

N60087_003869
BRUNSWICK_NAS
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-40153-1, NAS BRUNSWICK ME
06/30/2018
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-40153-1

Job Description: TT: PFAS, Brunswick, Discharge

For:

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



Approved for release.
David R. Alltucker
Project Manager I
6/30/2018 1:53 PM

David R. Alltucker, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4383
david.alltucker@testamericainc.com
06/30/2018

Table of Contents

Cover Title Page	1
Data Summaries	4
Definitions	4
Case Narrative	5
Detection Summary	6
Client Sample Results	8
Default Detection Limits	12
Isotope Dilution Summary	13
QC Sample Results	14
QC Association	17
Chronicle	18
Certification Summary	19
Method Summary	20
Sample Summary	21
Manual Integration Summary	22
Reagent Traceability	30
COAs	66
Organic Sample Data	435
LCMS	435
Method PFC DOD	435
Method PFC DOD QC Summary	436
Method PFC DOD Sample Data	444
Standards Data	492
Method PFC DOD ICAL Data	492
Method PFC DOD CCAL Data	676
Raw QC Data	776

Table of Contents

Method PFC DOD Blank Data	776
Method PFC DOD LCS/LCSD Data	828
Method PFC DOD Run Logs	854
Method PFC DOD Prep Data	859
Shipping and Receiving Documents	862
Client Chain of Custody	863
Sample Receipt Checklist	864

Definitions/Glossary

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

TestAmerica Job ID: 320-40153-1

Qualifiers

LCMS

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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
320-40153-1

Receipt

The samples were received on 6/8/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6° 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 Perfluorohexanesulfonic acid (PFHxS) and Perfluorooctanoic acid (PFOA) associated with the following sample exceeded the instrument calibration range: TP-PFC-030-TPI (320-40153-1). These analytes have been qualified; however, the peak did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

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

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-228913.

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

Detection Summary

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

TestAmerica Job ID: 320-40153-1

Client Sample ID: TP-PFC-030-TPI

Lab Sample ID: 320-40153-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	64	M	1.8	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	180		1.8	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	330		1.8	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	65		1.8	0.54	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1300	M E	1.8	0.48	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	2.4		1.8	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.71	J M	1.8	0.42	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	48		1.8	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	350	E	1.8	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	7.1		1.8	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	310		3.5	0.97	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	67	D M	18	5.2	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	190	D	18	3.8	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	340	D	18	4.1	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	71	D	18	5.4	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1700	D	18	4.8	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	50	D	18	4.1	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	360	D	18	3.3	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	7.5	J D	18	3.3	ng/L	10		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	300	D	35	9.7	ng/L	10		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-030-MIDCARBON

Lab Sample ID: 320-40153-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	110		1.7	0.49	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	240		1.7	0.36	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	190		1.7	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.8		1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	46	M	1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	7.3		1.7	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.2		1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-030-TPE

Lab Sample ID: 320-40153-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	110		1.8	0.53	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	200		1.8	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	88		1.8	0.42	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.54	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	3.7	M	1.8	0.48	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.8		1.8	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.40	J	1.8	0.34	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-030-TPE-D

Lab Sample ID: 320-40153-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	110		1.8	0.53	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

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

TestAmerica Job ID: 320-40153-1

Client Sample ID: TP-PFC-030-TPE-D (Continued)

Lab Sample ID: 320-40153-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	190		1.8	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	90		1.8	0.42	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.6	J	1.8	0.55	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	3.6	M	1.8	0.49	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.8		1.8	0.42	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.37	J	1.8	0.34	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-40153-1

Client Sample ID: TP-PFC-030-TPI

Lab Sample ID: 320-40153-1

Date Collected: 06/07/18 09:35

Matrix: Water

Date Received: 06/08/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	64	M	1.8	0.52	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluoropentanoic acid (PFPeA)	180		1.8	0.38	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorohexanoic acid (PFHxA)	330		1.8	0.41	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluoroheptanoic acid (PFHpA)	65		1.8	0.54	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorooctanoic acid (PFOA)	1300	M E	1.8	0.48	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorononanoic acid (PFNA)	2.4		1.8	0.46	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorodecanoic acid (PFDA)	0.71	J M	1.8	0.42	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	0.63	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	0.46	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	0.67	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	0.73	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorobutanesulfonic acid (PFBS)	48		1.8	0.41	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorohexanesulfonic acid (PFHxS)	350	E	1.8	0.33	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluoroheptanesulfonic Acid (PFHpS)	7.1		1.8	0.33	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorooctanesulfonic acid (PFOS)	310		3.5	0.97	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	0.49	ng/L		06/13/18 15:12	06/27/18 05:40	1
Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	1.1	ng/L		06/13/18 15:12	06/27/18 05:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	97		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C4 PFBA	110		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C5 PFPeA	97		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C2 PFHxA	99		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C4-PFHpA	107		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C4 PFOA	87		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C5 PFNA	105		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C2 PFDA	111		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C2 PFUnA	109		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C2 PFDoA	96		50 - 150	06/13/18 15:12	06/27/18 05:40	1
18O2 PFHxS	95		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C2-PFTeDA	108		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C4 PFOS	103		50 - 150	06/13/18 15:12	06/27/18 05:40	1
13C3-PFBS	96		50 - 150	06/13/18 15:12	06/27/18 05:40	1

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	67	D M	18	5.2	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluoropentanoic acid (PFPeA)	190	D	18	3.8	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorohexanoic acid (PFHxA)	340	D	18	4.1	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluoroheptanoic acid (PFHpA)	71	D	18	5.4	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorooctanoic acid (PFOA)	1700	D	18	4.8	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorononanoic acid (PFNA)	13	U	18	4.6	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorodecanoic acid (PFDA)	8.8	U	18	4.2	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluoroundecanoic acid (PFUnA)	13	U	18	6.3	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorododecanoic acid (PFDoA)	13	U	18	4.6	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorotridecanoic Acid (PFTriA)	26	U	35	6.7	ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorotetradecanoic acid (PFTeA)	26	U	35	7.3	ng/L		06/13/18 15:12	06/30/18 01:08	10

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-40153-1

Client Sample ID: TP-PFC-030-TPI

Lab Sample ID: 320-40153-1

Date Collected: 06/07/18 09:35

Matrix: Water

Date Received: 06/08/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	50	D	18	4.1 ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorohexanesulfonic acid (PFHxS)	360	D	18	3.3 ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluoroheptanesulfonic Acid (PFHpS)	7.5	J D	18	3.3 ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorooctanesulfonic acid (PFOS)	300	D	35	9.7 ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorodecanesulfonic acid (PFDS)	13	U	18	4.9 ng/L		06/13/18 15:12	06/30/18 01:08	10
Perfluorooctane Sulfonamide (FOSA)	26	U	35	11 ng/L		06/13/18 15:12	06/30/18 01:08	10
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C8 FOSA	86		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C4 PFBA	93		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C5 PFPeA	91		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C2 PFHxA	93		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C4-PFHpA	89		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C4 PFOA	92		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C5 PFNA	92		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C2 PFDA	95		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C2 PFUnA	94		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C2 PFDoA	91		50 - 150			06/13/18 15:12	06/30/18 01:08	10
18O2 PFHxS	95		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C2-PFTeDA	83		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C4 PFOS	95		50 - 150			06/13/18 15:12	06/30/18 01:08	10
13C3-PFBS	83		50 - 150			06/13/18 15:12	06/30/18 01:08	10

Client Sample ID: TP-PFC-030-MIDCARBON

Lab Sample ID: 320-40153-2

Date Collected: 06/07/18 09:40

Matrix: Water

Date Received: 06/08/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	110		1.7	0.49 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluoropentanoic acid (PFPeA)	240		1.7	0.36 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorohexanoic acid (PFHxA)	190		1.7	0.39 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluoroheptanoic acid (PFHpA)	7.8		1.7	0.51 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorooctanoic acid (PFOA)	46	M	1.7	0.45 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.43 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorodecanoic acid (PFDA)	0.84	U	1.7	0.40 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	0.60 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.43 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	0.63 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	0.69 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorobutanesulfonic acid (PFBS)	7.3		1.7	0.38 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorohexanesulfonic acid (PFHxS)	3.2		1.7	0.32 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.84	U	1.7	0.31 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.3	0.92 ng/L		06/13/18 15:12	06/27/18 05:48	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.47 ng/L		06/13/18 15:12	06/27/18 05:48	1

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-40153-1

Client Sample ID: TP-PFC-030-MIDCARBON

Lab Sample ID: 320-40153-2

Date Collected: 06/07/18 09:40

Matrix: Water

Date Received: 06/08/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	1.1	ng/L		06/13/18 15:12	06/27/18 05:48	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	79		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C4 PFBA	91		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C5 PFPeA	79		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C2 PFHxA	86		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C4-PFHpA	94		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C4 PFOA	88		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C5 PFNA	86		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C2 PFDA	90		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C2 PFUnA	84		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C2 PFDoA	74		50 - 150				06/13/18 15:12	06/27/18 05:48	1
18O2 PFHxS	80		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C2-PFTeDA	80		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C4 PFOS	77		50 - 150				06/13/18 15:12	06/27/18 05:48	1
13C3-PFBS	77		50 - 150				06/13/18 15:12	06/27/18 05:48	1

Client Sample ID: TP-PFC-030-TPE

Lab Sample ID: 320-40153-3

Date Collected: 06/07/18 09:45

Matrix: Water

Date Received: 06/08/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	110		1.8	0.53	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluoropentanoic acid (PFPeA)	200		1.8	0.38	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorohexanoic acid (PFHxA)	88		1.8	0.42	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.54	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorooctanoic acid (PFOA)	3.7	M	1.8	0.48	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorononanoic acid (PFNA)	1.3	U	1.8	0.46	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorodecanoic acid (PFDA)	0.89	U	1.8	0.43	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	0.64	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	0.46	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	0.68	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	0.74	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorobutanesulfonic acid (PFBS)	1.8		1.8	0.41	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorohexanesulfonic acid (PFHxS)	0.40	J	1.8	0.34	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.89	U	1.8	0.33	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	0.98	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	0.50	ng/L		06/13/18 15:12	06/27/18 05:56	1
Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	1.2	ng/L		06/13/18 15:12	06/27/18 05:56	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	79		50 - 150				06/13/18 15:12	06/27/18 05:56	1
13C4 PFBA	93		50 - 150				06/13/18 15:12	06/27/18 05:56	1
13C5 PFPeA	82		50 - 150				06/13/18 15:12	06/27/18 05:56	1
13C2 PFHxA	87		50 - 150				06/13/18 15:12	06/27/18 05:56	1
13C4-PFHpA	94		50 - 150				06/13/18 15:12	06/27/18 05:56	1
13C4 PFOA	95		50 - 150				06/13/18 15:12	06/27/18 05:56	1

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-40153-1

Client Sample ID: TP-PFC-030-TPE

Lab Sample ID: 320-40153-3

Date Collected: 06/07/18 09:45

Matrix: Water

Date Received: 06/08/18 09:00

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	87		50 - 150	06/13/18 15:12	06/27/18 05:56	1
13C2 PFDA	90		50 - 150	06/13/18 15:12	06/27/18 05:56	1
13C2 PFUnA	86		50 - 150	06/13/18 15:12	06/27/18 05:56	1
13C2 PFDoA	78		50 - 150	06/13/18 15:12	06/27/18 05:56	1
18O2 PFHxS	83		50 - 150	06/13/18 15:12	06/27/18 05:56	1
13C2-PFTeDA	79		50 - 150	06/13/18 15:12	06/27/18 05:56	1
13C4 PFOS	85		50 - 150	06/13/18 15:12	06/27/18 05:56	1
13C3-PFBS	83		50 - 150	06/13/18 15:12	06/27/18 05:56	1

Client Sample ID: TP-PFC-030-TPE-D

Lab Sample ID: 320-40153-4

Date Collected: 06/07/18 00:00

Matrix: Water

Date Received: 06/08/18 09:00

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	110		1.8	0.53	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluoropentanoic acid (PFPeA)	190		1.8	0.39	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorohexanoic acid (PFHxA)	90		1.8	0.42	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluoroheptanoic acid (PFHpA)	1.6	J	1.8	0.55	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorooctanoic acid (PFOA)	3.6	M	1.8	0.49	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorononanoic acid (PFNA)	1.4	U M	1.8	0.47	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorodecanoic acid (PFDA)	0.90	U	1.8	0.43	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluoroundecanoic acid (PFUnA)	1.4	U	1.8	0.65	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorododecanoic acid (PFDoA)	1.4	U	1.8	0.47	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	0.69	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	0.75	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorobutanesulfonic acid (PFBS)	1.8		1.8	0.42	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorohexanesulfonic acid (PFHxS)	0.37	J	1.8	0.34	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.90	U	1.8	0.33	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	0.99	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	0.51	ng/L		06/13/18 15:12	06/27/18 06:04	1
Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	1.2	ng/L		06/13/18 15:12	06/27/18 06:04	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	78		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C4 PFBA	91		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C5 PFPeA	80		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C2 PFHxA	83		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C4-PFHpA	92		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C4 PFOA	91		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C5 PFNA	88		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C2 PFDA	87		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C2 PFUnA	86		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C2 PFDoA	76		50 - 150	06/13/18 15:12	06/27/18 06:04	1
18O2 PFHxS	83		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C2-PFTeDA	77		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C4 PFOS	83		50 - 150	06/13/18 15:12	06/27/18 06:04	1
13C3-PFBS	79		50 - 150	06/13/18 15:12	06/27/18 06:04	1

TestAmerica Sacramento

Default Detection Limits

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

TestAmerica Job ID: 320-40153-1

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

Prep: 3535

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

Isotope Dilution Summary

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

TestAmerica Job ID: 320-40153-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFOSA (50-150)	PFBA (50-150)	PFPeA (50-150)	PFHxA (50-150)	PFHpA (50-150)	PFOA (50-150)	PFNA (50-150)	PFDA (50-150)
320-40153-1	TP-PFC-030-TPI	97	110	97	99	107	87	105	111
320-40153-1 - DL	TP-PFC-030-TPI	86	93	91	93	89	92	92	95
320-40153-2	TP-PFC-030-MIDCARBON	79	91	79	86	94	88	86	90
320-40153-3	TP-PFC-030-TPE	79	93	82	87	94	95	87	90
320-40153-4	TP-PFC-030-TPE-D	78	91	80	83	92	91	88	87
LCS 320-228913/2-A	Lab Control Sample	78	90	83	84	91	90	88	88
LCSD 320-228913/3-A	Lab Control Sample Dup	77	93	82	90	90	89	86	92
MB 320-228913/1-A	Method Blank	78	93	88	89	93	95	92	89

		Percent Isotope Dilution Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	PFUnA (50-150)	PFDoA (50-150)	PFHxS (50-150)	PFTDA (50-150)	PFOS (50-150)	3C3-PFB (50-150)
320-40153-1	TP-PFC-030-TPI	109	96	95	108	103	96
320-40153-1 - DL	TP-PFC-030-TPI	94	91	95	83	95	83
320-40153-2	TP-PFC-030-MIDCARBON	84	74	80	80	77	77
320-40153-3	TP-PFC-030-TPE	86	78	83	79	85	83
320-40153-4	TP-PFC-030-TPE-D	86	76	83	77	83	79
LCS 320-228913/2-A	Lab Control Sample	86	73	78	69	80	78
LCSD 320-228913/3-A	Lab Control Sample Dup	80	76	82	74	82	81
MB 320-228913/1-A	Method Blank	90	84	81	81	85	82

Surrogate Legend

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

QC Sample Results

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

TestAmerica Job ID: 320-40153-1

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

Lab Sample ID: MB 320-228913/1-A
Matrix: Water
Analysis Batch: 231147

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 228913

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanoic acid (PFBA)	1.5	U	2.0	0.59	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.43	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	0.47	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	0.61	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorooctanoic acid (PFOA)	1.5	U	2.0	0.54	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorononanoic acid (PFNA)	1.5	U	2.0	0.52	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.48	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluoroundecanoic acid (PFUnA)	1.5	U	2.0	0.72	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	0.52	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	0.76	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	0.83	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.46	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.38	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.37	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	1.1	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	0.56	ng/L		06/13/18 15:12	06/27/18 05:17	1
Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	1.3	ng/L		06/13/18 15:12	06/27/18 05:17	1

Isotope Dilution	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C8 FOSA	78		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C4 PFBA	93		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C5 PFPeA	88		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C2 PFHxA	89		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C4-PFHpA	93		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C4 PFOA	95		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C5 PFNA	92		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C2 PFDA	89		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C2 PFUnA	90		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C2 PFDoA	84		50 - 150	06/13/18 15:12	06/27/18 05:17	1
18O2 PFHxS	81		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C2-PFTeDA	81		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C4 PFOS	85		50 - 150	06/13/18 15:12	06/27/18 05:17	1
13C3-PFBS	82		50 - 150	06/13/18 15:12	06/27/18 05:17	1

Lab Sample ID: LCS 320-228913/2-A
Matrix: Water
Analysis Batch: 231147

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 228913

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec.	Limits
		Result	Qualifier					
Perfluorobutanoic acid (PFBA)	40.0	36.1		ng/L		90		83 - 118
Perfluoropentanoic acid (PFPeA)	40.0	33.9		ng/L		85		83 - 108
Perfluorohexanoic acid (PFHxA)	40.0	35.7		ng/L		89		83 - 109
Perfluoroheptanoic acid (PFHpA)	40.0	34.4		ng/L		86		80 - 113
Perfluorooctanoic acid (PFOA)	40.0	33.6		ng/L		84		80 - 107
Perfluorononanoic acid (PFNA)	40.0	34.5		ng/L		86		83 - 113
Perfluorodecanoic acid (PFDA)	40.0	37.2		ng/L		93		85 - 113
Perfluoroundecanoic acid (PFUnA)	40.0	34.8		ng/L		87		76 - 105

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-40153-1

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

Lab Sample ID: LCS 320-228913/2-A

Matrix: Water

Analysis Batch: 231147

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 228913

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorododecanoic acid (PFDoA)	40.0	37.9		ng/L		95	87 - 116
Perfluorotridecanoic Acid (PFTriA)	40.0	41.7		ng/L		104	75 - 129
Perfluorotetradecanoic acid (PFTeA)	40.0	42.2		ng/L		105	82 - 115
Perfluorobutanesulfonic acid (PFBS)	35.4	32.4		ng/L		92	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	36.4	31.8		ng/L		87	81 - 106
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	34.3		ng/L		90	80 - 117
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3	M	ng/L		92	82 - 112
Perfluorodecanesulfonic acid (PFDS)	38.6	32.6		ng/L		85	81 - 114
Perfluorooctane Sulfonamide (FOSA)	40.0	36.1		ng/L		90	85 - 114

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C8 FOSA	78		50 - 150
13C4 PFBA	90		50 - 150
13C5 PFPeA	83		50 - 150
13C2 PFHxA	84		50 - 150
13C4-PFHpA	91		50 - 150
13C4 PFOA	90		50 - 150
13C5 PFNA	88		50 - 150
13C2 PFDA	88		50 - 150
13C2 PFUnA	86		50 - 150
13C2 PFDoA	73		50 - 150
18O2 PFHxS	78		50 - 150
13C2-PFTeDA	69		50 - 150
13C4 PFOS	80		50 - 150
13C3-PFBS	78		50 - 150

Lab Sample ID: LCSD 320-228913/3-A

Matrix: Water

Analysis Batch: 231147

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 228913

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	36.3		ng/L		91	83 - 118	0	30
Perfluoropentanoic acid (PFPeA)	40.0	35.7		ng/L		89	83 - 108	5	30
Perfluorohexanoic acid (PFHxA)	40.0	34.0		ng/L		85	83 - 109	5	30
Perfluoroheptanoic acid (PFHpA)	40.0	33.8		ng/L		85	80 - 113	2	30
Perfluorooctanoic acid (PFOA)	40.0	36.4		ng/L		91	80 - 107	8	30
Perfluorononanoic acid (PFNA)	40.0	36.4		ng/L		91	83 - 113	6	30
Perfluorodecanoic acid (PFDA)	40.0	35.2		ng/L		88	85 - 113	6	30
Perfluoroundecanoic acid (PFUnA)	40.0	36.9		ng/L		92	76 - 105	6	30
Perfluorododecanoic acid (PFDoA)	40.0	40.1		ng/L		100	87 - 116	6	30

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-40153-1

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

Lab Sample ID: LCSD 320-228913/3-A
Matrix: Water
Analysis Batch: 231147

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 228913

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD
									Limit
Perfluorotridecanoic Acid (PFTriA)	40.0	39.5		ng/L		99	75 - 129	5	30
Perfluorotetradecanoic acid (PFTeA)	40.0	36.7		ng/L		92	82 - 115	14	30
Perfluorobutanesulfonic acid (PFBS)	35.4	32.3		ng/L		91	87 - 120	0	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	32.4		ng/L		89	81 - 106	2	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	36.4		ng/L		96	80 - 117	6	30
Perfluorooctanesulfonic acid (PFOS)	37.1	34.2	M	ng/L		92	82 - 112	0	30
Perfluorodecanesulfonic acid (PFDS)	38.6	35.5		ng/L		92	81 - 114	9	30
Perfluorooctane Sulfonamide (FOSA)	40.0	37.3		ng/L		93	85 - 114	3	30

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C8 FOSA	77		50 - 150
13C4 PFBA	93		50 - 150
13C5 PFPeA	82		50 - 150
13C2 PFHxA	90		50 - 150
13C4-PFHpA	90		50 - 150
13C4 PFOA	89		50 - 150
13C5 PFNA	86		50 - 150
13C2 PFDA	92		50 - 150
13C2 PFUnA	80		50 - 150
13C2 PFDoA	76		50 - 150
18O2 PFHxS	82		50 - 150
13C2-PFTeDA	74		50 - 150
13C4 PFOS	82		50 - 150
13C3-PFBS	81		50 - 150

QC Association Summary

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

TestAmerica Job ID: 320-40153-1

LCMS

Prep Batch: 228913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-40153-1	TP-PFC-030-TPI	Total/NA	Water	3535	
320-40153-1 - DL	TP-PFC-030-TPI	Total/NA	Water	3535	
320-40153-2	TP-PFC-030-MIDCARBON	Total/NA	Water	3535	
320-40153-3	TP-PFC-030-TPE	Total/NA	Water	3535	
320-40153-4	TP-PFC-030-TPE-D	Total/NA	Water	3535	
MB 320-228913/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-228913/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-228913/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 231147

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-40153-1	TP-PFC-030-TPI	Total/NA	Water	EPA 537 (Mod)	228913
320-40153-2	TP-PFC-030-MIDCARBON	Total/NA	Water	EPA 537 (Mod)	228913
320-40153-3	TP-PFC-030-TPE	Total/NA	Water	EPA 537 (Mod)	228913
320-40153-4	TP-PFC-030-TPE-D	Total/NA	Water	EPA 537 (Mod)	228913
MB 320-228913/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	228913
LCS 320-228913/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	228913
LCSD 320-228913/3-A	Lab Control Sample Dup	Total/NA	Water	EPA 537 (Mod)	228913

Analysis Batch: 231842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-40153-1 - DL	TP-PFC-030-TPI	Total/NA	Water	EPA 537 (Mod)	228913

Lab Chronicle

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

TestAmerica Job ID: 320-40153-1

Client Sample ID: TP-PFC-030-TPI

Date Collected: 06/07/18 09:35

Date Received: 06/08/18 09:00

Lab Sample ID: 320-40153-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			228913	06/13/18 15:12	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	231147	06/27/18 05:40	S1M	TAL SAC
Total/NA	Prep	3535	DL		228913	06/13/18 15:12	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	10	231842	06/30/18 01:08	AAR	TAL SAC

Client Sample ID: TP-PFC-030-MIDCARBON

Date Collected: 06/07/18 09:40

Date Received: 06/08/18 09:00

Lab Sample ID: 320-40153-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			228913	06/13/18 15:12	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	231147	06/27/18 05:48	S1M	TAL SAC

Client Sample ID: TP-PFC-030-TPE

Date Collected: 06/07/18 09:45

Date Received: 06/08/18 09:00

Lab Sample ID: 320-40153-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			228913	06/13/18 15:12	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	231147	06/27/18 05:56	S1M	TAL SAC

Client Sample ID: TP-PFC-030-TPE-D

Date Collected: 06/07/18 00:00

Date Received: 06/08/18 09:00

Lab Sample ID: 320-40153-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			228913	06/13/18 15:12	AME	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	231147	06/27/18 06:04	S1M	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

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

TestAmerica Job ID: 320-40153-1

Laboratory: TestAmerica Sacramento

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

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

Method Summary

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

TestAmerica Job ID: 320-40153-1

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

Protocol References:

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

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

Laboratory References:

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

Sample Summary

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

TestAmerica Job ID: 320-40153-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-40153-1	TP-PFC-030-TPI	Water	06/07/18 09:35	06/08/18 09:00
320-40153-2	TP-PFC-030-MIDCARBON	Water	06/07/18 09:40	06/08/18 09:00
320-40153-3	TP-PFC-030-TPE	Water	06/07/18 09:45	06/08/18 09:00
320-40153-4	TP-PFC-030-TPE-D	Water	06/07/18 00:00	06/08/18 09:00

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 230408

Lab Sample ID: IC 320-230408/2 Client Sample ID: _____

Date Analyzed: 06/22/18 09:18 Lab File ID: 2018.06.022LLICALA_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.70	Baseline	roycea	06/22/18 10:11
4:2 FTS	1.95	Baseline	roycea	06/22/18 10:11
Perfluoroheptanoic acid (PFHpA)	2.31	Baseline	roycea	06/22/18 10:11
6:2 FTS	2.63	Baseline	roycea	06/22/18 10:30
Perfluorooctanesulfonic acid (PFOS)	3.02	Baseline	roycea	06/22/18 10:10
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.53	Assign Peak	roycea	06/22/18 10:11
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.69	Baseline	roycea	06/22/18 10:17

Lab Sample ID: IC 320-230408/3 Client Sample ID: _____

Date Analyzed: 06/22/18 09:26 Lab File ID: 2018.06.022LLICALA_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.67	Baseline	roycea	06/22/18 10:14
Perfluorooctanesulfonic acid (PFOS)	3.03	Baseline	roycea	06/22/18 10:14
Perfluoroundecanoic acid (PFUnA)	3.71	Baseline	roycea	06/22/18 10:16

Lab Sample ID: IC 320-230408/4 Client Sample ID: _____

Date Analyzed: 06/22/18 09:33 Lab File ID: 2018.06.022LLICALA_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.02	Baseline	roycea	06/22/18 10:18
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.71	Baseline	roycea	06/22/18 10:19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 230408

Lab Sample ID: ICB 320-230408/9 Client Sample ID: _____

Date Analyzed: 06/22/18 10:13 Lab File ID: 2018.06.022LLICALA_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.65	Baseline	roycea	06/22/18 11:14
Perfluorododecanoic acid (PFDoA)		Invalid Compound ID	roycea	06/22/18 11:15
Perfluorotridecanoic Acid (PFTriA)		Invalid Compound ID	roycea	06/22/18 11:16

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 231134

Lab Sample ID: CCB 320-231134/1 Client Sample ID: _____

Date Analyzed: 06/26/18 23:17 Lab File ID: 2018.06.26LLC_001.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.76	Wrong peak	ruangyots akuld	06/27/18 13:47
Perfluorooctanoic acid (PFOA)	2.68	Isomers	ruangyots akuld	06/27/18 13:47

Lab Sample ID: CCVL 320-231134/2 Client Sample ID: _____

Date Analyzed: 06/26/18 23:24 Lab File ID: 2018.06.26LLC_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.06	Baseline	ruangyots akuld	06/27/18 13:49

Lab Sample ID: CCV 320-231134/3 CCVIS Client Sample ID: _____

Date Analyzed: 06/26/18 23:32 Lab File ID: 2018.06.26LLC_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.05	Isomers	ruangyots akuld	06/27/18 13:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 231147

Lab Sample ID: LCS 320-228913/2-A Client Sample ID: _____

Date Analyzed: 06/27/18 05:25 Lab File ID: 2018.06.26LLC_048.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.05	Isomers	mongkols	06/28/18 09:01

Lab Sample ID: LCSD 320-228913/3-A Client Sample ID: _____

Date Analyzed: 06/27/18 05:32 Lab File ID: 2018.06.26LLC_049.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.05	Isomers	mongkols	06/28/18 09:01

Lab Sample ID: 320-40153-1 Client Sample ID: TP-PFC-030-TPI

Date Analyzed: 06/27/18 05:40 Lab File ID: 2018.06.26LLC_050.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.44	Baseline	mongkols	06/28/18 09:03
Perfluorooctanoic acid (PFOA)	2.68	Isomers	mongkols	06/28/18 09:03
Perfluorodecanoic acid (PFDA)	3.41	Baseline	mongkols	06/28/18 09:03

Lab Sample ID: 320-40153-2 Client Sample ID: TP-PFC-030-MIDCARBON

Date Analyzed: 06/27/18 05:48 Lab File ID: 2018.06.26LLC_051.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.67	Isomers	mongkols	06/28/18 09:04

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 231147

Lab Sample ID: 320-40153-3 Client Sample ID: TP-PFC-030-TPE

Date Analyzed: 06/27/18 05:56 Lab File ID: 2018.06.26LLC_052.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.59	Isomers	mongkols	06/28/18 09:05

Lab Sample ID: 320-40153-4 Client Sample ID: TP-PFC-030-TPE-D

Date Analyzed: 06/27/18 06:04 Lab File ID: 2018.06.26LLC_053.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.59	Isomers	mongkols	06/28/18 09:06
Perfluorononanoic acid (PFNA)		Invalid Compound ID	mongkols	06/28/18 09:06

Lab Sample ID: CCV 320-231147/9 Client Sample ID: _____

Date Analyzed: 06/27/18 06:11 Lab File ID: 2018.06.26LLC_054.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.04	Isomers	mongkols	06/28/18 09:07

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 231836

Lab Sample ID: IC 320-231836/2 Client Sample ID: _____

Date Analyzed: 06/29/18 21:29 Lab File ID: 2018.06.29LLICALA_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.43	Baseline	roycea	06/30/18 07:10
Perfluorohexanoic acid (PFHxA)	1.99	Baseline	roycea	06/30/18 07:10
6:2 FTS	2.64	Baseline	roycea	06/30/18 07:10
Perfluoroheptanesulfonic Acid (PFHpS)	2.67	Baseline	roycea	06/30/18 07:11
Perfluorooctanoic acid (PFOA)	2.67	Baseline	roycea	06/30/18 07:09
Perfluorooctanesulfonic acid (PFOS)	3.03	Assign Peak	roycea	06/30/18 07:09
Perfluorodecanesulfonic acid (PFDS)	3.69	Baseline	roycea	06/30/18 07:11
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.71	Baseline	roycea	06/30/18 07:13

Lab Sample ID: IC 320-231836/3 Client Sample ID: _____

Date Analyzed: 06/29/18 21:36 Lab File ID: 2018.06.29LLICALA_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.43	Baseline	roycea	06/30/18 07:15
Perfluorobutanesulfonic acid (PFBS)	1.74	Baseline	roycea	06/30/18 07:16
Perfluorooctanoic acid (PFOA)	2.66	Baseline	roycea	06/30/18 07:15

Lab Sample ID: IC 320-231836/4 Client Sample ID: _____

Date Analyzed: 06/29/18 21:44 Lab File ID: 2018.06.29LLICALA_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C4 PFBA	1.42	Incomplete Integration	roycea	06/30/18 07:17
Perfluorobutanoic acid (PFBA)	1.43	Incomplete Integration	roycea	06/30/18 07:17

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 231836

Lab Sample ID: ICB 320-231836/9 Client Sample ID: _____

Date Analyzed: 06/29/18 22:23 Lab File ID: 2018.06.29LLICALA_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.65	Baseline	roycea	06/30/18 07:22
Perfluoroundecanoic acid (PFUnA)	3.70	Baseline	roycea	06/30/18 07:23

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 231842

Lab Sample ID: 320-40153-1 DL Client Sample ID: TP-PFC-030-TPI DL

Date Analyzed: 06/30/18 01:08 Lab File ID: 2018.06.29LLBBX_021.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.43	Baseline	roycea	06/30/18 08:25

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00073	12/01/18	06/01/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA 00008	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FTS 00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA 00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM3HFPO-DA 00003	200 uL	13C3 HFPO-DA	0.05 ug/mL
					LCM4PFHPA 00014	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA 00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA 00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA 00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS 00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00022	200 uL	13C2 PFHxA	0.05 ug/mL
LCMPFHxS 00015	200 uL	1802 PFHxS	0.0473 ug/mL					
LCMPFNA 00015	200 uL	13C5 PFNA	0.05 ug/mL					
LCMPFOA 00019	200 uL	13C4 PFOA	0.05 ug/mL					
LCMPFOS 00027	200 uL	13C4 PFOS	0.0478 ug/mL					
LCMPFuDA 00017	200 uL	13C2 PFUnA	0.05 ug/mL					
.LCd3-NMeFOSAA 00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NETFOSAA 00008	11/08/22		WELLINGTON, Lot d5NETFOSAA117		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
.LCM2-6:FTS 00008	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS 00010	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA 00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA 00014	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM3HFPO-DA 00003	05/18/21		WELLINGTON, Lot M3HFPODA0518		(Purchased Reagent)		13C3 HFPO-DA	50 ug/mL
.LCM4PFHPA 00014	05/03/22		Wellington Laboratories, Lot M4PFHpA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
.LCM5PFPEA 00015	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA 00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA 00015	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS 00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA 00020	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA 00015	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA 00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS 00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
.LCMPFNA 00015	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA 00019	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS 00027	02/15/23		Wellington Laboratories, Lot MPFOS0218		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFuDA 00017	11/22/21		Wellington Laboratories, Lot MPFuDA1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-IS 00056	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
LCPFCLLO_00007	12/01/18	06/05/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00075	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFOA 00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)	13C2-PFOA	50 ug/mL
LCPFC_LLO_00007	12/01/18	06/05/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NETFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
..LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA 00008	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:Fts 00008	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2Fts 00010	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA 00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA 00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA 00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA 00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA 00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS 00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA 00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA 00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS 00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA 00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)	d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA 00008	11/08/22		WELLINGTON, Lot d5NETFOSAA1117			(Purchased Reagent)	d5-NETFOSAA	50 ug/mL
..LCM2-6:Fts 00008	02/16/23		WELLINGTON, Lot M262Fts0218			(Purchased Reagent)	M2-6:2Fts	47.5 ug/mL
..LCM2-8:2Fts 00010	01/24/23		WELLINGTON, Lot M282Fts0118			(Purchased Reagent)	M2-8:2Fts	47.9 ug/mL
..LCM2PFHxDA 00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)	13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00014	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)	13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00014	05/03/22		Wellington Laboratories, Lot M4PFHPA0517			(Purchased Reagent)	13C4-PFHpA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM5PFPEA 00015	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00015	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00020	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00015	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00015	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00019	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00027	02/15/23		Wellington Laboratories, Lot MPFOS0218		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00017	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL1_00006	11/18/18	06/05/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NMeFOSAA	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
							1802 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_00151	500 uL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.02335 ng/mL
							1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.0237 ng/mL
							1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.02395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							Perfluorobutanoic acid (PFBA)	0.025 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.025 ng/mL
Perfluorododecanoic acid (PFDoA)	0.025 ng/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanesulfonic acid (PFDS)	0.0241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0238 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.025 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025025 ng/mL
							Perfluorononanesulfonic acid	0.024 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.025 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.025 ng/mL
							Perfluoropentanesulfonic acid	0.02345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.025 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.025 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.025 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00008	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FtS_00008	200 uL	M2-6:2FtS	0.0475 ug/mL
					LCM2-8:2FtS_00010	200 uL	M2-8:2FtS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA117				(Purchased Reagent) d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00008	11/08/22		WELLINGTON, Lot d5NETFOSAA117				(Purchased Reagent) d5-NETFOSAA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2-6:FTS 00008	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS 00010	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA 00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA 00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA 00014	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00014	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA 00015	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00015	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00020	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00015	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00015	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00019	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00027	02/15/23		Wellington Laboratories, Lot MPFOS0218		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00017	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00151	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LCPFCSP_00148	200 uL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.00934 ug/mL
							1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.00948 ug/mL
							1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.00958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							Perfluorobutanoic acid (PFBA)	0.01 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.00884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.01 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.01 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.00964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.01 ug/mL
							Perfluoroheptanesulfonic Acid (PFHps)	0.00952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.01 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0091 ug/mL
							Perfluorononanoic acid (PFNA)	0.01 ug/mL
							Perfluorooctanoic acid (PFOA)	0.01001 ug/mL
							Perfluorononanesulfonic acid	0.0096 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.00928 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctane Sulfonamide (FOSA)	0.01 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.01 ug/mL
							Perfluoropentanesulfonic acid	0.00938 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.01 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.01 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.01 ug/mL
..LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NETFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDaA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
...LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
...LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
...LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
...LCbr-NETFOSAA_00001	01/17/23		WELLINGTON, Lot brNETFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCbr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
...LCPFOA_00011	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOS-br_00007	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS_00007	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00013	09/01/22		Wellington Laboratories, Lot FOSA0817I		(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00008	06/14/22		Wellington Laboratories, Lot PFPeA0617		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFPeS_00003	01/11/22		Wellington Laboratories, Lot LFPFeS0117		(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00008	09/30/21		Wellington Laboratories, Lot PFTeDA0916		(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTTrDA_00008	05/02/22		Wellington Laboratories, Lot PFTTrDA0517		(Purchased Reagent)		Perfluorotridecanoic Acid (PFTTriA)	50 ug/mL
...LCPFUdA_00008	10/18/21		Wellington Laboratories, Lot PFUdA1016		(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL2_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCPMFC_ALL_SU_00075	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00151	1000 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.0467 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.0474 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.0479 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutanoic acid (PFBA)	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.05 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05005 ng/mL
							Perfluorononanesulfonic acid	0.048 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.05 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluoropentanesulfonic acid	0.0469 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.05 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.05 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FtS_00008	200 uL	M2-6:2FtS	0.0475 ug/mL
					LCM2-8:2FtS_00010	200 uL	M2-8:2FtS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FtS_00008	02/16/23		WELLINGTON, Lot M262FtS0218		(Purchased Reagent)		M2-6:2FtS	47.5 ug/mL
..LCM2-8:2FtS_00010	01/24/23		WELLINGTON, Lot M282FtS0118		(Purchased Reagent)		M2-8:2FtS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22		Wellington Laboratories, Lot M4PFHpA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00015	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOS_00027	02/15/23		Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00017	11/22/21		Wellington Laboratories, Lot MPFUDa1116			(Purchased Reagent)	13C2 PFUnA	50 ug/mL
.LCPFCSP_00151	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LCPFCSP_00148	200 uL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.00934 ug/mL
							1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.00948 ug/mL
							1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.00958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.01 ug/mL
							Perfluorobutanoic acid (PFBA)	0.01 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.00884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.01 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.01 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.00964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.01 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.00952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.01 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0091 ug/mL
							Perfluorononanoic acid (PFNA)	0.01 ug/mL
							Perfluorooctanoic acid (PFOA)	0.01001 ug/mL
							Perfluorononanesulfonic acid	0.0096 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.00928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.01 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.01 ug/mL
							Perfluoropentanesulfonic acid	0.00938 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.01 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.01 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.01 ug/mL
..LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.479 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCbr-NETFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
...LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
...LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
...LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
...LCbr-NETFOSAA_00001	01/17/23		WELLINGTON, Lot brNETFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCbr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFDoA_00008	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHps0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHps)	47.6 ug/mL
...LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00011	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00007	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00013	09/01/22		Wellington Laboratories, Lot FOSA0817I		(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00008	06/14/22		Wellington Laboratories, Lot PFPeA0617		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFPeS_00003	01/11/22		Wellington Laboratories, Lot LPFPeS0117		(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00008	09/30/21		Wellington Laboratories, Lot PFTeDA0916		(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00008	05/02/22		Wellington Laboratories, Lot PFTrDA0517		(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00008	10/18/21		Wellington Laboratories, Lot PFUdA1016		(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFLL3_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NMeFOSAA	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPF CSP_00148	100 uL	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-perfluorodecane sulfonic acid (8:2)	0.2395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							Perfluorobutanoic acid (PFBA)	0.25 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.25 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.25 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.238 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25025 ng/mL
							Perfluorononanesulfonic acid	0.24 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.25 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.25 ng/mL
Perfluoropentanesulfonic acid	0.2345 ng/mL							
Perfluorotetradecanoic acid (PFTeA)	0.25 ng/mL							
Perfluorotridecanoic Acid (PFTriA)	0.25 ng/mL							
Perfluoroundecanoic acid (PFUnA)	0.25 ng/mL							
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NetFOSAA_00008	200 uL	d5-NetFOSAA	0.05 ug/mL
					LCM2-6:Fts_00008	200 uL	M2-6:2Fts	0.0475 ug/mL
					LCM2-8:2Fts_00010	200 uL	M2-8:2Fts	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
LCM4PFHPA_00014	200 uL	13C4-PFHPA	0.05 ug/mL					

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM5PFPEA_00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FtS_00008	02/16/23		WELLINGTON, Lot M262FtS0218		(Purchased Reagent)		M2-6:2FtS	47.5 ug/mL
..LCM2-8:2FtS_00010	01/24/23		WELLINGTON, Lot M282FtS0118		(Purchased Reagent)		M2-8:2FtS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00015	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23		Wellington Laboratories, Lot MPFOS0218		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21		Wellington Laboratories, Lot MPFUdA1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FtS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.467 ug/mL
					LC6:2FtS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.474 ug/mL
					LC8:2FtS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTTriA)	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCBr-NEtFOSAA_00001	01/17/23		WELLINGTON, Lot brNETFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCBr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDaA_00008	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxS-br_00006	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) Perfluorooctanoic acid (PFOA)	50 ug/mL 0.05 ug/mL
..LCPFNS 00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA 00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS 00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL4_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCPMFC_ALL_SU_00075	10 mL	d3-NMeFOSAA d5-NetFOSAA M2-6:2FTS M2-8:2FTS 13C2-PFHxDA 13C2-PFOA 13C2-PFTeDA 13C4-PFHpA 13C5 PFPeA 13C8 FOSA 13C4 PFBA 13C3-PFBS 13C2 PFDA 13C2 PFDoA 13C2 PFHxA 18O2 PFHxS 13C5 PFNA 13C4 PFOA 13C4 PFOS 13C2 PFUnA	2.5 ng/mL 2.5 ng/mL 2.375 ng/mL 2.395 ng/mL 2.5 ng/mL 2.5 ng/mL 2.5 ng/mL 2.5 ng/mL 2.5 ng/mL 2.5 ng/mL 2.5 ng/mL 2.325 ng/mL 2.5 ng/mL 2.5 ng/mL 2.5 ng/mL 2.365 ng/mL 2.5 ng/mL 2.5 ng/mL 2.5 ng/mL 2.39 ng/mL 2.5 ng/mL
					LCPFCSP_00148	400 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2) 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2) 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2) N-ethyl perfluorooctane sulfonamidoacetic acid N-methyl perfluorooctane sulfonamidoacetic acid	0.934 ng/mL 0.948 ng/mL 0.958 ng/mL 1 ng/mL 1 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorobutanoic acid (PFBA)	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid (PFDA)	1 ng/mL
							Perfluorododecanoic acid (PFDoA)	1 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1.001 ng/mL
							Perfluorononanesulfonic acid	0.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluoropentanesulfonic acid	0.938 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00008	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:F2S_00008	200 uL	M2-6:F2S	0.0475 ug/mL
					LCM2-8:F2S_00010	200 uL	M2-8:F2S	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FtS_00008	02/16/23		WELLINGTON, Lot M262FtS0218		(Purchased Reagent)		M2-6:2FtS	47.5 ug/mL
..LCM2-8:2FtS_00010	01/24/23		WELLINGTON, Lot M282FtS0118		(Purchased Reagent)		M2-8:2FtS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFtEDA_00014	11/30/22		Wellington Laboratories, Lot M2PFtEDA1117		(Purchased Reagent)		13C2-PFtEDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00015	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDa_00015	02/16/23		Wellington Laboratories, Lot MPFDa0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23		Wellington Laboratories, Lot MPFOS0218		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00017	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPPCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FtS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FtS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FtS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHPa_00011	100 uL	Perfluoroheptanoic acid (PFHPa)	0.5 ug/mL
					LCPFHPaSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHPs)	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NETFOSAA_00001	01/17/23		WELLINGTON, Lot brNETFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpa_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOS-br_00007	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOSA_00013	09/01/22		Wellington Laboratories, Lot FOSA0817I		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFPeA_00008	06/14/22		Wellington Laboratories, Lot PFPeA0617		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22		Wellington Laboratories, Lot LPFPeS0117		(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00008	09/30/21		Wellington Laboratories, Lot PFTeDA0916		(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00008	05/02/22		Wellington Laboratories, Lot PFTrDA0517		(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFuDA_00008	10/18/21		Wellington Laboratories, Lot PFUDa1016		(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL5_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	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_00148	1000 uL	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	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
		Perfluorododecanoic acid (PFDoA)	2.5 ng/mL					
		Perfluorodecanesulfonic acid (PFDS)	2.41 ng/mL					
		Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL					

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanesulfonic Acid (PFHpS)	2.38 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5025 ng/mL
							Perfluorononanesulfonic acid (PFOS)	2.4 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL
							Perfluoropentanesulfonic acid (PFTeA)	2.345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00008	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FtS_00008	200 uL	M2-6:2FtS	0.0475 ug/mL
					LCM2-8:2FtS_00010	200 uL	M2-8:2FtS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFtEDA_00014	200 uL	13C2-PFtEDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00008	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FtS_00008	02/16/23		WELLINGTON, Lot M262FtS0218		(Purchased Reagent)		M2-6:2FtS	47.5 ug/mL
..LCM2-8:2FtS_00010	01/24/23		WELLINGTON, Lot M282FtS0118		(Purchased Reagent)		M2-8:2FtS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFtEDA_00014	11/30/22		Wellington Laboratories, Lot M2PFtEDA1117		(Purchased Reagent)		13C2-PFtEDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM4PFHFA 00014	05/03/22		Wellington Laboratories, Lot M4PFHFA0517		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA 00015	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00015	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00020	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00015	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00015	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00019	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00027	02/15/23		Wellington Laboratories, Lot MPFOS0218		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00017	11/22/21		Wellington Laboratories, Lot MPFUdA1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
							Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFTEdA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23		WELLINGTON, Lot brNetFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorononanesulfonic acid	0.05 ug/mL
..LCPFOA_00011	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	48 ug/mL
..LCPFOS-br_00007	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	50 ug/mL
..LCPFOSA_00013	09/01/22		Wellington Laboratories, Lot FOSA0817I		(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	46.4 ug/mL
..LCPFPeA_00008	06/14/22		Wellington Laboratories, Lot PFPeA0617		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22		Wellington Laboratories, Lot LPFPeS0117		(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTEdA_00008	09/30/21		Wellington Laboratories, Lot PFTeDA0916		(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00008	05/02/22		Wellington Laboratories, Lot PFTrDA0517		(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21		Wellington Laboratories, Lot PFUdA1016		(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL6_00006	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCPMFC_ALL_SU_00075	10 mL	d3-NMeFOSAA d5-NEtFOSAA	2.5 ng/mL 2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

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_00148	2 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	4.67 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	4.74 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	4.79 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							Perfluorobutanoic acid (PFBA)	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5.005 ng/mL
							Perfluorononanesulfonic acid	4.8 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluoropentanesulfonic acid	4.69 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00008	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FtS_00008	200 uL	M2-6:2FtS	0.0475 ug/mL
					LCM2-8:2FtS_00010	200 uL	M2-8:2FtS	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00014	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00017	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00008	11/08/22		WELLINGTON, Lot d5NETFOSAA1117		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FtS_00008	02/16/23		WELLINGTON, Lot M262FtS0218		(Purchased Reagent)		M2-6:2FtS	47.5 ug/mL
..LCM2-8:2FtS_00010	01/24/23		WELLINGTON, Lot M282FtS0118		(Purchased Reagent)		M2-8:2FtS	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00014	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00014	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00015	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOA_00019	05/04/23		Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)	13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23		Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21		Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)	13C2 PFUnA	50 ug/mL
.LCPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.467 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.474 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.479 ug/mL
					LCbr-NETFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL					
LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL					
LCPFTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL					
LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCBr-NEtFOSAA_00001	01/17/23		WELLINGTON, Lot brNETFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCBr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorononanesulfonic acid	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
..LCPFOSA_00013	09/01/22		Wellington Laboratories, Lot FOSA0817I		(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00008	06/14/22		Wellington Laboratories, Lot PFPeA0617		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22		Wellington Laboratories, Lot LPFPeS0117		(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTEdA_00008	09/30/21		Wellington Laboratories, Lot PFTeDA0916		(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00008	05/02/22		Wellington Laboratories, Lot PFTTrDA0517		(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_00005	11/18/18	06/05/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00075	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00148	4 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	9.34 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	9.48 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	9.58 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutanoic acid (PFBA)	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid (PFDA)	10 ng/mL
							Perfluorododecanoic acid (PFDoA)	10 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	9.52 ng/mL
							Perfluorohexanoic acid (PFHxA)	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10.01 ng/mL
							Perfluorononanesulfonic acid	9.6 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	10 ng/mL
							Perfluoropentanoic acid (PFPeA)	10 ng/mL
							Perfluoropentanesulfonic acid	9.38 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	10 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	10 ng/mL
							Perfluoroundecanoic acid (PFUnA)	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFC_ALL_SU_00075	12/05/18	06/05/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00008	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00008	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:F2S_00008	200 uL	M2-6:2F2S	0.0475 ug/mL
					LCM2-8:2F2S_00010	200 uL	M2-8:2F2S	0.0479 ug/mL
					LCM2PFHxDA_00016	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTEdA_00014	200 uL	13C2-PFTEdA	0.05 ug/mL
					LCM4PFHPA_00014	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00015	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00019	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00015	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00008	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00020	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00015	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00022	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00015	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00015	200 uL	13C5 PFNA	0.05 ug/mL
LCMPFOA_00019	200 uL	13C4 PFOA	0.05 ug/mL					
LCMPFOS_00027	200 uL	13C4 PFOS	0.0478 ug/mL					
LCMPFUdA_00017	200 uL	13C2 PFUnA	0.05 ug/mL					
..LCd3-NMeFOSAA_00008	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)	d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00008	11/08/22		WELLINGTON, Lot d5NETFOSAA1117			(Purchased Reagent)	d5-NETFOSAA	50 ug/mL
..LCM2-6:F2S_00008	02/16/23		WELLINGTON, Lot M262F2S0218			(Purchased Reagent)	M2-6:2F2S	47.5 ug/mL
..LCM2-8:2F2S_00010	01/24/23		WELLINGTON, Lot M282F2S0118			(Purchased Reagent)	M2-8:2F2S	47.9 ug/mL
..LCM2PFHxDA_00016	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)	13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)	13C2-PFOA	50 ug/mL
..LCM2PFTEdA_00014	11/30/22		Wellington Laboratories, Lot M2PFTEdA1117			(Purchased Reagent)	13C2-PFTEdA	50 ug/mL
..LCM4PFHPA_00014	05/03/22		Wellington Laboratories, Lot M4PFHPA0517			(Purchased Reagent)	13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00015	07/20/22		Wellington Laboratories, Lot M5PFPEA0717			(Purchased Reagent)	13C5 PFPeA	50 ug/mL
..LCM8FOSA_00019	10/11/22		Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)	13C8 FOSA	50 ug/mL
..LCMPFBA_00015	02/16/23		Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)	13C4 PFBA	50 ug/mL
..LCMPFBS_00008	02/15/23		Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)	13C3-PFBS	46.5 ug/mL
..LCMPFDA_00020	02/16/23		Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)	13C2 PFDA	50 ug/mL
..LCMPFDoA_00015	02/16/23		Wellington Laboratories, Lot MPFDoA0218			(Purchased Reagent)	13C2 PFDoA	50 ug/mL
..LCMPFHxA_00022	10/27/22		Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)	13C2 PFHxA	50 ug/mL
..LCMPFHxS_00015	03/22/23		Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)	18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00015	12/14/22		Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)	13C5 PFNA	50 ug/mL
..LCMPFOA_00019	05/04/23		Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)	13C4 PFOA	50 ug/mL
..LCMPFOS_00027	02/15/23		Wellington Laboratories, Lot MPFOS0218			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00017	11/22/21		Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)	13C2 PFUnA	50 ug/mL
..LCMPFCSP_00148	11/18/18	05/17/18	Methanol, Lot 090285	10 mL	LC4:2F2S_00005	100 uL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.467 ug/mL
					LC6:2F2S_00007	100 uL	1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.474 ug/mL
					LC8:2F2S_00007	100 uL	1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.479 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCbr-NETFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.476 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.48 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.5005 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.469 ug/mL
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NETFOSAA_00001	01/17/23		WELLINGTON, Lot brNETFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCbr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpa_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHps0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHps)	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFPeA_00008	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00008	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTrDA_00008	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFCIC_FULL_00011	07/02/18	02/22/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC_ALL_SU_00041	10 mL	13C2-PFOA	2.5 ng/mL
..LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFCIC_FULL_00011	07/02/18	02/22/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NETFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFAC-24PAR_00001	250 uL	13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.4125 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.375 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.28 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.31375 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL							
Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL							
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00006	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFOS 00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFudA 00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA 00006	05/19/22		WELLINGTON, Lot d3NMeFOSAA0517		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA 00006	11/08/22		WELLINGTON, Lot d5NETFOSAA1117		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:F2S 00006	02/17/22		WELLINGTON, Lot M262F2S0217		(Purchased Reagent)		M2-6:F2S	47.5 ug/mL
..LCM2-8:2F2S 00008	07/05/22		WELLINGTON, Lot M282F2S0717		(Purchased Reagent)		M2-8:2F2S	47.9 ug/mL
..LCM2PFHxDA 00013	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTEDA 00012	11/30/22		Wellington Laboratories, Lot M2PFTEDA1117		(Purchased Reagent)		13C2-PFTEDA	50 ug/mL
..LCM4PFHPA 00012	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA 00013	07/20/22		Wellington Laboratories, Lot M5PFPEA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00016	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00013	04/12/22		Wellington Laboratories, Lot MPFBA0417		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00006	05/24/22		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00018	07/13/22		Wellington Laboratories, Lot MPFDA0717		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00013	05/23/22		Wellington Laboratories, Lot MPFDoA0517		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00019	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00013	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00013	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00017	10/17/22		Wellington Laboratories, Lot MPFOA1017		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00025	10/17/22		Wellington Laboratories, Lot MPFOS1017		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFudA 00014	11/22/21		Wellington Laboratories, Lot MPFudA1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFAC-24PAR_00001	09/15/22		Wellington Laboratories, Lot PFAC24PAR0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	1.93 ug/mL
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid (PFDoA)	2 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	1.9 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.824 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.851 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid (PFPeA)	2 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
LCPFCSP_00150	11/18/18	05/17/18	Methanol, Lot 090285	250 mL	LC11CIPF30Uds_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
					LC9CI-PF3ONS_00002	100 uL	9-Chlorohexadecafluoro-3-oxonane-1-sulfonate	0.01864 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCDONA_00002	100 uL	Adona	0.02 ug/mL
					LCHFPO-DA_00002	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00008	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00010	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFODA_00010	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00008	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFTeDA_00008	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00008	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.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-oxonane-1-sulfonate	46.6 ug/mL
.LCbr-NETFOSAA_00001	01/17/23		WELLINGTON, Lot brNETFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCbr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCDONA_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
.LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutane Sulfonate Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL 44.2 ug/mL
.LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00008	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpa_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
.LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA_00010	07/13/22		Wellington Laboratories, Lot PFHxDA0717		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexane Sulfonate Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL 45.5 ug/mL
.LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA) Perfluorooctanoic acid (PFOA)	50 ug/mL 0.05 ug/mL
.LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
.LCPFOA_00011	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00010	07/13/22		Wellington Laboratories, Lot PFODA0717		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00007	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00013	09/01/22		Wellington Laboratories, Lot FOSA0817I		(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFPeA_00008	06/14/22		Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFPeS_00003	01/11/22		Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)	Perfluoropentanesulfonic acid	46.9 ug/mL
.LCPFTeDA_00008	09/30/21		Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00008	05/02/22		Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
.LCPFUdA_00008	10/18/21		Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC11CIPF30Uds_00002

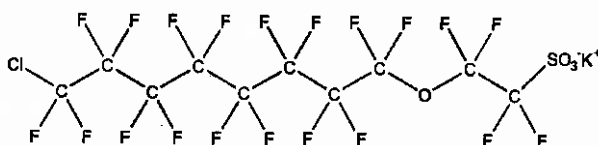


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 11CI-PF3OUdS **LOT NUMBER:** 11CIPF3OUdS0916
COMPOUND: Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate

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



MOLECULAR FORMULA: C₁₀F₂₀ClSO₄K **MOLECULAR WEIGHT:** 670.69
CONCENTRATION: 50.0 ± 2.5 µg/ml (K Salt) **SOLVENT(S):** Methanol
 47.1 ± 2.4 µg/ml (11CI-PF3OUdS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- This compound is a minor component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

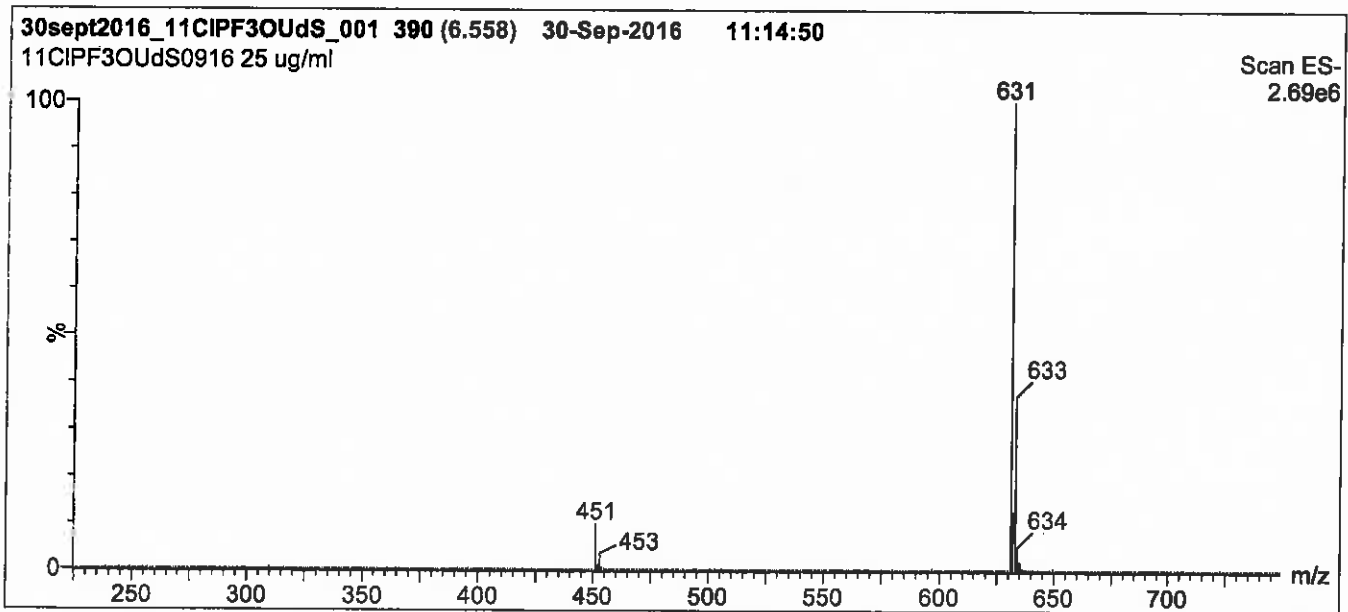
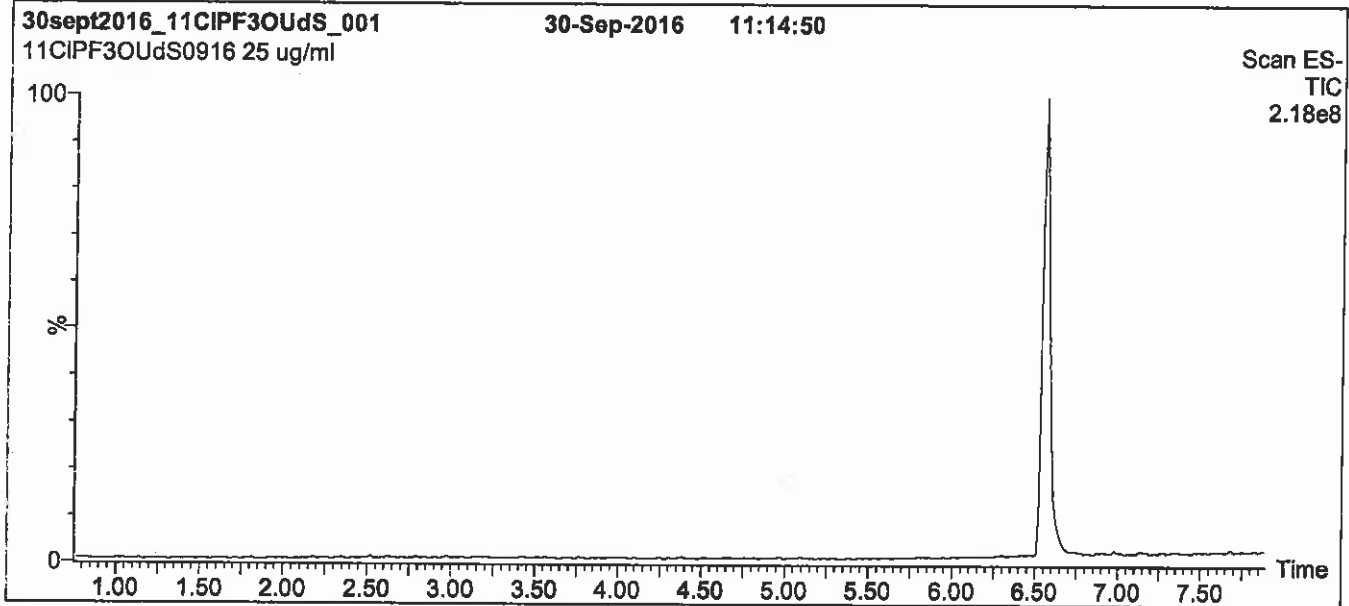
QUALITY MANAGEMENT:

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



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

Figure 1: 11CI-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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

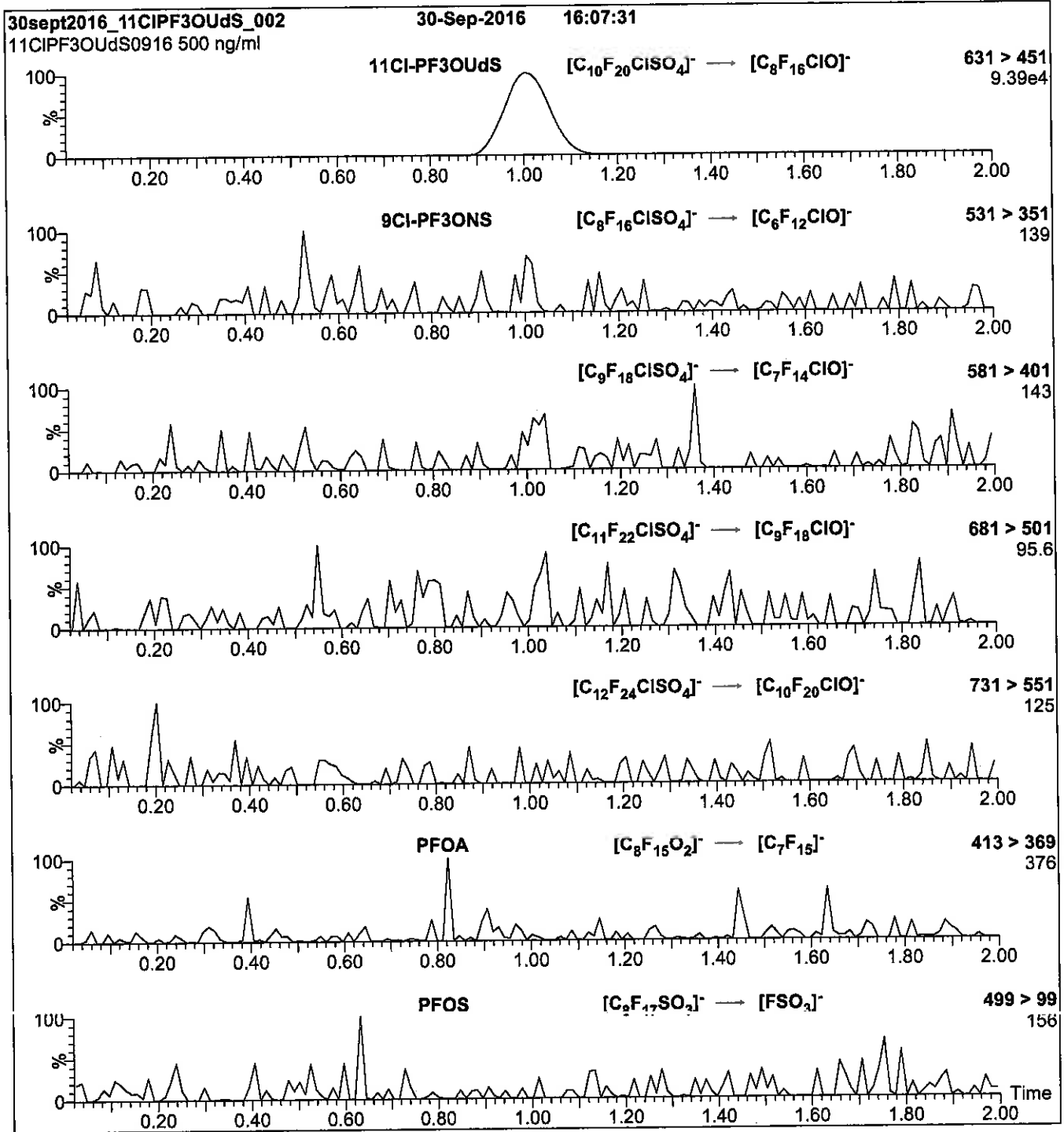
Flow: 300 μ l/min

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 μ l (500 ng/ml 11Cl-PF3OUdS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 20

