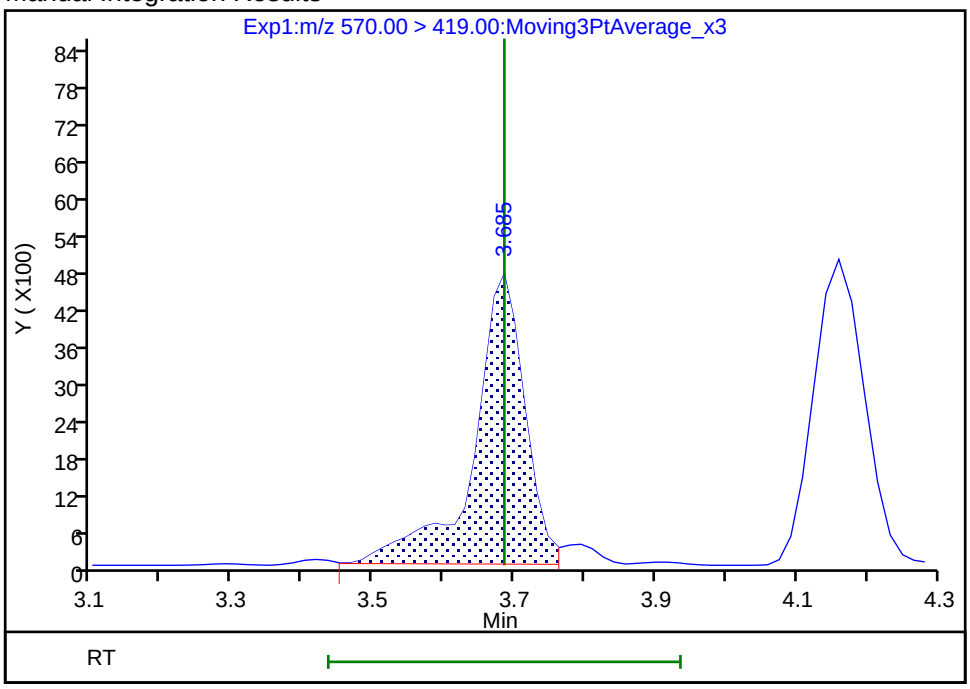
Processing Integration Results

RT: 3.69
Area: 25775
Amount: 0.050670
Amount Units: ng/ml



Manual Integration Results

RT: 3.69
Area: 23629
Amount: 0.046452
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:50:27
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

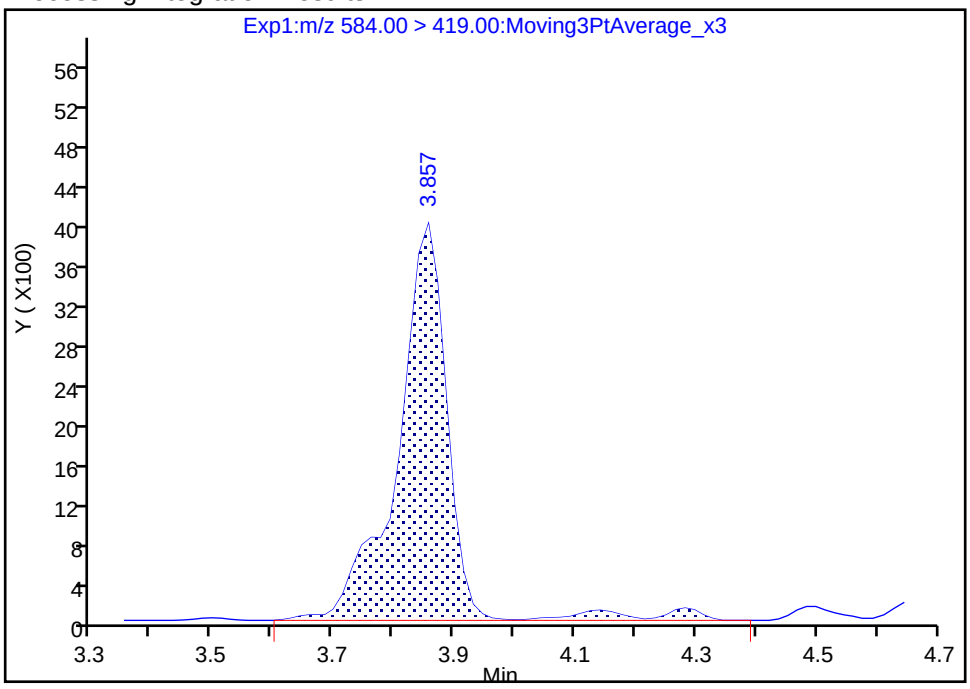
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Injection Date: 12-Aug-2018 10:33:17 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

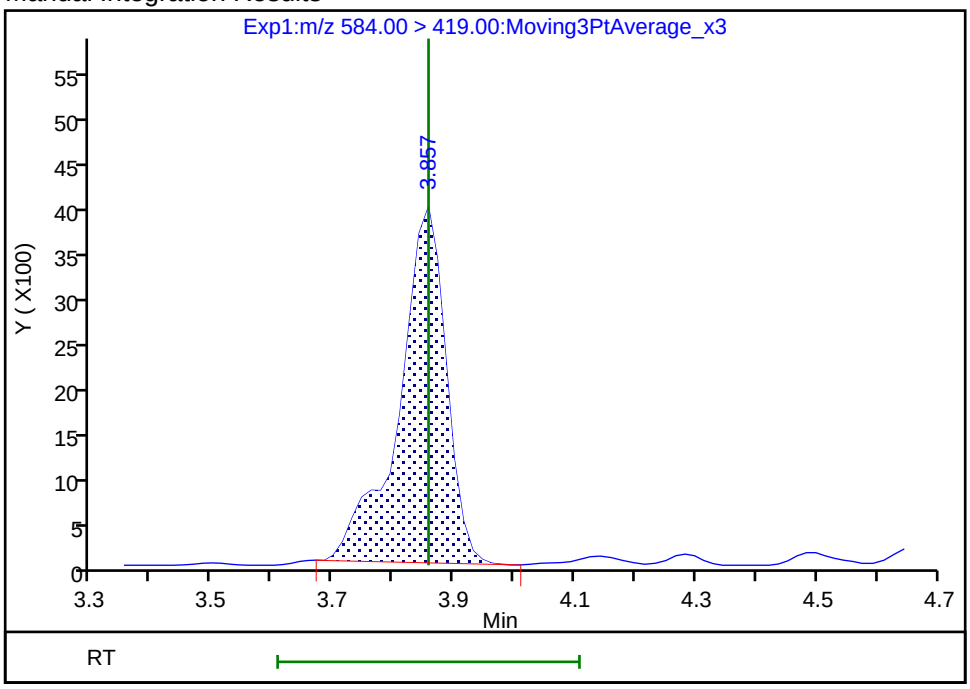
Processing Integration Results

RT: 3.86
Area: 23303
Amount: 0.057456
Amount Units: ng/ml



Manual Integration Results

RT: 3.86
Area: 21537
Amount: 0.053102
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:50:39
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

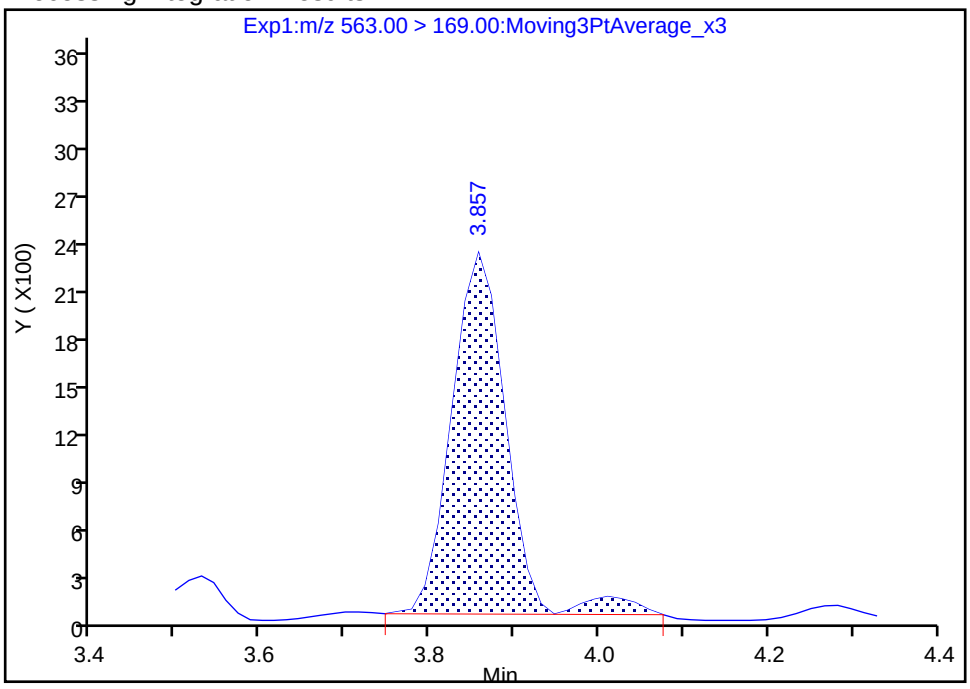
Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_005.d
Injection Date: 12-Aug-2018 10:33:17 Instrument ID: A9
Lims ID: CCVL
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

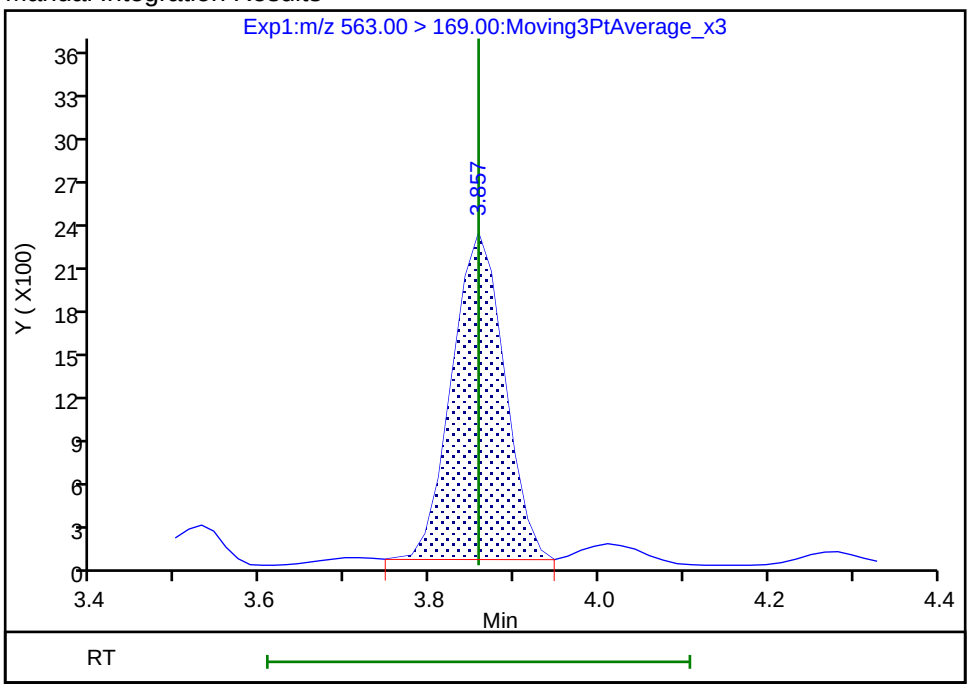
Processing Integration Results

RT: 3.86
Area: 10316
Amount: 0.053541
Amount Units: ng/ml



Manual Integration Results

RT: 3.86
Area: 9826
Amount: 0.053541
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:50:48
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239460/3 Calibration Date: 08/12/2018 10:40

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.12LLA_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	0.9293	0.9286		0.999	1.00	-0.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.036		1.02	1.00	1.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	117.8		1.01	0.884	14.1	30.0
4:2 FTS	AveID	17.02	14.73		0.808	0.934	-13.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.8653		0.925	1.00	-7.5	30.0
Perfluoropentanesulfonic acid	AveID	48.91	53.00		1.02	0.938	8.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.075		1.03	1.00	3.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.192		0.848	0.910	-6.8	30.0
6:2 FTS	AveID	2.137	2.335		1.04	0.948	9.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.014		0.956	0.952	0.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.114		1.02	1.00	1.7	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.063		1.01	1.00	0.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.075		0.931	0.928	0.3	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	3.321		1.08	1.00	8.1	30.0
8:2 FTS	AveID	14.02	15.31		1.05	0.958	9.2	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.7262		1.06	0.960	10.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.303		1.06	1.00	6.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	0.9150		0.905	1.00	-9.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.8074		0.934	0.964	-3.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.8902		0.993	1.00	-0.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.7785		0.925	1.00	-7.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.060		1.08	1.00	7.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.7851		1.05	1.00	4.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1543		0.958	1.00	-4.2	30.0
13C4 PFBA	Ave	1.117	1.040		2.33	2.50	-6.9	30.0
13C5-PFPeA	Ave	0.999	0.8772		2.20	2.50	-12.2	30.0
13C3-PFBS	Ave	0.0155	0.0128		1.92	2.33	-17.3	30.0
13C2 PFHxA	Ave	1.037	0.9793		2.36	2.50	-5.5	30.0
13C4-PFHpA	Ave	1.177	1.116		2.37	2.50	-5.2	30.0
18O2 PFHxS	Ave	0.8862	0.7929		2.12	2.37	-10.5	30.0
M2-6:2FTS	Ave	0.1144	0.1157		2.40	2.38	1.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239460/3 Calibration Date: 08/12/2018 10:40

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.12LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	0.996		2.52	2.50	0.9	30.0
13C4 PFOS	Ave	0.9223	0.8454		2.19	2.39	-8.3	30.0
13C5 PFNA	Ave	0.8463	0.9310		2.75	2.50	10.0	30.0
13C8 FOSA	Ave	0.5512	0.4929		2.24	2.50	-10.6	30.0
13C2 PFDA	Ave	0.8474	0.8578		2.53	2.50	1.2	30.0
M2-8:2FTS	Ave	0.0133	0.0136		2.46	2.40	2.6	30.0
d3-NMeFOSAA	Ave	0.1647	0.1965		2.98	2.50	19.3	30.0
13C2 PFUnA	Ave	0.6849	0.7138		2.61	2.50	4.2	30.0
d5-NEtFOSAA	Ave	0.1353	0.1559		2.88	2.50	15.2	30.0
13C2 PFDoA	Ave	0.7384	0.7376		2.50	2.50	-0.1	30.0
13C2-PFTeDA	Ave	0.4715	0.5230		2.77	2.50	10.9	30.0
13C2-PFHxDA	Ave	0.4325	0.4664		2.70	2.50	7.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 12-Aug-2018 10:40:47 ALS Bottle#: 13 Worklist Smp#: 3
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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:51:57 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: roycea Date: 12-Aug-2018 13:51:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.494	0.0	0.540	7457728	2.33		93.1	13699	
2 Perfluorobutyric acid										
212.90 > 169.00	1.494	1.494	0.0	1.000	2769945	1.00		99.9	112	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.764	0.0	0.638	6288890	2.20		87.8	8714	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.000	2605129	1.02		102	143	
D 47 13C3-PFBS										
301.90 > 83.00	1.806	1.806	0.0	0.653	85288	1.92		82.7	395	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.806	1.806	0.0	1.000	3820652	1.01		114	865	
298.90 > 99.00	1.806	1.806	0.0	1.000	1284342		2.97(1.35-4.05)		494	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.018	-0.001	0.729	487779	NC			547	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.017	0.0	1.117	504508	0.8079		86.5	1713	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.740	7020714	2.36		94.5	10957	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	2429856	0.9249		92.5	727	
313.00 > 119.00	2.048	2.048	0.0	1.000	178505		13.61(6.96-20.87)		431	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.079	2.079	0.0	1.151	1823539	1.02		108	3051	
349.00 > 99.00	2.079	2.079	0.0	1.151	848667		2.15(1.15-3.45)		670	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.161	2.161	0.0	0.781	731221	NC			3621	

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	2.150	2.150	0.0	0.995	568804	NC			441	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.863	8003981	2.37		94.8	8744	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.400	2.400	0.0	1.005	3440514	1.03		103	320	
363.00 > 169.00	2.387	2.400	-0.013	1.000	774164		4.44(2.17-6.52)		1501	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.413	0.0	0.872	5377466	2.12		89.5	9445	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	2466896	0.8481		93.2	1644	
399.00 > 99.00	2.413	2.413	0.0	1.000	665312		3.71(1.90-5.70)		302	
65 ADONA										
377.00 > 251.00	2.439	2.439	0.0	0.773	5655396	NC			6629	
377.00 > 85.00	2.439	2.439	0.0	0.773	2446452		2.31(1.05-3.16)		1497	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.735	0.0	0.988	787881	2.40		101	1084	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.735	0.0	1.000	734454	1.04		109	671	
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.767	0.0	1.000	7138470	2.52		101	9172	
* 62 13C2-PFOA										
415.00 > 370.00	2.767	2.767	0.0		7169189	2.50			7093	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.767	2.767	0.0	1.000	3184915	1.02		102	466	
413.00 > 169.00	2.767	2.767	0.0	1.000	1109740		2.87(1.36-4.08)		1106	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.877	2341286	0.9556		100	1946	
449.00 > 99.00	2.767	2.767	0.0	0.877	583764		4.01(1.84-5.53)		1098	
D 18 13C4 PFOS										
503.00 > 80.00	3.155	3.155	0.0	1.140	5794052	2.19		91.7	3741	
D 19 13C5 PFNA										
468.00 > 423.00	3.155	3.155	0.0	1.140	6674164	2.75		110	9962	
20 Perfluorononanoic acid										
463.00 > 419.00	3.155	3.155	0.0	1.000	2838814	1.01		101	684	
463.00 > 169.00	3.155	3.155	0.0	1.000	506803		5.60(2.68-8.03)		1075	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.155	3.155	0.0	1.000	2419524	0.9306		100	1142	
499.00 > 99.00	3.155	3.155	0.0	1.000	554337		4.36(2.04-6.12)		1240	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.369	3.369	0.0	1.068	2452856	NC			2387	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.483	-0.016	1.253	3533925	2.24		89.4	3973	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	4694695	1.08		108	3183	
D 26 M2-8:2FTS										
529.00 > 81.00	3.514	3.515	-0.001	1.270	93616	2.46		103	354	

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	3.498	3.498	0.0	0.995	573247	1.05		109	1956	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.498	3.498	0.0	1.109	1690158	1.06		111	2236	
549.00 > 99.00	3.498	3.498	0.0	1.109	253505		6.67(3.02-9.05)		1282	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.530	-0.016	1.270	6149866	2.53		101	6332	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.514	3.514	0.0	1.000	3206027	1.06		106	676	
513.00 > 169.00	3.514	3.514	0.0	1.000	191984		16.70(7.12-21.35)		330	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.671	3.671	0.0	1.327	1408810	2.98		119	2269	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.671	3.671	0.0	1.000	515646	0.9054		90.5	224	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.841	3.842	-0.001	1.388	1117808	2.88		115	1570	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.826	3.826	0.0	1.213	1886927	0.9339		96.9	2603	
599.00 > 99.00	3.841	3.826	0.015	1.218	437221		4.32(2.14-6.43)		747	
D 30 13C2 PFUnA										
565.00 > 520.00	3.841	3.857	-0.016	1.388	5117329	2.61		104	8982	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.841	3.841	0.0	1.000	398012	0.99		99.3	657	M
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.857	3.857	0.0	1.004	1593478	0.9246		92.5	237	
563.00 > 169.00	3.841	3.857	-0.016	1.000	185336		8.60(5.24-15.72)		656	
35 MeFOSA										
512.00 > 169.00	3.962	3.962	0.0		637649	NC			1234	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.010	4.010	0.0	1.271	3001853	NC			3545	
D 36 13C2 PFDoA										
615.00 > 570.00	4.142	4.160	-0.018	1.497	5287723	2.50		99.9	4866	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.142	4.142	0.0	1.000	2242641	1.08		108	419	
613.00 > 169.00	4.142	4.142	0.0	1.000	233083		9.62(4.68-14.05)		616	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.142	4.142	0.0	1.179	336090	NC			967	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.391	4.391	0.0	1.392	181352	NC			947	
699.00 > 99.00	4.391	4.391	0.0	1.392	364498		0.50(0.28-0.83)		754	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.422	4.422	0.0	1.068	1660527	1.05		105	541	
663.00 > 169.00	4.422	4.422	0.0	1.068	281258		5.90(3.09-9.27)		962	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.664	4.677	-0.013	1.686	3749287	2.77		111	8583	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.664	4.664	0.0	1.000	231350	0.9577		95.8	1014	
713.00 > 219.00	4.664	4.664	0.0	1.000	162190		1.43(0.70-2.09)		881	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.096	5.093	0.003	1.842	3343678	2.70		108	5662	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.096	5.096	0.0	1.000	1194922	NC			95.9	
813.00 > 169.00	5.096	5.096	0.0	1.000	215398		5.55(2.77-8.32)		553	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.465	5.465	0.0	1.072	939956	NC			456	
913.00 > 169.00	5.465	5.465	0.0	1.072	175302		5.36(2.55-7.64)		1097	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 12-Aug-2018 13:52:00 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_006.d

Injection Date: 12-Aug-2018 10:40:47 Instrument ID: A9

Lims ID: CCV L4

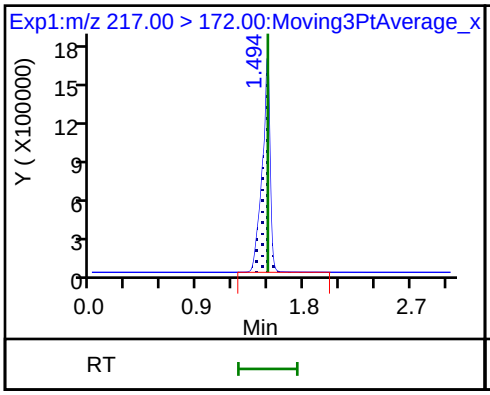
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 3

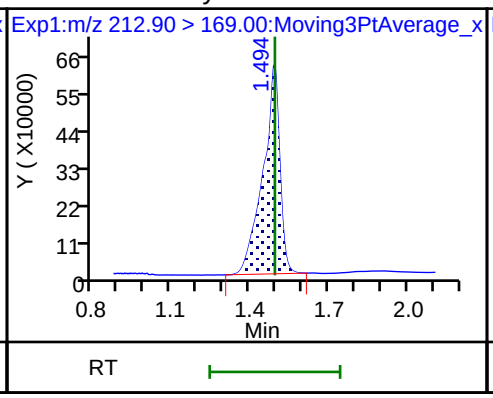
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

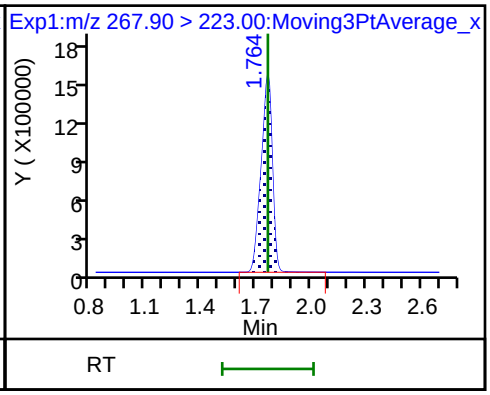
D 1 13C4 PFBA



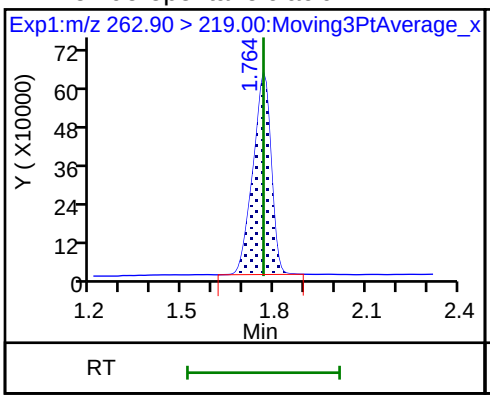
2 Perfluorobutyric acid



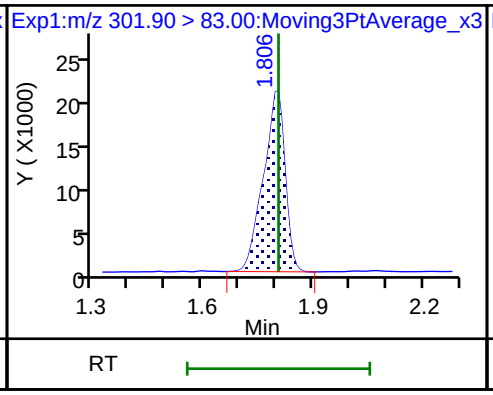
D 3 13C5-PFPeA



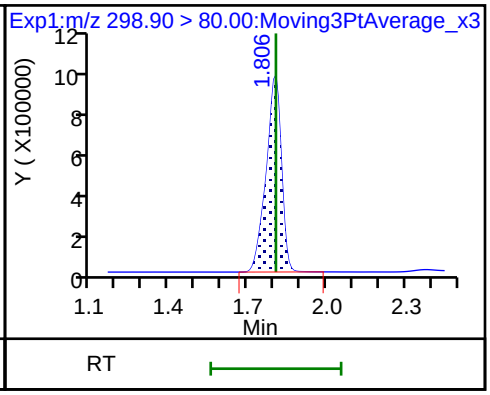
4 Perfluoropentanoic acid



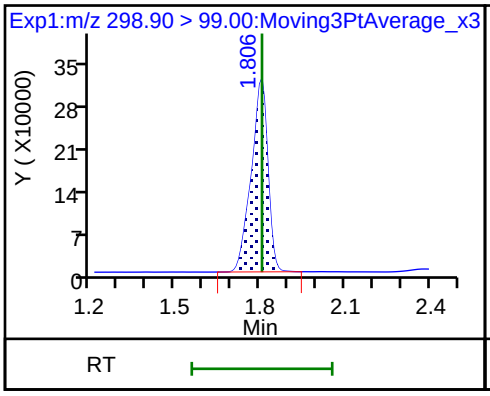
D 47 13C3-PFBS



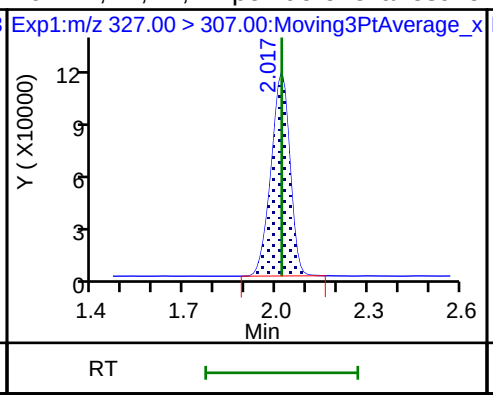
5 Perfluorobutanesulfonic acid



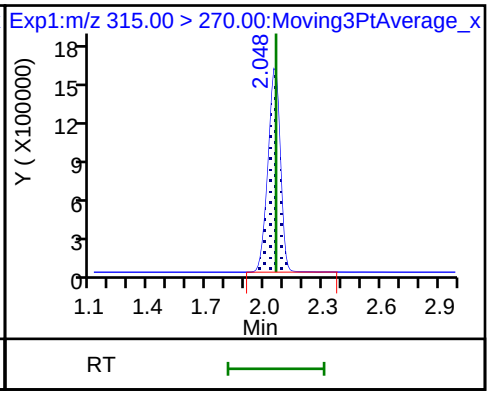
5 Perfluorobutanesulfonic acid



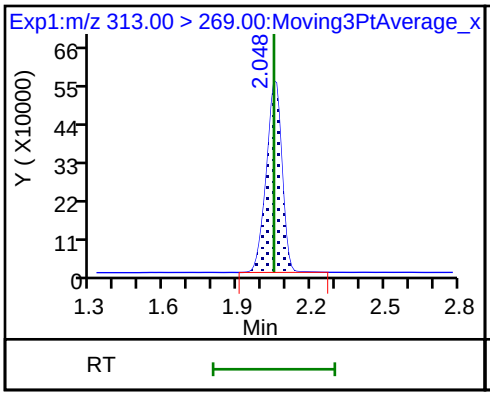
61 1H,1H,2H,2H-perfluorohexanesulfon



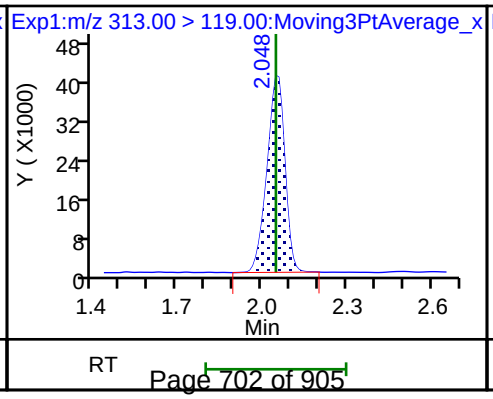
D 7 13C2 PFHxA



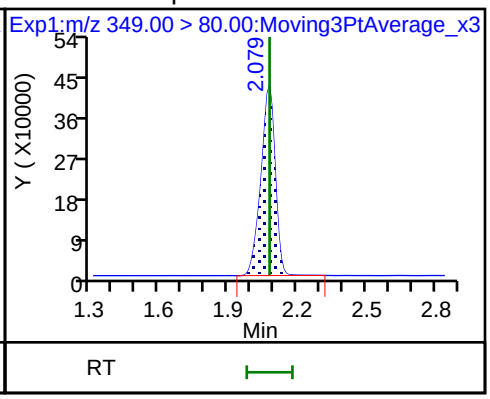
6 Perfluorohexanoic acid



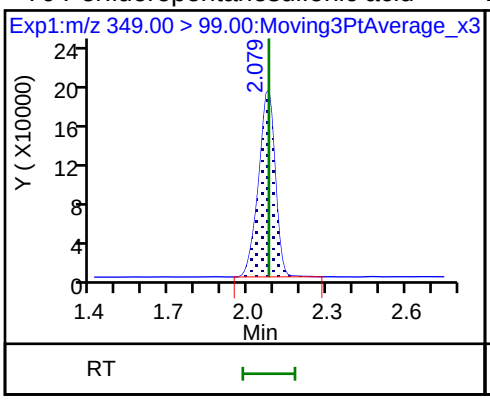
6 Perfluorohexanoic acid



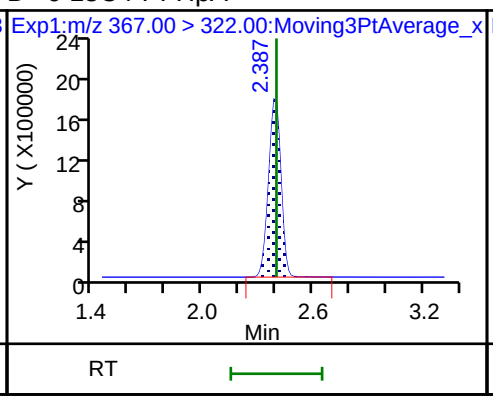
70 Perfluoropentanesulfonic acid



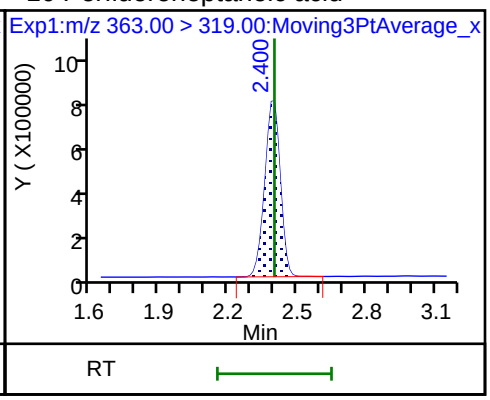
70 Perfluoropentanesulfonic acid



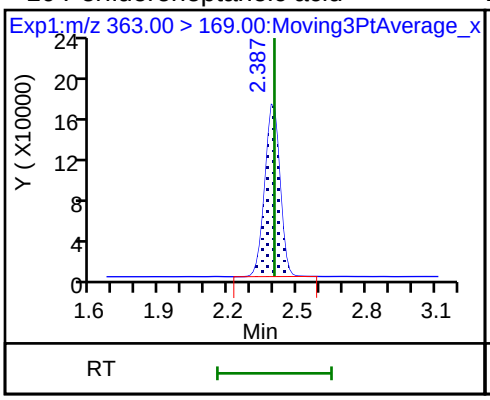
D 9 13C4-PFHpA



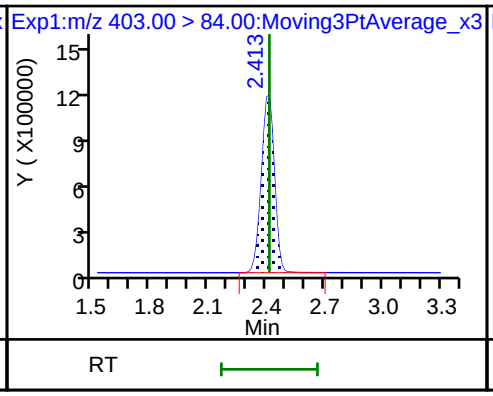
10 Perfluoroheptanoic acid



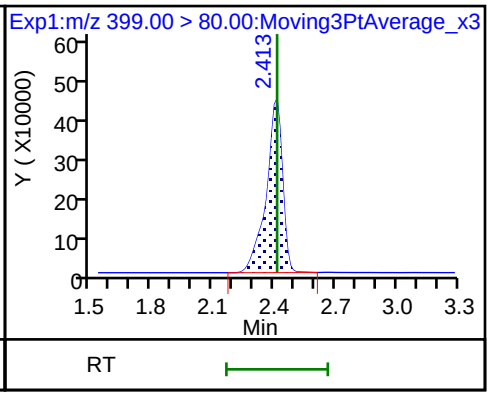
10 Perfluoroheptanoic acid



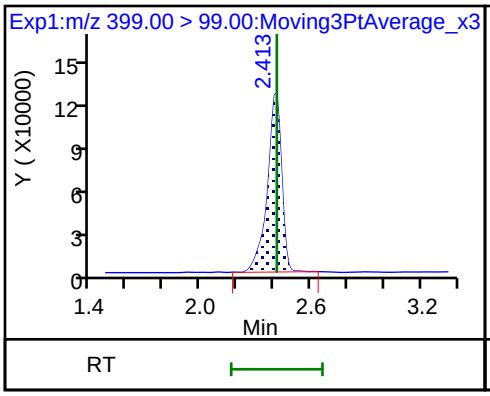
D 11 18O2 PFHxS



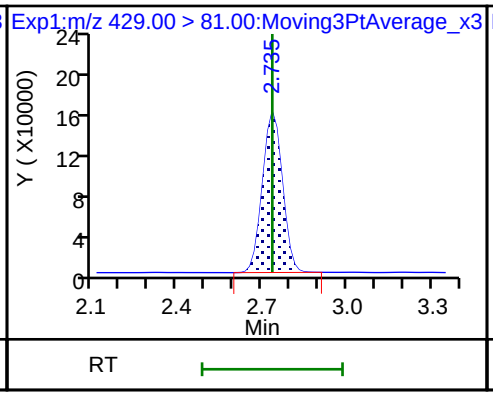
8 Perfluorohexanesulfonic acid



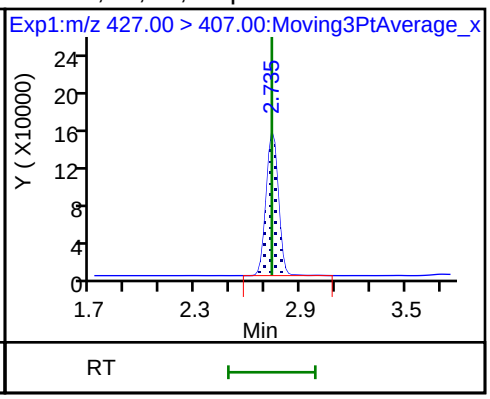
8 Perfluorohexanesulfonic acid



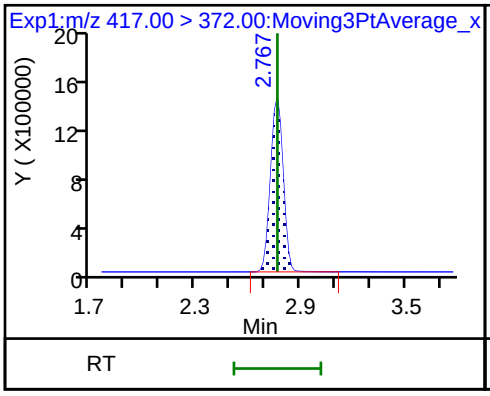
D 12 M2-6:2FTS



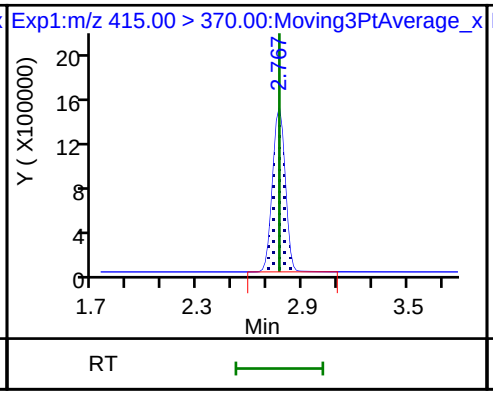
13 1H,1H,2H,2H-perfluorooctanesulfoni



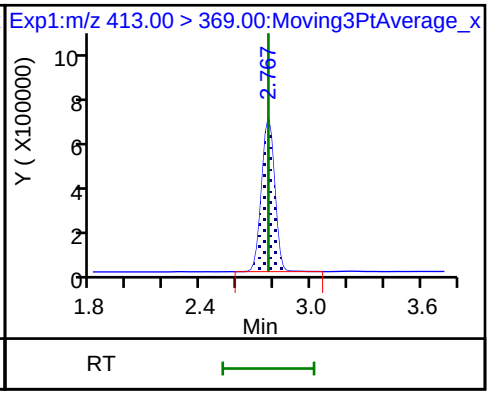
D 14 13C4 PFOA



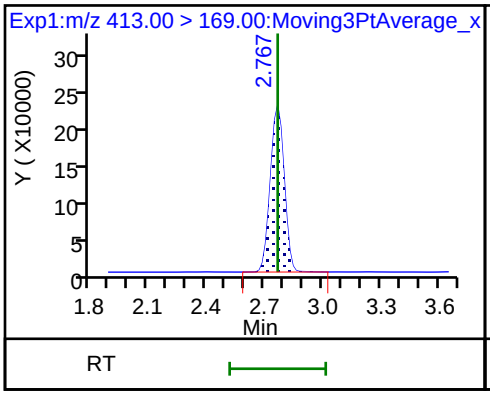
* 62 13C2-PFOA



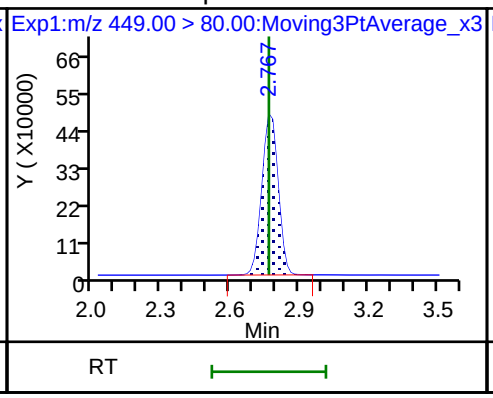
15 Perfluorooctanoic acid



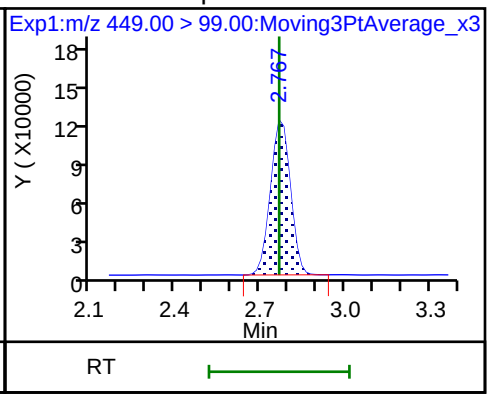
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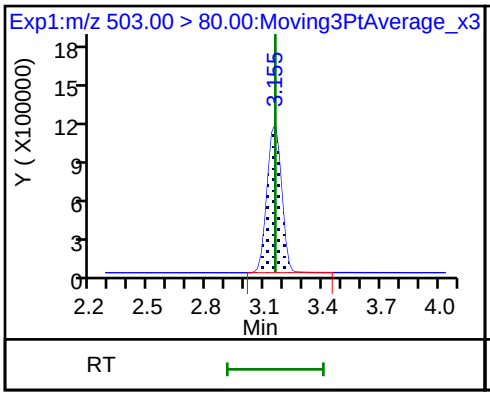
16 Perfluoroheptanesulfonic acid



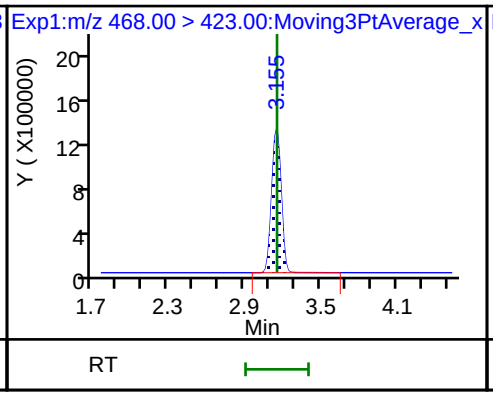
16 Perfluoroheptanesulfonic acid



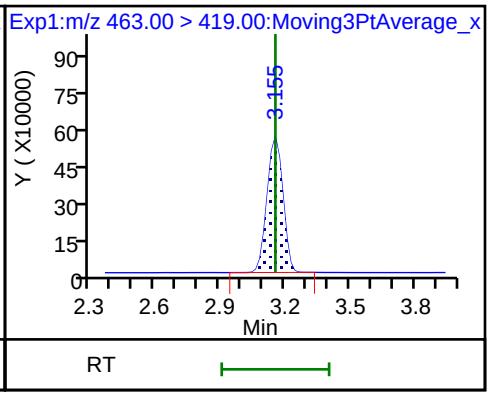
D 18 13C4 PFOS



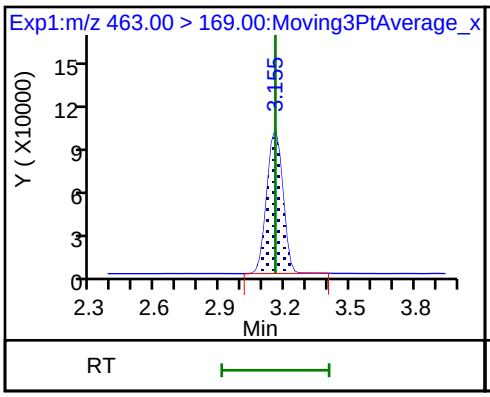
D 19 13C5 PFNA



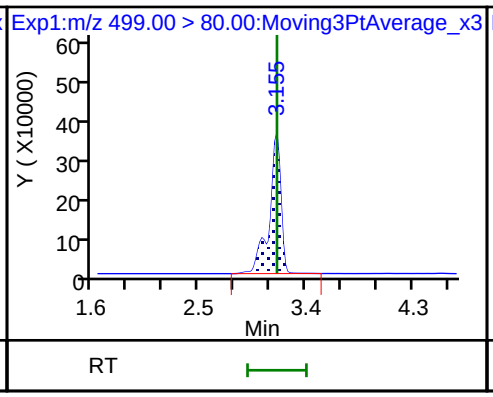
20 Perfluorononanoic acid



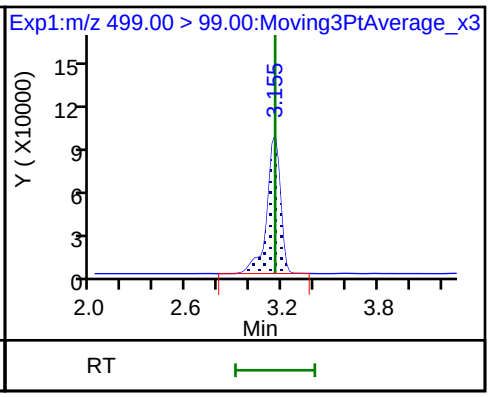
20 Perfluorononanoic acid



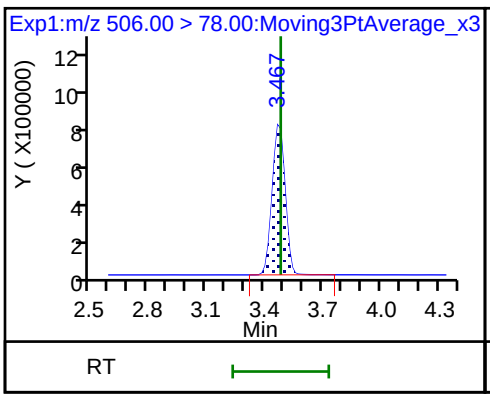
17 Perfluorooctane sulfonic acid



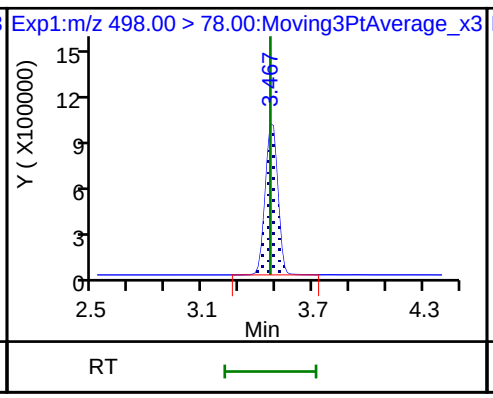
17 Perfluorooctane sulfonic acid



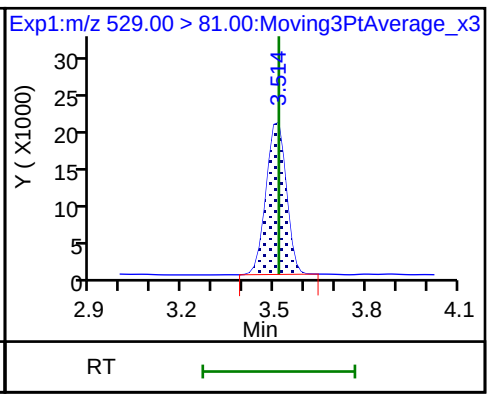
D 21 13C8 FOSA



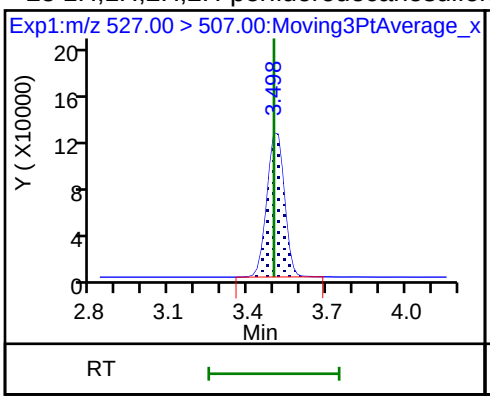
22 Perfluorooctane Sulfonamide



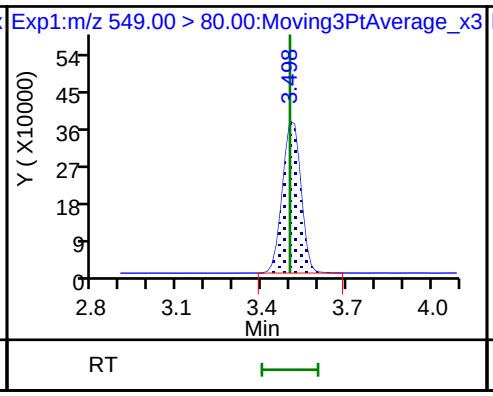
D 26 M2-8:2FTS



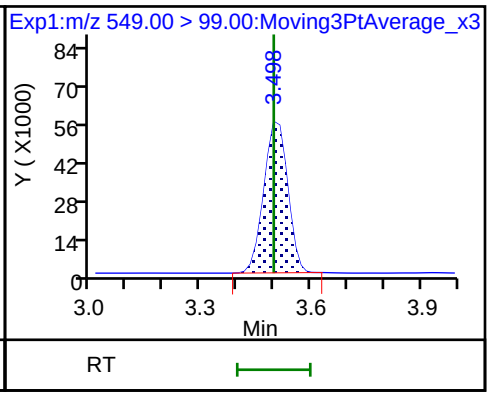
25 1H,1H,2H,2H-perfluorodecanesulfoni



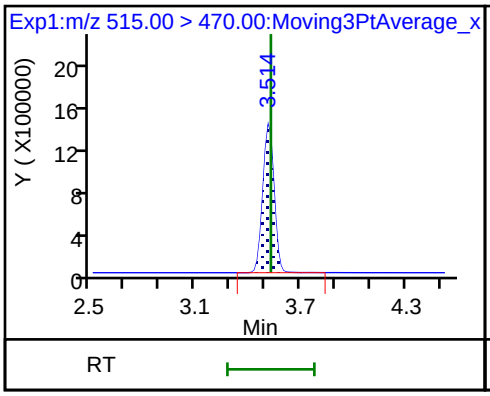
68 Perfluorononanesulfonic acid



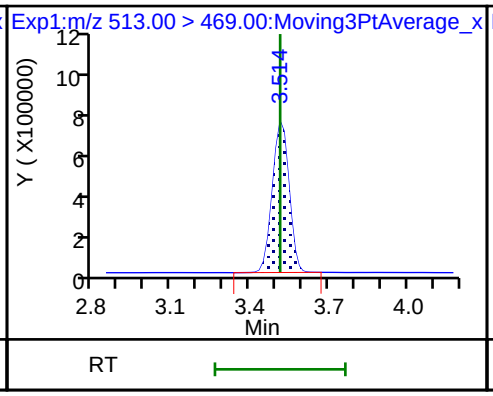
68 Perfluorononanesulfonic acid



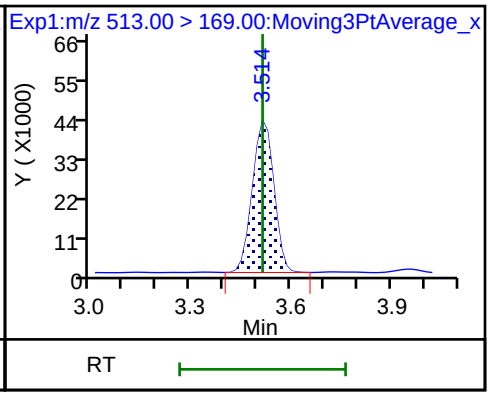
D 23 13C2 PFDA



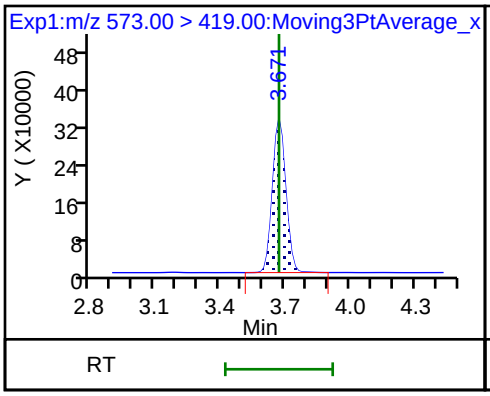
24 Perfluorodecanoic acid



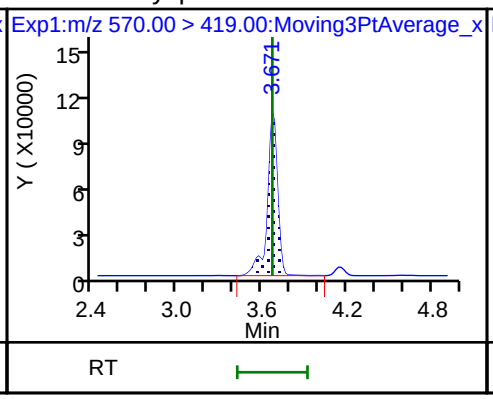
24 Perfluorodecanoic acid



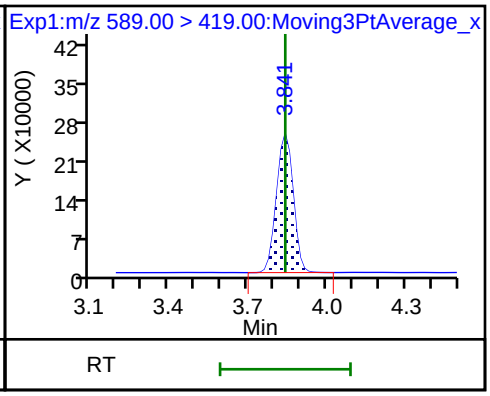
D 27 d3-NMeFOSAA



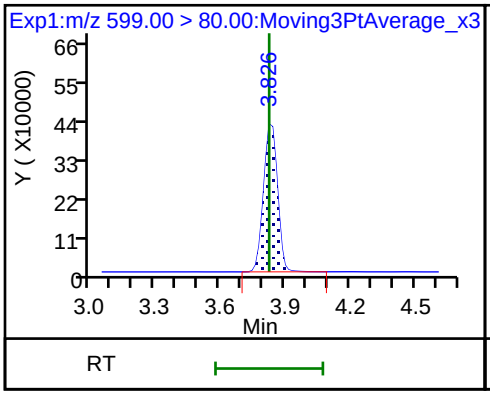
28 N-methyl perfluorooctane sulfonami



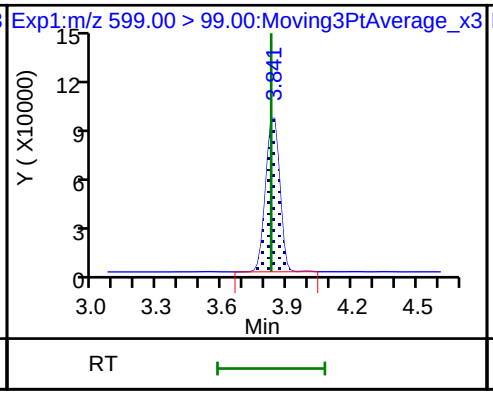
D 32 d5-NEtFOSAA



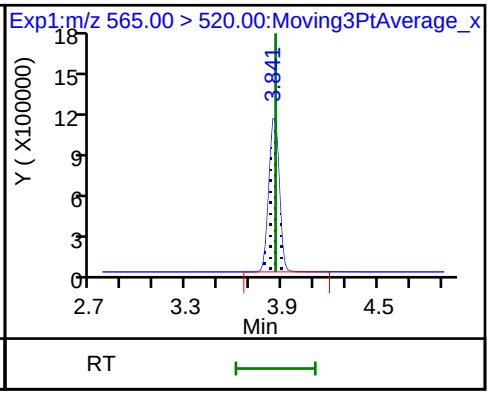
29 Perfluorodecane Sulfonic acid



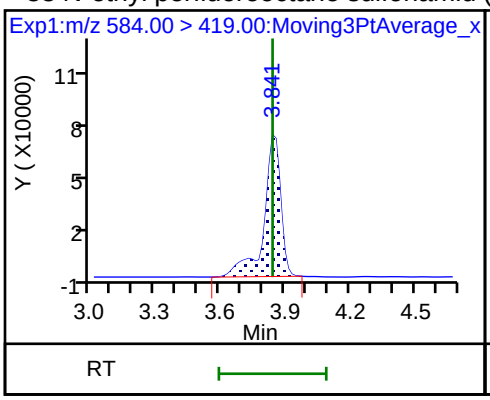
29 Perfluorodecane Sulfonic acid



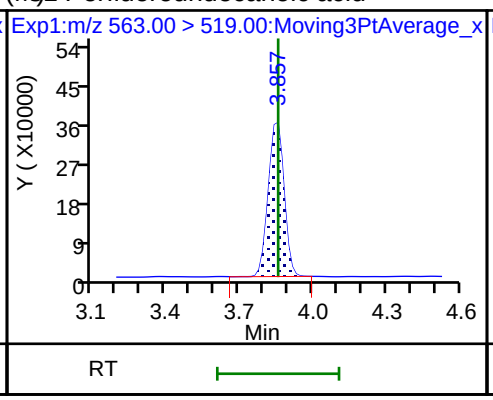
D 30 13C2 PFUnA



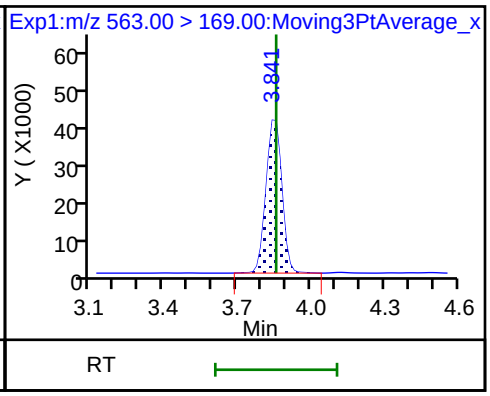
33 N-ethyl perfluorooctane sulfonamid (M)



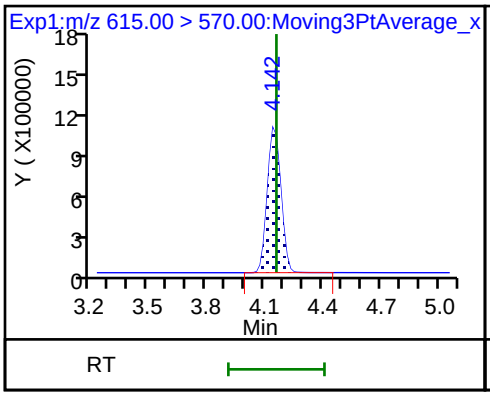
31 Perfluoroundecanoic acid



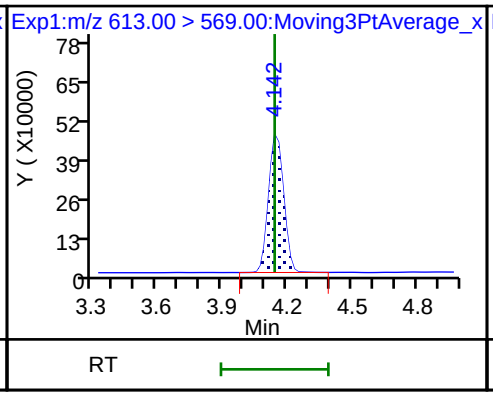
31 Perfluoroundecanoic acid



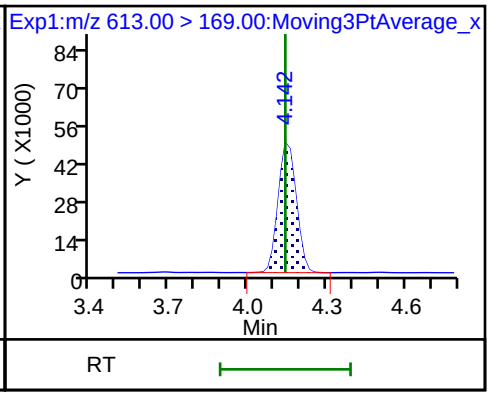
D 36 13C2 PFDoA



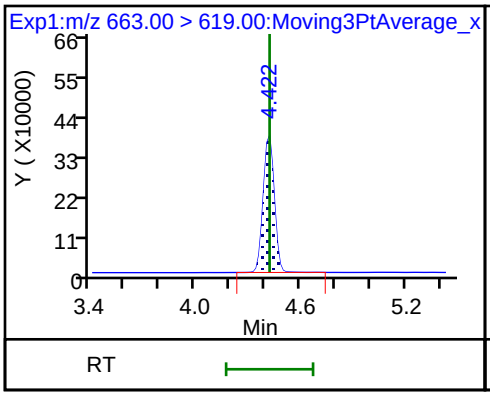
37 Perfluorododecanoic acid



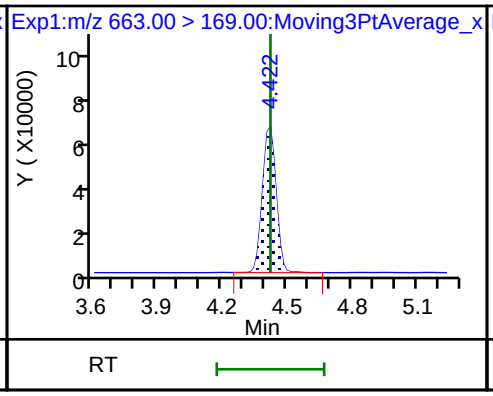
37 Perfluorododecanoic acid



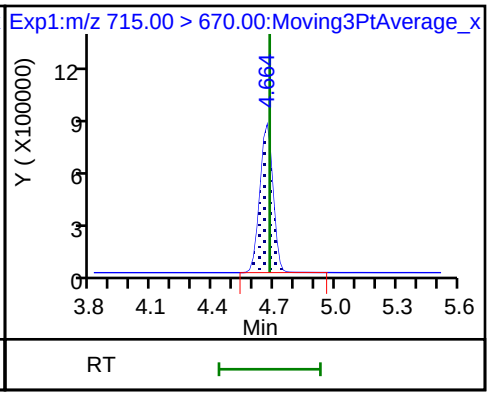
41 Perfluorotridecanoic acid



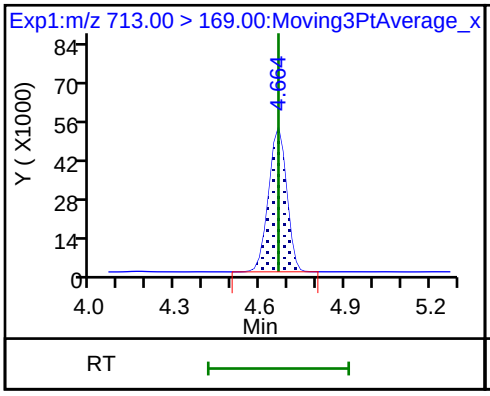
41 Perfluorotridecanoic acid



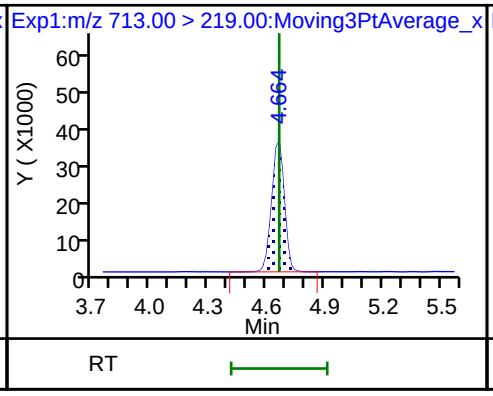
D 43 13C2-PFTeDA



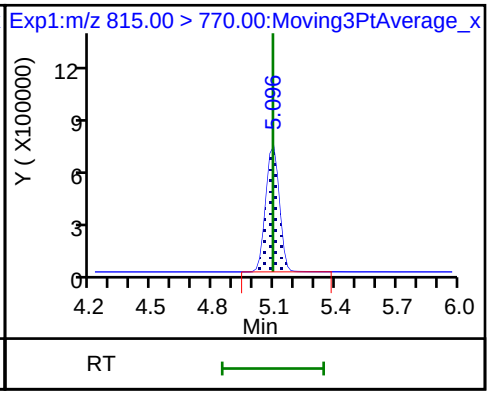
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

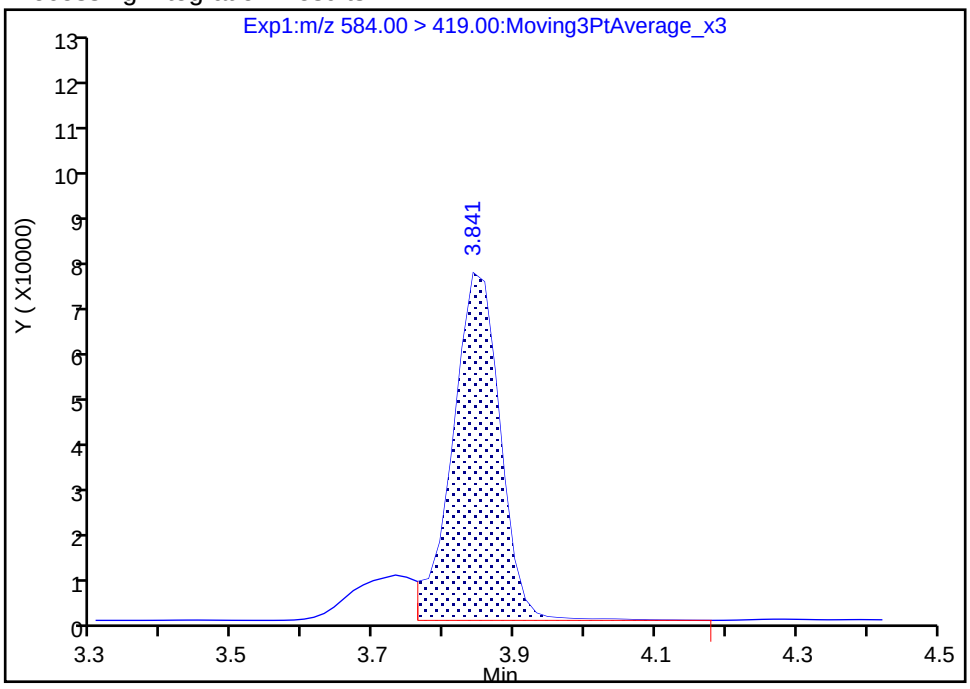
Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_006.d
Injection Date: 12-Aug-2018 10:40:47 Instrument ID: A9
Lims ID: CCV L4
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

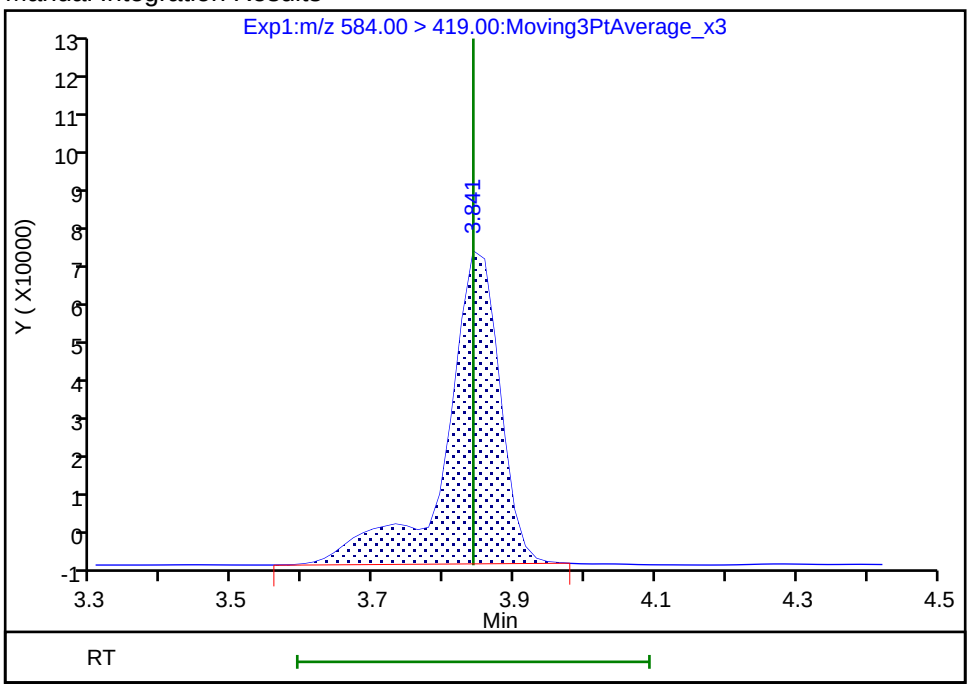
Processing Integration Results

RT: 3.84
Area: 346213
Amount: 0.863334
Amount Units: ng/ml



Manual Integration Results

RT: 3.84
Area: 398012
Amount: 0.992502
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:51:48
Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239460/16 Calibration Date: 08/12/2018 12:18

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.12LLA_019.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9293	0.9559		2.57	2.50	2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	0.9884		2.42	2.50	-3.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	105.5		2.26	2.21	2.2	30.0
4:2 FTS	AveID	17.02	14.34		1.97	2.34	-15.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.8759		2.34	2.50	-6.4	30.0
Perfluoropentanesulfonic acid	AveID	48.91	52.07		2.50	2.35	6.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.067		2.57	2.50	2.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.255		2.23	2.28	-1.9	30.0
6:2 FTS	AveID	2.137	2.161		2.40	2.37	1.1	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.125		2.65	2.38	11.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.028		2.35	2.50	-6.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.017		2.41	2.50	-3.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.126		2.44	2.32	5.0	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	2.903		2.36	2.50	-5.5	30.0
8:2 FTS	AveID	14.02	15.59		2.66	2.40	11.2	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.7485		2.74	2.40	14.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.181		2.40	2.50	-3.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	1.046		2.59	2.50	3.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.8904		2.57	2.41	6.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.9143		2.55	2.50	1.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.8046		2.39	2.50	-4.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.070		2.72	2.50	8.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.7877		2.62	2.50	5.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1524		2.36	2.50	-5.4	30.0
13C4 PFBA	Ave	1.117	0.9871		2.21	2.50	-11.6	30.0
13C5-PFPeA	Ave	0.999	0.8835		2.21	2.50	-11.5	30.0
13C3-PFBS	Ave	0.0155	0.0131		1.96	2.33	-15.6	30.0
13C2 PFHxA	Ave	1.037	0.9829		2.37	2.50	-5.2	30.0
13C4-PFHpA	Ave	1.177	1.150		2.44	2.50	-2.3	30.0
18O2 PFHxS	Ave	0.8862	0.7776		2.08	2.37	-12.3	30.0
M2-6:2FTS	Ave	0.1144	0.1199		2.49	2.38	4.8	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239460/16 Calibration Date: 08/12/2018 12:18

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.12LLA_019.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	1.010		2.56	2.50	2.4	30.0
13C4 PFOS	Ave	0.9223	0.7919		2.05	2.39	-14.1	30.0
13C5 PFNA	Ave	0.8463	0.8969		2.65	2.50	6.0	30.0
13C8 FOSA	Ave	0.5512	0.4854		2.20	2.50	-11.9	30.0
M2-8:2FTS	Ave	0.0133	0.0132		2.37	2.40	-1.0	30.0
13C2 PFDA	Ave	0.8474	0.8752		2.58	2.50	3.3	30.0
d3-NMeFOSAA	Ave	0.1647	0.1883		2.86	2.50	14.3	30.0
13C2 PFUnA	Ave	0.6849	0.6990		2.55	2.50	2.1	30.0
d5-NEtFOSAA	Ave	0.1353	0.1517		2.80	2.50	12.1	30.0
13C2 PFDoA	Ave	0.7384	0.7491		2.54	2.50	1.4	30.0
13C2-PFTeDA	Ave	0.4715	0.4839		2.57	2.50	2.6	30.0
13C2-PFHxDA	Ave	0.4325	0.4549		2.63	2.50	5.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_019.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 12-Aug-2018 12:18:24 ALS Bottle#: 14 Worklist Smp#: 16
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\20180812-62571.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 13-Aug-2018 11:36:19 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 11:35:56

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	6734548	2.57		103	338	
D 1 13C4 PFBA										
217.00 > 172.00	1.489	1.494	-0.005	0.541	7045316	2.21		88.4	7498	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.000	6233231	2.42		96.9	320	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.764	0.0	0.641	6306243	2.21		88.5	8859	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	8694774	2.26		102	1684	
298.90 > 99.00	1.797	1.797	0.0	1.000	3044150		2.86(1.35-4.05)		1138	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.806	-0.009	0.653	86692	1.96		84.4	425	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.007	0.0	1.117	1248180	1.97		84.2	2668	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.018	-0.011	0.730	479918	NC			662	
6 Perfluorohexanoic acid										M
313.00 > 269.00	2.048	2.048	0.0	1.005	6144650	2.34		93.6	1327	
313.00 > 119.00	2.048	2.048	0.0	1.005	456948		13.45(6.96-20.87)		709	M
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.058	-0.021	0.741	7015268	2.37		94.8	6423	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.068	0.0	1.151	4553037	2.50		106	6821	
349.00 > 99.00	2.068	2.068	0.0	1.151	2088033		2.18(1.15-3.45)		1245	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.150	0.0	1.005	1323069	NC			862	

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	2.161	-0.021	0.778	685887	NC			3342	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.386	0.0	1.006	8759088	2.57		103	795	
363.00 > 169.00	2.386	2.386	0.0	1.006	2009250		4.36(2.17-6.52)		2861	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	6337477	2.23		98.1	3114	
399.00 > 99.00	2.400	2.400	0.0	1.000	1694838		3.74(1.90-5.70)		797	
D 9 13C4-PFHpA										
367.00 > 322.00	2.373	2.400	-0.027	0.863	8205918	2.44		97.7	9430	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	5250485	2.08		87.7	7907	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.719	0.0	1.000	1753909	2.40		101	1387	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.735	-0.016	0.988	813241	2.49		105	1564	
* 62 13C2-PFOA										
415.00 > 370.00	2.750	2.750	0.0		7137578	2.50			10232	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.750	2.750	0.0	0.877	6051465	2.65		111	3740	
449.00 > 99.00	2.750	2.750	0.0	0.877	1459025		4.15(1.84-5.53)		2342	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.750	2.750	0.0	1.000	7418965	2.35		93.8	885	
413.00 > 169.00	2.750	2.750	0.0	1.000	2698680		2.75(1.36-4.08)		2166	
D 14 13C4 PFOA										
417.00 > 372.00	2.750	2.767	-0.017	1.000	7209128	2.56		102	7832	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.135	3.135	0.0	1.000	5905584	2.44		105	3754	
499.00 > 99.00	3.135	3.135	0.0	1.000	1404368		4.21(2.04-6.12)		1979	
20 Perfluorononanoic acid										
463.00 > 419.00	3.135	3.135	0.0	1.000	6510344	2.41		96.4	1069	
463.00 > 169.00	3.135	3.135	0.0	1.000	1217418		5.35(2.68-8.03)		2241	
D 19 13C5 PFNA										
468.00 > 423.00	3.135	3.155	-0.020	1.140	6401334	2.65		106	5975	
D 18 13C4 PFOS										
503.00 > 80.00	3.135	3.155	-0.020	1.140	5403317	2.05		85.9	3820	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.351	3.351	0.0	1.069	6247727	NC			3956	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.465	3.465	0.0	1.000	10057350	2.36		94.5	4951	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.481	3.481	0.0	1.000	1402860	2.66		111	2267	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.481	3.481	0.0	1.110	4061332	2.74		114	2819	
549.00 > 99.00	3.481	3.481	0.0	1.110	686521		5.92(3.02-9.05)		1862	
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.483	-0.018	1.260	3464407	2.20		88.1	4165	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.497	3.497	0.0	1.000	7375244	2.40		96.1	1439	
513.00 > 169.00	3.497	3.497	0.0	1.000	489737		15.06(7.12-21.35)		458	
D 26 M2-8:2FTS										
529.00 > 81.00	3.481	3.515	-0.034	1.266	89986	2.37		99.0	387	
D 23 13C2 PFDA										
515.00 > 470.00	3.497	3.530	-0.033	1.271	6246482	2.58		103	9082	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.656	3.656	0.0	1.000	1406489	2.59		104	531	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.656	3.671	-0.015	1.329	1344058	2.86		114	3058	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.808	3.808	0.0	1.215	4851116	2.57		107	4061	
599.00 > 99.00	3.808	3.808	0.0	1.215	969266		5.00(2.14-6.43)		1405	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.824	3.824	0.0	1.000	990236	2.55		102	1692	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.824	3.824	0.0	1.000	4014394	2.39		95.6	580	
563.00 > 169.00	3.824	3.824	0.0	1.000	431004		9.31(5.24-15.72)		1867	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.824	3.842	-0.018	1.390	1083050	2.80		112	1442	
D 30 13C2 PFUnA										
565.00 > 520.00	3.824	3.857	-0.033	1.390	4989335	2.55		102	7050	
35 MeFOSA										
512.00 > 169.00	3.961	3.961	0.0		1575749	NC			1348	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.992	3.992	0.0	1.273	7110816	NC			6474	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.123	4.123	0.0	1.000	5721158	2.72		109	1250	
613.00 > 169.00	4.123	4.123	0.0	1.000	604519		9.46(4.68-14.05)		1649	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.123	4.123	0.0	1.185	839289	NC			2595	
D 36 13C2 PFDoA										
615.00 > 570.00	4.123	4.160	-0.037	1.499	5346422	2.54		101	4570	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.358	4.358	0.0	1.390	466145	NC			2234	
699.00 > 99.00	4.358	4.358	0.0	1.390	871843		0.53(0.28-0.83)		2416	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.389	4.389	0.0	1.065	4211433	2.62		105	1315	
663.00 > 169.00	4.389	4.389	0.0	1.065	723764		5.82(3.09-9.27)		2134	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.628	4.628	0.0	1.000	526239	2.36		94.6	2155	
713.00 > 219.00	4.628	4.628	0.0	1.000	423680		1.24(0.70-2.09)		1645	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.628	4.677	-0.049	1.683	3453927	2.57		103	6958	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.059	0.0	1.000	2939701	NC			230	
813.00 > 169.00	5.059	5.059	0.0	1.000	543474		5.41(2.77-8.32)		1520	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.059	5.093	-0.034	1.839	3247004	2.63		105	5476	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.419	5.419	0.0	1.071	2160782	NC			806	
913.00 > 169.00	5.419	5.419	0.0	1.071	425488		5.08(2.55-7.64)		1714	

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: 13-Aug-2018 11:36:22 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_019.d

Injection Date: 12-Aug-2018 12:18:24 Instrument ID: A9

Lims ID: CCV L5

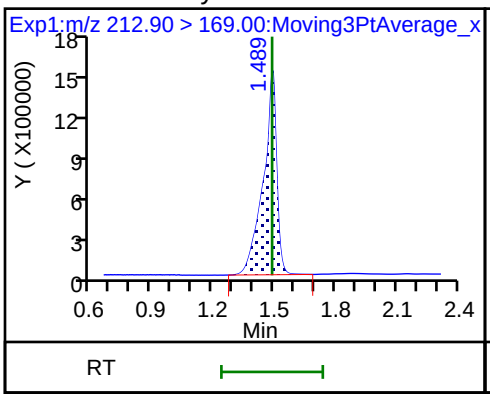
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 16

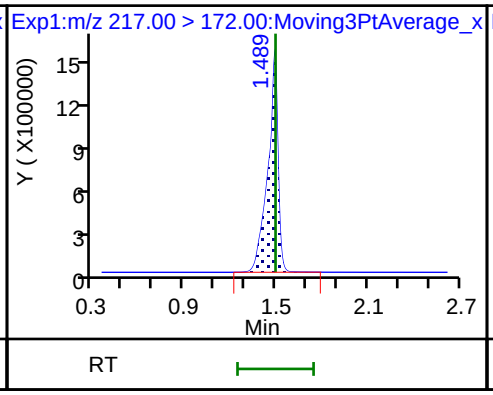
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

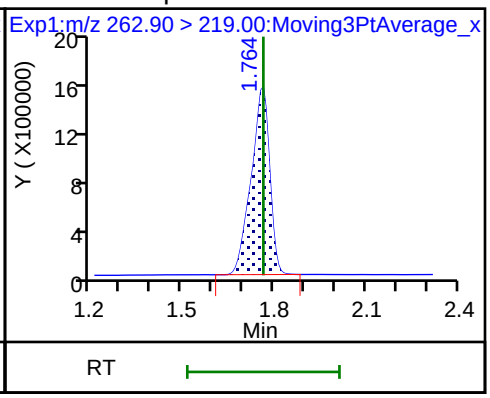
2 Perfluorobutyric acid



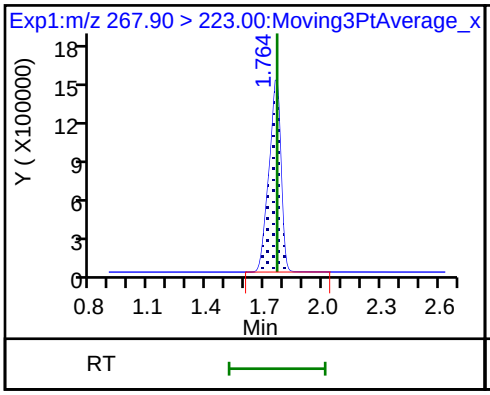
D 1 13C4 PFBA



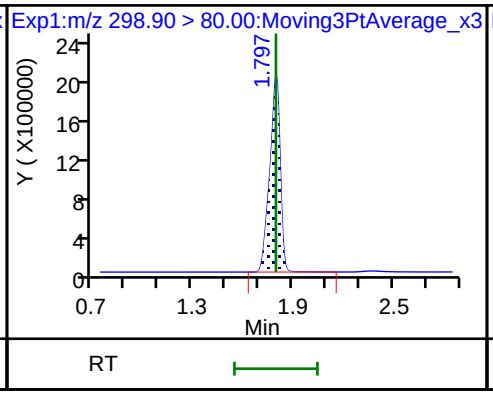
4 Perfluoropentanoic acid



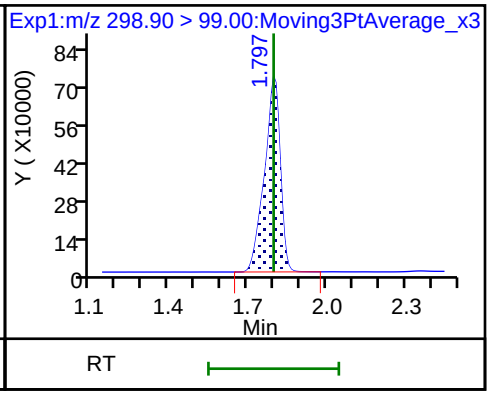
D 3 13C5-PFPeA



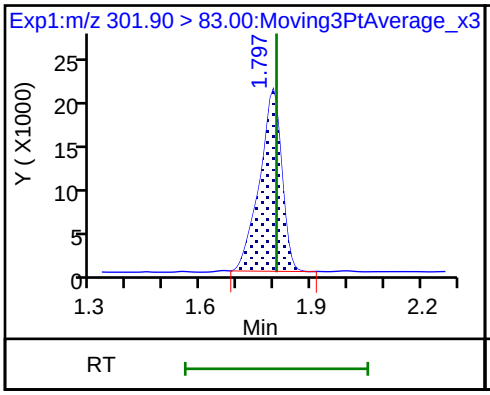
5 Perfluorobutanesulfonic acid



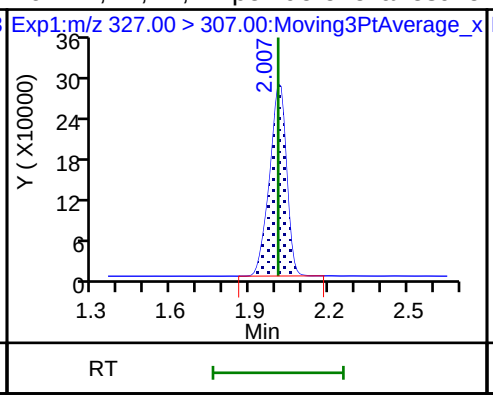
5 Perfluorobutanesulfonic acid



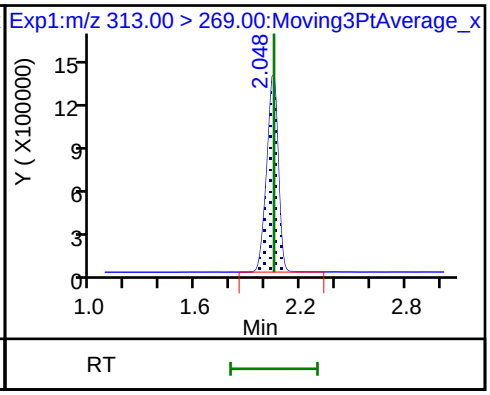
D 47 13C3-PFBS



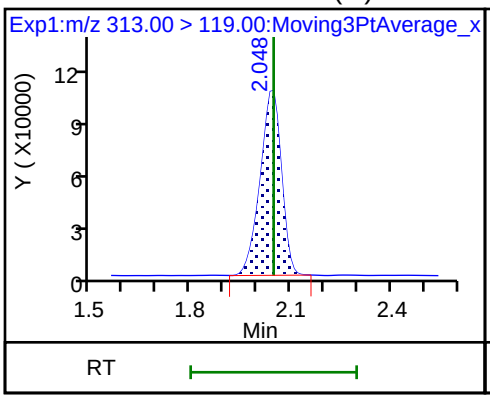
61 1H,1H,2H,2H-perfluorohexanesulfoni



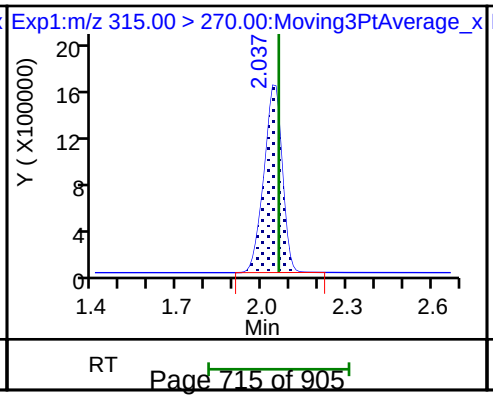
6 Perfluorohexanoic acid



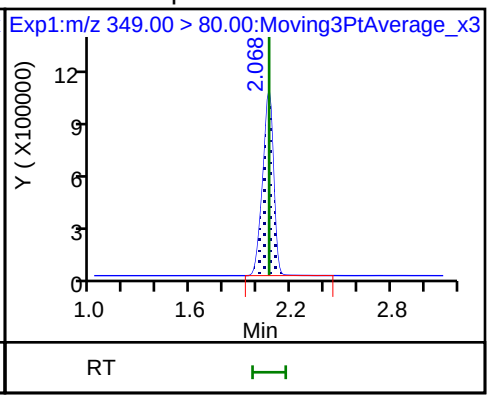
6 Perfluorohexanoic acid (M)



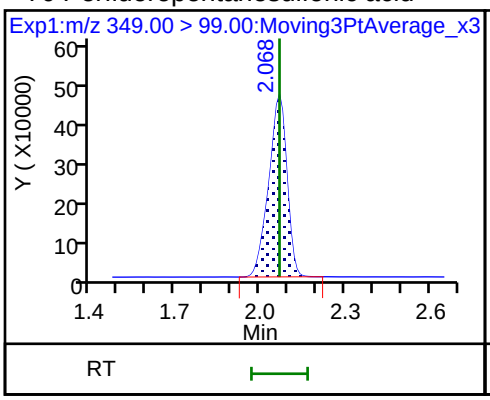
D 7 13C2 PFHxA



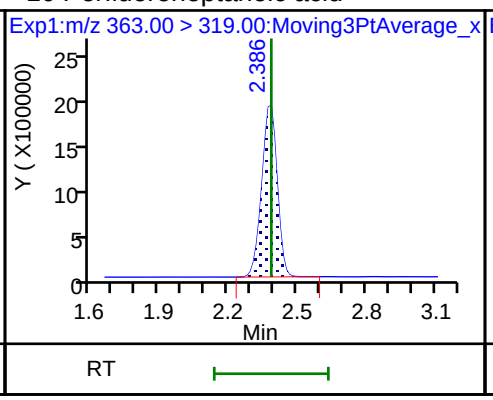
70 Perfluoropentanesulfonic acid



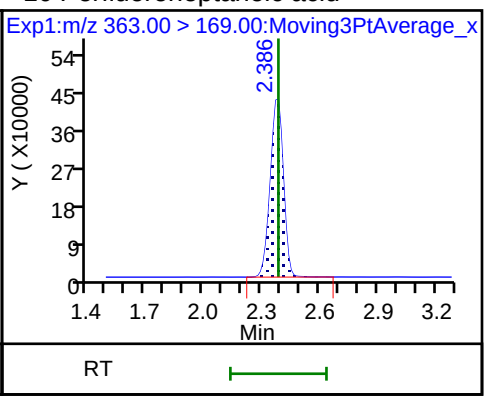
70 Perfluoropentanesulfonic acid



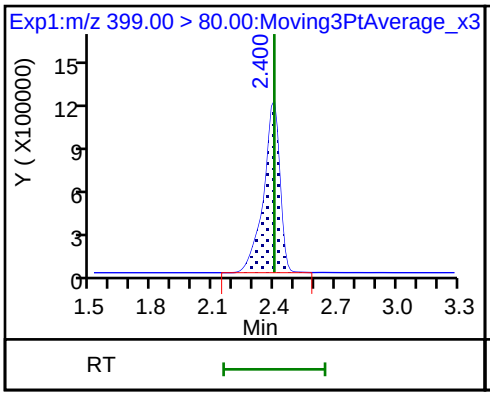
10 Perfluoroheptanoic acid



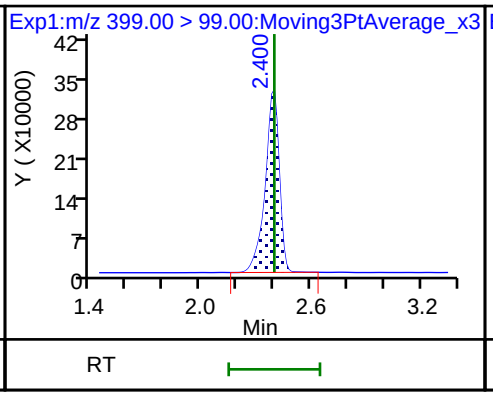
10 Perfluoroheptanoic acid



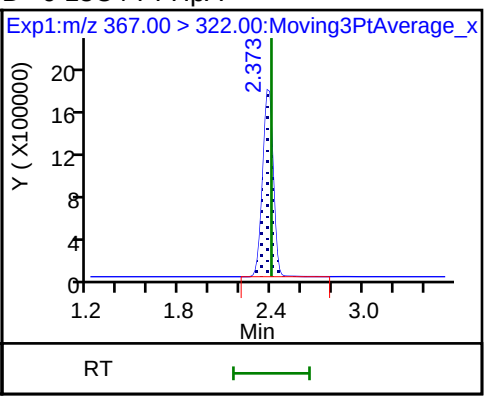
8 Perfluorohexanesulfonic acid



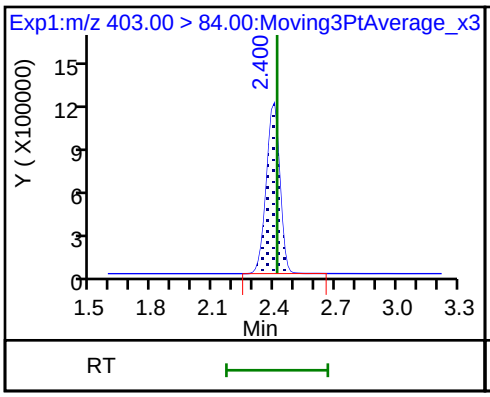
8 Perfluorohexanesulfonic acid



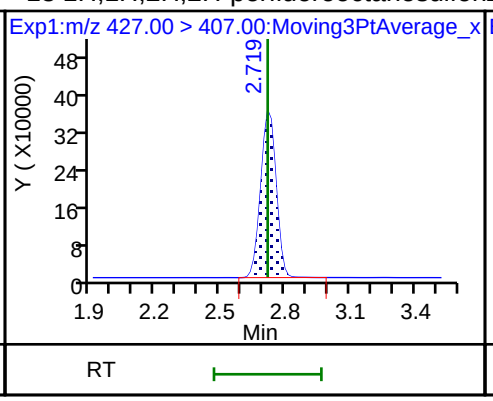
D 9 13C4-PFHpA



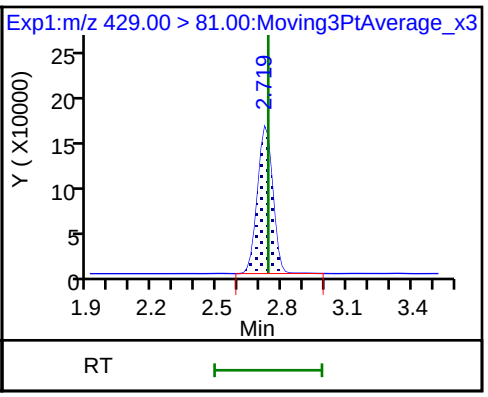
D 11 18O2 PFHxS



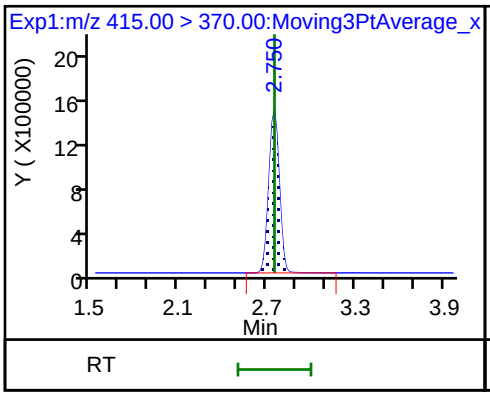
13 1H,1H,2H,2H-perfluorooctanesulfon



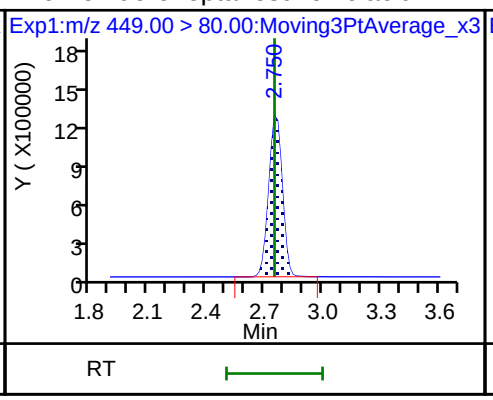
D 12 M2-6:2FTS



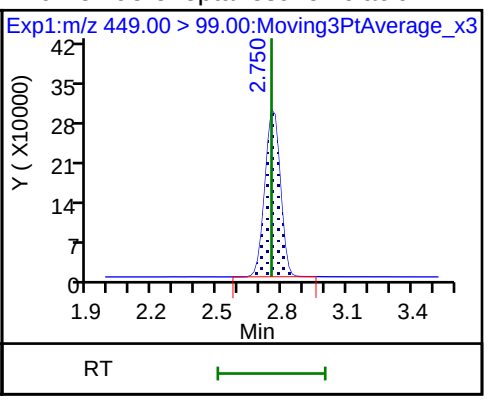
* 62 13C2-PFOA



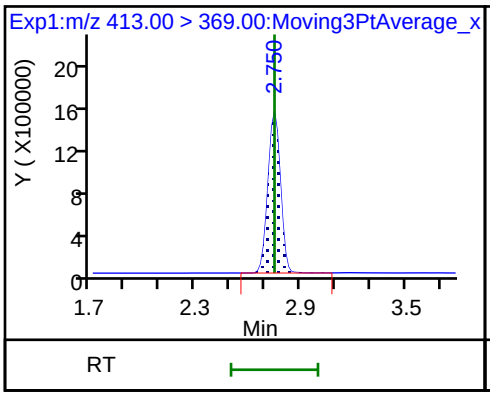
16 Perfluoroheptanesulfonic acid



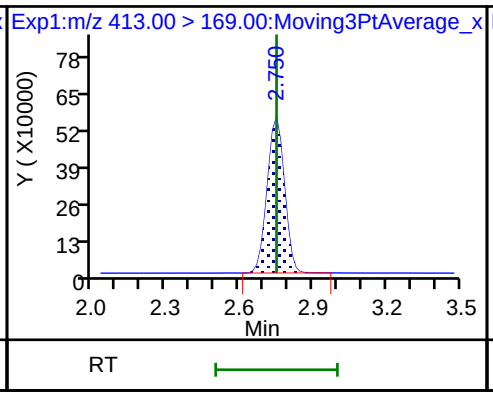
16 Perfluoroheptanesulfonic acid



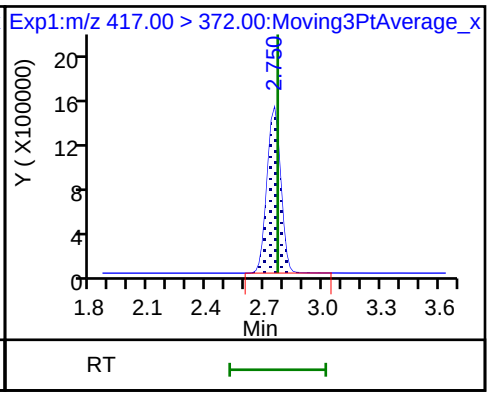
15 Perfluorooctanoic acid



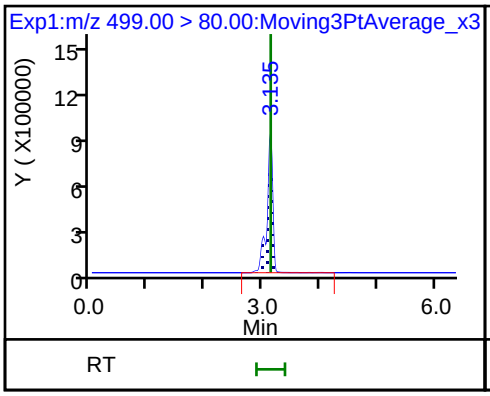
15 Perfluorooctanoic acid



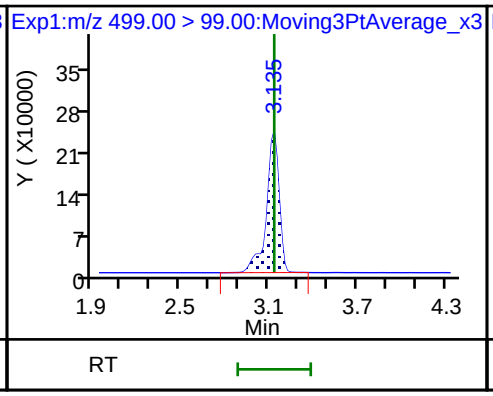
D 14 13C4 PFOA



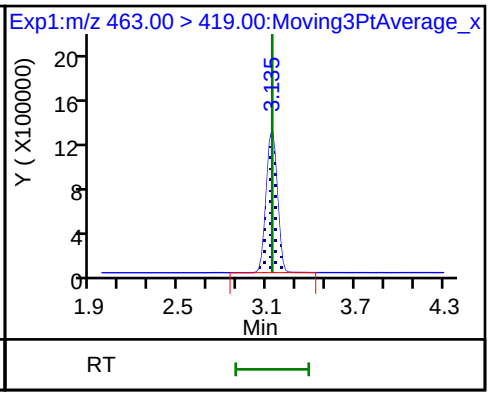
17 Perfluorooctane sulfonic acid



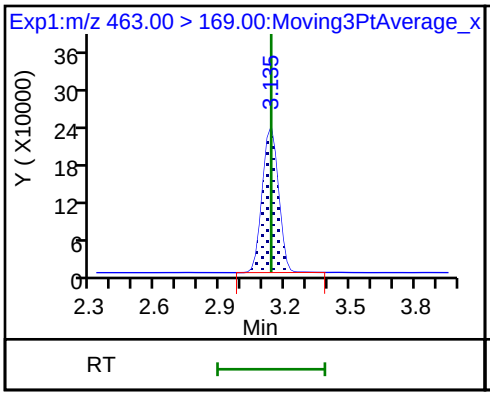
17 Perfluorooctane sulfonic acid



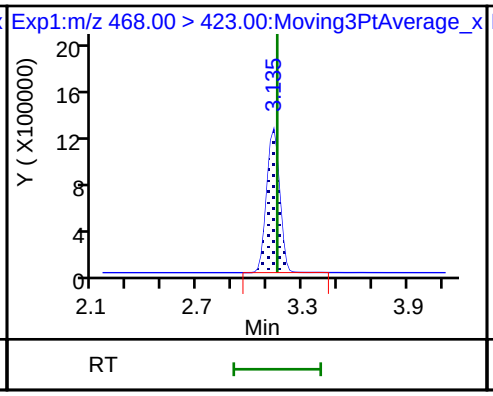
20 Perfluorononanoic acid



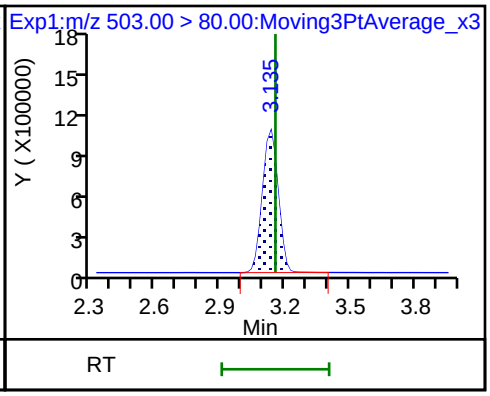
20 Perfluorononanoic acid



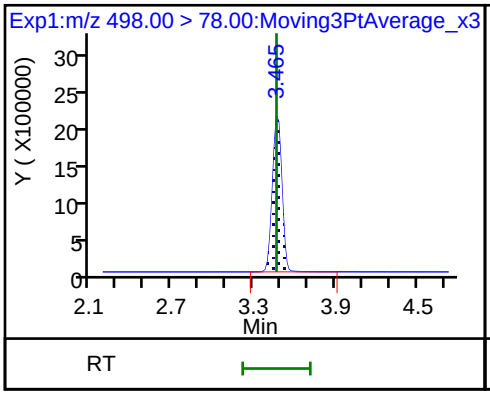
D 19 13C5 PFNA



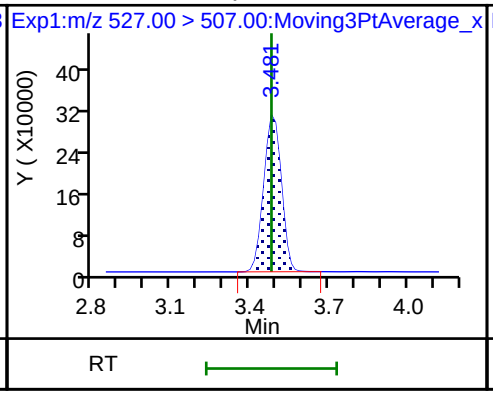
D 18 13C4 PFOS



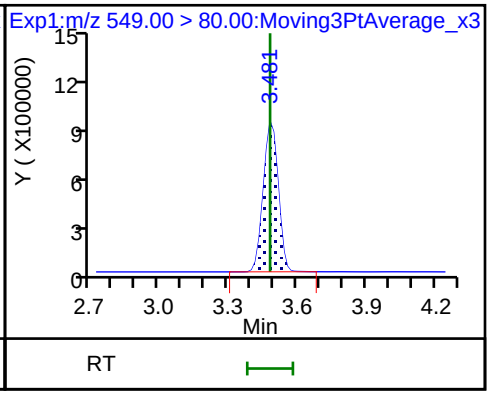
22 Perfluorooctane Sulfonamide



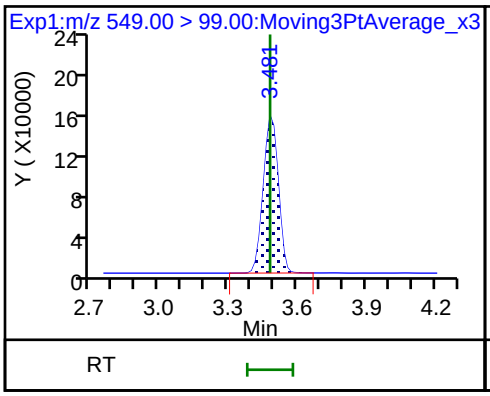
25 1H,1H,2H,2H-perfluorodecanesulfoni



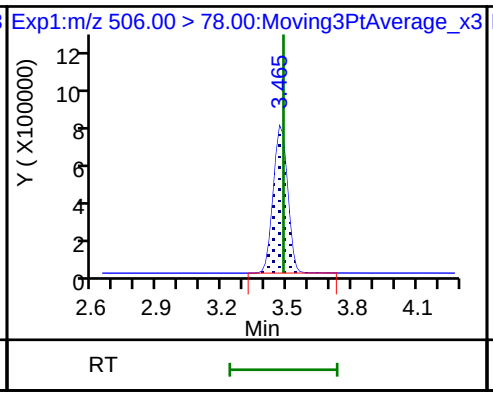
68 Perfluorononanesulfonic acid



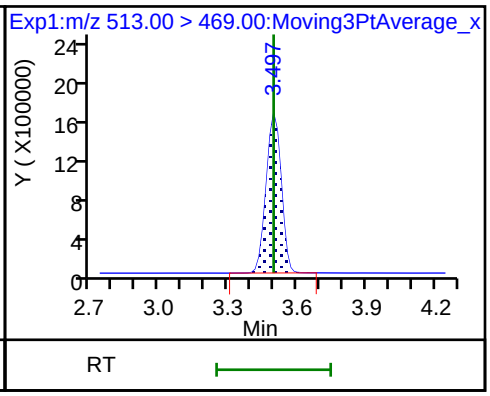
68 Perfluorononanesulfonic acid



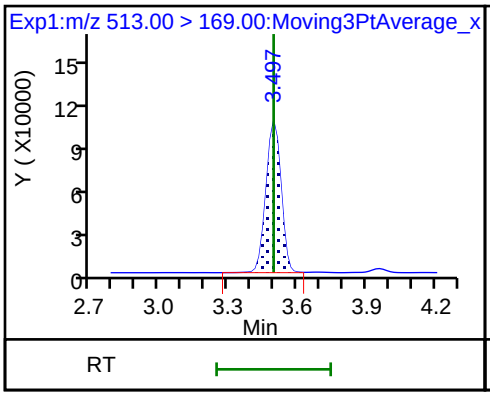
D 21 13C8 FOSA



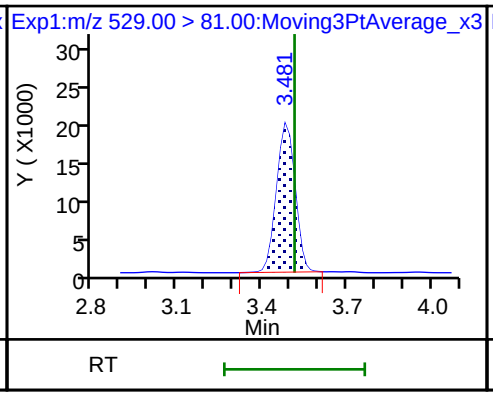
24 Perfluorodecanoic acid



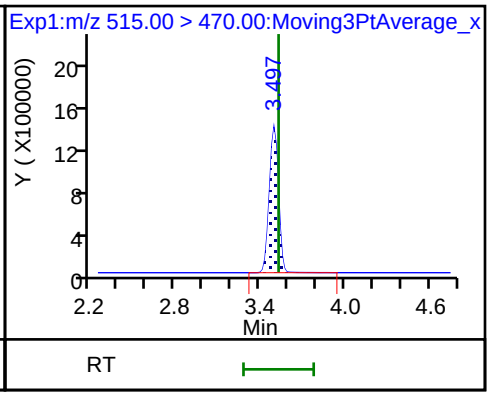
24 Perfluorodecanoic acid



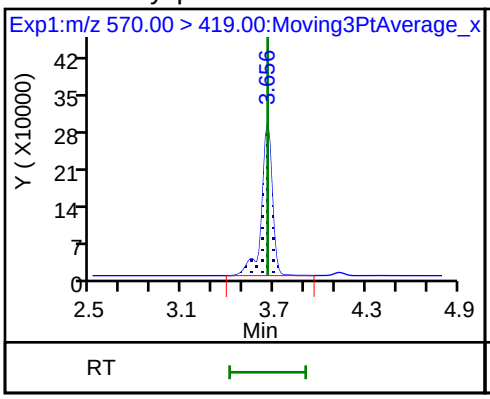
D 26 M2-8:2FTS



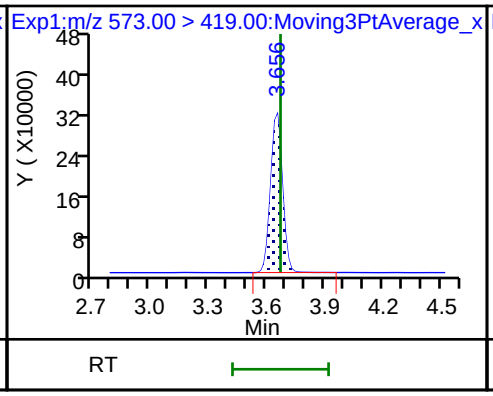
D 23 13C2 PFDA



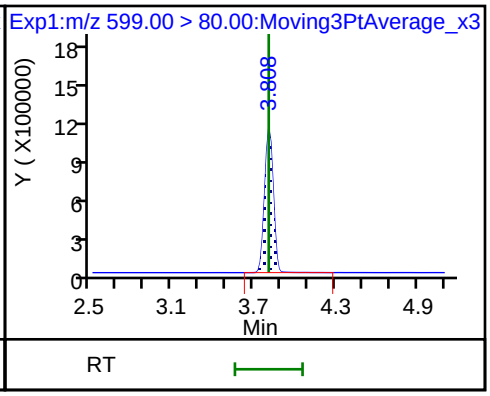
28 N-methyl perfluorooctane sulfonami



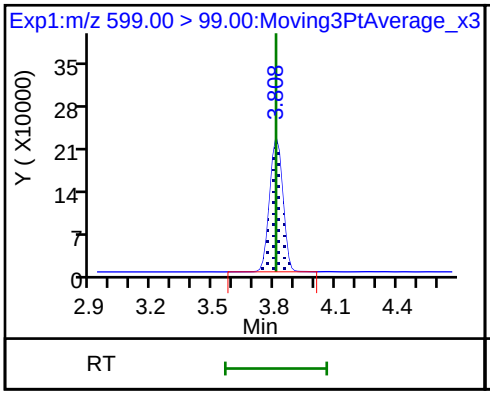
D 27 d3-NMeFOSAA



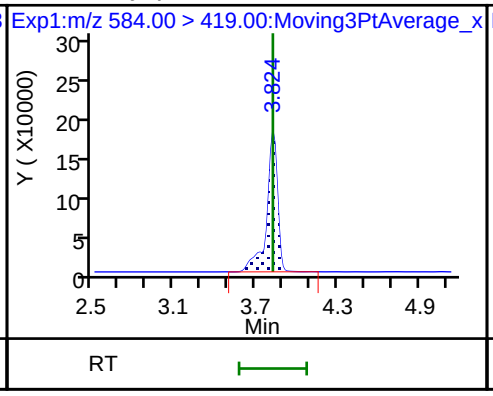
29 Perfluorodecane Sulfonic acid



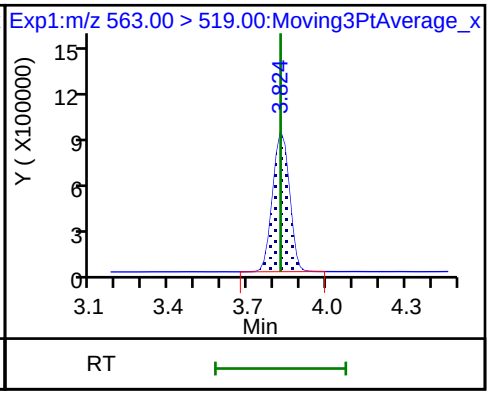
29 Perfluorodecane Sulfonic acid



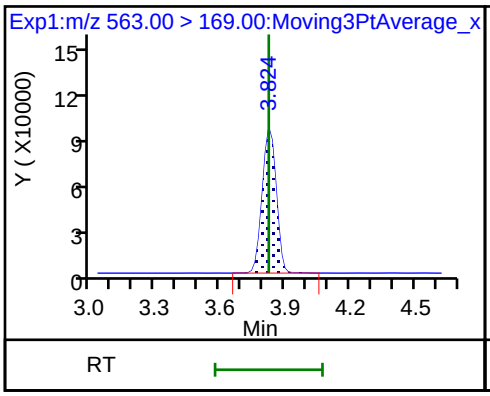
33 N-ethyl perfluorooctane sulfonamid



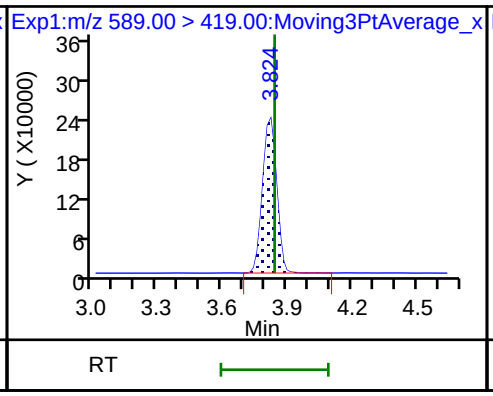
31 Perfluoroundecanoic acid



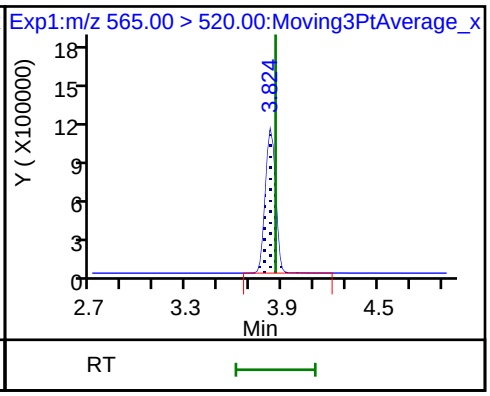
31 Perfluoroundecanoic acid



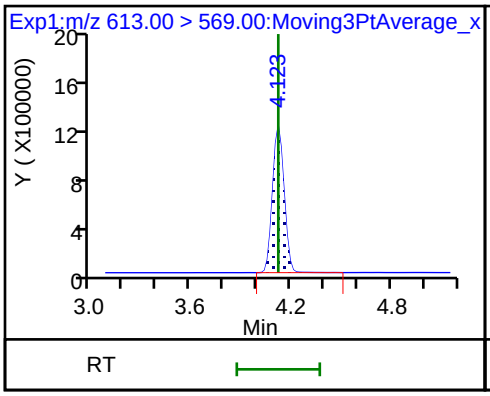
D 32 d5-NEtFOSAA



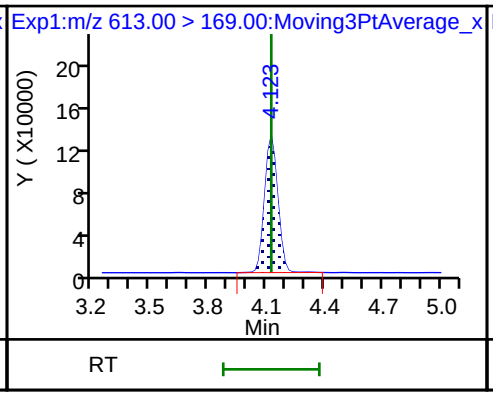
D 30 13C2 PFUnA



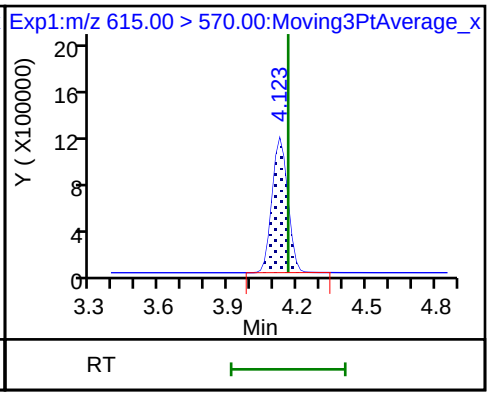
37 Perfluorododecanoic acid



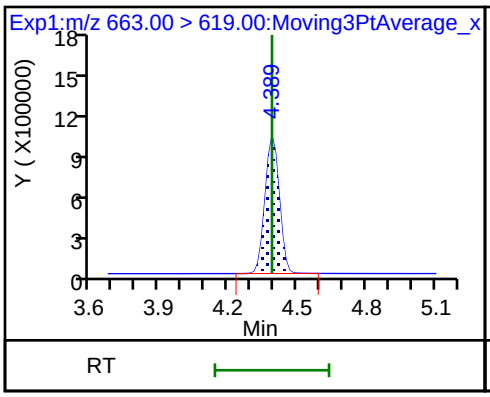
37 Perfluorododecanoic acid



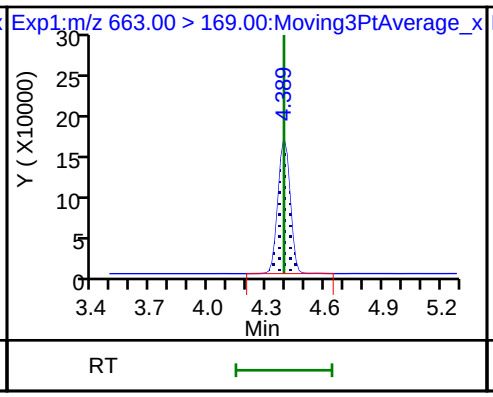
D 36 13C2 PFDoA



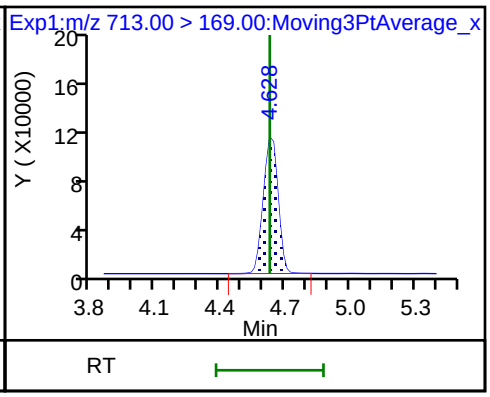
41 Perfluorotridecanoic acid



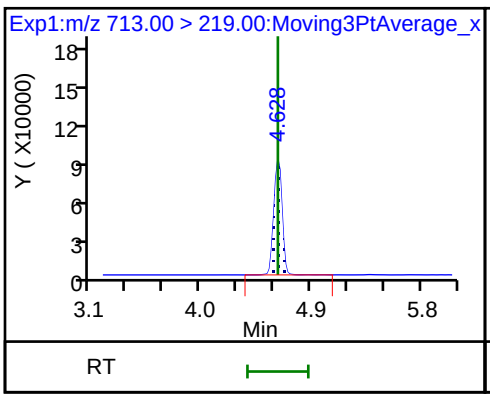
41 Perfluorotridecanoic acid



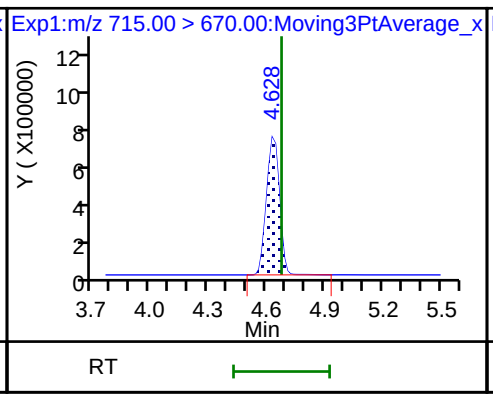
42 Perfluorotetradecanoic acid



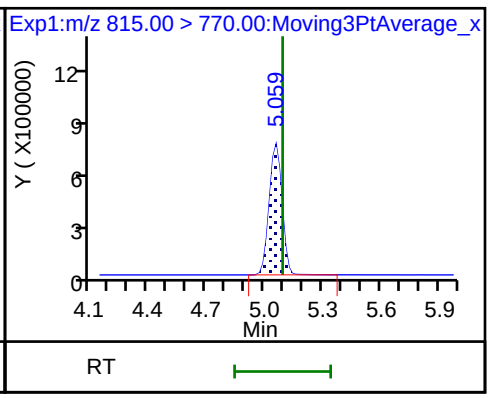
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