Reagent

LC4 : 2FTS_00005

n: 9/21/17 skv

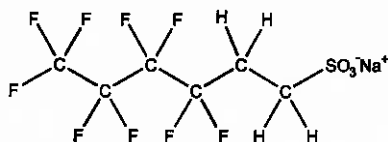


WELLINGTON LABORATORIES

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: C₆H₄F₉SO₃Na **MOLECULAR WEIGHT:** 350.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
46.7 ± 2.3 µg/ml (4:2FTS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/12/2016
EXPIRY DATE: (mm/dd/yyyy) 12/12/2021
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

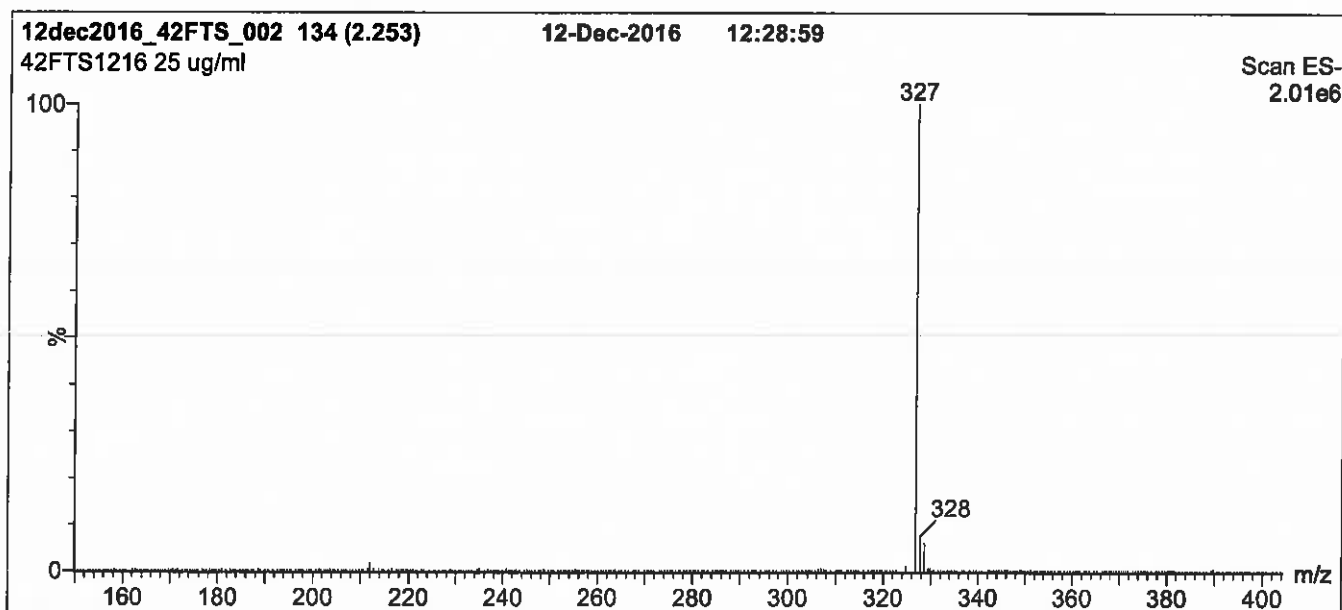
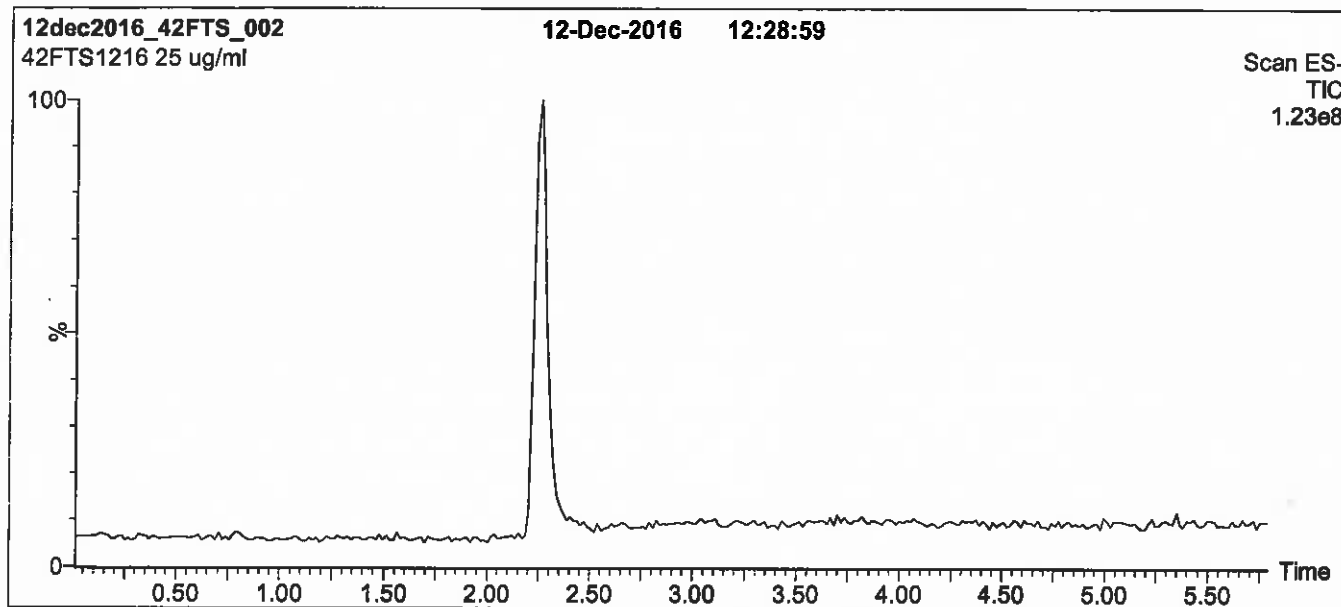
QUALITY MANAGEMENT:

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



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

Figure 1: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

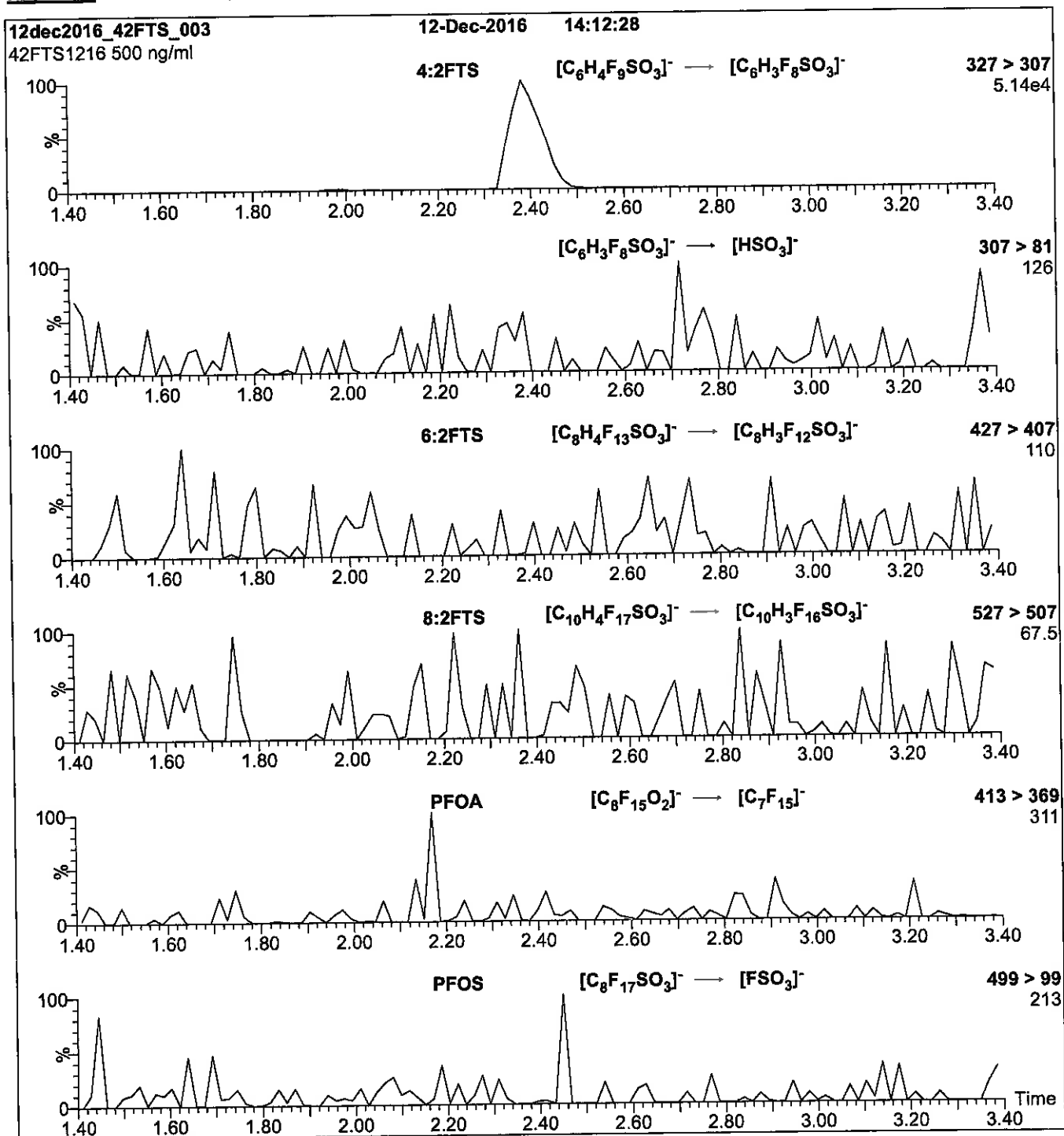
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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 μ l (500 ng/ml 4:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 25

Reagent

LC6:2FTS_00007

r: 9/20/17 SW

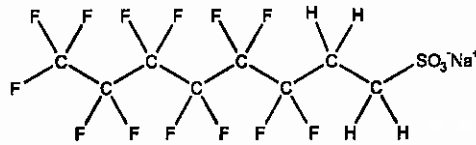


WELLINGTON LABORATORIES

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: C₈H₄F₁₈SO₃Na **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: 
 B.G. Chittim, General Manager **Date:** 04/24/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

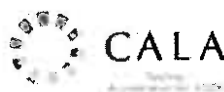
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

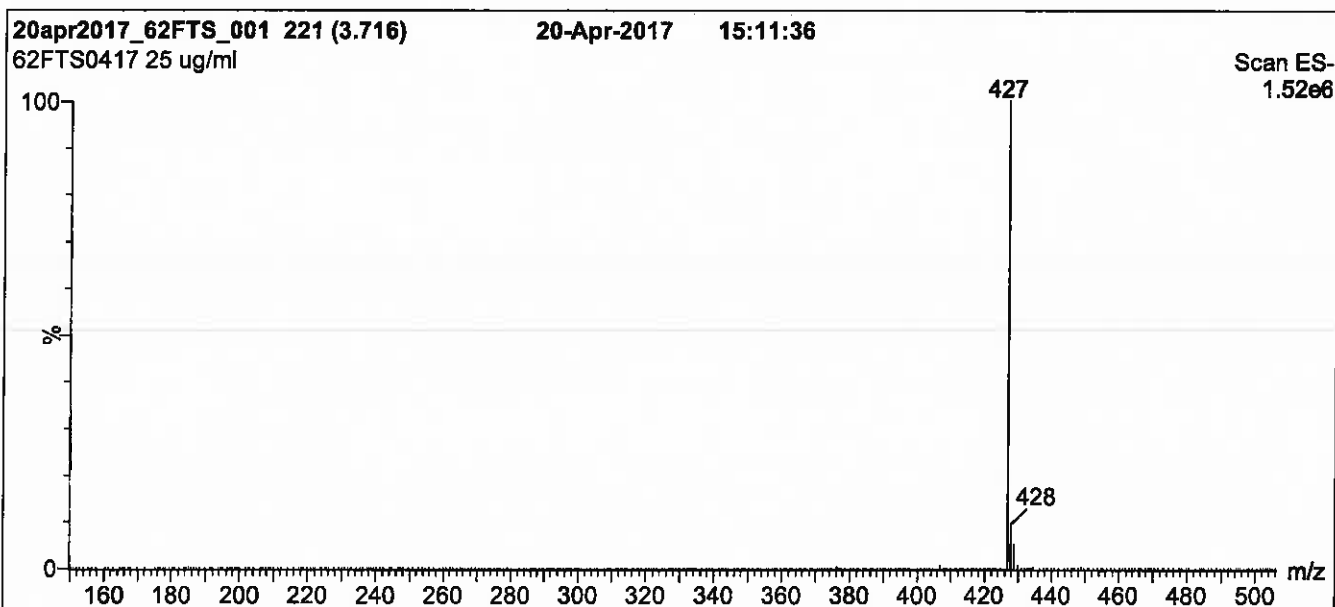
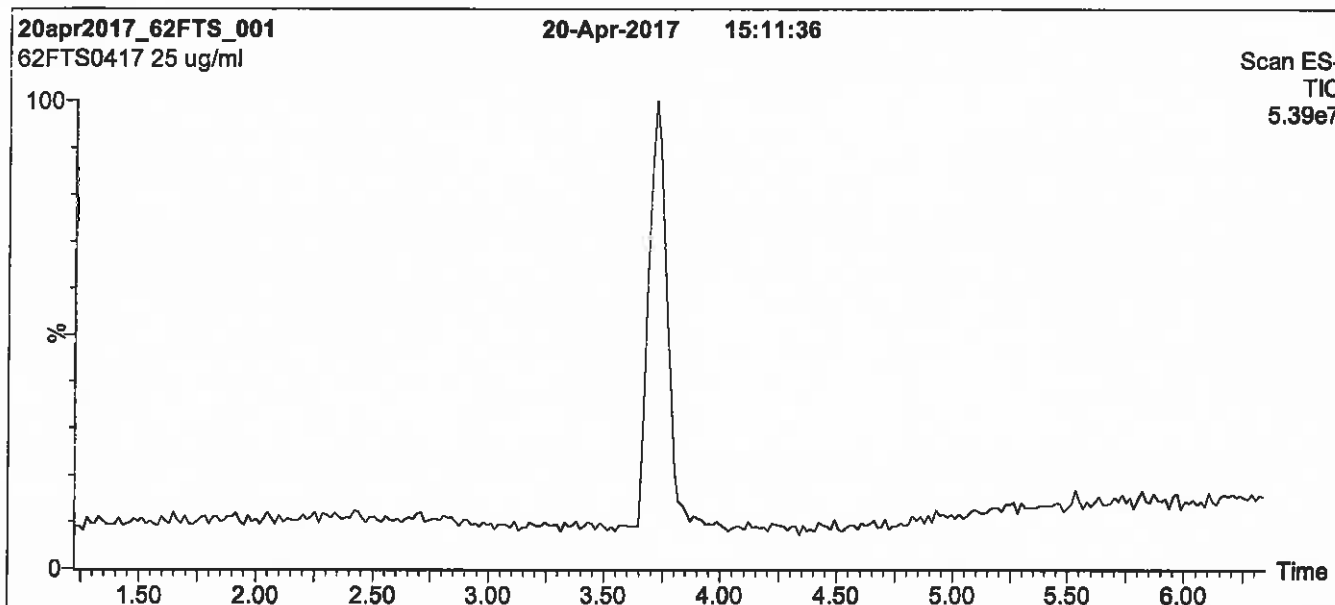
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈,
 1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

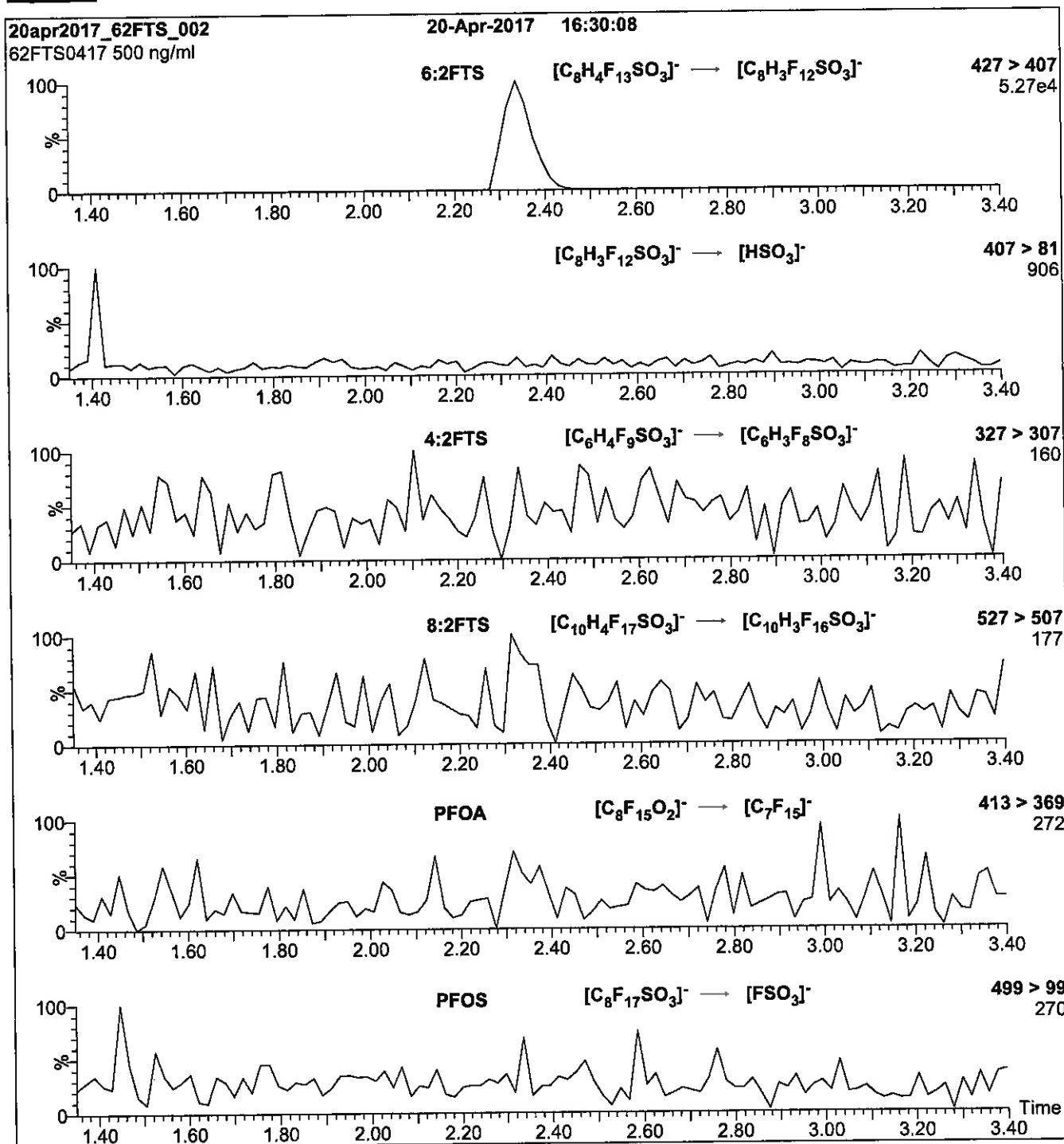
Flow: 300 μl/min

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 μ l (500 ng/ml 6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LC8 : 2FTS _ 00007

n: 9(21/17SK)

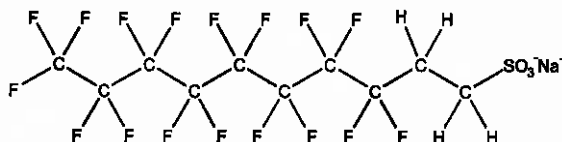


WELLINGTON LABORATORIES

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: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt) **SOLVENT(S):** Methanol
 $47.9 \pm 2.4 \mu\text{g/ml}$ (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

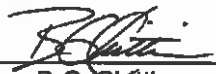
DOCUMENTATION/ DATA ATTACHED:

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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

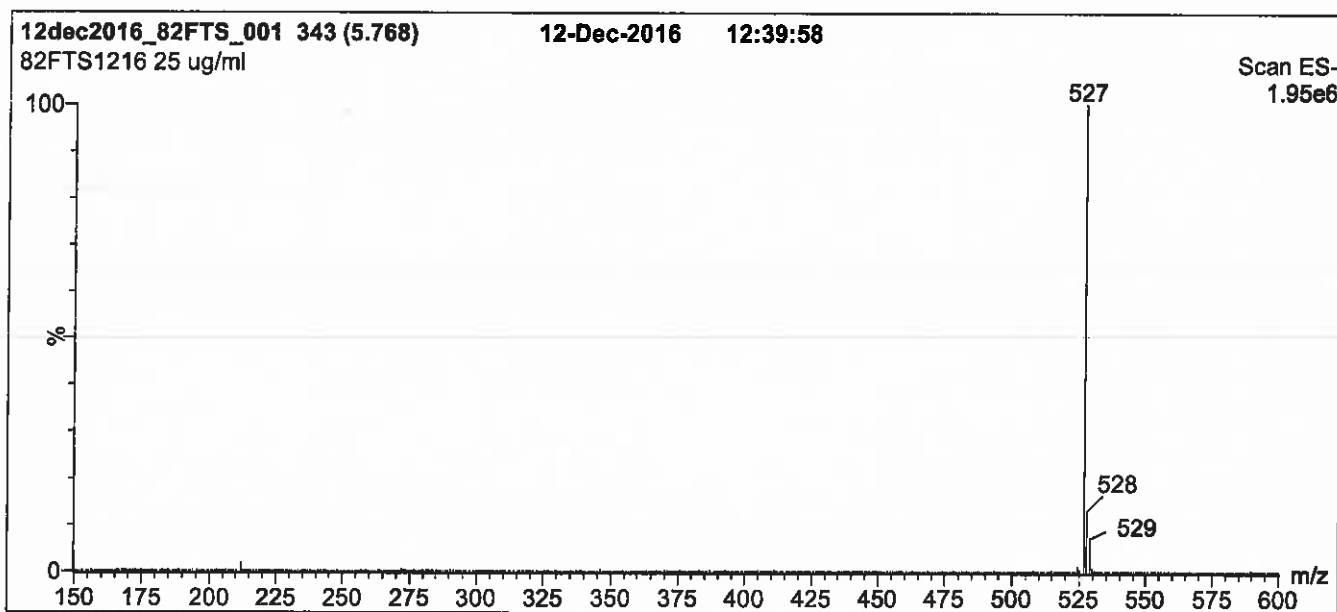
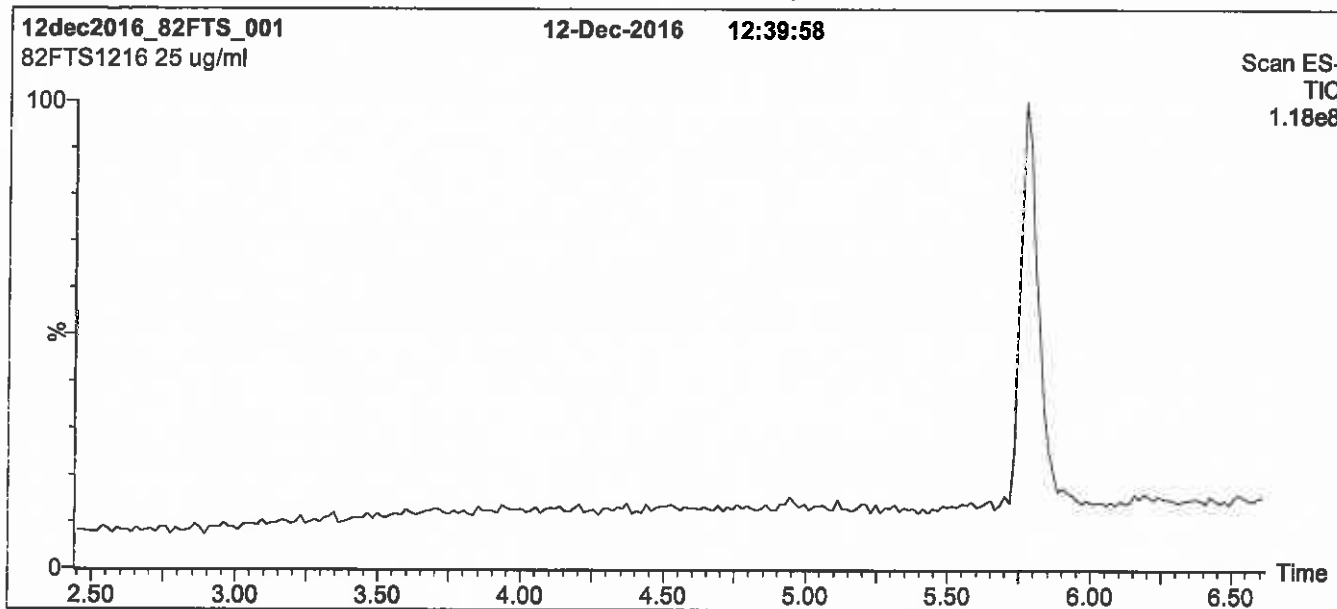
QUALITY MANAGEMENT:

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



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

Figure 1: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

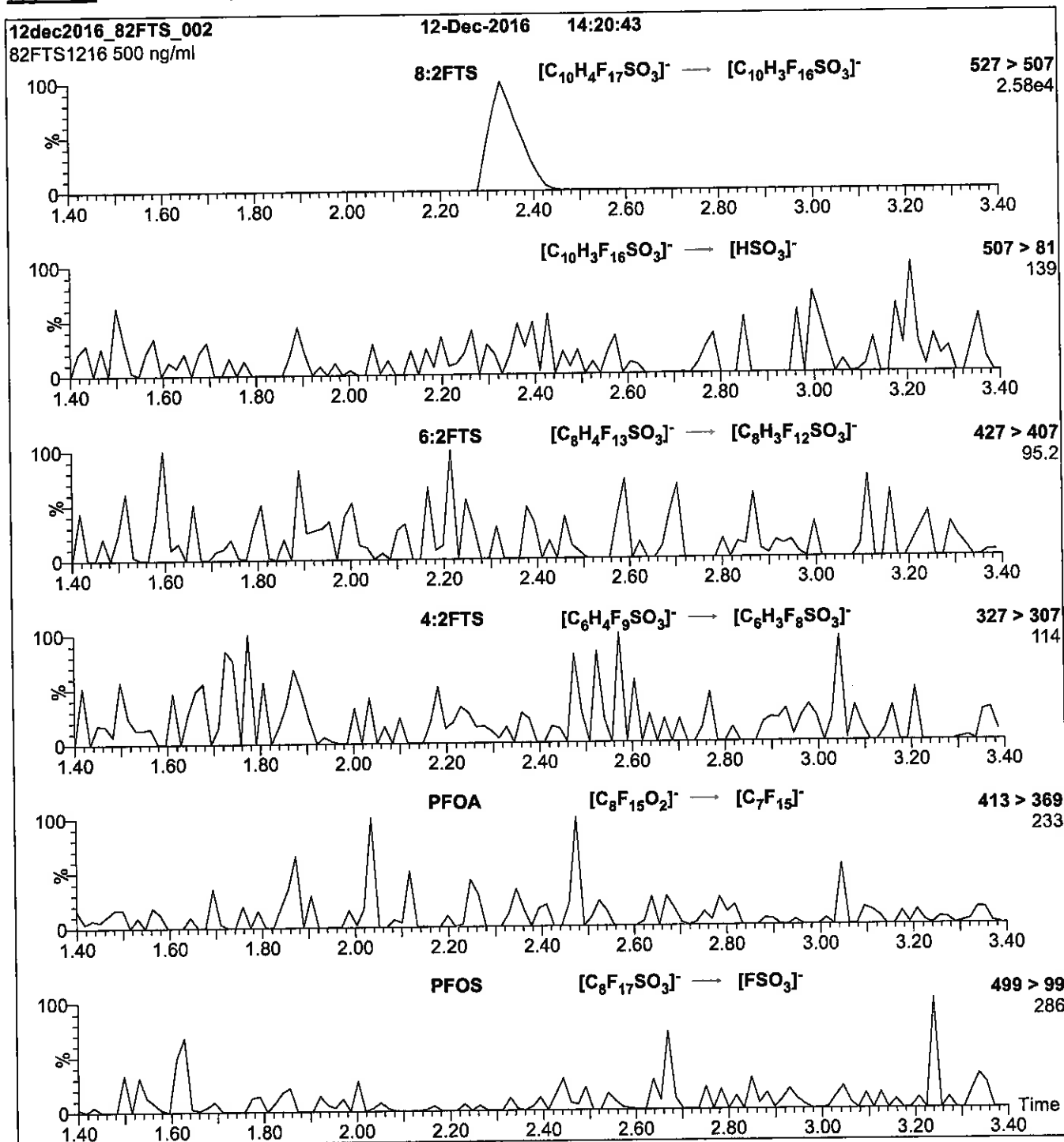
Flow: 300 μ l/min

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 μ l (500 ng/ml 8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 30

Reagent

LC9CI-PF3ONS_00002

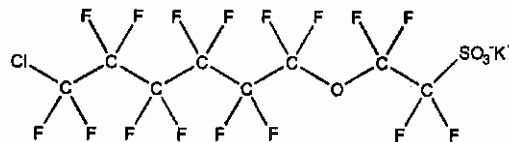


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 9CI-PF3ONS **LOT NUMBER:** 9CIPF3ONS0916
COMPOUND: Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate

STRUCTURE: **CAS #:** 73606-19-6



MOLECULAR FORMULA: $C_9F_{16}ClSO_4K$ **MOLECULAR WEIGHT:** 570.67
CONCENTRATION: 50.0 ± 2.5 µg/ml (K Salt) **SOLVENT(S):** Methanol
 46.6 ± 2.3 µg/ml (9CI-PF3ONS 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 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:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

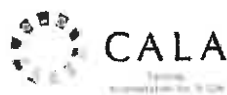
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

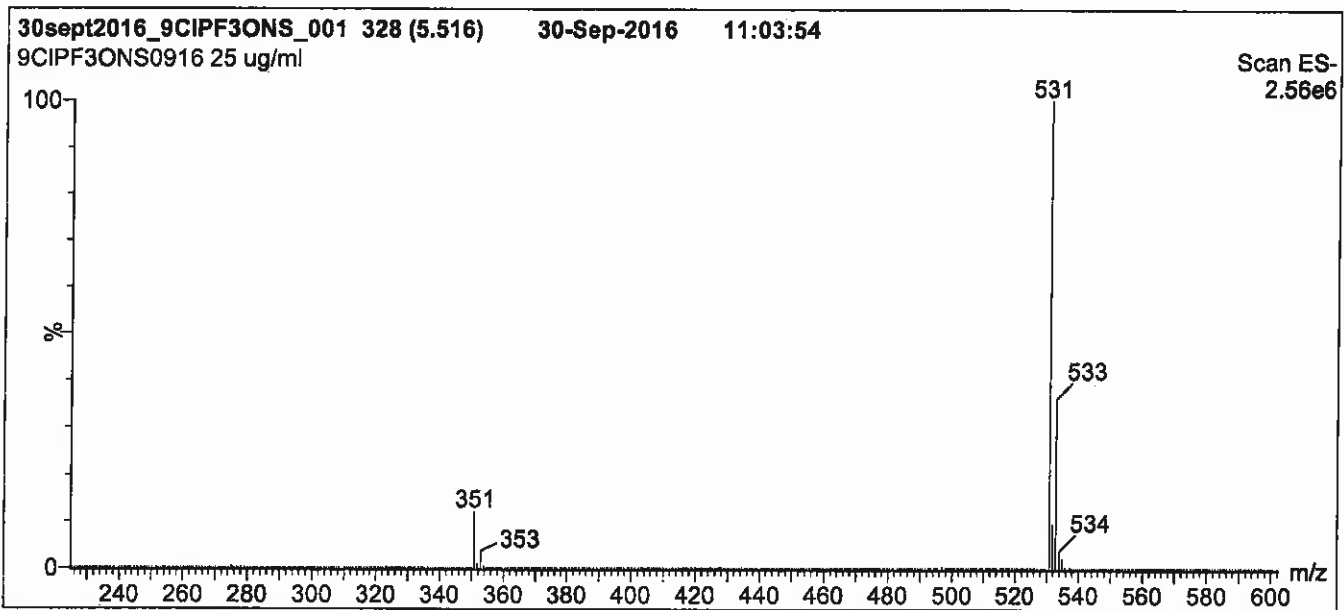
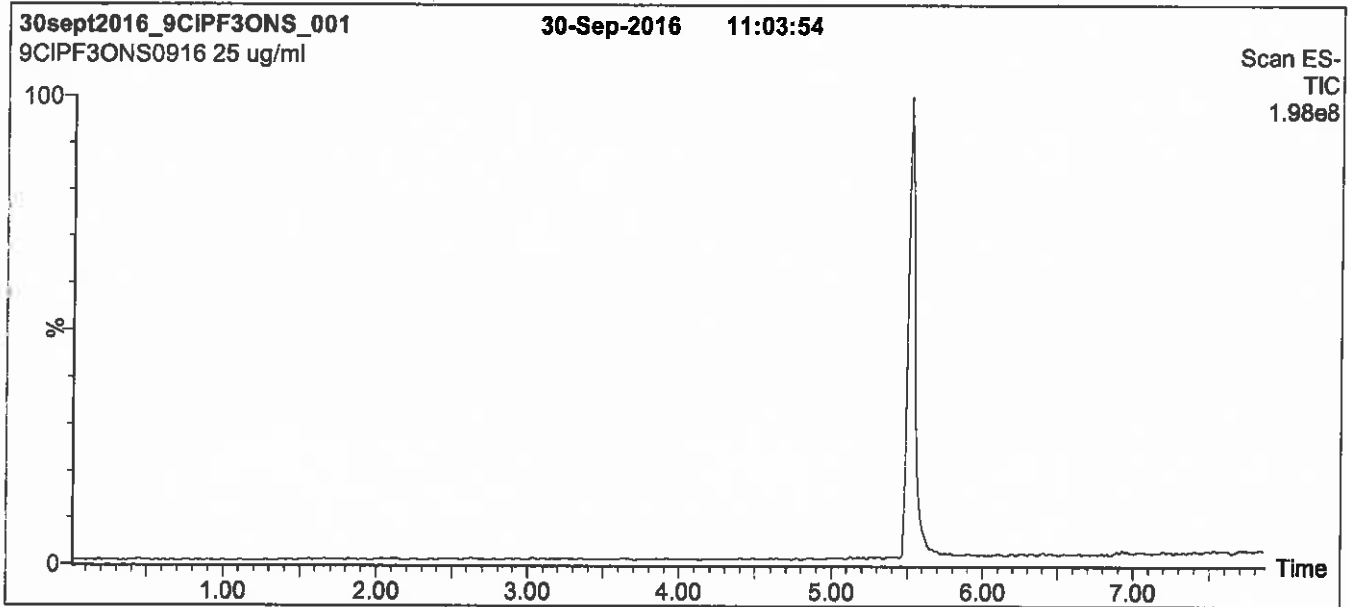
QUALITY MANAGEMENT:

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



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

Figure 1: 9CI-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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

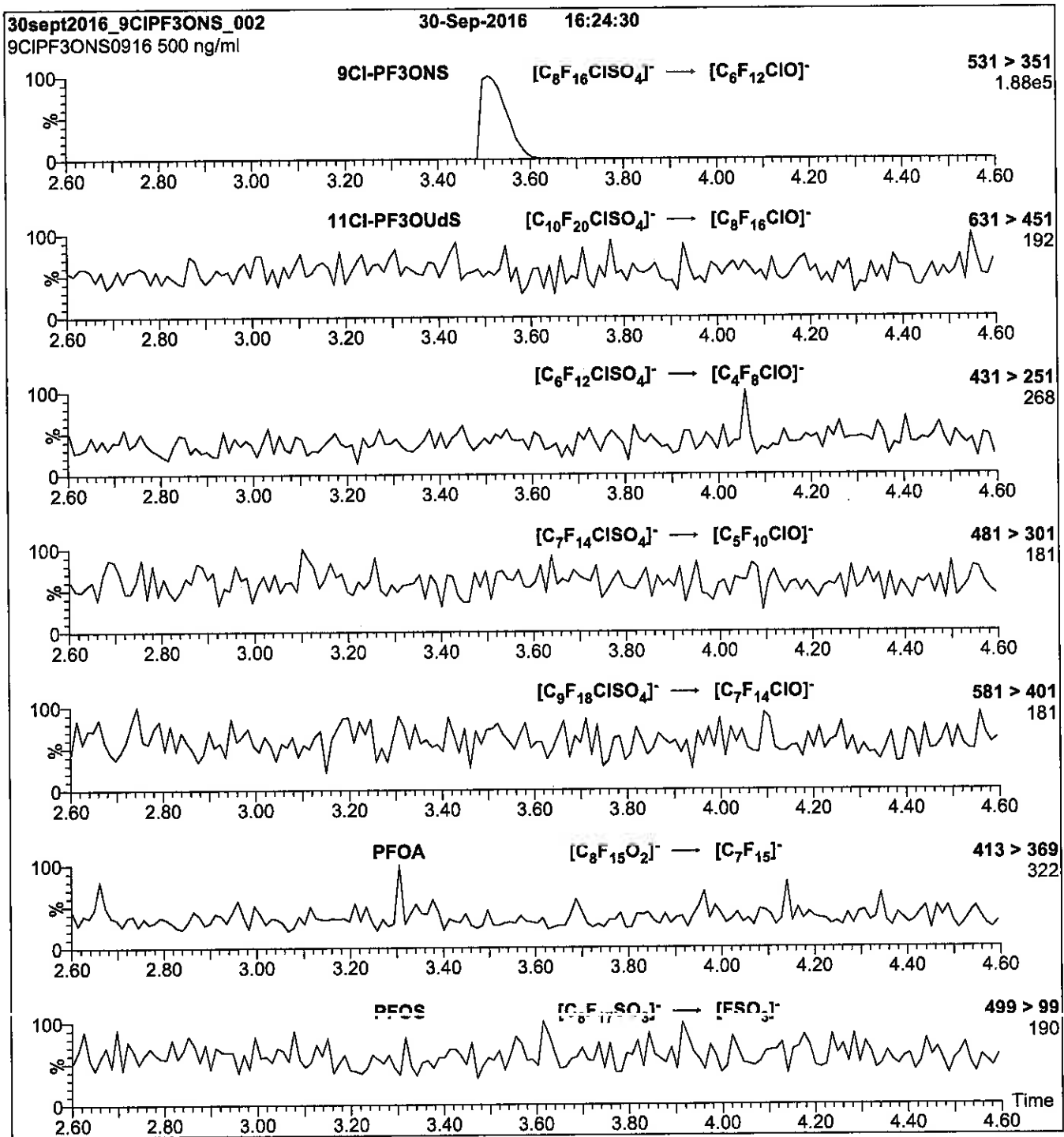
Flow: 300 μ l/min

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: 9CI-PF3ONS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml 9CI-PF3ONS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCbr-NEtFOSAA_00001



**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 ¹⁹F-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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

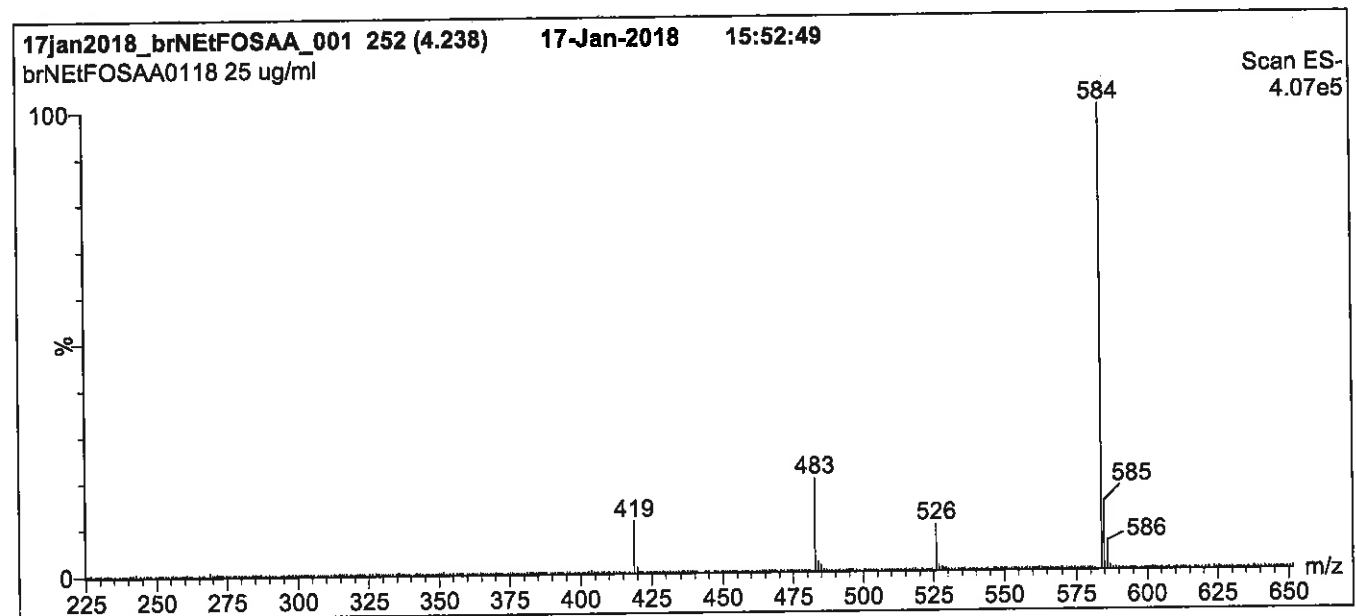
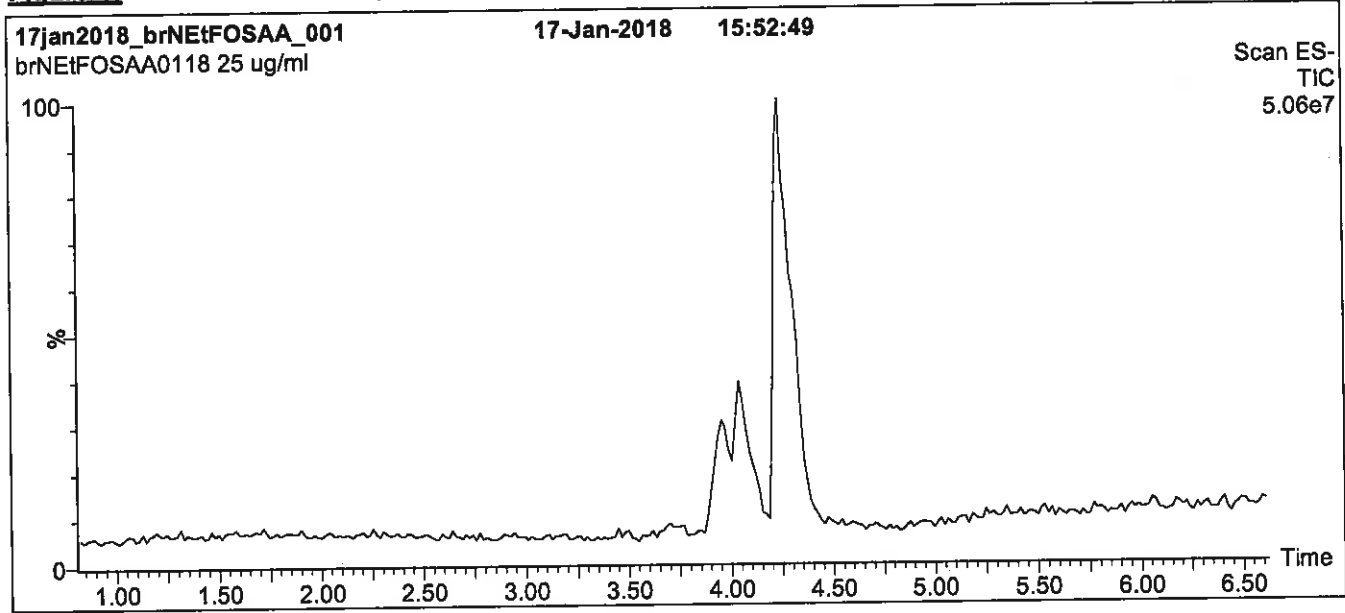
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

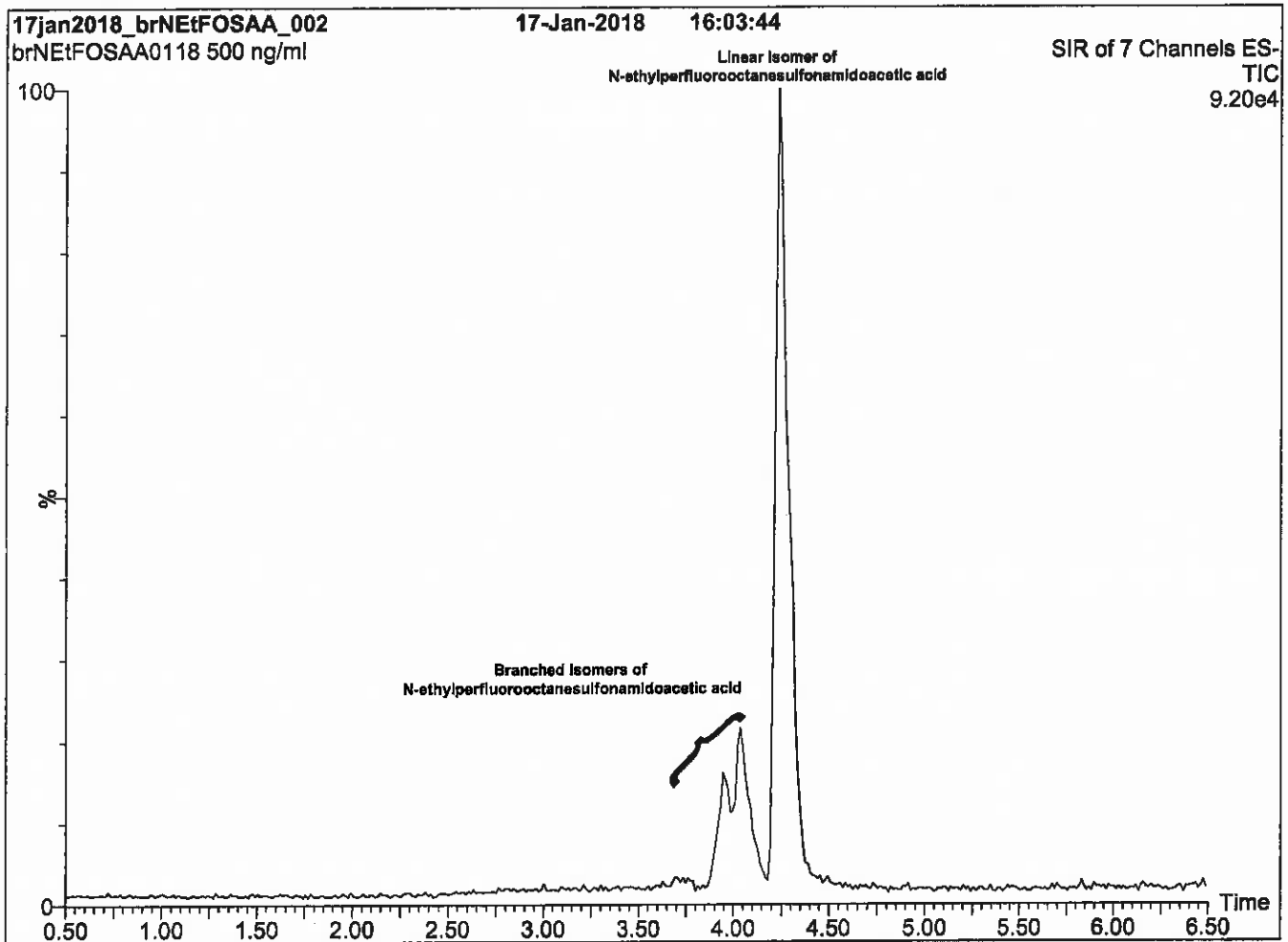
Flow: 300 μl/min

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 RP₁₈
1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

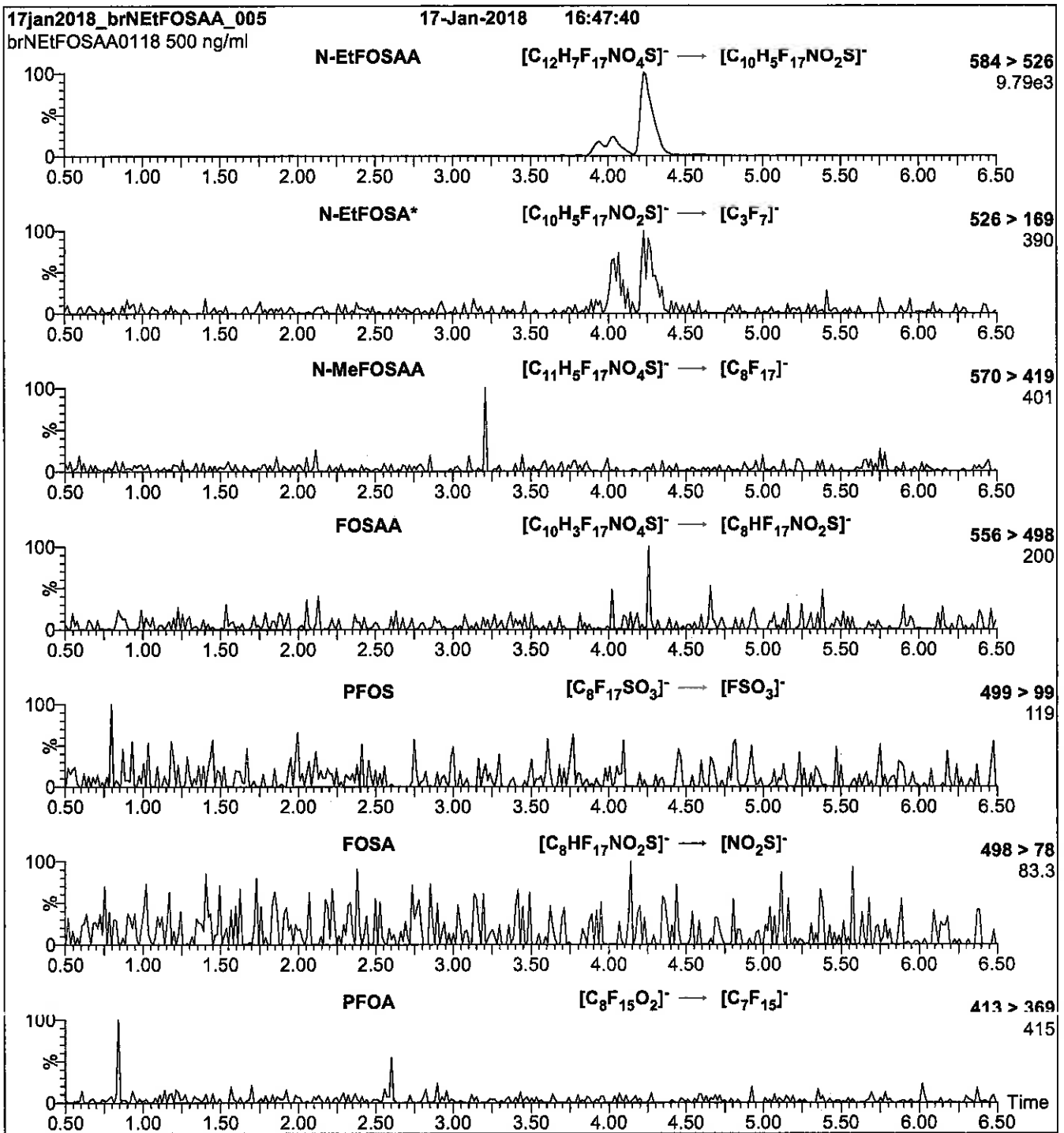
Flow: 300 μl/min

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

MS Parameters

Mobile phase: Same as Figure 2

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

Flow: 300 µl/min

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 ¹⁹F-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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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).



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 ¹⁹F-NMR)*

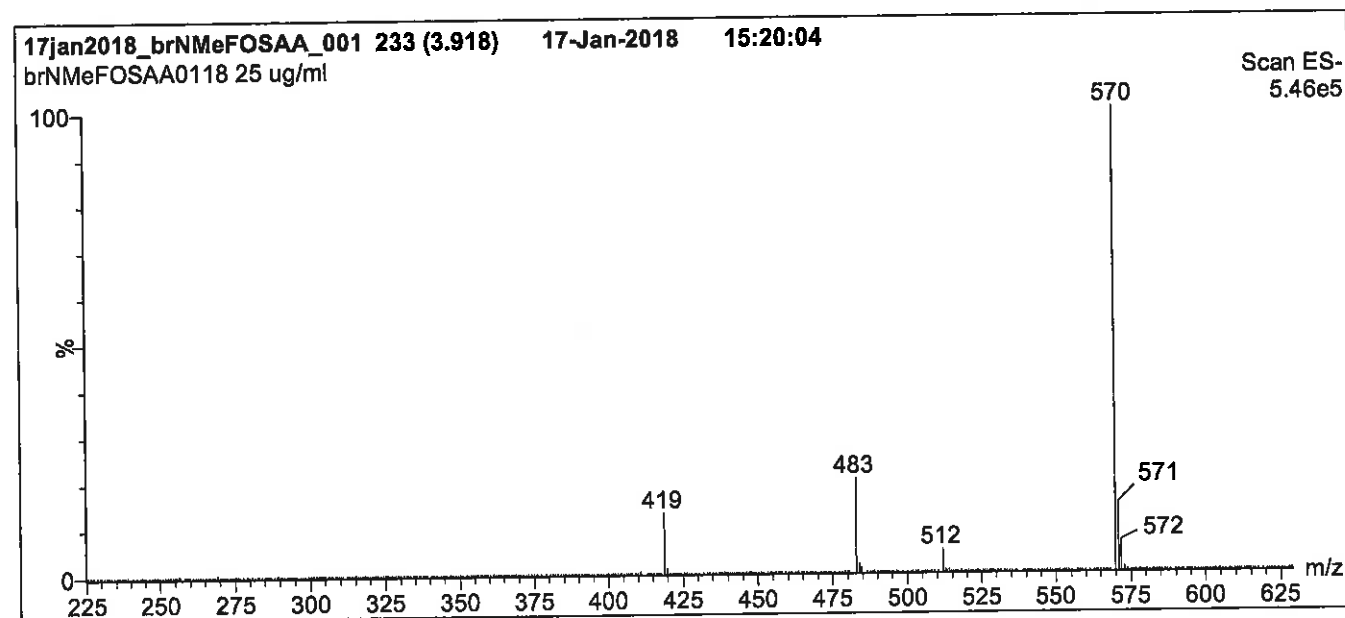
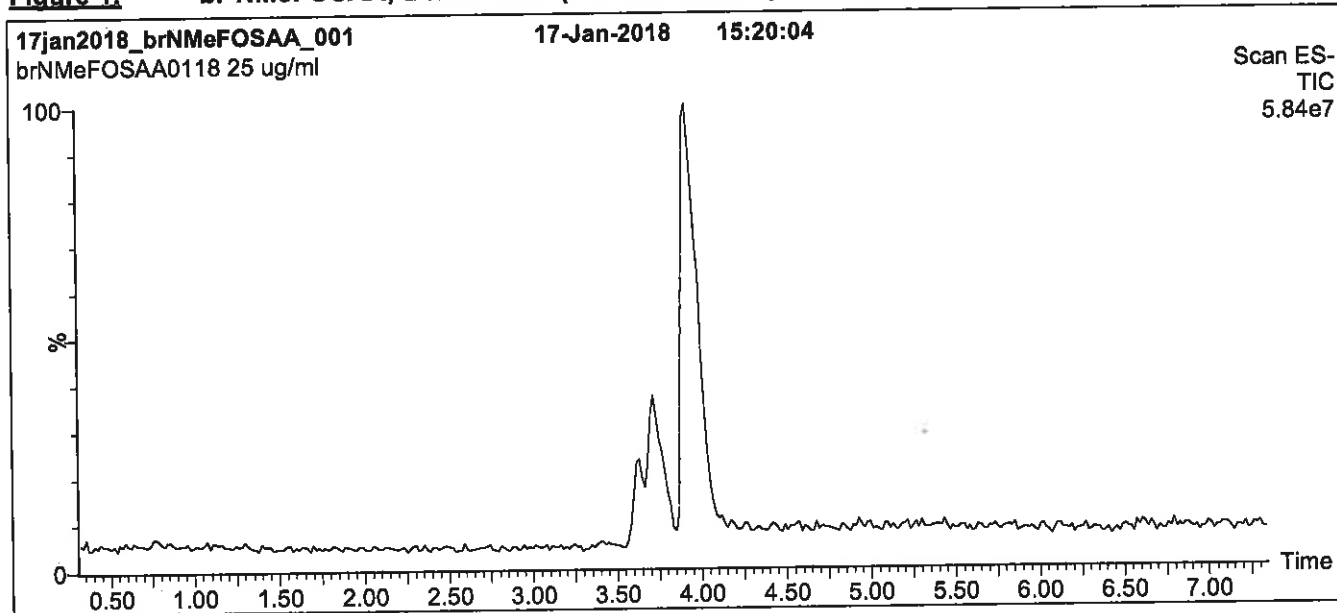
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_7\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ <div style="text-align: center; margin-left: 100px;"> CH_3 </div>	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_3\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ <div style="text-align: center; margin-left: 100px;"> CH_3 </div>	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_2\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ <div style="text-align: center; margin-left: 100px;"> CH_3 </div>	2.0
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	$\text{CF}_3\text{CF}_2\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ <div style="text-align: center; margin-left: 100px;"> CH_3 </div>	6.0
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	$\text{CF}_3\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_5\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ <div style="text-align: center; margin-left: 100px;"> CH_3 </div>	14.0
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{C}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H} \\ \\ \text{CF}_3 \end{array}$ <div style="text-align: center; margin-left: 100px;"> CH_3 </div>	0.2
7	Other Unidentified isomers		1.1

* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: 
B.G. Chittim, General Manager

Date: 03/22/2018
(mm/dd/yyyy)

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 RP₁₈,
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 55% (80:20 MeOH:ACN) / 45% H₂O
 (both with 10 mM NH₄OAc 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

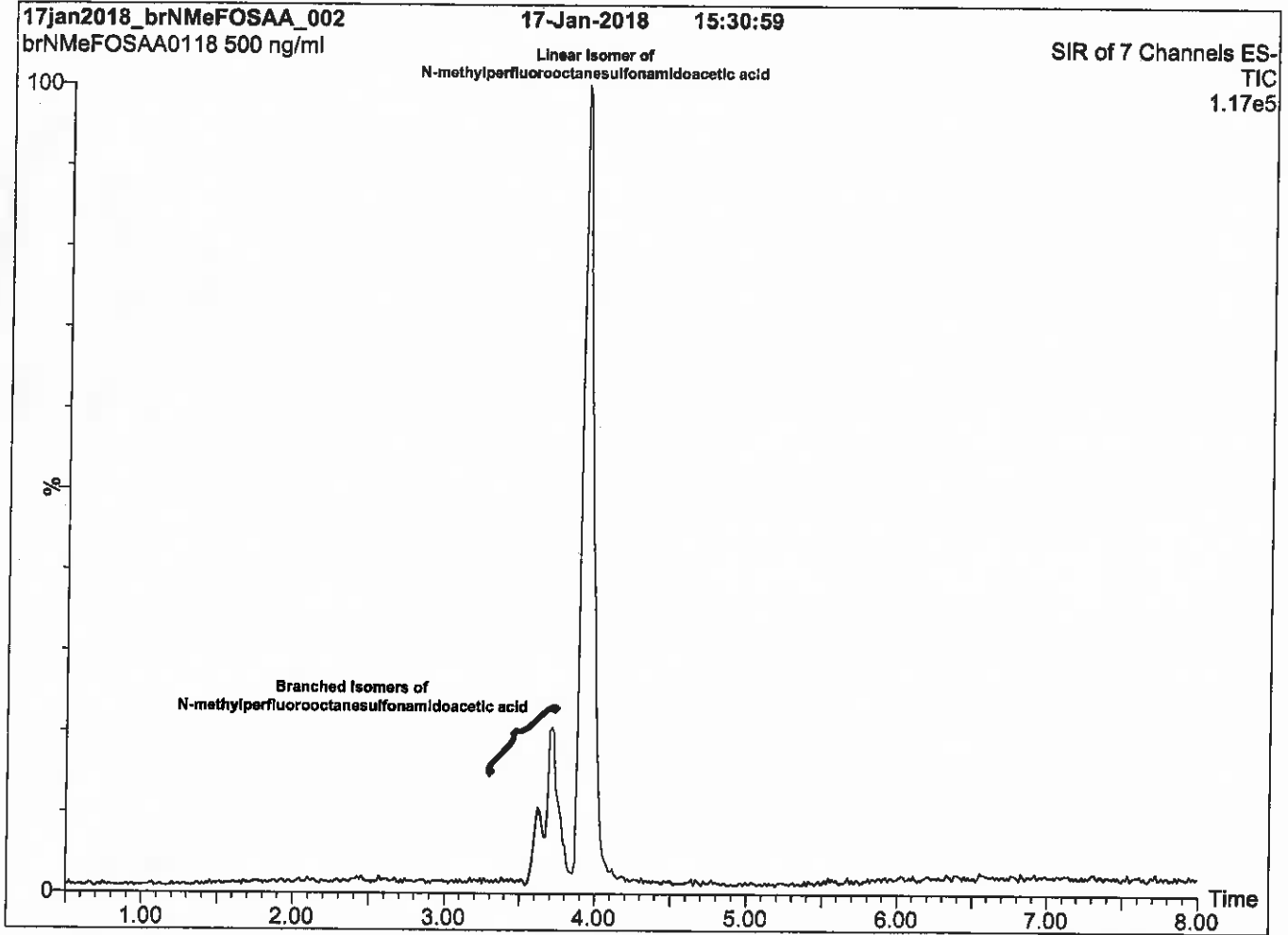
Flow: 300 μ l/min

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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

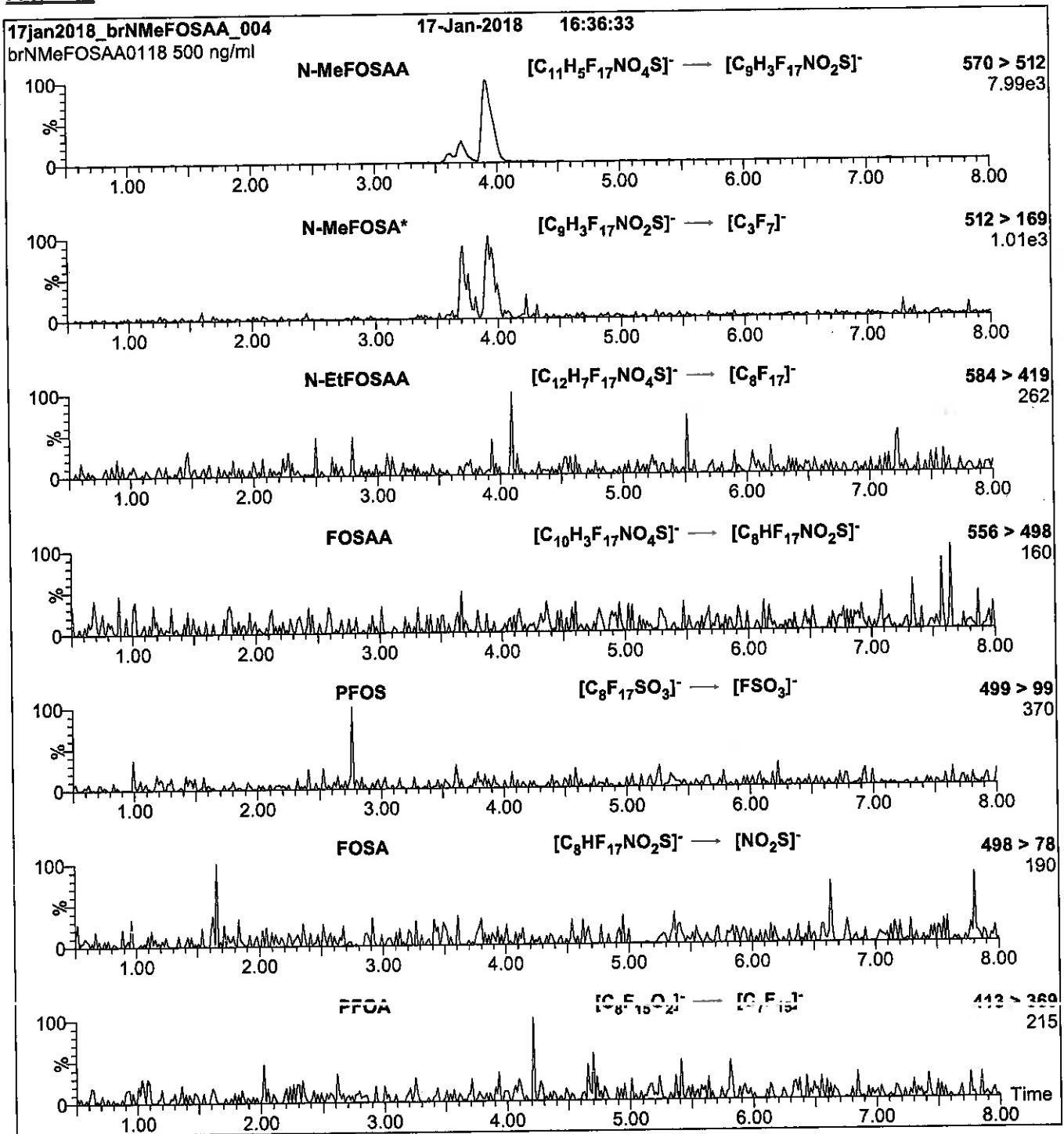
Flow: 300 μ l/min

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

MS Parameters

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

Mobile phase: Same as Figure 2

Flow: 300 μ l/min

Reagent

LCd3-NMeFOSAA_00006



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

R: 12/4/17 CCL

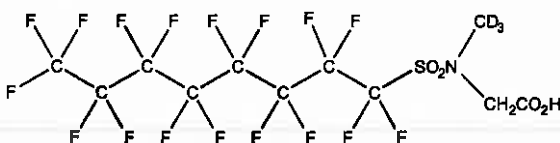


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0517
COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₁₁D₃H₃F₁₇NO₄S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/19/2017
EXPIRY DATE: (mm/dd/yyyy) 05/19/2022
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 574.23
SOLVENT(S): Methanol
 Water (<1%)
ISOTOPIC PURITY: ≥98% ²H₃


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

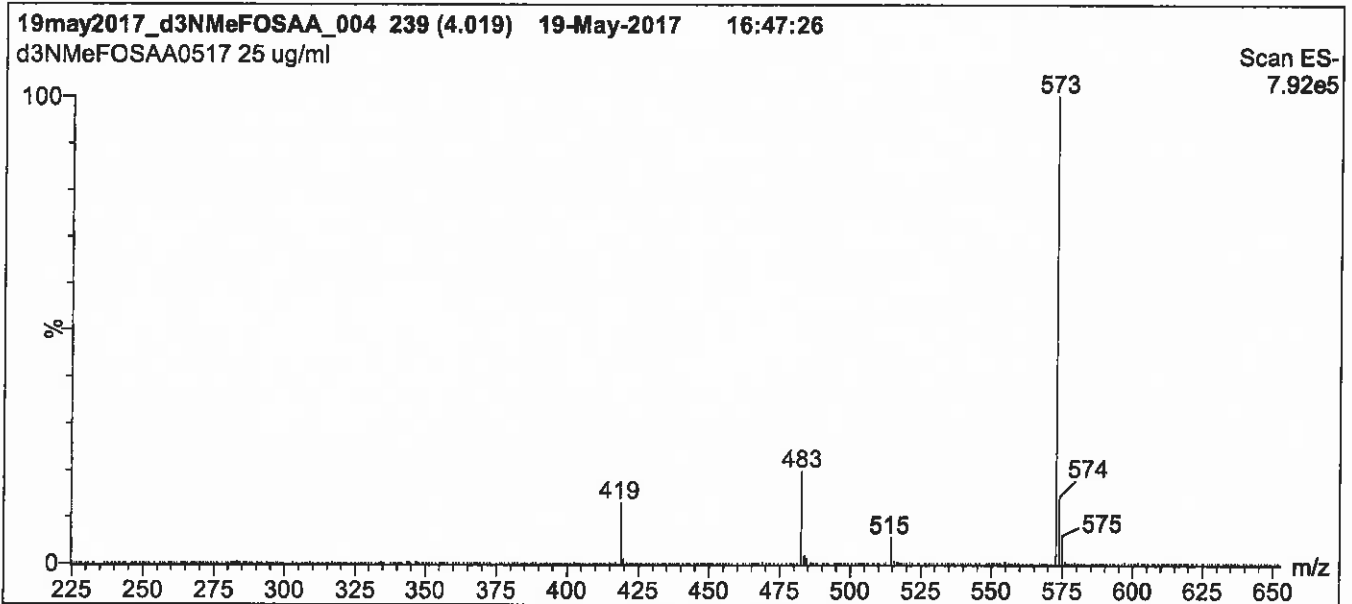
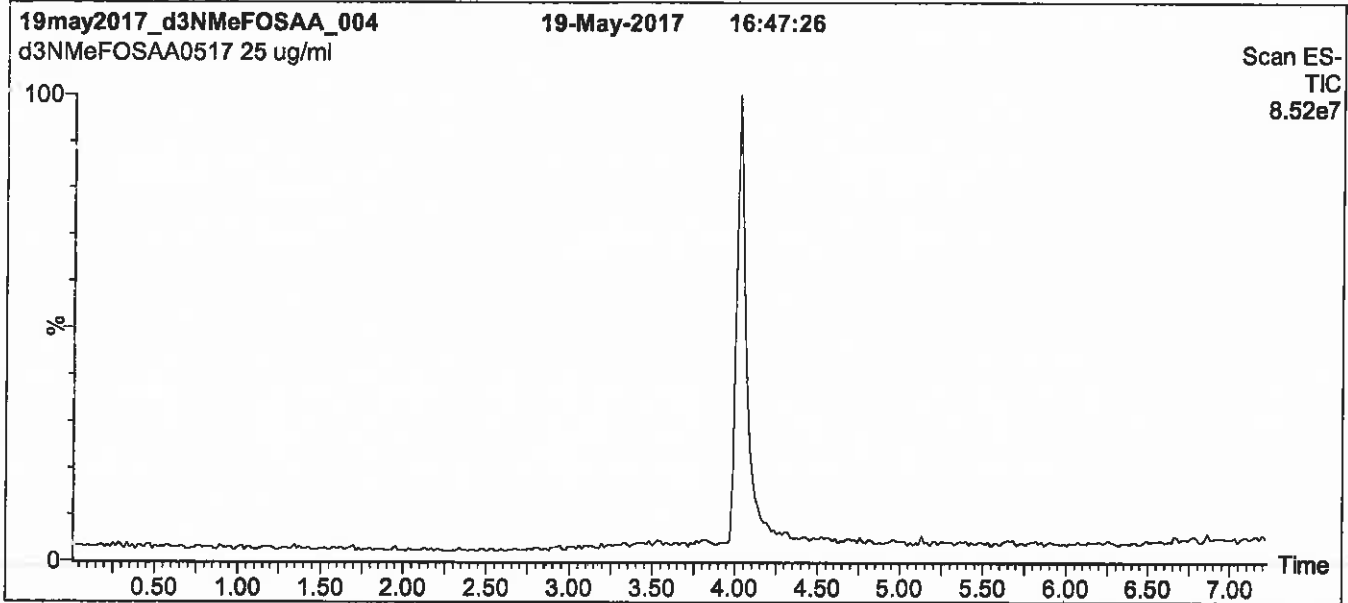
QUALITY MANAGEMENT:

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).



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 RP₁₈
1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

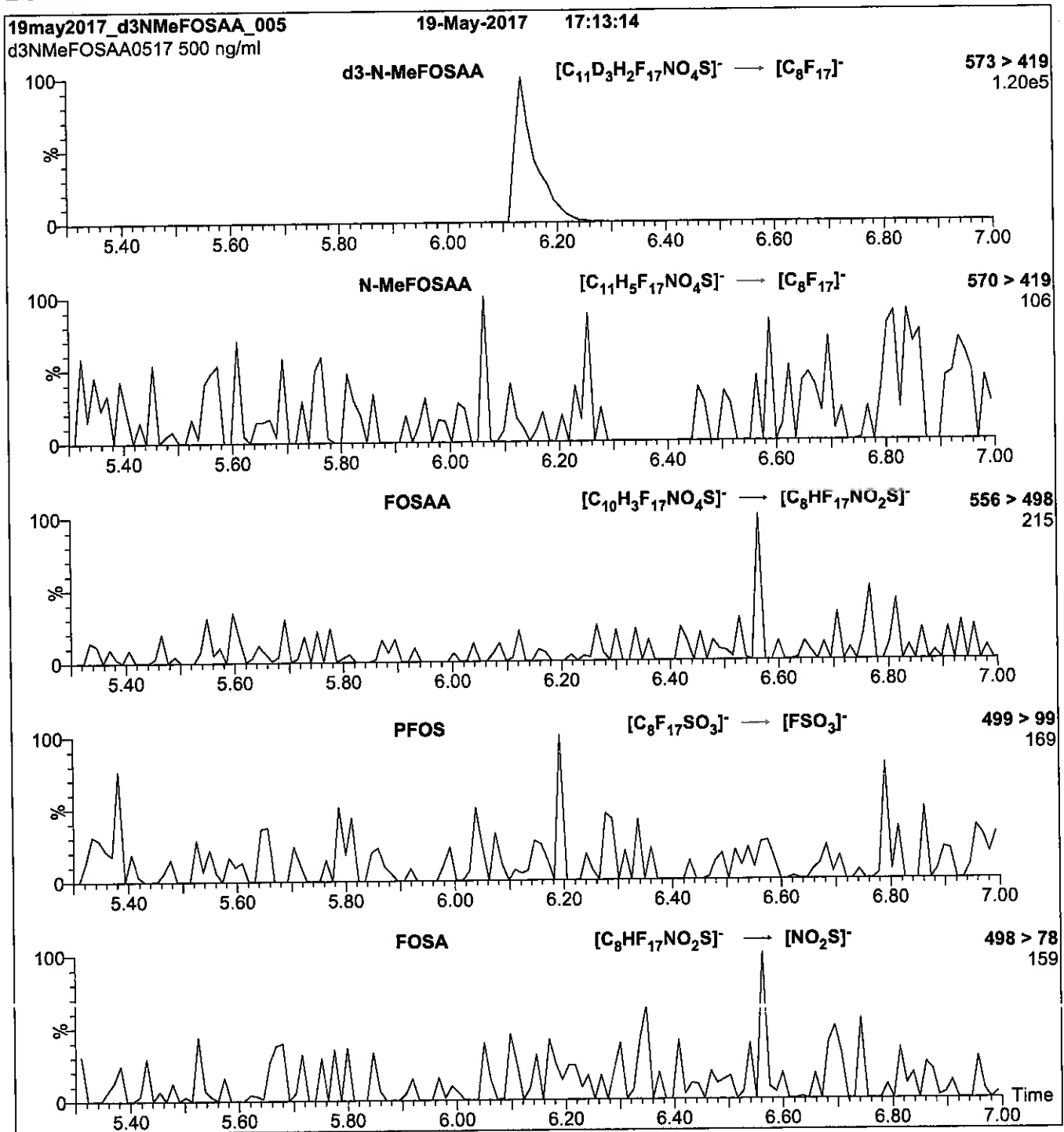
Flow: 300 μl/min

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 μ l (500 ng/ml d3-N-MeFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

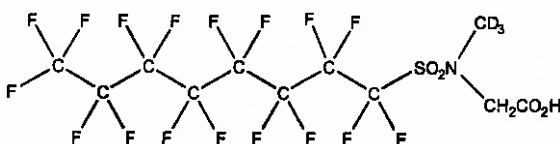
Reagent

LCd3-NMeFOSAA_00008

**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: C₁₁D₃H₃F₁₇NO₄S
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 574.23
SOLVENT(S): Methanol
 Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥98% ²H₃

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:

B.G. Chittim, General Manager

Date: 11/16/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

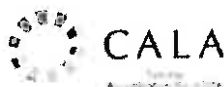
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

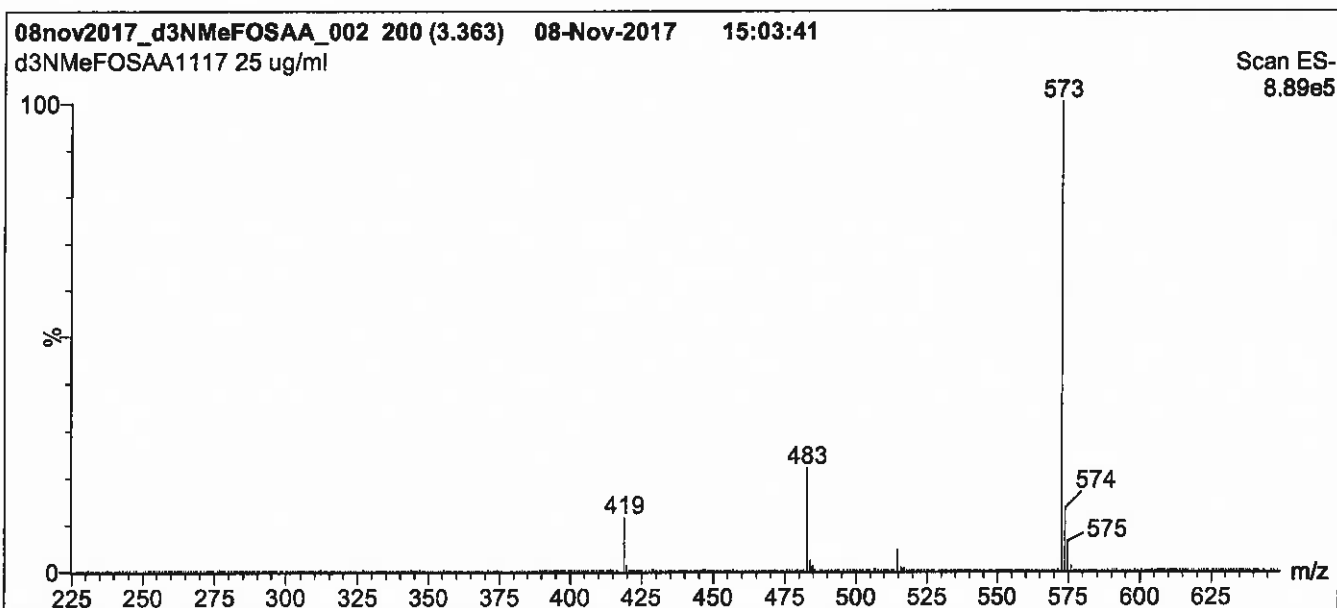
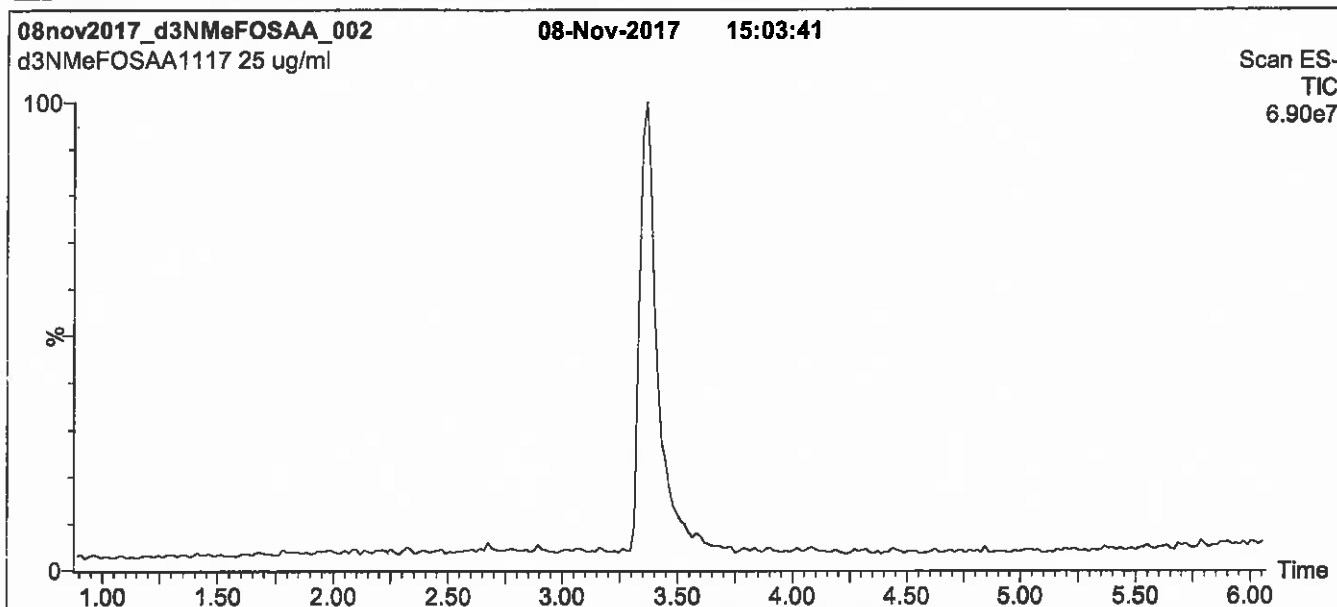
QUALITY MANAGEMENT:

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).



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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

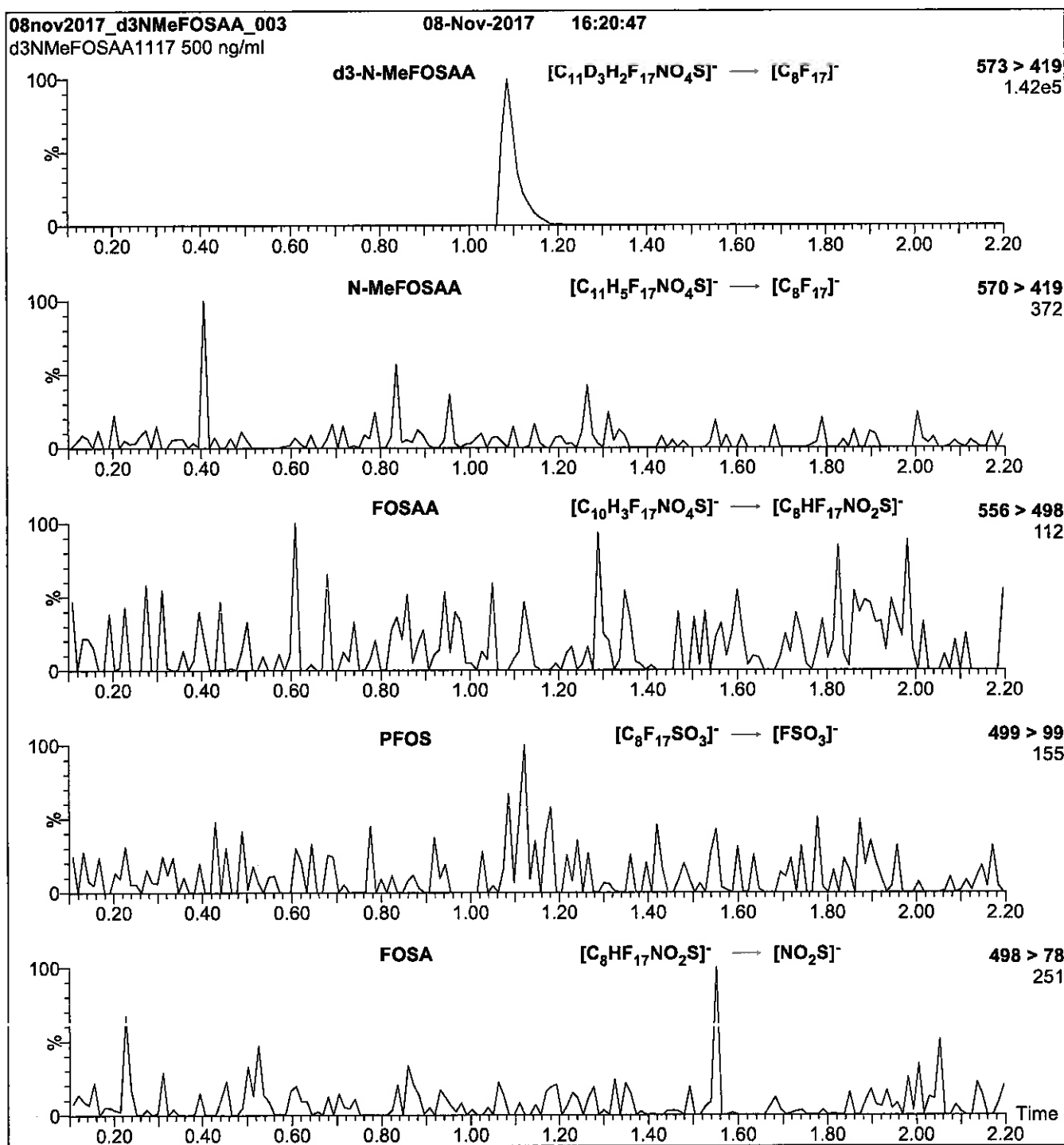
Flow: 300 μ l/min

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 μ l (500 ng/ml) d3-N-MeFOSAA

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd5-NEtFOSAA_00006

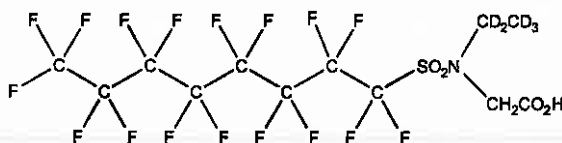


WELLINGTON LABORATORIES

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: C₁₂D₅H₃F₁₇NO₄S
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 590.26
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥98% ²H₅

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: 
B.G. Chittim, General Manager

Date: 11/16/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

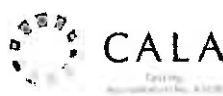
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

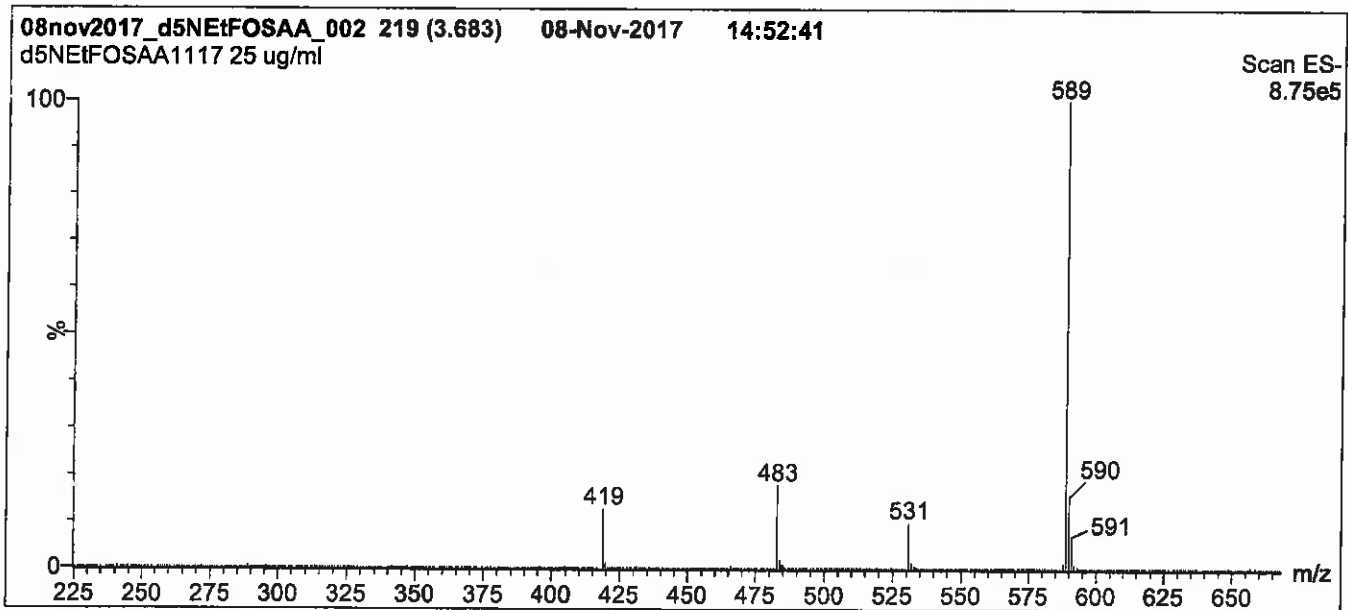
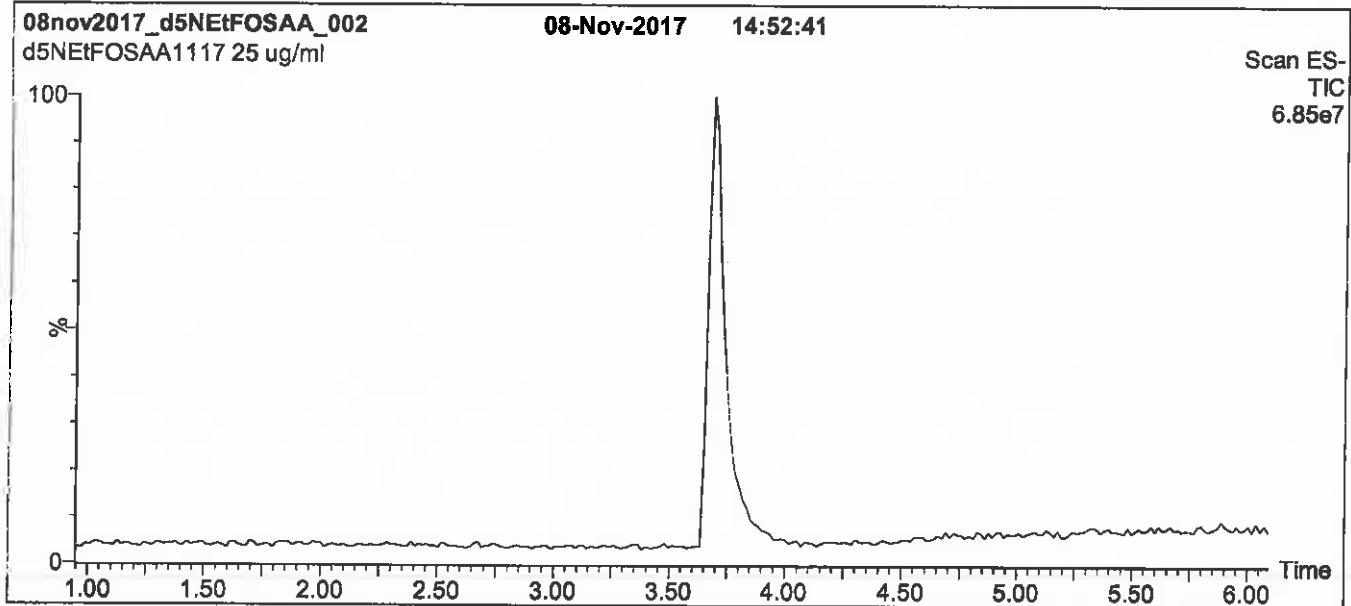
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

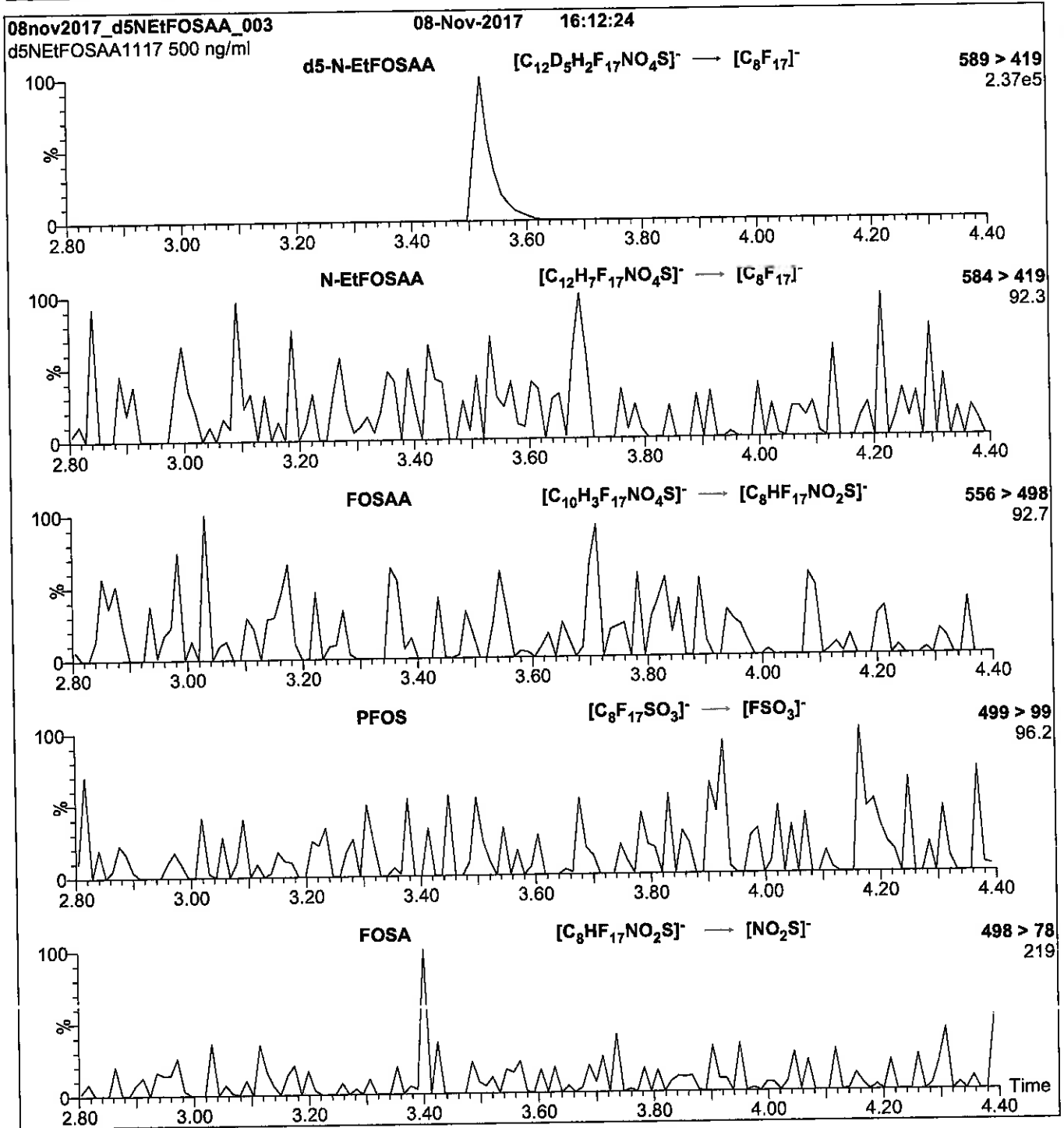
Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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 μ l (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 20

Reagent

LCd5-NEtFOSAA_00008

1263180
ID: LCd5-NEtFOSAA_00008
Exp: 11/08/22 Prod: C9W Oper: 05/08/18
d5-N-EtFOSAA

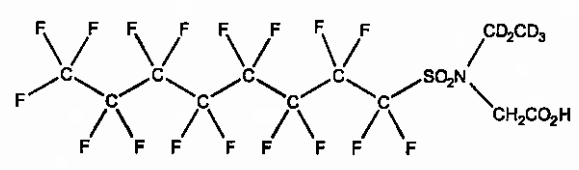


WELLINGTON LABORATORIES

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: C₁₂D₆H₃F₁₇NO₄S
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 590.26
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/08/2017
EXPIRY DATE: (mm/dd/yyyy) 11/08/2022
RECOMMENDED STORAGE: Refrigerate ampoule

ISOTOPIC PURITY: ≥98% ²H₅

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim, General Manager

Date: 11/16/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

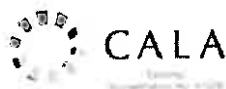
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

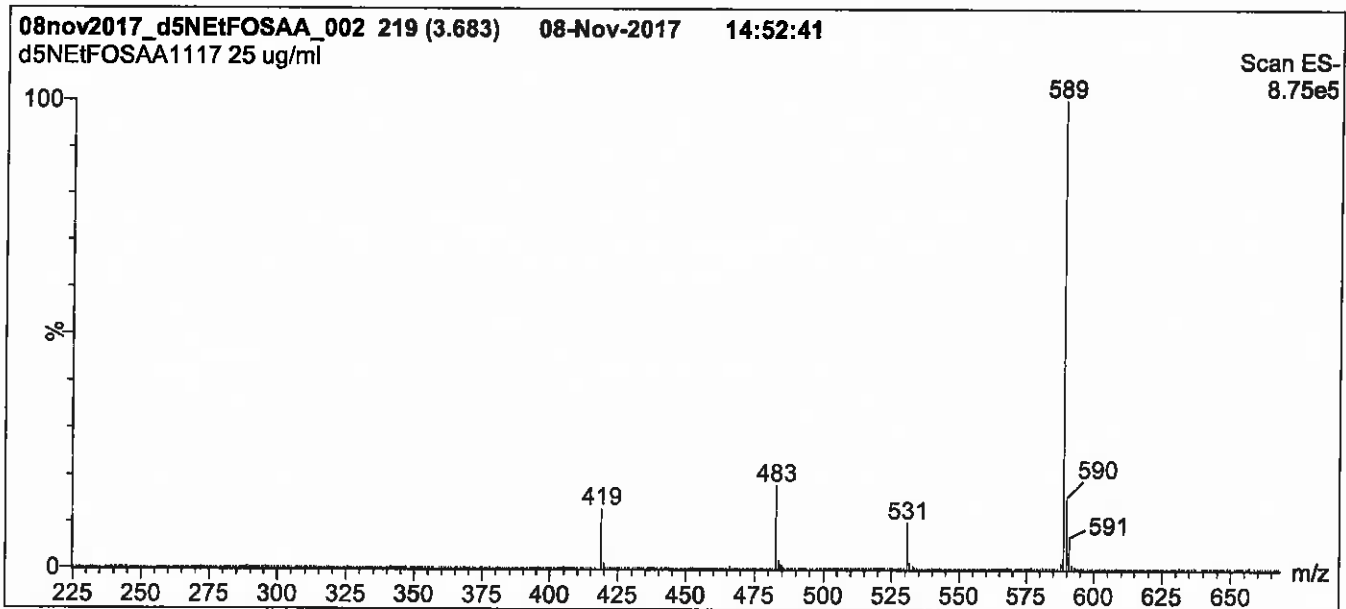
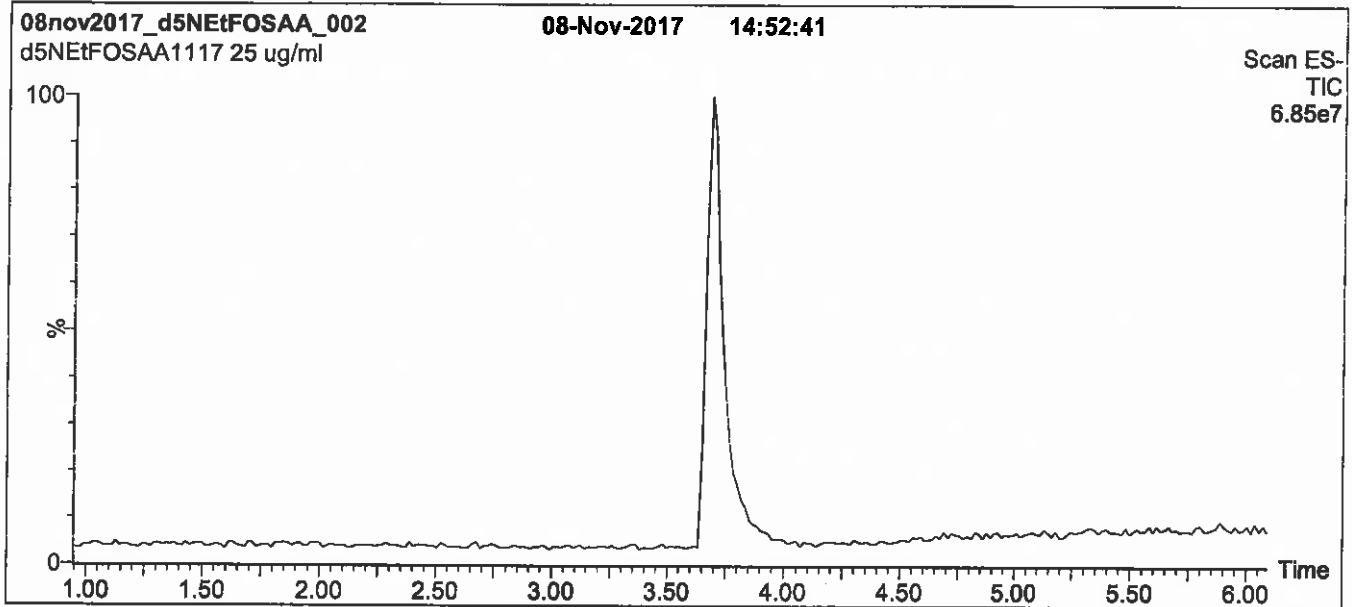
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
 1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 60% (80:20 MeOH:ACN) / 40% H₂O
 (both with 10 mM NH₄OAc 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

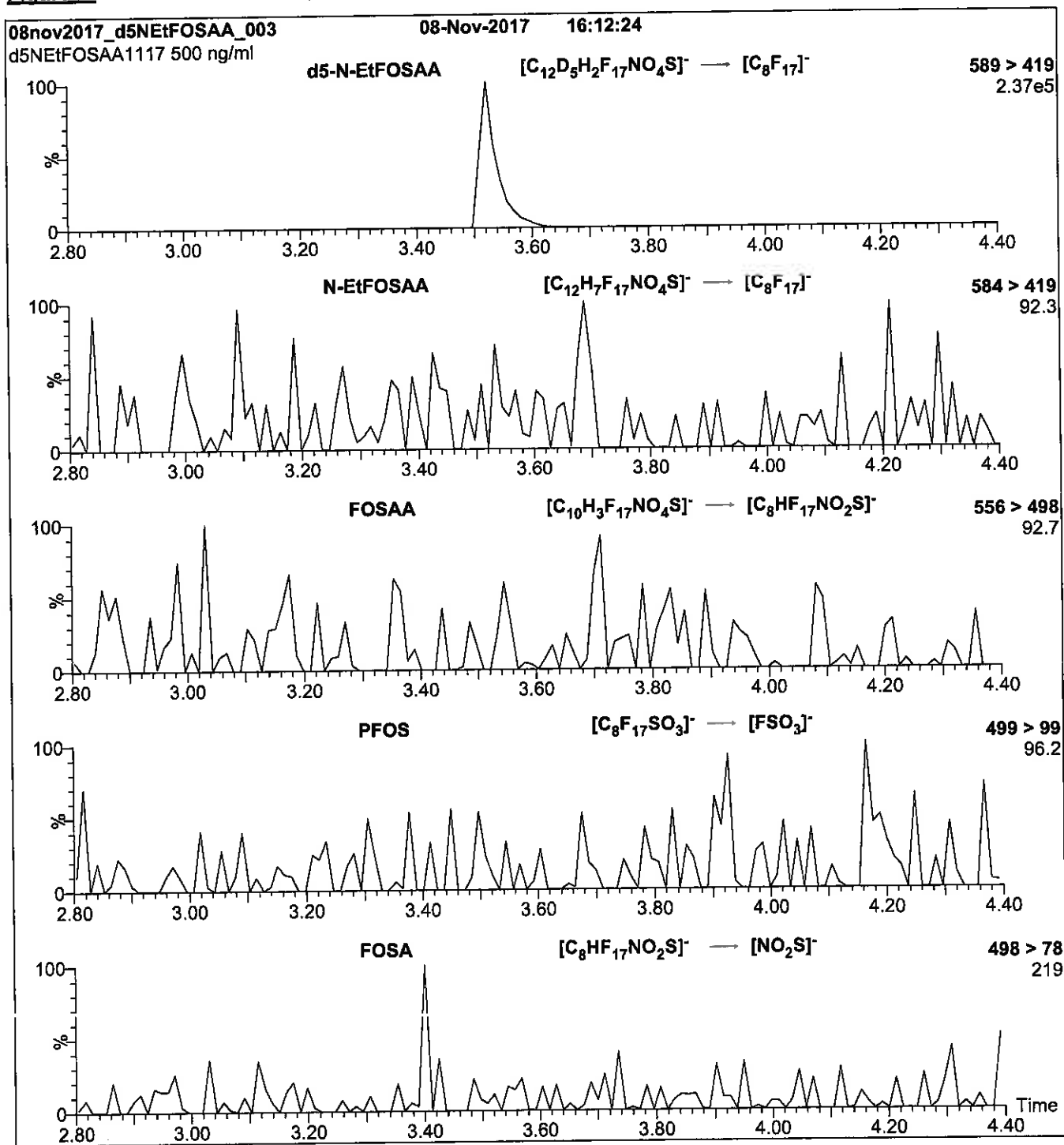
Flow: 300 μl/min

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 μ l (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
 Collision Energy (eV) = 20

Reagent

LCDONA_00002

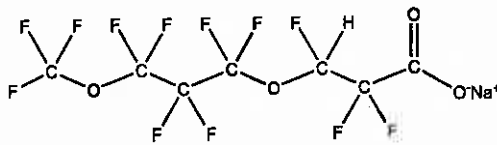


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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



MOLECULAR FORMULA: $C_7HF_{12}O_4Na$ **MOLECULAR WEIGHT:** 400.05
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ (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: 
 B.G. Chittim, General Manager **Date:** 03/27/2018
 (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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

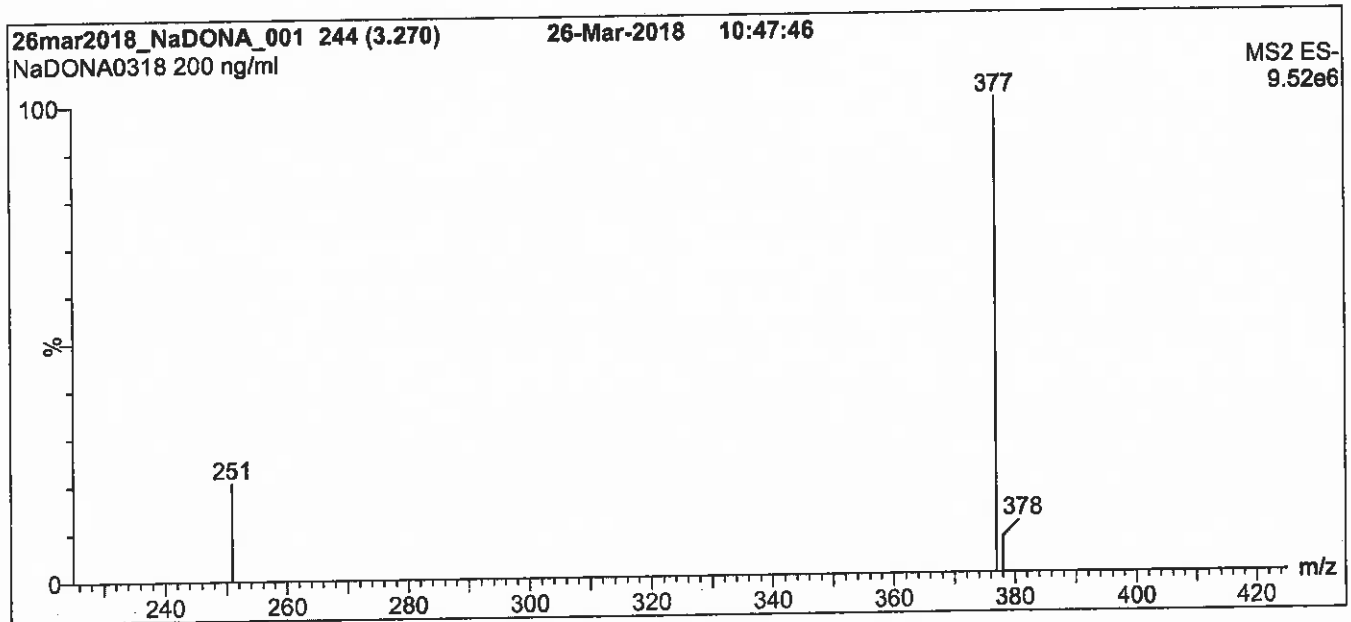
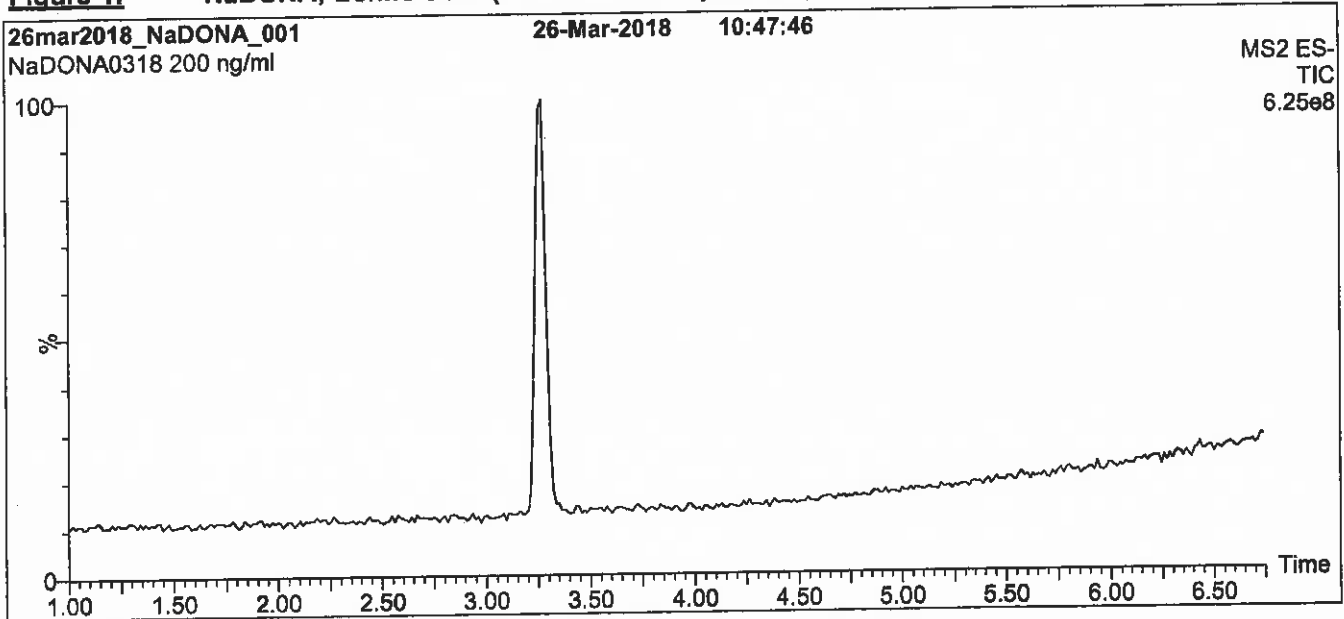
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

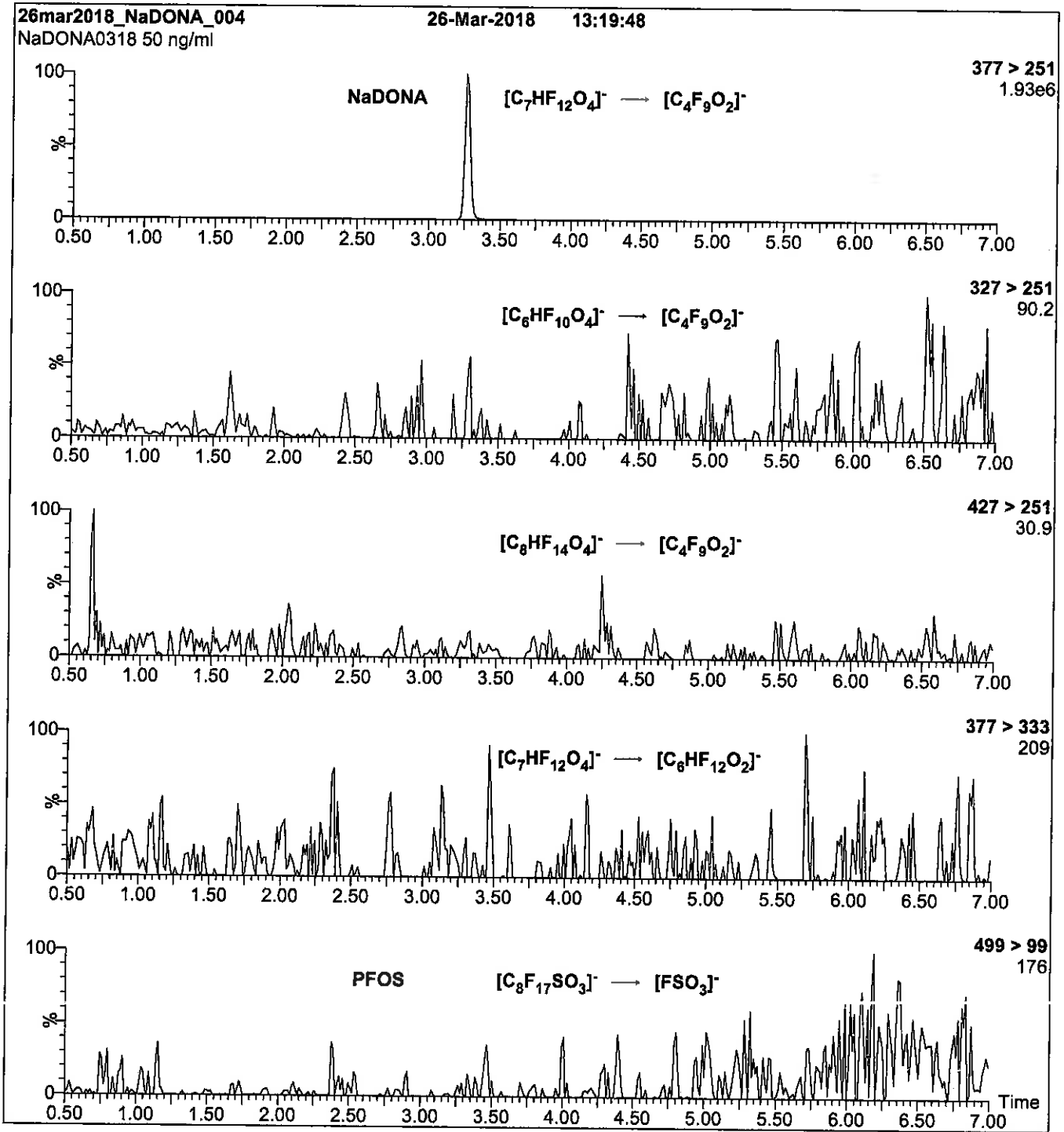
Flow: 300 μ l/min

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

17 4/18/18 Seal



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

HFPO-DA

LOT NUMBER:

HFPODA0318

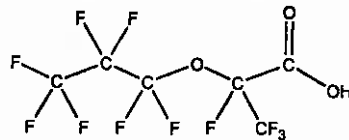
COMPOUND:

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

STRUCTURE:

CAS #:

13252-13-6



MOLECULAR FORMULA:

C₈H₁₁O₃

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:


B.G. Chittim, General Manager

Date: 03/28/2018

(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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

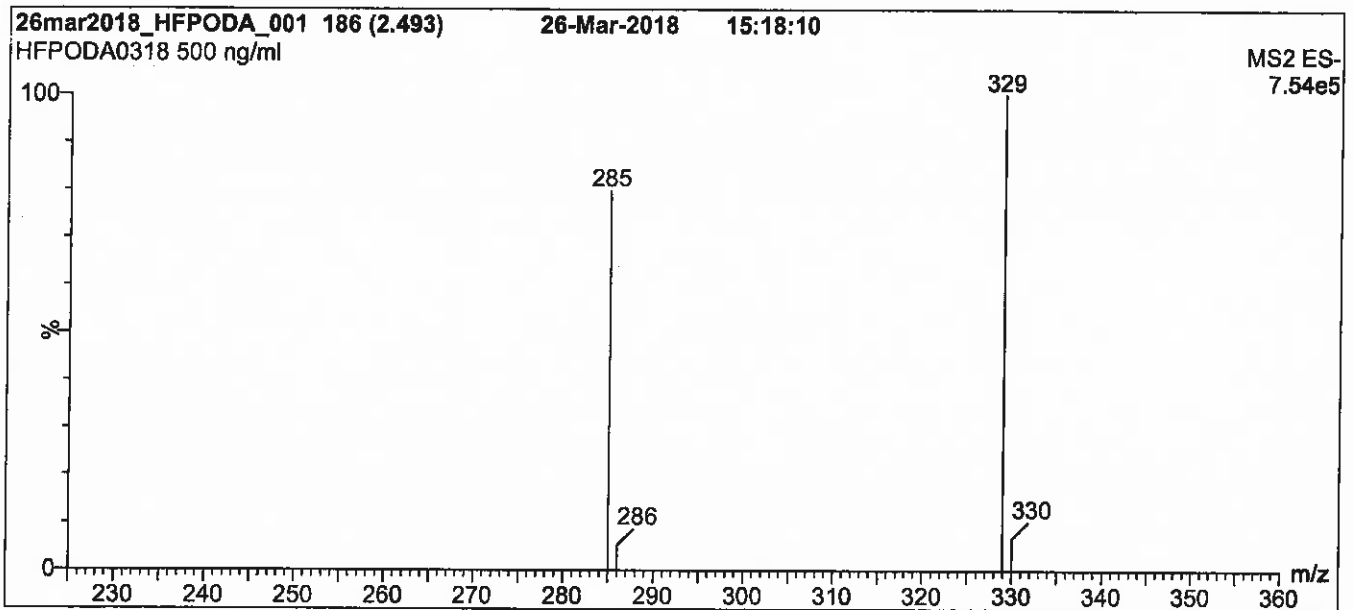
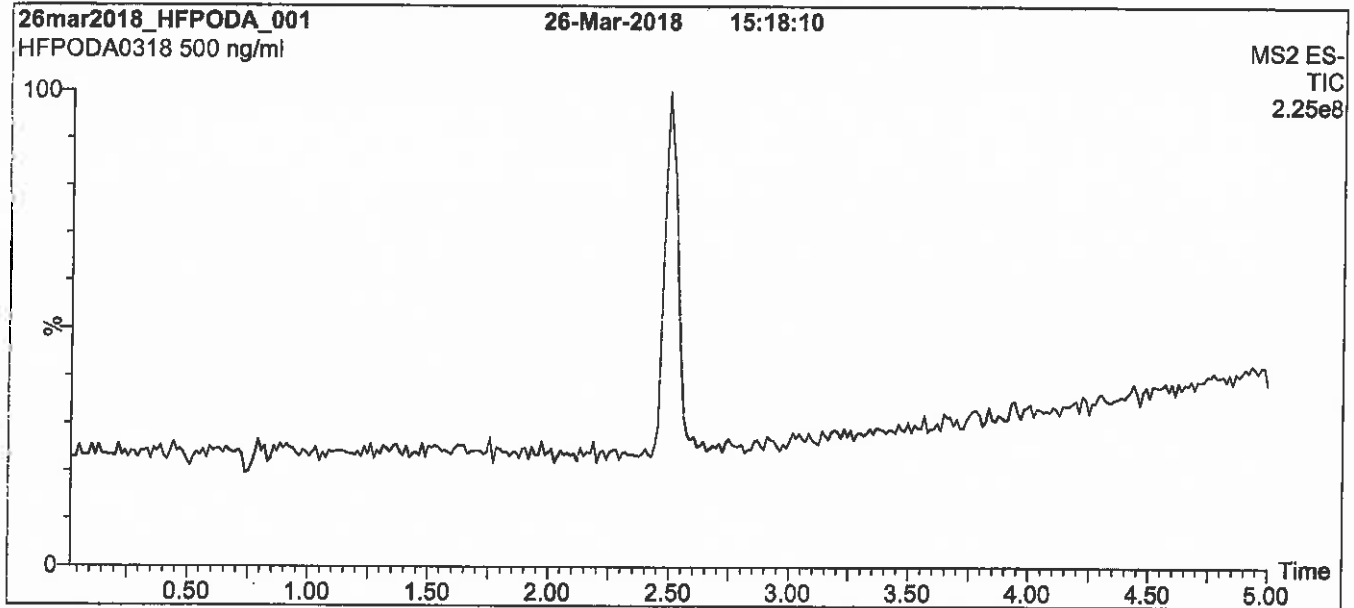
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

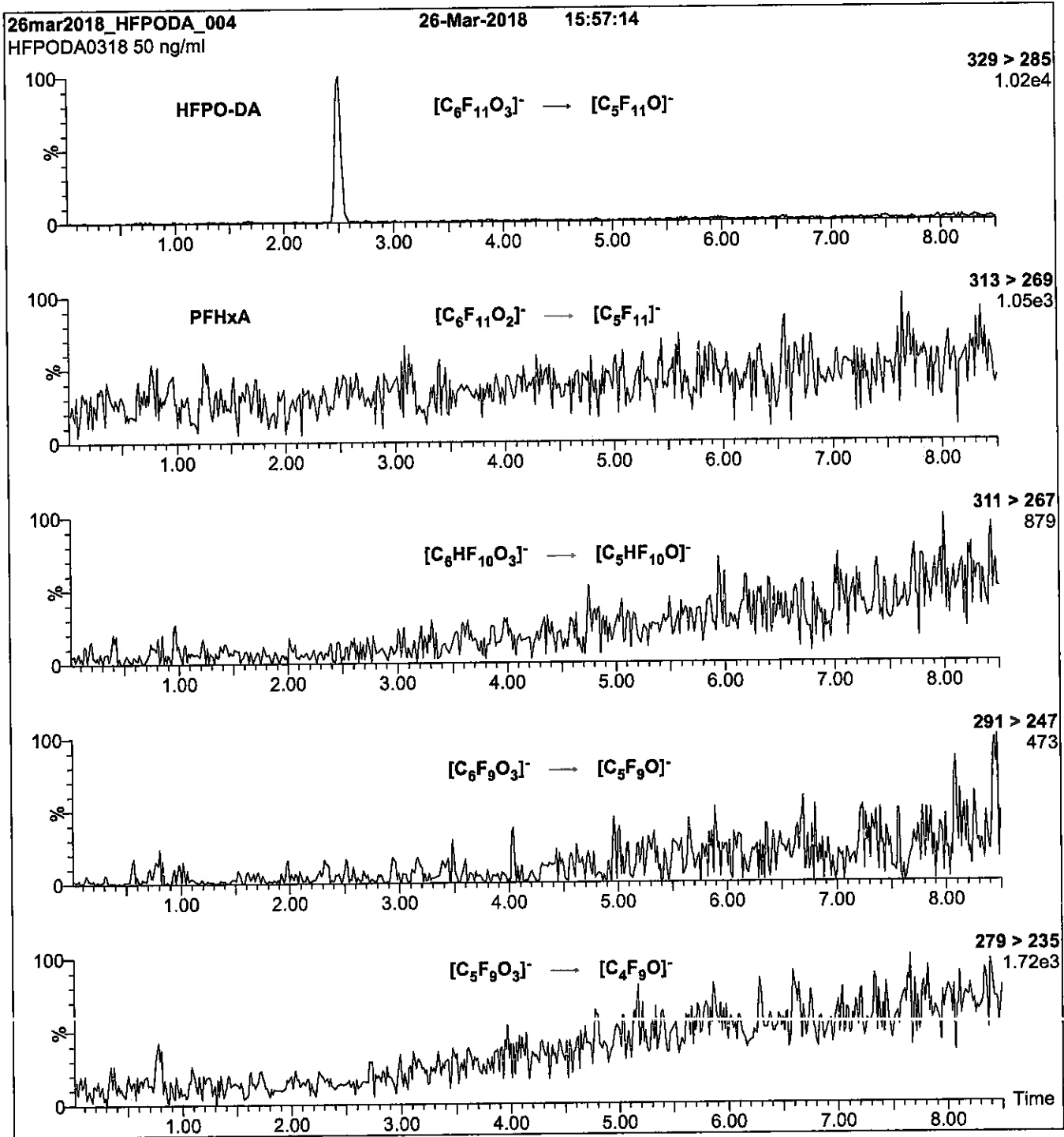
Flow: 300 μ l/min

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 μ l/min

MS Parameters

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

Reagent

LCM2-6:FTS_00006

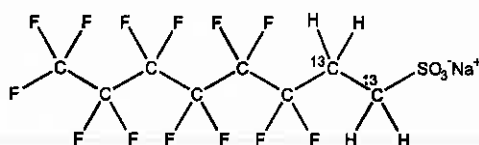


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2F2S **LOT NUMBER:** M262F2S0217
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆H₄F₁₃SO₃Na **MOLECULAR WEIGHT:** 452.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.5 ± 2.4 µg/ml (M2-6:2F2S anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 02/17/2017 (1,2-¹³C₂)
EXPIRY DATE: (mm/dd/yyyy) 02/17/2022
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2F2S contains 4.22% of ³⁴S (due to natural isotopic abundance) therefore both native 6:2F2S and M2-6:2F2S 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 M2-6:2F2S during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/24/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

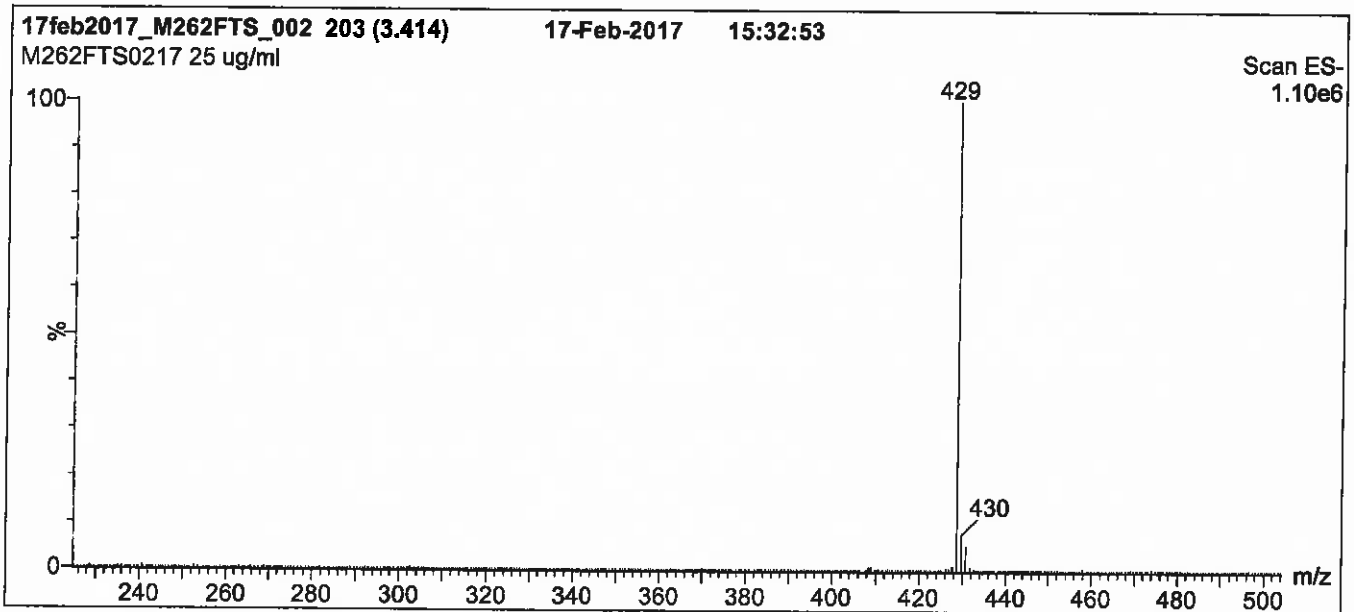
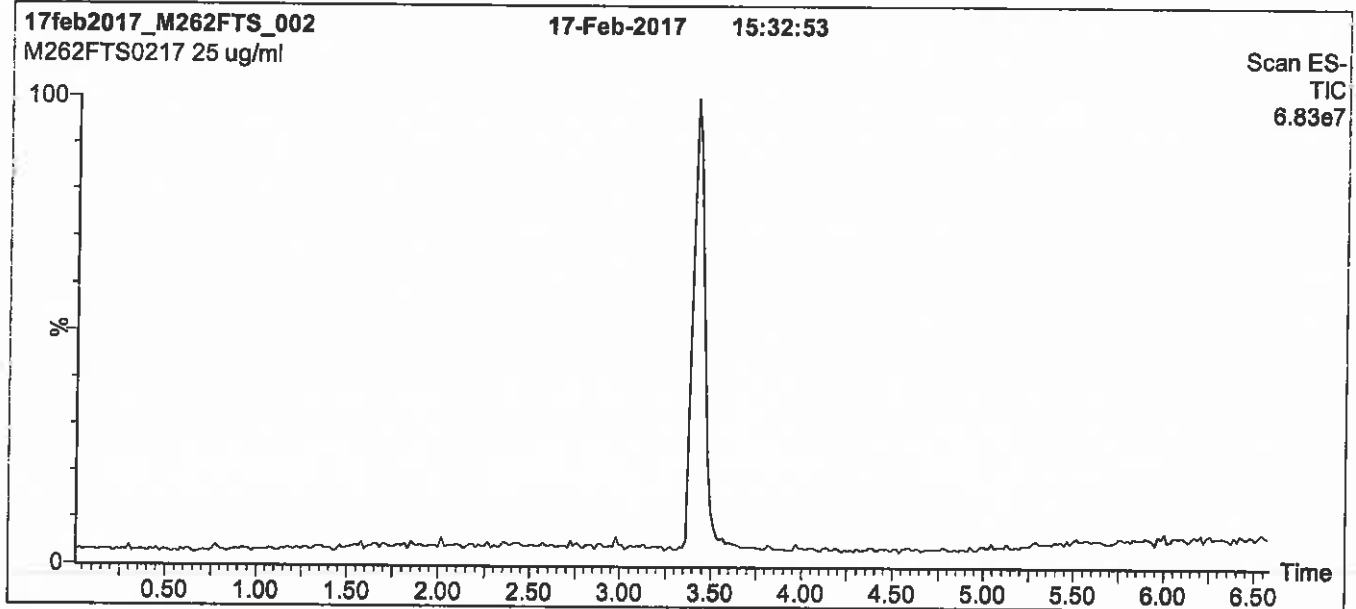
QUALITY MANAGEMENT:

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



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

Figure 1: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

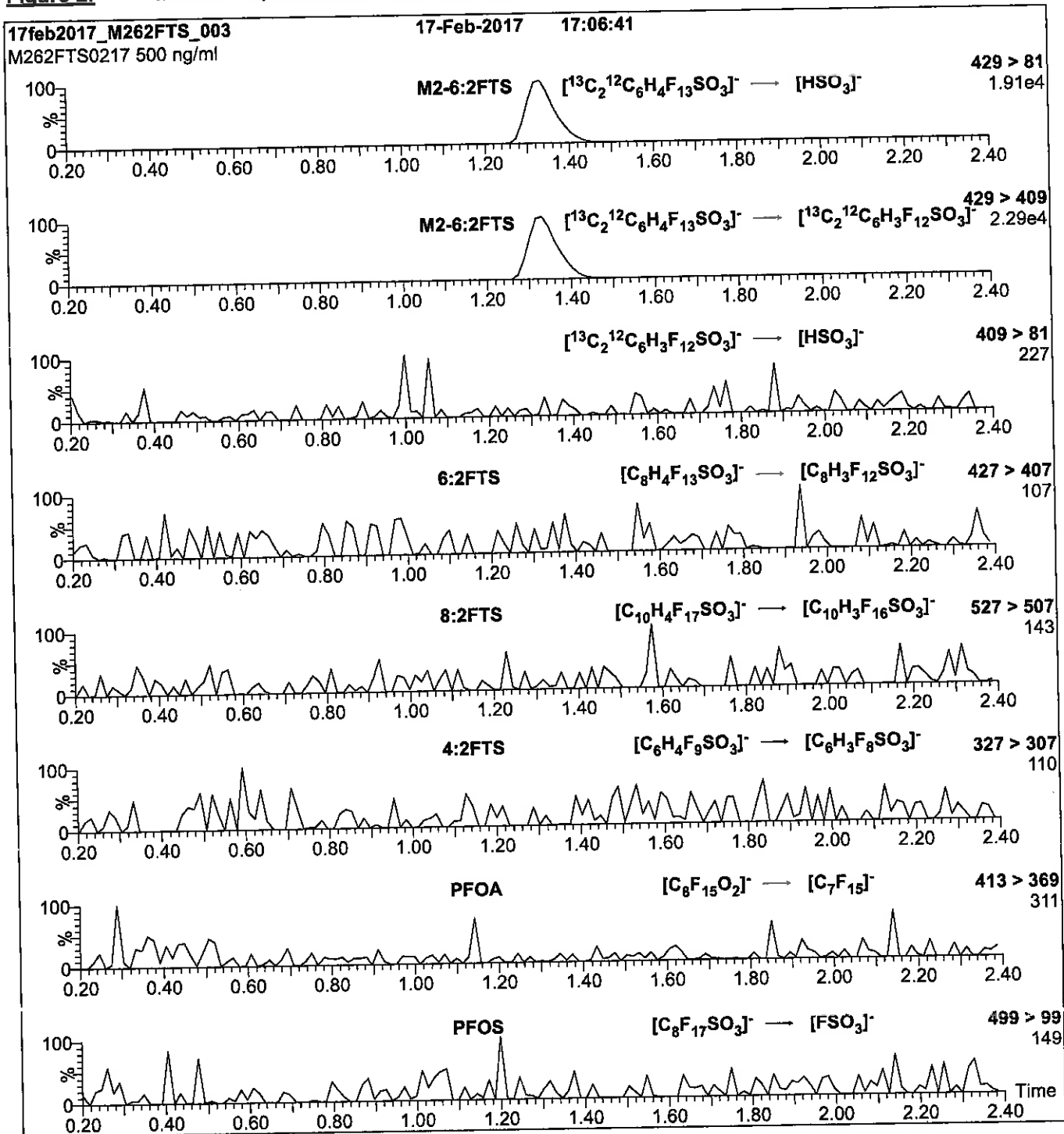
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to Initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

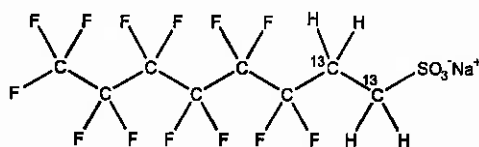
Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCM2-6:FTS_00008

R: 5/30/18 *can*1263197
ID: LCM2-6:FTS_00008
Exp:02/16/23 Ppt:CBW Opn:05/02/18
M2-6:2FTS**WELLINGTON
LABORATORIES****CERTIFICATE OF ANALYSIS
DOCUMENTATION****PRODUCT CODE:** M2-6:2FTS **LOT NUMBER:** M262FTS0218
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]octane sulfonate**STRUCTURE:** **CAS #:** Not available

MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₆ H ₄ F ₁₃ SO ₃ Na	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)	ISOTOPIC PURITY:	≥99% ¹³ C
CHEMICAL PURITY:	>98%		(1,2- 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 ³⁴S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE
Certified By: 
B.G. Chittim, General Manager

Date: 03/07/2018
(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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

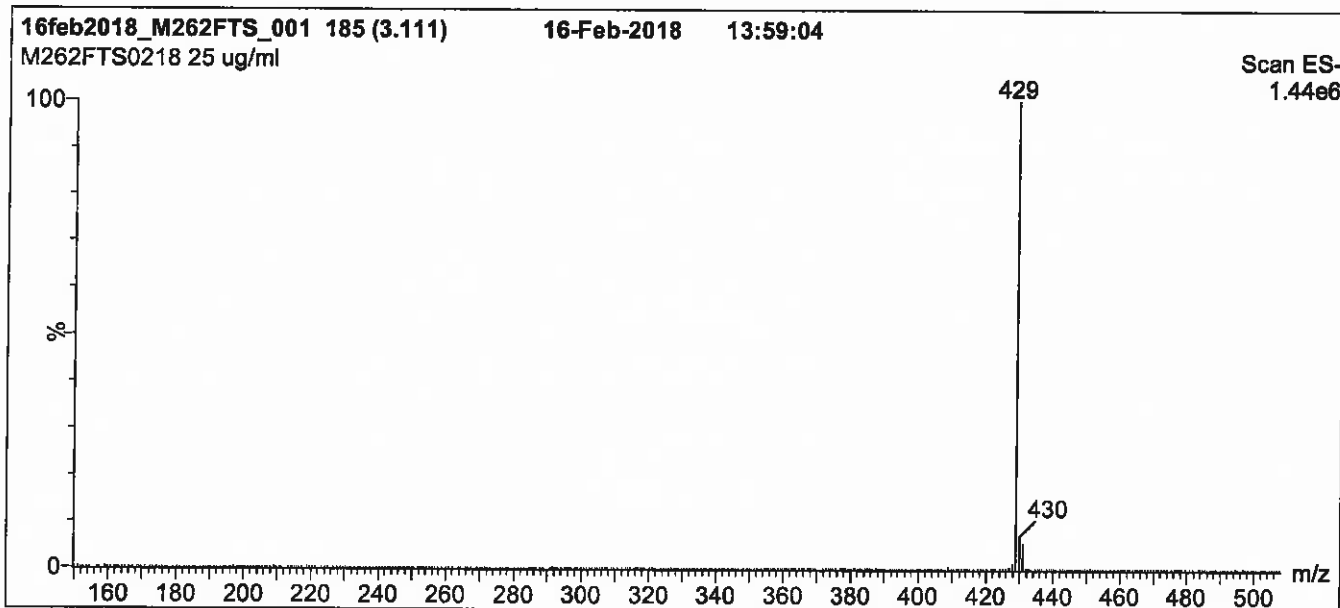
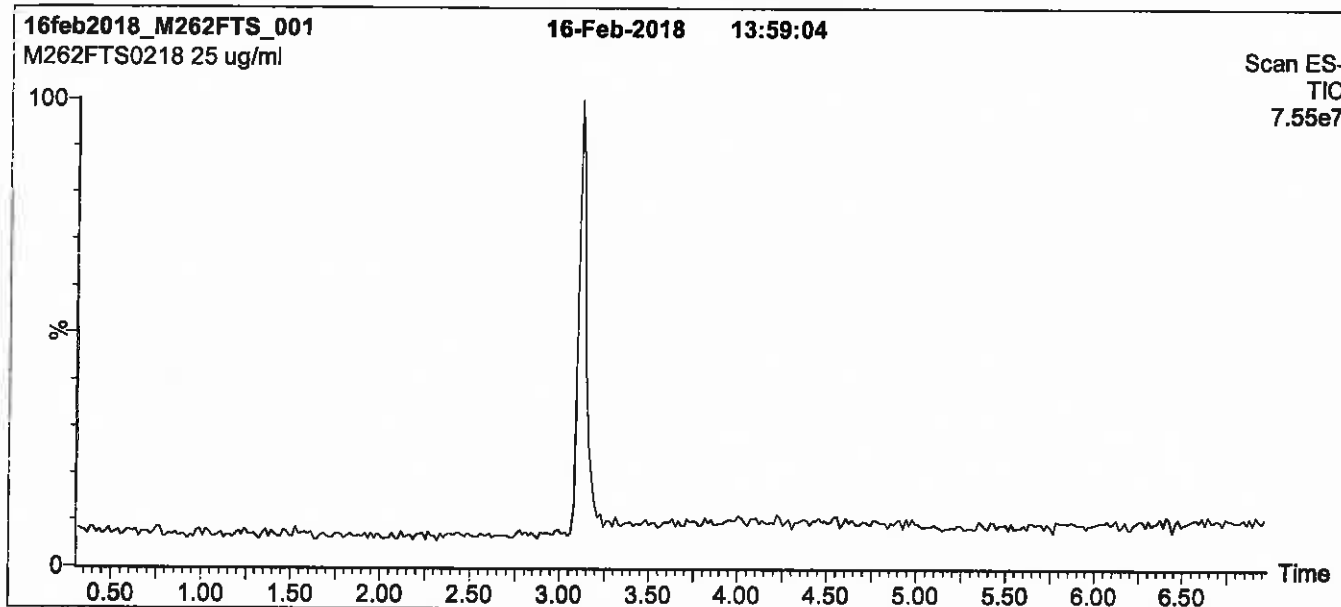
QUALITY MANAGEMENT:

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).