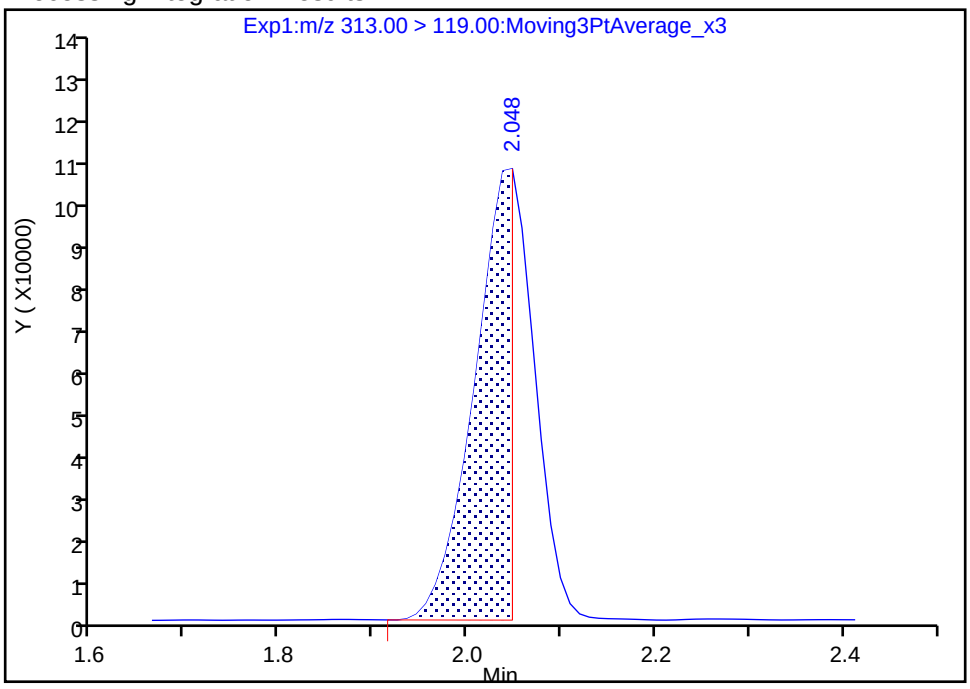
Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_019.d
Injection Date: 12-Aug-2018 12:18:24 Instrument ID: A9
Lims ID: CCV L5
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 16
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

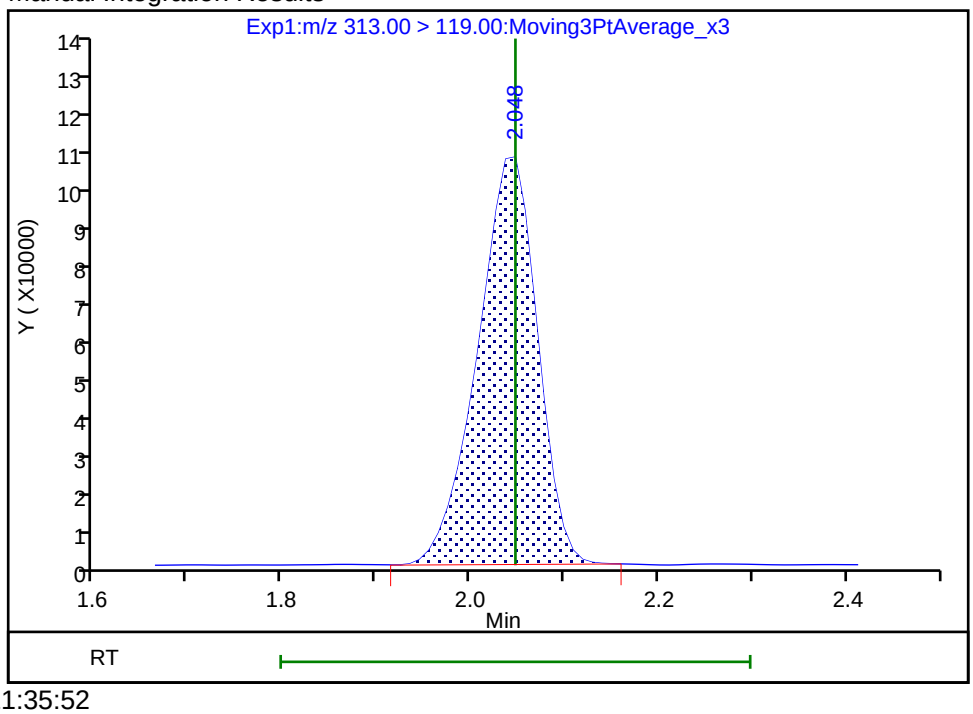
Processing Integration Results

RT: 2.05
Area: 281806
Amount: 2.340790
Amount Units: ng/ml



Manual Integration Results

RT: 2.05
Area: 456948
Amount: 2.340790
Amount Units: ng/ml



Reviewer: roycea, 13-Aug-2018 11:35:52
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCVL 320-239481/2 Calibration Date: 08/13/2018 08:13

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.13LLA_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	0.9293	0.9272		0.0499	0.0500	-0.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.065		0.0522	0.0500	4.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	113.1		0.0484	0.0442	9.5	30.0
4:2 FTS	AveID	17.02	15.76		0.400	0.0467	-7.4	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.8809		0.0471	0.0500	-5.8	30.0
Perfluoropentanesulfonic acid	AveID	48.91	56.34		0.0540	0.0469	15.2	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.137		0.0547	0.0500	9.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.323		0.0471	0.0455	3.4	30.0
6:2 FTS	AveID	2.137	2.432		0.0539	0.0474	13.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	0.9078		0.0428	0.0476	-10.2	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.233		0.0563	0.0501	12.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.115		0.0528	0.0500	5.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.042		0.0451	0.0464	-2.8	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	2.989		0.0487	0.0500	-2.7	30.0
8:2 FTS	AveID	14.02	13.83		0.400	0.0479	-1.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.157		0.0471	0.0500	-5.9	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.6631		0.0486	0.0480	1.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	0.8923		0.400	0.0500	-11.7	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.7965		0.0461	0.0482	-4.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.8379		0.400	0.0500	-6.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.9652		0.0573	0.0500	14.6	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.047		0.0532	0.0500	6.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.6804		0.0453	0.0500	-9.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1557		0.0483	0.0500	-3.3	30.0
13C4 PFBA	Ave	1.117	0.9666		2.16	2.50	-13.5	30.0
13C5-PFPeA	Ave	0.999	0.8330		2.09	2.50	-16.6	30.0
13C3-PFBS	Ave	0.0155	0.0113		1.69	2.33	-27.3	30.0
13C2 PFHxA	Ave	1.037	0.8952		2.16	2.50	-13.6	30.0
13C4-PFHpA	Ave	1.177	1.077		2.29	2.50	-8.5	30.0
18O2 PFHxS	Ave	0.8862	0.7279		1.94	2.37	-17.9	30.0
M2-6:2FTS	Ave	0.1144	0.1189		2.47	2.38	3.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCVL 320-239481/2 Calibration Date: 08/13/2018 08:13

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.13LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	0.9457		2.40	2.50	-4.1	30.0
13C4 PFOS	Ave	0.9223	0.8103		2.10	2.39	-12.1	30.0
13C5 PFNA	Ave	0.8463	0.8599		2.54	2.50	1.6	30.0
13C8 FOSA	Ave	0.5512	0.4817		2.18	2.50	-12.6	30.0
13C2 PFDA	Ave	0.8474	0.8450		2.49	2.50	-0.3	30.0
M2-8:2FTS	Ave	0.0133	0.0149		2.69	2.40	12.4	30.0
d3-NMeFOSAA	Ave	0.1647	0.1898		2.88	2.50	15.2	30.0
d5-NEtFOSAA	Ave	0.1353	0.1597		2.95	2.50	18.0	30.0
13C2 PFUnA	Ave	0.6849	0.6484		2.37	2.50	-5.3	30.0
13C2 PFDoA	Ave	0.7384	0.7529		2.55	2.50	2.0	30.0
13C2-PFTeDA	Ave	0.4715	0.4572		2.42	2.50	-3.0	30.0
13C2-PFHxDA	Ave	0.4325	0.3969		2.29	2.50	-8.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62576.b\2018.08.13LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 13-Aug-2018 08:13:53 ALS Bottle#: 21 Worklist Smp#: 2
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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180813-62576.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 13-Aug-2018 09:00:56 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 08:58:04

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	1.494	0.0	0.537	7460815	2.16		86.5	8766	
2 Perfluorobutyric acid										
212.90 > 169.00	1.494	1.494	0.0	1.000	138347	0.0499		99.8	6.4	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.772	0.0	0.637	6429505	2.09		83.4	8652	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.772	0.0	1.000	137005	0.0522		104	6.9	
D 47 13C3-PFBS										
301.90 > 83.00	1.805	1.805	0.0	0.649	80766	1.69		72.7	377	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.814	1.814	0.0	1.005	173659	0.0484		109	39.7	
298.90 > 99.00	1.805	1.814	-0.009	1.000	62187		2.79(1.35-4.05)		25.4	
D 60 M2-4:2FTS										
329.00 > 81.00	2.027	2.027	0.0	0.729	446149	NC			618	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.027	2.027	0.0	1.123	25566	0.0432		92.6	118	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.058	0.0	0.740	6909145	2.16		86.4	8929	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.058	2.058	0.0	1.000	121720	0.0471		94.2	29.7	
313.00 > 119.00	2.058	2.058	0.0	1.000	11466		10.62(6.96-20.87)		21.8	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.078	2.078	0.0	1.151	91791	0.0540		115	262	
349.00 > 99.00	2.078	2.078	0.0	1.151	41966		2.19(1.15-3.45)		29.4	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.160	2.160	0.0	0.776	828936	NC			3000	

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	2.160	2.160	0.0	1.000	28995	NC			22.7	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.400	0.0	0.862	8309526	2.29		91.5	9266	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.400	2.400	0.0	1.000	188938	0.0547		109	18.2	
363.00 > 169.00	2.400	2.400	0.0	1.000	37363		5.06(2.17-6.52)		71.3	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.413	0.0	0.867	5315050	1.94		82.1	5126	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	135285	0.0471		103	150	
399.00 > 99.00	2.413	2.413	0.0	1.000	41771		3.24(1.90-5.70)		19.5	
65 ADONA										
377.00 > 251.00	2.452	2.452	0.0	0.777	275582	NC			607	
377.00 > 85.00	2.452	2.452	0.0	0.777	111497		2.47(1.05-3.16)		79.9	
D 12 M2-6:2FTS										
429.00 > 81.00	2.751	2.751	0.0	0.989	872015	2.47		104	1141	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.751	2.751	0.0	1.000	42324	0.0539		114	37.1	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.782	0.0	1.000	7299437	2.40		95.9	14399	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.782	2.782	0.0	0.882	108109	0.0428		89.8	114	
449.00 > 99.00	2.782	2.782	0.0	0.882	25826		4.19(1.84-5.53)		71.8	
* 62 13C2-PFOA										
415.00 > 370.00	2.782	2.782	0.0		7718423	2.50			8949	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.782	2.782	0.0	1.000	180212	0.0563		113	24.2	
413.00 > 169.00	2.782	2.782	0.0	1.000	63795		2.82(1.36-4.08)		85.4	
D 18 13C4 PFOS										
503.00 > 80.00	3.154	3.154	0.0	1.134	5979190	2.10		87.9	5535	
D 19 13C5 PFNA										
468.00 > 423.00	3.173	3.173	0.0	1.140	6637164	2.54		102	6513	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.173	3.173	0.0	1.006	120996	0.0451		97.2	78.9	
499.00 > 99.00	3.173	3.173	0.0	1.006	34269		3.53(2.04-6.12)		70.0	
20 Perfluorononanoic acid										
463.00 > 419.00	3.173	3.173	0.0	1.000	147959	0.0528		106	29.7	
463.00 > 169.00	3.154	3.173	-0.019	0.994	25363		5.83(2.68-8.03)		50.3	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.385	3.385	0.0	1.073	121327	NC			193	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.246	3717975	2.18		87.4	3982	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	222279	0.0487		97.3	469	
D 26 M2-8:2FTS										
529.00 > 81.00	3.529	3.529	0.0	1.268	110506	2.69		112	565	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.529	3.529	0.0	1.268	6522405	2.49		99.7	5452	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.529	3.529	0.0	1.119	79622	0.0486		101	106	
549.00 > 99.00	3.514	3.529	-0.015	1.114	13661		5.83(3.02-9.05)		109	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.529	3.529	0.0	1.000	30556	0.0472		98.6	227	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.529	3.529	0.0	1.000	150952	0.0471		94.1	38.4	
513.00 > 169.00	3.529	3.529	0.0	1.000	9857		15.31(7.12-21.35)		19.1	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.684	3.684	0.0	1.324	1464788	2.88		115	3699	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.699	3.699	0.0	1.004	26141	0.0441		88.3	11.7	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.856	3.856	0.0	1.386	1232961	2.95		118	1568	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.856	3.856	0.0	1.223	96042	0.0461		95.6	186	
599.00 > 99.00	3.841	3.856	-0.015	1.218	15587		6.16(2.14-6.43)		32.5	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.871	3.871	0.0	1.004	20663	0.0467		93.4	38.6	
D 30 13C2 PFUnA										
565.00 > 520.00	3.871	3.871	0.0	1.391	5004296	2.37		94.7	12019	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.871	3.871	0.0	1.000	96601	0.0573		115	15.9	
563.00 > 169.00	3.856	3.871	-0.015	0.996	11403		8.47(5.24-15.72)		41.7	
35 MeFOSA										
512.00 > 169.00	3.946	3.946	0.0		31318	NC			121	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.025	4.025	0.0	1.276	157950	NC			653	
D 36 13C2 PFDoA										
615.00 > 570.00	4.178	4.178	0.0	1.501	5811456	2.55		102	5615	
74 1H,1H,2H,2H-perfluorododecanesulfo										M
627.00 > 607.00	4.178	4.178	0.0	1.184	13375	NC			24.2	M
37 Perfluorododecanoic acid										
613.00 > 569.00	4.178	4.178	0.0	1.000	121680	0.0532		106	23.7	
613.00 > 169.00	4.178	4.178	0.0	1.000	13101		9.29(4.68-14.05)		31.9	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.406	4.406	0.0	1.397	11447	NC			57.0	
699.00 > 99.00	4.406	4.406	0.0	1.397	15177		0.75(0.28-0.83)		55.6	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.437	4.437	0.0	1.062	79085	0.0453		90.7	29.6	
663.00 > 169.00	4.437	4.437	0.0	1.062	14777		5.35(3.09-9.27)		45.1	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.692	4.692	0.0	1.686	3528920	2.42		97.0	8899	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.692	4.692	0.0	1.000	10991	0.0483		96.7	43.2	
713.00 > 219.00	4.692	4.692	0.0	1.000	10334		1.06(0.70-2.09)		42.5	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.126	5.126	0.0	1.842	3063350	2.29		91.8	7000	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.126	5.126	0.0	1.000	87021	NC			7.4	
813.00 > 169.00	5.126	5.126	0.0	1.000	14248		6.11(2.77-8.32)		49.3	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.504	5.504	0.0	1.074	40413	NC			22.1	
913.00 > 169.00	5.504	5.504	0.0	1.074	7809		5.18(2.55-7.64)		63.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006 Amount Added: 1.00 Units: mL

Report Date: 13-Aug-2018 09:00:58 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62576.b\2018.08.13LLA_005.d

Injection Date: 13-Aug-2018 08:13:53 Instrument ID: A9

Lims ID: CCVL

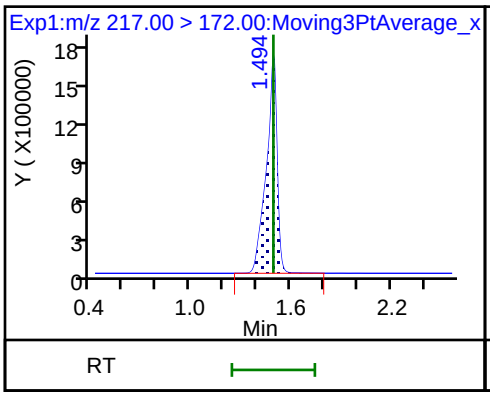
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 21 Worklist Smp#: 2

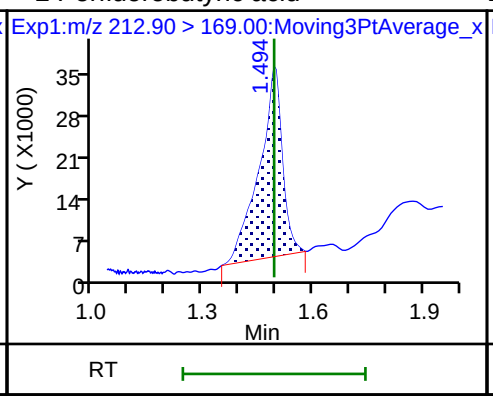
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

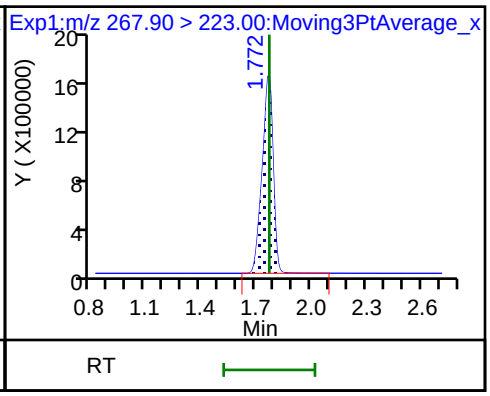
D 1 13C4 PFBA



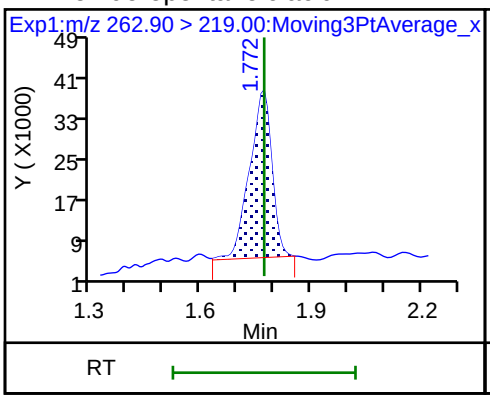
2 Perfluorobutyric acid



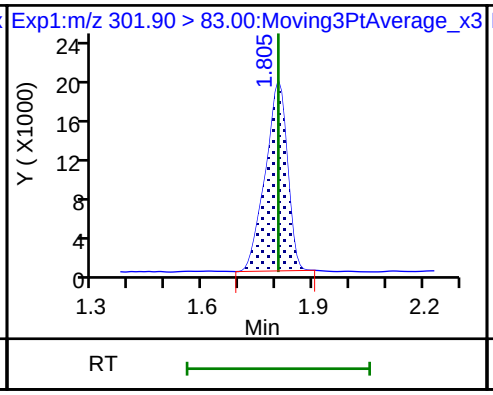
D 3 13C5-PFPeA



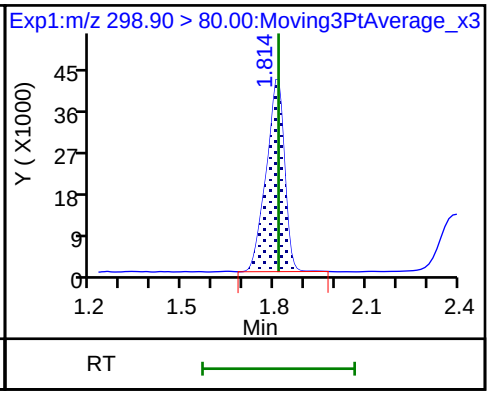
4 Perfluoropentanoic acid



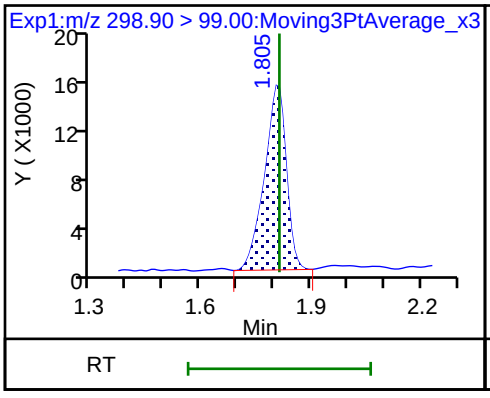
D 47 13C3-PFBS



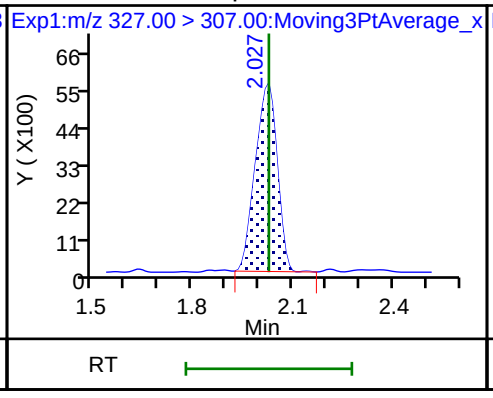
5 Perfluorobutanesulfonic acid



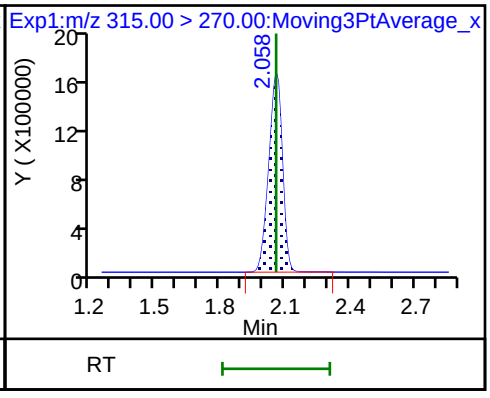
5 Perfluorobutanesulfonic acid



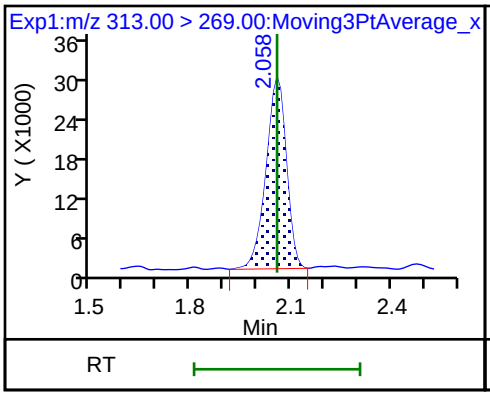
61 1H,1H,2H,2H-perfluorohexanesulfon



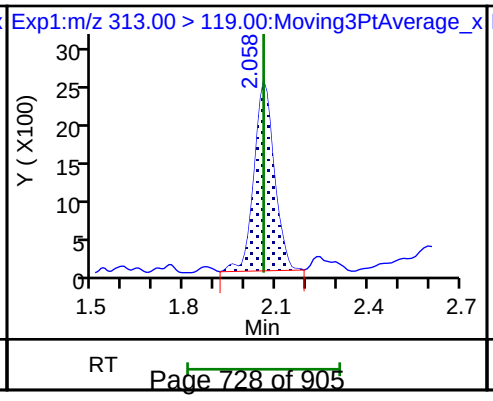
D 7 13C2 PFHxA



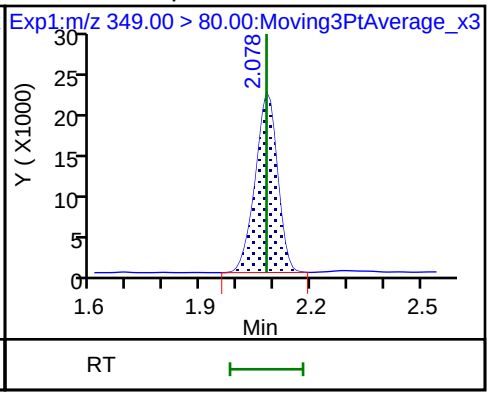
6 Perfluorohexanoic acid



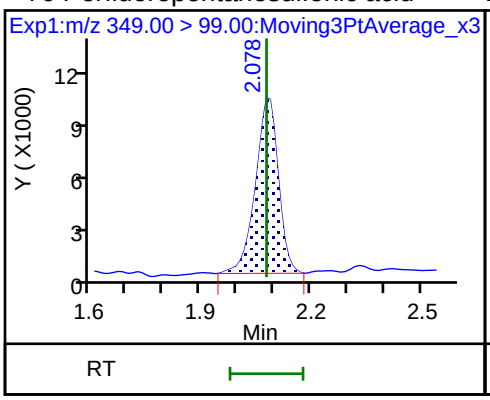
6 Perfluorohexanoic acid



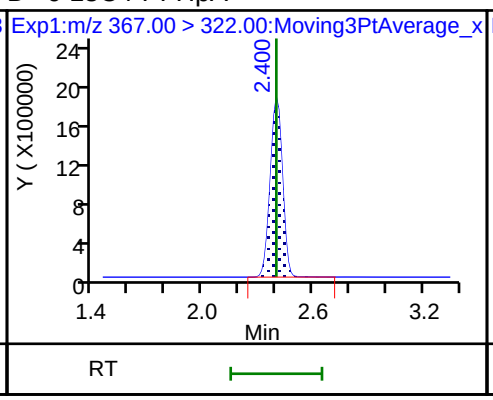
70 Perfluoropentanesulfonic acid



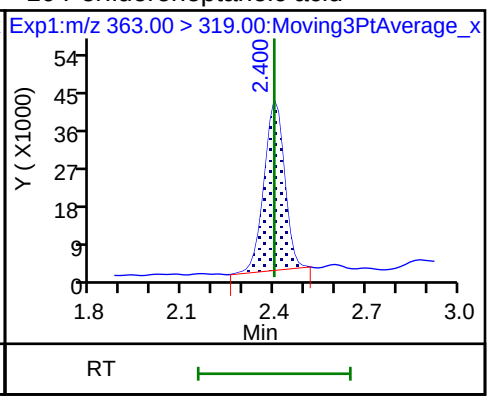
70 Perfluoropentanesulfonic acid



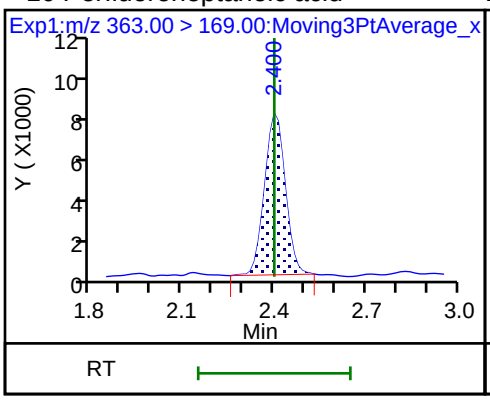
D 9 13C4-PFHpA



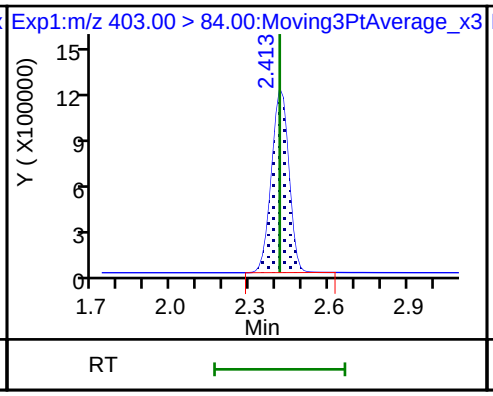
10 Perfluoroheptanoic acid



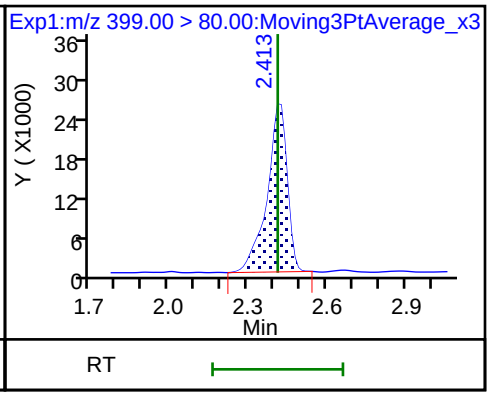
10 Perfluoroheptanoic acid



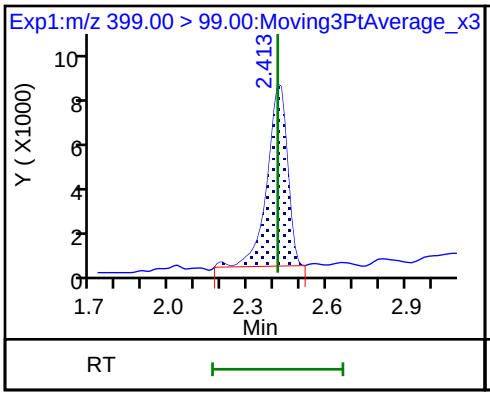
D 11 18O2 PFHxS



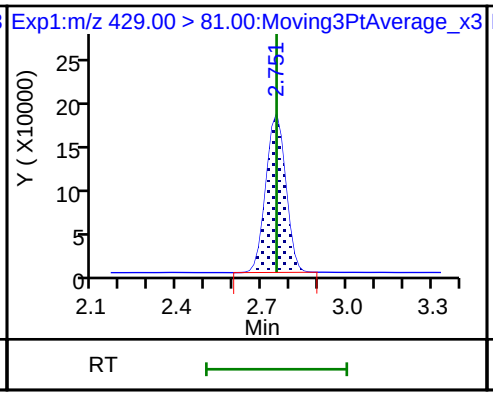
8 Perfluorohexanesulfonic acid



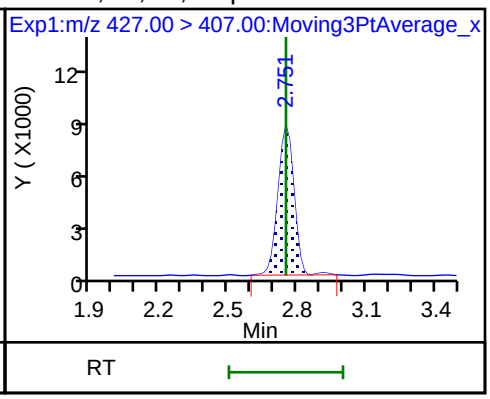
8 Perfluorohexanesulfonic acid



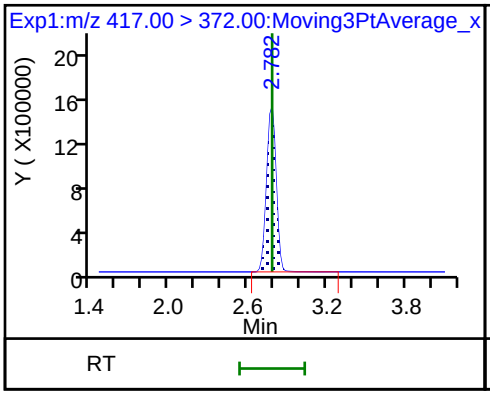
D 12 M2-6:2FTS



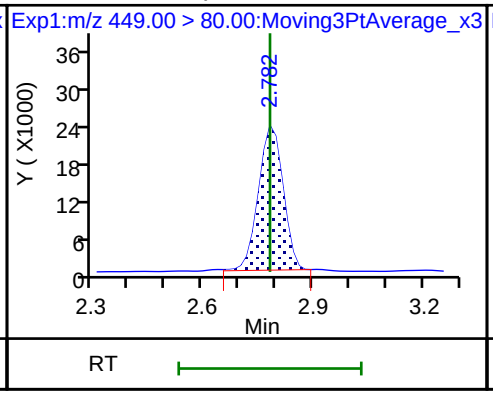
13 1H,1H,2H,2H-perfluorooctanesulfoni



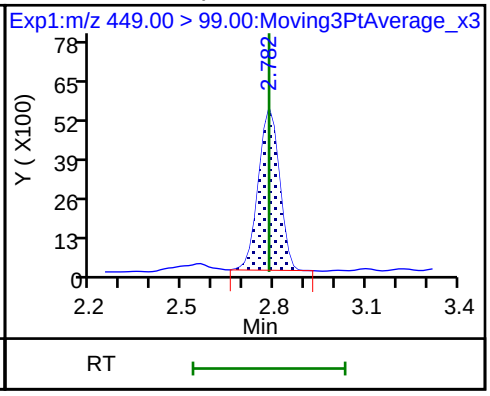
D 14 13C4 PFOA



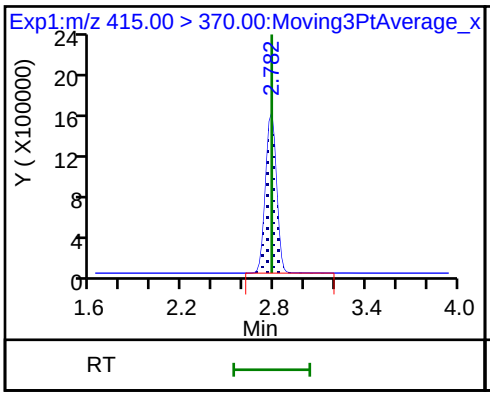
16 Perfluoroheptanesulfonic acid



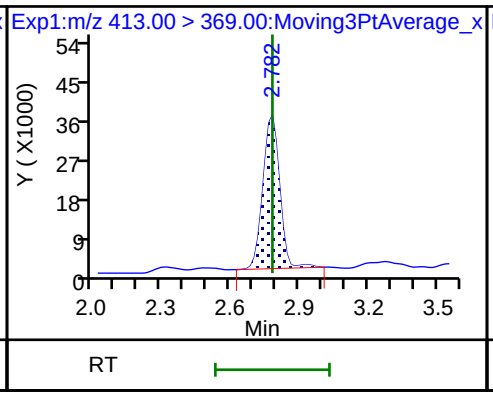
16 Perfluoroheptanesulfonic acid



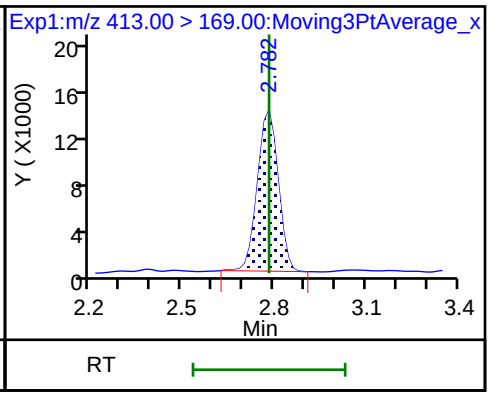
* 62 13C2-PFOA



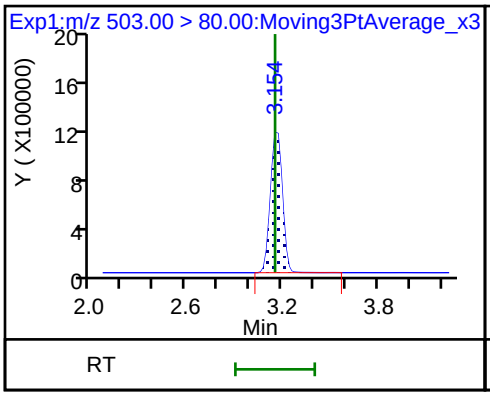
15 Perfluorooctanoic acid



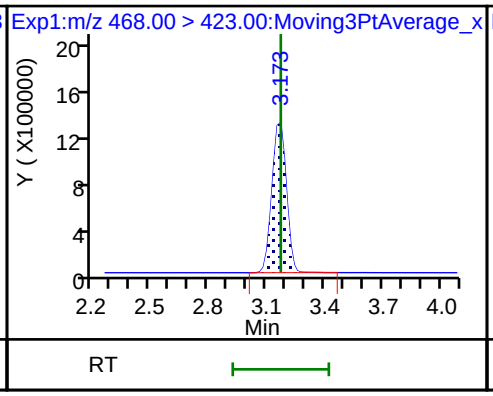
15 Perfluorooctanoic acid



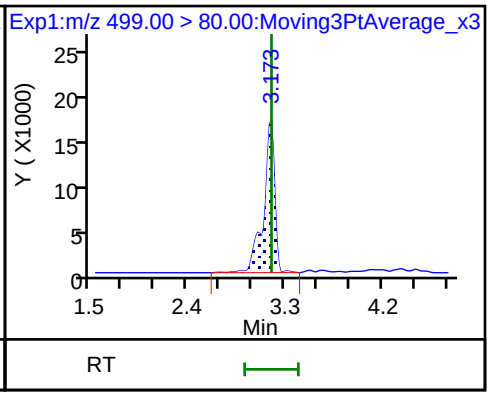
D 18 13C4 PFOS



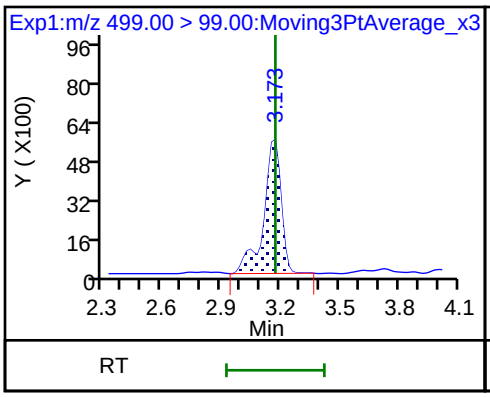
D 19 13C5 PFNA



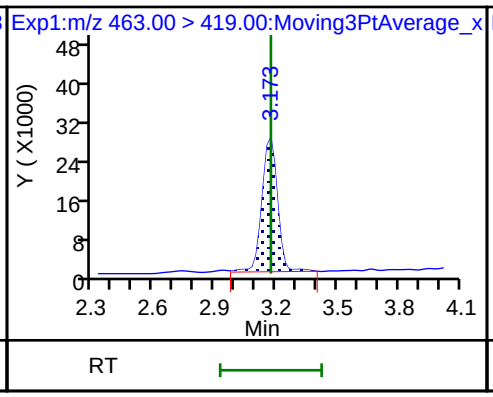
17 Perfluorooctane sulfonic acid



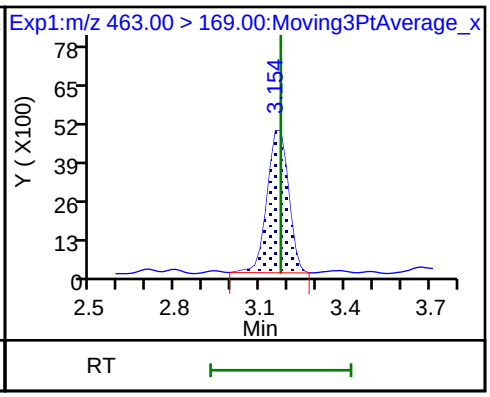
17 Perfluorooctane sulfonic acid



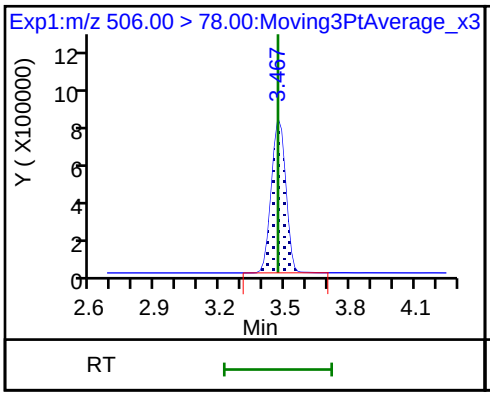
20 Perfluorononanoic acid



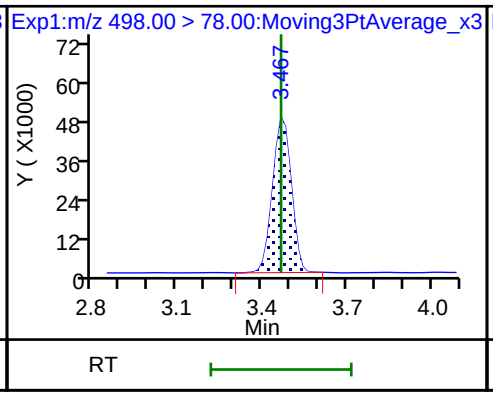
20 Perfluorononanoic acid



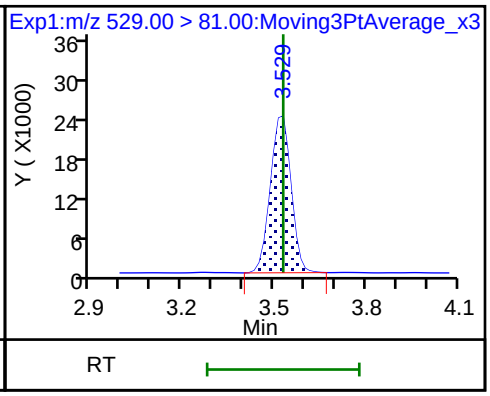
D 21 13C8 FOSA



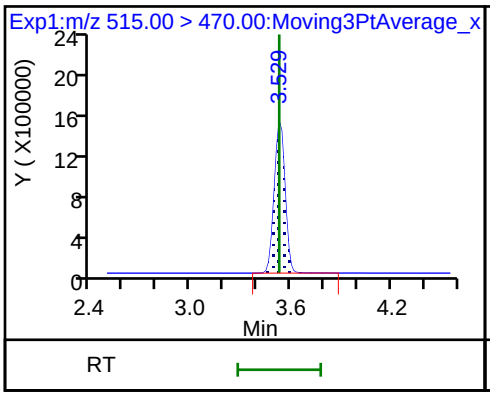
22 Perfluorooctane Sulfonamide



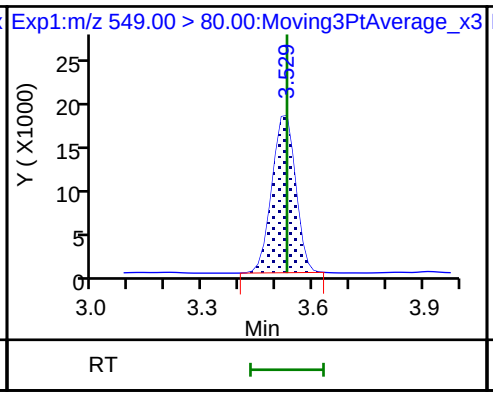
D 26 M2-8:2FTS



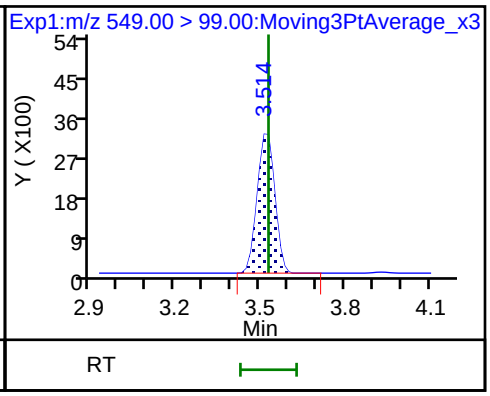
D 23 13C2 PFDA



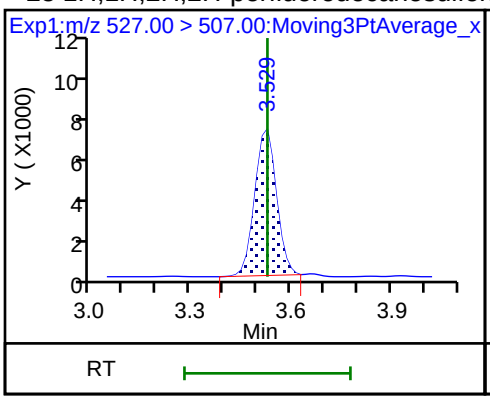
68 Perfluorononanesulfonic acid



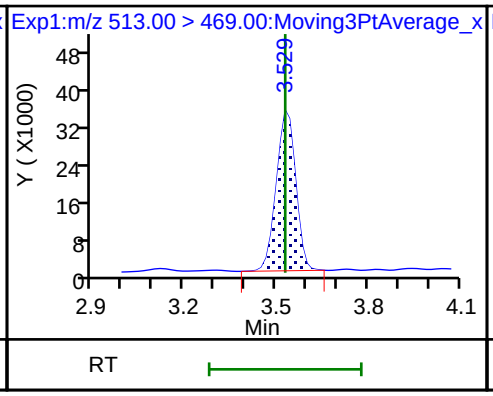
68 Perfluorononanesulfonic acid



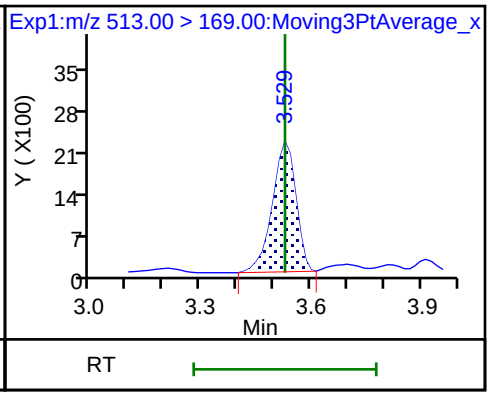
25 1H,1H,2H,2H-perfluorodecanesulfoni



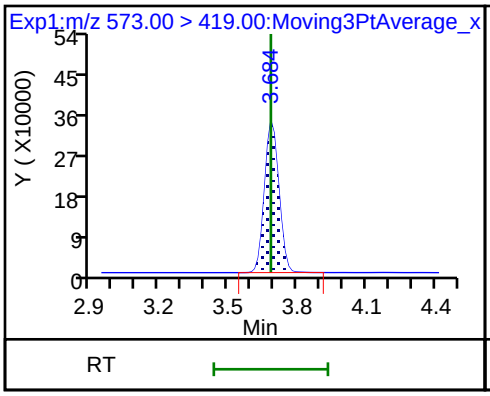
24 Perfluorodecanoic acid



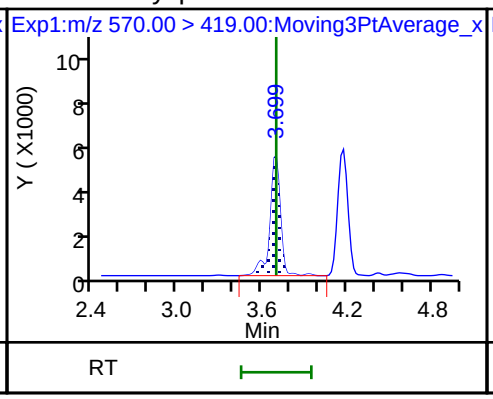
24 Perfluorodecanoic acid



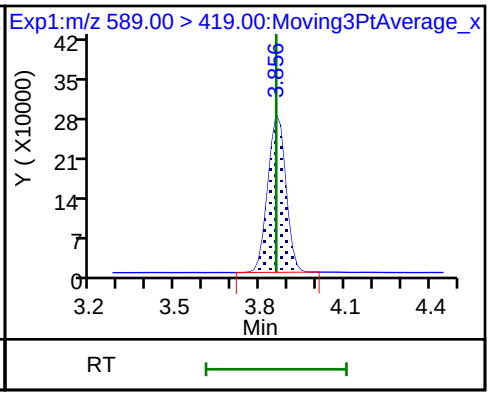
D 27 d3-NMeFOSAA



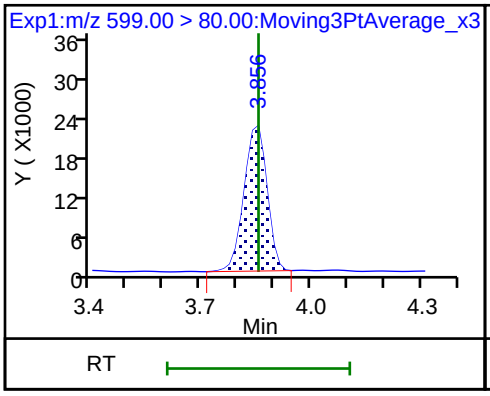
28 N-methyl perfluorooctane sulfonami



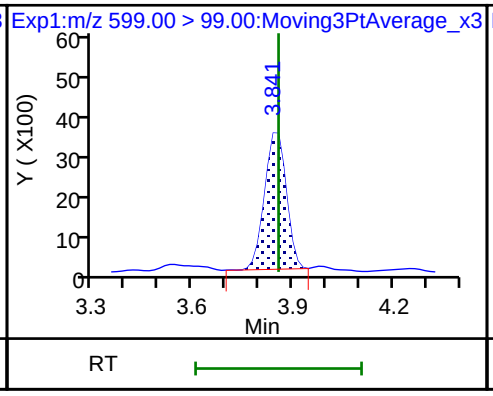
D 32 d5-NEtFOSAA



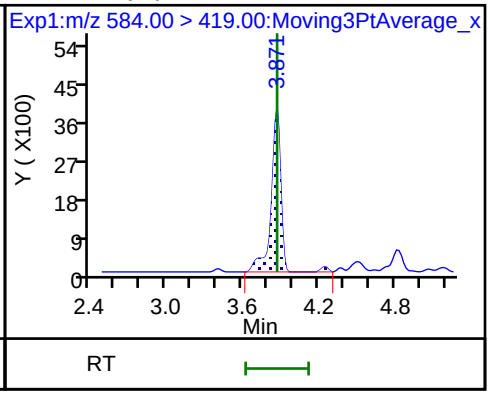
29 Perfluorodecane Sulfonic acid



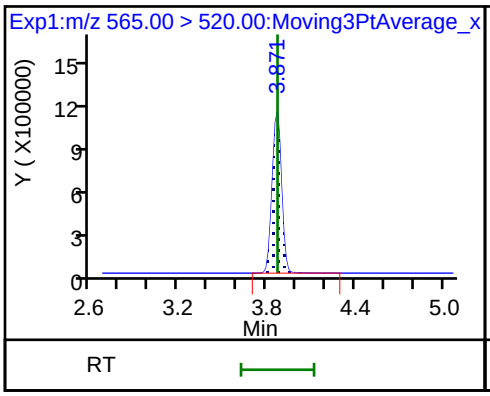
29 Perfluorodecane Sulfonic acid



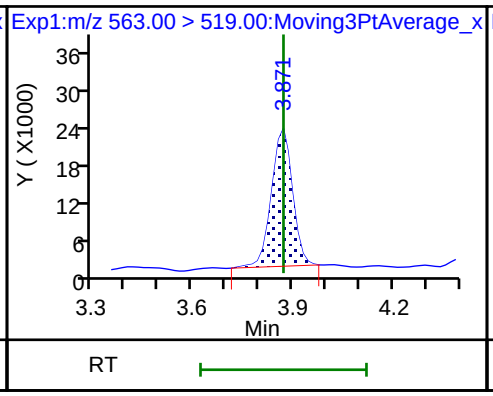
33 N-ethyl perfluorooctane sulfonamid



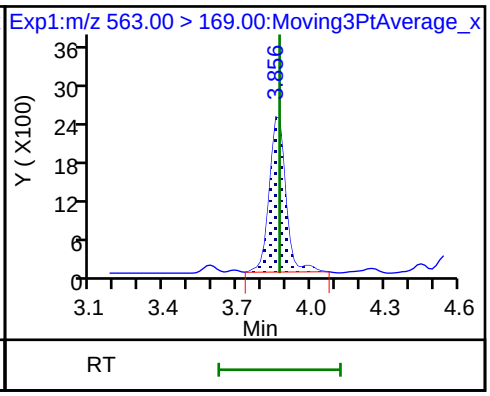
D 30 13C2 PFUnA



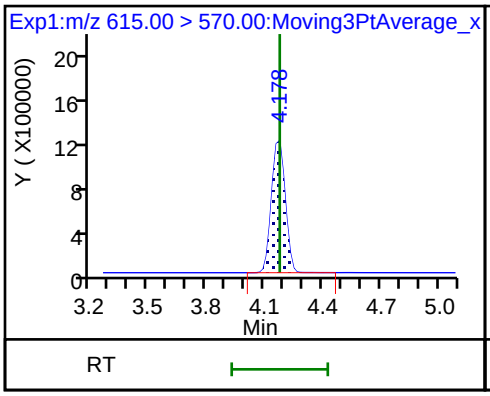
31 Perfluoroundecanoic acid



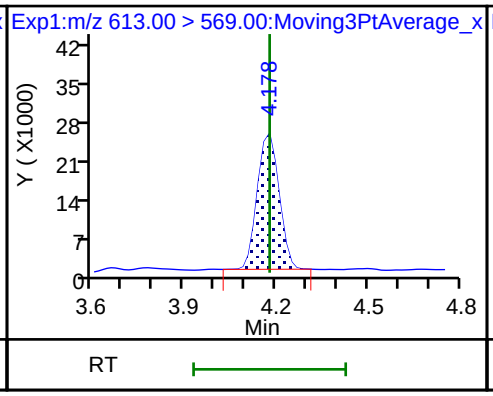
31 Perfluoroundecanoic acid



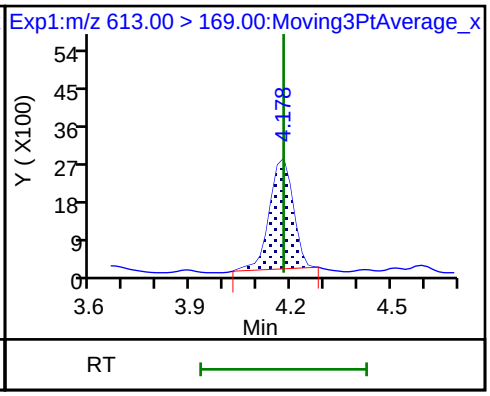
D 36 13C2 PFDoA



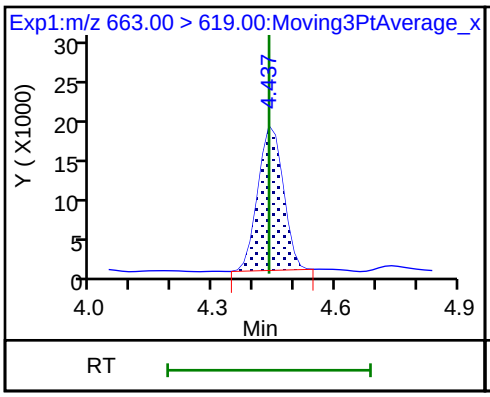
37 Perfluorododecanoic acid



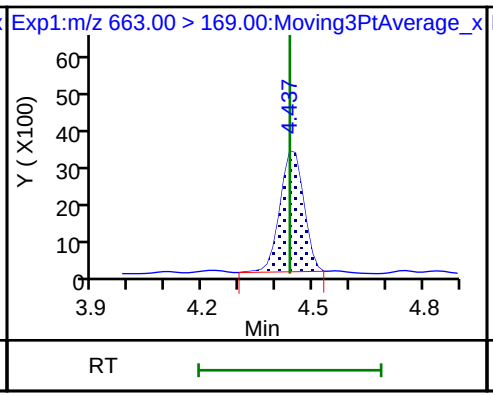
37 Perfluorododecanoic acid



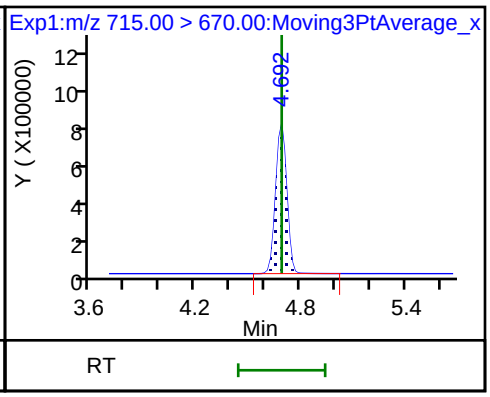
41 Perfluorotridecanoic acid



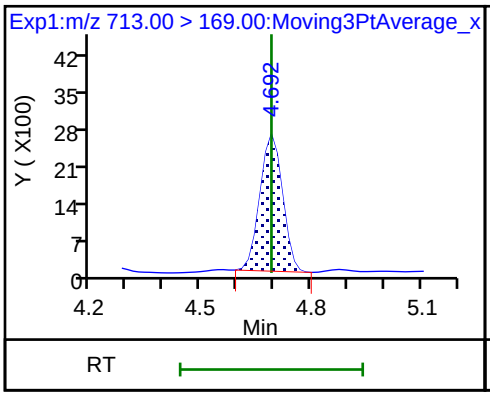
41 Perfluorotridecanoic acid



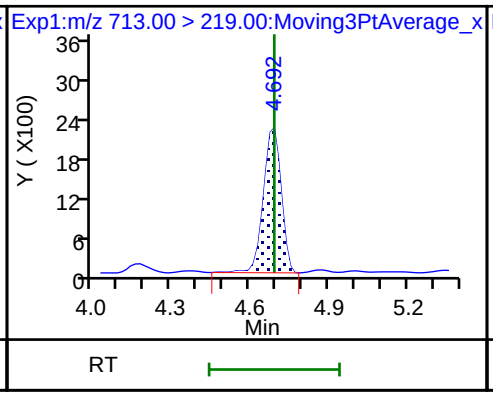
D 43 13C2-PFTeDA



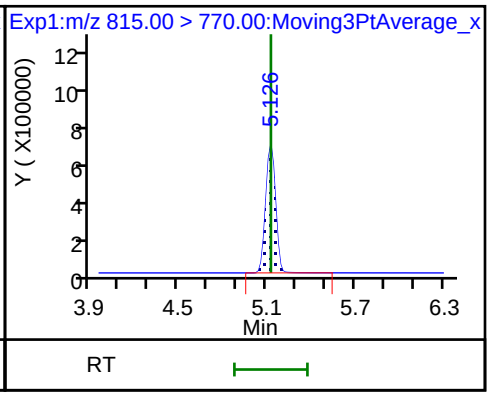
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239481/3 Calibration Date: 08/13/2018 08:21

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.13LLA_019.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9293	0.9346		2.51	2.50	0.6	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.046		2.56	2.50	2.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	111.4		2.38	2.21	7.8	30.0
4:2 FTS	AveID	17.02	13.31		1.83	2.34	-21.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.8896		2.38	2.50	-4.9	30.0
Perfluoropentanesulfonic acid	AveID	48.91	55.55		2.66	2.35	13.6	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	0.998		2.40	2.50	-3.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.187		2.11	2.28	-7.2	30.0
6:2 FTS	AveID	2.137	2.138		2.37	2.37	0.0	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.118		2.63	2.38	10.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.049		2.39	2.50	-4.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.145		2.48	2.32	6.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.023		2.42	2.50	-3.0	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	2.996		2.44	2.50	-2.4	30.0
8:2 FTS	AveID	14.02	14.78		2.52	2.40	5.4	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.7590		2.78	2.40	15.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.195		2.43	2.50	-2.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	0.9646		2.39	2.50	-4.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.9206		2.57	2.50	2.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.9009		2.61	2.41	8.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.8625		2.56	2.50	2.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.086		2.76	2.50	10.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.8228		2.74	2.50	9.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1490		2.31	2.50	-7.5	30.0
13C4 PFBA	Ave	1.117	1.009		2.26	2.50	-9.7	30.0
13C5-PFPeA	Ave	0.999	0.8496		2.13	2.50	-14.9	30.0
13C3-PFBS	Ave	0.0155	0.0122		1.83	2.33	-21.3	30.0
13C2 PFHxA	Ave	1.037	0.8933		2.15	2.50	-13.8	30.0
13C4-PFHpA	Ave	1.177	1.130		2.40	2.50	-4.0	30.0
18O2 PFHxS	Ave	0.8862	0.7805		2.08	2.37	-11.9	30.0
M2-6:2FTS	Ave	0.1144	0.1163		2.41	2.38	1.6	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239481/3 Calibration Date: 08/13/2018 08:21

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.13LLA_019.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	1.002		2.54	2.50	1.6	30.0
13C4 PFOS	Ave	0.9223	0.7712		2.00	2.39	-16.4	30.0
13C5 PFNA	Ave	0.8463	0.9013		2.66	2.50	6.5	30.0
13C8 FOSA	Ave	0.5512	0.4885		2.22	2.50	-11.4	30.0
13C2 PFDA	Ave	0.8474	0.8579		2.53	2.50	1.2	30.0
M2-8:2FTS	Ave	0.0133	0.0134		2.41	2.40	0.4	30.0
d3-NMeFOSAA	Ave	0.1647	0.1850		2.81	2.50	12.3	30.0
d5-NEtFOSAA	Ave	0.1353	0.1486		2.75	2.50	9.8	30.0
13C2 PFUnA	Ave	0.6849	0.6598		2.41	2.50	-3.7	30.0
13C2 PFDoA	Ave	0.7384	0.6864		2.32	2.50	-7.0	30.0
13C2-PFTeDA	Ave	0.4715	0.4977		2.64	2.50	5.6	30.0
13C2-PFHxDA	Ave	0.4325	0.4352		2.52	2.50	0.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62576.b\2018.08.13LLA_019.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 13-Aug-2018 08:21:23 ALS Bottle#: 14 Worklist Smp#: 3
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\20180813-62576.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 13-Aug-2018 09:01:03 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 08:58:58

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	1.494	0.0	0.537	7453256	2.26		90.3	16923	
2 Perfluorobutyric acid										
212.90 > 169.00	1.494	1.494	0.0	1.000	6965552	2.51		101	322	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.772	0.0	0.637	6276196	2.13		85.1	7159	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.772	0.0	1.000	6564443	2.56		103	345	
D 47 13C3-PFBS										
301.90 > 83.00	1.806	1.805	0.001	0.649	83664	1.83		78.7	387	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.806	1.806	0.0	1.000	8855341	2.38		108	1714	
298.90 > 99.00	1.806	1.806	0.0	1.000	3169285		2.79(1.35-4.05)		1189	
D 60 M2-4:2FTS										
329.00 > 81.00	2.028	2.027	0.001	0.729	432636	NC			466	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.028	2.028	0.0	1.123	1118224	1.83		78.2	2700	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.058	0.0	0.740	6598722	2.15		86.2	10723	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.058	2.058	0.0	1.000	5870135	2.38		95.1	1220	
313.00 > 119.00	2.058	2.058	0.0	1.000	452012		12.99(6.96-20.87)		968	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.089	2.089	0.0	1.157	4687170	2.66		114	5525	
349.00 > 99.00	2.089	2.089	0.0	1.157	2133938		2.20(1.15-3.45)		1306	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.161	2.160	0.001	0.776	897955	NC			4723	

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	2.161	2.161	0.0	1.000	1396879	NC			920	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.400	0.0	0.862	8350948	2.40		96.0	11797	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.400	2.400	0.0	1.000	8338042	2.40		96.2	745	
363.00 > 169.00	2.400	2.400	0.0	1.000	1883957		4.43(2.17-6.52)		2405	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.413	0.0	0.867	5454383	2.08		88.1	4453	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	6225553	2.11		92.8	4067	
399.00 > 99.00	2.413	2.413	0.0	1.000	1637520		3.80(1.90-5.70)		793	
D 12 M2-6:2FTS										
429.00 > 81.00	2.751	2.751	0.0	0.989	816140	2.41		102	1119	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.751	2.751	0.0	1.000	1741102	2.37		100	1460	
D 14 13C4 PFOA										
417.00 > 372.00	2.783	2.782	0.001	1.000	7401225	2.54		102	16438	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.783	2.783	0.0	0.882	6065154	2.63		111	3430	
449.00 > 99.00	2.783	2.783	0.0	0.882	1466196		4.14(1.84-5.53)		1729	
* 62 13C2-PFOA										
415.00 > 370.00	2.783	2.783	0.0		7387068	2.50			6972	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.783	2.783	0.0	1.000	7768060	2.39		95.7	962	
413.00 > 169.00	2.783	2.783	0.0	1.000	2913005		2.67(1.36-4.08)		2866	
D 18 13C4 PFOS										
503.00 > 80.00	3.154	3.154	0.0	1.134	5446293	2.00		83.6	3802	
D 19 13C5 PFNA										
468.00 > 423.00	3.173	3.173	0.0	1.140	6658047	2.66		106	5297	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.154	3.154	0.0	1.000	6054239	2.48		107	2912	
499.00 > 99.00	3.154	3.154	0.0	1.000	1320277		4.59(2.04-6.12)		1645	
20 Perfluorononanoic acid										
463.00 > 419.00	3.173	3.173	0.0	1.000	6811263	2.42		97.0	1076	
463.00 > 169.00	3.173	3.173	0.0	1.000	1237248		5.51(2.68-8.03)		1920	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.385	3.385	0.0	1.073	5971845	NC			3812	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.246	3608829	2.22		88.6	4826	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.482	3.482	0.0	1.004	10813620	2.44		97.6	5838	
D 26 M2-8:2FTS										
529.00 > 81.00	3.529	3.529	0.0	1.268	94471	2.41		100	488	
D 23 13C2 PFDA										
515.00 > 470.00	3.529	3.529	0.0	1.268	6337036	2.53		101	6767	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.514	3.514	0.0	1.114	4151223	2.78		116	3198	
549.00 > 99.00	3.514	3.514	0.0	1.114	717854		5.78(3.02-9.05)		1585	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.514	3.514	0.0	0.996	1396030	2.52		105	4424	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.529	3.529	0.0	1.000	7573131	2.43		97.2	1422	
513.00 > 169.00	3.529	3.529	0.0	1.000	512626		14.77(7.12-21.35)		485	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.685	3.684	0.001	1.324	1366847	2.81		112	1126	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.685	3.685	0.0	1.000	1318421	2.39		95.4	640	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.857	3.856	0.001	1.386	1097907	2.75		110	1668	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.857	3.857	0.0	1.223	4947855	2.61		108	4057	
599.00 > 99.00	3.841	3.857	-0.016	1.218	1051937		4.70(2.14-6.43)		1499	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.857	3.857	0.0	1.000	1010738	2.57		103	1288	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.871	0.001	1.391	4874008	2.41		96.3	7759	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.872	3.872	0.0	1.000	4203961	2.56		102	634	
563.00 > 169.00	3.872	3.872	0.0	1.000	436710		9.63(5.24-15.72)		1122	
35 MeFOSA										
512.00 > 169.00	3.962	3.962	0.0		1570685	NC			1399	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.026	4.026	0.0	1.276	6882598	NC			8016	
D 36 13C2 PFDoA										
615.00 > 570.00	4.160	4.178	-0.018	1.495	5070290	2.32		93.0	7703	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.160	4.160	0.0	1.179	805121	NC			1192	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.160	4.160	0.0	1.000	5508759	2.76		110	943	
613.00 > 169.00	4.160	4.160	0.0	1.000	595920		9.24(4.68-14.05)		1136	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.406	4.406	0.0	1.397	510307	NC			1602	
699.00 > 99.00	4.406	4.406	0.0	1.397	861111		0.59(0.28-0.83)		2022	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.437	4.437	0.0	1.067	4172053	2.74		110	1240	
663.00 > 169.00	4.437	4.437	0.0	1.067	695888		6.00(3.09-9.27)		1495	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.692	4.692	0.0	1.686	3676867	2.64		106	6578	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.692	4.692	0.0	1.000	547703	2.31		92.5	1708	
713.00 > 219.00	4.677	4.692	-0.015	0.997	414111		1.32(0.70-2.09)		1190	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.126	5.126	0.0	1.842	3214850	2.52		101	4591	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.126	5.126	0.0	1.000	2911270	NC			218	
813.00 > 169.00	5.126	5.126	0.0	1.000	493000		5.91(2.77-8.32)		1469	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.504	5.504	0.0	1.074	2149467	NC			854	
913.00 > 169.00	5.490	5.504	-0.014	1.071	403552		5.33(2.55-7.64)		1809	

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: 13-Aug-2018 09:01:05 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62576.b\2018.08.13LLA_019.d

Injection Date: 13-Aug-2018 08:21:23 Instrument ID: A9

Lims ID: CCV L5

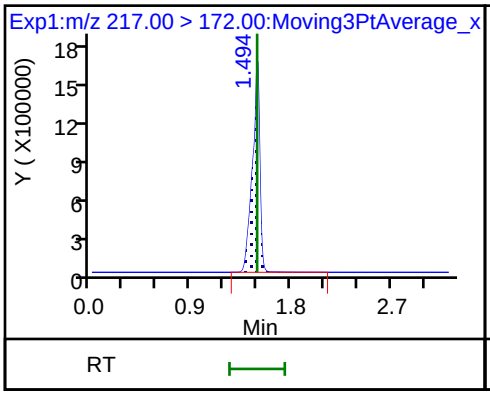
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 3

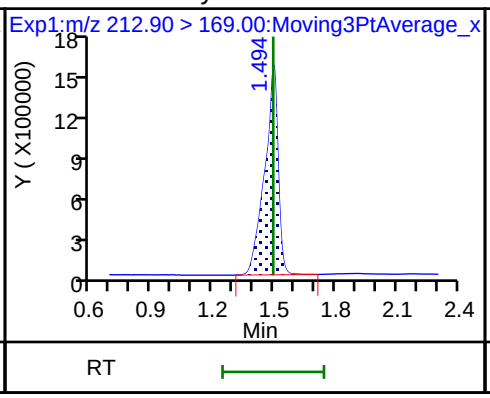
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

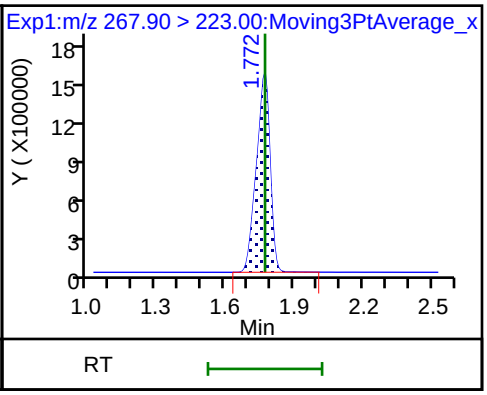
D 1 13C4 PFBA



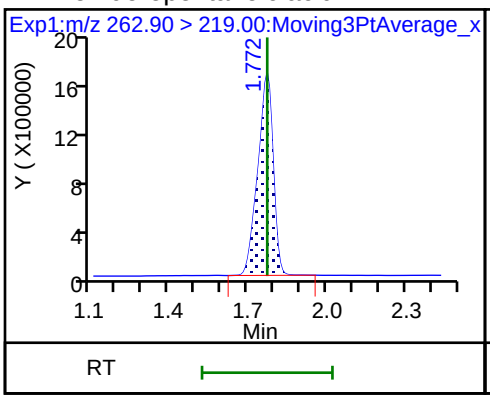
2 Perfluorobutyric acid



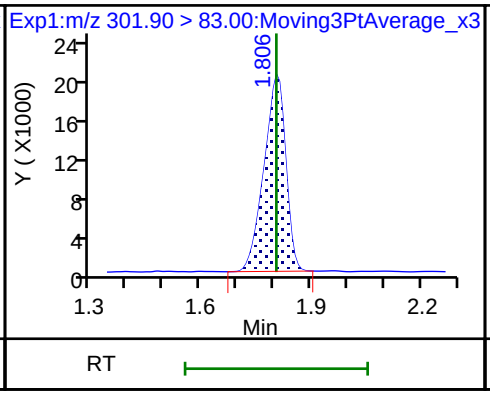
D 3 13C5-PFPeA



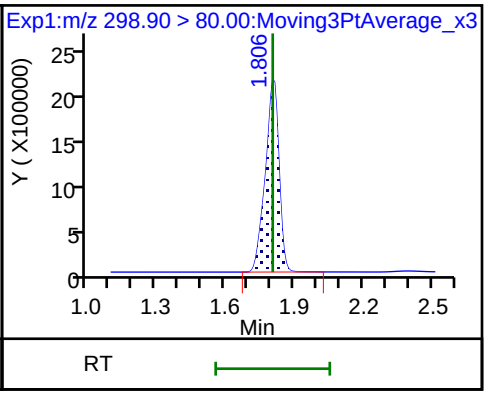
4 Perfluoropentanoic acid



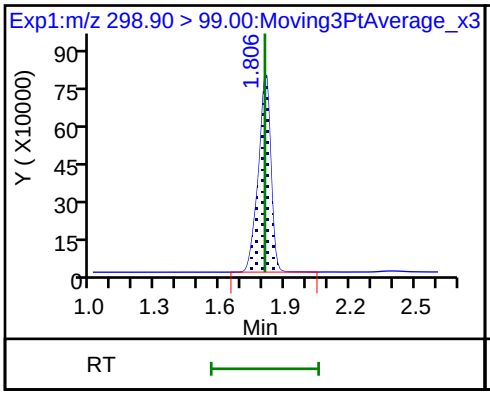
D 47 13C3-PFBS



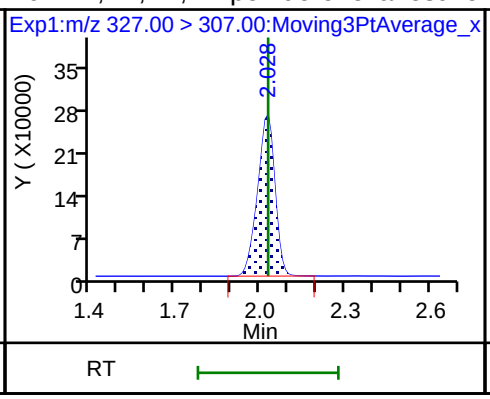
5 Perfluorobutanesulfonic acid



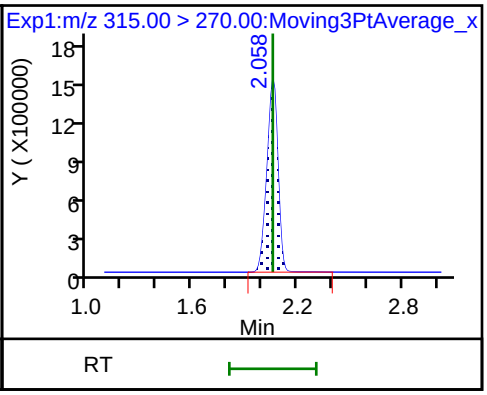
5 Perfluorobutanesulfonic acid



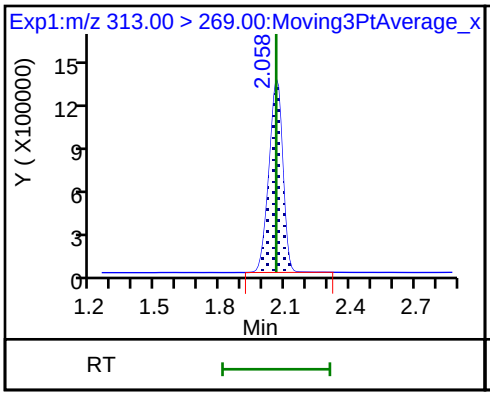
61 1H,1H,2H,2H-perfluorohexanesulfon



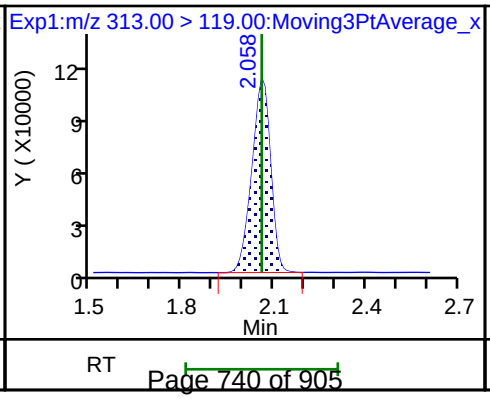
D 7 13C2 PFHxA



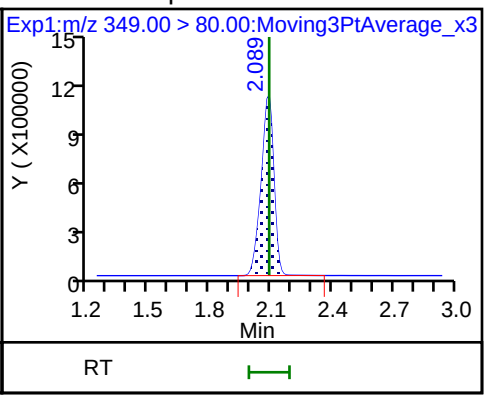
6 Perfluorohexanoic acid



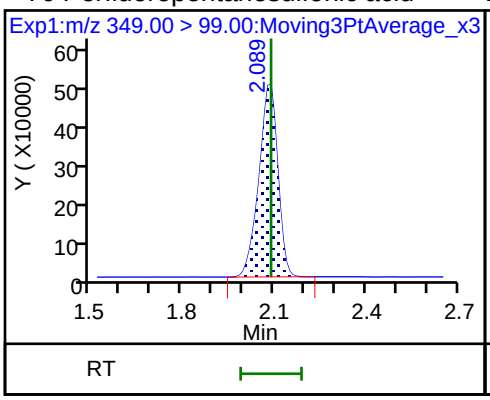
6 Perfluorohexanoic acid



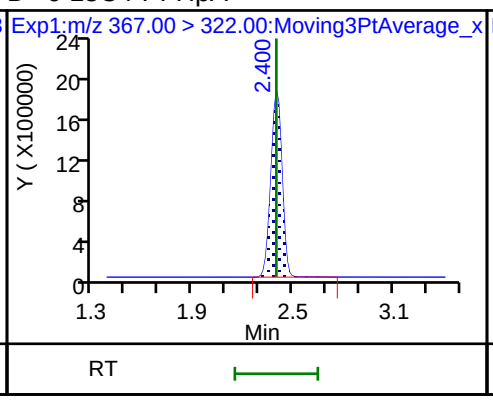
70 Perfluoropentanesulfonic acid



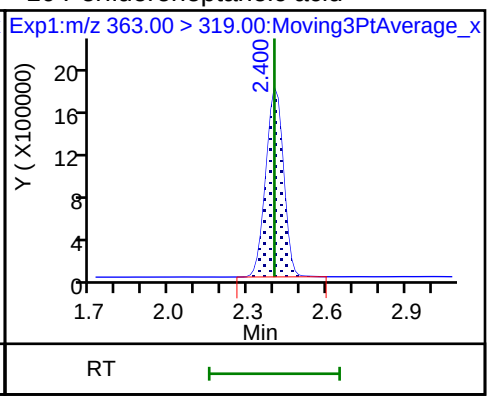
70 Perfluoropentanesulfonic acid



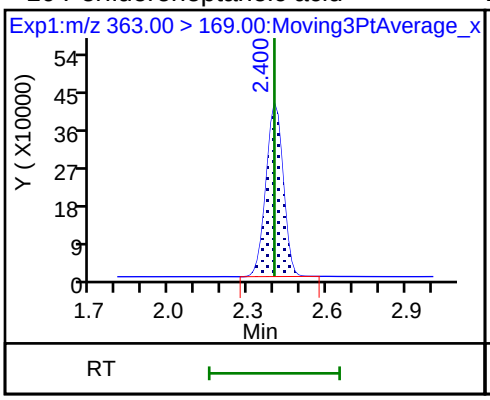
D 9 13C4-PFHpA



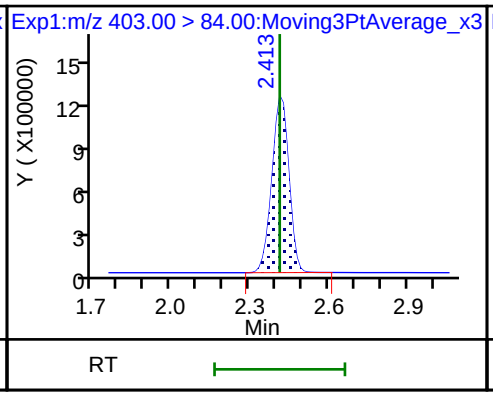
10 Perfluoroheptanoic acid



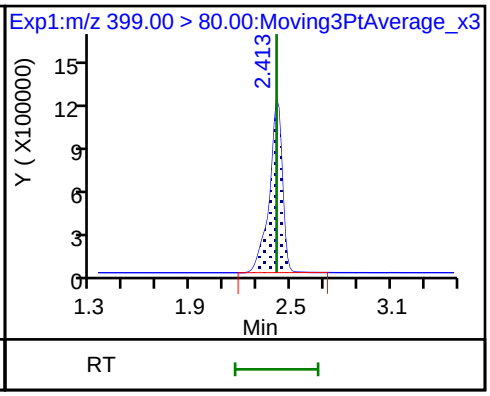
10 Perfluoroheptanoic acid



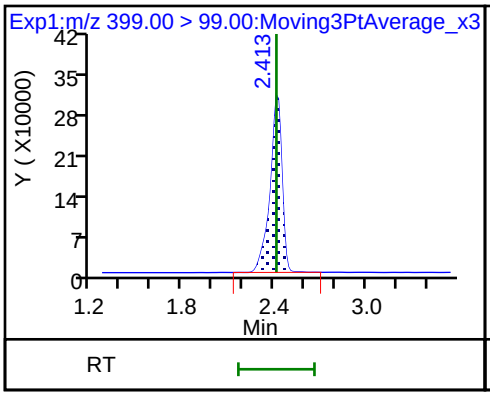
D 11 18O2 PFHxS



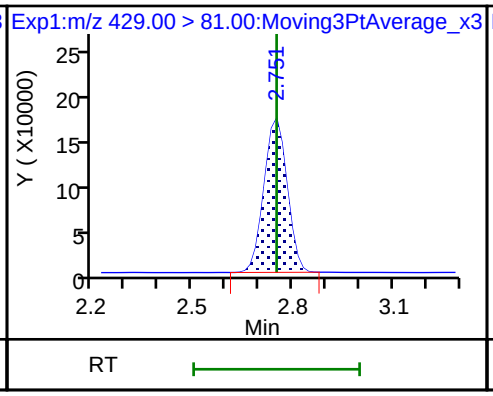
8 Perfluorohexanesulfonic acid



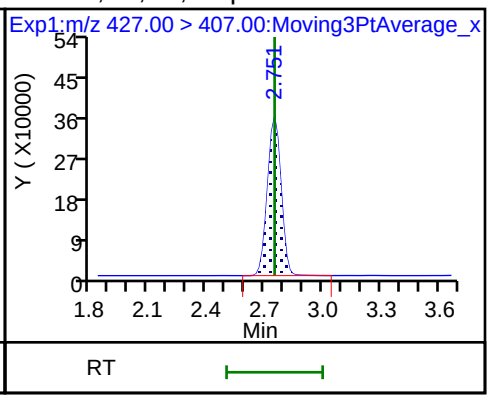
8 Perfluorohexanesulfonic acid



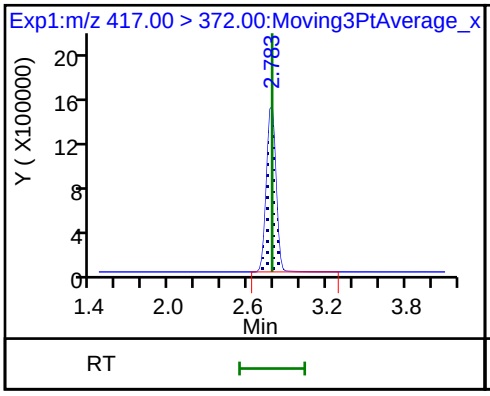
D 12 M2-6:2FTS



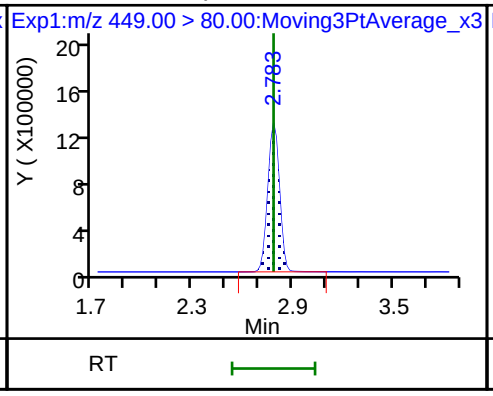
13 1H,1H,2H,2H-perfluorooctanesulfoni



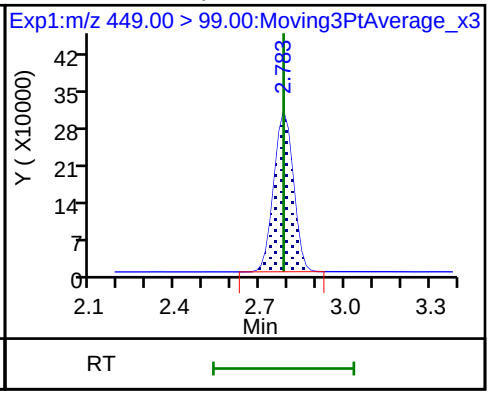
D 14 13C4 PFOA



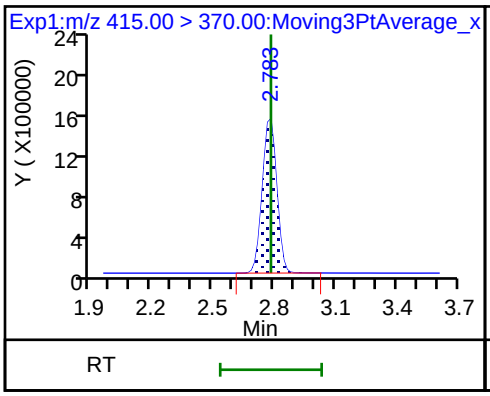
16 Perfluoroheptanesulfonic acid



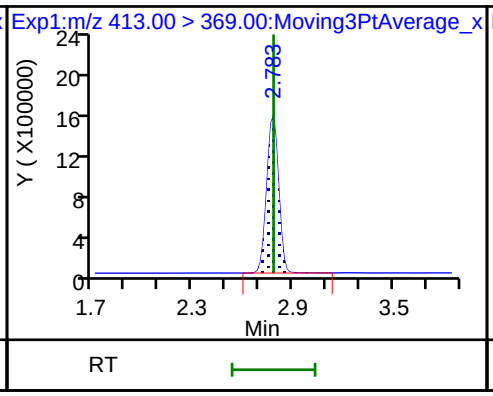
16 Perfluoroheptanesulfonic acid



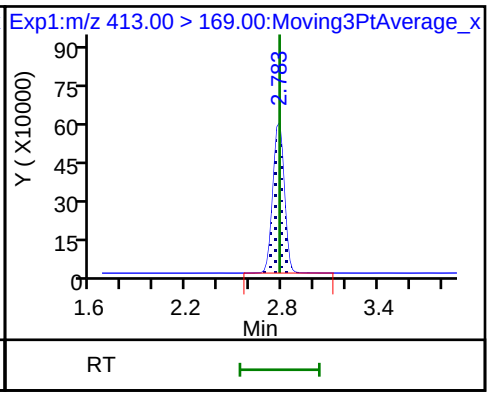
* 62 13C2-PFOA



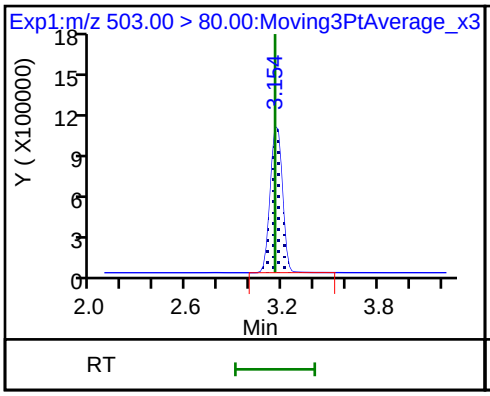
15 Perfluorooctanoic acid



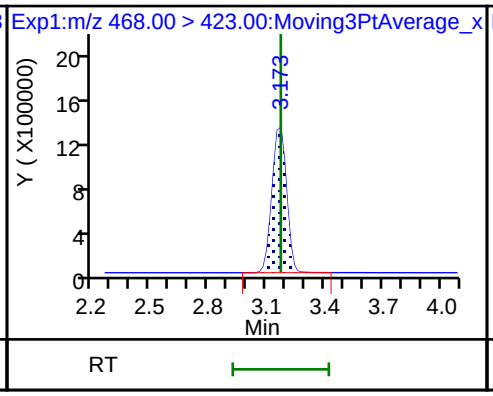
15 Perfluorooctanoic acid



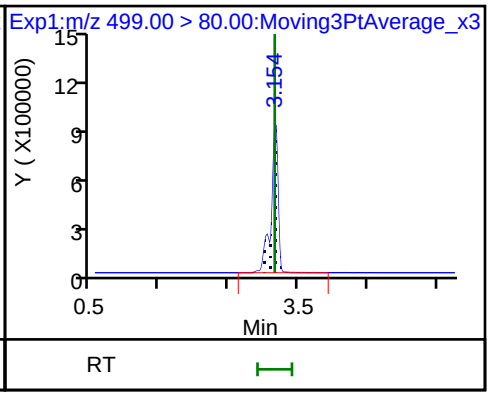
D 18 13C4 PFOS



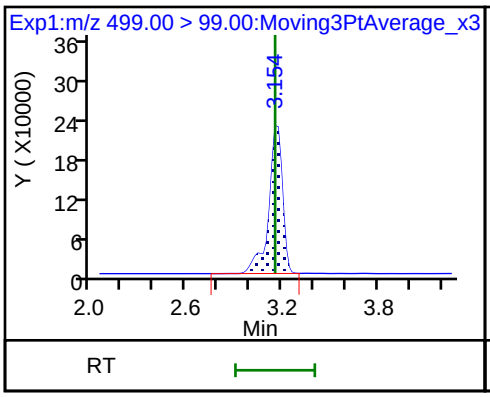
D 19 13C5 PFNA



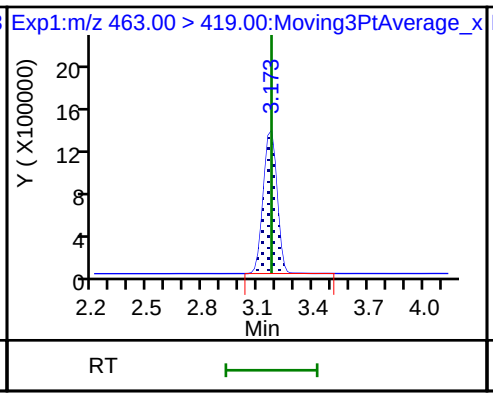
17 Perfluorooctane sulfonic acid



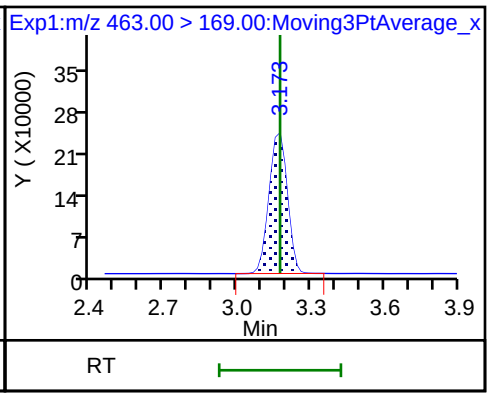
17 Perfluorooctane sulfonic acid



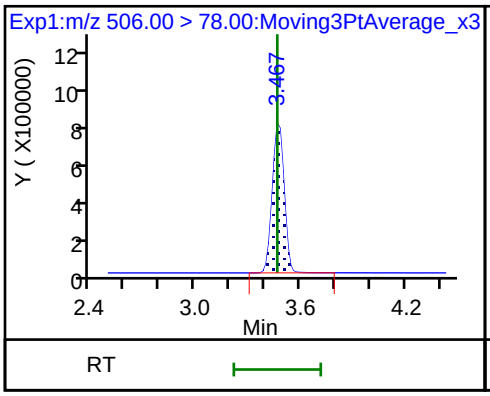
20 Perfluorononanoic acid



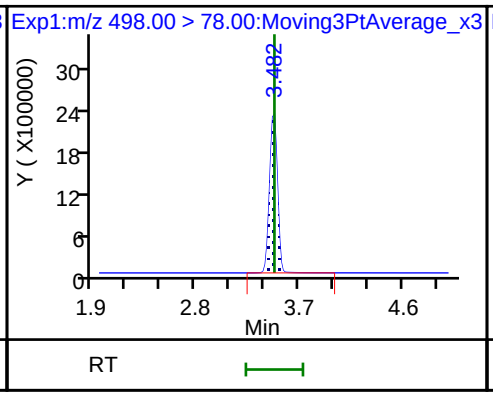
20 Perfluorononanoic acid



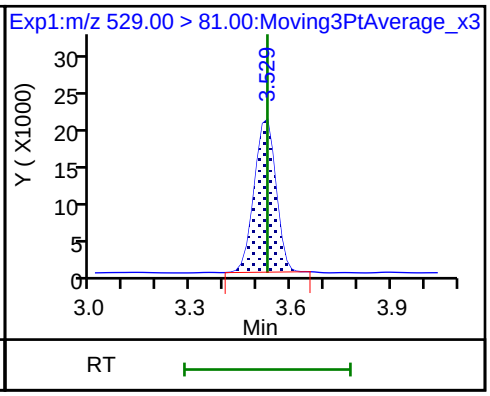
D 21 13C8 FOSA



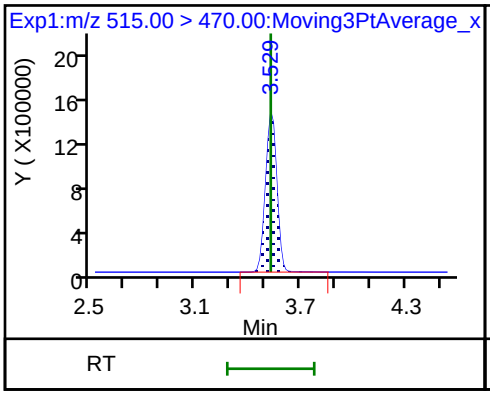
22 Perfluorooctane Sulfonamide



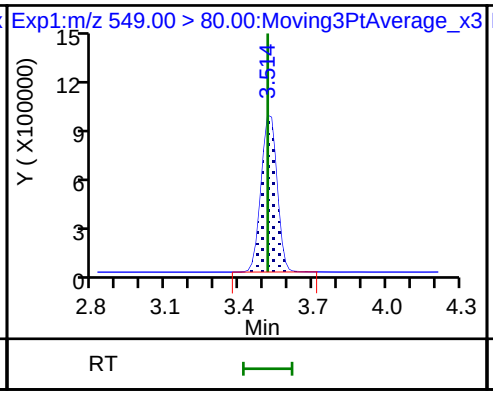
D 26 M2-8:2FTS



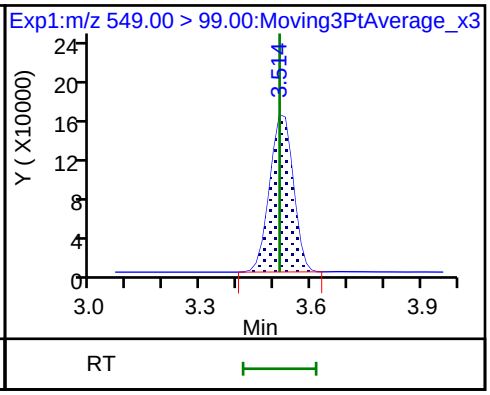
D 23 13C2 PFDA



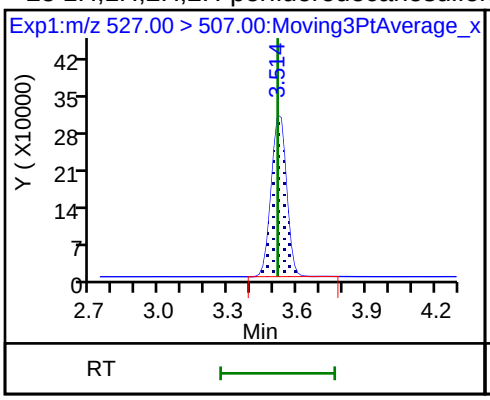
68 Perfluorononanesulfonic acid



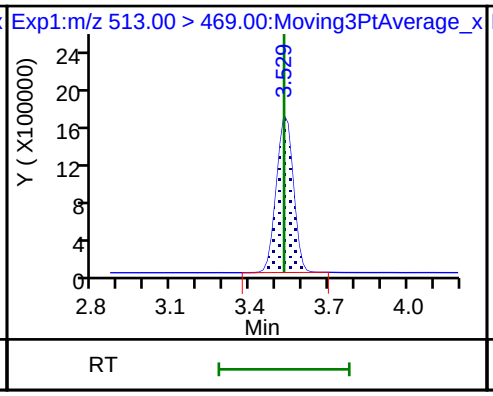
68 Perfluorononanesulfonic acid



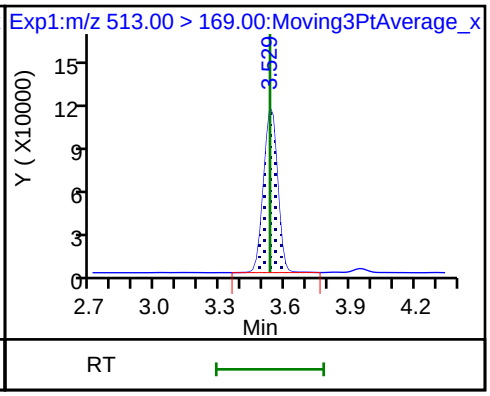
25 1H,1H,2H,2H-perfluorodecanesulfoni



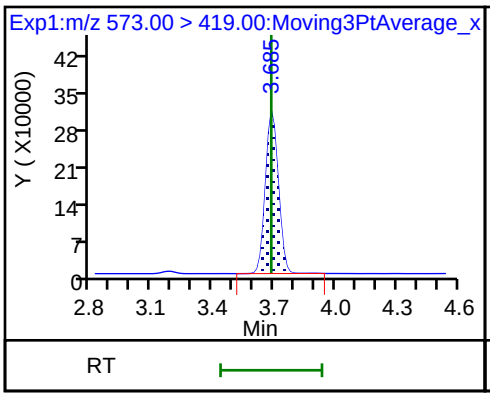
24 Perfluorodecanoic acid



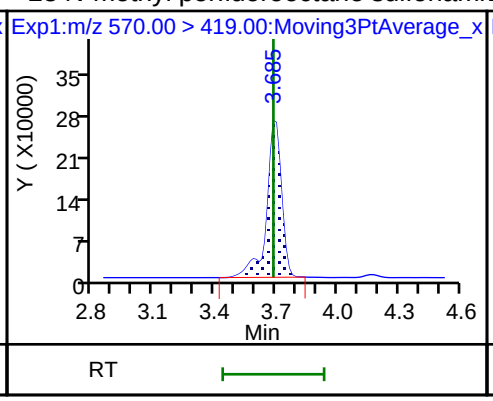
24 Perfluorodecanoic acid



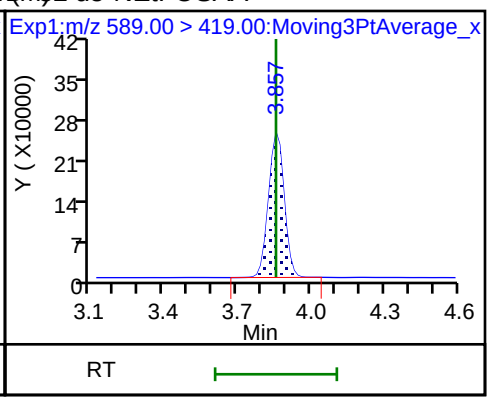
D 27 d3-NMeFOSAA



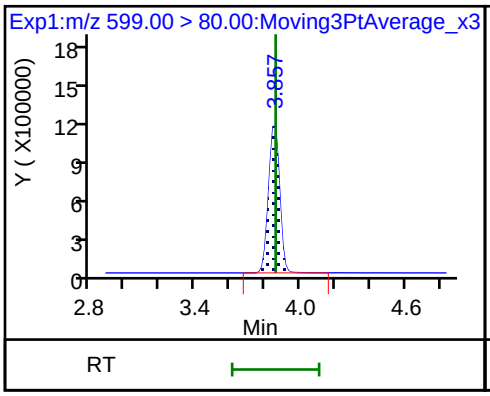
28 N-methyl perfluorooctane sulfonamid



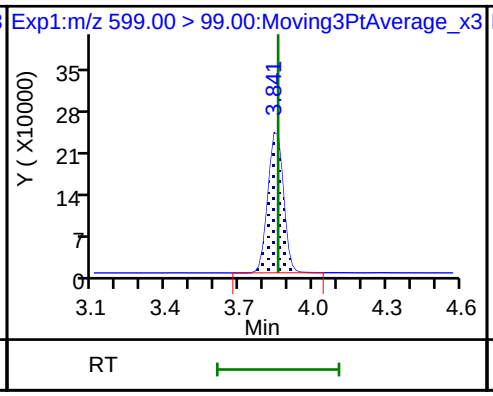
D 32 d5-NEtFOSAA



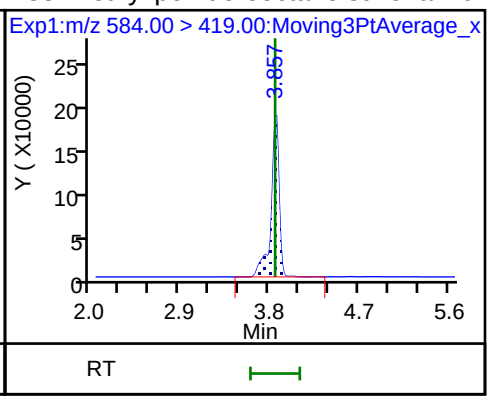
29 Perfluorodecane Sulfonic acid



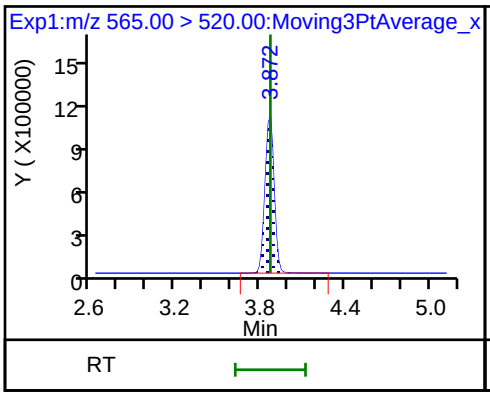
29 Perfluorodecane Sulfonic acid



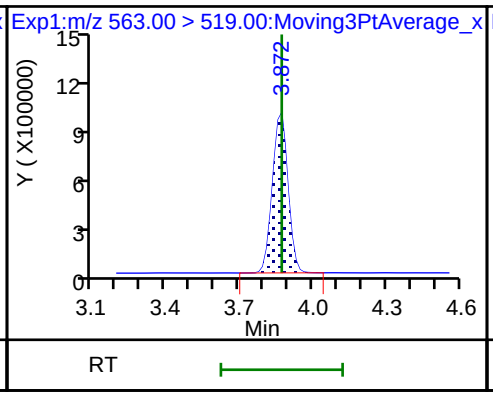
33 N-ethyl perfluorooctane sulfonamid



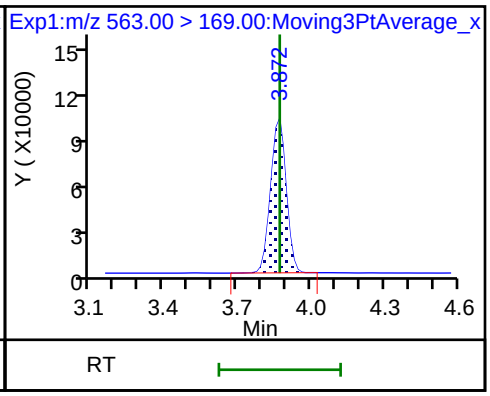
D 30 13C2 PFUnA



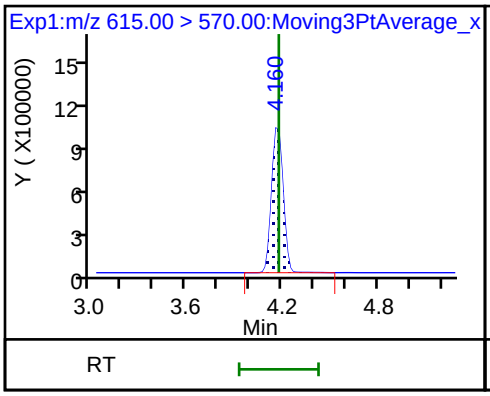
31 Perfluoroundecanoic acid



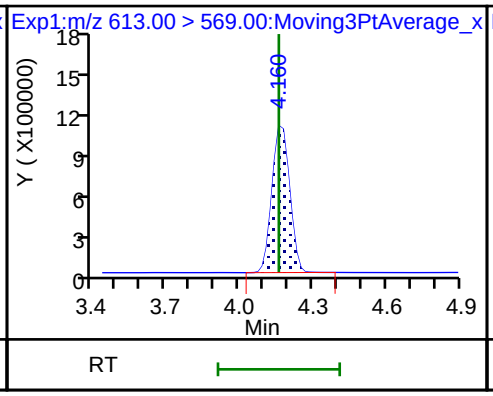
31 Perfluoroundecanoic acid



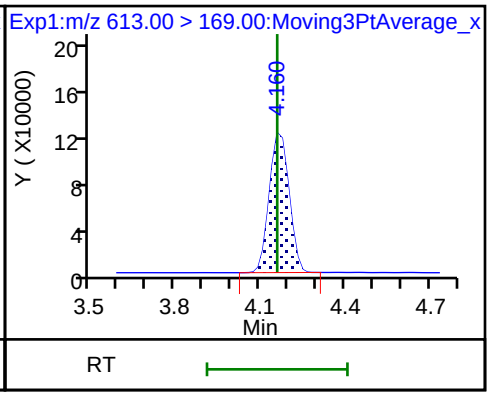
D 36 13C2 PFDoA



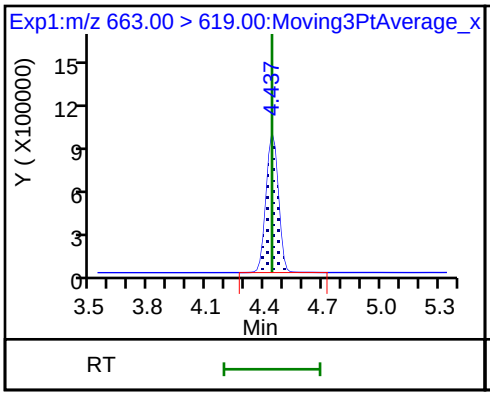
37 Perfluorododecanoic acid



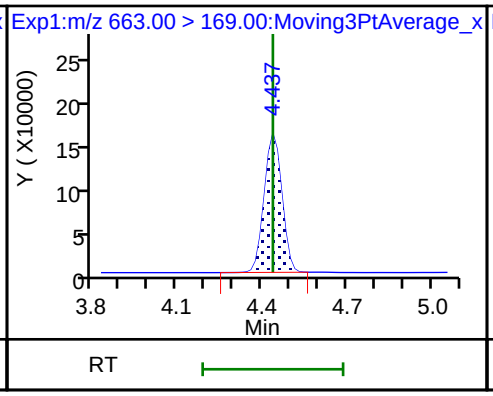
37 Perfluorododecanoic acid



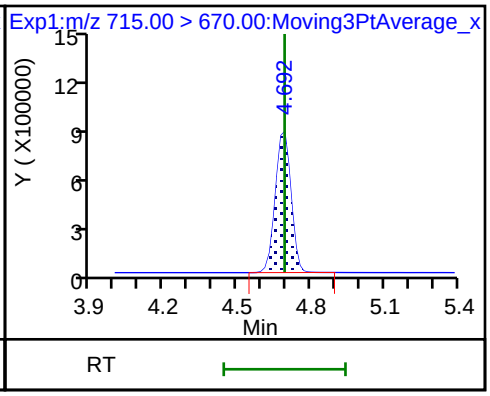
41 Perfluorotridecanoic acid



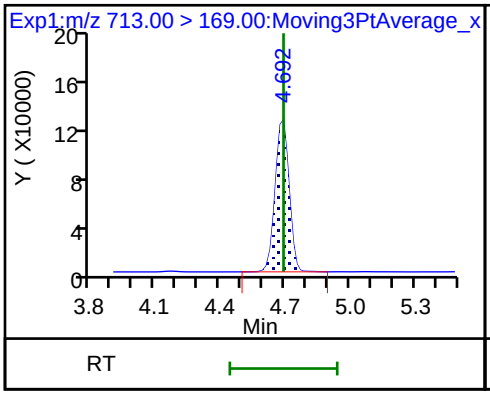
41 Perfluorotridecanoic acid



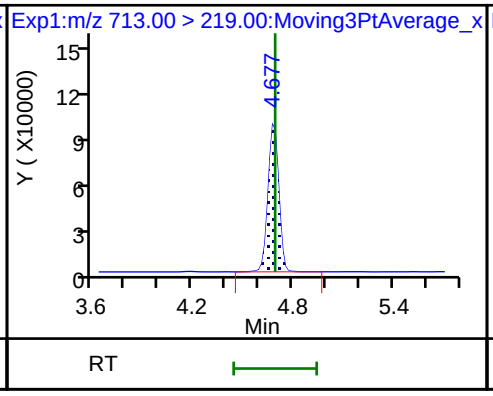
D 43 13C2-PFTeDA



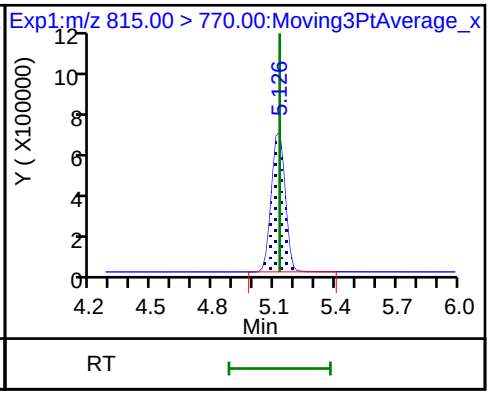
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

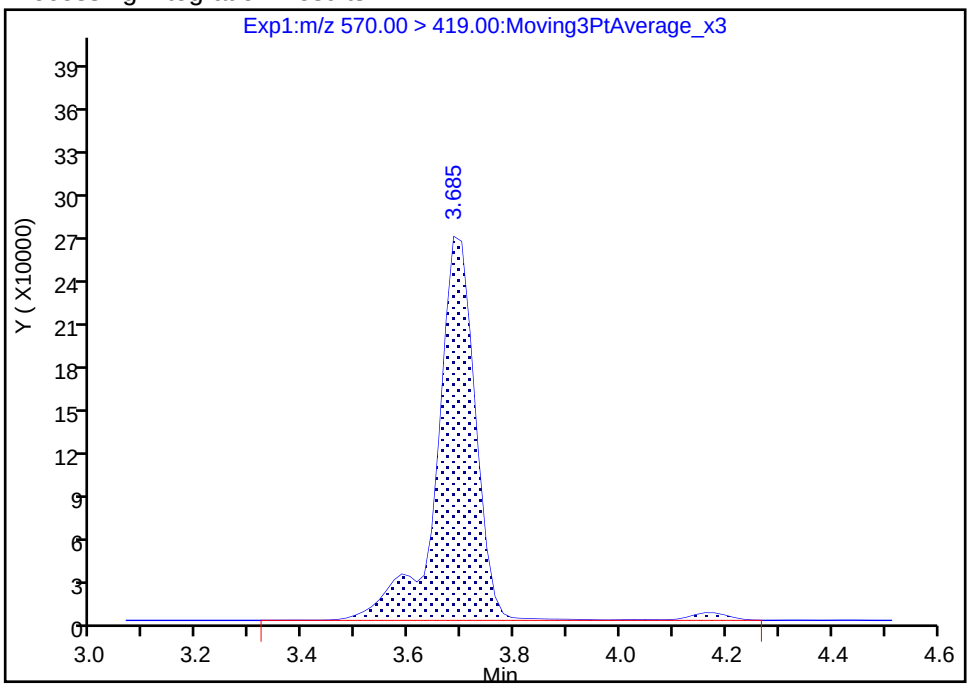
Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62576.b\2018.08.13LLA_019.d
Injection Date: 13-Aug-2018 08:21:23 Instrument ID: A9
Lims ID: CCV L5
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 3
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

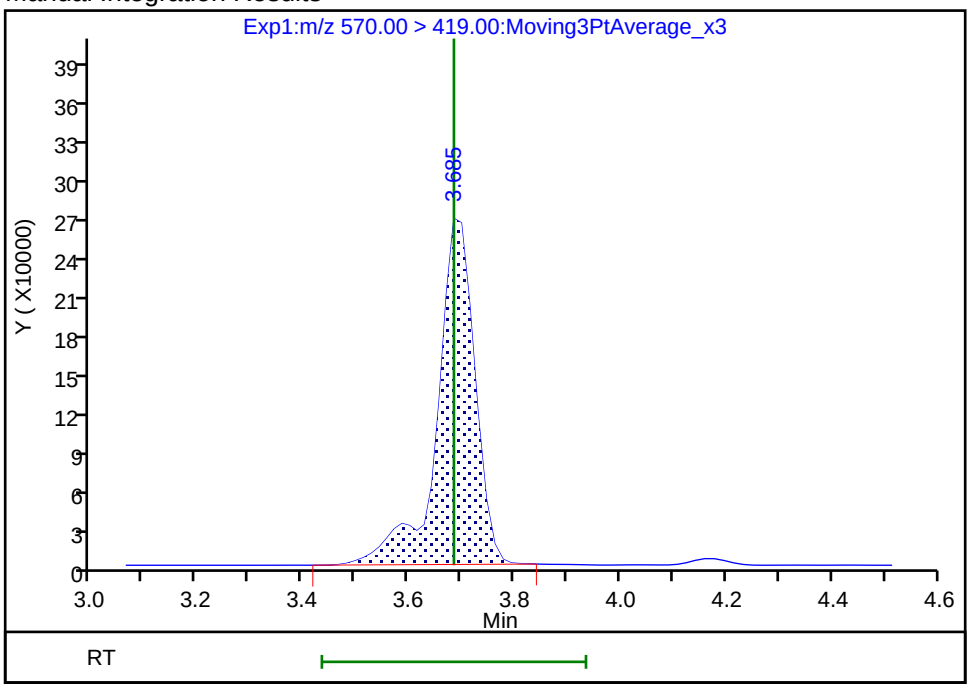
Processing Integration Results

RT: 3.69
Area: 1360575
Amount: 2.462265
Amount Units: ng/ml



Manual Integration Results

RT: 3.69
Area: 1318421
Amount: 2.385978
Amount Units: ng/ml



Reviewer: roycea, 13-Aug-2018 08:58:47
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239523/1 Calibration Date: 08/13/2018 09:29

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.13LLA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9293	0.9655		2.60	2.50	3.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.032		2.53	2.50	1.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	106.7		2.28	2.21	3.3	30.0
4:2 FTS	AveID	17.02	13.45		1.84	2.34	-21.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.8768		2.34	2.50	-6.3	30.0
Perfluoropentanesulfonic acid	AveID	48.91	51.96		2.49	2.35	6.3	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.028		2.48	2.50	-1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.197		2.13	2.28	-6.4	30.0
6:2 FTS	AveID	2.137	2.072		2.30	2.37	-3.0	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.100		2.51	2.50	0.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.080		2.54	2.38	6.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.037		2.46	2.50	-1.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.029		2.23	2.32	-4.1	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	2.980		2.43	2.50	-3.0	30.0
8:2 FTS	AveID	14.02	15.94		2.72	2.40	13.7	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.7036		2.58	2.40	7.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.203		2.45	2.50	-2.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	0.9860		2.44	2.50	-2.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.8328		2.41	2.41	-0.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.9254		2.58	2.50	3.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.8425		2.50	2.50	0.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	0.9678		2.46	2.50	-1.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.7623		2.54	2.50	1.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1632		2.53	2.50	1.3	30.0
13C4 PFBA	Ave	1.117	0.998		2.23	2.50	-10.7	30.0
13C5-PFPeA	Ave	0.999	0.8645		2.16	2.50	-13.4	30.0
13C3-PFBS	Ave	0.0155	0.0131		1.97	2.33	-15.3	30.0
13C2 PFHxA	Ave	1.037	0.9491		2.29	2.50	-8.4	30.0
13C4-PFHpA	Ave	1.177	1.164		2.47	2.50	-1.1	30.0
18O2 PFHxS	Ave	0.8862	0.7835		2.09	2.37	-11.6	30.0
M2-6:2FTS	Ave	0.1144	0.1304		2.71	2.38	14.0	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239523/1 Calibration Date: 08/13/2018 09:29

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.13LLA_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	0.9759		2.47	2.50	-1.1	30.0
13C4 PFOS	Ave	0.9223	0.8193		2.12	2.39	-11.2	30.0
13C5 PFNA	Ave	0.8463	0.8983		2.65	2.50	6.1	30.0
13C8 FOSA	Ave	0.5512	0.4957		2.25	2.50	-10.1	30.0
M2-8:2FTS	Ave	0.0133	0.0127		2.29	2.40	-4.4	30.0
13C2 PFDA	Ave	0.8474	0.8353		2.46	2.50	-1.4	30.0
d3-NMeFOSAA	Ave	0.1647	0.1901		2.89	2.50	15.4	30.0
d5-NEtFOSAA	Ave	0.1353	0.1533		2.83	2.50	13.3	30.0
13C2 PFUnA	Ave	0.6849	0.6565		2.40	2.50	-4.1	30.0
13C2 PFDoA	Ave	0.7384	0.7864		2.66	2.50	6.5	30.0
13C2-PFTeDA	Ave	0.4715	0.5049		2.68	2.50	7.1	30.0
13C2-PFHxDA	Ave	0.4325	0.4605		2.66	2.50	6.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_027.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 13-Aug-2018 09:29:04 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\20180813-62587.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 13-Aug-2018 10:05:21 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 09:50:33