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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

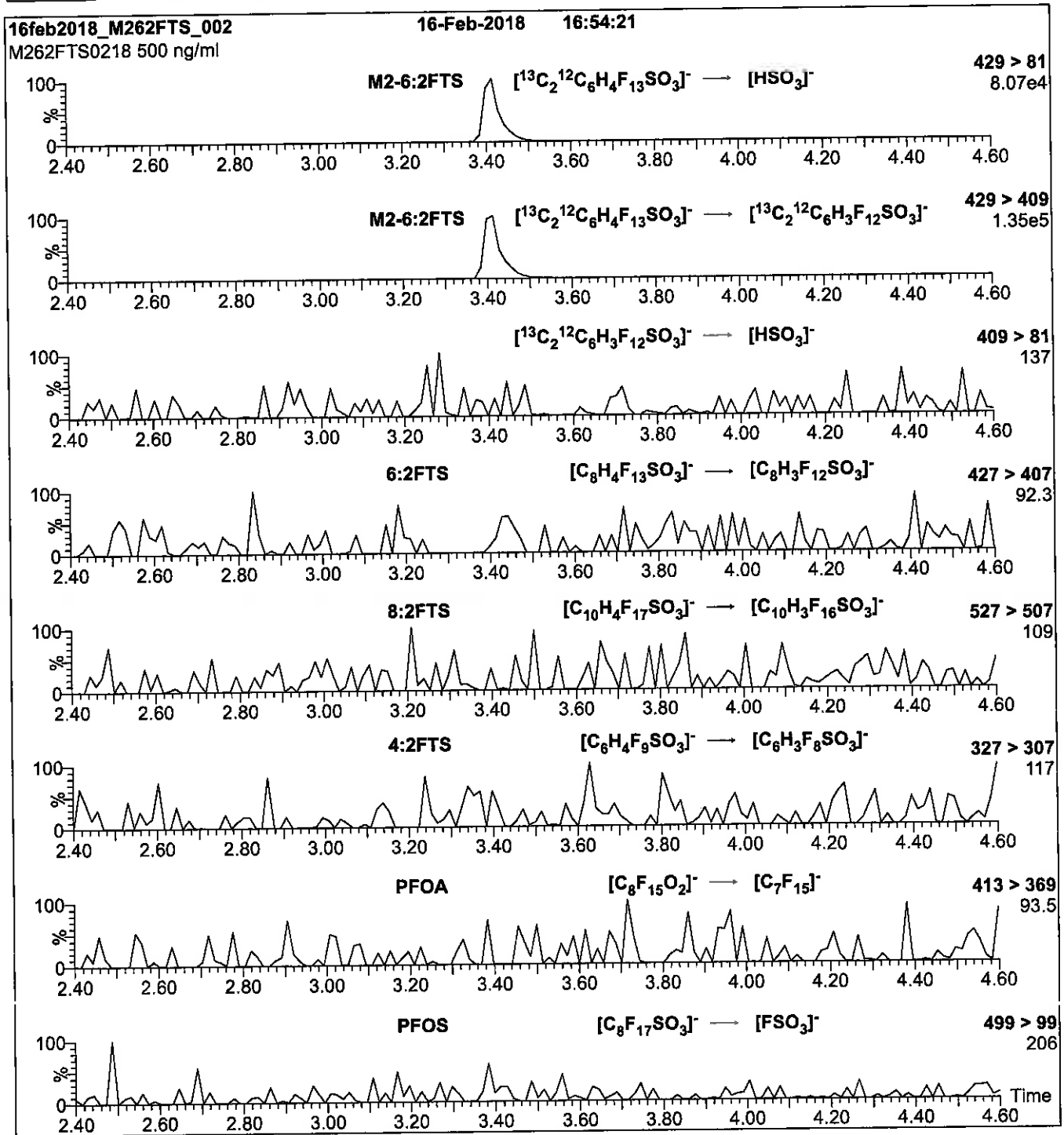
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCM2-8 : 2FTS_00008

V: 12/4/17 CCL

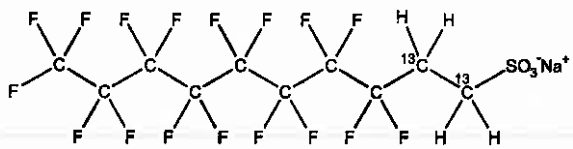


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0717
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈H₄F₁₇SO₃Na **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% ¹³C
LAST TESTED: (mm/dd/yyyy) 07/05/2017 (1,2-¹³C₂)
EXPIRY DATE: (mm/dd/yyyy) 07/05/2022
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

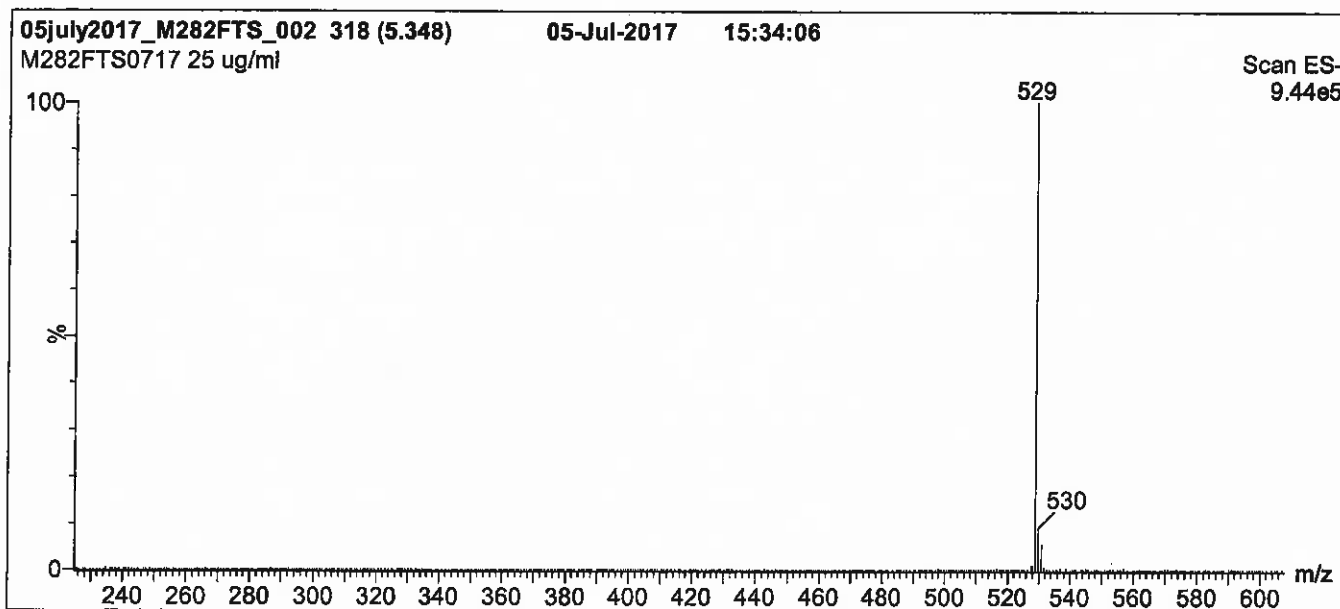
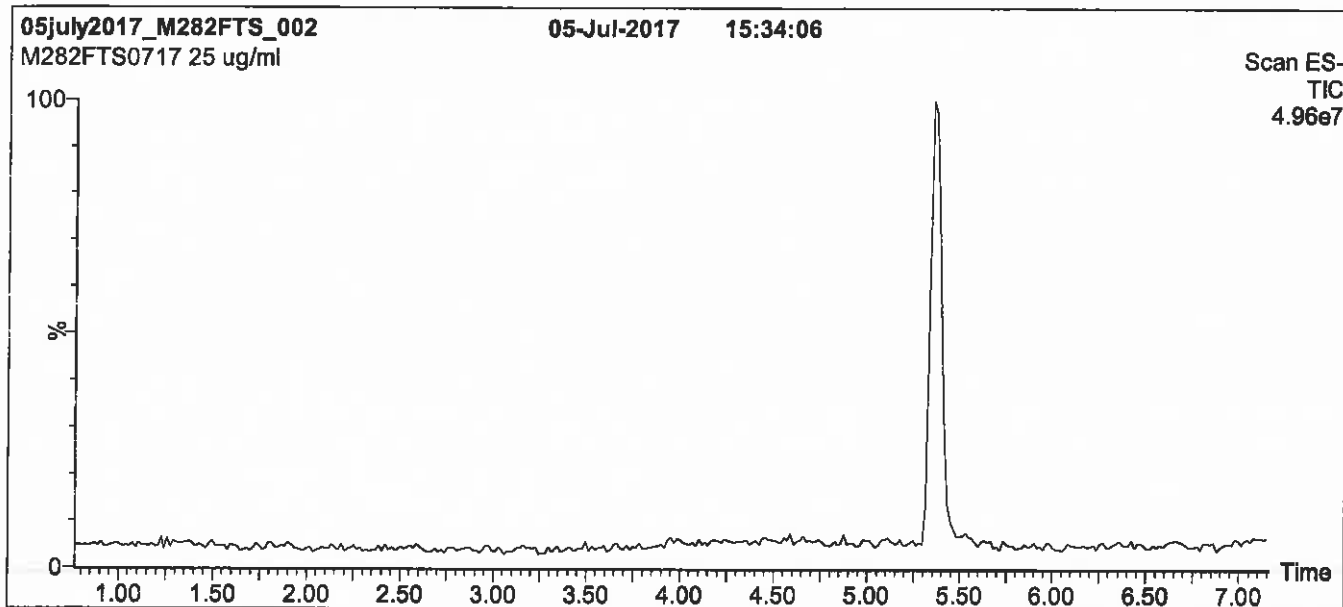
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

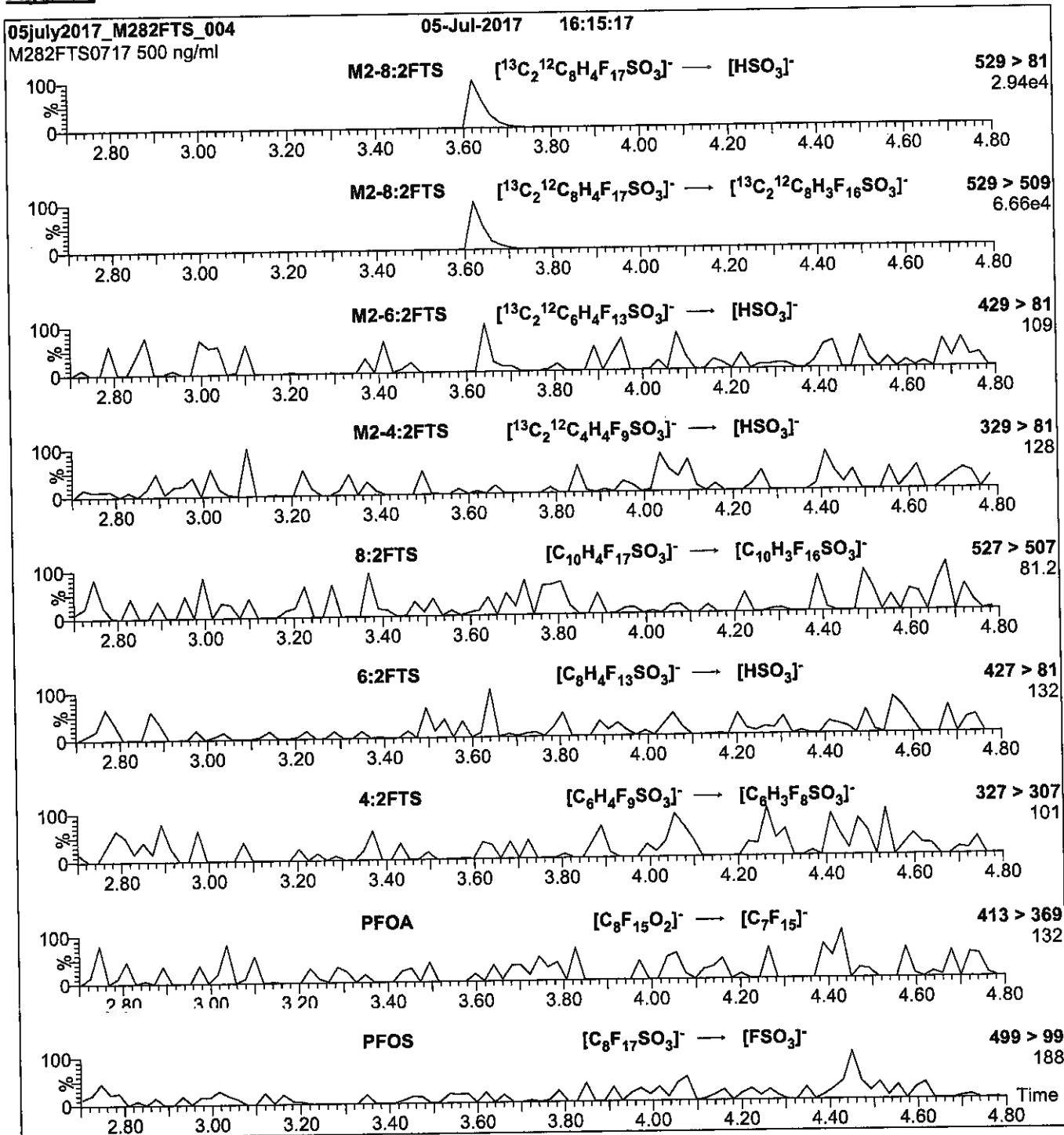
Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to Initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM2-8:2FTS_00010

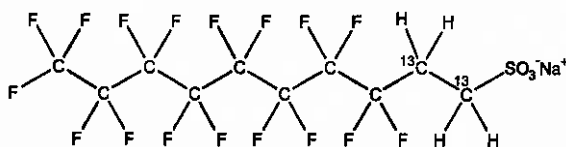


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0118
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈H₄F₁₇SO₃Na **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% ¹³C
LAST TESTED: (mm/dd/yyyy) 01/24/2018 (1,2-¹³C₂)
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 ³⁴S (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
B.G. Chittim, General Manager (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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

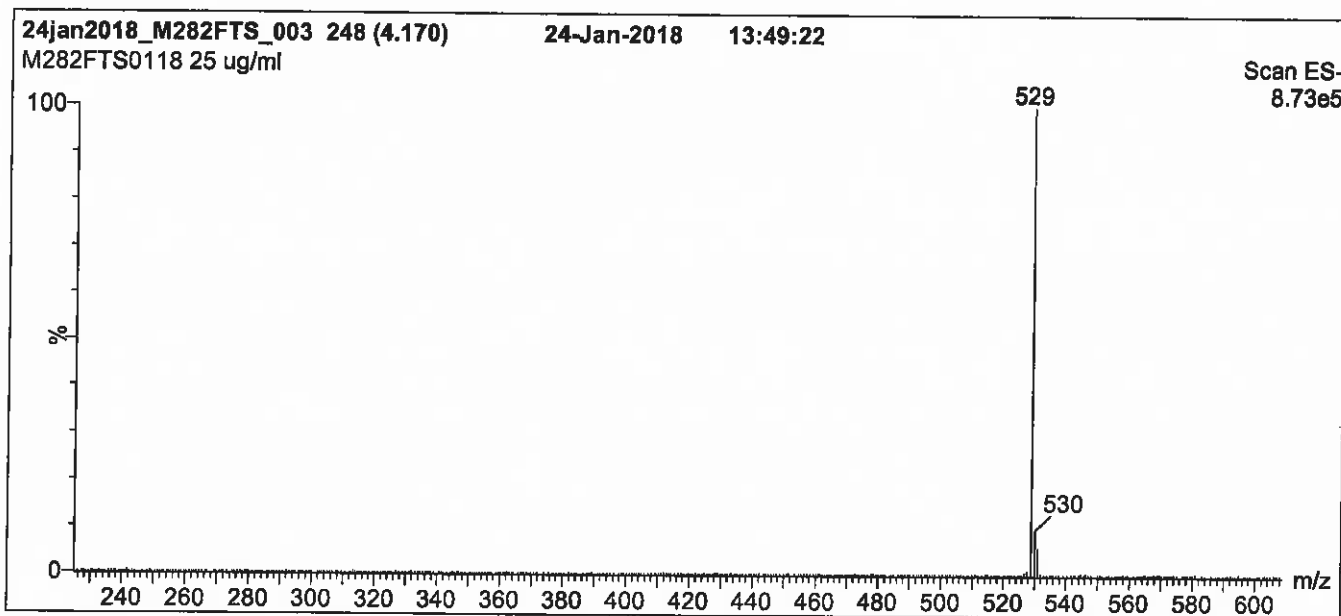
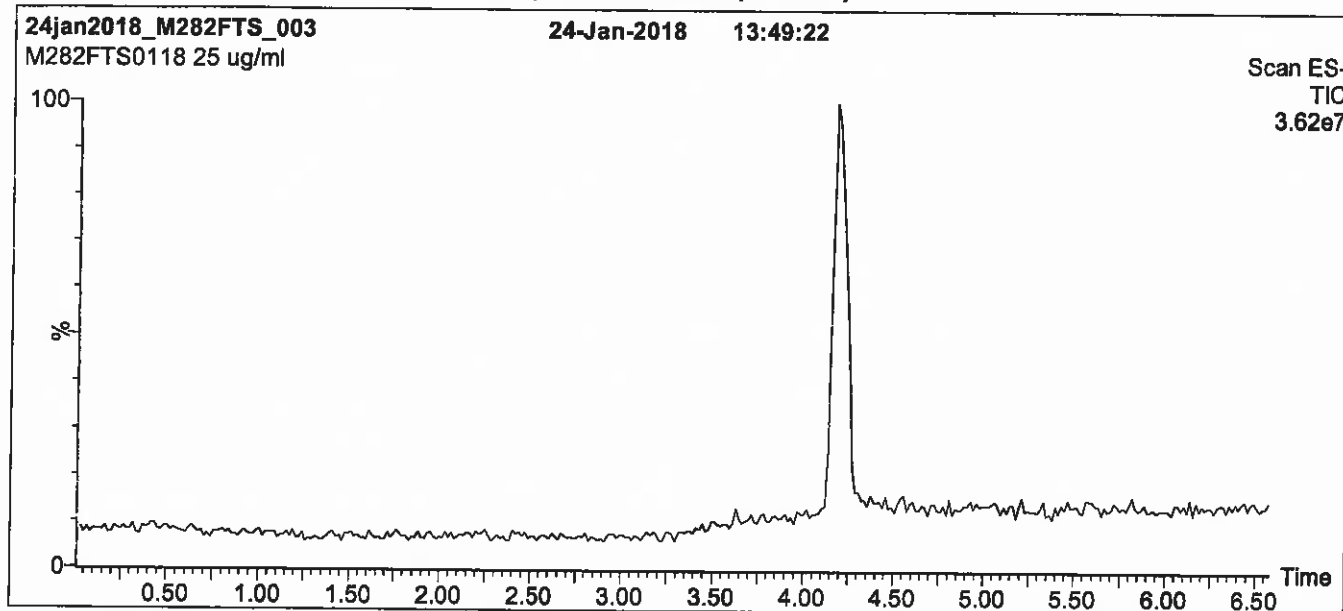
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈,
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

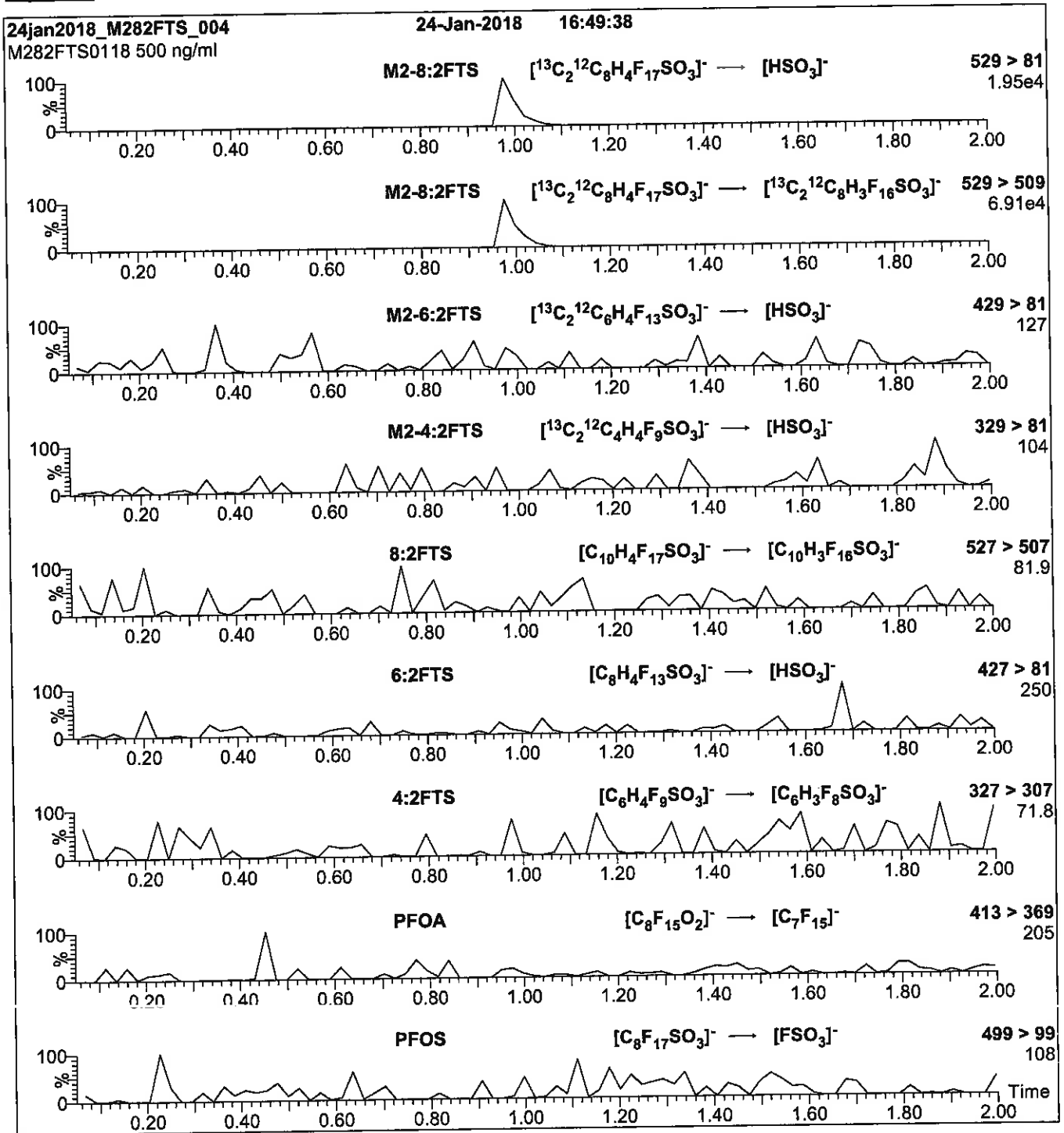
Flow: 300 μ l/min

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% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
 Collision Energy (eV) = 25

Reagent

LCM2PFHxDA_00013

r: 12/4/17 CCL

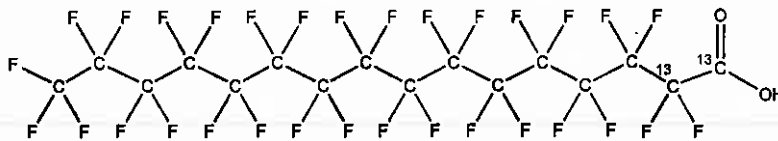


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA **LOT NUMBER:** M2PFHxDA0717
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexadecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₄HF₃₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 816.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

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: 
B.G. Chittim, General Manager

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

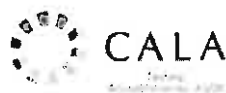
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

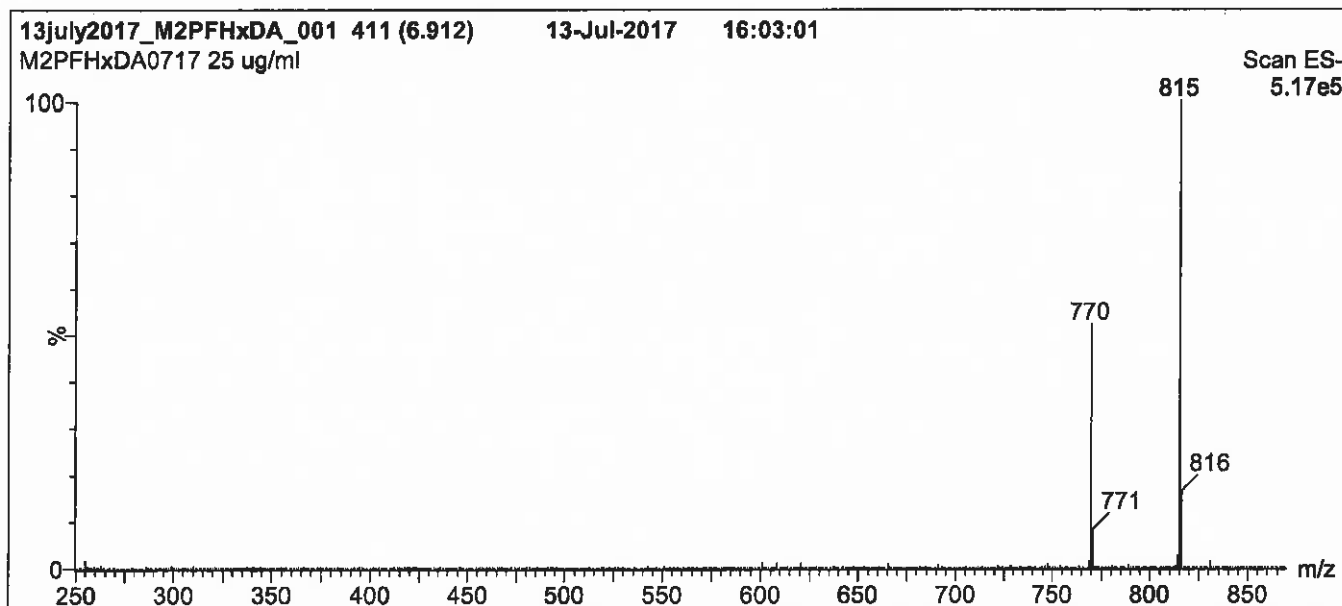
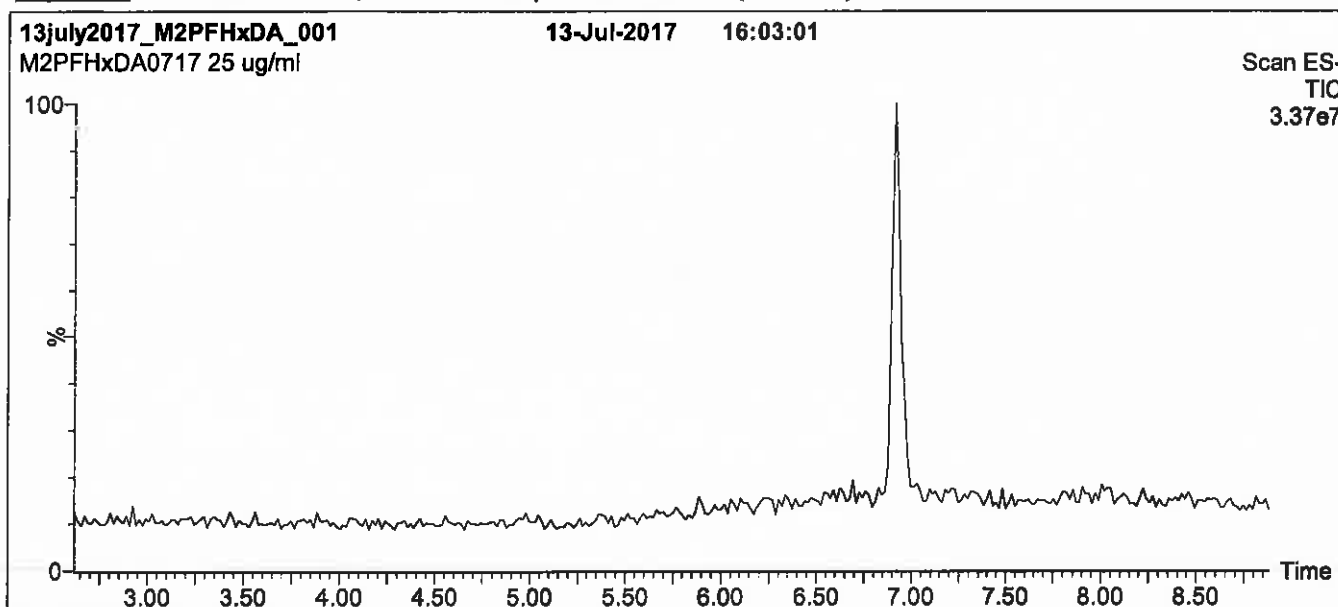
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

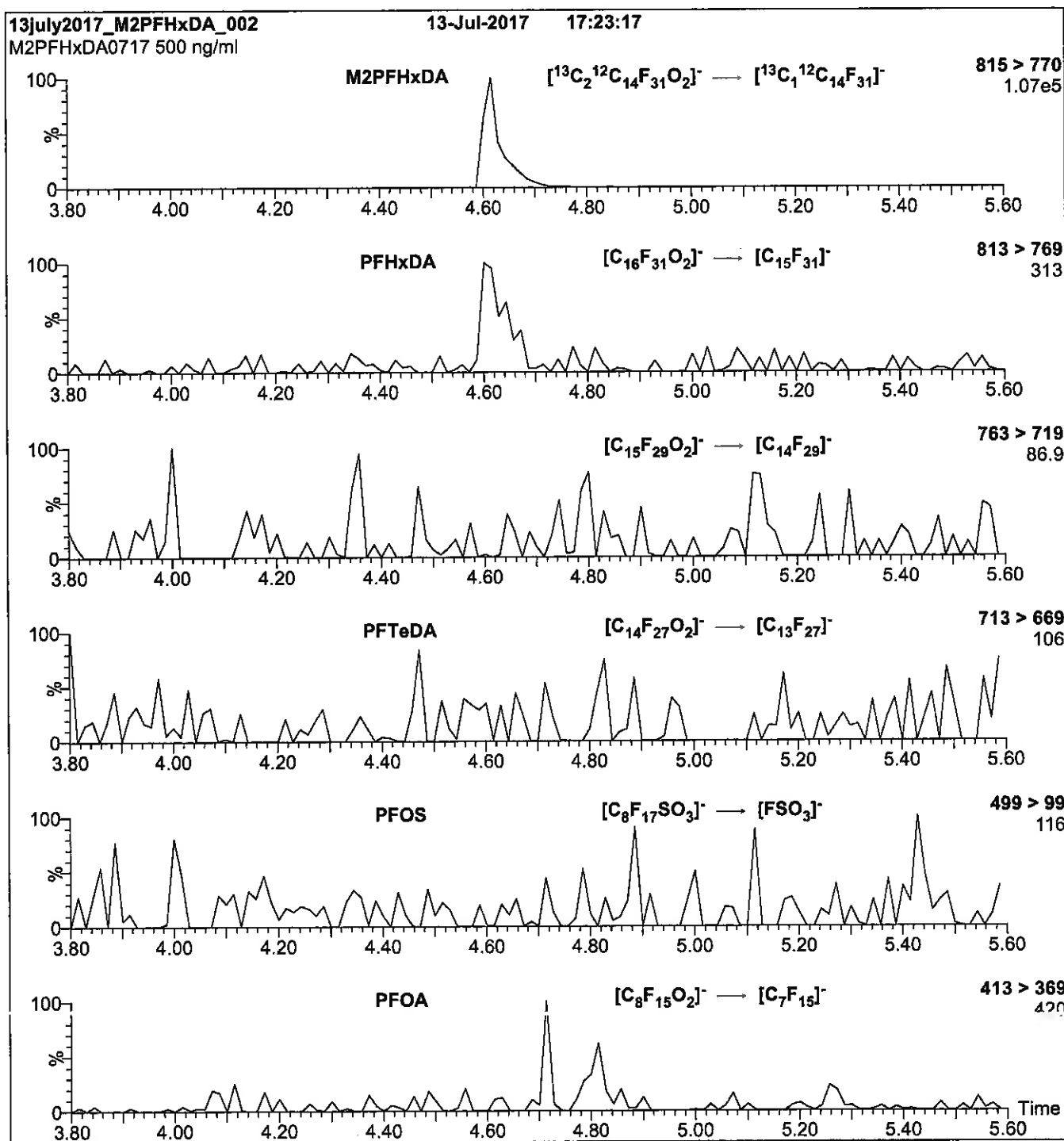
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.28\text{e-}3$
Collision Energy (eV) = 15

Reagent

LCM2PFHxDA_00016



1283133
 ID: LCM2PFHxDA_00016
 Exp: 07/13/22 Prep: CBW Opn: 06/30/18
 13C2-PFHxDA at 50ug/mL

R: 5/30/18 CBW

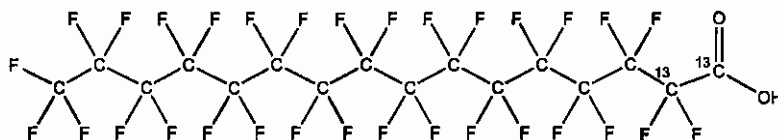


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA **LOT NUMBER:** M2PFHxDA0717
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexadecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₁₄ HF ₃₁ O ₂	MOLECULAR WEIGHT:	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2- ¹³ C ₂)
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

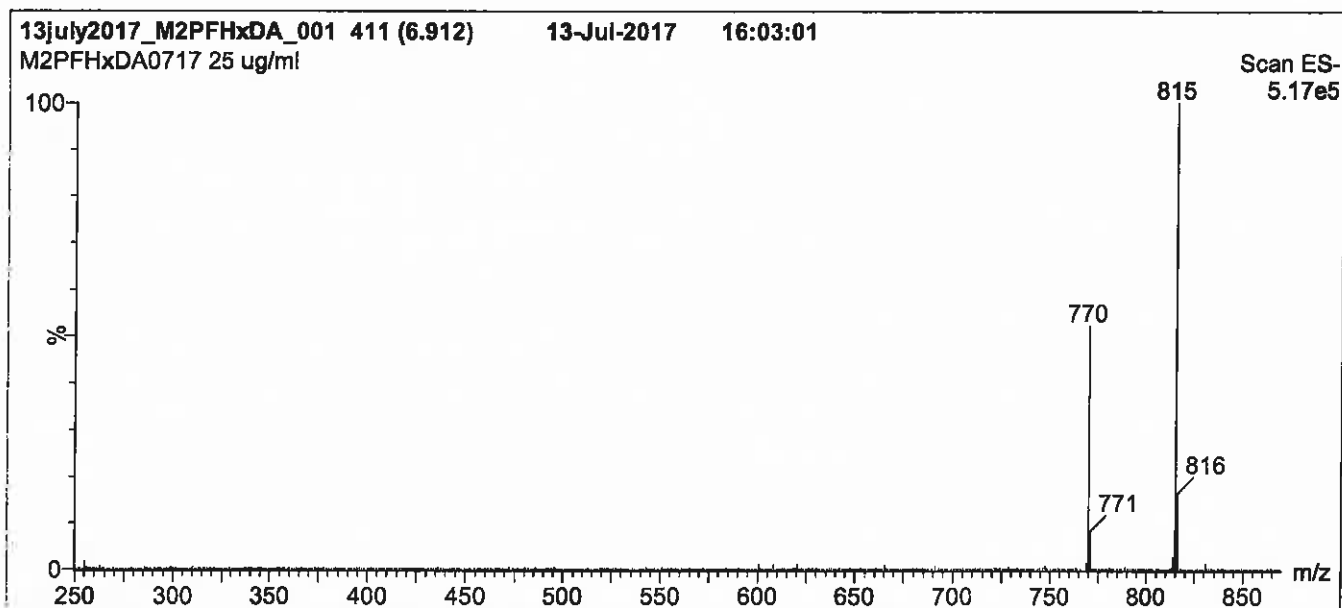
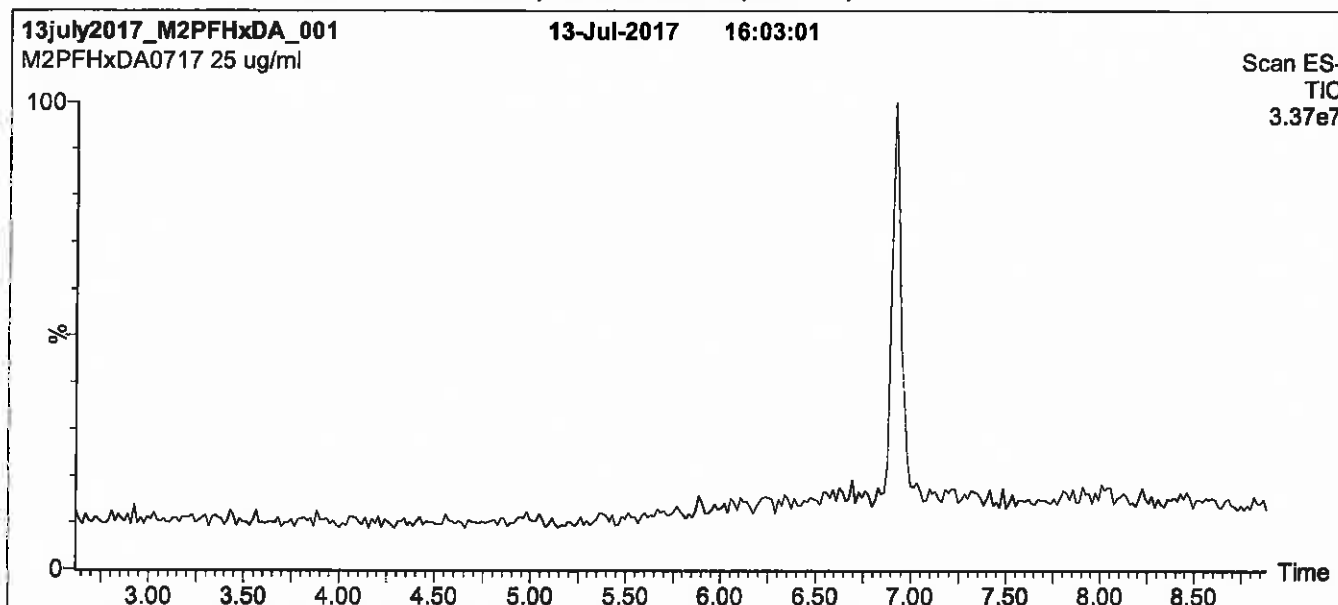
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

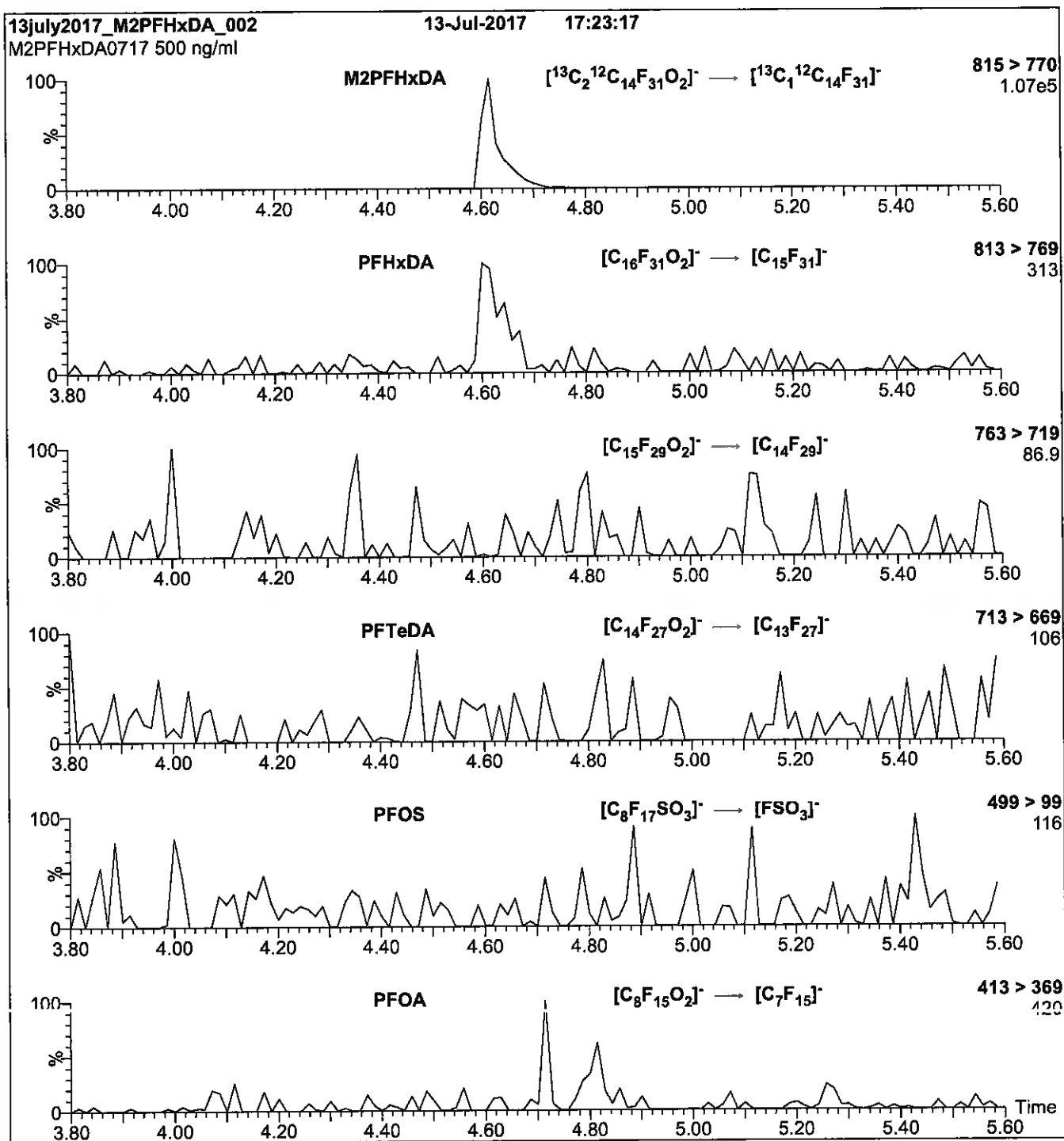
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCM2PFOA_00008



**WELLINGTON
LABORATORIES**

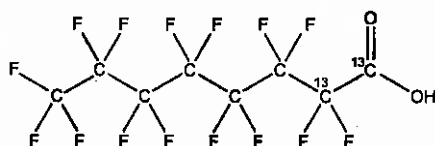
**CERTIFICATE OF ANALYSIS
DOCUMENTATION**

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]octanoic acid

LOT NUMBER: M2PFOA0216

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 416.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

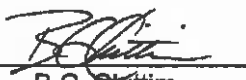
DOCUMENTATION/ DATA ATTACHED:

- 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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

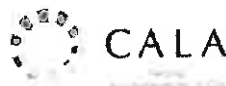
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

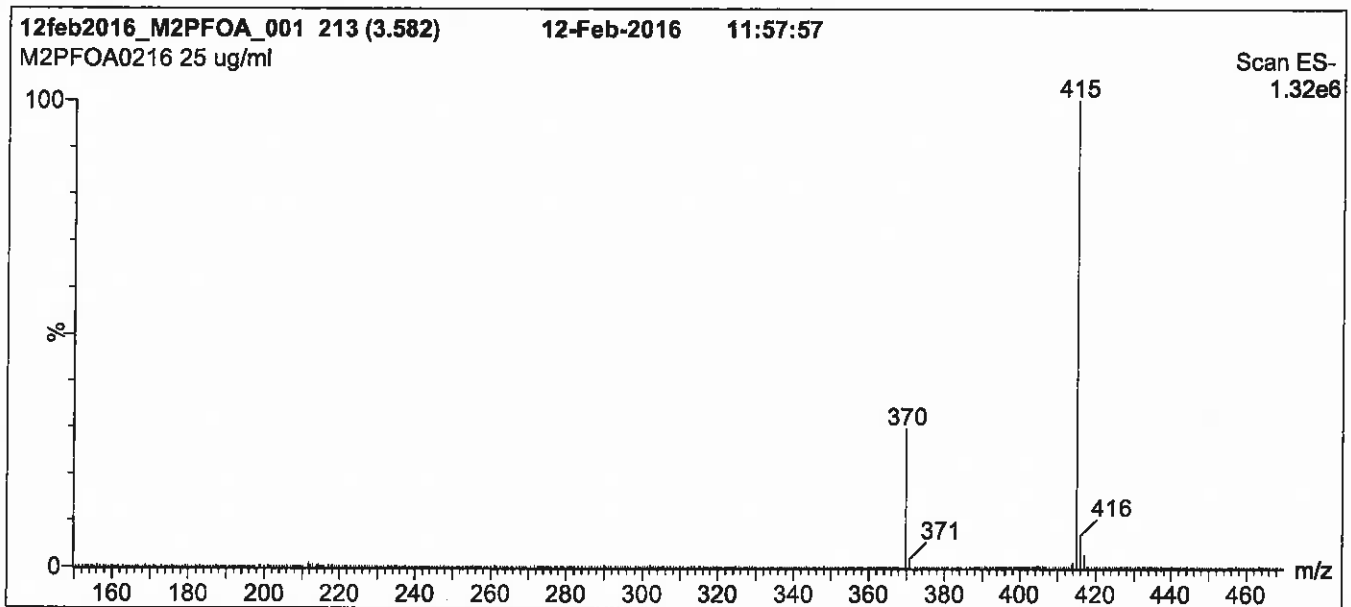
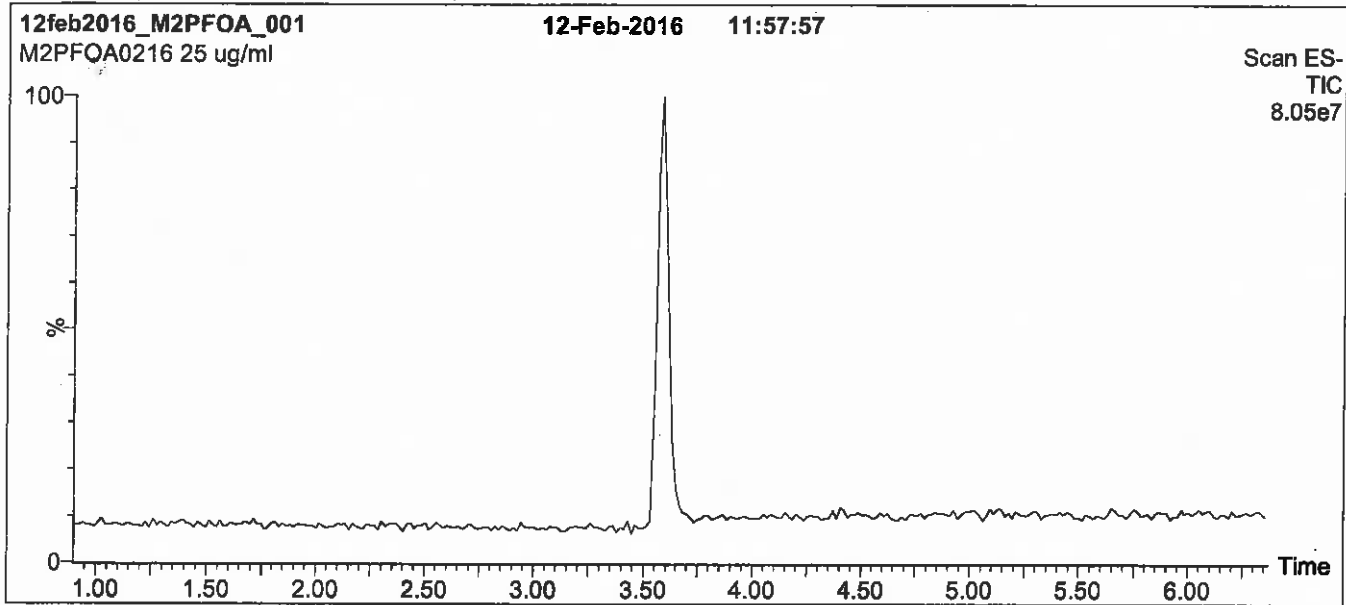
QUALITY MANAGEMENT:

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



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

Figure 1: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

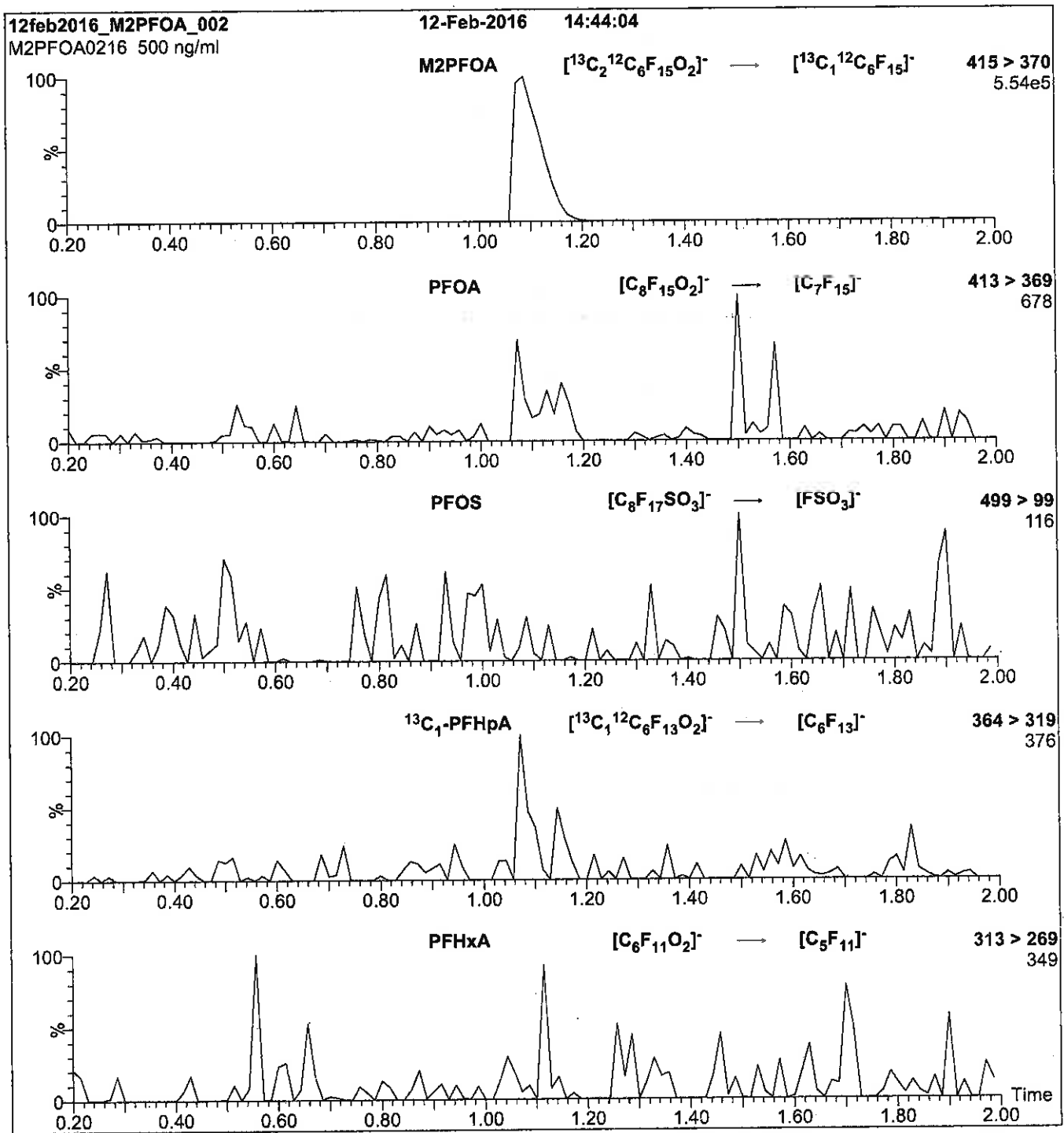
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM2PFTeDA_00012

1108065
ID: LCM2PFTeDA_00012
Exp: 11/30/22 Prod: CCL
13C2-PFTeDA at 50ug/ml

V: 12/4/17 CCL

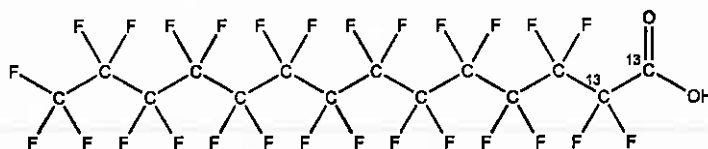


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA **LOT NUMBER:** M2PFTeDA1117
COMPOUND: Perfluoro-n-[1,2-¹³C₂]tetradecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₂HF₂₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 716.10
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

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: 
B.G. Chittim, General Manager

Date: 12/01/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

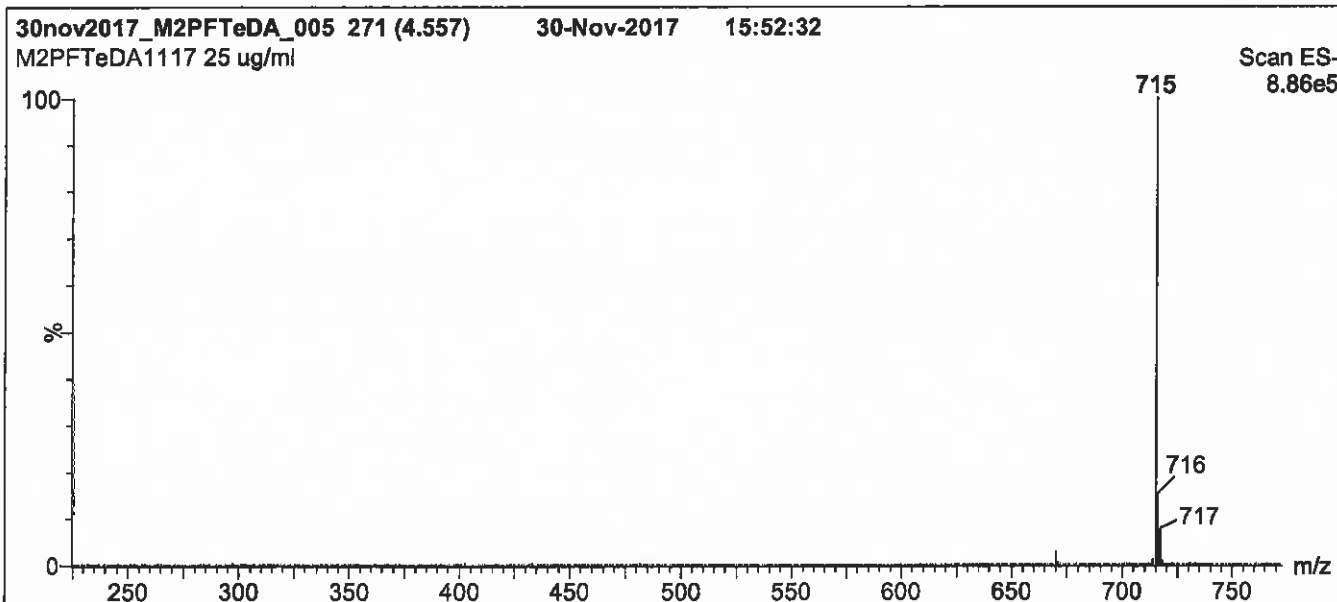
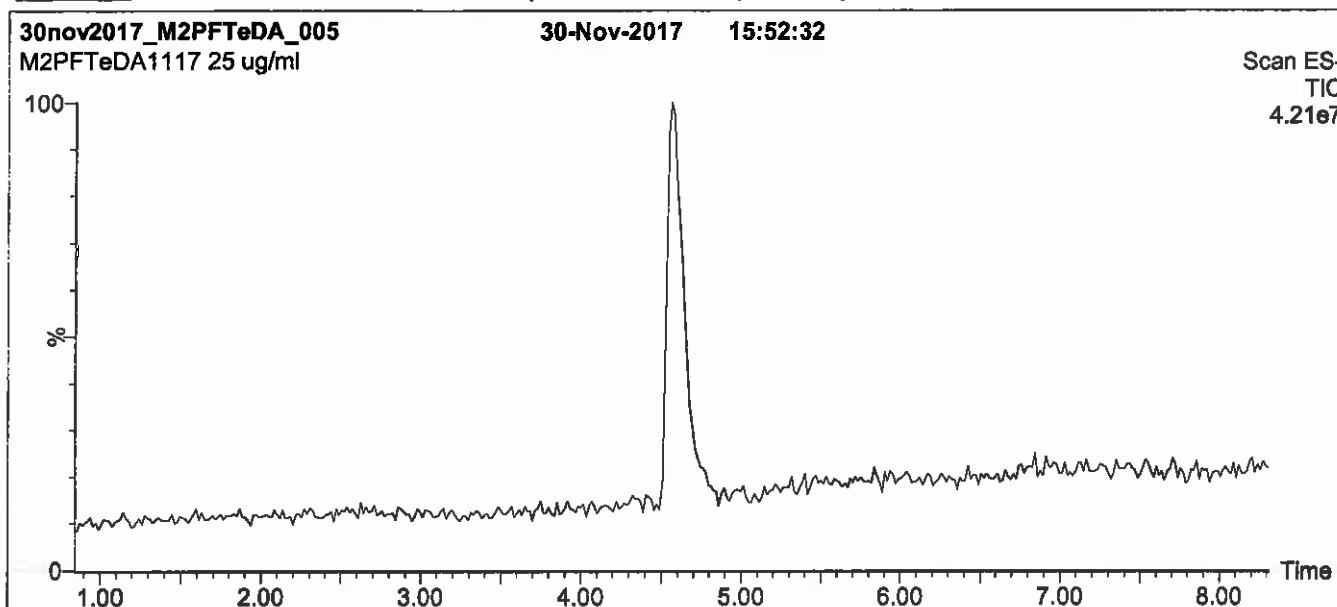
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc 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

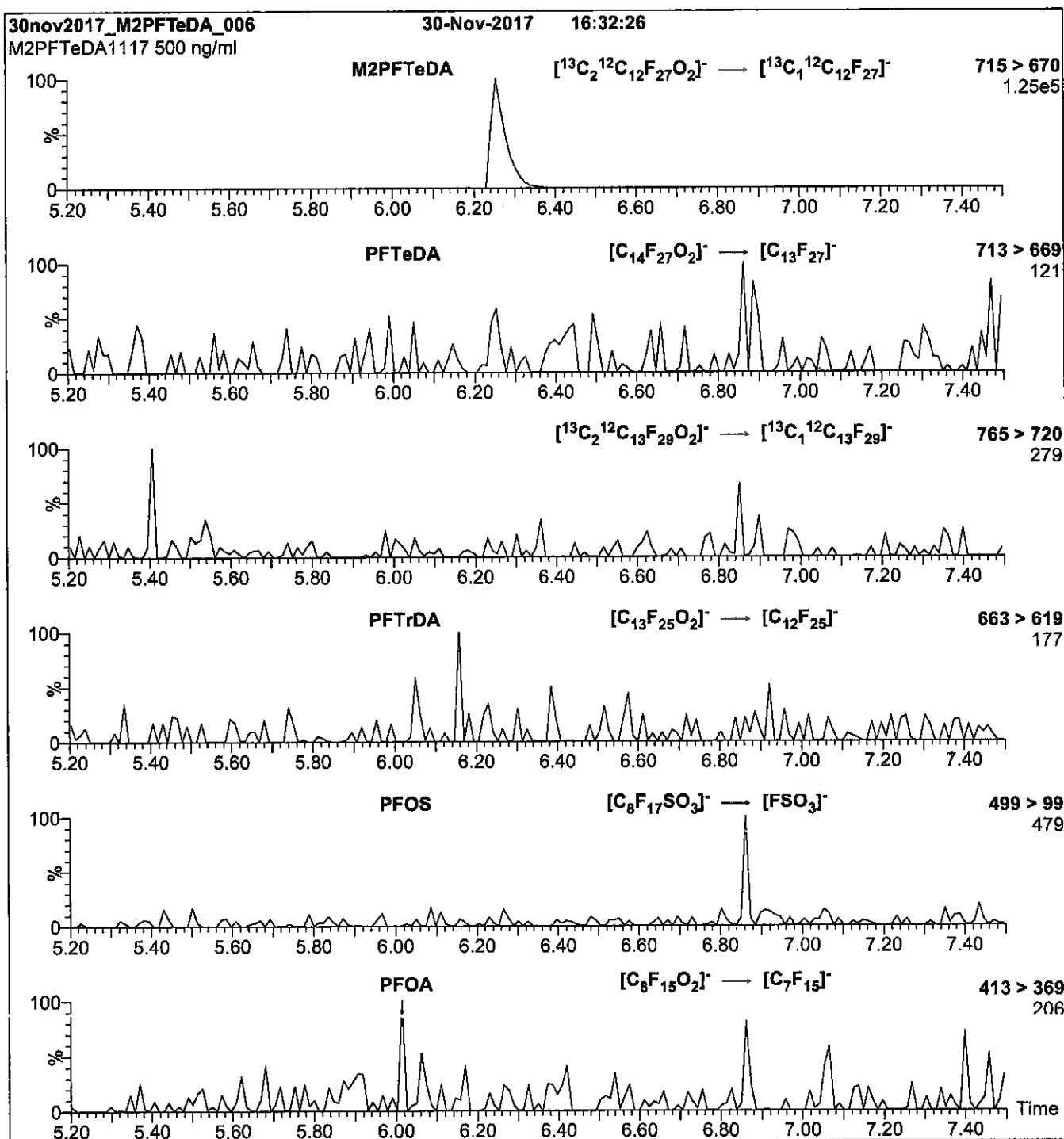
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.31×10^{-3}
Collision Energy (eV) = 14

Reagent

LCM2PFTeDA_00014



1263136
 ID: LCM2PFTeDA_00014
 Exp: 11/30/22 Ppt: CBW Opn: 05/30/18
 13C2-PFTeDA at 50ug/mL

R: 5/30/18 CAW

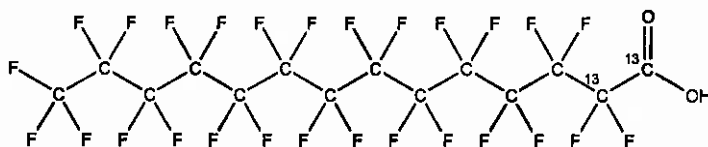


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA **LOT NUMBER:** M2PFTeDA1117
COMPOUND: Perfluoro-n-[1,2-¹³C₂]tetradecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₁₂ HF ₂₇ O ₂	MOLECULAR WEIGHT:	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2- ¹³ C ₂)
LAST TESTED: (mm/dd/yyyy)	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
 B.G. Chittim, General Manager (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

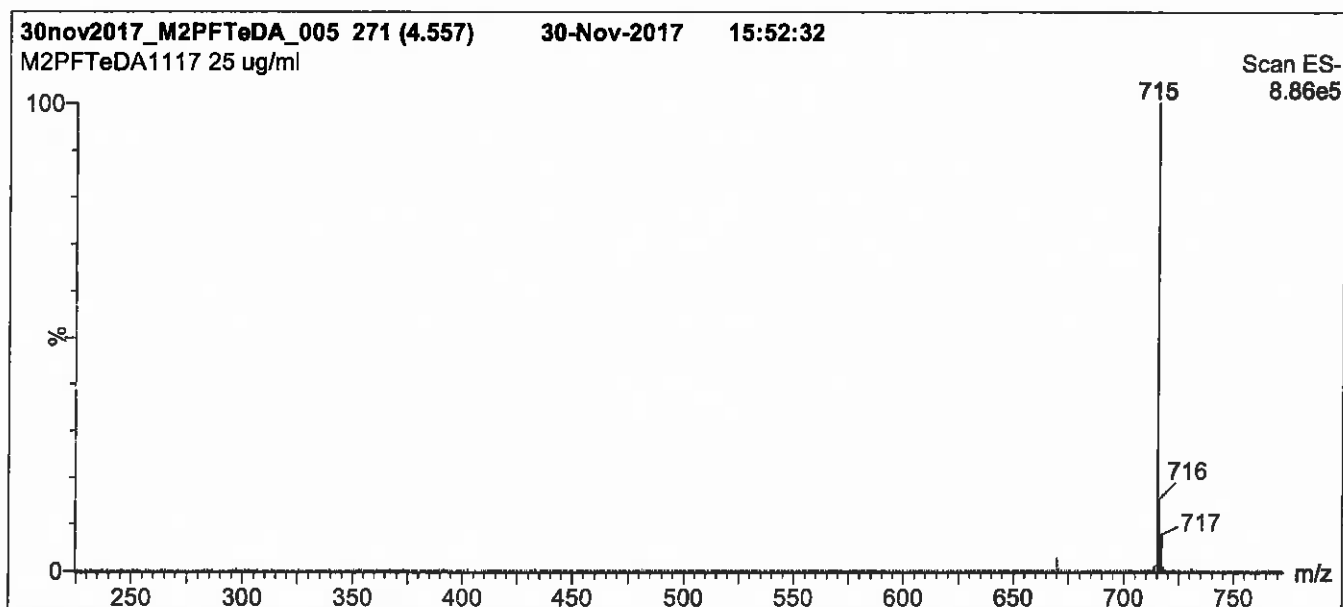
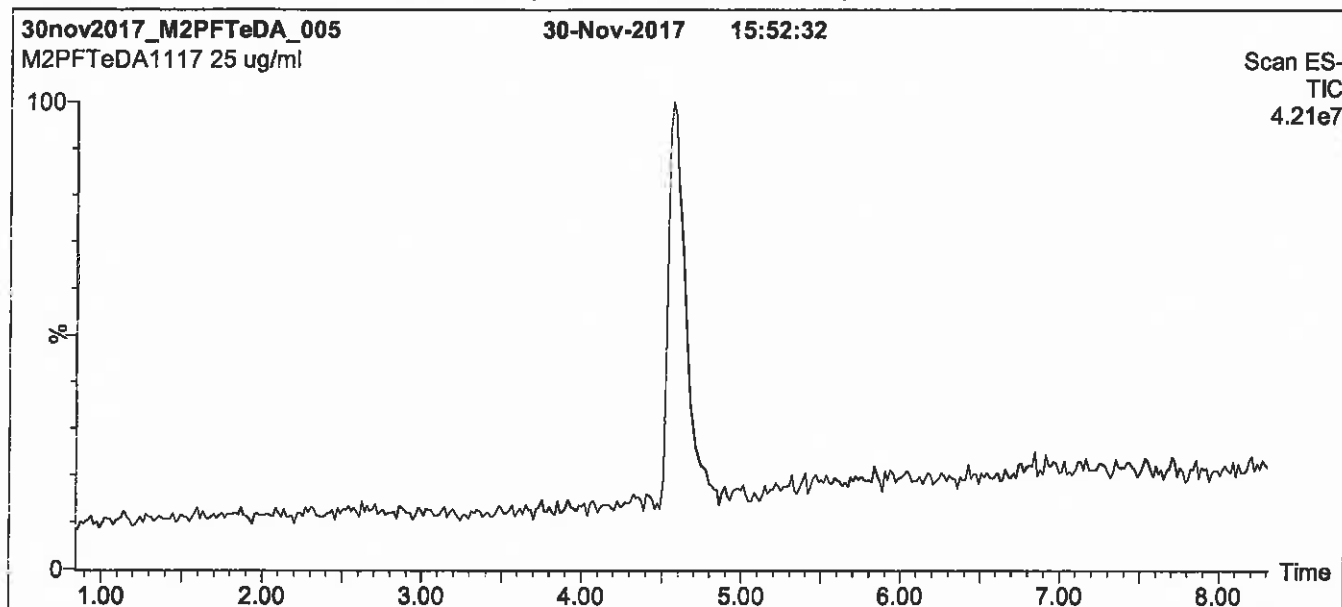
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc 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

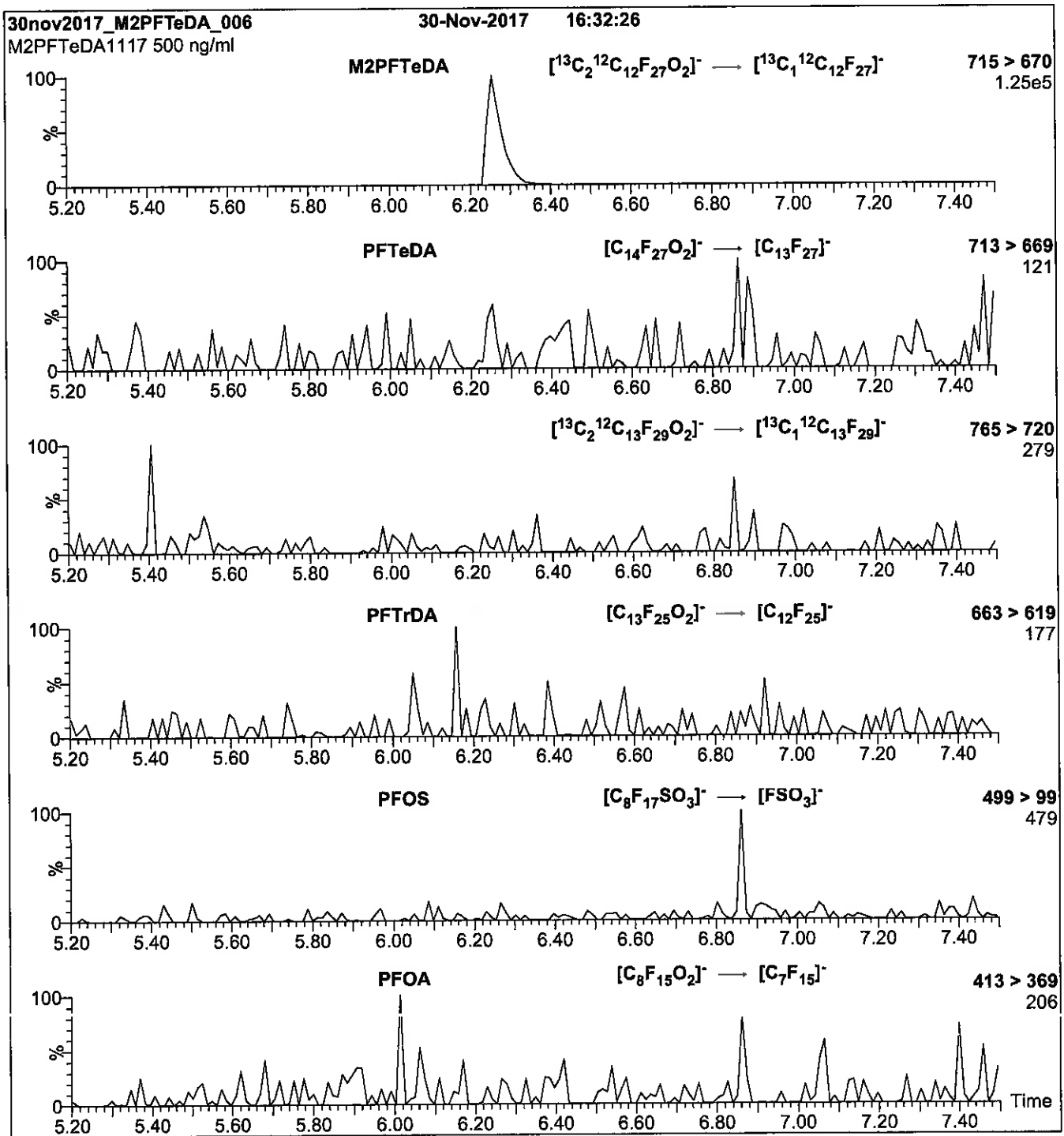
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.31\text{e-}3$
Collision Energy (eV) = 14

Reagent

LCM3HFPO-DA_00003



1263201

ID: LCM3HFPO-DA_00003
Exp:05/18/21 Prod:CBM Opn:05/30/18
M3HFPO-DA**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

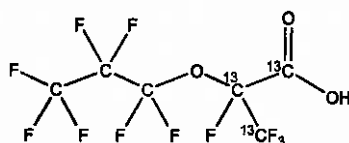
M3HFPO-DA

LOT NUMBER:

M3HFPODA0518

COMPOUND:2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-¹³C₃-propanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₃¹²C₃HF₁₁O₃**CONCENTRATION:**

50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

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

MOLECULAR WEIGHT:

333.03

SOLVENT(S):

Methanol

ISOTOPIC PURITY:≥99% ¹³C(¹³C₃)**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: 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:

B.G. Chittim, General Manager

Date: 05/25/2018

(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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

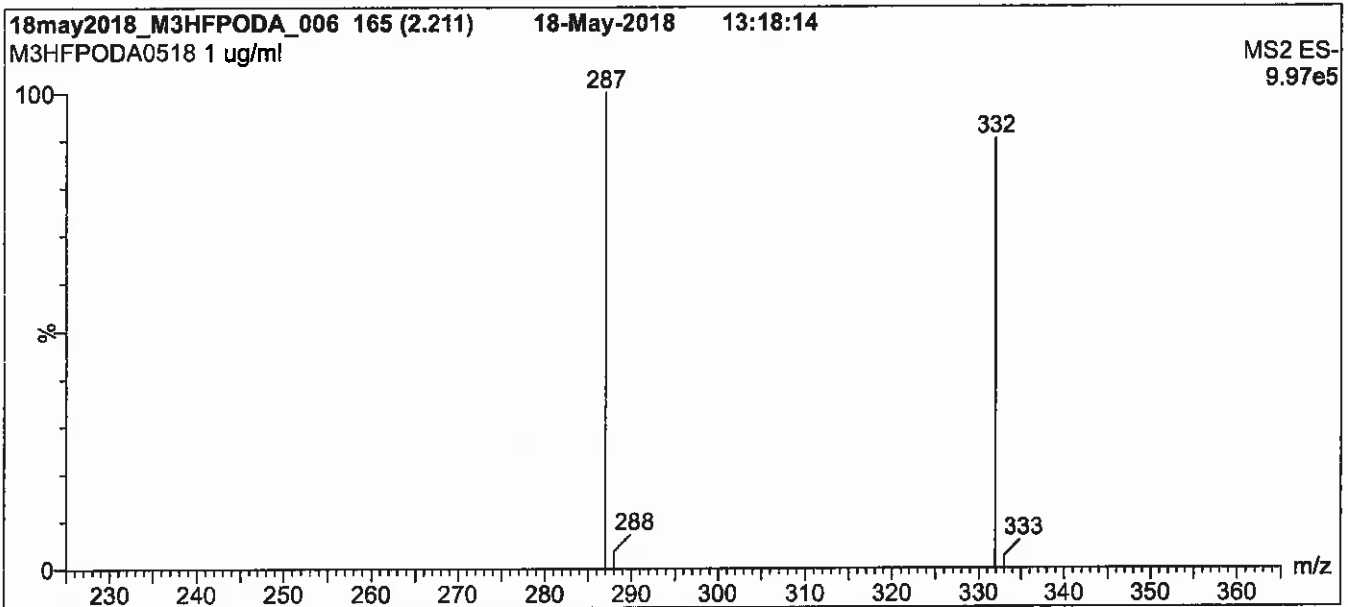
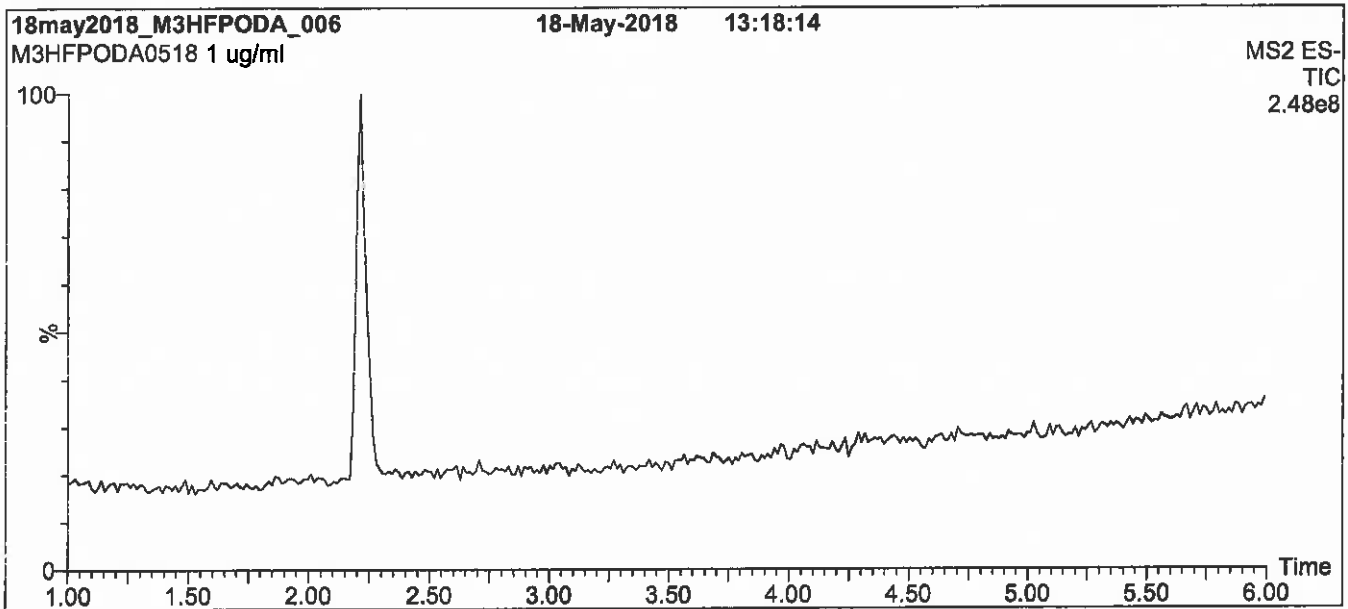
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

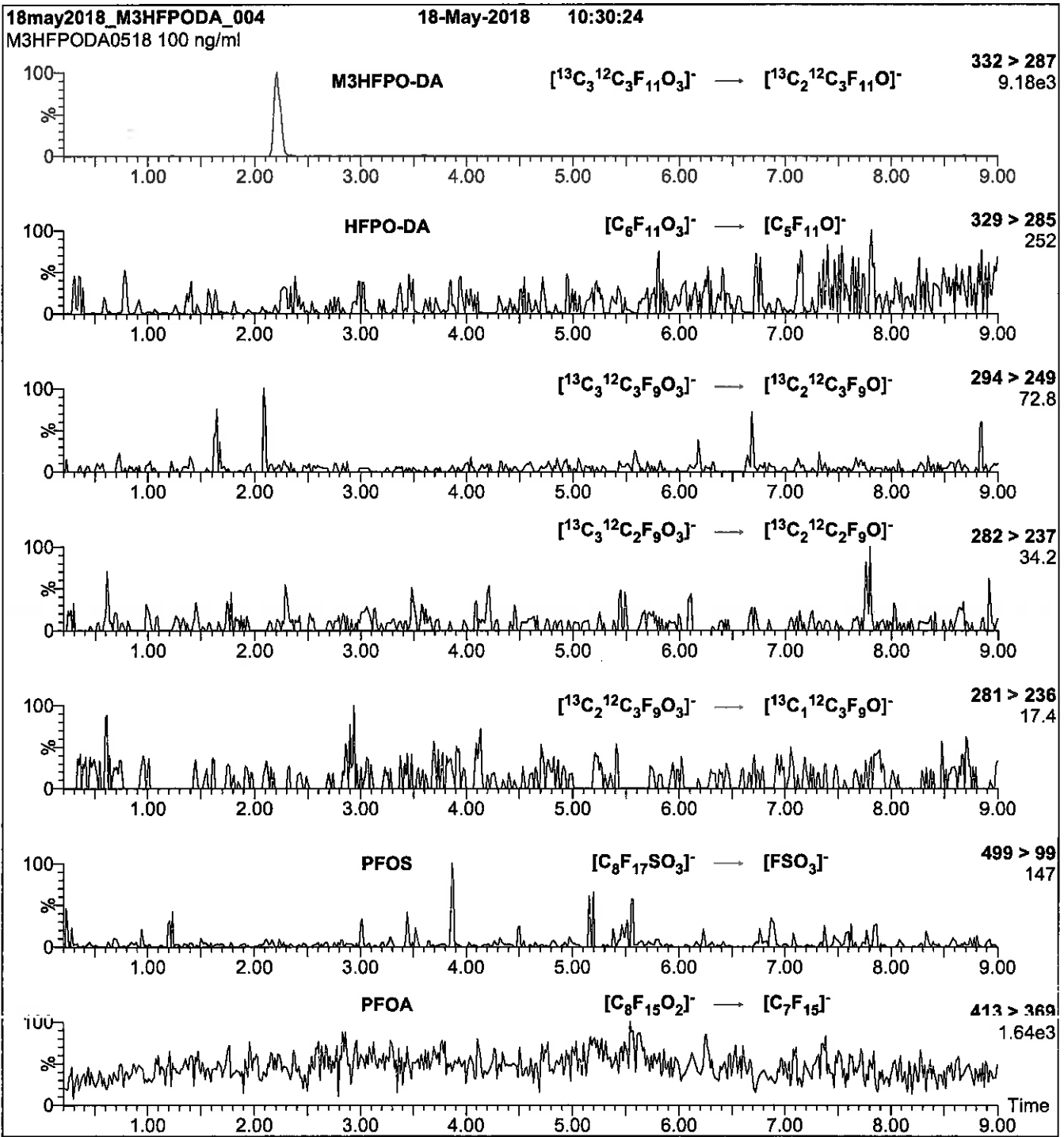
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM4PFHPA_00012



1106316

ID: LCM4PFHPA_00012

Exp: 05/03/22 Pprd: CCL

13C4-Perfluoroheptanoic a

v: 12/4/17 CCL

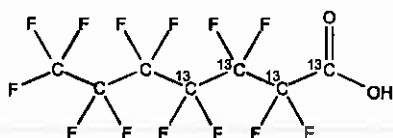
**WELLINGTON
LABORATORIES****CERTIFICATE OF ANALYSIS
DOCUMENTATION****PRODUCT CODE:** M4PFHpA **LOT NUMBER:** M4PFHpA0517
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]heptanoic acid**STRUCTURE:** **CAS #:** Not available**MOLECULAR FORMULA:** ¹³C₄¹²C₃HF₁₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml**MOLECULAR WEIGHT:** 368.03
SOLVENT(S): Methanol
Water (<1%)**CHEMICAL PURITY:** >98%**ISOTOPIC PURITY:** ≥99%¹³C
(1,2,3,4-¹³C₄)**LAST TESTED:** (mm/dd/yyyy) 05/03/2017**EXPIRY DATE:** (mm/dd/yyyy) 05/03/2022**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place**DOCUMENTATION/ DATA ATTACHED:**

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**Certified By:** 
B.G. Chittim, General Manager**Date:** 05/11/2017
(mm/dd/yyyy)Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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

HAZARDS:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

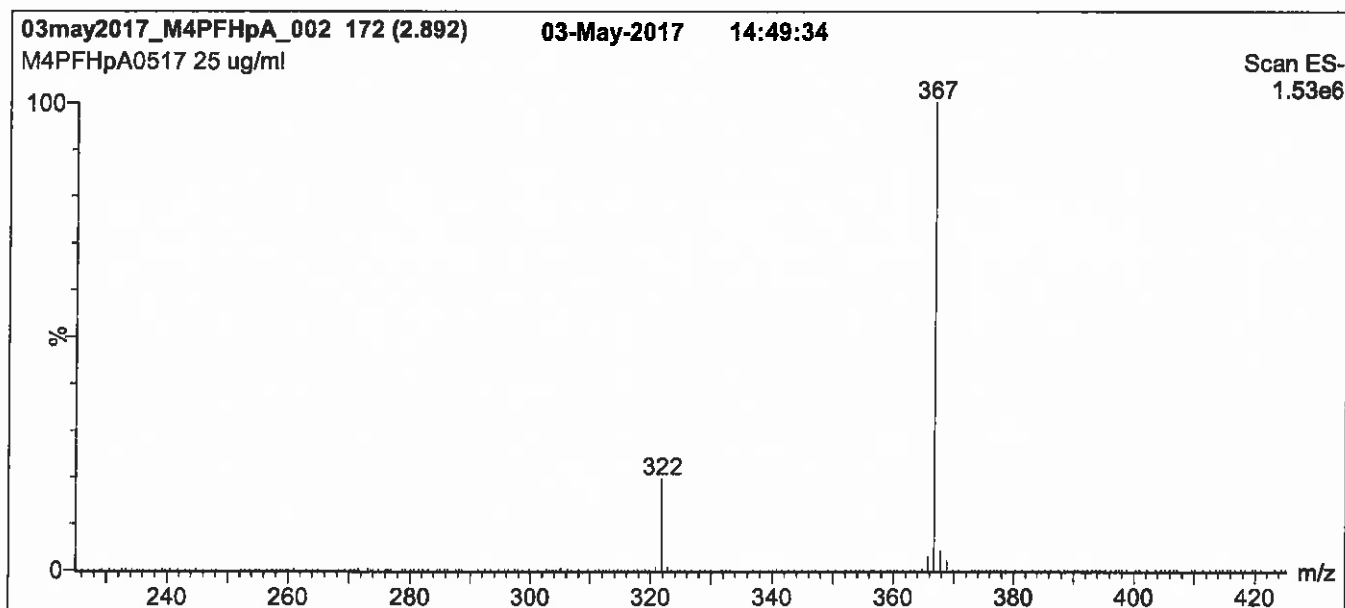
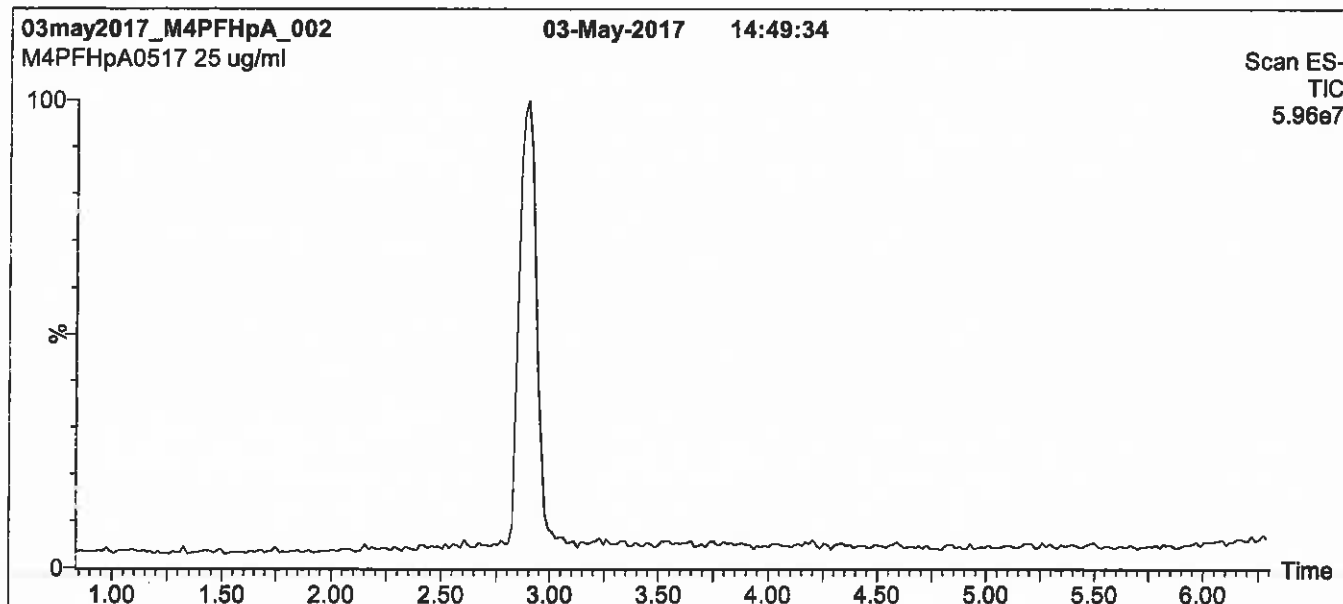
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

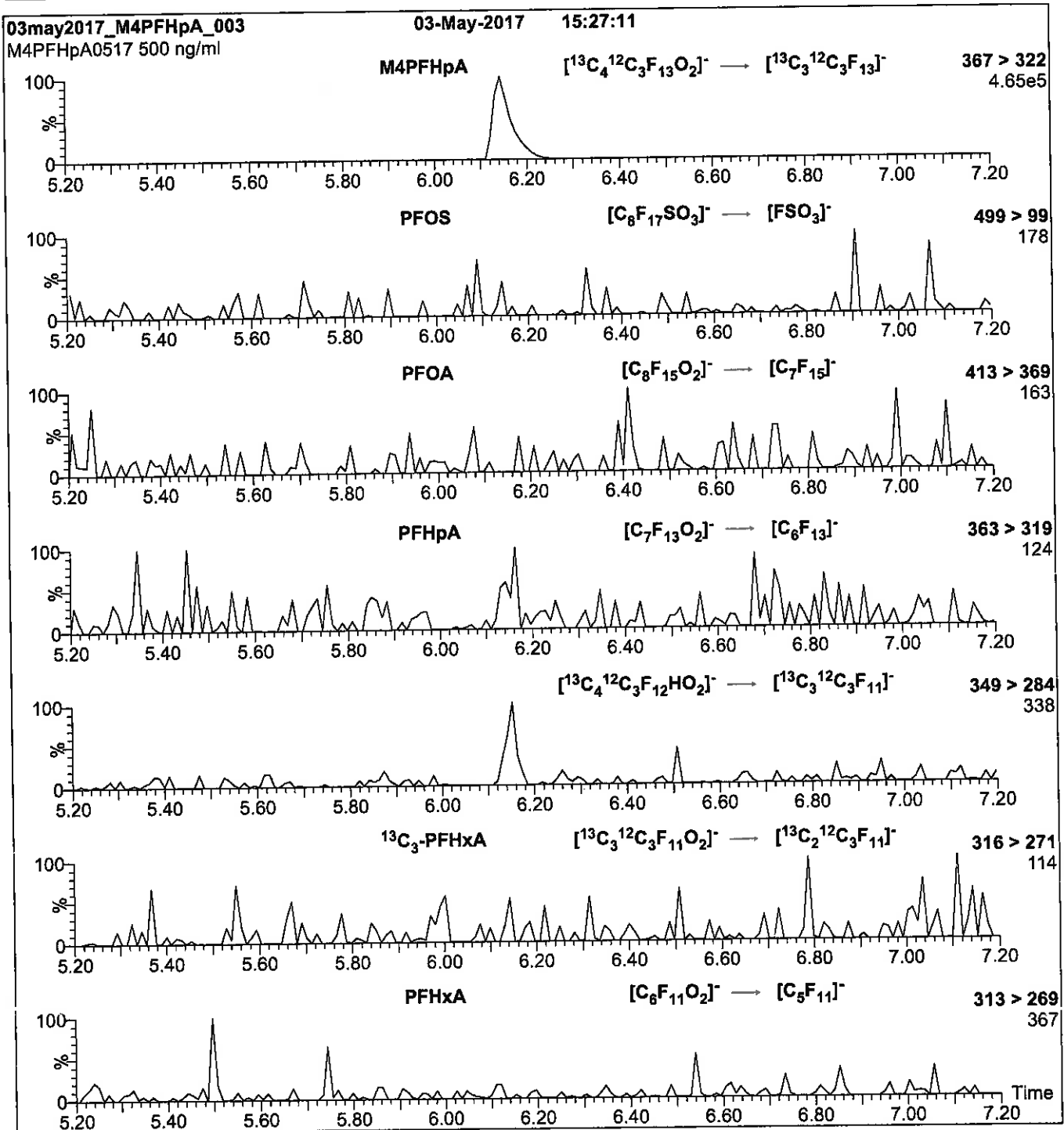
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

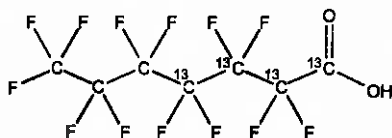
LCM4PFHPA_00014



1263142

ID: LCM4PFHPA_00014
Exp: 05/03/22 Prod: CBW Opr: 05/30/18
13C4-Perfluoroheptanoic a

R: 12T 5/30/18 CAW

WELLINGTON
LABORATORIESCERTIFICATE OF ANALYSIS
DOCUMENTATION**PRODUCT CODE:** M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]heptanoic acid**LOT NUMBER:** M4PFHpA0517**STRUCTURE:****CAS #:** Not available**MOLECULAR FORMULA:** ¹³C₄¹²C₃HF₁₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml**MOLECULAR WEIGHT:** 368.03
SOLVENT(S): Methanol
Water (<1%)**CHEMICAL PURITY:** >98%
LAST TESTED: (mm/dd/yyyy) 05/03/2017
EXPIRY DATE: (mm/dd/yyyy) 05/03/2022**ISOTOPIC PURITY:** ≥99%¹³C
(1,2,3,4-¹³C₄)**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place**DOCUMENTATION/ DATA ATTACHED:**

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**Certified By:** 
B.G. Chittim, General Manager**Date:** 05/11/2017
(mm/dd/yyyy)Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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

HAZARDS:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

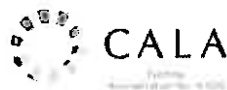
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

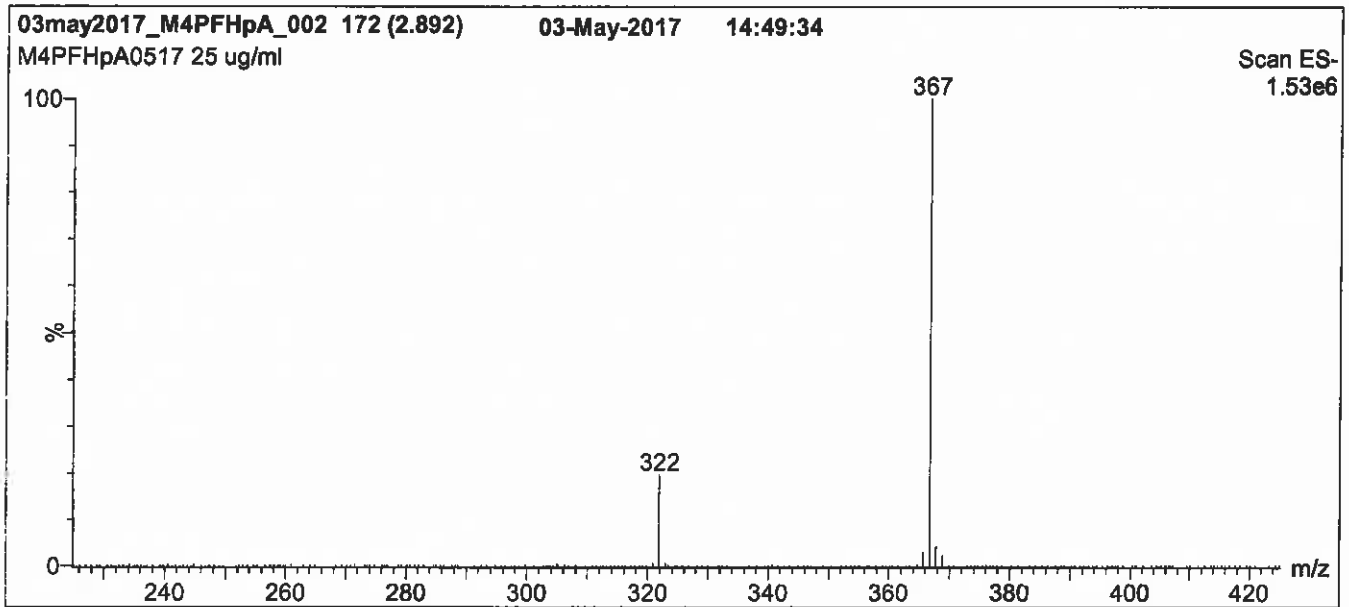
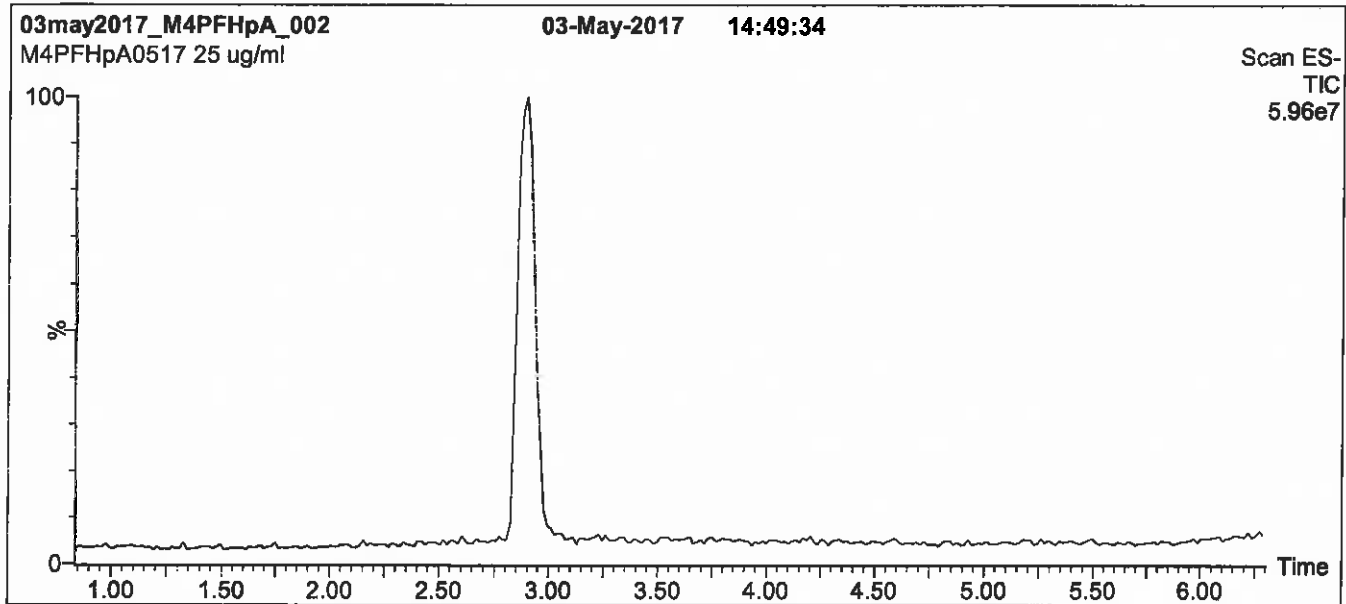
QUALITY MANAGEMENT:

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).



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: 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

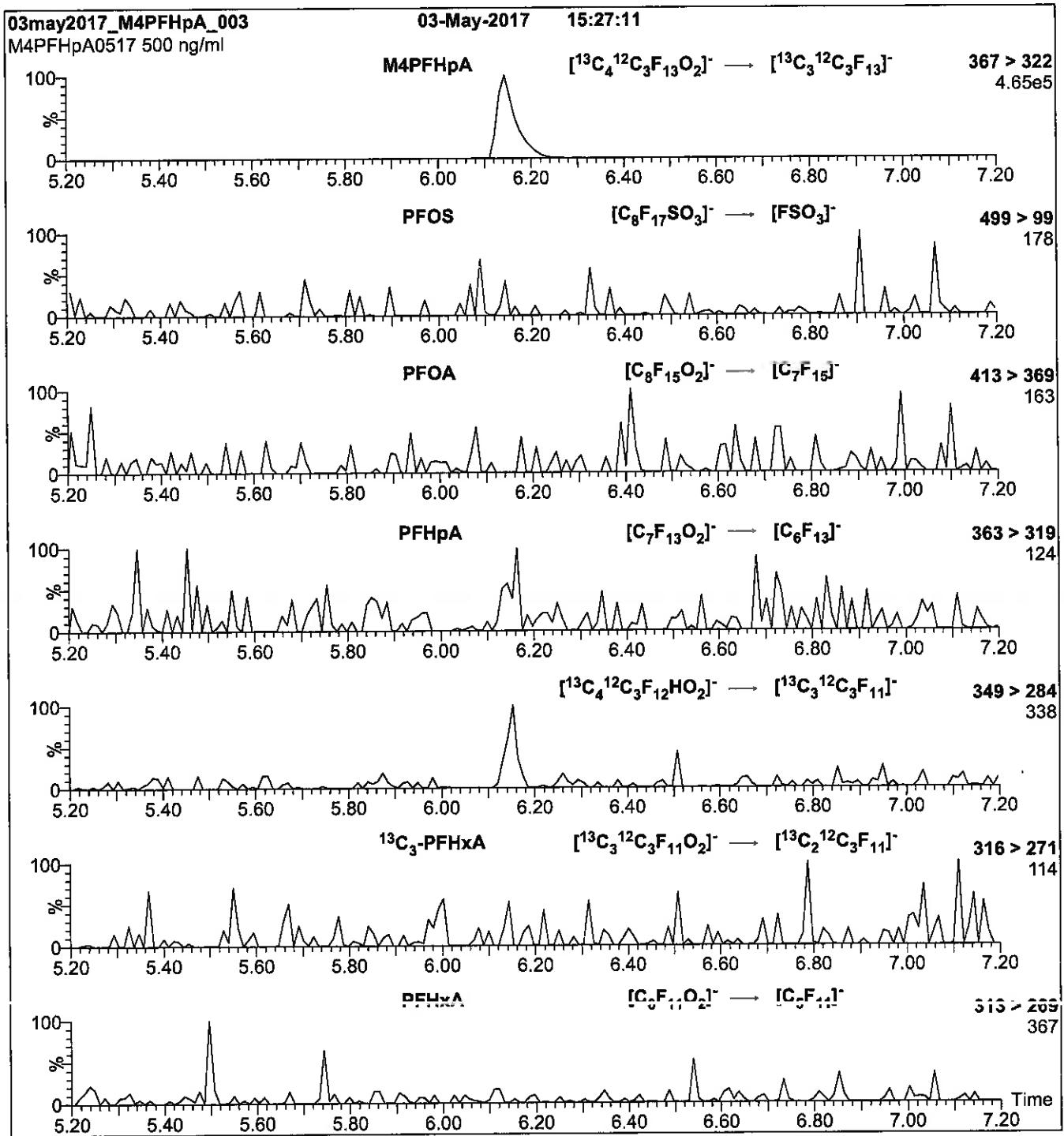
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM5PFPEA_00013



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

r: 12/4/17 ccc

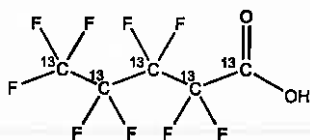


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M5PFPeA **LOT NUMBER:** M5PFPeA0717
COMPOUND: Perfluoro-n-[¹³C₅]pentanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₅ HF ₈ O ₂	MOLECULAR WEIGHT:	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (¹³ C ₅)
LAST TESTED: (mm/dd/yyyy)	07/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/20/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

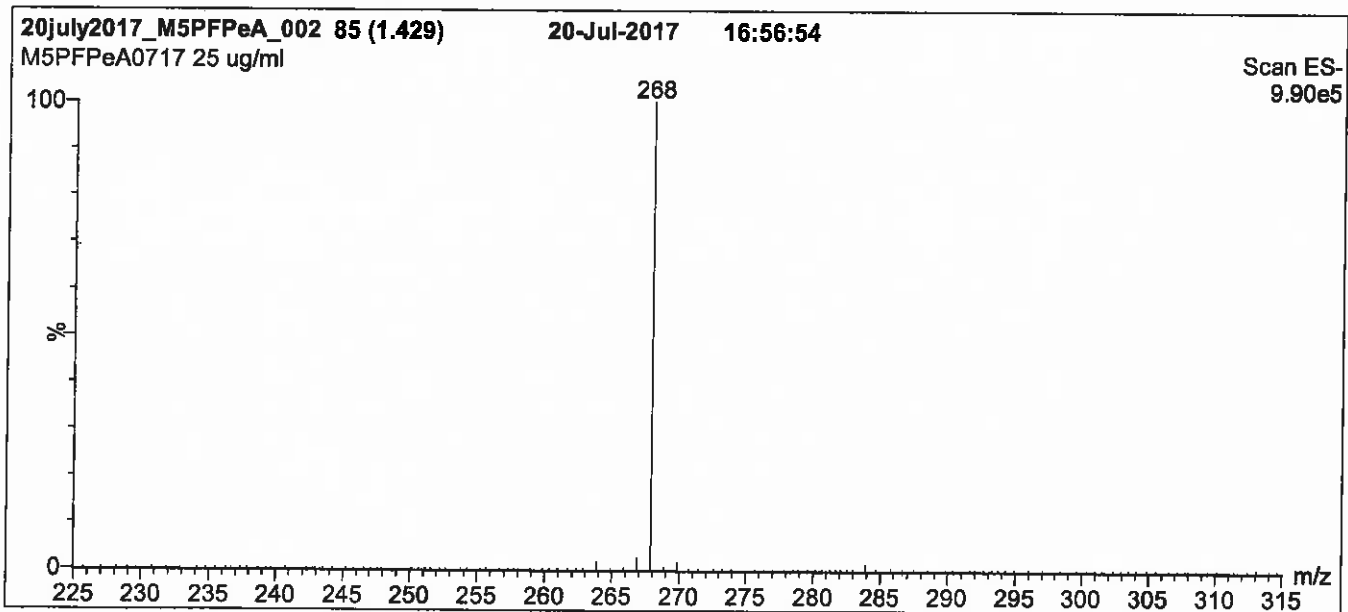
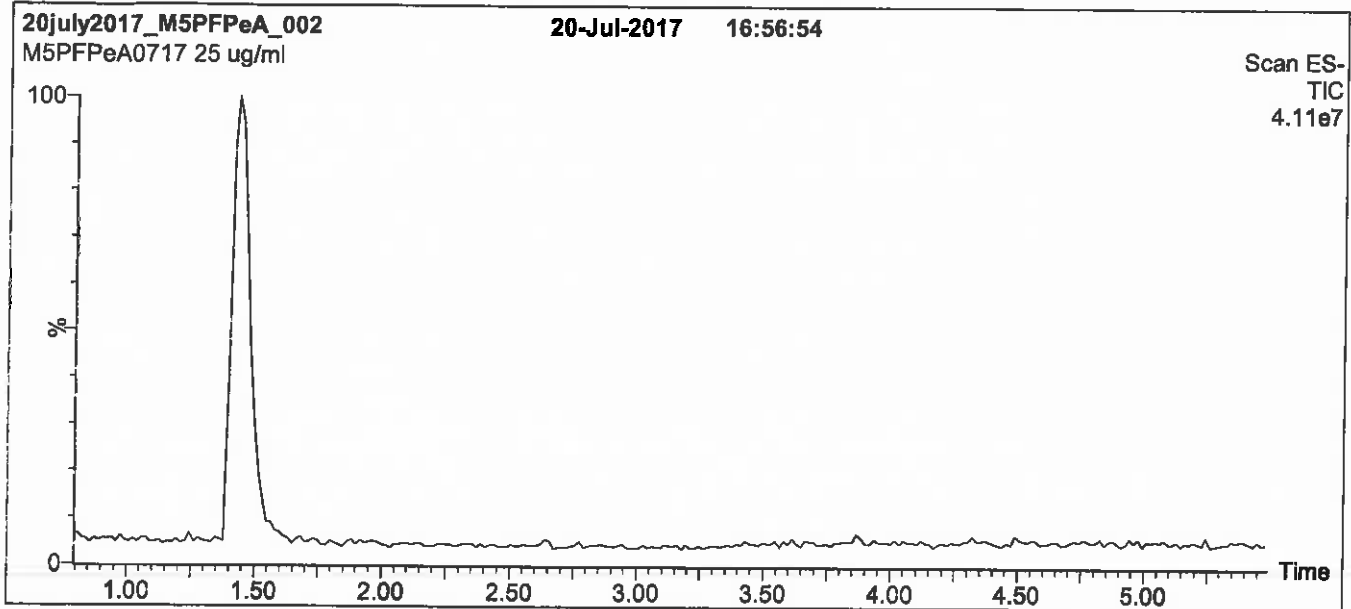
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

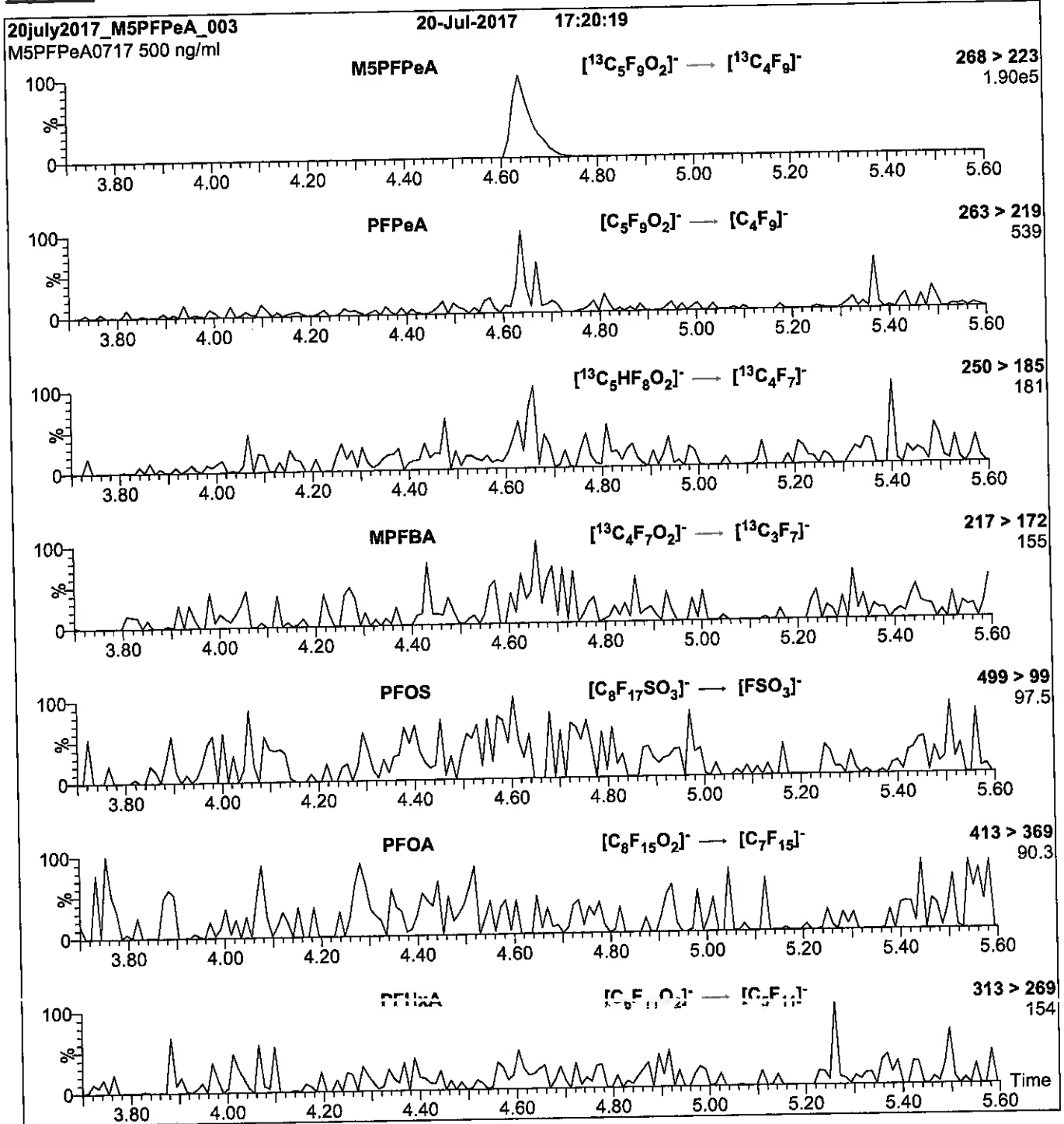
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.54e-3
 Collision Energy (eV) = 9

Reagent

LCM5PFPEA_00015



1263145
 ID: LCM5PFPEA_00015
 Exp: 07/20/22 Prod: CBW Opn: 05/30/18
 13C5-Perfluoropentanoic a

R: 5/30/18 CW



WELLINGTON LABORATORIES

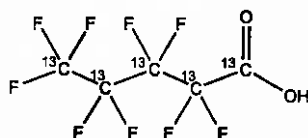
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[¹³C₅]pentanoic acid

LOT NUMBER: M5PFPeA0717

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₅HF₈O₂
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

ISOTOPIC PURITY: ≥99% ¹³C
 (¹³C₅)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 07/26/2017
 (mm/dd/yyyy)

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

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

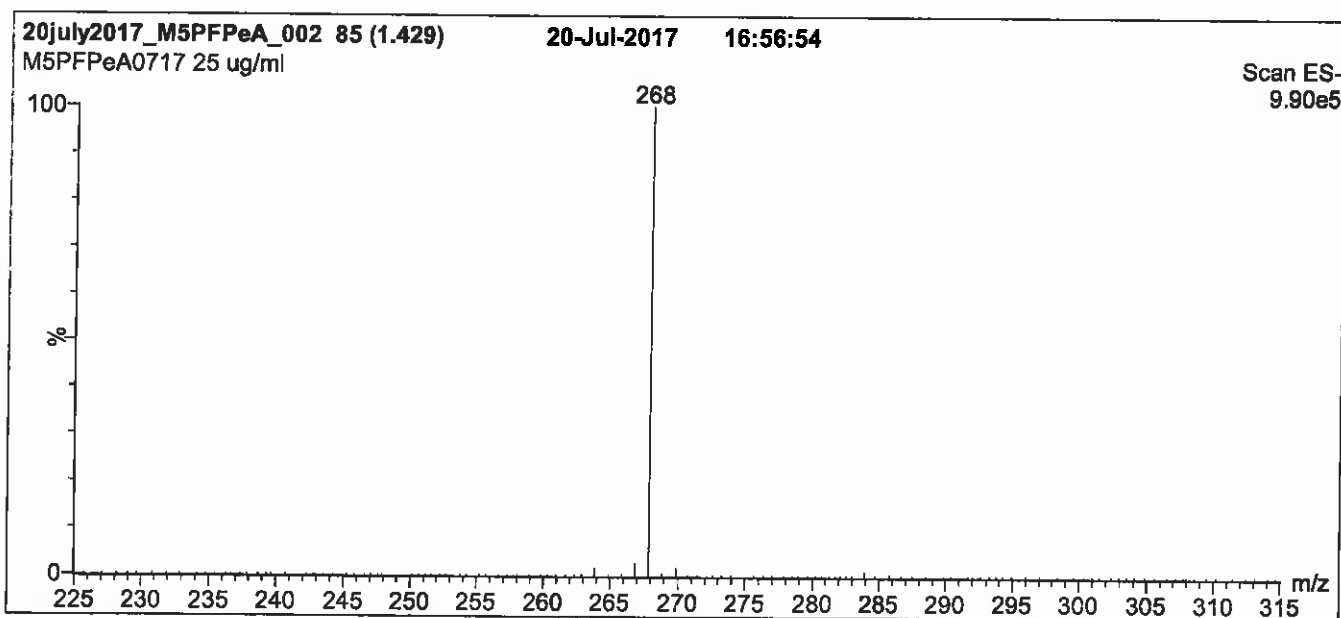
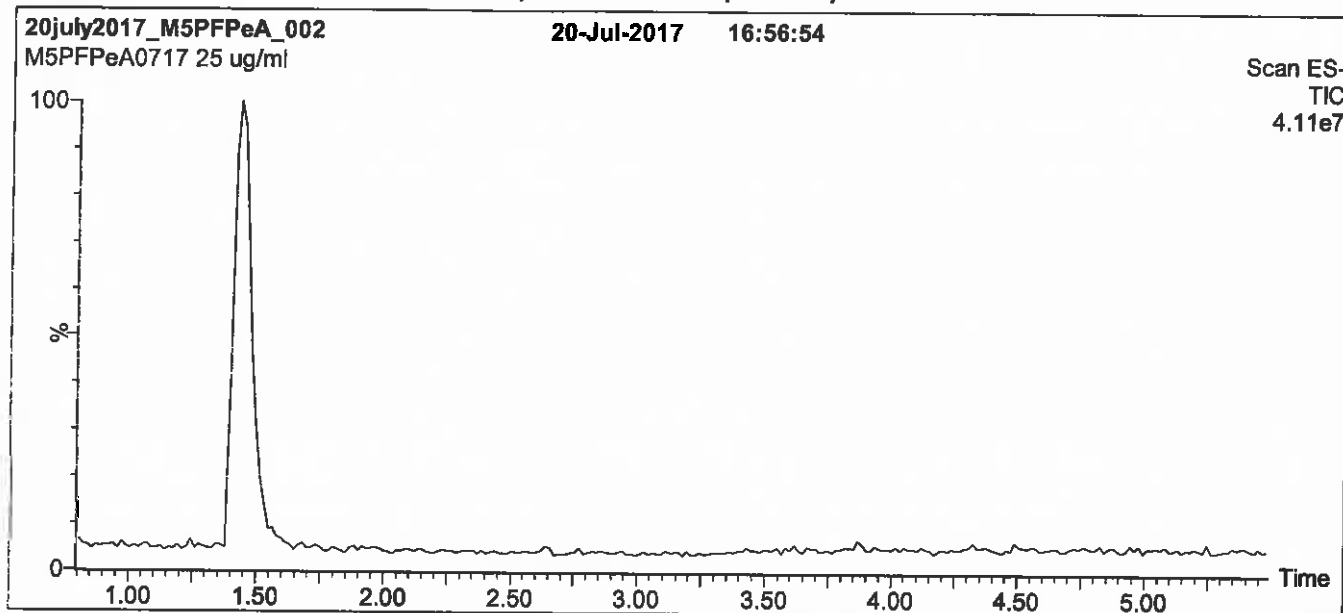
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

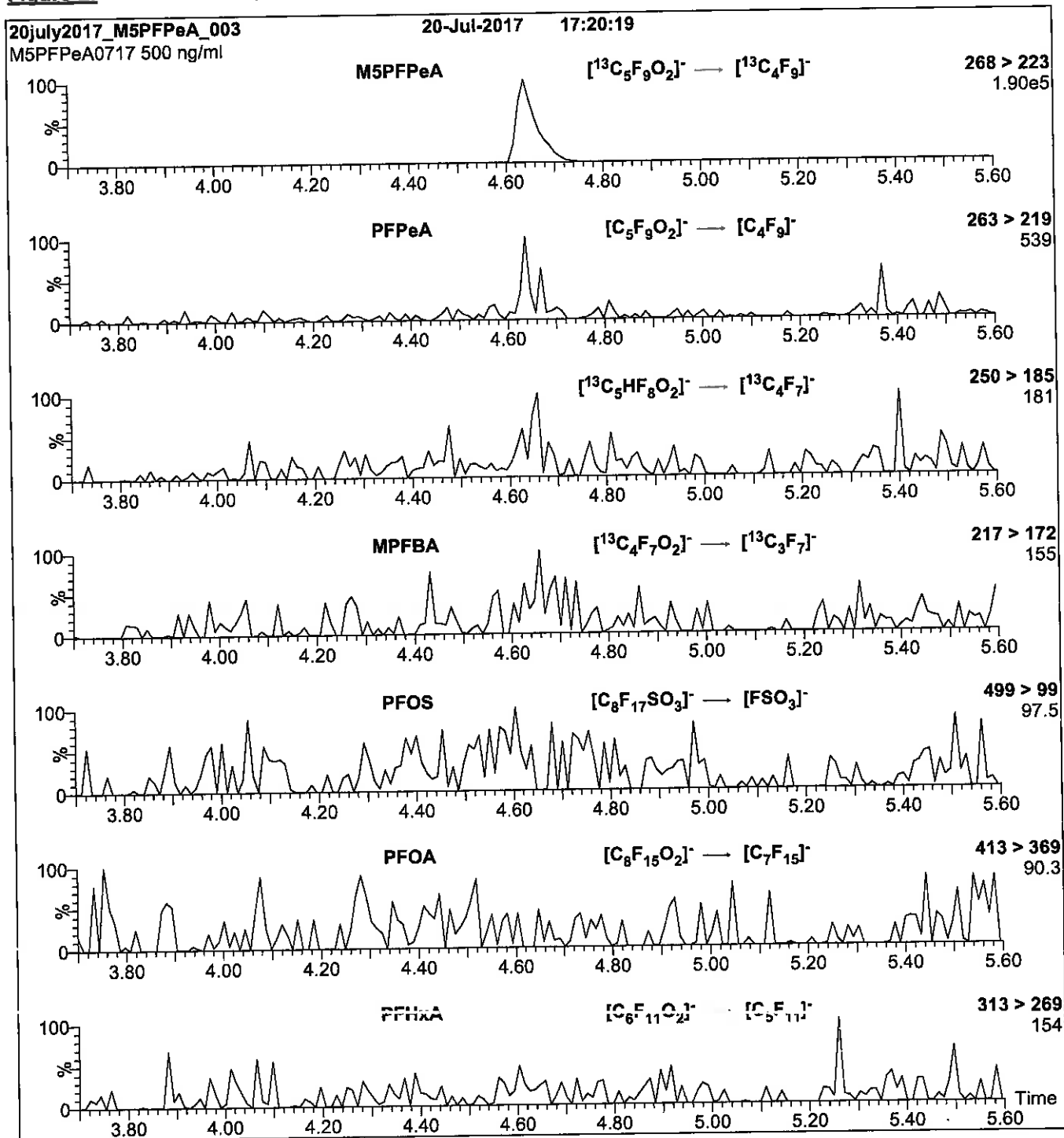
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.54e-3
 Collision Energy (eV) = 9

Reagent

LCM8FOSA_00016

1106276
ID: LCM8FOSA_00016
Exp: 10/11/22 Pp4: CCL
13C8-Perfluorooctanesulfo

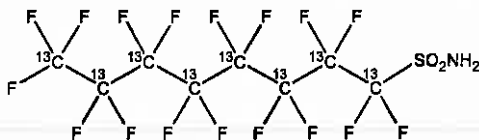
r: 12/14/17
CCL



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I **LOT NUMBER:** M8FOSA1017I
COMPOUND: Perfluoro-1-[¹³C₈]octanesulfonamide
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₈H₂F₁₇NO₂S **MOLECULAR WEIGHT:** 507.09
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Isopropanol
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 10/11/2017 (¹³C₈)
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-[¹³C₄]octanesulfonamide and ~ 0.01% of perfluoro-1-[¹³C₇]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 10/20/2017
B.G. Chittim, General Manager (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

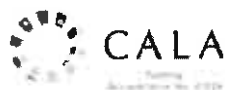
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

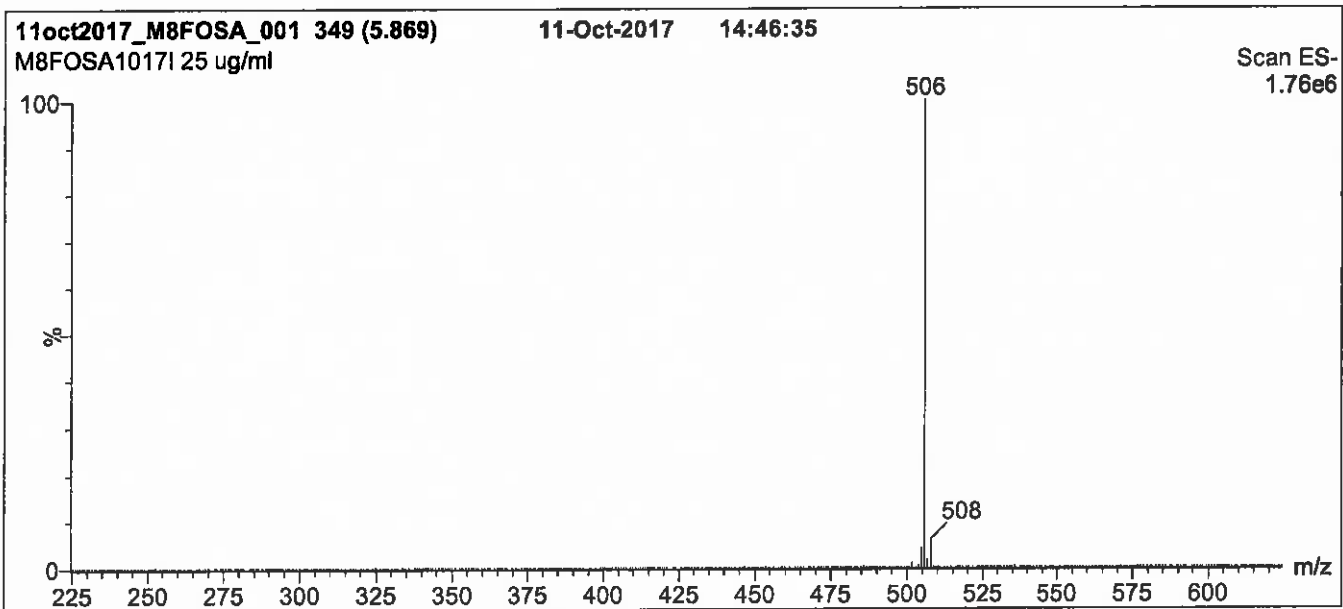
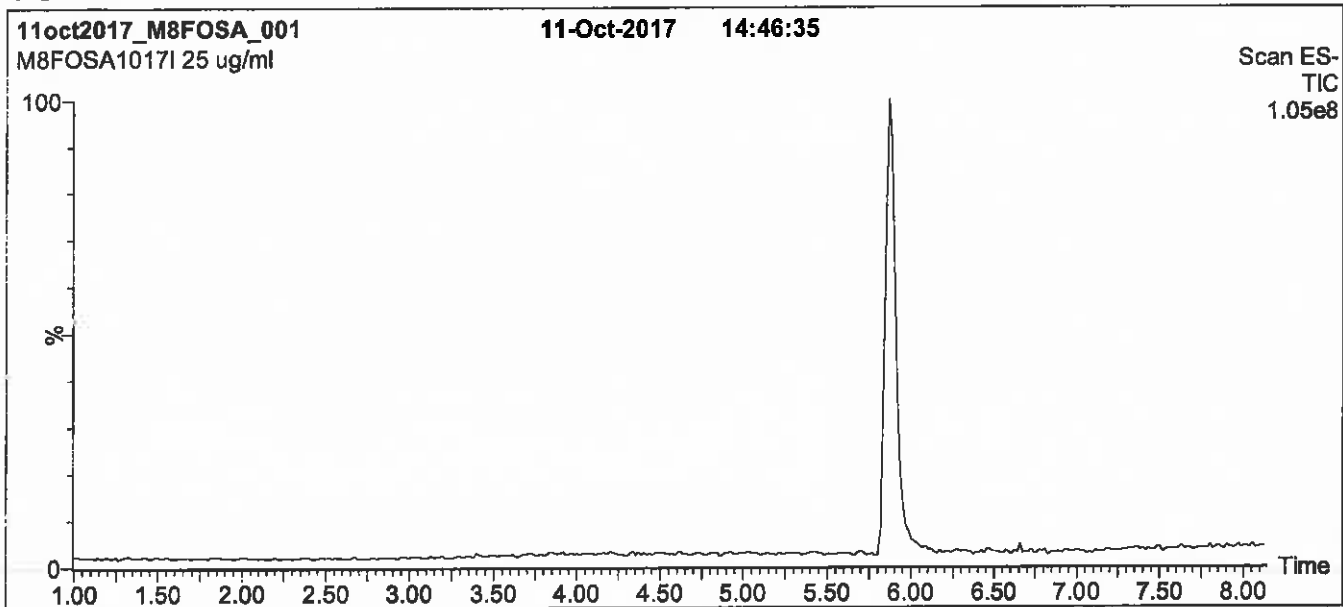
QUALITY MANAGEMENT:

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).