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	6940062	2.60		104	274	
D 1 13C4 PFBA										
217.00 > 172.00	1.488	1.494	-0.006	0.541	7187767	2.23		89.3	8376	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.755	0.0	1.000	6427177	2.53		101	325	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.764	-0.009	0.638	6227198	2.16		86.6	7112	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	8900692	2.28		103	1723	
298.90 > 99.00	1.797	1.797	0.0	1.000	3047932		2.92(1.35-4.05)		1051	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.798	-0.001	0.653	87754	1.97		84.7	422	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.007	0.0	1.117	1184976	1.84		79.0	2197	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.018	-0.011	0.730	480311	NC			545	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	5994211	2.34		93.7	1102	
313.00 > 119.00	2.048	2.048	0.0	1.000	449355		13.34(6.96-20.87)		698	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.744	6836777	2.29		91.6	10491	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.068	0.0	1.151	4599235	2.49		106	4456	
349.00 > 99.00	2.068	2.068	0.0	1.151	2121199		2.17(1.15-3.45)		1289	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.150	0.0	1.000	1431438	NC			814	

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	857564	NC			4088	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.386	2.386	0.0	1.000	8622573	2.48		99.0	719	
363.00 > 169.00	2.386	2.386	0.0	1.000	2010828		4.29(2.17-6.52)		2838	
D 9 13C4-PFHpA										
367.00 > 322.00	2.386	2.387	-0.001	0.868	8385939	2.47		98.9	12722	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	6148377	2.13		93.6	3186	
399.00 > 99.00	2.400	2.400	0.0	1.000	1694657		3.63(1.90-5.70)		721	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5339373	2.09		88.4	7104	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.735	0.0	1.006	1845536	2.30		97.0	1297	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.735	-0.016	0.988	892551	2.71		114	1234	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.750	2.750	0.0	1.000	7742870	2.51		100	909	
413.00 > 169.00	2.750	2.750	0.0	1.000	2769486		2.80(1.36-4.08)		1824	
* 62 13C2-PFOA										
415.00 > 370.00	2.750	2.750	0.0		7203377	2.50			8814	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.766	2.766	0.0	0.882	6066388	2.54		107	4761	
449.00 > 99.00	2.766	2.766	0.0	0.882	1511702		4.01(1.84-5.53)		2843	
D 14 13C4 PFOA										
417.00 > 372.00	2.750	2.767	-0.017	1.000	7029637	2.47		98.9	9130	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.135	3.135	0.0	1.000	5634433	2.23		95.9	3546	
499.00 > 99.00	3.135	3.135	0.0	1.000	1359872		4.14(2.04-6.12)		1792	
20 Perfluorononanoic acid										
463.00 > 419.00	3.135	3.135	0.0	1.000	6706718	2.46		98.3	1160	
463.00 > 169.00	3.135	3.135	0.0	1.000	1251982		5.36(2.68-8.03)		1844	
D 19 13C5 PFNA										
468.00 > 423.00	3.135	3.154	-0.019	1.140	6470415	2.65		106	6581	
D 18 13C4 PFOS										
503.00 > 80.00	3.135	3.154	-0.019	1.140	5642247	2.12		88.8	3497	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.351	3.351	0.0	1.069	6247371	NC			3801	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.465	3.465	0.0	1.000	10641823	2.43		97.0	5436	
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.467	-0.002	1.260	3570907	2.25		89.9	3652	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.496	3.496	0.0	1.115	3986404	2.58		107	2724	
549.00 > 99.00	3.496	3.496	0.0	1.115	658391		6.05(3.02-9.05)		1870	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.496	3.496	0.0	1.000	1397338	2.72		114	3285	

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	3.498	-0.002	1.271	87673	2.29		95.6	472	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.513	3.513	0.0	1.000	7240426	2.45		97.9	1359	
513.00 > 169.00	3.513	3.513	0.0	1.000	486121		14.89(7.12-21.35)		413	
D 23 13C2 PFDA										
515.00 > 470.00	3.513	3.514	-0.001	1.277	6016993	2.46		98.6	4226	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.669	3.669	0.0	1.004	1350230	2.44		97.6	714	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.656	3.671	-0.015	1.329	1369460	2.89		115	2868	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.824	3.824	0.0	1.220	4738334	2.41		99.9	3735	
599.00 > 99.00	3.824	3.824	0.0	1.220	1044824		4.54(2.14-6.43)		1401	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.839	3.839	0.0	1.004	1022083	2.58		103	2199	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.839	3.839	0.0	1.000	3983997	2.50		100	602	
563.00 > 169.00	3.839	3.839	0.0	1.000	403785		9.87(5.24-15.72)		1396	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.824	3.841	-0.017	1.390	1104477	2.83		113	2060	
D 30 13C2 PFUnA										
565.00 > 520.00	3.839	3.841	-0.002	1.396	4729061	2.40		95.9	8379	
35 MeFOSA										
512.00 > 169.00	3.961	3.961	0.0		1543072	NC			1436	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.992	3.992	0.0	1.273	7134374	NC			12270	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.140	4.140	0.0	1.000	5482056	2.46		98.4	959	
613.00 > 169.00	4.140	4.140	0.0	1.000	627681		8.73(4.68-14.05)		1700	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.140	4.140	0.0	1.184	761178	NC			3783	
D 36 13C2 PFDoA										
615.00 > 570.00	4.140	4.142	-0.002	1.505	5664343	2.66		106	4965	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.374	4.374	0.0	1.395	449642	NC			1671	
699.00 > 99.00	4.374	4.374	0.0	1.395	812986		0.55(0.28-0.83)		1745	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.405	4.405	0.0	1.064	4317741	2.54		102	1306	
663.00 > 169.00	4.405	4.405	0.0	1.064	722528		5.98(3.09-9.27)		2663	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.592	4.592	0.0		1490	NC			0.0	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.645	4.645	0.0	1.000	593419	2.53		101	2186	
713.00 > 219.00	4.645	4.645	0.0	1.000	413702		1.43(0.70-2.09)		1413	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.661	-0.016	1.689	3636621	2.68		107	10394	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.076	5.076	0.0	1.000	3160429	NC			254	
813.00 > 169.00	5.076	5.076	0.0	1.000	548555		5.76(2.77-8.32)		1706	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.076	5.093	-0.017	1.845	3317171	2.66		106	5387	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.447	5.447	0.0	1.073	2291445	NC			864	
913.00 > 169.00	5.447	5.447	0.0	1.073	435393		5.26(2.55-7.64)		1929	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00009 Amount Added: 1.00 Units: mL

Report Date: 13-Aug-2018 10:05:23 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_027.d

Injection Date: 13-Aug-2018 09:29:04 Instrument ID: A9

Lims ID: CCV L5

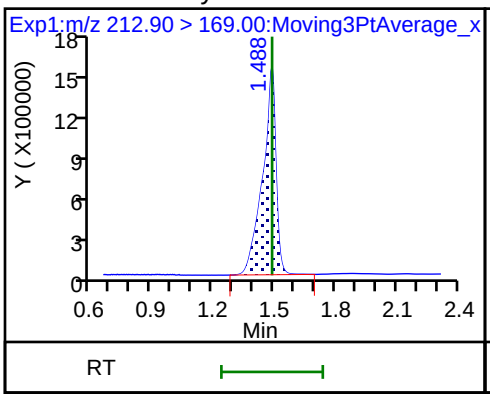
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 14 Worklist Smp#: 1

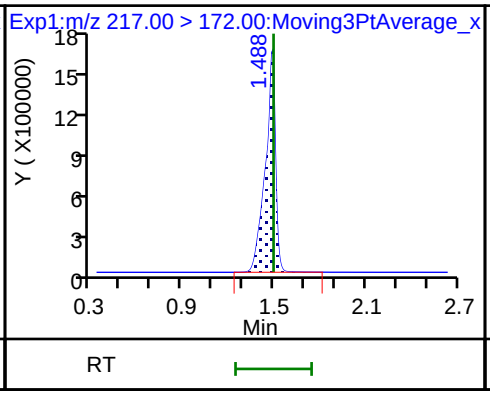
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

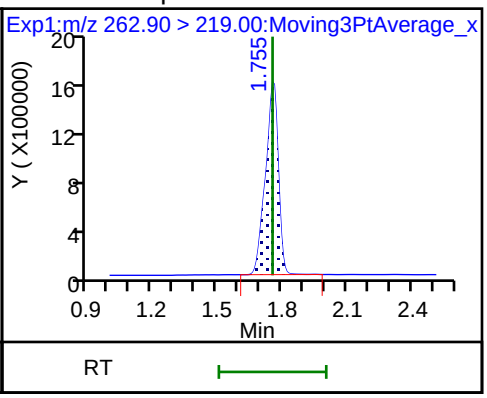
2 Perfluorobutyric acid



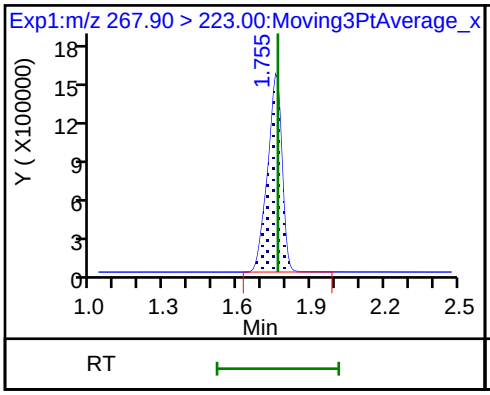
D 1 13C4 PFBA



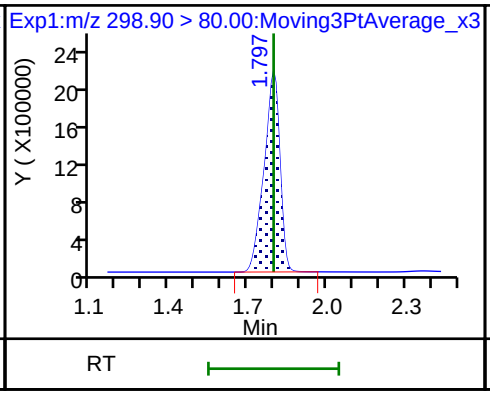
4 Perfluoropentanoic acid



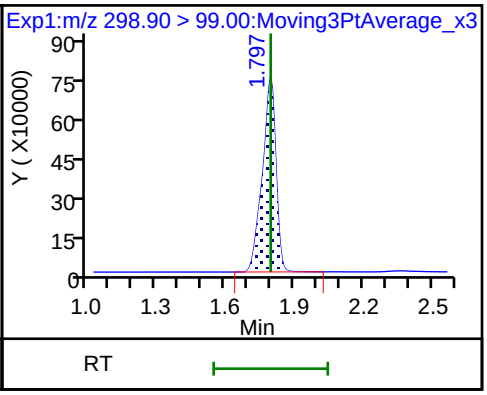
D 3 13C5-PFPeA



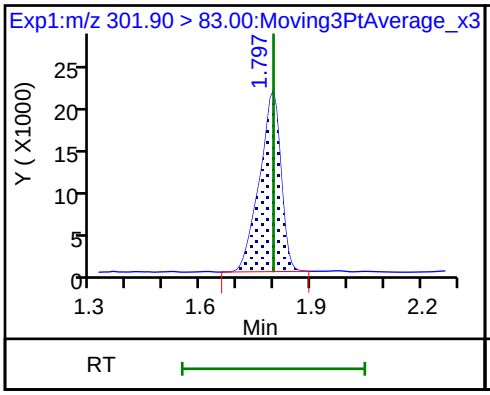
5 Perfluorobutanesulfonic acid



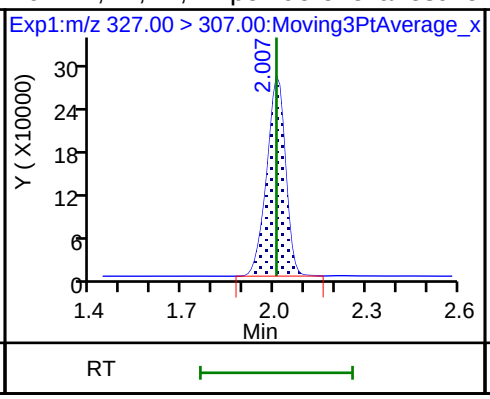
5 Perfluorobutanesulfonic acid



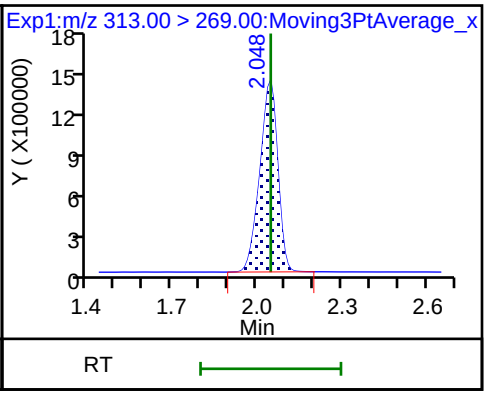
D 47 13C3-PFBS



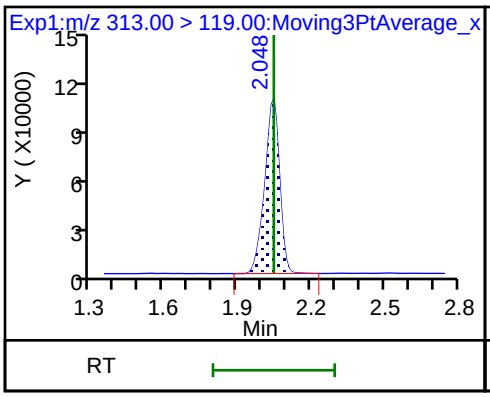
61 1H,1H,2H,2H-perfluorohexanesulfoni



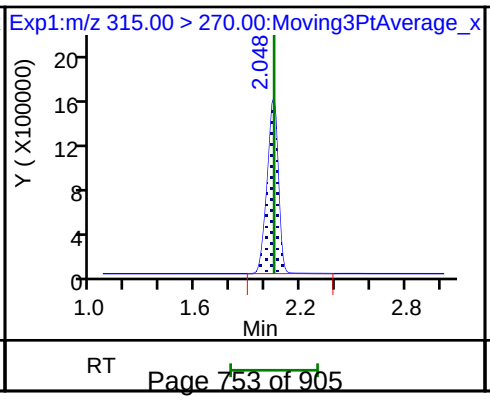
6 Perfluorohexanoic acid



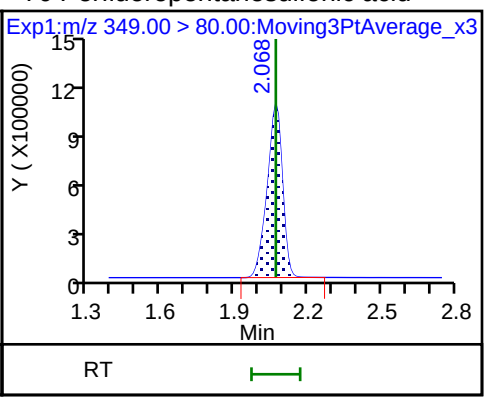
6 Perfluorohexanoic acid



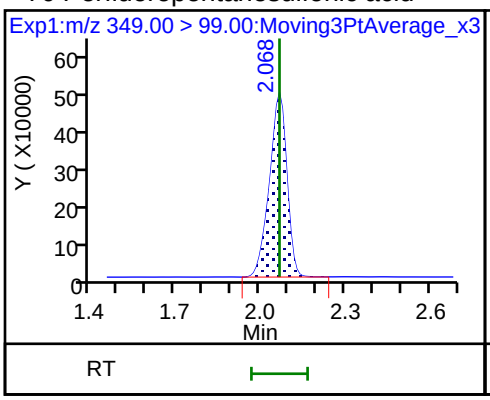
D 7 13C2 PFHxA



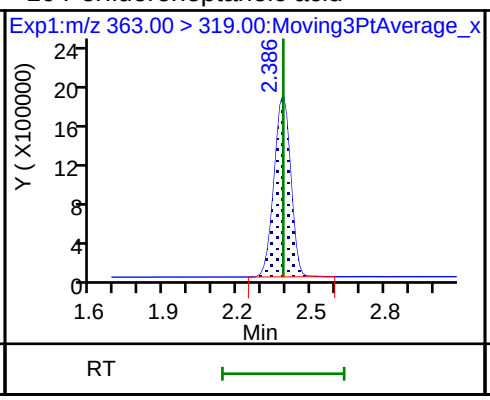
70 Perfluoropentanesulfonic acid



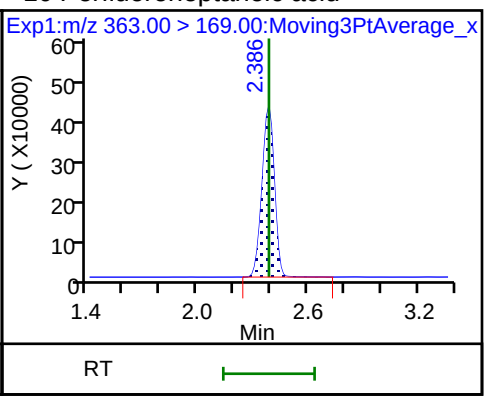
70 Perfluoropentanesulfonic acid



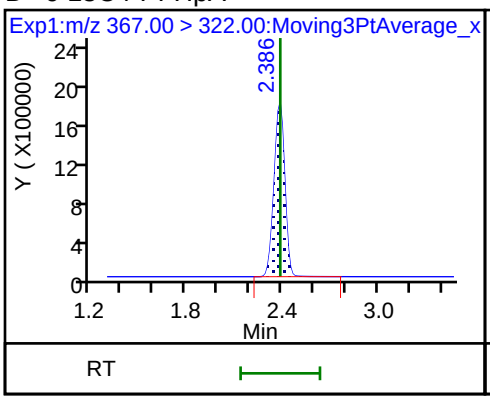
10 Perfluoroheptanoic acid



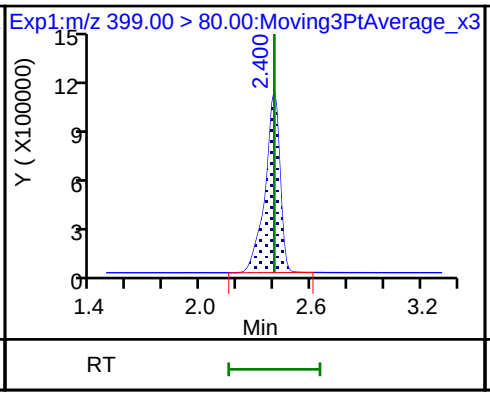
10 Perfluoroheptanoic acid



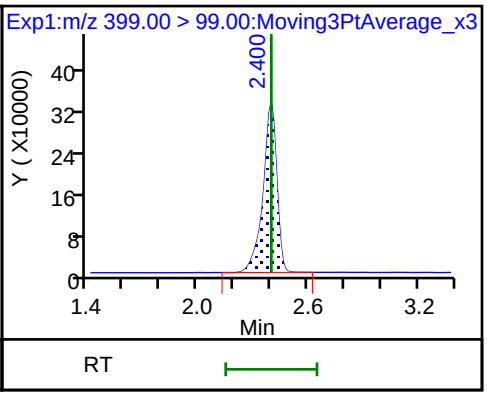
D 9 13C4-PFHpA



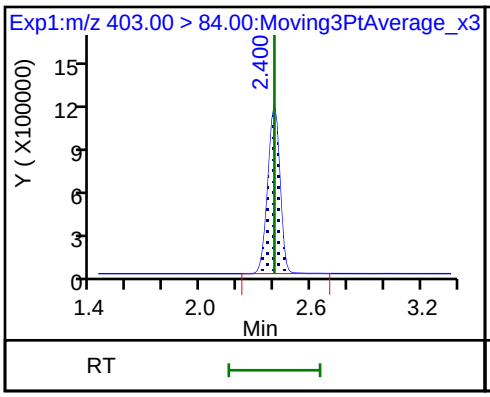
8 Perfluorohexanesulfonic acid



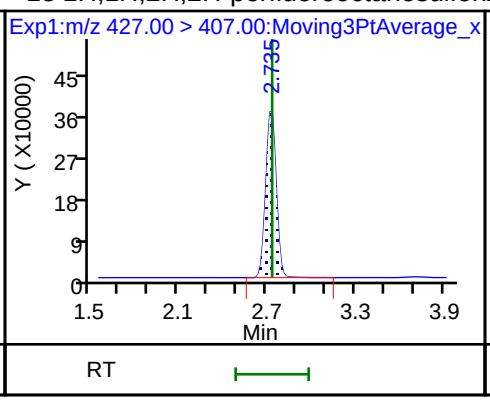
8 Perfluorohexanesulfonic acid



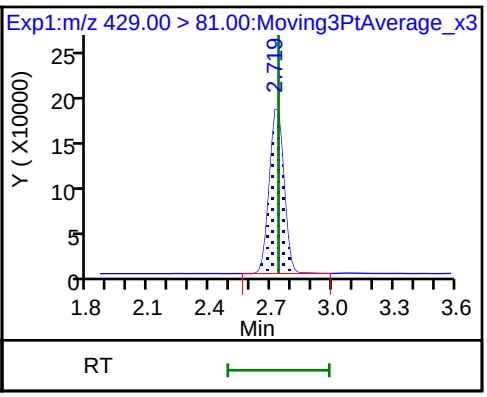
D 11 18O2 PFHxS



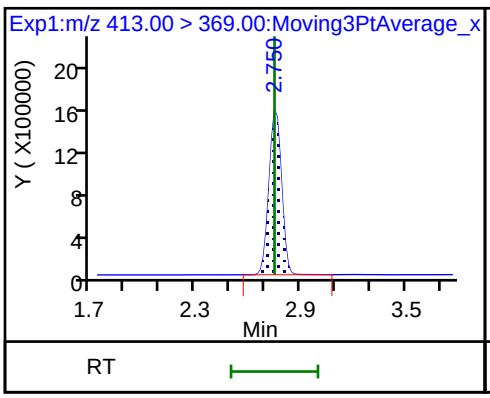
13 1H,1H,2H,2H-perfluorooctanesulfon



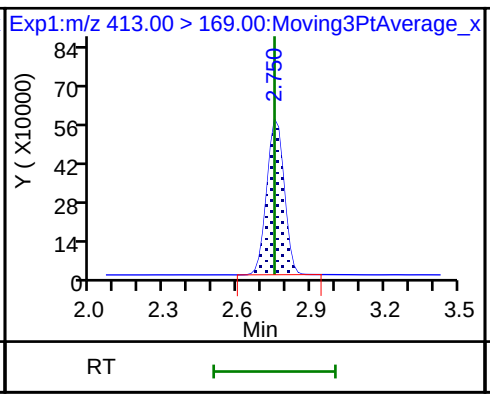
D 12 M2-6:2FTS



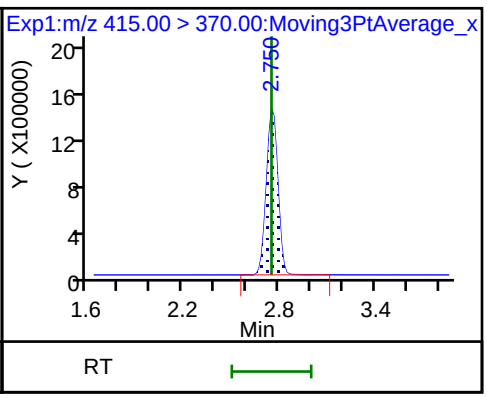
15 Perfluorooctanoic acid



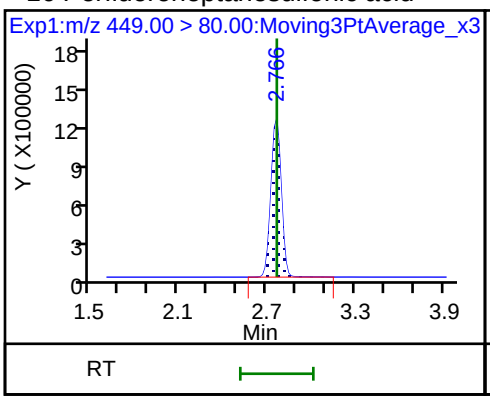
15 Perfluorooctanoic acid



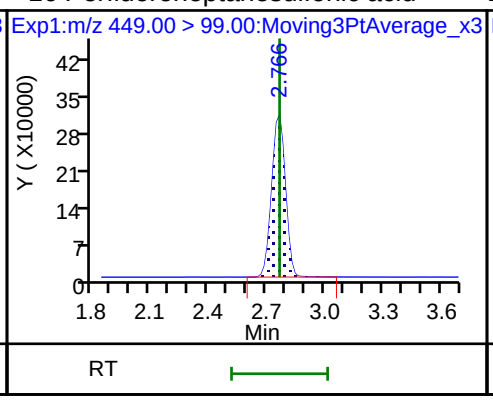
* 62 13C2-PFOA



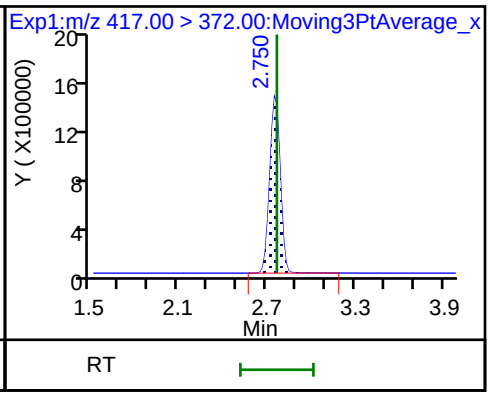
16 Perfluoroheptanesulfonic acid



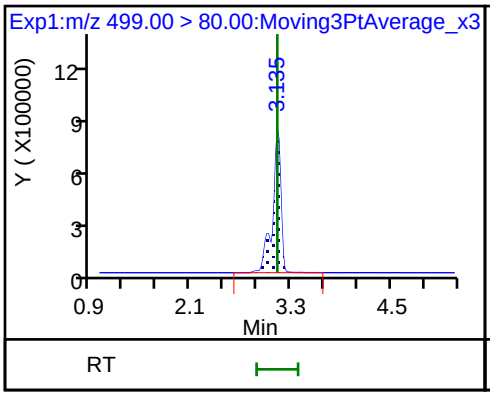
16 Perfluoroheptanesulfonic acid



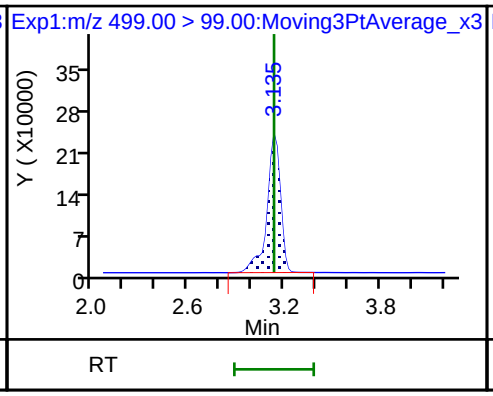
D 14 13C4 PFOA



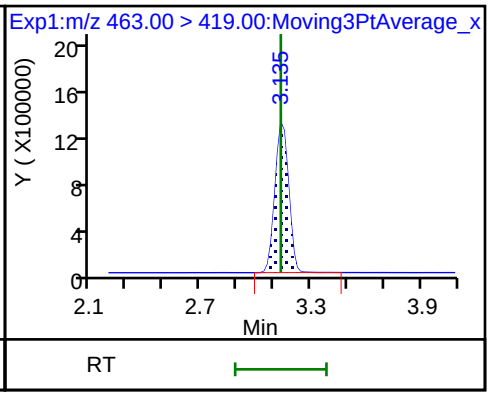
17 Perfluorooctane sulfonic acid



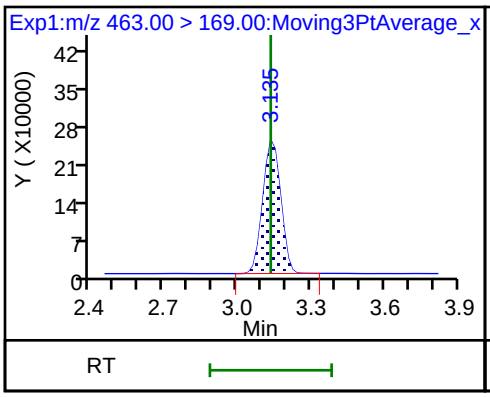
17 Perfluorooctane sulfonic acid



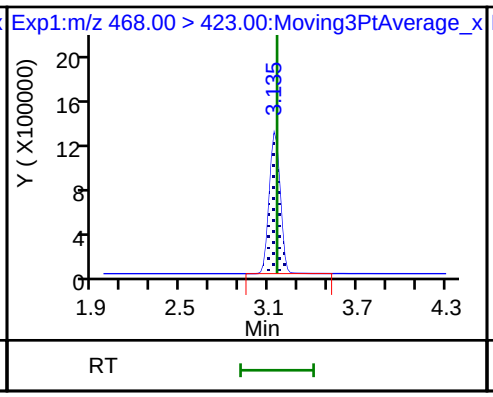
20 Perfluorononanoic acid



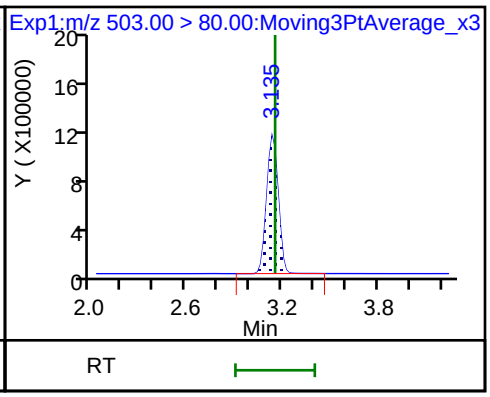
20 Perfluorononanoic acid



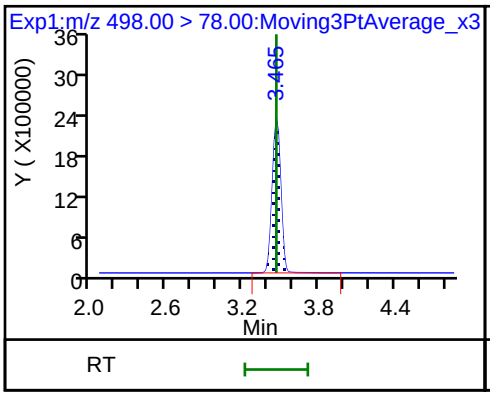
D 19 13C5 PFNA



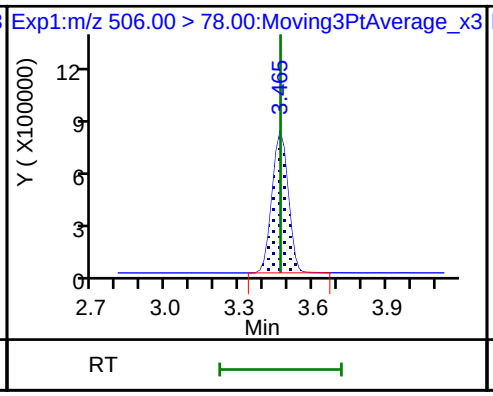
D 18 13C4 PFOS



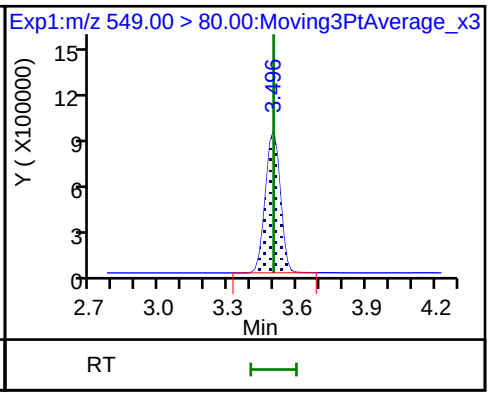
22 Perfluorooctane Sulfonamide



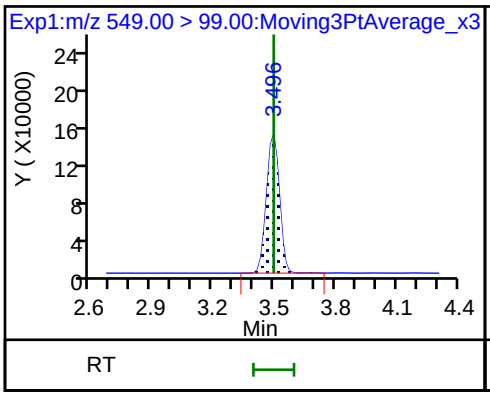
D 21 13C8 FOSA



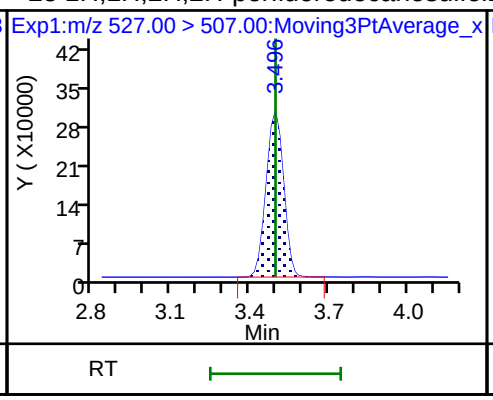
68 Perfluorononanesulfonic acid

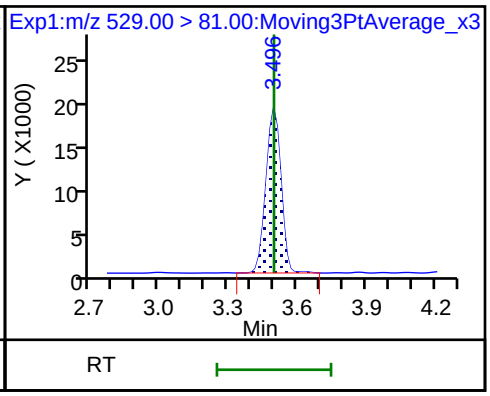


68 Perfluorononanesulfonic acid

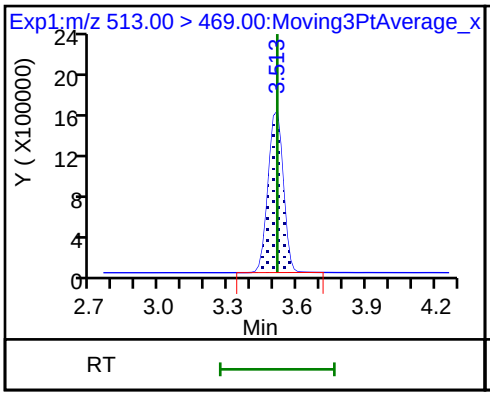


25 1H,1H,2H,2H-perfluorodecanesulfonD 26 M2-8:2FTS

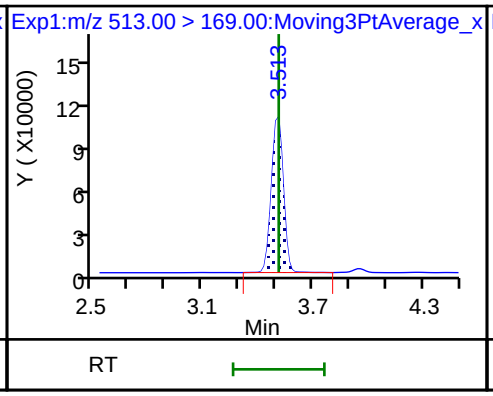




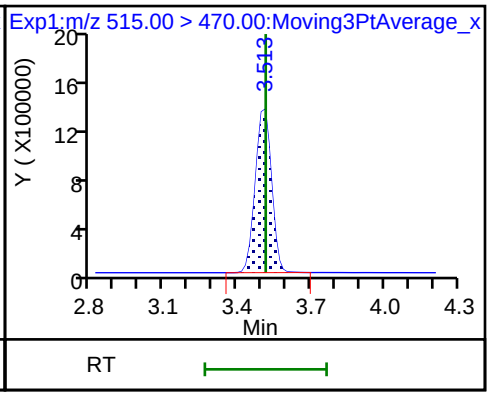
24 Perfluorodecanoic acid



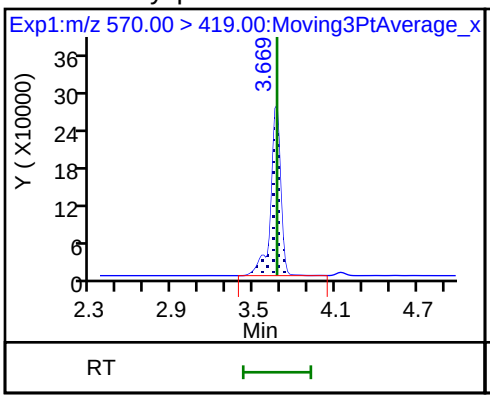
24 Perfluorodecanoic acid

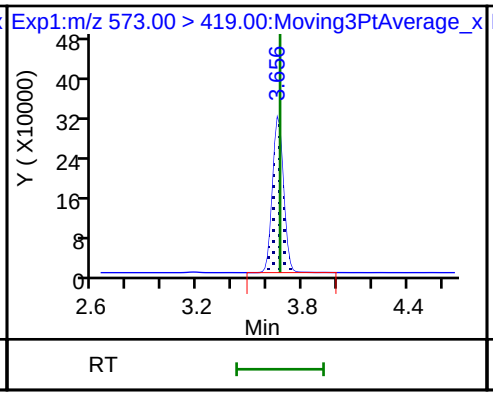


D 23 13C2 PFDA

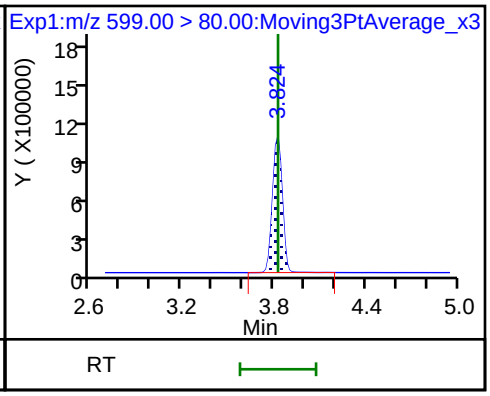


28 N-methyl perfluorooctane sulfonamiD 27 d3-NMeFOSAA

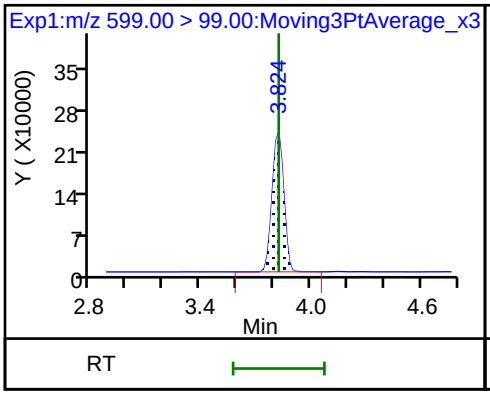




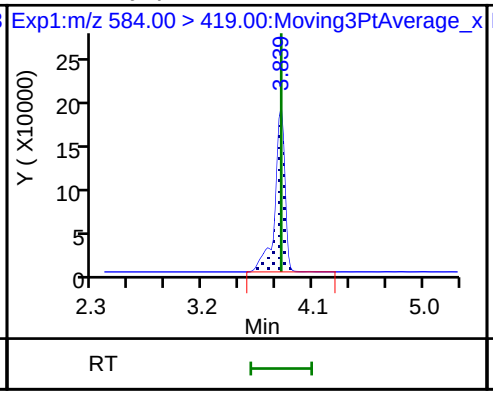
29 Perfluorodecane Sulfonic acid



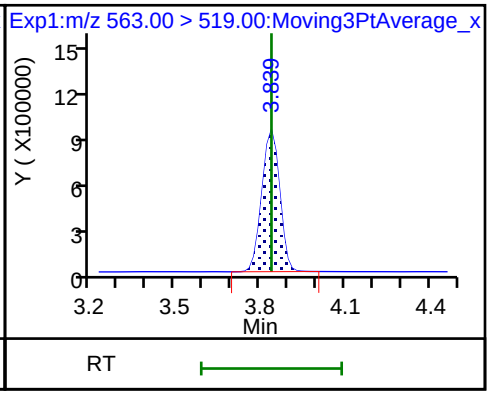
29 Perfluorodecane Sulfonic acid



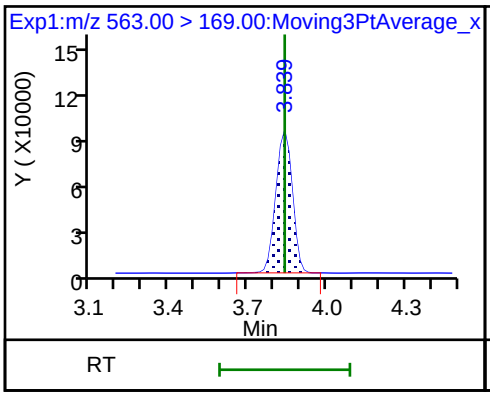
33 N-ethyl perfluorooctane sulfonamid



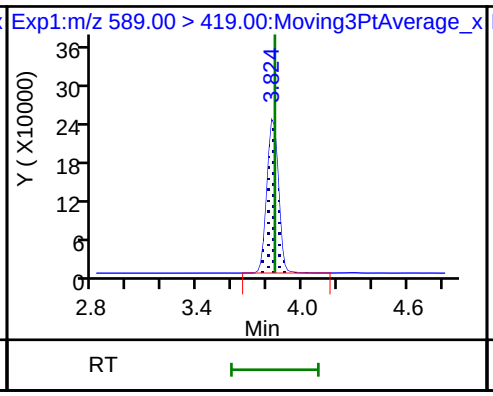
31 Perfluoroundecanoic acid



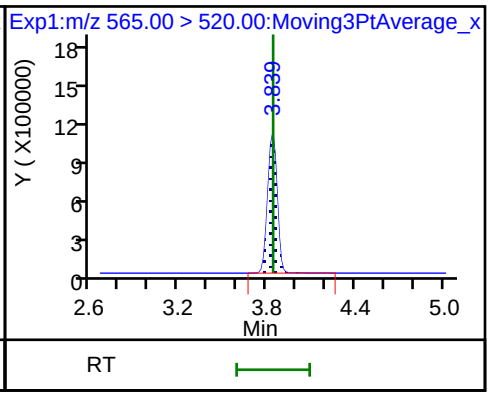
31 Perfluoroundecanoic acid



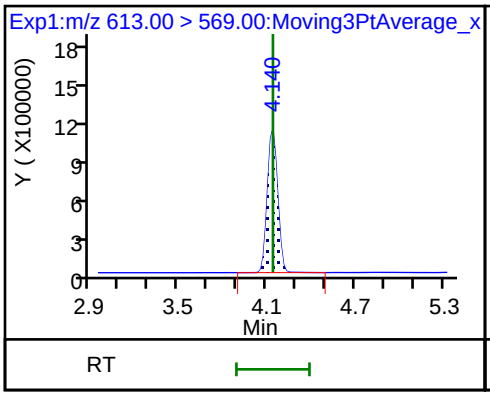
D 32 d5-NEtFOSAA



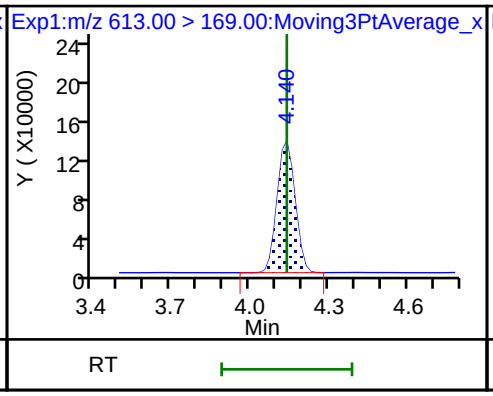
D 30 13C2 PFUnA



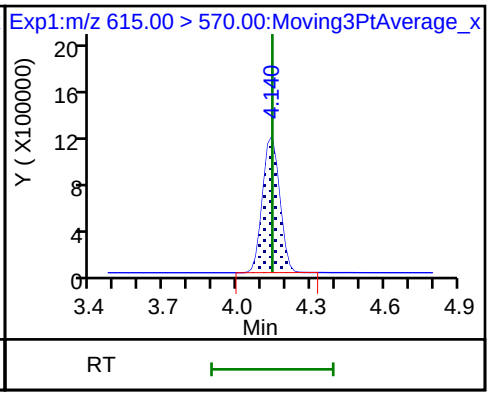
37 Perfluorododecanoic acid



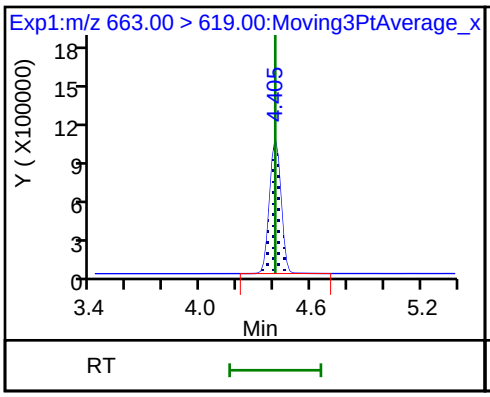
37 Perfluorododecanoic acid



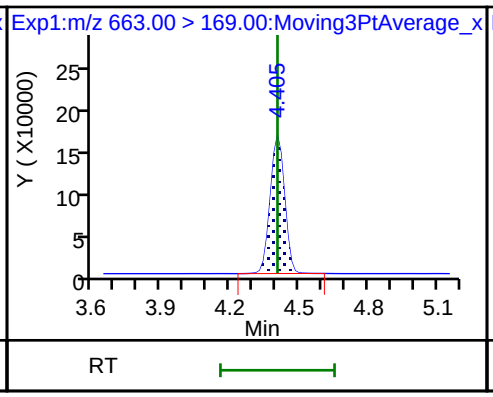
D 36 13C2 PFDoA



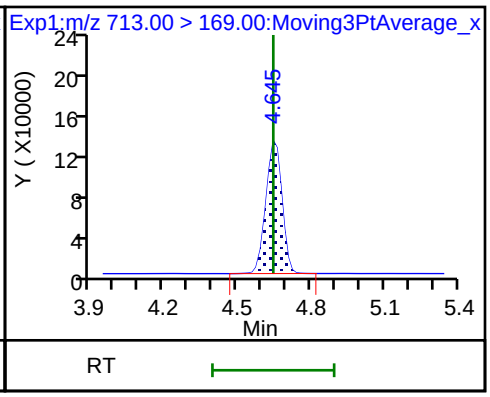
41 Perfluorotridecanoic acid



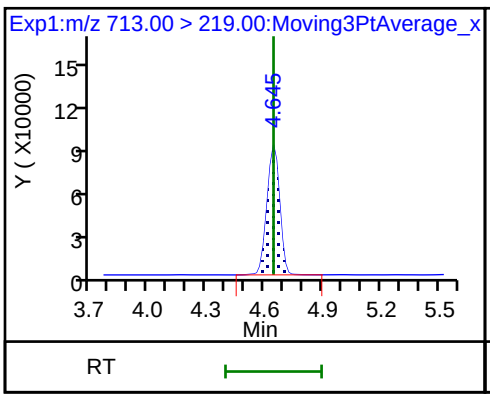
41 Perfluorotridecanoic acid



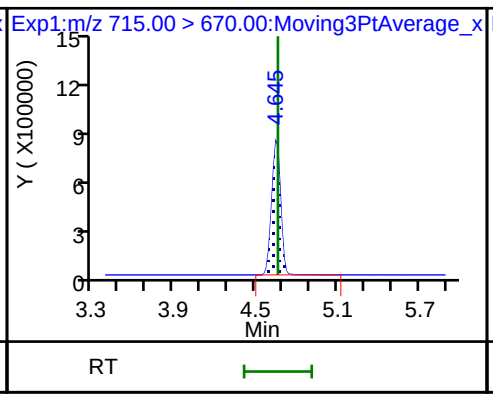
42 Perfluorotetradecanoic acid



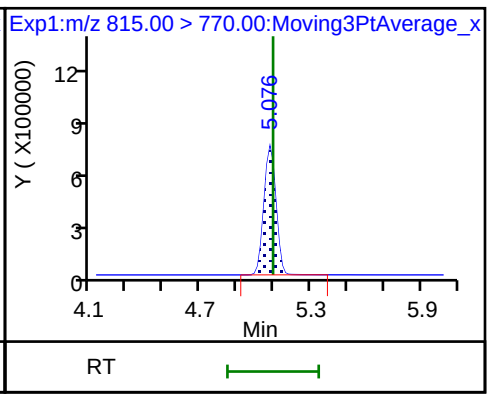
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239523/5 Calibration Date: 08/13/2018 09:59

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.13LLA_030.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9293	0.9409		1.01	1.00	1.2	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.020	1.015		0.995	1.00	-0.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	103.3	112.1		0.959	0.884	8.5	30.0
4:2 FTS	AveID	17.02	13.70		0.752	0.934	-19.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9355	0.9019		0.964	1.00	-3.6	30.0
Perfluoropentanesulfonic acid	AveID	48.91	53.30		1.02	0.938	9.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.038	1.117		1.08	1.00	7.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.279	1.183		0.841	0.910	-7.6	30.0
6:2 FTS	AveID	2.137	2.322		1.03	0.948	8.7	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.011	1.068		1.01	0.952	5.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.096	1.102		1.01	1.00	0.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.055	1.058		1.00	1.00	0.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.072	1.080		0.935	0.928	0.7	30.0
Perfluorooctane Sulfonamide (PFOSA)	AveID	3.071	3.320		1.08	1.00	8.1	30.0
Perfluorononanesulfonic acid	AveID	0.6548	0.6690		0.981	0.960	2.2	30.0
8:2 FTS	AveID	14.02	14.34		0.980	0.958	2.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.229	1.189		0.967	1.00	-3.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.011	1.012		1.00	1.00	0.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.8334	0.8547		0.989	0.964	2.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8969	0.9138		1.02	1.00	1.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8420	0.8182		0.972	1.00	-2.8	30.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9834	1.061		1.08	1.00	7.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.7505	0.7715		1.03	1.00	2.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.1611	0.1572		0.976	1.00	-2.4	30.0
13C4 PFBA	Ave	1.117	1.027		2.30	2.50	-8.0	30.0
13C5-PFPeA	Ave	0.999	0.8919		2.23	2.50	-10.7	30.0
13C3-PFBS	Ave	0.0155	0.0130		1.96	2.33	-15.8	30.0
13C2 PFHxA	Ave	1.037	0.9646		2.33	2.50	-6.9	30.0
13C4-PFHpA	Ave	1.177	1.144		2.43	2.50	-2.8	30.0
18O2 PFHxS	Ave	0.8862	0.8109		2.16	2.37	-8.5	30.0
M2-6:2FTS	Ave	0.1144	0.1235		2.56	2.38	7.9	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Lab Sample ID: CCV 320-239523/5 Calibration Date: 08/13/2018 09:59

Instrument ID: A9 Calib Start Date: 08/03/2018 16:12

GC Column: Acquity ID: 2.10(mm) Calib End Date: 08/03/2018 16:57

Lab File ID: 2018.08.13LLA_030.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9865	1.026		2.60	2.50	4.0	30.0
13C4 PFOS	Ave	0.9223	0.8292		2.15	2.39	-10.1	30.0
13C5 PFNA	Ave	0.8463	0.9039		2.67	2.50	6.8	30.0
13C8 FOSA	Ave	0.5512	0.4930		2.24	2.50	-10.6	30.0
M2-8:2FTS	Ave	0.0133	0.0156		2.80	2.40	17.0	30.0
13C2 PFDA	Ave	0.8474	0.8939		2.64	2.50	5.5	30.0
d3-NMeFOSAA	Ave	0.1647	0.1959		2.97	2.50	18.9	30.0
13C2 PFUnA	Ave	0.6849	0.6954		2.54	2.50	1.5	30.0
d5-NEtFOSAA	Ave	0.1353	0.1555		2.87	2.50	14.9	30.0
13C2 PFDoA	Ave	0.7384	0.7905		2.68	2.50	7.0	30.0
13C2-PFTeDA	Ave	0.4715	0.5162		2.74	2.50	9.5	30.0
13C2-PFHxDA	Ave	0.4325	0.4502		2.60	2.50	4.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_030.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 13-Aug-2018 09:59:07 ALS Bottle#: 13 Worklist Smp#: 5
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*sub3

Method: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 13-Aug-2018 10:10:44 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 10:10:37

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	2783376	1.01		101	96.4	
D 1 13C4 PFBA										
217.00 > 172.00	1.489	1.494	-0.005	0.541	7395659	2.30		92.0	9142	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.756	1.756	0.0	1.000	2605905	0.99		99.5	128	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.764	-0.008	0.638	6419675	2.23		89.3	6676	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	3714104	0.9591		108	830	
298.90 > 99.00	1.797	1.797	0.0	1.000	1235003		3.01(1.35-4.05)		443	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.798	-0.001	0.653	87170	1.96		84.2	438	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.007	0.0	1.117	479867	0.7519		80.5	1675	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.018	-0.011	0.730	507345	NC			570	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	2504823	0.9641		96.4	489	
313.00 > 119.00	2.048	2.048	0.0	1.000	186008		13.47(6.96-20.87)		275	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.048	0.0	0.745	6943006	2.33		93.1	8826	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.068	0.0	1.151	1874279	1.02		109	3172	
349.00 > 99.00	2.068	2.068	0.0	1.151	841017		2.23(1.15-3.45)		572	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.140	2.140	0.0	1.000	552045	NC			343	

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	822460	NC			3150	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.387	2.387	0.0	1.000	3679041	1.08		108	352	
363.00 > 169.00	2.387	2.387	0.0	1.000	777529		4.73(2.17-6.52)		1250	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.387	0.0	0.868	8234622	2.43		97.2	10409	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	2512575	0.8412		92.4	1636	
399.00 > 99.00	2.400	2.400	0.0	1.000	709775		3.54(1.90-5.70)		295	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.400	0.0	0.872	5521748	2.16		91.5	9384	
65 ADONA										
377.00 > 251.00	2.426	2.426	0.0	0.774	5560227	NC			5723	
377.00 > 85.00	2.426	2.426	0.0	0.774	2337179		2.38(1.05-3.16)		1413	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.719	0.0	1.000	782605	1.03		109	675	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.735	-0.016	0.988	844205	2.56		108	1102	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.751	2.751	0.0	1.000	3259447	1.01		101	427	
413.00 > 169.00	2.751	2.751	0.0	1.000	1106838		2.94(1.36-4.08)		928	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		7197958	2.50			5369	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.751	2.751	0.0	0.877	2428152	1.01		106	1861	
449.00 > 99.00	2.767	2.751	0.016	0.882	561326		4.33(1.84-5.53)		1574	
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	7387536	2.60		104	11170	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.136	0.0	1.000	2392572	0.9345		101	1086	
499.00 > 99.00	3.136	3.136	0.0	1.000	545069		4.39(2.04-6.12)		984	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	2754166	1.00		100	531	
463.00 > 169.00	3.136	3.136	0.0	1.000	511268		5.39(2.68-8.03)		955	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.154	-0.018	1.140	6506180	2.67		107	6539	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.154	-0.018	1.140	5705623	2.15		89.9	3825	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.352	3.352	0.0	1.069	2528991	NC			2285	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	4711400	1.08		108	2866	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.467	0.0	1.260	3548272	2.24		89.4	3573	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.482	3.482	0.0	1.110	1533233	0.9808		102	1722	
549.00 > 99.00	3.482	3.482	0.0	1.110	265204		5.78(3.02-9.05)		1283	

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	3.498	3.498	0.0	1.004	615325	0.9802		102	2555	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.498	0.0	1.000	3060174	0.9673		96.7	712	
513.00 > 169.00	3.498	3.498	0.0	1.000	195602		15.64(7.12-21.35)		293	
D 26 M2-8:2FTS										
529.00 > 81.00	3.482	3.498	-0.016	1.266	107248	2.80		117	529	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.514	-0.016	1.272	6433882	2.64		105	8879	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.657	0.0	1.000	570748	1.00		100	283	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.329	1410386	2.97		119	2522	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.809	3.809	0.0	1.215	1967007	0.9887		103	2140	
599.00 > 99.00	3.809	3.809	0.0	1.215	433240		4.54(2.14-6.43)		605	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.825	3.825	0.0	1.000	409158	1.02		102	919	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.825	3.825	0.0	1.000	1638256	0.9718		97.2	247	
563.00 > 169.00	3.825	3.825	0.0	1.000	158759		10.32(5.24-15.72)		548	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.825	3.841	-0.016	1.391	1119343	2.87		115	1915	
D 30 13C2 PFUnA										
565.00 > 520.00	3.825	3.841	-0.016	1.391	5005507	2.54		102	7826	
35 MeFOSA										
512.00 > 169.00	3.946	3.946	0.0		603246	NC			1090	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.994	3.994	0.0	1.273	3030261	NC			5465	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.125	4.125	0.0	1.000	2414612	1.08		108	471	
613.00 > 169.00	4.125	4.125	0.0	1.000	269572		8.96(4.68-14.05)		877	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.125	4.125	0.0	1.184	327774	NC			1454	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.142	-0.017	1.500	5689692	2.68		107	4968	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.375	4.375	0.0	1.395	185963	NC			757	
699.00 > 99.00	4.375	4.375	0.0	1.395	337141		0.55(0.28-0.83)		792	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.406	4.406	0.0	1.068	1755842	1.03		103	577	
663.00 > 169.00	4.406	4.406	0.0	1.068	292963		5.99(3.09-9.27)		1148	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.645	4.645	0.0	1.000	233648	0.9759		97.6	1215	
713.00 > 219.00	4.645	4.645	0.0	1.000	172935		1.35(0.70-2.09)		636	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.661	-0.016	1.689	3715677	2.74		109	7418	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.076	5.076	0.0	1.000	1275785	NC			104	
813.00 > 169.00	5.076	5.076	0.0	1.000	223724		5.70(2.77-8.32)		755	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.076	5.093	-0.017	1.845	3240496	2.60		104	4979	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.433	5.433	0.0	1.070	915490	NC			407	
913.00 > 169.00	5.433	5.433	0.0	1.070	173854		5.27(2.55-7.64)		1152	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006 Amount Added: 1.00 Units: mL

Report Date: 13-Aug-2018 10:10:47 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62587.b\2018.08.13LLA_030.d

Injection Date: 13-Aug-2018 09:59:07 Instrument ID: A9

Lims ID: CCV L4

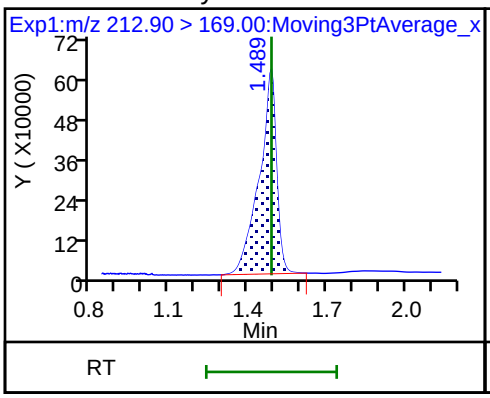
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Operator ID: A9\Administrator ALS Bottle#: 13 Worklist Smp#: 5

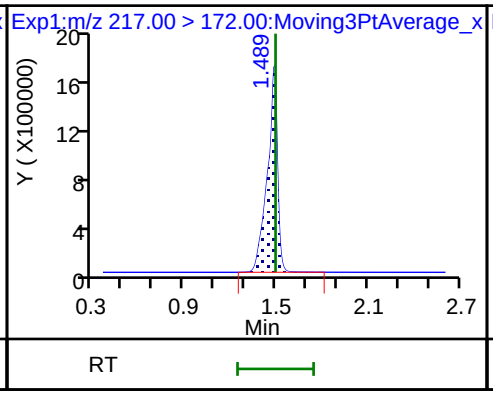
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

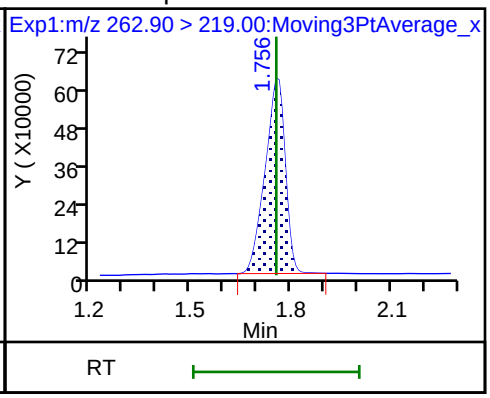
2 Perfluorobutyric acid



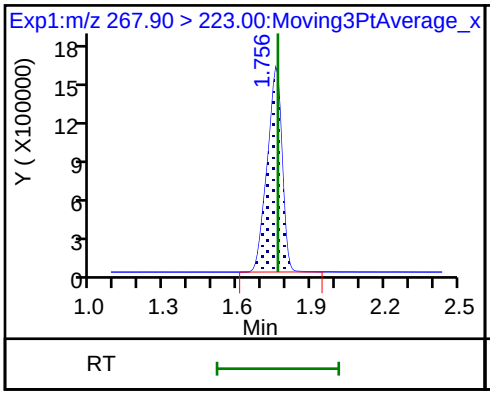
D 1 13C4 PFBA



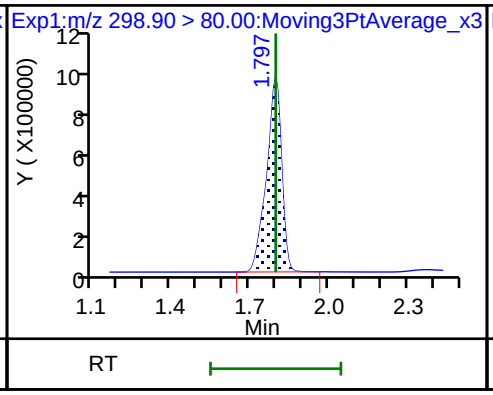
4 Perfluoropentanoic acid



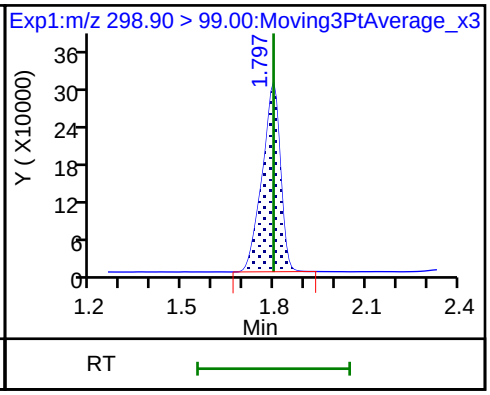
D 3 13C5-PFPeA



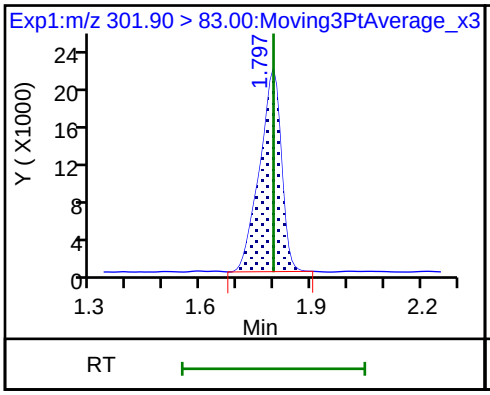
5 Perfluorobutanesulfonic acid



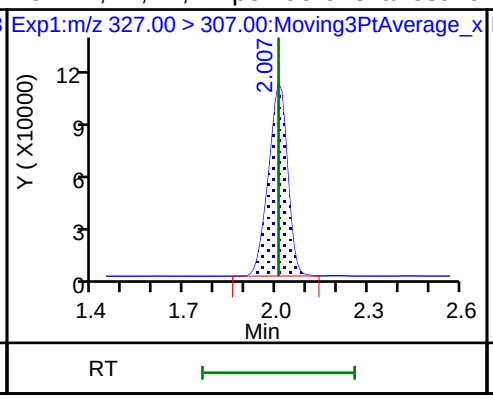
5 Perfluorobutanesulfonic acid



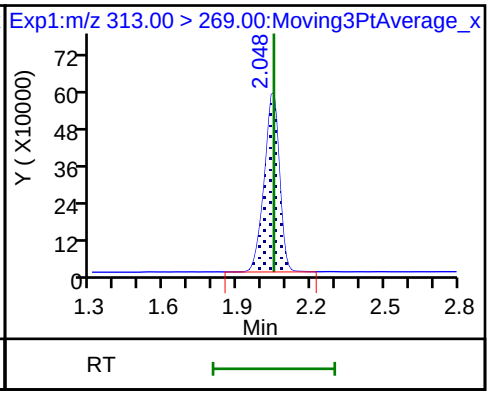
D 47 13C3-PFBS



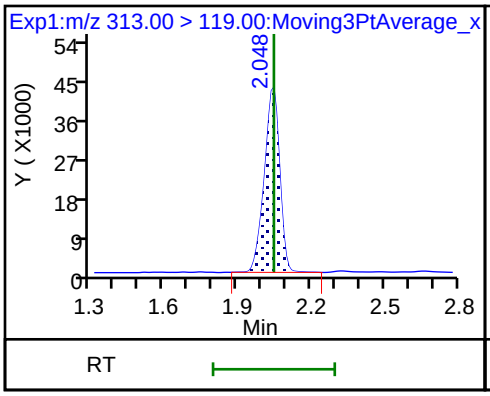
61 1H,1H,2H,2H-perfluorohexanesulfoni



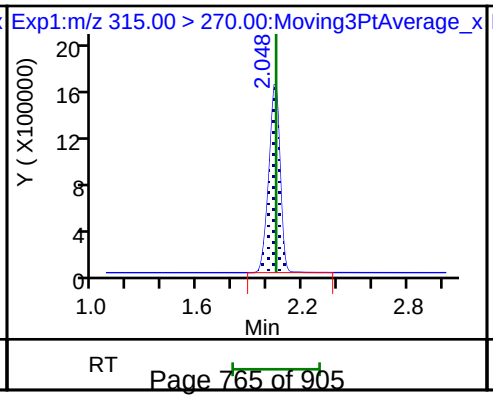
6 Perfluorohexanoic acid



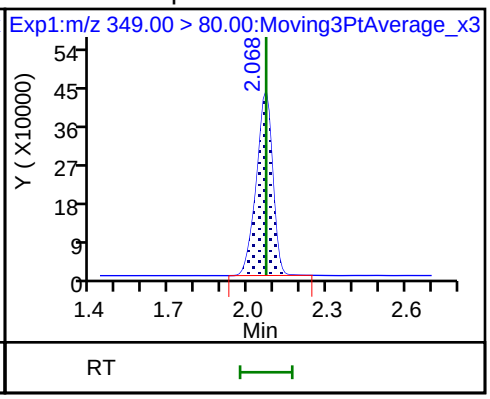
6 Perfluorohexanoic acid



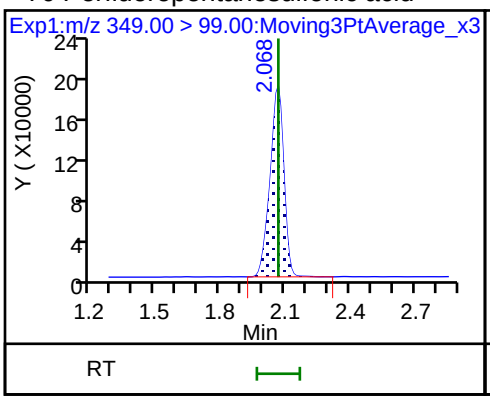
D 7 13C2 PFHxA



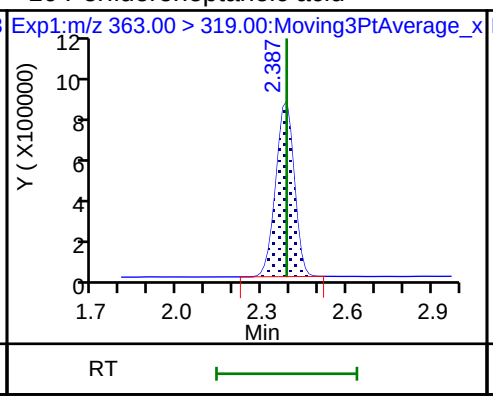
70 Perfluoropentanesulfonic acid



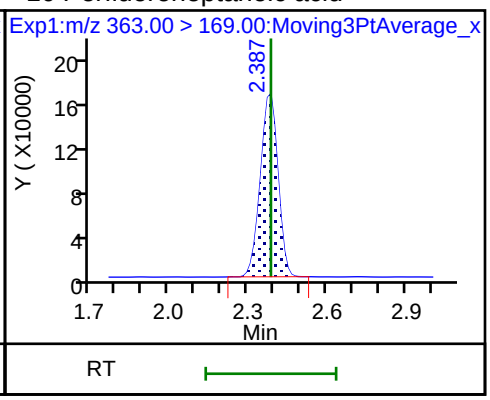
70 Perfluoropentanesulfonic acid



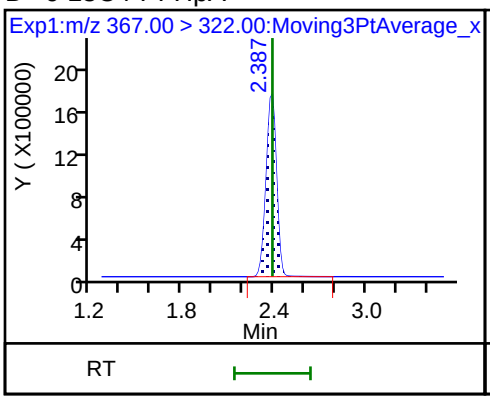
10 Perfluoroheptanoic acid



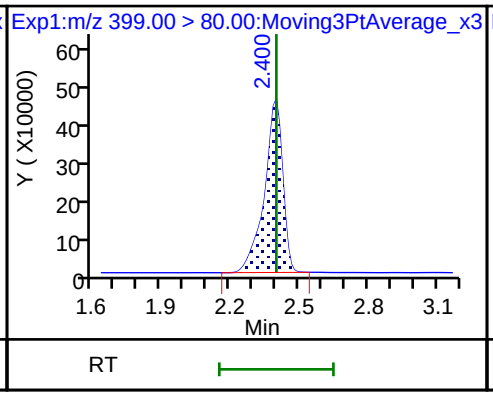
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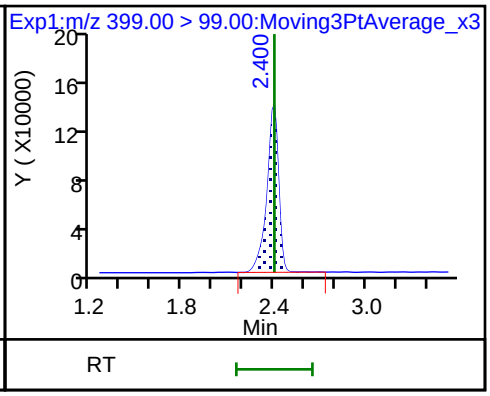
D 9 13C4-PFHpA



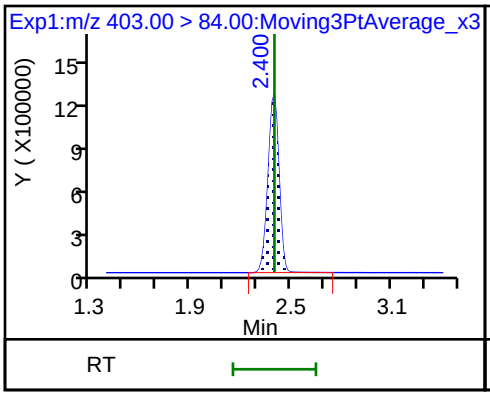
8 Perfluorohexanesulfonic acid



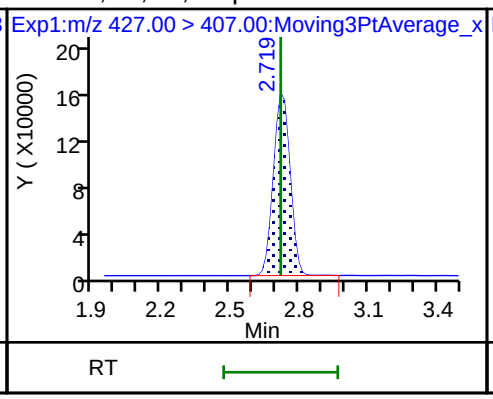
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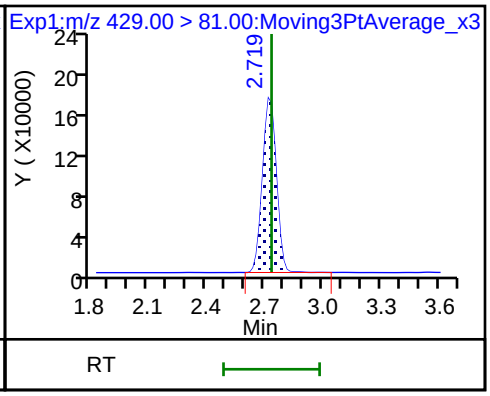
D 11 18O2 PFHxS



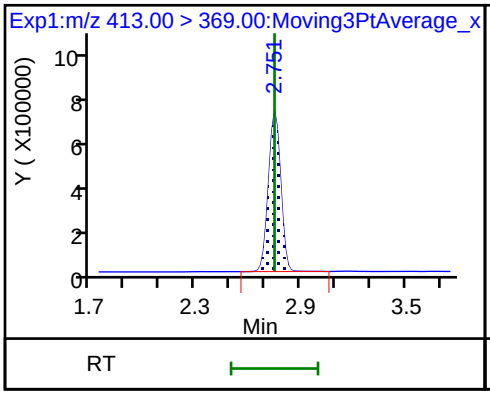
13 1H,1H,2H,2H-perfluorooctanesulfon



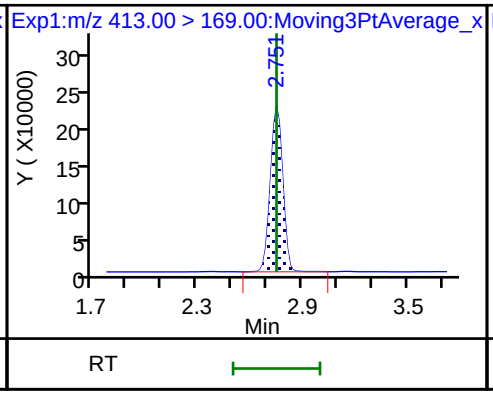
D 12 M2-6:2FTS



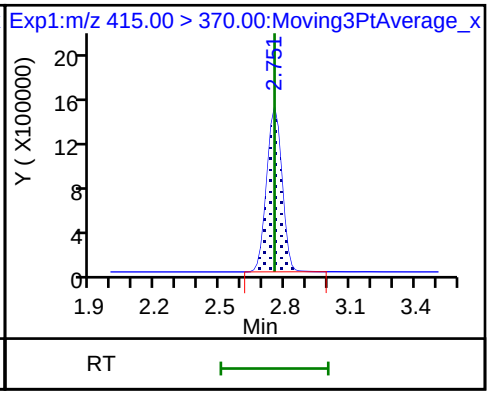
15 Perfluorooctanoic acid



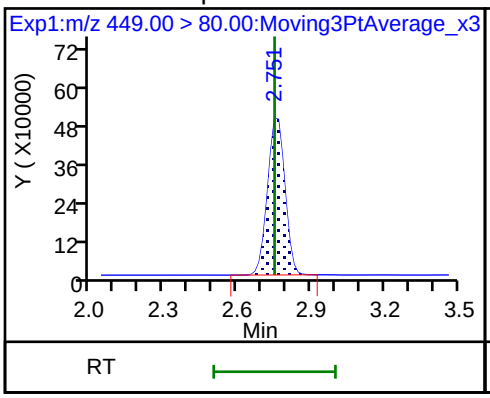
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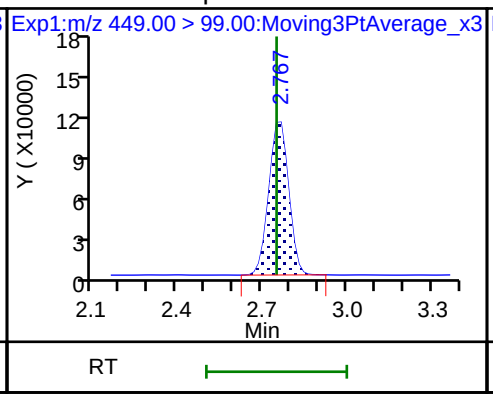
* 62 13C2-PFOA



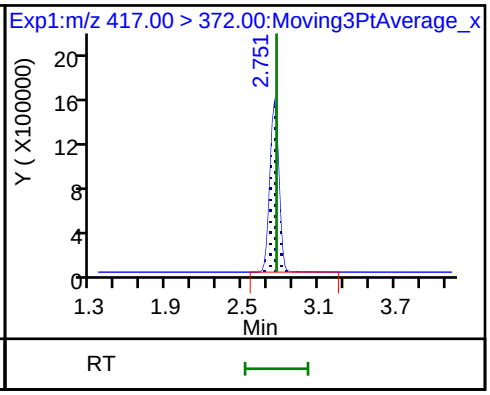
16 Perfluoroheptanesulfonic acid



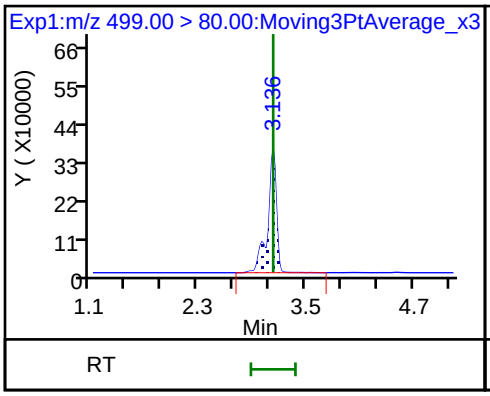
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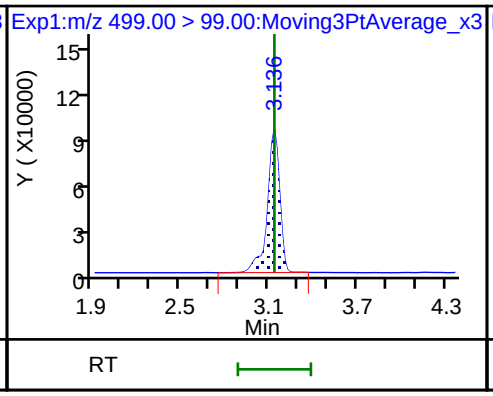
D 14 13C4 PFOA



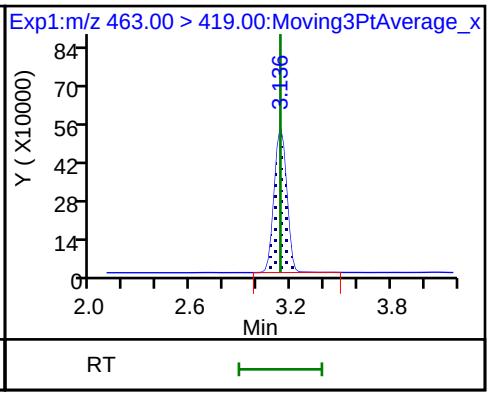
17 Perfluorooctane sulfonic acid



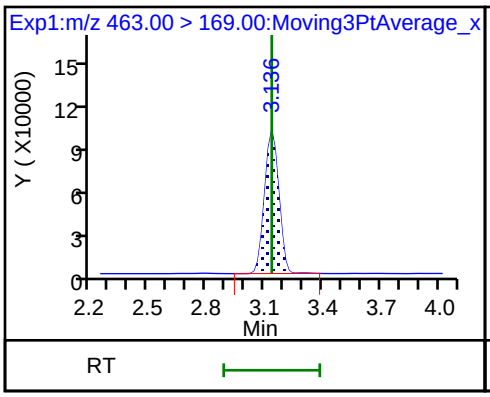
17 Perfluorooctane sulfonic acid



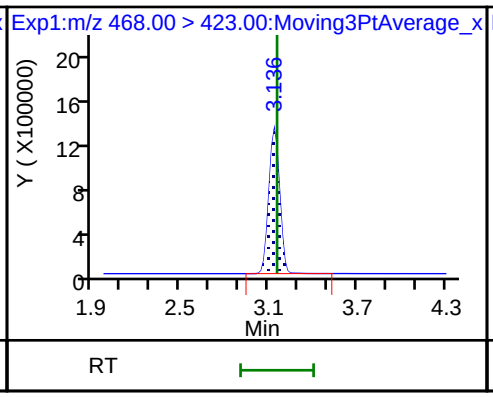
20 Perfluorononanoic acid



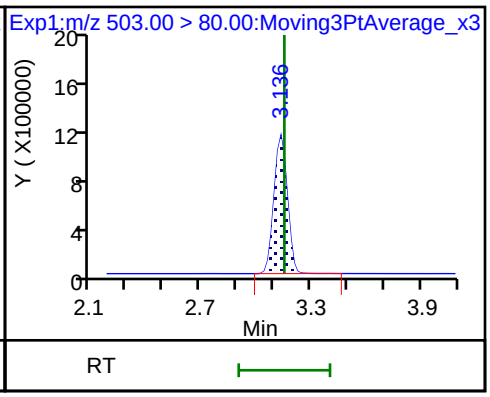
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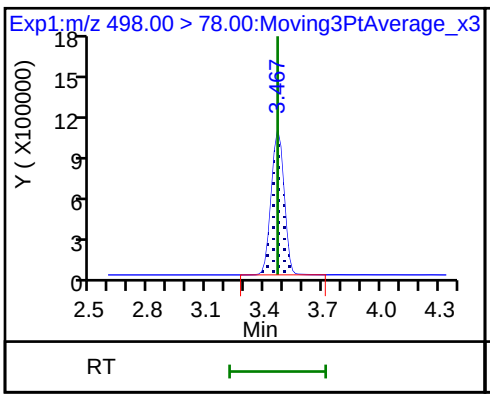
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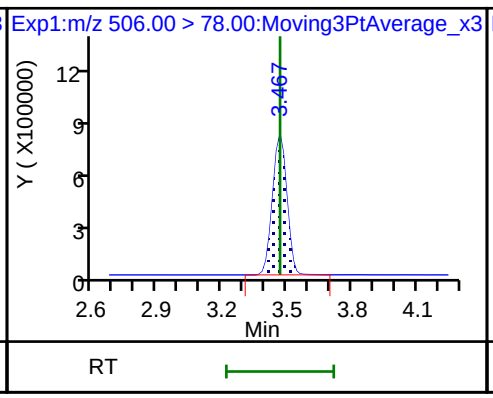
D 18 13C4 PFOS



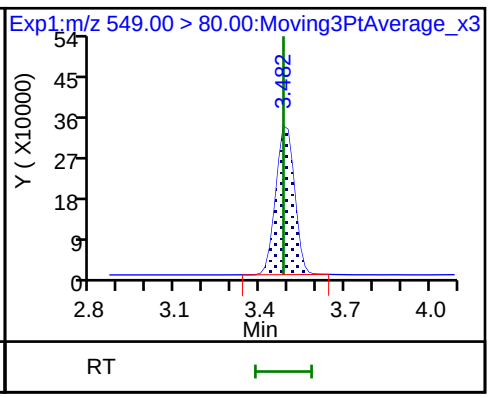
22 Perfluorooctane Sulfonamide



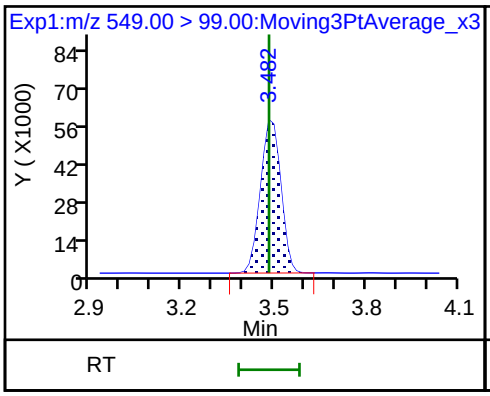
D 21 13C8 FOSA



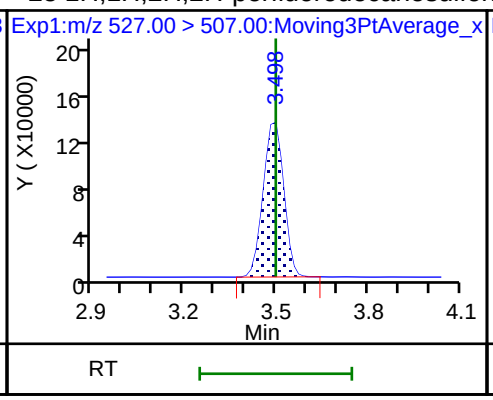
68 Perfluorononanesulfonic acid



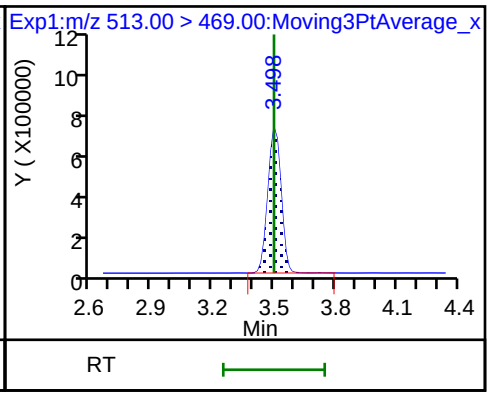
68 Perfluorononanesulfonic acid



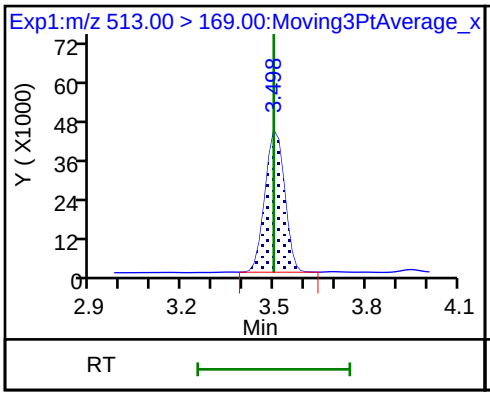
25 1H,1H,2H,2H-perfluorodecanesulfoni



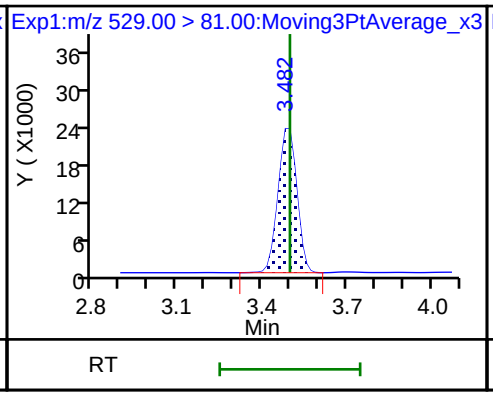
24 Perfluorodecanoic acid



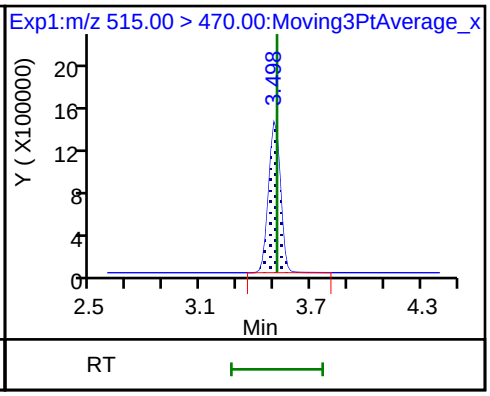
24 Perfluorodecanoic acid



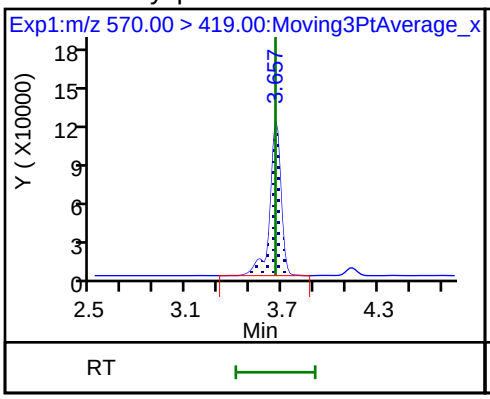
D 26 M2-8:2FTS



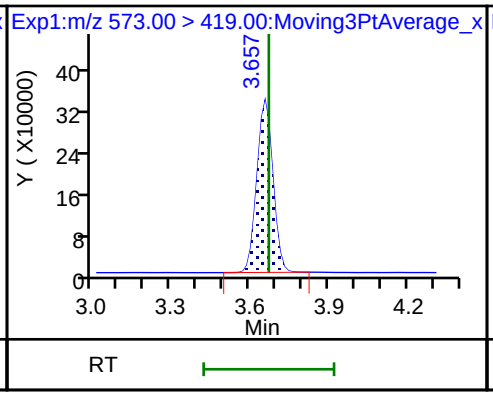
D 23 13C2 PFDA



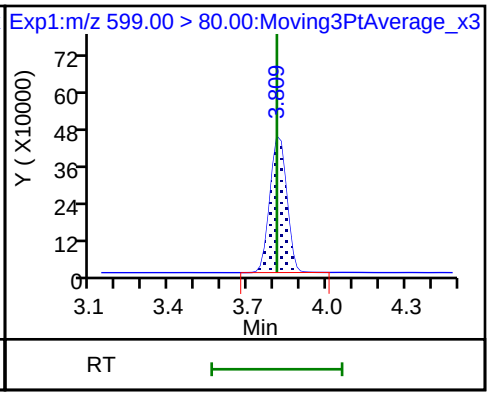
28 N-methyl perfluorooctane sulfonami



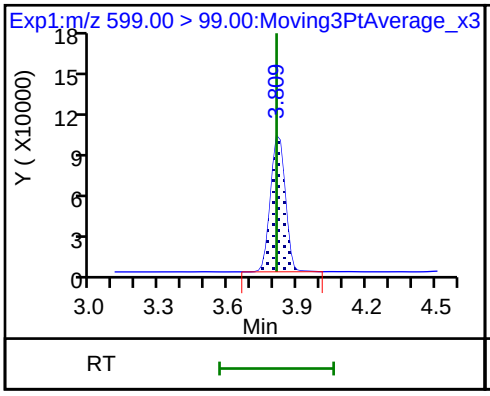
D 27 d3-NMeFOSAA



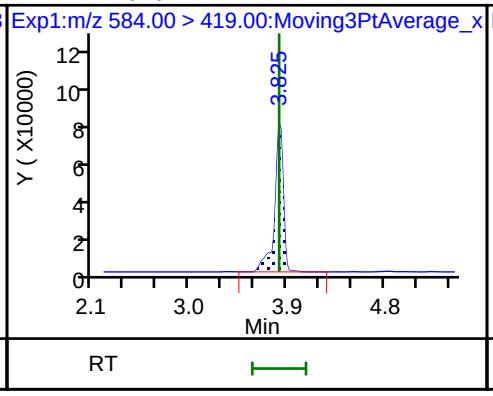
29 Perfluorodecane Sulfonic acid



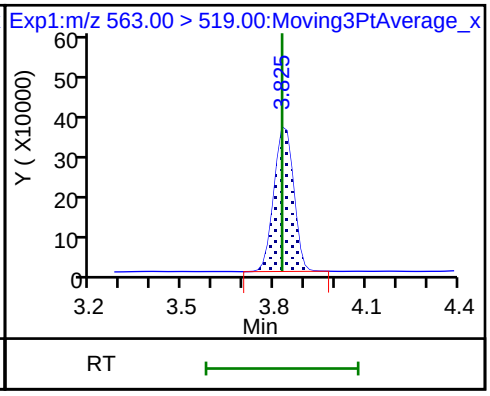
29 Perfluorodecane Sulfonic acid



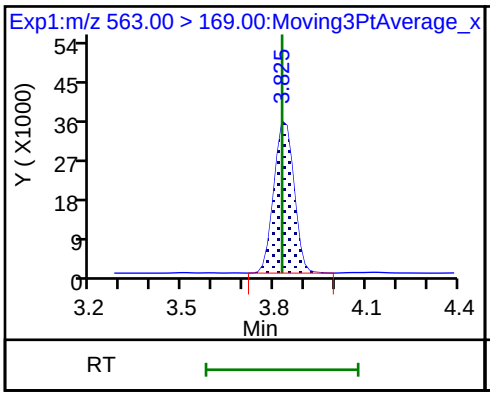
33 N-ethyl perfluorooctane sulfonamid



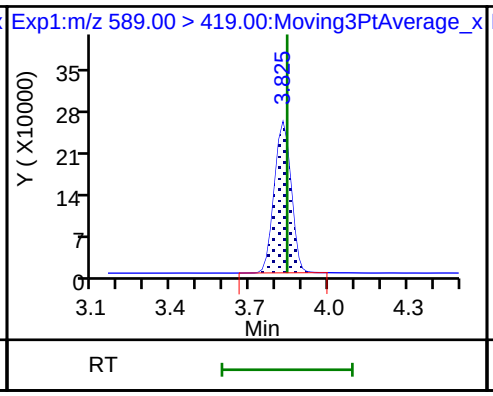
31 Perfluoroundecanoic acid



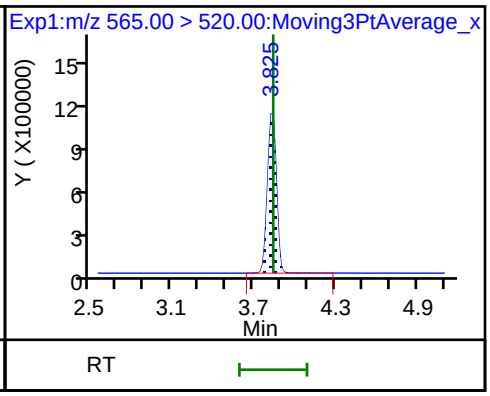
31 Perfluoroundecanoic acid



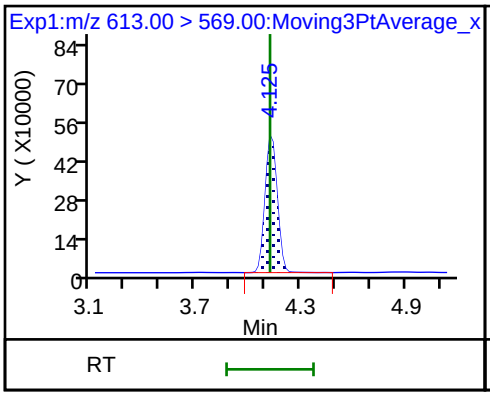
D 32 d5-NEtFOSAA



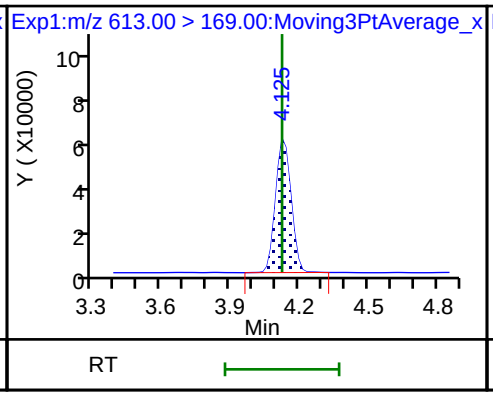
D 30 13C2 PFUnA



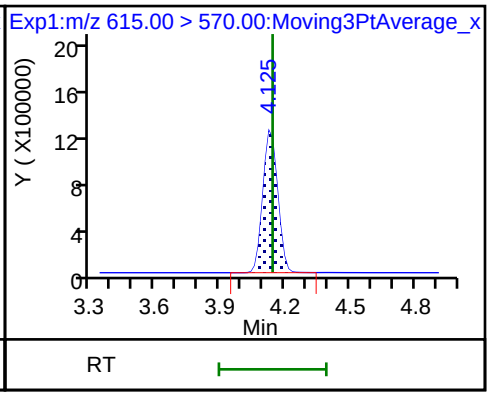
37 Perfluorododecanoic acid



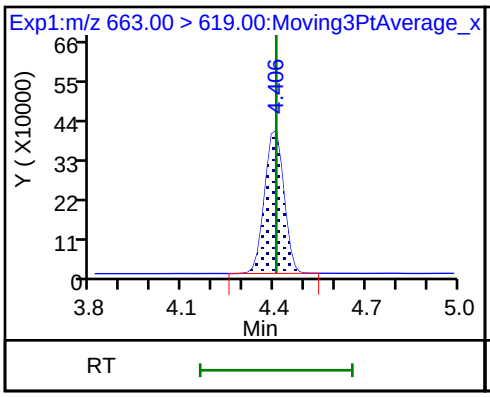
37 Perfluorododecanoic acid



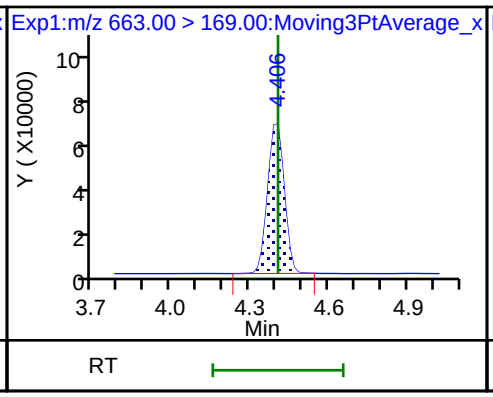
D 36 13C2 PFDoA



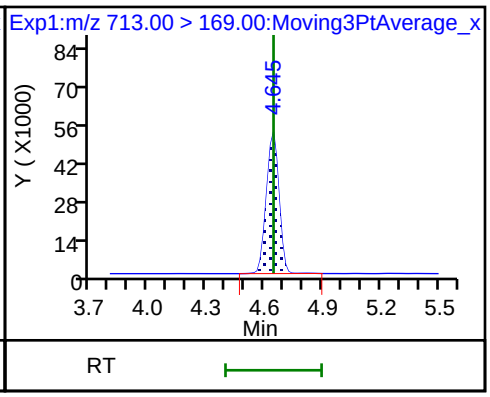
41 Perfluorotridecanoic acid



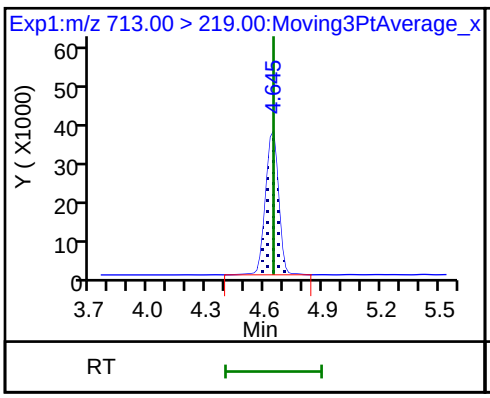
41 Perfluorotridecanoic acid



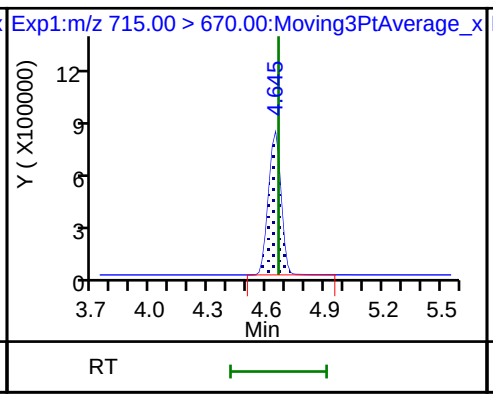
42 Perfluorotetradecanoic acid



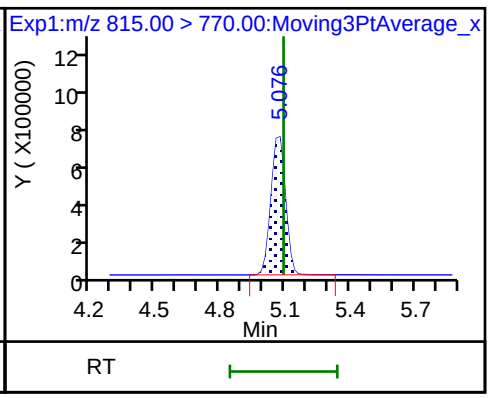
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-239407/1-A

Matrix: Water Lab File ID: 2018.08.11LA9A_007.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 250(mL) Date Analyzed: 08/11/2018 20:44

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.: 239432 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0010	U	0.0020	0.0010	0.00047
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0015	U	0.0020	0.0015	0.00061
335-67-1	Perfluorooctanoic acid (PFOA)	0.0015	U	0.0020	0.0015	0.00054
375-95-1	Perfluorononanoic acid (PFNA)	0.0015	U	0.0020	0.0015	0.00052
335-76-2	Perfluorodecanoic acid (PFDA)	0.0010	U	0.0020	0.0010	0.00048
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0015	U	0.0020	0.0015	0.00072
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0015	U	0.0020	0.0015	0.00052
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0030	U	0.0040	0.0030	0.00076
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0030	U	0.0040	0.0030	0.00083
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0010	U	0.0020	0.0010	0.00046
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0010	U	0.0020	0.0010	0.00038
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	U M	0.0040	0.0030	0.0011
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.010	U	0.020	0.010	0.0030
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.010	U	0.020	0.010	0.0028

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-239407/1-A

Matrix: Water Lab File ID: 2018.08.11LA9A_007.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 250(mL) Date Analyzed: 08/11/2018 20:44

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.: 239432 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	88		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	95		50-150
STL00996	13C2 PFDA	94		50-150
STL00997	13C2 PFUnA	88		50-150
STL00998	13C2 PFDoA	93		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	93		50-150
STL00991	13C4 PFOS	83		50-150
STL02337	13C3-PFBS	80		50-150
STL02117	d5-NEtFOSAA	92		50-150
STL02118	d3-NMeFOSAA	102		50-150

Report Date: 13-Aug-2018 07:40:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_007.d
Lims ID: MB 320-239407/1-A
Client ID:
Sample Type: MB
Inject. Date: 11-Aug-2018 20:44:34 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-239407/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 11-Aug-2018 21:29:39

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	-0.001	1.004	11172	0.004121			1.2	
D 1 13C4 PFBA										
217.00 > 172.00	1.483	1.494	-0.011	0.536	7293085	2.12		84.8	8841	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.005	5557	0.002113			0.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.772	-0.016	0.635	6445924	2.10		83.8	9211	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.805	-0.008	0.650	88469	1.86		79.9	502	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	10290	0.003916			2.6	
313.00 > 119.00	2.048	2.048	0.0	1.000	948		10.85(6.96-20.87)		2.1	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.740	7021975	2.20		88.0	10427	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.160	-0.010	0.777	635495	NC			2895	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.400	2.387	0.013	1.005	5804	0.001752			0.7	
363.00 > 169.00	2.400	2.387	0.013	1.005	1705		3.40(2.17-6.52)		5.4	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.863	7976651	2.20		88.0	12356	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	18960	0.006582			27.8	
399.00 > 99.00	2.413	2.400	0.013	1.005	9839		1.93(1.90-5.70)		3.3	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.867	5325571	1.95		82.5	15235	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.719	0.016	1.000	10052	0.0128			8.8	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.751	-0.016	0.988	874936	2.48		105	1518	
* 62 13C2-PFOA										
415.00 > 370.00	2.767	2.751	0.016		7699444	2.50			30137	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.767	2.751	0.016	1.000	18463	0.005936			3.0	
413.00 > 169.00	2.767	2.751	0.016	1.000	6443		2.87(1.36-4.08)		8.6	
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.767	0.0	1.000	7097606	2.34		93.4	11441	
D 19 13C5 PFNA										
468.00 > 423.00	3.154	3.155	-0.001	1.140	6194642	2.38		95.1	7350	
D 18 13C4 PFOS										
503.00 > 80.00	3.154	3.155	-0.001	1.140	5637544	1.98		83.0	5171	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	8042	0.002005			16.4	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.483	-0.016	1.253	3264590	1.92		76.9	4779	
D 26 M2-8:2FTS										
529.00 > 81.00	3.498	3.514	-0.016	1.264	109234	2.67		111	589	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.529	-0.015	1.270	6134063	2.35		94.0	9534	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.671	3.657	0.014	1.000	3338	0.006386			2.2	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.671	3.671	0.0	1.327	1292916	2.55		102	2632	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.857	3.826	0.031	1.004	3206	0.009346			3.1	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.841	3.841	0.0	1.388	956135	2.29		91.8	1606	
D 30 13C2 PFUnA										
565.00 > 520.00	3.841	3.857	-0.016	1.388	4615654	2.19		87.5	10284	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.010	3.994	0.016	1.271	2013	NC			7.2	
D 36 13C2 PFDoA										
615.00 > 570.00	4.142	4.142	0.0	1.497	5287748	2.33		93.0	6261	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.664	4.661	0.003	1.686	3361552	2.31		92.6	10425	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.096	5.059	0.037	1.000	24823	NC			2.0	
813.00 > 169.00	5.096	5.059	0.037	1.000	4012		6.19(2.77-8.32)		14.2	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.096	5.092	0.004	1.842	2395014	1.80		71.9	3973	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 13-Aug-2018 07:40:34 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_007.d

Injection Date: 11-Aug-2018 20:44:34 Instrument ID: A9

Lims ID: MB 320-239407/1-A

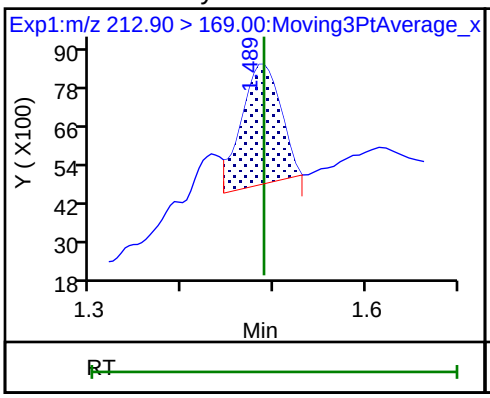
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 1 Worklist Smp#: 4

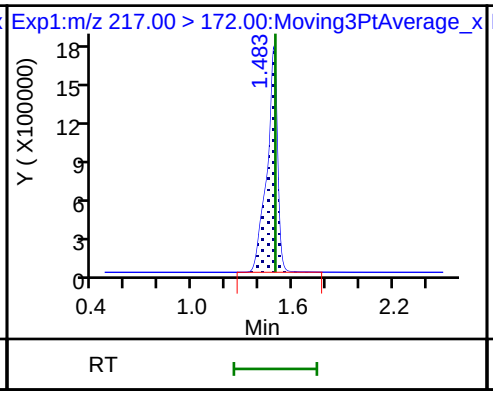
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

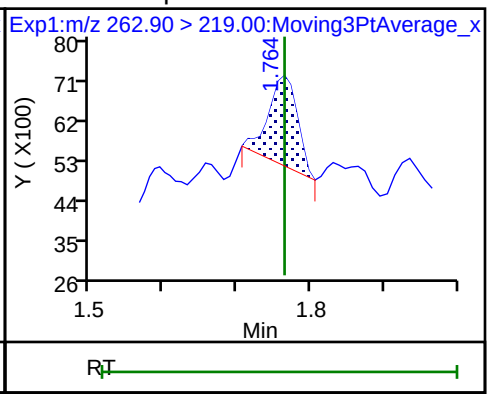
2 Perfluorobutyric acid



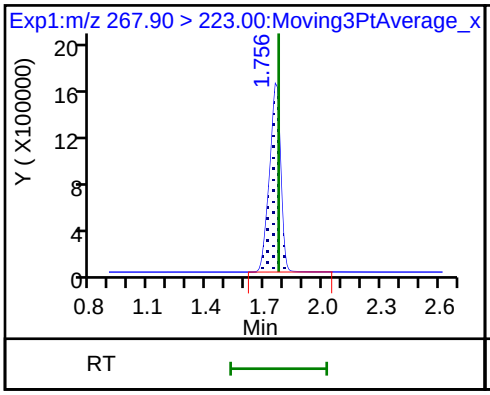
D 1 13C4 PFBA



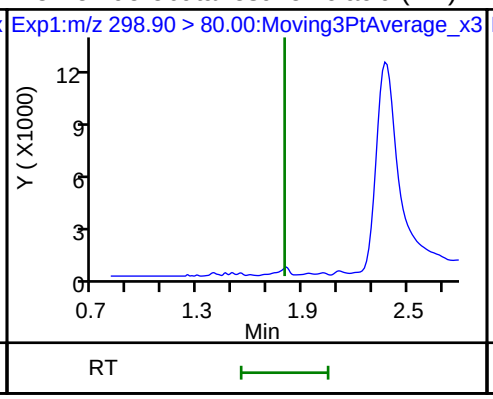
4 Perfluoropentanoic acid



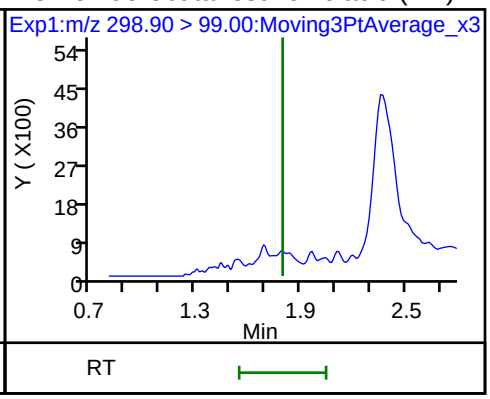
D 3 13C5-PFPeA



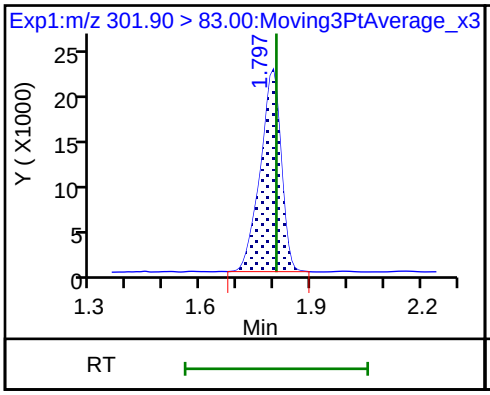
5 Perfluorobutanesulfonic acid (ND)



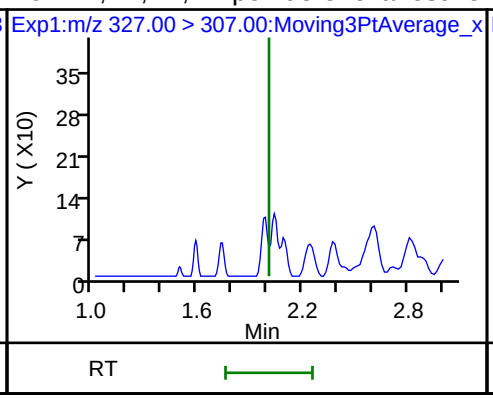
5 Perfluorobutanesulfonic acid (ND)



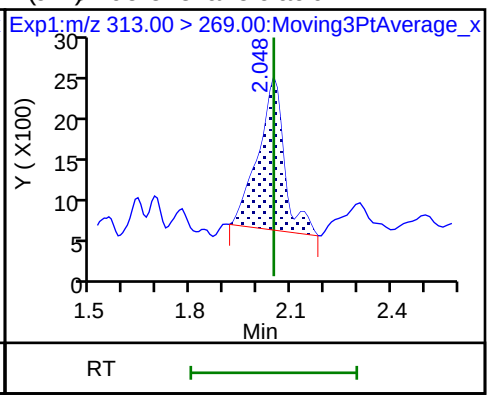
D 47 13C3-PFBS



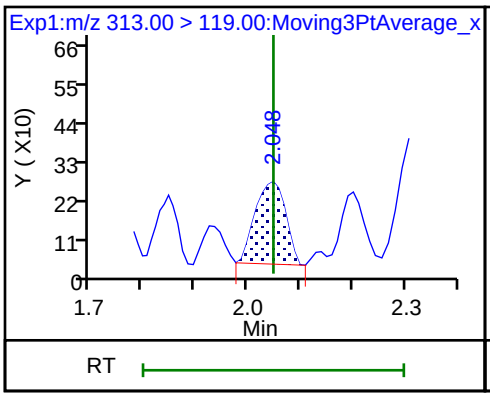
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



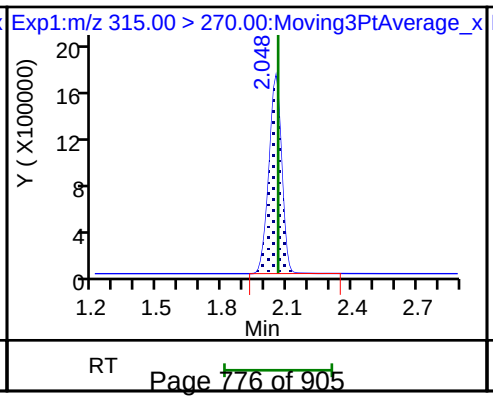
6 Perfluorohexanoic acid



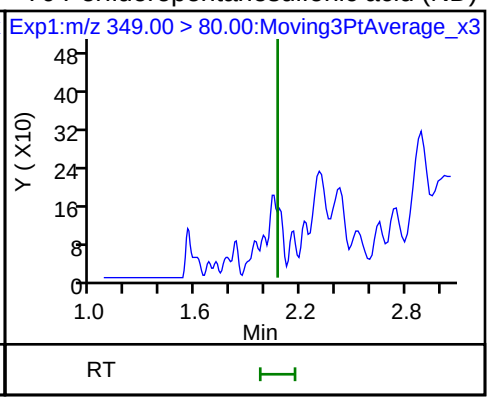
6 Perfluorohexanoic acid



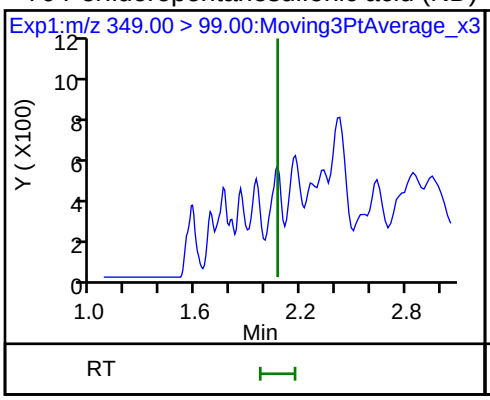
D 7 13C2 PFHxA



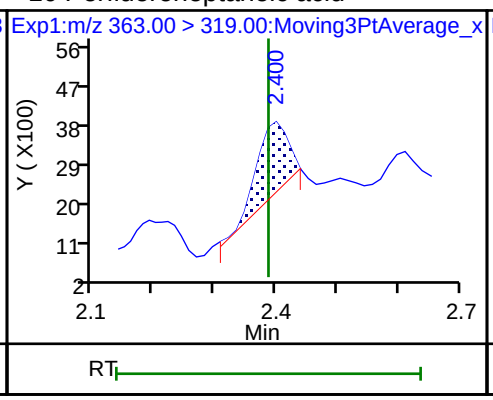
70 Perfluoropentanesulfonic acid (ND)



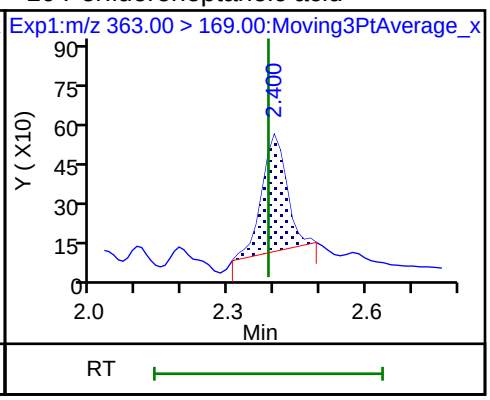
70 Perfluoropentanesulfonic acid (ND)