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 RP₁₈,
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

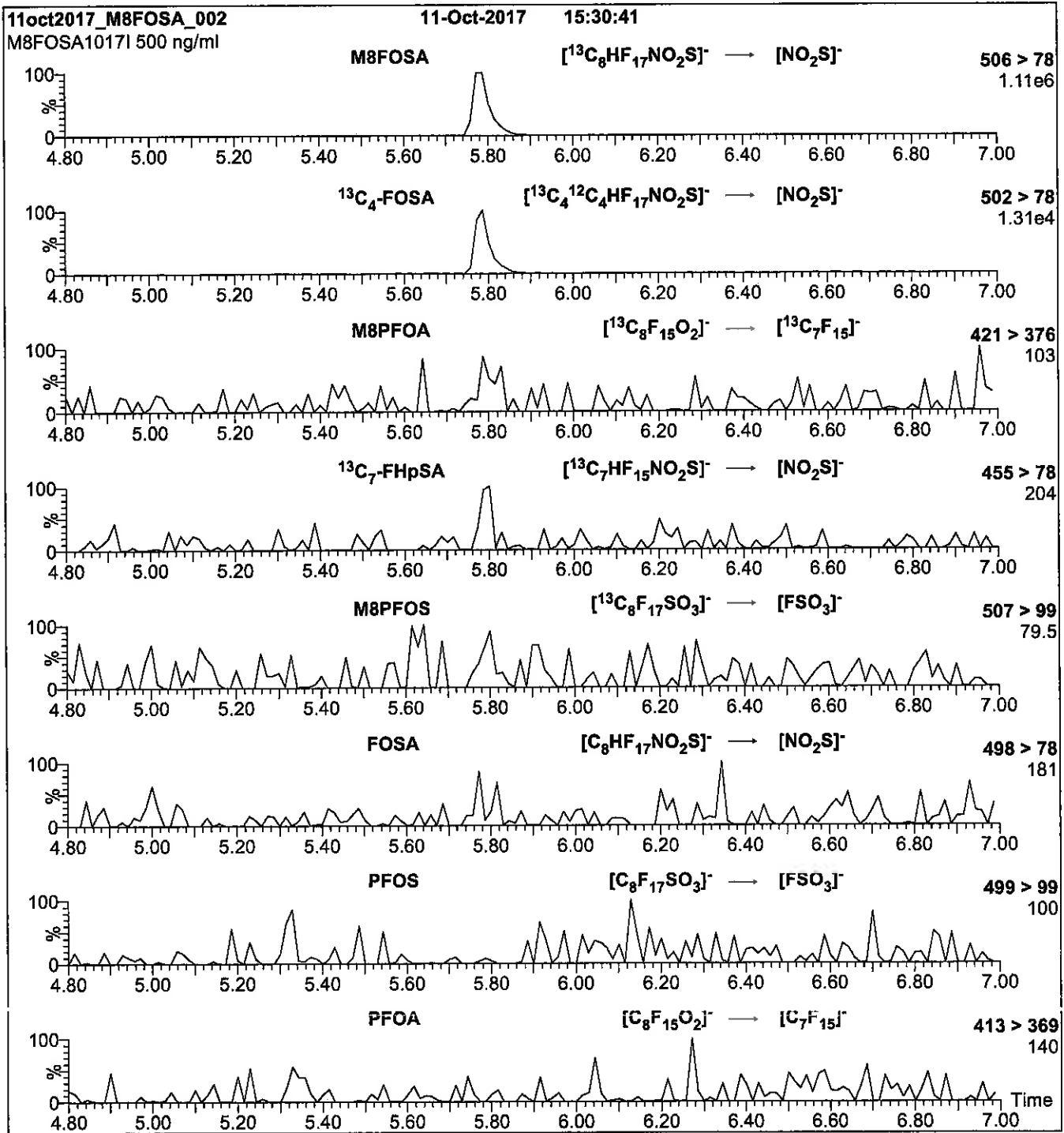
Flow: 300 μ l/min

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% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM8FOSA_00019

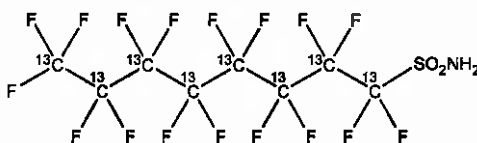


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I **LOT NUMBER:** M8FOSA10171
COMPOUND: Perfluoro-1-[¹³C₈]octanesulfonamide

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₈H₂F₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/11/2017
EXPIRY DATE: (mm/dd/yyyy) 10/11/2022
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 507.09
SOLVENT(S): Isopropanol
ISOTOPIC PURITY: ≥99% ¹³C
(¹³C₈)

DOCUMENTATION/ DATA ATTACHED:

- Figure 1: 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-[¹³C₄]octanesulfonamide and ~ 0.01% of perfluoro-1-[¹³C₇]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim, General Manager **Date:** 10/20/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

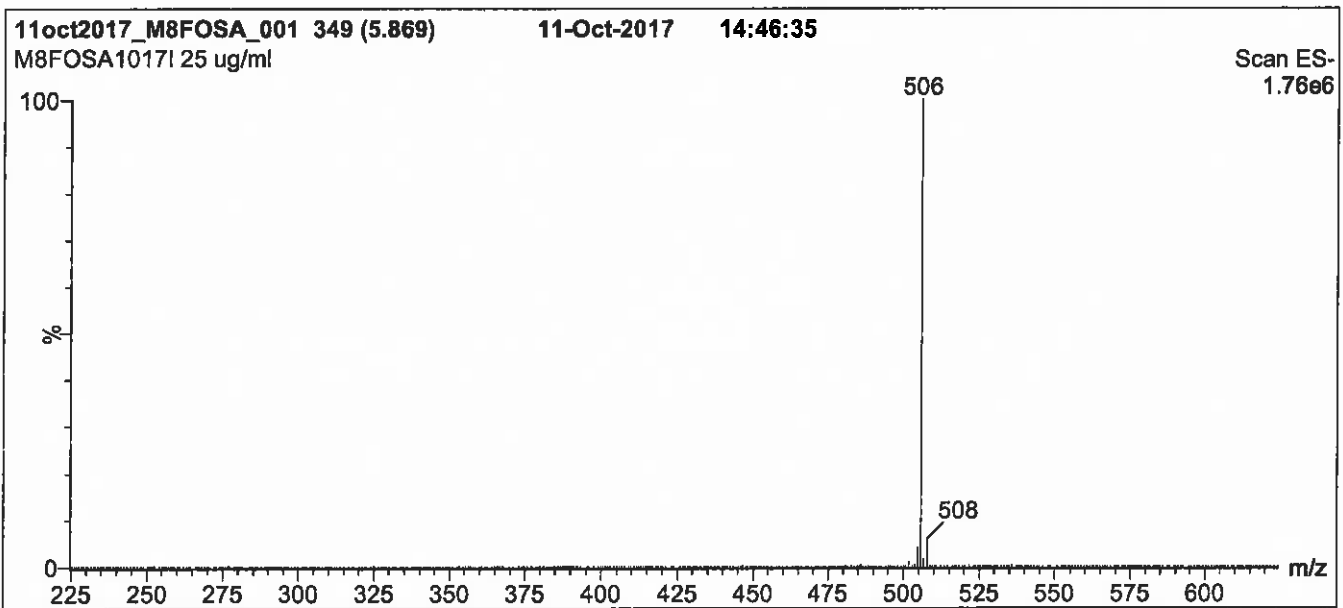
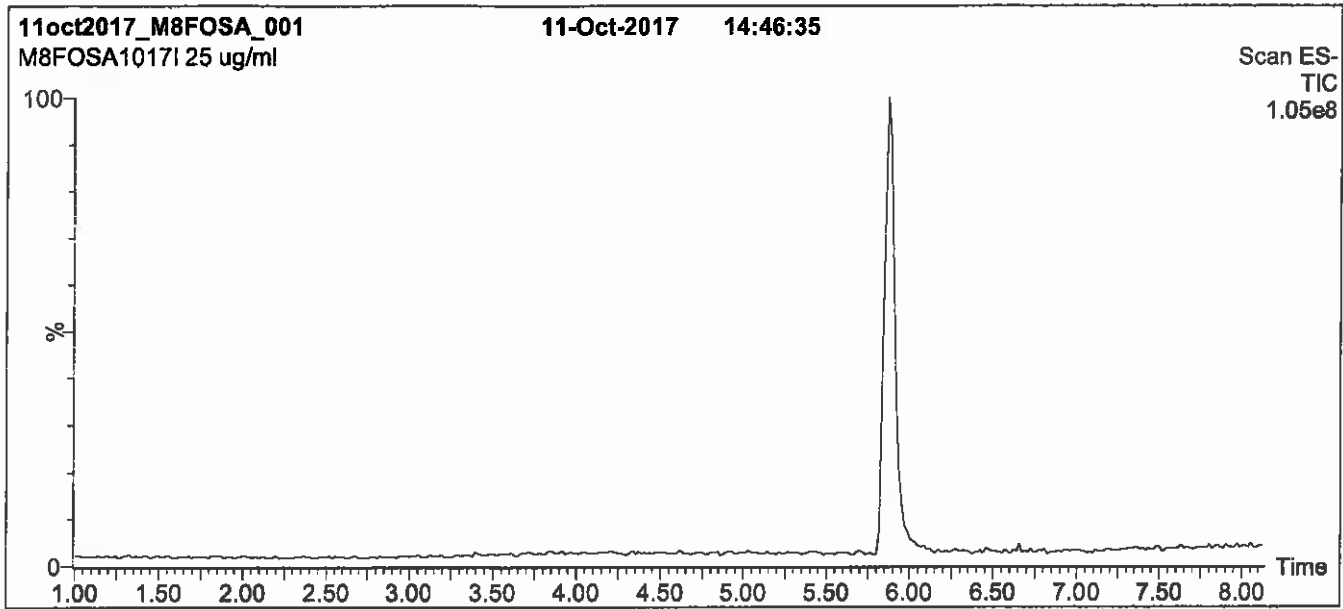
QUALITY MANAGEMENT:

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).



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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

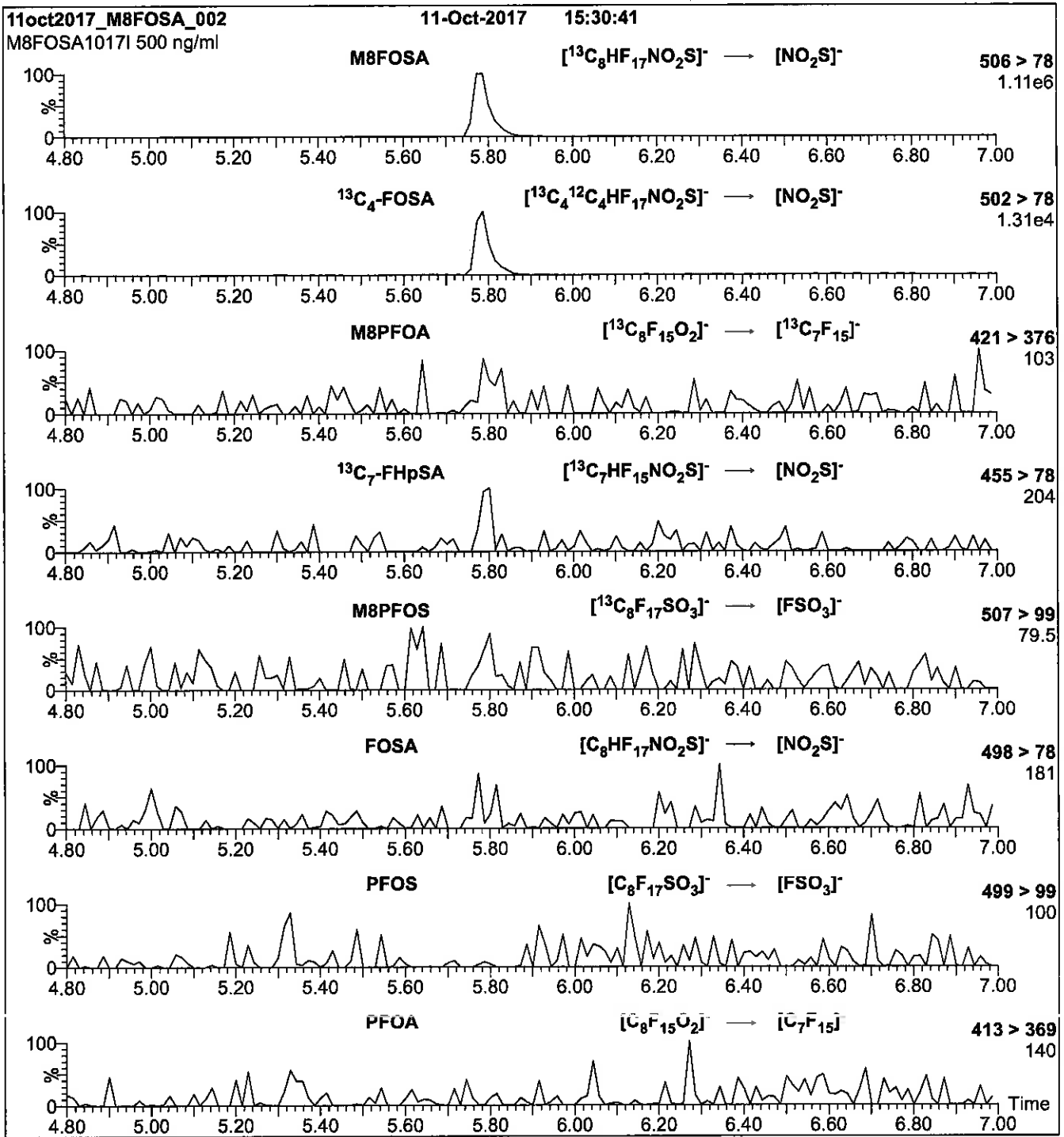
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.43×10^{-3}
Collision Energy (eV) = 30

Reagent

LCMPFBA_00013



1106251
 ID: LCMPFBA_00013
 Exp: 04/12/22 Prod: CCL
 13C4-Perfluorobutanoic ac

1: 12/14/17 ccc

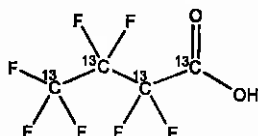


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFBA **LOT NUMBER:** MPFBA0417
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]butanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ HF ₇ O ₂	MOLECULAR WEIGHT:	218.01
CONCENTRATION:	50 ± 2.5 µg/ml	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2,3,4- ¹³ C ₄)
LAST TESTED: (mm/dd/yyyy)	04/12/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/12/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{j=1}^n u(y, x_j)^2}$$

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 $\pm 5\%$ (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.

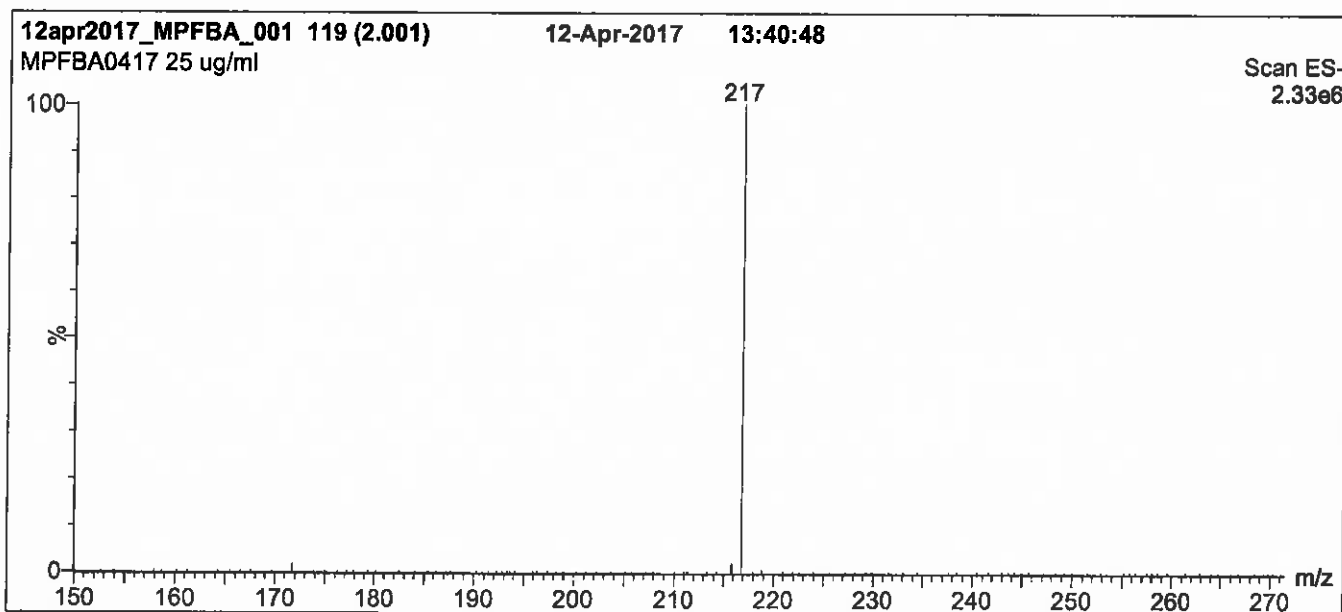
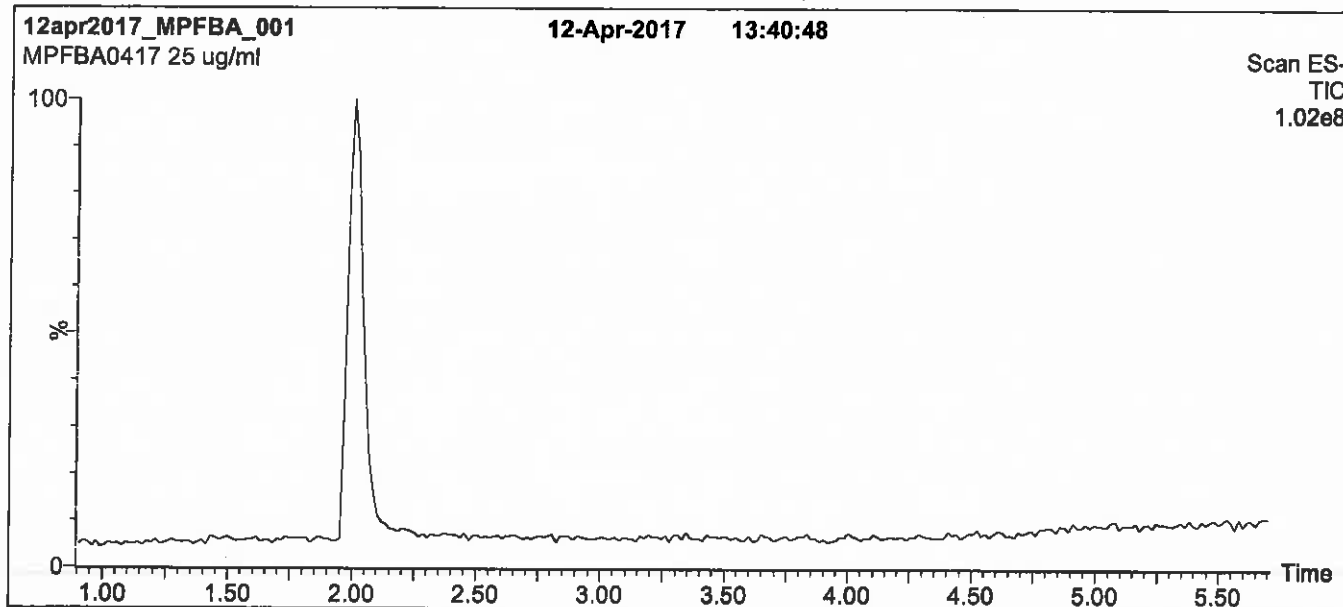
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 30% (80:20 MeOH:ACN) / 70% H₂O
 (both with 10 mM NH₄OAc 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

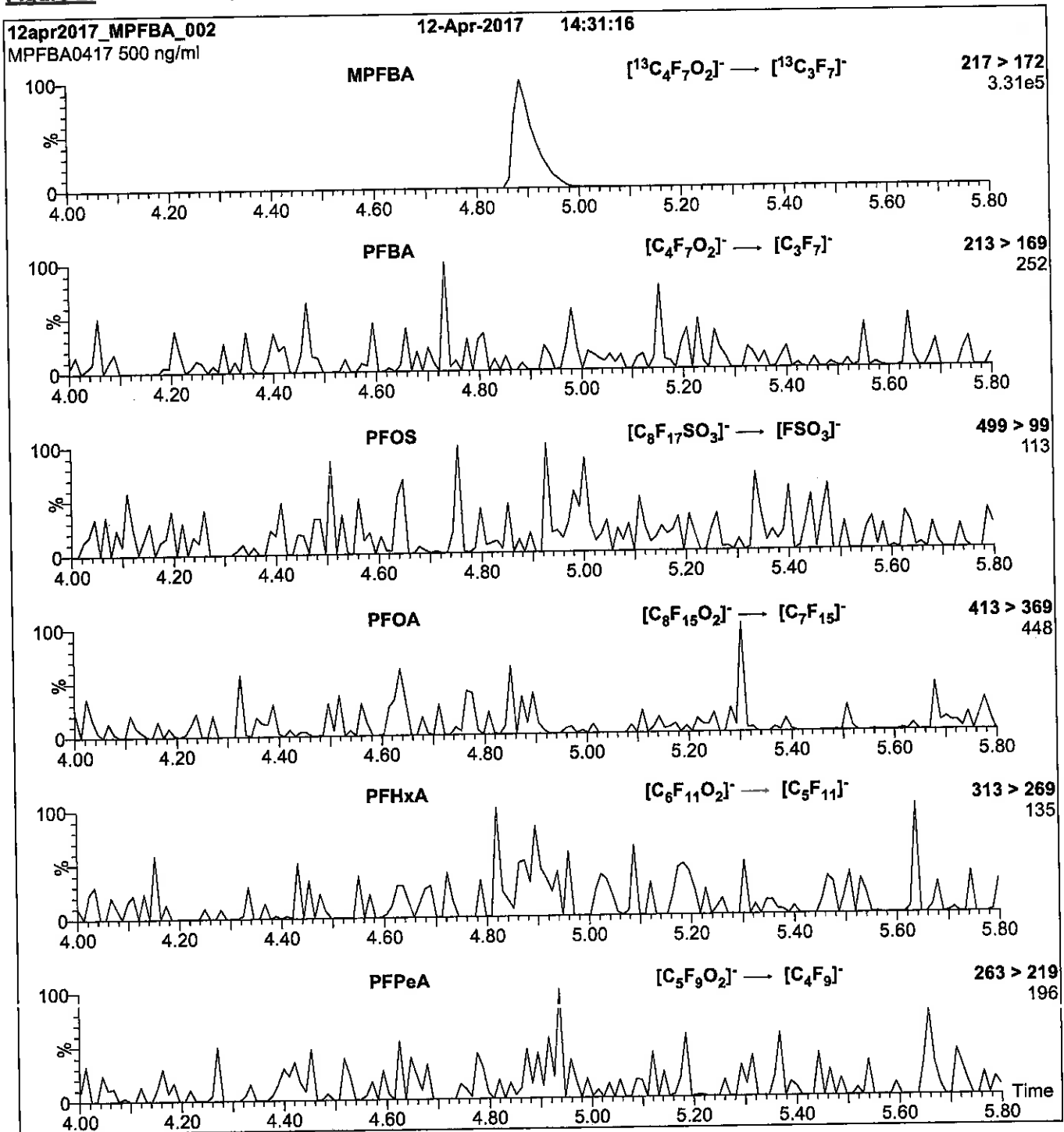
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFBA_00015



R: 5/30/18 cbw

1263154

ID: LCMFBA_00015

Exp: 02/16/23 Prep: CBW Opn: 05/30/18

13C4-Perfluorobutanoic ac

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

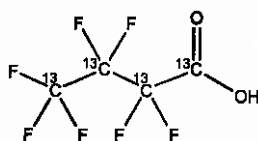
MPFBA

LOT NUMBER:

MPFBA0218

COMPOUND:Perfluoro-n-[1,2,3,4-¹³C₄]butanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₄HF₇O₂**MOLECULAR WEIGHT:**

218.01

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99%¹³C(1,2,3,4-¹³C₄)**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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 02/22/2018

(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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

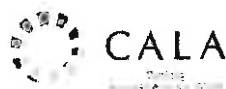
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

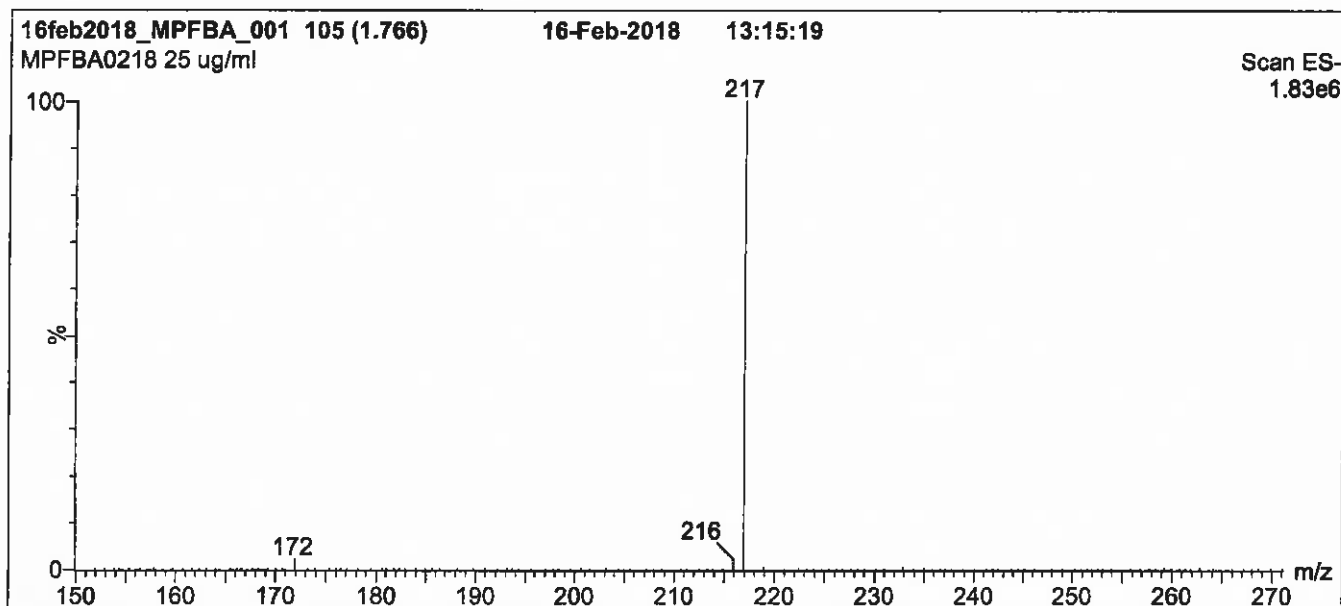
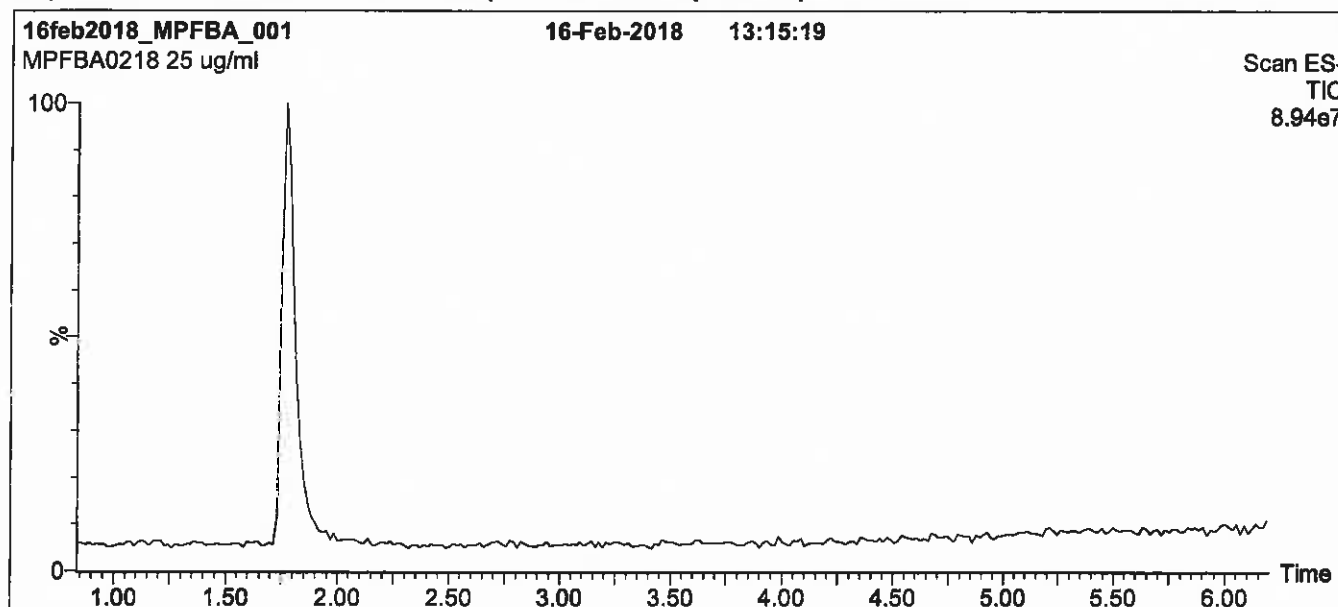
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc 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

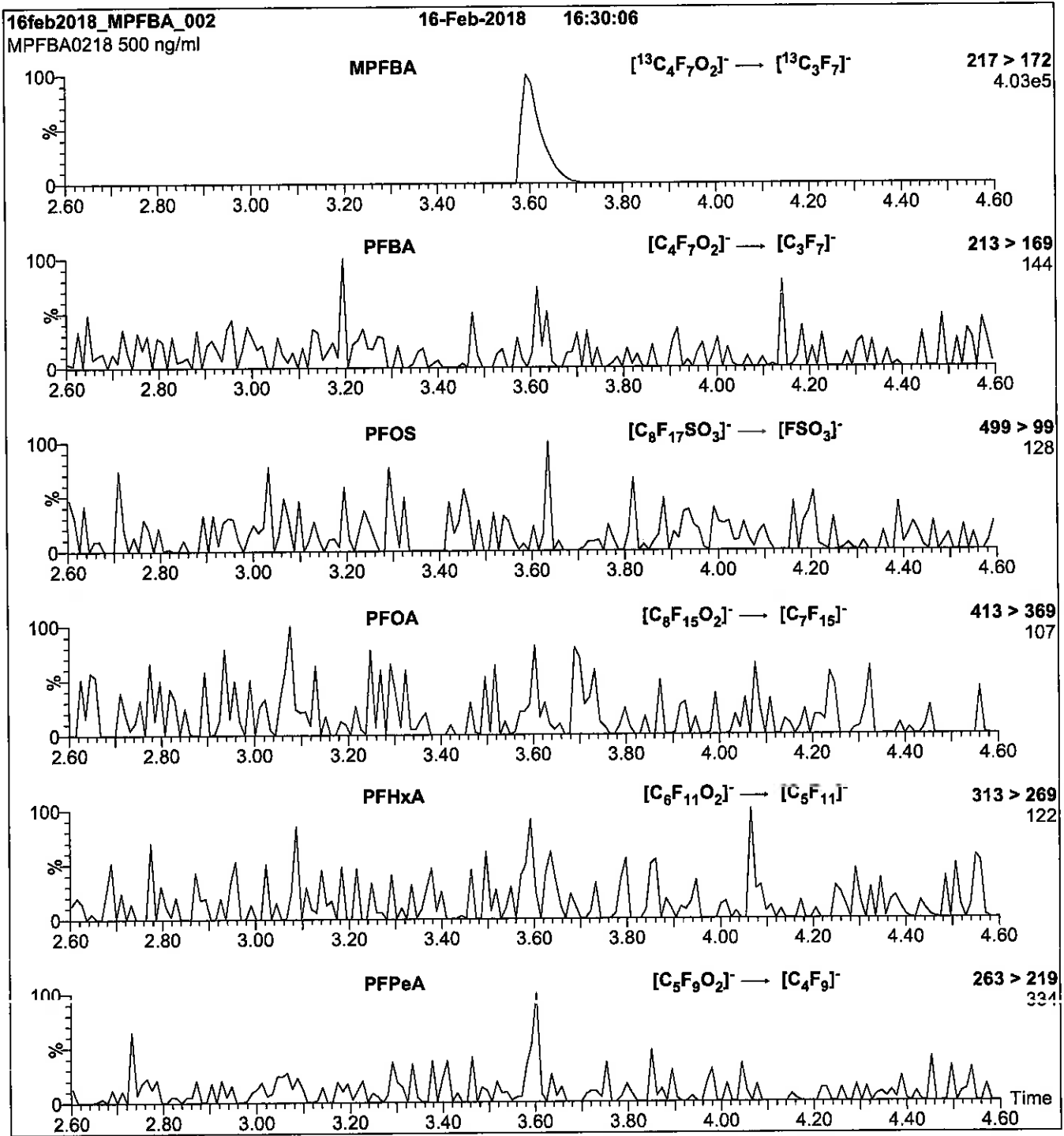
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFBS_00006

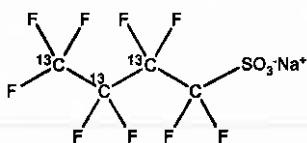
r: 12/4/17 ccc



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBS **LOT NUMBER:** M3PFBS0815
COMPOUND: Sodium perfluoro-1-[2,3,4-¹³C₃]butanesulfonate
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₃¹²CF₆SO₃Na **MOLECULAR WEIGHT:** 325.06
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
46.5 ± 2.3 µg/ml (M3PFBS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 05/24/2017 (2,3,4-¹³C₃)
EXPIRY DATE: (mm/dd/yyyy) 05/24/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 05/25/2017
B.G. Chittim, General Manager (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

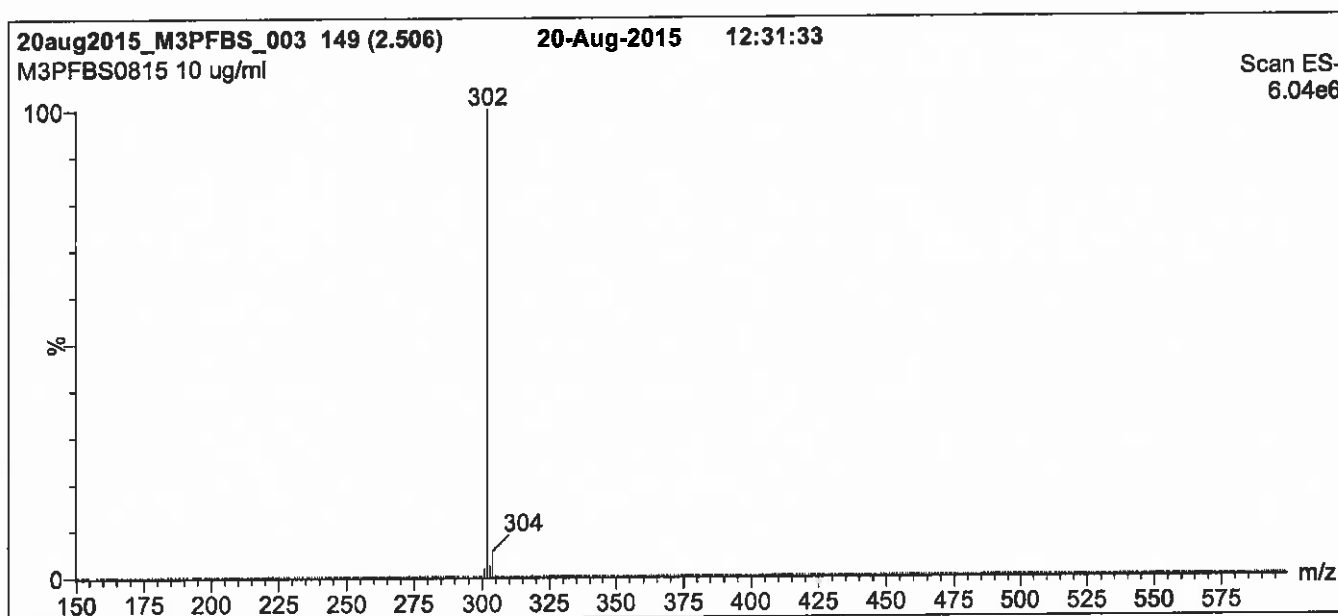
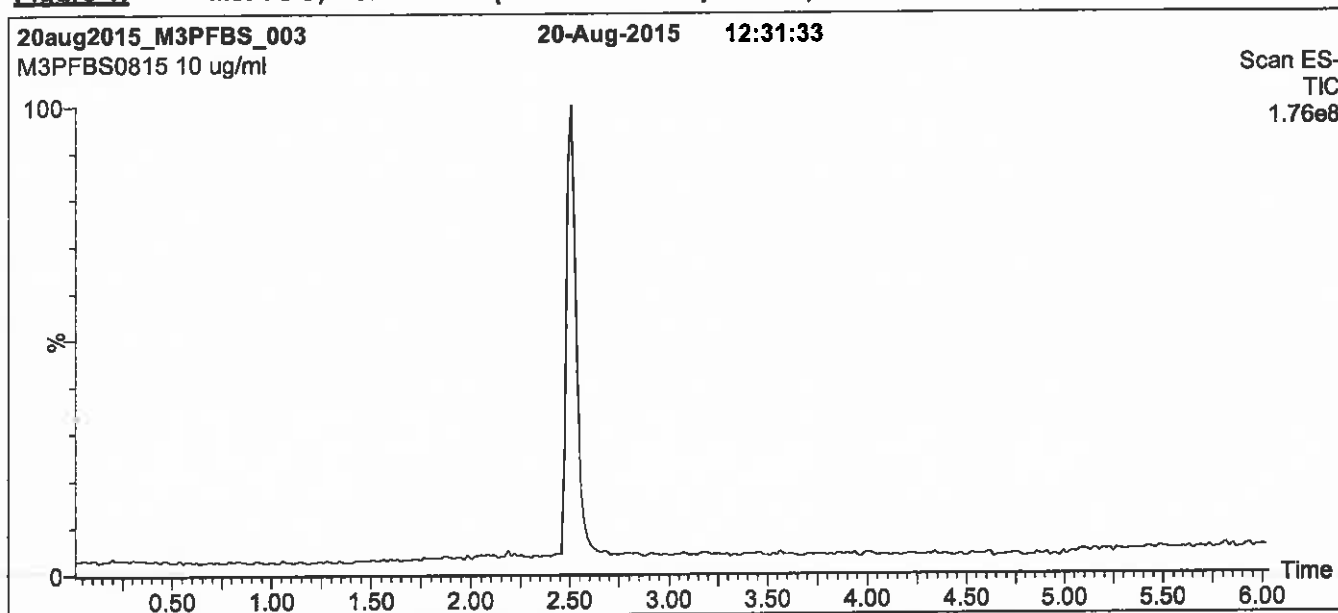
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 40% (80:20 MeOH:ACN) / 60% H₂O
 (both with 10 mM NH₄OAc 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

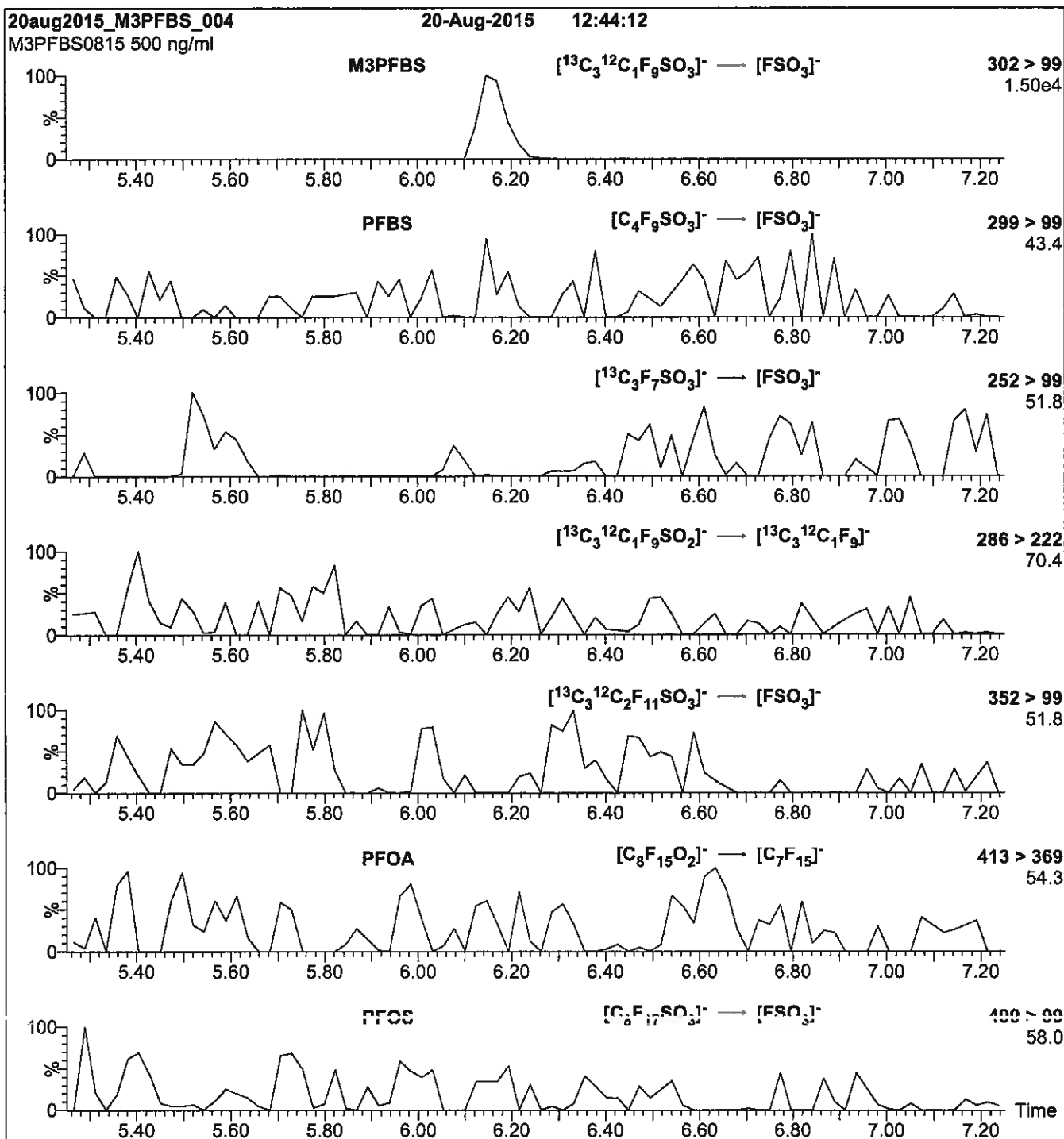
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 25

Reagent

LCMPFBS_00008

R: 5/30/18 *CB*

1263177
ID: LCMFBS_00008
Exp: 02/15/23 Ppd: CBW Opn: 05/30/18
13C3-Perfluorobutanesulfo

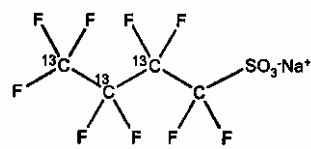


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBS **LOT NUMBER:** M3PFBS0218
COMPOUND: Sodium perfluoro-1-[2,3,4-¹³C₃]butanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₃ ¹² CF ₉ SO ₃ Na	MOLECULAR WEIGHT:	325.06
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.5 ± 2.3 µg/ml (M3PFBS anion)	SOLVENT(S):	Methanol
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (2,3,4- ¹³ C ₃)
LAST TESTED: (mm/dd/yyyy)	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
B.G. Chittim, General Manager (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.

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 (SDS) 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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

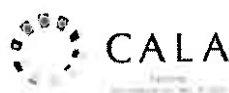
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

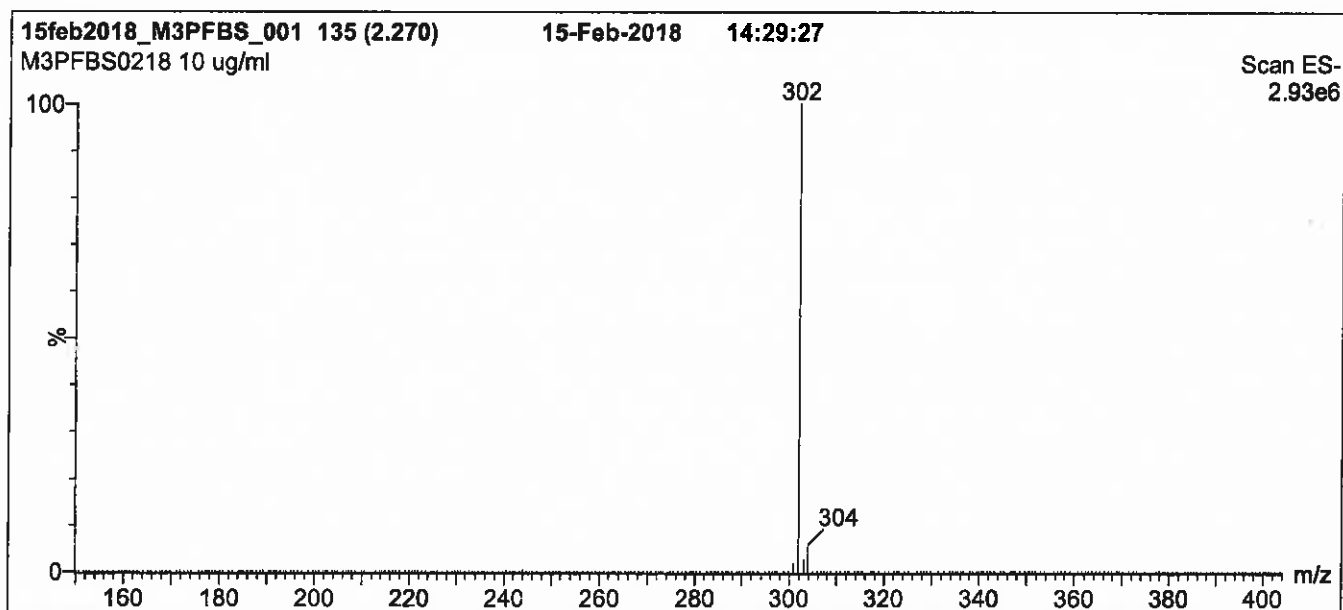
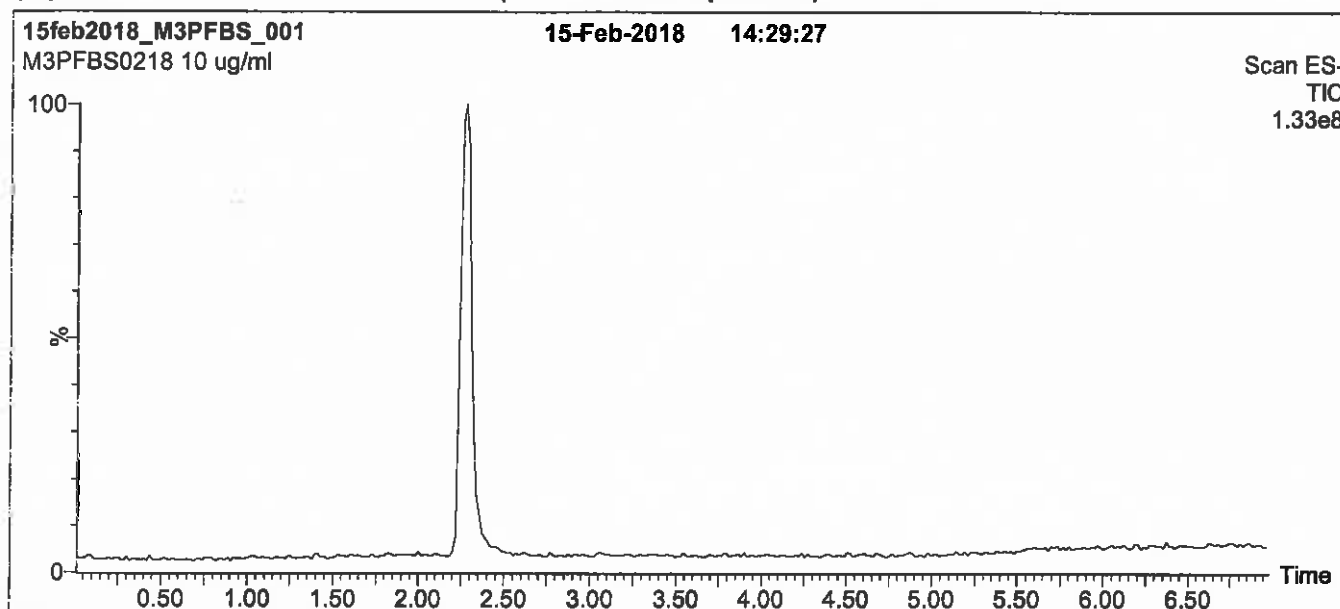
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc 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

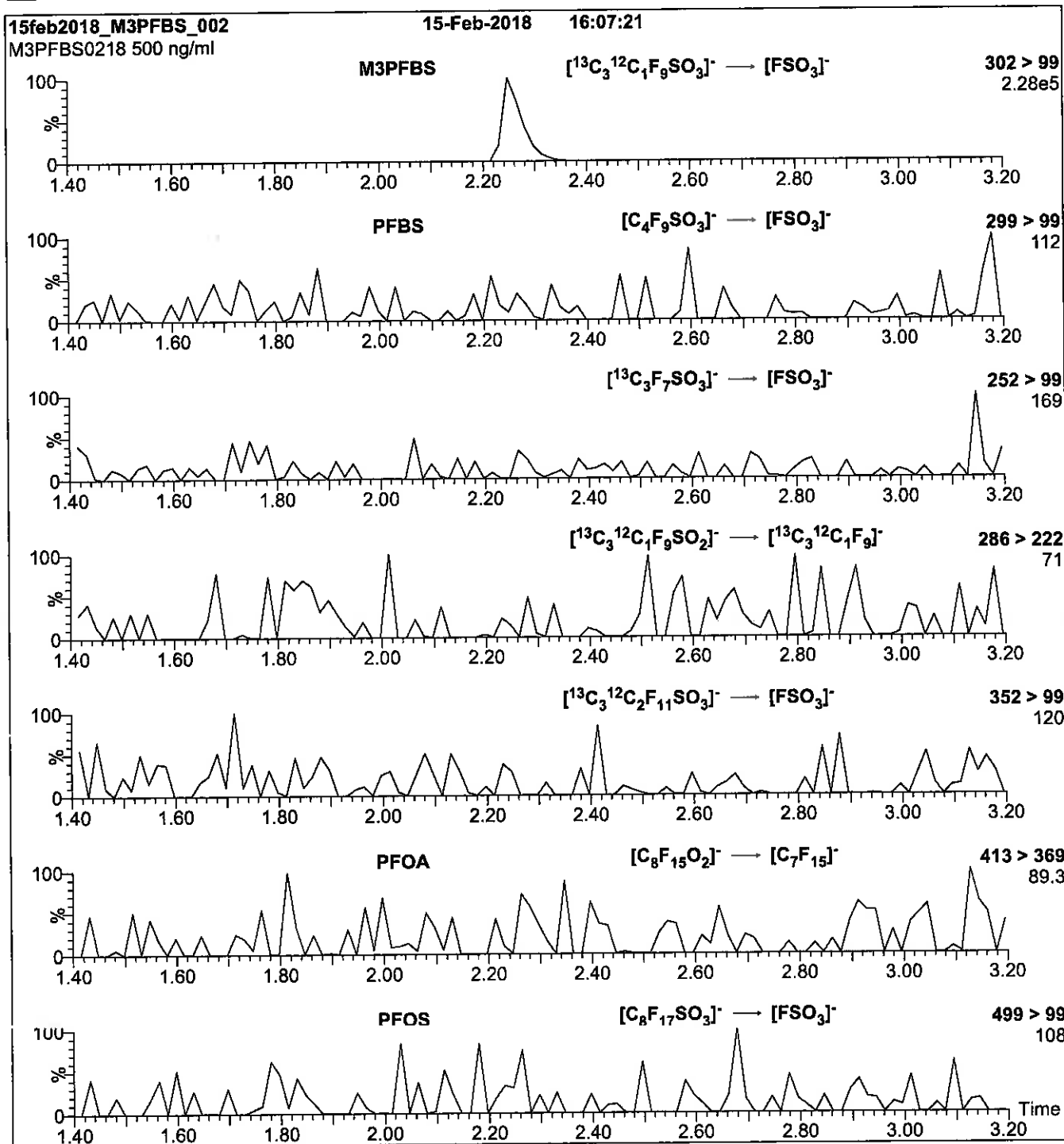
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 25

Reagent

LCMPFDA_00018

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 (SDS) 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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

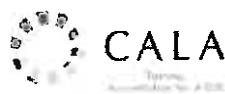
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

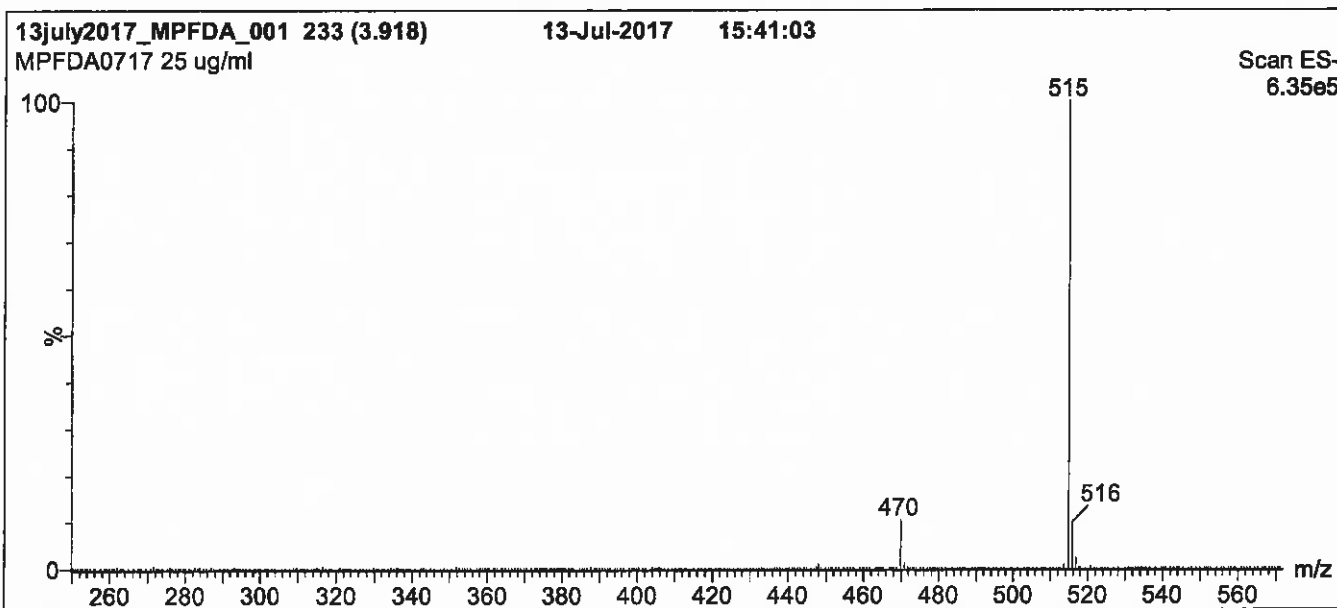
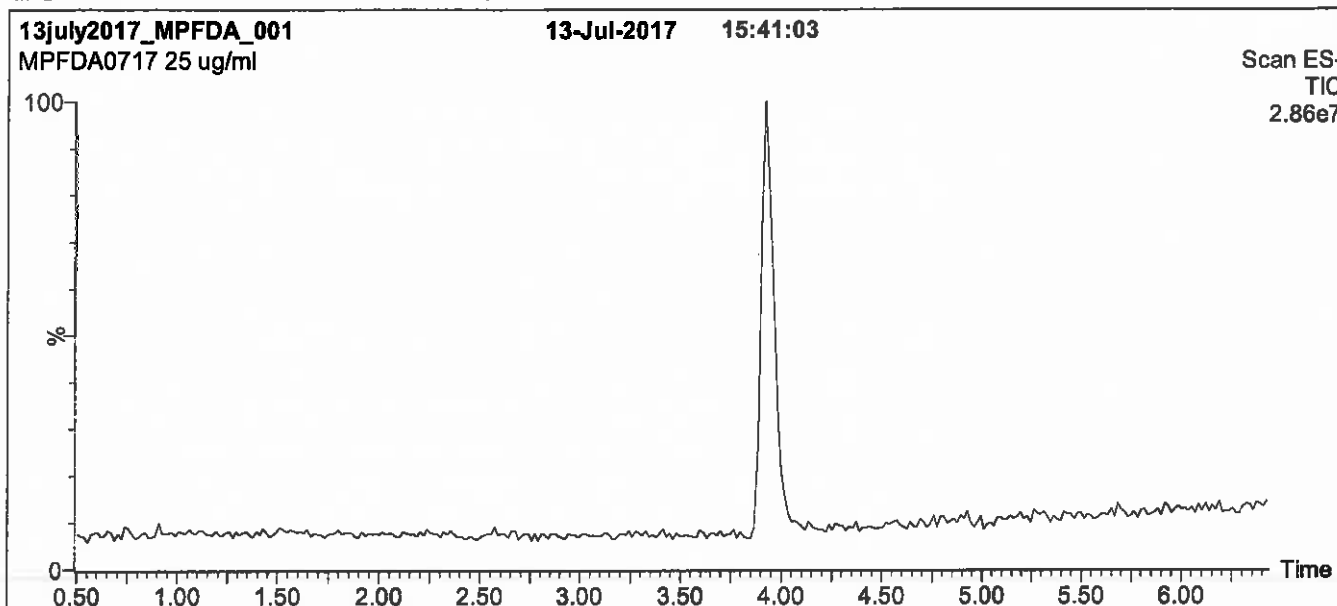
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

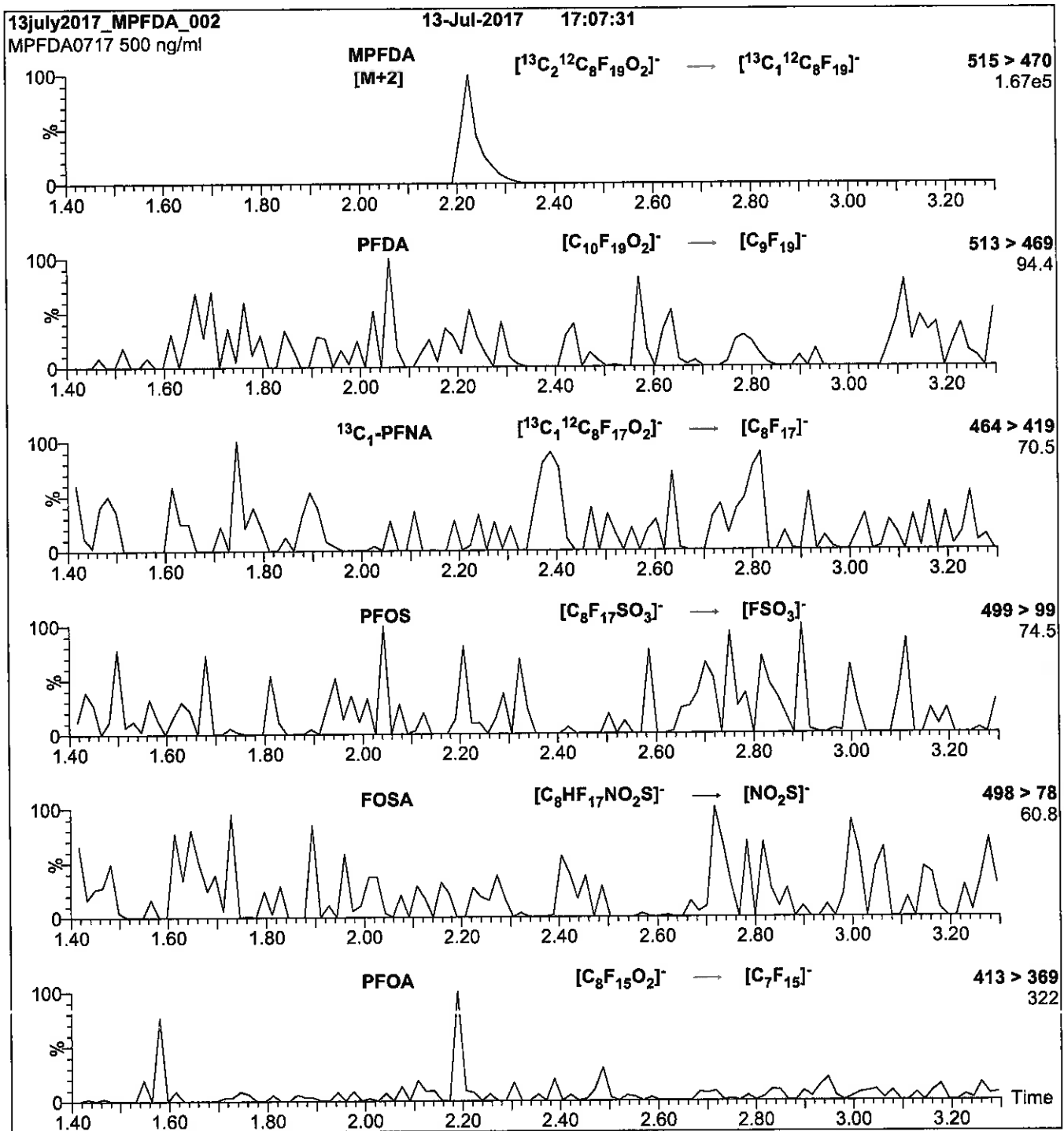
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.17\text{e-}3$
 Collision Energy (eV) = 13