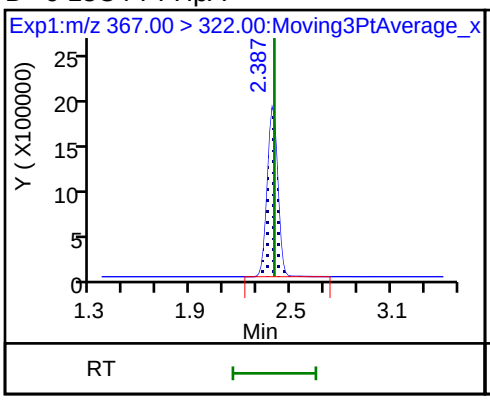
10 Perfluoroheptanoic acid



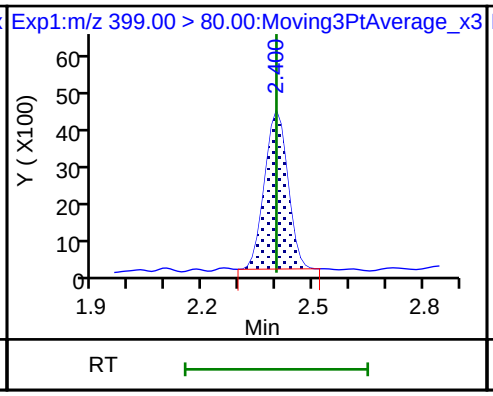
10 Perfluoroheptanoic acid



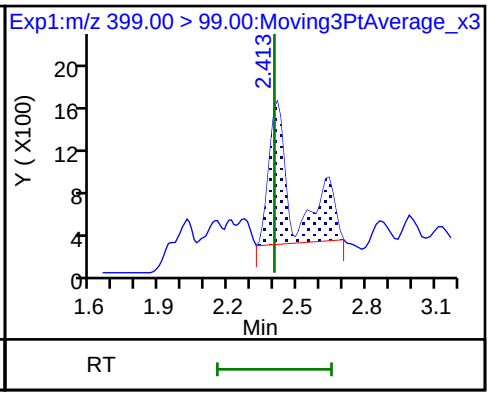
D 9 13C4-PFHpA



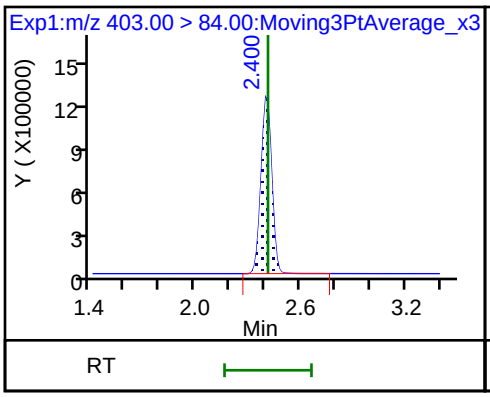
8 Perfluorohexanesulfonic acid



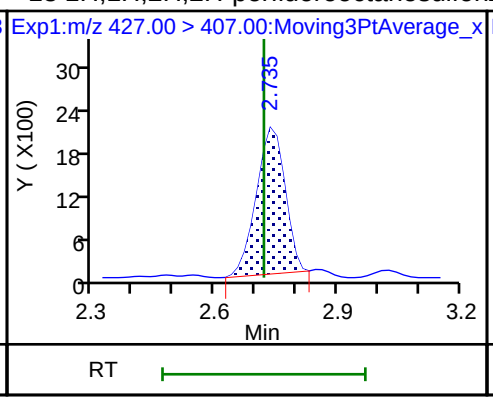
8 Perfluorohexanesulfonic acid



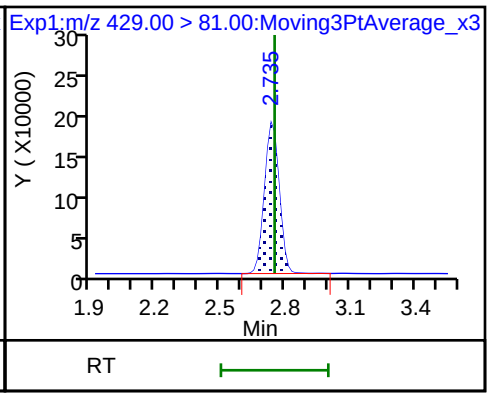
D 11 18O2 PFHxS



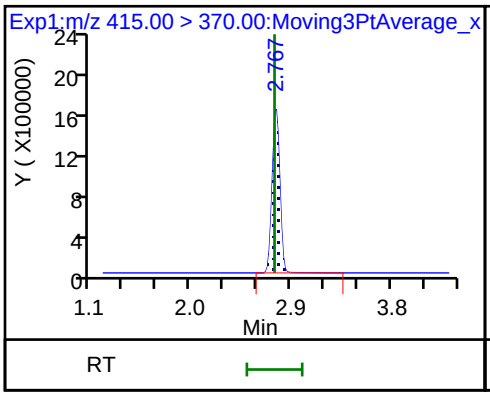
13 1H,1H,2H,2H-perfluorooctanesulfon



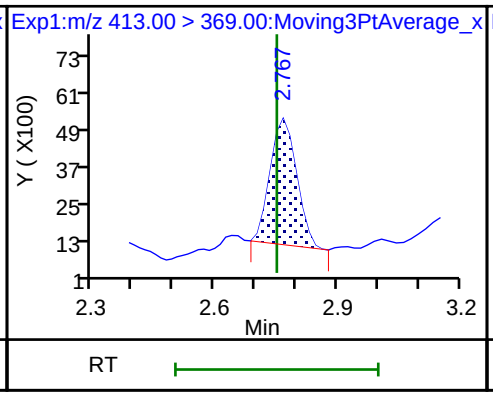
D 12 M2-6:2FTS



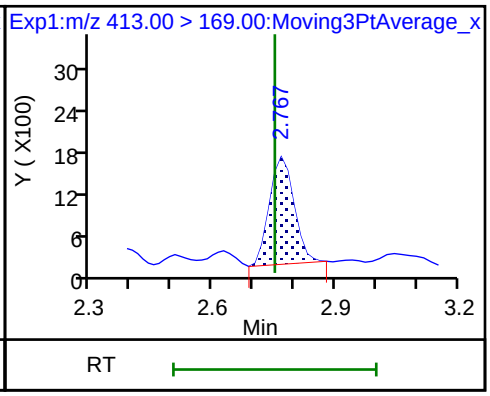
* 62 13C2-PFOA



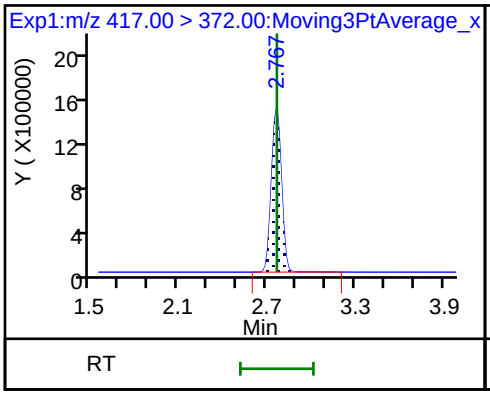
15 Perfluorooctanoic acid



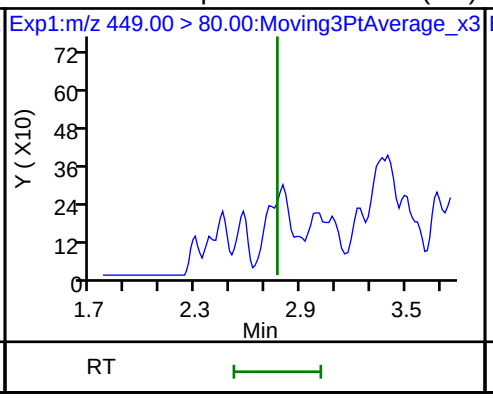
15 Perfluorooctanoic acid



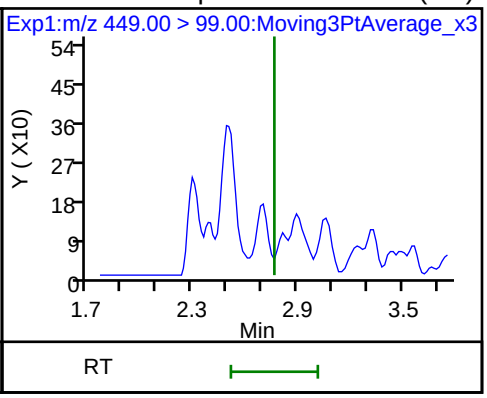
D 14 13C4 PFOA



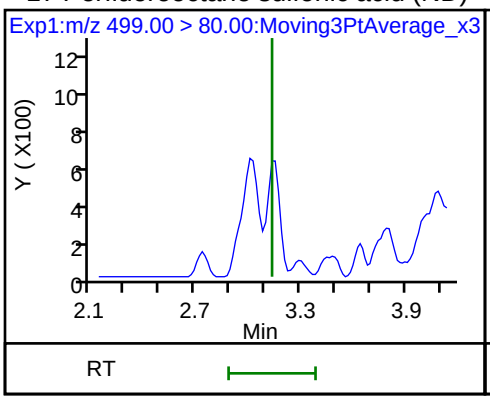
16 Perfluoroheptanesulfonic acid (ND)



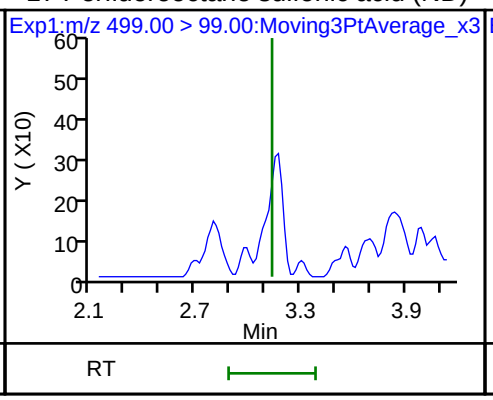
16 Perfluoroheptanesulfonic acid (ND)



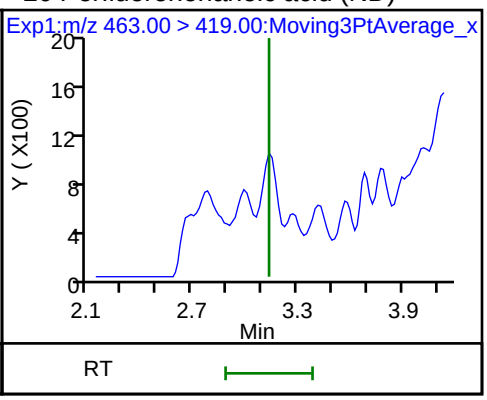
17 Perfluorooctane sulfonic acid (ND)



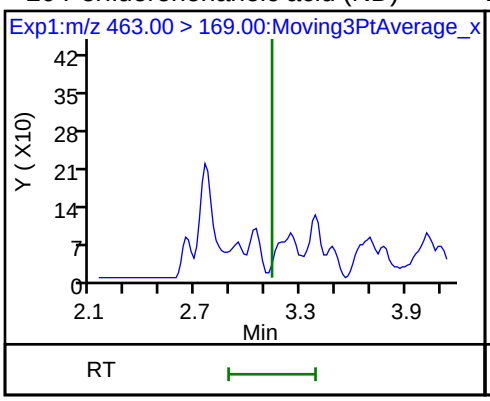
17 Perfluorooctane sulfonic acid (ND)



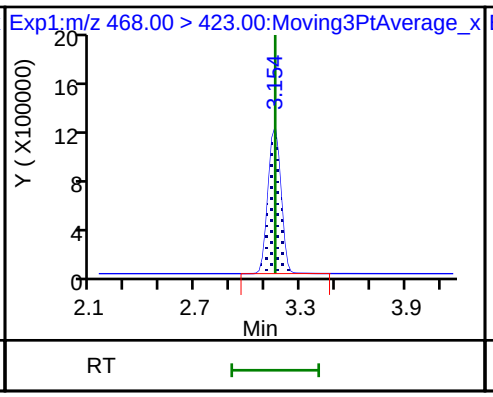
20 Perfluorononanoic acid (ND)



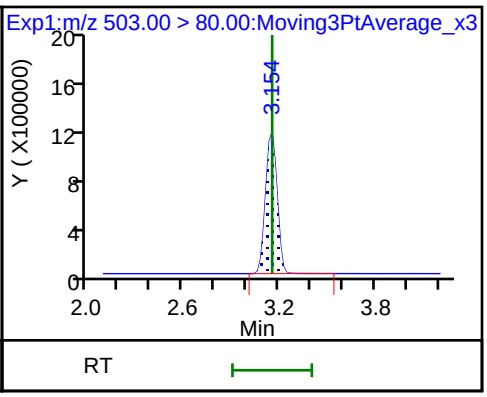
20 Perfluorononanoic acid (ND)



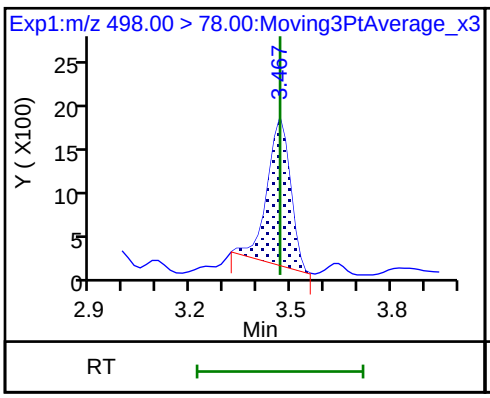
D 19 13C5 PFNA



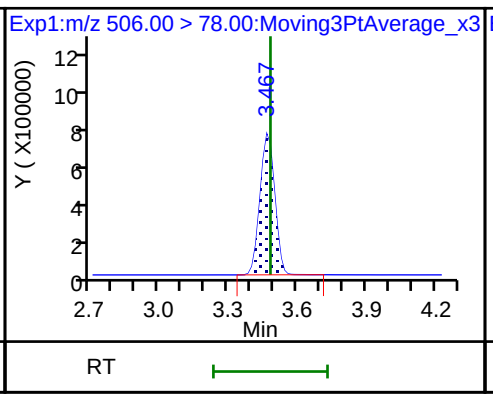
D 18 13C4 PFOS



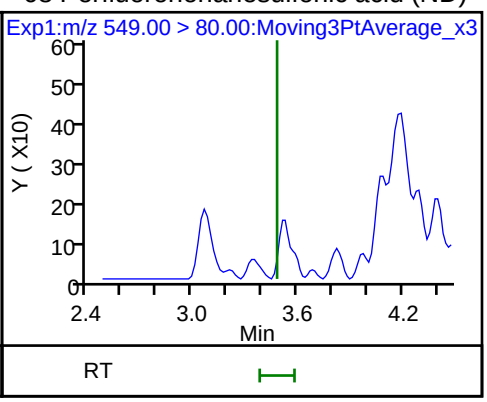
22 Perfluorooctane Sulfonamide



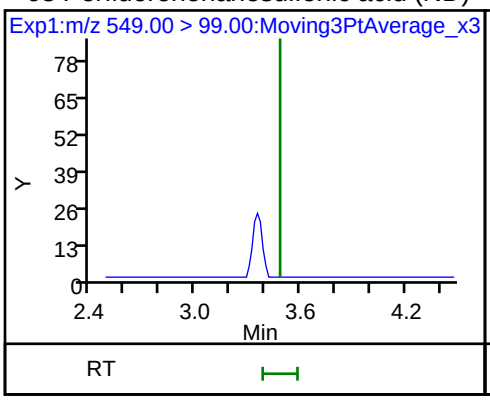
D 21 13C8 FOSA



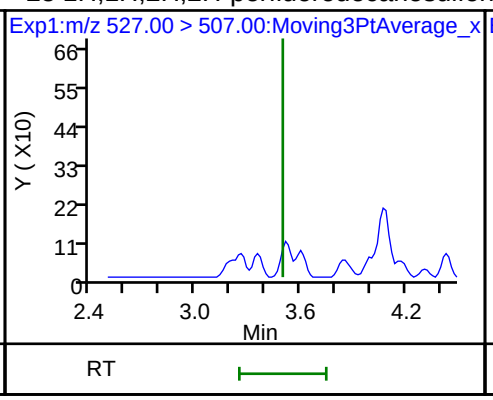
68 Perfluorononanesulfonic acid (ND)



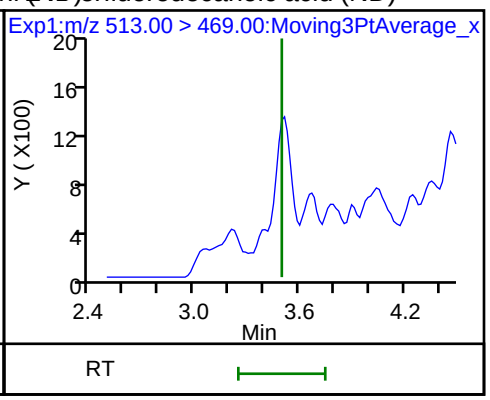
68 Perfluorononanesulfonic acid (ND)



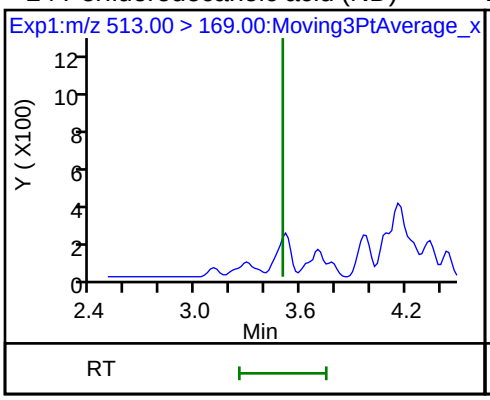
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



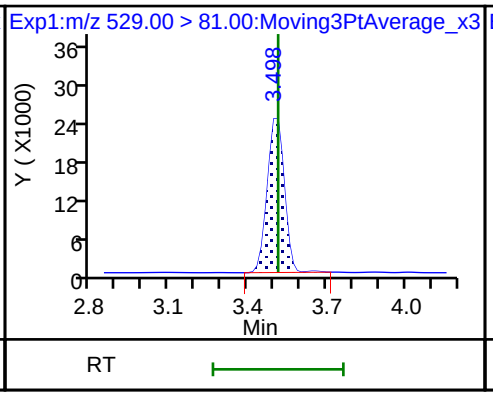
24 Perfluorodecanoic acid (ND)



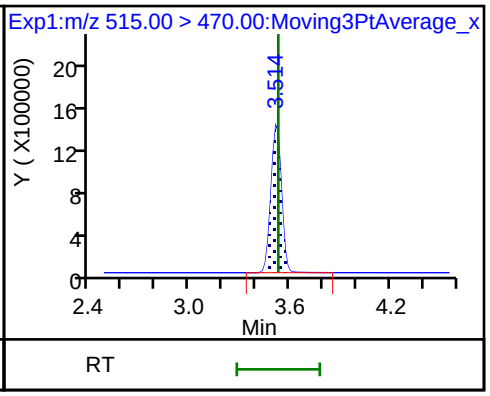
24 Perfluorodecanoic acid (ND)



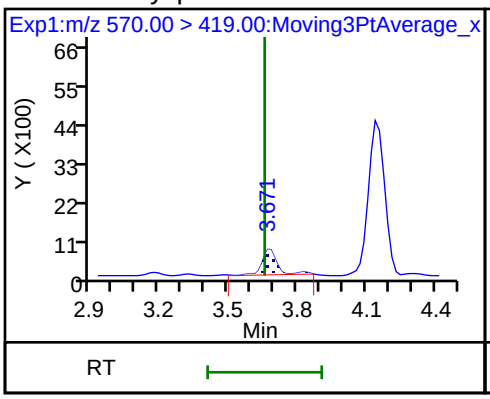
D 26 M2-8:2FTS



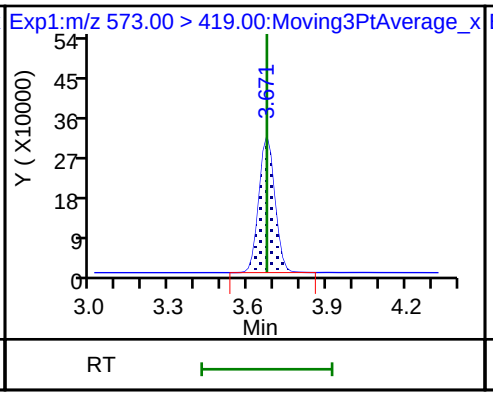
D 23 13C2 PFDA



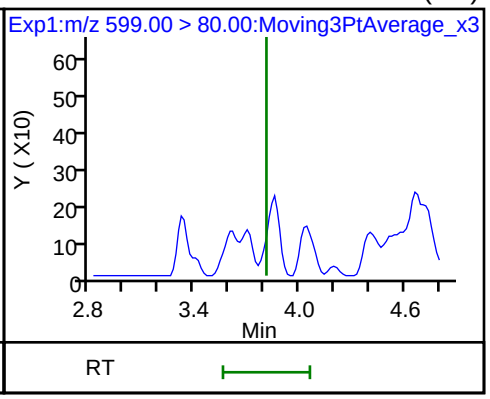
28 N-methyl perfluorooctane sulfonami



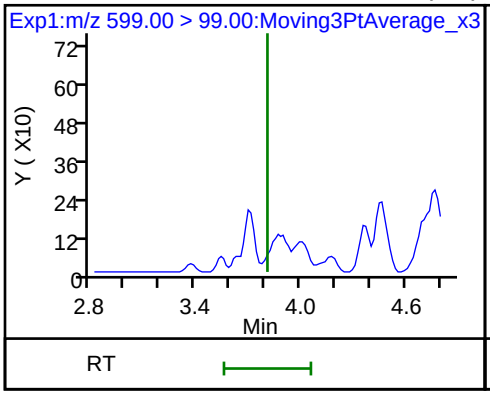
D 27 d3-NMeFOSAA



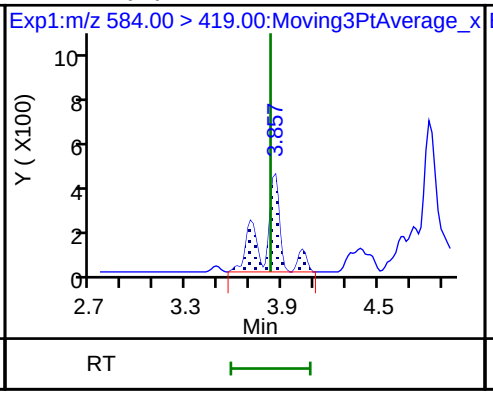
29 Perfluorodecane Sulfonic acid (ND)



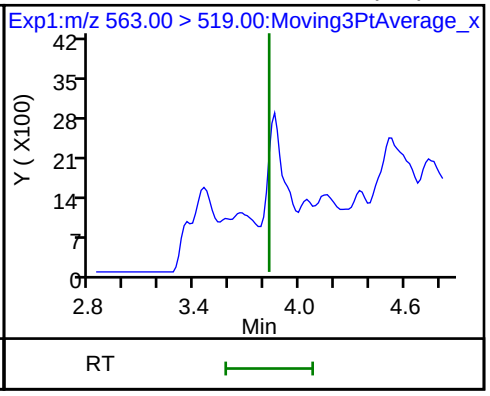
29 Perfluorodecane Sulfonic acid (ND)



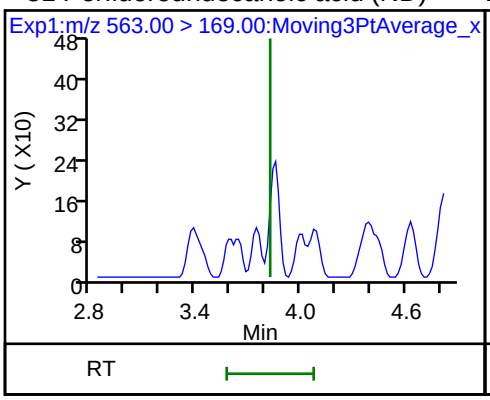
33 N-ethyl perfluorooctane sulfonamid



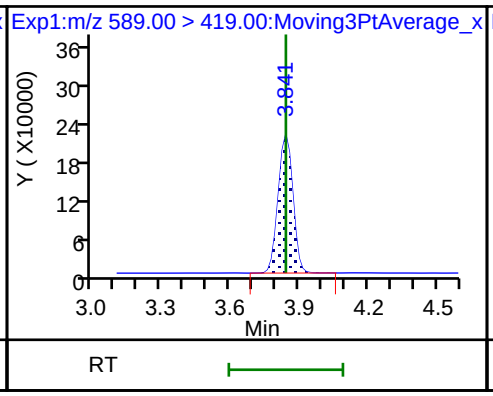
31 Perfluoroundecanoic acid (ND)



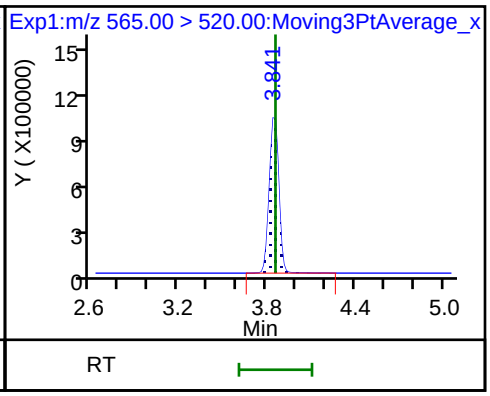
31 Perfluoroundecanoic acid (ND)



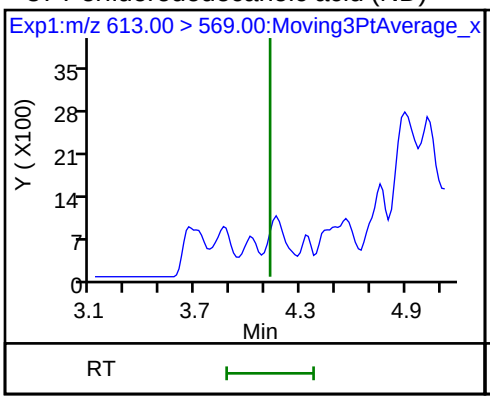
D 32 d5-NEtFOSAA



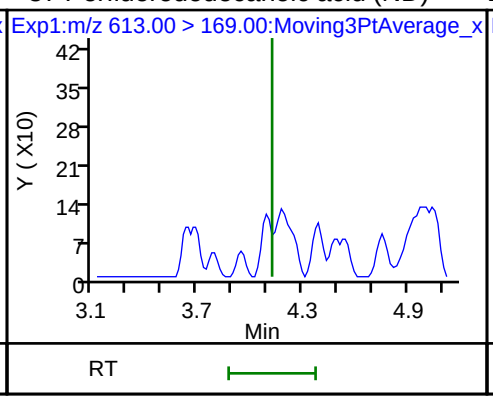
D 30 13C2 PFUnA



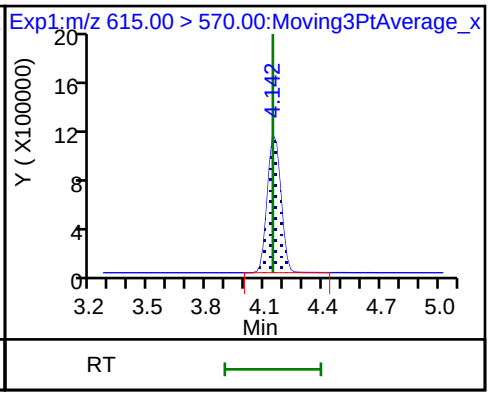
37 Perfluorododecanoic acid (ND)



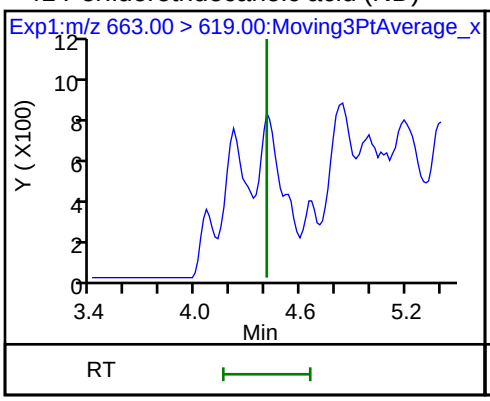
37 Perfluorododecanoic acid (ND)



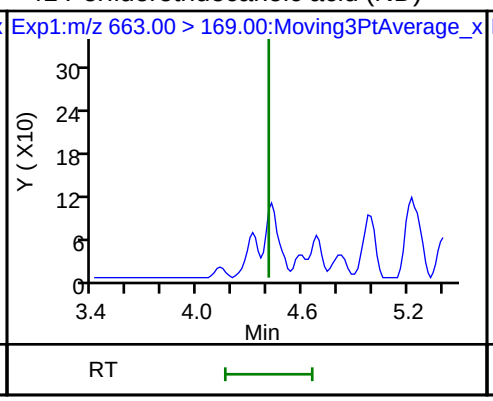
D 36 13C2 PFDoA



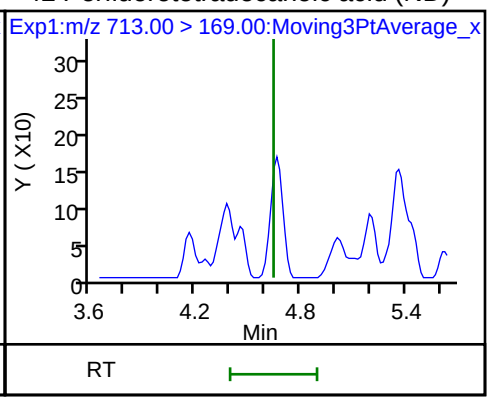
41 Perfluorotridecanoic acid (ND)



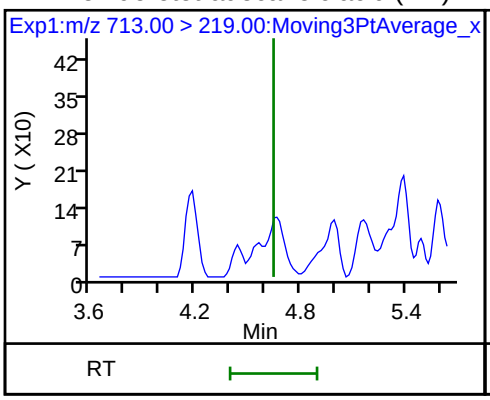
41 Perfluorotridecanoic acid (ND)



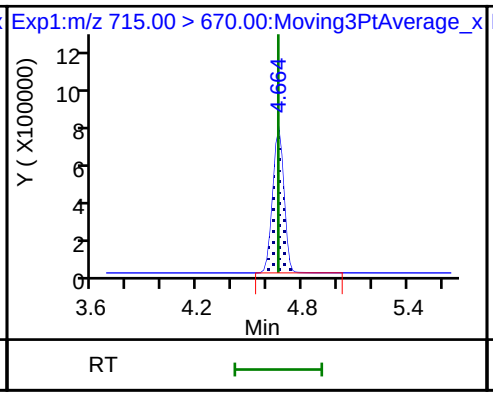
42 Perfluorotetradecanoic acid (ND)



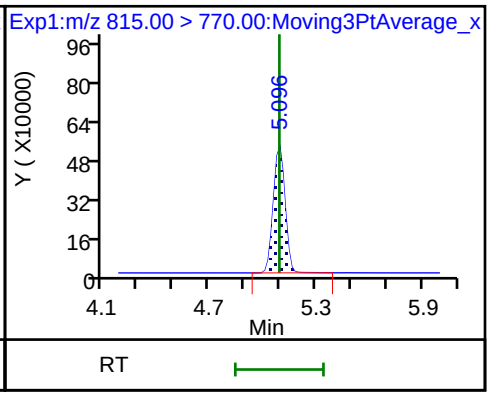
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: | Lab Sample ID: CCB 320-239432/1

Matrix: Water | Lab File ID: 2018.08.11LA9A_004.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 08/11/2018 20:22

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.: 239432 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
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)	0.00704	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U M	0.050	0.040	0.014
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.40	U	0.50	0.40	0.078
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.40	U	0.50	0.40	0.048

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: | Lab Sample ID: CCB 320-239432/1

Matrix: Water | Lab File ID: 2018.08.11LA9A_004.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 08/11/2018 20:22

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.: 239432 | Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		50-150
STL01892	13C4-PFHpA	96		50-150
STL00990	13C4 PFOA	103		50-150
STL00995	13C5 PFNA	104		50-150
STL00996	13C2 PFDA	100		50-150
STL00997	13C2 PFUnA	106		50-150
STL00998	13C2 PFDoA	95		50-150
STL00994	18O2 PFHxS	90		50-150
STL02116	13C2-PFTeDA	106		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	83		50-150
STL02117	d5-NEtFOSAA	107		50-150
STL02118	d3-NMeFOSAA	106		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 11-Aug-2018 20:22:02 ALS Bottle#: 20 Worklist Smp#: 1
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\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 09:25:05 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: phomsophat Date: 11-Aug-2018 21:28:33

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	1.488	0.006	0.537	7453357	2.22		88.7	11889	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.764	0.008	0.637	6620062	2.20		88.2	10719	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	0.995	10777	0.003989			0.6	
D 47 13C3-PFBS										
301.90 > 83.00	1.805	1.797	0.008	0.649	90067	1.94		83.3	444	
D 60 M2-4:2FTS										
329.00 > 81.00	2.027	2.017	0.010	0.729	615282	NC			736	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.048	0.010	0.740	7526576	2.41		96.6	14996	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.160	2.150	0.010	0.776	774633	NC			3358	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.400	0.0	0.862	8461516	2.39		95.6	13401	
D 11 18O2 PFHxS										
403.00 > 84.00	2.426	2.413	0.013	0.872	5648887	2.12		89.6	4144	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	0.995	21519	0.007043			35.8	
399.00 > 99.00	2.426	2.413	0.013	1.000	6299		3.42(1.90-5.70)		3.0	
D 12 M2-6:2FTS										
429.00 > 81.00	2.751	2.751	0.0	0.989	900633	2.62		110	1400	
D 14 13C4 PFOA										
417.00 > 372.00	2.783	2.767	0.016	1.000	7646934	2.58		103	15204	
* 62 13C2-PFOA										
415.00 > 370.00	2.783	2.767	0.016		7519014	2.50			16498	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.783	2.767	0.016	1.000	24135	0.007202			3.4	
413.00 > 169.00	2.783	2.767	0.016	1.000	10536		2.29(1.36-4.08)		17.4	
D 18 13C4 PFOS										
503.00 > 80.00	3.173	3.154	0.019	1.140	5984715	2.16		90.3	5005	
D 19 13C5 PFNA										
468.00 > 423.00	3.173	3.154	0.019	1.140	6622896	2.60		104	7546	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.173	3.154	0.019	1.000	4299	0.001601			4.0	
499.00 > 99.00	3.173	3.154	0.019	1.000	1101		3.90(2.04-6.12)		2.2	M
D 21 13C8 FOSA										
506.00 > 78.00	3.482	3.467	0.015	1.252	3790296	2.29		91.5	5054	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	0.996	2042	0.000439			5.2	
D 26 M2-8:2FTS										
529.00 > 81.00	3.529	3.514	0.015	1.268	101983	2.55		107	437	
D 23 13C2 PFDA										
515.00 > 470.00	3.544	3.529	0.015	1.273	6361569	2.50		99.8	6576	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.699	3.685	0.014	1.329	1314740	2.65		106	3438	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.872	3.857	0.015	1.391	1090088	2.68		107	1684	
D 30 13C2 PFUnA										
565.00 > 520.00	3.872	3.857	0.015	1.391	5456909	2.65		106	7947	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.872	3.857	0.015	1.000	7476	0.004068			1.1	R
563.00 > 169.00	3.857	3.857	0.0	0.996	1610		4.64(5.24-15.72)		7.3	
D 36 13C2 PFDoA										
615.00 > 570.00	4.178	4.160	0.018	1.502	5277935	2.38		95.1	9368	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.692	4.676	0.016	1.686	3769658	2.66		106	12624	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.126	5.109	0.017	1.842	3403114	2.62		105	4858	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.126	5.109	0.017	1.000	27495	NC			2.2	
813.00 > 169.00	5.126	5.109	0.017	1.000	5014		5.48(2.77-8.32)		19.4	

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: 12-Aug-2018 09:25:12 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_004.d

Injection Date: 11-Aug-2018 20:22:02 Instrument ID: A9

Lims ID: CCB

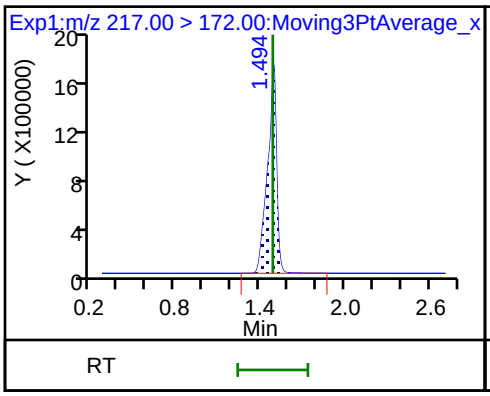
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 1

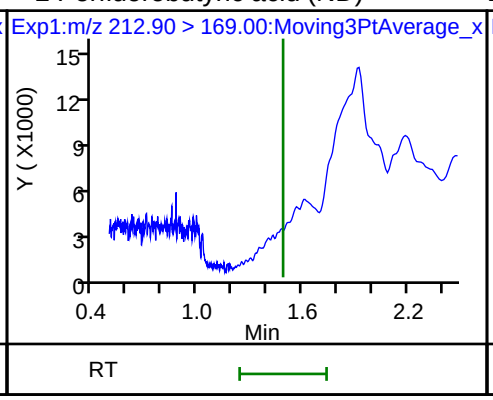
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

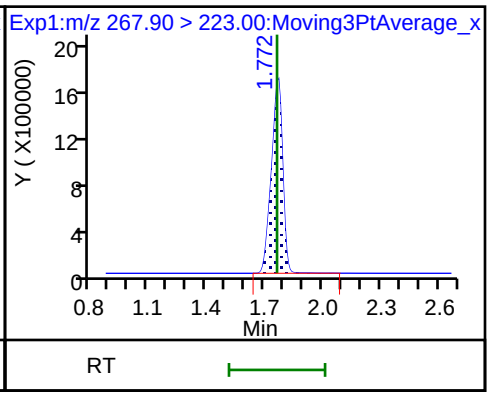
D 1 13C4 PFBA



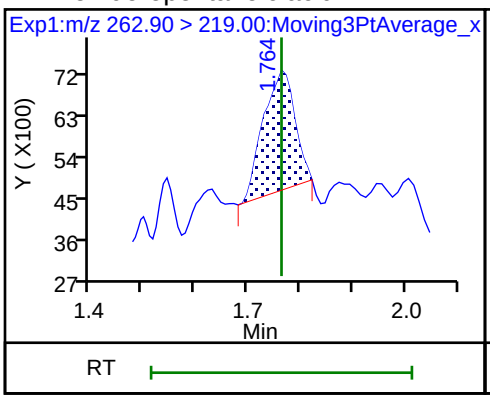
2 Perfluorobutyric acid (ND)



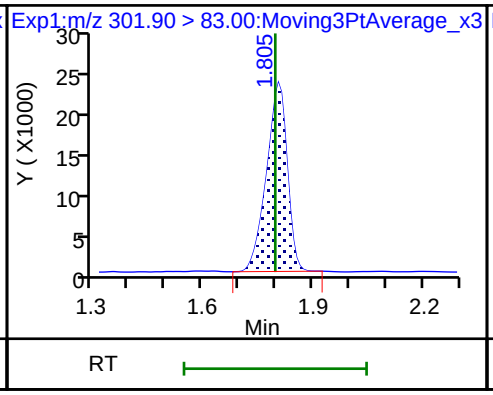
D 3 13C5-PFPeA



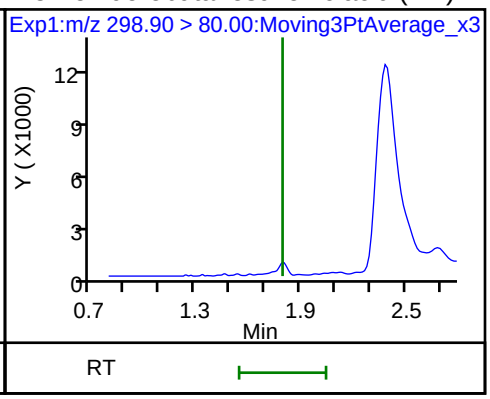
4 Perfluoropentanoic acid



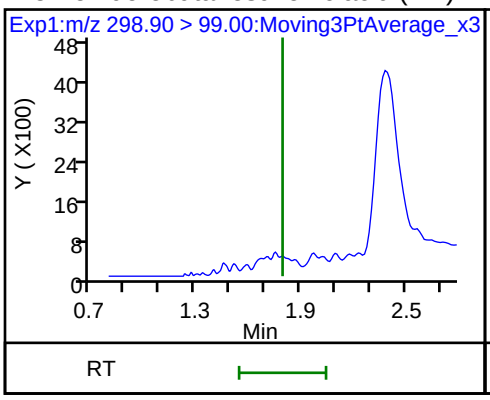
D 47 13C3-PFBS



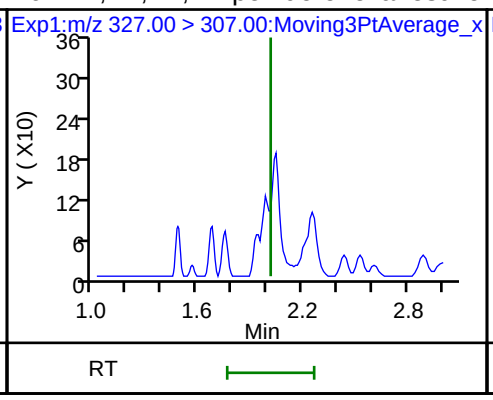
5 Perfluorobutanesulfonic acid (ND)



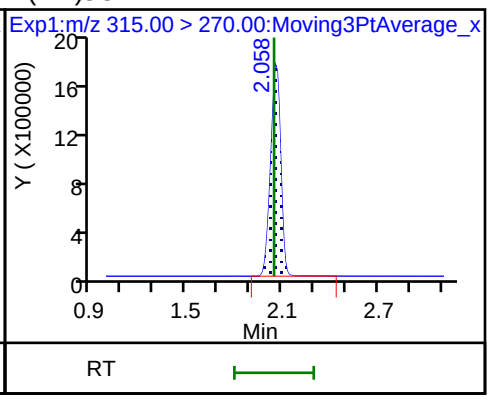
5 Perfluorobutanesulfonic acid (ND)



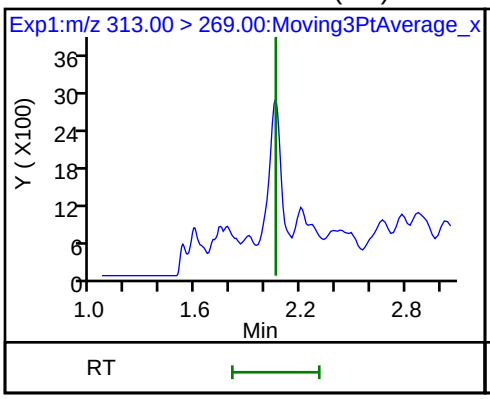
61 1H,1H,2H,2H-perfluorohexanesulfonic (NT)



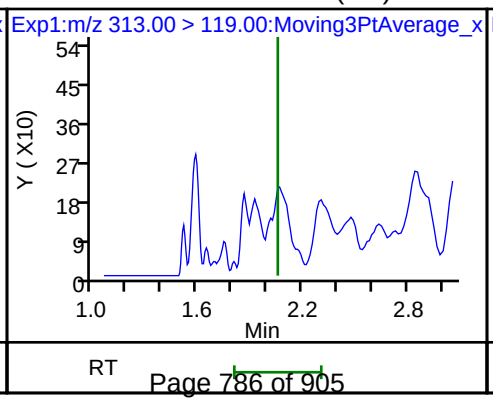
D 13C2 PFHxA



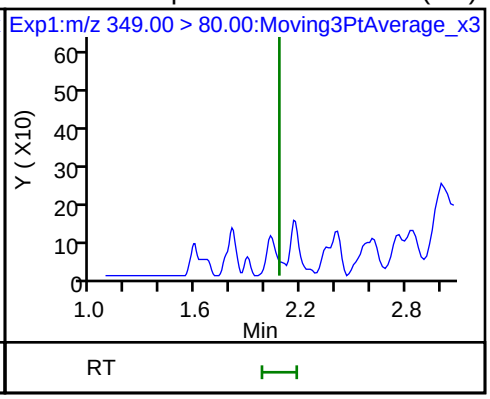
6 Perfluorohexanoic acid (ND)



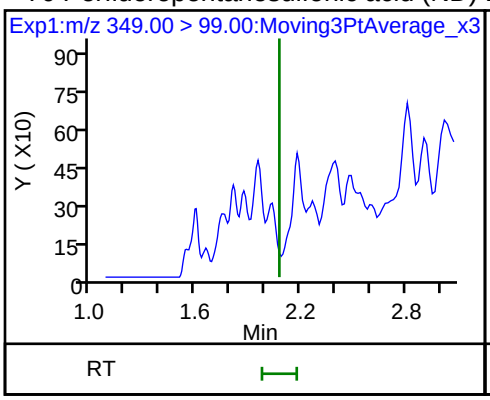
6 Perfluorohexanoic acid (ND)



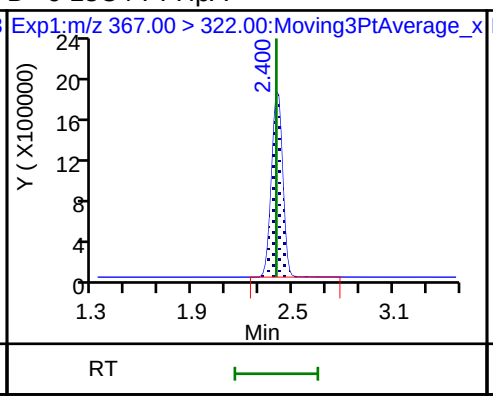
70 Perfluoropentanesulfonic acid (ND)



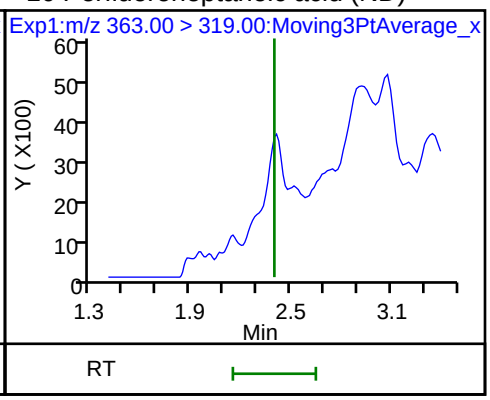
70 Perfluoropentanesulfonic acid (ND)



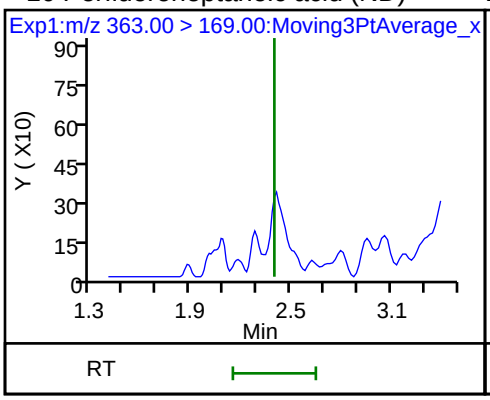
D 9 13C4-PFHpA



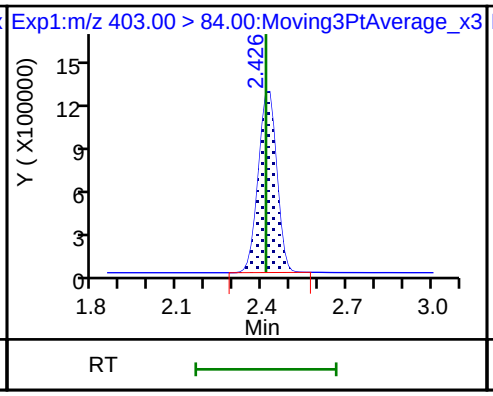
10 Perfluoroheptanoic acid (ND)



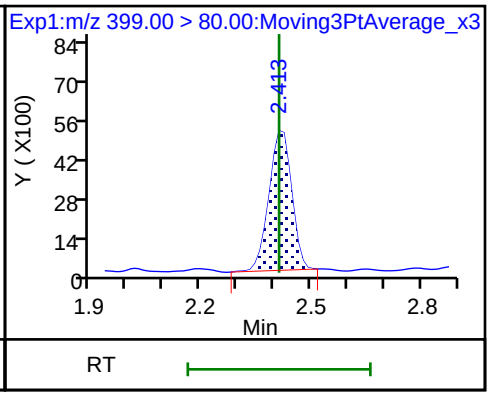
10 Perfluoroheptanoic acid (ND)



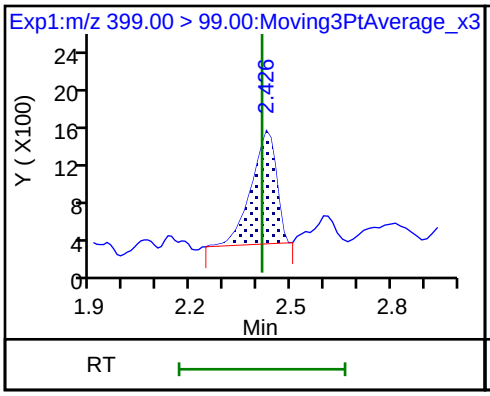
D 11 18O2 PFHxS



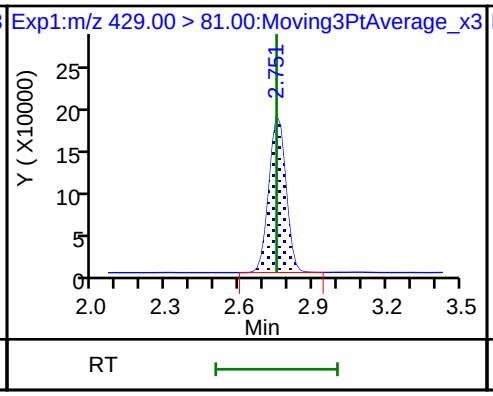
8 Perfluorohexanesulfonic acid



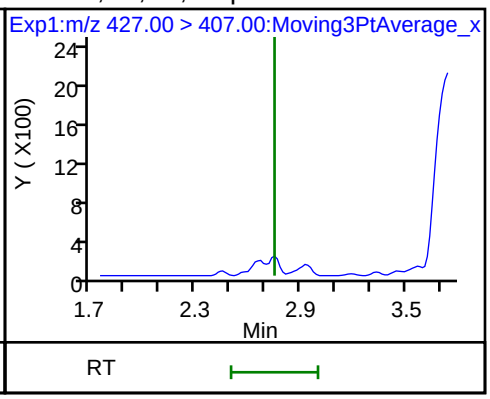
8 Perfluorohexanesulfonic acid



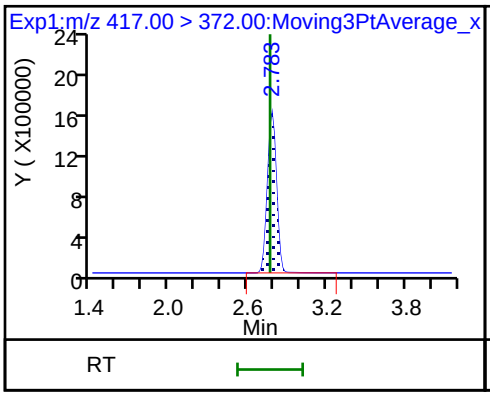
D 12 M2-6:2FTS



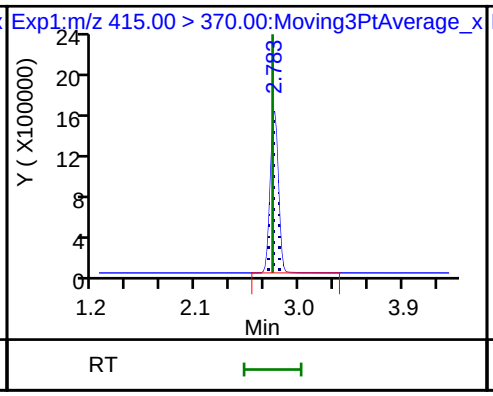
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



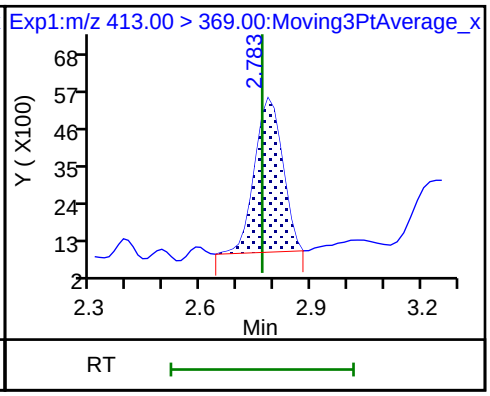
D 14 13C4 PFOA



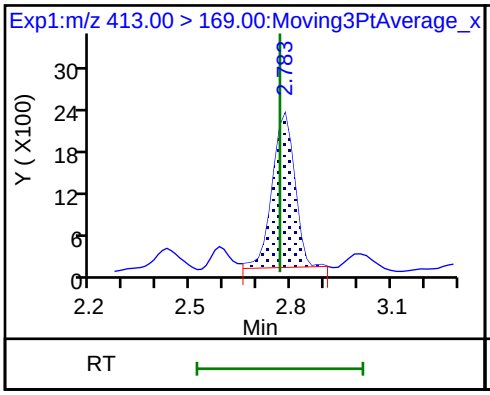
* 62 13C2-PFOA



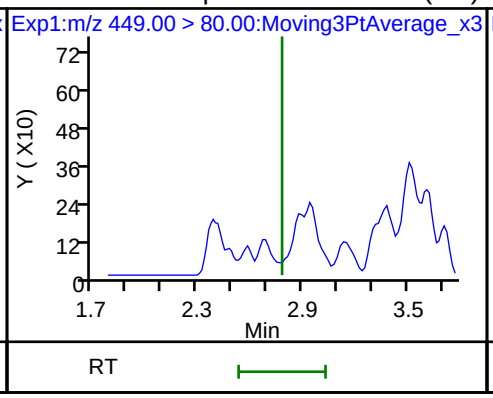
15 Perfluorooctanoic acid



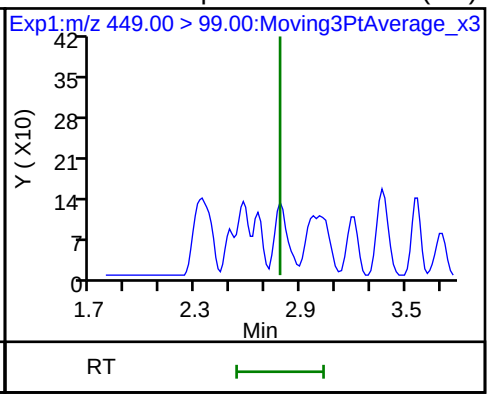
15 Perfluorooctanoic acid



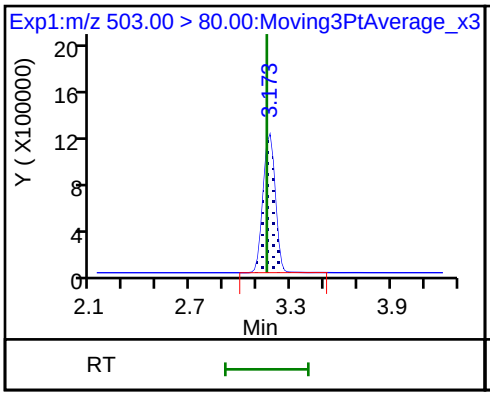
16 Perfluoroheptanesulfonic acid (ND)



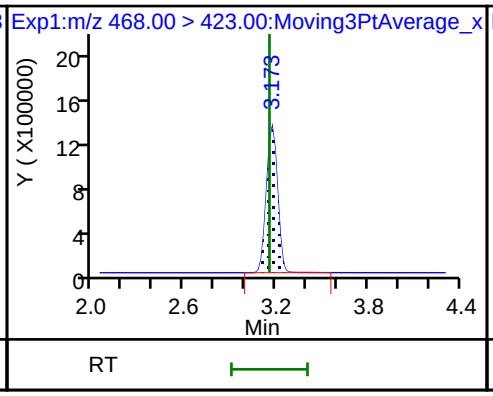
16 Perfluoroheptanesulfonic acid (ND)



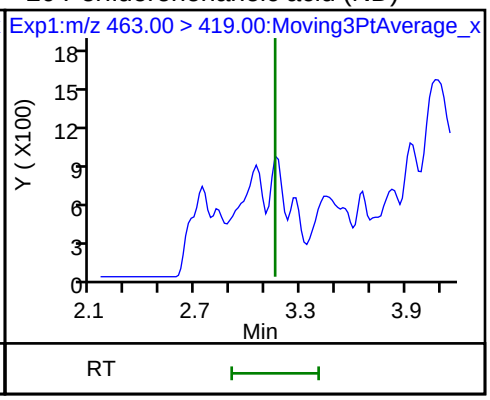
D 18 13C4 PFOS



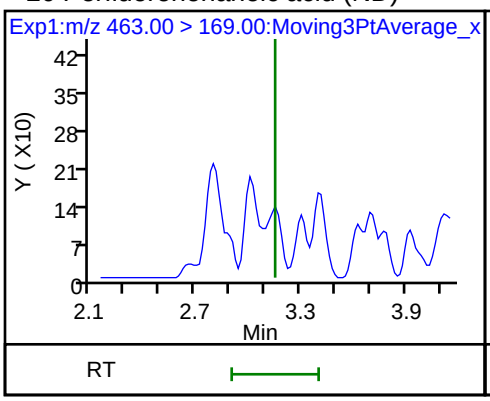
D 19 13C5 PFNA



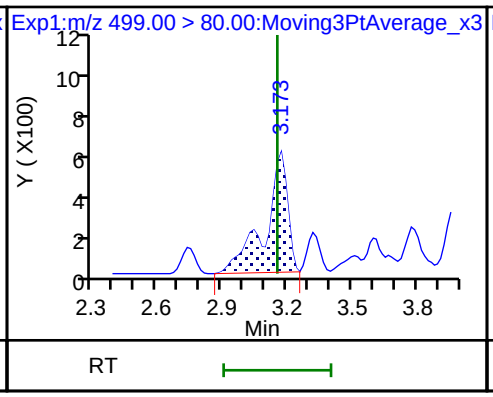
20 Perfluorononanoic acid (ND)



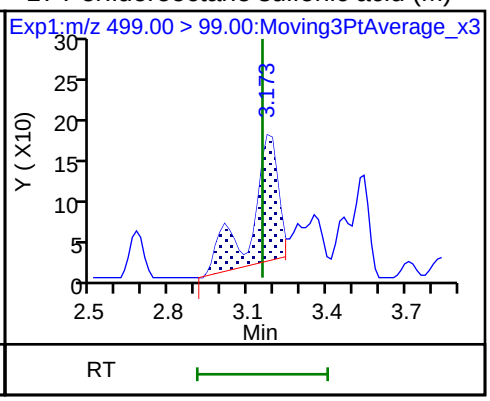
20 Perfluorononanoic acid (ND)



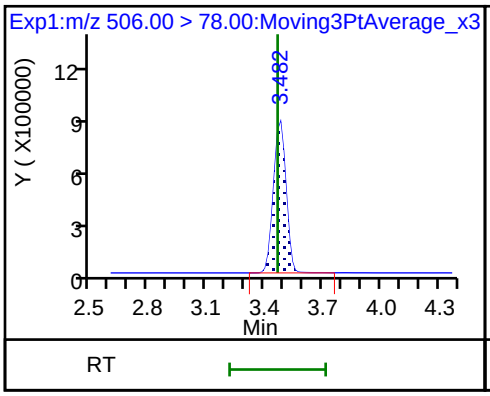
17 Perfluorooctane sulfonic acid



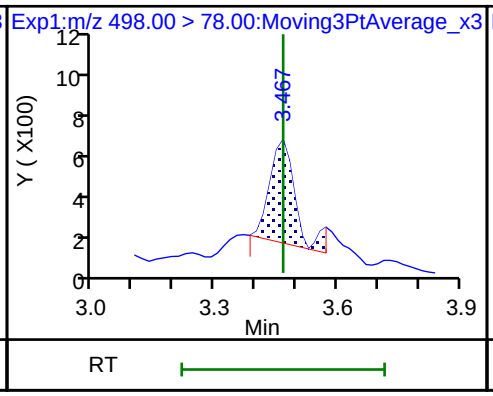
17 Perfluorooctane sulfonic acid (M)



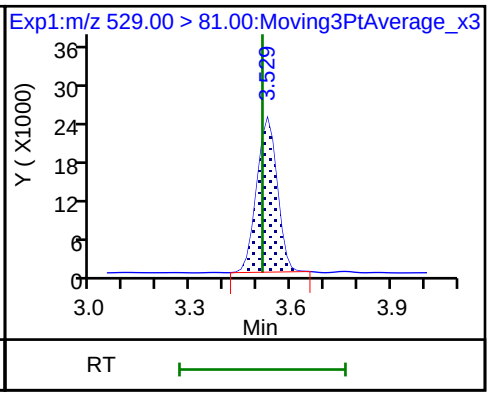
D 21 13C8 FOSA



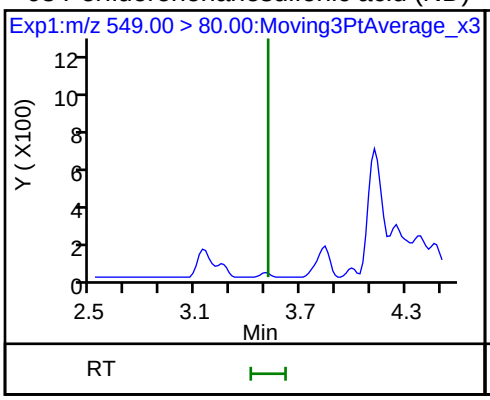
22 Perfluorooctane Sulfonamide



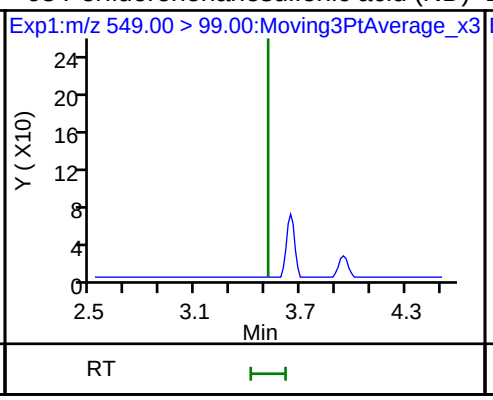
D 26 M2-8:2FTS



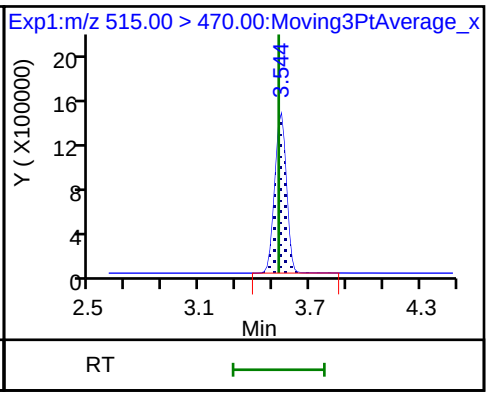
68 Perfluorononanesulfonic acid (ND)



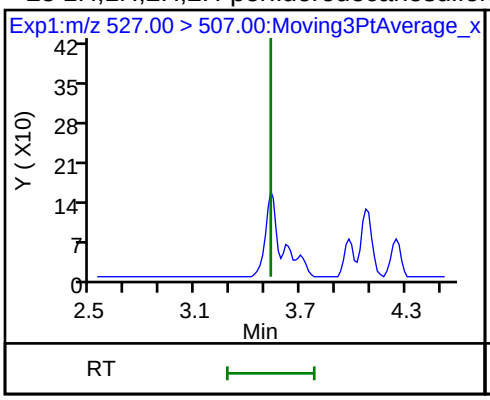
68 Perfluorononanesulfonic acid (ND)



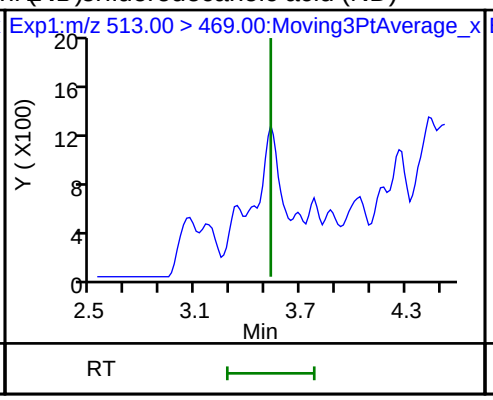
D 23 13C2 PFDA



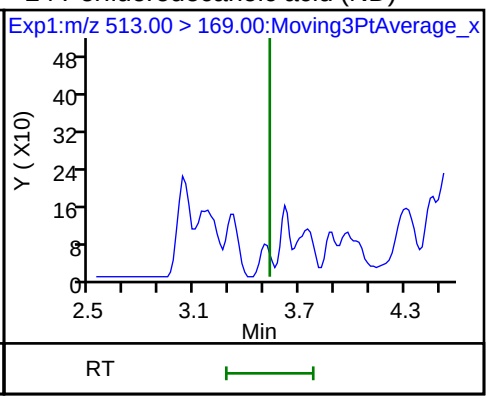
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



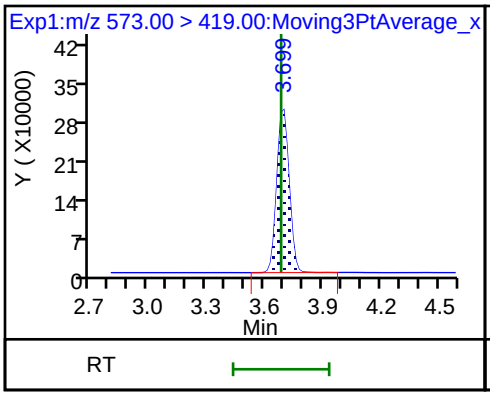
24 Perfluorodecanoic acid (ND)



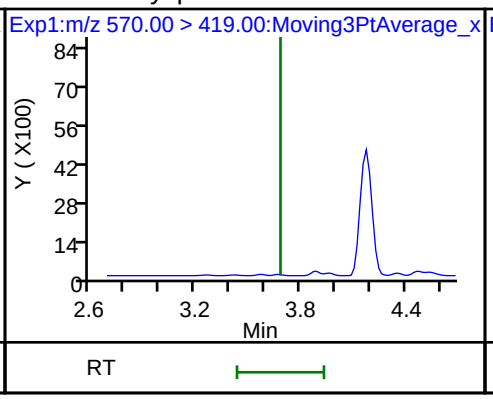
24 Perfluorodecanoic acid (ND)



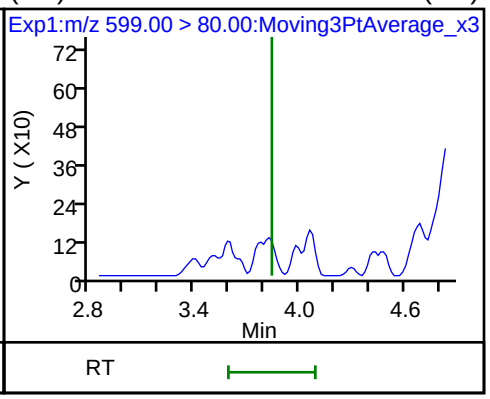
D 27 d3-NMeFOSAA



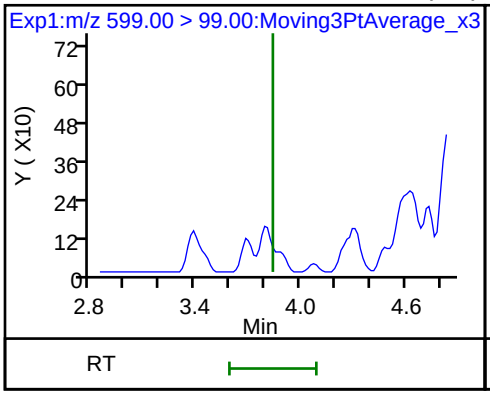
28 N-methyl perfluorooctane sulfonami (ND)



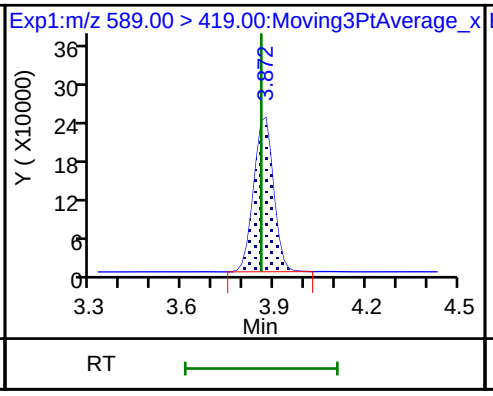
29 Perfluorodecane Sulfonic acid (ND)



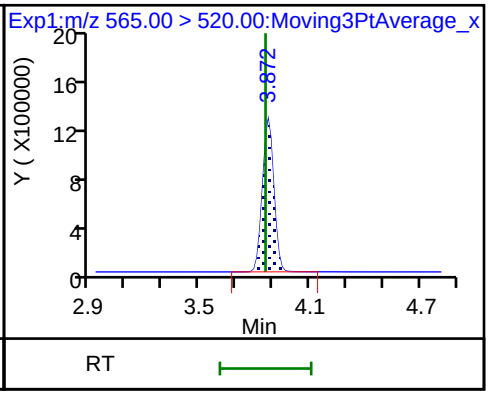
29 Perfluorodecane Sulfonic acid (ND)



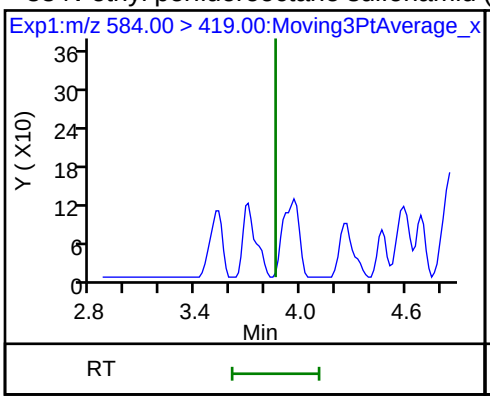
D 32 d5-NEtFOSAA



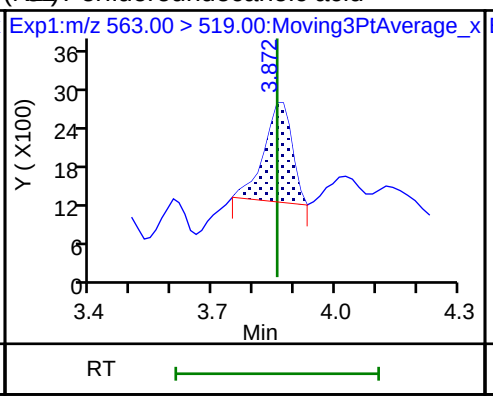
D 30 13C2 PFUnA



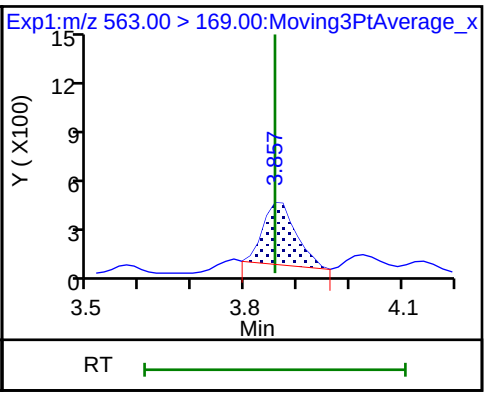
33 N-ethyl perfluorooctane sulfonamid (ND)



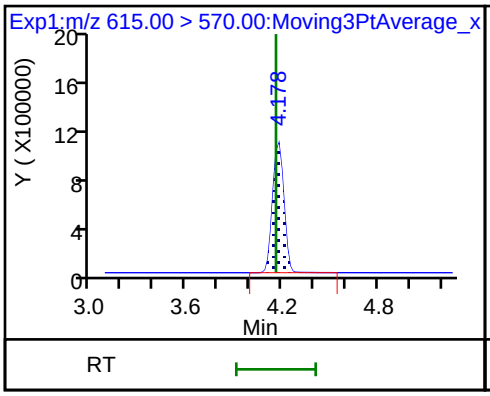
31 Perfluoroundecanoic acid



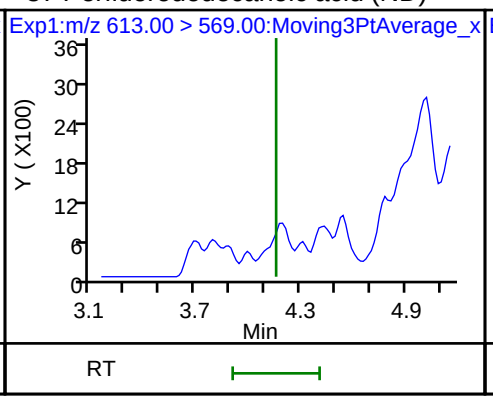
31 Perfluoroundecanoic acid



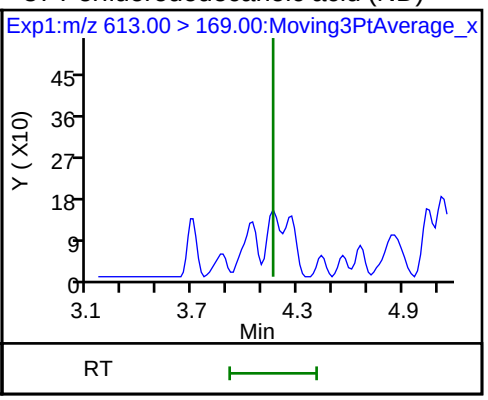
D 36 13C2 PFDoA



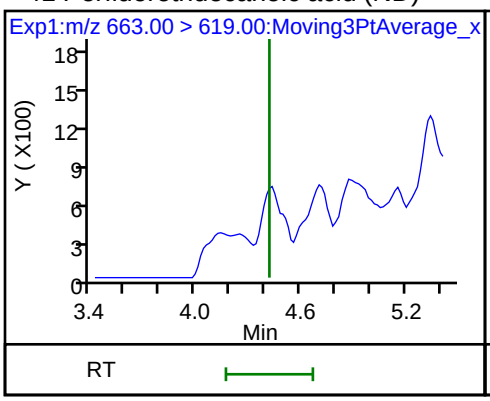
37 Perfluorododecanoic acid (ND)



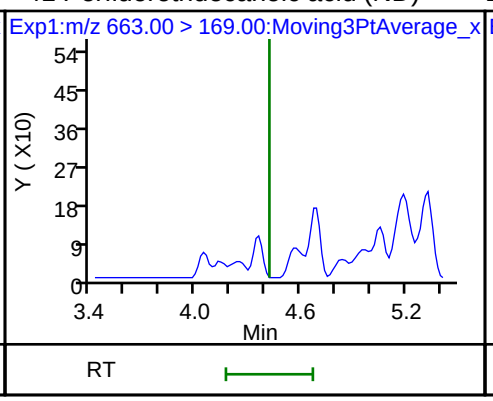
37 Perfluorododecanoic acid (ND)



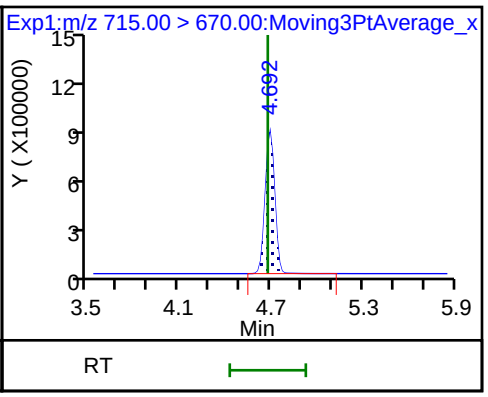
41 Perfluorotridecanoic acid (ND)



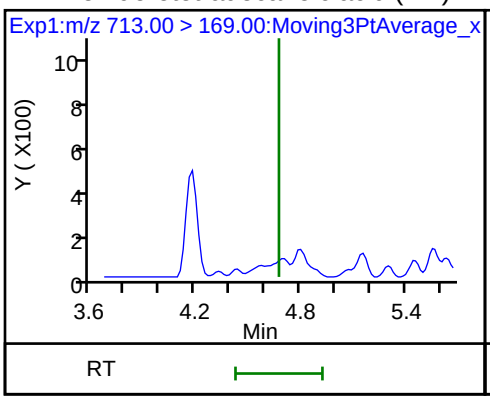
41 Perfluorotridecanoic acid (ND)



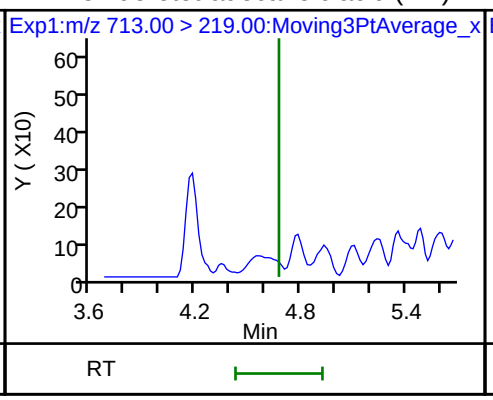
D 43 13C2-PFTeDA



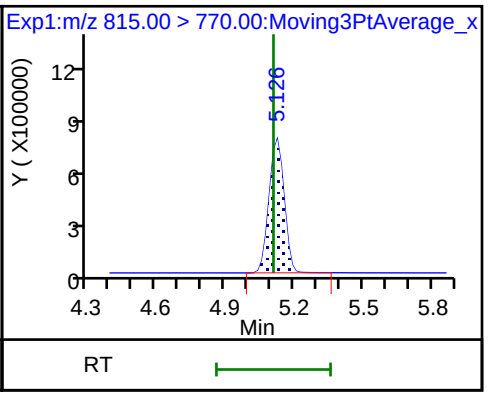
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

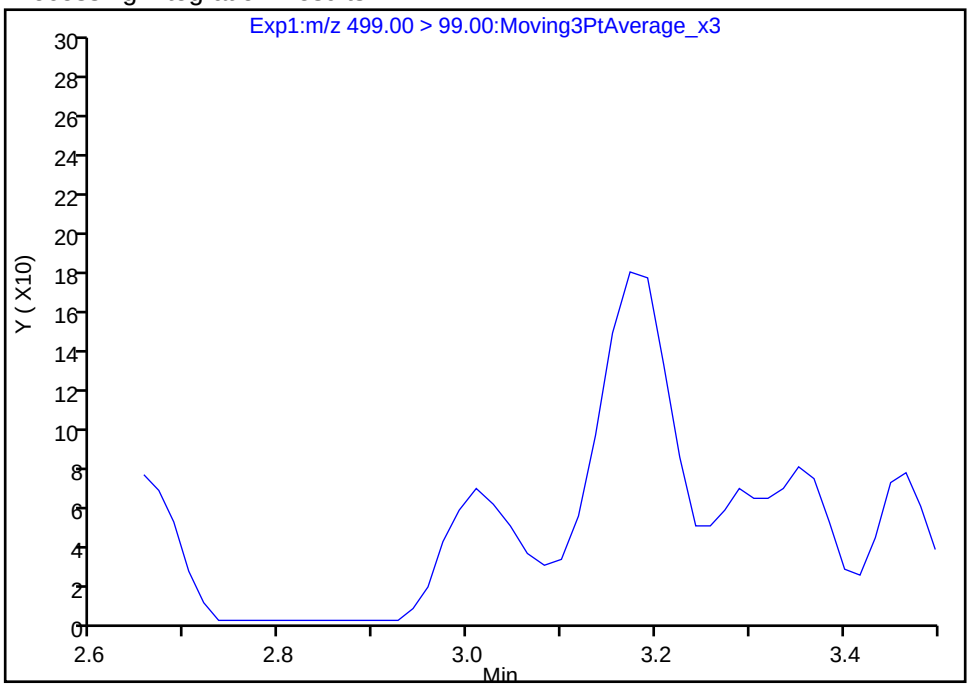
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_004.d				
Injection Date:	11-Aug-2018 20:22:02	Instrument ID:	A9		
Lims ID:	CCB				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	20	Worklist Smp#:	1
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

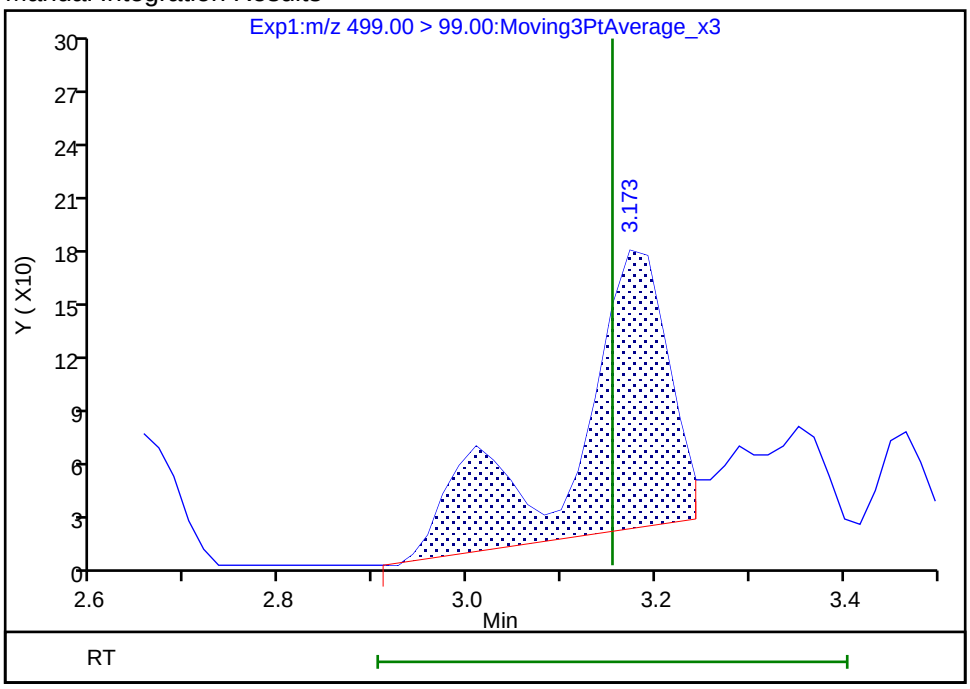
Processing Integration Results

RT: 3.10
Area: 0
Amount: 0.001601
Amount Units: ng/ml



Manual Integration Results

RT: 3.17
Area: 1101
Amount: 0.001601
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 09:21:00

Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-239460/1

Matrix: Water Lab File ID: 2018.08.12LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/12/2018 10:25

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.: 239460 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
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	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)	0.00620	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U M	0.050	0.040	0.014
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.40	U	0.50	0.40	0.078
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.40	U	0.50	0.40	0.048

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-239460/1

Matrix: Water Lab File ID: 2018.08.12LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/12/2018 10:25

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.: 239460 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	91		50-150
STL01892	13C4-PFHpA	95		50-150
STL00990	13C4 PFOA	103		50-150
STL00995	13C5 PFNA	105		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	100		50-150
STL00994	18O2 PFHxS	86		50-150
STL02116	13C2-PFTeDA	107		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	81		50-150
STL02117	d5-NEtFOSAA	118		50-150
STL02118	d3-NMeFOSAA	115		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 12-Aug-2018 10:25:47 ALS Bottle#: 20 Worklist Smp#: 1
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\20180812-62571.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:49:18 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: roycea Date: 12-Aug-2018 13:49:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.483	0.011	0.537	7475503	2.27		90.7	10357	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.747	0.025	0.637	6362010	2.16		86.4	6564	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.764	-0.009	0.991	9788	0.003770			0.6	
D 47 13C3-PFBS										
301.90 > 83.00	1.805	1.789	0.016	0.649	86158	1.89		81.2	485	
D 60 M2-4:2FTS										
329.00 > 81.00	2.027	1.997	0.030	0.729	516851	NC			544	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.038	0.020	0.740	6940371	2.27		90.8	10872	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.160	2.140	0.020	0.776	784851	NC			3266	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.374	0.026	0.862	8220876	2.37		94.7	9505	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.387	0.026	0.867	5341302	2.04		86.4	7344	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	17926	0.006204			27.8	
399.00 > 99.00	2.426	2.413	0.013	1.005	8875		2.02(1.90-5.70)		3.0	
D 12 M2-6:2FTS										
429.00 > 81.00	2.751	2.719	0.032	0.989	904155	2.68		113	1295	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.735	0.047	1.000	7498355	2.58		103	4538	
* 62 13C2-PFOA										
415.00 > 370.00	2.782	2.767	0.015		7376015	2.50			9244	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.782	2.767	0.015	1.000	24622	0.007493			3.6	
413.00 > 169.00	2.767	2.767	0.0	0.994	6464		3.81(1.36-4.08)		7.4	
D 18 13C4 PFOS										
503.00 > 80.00	3.154	3.118	0.036	1.134	5864782	2.16		90.2	4859	
D 19 13C5 PFNA										
468.00 > 423.00	3.173	3.118	0.055	1.140	6580628	2.64		105	5821	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.173	3.155	0.018	1.006	4456	0.001693			4.9	
499.00 > 99.00	3.154	3.155	-0.001	1.000	1441		3.09(2.04-6.12)		3.7	M
D 21 13C8 FOSA										
506.00 > 78.00	3.482	3.467	0.015	1.251	3691471	2.27		90.8	3513	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.482	3.467	0.015	1.000	1417	0.000312			2.3	
D 23 13C2 PFDA										
515.00 > 470.00	3.529	3.482	0.047	1.268	6380581	2.55		102	8536	
D 26 M2-8:2FTS										
529.00 > 81.00	3.514	3.482	0.032	1.263	99828	2.55		106	542	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.684	3.643	0.041	1.324	1400687	2.88		115	2354	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.856	3.810	0.046	1.386	1178883	2.95		118	1909	
D 30 13C2 PFUnA										
565.00 > 520.00	3.871	3.810	0.061	1.391	4894242	2.42		96.9	7718	
D 36 13C2 PFDoA										
615.00 > 570.00	4.159	4.109	0.050	1.495	5467792	2.51		100	6610	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.676	4.630	0.046	1.681	3729270	2.68		107	7380	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.109	5.042	0.067	1.836	3404651	2.67		107	4338	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.109	5.096	0.013	1.000	27084	NC			2.4	
813.00 > 169.00	5.109	5.096	0.013	1.000	4641		5.84(2.77-8.32)		14.8	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00008 Amount Added: 1.00 Units: mL

Report Date: 12-Aug-2018 13:49:21 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_004.d

Injection Date: 12-Aug-2018 10:25:47 Instrument ID: A9

Lims ID: CCB

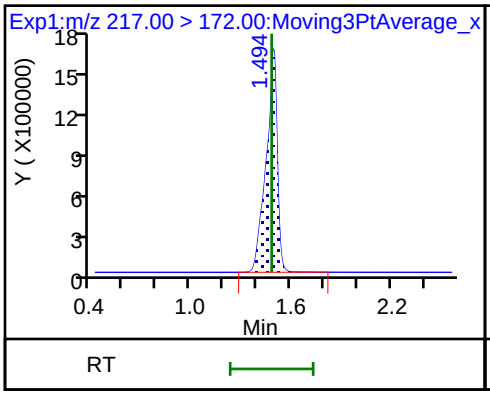
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 1

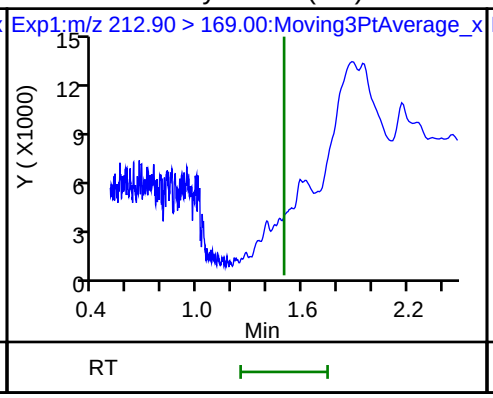
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

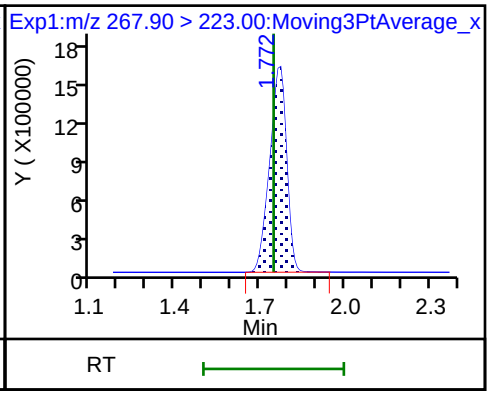
D 1 13C4 PFBA



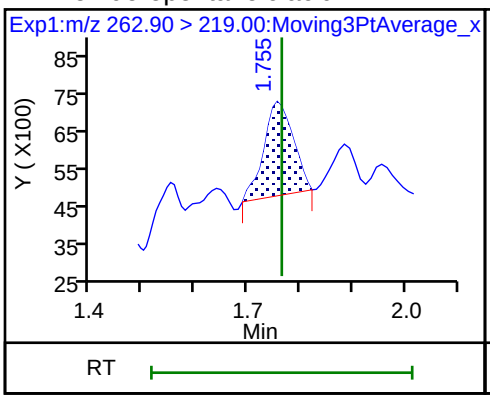
2 Perfluorobutyric acid (ND)



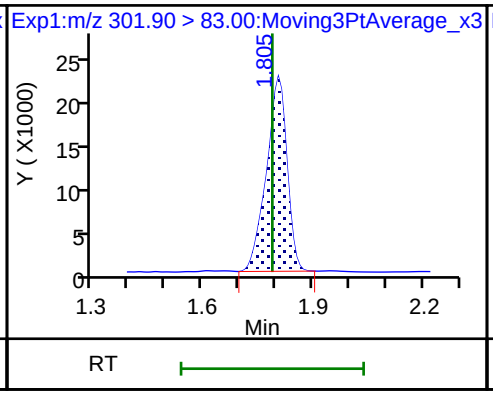
D 3 13C5-PFPeA



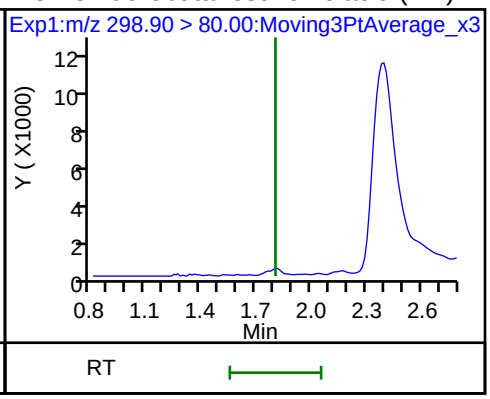
4 Perfluoropentanoic acid



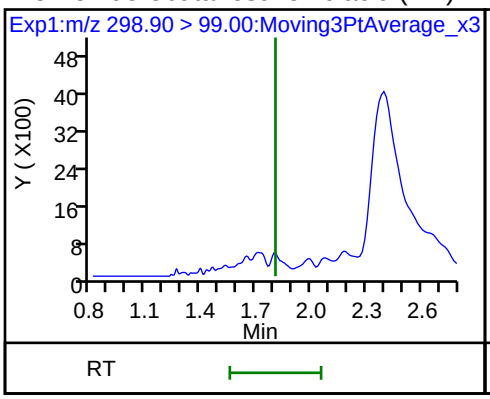
D 47 13C3-PFBS



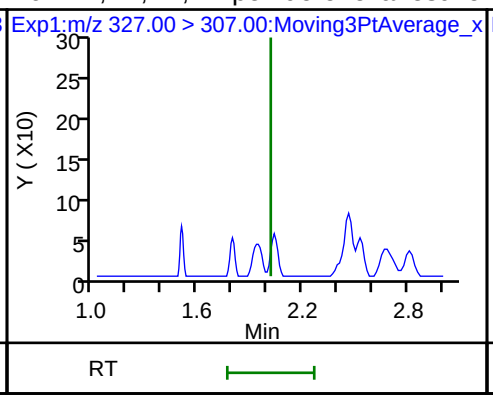
5 Perfluorobutanesulfonic acid (ND)



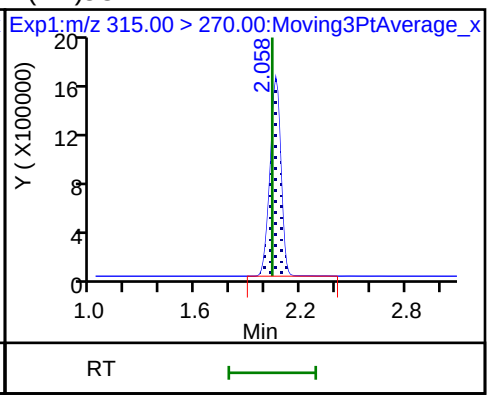
5 Perfluorobutanesulfonic acid (ND)



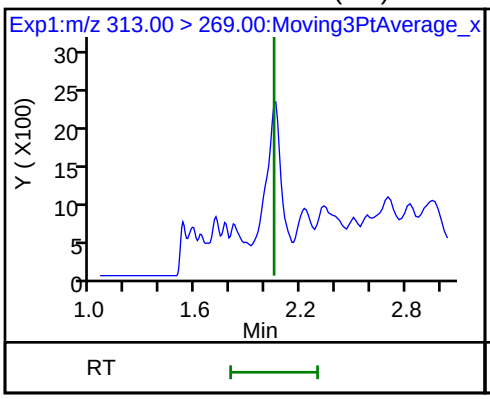
61 1H,1H,2H,2H-perfluorohexanesulfonic acid (ND)



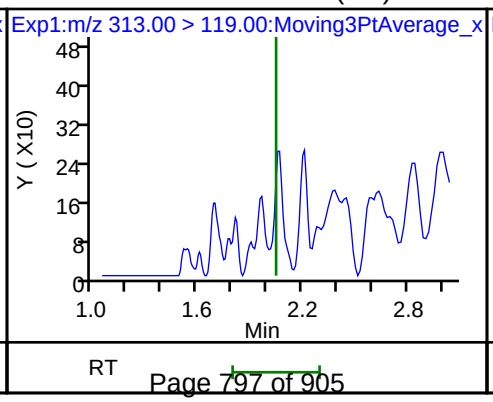
D 13C2 PFHxA



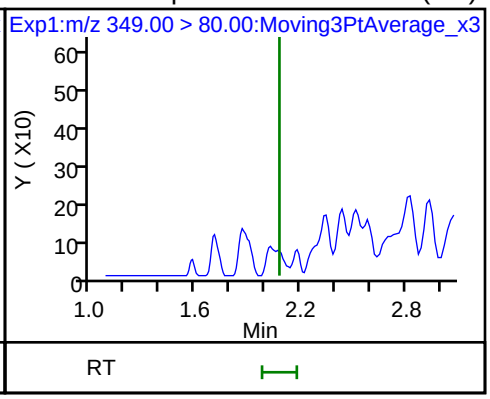
6 Perfluorohexanoic acid (ND)



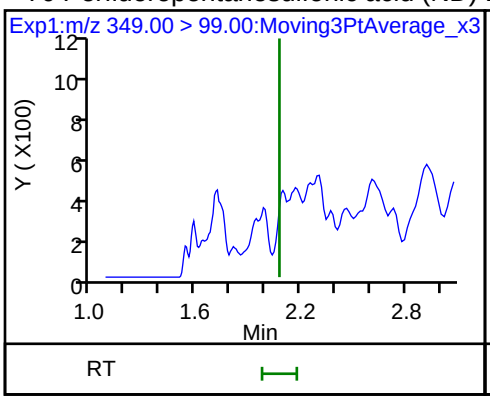
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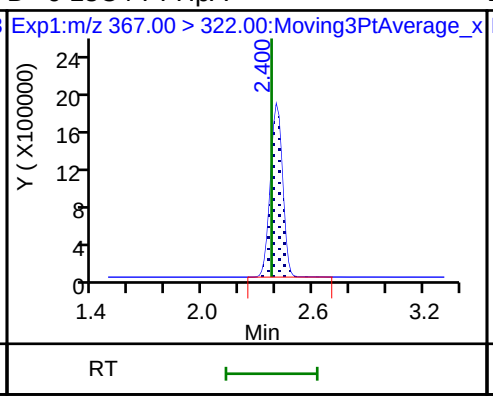
70 Perfluoropentanesulfonic acid (ND)



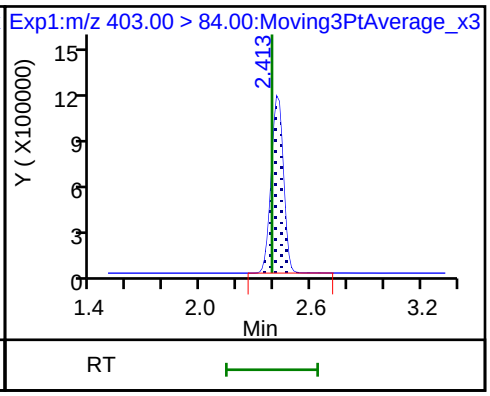
70 Perfluoropentanesulfonic acid (ND)



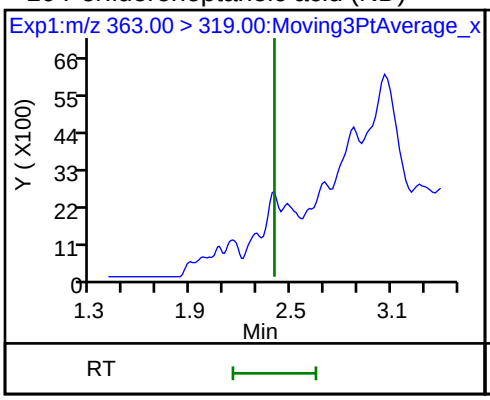
D 9 13C4-PFHpA



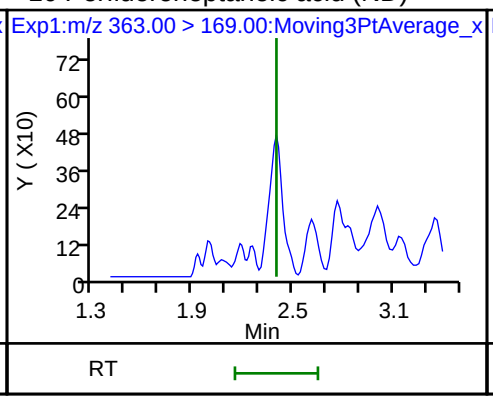
D 11 18O2 PFHxS



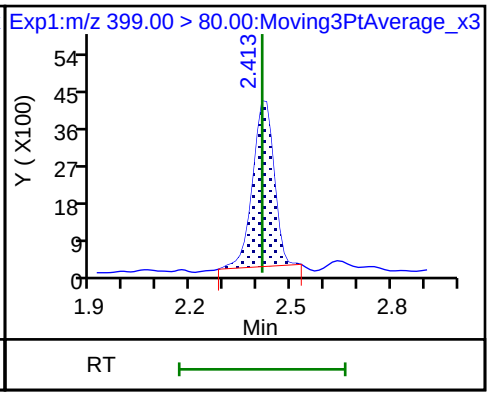
10 Perfluoroheptanoic acid (ND)



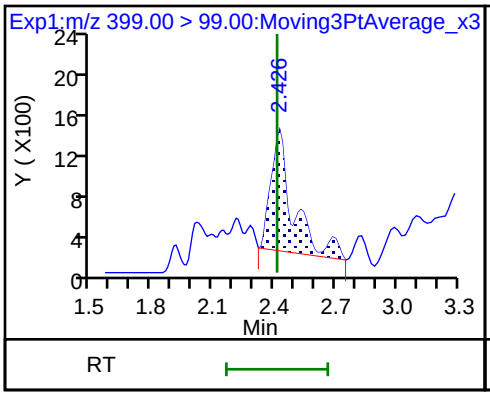
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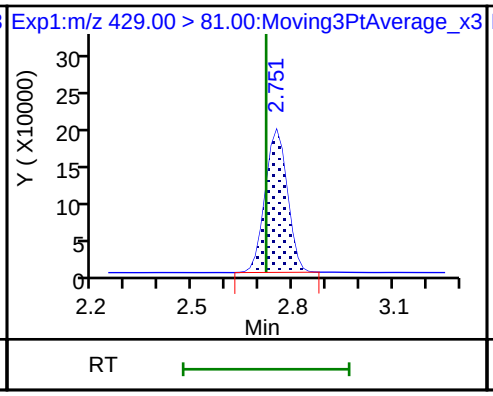
8 Perfluorohexanesulfonic acid



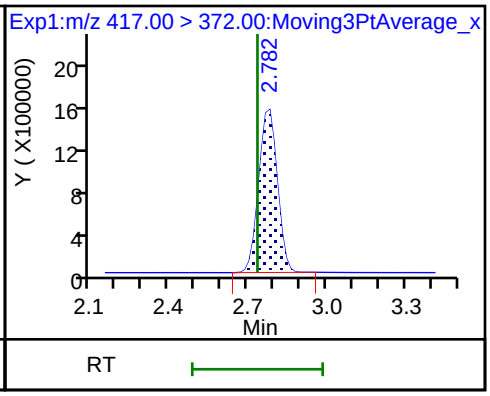
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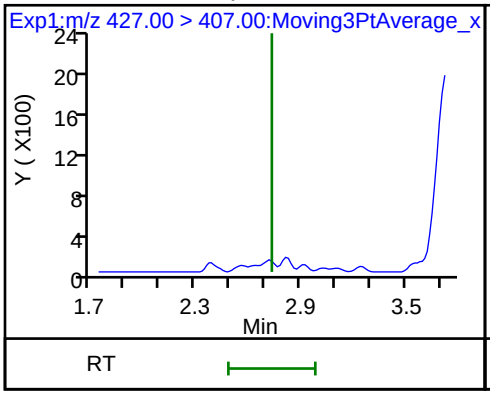
D 12 M2-6:2FTS



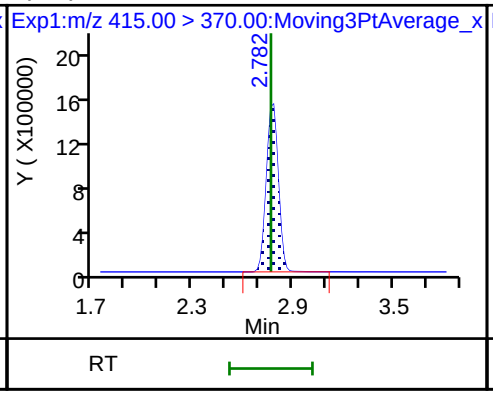
D 14 13C4 PFOA



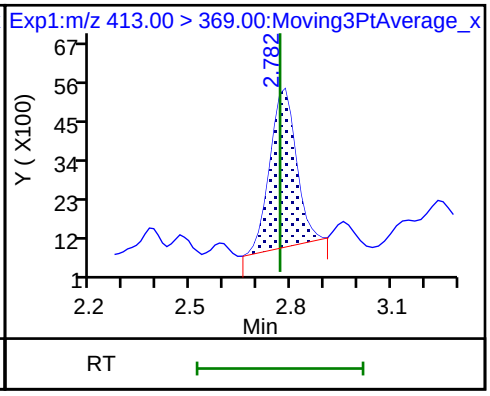
13 1H,1H,2H,2H-perfluorooctanesulfonic acid (ND)



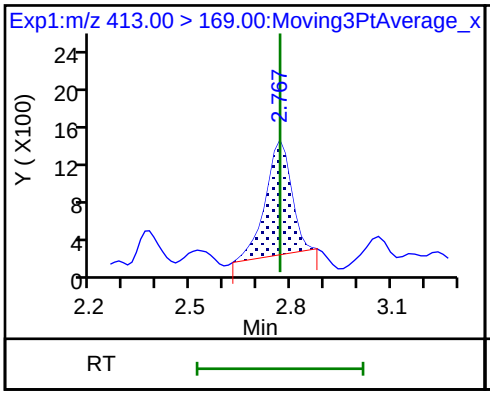
D 13C2-PFOA



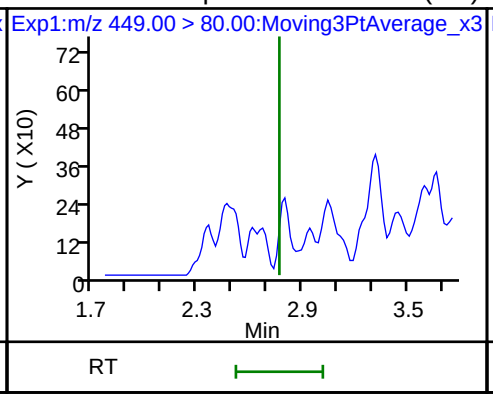
15 Perfluorooctanoic acid



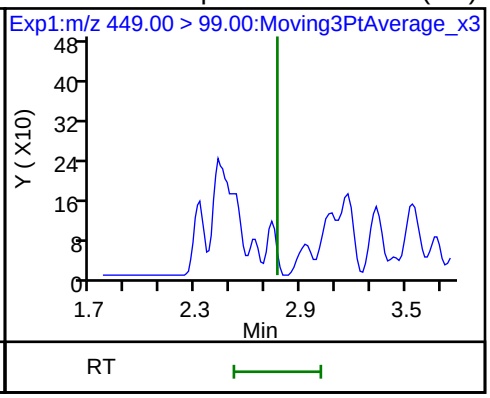
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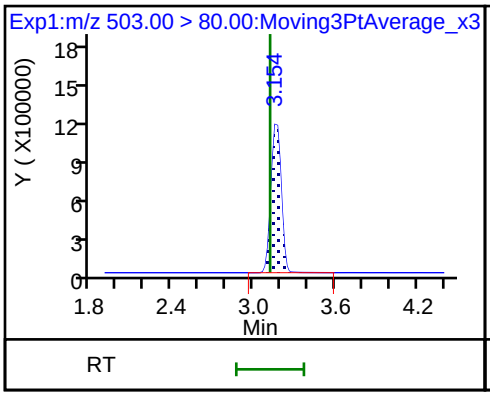
16 Perfluoroheptanesulfonic acid (ND)



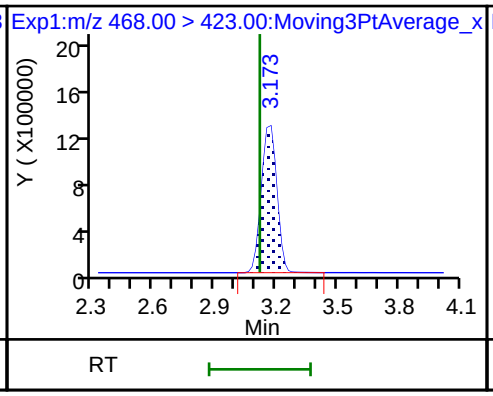
16 Perfluoroheptanesulfonic acid (ND)



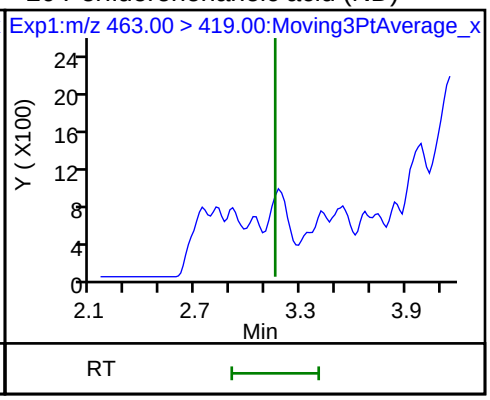
D 18 13C4 PFOS



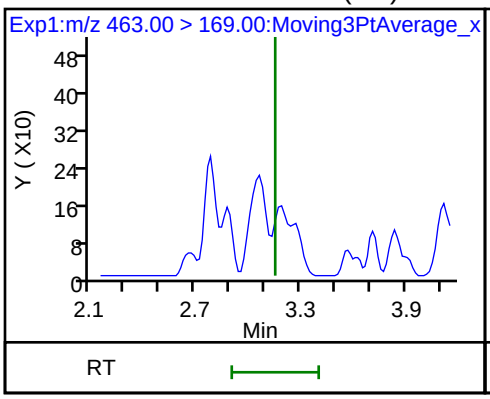
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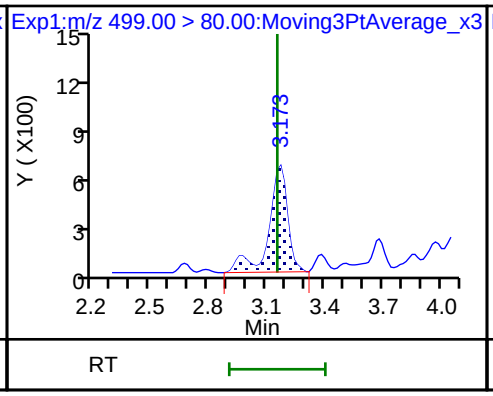
20 Perfluorononanoic acid (ND)



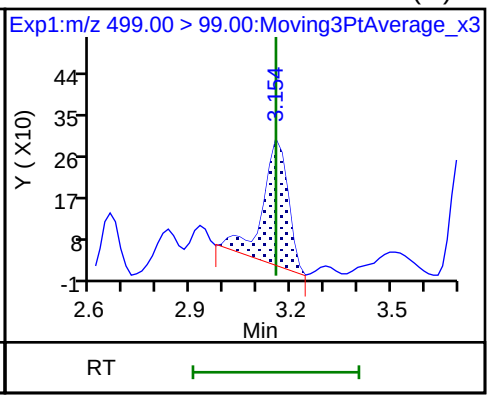
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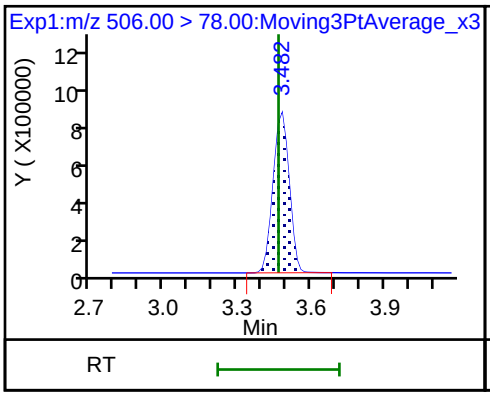
17 Perfluorooctane sulfonic acid



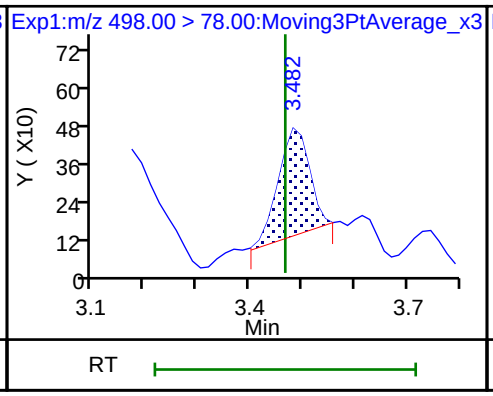
17 Perfluorooctane sulfonic acid (M)



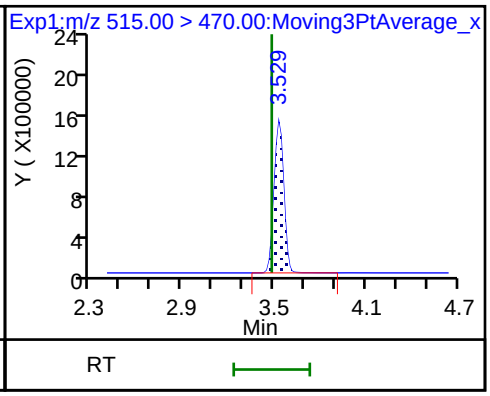
D 21 13C8 FOSA



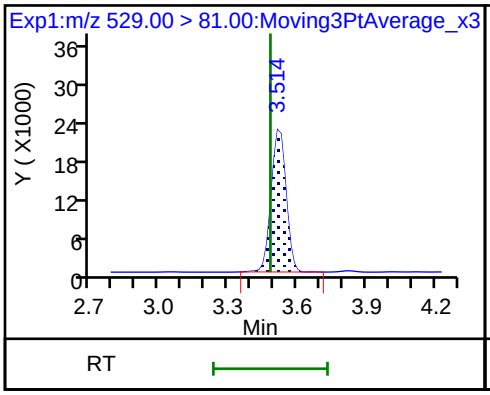
22 Perfluorooctane Sulfonamide



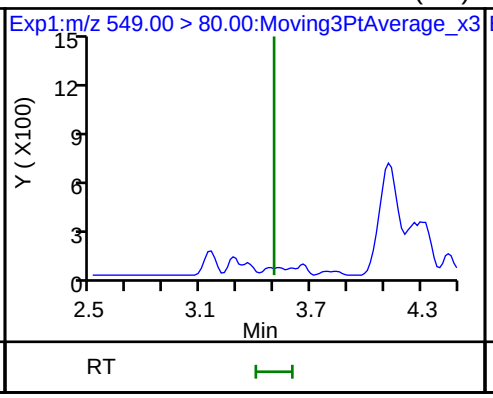
D 23 13C2 PFDA



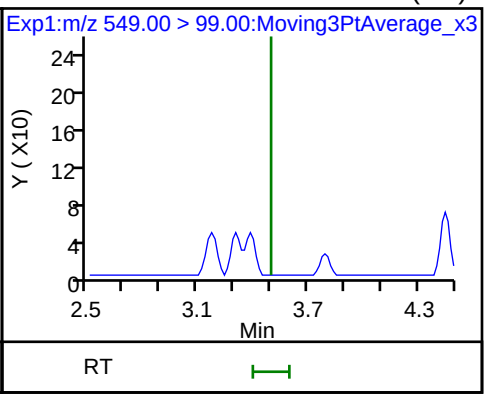
D 26 M2-8:2FTS



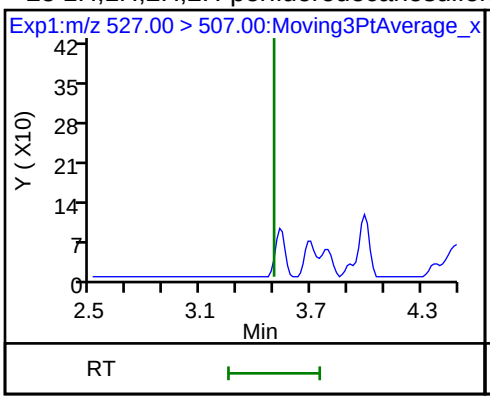
68 Perfluorononanesulfonic acid (ND)



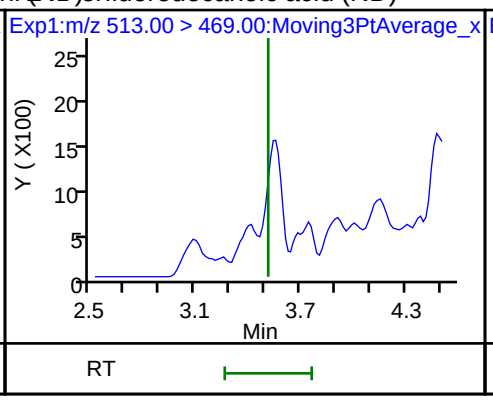
68 Perfluorononanesulfonic acid (ND)



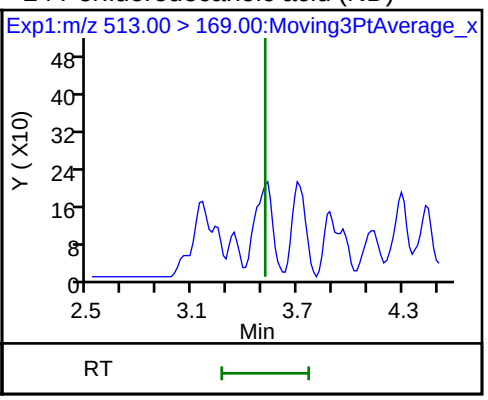
25 1H,1H,2H,2H-perfluorodecanesulfoni



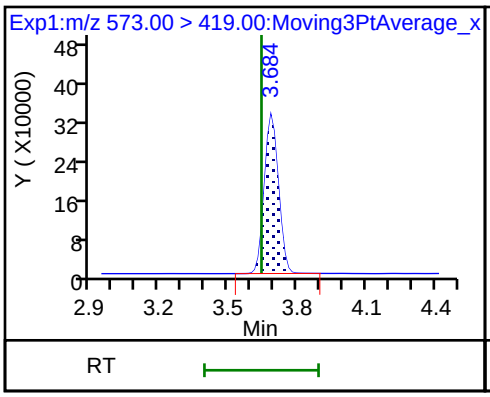
24 Perfluorodecanoic acid (ND)



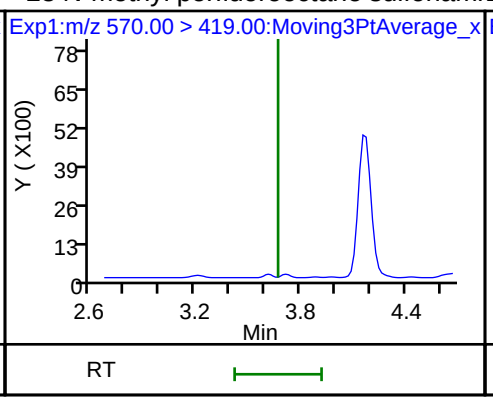
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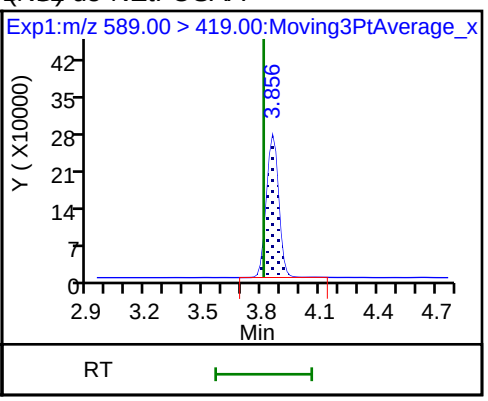
D 27 d3-NMeFOSAA



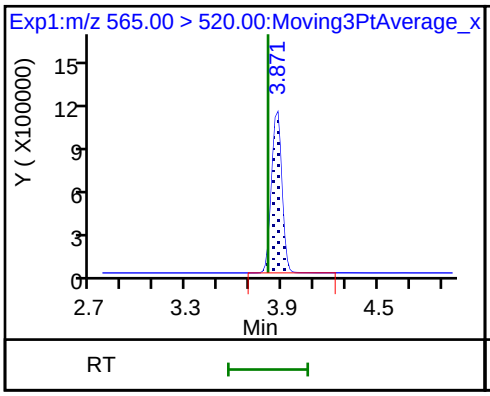
28 N-methyl perfluorooctane sulfonamid



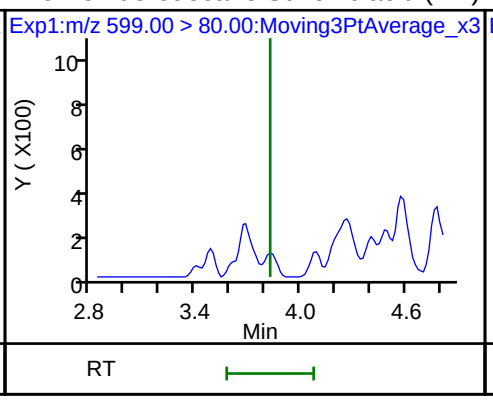
D 32 d5-NEtFOSAA



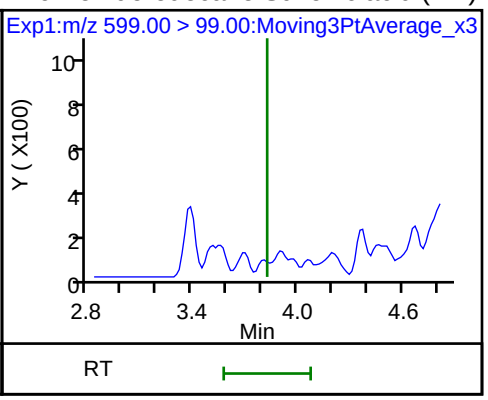
D 30 13C2 PFUnA



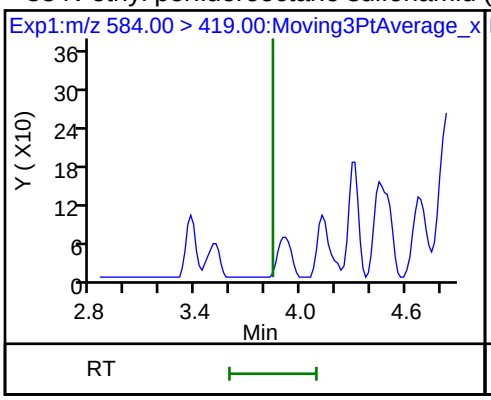
29 Perfluorodecane Sulfonic acid (ND)