Reagent

LCMPFDA_00020



1263165

ID: LCMPFDA_00020

Exp:02/16/23 Prod:CBM Cpn:0500/18

13C2-Perfluorodecanoic a

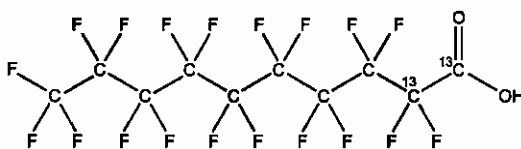


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA **LOT NUMBER:** MPFDA0218
COMPOUND: Perfluoro-n-[1,2-¹³C₂]decanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₈O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023

ISOTOPIC PURITY: ≥99% ¹³C
 (1,2-¹³C₂)

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 ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager **Date:** 03/07/2018
 (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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

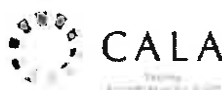
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

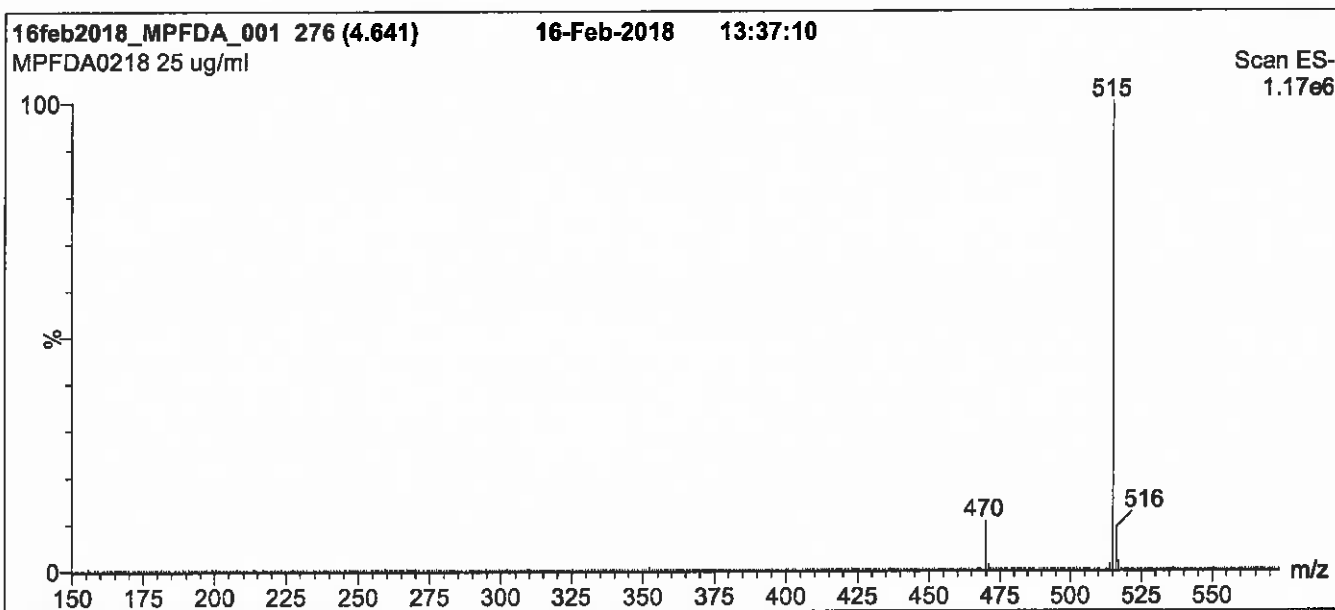
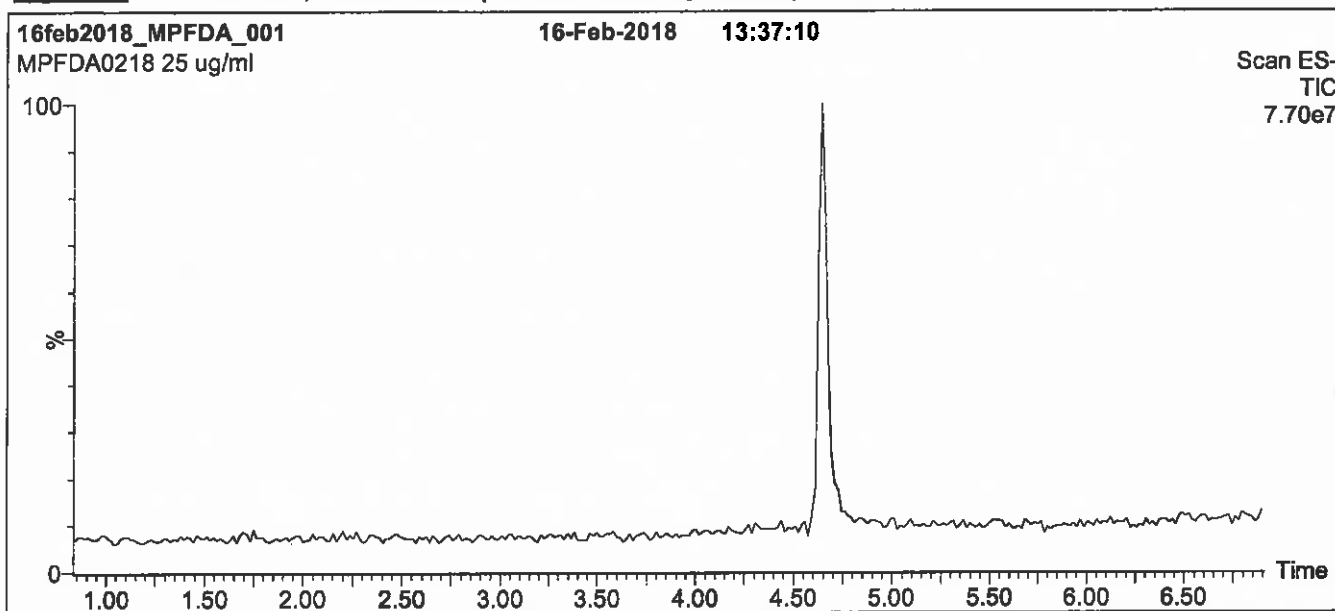
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

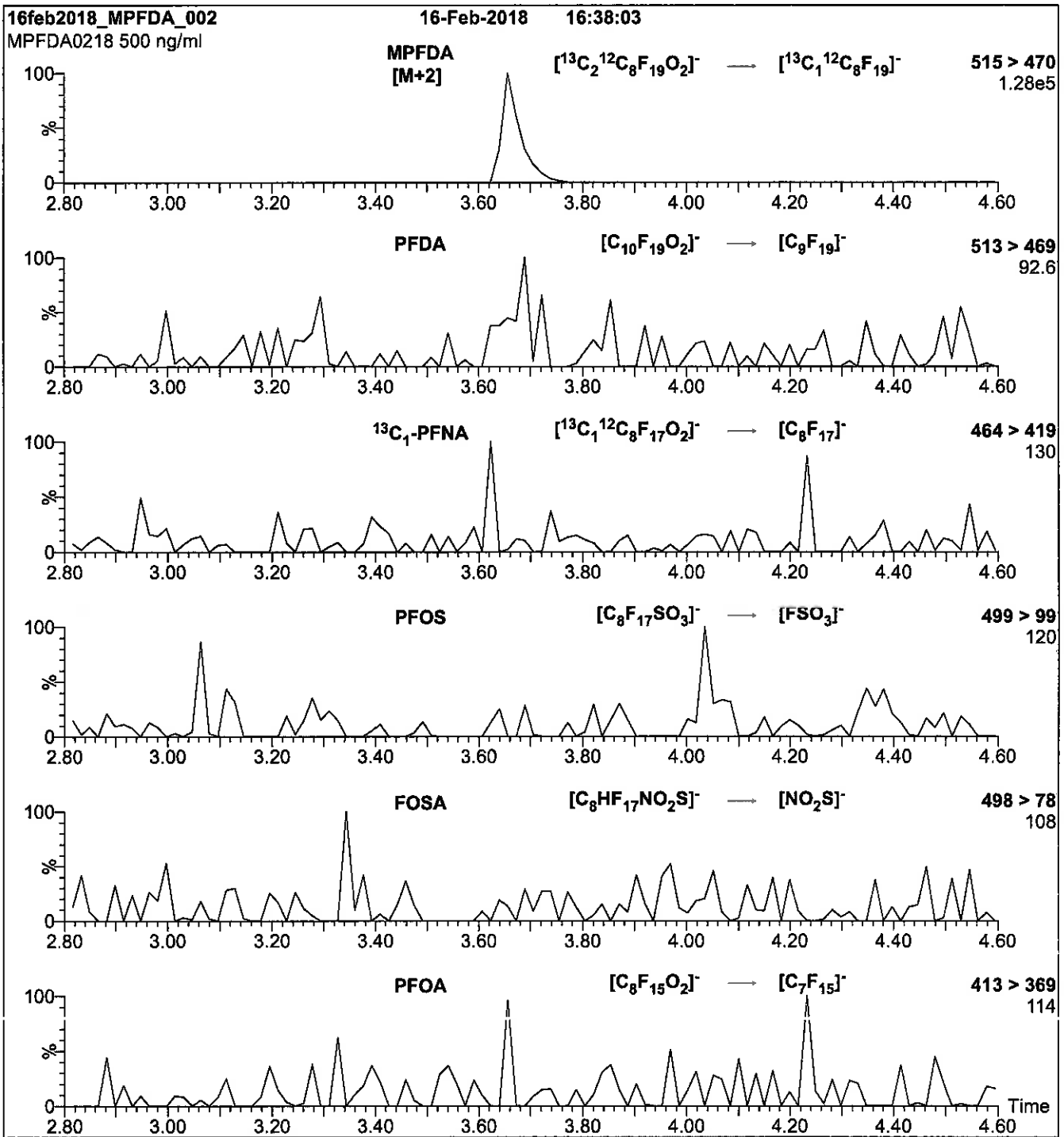
Flow: 300 μ l/min

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 μ l (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCMPFD_oA_00013



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

0: 12/4/17

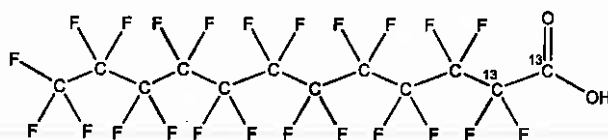


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA **LOT NUMBER:** MPFDoA0517
COMPOUND: Perfluoro-n-[1,2-¹³C₂]dodecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₀H₂₃O₂ **MOLECULAR WEIGHT:** 616.08
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 05/23/2017
EXPIRY DATE: (mm/dd/yyyy) 05/23/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

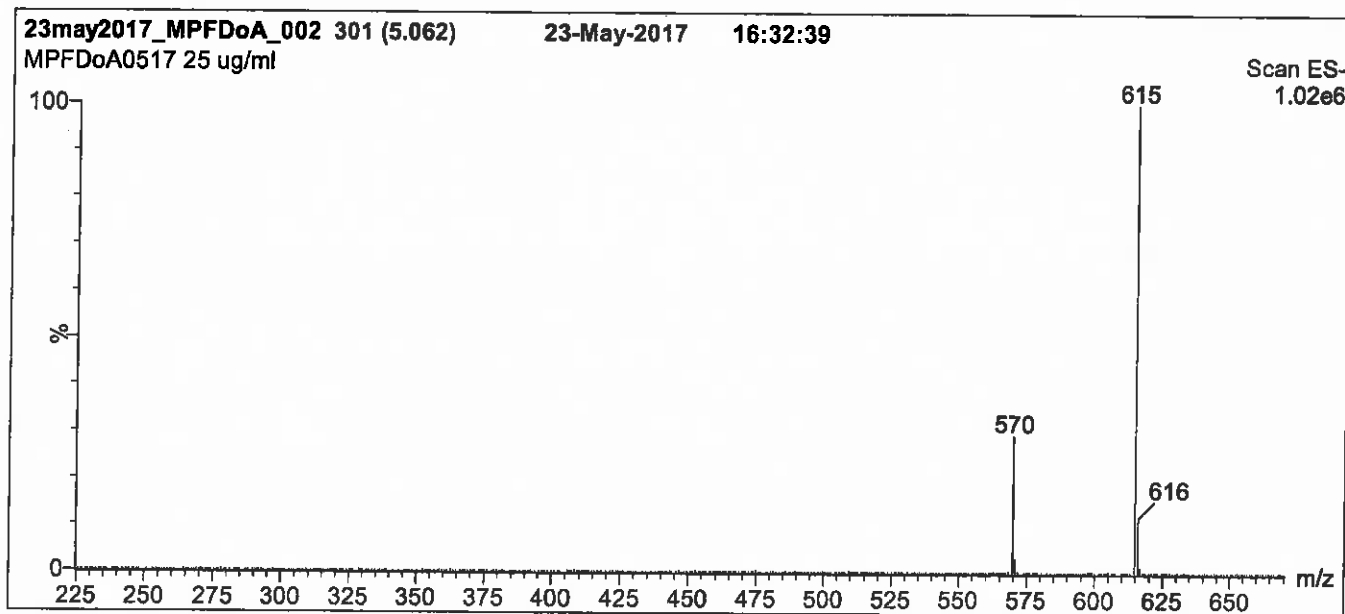
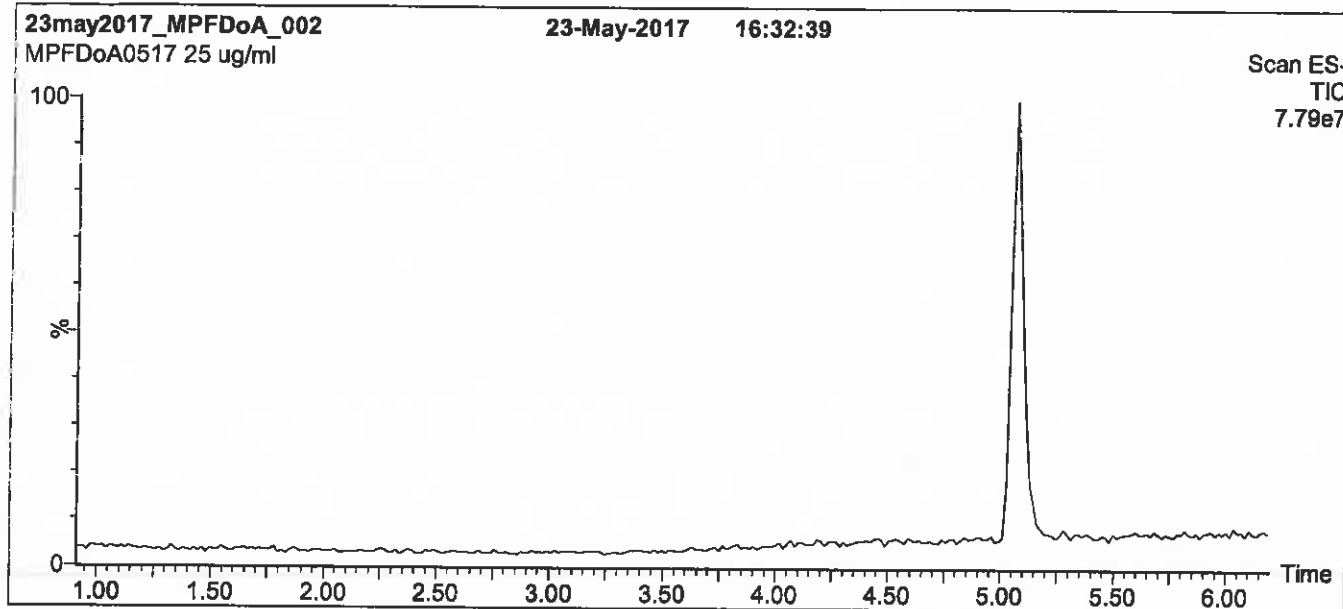
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

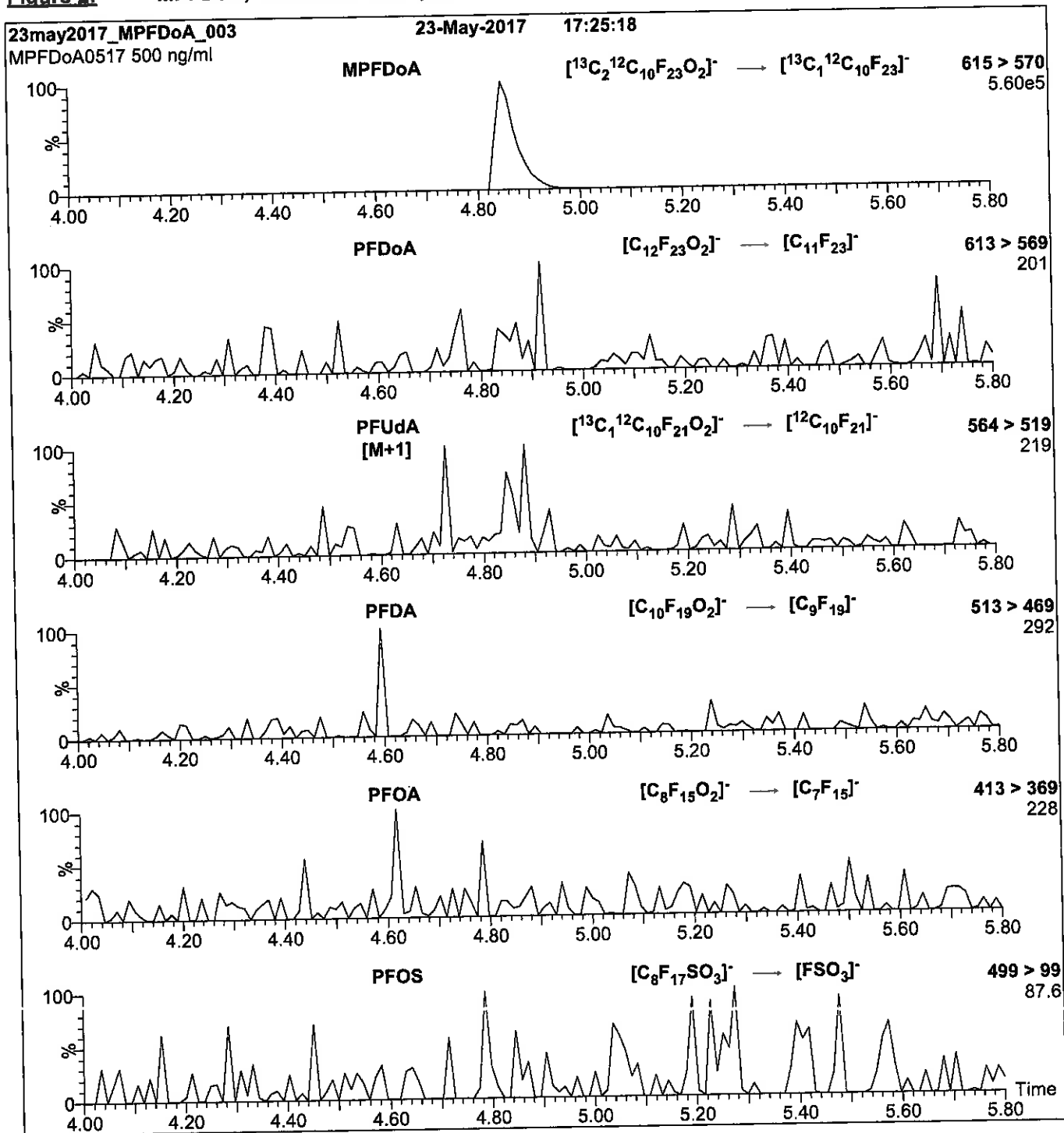
Mobile phase: Gradient
 Start: 60% (80:20 MeOH:ACN) / 40% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 1.5 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
 Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.00
 Cone Voltage (V) = 20.00
 Cone Gas Flow (l/hr) = 100
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.39e-3
 Collision Energy (eV) = 13

Reagent

LCMPFD_oA_00015

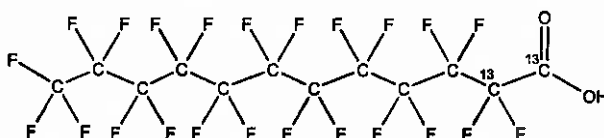


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA **LOT NUMBER:** MPFDoA0218
COMPOUND: Perfluoro-n-[1,2-¹³C₂]dodecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₀HF₂₃O₂ **MOLECULAR WEIGHT:** 616.08
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2-¹³C₂)
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

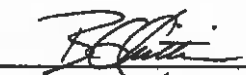
DOCUMENTATION/ DATA ATTACHED:

- 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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 02/23/2018
B.G. Chittim, General Manager (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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

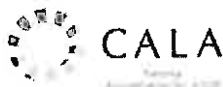
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

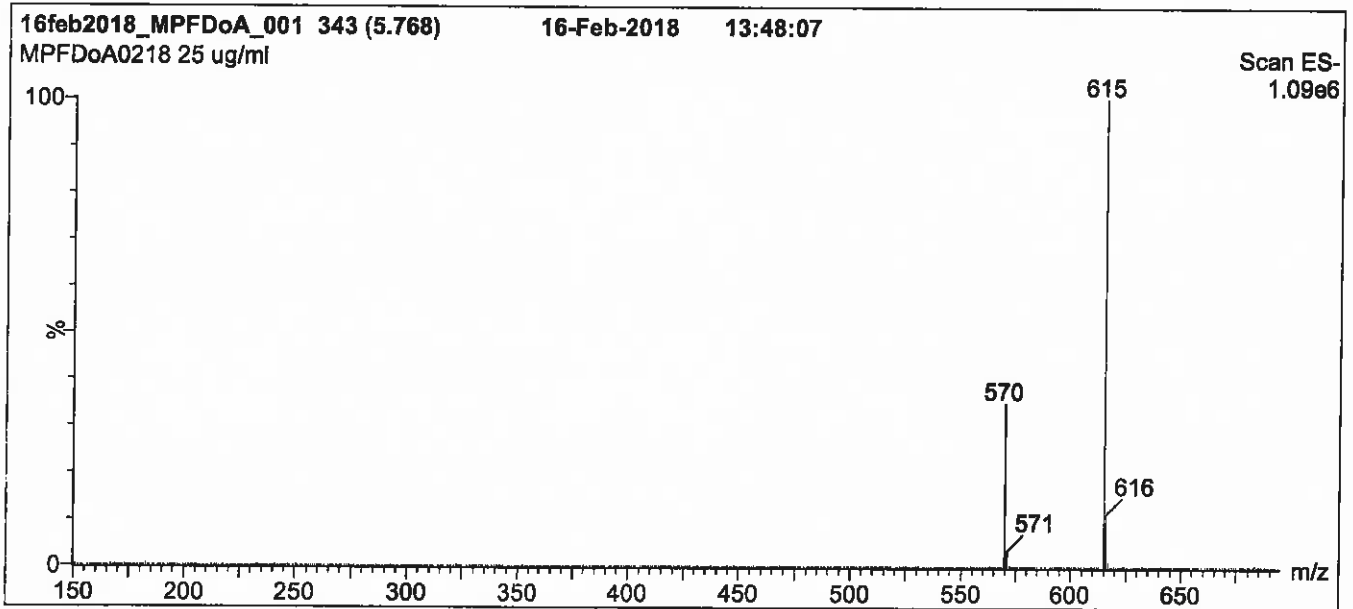
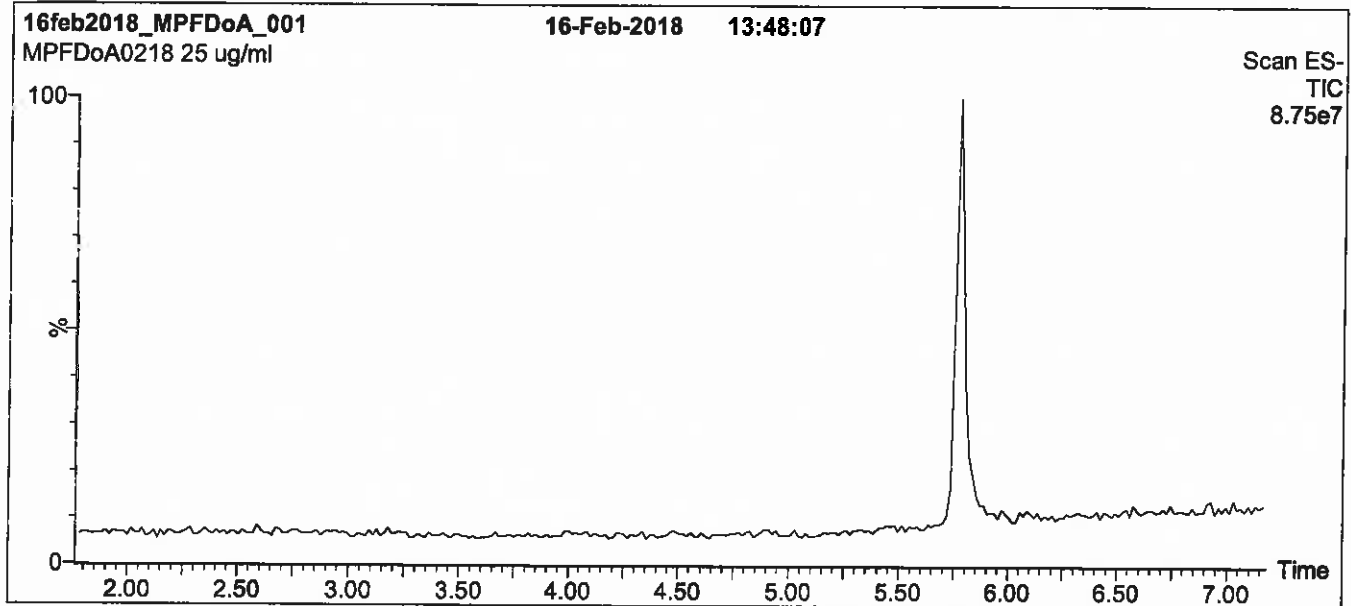
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

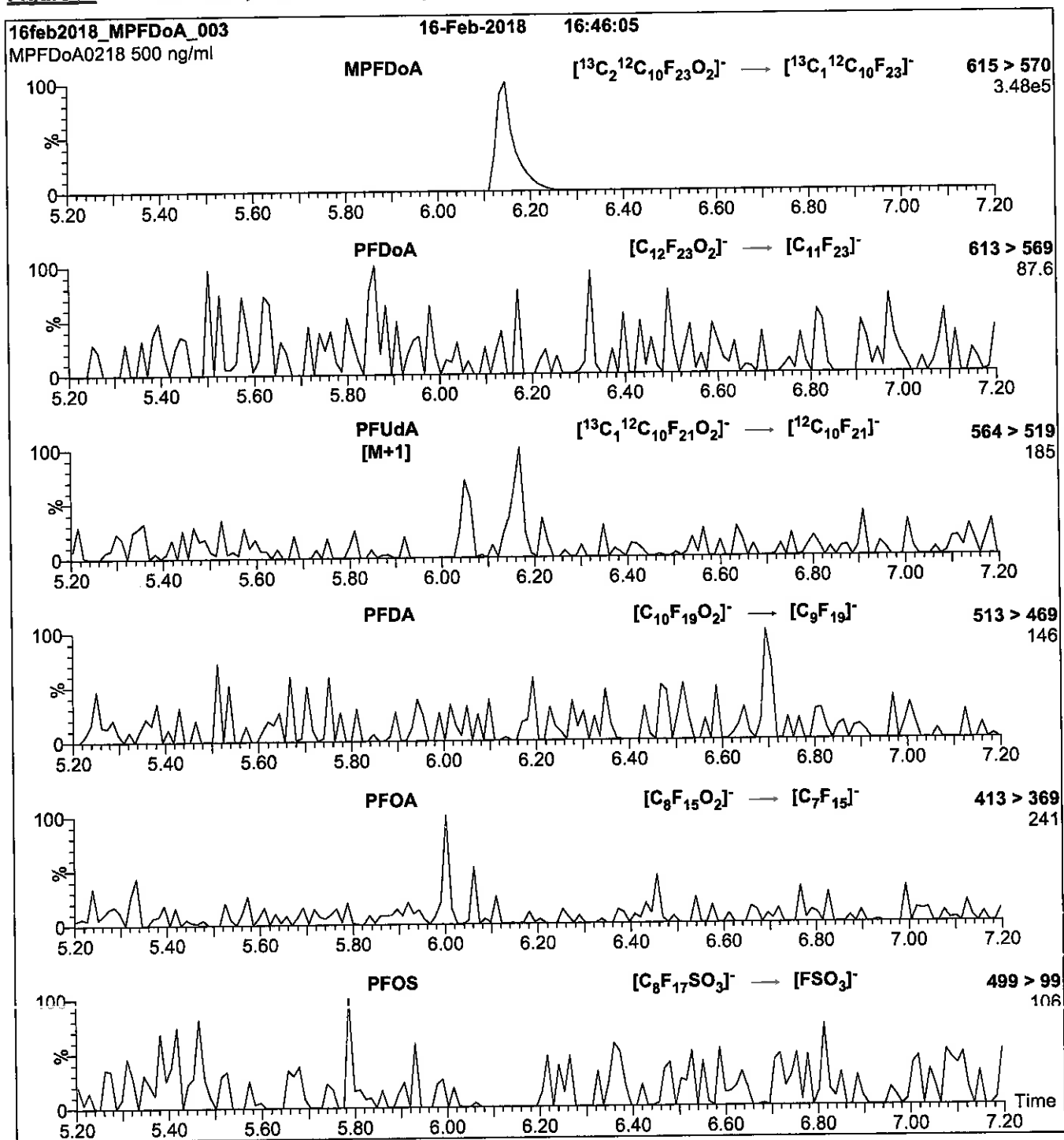
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFHxA_00019

V: 10/14/17 CCL



WELLINGTON LABORATORIES

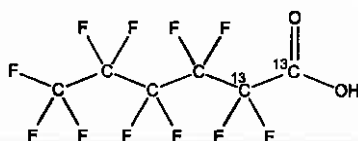
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexanoic acid

LOT NUMBER: MPFHxA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₄HF₁₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

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: 
B.G. Chittim, General Manager

Date: 10/30/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

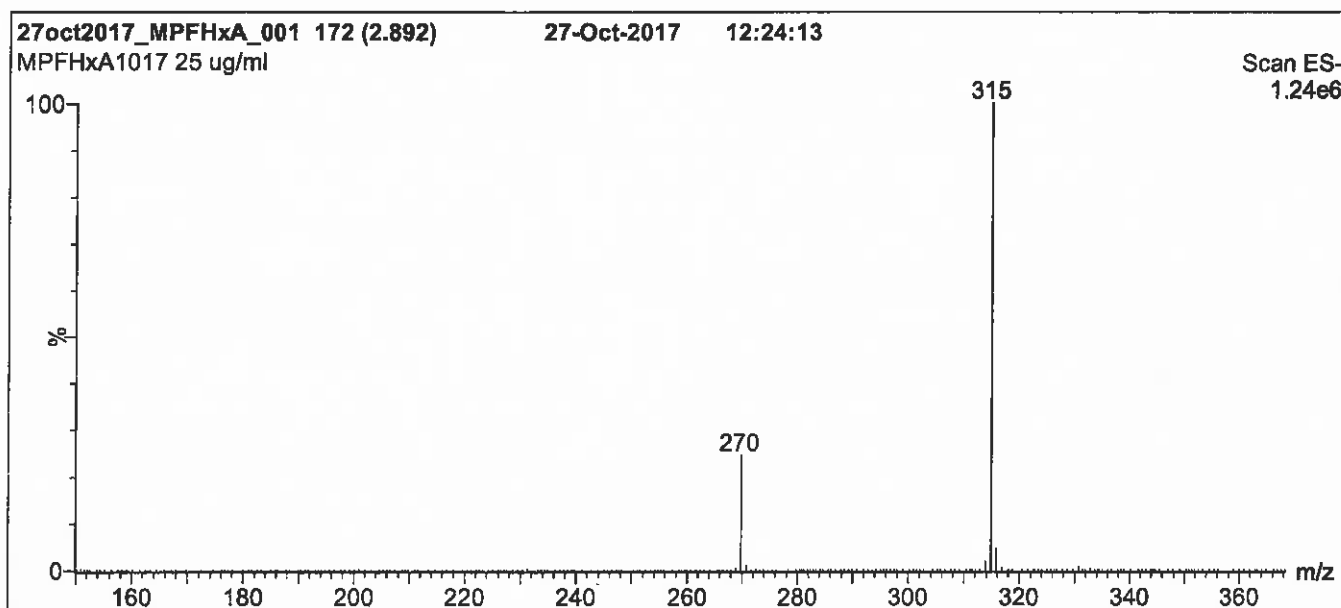
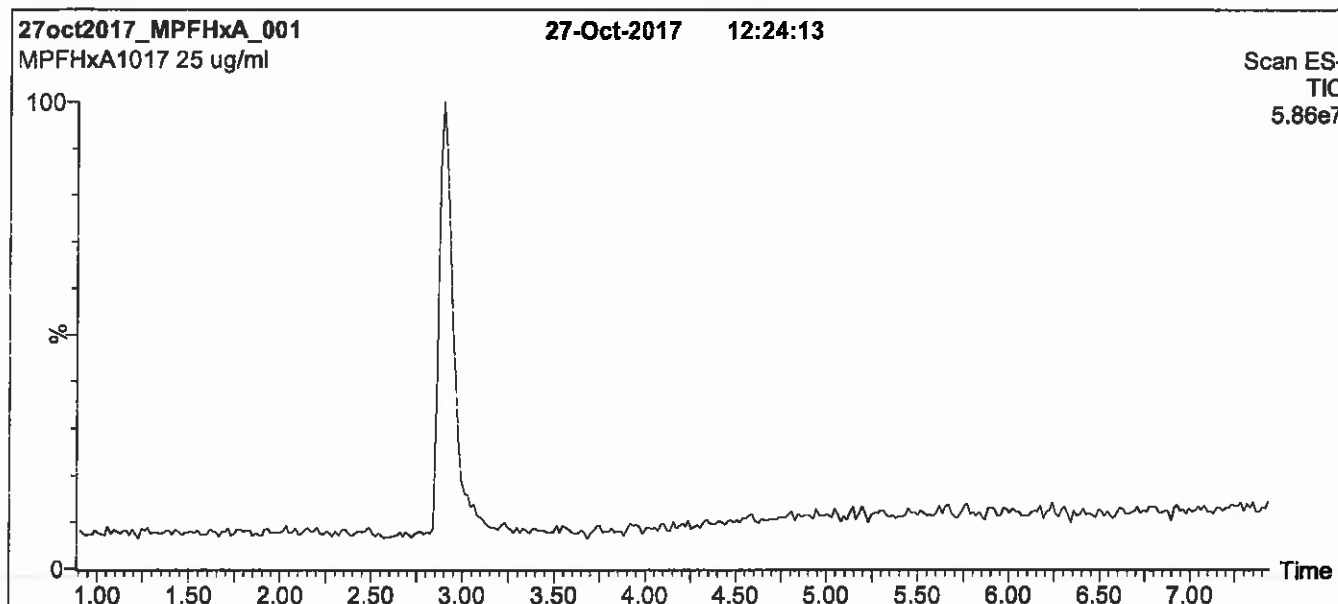
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

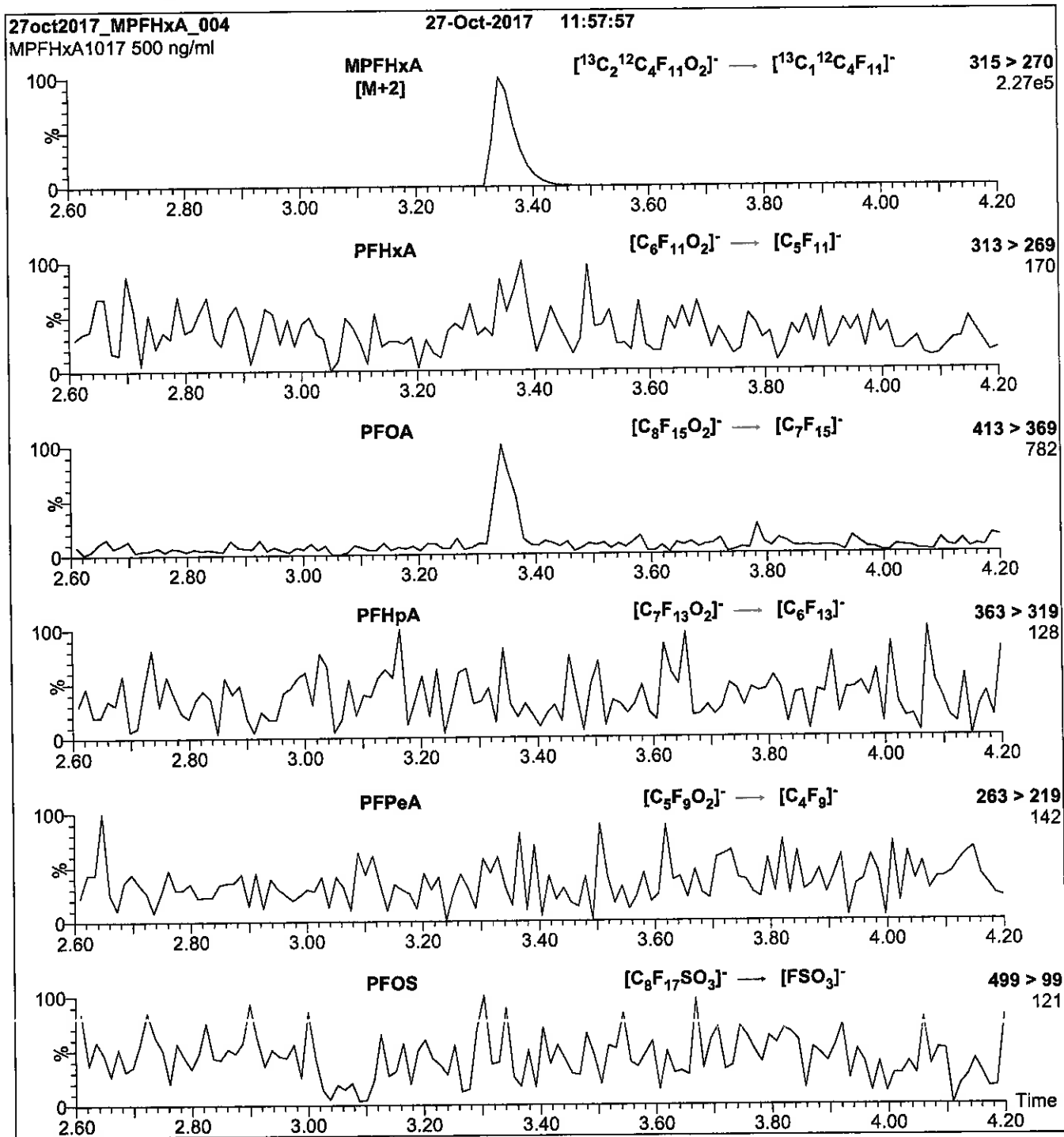
Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

Flow: 300 μ l/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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.58\text{e-}3$
Collision Energy (eV) = 10

Reagent

LCMPFHxA_00022

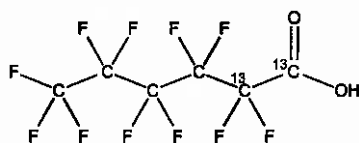


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA **LOT NUMBER:** MPFHxA1017
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₄HF₁₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99%¹³C
 (1,2-¹³C₂)

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: 
 B.G. Chittim, General Manager

Date: 10/30/2017
 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

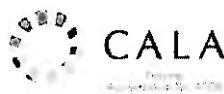
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

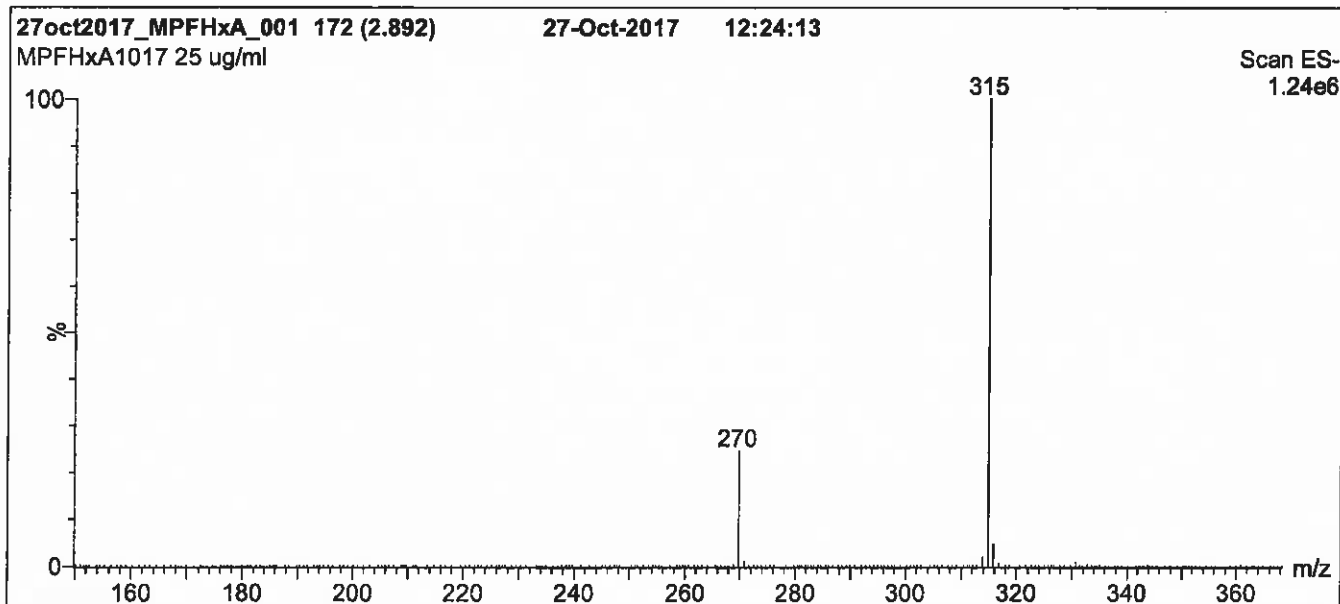
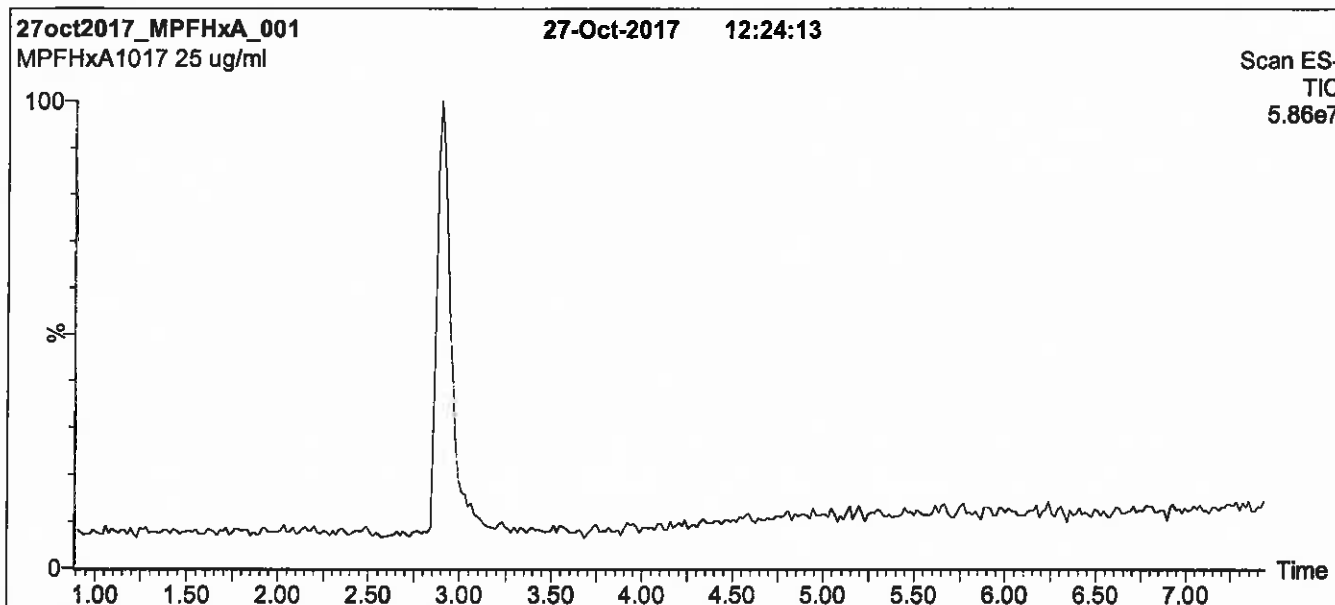
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 40% (80:20 MeOH:ACN) / 60% H₂O
 (both with 10 mM NH₄OAc 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

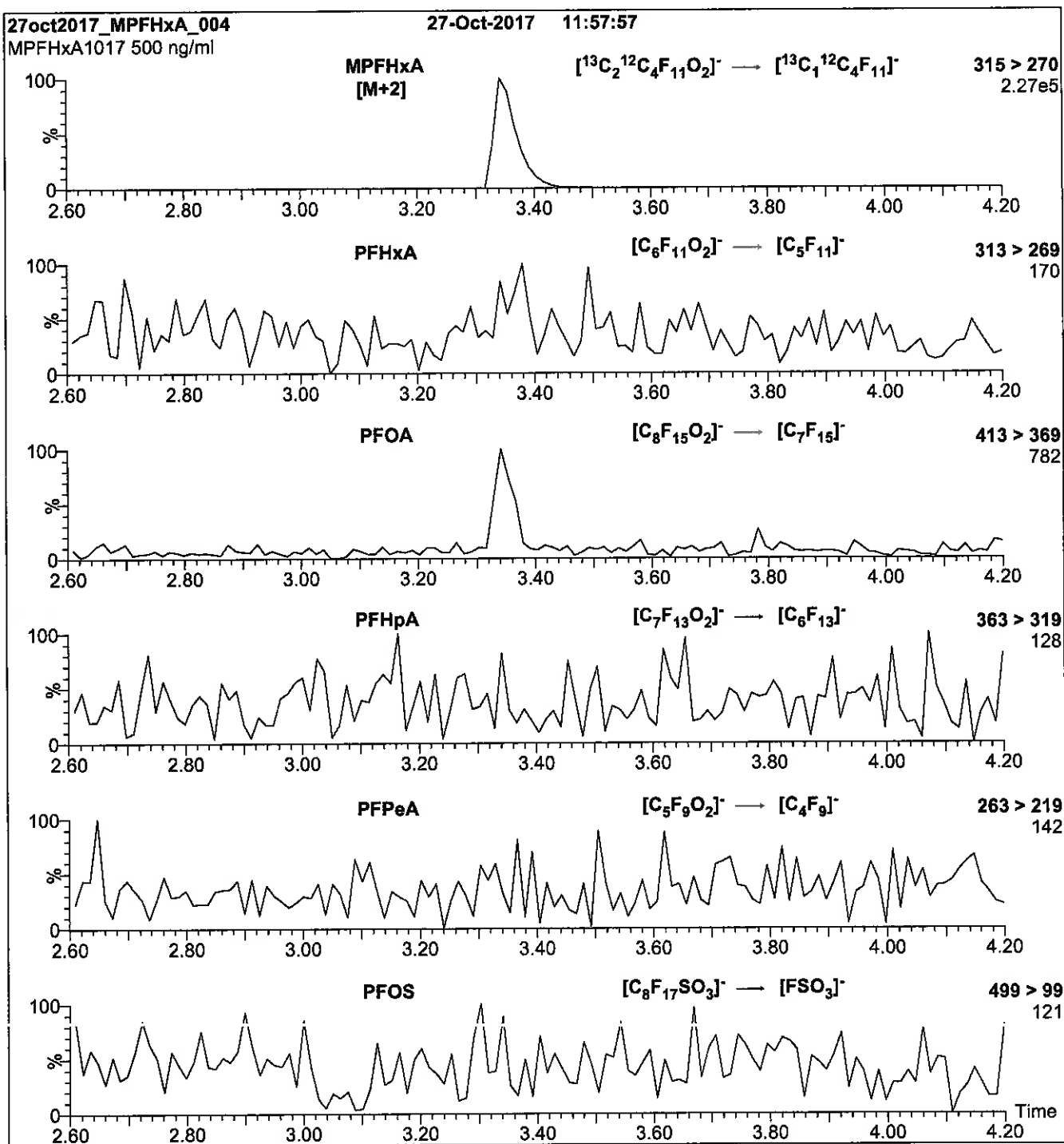
Flow: 300 μ l/min

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 μ l (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHXS_00013

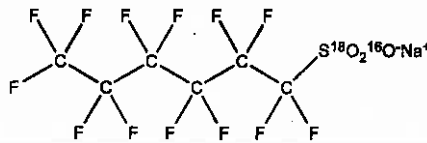


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS **LOT NUMBER:** MPFHxS0217
COMPOUND: Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₆F₁₃S¹⁸O₂¹⁶O_{Na} **MOLECULAR WEIGHT:** 426.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.3 ± 2.4 µg/ml (MPFHxS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** >94% (¹⁸O₂)
LAST TESTED: (mm/dd/yyyy) 02/17/2017
EXPIRY DATE: (mm/dd/yyyy) 02/17/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS (C₆F₁₃S¹⁸O₂¹⁶O) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[¹⁸O₂]sulfonate (¹⁸O₂-PFOS).
- Due to the isotopic purity of the starting material (¹⁸O₂ >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:** 03/02/2017
B.G. Chittim (mm/dd/yyyy)

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

INTENDED USE:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

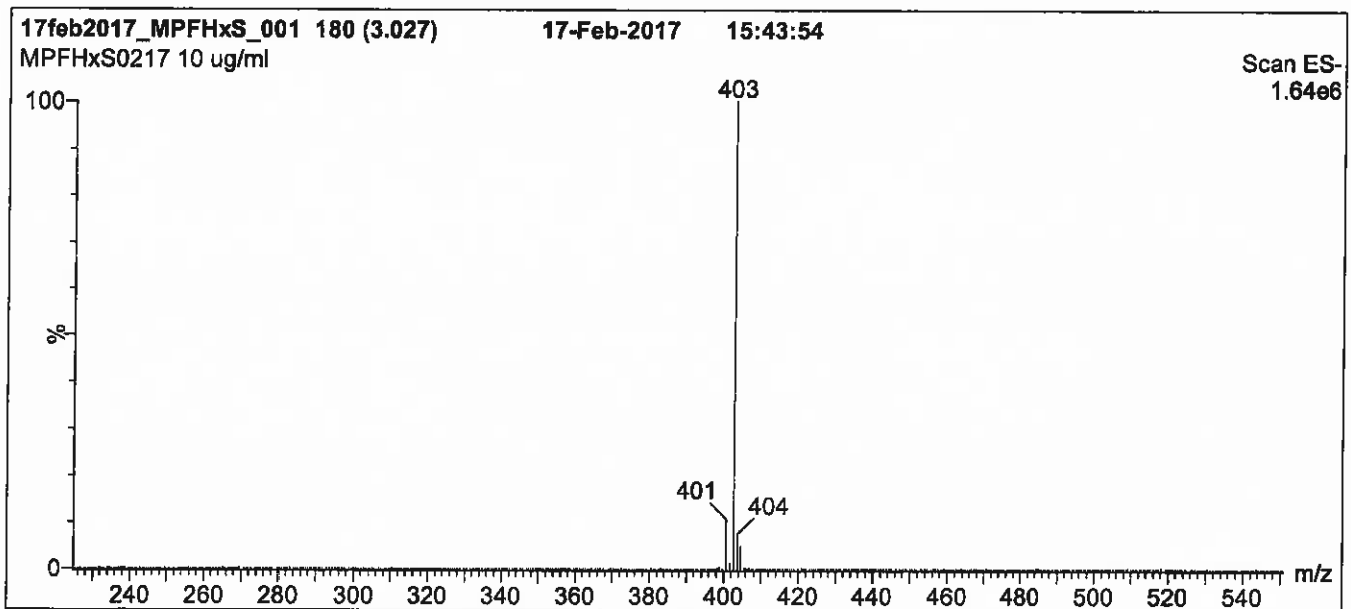
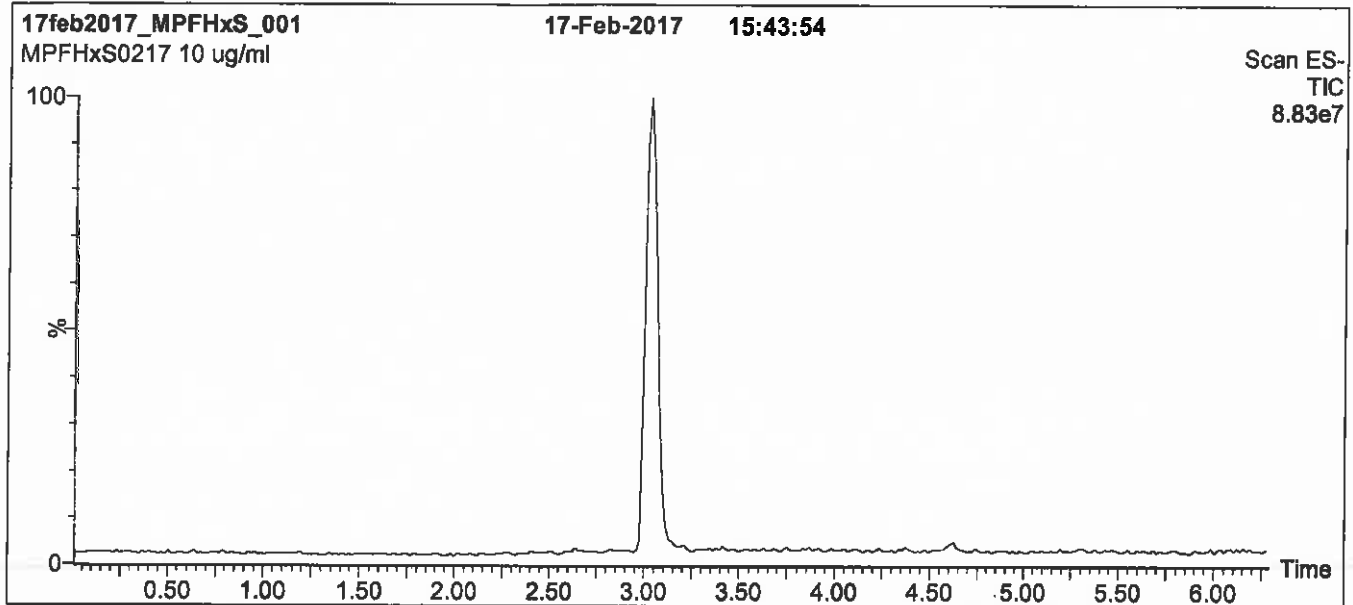
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

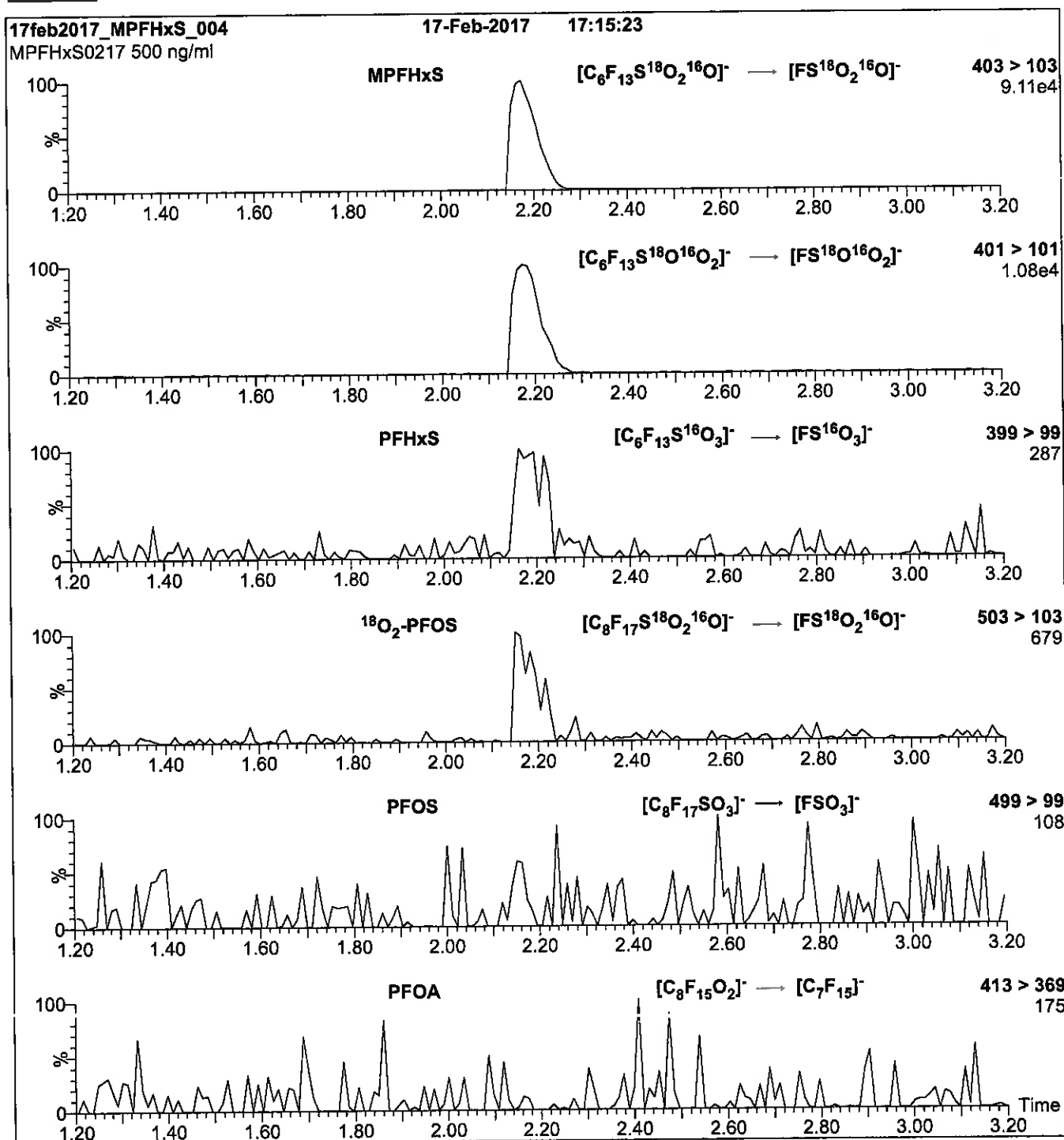
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHXS_00015



1263157

ID: LCMPFHxS_00015

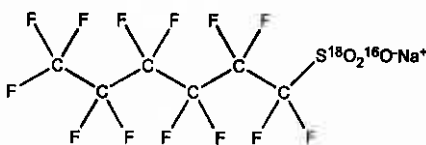
Exp: 03/22/23 Ppd: CBW Opi: 05/00/18

18O2-Perfluorohexanesulfo

**WELLINGTON
LABORATORIES****CERTIFICATE OF ANALYSIS
DOCUMENTATION**

PRODUCT CODE: MPFHxS **LOT NUMBER:** MPFHxS0318
COMPOUND: Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₆F₁₃S¹⁸O₂¹⁶ONa **MOLECULAR WEIGHT:** 426.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 47.3 ± 2.4 µg/ml (MPFHxS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** >94% (¹⁸O₂)
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 (C₆F₁₃S¹⁸O₂¹⁶O⁻) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃⁻) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[¹⁸O₂]sulfonate (¹⁸O₂-PFOS) and ~ 0.3% of sodium perfluoro-1-heptane[¹⁸O₂]sulfonate (¹⁸O₂-PFHpS).
- Due to the isotopic purity of the starting material (¹⁸O₂ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager

Date: 03/27/2018
 (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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

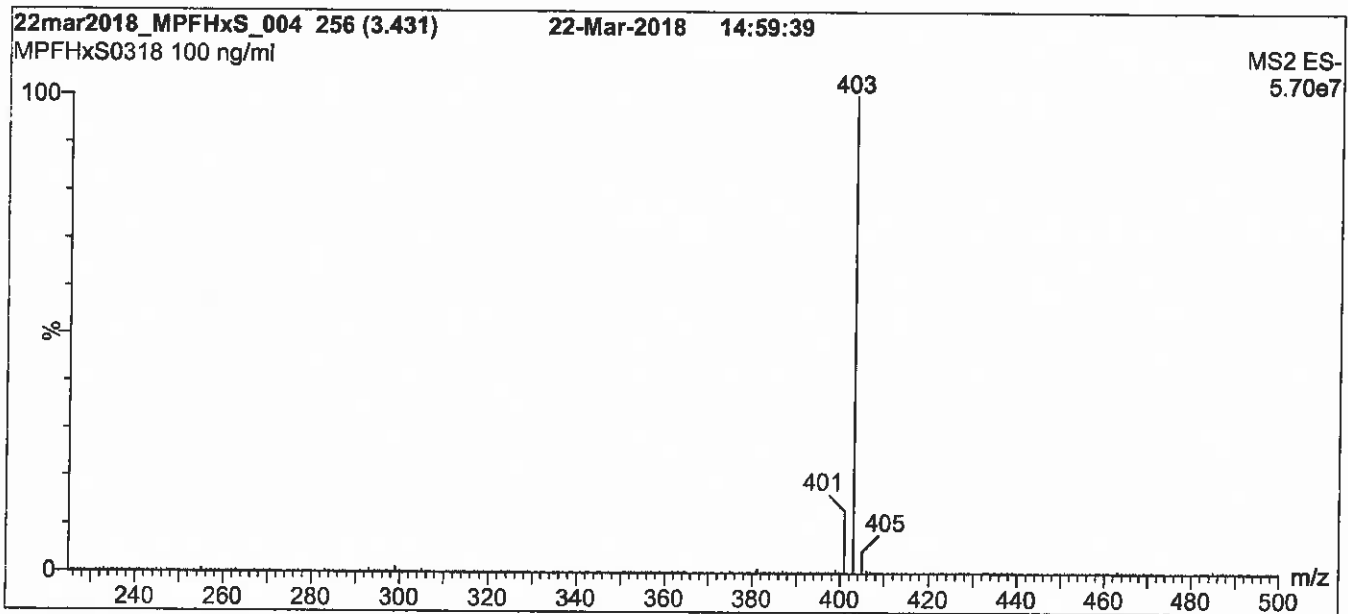
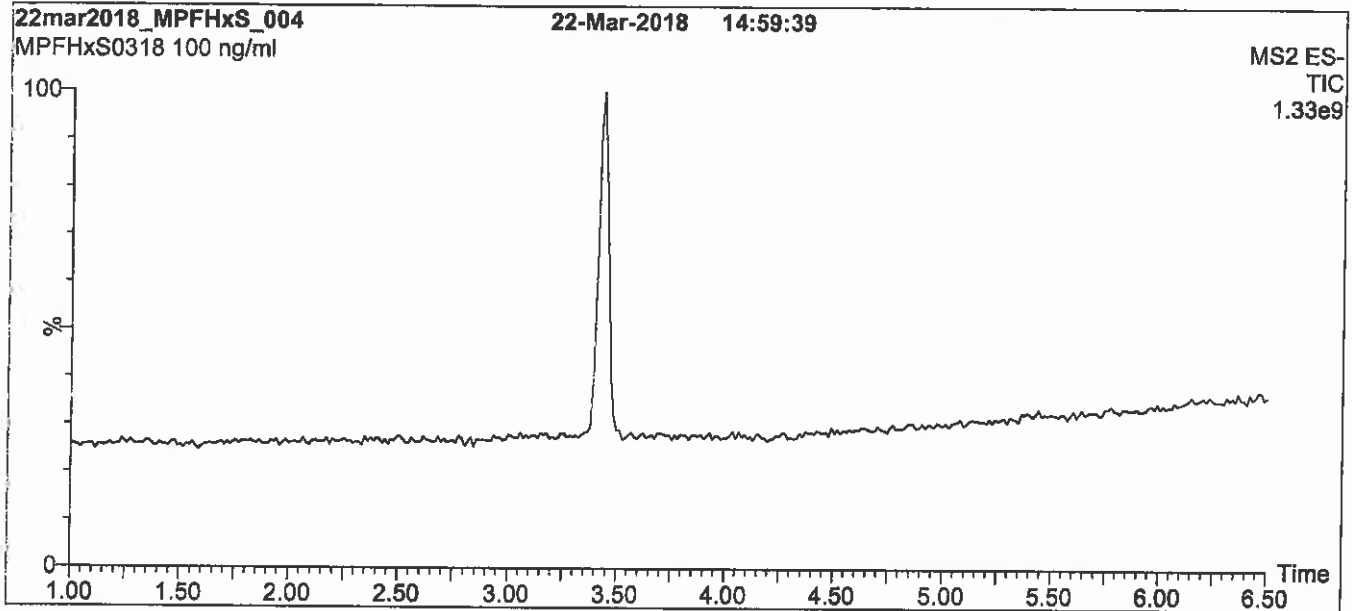
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