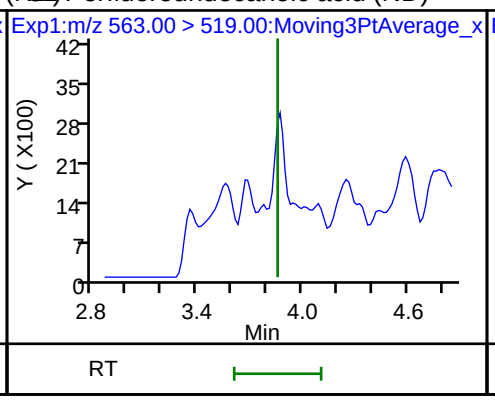
29 Perfluorodecane Sulfonic acid (ND)



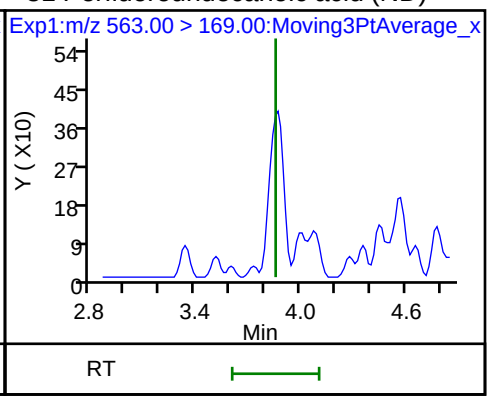
33 N-ethyl perfluorooctane sulfonamid (ND)



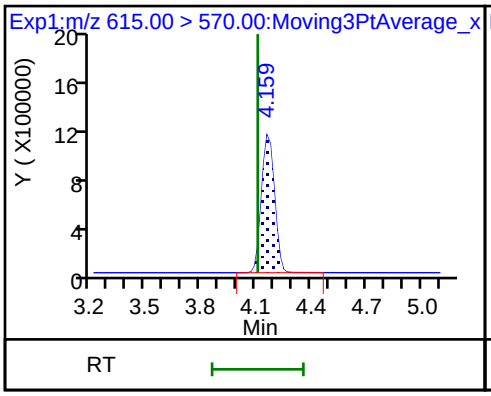
31 Perfluoroundecanoic acid (ND)



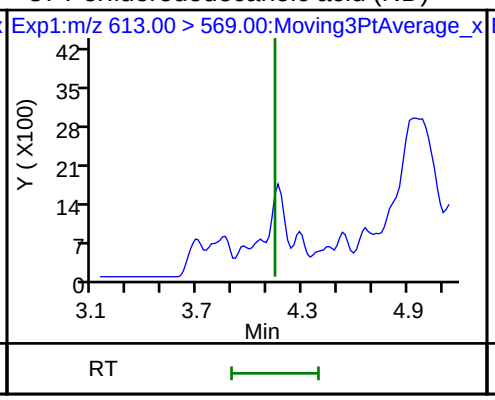
31 Perfluoroundecanoic acid (ND)



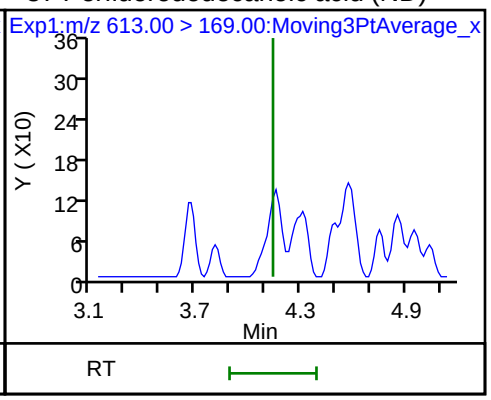
D 36 13C2 PFDoA



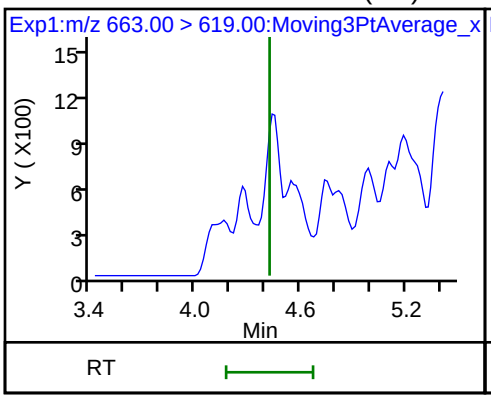
37 Perfluorododecanoic acid (ND)



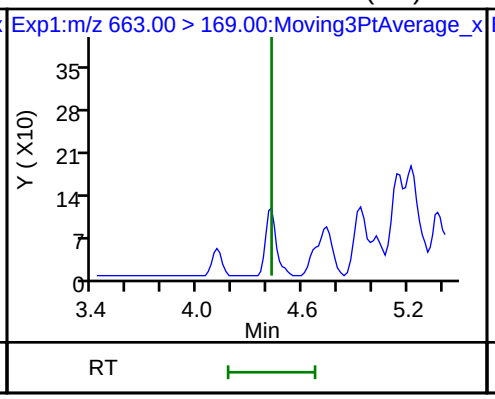
37 Perfluorododecanoic acid (ND)



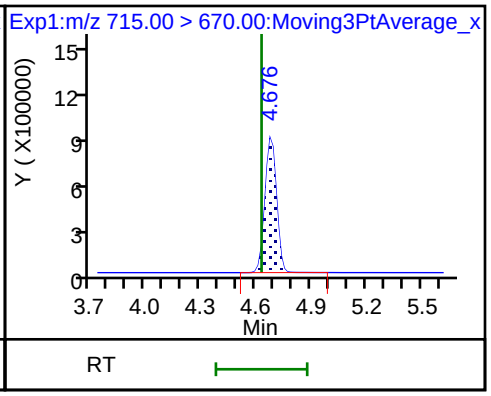
41 Perfluorotridecanoic acid (ND)



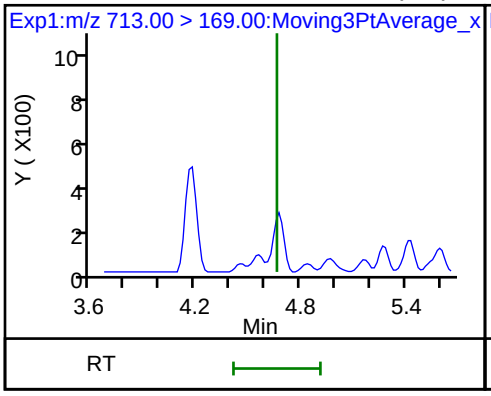
41 Perfluorotridecanoic acid (ND)



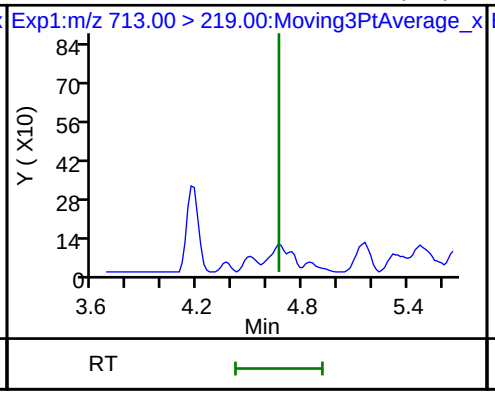
D 43 13C2-PFTeDA



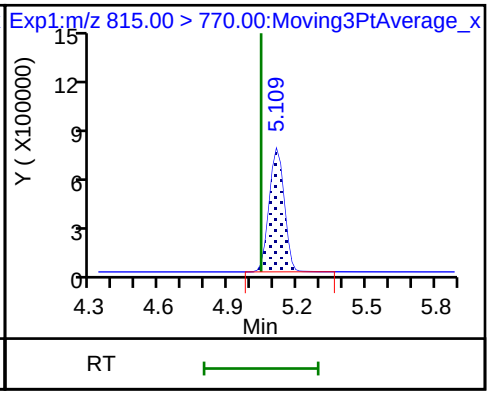
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

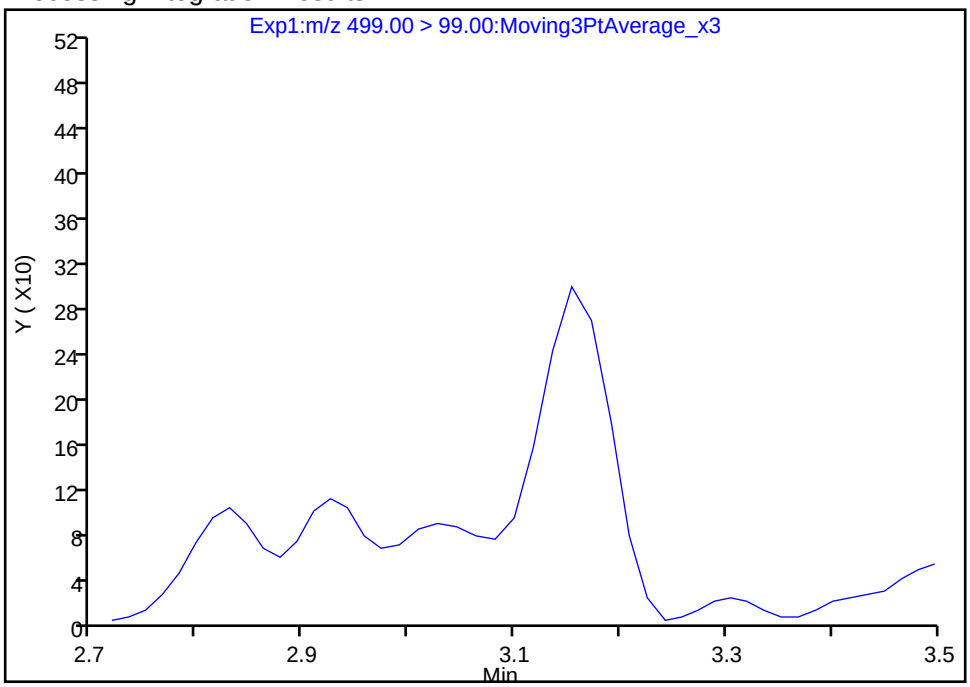
Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_004.d
Injection Date: 12-Aug-2018 10:25:47 Instrument ID: A9
Lims ID: CCB
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

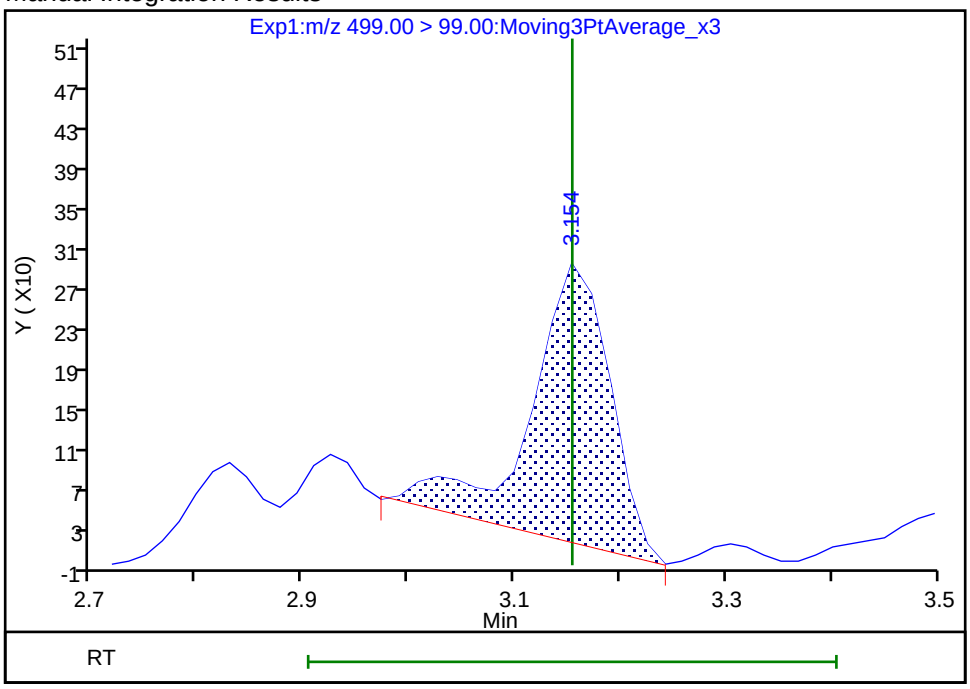
Processing Integration Results

RT: 3.12
Area: 0
Amount: 0.001693
Amount Units: ng/ml



Manual Integration Results

RT: 3.15
Area: 1441
Amount: 0.001693
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:49:08
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-239481/1

Matrix: Water Lab File ID: 2018.08.13LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/13/2018 08:06

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.: 239481 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
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)	0.00668	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U M	0.050	0.040	0.014
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.40	U M	0.50	0.40	0.078
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.40	U	0.50	0.40	0.048

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-239481/1

Matrix: Water Lab File ID: 2018.08.13LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/13/2018 08:06

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.: 239481 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	96		50-150
STL00995	13C5 PFNA	105		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	95		50-150
STL00998	13C2 PFDoA	92		50-150
STL00994	18O2 PFHxS	84		50-150
STL02116	13C2-PFTeDA	100		50-150
STL00991	13C4 PFOS	84		50-150
STL02337	13C3-PFBS	78		50-150
STL02117	d5-NEtFOSAA	111		50-150
STL02118	d3-NMeFOSAA	110		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62576.b\2018.08.13LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 13-Aug-2018 08:06:20 ALS Bottle#: 20 Worklist Smp#: 1
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\20180813-62576.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 13-Aug-2018 09:00:40 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 13-Aug-2018 08:56:40

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	1.488	1.494	-0.006	0.535	7542362	2.16		86.5	10989	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.772	-0.008	0.634	6337214	2.03		81.3	7107	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.772	0.0	1.005	7848	0.003035			0.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.805	-0.008	0.646	87318	1.81		77.7	395	
D 60 M2-4:2FTS										
329.00 > 81.00	2.017	2.027	-0.010	0.725	434401	NC			516	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.058	0.0	0.740	6990849	2.16		86.4	7723	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.058	2.058	0.0	1.000	6379	0.002439			1.4	
313.00 > 119.00	2.037	2.058	-0.021	0.990	616		10.36(6.96-20.87)		1.2	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.160	2.160	0.0	0.776	904826	NC			3329	
D 9 13C4-PFHpA										
367.00 > 322.00	2.399	2.400	-0.001	0.862	8179946	2.22		89.0	8660	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.413	0.0	0.867	5471139	1.98		83.6	16535	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.413	2.413	0.0	1.000	19770	0.006680			27.0	
399.00 > 99.00	2.413	2.413	0.0	1.000	6043		3.27(1.90-5.70)		2.5	
D 12 M2-6:2FTS										
429.00 > 81.00	2.750	2.751	-0.001	0.989	936378	2.62		110	1500	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.782	0.0	1.000	7376788	2.39		95.7	11631	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
* 62 13C2-PFOA										
415.00 > 370.00	2.782	2.782	0.0		7810032	2.50			6762	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.782	2.782	0.0	1.000	25478	0.007881			3.3	
413.00 > 169.00	2.782	2.782	0.0	1.000	9248		2.75(1.36-4.08)		9.8	
D 18 13C4 PFOS										
503.00 > 80.00	3.172	3.154	0.018	1.140	5778371	2.01		83.9	4279	
D 19 13C5 PFNA										
468.00 > 423.00	3.172	3.173	-0.001	1.140	6917782	2.62		105	7469	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.153	3.173	-0.020	0.994	6115	0.002358			3.1	
499.00 > 99.00	3.172	3.173	-0.001	1.000	1287		4.75(2.04-6.12)		2.7	M
D 21 13C8 FOSA										
506.00 > 78.00	3.465	3.467	-0.002	1.245	3708228	2.15		86.1	4607	
D 26 M2-8:2FTS										
529.00 > 81.00	3.528	3.529	-0.001	1.268	102005	2.46		103	395	
D 23 13C2 PFDA										
515.00 > 470.00	3.542	3.529	0.013	1.273	6761473	2.55		102	8884	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.542	3.529	0.013	1.000	6124	0.001842			1.6	
513.00 > 169.00	3.542	3.529	0.013	1.000	677		9.05(7.12-21.35)		2.4	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.697	3.684	0.013	1.329	1409972	2.74		110	2860	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.870	3.856	0.014	1.391	1169649	2.77		111	1518	
D 30 13C2 PFUnA										
565.00 > 520.00	3.870	3.871	-0.001	1.391	5058526	2.36		94.6	9849	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.870	3.871	-0.001	1.000	10480	0.006151			1.8	R
563.00 > 169.00	3.855	3.871	-0.016	0.996	2239		4.68(5.24-15.72)		8.8	
D 36 13C2 PFDoA										
615.00 > 570.00	4.177	4.178	-0.001	1.501	5287854	2.29		91.7	5430	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.691	4.692	-0.001	1.686	3683963	2.50		100	11154	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.125	5.126	-0.001	1.842	3320501	2.46		98.3	5292	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.125	5.126	-0.001	1.000	28564	NC			2.3	
813.00 > 169.00	5.125	5.126	-0.001	1.000	4840		5.90(2.77-8.32)		17.0	

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: 13-Aug-2018 09:00:54 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180813-62576.b\2018.08.13LLA_004.d

Injection Date: 13-Aug-2018 08:06:20 Instrument ID: A9

Lims ID: CCB

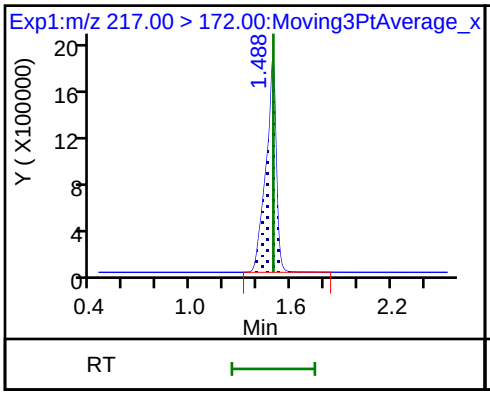
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 1

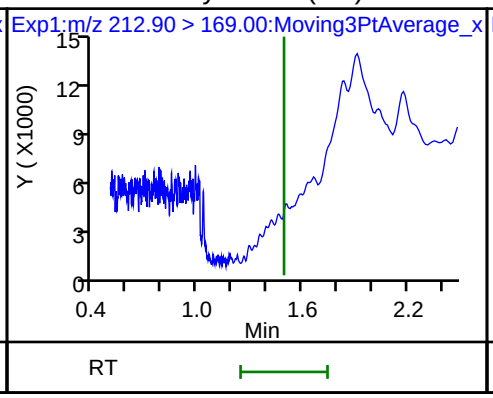
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

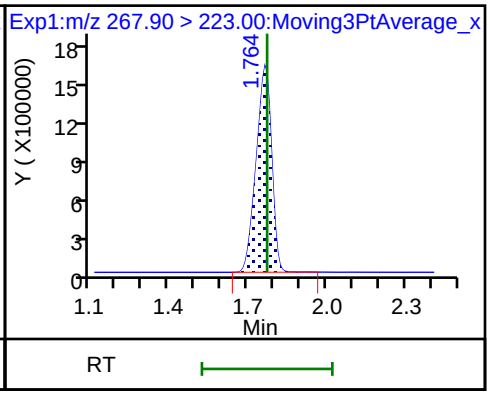
D 1 13C4 PFBA



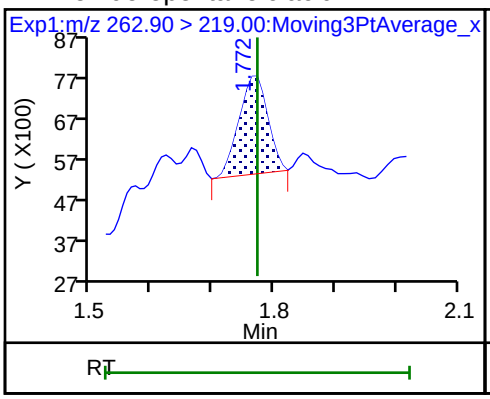
2 Perfluorobutyric acid (ND)



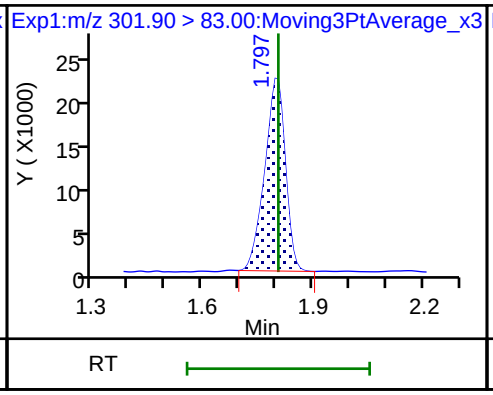
D 3 13C5-PFPeA



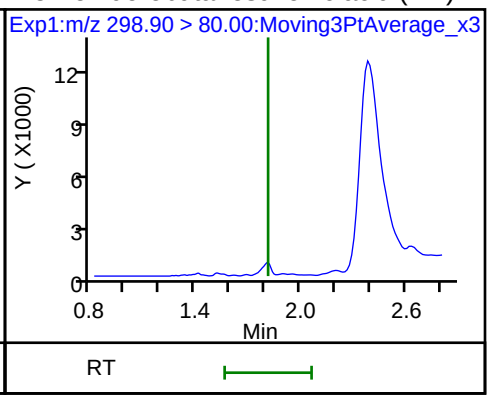
4 Perfluoropentanoic acid



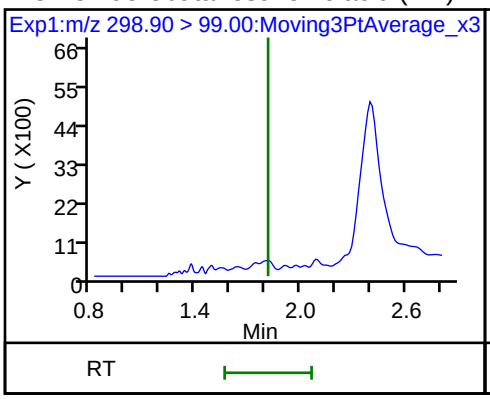
D 47 13C3-PFBS



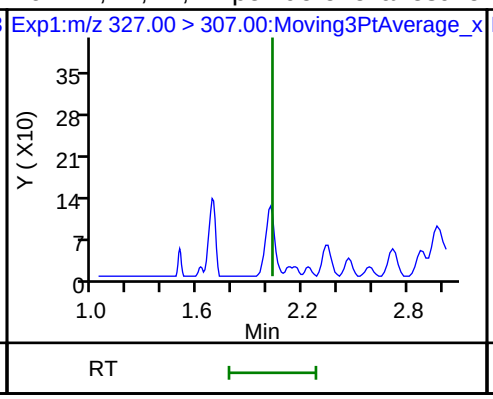
5 Perfluorobutanesulfonic acid (ND)



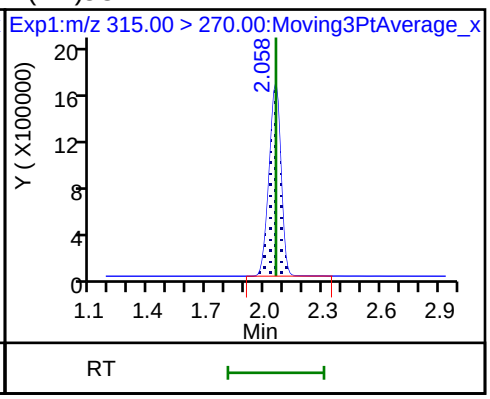
5 Perfluorobutanesulfonic acid (ND)



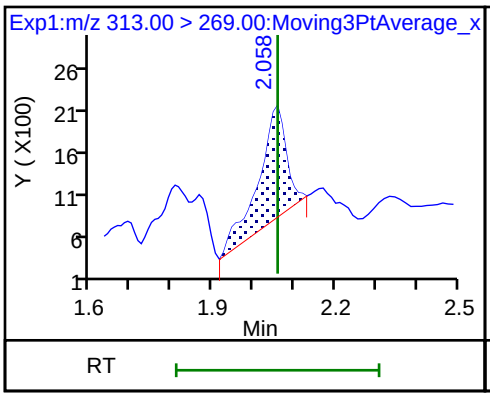
61 1H,1H,2H,2H-perfluorohexanesulfonic (NT)



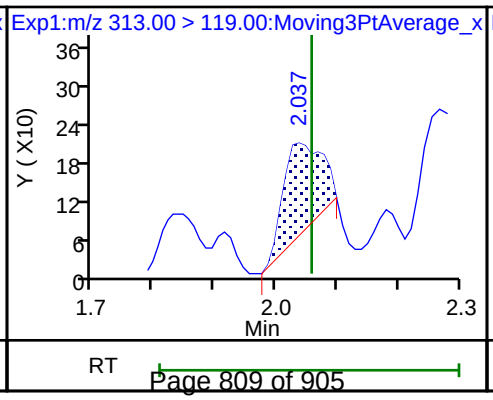
D 13C2 PFHxA



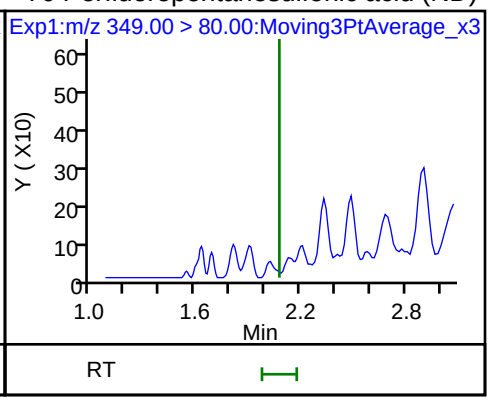
6 Perfluorohexanoic acid



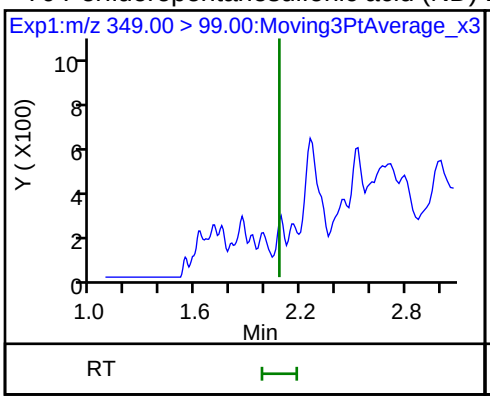
6 Perfluorohexanoic acid



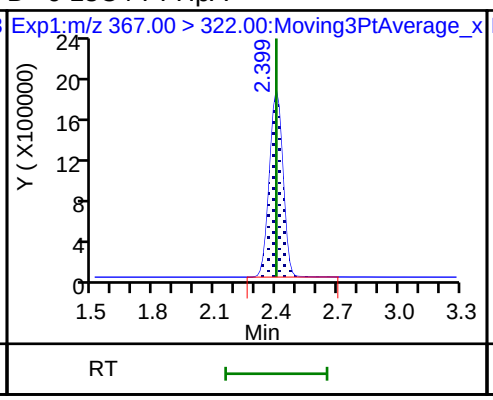
70 Perfluoropentanesulfonic acid (ND)



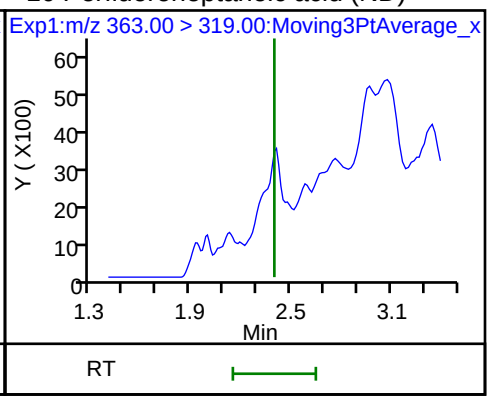
70 Perfluoropentanesulfonic acid (ND)



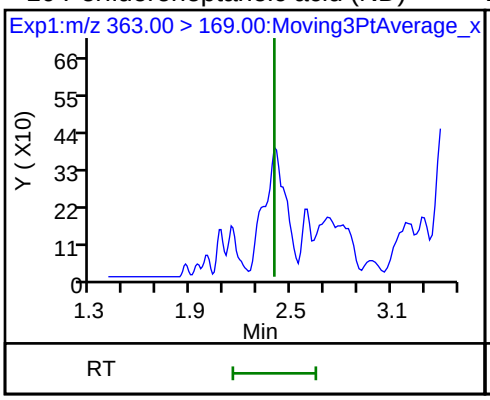
D 9 13C4-PFHpA



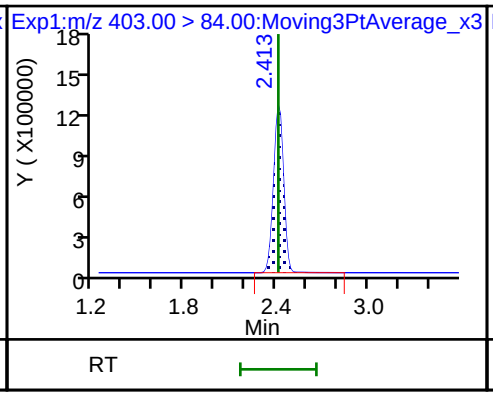
10 Perfluoroheptanoic acid (ND)



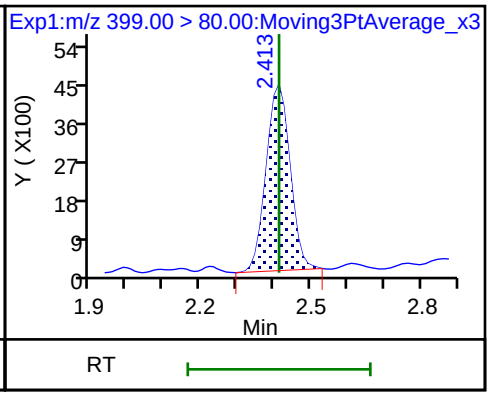
10 Perfluoroheptanoic acid (ND)



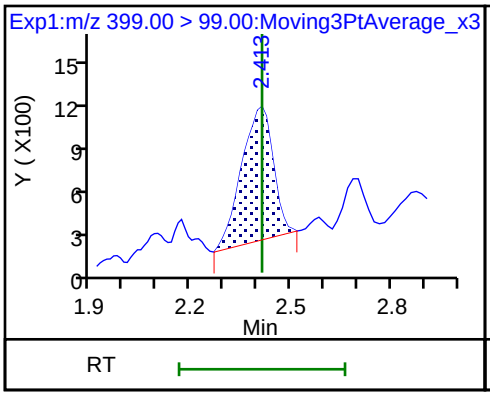
D 11 18O2 PFHxS



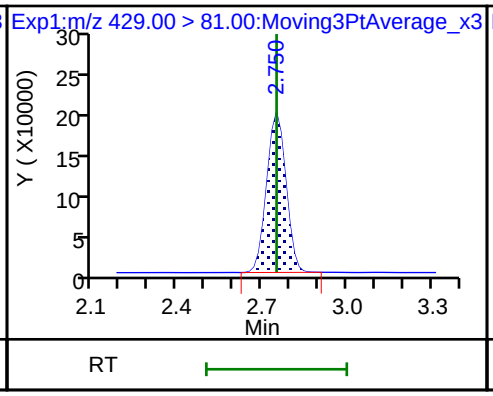
8 Perfluorohexanesulfonic acid



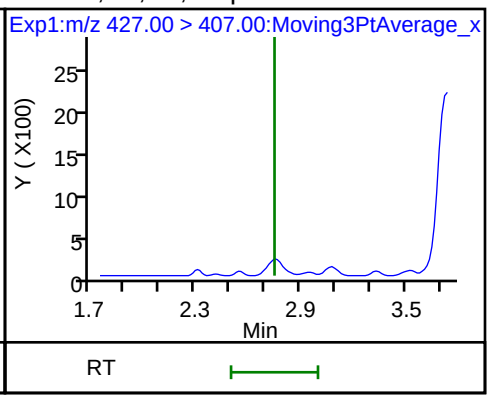
8 Perfluorohexanesulfonic acid



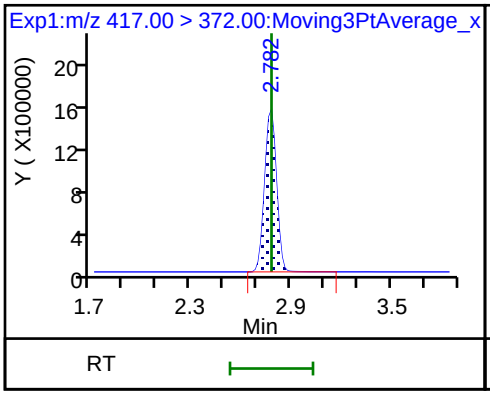
D 12 M2-6:2FTS



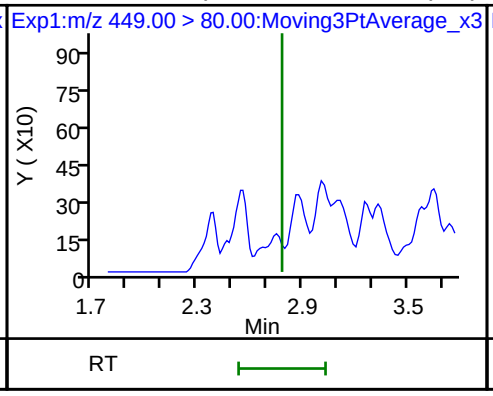
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



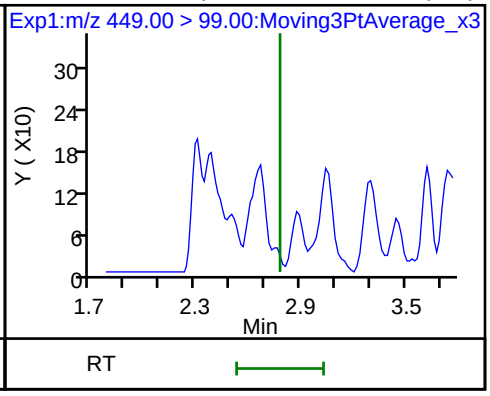
D 14 13C4 PFOA



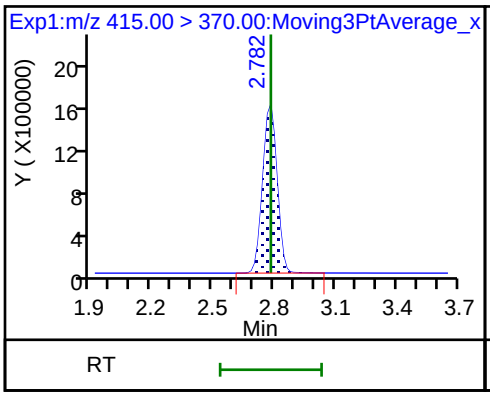
16 Perfluoroheptanesulfonic acid (ND)



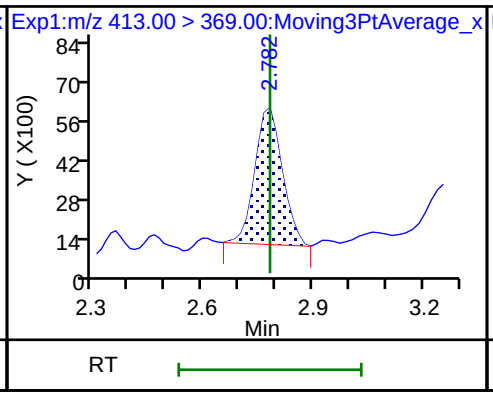
16 Perfluoroheptanesulfonic acid (ND)



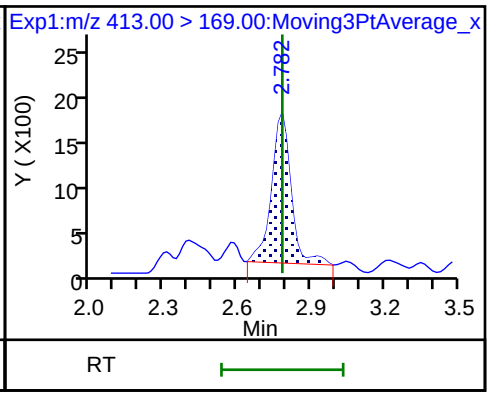
* 62 13C2-PFOA



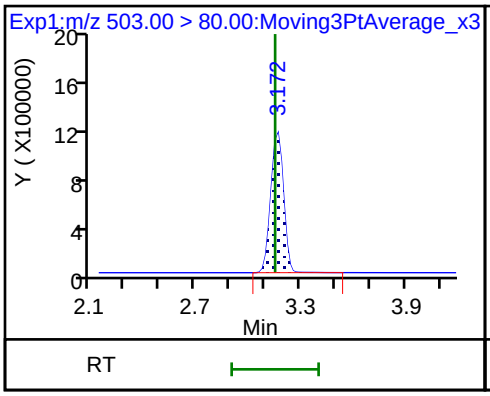
15 Perfluorooctanoic acid



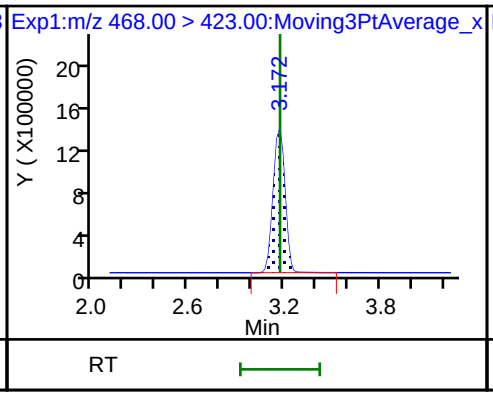
15 Perfluorooctanoic acid



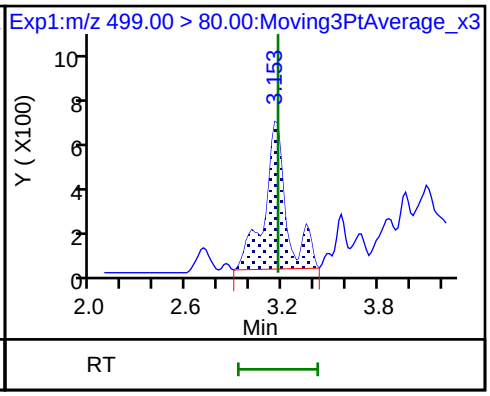
D 18 13C4 PFOS



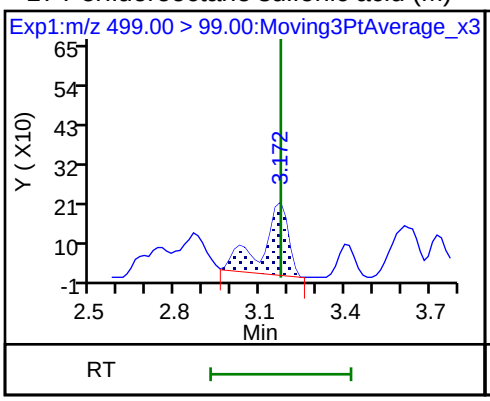
D 19 13C5 PFNA



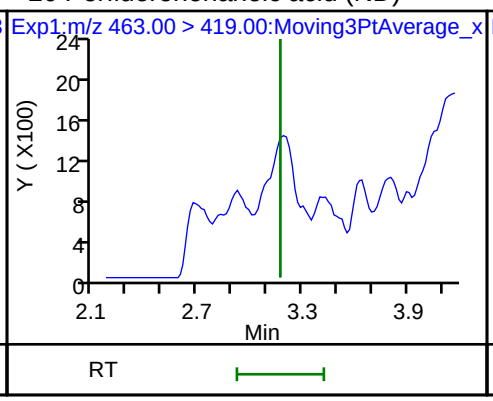
17 Perfluorooctane sulfonic acid



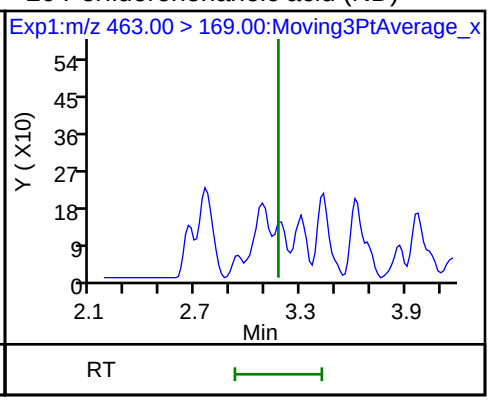
17 Perfluorooctane sulfonic acid (M)



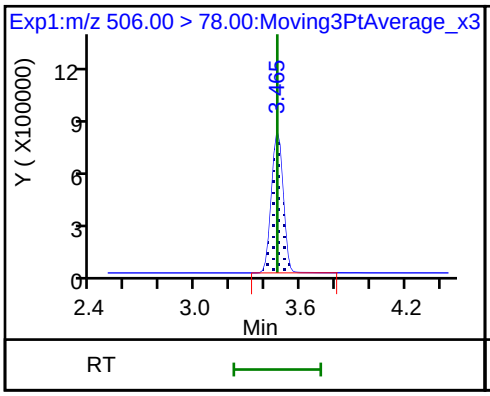
20 Perfluorononanoic acid (ND)



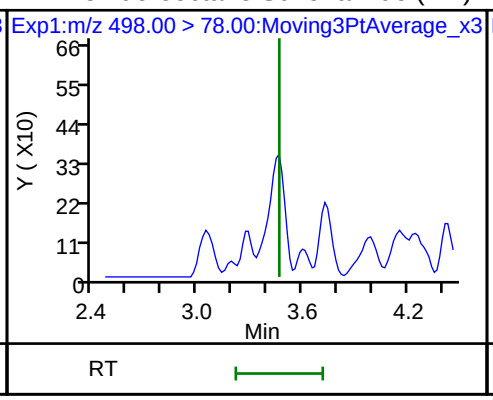
20 Perfluorononanoic acid (ND)



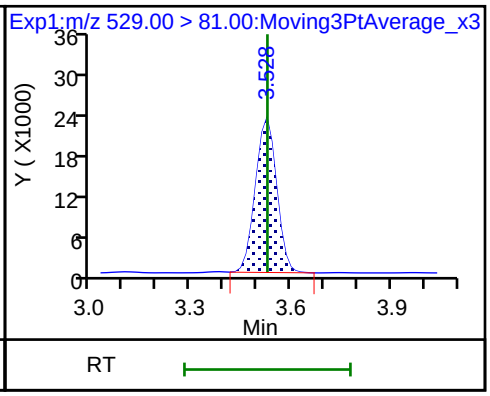
D 21 13C8 FOSA



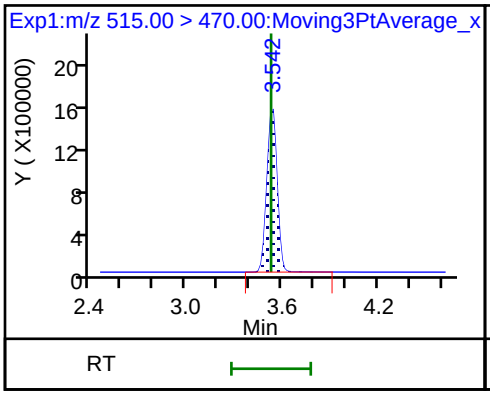
22 Perfluorooctane Sulfonamide (ND)



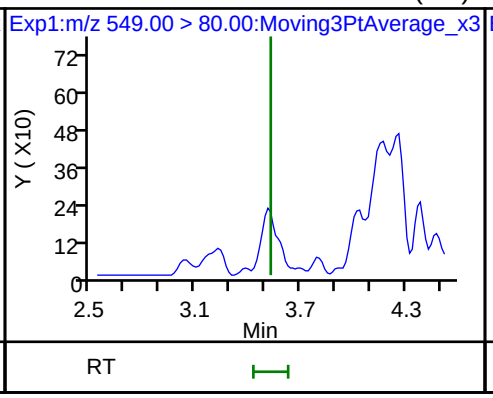
D 26 M2-8:2FTS



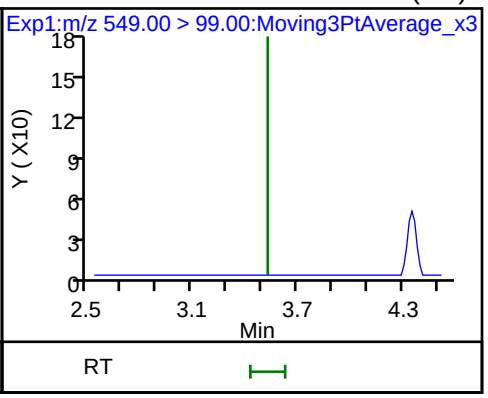
D 23 13C2 PFDA



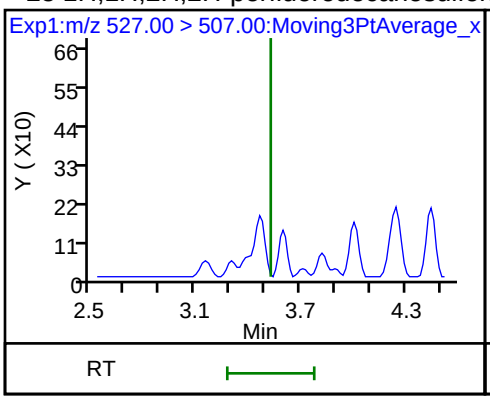
68 Perfluorononanesulfonic acid (ND)



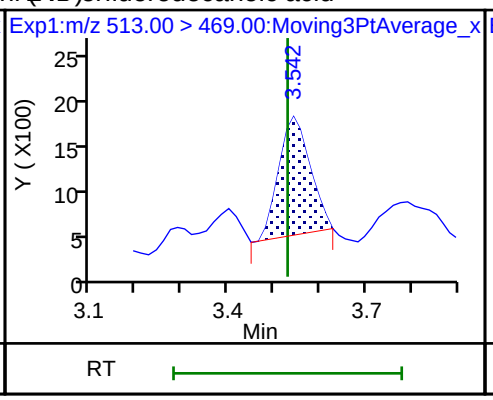
68 Perfluorononanesulfonic acid (ND)



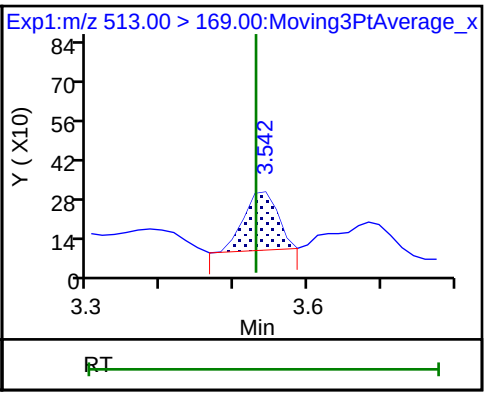
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



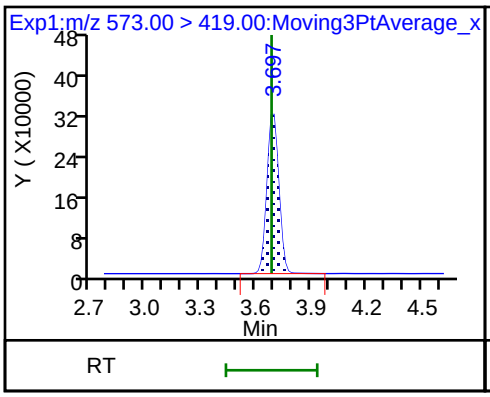
24 Perfluorodecanoic acid



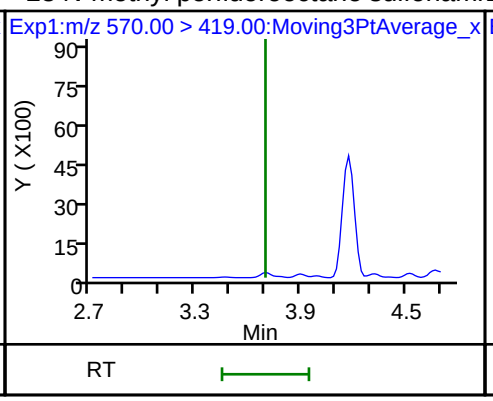
24 Perfluorodecanoic acid



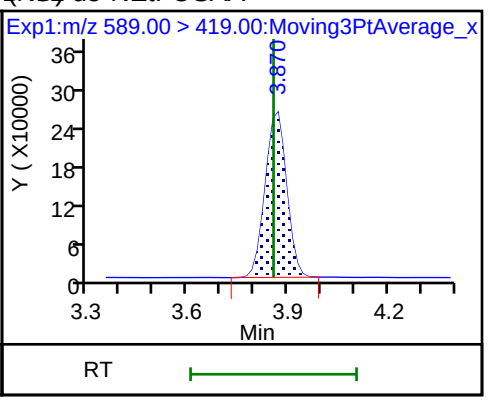
D 27 d3-NMeFOSAA



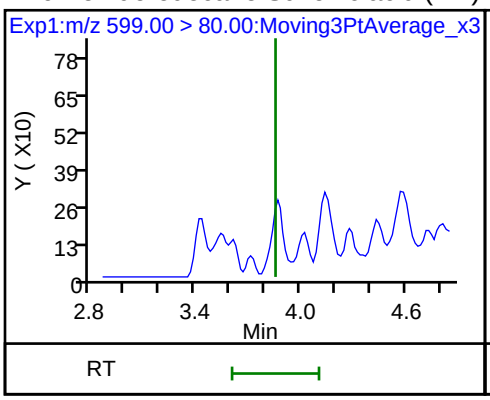
28 N-methyl perfluorooctane sulfonamid (ND)



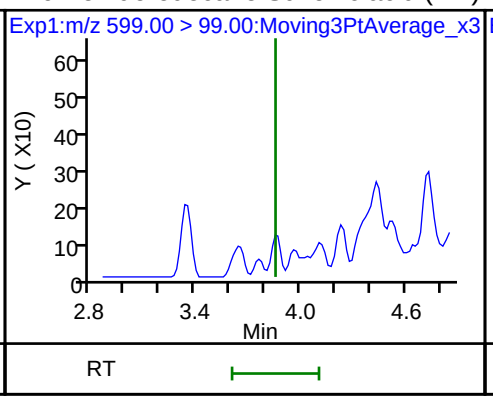
D 32 d5-NEtFOSAA



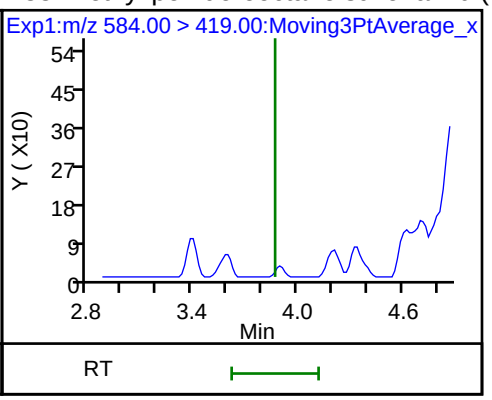
29 Perfluorodecane Sulfonic acid (ND)



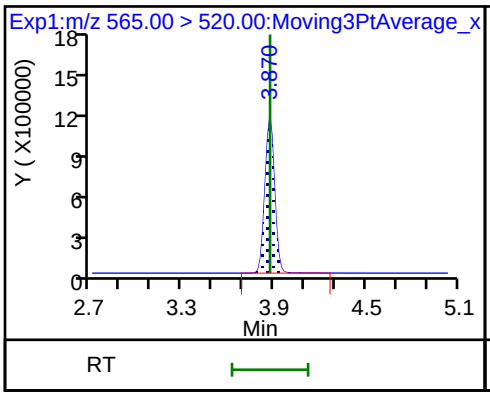
29 Perfluorodecane Sulfonic acid (ND)



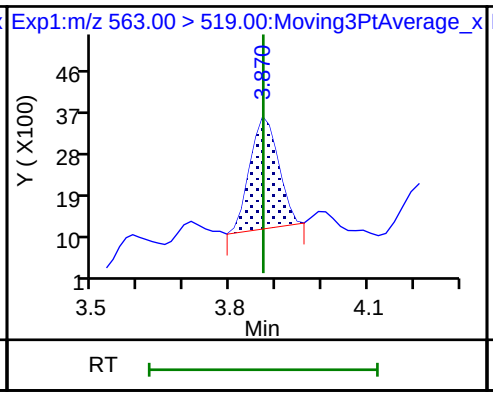
33 N-ethyl perfluorooctane sulfonamid (ND)



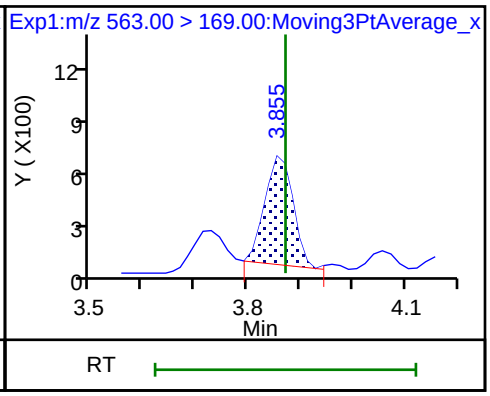
D 30 13C2 PFUnA



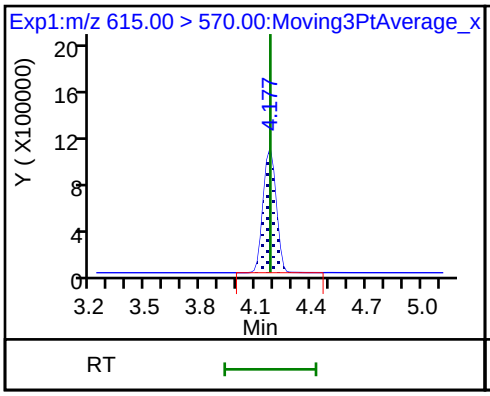
31 Perfluoroundecanoic acid



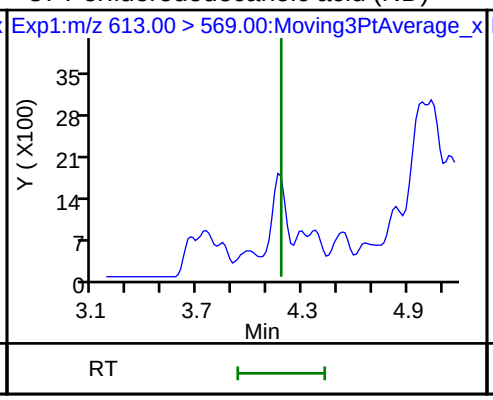
31 Perfluoroundecanoic acid



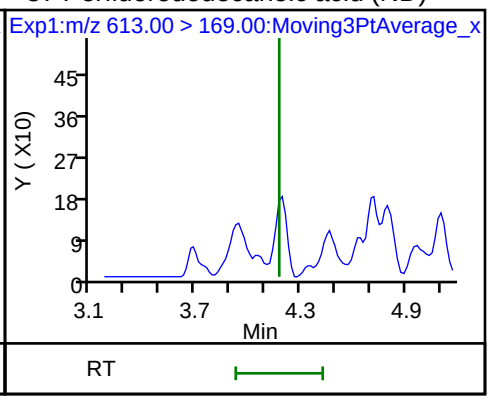
D 36 13C2 PFDoA



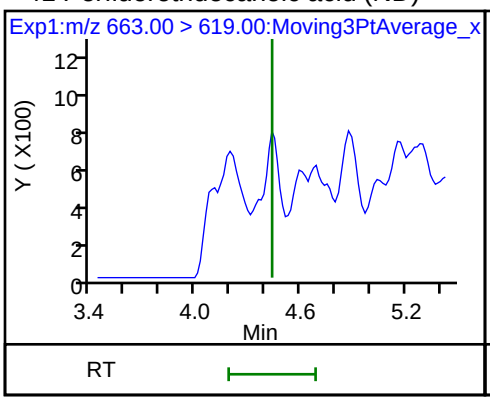
37 Perfluorododecanoic acid (ND)



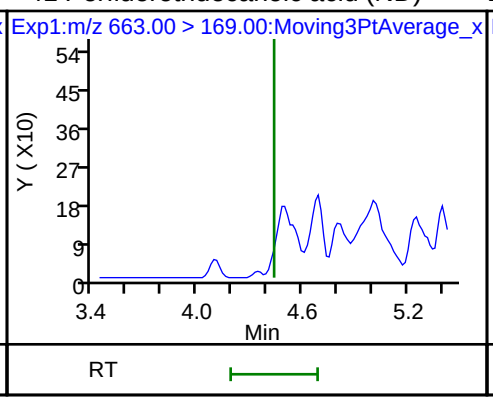
37 Perfluorododecanoic acid (ND)



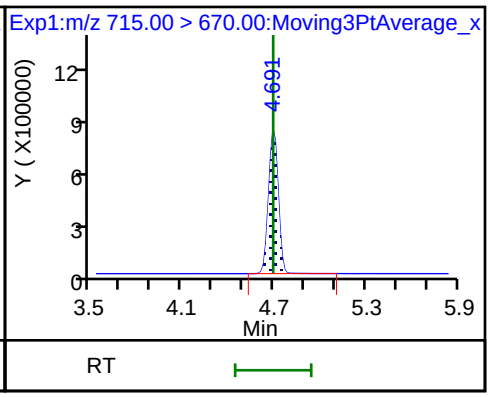
41 Perfluorotridecanoic acid (ND)



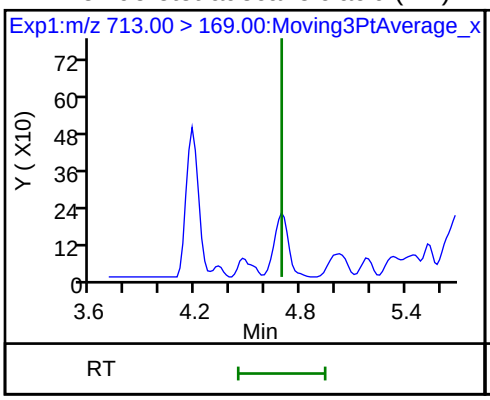
41 Perfluorotridecanoic acid (ND)



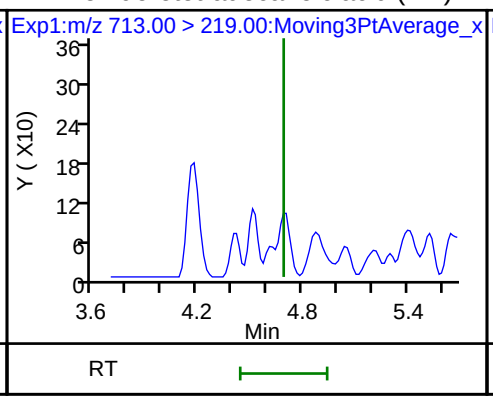
D 43 13C2-PFTeDA



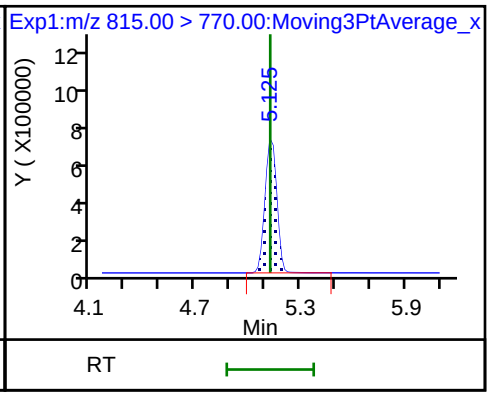
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

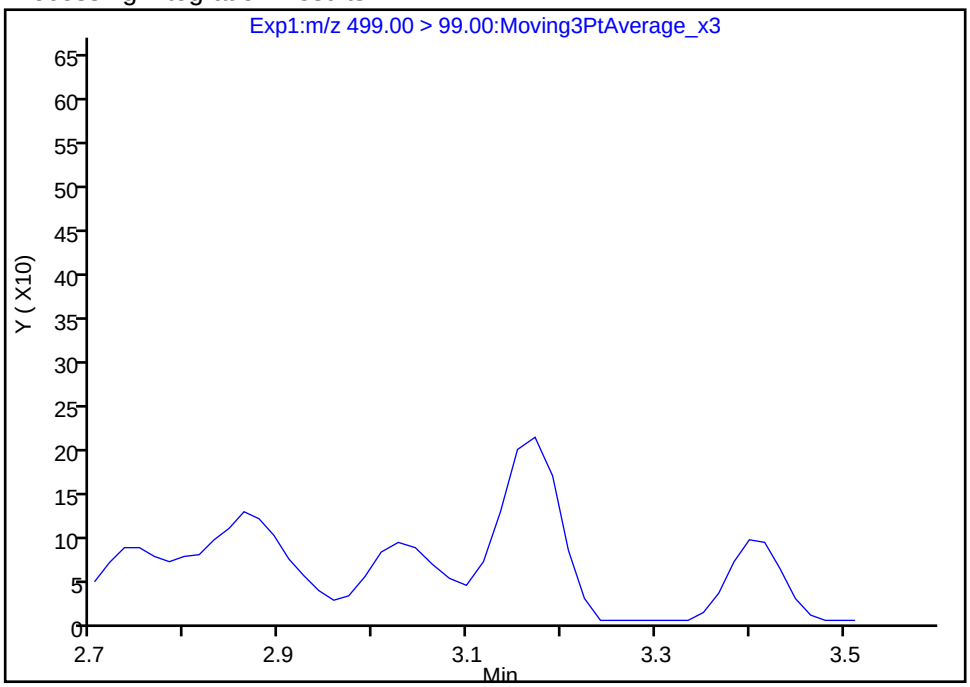
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Lims ID:	CCB				
Client ID:					
Operator ID:	A9\Administrator	ALS Bottle#:	20	Worklist Smp#:	1
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

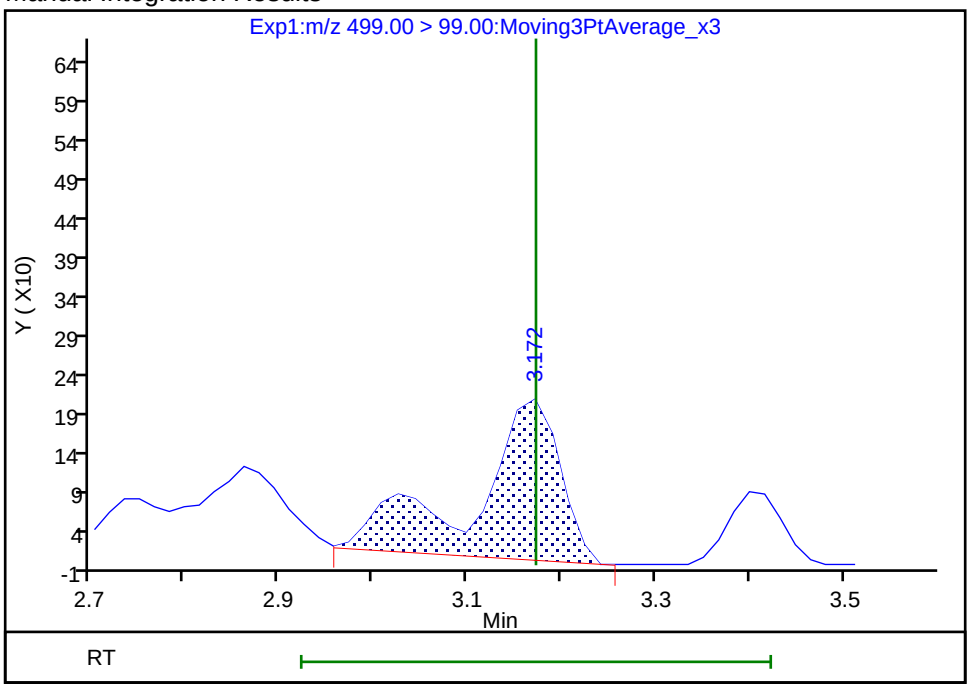
Processing Integration Results

RT: 3.14
Area: 0
Amount: 0.002358
Amount Units: ng/ml



Manual Integration Results

RT: 3.17
Area: 1287
Amount: 0.002358
Amount Units: ng/ml



Reviewer: roycea, 13-Aug-2018 08:55:34

Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: ICB 320-237921/9

Matrix: Water Lab File ID: 2018.08.03LLICAL_012.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/03/2018 17:04

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.: 237921 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
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	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)	0.00558	J	0.050	0.040	0.0043
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U M	0.050	0.040	0.014
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.40	U	0.50	0.40	0.078
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.40	U	0.50	0.40	0.048

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: ICB 320-237921/9

Matrix: Water Lab File ID: 2018.08.03LLICAL_012.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 08/03/2018 17:04

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.: 237921 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		50-150
STL01892	13C4-PFHpA	100		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	111		50-150
STL00996	13C2 PFDA	112		50-150
STL00997	13C2 PFUnA	106		50-150
STL00998	13C2 PFDoA	99		50-150
STL00994	18O2 PFHxS	102		50-150
STL02116	13C2-PFTeDA	105		50-150
STL00991	13C4 PFOS	100		50-150
STL02337	13C3-PFBS	99		50-150
STL02117	d5-NEtFOSAA	102		50-150
STL02118	d3-NMeFOSAA	97		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_012.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 03-Aug-2018 17:04:56 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\20180803-62120.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 03-Aug-2018 18:16:26 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK018

First Level Reviewer: roycea Date: 03-Aug-2018 17:57:51

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	1.480	1.485	-0.005	0.538	6175219	2.47		98.7	7388	
D 3 13C5-PFPeA										
267.90 > 223.00	1.753	1.753	0.0	0.638	5521786	2.47		98.7	7344	
D 47 13C3-PFBS										
301.90 > 83.00	1.787	1.792	-0.005	0.650	79747	2.30		99.0	274	
D 60 M2-4:2FTS										
329.00 > 81.00	2.007	2.006	0.001	0.730	545232	NC			324	
D 7 13C2 PFHxA										
315.00 > 270.00	2.037	2.046	-0.009	0.741	5863740	2.53		101	5913	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.140	2.146	-0.006	0.778	480113	NC			1900	
D 9 13C4-PFHpA										
367.00 > 322.00	2.385	2.384	0.001	0.867	6596822	2.50		100	10524	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.397	2.398	-0.001	1.000	14498	0.005584			18.6	
399.00 > 99.00	2.397	2.398	-0.001	1.000	5177		2.80(1.90-5.70)		1.2	
D 11 18O2 PFHxS										
403.00 > 84.00	2.397	2.400	-0.003	0.872	4799680	2.42		102	9198	
D 12 M2-6:2FTS										
429.00 > 81.00	2.718	2.732	-0.014	0.988	612411	2.39		101	715	
* 62 13C2-PFOA										
415.00 > 370.00	2.750	2.755	-0.005		5600406	2.50			9765	
D 14 13C4 PFOA										
417.00 > 372.00	2.750	2.757	-0.007	1.000	5482172	2.48		99.2	5781	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.750	2.757	-0.007	1.000	20021	0.008333			1.7	
413.00 > 169.00	2.750	2.757	-0.007	1.000	7164		2.79(1.36-4.08)		3.6	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	3.139	3.140	-0.001	1.141	5245370	2.77		111	6689	
D 18 13C4 PFOS										
503.00 > 80.00	3.139	3.140	-0.001	1.141	4934282	2.39		99.9	4203	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.363	3.348	0.015	1.072	1526	NC			2.6	
D 21 13C8 FOSA										
506.00 > 78.00	3.478	3.485	-0.007	1.265	3191695	2.58		103	3612	
D 26 M2-8:2FTS										
529.00 > 81.00	3.493	3.492	0.001	1.270	88220	2.96		124	421	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.493	3.492	0.001	1.004	3377	0.000861			1.5	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.508	3.505	0.003	1.004	6426	0.002449			0.7	R
513.00 > 169.00	3.523	3.505	0.018	1.009	1170		5.49(7.12-21.35)		1.2	
D 23 13C2 PFDA										
515.00 > 470.00	3.493	3.505	-0.012	1.270	5336845	2.81		112	6135	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.649	3.650	-0.001	1.327	894074	2.42		96.9	2146	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.649	3.662	-0.013	1.000	4514	0.0125			3.5	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.813	3.825	-0.012	1.387	769914	2.54		102	1906	
D 30 13C2 PFUnA										
565.00 > 520.00	3.828	3.831	-0.003	1.392	4053775	2.64		106	7874	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.828	3.831	-0.003	1.000	10912	0.007993			2.2	
563.00 > 169.00	3.828	3.831	-0.003	1.000	1666		6.55(5.24-15.72)		3.8	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.813	3.831	-0.018	1.000	4479	0.0162			14.2	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.994	3.993	0.001	1.273	2705	NC			9.4	
D 36 13C2 PFDoA										
615.00 > 570.00	4.124	4.127	-0.003	1.500	4103636	2.48		99.2	6478	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.629	4.635	-0.006	1.683	2784881	2.64		105	6211	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.042	5.049	-0.007	1.833	2448382	2.53		101	5770	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.042	5.049	-0.007	1.000	25798	NC			3.8	
813.00 > 169.00	5.042	5.049	-0.007	1.000	5432		4.75(2.77-8.32)		21.9	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.406	5.401	0.005	1.072	4115	NC			4.0	
913.00 > 169.00	5.406	5.401	0.005	1.072	979		4.20(2.55-7.64)		7.2	

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: 03-Aug-2018 18:16:38 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_012.d

Injection Date: 03-Aug-2018 17:04:56 Instrument ID: A9

Lims ID: ICB

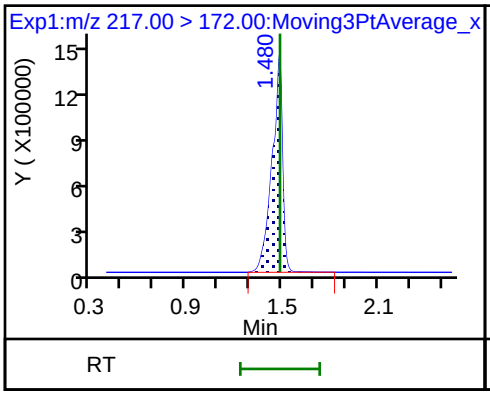
Client ID:

Operator ID: A9\Administrator ALS Bottle#: 20 Worklist Smp#: 9

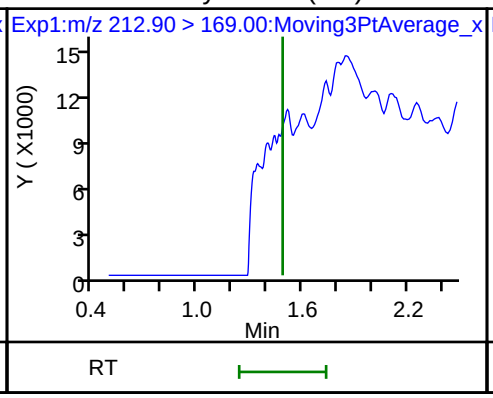
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

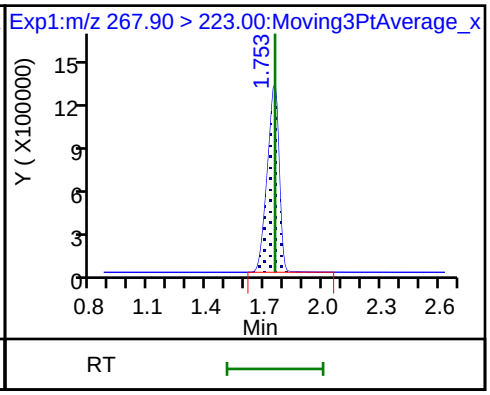
D 1 13C4 PFBA



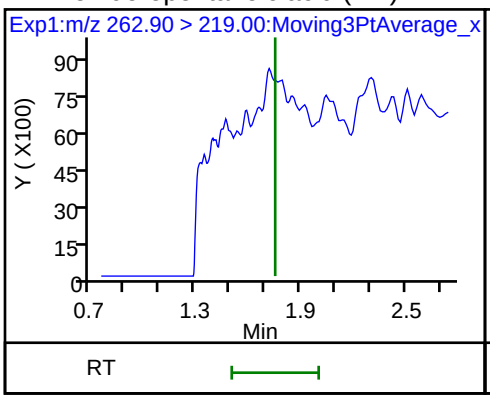
2 Perfluorobutyric acid (ND)



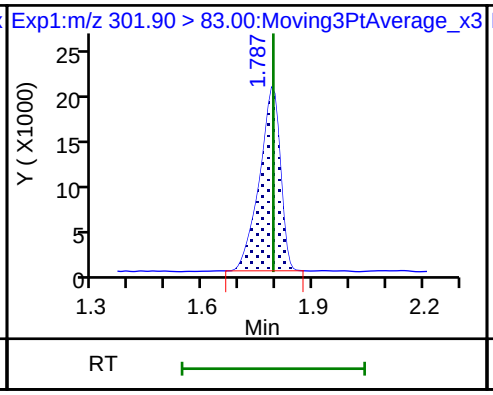
D 3 13C5-PFPeA



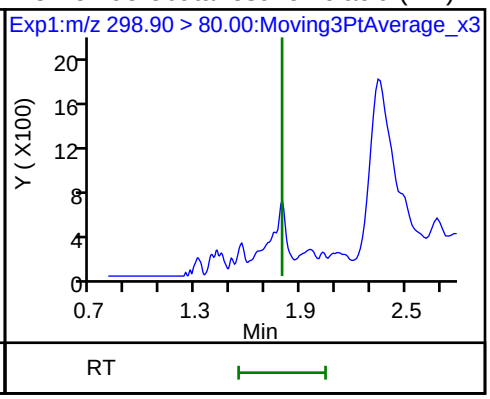
4 Perfluoropentanoic acid (ND)



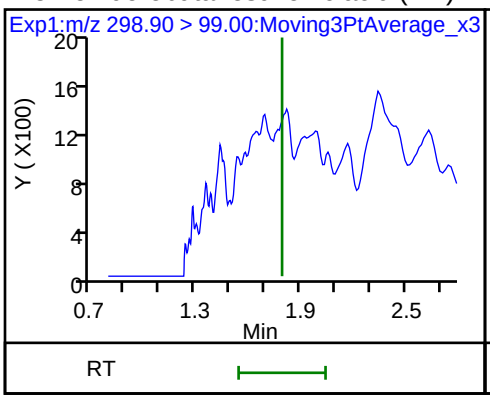
D 47 13C3-PFBS



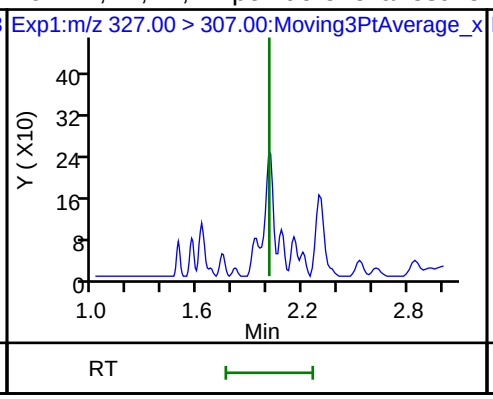
5 Perfluorobutanesulfonic acid (ND)



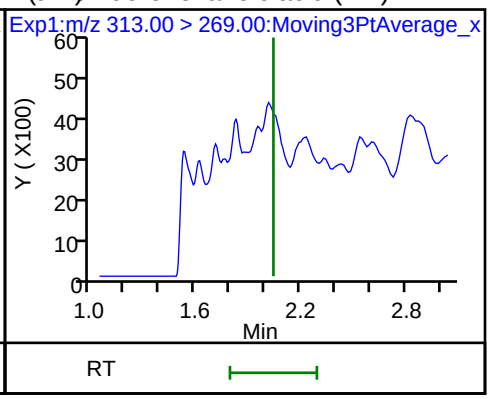
5 Perfluorobutanesulfonic acid (ND)



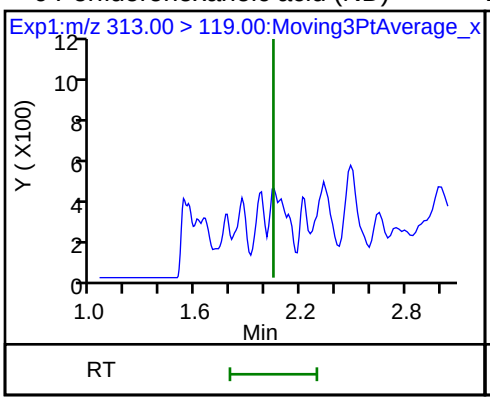
61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)



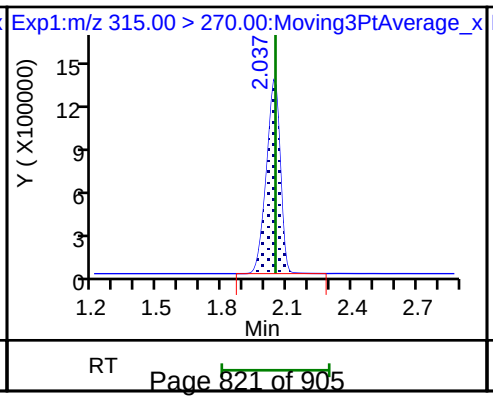
6 Perfluorohexanoic acid (ND)



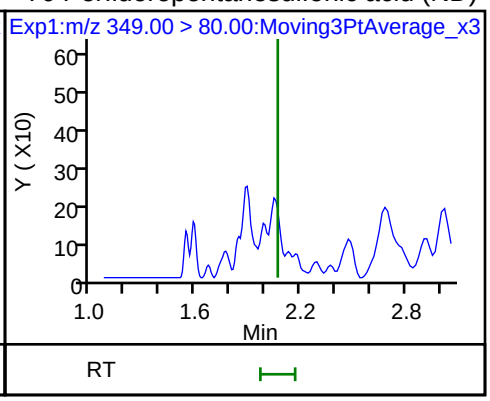
6 Perfluorohexanoic acid (ND)



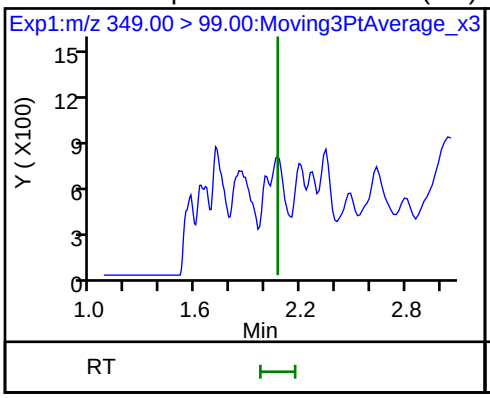
D 7 13C2 PFHxA



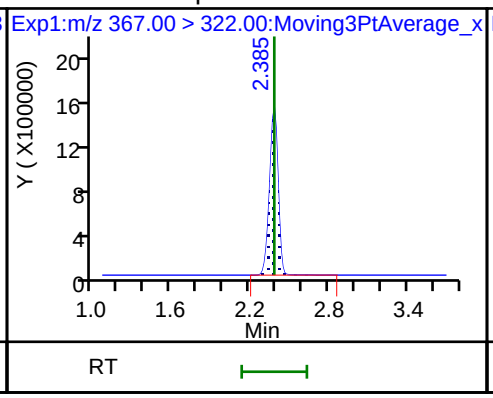
70 Perfluoropentanesulfonic acid (ND)



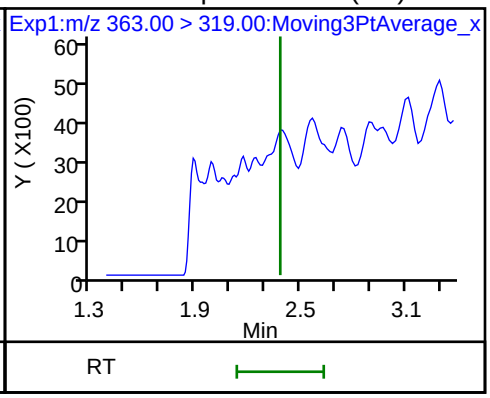
70 Perfluoropentanesulfonic acid (ND)



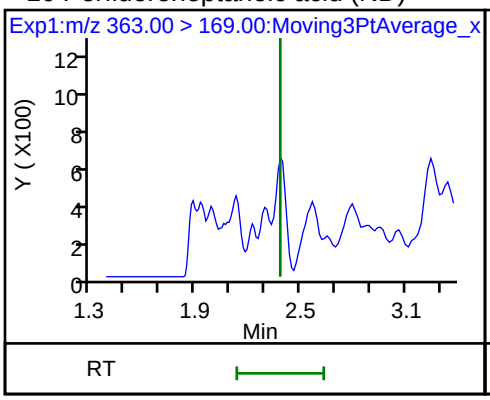
D 9 13C4-PFHpA



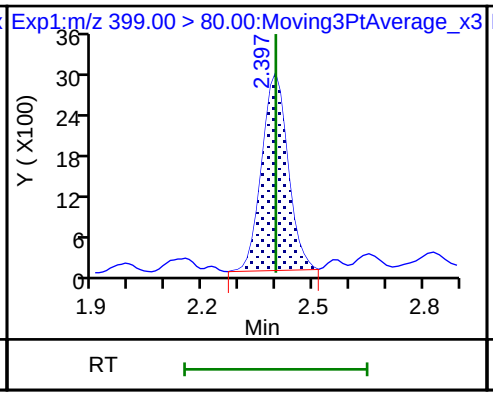
10 Perfluoroheptanoic acid (ND)



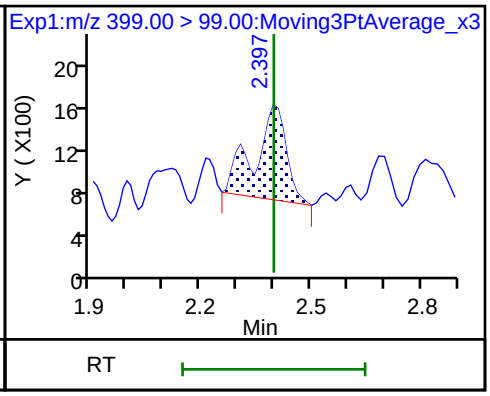
10 Perfluoroheptanoic acid (ND)



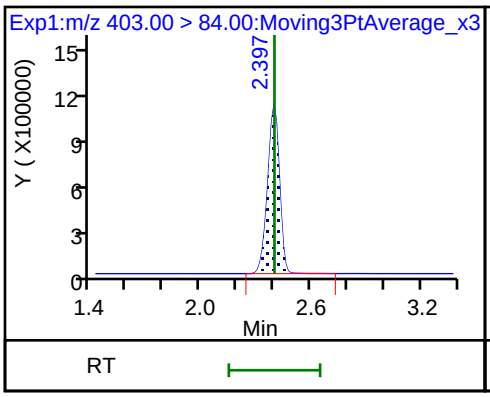
8 Perfluorohexanesulfonic acid



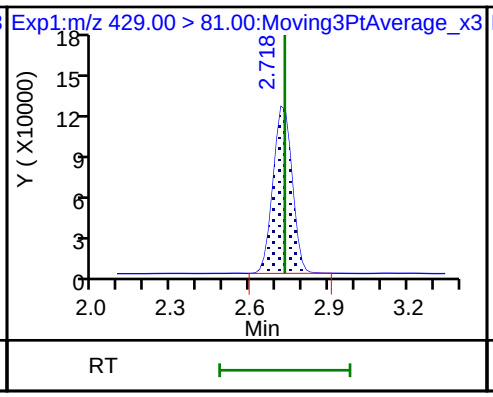
8 Perfluorohexanesulfonic acid



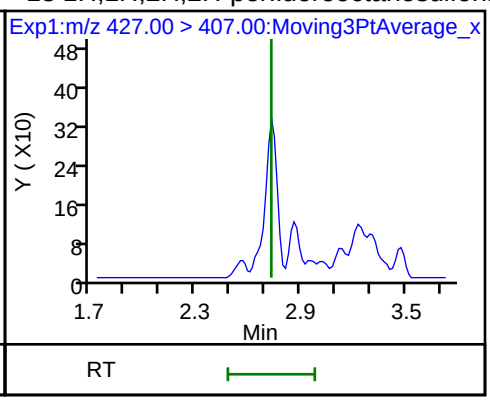
D 11 18O2 PFHxS



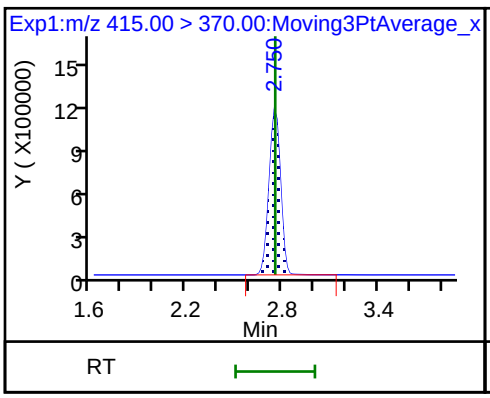
D 12 M2-6:2FTS



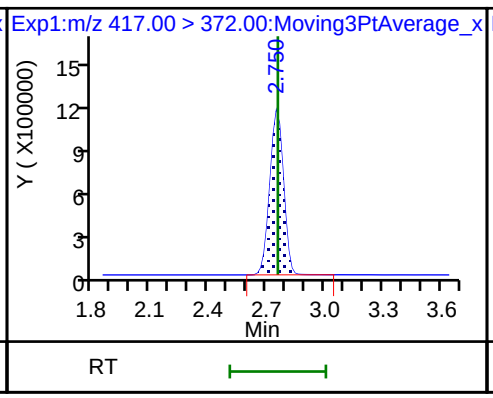
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



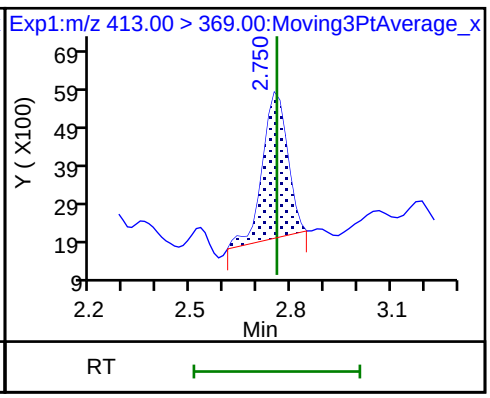
* 62 13C2-PFOA



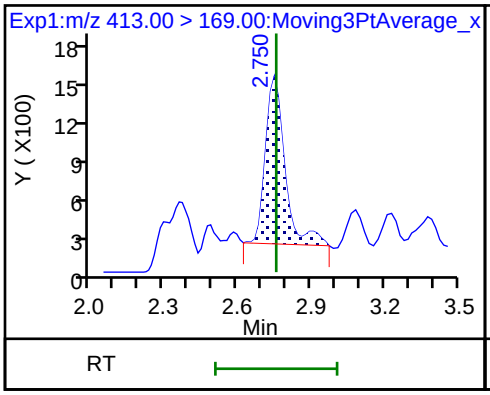
D 14 13C4 PFOA



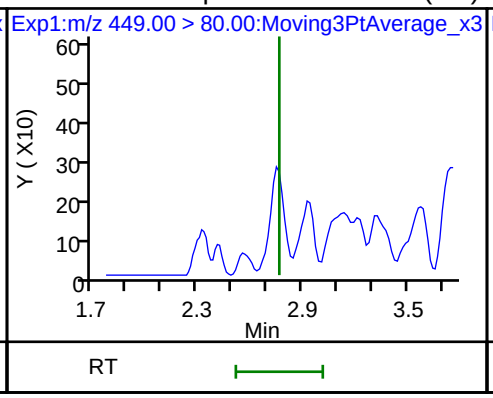
15 Perfluorooctanoic acid



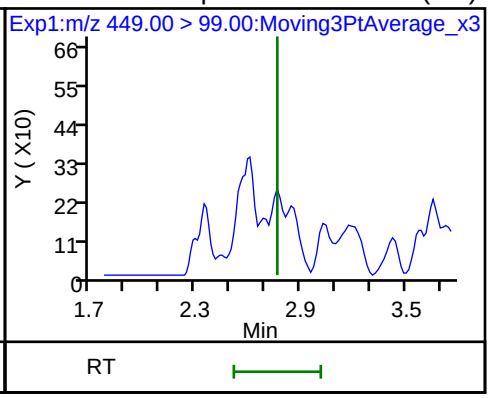
15 Perfluorooctanoic acid



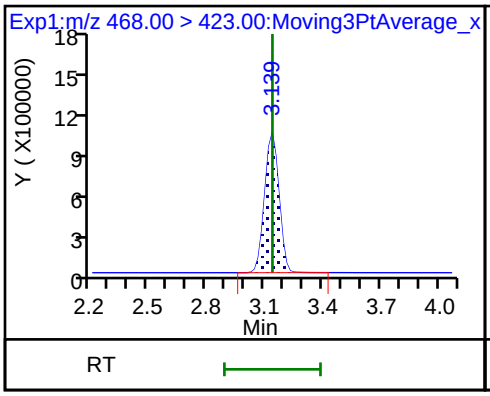
16 Perfluoroheptanesulfonic acid (ND)



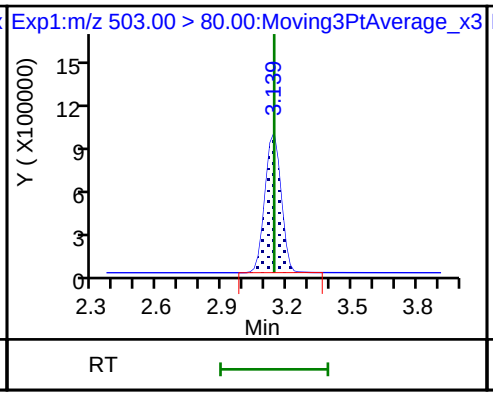
16 Perfluoroheptanesulfonic acid (ND)



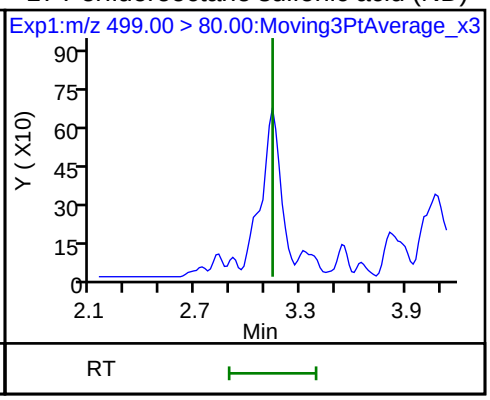
D 19 13C5 PFNA



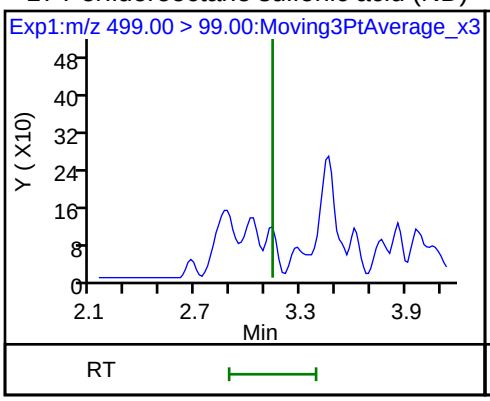
D 18 13C4 PFOS



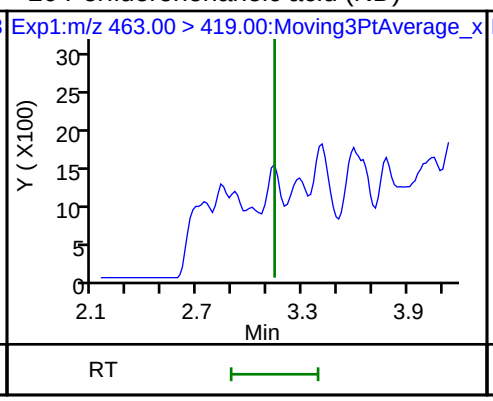
17 Perfluorooctane sulfonic acid (ND)



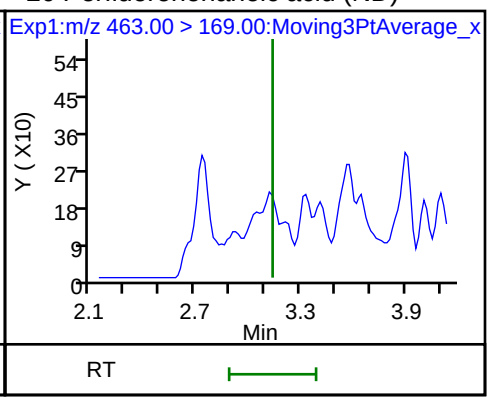
17 Perfluorooctane sulfonic acid (ND)



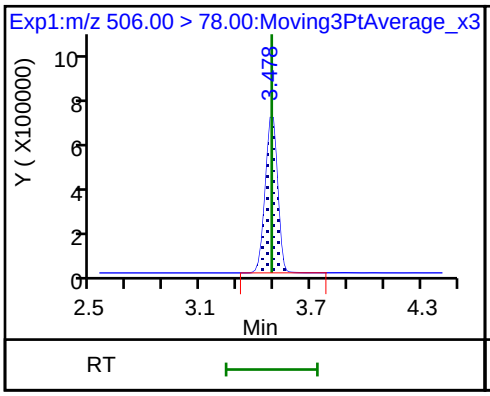
20 Perfluorononanoic acid (ND)



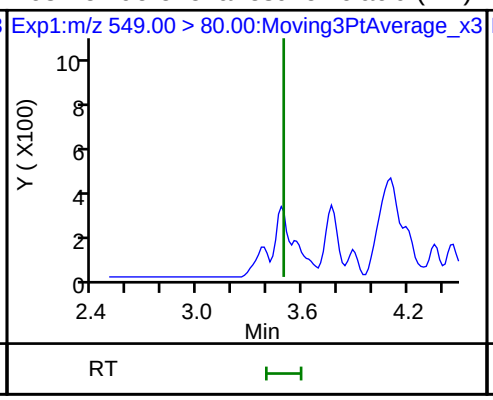
20 Perfluorononanoic acid (ND)



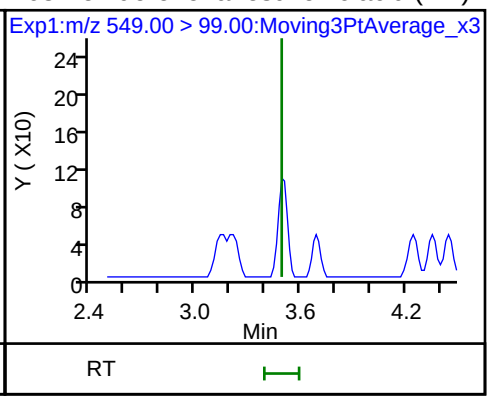
D 21 13C8 FOSA



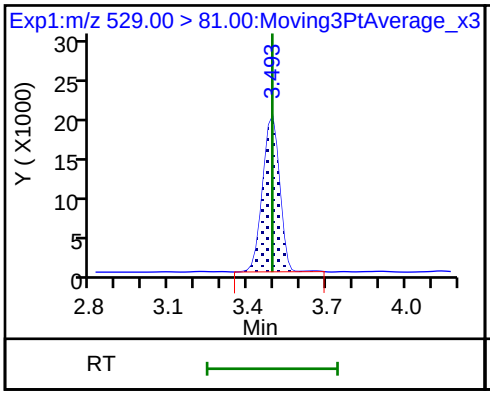
68 Perfluorononanesulfonic acid (ND)



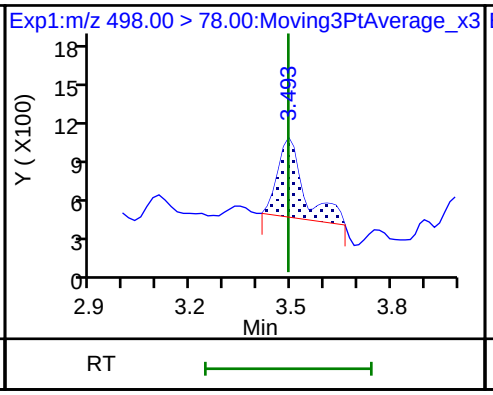
68 Perfluorononanesulfonic acid (ND)



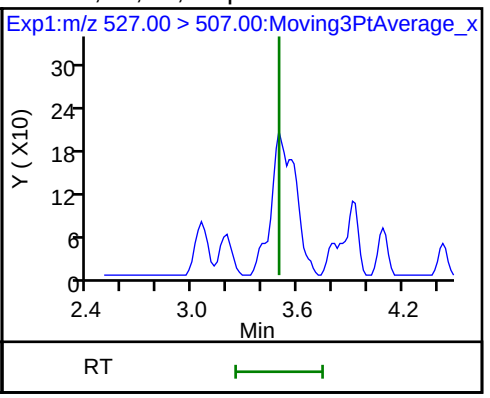
D 26 M2-8:2FTS



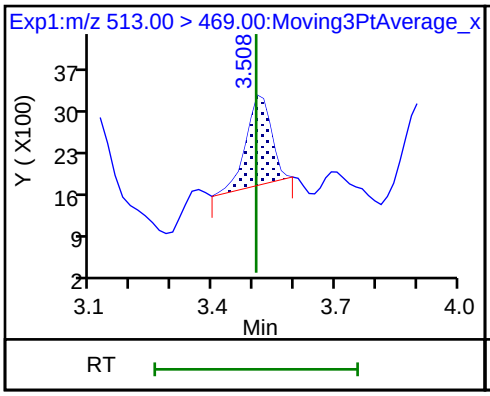
22 Perfluorooctane Sulfonamide



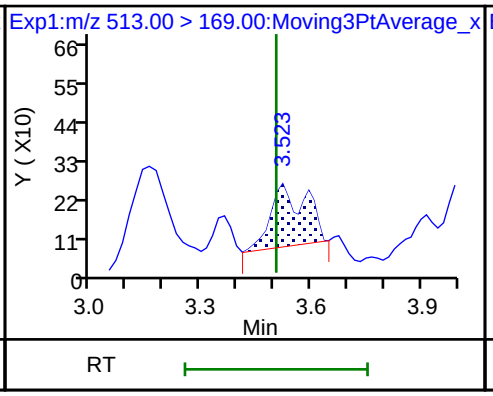
25 1H,1H,2H,2H-perfluorodecanesulfoni (ND)



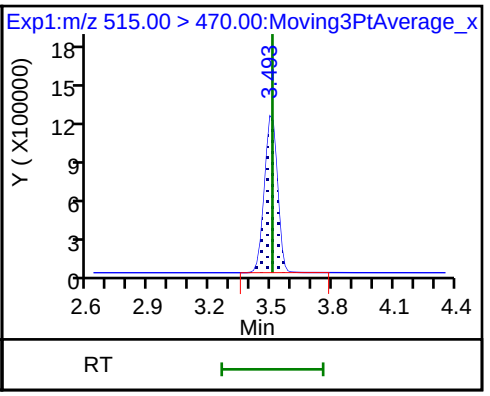
24 Perfluorodecanoic acid



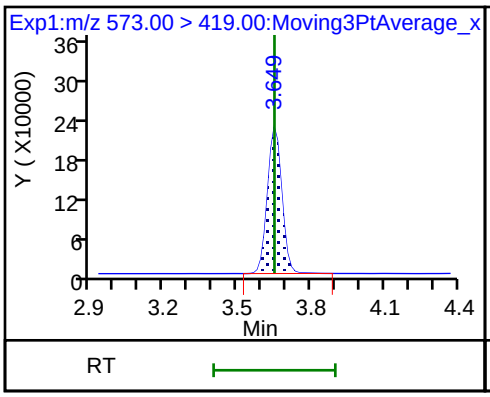
24 Perfluorodecanoic acid



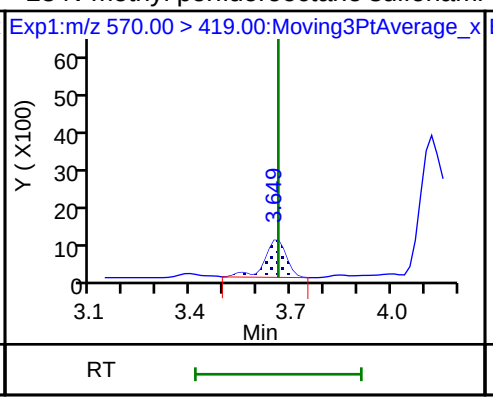
D 23 13C2 PFDA



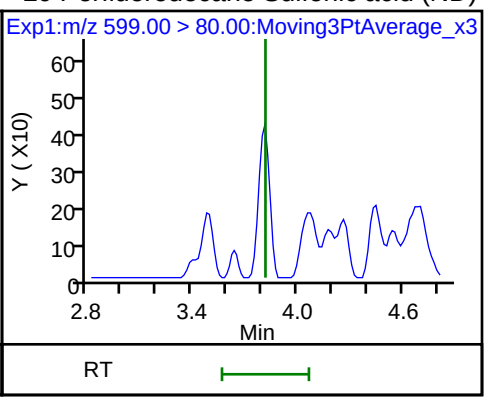
D 27 d3-NMeFOSAA



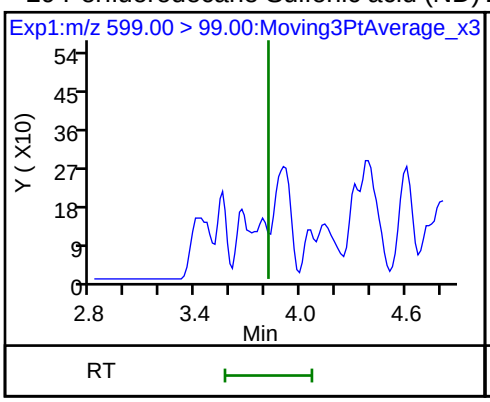
28 N-methyl perfluorooctane sulfonami



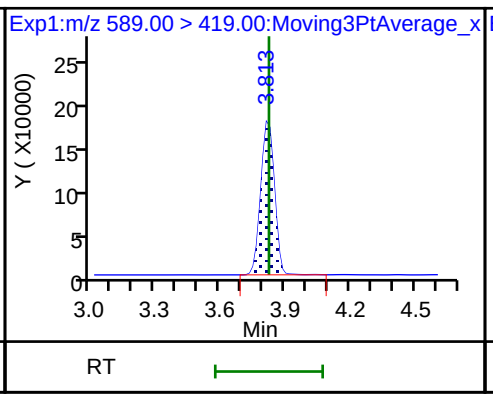
29 Perfluorodecane Sulfonic acid (ND)



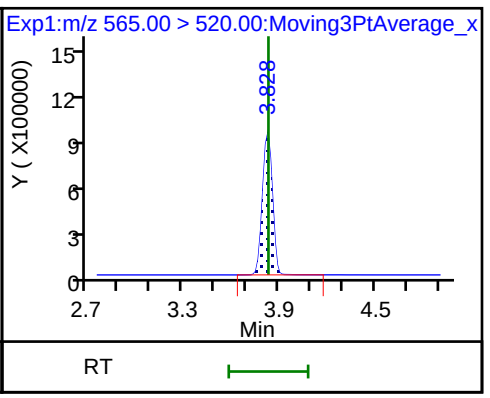
29 Perfluorodecane Sulfonic acid (ND)



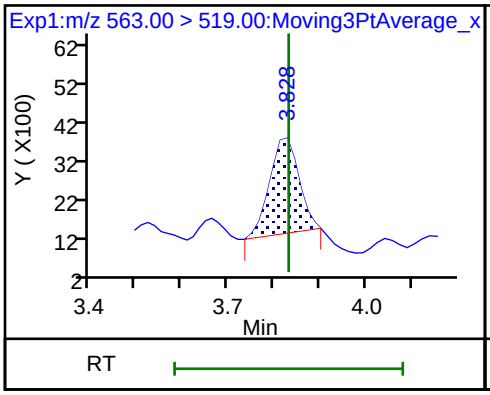
D 32 d5-NEtFOSAA



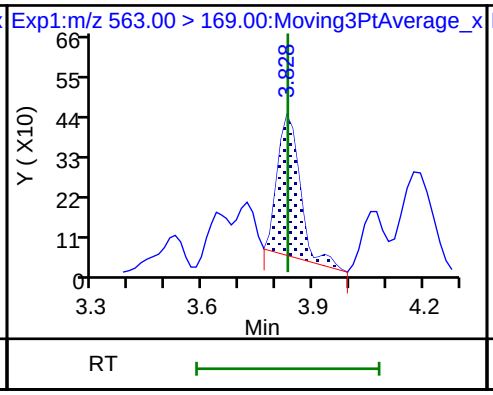
D 30 13C2 PFUnA



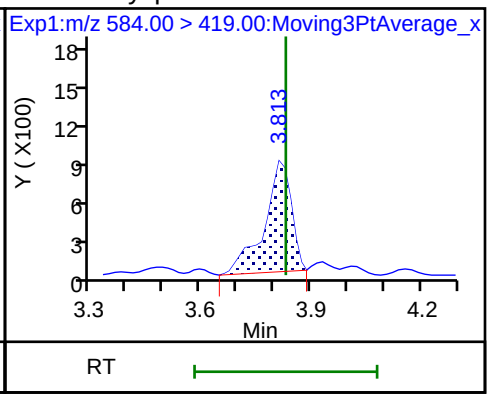
31 Perfluoroundecanoic acid



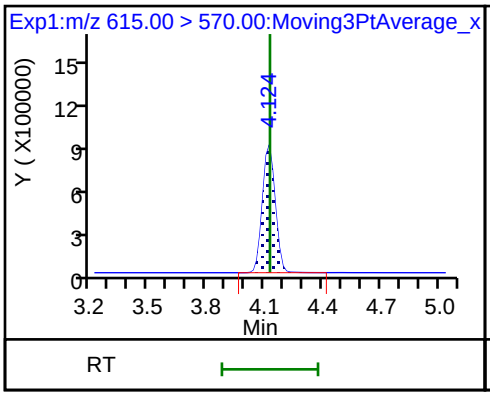
31 Perfluoroundecanoic acid



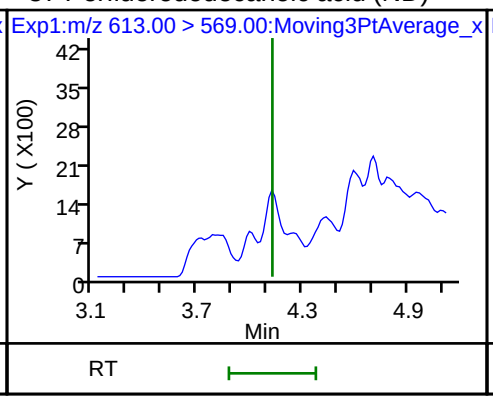
33 N-ethyl perfluorooctane sulfonamid



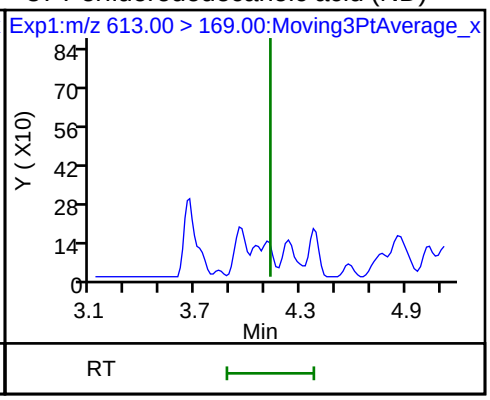
D 36 13C2 PFDoA



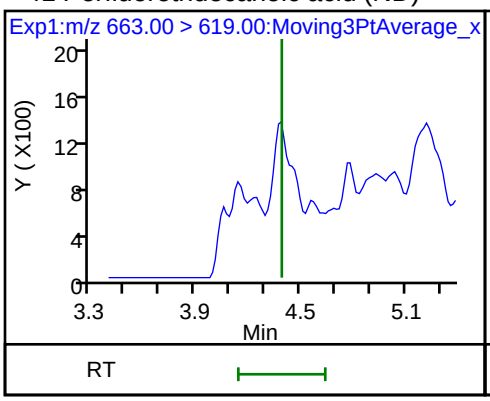
37 Perfluorododecanoic acid (ND)



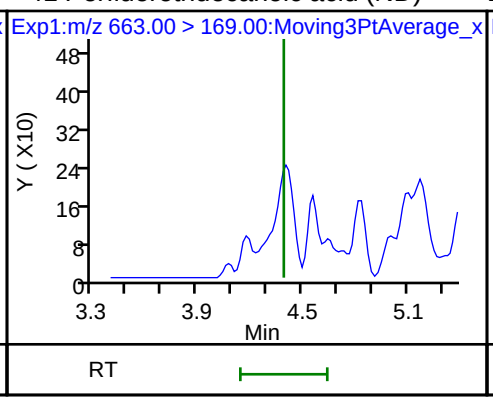
37 Perfluorododecanoic acid (ND)



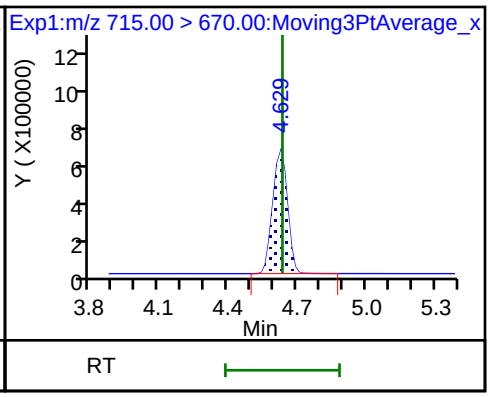
41 Perfluorotridecanoic acid (ND)



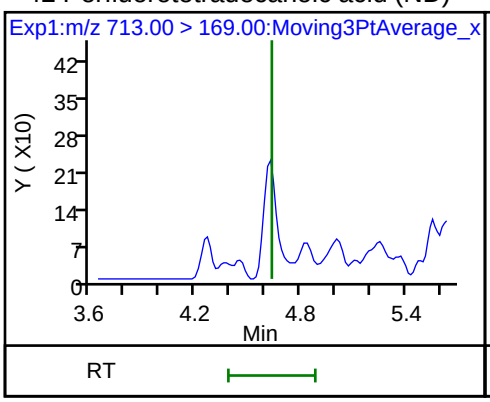
41 Perfluorotridecanoic acid (ND)



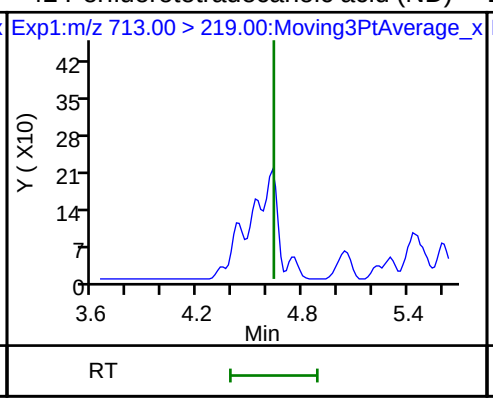
D 43 13C2-PFTeDA



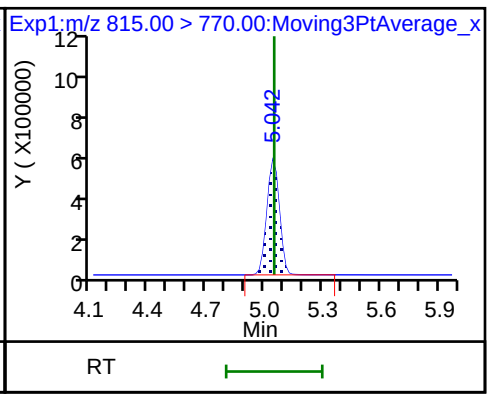
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-239407/2-A

Matrix: Water | Lab File ID: 2018.08.11LA9A_008.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 250(mL) | Date Analyzed: 08/11/2018 20:52

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.: 239432 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0410		0.0020	0.0010	0.00047
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0424		0.0020	0.0015	0.00061
335-67-1	Perfluorooctanoic acid (PFOA)	0.0381		0.0020	0.0015	0.00054
375-95-1	Perfluorononanoic acid (PFNA)	0.0389		0.0020	0.0015	0.00052
335-76-2	Perfluorodecanoic acid (PFDA)	0.0382		0.0020	0.0010	0.00048
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0380		0.0020	0.0015	0.00072
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0403		0.0020	0.0015	0.00052
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0379		0.0040	0.0030	0.00076
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0388		0.0040	0.0030	0.00083
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0362		0.0020	0.0010	0.00046
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0358	M	0.0020	0.0010	0.00038
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0366		0.0040	0.0030	0.0011
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0393		0.020	0.010	0.0030
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0413		0.020	0.010	0.0028

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 320-239407/2-A

Matrix: Water Lab File ID: 2018.08.11LA9A_008.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 250(mL) Date Analyzed: 08/11/2018 20:52

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.: 239432 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		50-150
STL01892	13C4-PFHpA	87		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	96		50-150
STL00996	13C2 PFDA	97		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	94		50-150
STL00994	18O2 PFHxS	73		50-150
STL02116	13C2-PFTeDA	90		50-150
STL00991	13C4 PFOS	76		50-150
STL02337	13C3-PFBS	72		50-150
STL02117	d5-NEtFOSAA	94		50-150
STL02118	d3-NMeFOSAA	95		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_008.d
Lims ID: LCS 320-239407/2-A
Client ID:
Sample Type: LCS
Inject. Date: 11-Aug-2018 20:52:06 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-239407/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: phomsophat Date: 11-Aug-2018 21:29:52

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	1.489	0.005	1.000	1008360	0.9859		98.6	152	
D 1 13C4 PFBA										
217.00 > 172.00	1.494	1.494	0.0	0.537	2751361	1.53		61.2	9704	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.764	0.008	1.000	1133618	0.9284		92.8	96.7	
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.772	0.0	0.637	2992390	1.86		74.4	6947	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.814	1.797	0.017	1.005	1683859	0.9041		102	578	
298.90 > 99.00	1.805	1.797	0.008	1.000	585700		2.87(1.35-4.05)		374	
D 47 13C3-PFBS										
301.90 > 83.00	1.805	1.805	0.0	0.649	41923	1.68		72.4	325	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.027	2.007	0.020	1.123	292878	0.9542		102	1789	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.058	2.048	0.010	1.000	1285894	1.03		103	568	
313.00 > 119.00	2.058	2.048	0.010	1.000	93155		13.80(6.96-20.87)		272	
D 7 13C2 PFHxA										
315.00 > 270.00	2.058	2.058	0.0	0.740	3351185	2.01		80.3	8088	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.089	2.069	0.020	1.157	849291	0.9631		103	1847	
349.00 > 99.00	2.089	2.069	0.020	1.157	390122		2.18(1.15-3.45)		367	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.160	2.150	0.010	1.000	269028	NC			276	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.160	2.160	0.0	0.776	363141	NC			2000	

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	2.400	2.387	0.013	1.000	1819092	1.06		106	198	
363.00 > 169.00	2.400	2.387	0.013	1.000	380304		4.78(2.17-6.52)		901	
D 9 13C4-PFHpA										
367.00 > 322.00	2.400	2.400	0.0	0.862	4129324	2.18		87.1	10640	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.413	2.400	0.013	1.000	1186326	0.8959		98.5	1346	M
399.00 > 99.00	2.413	2.400	0.013	1.000	312167		3.80(1.90-5.70)		169	
D 11 18O2 PFHxS										
403.00 > 84.00	2.413	2.413	0.0	0.867	2448000	1.72		72.5	5938	
65 ADONA										
377.00 > 251.00	2.452	2.452	0.0	0.777	2835998	NC			5605	
377.00 > 85.00	2.452	2.452	0.0	0.777	1172451		2.42(1.05-3.16)		939	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.751	2.719	0.032	1.000	371963	0.9081		95.8	296	
D 12 M2-6:2FTS										
429.00 > 81.00	2.751	2.751	0.0	0.989	455279	2.47		104	906	
* 62 13C2-PFOA										
415.00 > 370.00	2.783	2.751	0.032		4025409	2.50			8206	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.783	2.751	0.032	1.006	1546657	0.9519		95.1	240	
413.00 > 169.00	2.783	2.751	0.032	1.006	567268		2.73(1.36-4.08)		742	
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.767	0.0	0.994	3707576	2.33		93.4	4834	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.783	2.767	0.016	0.882	1149752	1.01		106	1315	
449.00 > 99.00	2.783	2.767	0.016	0.882	280815		4.09(1.84-5.53)		960	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.155	3.136	0.019	1.000	1106805	0.9153		98.6	426	
499.00 > 99.00	3.155	3.136	0.019	1.000	266422		4.15(2.04-6.12)		494	
20 Perfluorononanoic acid										
463.00 > 419.00	3.155	3.136	0.019	1.000	1340749	0.9723		97.2	345	
463.00 > 169.00	3.155	3.136	0.019	1.000	233422		5.74(2.68-8.03)		605	
D 19 13C5 PFNA										
468.00 > 423.00	3.155	3.155	0.0	1.134	3268465	2.40		95.9	6211	
D 18 13C4 PFOS										
503.00 > 80.00	3.155	3.155	0.0	1.134	2694760	1.81		75.9	2899	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.369	3.353	0.016	1.068	1209301	NC			1486	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.483	3.467	0.016	1.000	2209300	1.06		106	2840	
D 21 13C8 FOSA										
506.00 > 78.00	3.483	3.483	0.0	1.251	1694009	1.91		76.3	2987	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.514	3.483	0.031	1.114	774248	1.05		109	885	
549.00 > 99.00	3.514	3.483	0.031	1.114	111710		6.93(3.02-9.05)		893	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.514	3.498	0.016	1.000	278018	0.9151		95.5	1499	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.529	3.498	0.031	1.000	1545769	0.9548		95.5	340	
513.00 > 169.00	3.529	3.498	0.031	1.000	97998		15.77(7.12-21.35)		166	
D 26 M2-8:2FTS										
529.00 > 81.00	3.514	3.514	0.0	1.263	51905	2.43		101	259	
D 23 13C2 PFDA										
515.00 > 470.00	3.529	3.529	0.0	1.268	3292522	2.41		96.5	5661	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.685	3.657	0.028	1.004	249260	0.9836		98.4	255	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.671	3.671	0.0	1.319	626872	2.36		94.5	2197	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.841	3.810	0.031	1.218	876127	0.9324		96.7	1234	
599.00 > 99.00	3.841	3.810	0.031	1.218	197710		4.43(2.14-6.43)		286	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.857	3.826	0.031	1.004	189113	1.03		103	441	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.857	3.826	0.031	1.000	797103	0.9507		95.1	125	
563.00 > 169.00	3.857	3.826	0.031	1.000	85623		9.31(5.24-15.72)		352	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.841	3.841	0.0	1.380	510228	2.34		93.7	986	
D 30 13C2 PFUnA										
565.00 > 520.00	3.857	3.857	0.0	1.386	2489400	2.26		90.3	8744	
35 MeFOSA										
512.00 > 169.00	3.963	3.962	0.001		205442	NC			583	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	4.010	3.994	0.016	1.271	1464769	NC			11022	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.142	4.125	0.017	1.000	1108193	1.01		101	210	
613.00 > 169.00	4.142	4.125	0.017	1.000	111146		9.97(4.68-14.05)		484	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.160	4.125	0.035	1.184	147180	NC			604	
D 36 13C2 PFDoA										
615.00 > 570.00	4.142	4.142	0.0	1.488	2798613	2.35		94.2	5124	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.391	4.375	0.016	1.392	86869	NC			582	
699.00 > 99.00	4.391	4.375	0.016	1.392	153949		0.56(0.28-0.83)		413	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.422	4.406	0.016	1.068	796536	0.9481		94.8	262	
663.00 > 169.00	4.422	4.406	0.016	1.068	143489		5.55(3.09-9.27)		442	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.661	4.645	0.016	1.000	107076	0.9697		97.0	573	
713.00 > 219.00	4.661	4.645	0.016	1.000	73988		1.45(0.70-2.09)		280	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.661	4.661	0.0	1.675	1713651	2.26		90.3	4323	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.092	5.059	0.033	1.000	416188	NC			37.4	
813.00 > 169.00	5.092	5.059	0.033	1.000	75639		5.50(2.77-8.32)		260	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.092	5.092	0.0	1.830	1130716	1.62		64.9	2504	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.461	5.433	0.028	1.072	156552	NC			164	
913.00 > 169.00	5.461	5.433	0.028	1.072	29268		5.35(2.55-7.64)		264	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:35 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_008.d

Injection Date: 11-Aug-2018 20:52:06 Instrument ID: A9

Lims ID: LCS 320-239407/2-A

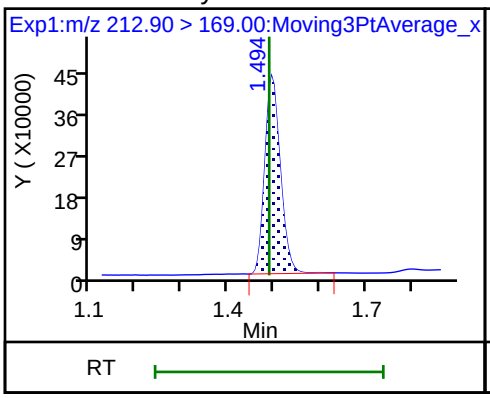
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Operator ID: A9\Administrator ALS Bottle#: 2 Worklist Smp#: 5

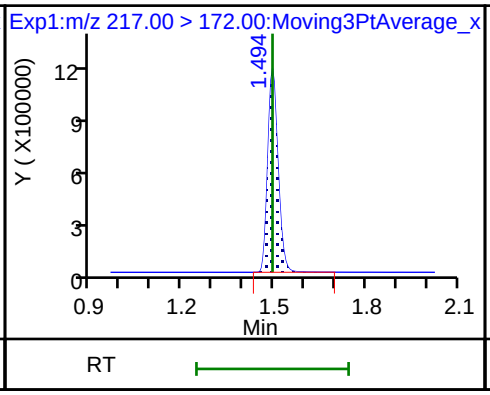
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

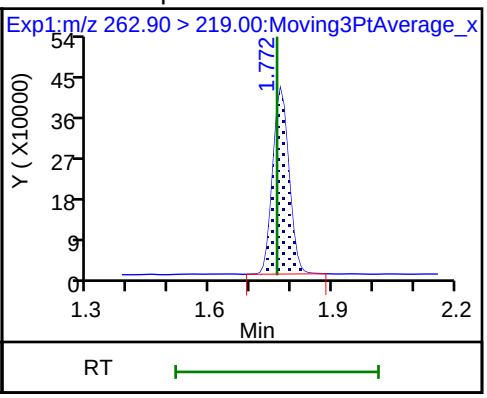
2 Perfluorobutyric acid



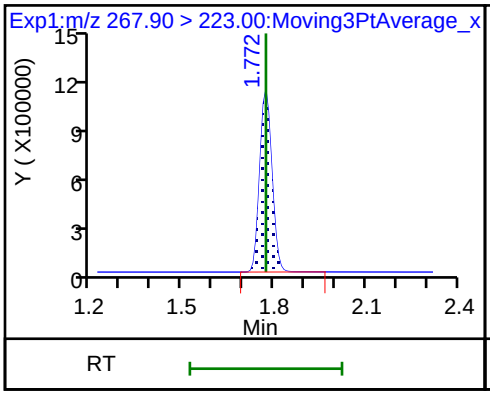
D 1 13C4 PFBA



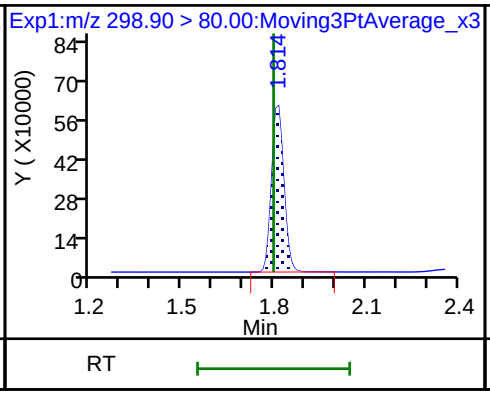
4 Perfluoropentanoic acid



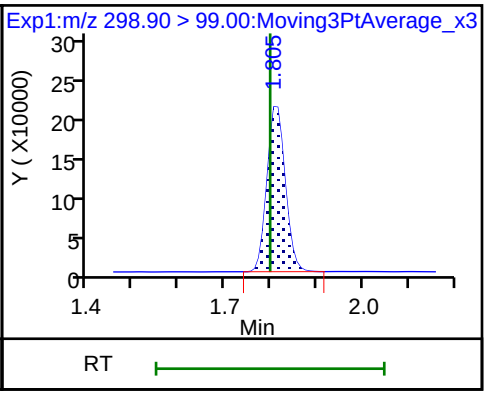
D 3 13C5-PFPeA



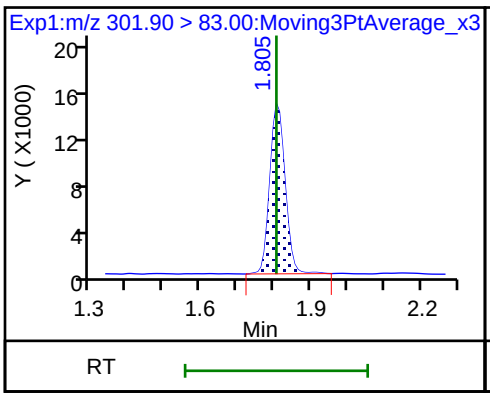
5 Perfluorobutanesulfonic acid



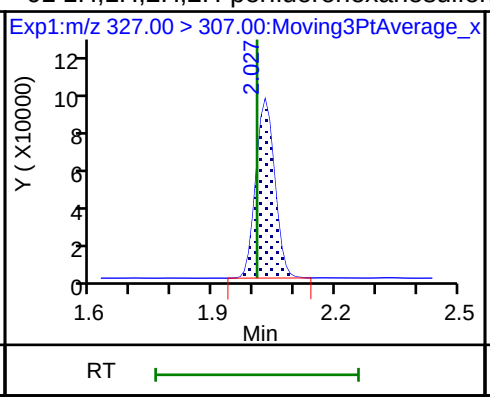
5 Perfluorobutanesulfonic acid



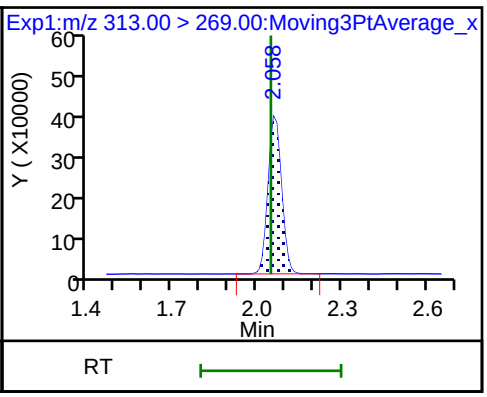
D 47 13C3-PFBS



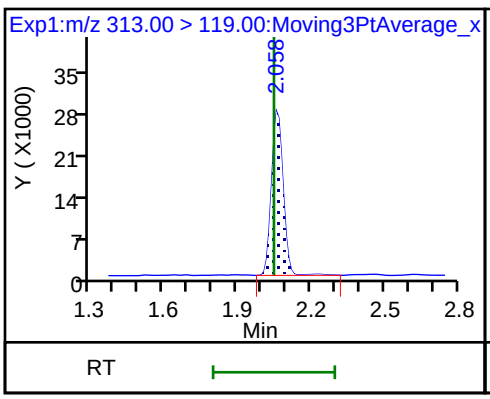
61 1H,1H,2H,2H-perfluorohexanesulfoni



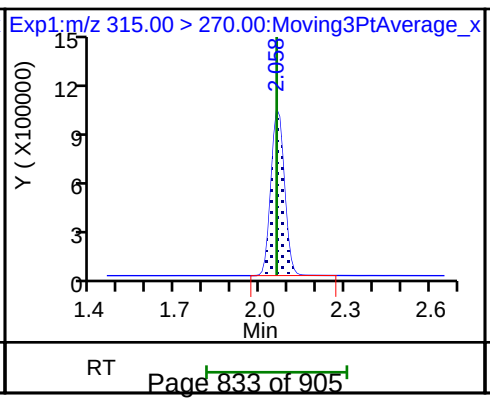
6 Perfluorohexanoic acid



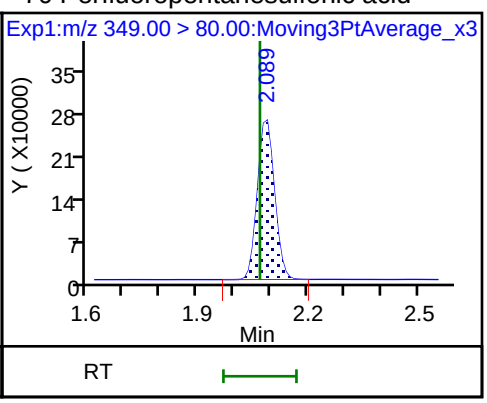
6 Perfluorohexanoic acid



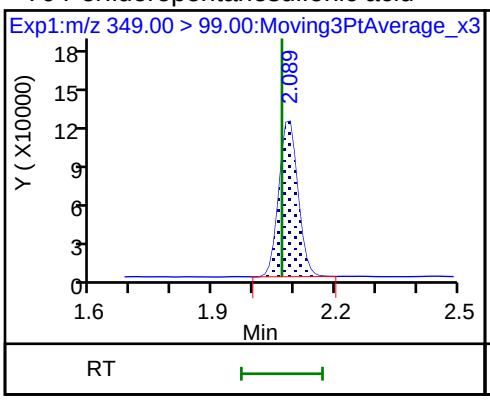
D 7 13C2 PFHxA



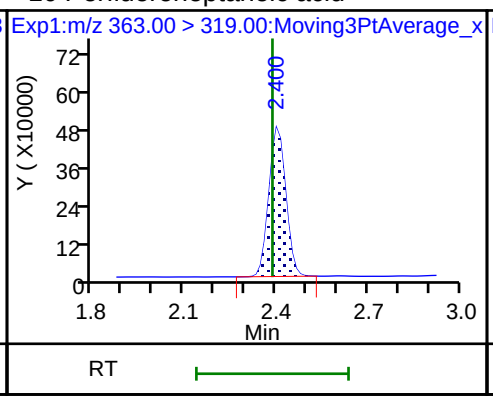
70 Perfluoropentanesulfonic acid



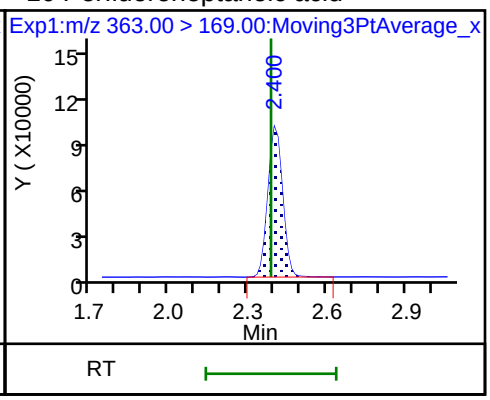
70 Perfluoropentanesulfonic acid



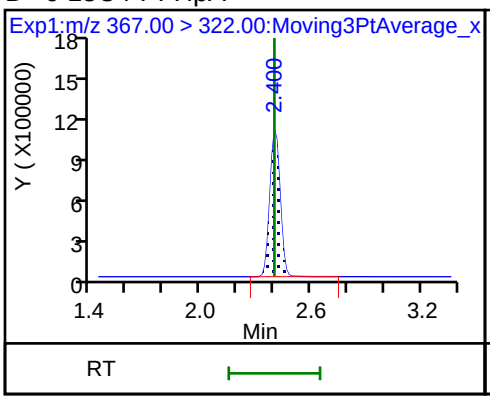
10 Perfluoroheptanoic acid



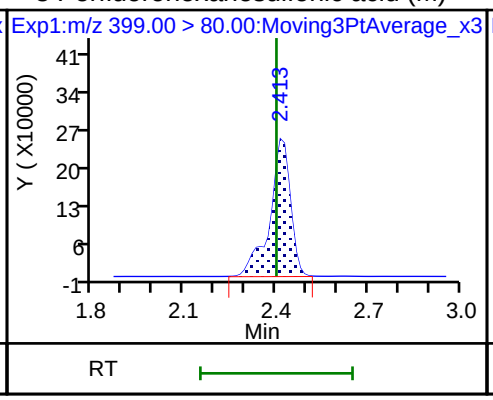
10 Perfluoroheptanoic acid



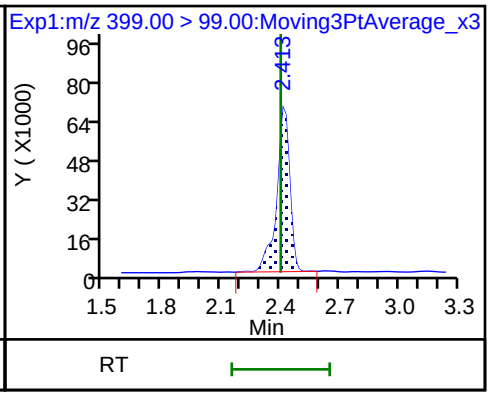
D 9 13C4-PFHpA



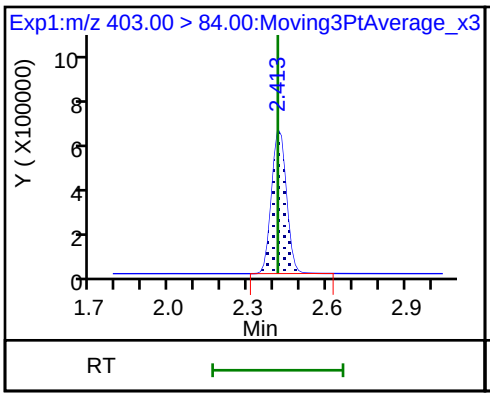
8 Perfluorohexanesulfonic acid (M)



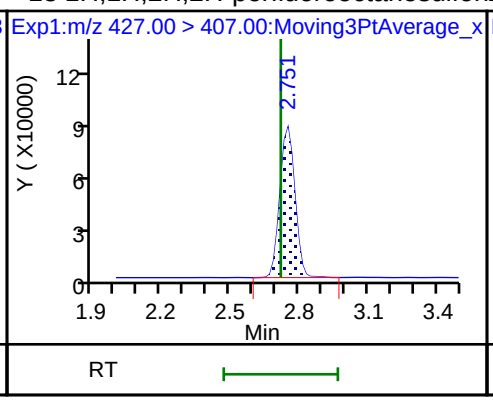
8 Perfluorohexanesulfonic acid



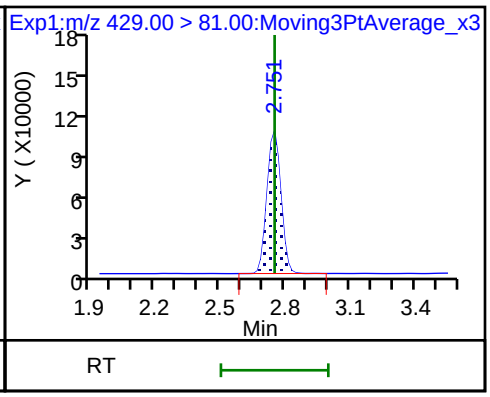
D 11 18O2 PFHxS



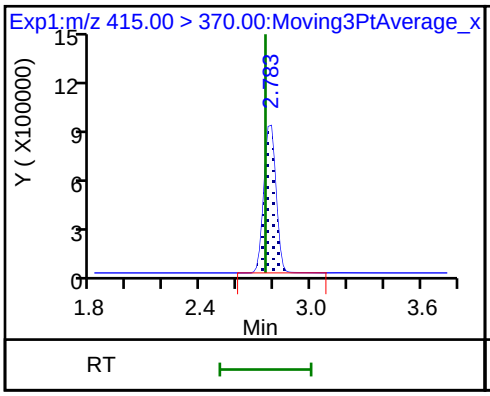
13 1H,1H,2H,2H-perfluorooctanesulfon



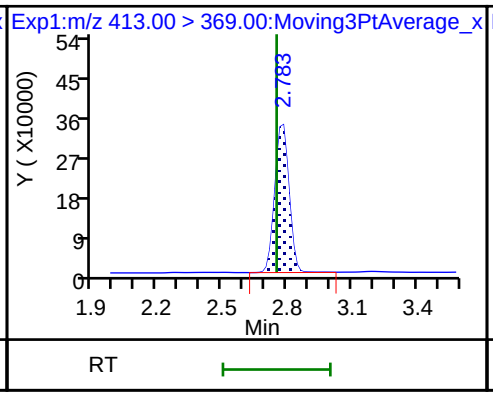
D 12 M2-6:2FTS



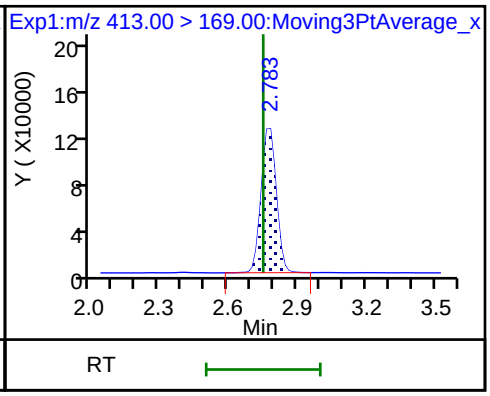
* 62 13C2-PFOA



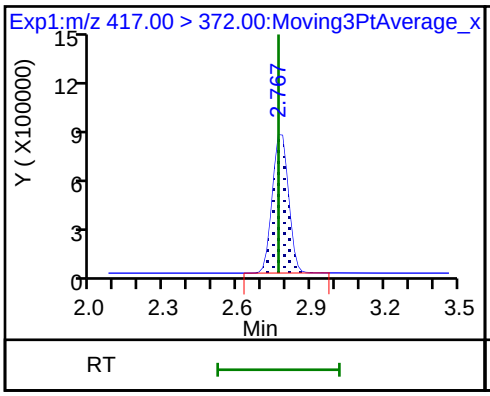
15 Perfluorooctanoic acid



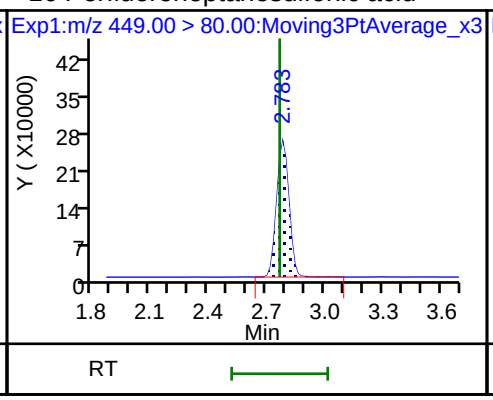
15 Perfluorooctanoic acid



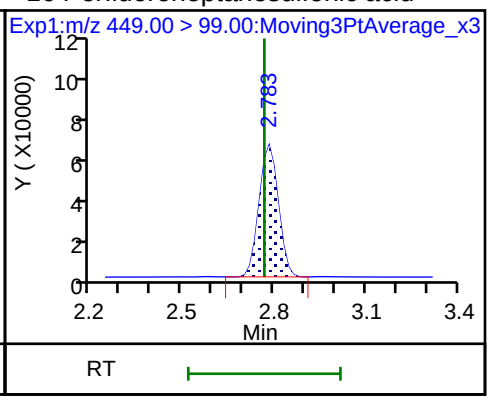
D 14 13C4 PFOA



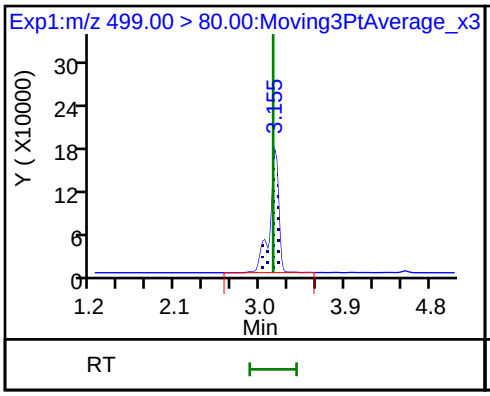
16 Perfluoroheptanesulfonic acid



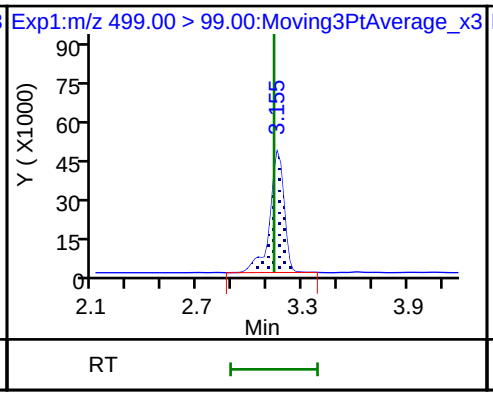
16 Perfluoroheptanesulfonic acid



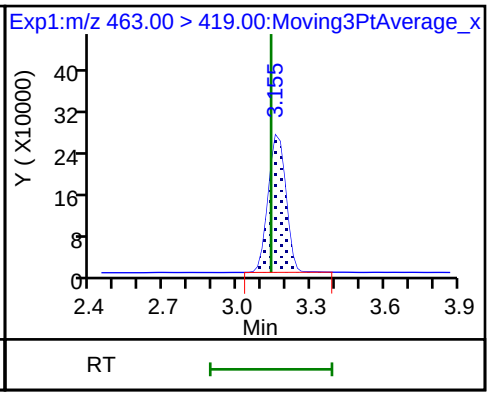
17 Perfluorooctane sulfonic acid



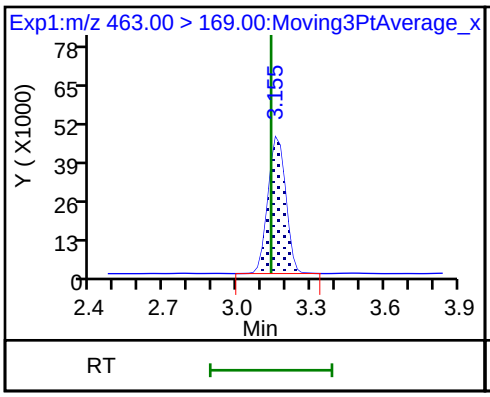
17 Perfluorooctane sulfonic acid



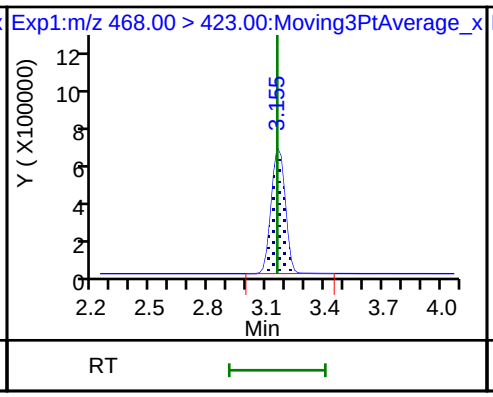
20 Perfluorononanoic acid



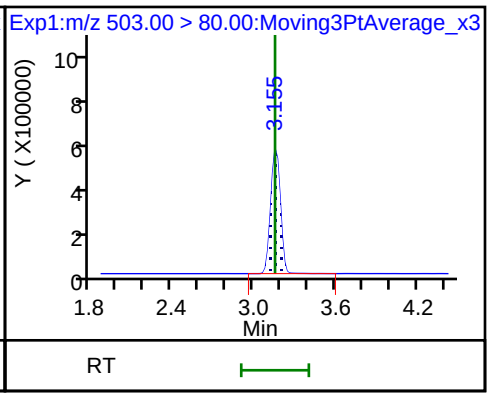
20 Perfluorononanoic acid



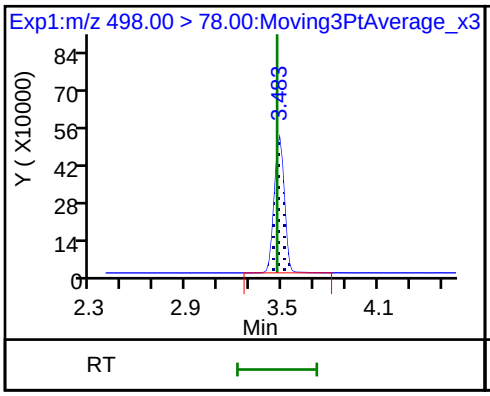
D 19 13C5 PFNA



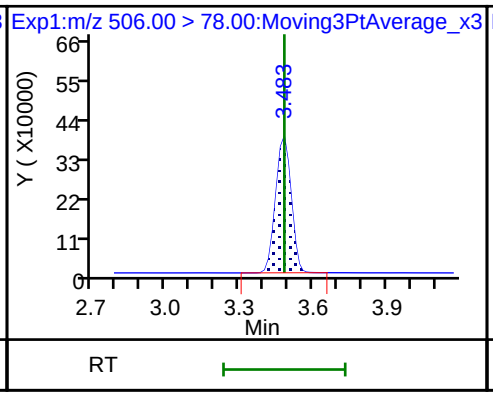
D 18 13C4 PFOS



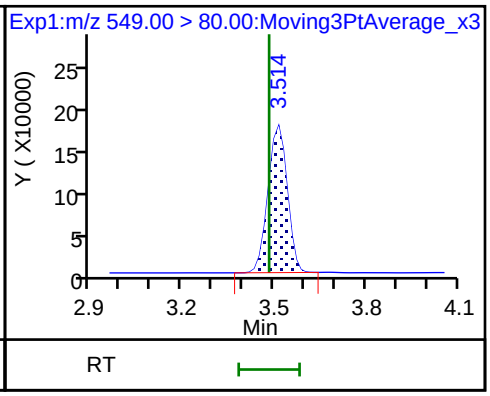
22 Perfluorooctane Sulfonamide



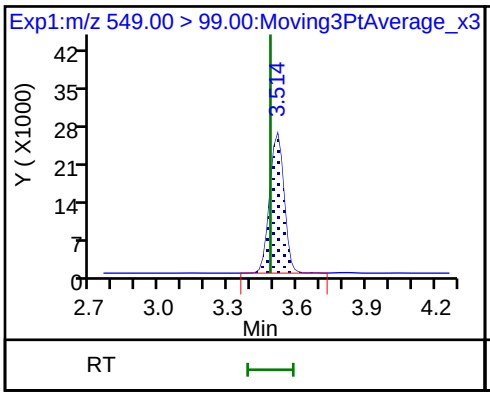
D 21 13C8 FOSA



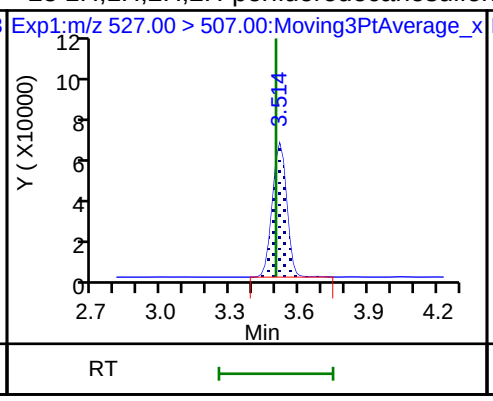
68 Perfluorononanesulfonic acid



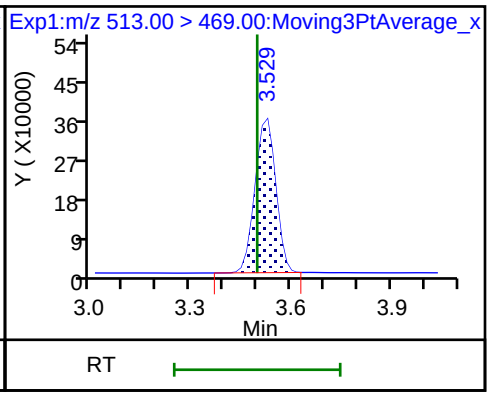
68 Perfluorononanesulfonic acid



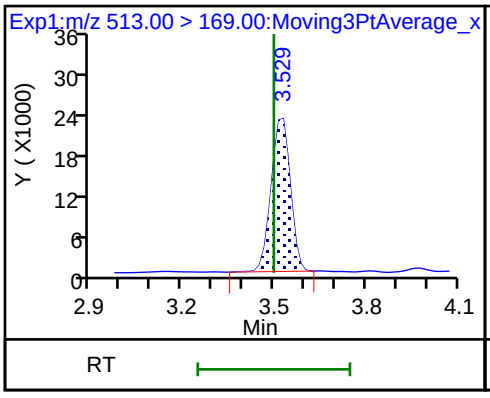
25 1H,1H,2H,2H-perfluorodecanesulfoni



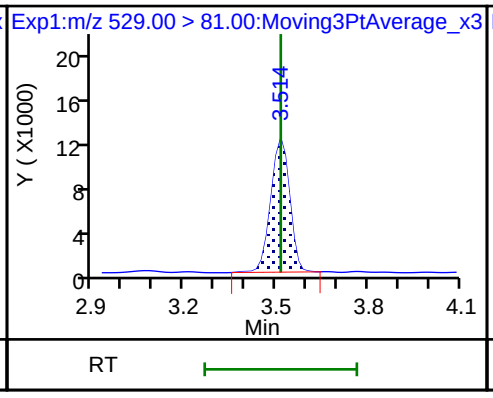
24 Perfluorodecanoic acid



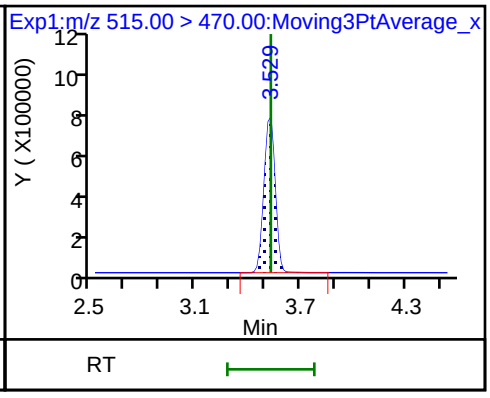
24 Perfluorodecanoic acid



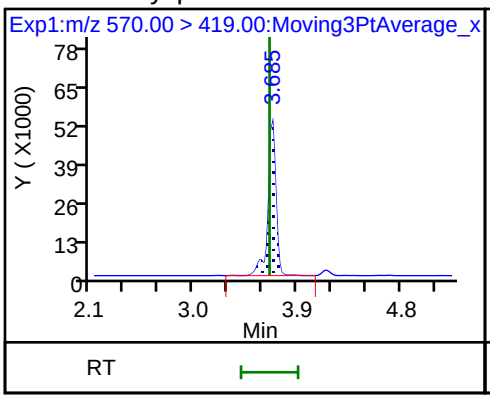
D 26 M2-8:2FTS



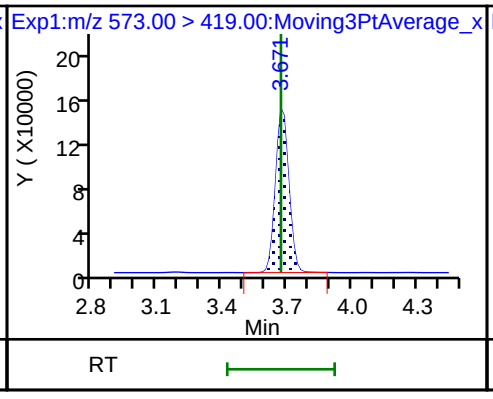
D 23 13C2 PFDA



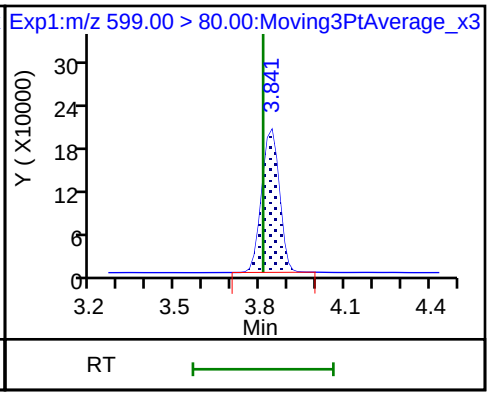
28 N-methyl perfluorooctane sulfonami



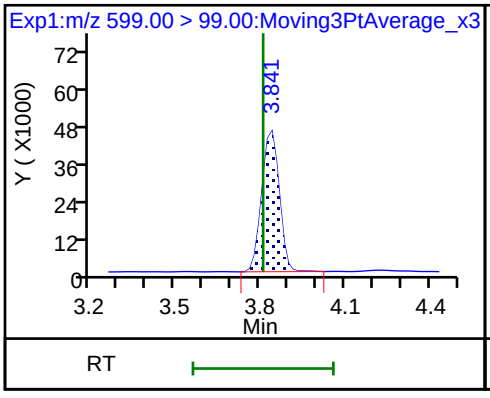
D 27 d3-NMeFOSAA



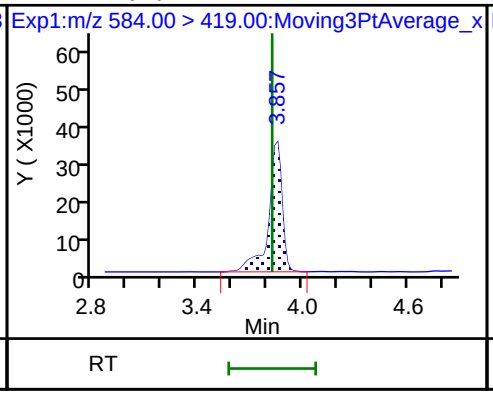
29 Perfluorodecane Sulfonic acid



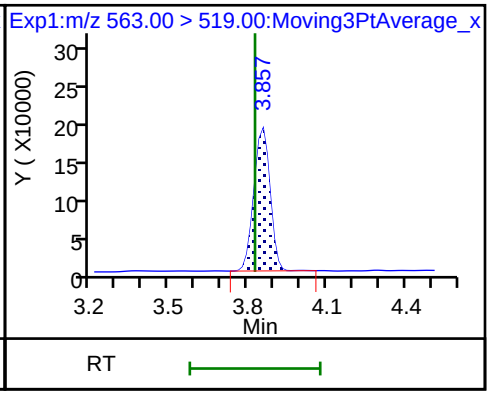
29 Perfluorodecane Sulfonic acid



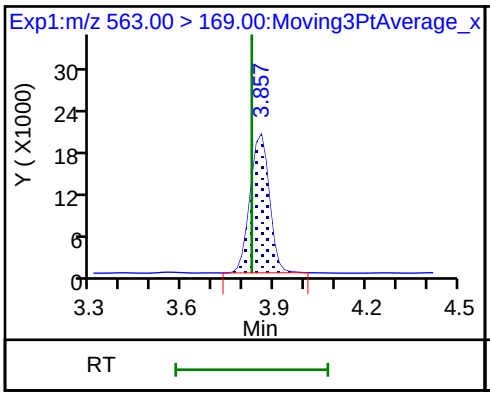
33 N-ethyl perfluorooctane sulfonamid



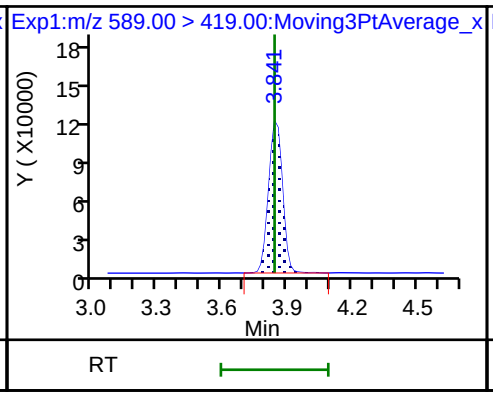
31 Perfluoroundecanoic acid



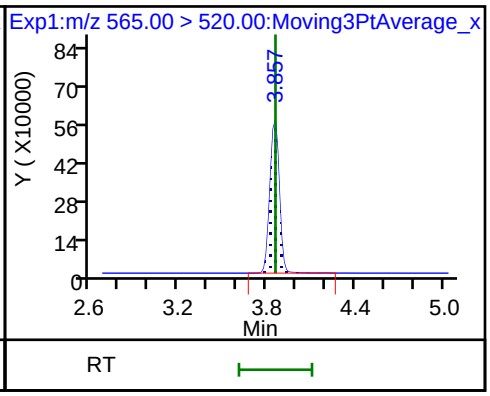
31 Perfluoroundecanoic acid



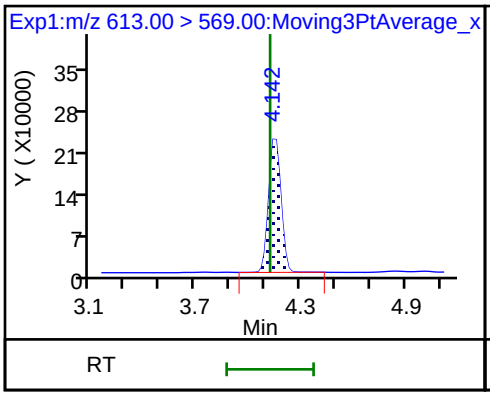
D 32 d5-NEtFOSAA



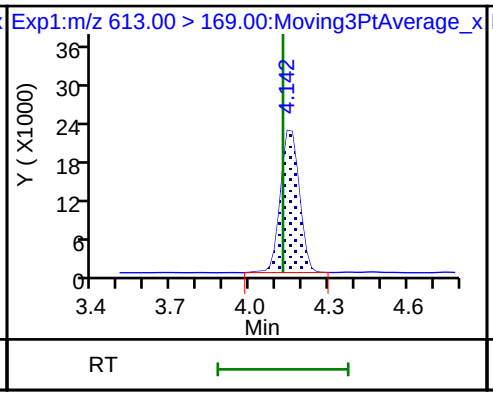
D 30 13C2 PFUnA



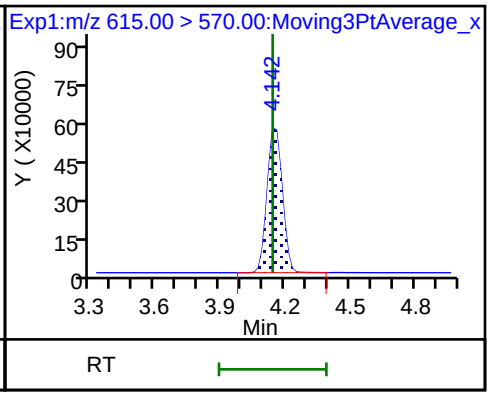
37 Perfluorododecanoic acid



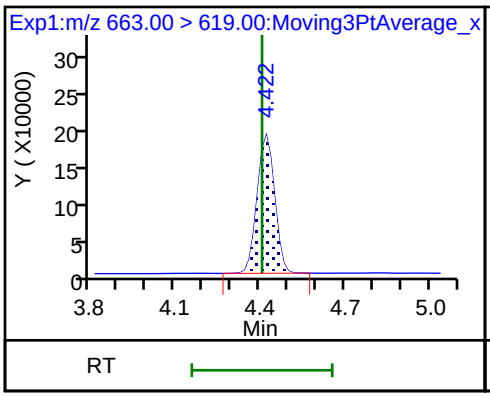
37 Perfluorododecanoic acid



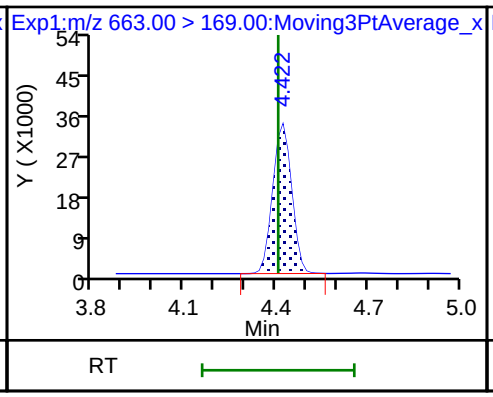
D 36 13C2 PFDoA



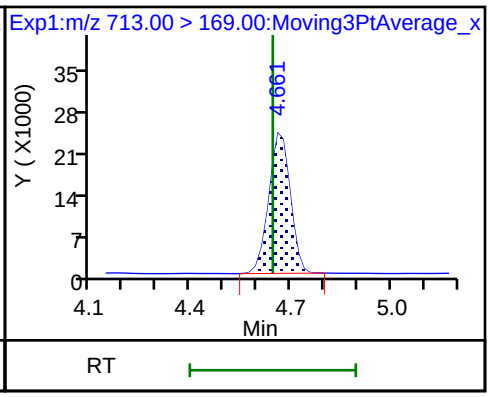
41 Perfluorotridecanoic acid



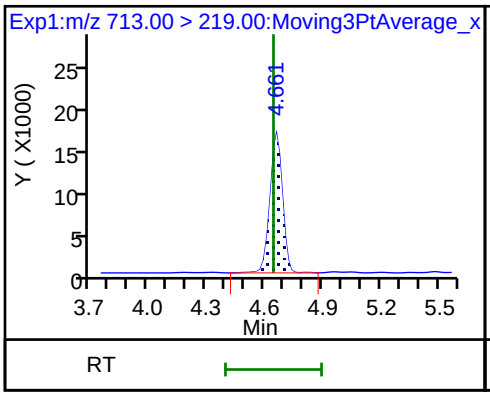
41 Perfluorotridecanoic acid



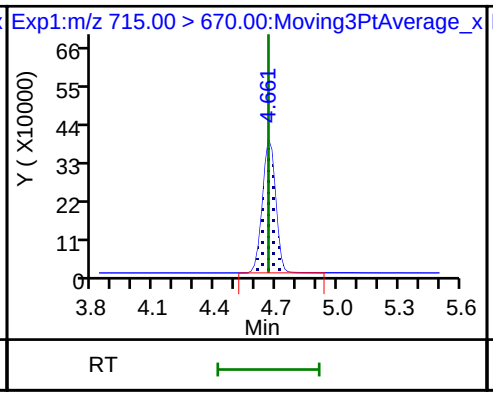
42 Perfluorotetradecanoic acid



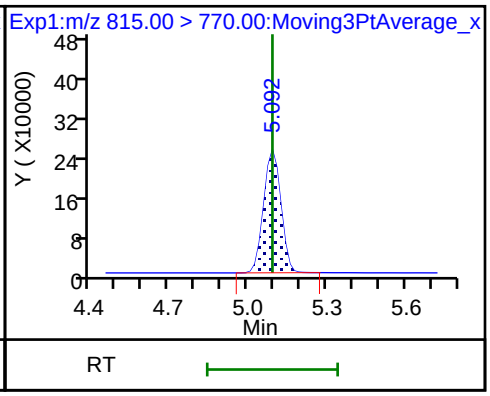
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

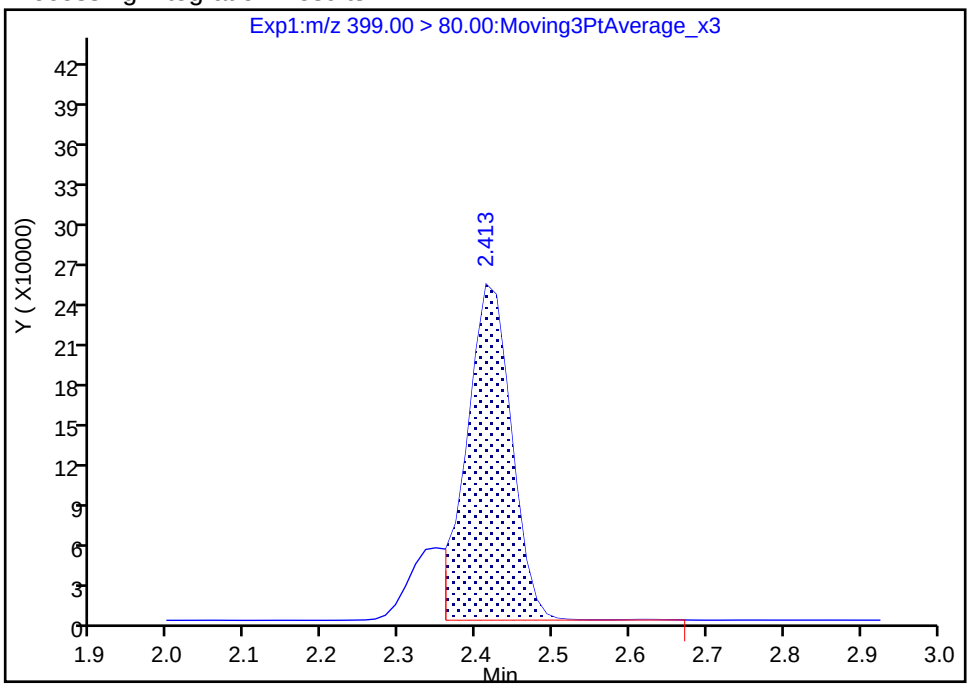
Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_008.d
Injection Date: 11-Aug-2018 20:52:06 Instrument ID: A9
Lims ID: LCS 320-239407/2-A
Client ID:
Operator ID: A9\Administrator ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

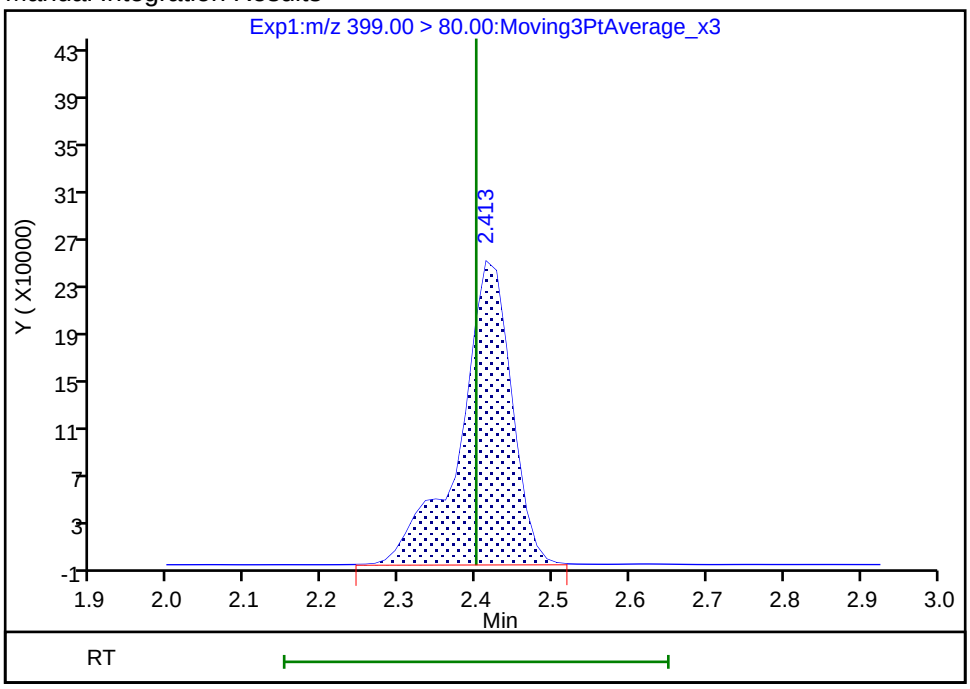
Processing Integration Results

RT: 2.41
Area: 1010126
Amount: 0.762838
Amount Units: ng/ml



Manual Integration Results

RT: 2.41
Area: 1186326
Amount: 0.895903
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:27:31
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 MS | Lab Sample ID: 320-41998-3 MS

Matrix: Water | Lab File ID: 2018.08.11LA9A_012.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 13:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 265.5(mL) | Date Analyzed: 08/11/2018 21:22

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.: 239432 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.260	H 4	0.0019	0.00094	0.00044
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.119	H	0.0019	0.0014	0.00057
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.433*	*H J1 4 M*	*0.0019*	0.0014	*0.00051*
375-95-1	Perfluorononanoic acid (PFNA)	0.0382	H	0.0019	0.0014	0.00049
335-76-2	Perfluorodecanoic acid (PFDA)	0.0379	H	0.0019	0.00094	0.00045
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0379	H	0.0019	0.0014	0.00068
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0389	H	0.0019	0.0014	0.00049
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0394	H	0.0038	0.0028	0.00072
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0353	H	0.0038	0.0028	0.00078
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0823	H	0.0019	0.00094	0.00043
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.247	H 4	0.0019	0.00094	0.00036
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*0.600*	*H J1 4*	*0.0038*	0.0028	*0.0010*
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0356	H	0.019	0.0094	0.0028
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0379	H	0.019	0.0094	0.0026

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 MS Lab Sample ID: 320-41998-3 MS

Matrix: Water Lab File ID: 2018.08.11LA9A_012.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 13:30

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 265.5(mL) Date Analyzed: 08/11/2018 21:22

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.: 239432 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		50-150
STL01892	13C4-PFHpA	97		50-150
STL00990	13C4 PFOA	97		50-150
STL00995	13C5 PFNA	98		50-150
STL00996	13C2 PFDA	102		50-150
STL00997	13C2 PFUnA	95		50-150
STL00998	13C2 PFDoA	102		50-150
STL00994	18O2 PFHxS	90		50-150
STL02116	13C2-PFTeDA	109		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	86		50-150
STL02117	d5-NEtFOSAA	103		50-150
STL02118	d3-NMeFOSAA	108		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_012.d
Lims ID: 320-41998-A-3-E MS
Client ID: TW03S-20180713
Sample Type: MS
Inject. Date: 11-Aug-2018 21:22:10 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41998-a-3-e ms
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 13:34:18

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	8625272	3.36		336	648	
D 1 13C4 PFBA										
217.00 > 172.00	1.489	1.494	-0.005	0.541	6901496	2.18		87.3	9951	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.005	15460521	6.08		608	443	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.772	-0.016	0.638	6230867	2.20		88.1	4496	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	8541569	2.19		247	521	
298.90 > 99.00	1.797	1.797	0.0	1.000	3109899		2.75(1.35-4.05)		688	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.805	-0.008	0.653	87980	2.01		86.4	233	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.007	0.0	1.117	592360	0.9196		98.5	2298	
D 60 M2-4:2FTS										
329.00 > 81.00	1.956	2.018	-0.062	0.711	2238	NC			0.3	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	17046606	6.89		689	1027	
313.00 > 119.00	2.048	2.048	0.0	1.000	1291554		13.20(6.96-20.87)		1403	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.744	6611467	2.25		90.1	6443	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.069	-0.001	1.151	4024238	2.17		232	742	
349.00 > 99.00	2.068	2.069	-0.001	1.151	1891560		2.13(1.15-3.45)		665	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.150	0.0	1.005	567408	NC			190	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.140	2.160	-0.020	0.778	725119	NC			1876	

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	2.387	2.387	0.0	1.000	10628743	3.17		317	422	
363.00 > 169.00	2.387	2.387	0.0	1.000	2458501		4.32(2.17-6.52)		3013	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.868	8078428	2.42		96.9	9703	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	18965991	6.54		719	3644	
399.00 > 99.00	2.400	2.400	0.0	1.000	5197173		3.65(1.90-5.70)		1774	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	5357180	2.13		90.2	5068	
65 ADONA										
377.00 > 251.00	2.426	2.452	-0.026	0.774	5305452	NC			4552	
377.00 > 85.00	2.426	2.452	-0.026	0.774	2185863		2.43(1.05-3.16)		800	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.719	0.0	1.000	5276999	7.83		826	4055	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.751	-0.032	0.988	748975	2.31		97.3	713	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.751	0.0		7081441	2.50			7327	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.751	2.751	0.0	1.000	34070793	11.5		1148	2636	E
413.00 > 169.00	2.751	2.751	0.0	1.000	16239470		2.10(1.36-4.08)		2817	M
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	6765879	2.42		96.9	8346	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.767	2.767	0.0	0.882	3418100	1.49		156	236	
449.00 > 99.00	2.767	2.767	0.0	0.882	813317		4.20(1.84-5.53)		408	M
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.136	3.136	0.0	1.000	38856402	15.9		1716	3353	E
499.00 > 99.00	3.136	3.136	0.0	1.000	9441017		4.12(2.04-6.12)		4968	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.136	0.0	1.000	2520039	1.01		101	429	
463.00 > 169.00	3.136	3.136	0.0	1.000	477096		5.28(2.68-8.03)		845	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.155	-0.019	1.140	5894961	2.46		98.4	6588	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.155	-0.019	1.140	5436595	2.08		87.1	2909	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.353	3.353	0.0	1.069	2593900	NC			2457	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	4591803	1.08		108	3313	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.483	-0.016	1.260	3466250	2.22		88.8	5022	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.498	3.483	0.015	1.115	1526979	1.03		107	341	
549.00 > 99.00	3.498	3.483	0.015	1.115	263226		5.80(3.02-9.05)		777	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.498	3.498	0.0	1.000	543924	0.9145		95.5	2179	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.514	3.498	0.016	1.000	3023196	1.01		101	581	
513.00 > 169.00	3.514	3.498	0.016	1.000	197748		15.29(7.12-21.35)		377	
D 26 M2-8:2FTS										
529.00 > 81.00	3.498	3.514	-0.016	1.272	101611	2.70		113	449	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.529	-0.015	1.277	6108534	2.54		102	11115	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.657	0.0	1.000	479831	0.9445		94.5	288	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.329	1256641	2.69		108	2732	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.826	3.810	0.016	1.220	1862021	0.9822		102	1869	
599.00 > 99.00	3.826	3.810	0.016	1.220	381835		4.88(2.14-6.43)		650	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.841	3.826	0.015	1.004	356649	1.01		101	669	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.841	3.826	0.015	1.000	1564732	1.01		101	225	
563.00 > 169.00	3.841	3.826	0.015	1.000	146164		10.71(5.24-15.72)		543	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.841	-0.015	1.391	987338	2.58		103	1512	
D 30 13C2 PFUnA										
565.00 > 520.00	3.841	3.857	-0.016	1.396	4620950	2.38		95.3	8267	
35 MeFOSA										
512.00 > 169.00	3.963	3.962	0.001		283044	NC			416	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.994	3.994	0.0	1.274	2799382	NC			3555	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.142	4.125	0.017	1.004	2168902	1.03		103	291	
613.00 > 169.00	4.142	4.125	0.017	1.004	207879		10.43(4.68-14.05)		719	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.125	4.125	0.0	1.179	296719	NC			937	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.142	-0.017	1.500	5344135	2.56		102	13246	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.375	4.375	0.0	1.395	179244	NC			753	
699.00 > 99.00	4.375	4.375	0.0	1.395	314165		0.57(0.28-0.83)		764	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.406	4.406	0.0	1.068	1679541	1.05		105	520	
663.00 > 169.00	4.406	4.406	0.0	1.068	265434		6.33(3.09-9.27)		1094	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.645	4.645	0.0	1.000	218773	0.9361		93.6	1011	
713.00 > 219.00	4.645	4.645	0.0	1.000	152936		1.43(0.70-2.09)		570	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.661	-0.016	1.689	3627087	2.72		109	7257	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.076	5.059	0.017	1.000	923086	NC			75.3	
813.00 > 169.00	5.076	5.059	0.017	1.000	161397		5.72(2.77-8.32)		575	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.076	5.092	-0.016	1.845	2505435	2.04		81.8	3937	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.447	5.433	0.014	1.073	456281	NC			264	
913.00 > 169.00	5.433	5.433	0.0	1.070	83035		5.50(2.55-7.64)		777	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:42 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_012.d

Injection Date: 11-Aug-2018 21:22:10 Instrument ID: A9

Lims ID: 320-41998-A-3-E MS

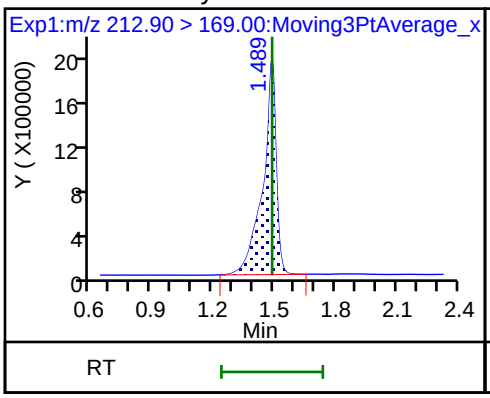
Client ID: TW03S-20180713

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

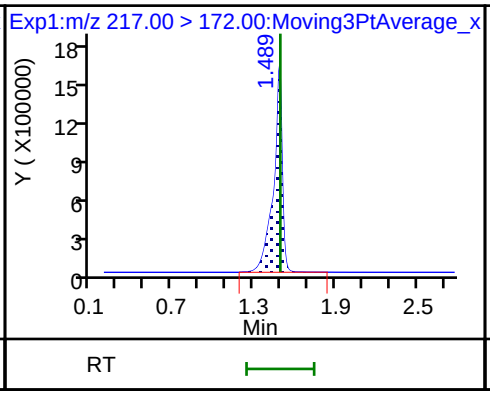
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

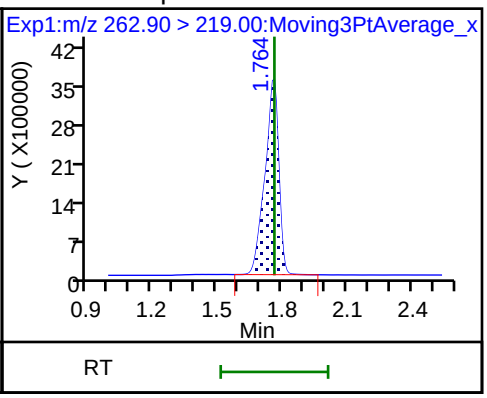
2 Perfluorobutyric acid



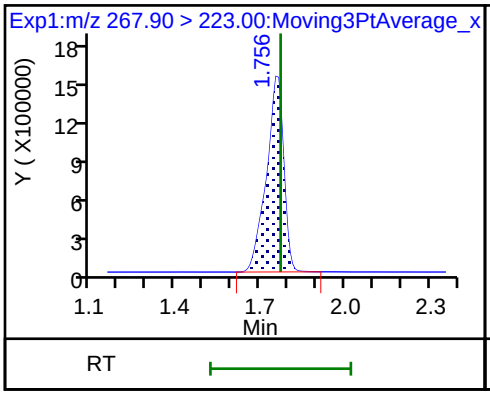
D 1 13C4 PFBA



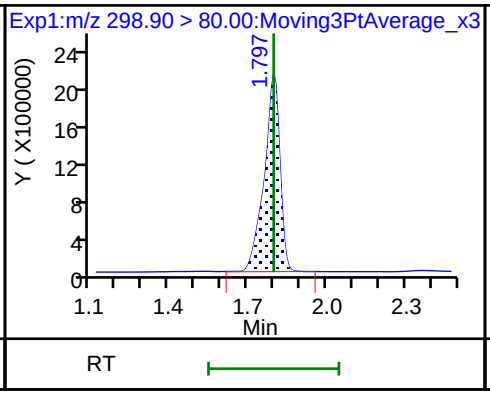
4 Perfluoropentanoic acid



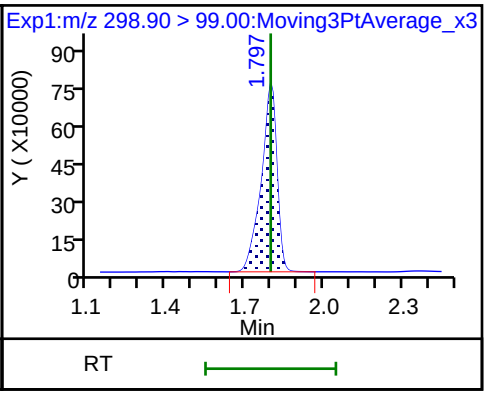
D 3 13C5-PFPeA



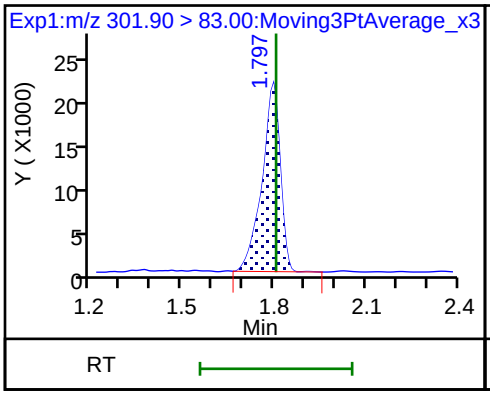
5 Perfluorobutanesulfonic acid



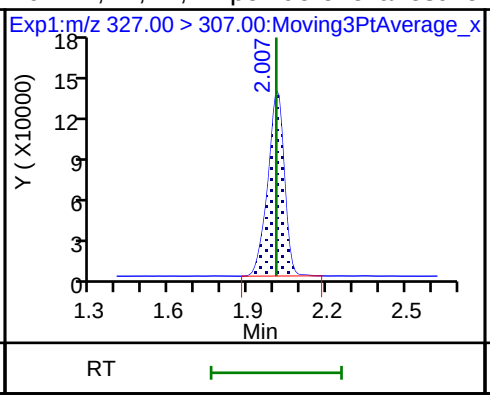
5 Perfluorobutanesulfonic acid



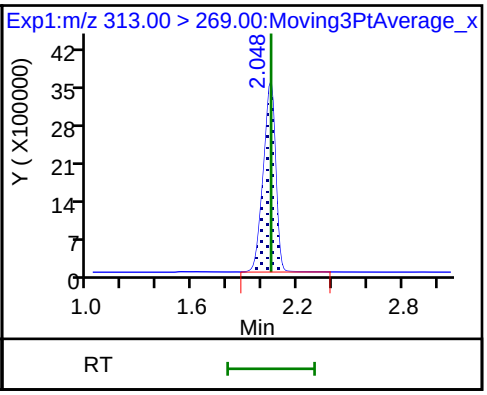
D 47 13C3-PFBS



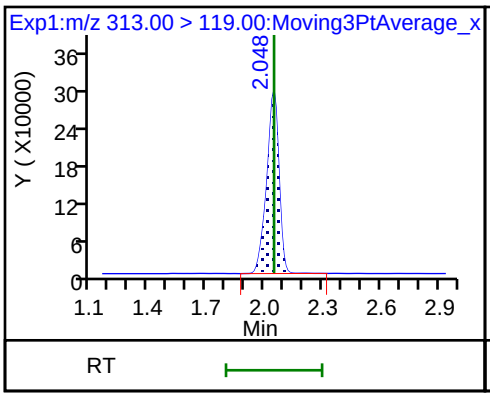
61 1H,1H,2H,2H-perfluorohexanesulfoni



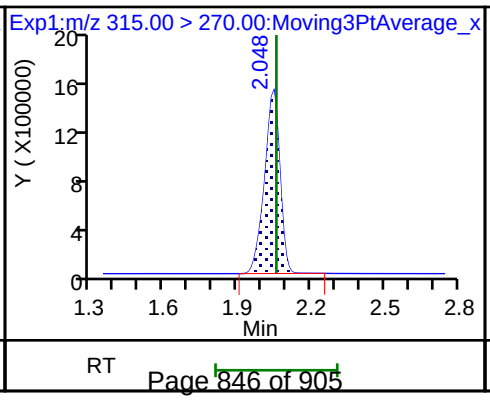
6 Perfluorohexanoic acid



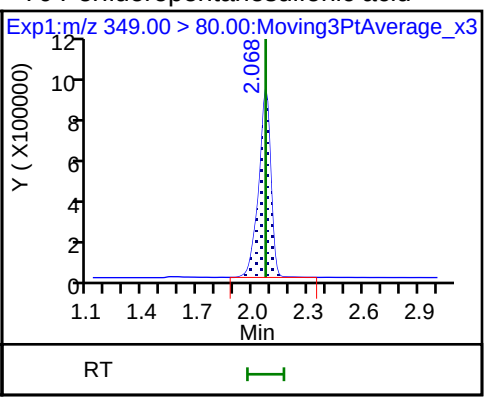
6 Perfluorohexanoic acid



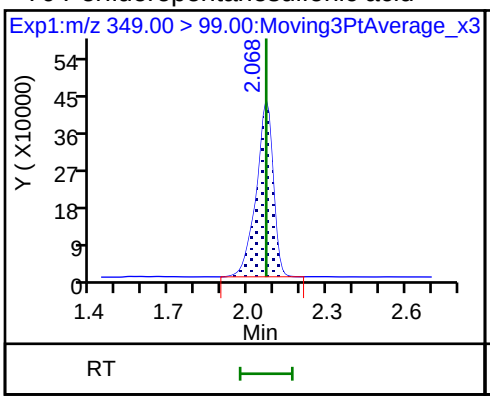
D 7 13C2 PFHxA



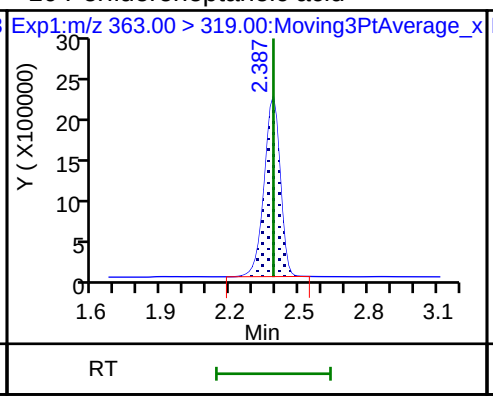
70 Perfluoropentanesulfonic acid



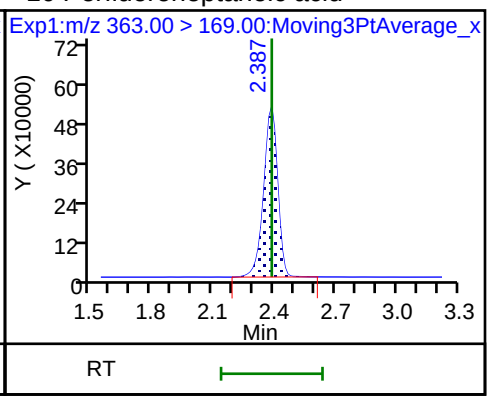
70 Perfluoropentanesulfonic acid



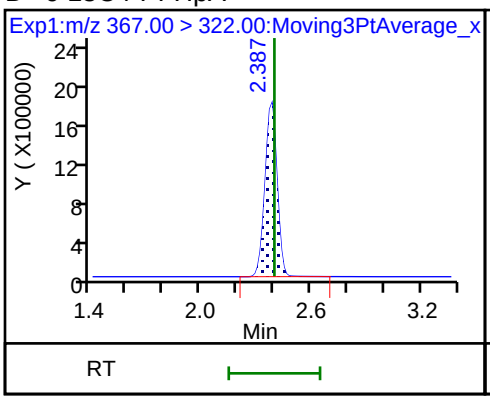
10 Perfluoroheptanoic acid



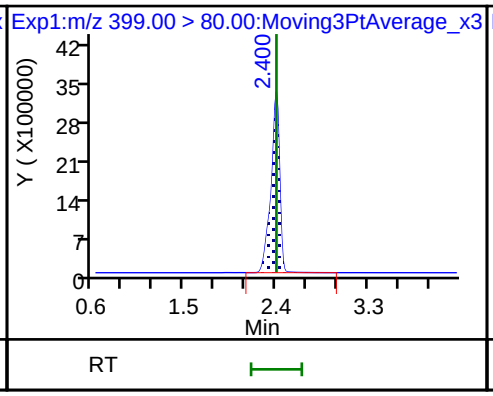
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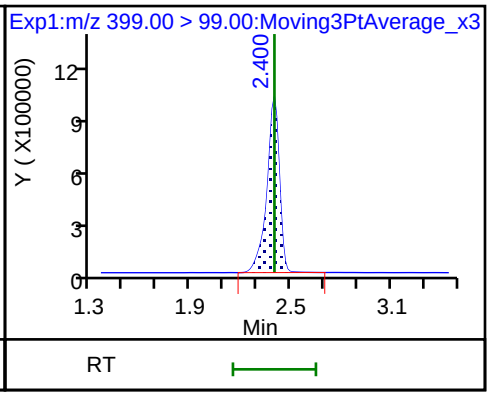
D 9 13C4-PFHpA



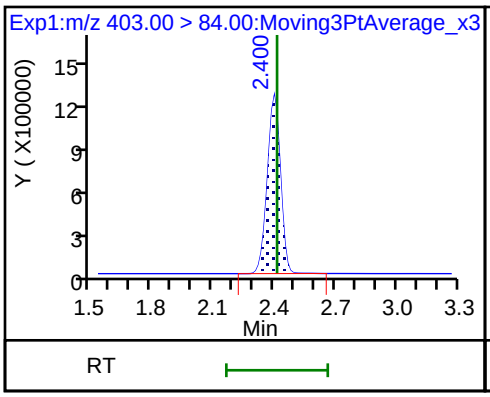
8 Perfluorohexanesulfonic acid



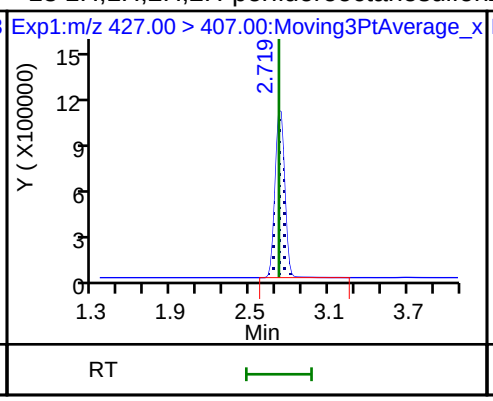
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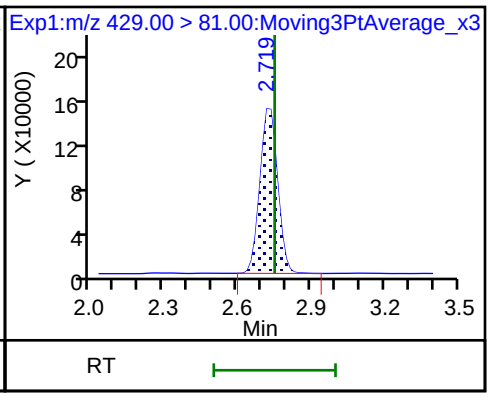
D 11 18O2 PFHxS



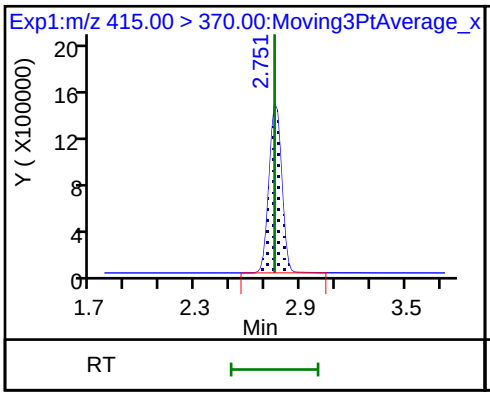
13 1H,1H,2H,2H-perfluorooctanesulfon



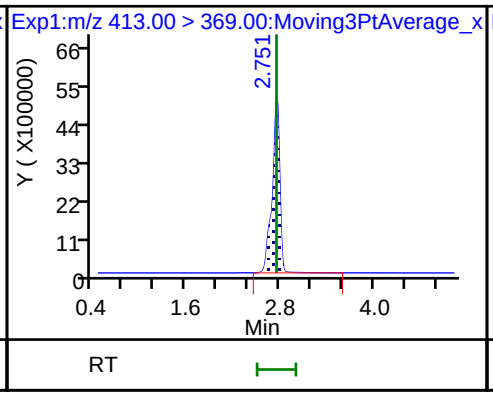
D 12 M2-6:2FTS



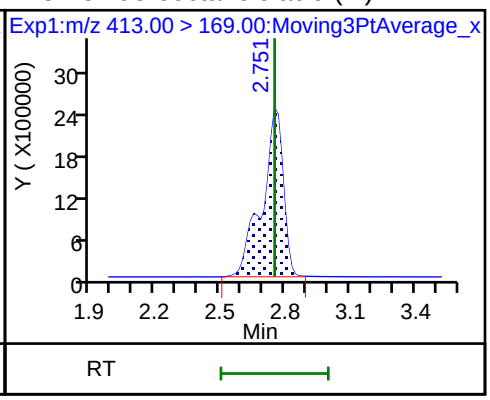
* 62 13C2-PFOA



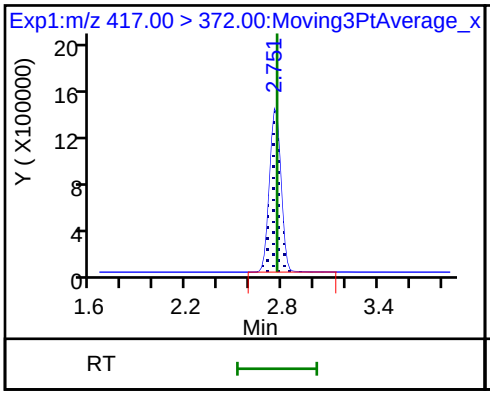
15 Perfluorooctanoic acid



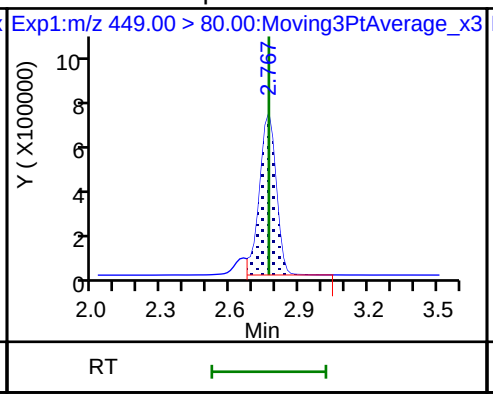
15 Perfluorooctanoic acid (M)



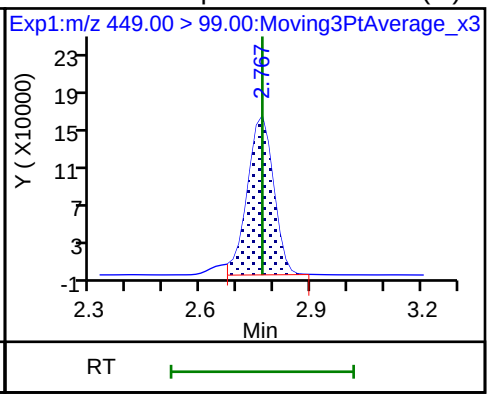
D 14 13C4 PFOA



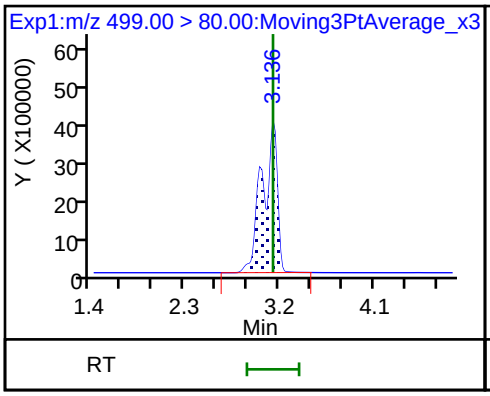
16 Perfluoroheptanesulfonic acid



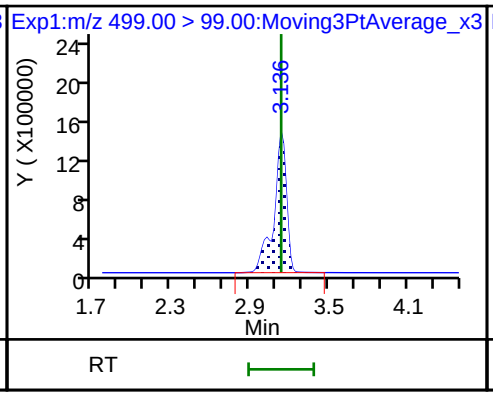
16 Perfluoroheptanesulfonic acid (M)



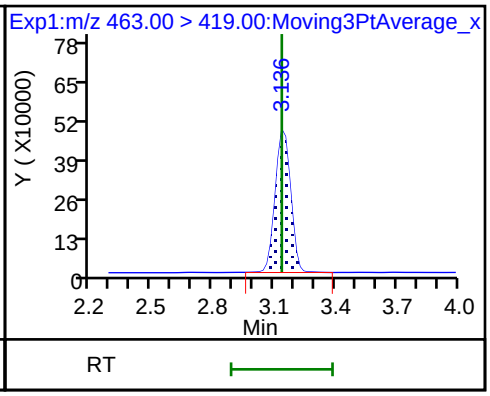
17 Perfluorooctane sulfonic acid



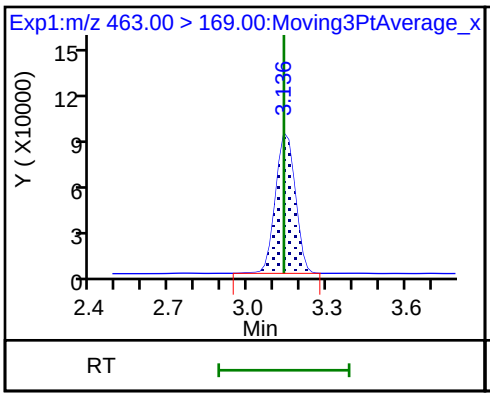
17 Perfluorooctane sulfonic acid



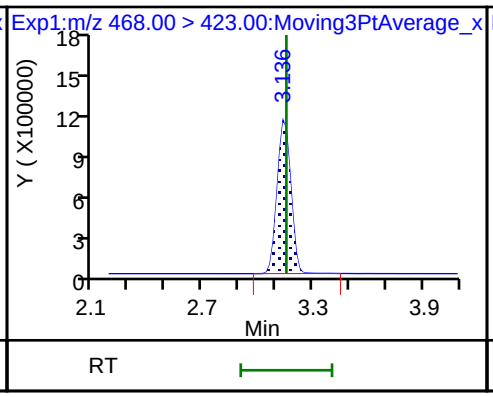
20 Perfluorononanoic acid



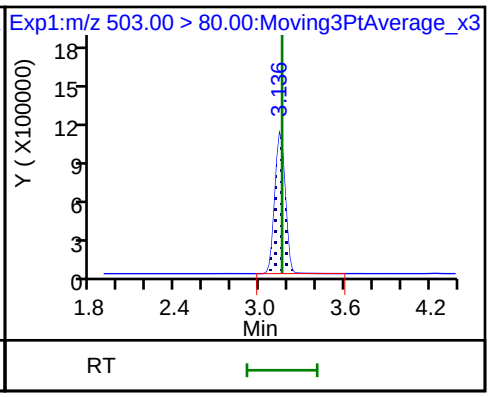
20 Perfluorononanoic acid



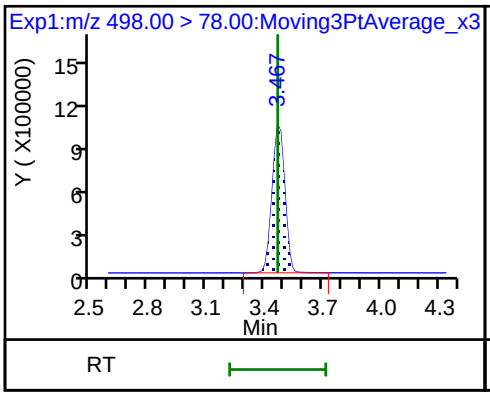
D 19 13C5 PFNA



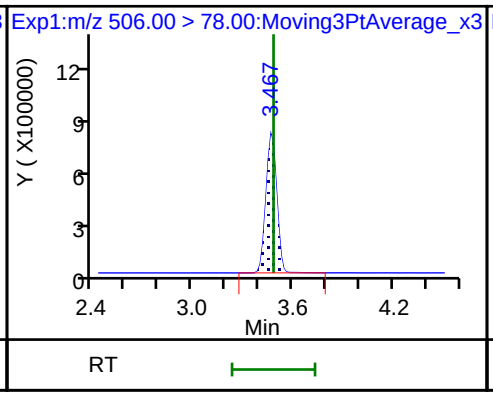
D 18 13C4 PFOS



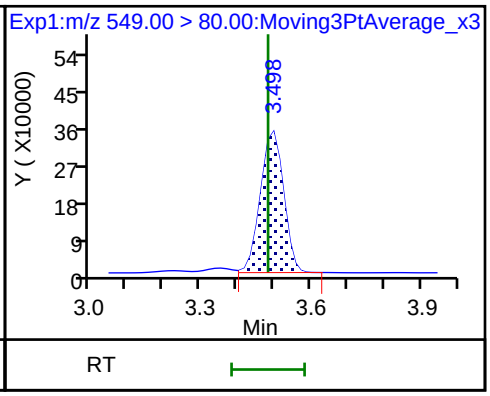
22 Perfluorooctane Sulfonamide



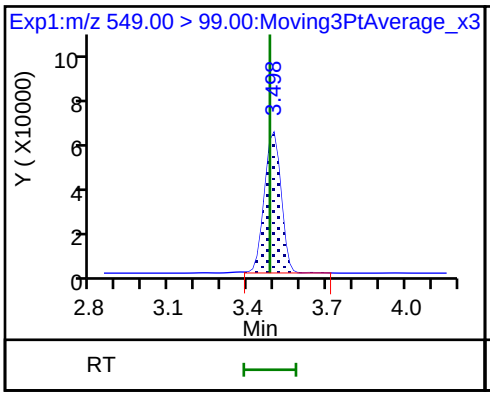
D 21 13C8 FOSA



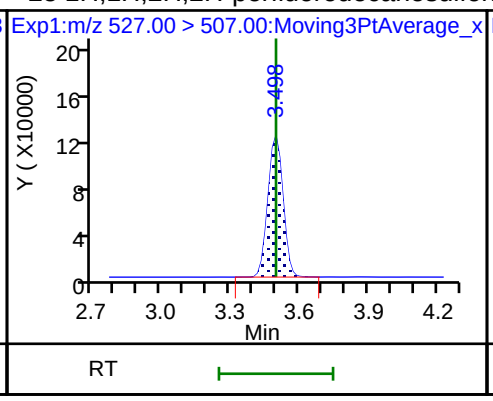
68 Perfluorononanesulfonic acid



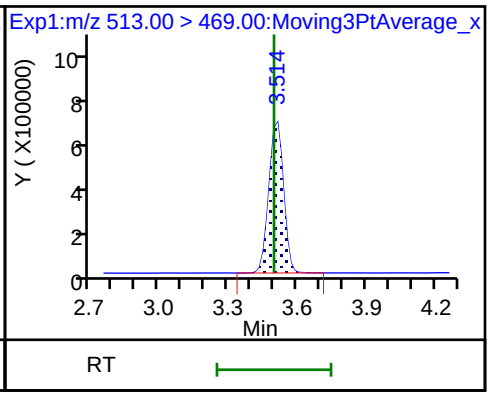
68 Perfluorononanesulfonic acid



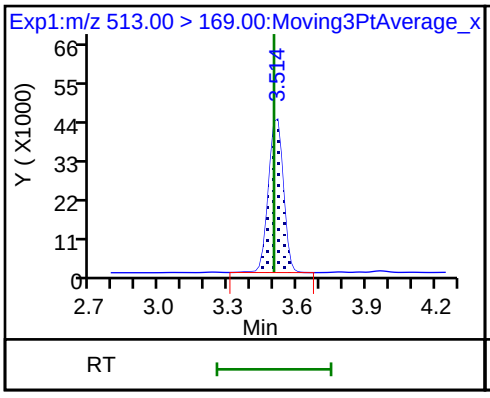
25 1H,1H,2H,2H-perfluorodecanesulfoni



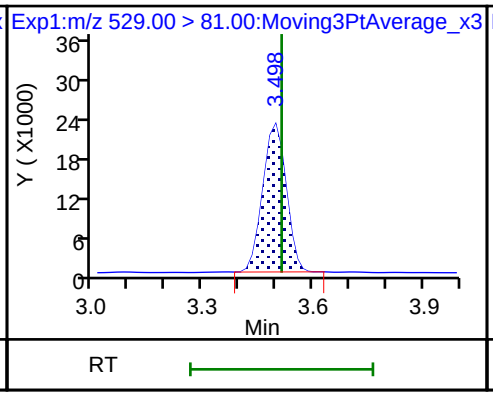
24 Perfluorodecanoic acid



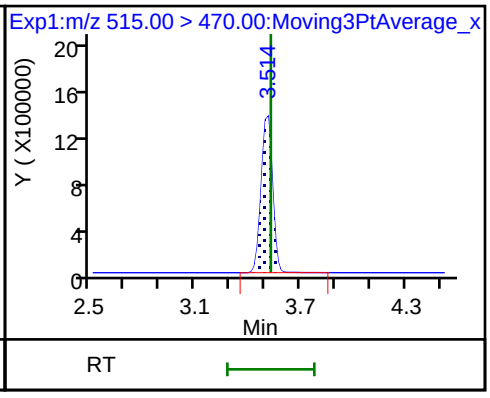
24 Perfluorodecanoic acid



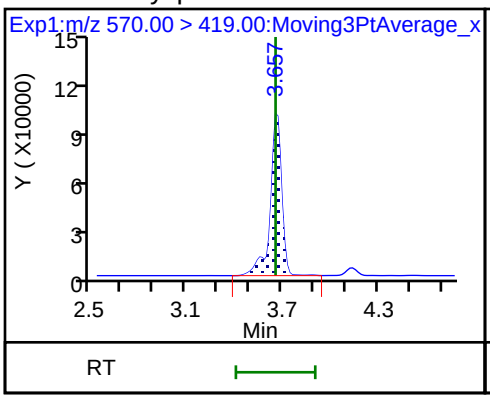
D 26 M2-8:2FTS



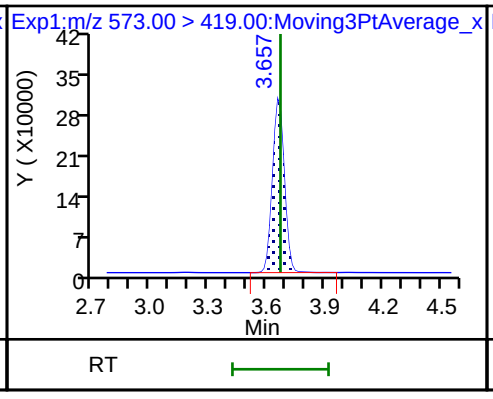
D 23 13C2 PFDA



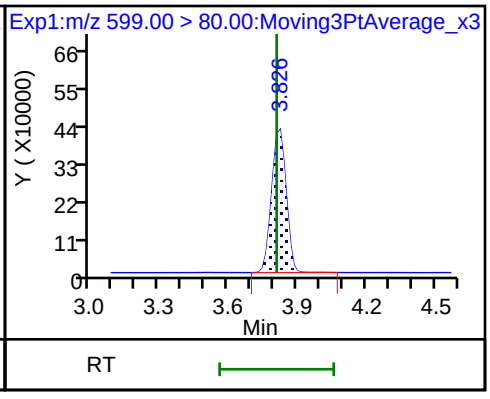
28 N-methyl perfluorooctane sulfonami



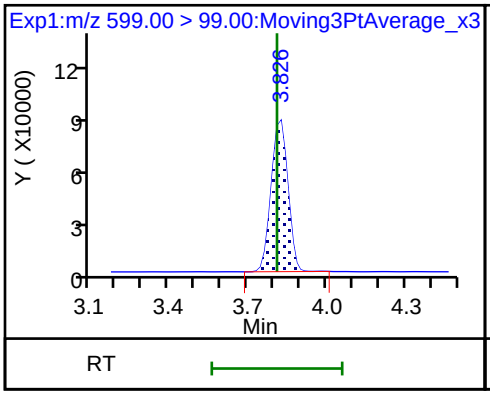
D 27 d3-NMeFOSAA



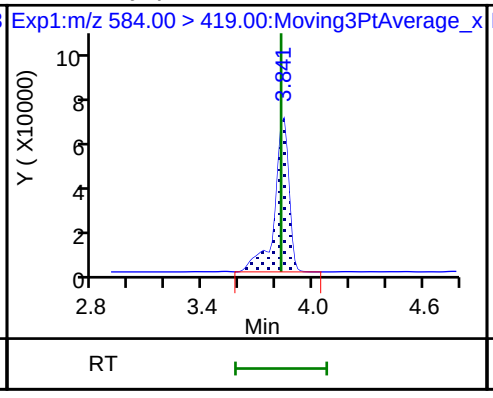
29 Perfluorodecane Sulfonic acid



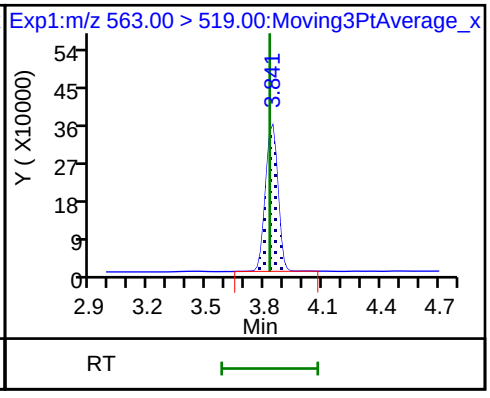
29 Perfluorodecane Sulfonic acid



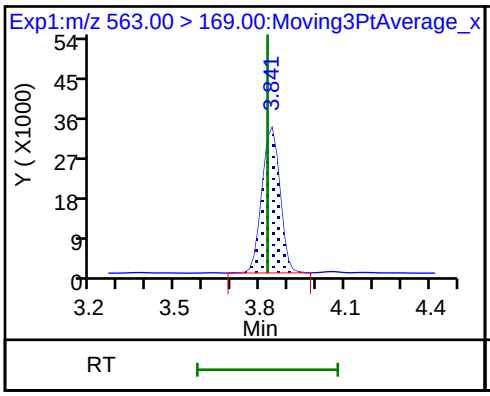
33 N-ethyl perfluorooctane sulfonamid



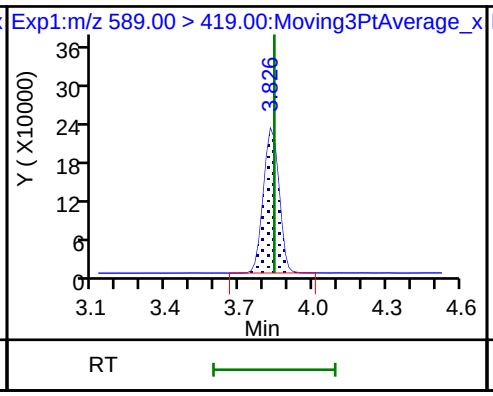
31 Perfluoroundecanoic acid



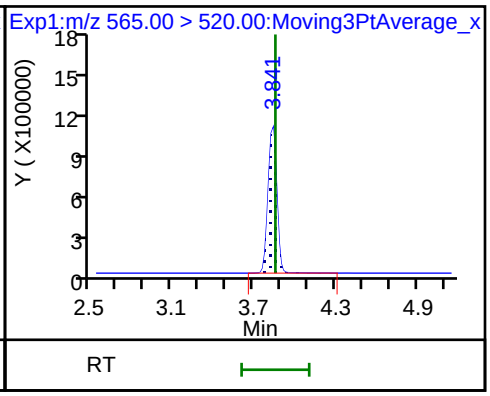
31 Perfluoroundecanoic acid



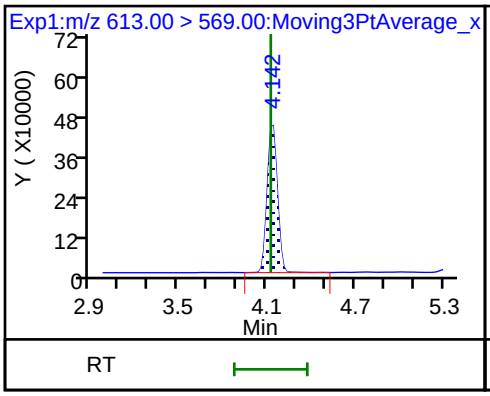
D 32 d5-NEtFOSAA



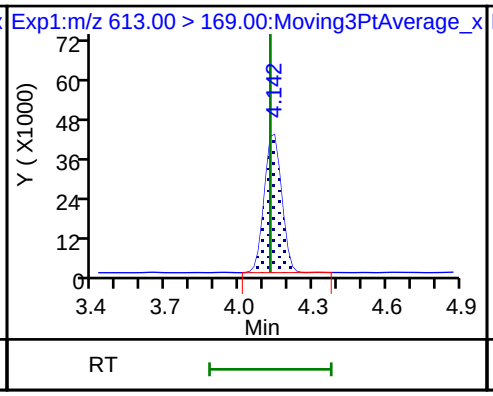
D 30 13C2 PFUnA



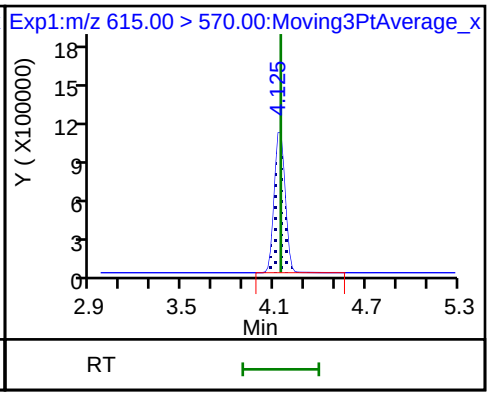
37 Perfluorododecanoic acid



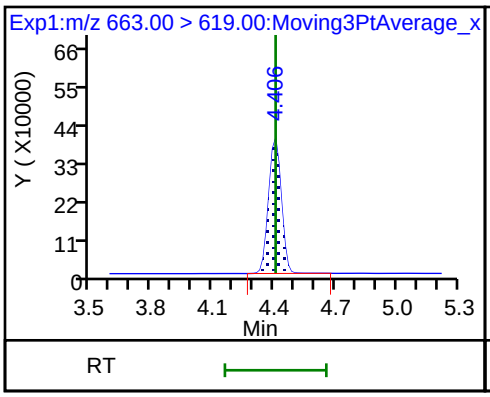
37 Perfluorododecanoic acid



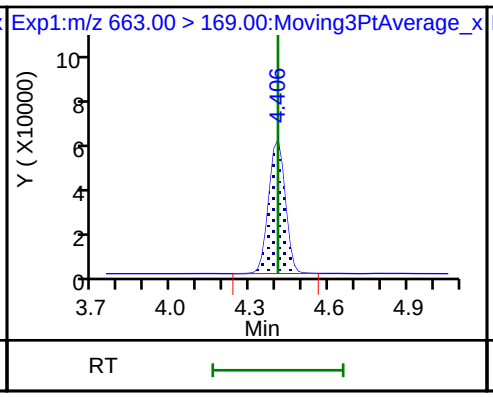
D 36 13C2 PFDoA



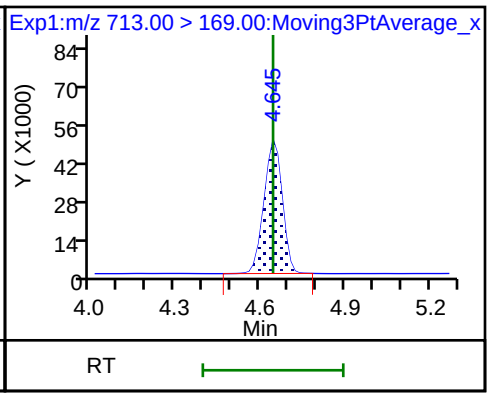
41 Perfluorotridecanoic acid



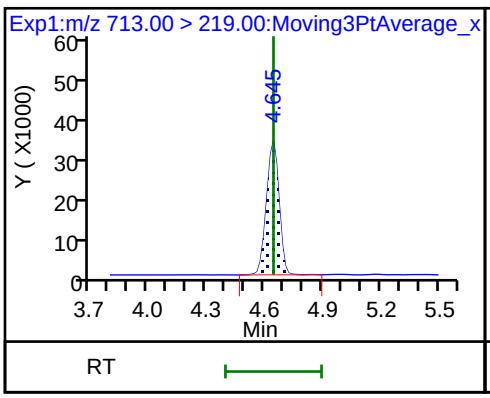
41 Perfluorotridecanoic acid



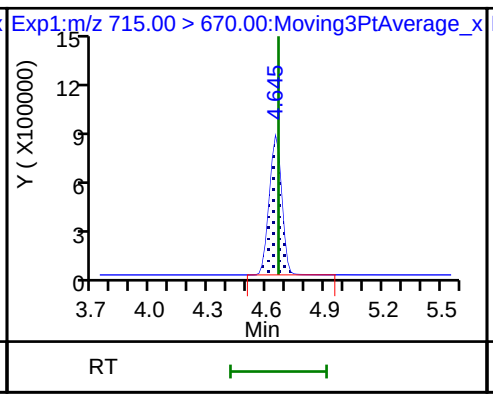
42 Perfluorotetradecanoic acid



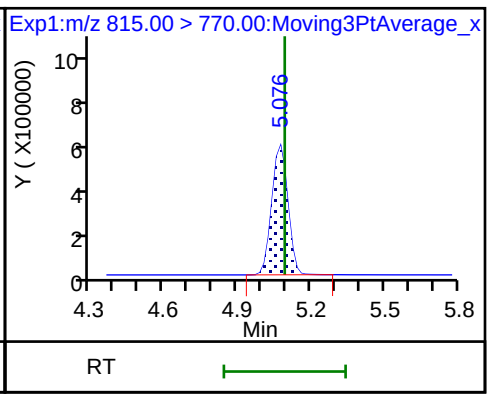
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

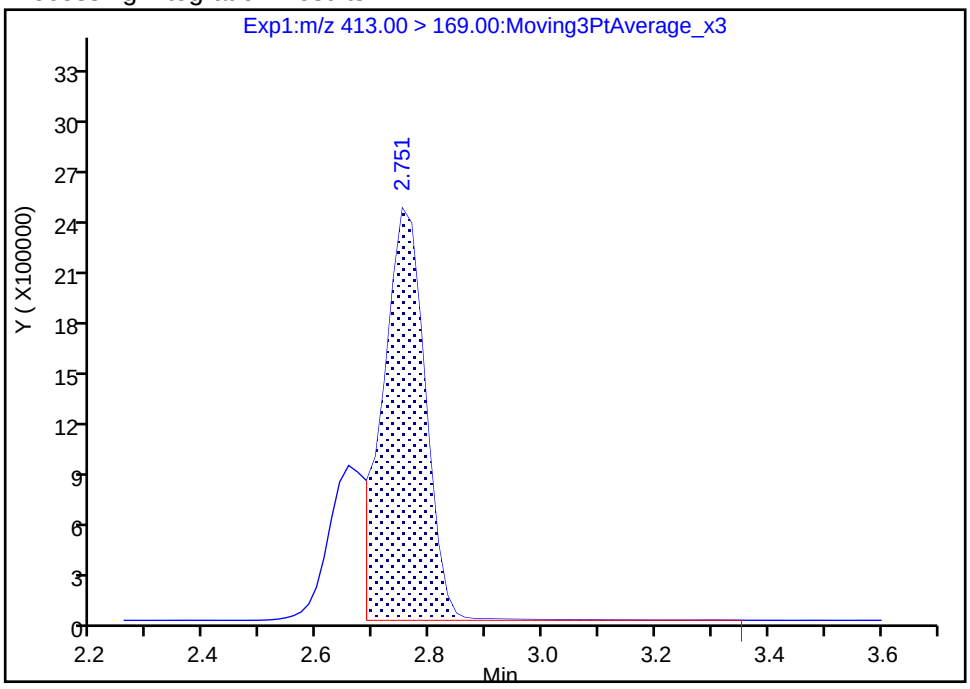
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_012.d				
Injection Date:	11-Aug-2018 21:22:10	Instrument ID:	A9		
Lims ID:	320-41998-A-3-E MS				
Client ID:	TW03S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

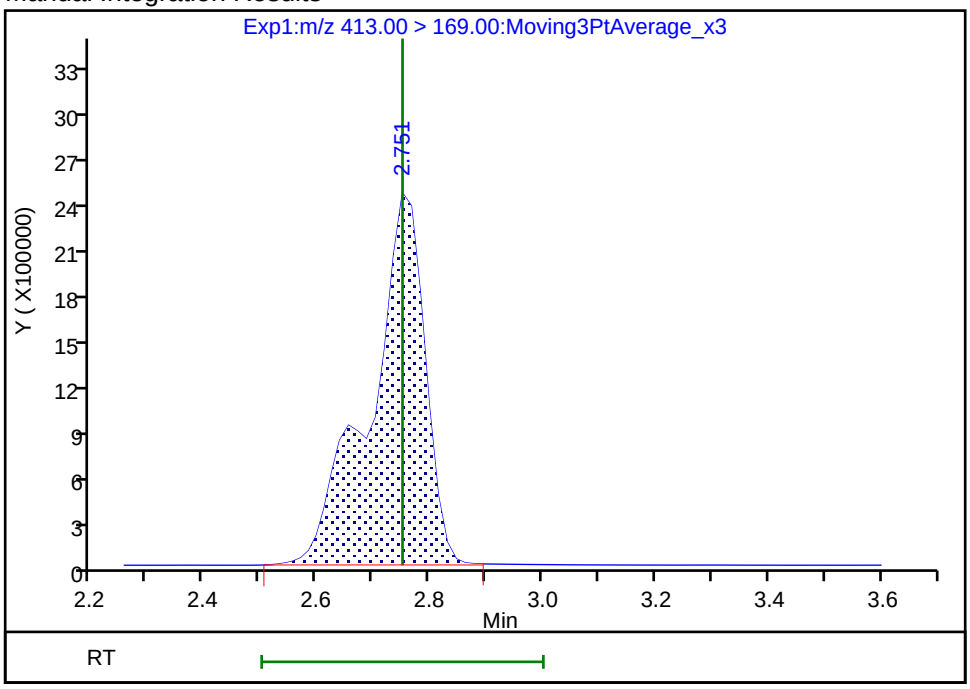
Processing Integration Results

RT: 2.75
Area: 12413475
Amount: 11.490476
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 16239470
Amount: 11.490476
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:33:27

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 MS DL | Lab Sample ID: 320-41998-3 MS DL

Matrix: Water | Lab File ID: 2018.08.12LLA_010.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 13:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 265.5(mL) | Date Analyzed: 08/12/2018 11:10

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

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

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

Analysis Batch No.: 239460 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*0.275*	*H 4 D*	*0.0094*	0.0047	*0.0022*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.125*	*H D*	*0.0094*	0.0071	*0.0029*
335-67-1	Perfluorooctanoic acid (PFOA)	0.516	H 4 D M	0.0094	0.0071	0.0025
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.0417*	*H D*	*0.0094*	0.0071	*0.0024*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.0367*	*H D*	*0.0094*	0.0047	*0.0023*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*0.0356*	*H D*	*0.0094*	0.0071	*0.0034*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.0401*	*H D*	*0.0094*	0.0071	*0.0024*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*0.0373*	*H D*	*0.019*	0.014	*0.0036*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*0.0383*	*H D*	*0.019*	0.014	*0.0039*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.0931*	*H J1 D*	*0.0094*	0.0047	*0.0022*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*0.263*	*H 4 D*	*0.0094*	0.0047	*0.0018*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.681	H 4 D	0.019	0.014	0.0052
2355-31-9	*N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)*	*0.0374*	*J H D*	*0.094*	0.047	*0.014*
2991-50-6	*N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)*	*0.0402*	*J H D*	*0.094*	0.047	*0.013*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 MS DL Lab Sample ID: 320-41998-3 MS DL

Matrix: Water Lab File ID: 2018.08.12LLA_010.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 13:30

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 265.5(mL) Date Analyzed: 08/12/2018 11:10

Con. Extract Vol.: 10.00(mL) Dilution Factor: 5

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

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

Analysis Batch No.: 239460 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	97		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	99		50-150
STL00996	13C2 PFDA	104		50-150
STL00997	13C2 PFUnA	95		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	89		50-150
STL00991	13C4 PFOS	85		50-150
STL02337	13C3-PFBS	76		50-150
STL02117	d5-NEtFOSAA	103		50-150
STL02118	d3-NMeFOSAA	103		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_010.d
Lims ID: 320-41998-A-3-E MS
Client ID: TW03S-20180713
Sample Type: MS
Inject. Date: 12-Aug-2018 11:10:51 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 20.0 ul Dil. Factor: 5.0000
Sample Info: 320-41998-a-3-e mS 5X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 14:05:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 13:57:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.484	1.494	-0.010	0.539	1622321	0.4308		86.2	2561	
2 Perfluorobutyric acid										
212.90 > 169.00	1.489	1.494	-0.005	1.004	2055972	0.6819		341	74.1	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.756	1.764	-0.008	1.000	3800952	1.30		648	171	
D 3 13C5-PFPeA										
267.90 > 223.00	1.756	1.764	-0.008	0.638	1436740	0.4267		85.3	2188	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.806	-0.009	1.000	2014105	0.4944		280	315	
298.90 > 99.00	1.797	1.806	-0.009	1.000	689848		2.92(1.35-4.05)		219	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.806	-0.009	0.653	18340	0.3517		75.6	83.5	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.007	2.017	-0.010	1.117	127220	0.1895		101	762	
D 60 M2-4:2FTS										
329.00 > 81.00	2.130	2.018	0.112	0.774	690	NC			0.5	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.038	2.048	-0.010	0.995	4181950	1.46		730	595	
313.00 > 119.00	2.048	2.048	0.0	1.000	297841		14.04(6.96-20.87)		540	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.745	1530451	0.4379		87.6	3282	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.069	2.079	-0.010	1.151	910124	0.4718		252	673	
349.00 > 99.00	2.069	2.079	-0.010	1.151	433723		2.10(1.15-3.45)		267	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.140	2.150	-0.010	1.000	122483	NC			66.5	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.140	2.161	-0.021	0.778	161605	NC			887	

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	2.387	2.400	-0.013	1.006	2638049	0.6630		332	191	
363.00 > 169.00	2.387	2.400	-0.013	1.006	560814		4.70(2.17-6.52)		852	
D 9 13C4-PFHpA										
367.00 > 322.00	2.374	2.400	-0.026	0.863	1915838	0.4827		96.5	4698	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.413	-0.013	1.000	4448952	1.40		768	1788	
399.00 > 99.00	2.400	2.413	-0.013	1.000	1151517		3.86(1.90-5.70)		466	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	1176654	0.3938		83.3	5159	
65 ADONA										
377.00 > 251.00	2.426	2.439	-0.013	0.774	1311750	NC			2278	
377.00 > 85.00	2.426	2.439	-0.013	0.774	529407		2.48(1.05-3.16)		317	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.719	2.735	-0.016	1.000	1416702	1.63		857	1034	
D 12 M2-6:2FTS										
429.00 > 81.00	2.719	2.735	-0.016	0.988	193739	0.5022		106	271	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.767	-0.016		1685840	0.5000			3635	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.751	2.767	-0.016	0.877	727921	0.2722		143	174	
449.00 > 99.00	2.751	2.767	-0.016	0.877	200229		3.64(1.84-5.53)		244	M
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.751	2.767	-0.016	1.000	9930285	2.74		1369	926	
413.00 > 169.00	2.751	2.767	-0.016	1.000	3966455		2.50(1.36-4.08)		2009	M
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	1653685	0.4972		99.4	6899	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.155	-0.019	1.000	10260884	3.62		1948	2615	
499.00 > 99.00	3.136	3.155	-0.019	1.000	2083492		4.92(2.04-6.12)		2295	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.155	-0.019	1.000	661905	0.2214		111	143	
463.00 > 169.00	3.136	3.155	-0.019	1.000	116110		5.70(2.68-8.03)		269	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.155	-0.019	1.140	1417177	0.4966		99.3	2782	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.155	-0.019	1.140	1264851	0.4067		85.1	1282	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.353	3.369	-0.016	1.069	531362	NC			711	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	917115	0.2011		101	1439	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.483	-0.016	1.260	742427	0.3995		79.9	2256	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.483	3.498	-0.015	1.000	155176	0.2196		115	844	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.483	3.498	-0.015	1.110	358300	0.2068		108	233	
549.00 > 99.00	3.498	3.498	0.0	1.115	60419		5.93(3.02-9.05)		543	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.498	3.514	-0.016	1.000	714686	0.1950		97.5	158	
513.00 > 169.00	3.498	3.514	-0.016	1.000	39091		18.28(7.12-21.35)		75.5	
D 26 M2-8:2FTS										
529.00 > 81.00	3.483	3.515	-0.032	1.266	24139	0.5386		112	120	
D 23 13C2 PFDA										
515.00 > 470.00	3.498	3.530	-0.032	1.272	1490543	0.5217		104	3608	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.657	3.671	-0.014	1.000	114931	0.1988		99.4	201	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.329	286015	0.5149		103	830	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.810	3.826	-0.016	1.215	424337	0.1924		99.8	625	
599.00 > 99.00	3.810	3.826	-0.016	1.215	86013		4.93(2.14-6.43)		123	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.826	3.841	-0.015	1.000	89858	0.2132		107	165	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.842	-0.016	1.391	234956	0.5149		103	544	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.826	3.857	-0.031	1.000	349258	0.1891		94.5	55.9	
563.00 > 169.00	3.826	3.857	-0.031	1.000	39225		8.90(5.24-15.72)		132	
D 30 13C2 PFUnA										
565.00 > 520.00	3.826	3.857	-0.031	1.391	1096848	0.4750		95.0	2193	
35 MeFOSA										
512.00 > 169.00	3.962	3.962	0.0		58123	NC			152	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.994	4.010	-0.016	1.273	636923	NC			1915	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.125	4.142	-0.017	1.000	463797	0.2127		106	82.6	
613.00 > 169.00	4.125	4.142	-0.017	1.000	46562		9.96(4.68-14.05)		164	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.125	4.142	-0.017	1.184	72694	NC			248	
D 36 13C2 PFDoA										
615.00 > 570.00	4.125	4.160	-0.035	1.499	1108605	0.4453		89.1	2039	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.375	4.391	-0.016	1.395	39738	NC			197	
699.00 > 99.00	4.375	4.391	-0.016	1.395	64446		0.62(0.28-0.83)		207	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.391	4.422	-0.031	1.064	329270	0.1979		98.9	119	
663.00 > 169.00	4.391	4.422	-0.031	1.064	60639		5.43(3.09-9.27)		214	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.646	4.664	-0.018	1.000	46324	0.2035		102	240	
713.00 > 219.00	4.646	4.664	-0.018	1.000	31919		1.45(0.70-2.09)		132	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.646	4.677	-0.031	1.689	706723	0.4445		88.9	3057	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.076	5.093	-0.017	1.845	510829	0.3503		70.1	1553	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.076	5.096	-0.020	1.000	200417	NC			20.3	
813.00 > 169.00	5.076	5.096	-0.020	1.000	33181		6.04(2.77-8.32)		95.9	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.433	5.465	-0.032	1.070	84248	NC			129	
913.00 > 169.00	5.433	5.465	-0.032	1.070	16847		5.00(2.55-7.64)		165	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:42:08 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_010.d

Injection Date: 12-Aug-2018 11:10:51 Instrument ID: A9

Lims ID: 320-41998-A-3-E MS

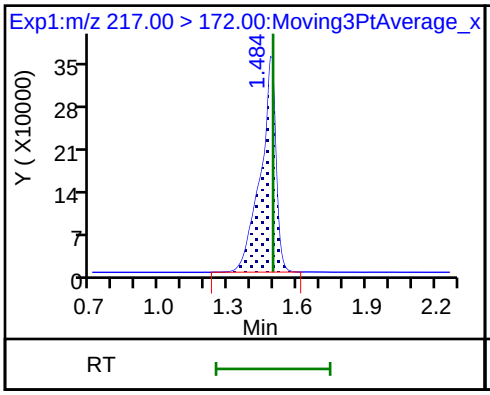
Client ID: TW03S-20180713

Operator ID: A9\Administrator ALS Bottle#: 4 Worklist Smp#: 7

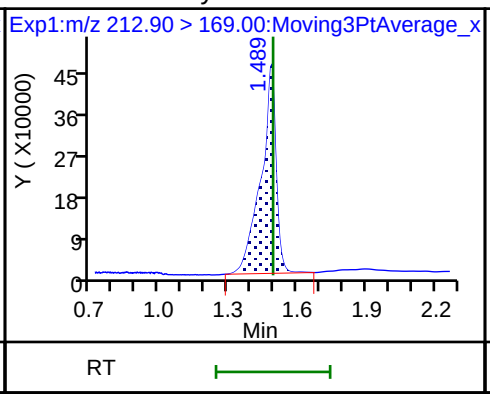
Injection Vol: 20.0 ul Dil. Factor: 5.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

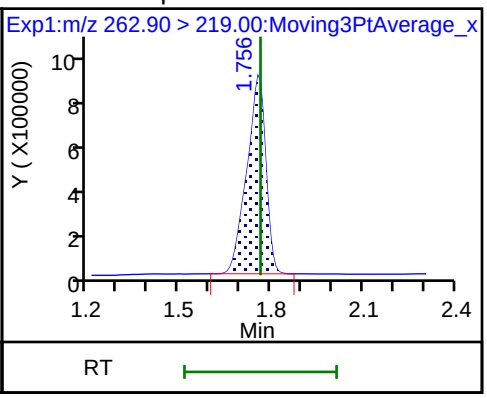
D 1 13C4 PFBA



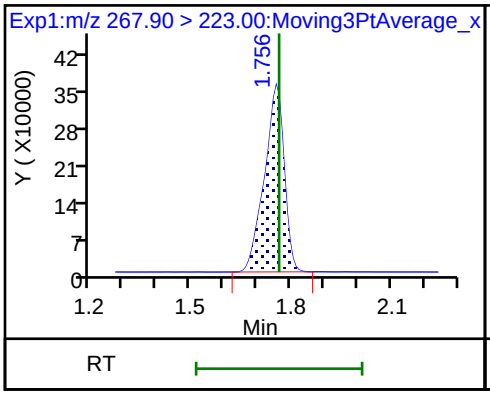
2 Perfluorobutyric acid



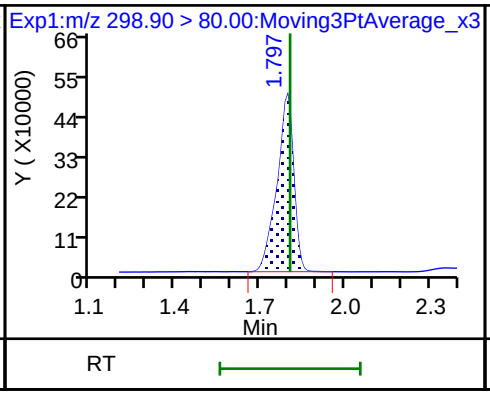
4 Perfluoropentanoic acid



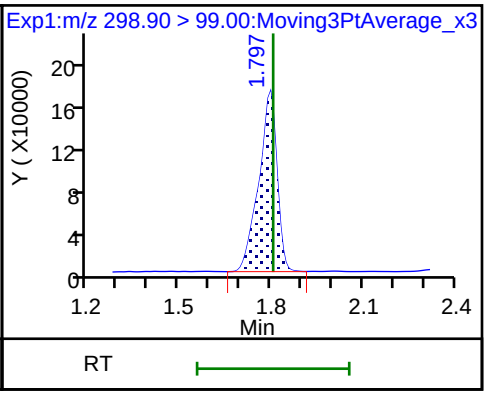
D 3 13C5-PFPeA



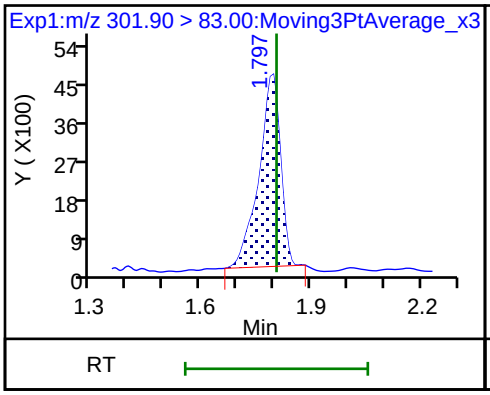
5 Perfluorobutanesulfonic acid



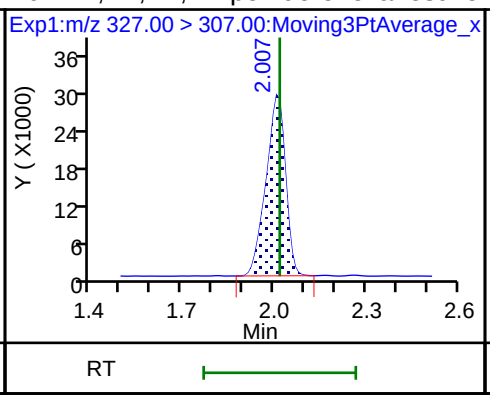
5 Perfluorobutanesulfonic acid



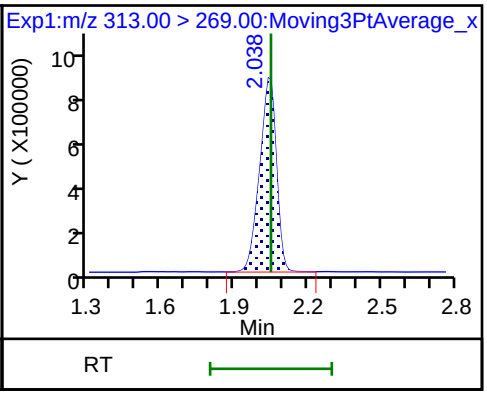
D 47 13C3-PFBS



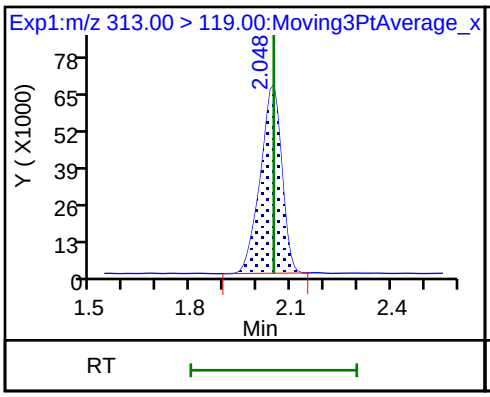
61 1H,1H,2H,2H-perfluorohexanesulfoni



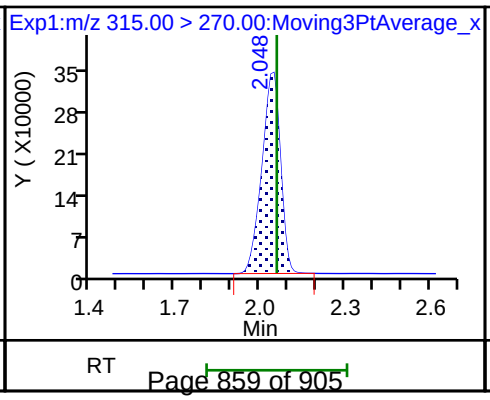
6 Perfluorohexanoic acid



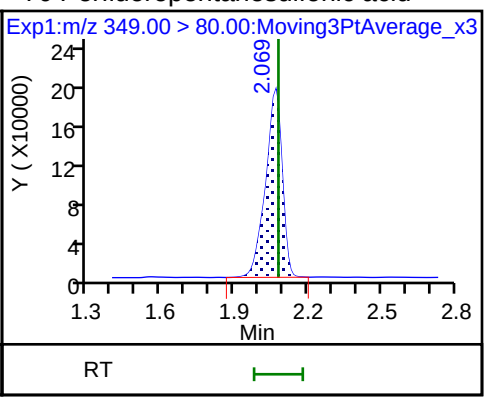
6 Perfluorohexanoic acid



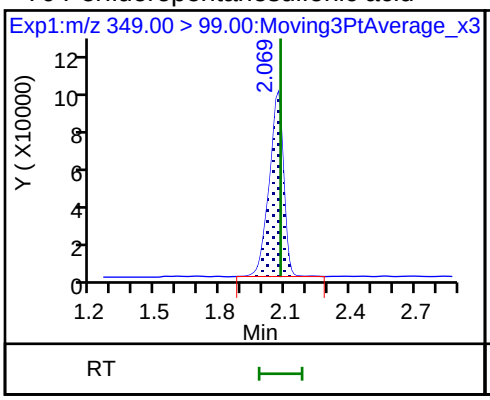
D 7 13C2 PFHxA



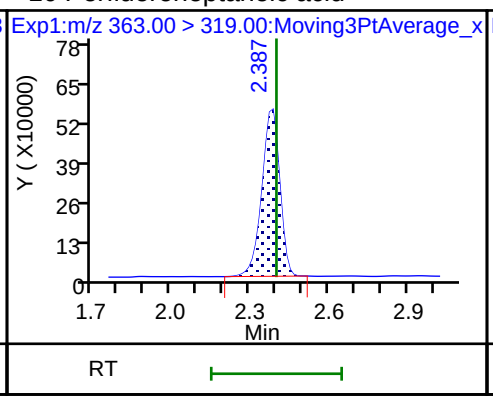
70 Perfluoropentanesulfonic acid



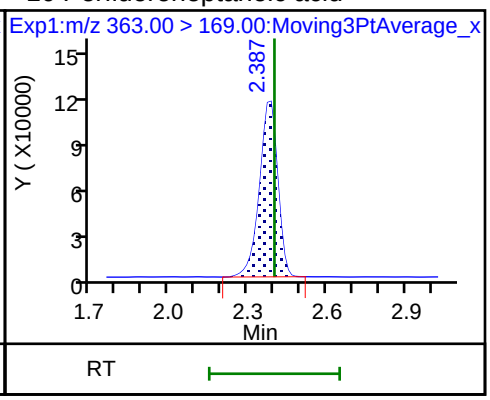
70 Perfluoropentanesulfonic acid



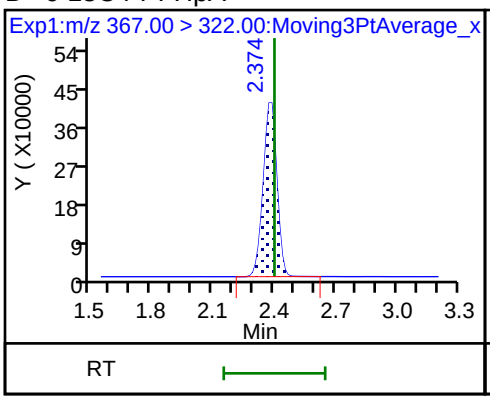
10 Perfluoroheptanoic acid



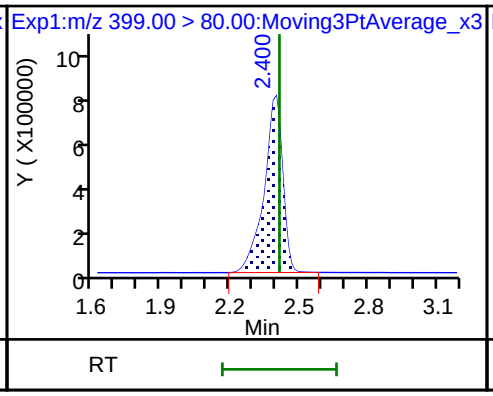
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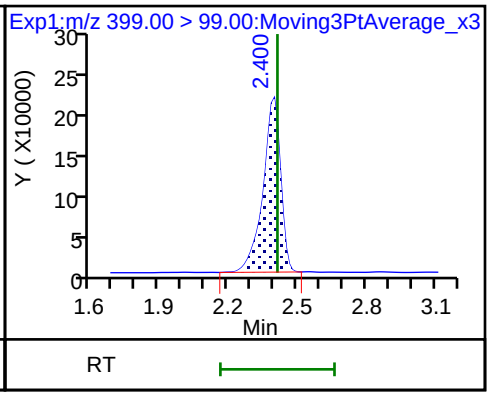
D 9 13C4-PFHpA



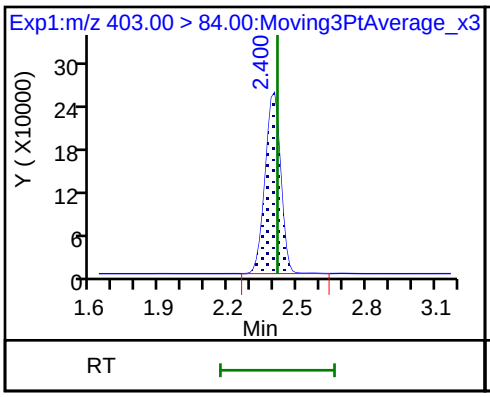
8 Perfluorohexanesulfonic acid



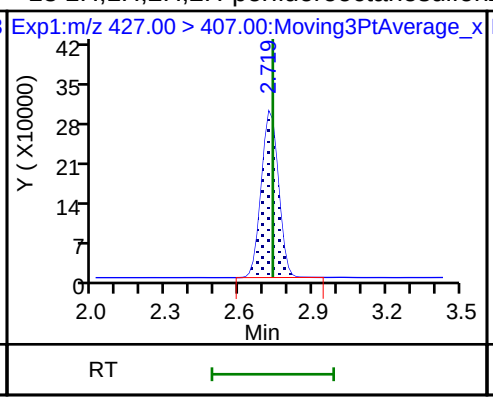
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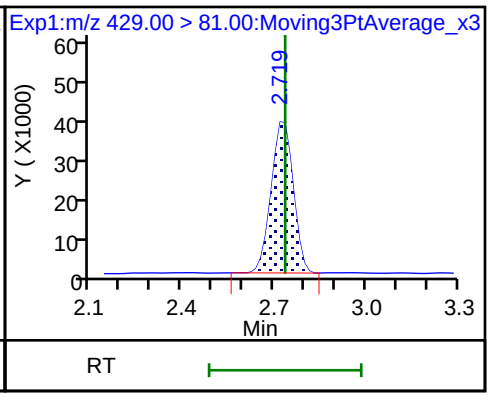
D 11 18O2 PFHxS



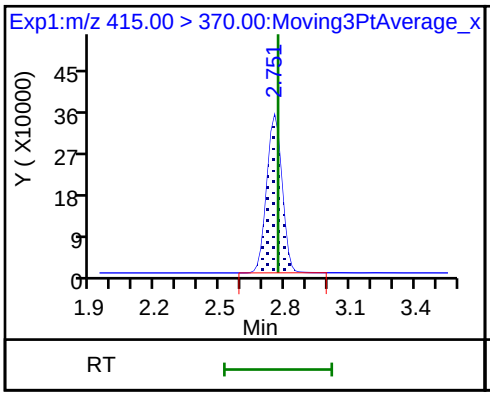
13 1H,1H,2H,2H-perfluorooctanesulfon



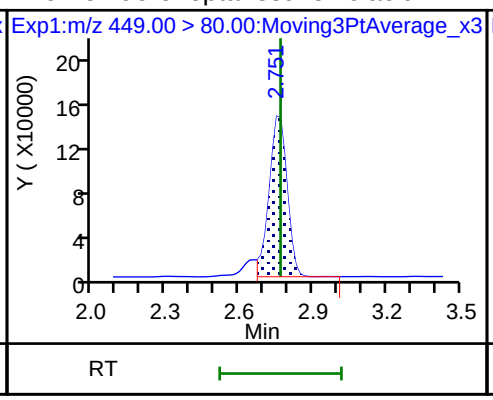
D 12 M2-6:2FTS



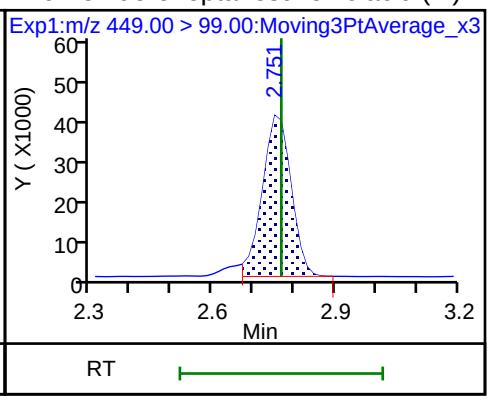
* 62 13C2-PFOA



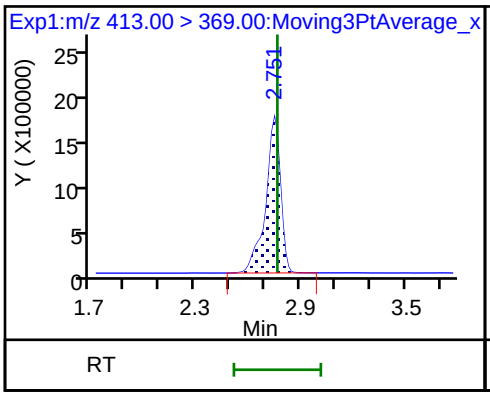
16 Perfluoroheptanesulfonic acid



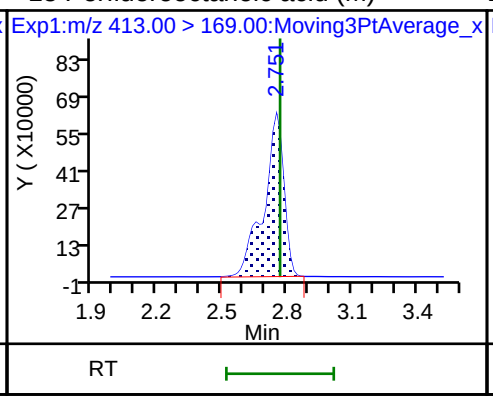
16 Perfluoroheptanesulfonic acid (M)



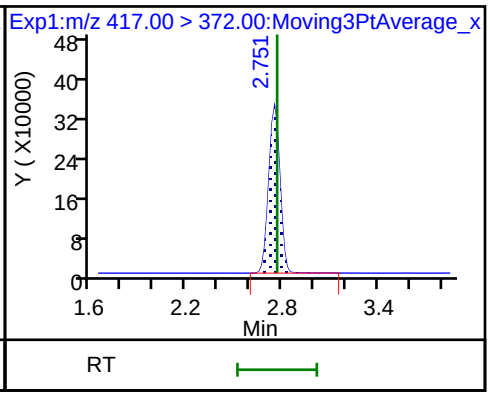
15 Perfluorooctanoic acid



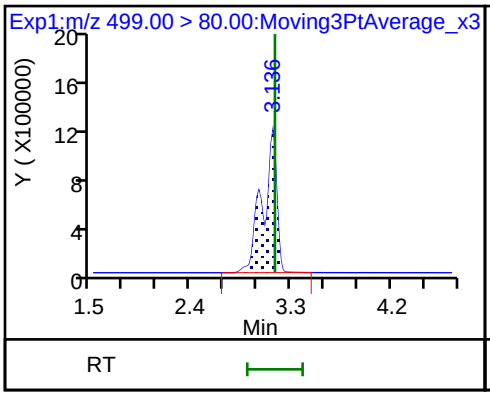
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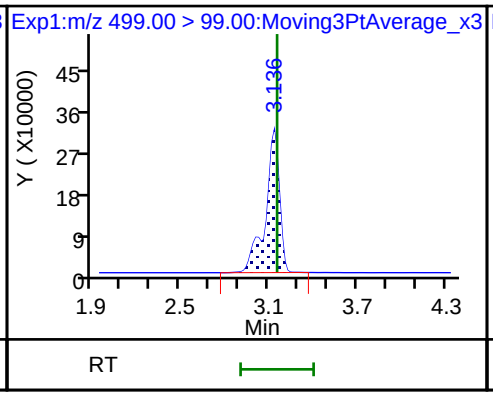
D 14 13C4 PFOA



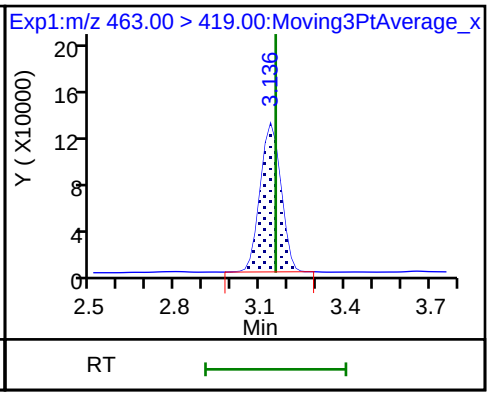
17 Perfluorooctane sulfonic acid



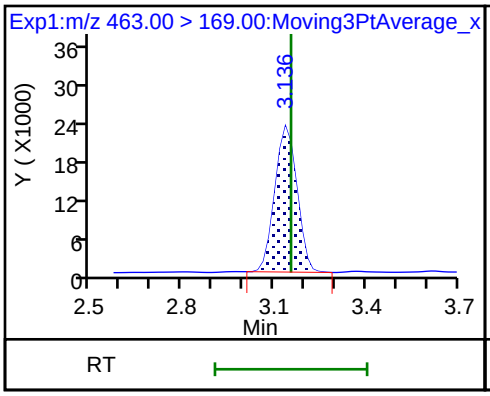
17 Perfluorooctane sulfonic acid



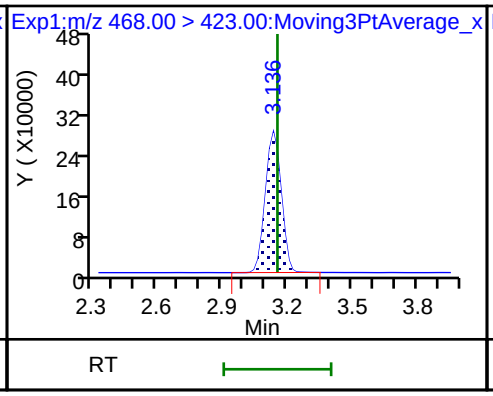
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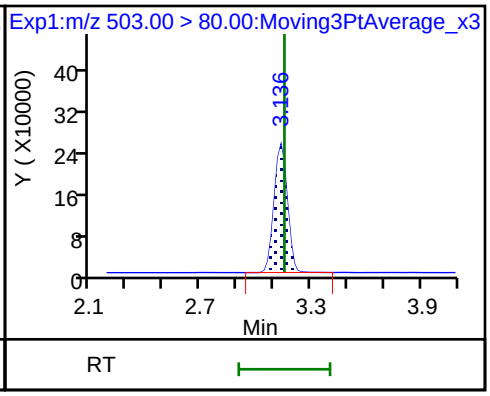
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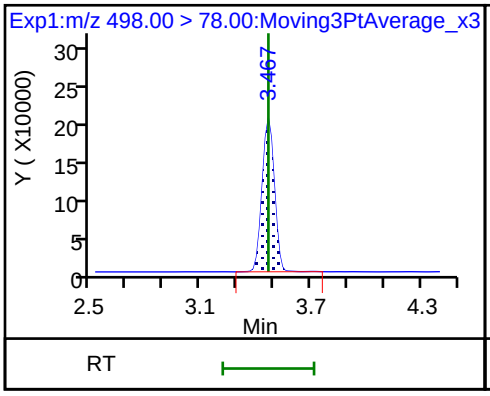
D 19 13C5 PFNA



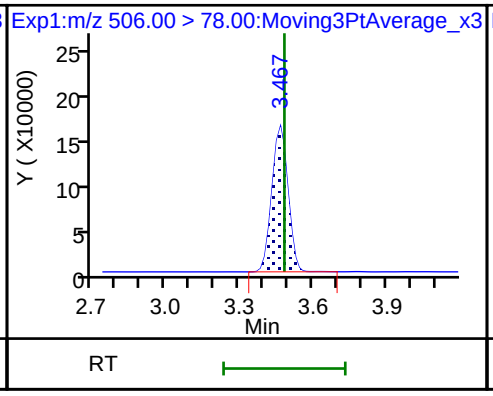
D 18 13C4 PFOS



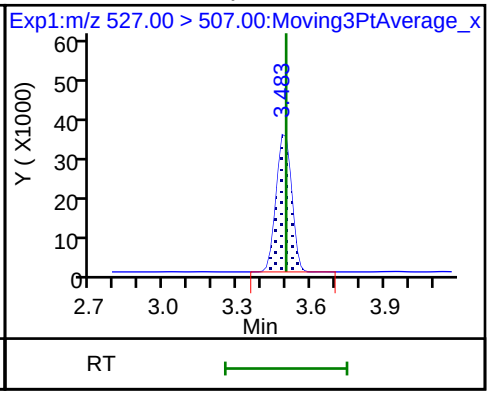
22 Perfluorooctane Sulfonamide



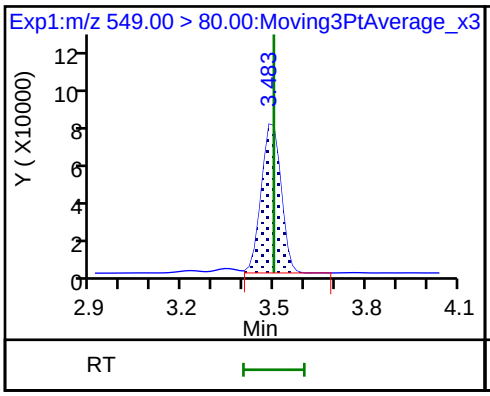
D 21 13C8 FOSA



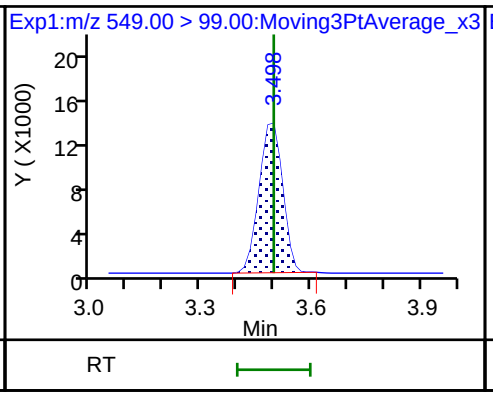
25 1H,1H,2H,2H-perfluorodecanesulfoni



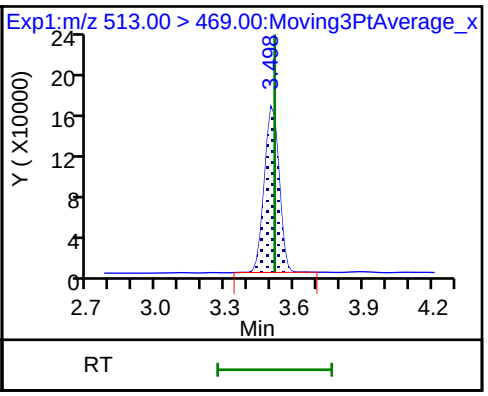
68 Perfluorononanesulfonic acid



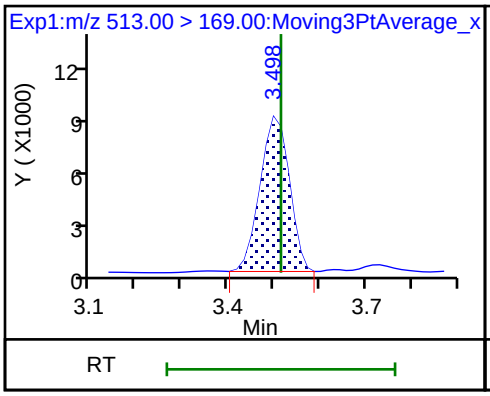
68 Perfluorononanesulfonic acid



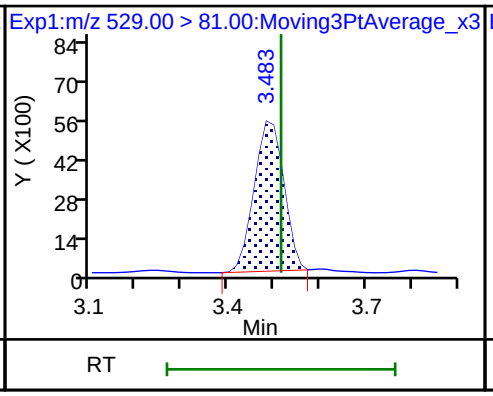
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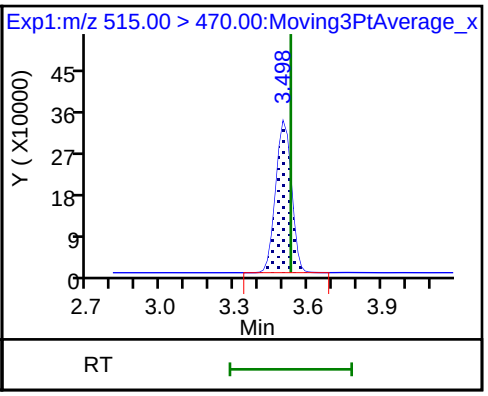
24 Perfluorodecanoic acid



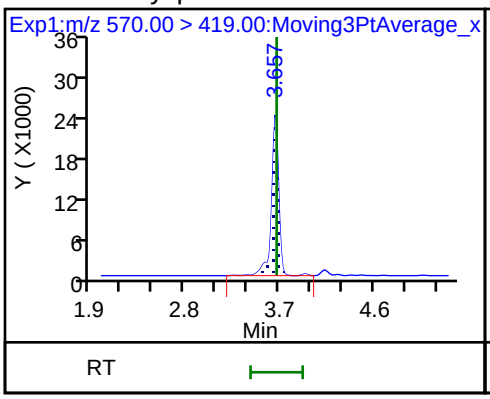
D 26 M2-8:2FTS



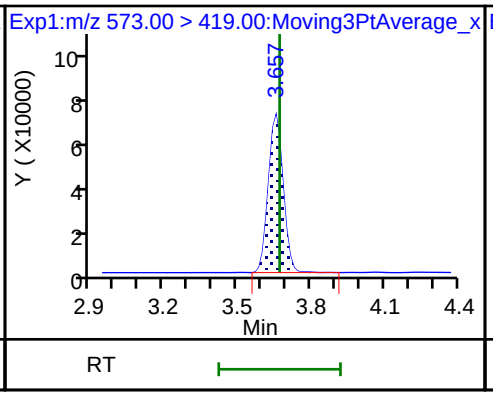
D 23 13C2 PFDA



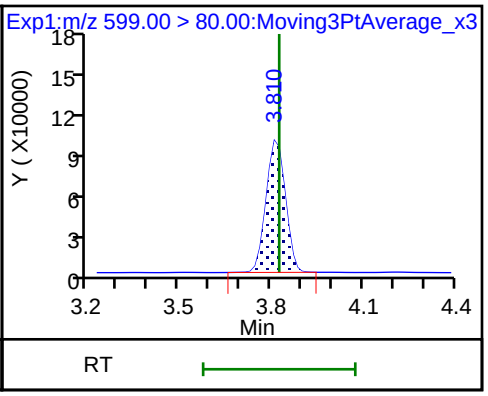
28 N-methyl perfluorooctane sulfonami



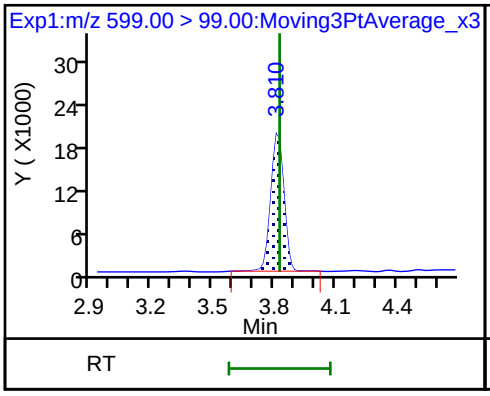
D 27 d3-NMeFOSAA



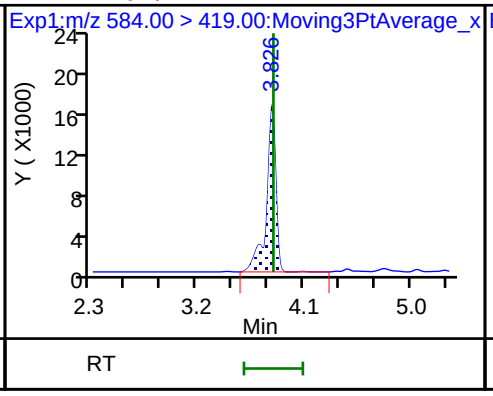
29 Perfluorodecane Sulfonic acid



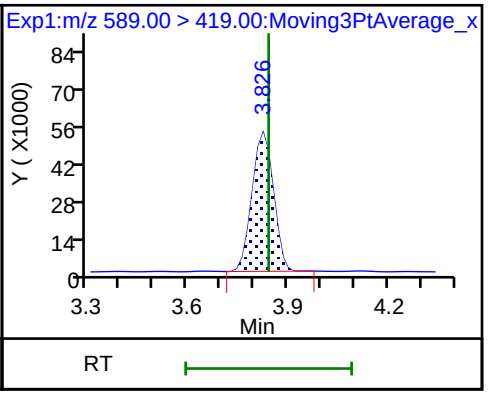
29 Perfluorodecane Sulfonic acid



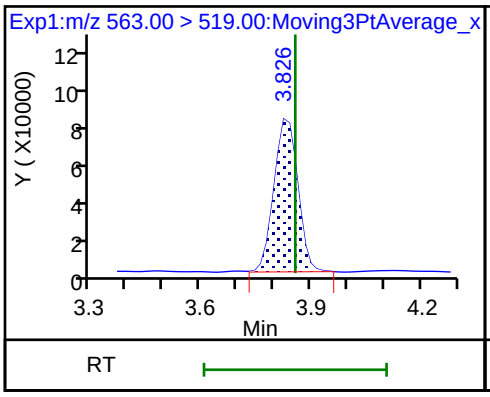
33 N-ethyl perfluorooctane sulfonamid



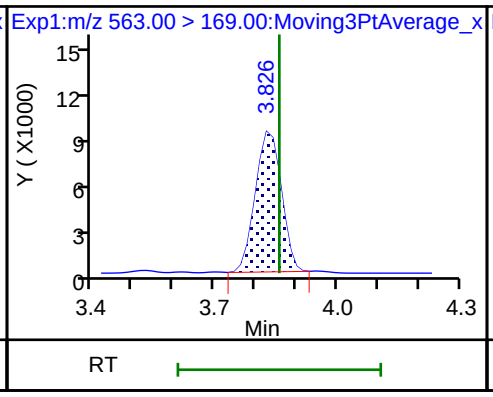
D 32 d5-NEtFOSAA



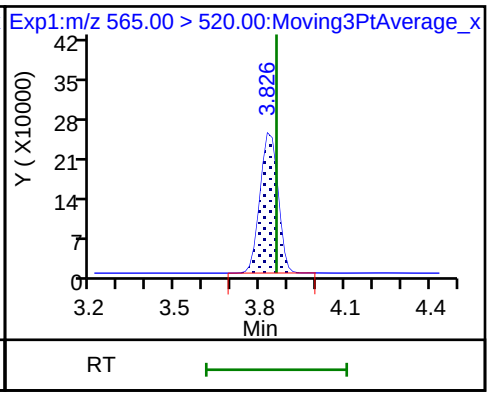
31 Perfluoroundecanoic acid



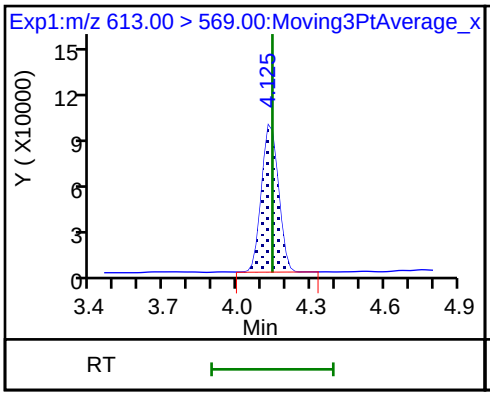
31 Perfluoroundecanoic acid



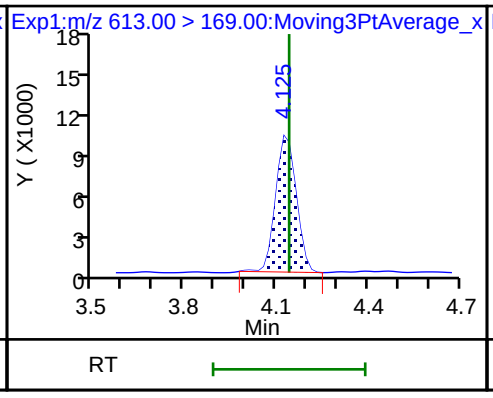
D 30 13C2 PFUnA



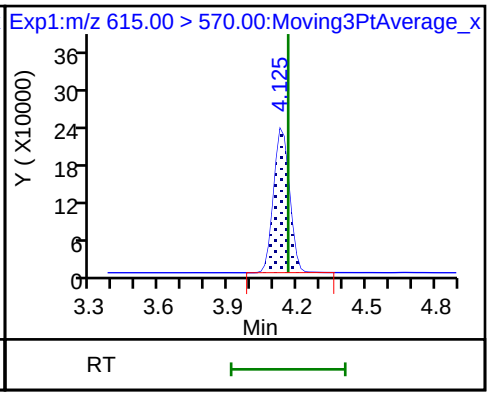
37 Perfluorododecanoic acid



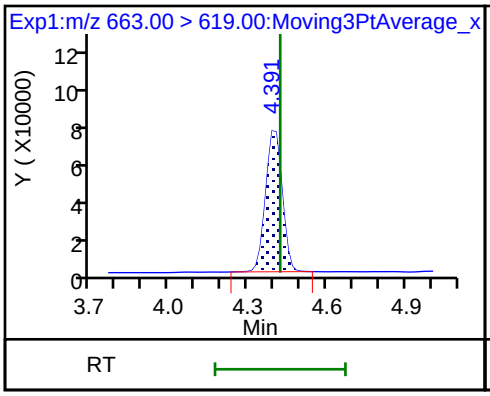
37 Perfluorododecanoic acid



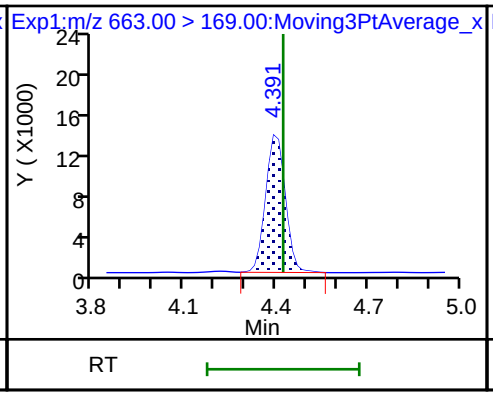
D 36 13C2 PFDoA



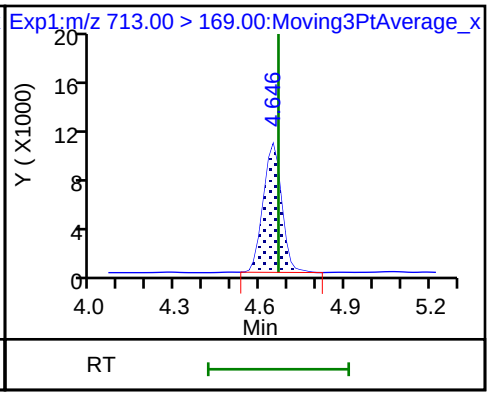
41 Perfluorotridecanoic acid



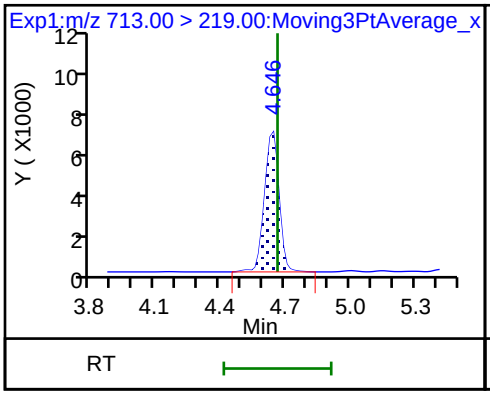
41 Perfluorotridecanoic acid



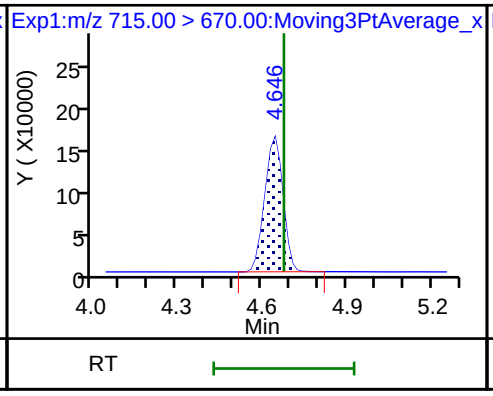
42 Perfluorotetradecanoic acid



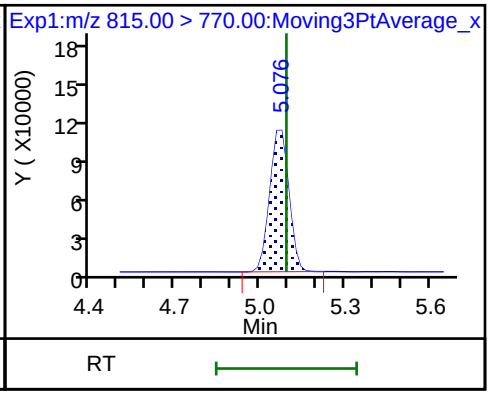
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

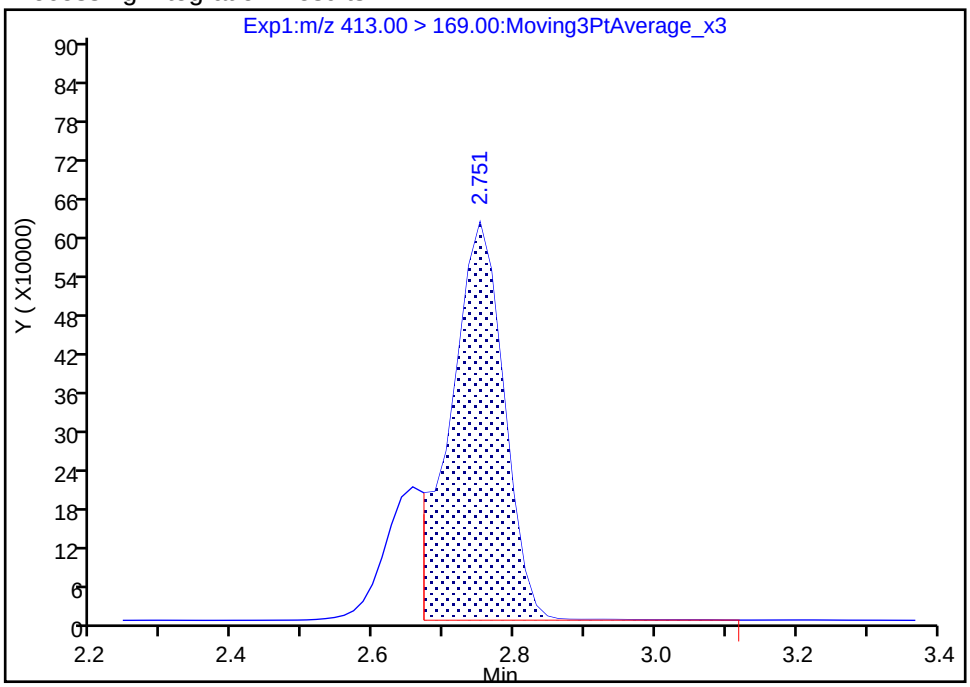
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_010.d				
Injection Date:	12-Aug-2018 11:10:51	Instrument ID:	A9		
Lims ID:	320-41998-A-3-E MS				
Client ID:	TW03S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	20.0 ul	Dil. Factor:	5.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

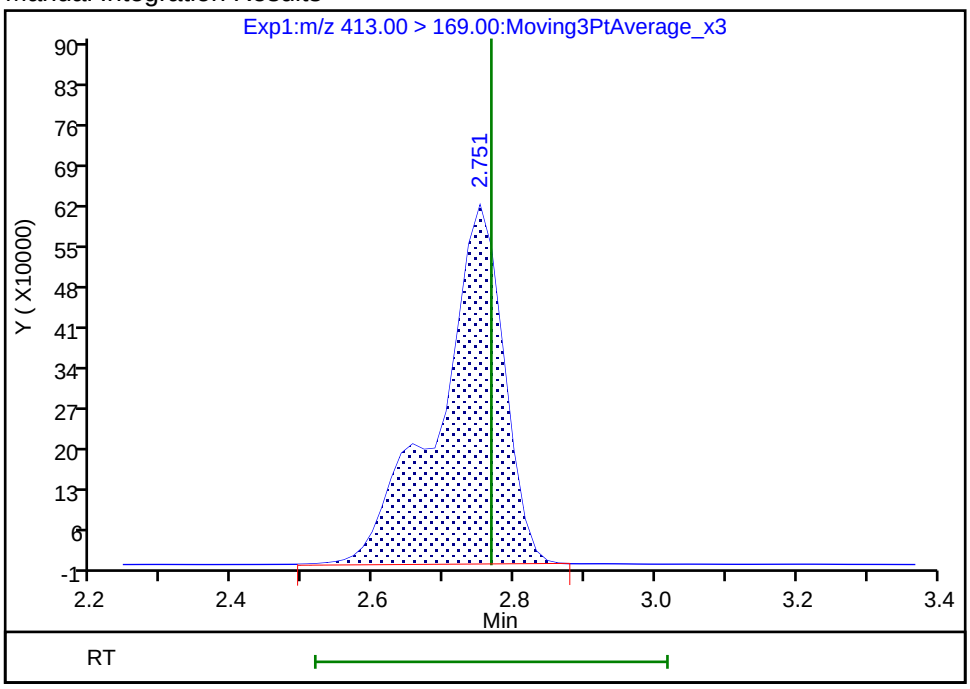
Processing Integration Results

RT: 2.75
Area: 3216306
Amount: 2.740431
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 3966455
Amount: 2.740431
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:57:29

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 MSD | Lab Sample ID: 320-41998-3 MSD

Matrix: Water | Lab File ID: 2018.08.11LA9A_013.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 13:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 272.6(mL) | Date Analyzed: 08/11/2018 21:29

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.: 239432 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	Perfluorohexanoic acid (PFHxA)	0.247	H 4	0.0018	0.00092	0.00043
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.117	H	0.0018	0.0014	0.00056
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.453*	*H J1 4 M*	*0.0018*	0.0014	*0.00050*
375-95-1	Perfluorononanoic acid (PFNA)	0.0388	H	0.0018	0.0014	0.00048
335-76-2	Perfluorodecanoic acid (PFDA)	0.0369	H	0.0018	0.00092	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0364	H	0.0018	0.0014	0.00066
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0382	H	0.0018	0.0014	0.00048
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0370	H	0.0037	0.0028	0.00070
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0327	H	0.0037	0.0028	0.00076
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0805	H	0.0018	0.00092	0.00042
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.244	H 4	0.0018	0.00092	0.00035
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*0.648*	*H J1 4*	*0.0037*	0.0028	*0.0010*
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0362	H M	0.018	0.0092	0.0028
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0375	H	0.018	0.0092	0.0026

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 MSD | Lab Sample ID: 320-41998-3 MSD

Matrix: Water | Lab File ID: 2018.08.11LA9A_013.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 13:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 272.6(mL) | Date Analyzed: 08/11/2018 21:29

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.: 239432 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	97		50-150
STL00996	13C2 PFDA	97		50-150
STL00997	13C2 PFUnA	89		50-150
STL00998	13C2 PFDoA	96		50-150
STL00994	18O2 PFHxS	84		50-150
STL02116	13C2-PFTeDA	101		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	83		50-150
STL02117	d5-NEtFOSAA	94		50-150
STL02118	d3-NMeFOSAA	98		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_013.d
Lims ID: 320-41998-A-3-F MSD
Client ID: TW03S-20180713
Sample Type: MSD
Inject. Date: 11-Aug-2018 21:29:41 ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Sample Info: 320-41998-a-3-f msd
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 13:44:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 13:35:41

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	1.483	1.489	-0.006	1.000	7021861	3.38		338	744	
D 1 13C4 PFBA										
217.00 > 172.00	1.483	1.494	-0.011	0.536	5584699	2.18		87.4	11811	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.005	11957963	6.02		602	494	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.772	-0.017	0.635	4869902	2.13		85.3	6748	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.797	1.797	0.0	1.000	6673394	2.19		248	625	
298.90 > 99.00	1.797	1.797	0.0	1.000	2475392		2.70(1.35-4.05)		745	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.805	-0.008	0.650	68455	1.93		83.2	245	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.007	0.010	1.122	524557	1.05		112	2136	
D 60 M2-4:2FTS										
329.00 > 81.00	2.099	2.018	0.081	0.759	2881	NC			0.3	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	12784635	6.74		674	1109	
313.00 > 119.00	2.048	2.048	0.0	1.000	1028442		12.43(6.96-20.87)		1343	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.740	5070468	2.14		85.5	5912	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.069	-0.001	1.151	3165349	2.20		234	897	
349.00 > 99.00	2.068	2.069	-0.001	1.151	1504809		2.10(1.15-3.45)		652	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.150	0.0	1.000	448051	NC			205	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.160	-0.010	0.777	674277	NC			2063	

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	2.387	2.387	0.0	1.000	8110629	3.20		320	510	
363.00 > 169.00	2.387	2.387	0.0	1.000	1952915		4.15(2.17-6.52)		3710	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.863	6111138	2.27		90.8	10329	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.400	0.0	1.000	14514221	6.66		732	3937	
399.00 > 99.00	2.400	2.400	0.0	1.000	4026266		3.60(1.90-5.70)		1770	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.867	4027249	1.99		84.0	5293	
65 ADONA										
377.00 > 251.00	2.439	2.452	-0.013	0.778	4091782	NC			6519	
377.00 > 85.00	2.439	2.452	-0.013	0.778	1793169		2.28(1.05-3.16)		887	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.719	0.016	1.000	4469723	7.58		799	2980	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.751	-0.016	0.988	655756	2.50		105	739	
* 62 13C2-PFOA										
415.00 > 370.00	2.767	2.751	0.016		5720577	2.50			8146	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.767	2.751	0.016	1.000	27340172	12.3		1233	1375	EM
413.00 > 169.00	2.767	2.751	0.016	1.000	13021555		2.10(1.36-4.08)		2754	M
D 14 13C4 PFOA										
417.00 > 372.00	2.767	2.767	0.0	1.000	5055756	2.24		89.6	13550	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.767	2.767	0.0	0.882	2639807	1.52		160	221	
449.00 > 99.00	2.767	2.767	0.0	0.882	657170		4.02(1.84-5.53)		423	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.135	3.136	-0.001	1.000	32505995	17.7		1904	3647	E
499.00 > 99.00	3.135	3.136	-0.001	1.000	7659770		4.24(2.04-6.12)		3803	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.136	0.017	1.006	2105544	1.06		106	385	
463.00 > 169.00	3.135	3.136	-0.001	1.000	395631		5.32(2.68-8.03)		774	
D 19 13C5 PFNA										
468.00 > 423.00	3.135	3.155	-0.020	1.133	4713706	2.43		97.4	12652	
D 18 13C4 PFOS										
503.00 > 80.00	3.135	3.155	-0.020	1.133	4099631	1.94		81.3	2032	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.351	3.353	-0.002	1.069	1888011	NC			1910	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.466	3.467	-0.001	1.000	3261422	1.05		105	2646	
D 21 13C8 FOSA										
506.00 > 78.00	3.466	3.483	-0.017	1.253	2533367	2.01		80.3	3824	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.497	3.483	0.014	1.115	1159441	1.03		108	316	
549.00 > 99.00	3.497	3.483	0.014	1.115	192794		6.01(3.02-9.05)		432	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.497	3.498	-0.001	1.000	448920	1.00		104	2018	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.513	3.498	0.015	1.000	2335925	1.01		101	505	
513.00 > 169.00	3.513	3.498	0.015	1.000	152180		15.35(7.12-21.35)		255	
D 26 M2-8:2FTS										
529.00 > 81.00	3.497	3.514	-0.017	1.264	77033	2.53		106	358	
D 23 13C2 PFDA										
515.00 > 470.00	3.513	3.529	-0.016	1.270	4720780	2.43		97.4	13880	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.670	3.657	0.013	1.004	366397	0.9856		98.6	263	M
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.656	3.671	-0.015	1.321	919603	2.44		97.6	2240	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.824	3.810	0.014	1.220	1295222	0.9060		94.0	1325	
599.00 > 99.00	3.824	3.810	0.014	1.220	278950		4.64(2.14-6.43)		516	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.840	3.826	0.014	1.004	267799	1.02		102	397	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.840	3.826	0.014	1.000	1161790	0.99		99.2	168	
563.00 > 169.00	3.840	3.826	0.014	1.000	110485		10.52(5.24-15.72)		368	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.824	3.841	-0.017	1.382	729347	2.36		94.2	1363	
D 30 13C2 PFUnA										
565.00 > 520.00	3.840	3.857	-0.017	1.388	3476370	2.22		88.7	5895	
35 MeFOSA										
512.00 > 169.00	3.961	3.962	-0.001		209473	NC			617	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.993	3.994	-0.001	1.273	2136716	NC			3548	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.124	4.125	-0.001	1.000	1652213	1.04		104	277	
613.00 > 169.00	4.124	4.125	-0.001	1.000	175934		9.39(4.68-14.05)		612	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.140	4.125	0.015	1.184	243249	NC			878	
D 36 13C2 PFDoA										
615.00 > 570.00	4.124	4.142	-0.018	1.491	4038532	2.39		95.6	5461	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.374	4.375	-0.001	1.395	120149	NC			707	
699.00 > 99.00	4.374	4.375	-0.001	1.395	229991		0.52(0.28-0.83)		528	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.405	4.406	-0.001	1.068	1224008	1.01		101	373	
663.00 > 169.00	4.405	4.406	-0.001	1.068	205858		5.95(3.09-9.27)		810	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.644	4.645	-0.001	1.000	156038	0.8926		89.3	849	
713.00 > 219.00	4.644	4.645	-0.001	1.000	122660		1.27(0.70-2.09)		629	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.644	4.661	-0.017	1.679	2713154	2.51		101	6237	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.075	5.059	0.016	1.000	662079	NC			56.6	
813.00 > 169.00	5.075	5.059	0.016	1.000	121277		5.46(2.77-8.32)		458	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 44 13C2-PFHxDA										
815.00 > 770.00	5.075	5.092	-0.017	1.834	1856921	1.88		75.0	4304	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.433	5.433	0.0	1.071	323743	NC			235	
913.00 > 169.00	5.433	5.433	0.0	1.071	59648		5.43(2.55-7.64)		695	

QC Flag Legend

Processing Flags

NC - Not Calibrated

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:40:44 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_013.d

Injection Date: 11-Aug-2018 21:29:41 Instrument ID: A9

Lims ID: 320-41998-A-3-F MSD

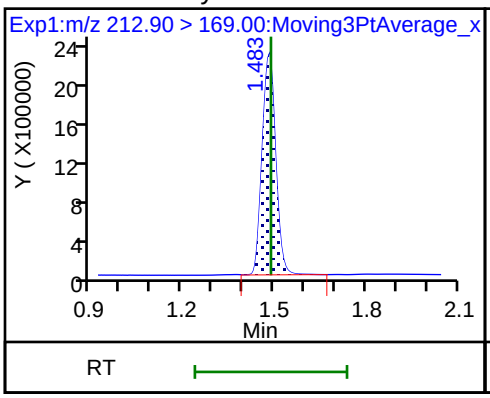
Client ID: TW03S-20180713

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

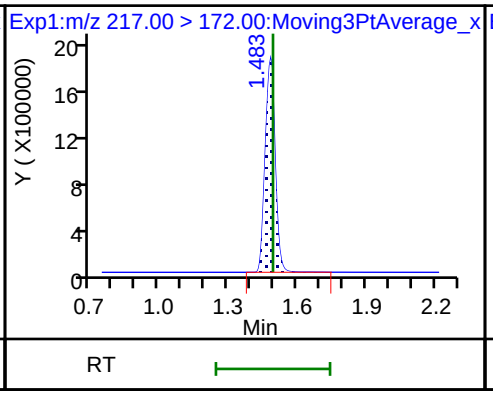
Injection Vol: 20.0 ul Dil. Factor: 1.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

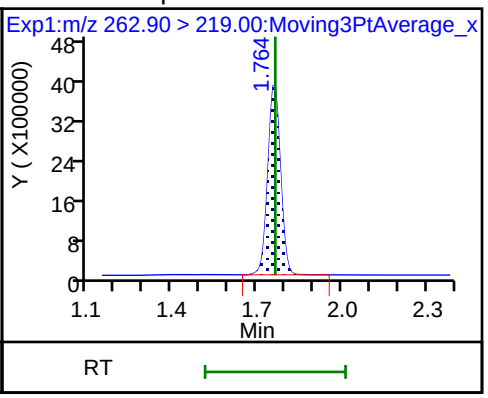
2 Perfluorobutyric acid



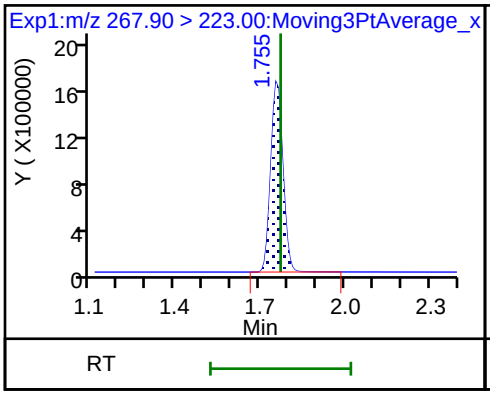
D 1 13C4 PFBA



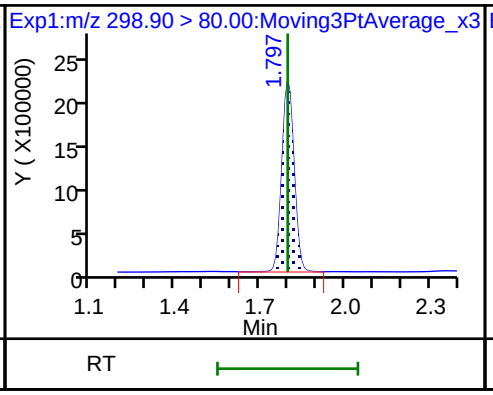
4 Perfluoropentanoic acid



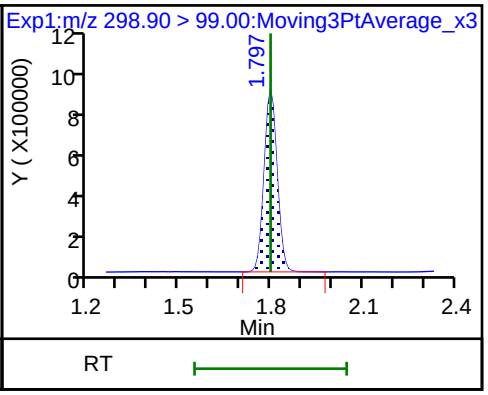
D 3 13C5-PFPeA



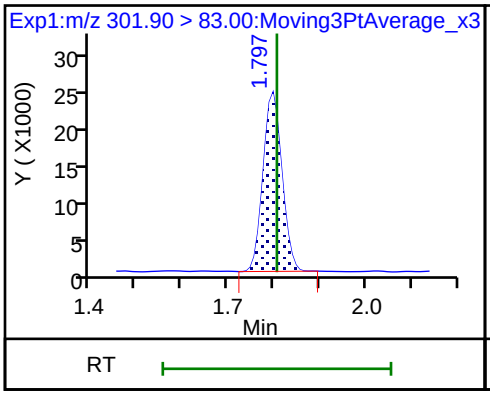
5 Perfluorobutanesulfonic acid



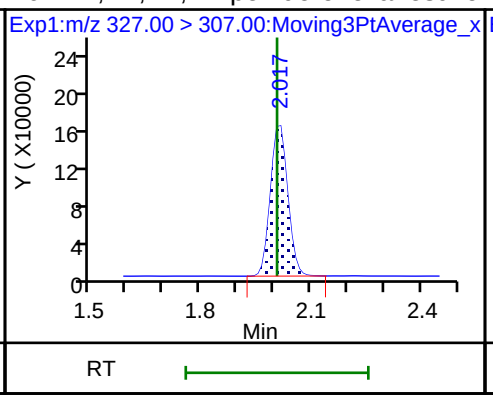
5 Perfluorobutanesulfonic acid



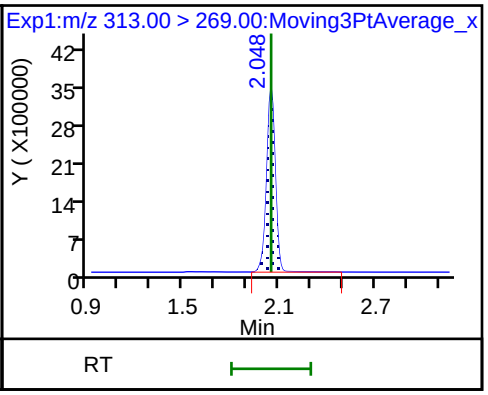
D 47 13C3-PFBS



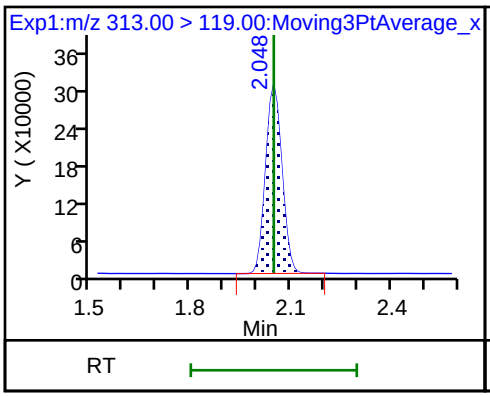
61 1H,1H,2H,2H-perfluorohexanesulfoni



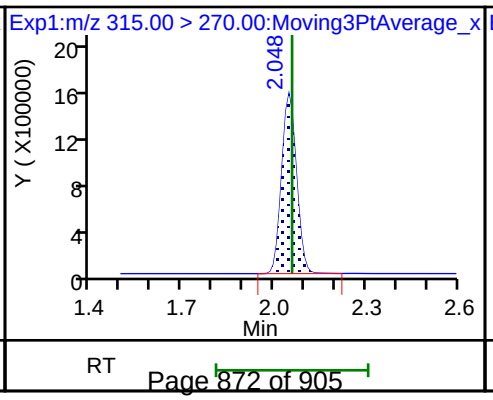
6 Perfluorohexanoic acid



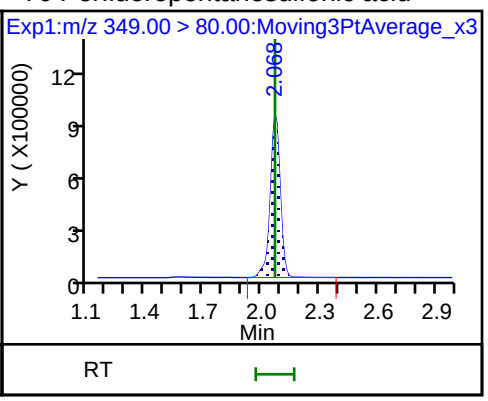
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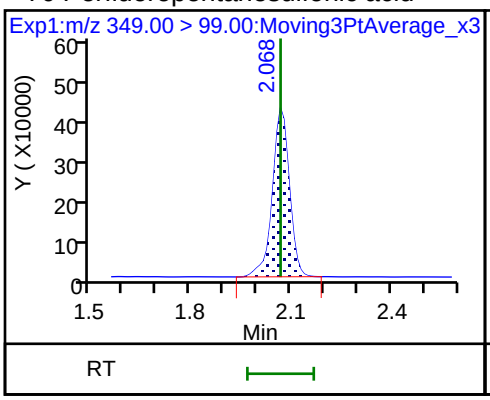
D 7 13C2 PFHxA



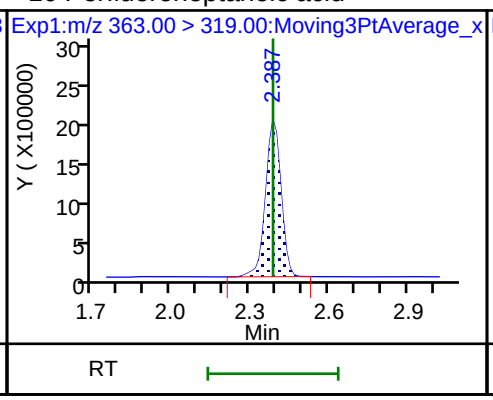
70 Perfluoropentanesulfonic acid



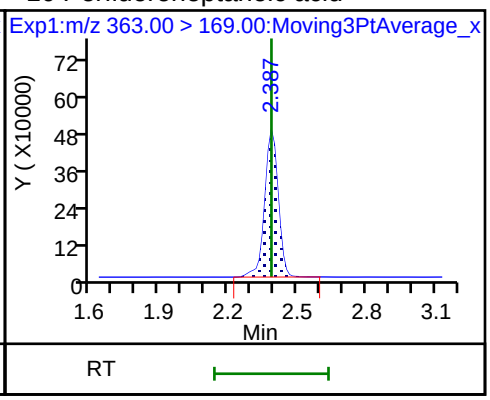
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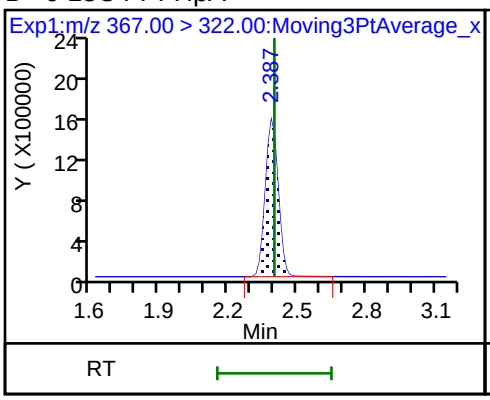
10 Perfluoroheptanoic acid



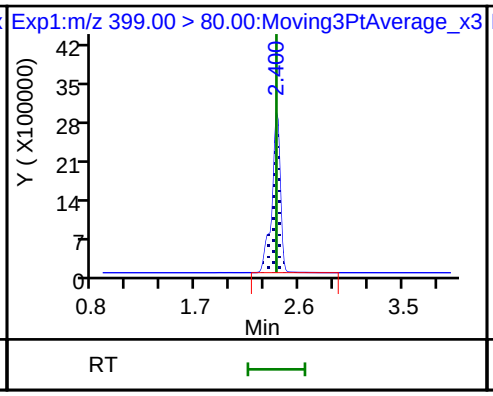
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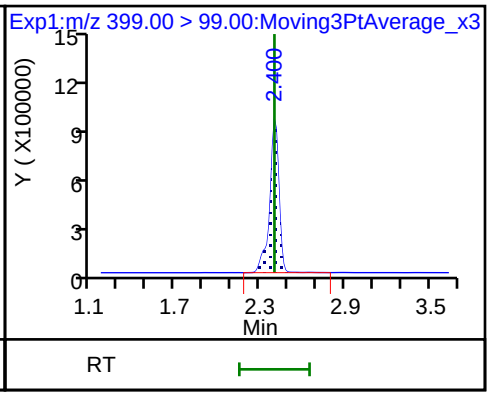
D 9 13C4-PFHpA



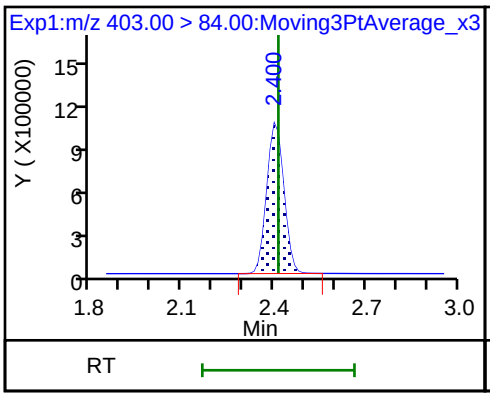
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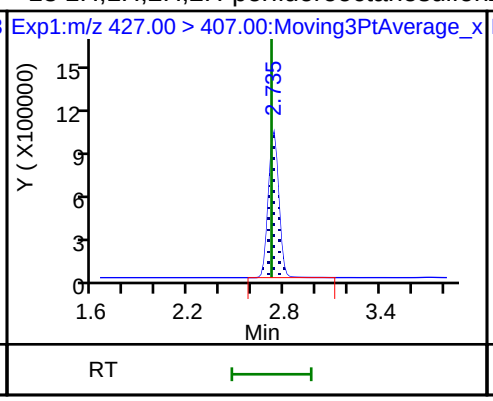
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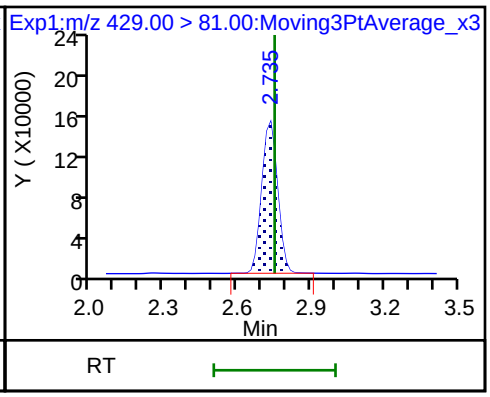
D 11 18O2 PFHxS



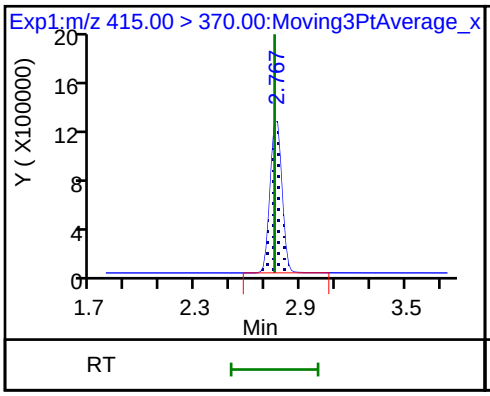
13 1H,1H,2H,2H-perfluorooctanesulfon



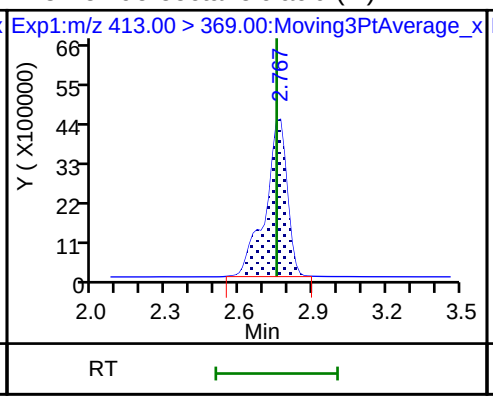
D 12 M2-6:2FTS



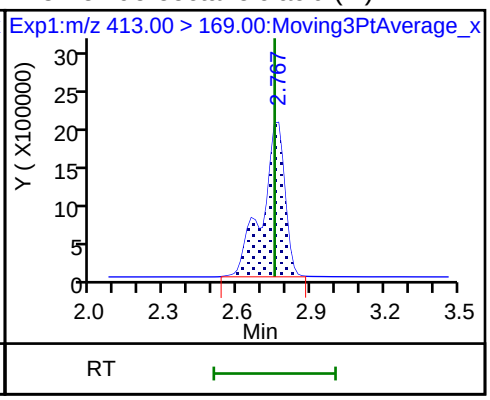
* 62 13C2-PFOA



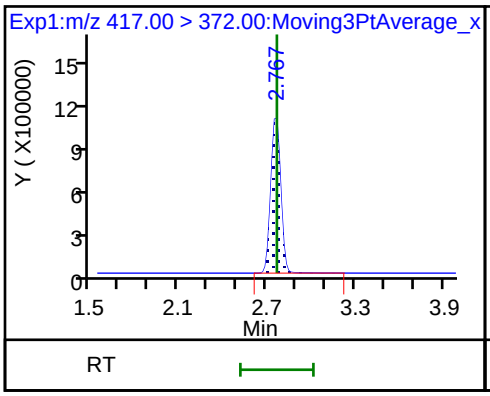
15 Perfluorooctanoic acid (M)



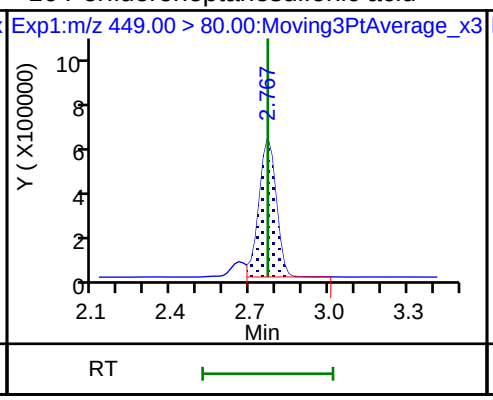
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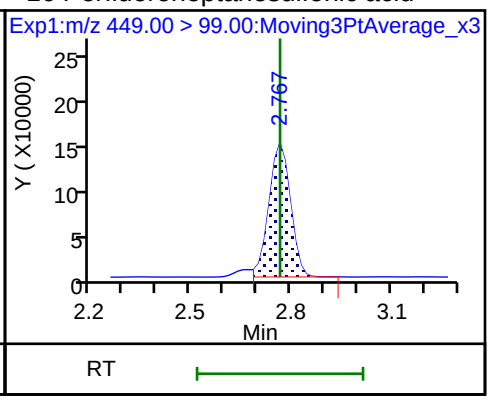
D 14 13C4 PFOA



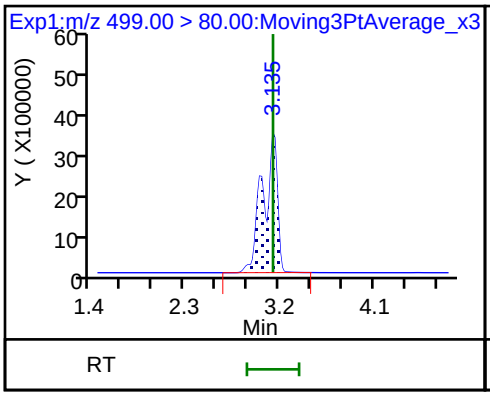
16 Perfluoroheptanesulfonic acid



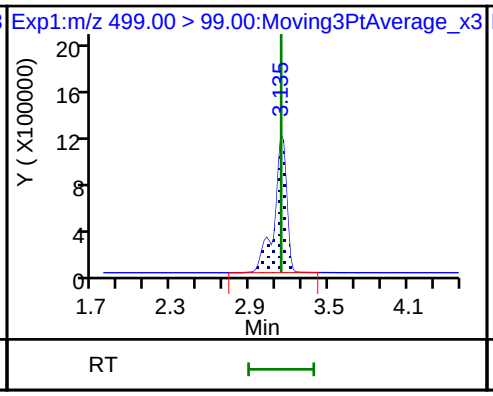
16 Perfluoroheptanesulfonic acid



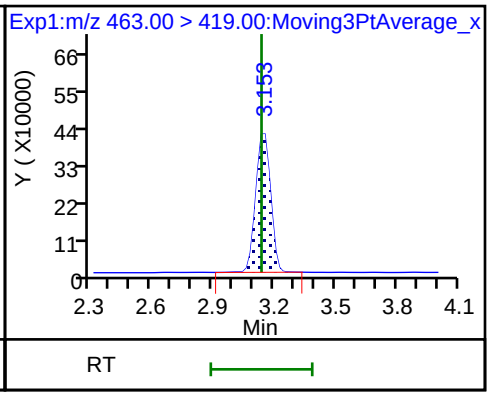
17 Perfluorooctane sulfonic acid



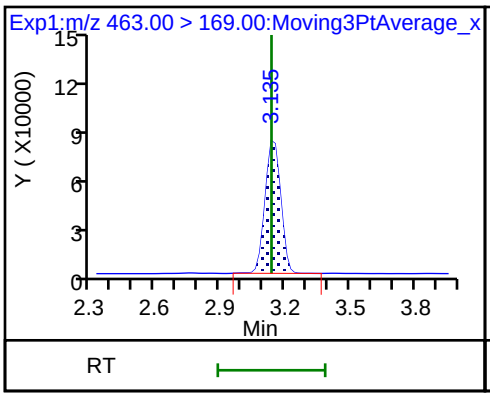
17 Perfluorooctane sulfonic acid



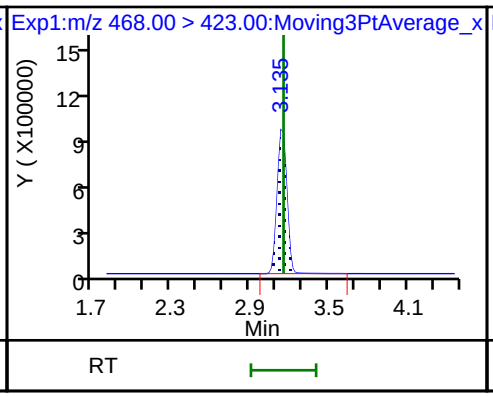
20 Perfluorononanoic acid



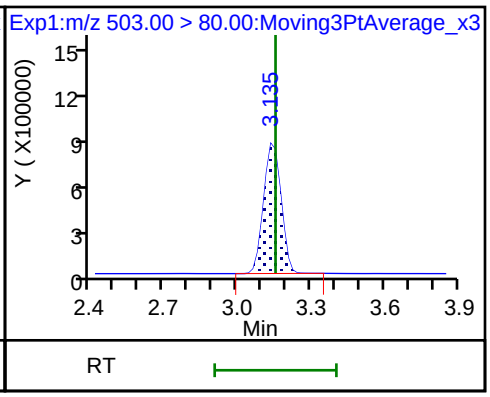
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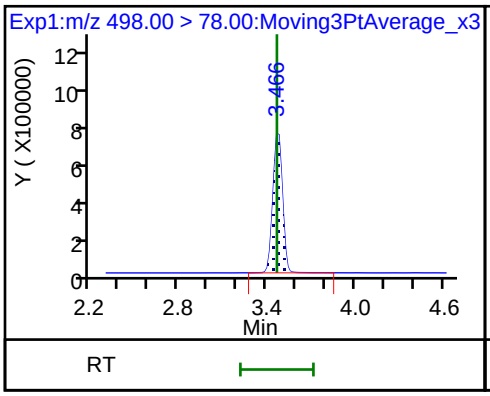
D 19 13C5 PFNA



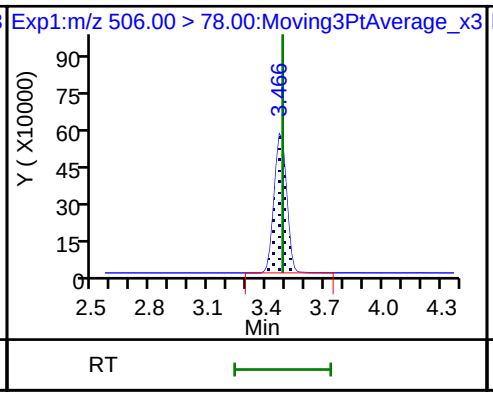
D 18 13C4 PFOS



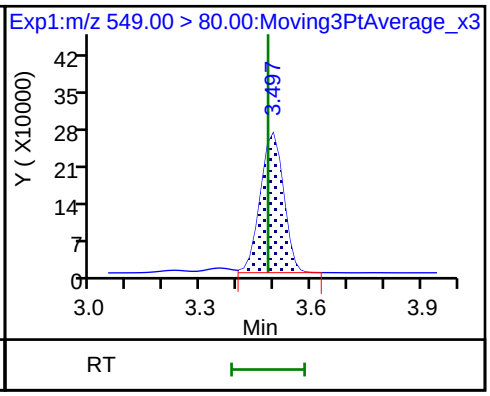
22 Perfluorooctane Sulfonamide



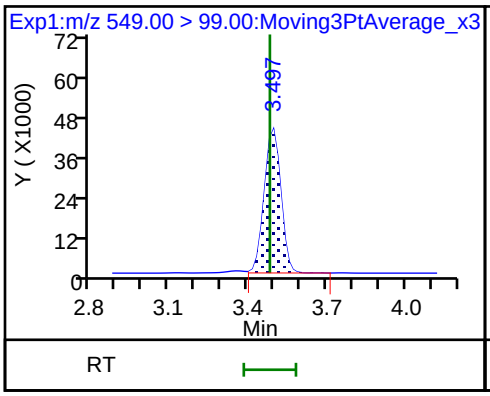
D 21 13C8 FOSA



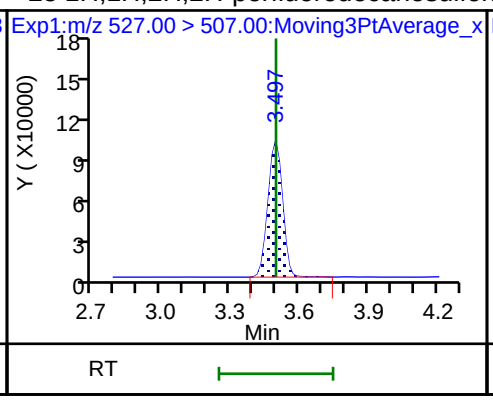
68 Perfluorononanesulfonic acid



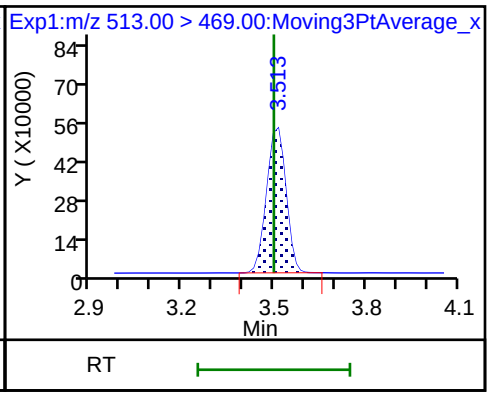
68 Perfluorononanesulfonic acid



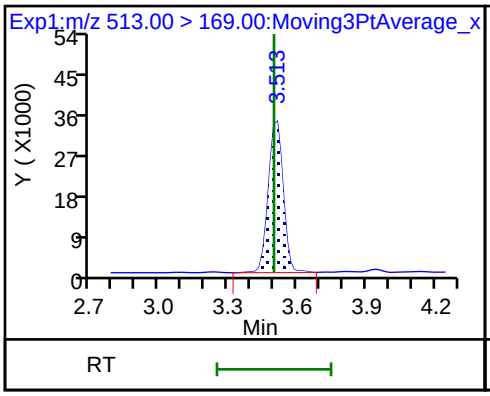
25 1H,1H,2H,2H-perfluorodecanesulfoni



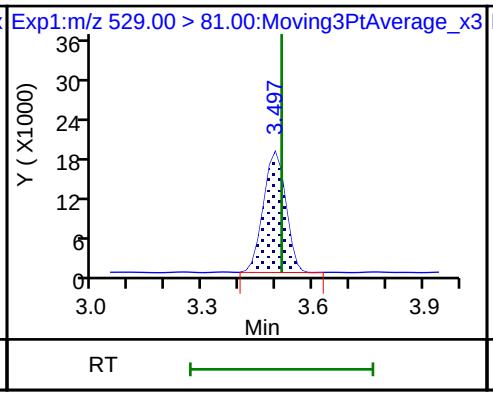
24 Perfluorodecanoic acid



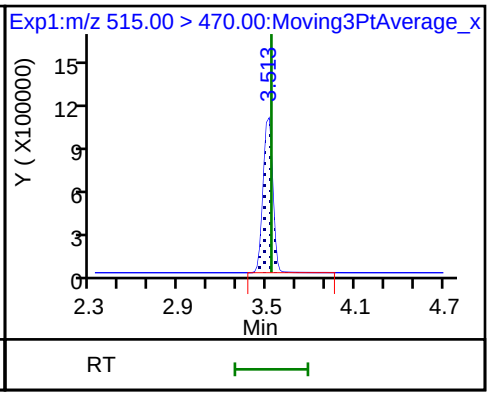
24 Perfluorodecanoic acid



D 26 M2-8:2FTS

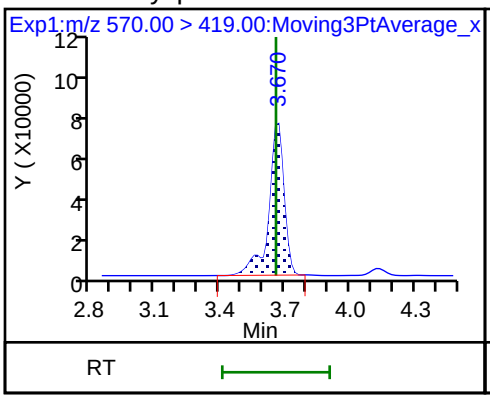


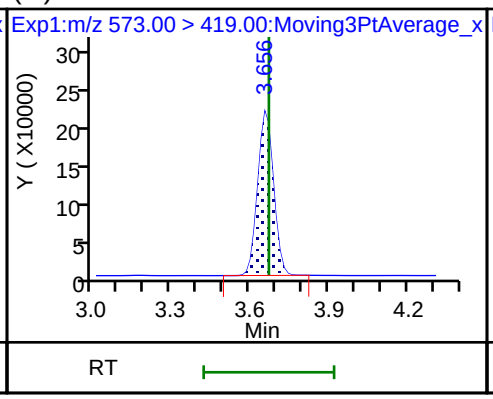
D 23 13C2 PFDA



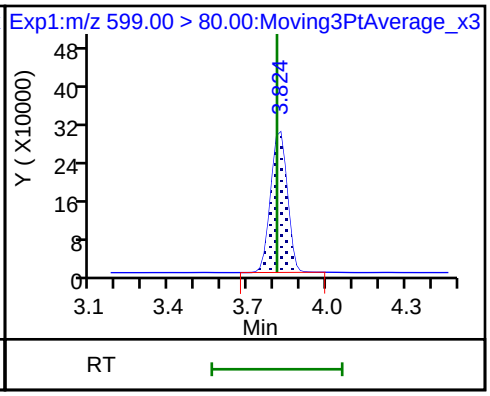
28 N-methyl perfluorooctane sulfonamid

D 27 d3-NMeFOSAA

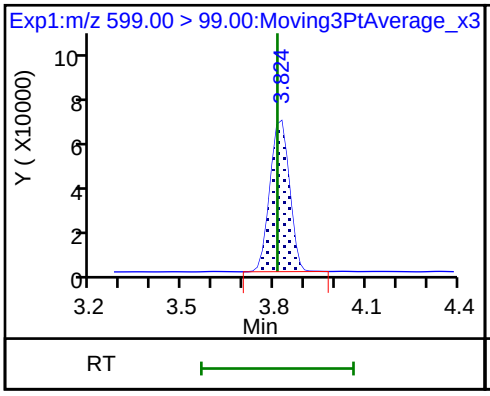




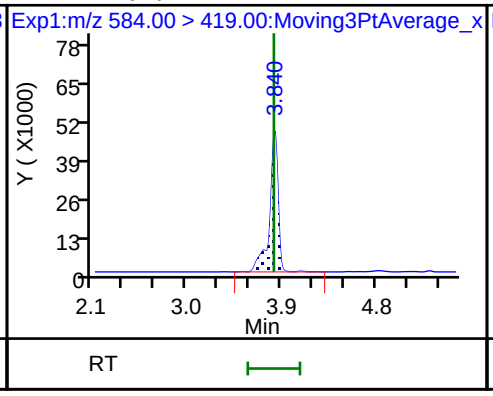
29 Perfluorodecane Sulfonic acid



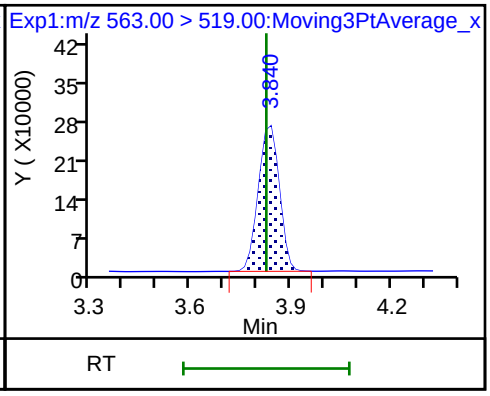
29 Perfluorodecane Sulfonic acid



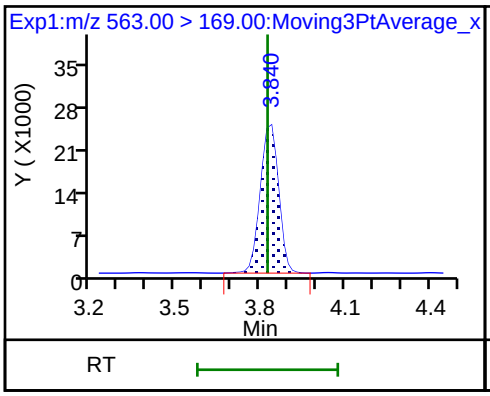
33 N-ethyl perfluorooctane sulfonamid



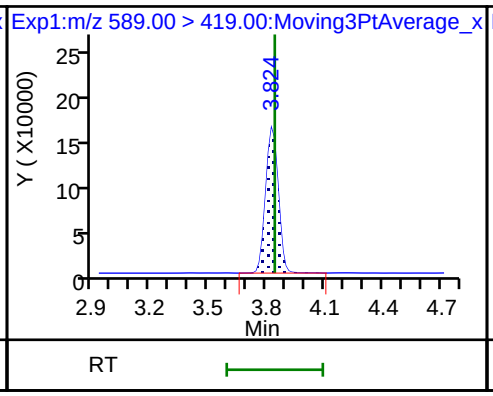
31 Perfluoroundecanoic acid



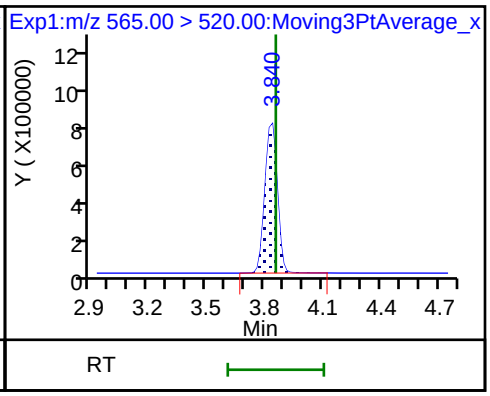
31 Perfluoroundecanoic acid



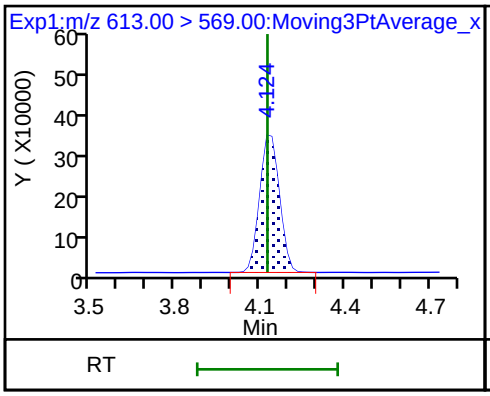
D 32 d5-NEtFOSAA



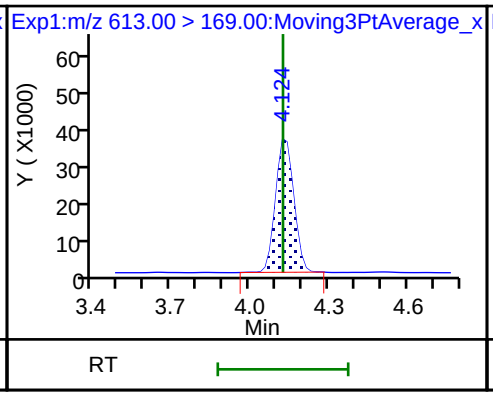
D 30 13C2 PFUnA



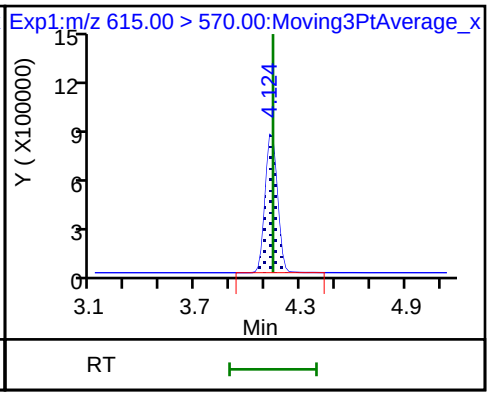
37 Perfluorododecanoic acid



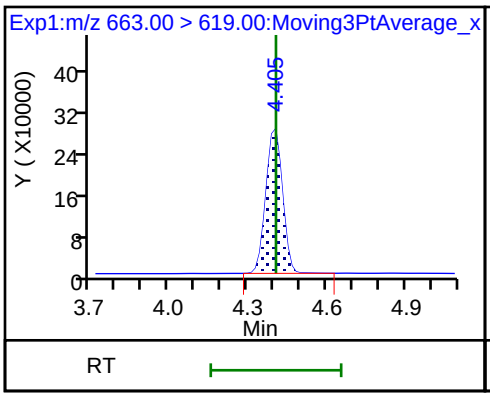
37 Perfluorododecanoic acid



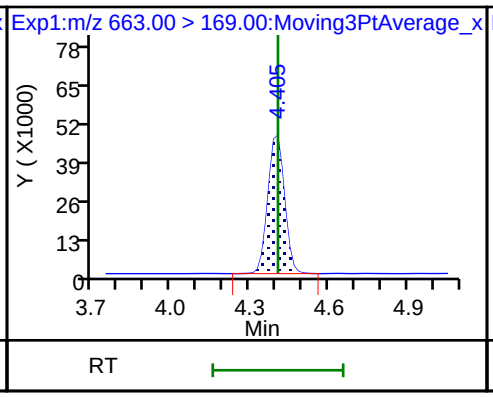
D 36 13C2 PFDoA



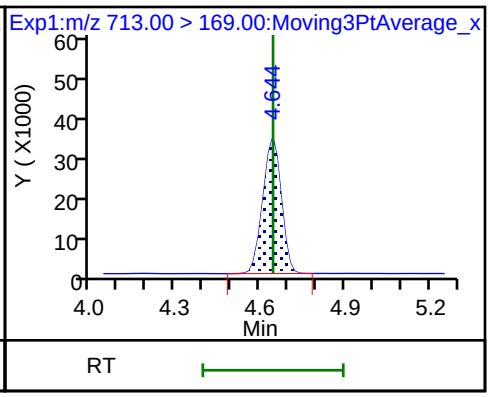
41 Perfluorotridecanoic acid



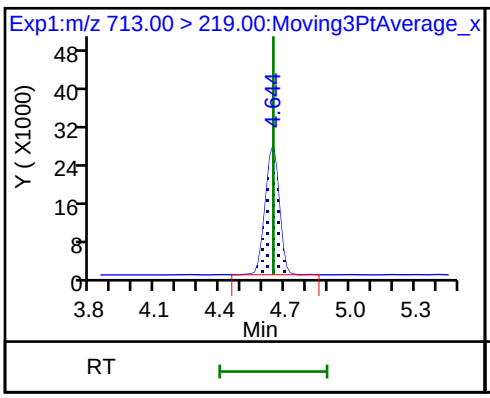
41 Perfluorotridecanoic acid



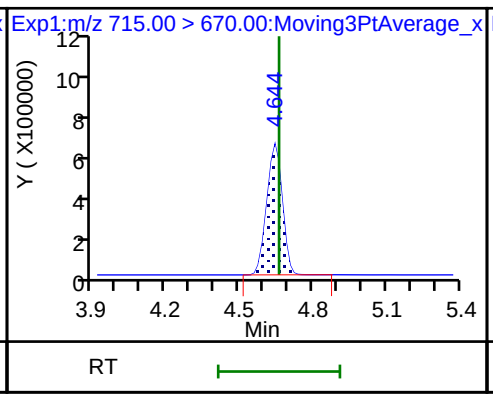
42 Perfluorotetradecanoic acid



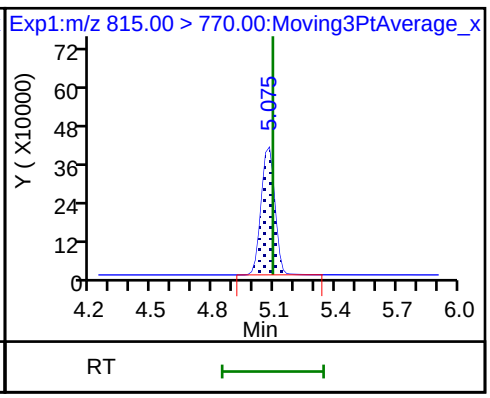
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

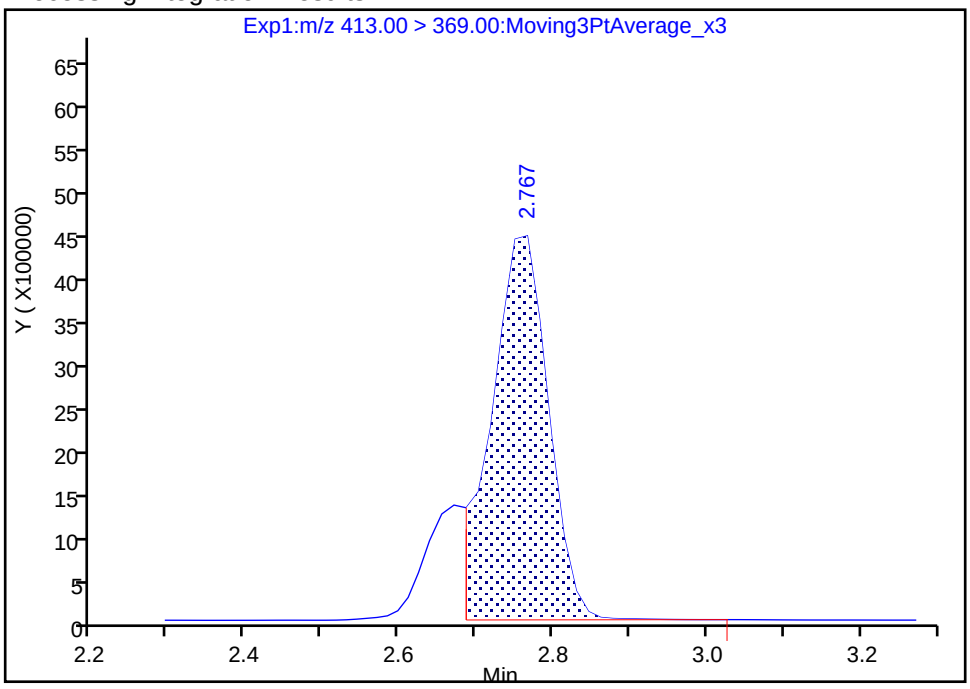
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_013.d				
Injection Date:	11-Aug-2018 21:29:41	Instrument ID:	A9		
Lims ID:	320-41998-A-3-F MSD				
Client ID:	TW03S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

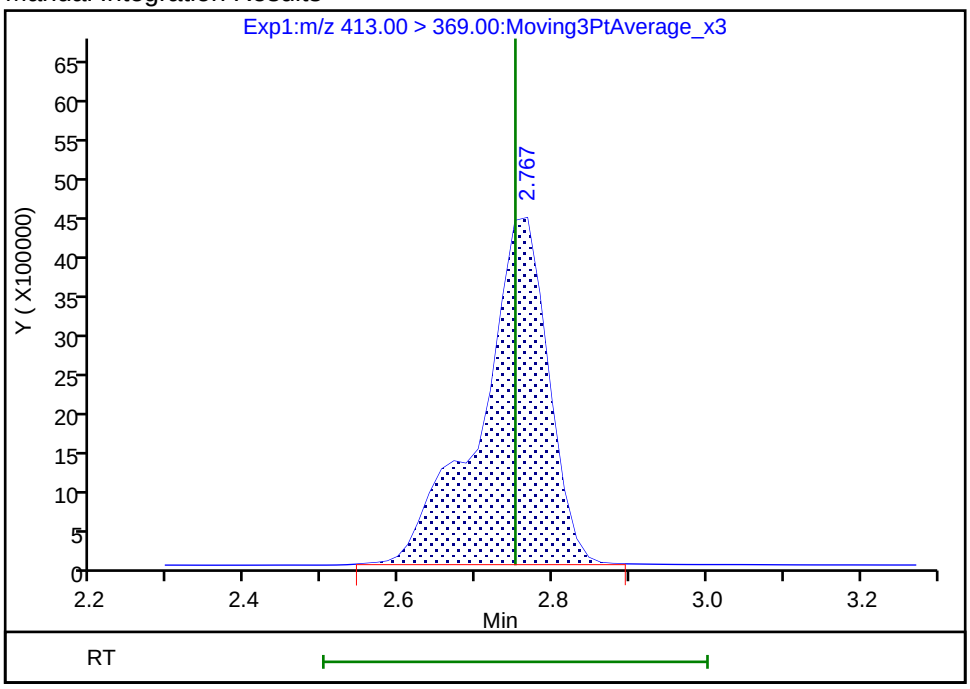
Processing Integration Results

RT: 2.77
Area: 22676888
Amount: 10.234753
Amount Units: ng/ml



Manual Integration Results

RT: 2.77
Area: 27340172
Amount: 12.339431
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:34:58

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

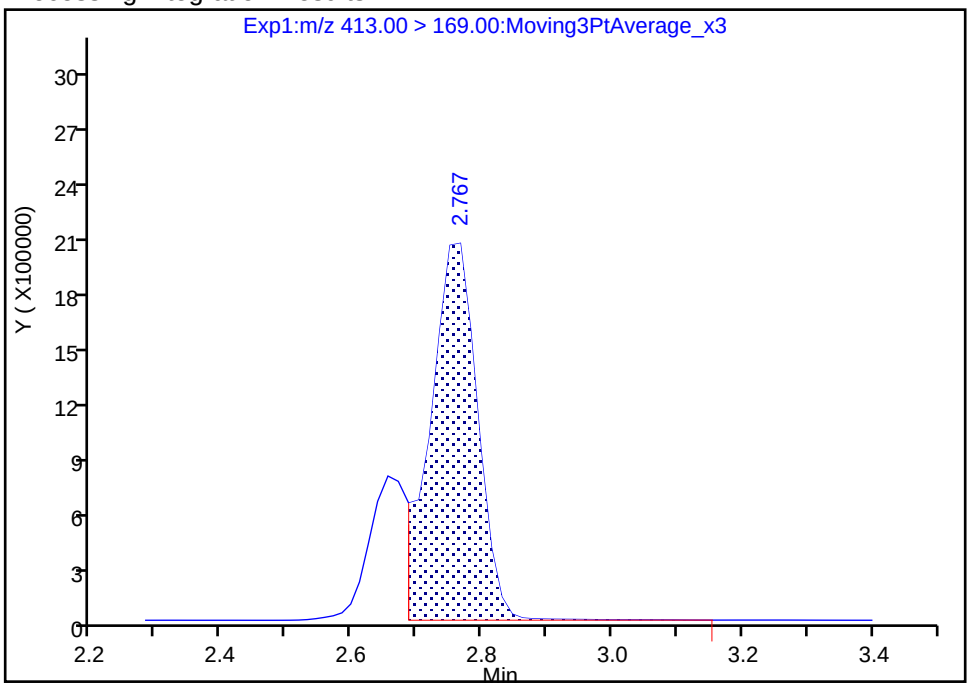
Data File: \\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_013.d
Injection Date: 11-Aug-2018 21:29:41 Instrument ID: A9
Lims ID: 320-41998-A-3-F MSD
Client ID: TW03S-20180713
Operator ID: A9\Administrator ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 20.0 ul Dil. Factor: 1.0000
Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

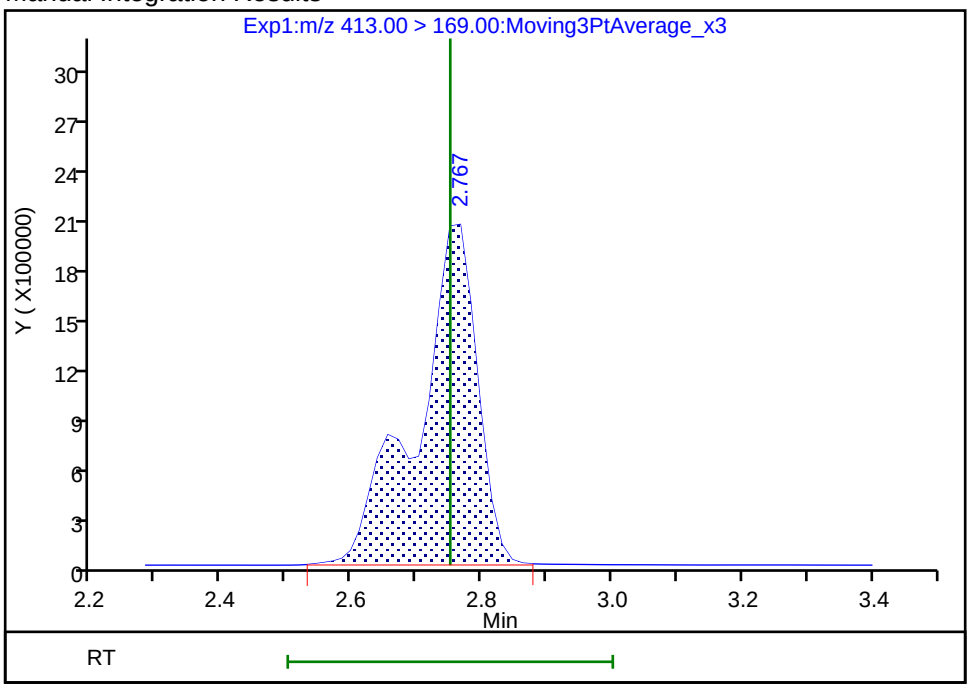
Processing Integration Results

RT: 2.77
Area: 10098244
Amount: 10.234753
Amount Units: ng/ml



Manual Integration Results

RT: 2.77
Area: 13021555
Amount: 12.339431
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:35:05
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

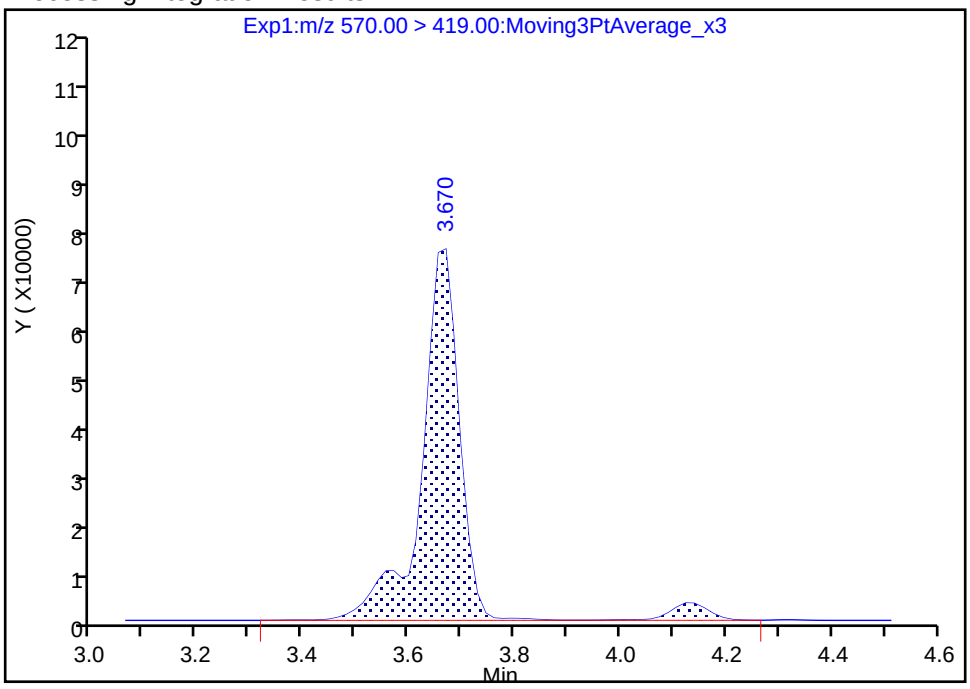
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180811-62560.b\2018.08.11LA9A_013.d				
Injection Date:	11-Aug-2018 21:29:41	Instrument ID:	A9		
Lims ID:	320-41998-A-3-F MSD				
Client ID:	TW03S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	20.0 ul	Dil. Factor:	1.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

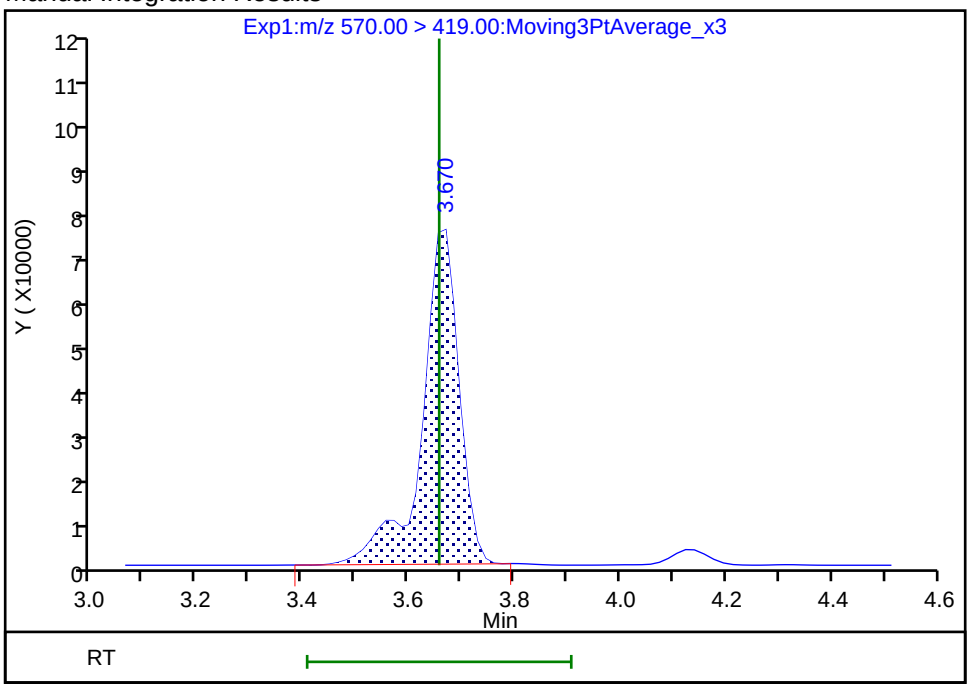
Processing Integration Results

RT: 3.67
Area: 389664
Amount: 1.048147
Amount Units: ng/ml



Manual Integration Results

RT: 3.67
Area: 366397
Amount: 0.985561
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:35:31

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 MSD DL | Lab Sample ID: 320-41998-3 MSD DL

Matrix: Water | Lab File ID: 2018.08.12LLA_011.d

Analysis Method: EPA 537 (Mod) | Date Collected: 07/13/2018 13:30

Extraction Method: 3535 | Date Extracted: 08/11/2018 09:18

Sample wt/vol: 272.6(mL) | Date Analyzed: 08/12/2018 11:18

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 5

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

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

Analysis Batch No.: 239460 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*0.275*	*H 4 D*	*0.0092*	0.0046	*0.0022*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.118*	*H D*	*0.0092*	0.0069	*0.0028*
335-67-1	Perfluorooctanoic acid (PFOA)	0.509	H 4 D M	0.0092	0.0069	0.0025
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.0417*	*H D*	*0.0092*	0.0069	*0.0024*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.0350*	*H D*	*0.0092*	0.0046	*0.0022*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*0.0364*	*H D*	*0.0092*	0.0069	*0.0033*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.0397*	*H D*	*0.0092*	0.0069	*0.0024*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*0.0350*	*H D*	*0.018*	0.014	*0.0035*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*0.0346*	*H D*	*0.018*	0.014	*0.0038*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.0876*	*H D*	*0.0092*	0.0046	*0.0021*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*0.265*	*H 4 D*	*0.0092*	0.0046	*0.0017*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.691	H 4 D	0.018	0.014	0.0050
2355-31-9	*N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)*	*0.0361*	*J H D*	*0.092*	0.046	*0.014*
2991-50-6	*N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)*	*0.0399*	*J H D*	*0.092*	0.046	*0.013*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Client Sample ID: TW03S-20180713 MSD DL Lab Sample ID: 320-41998-3 MSD DL

Matrix: Water Lab File ID: 2018.08.12LLA_011.d

Analysis Method: EPA 537 (Mod) Date Collected: 07/13/2018 13:30

Extraction Method: 3535 Date Extracted: 08/11/2018 09:18

Sample wt/vol: 272.6(mL) Date Analyzed: 08/12/2018 11:18

Con. Extract Vol.: 10.00(mL) Dilution Factor: 5

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

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

Analysis Batch No.: 239460 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	97		50-150
STL00995	13C5 PFNA	89		50-150
STL00996	13C2 PFDA	95		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	87		50-150
STL00994	18O2 PFHxS	79		50-150
STL02116	13C2-PFTeDA	82		50-150
STL00991	13C4 PFOS	80		50-150
STL02337	13C3-PFBS	72		50-150
STL02117	d5-NEtFOSAA	89		50-150
STL02118	d3-NMeFOSAA	95		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_011.d
Lims ID: 320-41998-A-3-F MSD
Client ID: TW03S-20180713
Sample Type: MSD
Inject. Date: 12-Aug-2018 11:18:22 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 20.0 ul Dil. Factor: 5.0000
Sample Info: 320-41998-a-3-f msd 5X
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A9\Administrator Instrument ID: A9

Method: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\PFAS_A9.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 12-Aug-2018 14:05:51 Calib Date: 03-Aug-2018 16:57:30
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A9\20180803-62120.b\2018.08.03LLICAL_011.d

Column 1 : Det: EXP1
Process Host: XAWRK001

First Level Reviewer: roycea Date: 12-Aug-2018 13:59:19

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	1.494	1.494	0.0	0.543	1635930	0.4177		83.5	3583	
2 Perfluorobutyric acid										
212.90 > 169.00	1.494	1.494	0.0	1.000	2119503	0.6971		349	77.5	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.764	1.764	0.0	1.000	3916885	1.36		678	171	
D 3 13C5-PFPeA										
267.90 > 223.00	1.764	1.764	0.0	0.641	1416279	0.4045		80.9	2342	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.806	1.806	0.0	1.005	1915109	0.4776		270	293	
298.90 > 99.00	1.806	1.806	0.0	1.005	694495		2.76(1.35-4.05)		209	
D 47 13C3-PFBS										
301.90 > 83.00	1.797	1.806	-0.009	0.653	18052	0.3328		71.6	70.4	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	2.017	2.017	0.0	1.122	124016	0.1877		100	758	
D 60 M2-4:2FTS										
329.00 > 81.00	1.806	2.018	-0.212	0.656	1505	NC			0.7	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.048	2.048	0.0	1.000	4181963	1.50		748	583	
313.00 > 119.00	2.048	2.048	0.0	1.000	305922		13.67(6.96-20.87)		528	
D 7 13C2 PFHxA										
315.00 > 270.00	2.048	2.058	-0.010	0.744	1493368	0.4108		82.2	3631	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.068	2.079	-0.011	1.151	879977	0.4635		247	569	
349.00 > 99.00	2.068	2.079	-0.011	1.151	408687		2.15(1.15-3.45)		219	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.150	2.150	0.0	1.000	122695	NC			68.1	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.150	2.161	-0.011	0.782	177384	NC			958	

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	2.387	2.400	-0.013	1.000	2564450	0.6452		323	192	
363.00 > 169.00	2.387	2.400	-0.013	1.000	598845		4.28(2.17-6.52)		1231	
D 9 13C4-PFHpA										
367.00 > 322.00	2.387	2.400	-0.013	0.868	1913966	0.4637		92.7	5520	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.400	2.413	-0.013	1.000	4566369	1.45		795	1894	
399.00 > 99.00	2.400	2.413	-0.013	1.000	1158492		3.94(1.90-5.70)		531	
D 11 18O2 PFHxS										
403.00 > 84.00	2.400	2.413	-0.013	0.872	1167517	0.3757		79.4	5196	
65 ADONA										
377.00 > 251.00	2.439	2.439	0.0	0.778	1221378	NC			1783	
377.00 > 85.00	2.426	2.439	-0.013	0.774	498341		2.45(1.05-3.16)		274	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.735	2.735	0.0	1.000	1437662	1.62		856	1054	
D 12 M2-6:2FTS										
429.00 > 81.00	2.735	2.735	0.0	0.994	196828	0.4905		103	247	
* 62 13C2-PFOA										
415.00 > 370.00	2.751	2.767	-0.016		1753275	0.5000			4168	
16 Perfluoroheptanesulfonic acid										M
449.00 > 80.00	2.767	2.767	0.0	0.882	726718	0.2775		146	183	
449.00 > 99.00	2.767	2.767	0.0	0.882	198308		3.66(1.84-5.53)		329	M
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.751	2.767	-0.016	1.000	10184745	2.77		1386	927	
413.00 > 169.00	2.751	2.767	-0.016	1.000	4065293		2.51(1.36-4.08)		1990	M
D 14 13C4 PFOA										
417.00 > 372.00	2.751	2.767	-0.016	1.000	1675597	0.4844		96.9	4340	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.136	3.155	-0.019	1.000	10471340	3.77		2031	2456	
499.00 > 99.00	3.136	3.155	-0.019	1.000	2294962		4.56(2.04-6.12)		2110	
20 Perfluorononanoic acid										
463.00 > 419.00	3.136	3.155	-0.019	1.000	633208	0.2275		114	124	
463.00 > 169.00	3.136	3.155	-0.019	1.000	114159		5.55(2.68-8.03)		251	
D 19 13C5 PFNA										
468.00 > 423.00	3.136	3.155	-0.019	1.140	1319677	0.4447		88.9	2185	
D 18 13C4 PFOS										
503.00 > 80.00	3.136	3.155	-0.019	1.140	1238439	0.3829		80.1	1207	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.353	3.369	-0.016	1.069	534987	NC			774	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.467	3.467	0.0	1.000	930189	0.1994		99.7	1407	
D 21 13C8 FOSA										
506.00 > 78.00	3.467	3.483	-0.016	1.260	759482	0.3929		78.6	2251	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.498	3.498	0.0	1.000	139139	0.2222		116	481	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.498	3.498	0.0	1.115	316844	0.1868		97.3	249	
549.00 > 99.00	3.498	3.498	0.0	1.115	53986		5.87(3.02-9.05)		388	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.514	3.514	0.0	1.000	664739	0.1906		95.3	159	
513.00 > 169.00	3.514	3.514	0.0	1.000	42447		15.66(7.12-21.35)		89.3	
D 26 M2-8:2FTS										
529.00 > 81.00	3.498	3.515	-0.017	1.272	21397	0.4591		95.8	121	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.530	-0.016	1.277	1418438	0.4774		95.5	3142	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.671	3.671	0.0	1.004	109633	0.1970		98.5	161	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.657	3.671	-0.014	1.329	275342	0.4766		95.3	1052	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.826	3.826	0.0	1.220	357772	0.1657		85.9	486	
599.00 > 99.00	3.826	3.826	0.0	1.220	86047		4.16(2.14-6.43)		134	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.841	3.841	0.0	1.004	82778	0.2173		109	151	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.826	3.842	-0.016	1.391	212344	0.4475		89.5	371	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.841	3.857	-0.016	1.000	343372	0.1984		99.2	53.7	
563.00 > 169.00	3.841	3.857	-0.016	1.000	25357		13.54(5.24-15.72)		104	
D 30 13C2 PFUnA										
565.00 > 520.00	3.841	3.857	-0.016	1.396	1027843	0.4280		85.6	5044	
35 MeFOSA										
512.00 > 169.00	3.962	3.962	0.0		54198	NC			200	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.994	4.010	-0.016	1.273	632684	NC			2306	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.142	4.142	0.0	1.000	478988	0.2166		108	90.8	
613.00 > 169.00	4.142	4.142	0.0	1.000	50578		9.47(4.68-14.05)		151	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	4.142	4.142	0.0	1.184	64365	NC			241	
D 36 13C2 PFDoA										
615.00 > 570.00	4.142	4.160	-0.018	1.505	1124526	0.4343		86.9	3614	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.375	4.391	-0.016	1.395	41353	NC			222	
699.00 > 99.00	4.375	4.391	-0.016	1.395	65023		0.64(0.28-0.83)		186	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.406	4.422	-0.016	1.064	322025	0.1908		95.4	101	
663.00 > 169.00	4.406	4.422	-0.016	1.064	56739		5.68(3.09-9.27)		178	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.645	4.664	-0.019	1.000	41432	0.1887		94.3	207	
713.00 > 219.00	4.645	4.664	-0.019	1.000	32140		1.29(0.70-2.09)		128	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.645	4.677	-0.032	1.688	681681	0.4123		82.5	3023	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.075	5.093	-0.018	1.845	497271	0.3279		65.6	2089	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.075	5.096	-0.021	1.000	195802	NC			20.4	
813.00 > 169.00	5.075	5.096	-0.021	1.000	33590		5.83(2.77-8.32)		99.5	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.434	5.465	-0.031	1.071	81132	NC			117	
913.00 > 169.00	5.434	5.465	-0.031	1.071	15807		5.13(2.55-7.64)		183	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 13-Aug-2018 07:42:11 Chrom Revision: 2.3 19-Jul-2018 15:14:50

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_011.d

Injection Date: 12-Aug-2018 11:18:22 Instrument ID: A9

Lims ID: 320-41998-A-3-F MSD

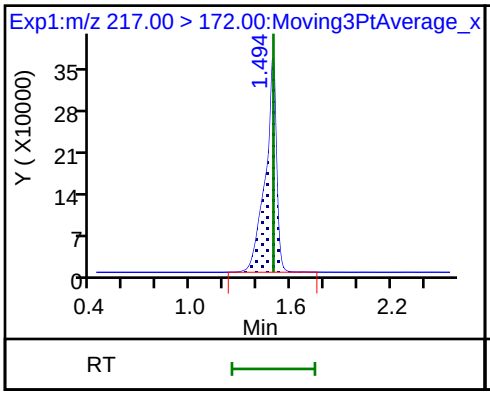
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Operator ID: A9\Administrator ALS Bottle#: 5 Worklist Smp#: 8

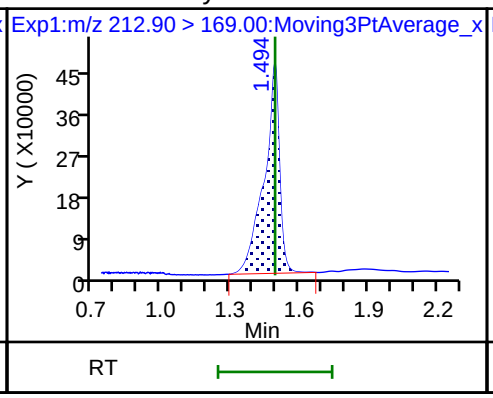
Injection Vol: 20.0 ul Dil. Factor: 5.0000

Method: PFAS_A9 Limit Group: LC PFC_QSM5-1 ICAL

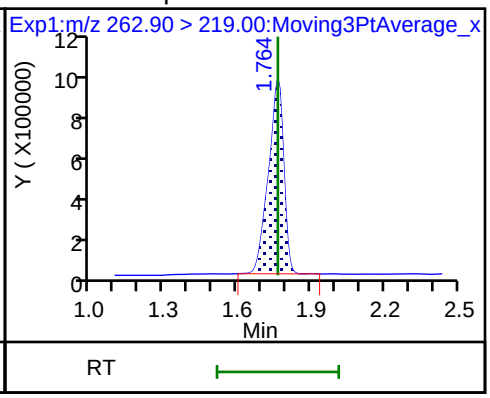
D 1 13C4 PFBA



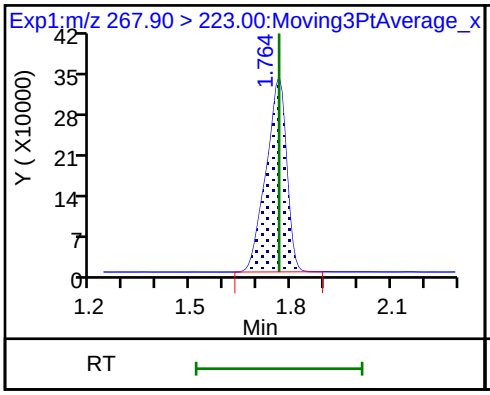
2 Perfluorobutyric acid



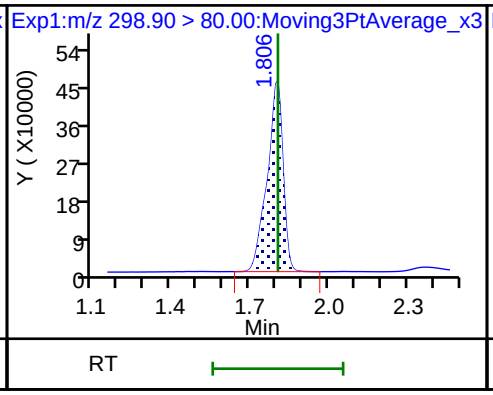
4 Perfluoropentanoic acid



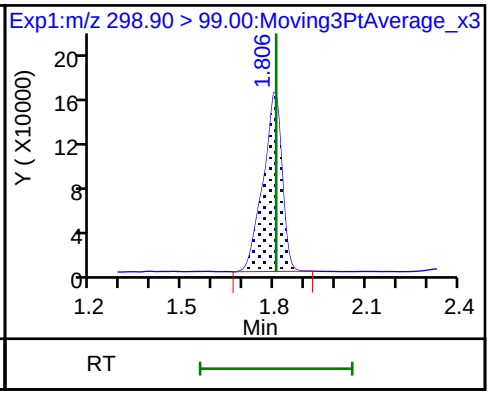
D 3 13C5-PFPeA



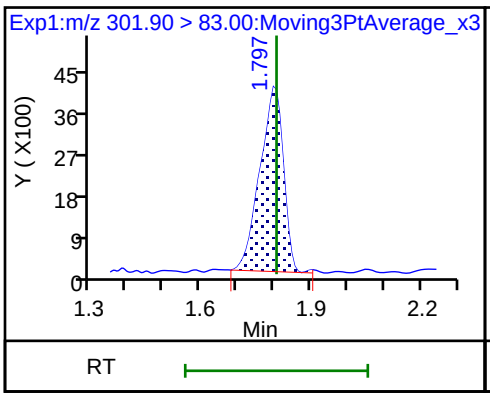
5 Perfluorobutanesulfonic acid



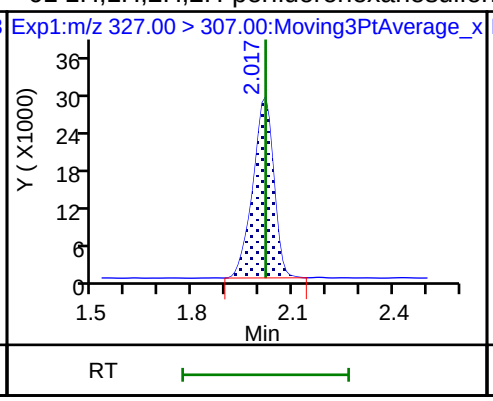
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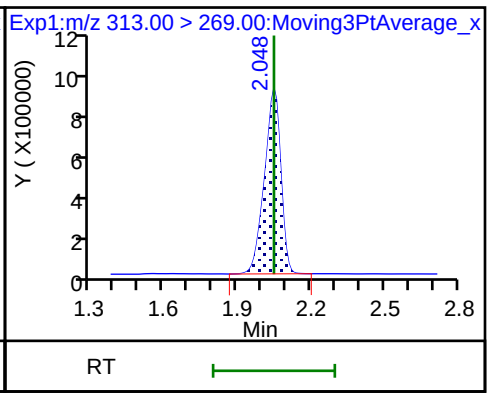
D 47 13C3-PFBS



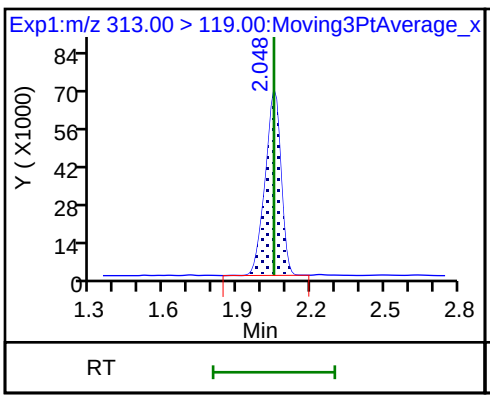
61 1H,1H,2H,2H-perfluorohexanesulfoni



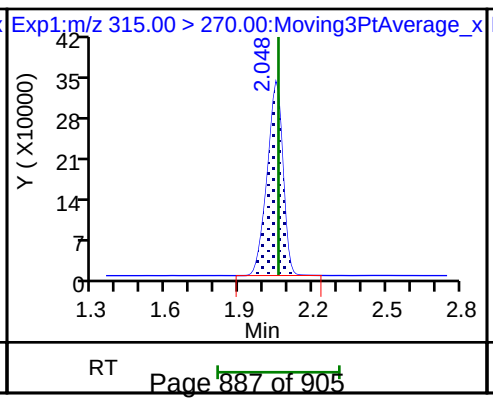
6 Perfluorohexanoic acid



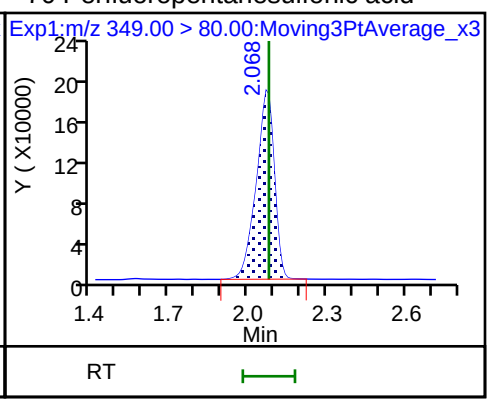
6 Perfluorohexanoic acid



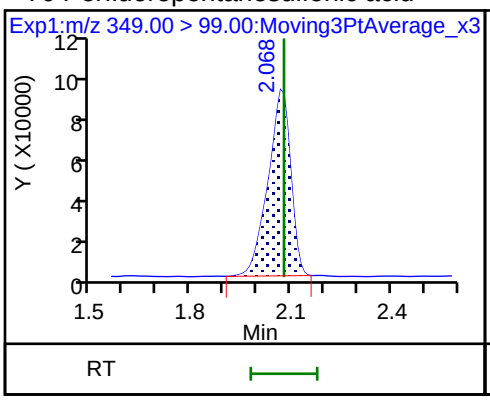
D 7 13C2 PFHxA



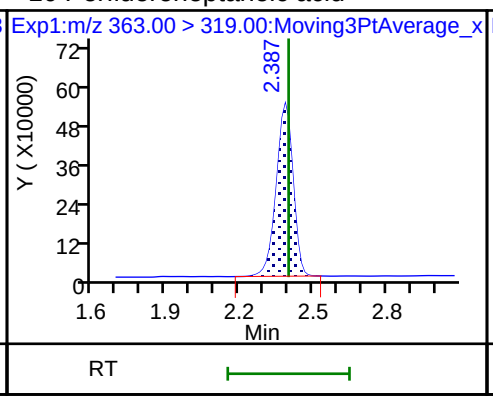
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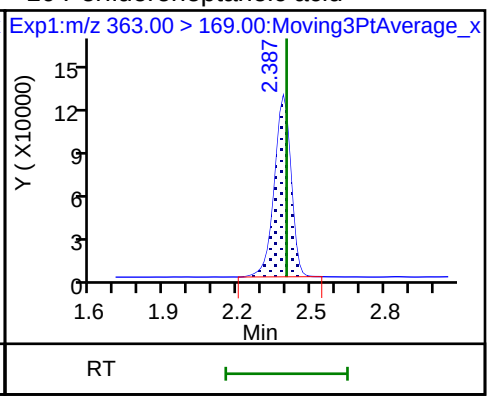
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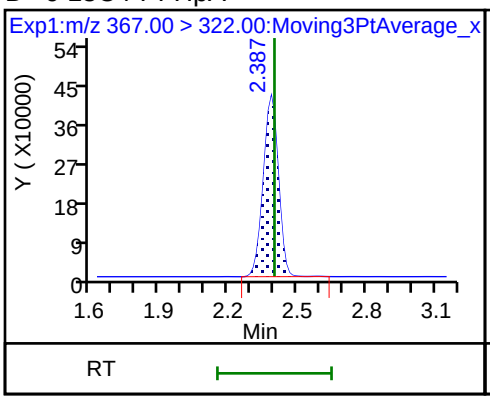
10 Perfluoroheptanoic acid



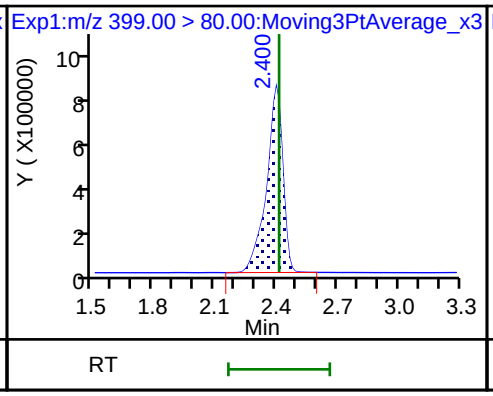
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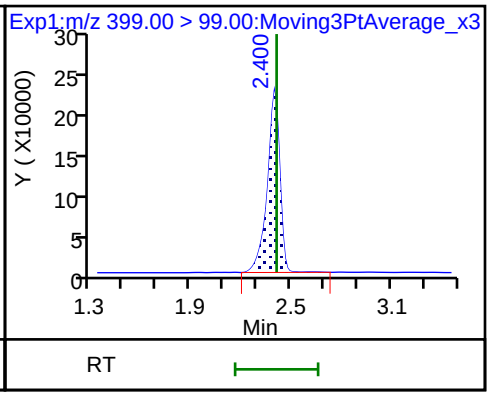
D 9 13C4-PFHpA



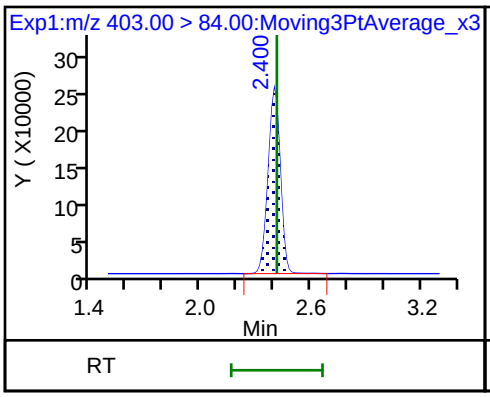
8 Perfluorohexanesulfonic acid



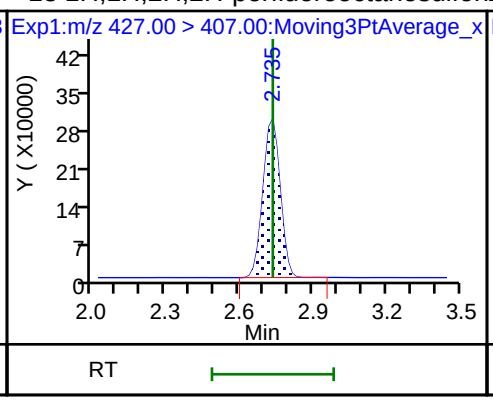
8 Perfluorohexanesulfonic acid



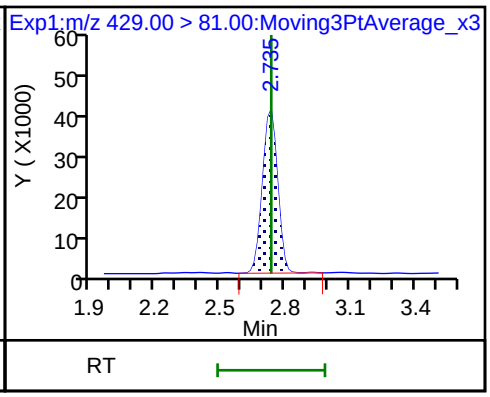
D 11 18O2 PFHxS



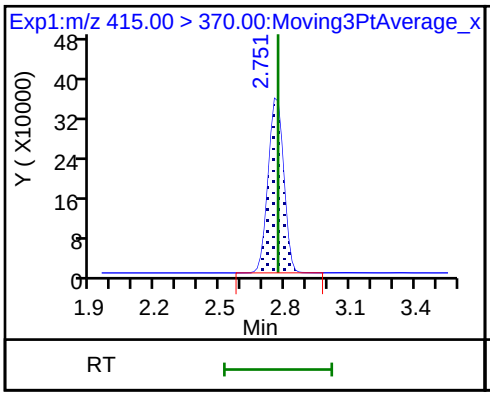
13 1H,1H,2H,2H-perfluorooctanesulfon



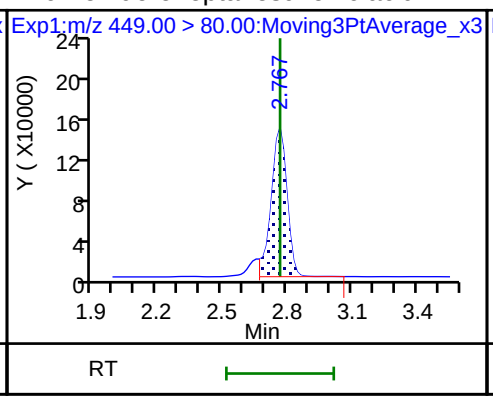
D 12 M2-6:2FTS



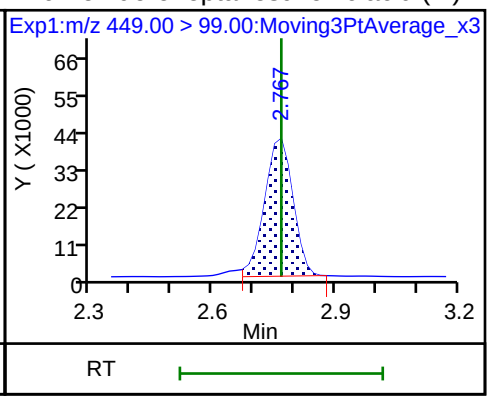
* 62 13C2-PFOA



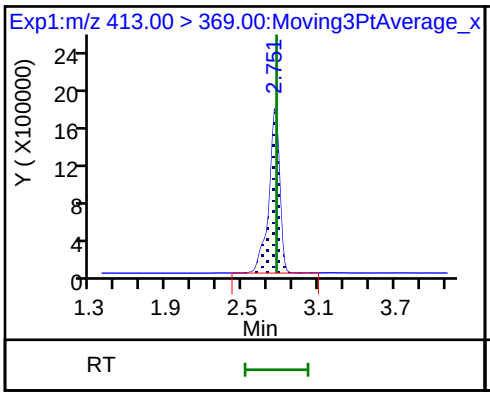
16 Perfluoroheptanesulfonic acid



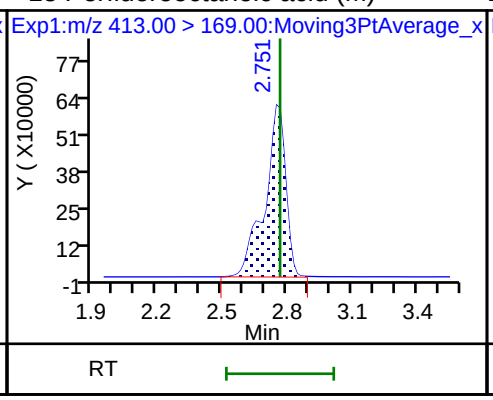
16 Perfluoroheptanesulfonic acid (M)



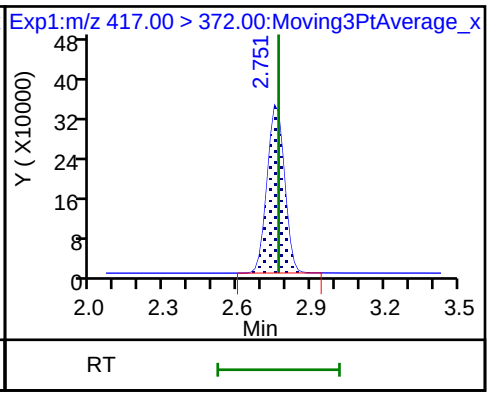
15 Perfluorooctanoic acid



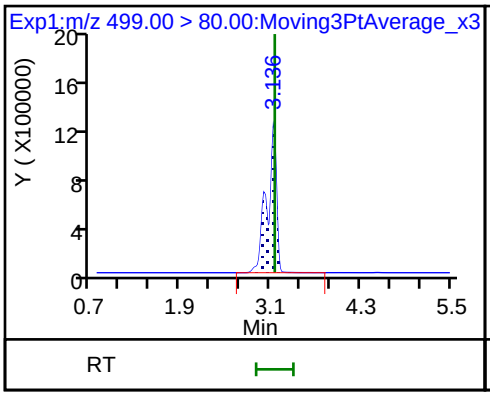
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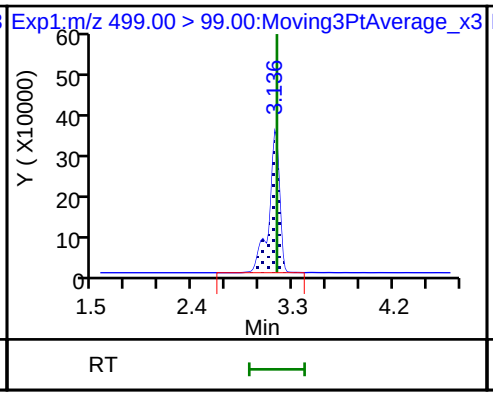
D 14 13C4 PFOA



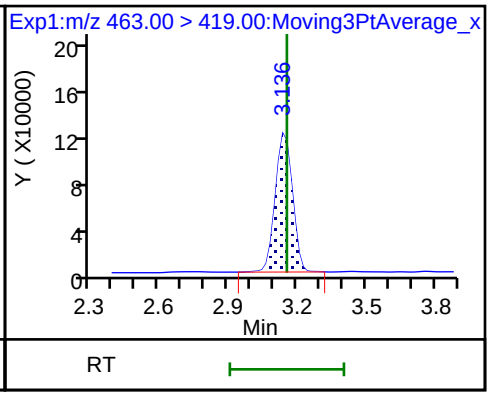
17 Perfluorooctane sulfonic acid



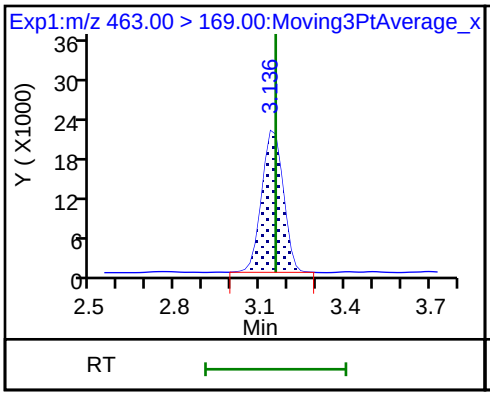
17 Perfluorooctane sulfonic acid



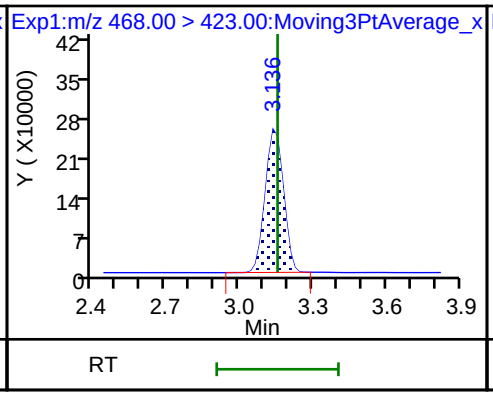
20 Perfluorononanoic acid



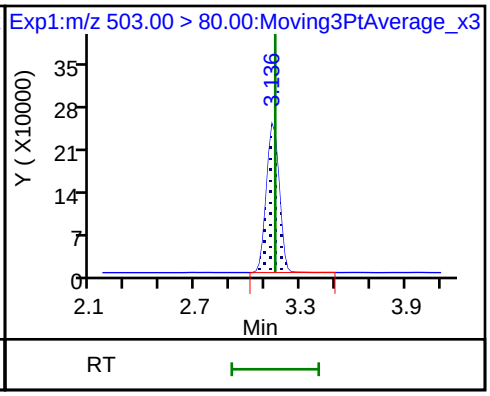
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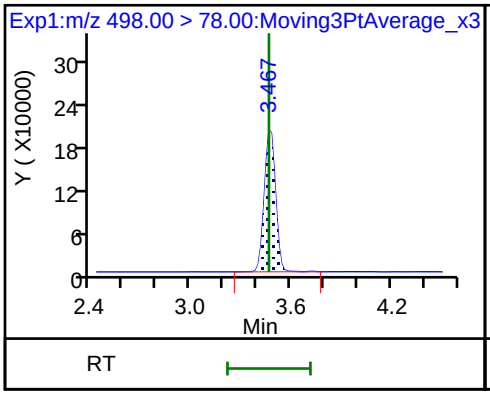
D 19 13C5 PFNA



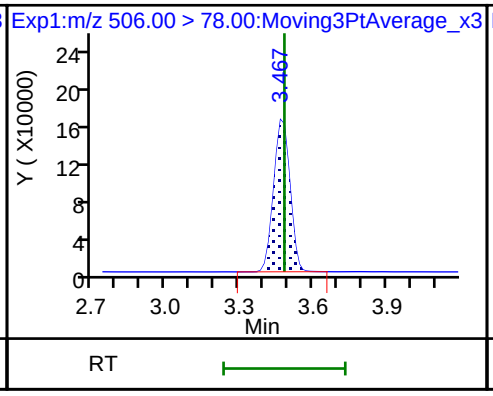
D 18 13C4 PFOS



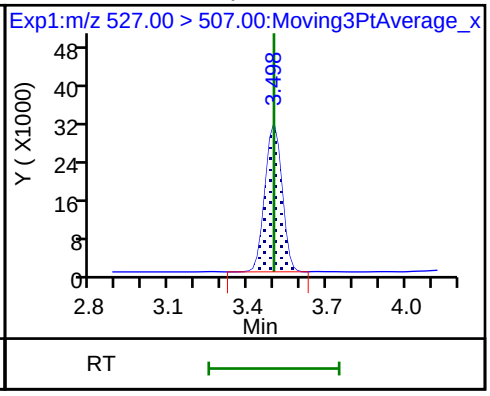
22 Perfluorooctane Sulfonamide



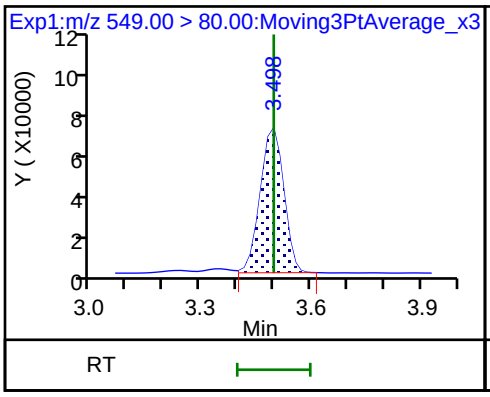
D 21 13C8 FOSA



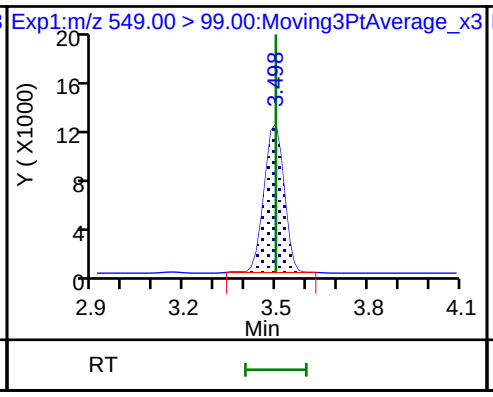
25 1H,1H,2H,2H-perfluorodecanesulfoni



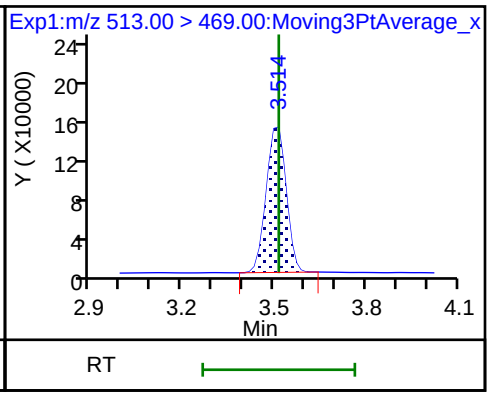
68 Perfluorononanesulfonic acid



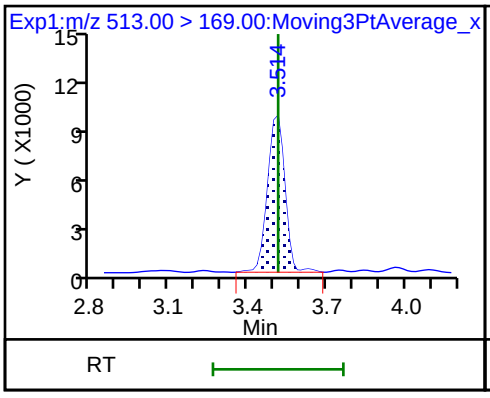
68 Perfluorononanesulfonic acid



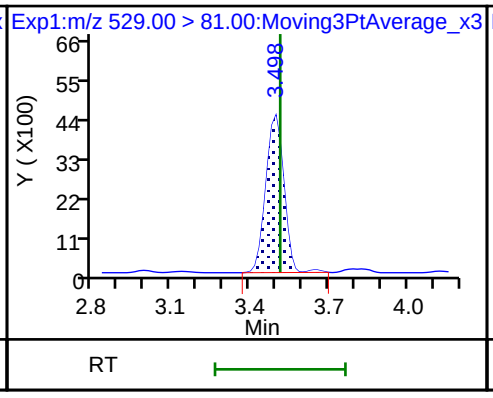
24 Perfluorodecanoic acid



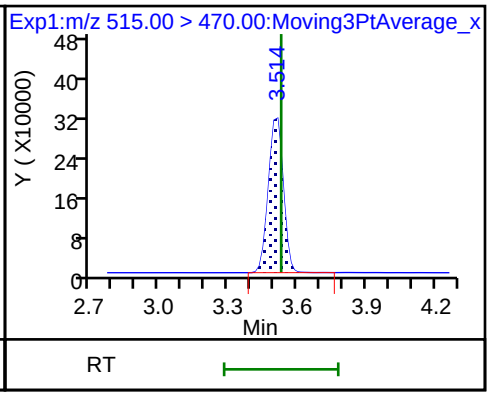
24 Perfluorodecanoic acid



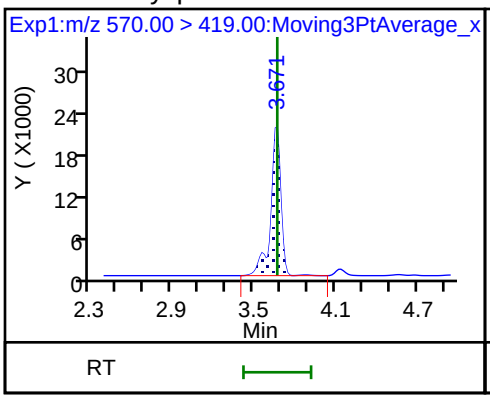
D 26 M2-8:2FTS



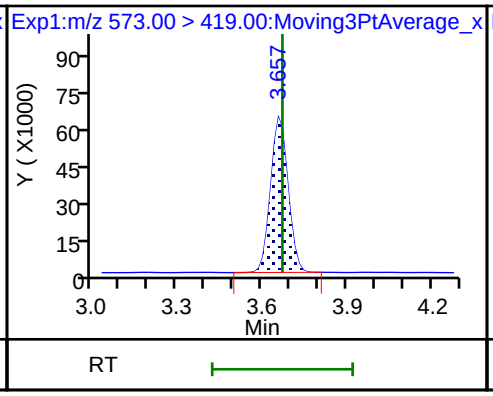
D 23 13C2 PFDA



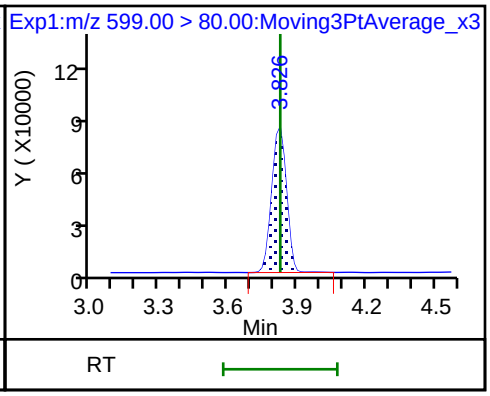
28 N-methyl perfluorooctane sulfonami



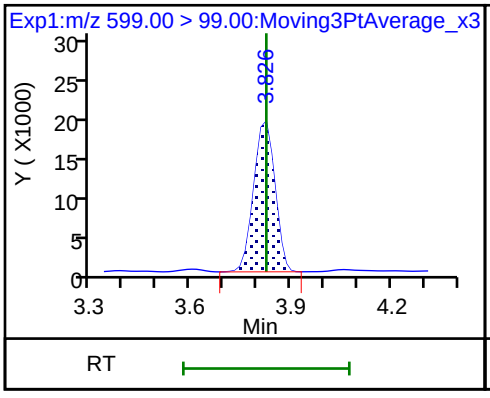
D 27 d3-NMeFOSAA



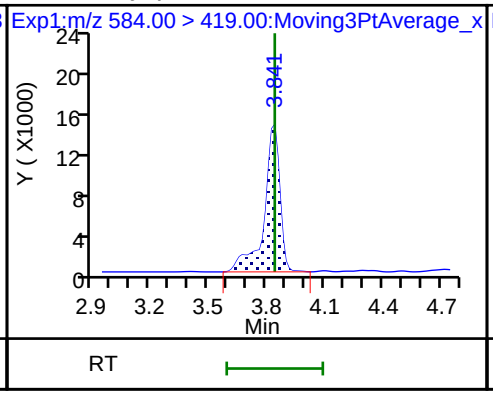
29 Perfluorodecane Sulfonic acid



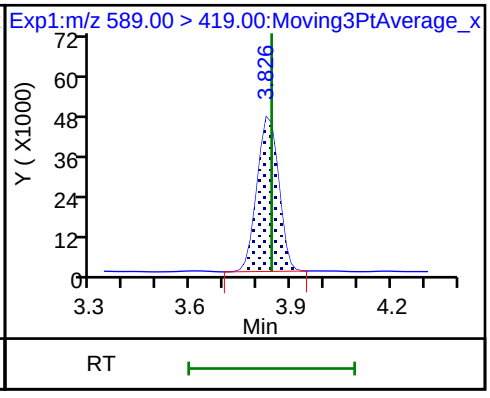
29 Perfluorodecane Sulfonic acid



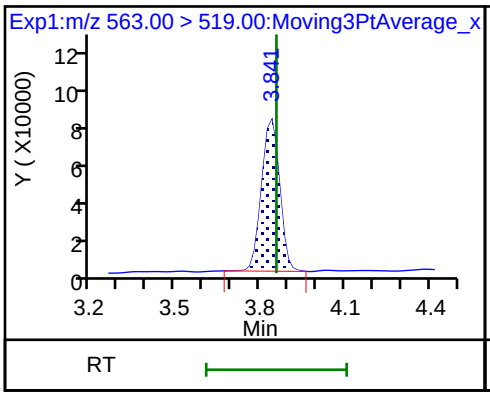
33 N-ethyl perfluorooctane sulfonamid



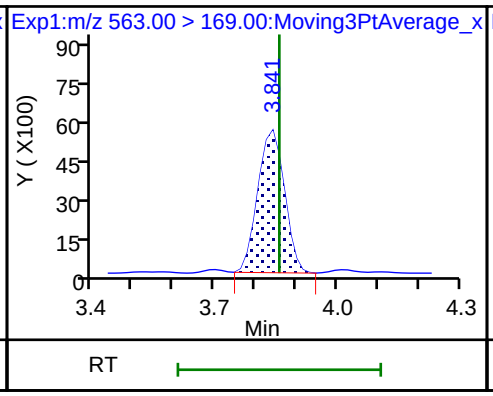
D 32 d5-NEtFOSAA



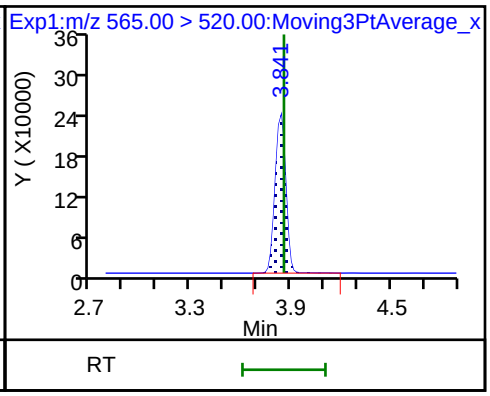
31 Perfluoroundecanoic acid



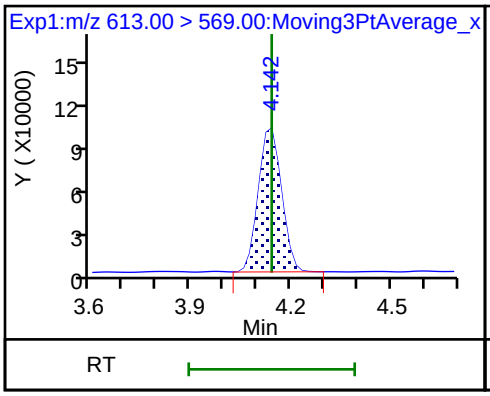
31 Perfluoroundecanoic acid



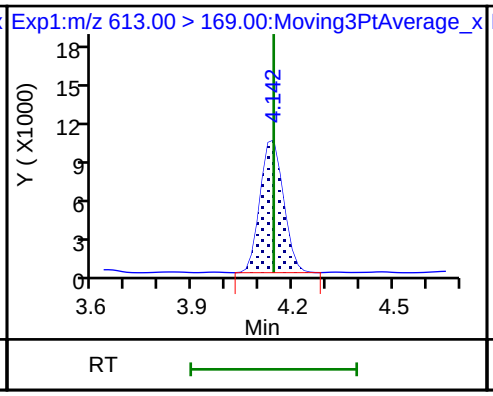
D 30 13C2 PFUnA



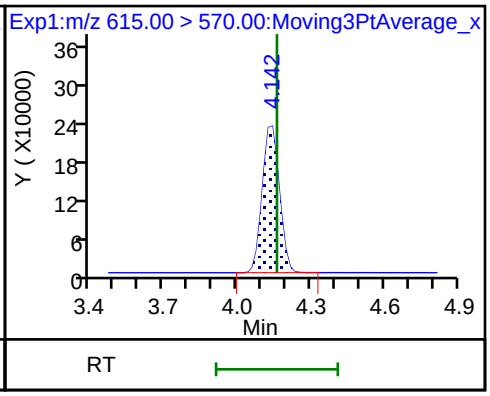
37 Perfluorododecanoic acid



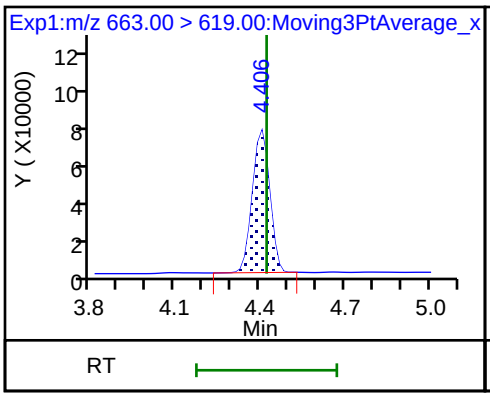
37 Perfluorododecanoic acid



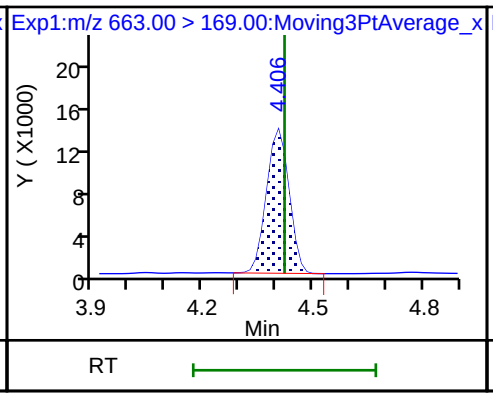
D 36 13C2 PFDoA



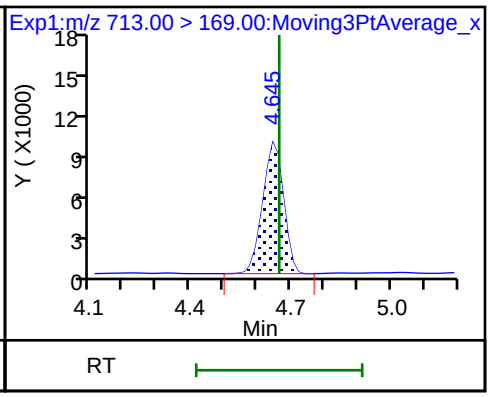
41 Perfluorotridecanoic acid



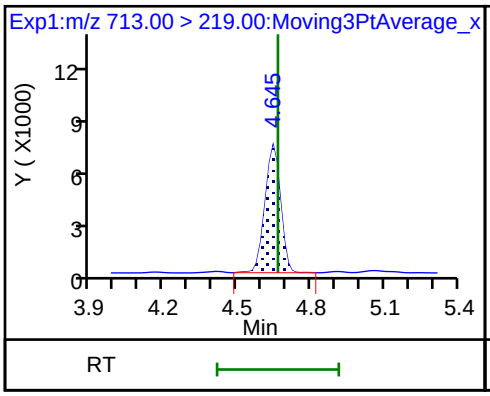
41 Perfluorotridecanoic acid



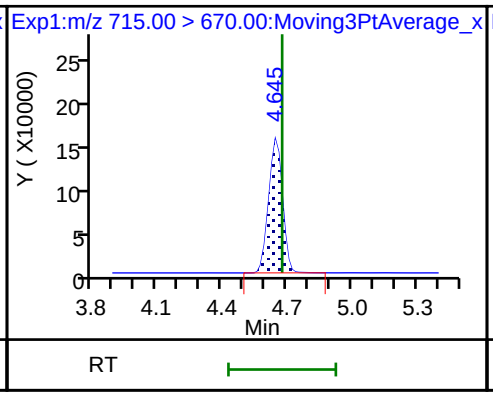
42 Perfluorotetradecanoic acid



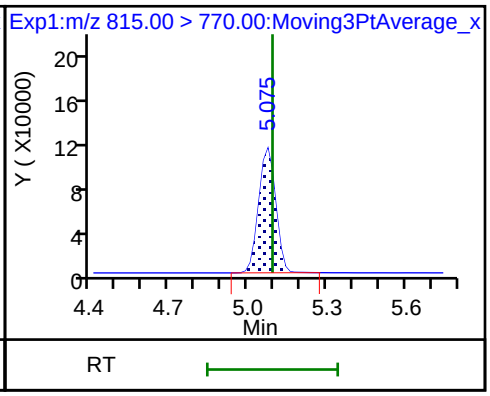
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

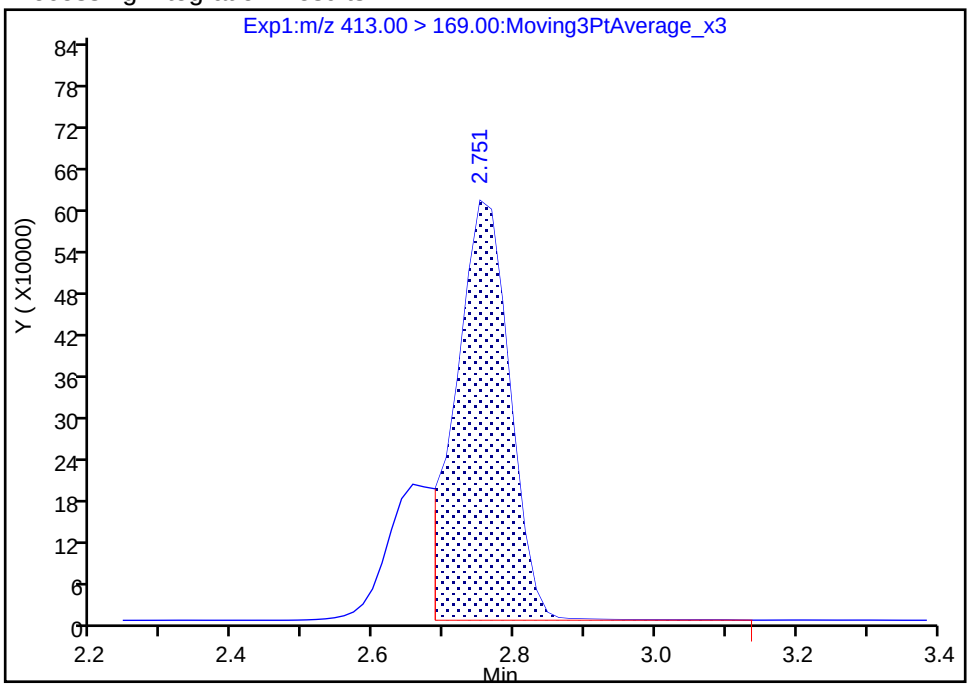
Data File:	\\ChromNA\Sacramento\ChromData\A9\20180812-62571.b\2018.08.12LLA_011.d				
Injection Date:	12-Aug-2018 11:18:22	Instrument ID:	A9		
Lims ID:	320-41998-A-3-F MSD				
Client ID:	TW03S-20180713				
Operator ID:	A9\Administrator	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	20.0 ul	Dil. Factor:	5.0000		
Method:	PFAS_A9	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

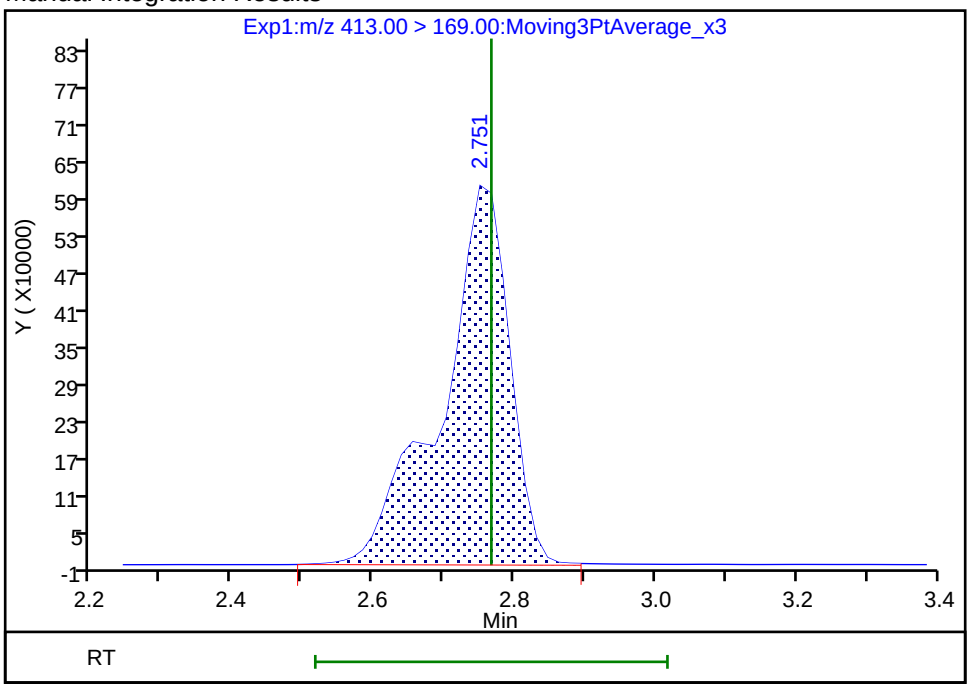
Processing Integration Results

RT: 2.75
Area: 3184502
Amount: 2.773899
Amount Units: ng/ml



Manual Integration Results

RT: 2.75
Area: 4065293
Amount: 2.773899
Amount Units: ng/ml



Reviewer: roycea, 12-Aug-2018 13:58:38

Audit Action: Manually Integrated Audit Reason: Isomers

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Start Date: 08/03/2018 16:12

Analysis Batch Number: 237921 End Date: 08/03/2018 17:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-237921/2		08/03/2018 16:12	1	2018.08.03LLICAL_005.d	Acquity 2.1(mm)
IC 320-237921/3		08/03/2018 16:19	1	2018.08.03LLICAL_006.d	Acquity 2.1(mm)
IC 320-237921/4		08/03/2018 16:27	1	2018.08.03LLICAL_007.d	Acquity 2.1(mm)
IC 320-237921/5 ICIS		08/03/2018 16:34	1	2018.08.03LLICAL_008.d	Acquity 2.1(mm)
IC 320-237921/6		08/03/2018 16:42	1	2018.08.03LLICAL_009.d	Acquity 2.1(mm)
IC 320-237921/7		08/03/2018 16:50	1	2018.08.03LLICAL_010.d	Acquity 2.1(mm)
IC 320-237921/8		08/03/2018 16:57	1	2018.08.03LLICAL_011.d	Acquity 2.1(mm)
ICB 320-237921/9		08/03/2018 17:04	1	2018.08.03LLICAL_012.d	Acquity 2.1(mm)
ICV 320-237921/10		08/03/2018 17:12	1	2018.08.03LLICAL_013.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Start Date: 08/11/2018 20:22

Analysis Batch Number: 239432 End Date: 08/11/2018 22:59

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-239432/1		08/11/2018 20:22	1	2018.08.11LA9A_004.d	Acquity 2.1(mm)
CCVL 320-239432/2		08/11/2018 20:29	1	2018.08.11LA9A_005.d	Acquity 2.1(mm)
CCV 320-239432/3 CCVIS		08/11/2018 20:37	1	2018.08.11LA9A_006.d	Acquity 2.1(mm)
MB 320-239407/1-A		08/11/2018 20:44	1	2018.08.11LA9A_007.d	Acquity 2.1(mm)
LCS 320-239407/2-A		08/11/2018 20:52	1	2018.08.11LA9A_008.d	Acquity 2.1(mm)
320-41998-1		08/11/2018 20:59	1	2018.08.11LA9A_009.d	Acquity 2.1(mm)
320-41998-2		08/11/2018 21:07	1	2018.08.11LA9A_010.d	Acquity 2.1(mm)
320-41998-3		08/11/2018 21:14	1	2018.08.11LA9A_011.d	Acquity 2.1(mm)
320-41998-3 MS		08/11/2018 21:22	1	2018.08.11LA9A_012.d	Acquity 2.1(mm)
320-41998-3 MSD		08/11/2018 21:29	1	2018.08.11LA9A_013.d	Acquity 2.1(mm)
320-41998-4		08/11/2018 21:37	1	2018.08.11LA9A_014.d	Acquity 2.1(mm)
320-41998-5		08/11/2018 21:44	1	2018.08.11LA9A_015.d	Acquity 2.1(mm)
CCV 320-239432/14		08/11/2018 21:59	1	2018.08.11LA9A_017.d	Acquity 2.1(mm)
320-41998-6		08/11/2018 22:07	1	2018.08.11LA9A_018.d	Acquity 2.1(mm)
ZZZZZ		08/11/2018 22:14	1		Acquity 2.1(mm)
ZZZZZ		08/11/2018 22:22	100		Acquity 2.1(mm)
CCV 320-239432/22		08/11/2018 22:59	1	2018.08.11LA9A_021.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Start Date: 08/12/2018 10:25

Analysis Batch Number: 239460 End Date: 08/12/2018 12:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-239460/1		08/12/2018 10:25	1	2018.08.12LLA_004.d	Acquity 2.1(mm)
CCVL 320-239460/2		08/12/2018 10:33	1	2018.08.12LLA_005.d	Acquity 2.1(mm)
CCV 320-239460/3 CCVIS		08/12/2018 10:40	1	2018.08.12LLA_006.d	Acquity 2.1(mm)
ZZZZZ		08/12/2018 10:48	5		Acquity 2.1(mm)
ZZZZZ		08/12/2018 10:55	5		Acquity 2.1(mm)
320-41998-3 DL		08/12/2018 11:03	5	2018.08.12LLA_009.d	Acquity 2.1(mm)
320-41998-3 MS DL		08/12/2018 11:10	5	2018.08.12LLA_010.d	Acquity 2.1(mm)
320-41998-3 MSD DL		08/12/2018 11:18	5	2018.08.12LLA_011.d	Acquity 2.1(mm)
320-41998-4 DL		08/12/2018 11:25	5	2018.08.12LLA_012.d	Acquity 2.1(mm)
ZZZZZ		08/12/2018 11:33	5		Acquity 2.1(mm)
ZZZZZ		08/12/2018 11:40	100		Acquity 2.1(mm)
ZZZZZ		08/12/2018 11:48	1		Acquity 2.1(mm)
CCV 320-239460/16		08/12/2018 12:18	1	2018.08.12LLA_019.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Start Date: 08/13/2018 08:06

Analysis Batch Number: 239481 End Date: 08/13/2018 08:51

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-239481/1		08/13/2018 08:06	1	2018.08.13LLA_004.d	Acquity 2.1(mm)
CCVL 320-239481/2		08/13/2018 08:13	1	2018.08.13LLA_005.d	Acquity 2.1(mm)
CCV 320-239481/3 CCVIS		08/13/2018 08:21	1	2018.08.13LLA_019.d	Acquity 2.1(mm)
ZZZZZ		08/13/2018 08:28	100		Acquity 2.1(mm)
ZZZZZ		08/13/2018 08:36	10		Acquity 2.1(mm)
CCV 320-239481/7		08/13/2018 08:51	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Instrument ID: A9 Start Date: 08/13/2018 09:29

Analysis Batch Number: 239523 End Date: 08/13/2018 09:59

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-239523/1		08/13/2018 09:29	1	2018.08.13LLA_027.d	Acquity 2.1(mm)
320-41998-7 DL		08/13/2018 09:36	100	2018.08.13LLA_028.d	Acquity 2.1(mm)
320-41998-7		08/13/2018 09:44	10	2018.08.13LLA_029.d	Acquity 2.1(mm)
CCV 320-239523/5		08/13/2018 09:59	1	2018.08.13LLA_030.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41998-1

SDG No.:

Batch Number: 239407 Batch Start Date: 08/11/18 09:18 Batch Analyst: Kouchari, Shamiran

Batch Method: 3535 Batch End Date: 08/11/18 16:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00092	LCPFC-IS 00055
MB 320-239407/1		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCS 320-239407/2		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
320-41998-A-1	TW01S-20180713	3535, EPA 537 (Mod)	T	303.58 g	93.76 g	209.8 mL	10.00 mL	390 uL	500 uL
320-41998-A-2	TW02S-20180713	3535, EPA 537 (Mod)	T	312.30 g	150.15 g	162.2 mL	10.00 mL	290 uL	500 uL
320-41998-A-3	TW03S-20180713	3535, EPA 537 (Mod)	T	317.44 g	37.96 g	279.5 mL	10.00 mL	500 uL	500 uL
320-41998-A-3 MS	TW03S-20180713	3535, EPA 537 (Mod)	T	303.16 g	37.66 g	265.5 mL	10.00 mL	500 uL	500 uL
320-41998-A-3 MSD	TW03S-20180713	3535, EPA 537 (Mod)	T	310.48 g	37.88 g	272.6 mL	10.00 mL	500 uL	500 uL
320-41998-A-4	TW04S-20180713	3535, EPA 537 (Mod)	T	301.05 g	80.16 g	220.9 mL	10.00 mL	415 uL	500 uL
320-41998-A-5	DUP02-20180713	3535, EPA 537 (Mod)	T	300.42 g	132.58 g	167.8 mL	10.00 mL	315 uL	500 uL
320-41998-A-6	EB02-20180713	3535, EPA 537 (Mod)	T	311.31 g	37.62 g	273.7 mL	10.00 mL	500 uL	500 uL
320-41998-A-7	I012MW07S-20180713	3535, EPA 537 (Mod)	T	320.29 g	37.53 g	282.8 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00163					
MB 320-239407/1		3535, EPA 537 (Mod)							
LCS 320-239407/2		3535, EPA 537 (Mod)		500 uL					
320-41998-A-1	TW01S-20180713	3535, EPA 537 (Mod)	T						
320-41998-A-2	TW02S-20180713	3535, EPA 537 (Mod)	T						
320-41998-A-3	TW03S-20180713	3535, EPA 537 (Mod)	T						
320-41998-A-3 MS	TW03S-20180713	3535, EPA 537 (Mod)	T	500 uL					
320-41998-A-3 MSD	TW03S-20180713	3535, EPA 537 (Mod)	T	500 uL					
320-41998-A-4	TW04S-20180713	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.: 320-41998-1

SDG No.:

Batch Number: 239407 Batch Start Date: 08/11/18 09:18 Batch Analyst: Kouchari, Shamiran

Batch Method: 3535 Batch End Date: 08/11/18 16:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00163					
320-41998-A-5	DUP02-20180713	3535, EPA 537 (Mod)	T						
320-41998-A-6	EB02-20180713	3535, EPA 537 (Mod)	T						
320-41998-A-7	I012MW07S-20180713	3535, EPA 537 (Mod)	T						

Batch Notes	
Analyst ID - Aliquot Step	SKD
Balance ID	QA-078
Batch Comment	Client labels match TA label, SKD 08/11/18
Analyst ID - Final Volume Step	SKD
H2O ID	08/09/18
Hexane ID	1313826
Internal Standard ID#	1265442
Manifold ID	G
Methanol ID	1328629
Sodium Hydroxide ID	1325869
Pipette ID	1320118
Analyst ID - Reagent Drop	SKD
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	VPM
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	HJA
Solvent Lot #	1320498
Solvent Name	0.3% NH4OH/MEOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003237137A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA

Analyst (Print Name) Amani Royce **Reagent ID** LC-80:20-

Date 8/12/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
320-41998	1	10,000	60	300	5x
	2				5x
	3				5x
	3MS				5x
	3MSD				5x
	4				5x
	5				5x
	6				
	7	10,000	15	1500	100x

aor 8/12/18

aor 8/12/18

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC - 1DA

Analyst (Print Name) Amani Ragab

Reagent ID LC-80:20-00012

Date 8/13/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
320-41998	7	10,000	15	1500	100x
↓	7	↓	30	300	10x

Archive

ave 8/13/18

Comments:

Shipping and Receiving Documents

Rev. Date: 06/27/2017

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1801764 Temp: 1.0 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: 160073.008 PO#: PO000798 Sampler: K. Kwok J. Dumont (name)

TAT (check one): Standard: ☐ 21 days Rush (surcharge may apply) ☒ 14 days ☐ 7 days Specify:

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Invoices	ICMEA	2423 Hoover Avenue	National City	CA	(619) 399-5900	(619) 431-3510

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Kelly Kwok	7/13/18	1700	B. Benedict	07/14/18	0944
B. Benedict	08/10/18	1509	Cityfreq	8-10-18	1605

5.4°C

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

Method of Shipment:

ATTN: Jake White-Dobbs Tracking No.:

320-41998 Chain of Custody

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	Mod. EPA Method 537: PFOA/PFOS	UCMR3 PFAS List:6	537 List: 14	Full List of 26	Other: Please List Below	EPA Method 537(DW only): PFOA/PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
TW01S-20180713	7/13/18	0950	Former MCAS Tustin	2	P	AQ			/						Level 3
TW02S-20180713	7/13/18	1150	Former MCAS Tustin	2	P	AQ			/						Level 3
TW03S-20180713	7/13/18	1330		6	P	AQ			/						Level 3
TW04S-20180713		~~1530~~ 1430		1	P	AQ			/						Level 3
DUP02-20180713		0000		2	P	AQ			/						Level 3
EB02-20180713		1545		2	P	AQ			/						Level 3
I-012MW07S-20180713		1530		2	P	AQ			/						Level 3

Special Instructions/Comments:

SEND DOCUMENTATION AND RESULTS TO:

Name: Kelly.kwok | Kurt Myers | Kim Shirood
Company:
Address:
City: State: Zip:
Phone: Fax:
Email: ~~Kelly~~ kkwok@icmea.net *

Container Types: P= HDPE, PJ= HDPE Jar
O = Other:

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: groundwater

* kurt.myers@woodpla.com
kimberly.shirood@woodpla.com.

Page: 1 of 1

Login Sample Receipt Checklist

Client: Wood E&I Solutions Inc

Job Number: 320-41998-1

Login Number: 41998
List Number: 1
Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.88		TRG	No	N	UHM	Y	0.25	1.8		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.88		TRG	No	N	UH	Y	0.27	1.8		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.8		TRG	Yes	Y	HD	Y	0.041	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	335-76-2	Perfluorodecanoic acid (PFDA)	0.088		TRG	No	N	UH	Y	0.042	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	307-55-1	Perfluorododecanoic acid (PFDoA)	0.13		TRG	No	N	UH	Y	0.046	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	375-85-9	Perfluoroheptanoic acid (PFHpA)	4.9		TRG	Yes	Y	HD	Y	0.054	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	31		TRG	Yes	Y	HD	Y	0.034	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	307-24-4	Perfluorohexanoic acid (PFHxA)	18		TRG	Yes	Y	HD	Y	0.042	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	375-95-1	Perfluorononanoic acid (PFNA)	0.057		TRG	No	Y	JHD	Y	0.046	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13		TRG	Yes	Y	HD	Y	0.097	0.35		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	335-67-1	Perfluorooctanoic acid (PFOA)	33		TRG	Yes	Y	HDM	Y	0.048	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.27		TRG	No	N	UH	Y	0.073	0.35		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.27		TRG	No	N	UH	Y	0.067	0.35		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:36	N	NA	Dilution	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.13		TRG	No	N	UH	Y	0.064	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.088		TRG	Yes	N	UH	Y	0.025	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.088		TRG	Yes	N	UH	Y	0.027	0.18		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.3		TRG	No	Y	HJ1D	Y	0.0041	0.018		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.0088		TRG	Yes	N	UH	Y	0.0042	0.018		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.013		TRG	Yes	N	UH	Y	0.0046	0.018		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	4.4		TRG	No	Y	HJ1D	Y	0.0054	0.018		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	17		TRG	No	Y	HJ1D	Y	0.0034	0.018		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	12		TRG	No	Y	HJ1D	Y	0.0042	0.018		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.054		TRG	Yes	Y	HDM	Y	0.0046	0.018		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13		TRG	No	Y	HJ1D	Y	0.0097	0.035		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	17		TRG	No	Y	HJ1DM	Y	0.0048	0.018		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.027		TRG	Yes	N	UH	Y	0.0073	0.035		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.027		TRG	Yes	N	UH	Y	0.0067	0.035		ug/l	ug/l		0
I012MW07S-20180713	PFC_IDA	8/13/2018	9:44	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.013		TRG	Yes	N	UH	Y	0.0064	0.018		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.012		TRG	Yes	N	UH	Y	0.0033	0.024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.012		TRG	Yes	N	UH	Y	0.0036	0.024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.041		TRG	Yes	Y	H	Y	0.00055	0.0024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.0012		TRG	Yes	N	UH	Y	0.00057	0.0024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018		TRG	Yes	N	UH	Y	0.00062	0.0024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.09		TRG	Yes	Y	H	Y	0.00073	0.0024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.16		TRG	Yes	Y	H	Y	0.00045	0.0024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.18		TRG	Yes	Y	H	Y	0.00056	0.0024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0043		TRG	Yes	Y	MH	Y	0.00062	0.0024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.098		TRG	Yes	Y	H	Y	0.0013	0.0048		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.4		TRG	Yes	Y	MH	Y	0.00064	0.0024		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0036		TRG	Yes	N	UMH	Y	0.00099	0.0048		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0036		TRG	Yes	N	UH	Y	0.00091	0.0048		ug/l	ug/l		0
TW01S-20180713	PFC_IDA	8/11/2018	20:59	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018		TRG	Yes	N	UH	Y	0.00086	0.0024		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.015		TRG	Yes	N	UH	Y	0.0043	0.031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.015		TRG	Yes	N	UH	Y	0.0046	0.031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.027		TRG	Yes	Y	H	Y	0.00071	0.0031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.0015		TRG	Yes	N	UH	Y	0.00074	0.0031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0023		TRG	Yes	N	UH	Y	0.0008	0.0031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.039		TRG	Yes	Y	H	Y	0.00094	0.0031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.078		TRG	Yes	Y	H	Y	0.00059	0.0031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.12		TRG	Yes	Y	H	Y	0.00072	0.0031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0023		TRG	Yes	N	UMH	Y	0.0008	0.0031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.041		TRG	Yes	Y	H	Y	0.0017	0.0062		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.59		TRG	Yes	Y	MH	Y	0.00083	0.0031		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0046		TRG	Yes	N	UH	Y	0.0013	0.0062		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0046		TRG	Yes	N	UH	Y	0.0012	0.0062		ug/l	ug/l		0
TW02S-20180713	PFC_IDA	8/11/2018	21:07	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0023		TRG	Yes	N	UH	Y	0.0011	0.0031		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0089		TRG	Yes	N	UH	Y	0.0025	0.018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0089		TRG	Yes	N	UHM	Y	0.0027	0.018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.051		TRG	Yes	Y	H	Y	0.00041	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.00089		TRG	Yes	N	UHM	Y	0.00043	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0013		TRG	Yes	N	UH	Y	0.00047	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.084		TRG	Yes	Y	H	Y	0.00055	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.22		TRG	Yes	Y	H	Y	0.00034	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.23		TRG	Yes	Y	HJ1M	Y	0.00042	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0035		TRG	Yes	Y	H	Y	0.00047	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.59		TRG	No	Y	HJ1	Y	0.00098	0.0036		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.41		TRG	No	Y	HJ1M	Y	0.00048	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0027		TRG	Yes	N	UH	Y	0.00074	0.0036		ug/l	ug/l		0

TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0027		TRG	Yes	N	UH	Y	0.00068	0.0036		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/11/2018	21:14	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0013		TRG	Yes	N	UH	Y	0.00064	0.0018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.045		TRG	No	N	UH	Y	0.013	0.089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.045		TRG	No	N	UH	Y	0.013	0.089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.051		TRG	No	Y	HDJ1	Y	0.0021	0.0089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	335-76-2	Perfluorodecanoic acid (PFDA)	0.0045		TRG	No	N	UH	Y	0.0021	0.0089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0067		TRG	No	N	UH	Y	0.0023	0.0089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.085		TRG	No	Y	HD	Y	0.0027	0.0089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.23		TRG	No	Y	HD	Y	0.0017	0.0089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	307-24-4	Perfluorohexanoic acid (PFHxA)	0.24		TRG	No	Y	HD	Y	0.0021	0.0089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	375-95-1	Perfluorononanoic acid (PFNA)	0.0035		TRG	No	Y	JHD	Y	0.0023	0.0089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.67		TRG	Yes	Y	HJ1D	Y	0.0049	0.018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	335-67-1	Perfluorooctanoic acid (PFOA)	0.47		TRG	Yes	Y	J1HDM	Y	0.0024	0.0089		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.013		TRG	No	N	UH	Y	0.0037	0.018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.013		TRG	No	N	UH	Y	0.0034	0.018		ug/l	ug/l		0
TW03S-20180713	PFC_IDA	8/12/2018	11:03	N	NA	Dilution	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0067		TRG	No	N	UH	Y	0.0032	0.0089		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.011		TRG	Yes	N	UMH	Y	0.0032	0.023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.011		TRG	Yes	N	UH	Y	0.0034	0.023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.072		TRG	Yes	Y	H	Y	0.00052	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.0011		TRG	Yes	N	UH	Y	0.00054	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0017		TRG	Yes	N	UH	Y	0.00059	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.12		TRG	Yes	Y	H	Y	0.00069	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.37		TRG	Yes	Y	H	Y	0.00043	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.3		TRG	Yes	Y	H	Y	0.00053	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0056		TRG	Yes	Y	MH	Y	0.00059	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.6		TRG	No	Y	J1H	Y	0.0012	0.0045		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.52		TRG	No	Y	MJ1H	Y	0.00061	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0034		TRG	Yes	N	UH	Y	0.00094	0.0045		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0034		TRG	Yes	N	UH	Y	0.00086	0.0045		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/11/2018	21:37	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0017		TRG	Yes	N	UH	Y	0.00081	0.0023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.057		TRG	No	N	UH	Y	0.016	0.11		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.057		TRG	No	N	UH	Y	0.017	0.11		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.078		TRG	No	Y	HD	Y	0.0026	0.011		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	335-76-2	Perfluorodecanoic acid (PFDA)	0.0057		TRG	No	N	UH	Y	0.0027	0.011		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0085		TRG	No	N	UH	Y	0.0029	0.011		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.13		TRG	No	Y	HD	Y	0.0035	0.011		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.43		TRG	No	Y	HD	Y	0.0022	0.011		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	307-24-4	Perfluorohexanoic acid (PFHxA)	0.32		TRG	No	Y	HD	Y	0.0027	0.011		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	375-95-1	Perfluorononanoic acid (PFNA)	0.0059		TRG	No	Y	JHDM	Y	0.0029	0.011		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.65		TRG	Yes	Y	HD	Y	0.0062	0.023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	335-67-1	Perfluorooctanoic acid (PFOA)	0.6		TRG	Yes	Y	HDM	Y	0.0031	0.011		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.017		TRG	No	N	UH	Y	0.0047	0.023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.017		TRG	No	N	UH	Y	0.0043	0.023		ug/l	ug/l		0
TW04S-20180713	PFC_IDA	8/12/2018	11:25	N	NA	Dilution	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0085		TRG	No	N	UH	Y	0.0041	0.011		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0091		TRG	Yes	N	UH	Y	0.0026	0.018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0091		TRG	Yes	N	UH	Y	0.0027	0.018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00091		TRG	Yes	N	UH	Y	0.00042	0.0018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.00091		TRG	Yes	N	UH	Y	0.00044	0.0018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0014		TRG	Yes	N	UH	Y	0.00047	0.0018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0014		TRG	Yes	N	UH	Y	0.00056	0.0018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00091		TRG	Yes	N	UMH	Y	0.00035	0.0018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.00091		TRG	Yes	N	UH	Y	0.00043	0.0018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0014		TRG	Yes	N	UH	Y	0.00047	0.0018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0027		TRG	Yes	N	UH	Y	0.001	0.0037		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.0014		TRG	Yes	N	UMH	Y	0.00049	0.0018		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0027		TRG	Yes	N	UH	Y	0.00076	0.0037		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0027		TRG	Yes	N	UH	Y	0.00069	0.0037		ug/l	ug/l		0
EB02-20180713	PFC_IDA	8/11/2018	22:07	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0014		TRG	Yes	N	UH	Y	0.00066	0.0018		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.015		TRG	Yes	N	UMH	Y	0.0042	0.03		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.015		TRG	Yes	N	UH	Y	0.0045	0.03		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.025		TRG	Yes	Y	H	Y	0.00069	0.003		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.0015		TRG	Yes	N	UH	Y	0.00072	0.003		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00088		TRG	Yes	Y	JH	Y	0.00077	0.003		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.038		TRG	Yes	Y	H	Y	0.00091	0.003		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.078		TRG	Yes	Y	H	Y	0.00057	0.003		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.12		TRG	Yes	Y	H	Y	0.0007	0.003		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.00093		TRG	Yes	Y	JMH	Y	0.00077	0.003		ug/l	ug/l		0
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.04		TRG	Yes	Y	H	Y	0.0016	0.006		ug/l	ug/l		0

DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.53		TRG	Yes	Y	MH	Y	0.0008	0.003		ug/l	ug/l			0							
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0015		TRG	Yes	Y	JH	Y	0.0012	0.006		ug/l	ug/l			0							
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0045		TRG	Yes	N	UH	Y	0.0011	0.006		ug/l	ug/l			0							
DUP02-20180713	PFC_IDA	8/11/2018	21:44	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0022		TRG	Yes	N	UH	Y	0.0011	0.003		ug/l	ug/l			0							
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0413		SC	Yes	Y		Y	0.0028	0.02		ug/l	ug/l			0	0.04	0.0413	103				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0393		SC	Yes	Y		Y	0.003	0.02		ug/l	ug/l			0	0.04	0.0393	98				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0362		SC	Yes	Y		Y	0.00046	0.002		ug/l	ug/l			0	0.0354	0.0362	102				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.0382		SC	Yes	Y		Y	0.00048	0.002		ug/l	ug/l			0	0.04	0.0382	95				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0403		SC	Yes	Y		Y	0.00052	0.002		ug/l	ug/l			0	0.04	0.0403	101				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0424		SC	Yes	Y		Y	0.00061	0.002		ug/l	ug/l			0	0.04	0.0424	106				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0358		SC	Yes	Y	M	Y	0.00038	0.002		ug/l	ug/l			0	0.0364	0.0358	98				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.041		SC	Yes	Y		Y	0.00047	0.002		ug/l	ug/l			0	0.04	0.041	103				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0389		SC	Yes	Y		Y	0.00052	0.002		ug/l	ug/l			0	0.04	0.0389	97				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0366		SC	Yes	Y		Y	0.0011	0.004		ug/l	ug/l			0	0.0371	0.0366	99				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.0381		SC	Yes	Y		Y	0.00054	0.002		ug/l	ug/l			0	0.04	0.0381	95				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0388		SC	Yes	Y		Y	0.00083	0.004		ug/l	ug/l			0	0.04	0.0388	97				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0379		SC	Yes	Y		Y	0.00076	0.004		ug/l	ug/l			0	0.04	0.0379	95				
LCS3202394072A	PFC_IDA	8/11/2018	20:52	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.038		SC	Yes	Y		Y	0.00072	0.002		ug/l	ug/l			0	0.04	0.038	95				
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.01		TRG	Yes	N	U	Y	0.0028	0.02		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.01		TRG	Yes	N	U	Y	0.003	0.02		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.001		TRG	Yes	N	U	Y	0.00046	0.002		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.001		TRG	Yes	N	U	Y	0.00048	0.002		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0015		TRG	Yes	N	U	Y	0.00052	0.002		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0015		TRG	Yes	N	U	Y	0.00061	0.002		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.001		TRG	Yes	N	U	Y	0.00038	0.002		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.001		TRG	Yes	N	U	Y	0.00047	0.002		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0015		TRG	Yes	N	U	Y	0.00052	0.002		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.003		TRG	Yes	N	UM	Y	0.0011	0.004		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.0015		TRG	Yes	N	U	Y	0.00054	0.002		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.003		TRG	Yes	N	U	Y	0.00083	0.004		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.003		TRG	Yes	N	U	Y	0.00076	0.004		ug/l	ug/l			0							
MB3202394071A	PFC_IDA	8/11/2018	20:44	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0015		TRG	Yes	N	U	Y	0.00072	0.002		ug/l	ug/l			0							
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0379		SC	Yes	Y	H	Y	0.0026	0.019		ug/l	ug/l			0.0089	0.0377	0.0379	101				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0356		SC	Yes	Y	H	Y	0.0028	0.019		ug/l	ug/l			0.0089	0.0377	0.0356	94				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0823		SC	Yes	Y	H	Y	0.00043	0.0019		ug/l	ug/l			0.051	0.0333	0.0823	94				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.0379		SC	Yes	Y	H	Y	0.00045	0.0019		ug/l	ug/l			0.00089	0.0377	0.0379	101				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0389		SC	Yes	Y	H	Y	0.00049	0.0019		ug/l	ug/l			0.0013	0.0377	0.0389	103				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.119		SC	Yes	Y	H	Y	0.00057	0.0019		ug/l	ug/l			0.084	0.0377	0.119	93				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.247		SC	Yes	Y	H4	Y	0.00036	0.0019		ug/l	ug/l			0.22	0.0343	0.247	86				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.26		SC	Yes	Y	H4	Y	0.00044	0.0019		ug/l	ug/l			0.23	0.0377	0.26	75				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0382		SC	Yes	Y	H	Y	0.00049	0.0019		ug/l	ug/l			0.0035	0.0377	0.0382	92				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.6		SC	No	Y	HJ14	Y	0.001	0.0038		ug/l	ug/l			0.59	0.035	0.6	25				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.433		SC	No	Y	HJ14M	Y	0.00051	0.0019		ug/l	ug/l			0.41	0.0377	0.433	62				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0353		SC	Yes	Y	H	Y	0.00078	0.0038		ug/l	ug/l			0.0027	0.0377	0.0353	94				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0394		SC	Yes	Y	H	Y	0.00072	0.0038		ug/l	ug/l			0.0027	0.0377	0.0394	105				
TW03S-20180713MS	PFC_IDA	8/11/2018	21:22	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0379		SC	Yes	Y	H	Y	0.00068	0.0019		ug/l	ug/l			0.0013	0.0377	0.0379	101				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0402		SC	No	Y	JHD	Y	0.013	0.094		ug/l	ug/l			0.045	0.0377	0.0402	107				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0374		SC	No	Y	JHD	Y	0.014	0.094		ug/l	ug/l			0.045	0.0377	0.0374	99				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0931		SC	No	Y	HJ1D	Y	0.0022	0.0094		ug/l	ug/l			0.051	0.0333	0.0931	125				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	335-76-2	Perfluorodecanoic acid (PFDA)	0.0367		SC	No	Y	HD	Y	0.0023	0.0094		ug/l	ug/l			0.0045	0.0377	0.0367	98				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0401		SC	No	Y	HD	Y	0.0024	0.0094		ug/l	ug/l			0.0067	0.0377	0.0401	106				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.125		SC	No	Y	HD	Y	0.0029	0.0094		ug/l	ug/l			0.085	0.0377	0.125	106				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.263		SC	No	Y	H4D	Y	0.0018	0.0094		ug/l	ug/l			0.23	0.0343	0.263	86				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	307-24-4	Perfluorohexanoic acid (PFHxA)	0.275		SC	No	Y	H4D	Y	0.0022	0.0094		ug/l	ug/l			0.24	0.0377	0.275	93				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	375-95-1	Perfluorononanoic acid (PFNA)	0.0417		SC	No	Y	HD	Y	0.0024	0.0094		ug/l	ug/l			0.0035	0.0377	0.0417	101				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.681		SC	Yes	Y	H4D	Y	0.0052	0.019		ug/l	ug/l			0.67	0.035	0.681	18				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	335-67-1	Perfluorooctanoic acid (PFOA)	0.516		SC	Yes	Y	H4DM	Y	0.0025	0.0094		ug/l	ug/l			0.47	0.0377	0.516	112				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0383		SC	No	Y	HD	Y	0.0039	0.019		ug/l	ug/l			0.013	0.0377	0.0383	102				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0373		SC	No	Y	HD	Y	0.0036	0.019		ug/l	ug/l			0.013	0.0377	0.0373	99				
TW03S-20180713MS	PFC_IDA	8/12/2018	11:10	N	NA	Dilution	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0356		SC	No	Y	HD	Y	0.0034	0.0094		ug/l	ug/l			0.0067	0.0377	0.0356	95				
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0375		SC	Yes	Y	H	Y	0.0026	0.018		ug/l	ug/l			0							
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0362		SC	Yes	Y	HM	Y	0.0028	0.018		ug/l	ug/l			0							
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0805		SC	Yes	Y	H	Y	0.00042	0.0018		ug/l	ug/l			0							
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	335-76-2	Perfluorodecanoic acid (PFDA)	0.0369		SC	Yes	Y	H	Y	0.00044	0.0018		ug/l	ug/l			0							
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0382		SC	Yes	Y	H	Y	0.00048	0.0018		ug/l	ug/l			0							
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.117		SC	Yes	Y	H	Y	0.00056	0.0018		ug/l	ug/l			0							
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.244		SC	Yes	Y	H4	Y	0.00035	0.0018		ug/l	ug/l			0							
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	307-24-4	Perfluorohexanoic acid (PFHxA)	0.247		SC	Yes	Y	H4	Y	0.00043	0.0018		ug/l	ug/l			0							

TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	375-95-1	Perfluorononanoic acid (PFNA)	0.0388		SC	Yes	Y	H	Y	0.00048	0.0018		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.648		SC	No	Y	HJ14	Y	0.001	0.0037		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	335-67-1	Perfluorooctanoic acid (PFOA)	0.453		SC	No	Y	HJ14M	Y	0.0005	0.0018		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0327		SC	Yes	Y	H	Y	0.00076	0.0037		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.037		SC	Yes	Y	H	Y	0.0007	0.0037		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/11/2018	21:29	N	NA	Initial	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0364		SC	Yes	Y	H	Y	0.00066	0.0018		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.0399		SC	No	Y	JHD	Y	0.013	0.092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.0361		SC	No	Y	JHD	Y	0.014	0.092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0876		SC	No	Y	HD	Y	0.0021	0.0092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	335-76-2	Perfluorodecanoic acid (PFDA)	0.035		SC	No	Y	HD	Y	0.0022	0.0092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0397		SC	No	Y	HD	Y	0.0024	0.0092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.118		SC	No	Y	HD	Y	0.0028	0.0092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.265		SC	No	Y	H4D	Y	0.0017	0.0092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	307-24-4	Perfluorohexanoic acid (PFHxA)	0.275		SC	No	Y	H4D	Y	0.0022	0.0092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	375-95-1	Perfluorononanoic acid (PFNA)	0.0417		SC	No	Y	HD	Y	0.0024	0.0092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.691		SC	Yes	Y	H4D	Y	0.005	0.018		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	335-67-1	Perfluorooctanoic acid (PFOA)	0.509		SC	Yes	Y	H4DM	Y	0.0025	0.0092		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0346		SC	No	Y	HD	Y	0.0038	0.018		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.035		SC	No	Y	HD	Y	0.0035	0.018		ug/l	ug/l		0
TW03S-20180713SD	PFC_IDA	8/12/2018	11:18	N	NA	Dilution	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0364		SC	No	Y	HD	Y	0.0033	0.0092		ug/l	ug/l		0

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0					87	120		
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0					87	116		
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0					82	111		
0					87	120		*
0					85	113		
0					87	116		
0					80	113		
0					81	106		
0					83	109		
0					83	113		
0					82	112		*
0					80	107		*
0					82	115		
0					75	129		
0					76	105		
0.0089	0.0367	0.0375	102	1	80	109	30	
0.0089	0.0367	0.0362	99	2	82	111	30	
0.051	0.0324	0.0805	91	2	87	120	30	
0.00089	0.0367	0.0369	101	3	85	113	30	
0.0013	0.0367	0.0382	104	2	87	116	30	
0.084	0.0367	0.117	89	2	80	113	30	
0.22	0.0334	0.244	82	1	81	106	30	
0.23	0.0367	0.247	43	5	83	109	30	*

0.0035	0.0367	0.0388	96	2	83	113	30	
0.59	0.034	0.648	167	8	82	112	30	*
0.41	0.0367	0.453	117	4	80	107	30	*
0.0027	0.0367	0.0327	89	7	82	115	30	
0.0027	0.0367	0.037	101	6	75	129	30	
0.0013	0.0367	0.0364	99	4	76	105	30	
0.045	0.0367	0.0399	109	1	80	109	30	
0.045	0.0367	0.0361	98	4	82	111	30	
0.051	0.0324	0.0876	112	6	87	120	30	
0.0045	0.0367	0.035	95	5	85	113	30	
0.0067	0.0367	0.0397	108	1	87	116	30	
0.085	0.0367	0.118	91	5	80	113	30	
0.23	0.0334	0.265	95	1	81	106	30	
0.24	0.0367	0.275	94	0	83	109	30	
0.0035	0.0367	0.0417	104	0	83	113	30	
0.67	0.034	0.691	48	2	82	112	30	*
0.47	0.0367	0.509	95	1	80	107	30	
0.013	0.0367	0.0346	94	10	82	115	30	
0.013	0.0367	0.035	95	6	75	129	30	
0.0067	0.0367	0.0364	99	2	76	105	30	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

KMEA
9210 Sky Park Ct.
San Diego, CA 92123
ATTN: Kelly Kwok

September 13, 2018

SUBJECT: REVISED MCAS Tustin, Data Validation

Dear Ms. Kwok,

Enclosed are the revised validation reports for the fraction listed below. These SDGs were received on August 22, 2018. Attachment 1 is a summary of the samples that were reviewed for each analysis.

- Revision: Changed validation level to Stage 4 to all SPLs.

LDC Project #42952_RV1:

SDG #	Fraction
320-41998-1, 1801623 1801766	Perfluorinated Alkyl Acids

The data validation was performed under Stage 4 validation guidelines. The analyses were validated using the following documents and variances, as applicable to each method:

- Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 5 and 6, Former Marine Corps Air Station Tustin, Tustin, California, Addendum #01 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling for Groundwater Remedial Action at OU3, Installation Restoration Program Site 1
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1, 2017
- USEPA, Program National Functional Guidelines for Superfund Organic Methods Data Review, August 2014

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist

2,105 pages-ADV 1 WEEK TAT

Attachment 1

90/10 (client select) EDD

LDC #42952 (KMEA San Diego, CA / MCAS Tustin)

LDC	SDG#	DATE REC'D	(2) DATE DUE	PFAs (537M)																																	
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	320-41998-1	08/22/18	08/29/18	10	0																																
B	1801623	08/22/18	08/29/18	4	0																																
C	1801766	08/22/18	08/29/18	5	0																																
Total	J/PG			19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B review). These sample counts do not include DL, RE, MS, MSD, or DUP's.

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Tustin

LDC Report Date: September 12, 2018

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-41998-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TW01S-20180713	320-41998-1	Water	07/13/18
TW02S-20180713	320-41998-2	Water	07/13/18
TW03S-20180713	320-41998-3	Water	07/13/18
TW03S-20180713DL	320-41998-3DL	Water	07/13/18
TW04S-20180713	320-41998-4	Water	07/13/18
TW04S-20180713DL	320-41998-4DL	Water	07/13/18
DUP02-20180713	320-41998-5	Water	07/13/18
I012MW07S-20180713	320-41998-7	Water	07/13/18
I012MW07S-20180713DL	320-41998-7DL	Water	07/13/18
TW03S-20180713MS	320-41998-3MS	Water	07/13/18
TW03S-20180713MSD	320-41998-3MSD	Water	07/13/18
TW03S-20180713DLMS	320-41998-3DLMS	Water	07/13/18
TW03S-20180713DLMSD	320-41998-3DLMSD	Water	07/13/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 5 and 6, Former Marine Corps Air Station Tustin, Tustin, California, Addendum #01 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling and Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perfluorinated Alkyl Acids by Environmental Protection Agency (EPA) Method 537 Modified

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TW01S-20180713 TW02S-20180713 TW03S-20180713 TW03S-20180713DL TW04S-20180713 TW04S-20180713DL DUP02-20180713 I012MW07S-20180713	All compounds	29	14	J (all detects) UJ (all non-detects)	P

II. LC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

For each calibration point, the percent differences (%D) of its true value were less than or equal to 30.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB02-20180713 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were not within the QC limits for TW03S-20180713MS/MSD and TW03S-20180713DLMS/MSD. No data were qualified since the parent sample results were greater than 4X the spiked concentration or was analyzed at greater than or equal to a 5X dilution. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples TW02S-20180713 and DUP02-20180713 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TW02S-20180713	DUP02-20180713				
PFHxA	0.12	0.12	0 (≤30)	-	-	-
PFHpA	0.039	0.038	3 (≤30)	-	-	-
PFOA	0.59	0.53	11 (≤30)	-	-	-
PFNA	0.0023U	0.00093	-	0.00137 (≤0.0031)	-	-
PFDoA	0.0023U	0.00088	-	0.00142 (≤0.0031)	-	-
PFTeDA	0.0046U	0.0015	-	0.0031 (≤0.0062)	-	-
PFBS	0.027	0.025	8 (≤30)	-	-	-
PFHxS	0.078	0.0789	1 (≤30)	-	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TW02S-20180713	DUP02-20180713				
PFOS	0.041	0.040	2 (≤30)	-	-	-

XI. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria.

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed not reportable as follows:

Sample	Compound	Finding	Flag	A or P
TW03S-20180713	PFHxA PFOA PFOS	Sample result exceeded calibration range.	Do not report	-
TW03S-20180713DL	All compounds except PFHxA PFOA PFOS	Sample result exceeded calibration range.	Do not report	-
TW04S-20180713	PFOA PFOS	Sample result exceeded calibration range.	Do not report	-
TW04S-20180713DL	All compounds except PFOA PFOS	Sample result exceeded calibration range.	Do not report	-

Sample	Compound	Finding	Flag	A or P
I012MW07S-20180713	PFHxA PFHpA PFOA PFBS PFHxS PFOS	Sample result exceeded calibration range.	Do not report	-
I012MW07S-20180713DL	All compounds except PFHxA PFHpA PFOA PFBS PFHxS PFOS	Sample result exceeded calibration range.	Do not report	-

Due to technical holding time, data were qualified as estimated in nine samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

MCAS Tustin
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 320-41998-1

Sample	Compound	Flag	A or P	Reason
TW01S-20180713 TW02S-20180713 DUP02-20180713	All compounds	J (all detects) UJ (all non-detects)	P	Technical holding times
TW03S-20180713	All compounds except PFHxA PFOA PFOS	J (all detects) UJ (all non-detects)	P	Technical holding times
TW03S-20180713DL	PFHxA PFOA PFOS	J (all detects) UJ (all non-detects)	P	Technical holding times
TW04S-20180713	All compounds except PFOA PFOS	J (all detects) UJ (all non-detects)	P	Technical holding times
TW04S-20180713DL	PFOA PFOS	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Technical holding times
I012MW07S-20180713	All compounds except PFHxA PFHpA PFOA PFBS PFHxS PFOS	J (all detects) UJ (all non-detects)	P	Technical holding times
I012MW07S-20180713DL	PFHxA PFHpA PFOA PFBS PFHxS PFOS	J (all detects) UJ (all non-detects)	P	Technical holding times
TW03S-20180713	PFHxA PFOA PFOS	Do not report	-	Overall assessment of data
TW03S-20180713DL	All compounds except PFHxA PFOA PFOS	Do not report	-	Overall assessment of data
TW04S-20180713	PFOA PFOS	Do not report	-	Overall assessment of data
TW04S-20180713DL	All compounds except PFOA PFOS	Do not report	-	Overall assessment of data

Sample	Compound	Flag	A or P	Reason
I012MW07S-20180713	PFHxA PFHpA PFOA PFBS PFHxS PFOS	Do not report	-	Overall assessment of data
I012MW07S-20180713DL	All compounds except PFHxA PFHpA PFOA PFBS PFHxS PFOS	Do not report	-	Overall assessment of data

MCAS Tustin
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 320-41998-1

No Sample Data Qualified in this SDG

MCAS Tustin
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 320-41998-1

No Sample Data Qualified in this SDG

LDC #: 42952A96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/1/18
SDG #: 320-41998-1 Stage 2B/4 Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: 9
2nd Reviewer: MV

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / TW	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A+A	RSD≤20%. TMETOD≤30%. ICV≤30%
IV.	Continuing calibration	A	CCV≤30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=8
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	TW	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	TW	D=2+7
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	TW	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	TW01S-20180713	320-41998-1	Water	07/13/18
2	TW02S-20180713 D1	320-41998-2	Water	07/13/18
3	TW03S-20180713	320-41998-3	Water	07/13/18
4	TW03S-20180713DL	320-41998-3DL	Water	07/13/18
5	TW04S-20180713	320-41998-4	Water	07/13/18
6	TW04S-20180713DL	320-41998-4DL	Water	07/13/18
7	DUP02-20180713 D1	320-41998-5	Water	07/13/18
8	~~EB02-20180713~~	~~320-41998-6~~	~~Water~~	~~07/13/18~~
9	I012MW07S-20180713	320-41998-7	Water	07/13/18
10	I012MW07S-20180713DL	320-41998-7DL	Water	07/13/18
11	TW03S-20180713MS	320-41998-3MS	Water	07/13/18
12	TW03S-20180713MSD	320-41998-3MSD	Water	07/13/18
13	TW03S-20180713DLMS	320-41998-3DLMS	Water	07/13/18
14	TW03S-20180713DLMSD	320-41998-3DLMSD	Water	07/13/18

LDC #: 42952A96

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: [illegible]
2nd Reviewer: SVG

Method: LC/MS PFOS/PFOAs (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were the S/N ratio for all compounds within validation criteria?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard?	✓			
IIIb.Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 30%	✓			
Were the S/N ratio for all compounds within validation criteria?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				

LDC #: 42952A96

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IV. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XI. Internal standards				
Were internal standard area counts within acceptance limits?	✓			
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data	✓			
Overall assessment of data was found to be acceptable.				

TARGET COMPOUND WORKSHEET

METHOD: PFOS/PFOAs

A. Perfluorohexanoic acid (PFHxA)			
B. Perfluoroheptanoic acid (PFHpA)			
C. Perfluorooctanoic acid (PFOA)			
D. Perfluorononanoic acid (PFNA)			
E. Perfluorodecanoic acid (PFDA)			
F. Perfluoroundecanoic acid (PFUnA)			
G. Perfluorododecanoic acid (PFDoA)			
H. Perfluorotridecanoic acid (PFTriDA)			
I. Perfluorotetradecanoic acid (PFTeDA)			
J. Perfluorobutanesulfonic acid (PFBS)			
K. Perfluorohexanesulfonic acid (PFHxS)			
L. Perfluoroheptanesulfonic acid (PFHpS)			
M. Perfluorooctanesulfonic acid (PFOS)			
N.Perfluorodecanesulfonic acid (PFDS)			
O. Perfluorooctane Sulfonamide (FOSA)			
P. Perfluorobutanoic acid (PFBA)			
Q. Perfluoropentanoic acis (PFPeA)			
R. 6:2FTS			
S. 8:2 FTS			
T. N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)			
U. N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)			

LDC #: ~~42852A~~ 96

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: SK
2nd Reviewer: SK

Method: LC/MS PFOS/PFOAs (EPA Method 537M)

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

(HT=14)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All	W		7-13-18	8-11-18		29	J/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 14 days, analyzed within 28 days.
Soil: Extracted within 14 days, analyzed within 28 days.

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LDC #: 42952A96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: JVG

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) or duplicate sample analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?
Y N N/A Were all duplicate sample relative percent differences (RPD) or differences within QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		11/12	A	T5 (83-109)	43 (83-109)	( )	3	No Qual >4x
			C	62 (80-107)	11T (80-107)	( )		
			M	25 (82-112)	16T (82-112)	( )		
				( )	( )	( )		
		13/14	J	125 (8T-120)	( )	( )	4	No Qual
			M	18 (82-112)	48 (82-112)	( )		
			C	112 (80-107)	( )	( )		(DF >5x)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC#: 43496

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JW

METHOD: PFCs (Method 537 mod)

Compound	Concentration (ug/L)		(≤30) RPD	Difference	Limits	Qual
	2	7				
A	0.12	0.12	0			
B	0.039	0.038	3			
C	0.59	0.53	11			
D	0.0023U	0.00093		0.00137	≤0.0031	
G	0.0023U	0.00088		0.00142	≤0.0031	
I	0.0046U	0.0015		0.0031	≤0.0062	
J	0.027	0.025	8			
K	0.078	0.0789	1			
M	0.041	0.040	2			

LDC #: 42952A96

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: OVR

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Compound	Finding	Qualifications
		3	A, C, M > calibration		ONR
		4	All except A, C, M		
		5	C, M		
		6	All except C, M		
		9	A, B, C, J, K, M		
		10	All except A, B, C, J, K, M		

Comments: _____

LDC #: 42952A96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: AC

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (2.5 std)	Recalculated RRF (2.5 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	8/3/18	PFOA (1st internal standard)	1.0679	1.0679	1.0956	1.0956	12.8	12.8
	(A9)		PFOS (2nd internal standard)	1.1005	1.1005	1.0724	1.0724	2.8	2.8
			(3rd internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 42952A96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:
2nd Reviewer:

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	2018.08.11_006	8/11/18	PFOA (1st internal standard)	1.0956	1.075	1.075	1.9	1.9
			PFOS (2nd internal standard)	1.0724	1.052	1.052	1.9	1.9
2	20180811o1T	8/11/18		1.0956	1.068	1.068	2.5	2.5
				1.0724	1.109	1.109	3.4	3.4
3	20180812006	8/12/18		1.0956	1.114	1.114	1.7	1.7
				1.0724	1.075	1.075	0.3	0.3
4	20180813o2T	8/13/18		1.0956	1.100	1.100	0.4	0.4
				1.0724	1.029	1.029	4.1	4.1

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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LDC #: 42953A96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: JVG

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 11/12

Compound	Spike Added (ng/L)		Sample Concentration (ng/L)	Spiked Sample Concentration (ng/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
PFOA	0.037	0.026	0.41	0.433	0.453	62	61	11T	11T	4	4
PFOS	0.0370	0.0340	0.59	0.600	0.648	25	28	16T	17O	8	8

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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LDC #: 42452A46

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 9
2nd Reviewer: JVG

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 320-23940T

Compound	Spike Added (ng/L)		Spike Concentration (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
PFOA	0.0400	NA	0.0381	NA	95	95				
PFOS	0.0371	V	0.0366	V	99	99				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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LDC #: 49952A96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: JVG

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1, PFOA:

Conc. = $\frac{(30219612)(1.95)(10)(\quad)}{(6469255)(1.0950)(209.8)(\quad)}$

= 0.396 ng/L

#	Sample ID	Compound	Reported Concentration (ng/L)	Calculated Concentration ( )	Qualification
	1	PFOA	0.40		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Tustin

LDC Report Date: September 12, 2018

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1801623

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SP-NorthINF-20180706	1801623-01	Water	07/06/18
SP-NorthEFF-20180706	1801623-02	Water	07/06/18
SP-SouthINF-20180706	1801623-03	Water	07/06/18
SP-SouthEFF-20180706	1801623-04	Water	07/06/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 5 and 6, Former Marine Corps Air Station Tustin, Tustin, California, Addendum #01 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling and Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perfluorinated Alkyl Acids by Environmental Protection Agency (EPA) Method 537 Modified

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

For each calibration point, the percent differences (%D) of its true value were less than or equal to 30.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria.

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

MCAS Tustin
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1801623

No Sample Data Qualified in this SDG

MCAS Tustin
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1801623

No Sample Data Qualified in this SDG

MCAS Tustin
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1801623

No Sample Data Qualified in this SDG

LDC #: 42952B96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/21/18
SDG #: 1801623 Stage 2B~~4~~ Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: 1
2nd Reviewer: JM

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	r^2, RSD≤30%. TWTOD≤30%. ICV≤30%
IV.	Continuing calibration	A	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation.
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation.
XIV.	System performance	A	Not reviewed for Stage 2B validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	SP-NorthINF-20180706 **	1801623-01 **	Water	07/06/18
2	SP-NorthEFF-20180706	1801623-02	Water	07/06/18
3	SP-SouthINF-20180706	1801623-03	Water	07/06/18
4	SP-SouthEFF-20180706	1801623-04	Water	07/06/18
5				
6				
7				
8				

Notes:

LDC #: 45950B96

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: SW

Method: LC/MS PFOS/PFOAs (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were the S/N ratio for all compounds within validation criteria?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard?	✓			
IIIb.Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 30%	✓			
Were the S/N ratio for all compounds within validation criteria?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?		•	✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				

LDC #: 42952B96

VALIDATION FINDINGS CHECKLIST

Reviewer: CP
2nd Reviewer: JM

Validation Area	Yes	No	NA	Findings/Comments
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		✓		
Was a MS/MSD analyzed every 20 samples of each matrix?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IV. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XI. Internal standards				
Were internal standard area counts within acceptance limits?	✓			
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFOS/PFOAs

A. Perfluorohexanoic acid (PFHxA)			
B. Perfluoroheptanoic acid (PFHpA)			
C. Perfluorooctanoic acid (PFOA)			
D. Perfluorononanoic acid (PFNA)			
E. Perfluorodecanoic acid (PFDA)			
F. Perfluoroundecanoic acid (PFUnA)			
G. Perfluorododecanoic acid (PFDoA)			
H. Perfluorotridecanoic acid (PFTriDA)			
I. Perfluorotetradecanoic acid (PFTeDA)			
J. Perfluorobutanesulfonic acid (PFBS)			
K. Perfluorohexanesulfonic acid (PFHxS)			
L. Perfluoroheptanesulfonic acid (PFHpS)			
M. Perfluorooctanesulfonic acid (PFOS)			
N.Perfluorodecanesulfonic acid (PFDS)			
O. Perfluorooctane Sulfonamide (FOSA)			
P. Perfluorobutanoic acid (PFBA)			
Q. Perfluoropentanoic acis (PFPeA)			
R. 6:2FTS			
S. 8:2 FTS			
T. N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)			
U. N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)			

LDC #: 42953B96

Validation Findings Worksheet
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: JVG

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
7/22/2018	M1	PFOA	0	0.3249662	0.25	0.0625
			s1	0.554415	0.5	0.25
			s2	1.05194	1	1
			s3	2.1991187	2	4
			s4	4.97143	5	25
			s5	10.174628	10	100
			s6	50.401466	50	2500
			s7	99.165976	100	10000
			s8	258.53661	250	62500
			s9	484.4631793	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	-0.77757	c	0.0442740
Std Err of Y Est				
R Squared		0.9997868		0.9995780
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.071062339	-0.000198133	1.03357	-1.17465E-04
Std Err of Coef.				
Correlation Coefficient		0.999893		
Coefficient of Determination (r^2)		0.999787		

LDC #: 42952B96

Validation Findings Worksheet
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: JG

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
7/22/2018	M1	PFOS	0	0.1202737	0.25	0.0625
			s1	0.3191512	0.5	0.25
			s2	0.83512	1	1
			s3	1.4104212	2	4
			s4	4.106465	5	25
			s5	8.8609587	10	100
			s6	40.585645	50	2500
			s7	96.510117	100	10000
			s8	249.07227	250	62500
			s9	486.01766	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	-1.56638	c	-0.1106090
Std Err of Y Est				
R Squared		0.9996415		0.9983370
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.999643346	-4.58907E-05	0.933231	9.70021E-05
Std Err of Coef.				
Correlation Coefficient		0.999821		
Coefficient of Determination (r^2)		0.999641		

LDC #: 4293B96

Validation Findings Worksheet
Initial Calibration Calculation Verification

Reviewer:
2nd Reviewer: SB

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
7/26/2018	M1	PFOA	0	0.3503125	0.25	0.0625
			s1	0.6418312	0.5	0.25
			s2	1.0706925	1	1
			s3	1.914575	2	4
			s4	4.8606362	5	25
			s5	9.4179575	10	100
			s6	53.464143	50	2500
			s7	102.74622	100	10000
			s8	251.3236147	250	62500
			s9	462.6002413	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	-0.37982	c	0.0373971
Std Err of Y Est				
R Squared		0.9999715		0.9964600
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.079523078	-0.000306411	1.06049	-2.65458E-04
Std Err of Coef.				
Correlation Coefficient		0.999986		
Coefficient of Determination (r^2)		0.999971		

LDC #: 49538G6

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: JVG

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	180726M1126	7/27/18	PFOA (1st internal standard)	1.0	9.7	9.69	3.1	3.1
			PFOS (2nd internal standard)	1	9.7	9.7	3.0	3.0
			(3rd internalstandard)					
2	180726M1108	7/7/18	PFOA (1st internal standard)	1.0	~~1.018~~ 0.953	0.953	4.7	4.7
			(2nd internal standard)					
			(3rd internalstandard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internalstandard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internalstandard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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LDC #: 49493B16

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 9
2nd Reviewer: JM

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: BB60119-BS1

Compound	Spike Added (NG/L)		Spike Concentration (NG/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
PFOA	40.0	NA	42.2	NA	106	106				
PFOS	↓	↓	39.9	↓	99.6	99.7				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

Privileged and Confidential

LDC #: ~~1095-B96~~

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: JM

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1, PFOS:

Conc. = $\frac{(-0.8333 \pm \sqrt{(0.9333)^2 - 4(9.7002e-5)(\frac{1.33e+4 \times 12.5}{1.1Be+3} - 0.1666)}}{(2)(9.7002e-5)(0.259)(\quad)}$

= 599.46 ng/L

#	Sample ID	Compound	Reported Concentration (ng/L)	Calculated Concentration ( )	Qualification
	1	PFOS	5.98		

Privileged and Confidential

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Tustin

LDC Report Date: September 12, 2018

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1801766

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
IS720W02S-20180712	1801766-02	Water	07/12/18
IS720W06S-20180712	1801766-04	Water	07/12/18
DUP01-20180712	1801766-05	Water	07/12/18
IS720W03S-20180712	1801766-06	Water	07/12/18
I012MW13S-20180712	1801766-07	Water	07/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances in Groundwater in Carve-Outs 5 and 6, Former Marine Corps Air Station Tustin, Tustin, California, Addendum #01 to Final Sampling and Analysis Plan for Per- and Polyfluoroalkyl Substances Sampling and Groundwater Remedial Action at Operable Unit 3, Installation Restoration Program Site 1 (June 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perfluorinated Alkyl Acids by Environmental Protection Agency (EPA) Method 537 Modified

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
I012MW13S-20180712	PFBS PFHxA PFHpA PFHxS PFOA PFOS	18	14	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A

II. LC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

For each calibration point, the percent differences (%D) of its true value were less than or equal to 30.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analysis Date	Compound	Concentration	Associated Samples
B8G0154-BLK1	07/20/18	PFOA	2.31 ng/L	IS720W02S-20180712 IS720W06S-20180712 DUP01-20180712 IS720W03S-20180712
B8G0223-BLK1	07/30/18	PFHxS	1.38 ng/L	I012MW13S-20180712

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater >5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample EB01-20180712 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB01-20180712	07/12/18	PFOA	2.73 ng/L	IS720W02S-20180712 IS720W06S-20180712 DUP01-20180712 IS720W03S-20180712 I012MW13S-20180712

Sample SB01-20180712 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
SB01-20180712	07/12/18	PFOS	1.84 ng/L	IS720W02S-20180712 IS720W06S-20180712 DUP01-20180712 IS720W03S-20180712 I012MW13S-20180712

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples DUP01-20180712 and I012MW13S-20180712 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP01-20180712	I012MW13S-20180712				
PFBS	6430	3660	55 (≤30)	-	J (all detects)	A
PFHxA	9750	13400	32 (≤30)	-	J (all detects)	A
PFHpA	4420	6220	34 (≤30)	-	J (all detects)	A
PFHxS	111000	103000	7 (≤30)	-	-	-
PFOA	38400	34400	11 (≤30)	-	-	-
PFNA	146	127	14 (≤30)	-	-	-
PFOS	22500	19700	13 (≤30)	-	-	-
PFDA	15.8	12.0	-	3.8 (≤4.38)	-	-

XI. Internal Standards

All internal standard recoveries (%R) were within QC limits with the exception of samples DUP01-20180712 and I012MW13S-20180712. No data were qualified since the samples were analyzed at a dilution.

XII. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
DUP01-20180712 I012MW13S-20180712	PFHxS	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to technical holding time, field duplicate RPD, and results exceeding the calibration range, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

MCAS Tustin
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1801766

Sample	Compound	Flag	A or P	Reason
I012MW13S-20180712	PFBS PFHxA PFHpA PFHxS PFOA PFOS	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Technical holding times
DUP01-20180712 I012MW13S-20180712	PFBS PFHxA PFHpA	J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)
DUP01-20180712 I012MW13S-20180712	PFHxS	J (all detects)	A	Compound quantitation (exceeded range)

MCAS Tustin
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1801766

No Sample Data Qualified in this SDG

MCAS Tustin
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1801766

No Sample Data Qualified in this SDG

LDC #: 42952C96 **VALIDATION COMPLETENESS WORKSHEET** Date: 8/21/18
SDG #: 1801766 Stage 2B/4 Page: 1 of 2
Laboratory: Vista Analytical Laboratory Reviewer: [illegible]
2nd Reviewer: JVG

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537-Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/TW	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	~~A~~ A	~~RSD≤20%~~ r² Title/ICV≤30%
IV.	Continuing calibration	A	CCV≤30%
V.	Laboratory Blanks	TW	
VI.	Field blanks	TW	EB=3 · SB=1
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	MS
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	TW	D=5+7
XI.	Internal standards	TW	
XII.	Compound quantitation RL/LOQ/LODs	~~TW~~ A	Not reviewed for Stage 2B validation.
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation.
XIV.	System performance	A	Not reviewed for Stage 2B validation.
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID		Lab ID	Matrix	Date
1	~~SB01-20180712~~		~~1801766-01~~	~~Water~~	~~07/12/18~~
2	IS720W02S-20180712		1801766-02	Water	07/12/18
3	~~EB01-20180712~~		~~1801766-03~~	~~Water~~	~~07/12/18~~
4	IS720W06S-20180712		1801766-04	Water	07/12/18
5	DUP01-20180712	D	1801766-05	Water	07/12/18
6	IS720W03S-20180712		1801766-06	Water	07/12/18
7	I012MW13S-20180712	D	1801766-07	Water	07/12/18
8					

Notes:

	~~BS01-20180712-BK1~~							
	~~BS01-223-BK1~~							

TARGET COMPOUND WORKSHEET

METHOD: PFOS/PFOAs

A. Perfluorohexanoic acid (PFHxA)			
B. Perfluoroheptanoic acid (PFHpA)			
C. Perfluorooctanoic acid (PFOA)			
D. Perfluorononanoic acid (PFNA)			
E. Perfluorodecanoic acid (PFDA)			
F. Perfluoroundecanoic acid (PFUnA)			
G. Perfluorododecanoic acid (PFDoA)			
H. Perfluorotridecanoic acid (PFTriDA)			
I. Perfluorotetradecanoic acid (PFTeDA)			
J. Perfluorobutanesulfonic acid (PFBS)			
K. Perfluorohexanesulfonic acid (PFHxS)			
L. Perfluoroheptanesulfonic acid (PFHpS)			
M. Perfluorooctanesulfonic acid (PFOS)			
N.Perfluorodecanesulfonic acid (PFDS)			
O. Perfluorooctane Sulfonamide (FOSA)			
P. Perfluorobutanoic acid (PFBA)			
Q. Perfluoropentanoic acis (PFPeA)			
R. 6:2FTS			
S. 8:2 FTS			
T. N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)			
U. N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)			

LDC #: 49526c96

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JV6

Method: LC/MS PFOS/PFOAs (EPA Method 537M)

All circled dates have exceeded the technical holding times.
Y/N N/A Were all cooler temperatures within validation criteria?

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
T (dets)	W		T-12-18	T-30-18		18	J/UJ/A*
	* qual PFBS, PFHxA, PFHpA, PFHxS, PFOA and PFOS						

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 14 days, analyzed within 28 days.
Soil: Extracted within 14 days, analyzed within 28 days.

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LDC #: 42953C96

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JV6

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

M N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Blank extraction date: 7/20/18 **Blank analysis date:** 7/25/18
Conc. units: ng/L **Associated samples:** 2, 4-6

Compound	Blank ID	Sample Identification								
	B8F0154-BLK1									
PFOA	2.31									

Blank extraction date: 7/30/18 **Blank analysis date:** 8/15/18 **Associated samples:** 7
Conc. units: ng/L

Compound	Blank ID	Sample Identification								
	B8F0223-BLK1									
PFHxS	1.38									

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 42932c96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: JV6

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Blank units: ng/L **Associated sample units:** ng/L
Sampling date: 7/13/18
Field blank type: (circle one) Trip Blank/Field Blank / Rinsate / Other: FB Associated Samples: 2, 4-7

Compound	Blank ID	Sample Identification								
	1									
PFOS	1.84									

Blank units: ng/L **Associated sample units:** ng/L
Sampling date: 7/13/18
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: 2. 4-7

Compound	Blank ID	Sample Identification								
	3									
PFOA	2.73									

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LDC#: 42952C96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: JM

METHOD: PFCs (Method 537 mod)

Compound	Concentration (ug/L)		(≤30) RPD	Difference	Limits	Qual
	5	7				
PFBS	6430	3660	55			bets/A
PFHxA	9750	13400	32			↓
PFHpA	4420	6220	34			
PFHxS	111000	103000	7			
PFOA	38400	34400	11			
PFNA	146	127	14			
PFOS	22500	19700	13			
PFDA	15.8	12.0		3.8	≤4.38	

LDC #: 42950c96

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JVG

METHOD: LC/MS PFAs (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all internal standard area counts within 50-150% limits?

(Y) N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		BB50154-BH	13C2-PFUnA	49.1 (50-150)		Hets/P
		5	13C2-PFHxA	191		No Qual (40x)
			1802-PFHxS	49.5		
			13C8-PFOS	332		
			13C2-PFDA	43.7		
		T	13C3-PFBS	248		No Qual (20x)
			13C2-PFHxA	233		
			13C2-PFOA	186		

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LDC #: ~~49552~~96

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: 9
2nd Reviewer: JV4

METHOD: __ GC __ ~~HP~~LC/MS

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	S, T	DFHxS > calib range		Dets/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 47952C96 **VALIDATION FINDINGS CHECKLIST**

Reviewer: 9
2nd Reviewer: JM

Method: LCMS (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the continuing calibration ≤ 30%?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		✓		
Was a MS/MSD analyzed every 20 samples of each matrix?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 43952C96

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: 3V

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?.	✓			
XI. Labeled standards				
Were internal standard area counts within ± 50% of the associated calibration standard?		✓		
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data	✓			
Overall assessment of data was found to be acceptable.				

LDC #: 42952e96

Validation Findings Worksheet
Initial Calibration Calculation Verification

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
7/24/2018	M1	PFOA	0	0.33366	0.25	0.0625
			s1	0.5829387	0.5	0.25
			s2	1.1960825	1	1
			s3	1.962205	2	4
			s4	5.32669	5	25
			s5	10.26973	10	100
			s6	50.938991	50	2500
			s7	98.28861	100	10000
			s8	245.97395	250	62500
			s9	481.65392	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	0.17353	c	0.0966246
Std Err of Y Est				
R Squared		0.9999889		0.9999240
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.000174296	-7.41816E-05	1.00368	-8.17309E-05
Std Err of Coef.				
Correlation Coefficient		0.999994		
Coefficient of Determination (r^2)		0.999989		

LDC #: 42956C96

Validation Findings Worksheet
Initial Calibration Calculation Verification

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
7/24/2018	M1	PFOS	0	0.19717	0.25	0.0625
			s1	0.5345925	0.5	0.25
			s2	0.7852275	1	1
			s3	1.6106562	2	4
			s4	4.3264412	5	25
			s5	8.6639537	10	100
			s6	48.60679	50	2500
			s7	91.114356	100	10000
			s8	224.25001	250	62500
			s9	483.26303	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	0.82641	c	-0.0082758
Std Err of Y Est				
R Squared		0.9997896		0.9993090
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.851325956	0.000224317	0.89405	0.000142388
Std Err of Coef.				
Correlation Coefficient		0.999895		
Coefficient of Determination (r^2)		0.999790		

Validation Findings Worksheet
Initial Calibration Calculation Verification

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
7/25/2018	M1	PFOA	0	0.3514612	0.25	0.0625
			s1	0.5297637	0.5	0.25
			s2	1.0612212	1	1
			s3	1.8767062	2	4
			s4	4.81088	5	25
			s5	9.877145	10	100
			s6	50.465425	50	2500
			s7	103.35185	100	10000
			s8	244.79577	250	62500
			s9	473.22775	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	0.05137	c	0.0363914
Std Err of Y Est				
R Squared		0.9999595		0.9998260
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.023485761	-0.000155302	1.02412	-1.56658E-04
Std Err of Coef.				
Correlation Coefficient		0.999980		
Coefficient of Determination (r^2)		0.999959		

Validation Findings Worksheet
Initial Calibration Calculation Verification

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
7/25/2018	M1	PFOS	0	0.2924012	0.25	0.0625
			s1	0.3518837	0.5	0.25
			s2	0.849175	1	1
			s3	1.6369012	2	4
			s4	3.9234325	5	25
			s5	8.70193	10	100
			s6	42.37124	50	2500
			s7	98.698087	100	10000
			s8	213.79478	250	62500
			s9	450.09033	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	0.66467	c	-0.0733419
Std Err of Y Est				
R Squared		0.9990860		0.9980200
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.860878165	7.11457E-05	0.893725	5.90217E-07
Std Err of Coef.				
Correlation Coefficient		0.999543		
Coefficient of Determination (r^2)		0.999086		

Validation Findings Worksheet
Initial Calibration Calculation Verification

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
8/16/2018	M1	PFOA	0	0.50197	0.25	0.0625
			s1	0.4828162	0.5	0.25
			s2	1.1275737	1	1
			s3	2.3277525	2	4
			s4	5.14974	5	25
			s5	9.8391587	10	100
			s6	47.623148	50	2500
			s7	96.855097	100	10000
			s8	254.21066	250	62500
			s9	489.69713	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	-0.66429	c	0.0700850
Std Err of Y Est				
R Squared		0.9998116		0.9995350
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.027185218	-9.00208E-05	0.992622	-1.55031E-05
Std Err of Coef.				
Correlation Coefficient		0.999906		
Coefficient of Determination (r^2)		0.999812		

LDC #: ~~42952~~c96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: Q
2nd Reviewer: JVG

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	180724ML3	7/25/18	~~PFOA~~ (1st internal standard)	10.0	10.4	10.4	4.1	4.1
			~~PFOS~~ (2nd internal standard)	10.0	11.0	10.97	9.7	9.7
			(3rd internalstandard)					
2	180816ML2	8/17/18	~~PFOA~~ (1st internal standard)	10.0	12.352	12.35	23.5	23.5
			~~PFOS~~ (2nd internal standard)					
			(3rd internalstandard)					
3	180816ML3	8/17/18	~~PFOA~~ (1st internal standard)	10.0	10.6	10.62	6.0	6.2
			(2nd internal standard)					
			(3rd internalstandard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internalstandard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: BB90154-BS1

Compound	Spike Added (ng/L)		Spike Concentration (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
PFOA	40.0	NA	38.9	NA	97.3	93				
PFOS	~~35.1~~ V	V	35.1	V	86.7	86.7				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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LDC #: 42952296

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: SVG

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 9, PFOA:

~~Conc.~~ = $\frac{(4.84e+4)(\quad)(\quad)(\quad)(\quad)}{(3.10e+3)(\quad)(\quad)(\quad)(\quad)}$

= see below

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification
		$Conc = -\frac{1.02412 + \sqrt{(1024P)^2 - [4 \times (0.0001566558)(-\frac{4.84e+4 \times 12.5}{3.10e+3} + 0.0363914)]}}{2 \times (-0.0001566558)(0.258)}$			
		$= 761.4$ ng/L			

Privileged and Confidential

LDC #: 42952

EDD POPULATION COMPLETENESS WORKSHEET

Date: 8/23
Page: 1 of 1
2nd Reviewer:

The LDC job number listed above was entered by JE.
Entered from Body or Summary

	EDD Process		Comments/Action
I.	EDD Completeness	-	
Ia.	- All methods present?	Y	
Ib.	- All samples present/match report?	Y	
Ic.	- All reported analytes present?	Y	
Id.	- 10% or 100% verification of EDD?	Y	
II.	EDD Preparation/Entry	-	
IIa.	- Carryover U/J?	M	
IIb.	- Reason Codes used? If so, note which codes.	Y	
IIc.	- Additional Information (QC Level, Validator, Validated Y/N, etc.)	Y	
III.	Reasonableness Checks	-	
IIIa.	- Do all qualified ND results have ND qualifier (e.g. UJ)?	Y	
IIIb.	- Do all qualified detect results have detect qualifier (e.g. J)?	Y	
IIIc.	- If reason codes are used, do all qualified results have reason code field populated, and vice versa?	Y	
IIId.	-Does the detect flag require changing for blank qualifier? If so, are all U results marked ND?	+	
IIIe.	- Do blank concentrations in report match EDD where data was qualified due to blank contamination?	—	
IIIf.	- Were multiple results reported due to dilutions/reanalysis? If so, were results qualified appropriately?	W/Y	
IIIg.	-Are there any discrepancies between the data packet and the EDD?	N	

Notes: *see discrepancy sheet

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TUSTIN_MCAS	SITE 00012	TW04S	Temporary well point	6082680.203	2204860.275	TW04S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW03S	Temporary well point	6082589.778	2205065.519	TW03S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
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TUSTIN_MCAS	SITE 00012	I012MW07S	Monitoring well	6083101.68	2204937.98	I012MW07S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW03S	Temporary well point	6082589.778	2205065.519	TW03S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW04S	Temporary well point	6082680.203	2204860.275	TW04S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	I012MW07S	Monitoring well	6083101.68	2204937.98	I012MW07S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW03S	Temporary well point	6082589.778	2205065.519	TW03S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW03S	Temporary well point	6082589.778	2205065.519	TW03S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW04S	Temporary well point	6082680.203	2204860.275	TW04S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00013S	TW01S	Temporary well point	6081565.66	2206400.867	TW01S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW03S	Temporary well point	6082589.778	2205065.519	TW03S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW03S	Temporary well point	6082589.778	2205065.519	TW03S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00013S	TW01S	Temporary well point	6081565.66	2206400.867	TW01S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW04S	Temporary well point	6082680.203	2204860.275	TW04S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW03S	Temporary well point	6082589.778	2205065.519	TW03S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00013S	TW02S	Temporary well point	6082537.205	2206268.384	TW02S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	I012MW07S	Monitoring well	6083101.68	2204937.98	I012MW07S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00013S	TW01S	Temporary well point	6081565.66	2206400.867	TW01S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00012	TW03S	Temporary well point	6082589.778	2205065.519	TW03S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00013S	TW02S	Temporary well point	6082537.205	2206268.384	TW02S-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1
TUSTIN_MCAS	SITE 00013S	TW02S	Temporary well point	6082537.205	2206268.384	DUP02-20180713	Ground water	13-Jul-18	Perfluoroalkyl Compounds	J41998-1