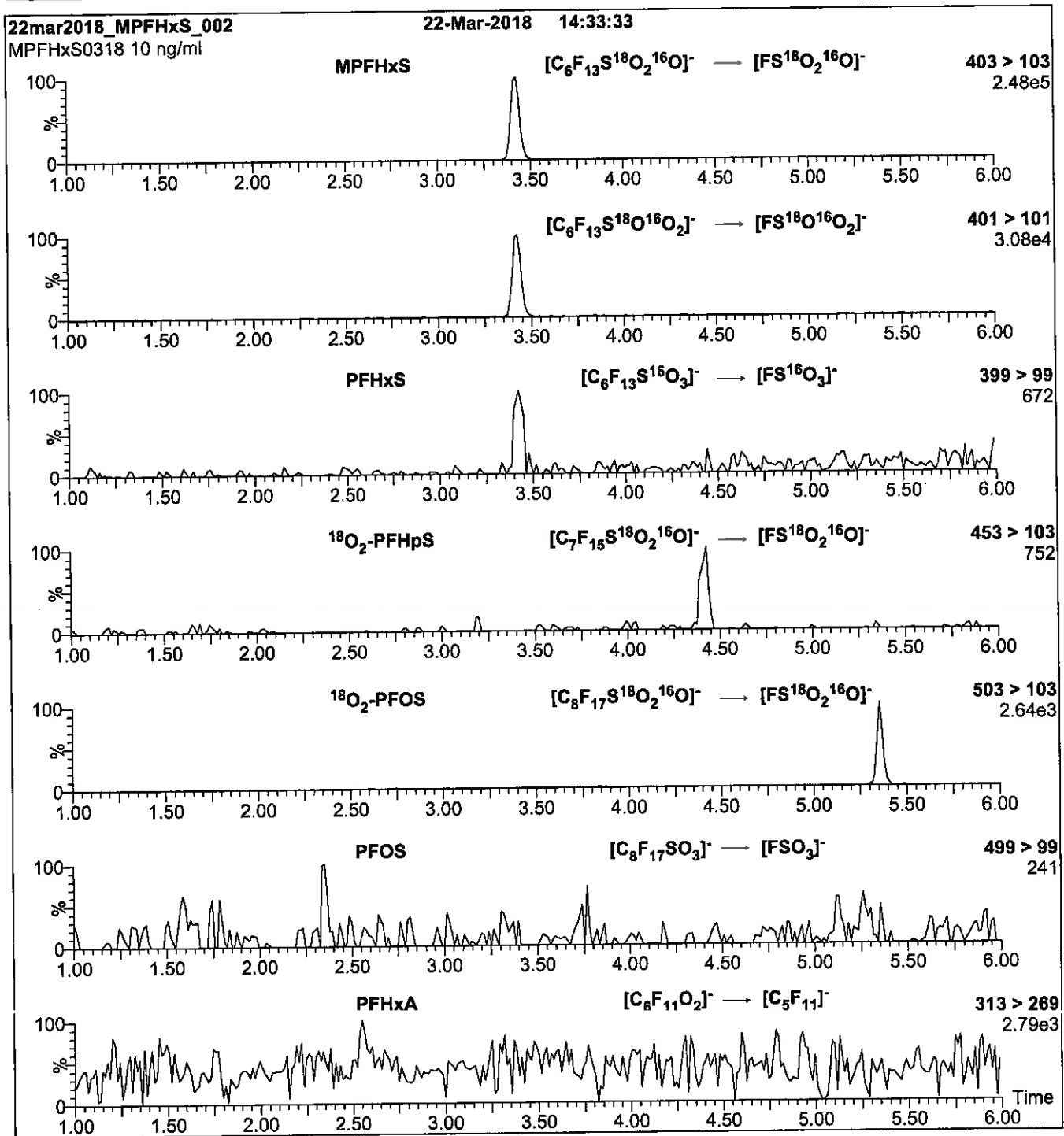
Flow: 300 μ l/min

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 μ /min

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

Reagent

LCMPFNA_00013



WELLINGTON LABORATORIES

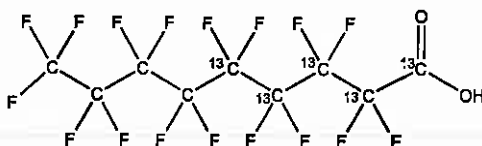
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-¹³C₅]nonanoic acid

LOT NUMBER: MPFNA0916

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₅¹²C₄HF₁₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 469.04
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99%¹³C
(1,2,3,4,5-¹³C₅)

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/11/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

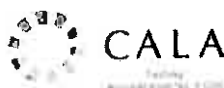
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

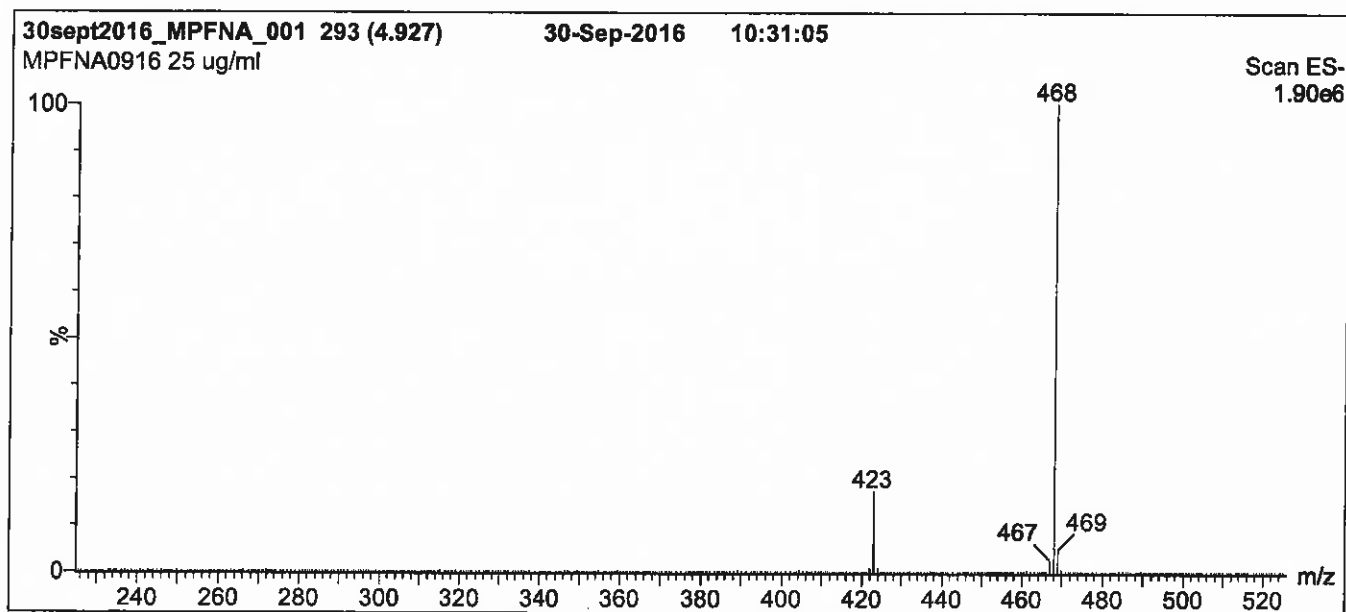
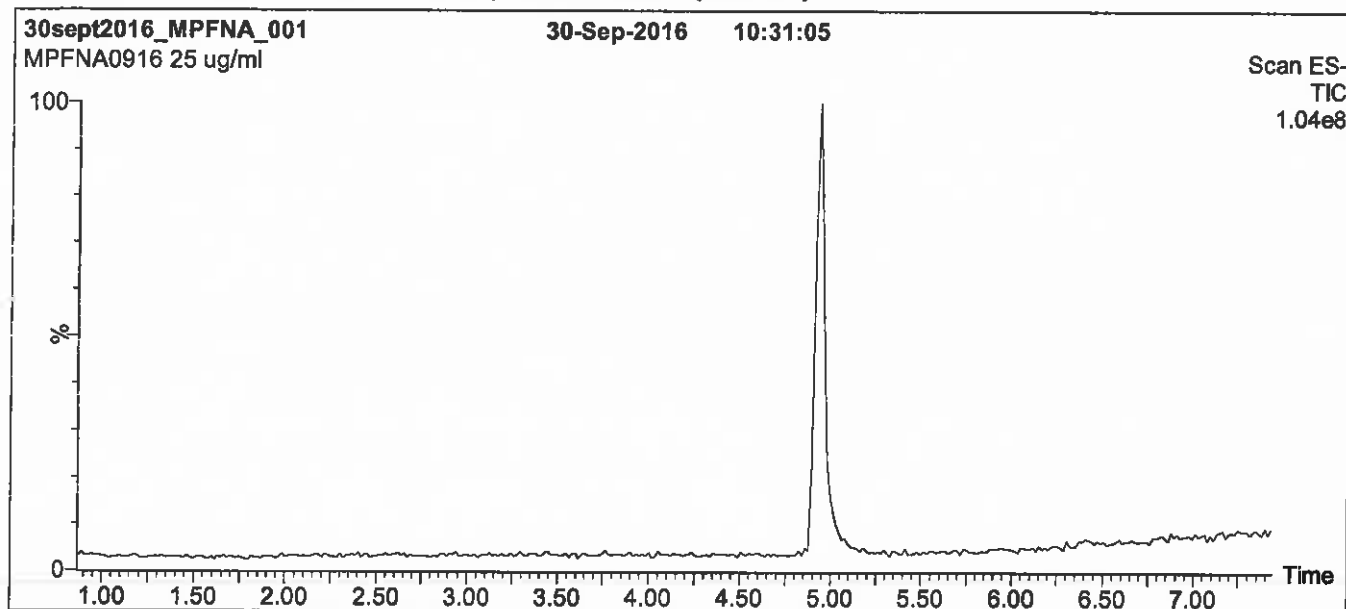
QUALITY MANAGEMENT:

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



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

Figure 1: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

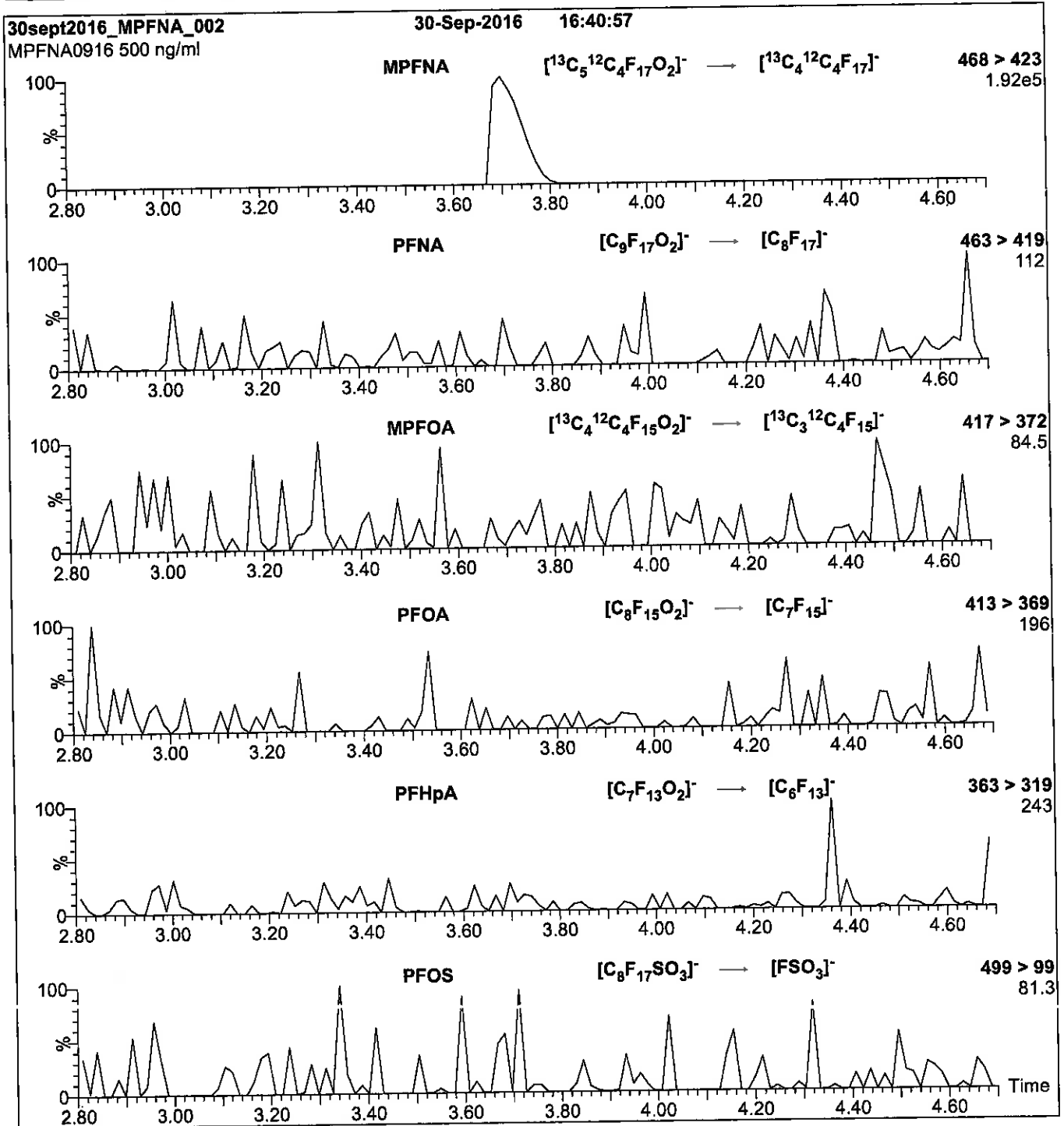
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFNA_00015



1263148
 ID: LCMFNA_00015
 Exp: 12/14/22 Ppt: CBW Opr: 05/30/18
 13C5-Perfluoronanoic aci

P: 5/30/18 CBW



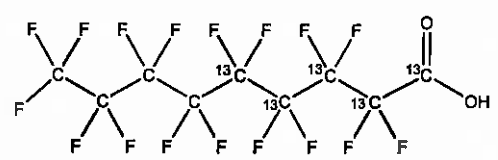
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-¹³C₅]nonanoic acid

LOT NUMBER: MPFNA1217

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₅¹²C₄HF₁₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 469.04
SOLVENT(S): Methanol
 Water (<1%)
ISOTOPIC PURITY: ≥99% ¹³C
 (1,2,3,4,5-¹³C₅)

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager
Date: 12/19/2017
 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

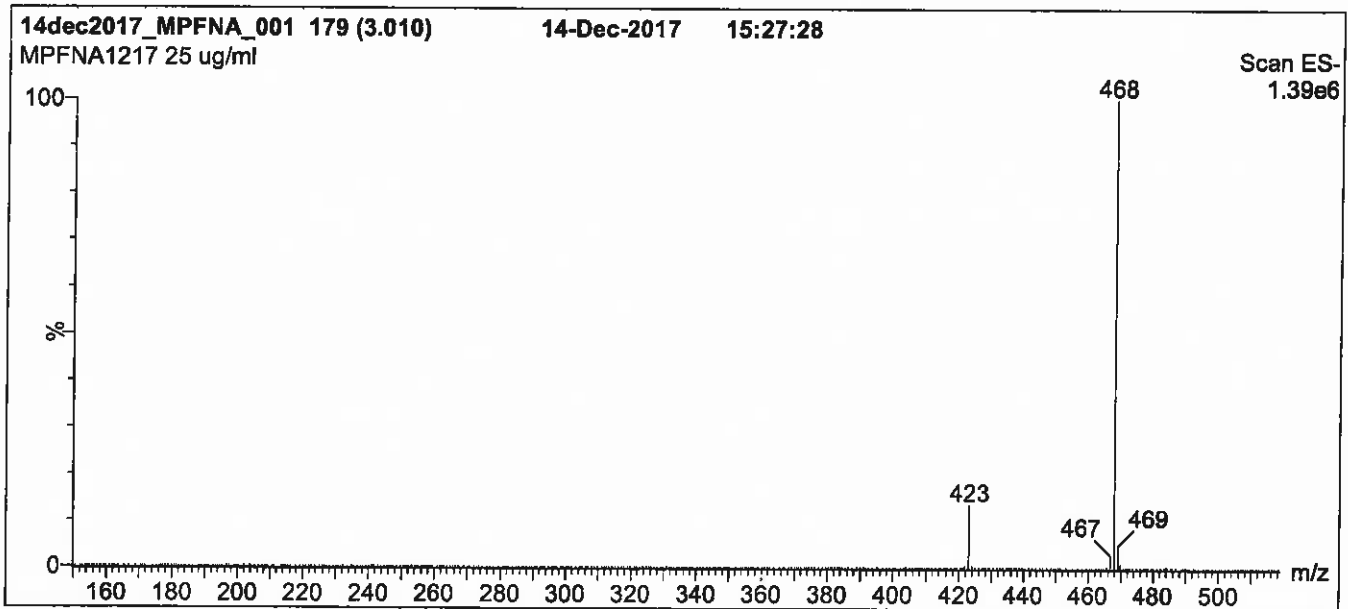
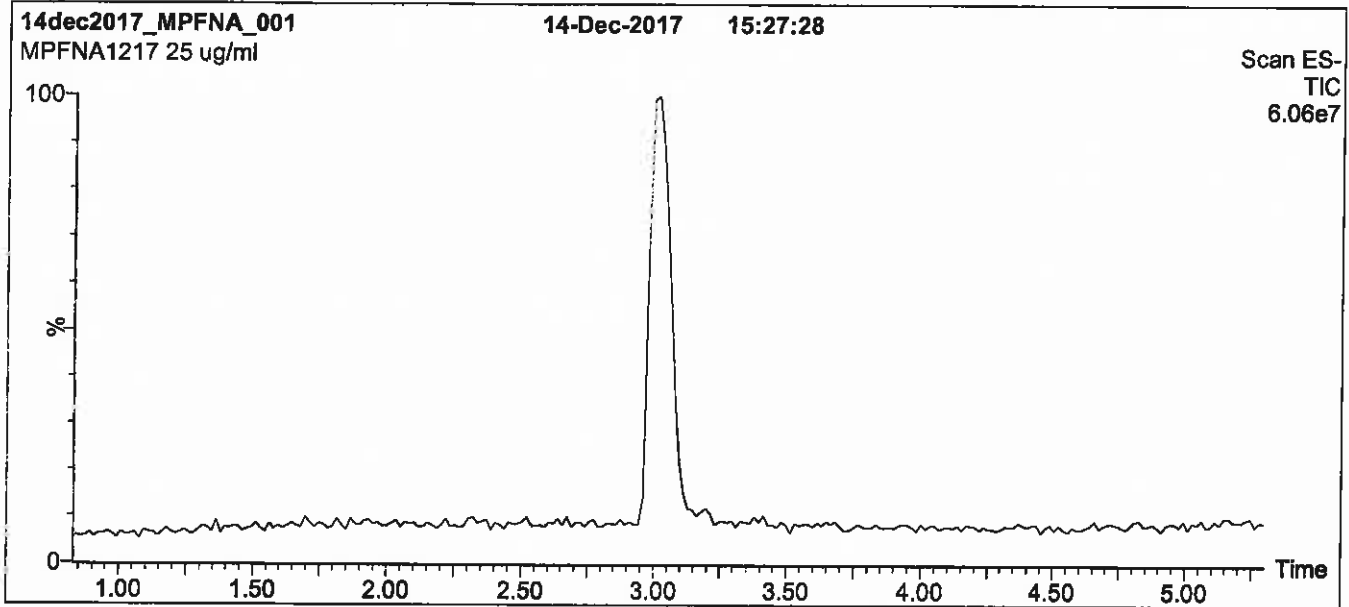
QUALITY MANAGEMENT:

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).



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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 55% (80:20 MeOH:ACN) / 45% H₂O
 (both with 10 mM NH₄OAc 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

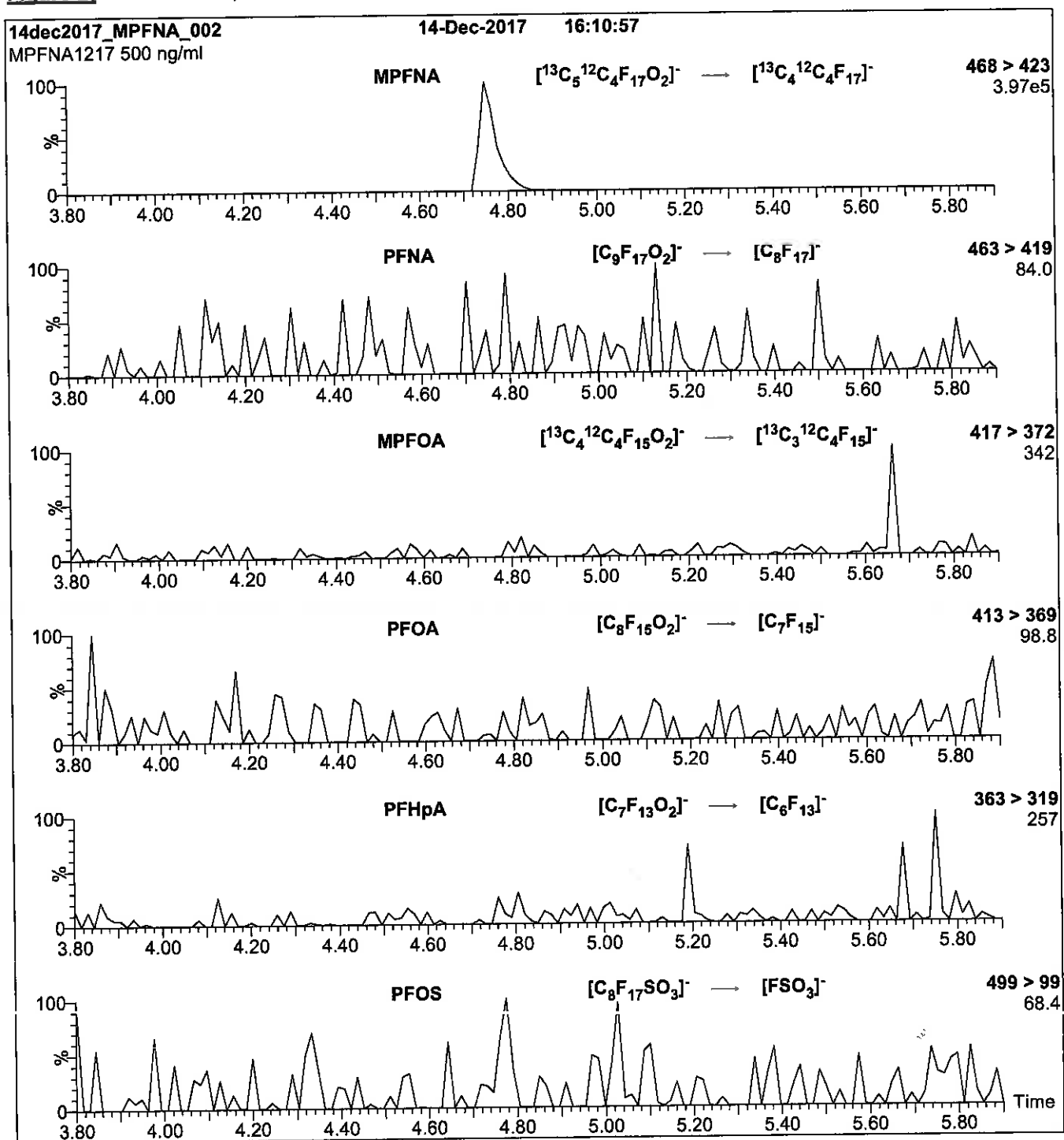
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFOA_00017

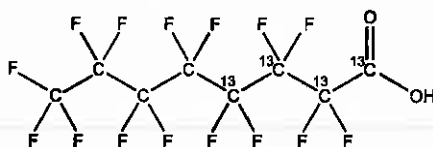


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA **LOT NUMBER:** MPFOA1017
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]octanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/17/2017
EXPIRY DATE: (mm/dd/yyyy) 10/17/2022

ISOTOPIC PURITY: ≥99% ¹³C
(1,2,3,4-¹³C₄)

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: 
B.G. Chittim, General Manager

Date: 10/19/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

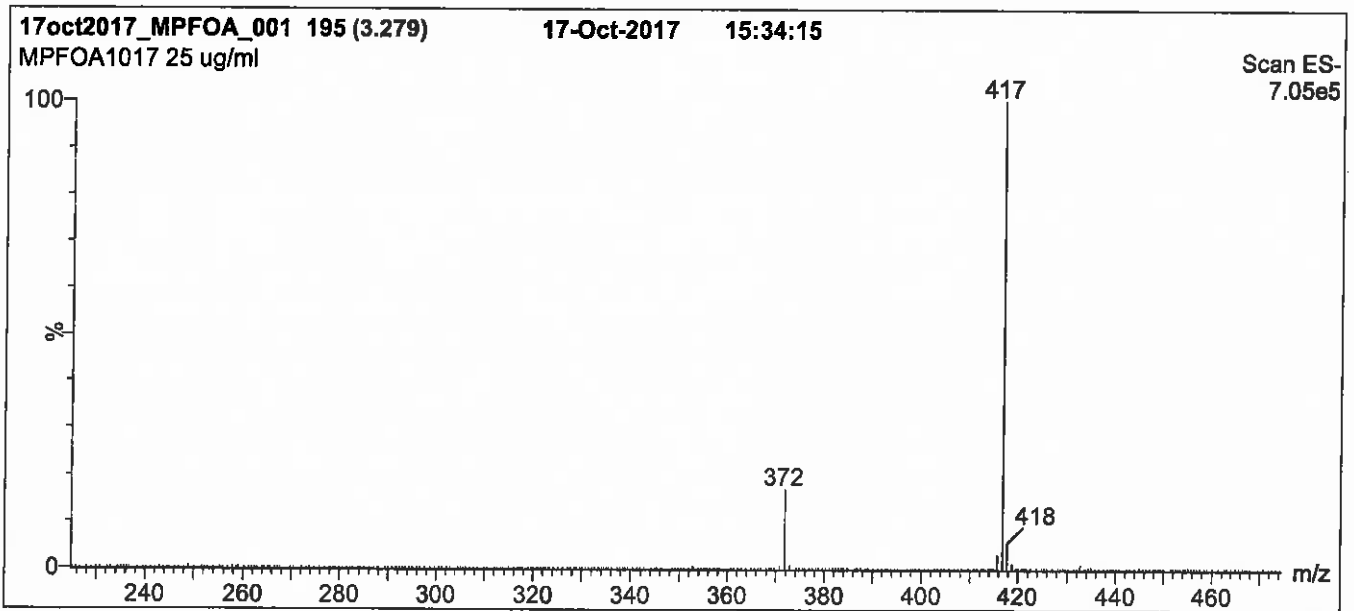
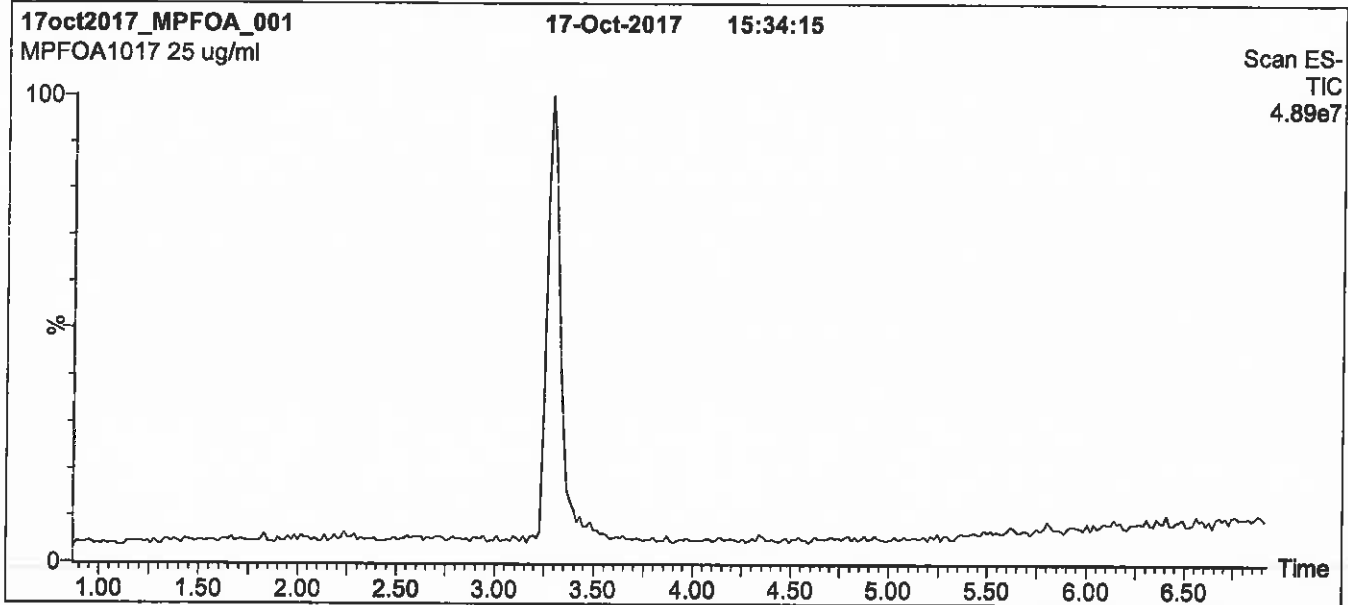
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

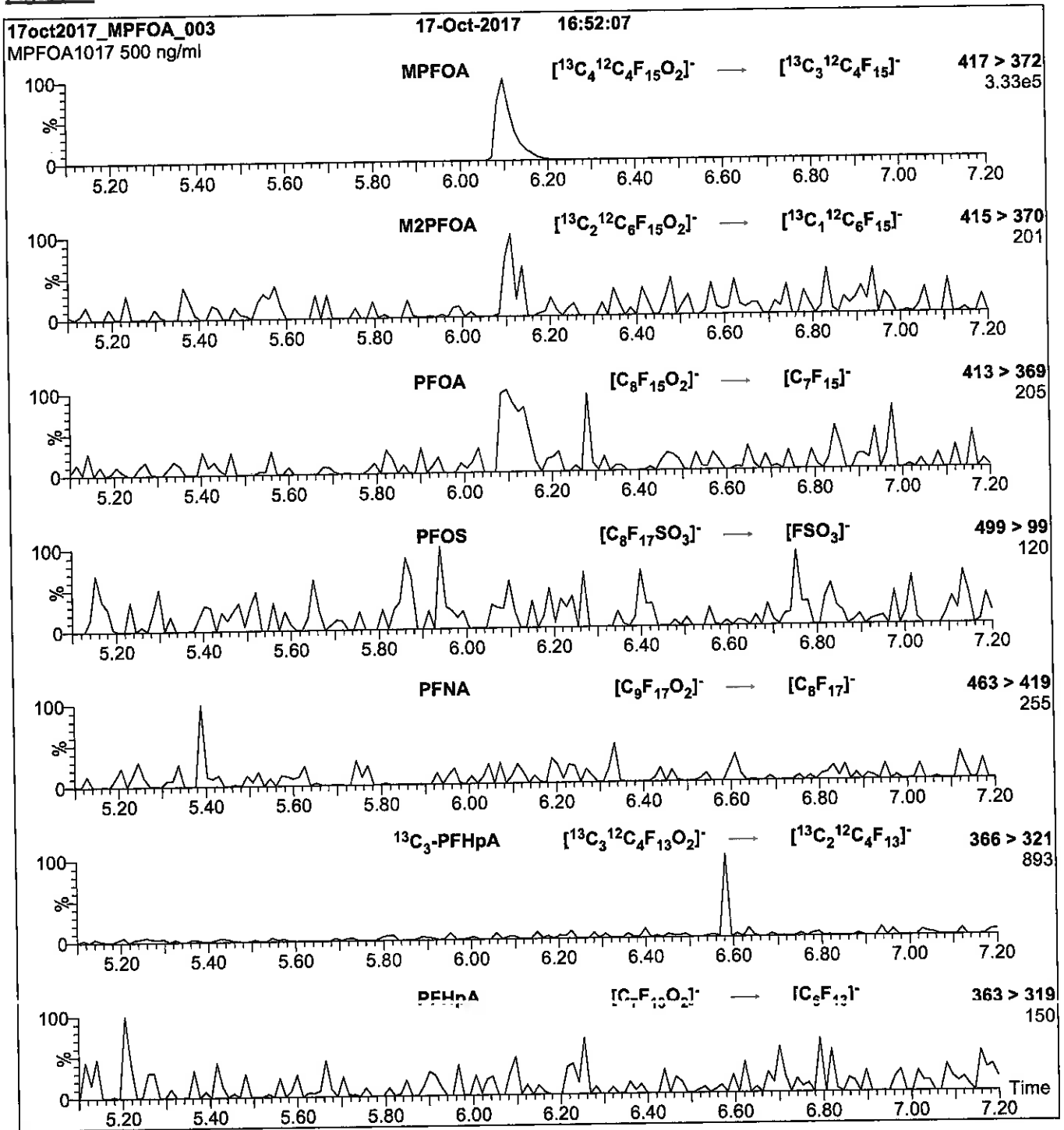
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00019

1263125
ID: LCMPPFOA_00019
Exp: 05/04/23 P1p1:CBW Qp1:050018
13C4-Perfluorooctanoic ac

r: 5/30/18 CBW



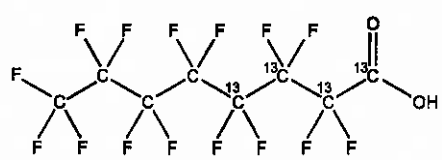
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]octanoic acid

LOT NUMBER: MPFOA0418

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄HF₁₅O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99% ¹³C
(1,2,3,4-¹³C₄)

CHEMICAL PURITY: >98%
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: 
B.G. Chittim, General Manager
Date: 05/17/2018
(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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

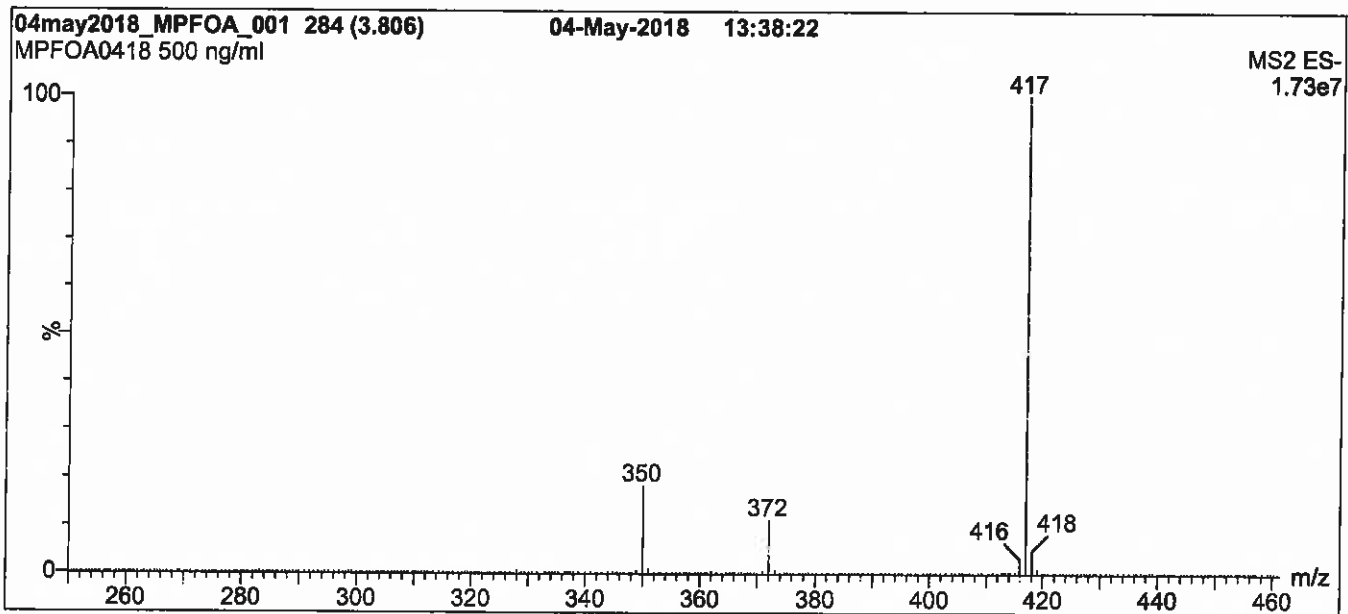
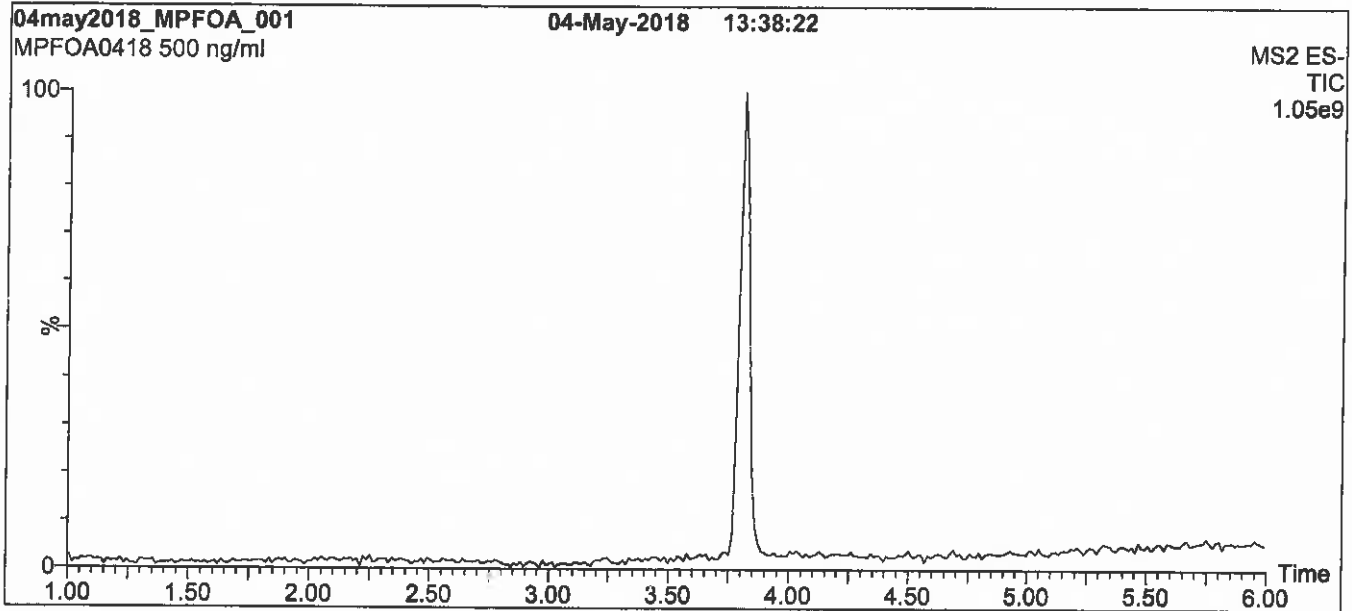
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

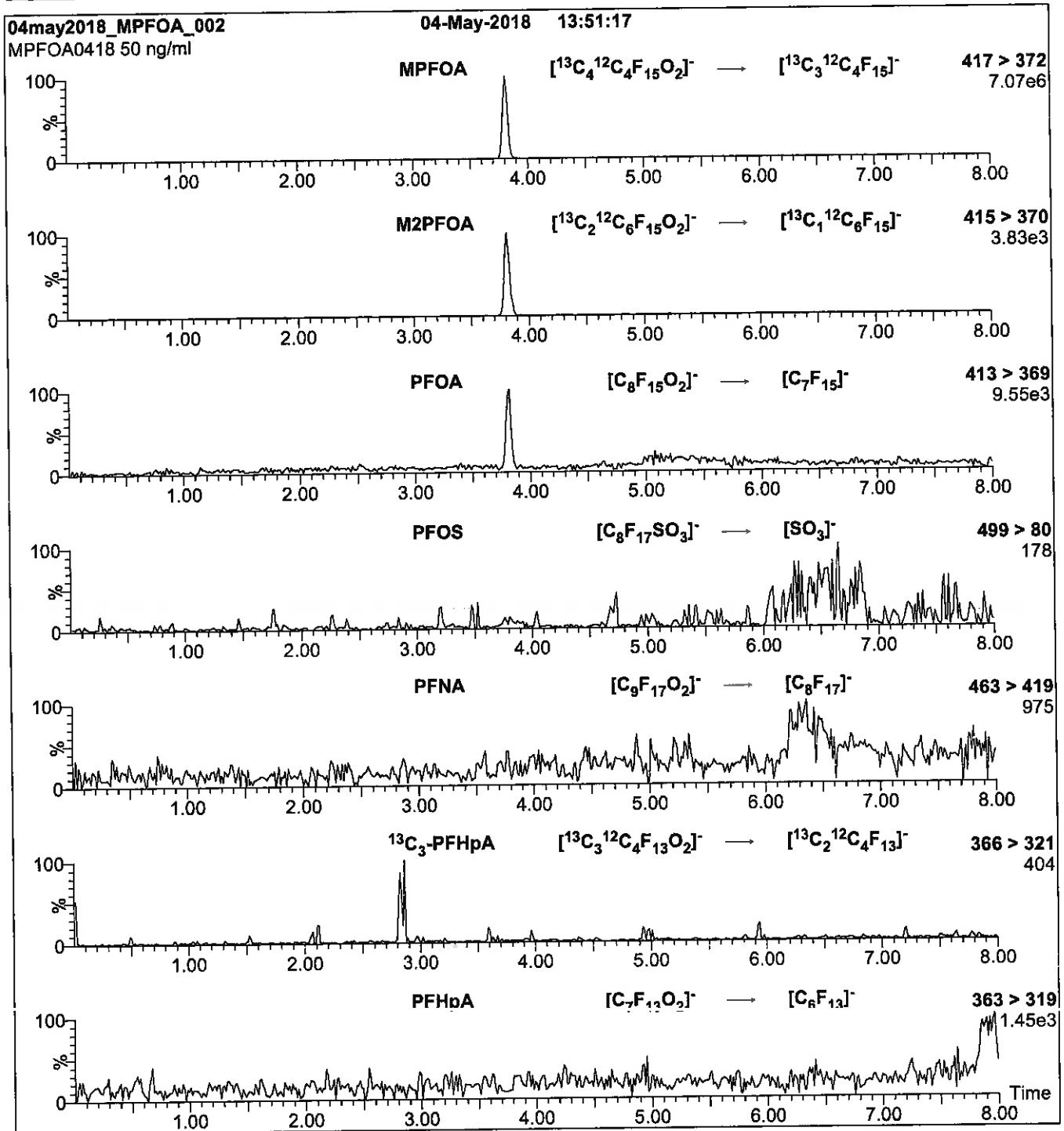
Flow: 300 µl/min

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_00025



1106029
 ID: LCMFOS_00025
 Exp: 10/17/22 Ppdt: SKV
 13C4-Perfluorooctanesulfo

f: 12/17/17 CCL

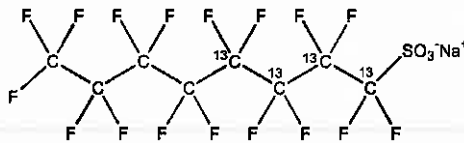


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1017
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ ¹² C ₄ F ₁₇ SO ₃ Na	MOLECULAR WEIGHT:	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	SOLVENT(S):	Methanol
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2,3,4- ¹³ C ₄)
LAST TESTED: (mm/dd/yyyy)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
RECOMMENDED STORAGE:	Store ampoules in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.4% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim, General Manager **Date:** 10/18/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

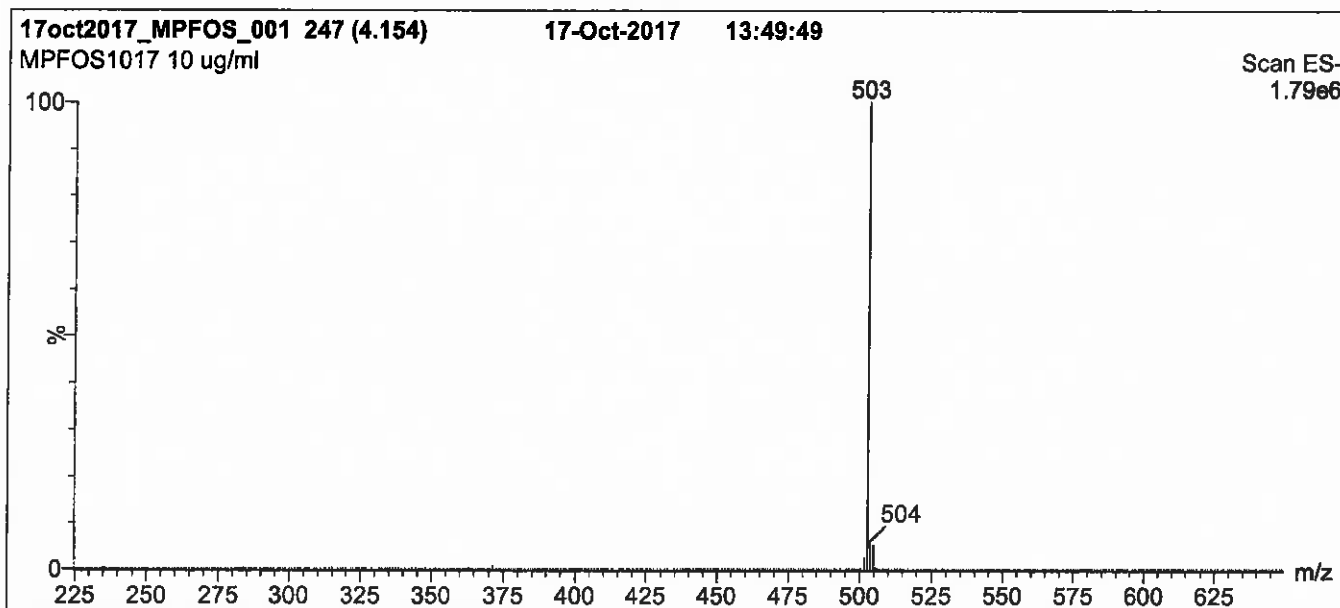
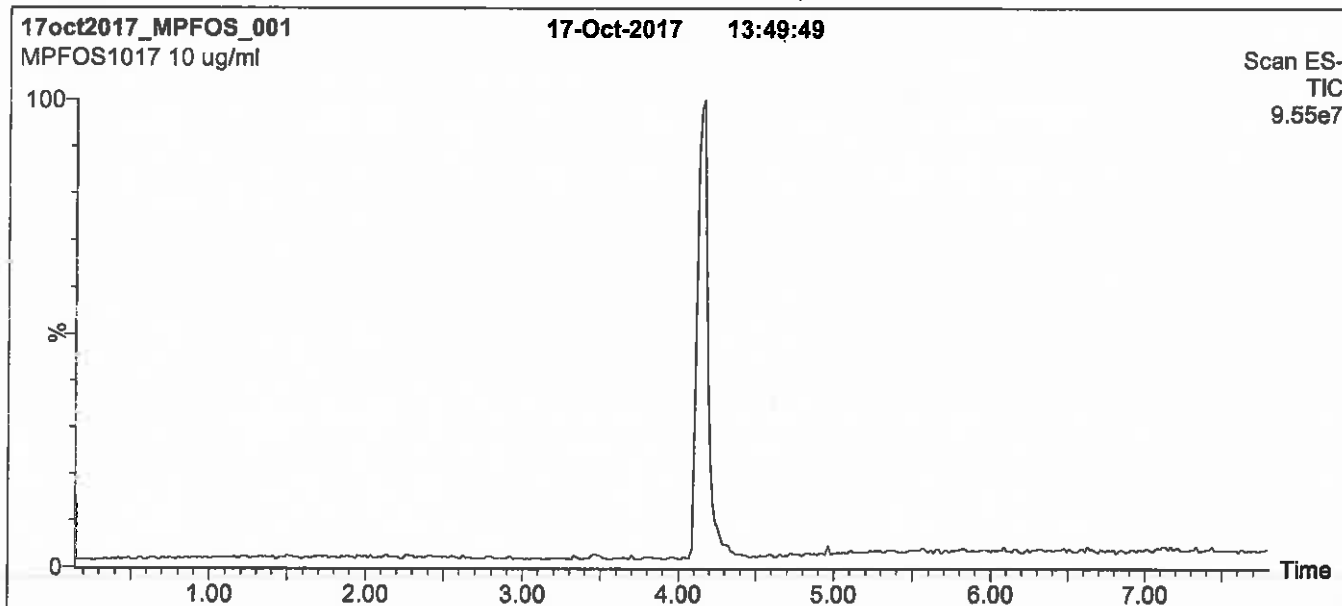
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

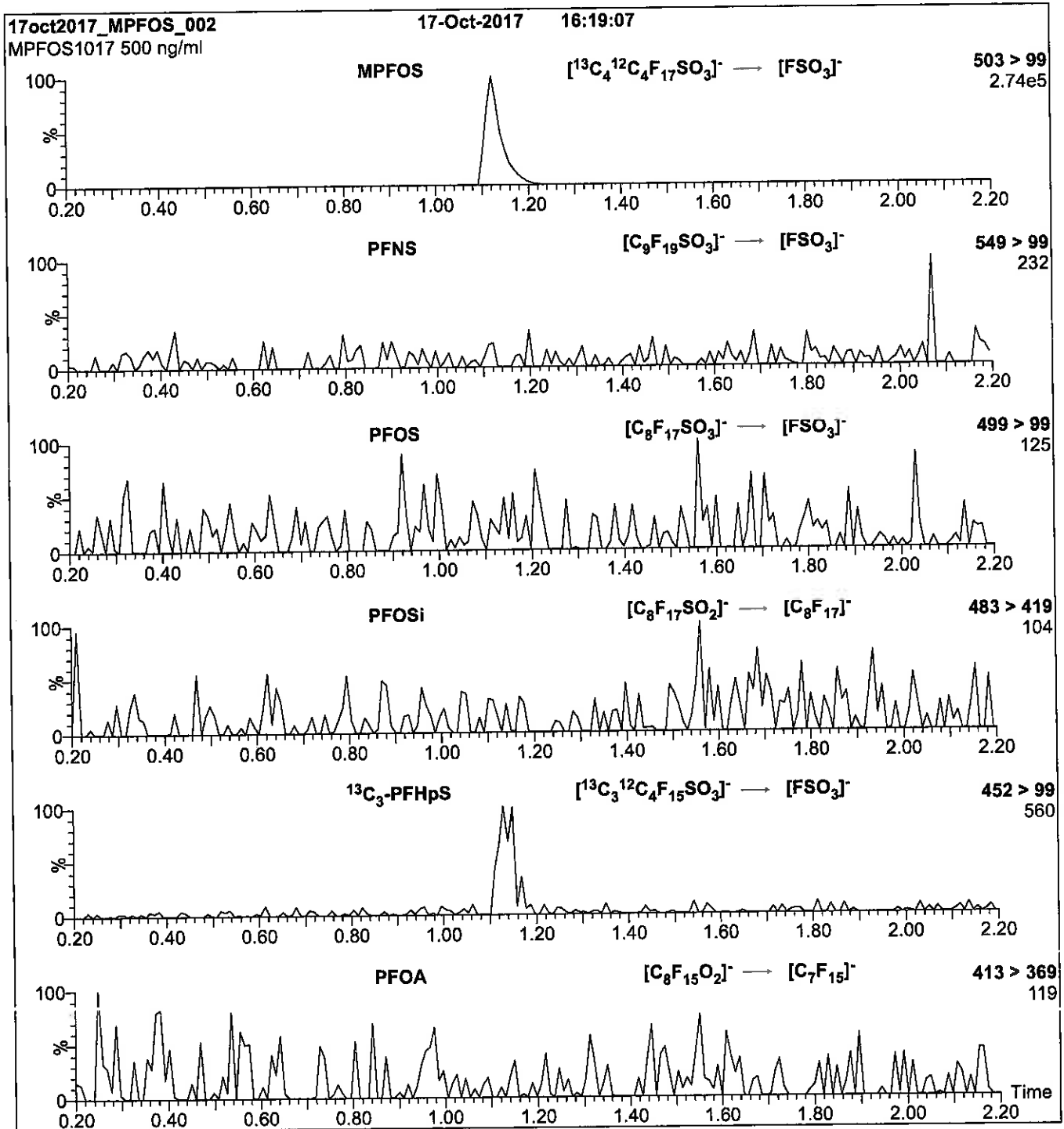
Flow: 300 μl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
 Capillary Voltage (kV) = 3.00
 Cone Voltage (V) = 60.00
 Cone Gas Flow (l/hr) = 50
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00027

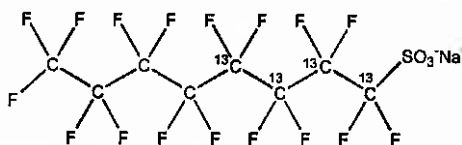


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0218
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ ¹² C ₄ F ₁₇ SO ₃ Na	MOLECULAR WEIGHT:	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	SOLVENT(S):	Methanol
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2,3,4- ¹³ C ₄)
LAST TESTED: (mm/dd/yyyy)	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.
- Contains ~ 0.6% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 

B.G. Chittim, General Manager

Date: 02/20/2018
(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.

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

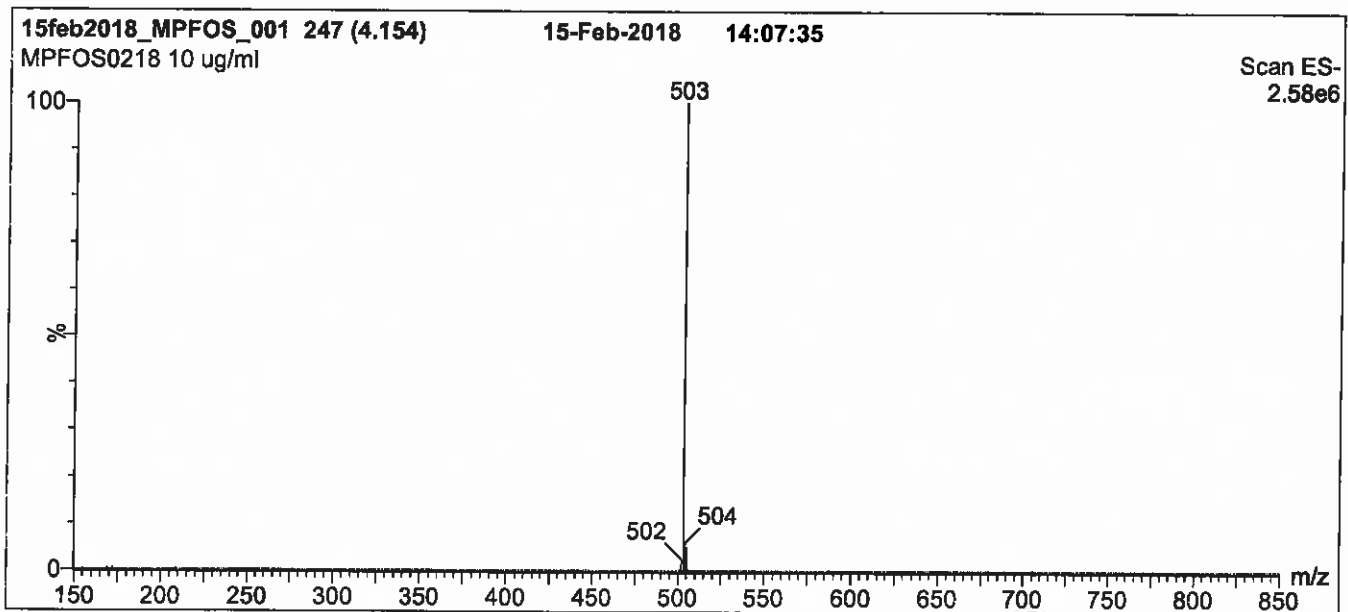
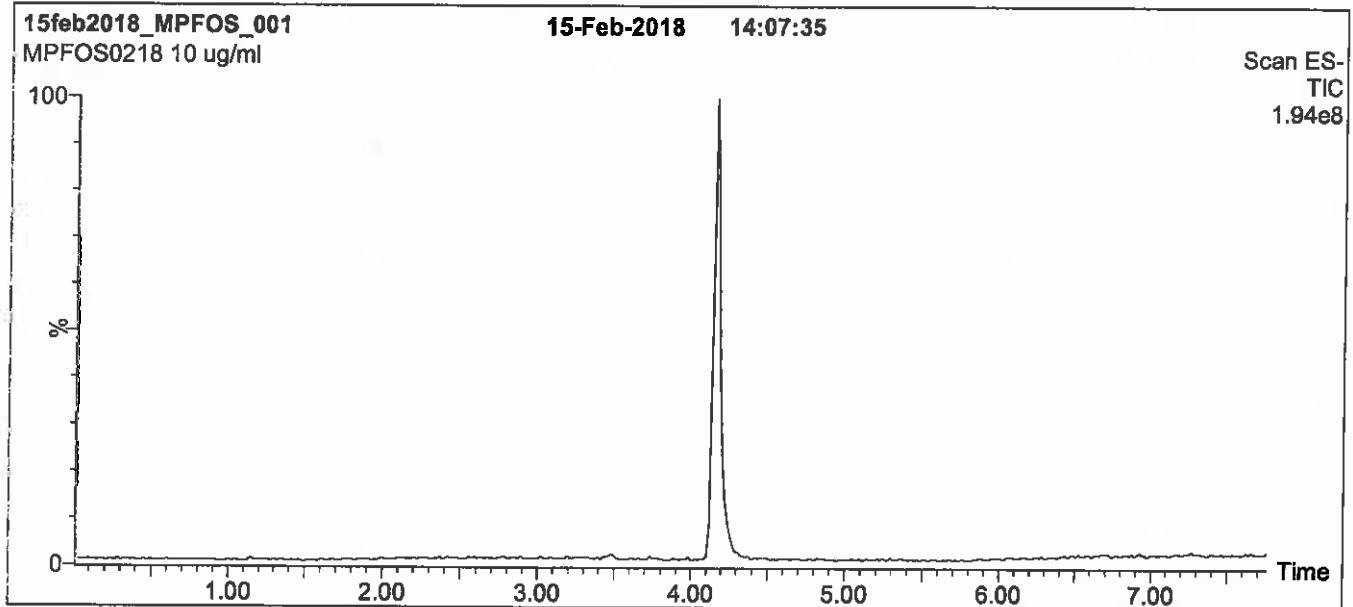
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

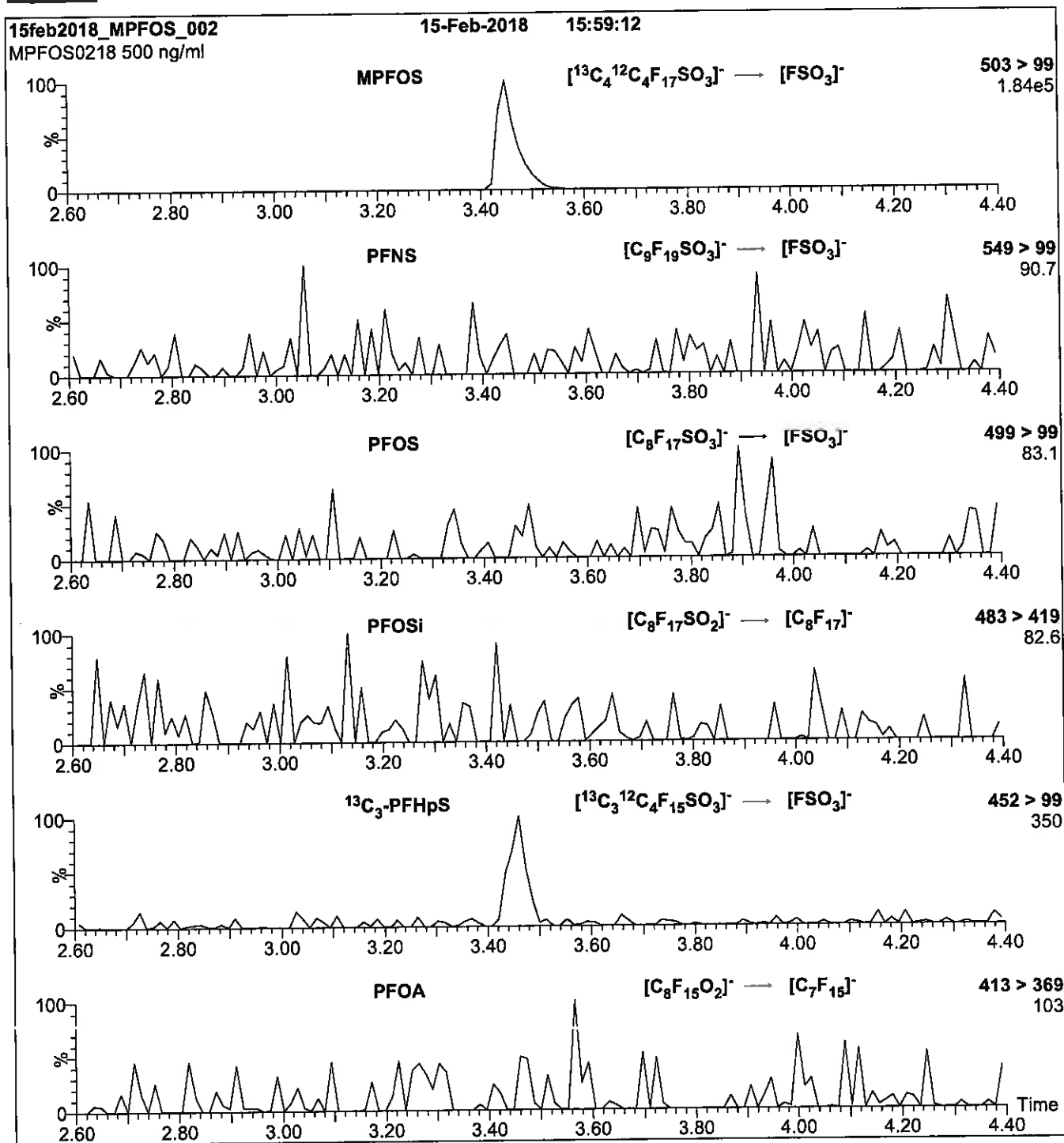
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00014



R: 12/24/17 CCL

1106187
ID: LCMFUDa_00014
Exp: 11/22/21 Prod: CCL
13C2-Perfluoroundecanoic

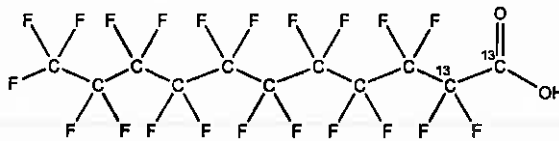


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUDa **LOT NUMBER:** MPFUDa1116
COMPOUND: Perfluoro-n-[1,2-¹³C₂]undecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₉HF₂₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

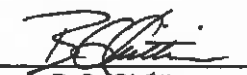
DOCUMENTATION/ DATA ATTACHED:

- 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 1-¹³C₁-PFUDa (~1%; see Figure 2), 2-¹³C₁-PFUDa (~1%), and PFUDa (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

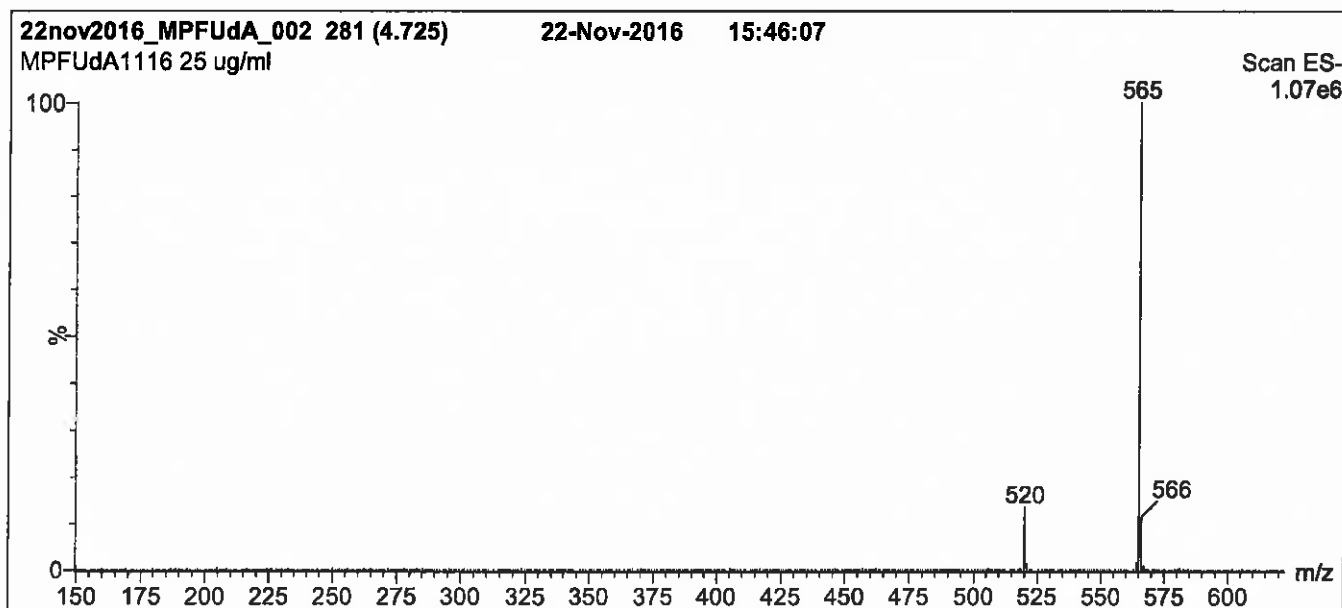
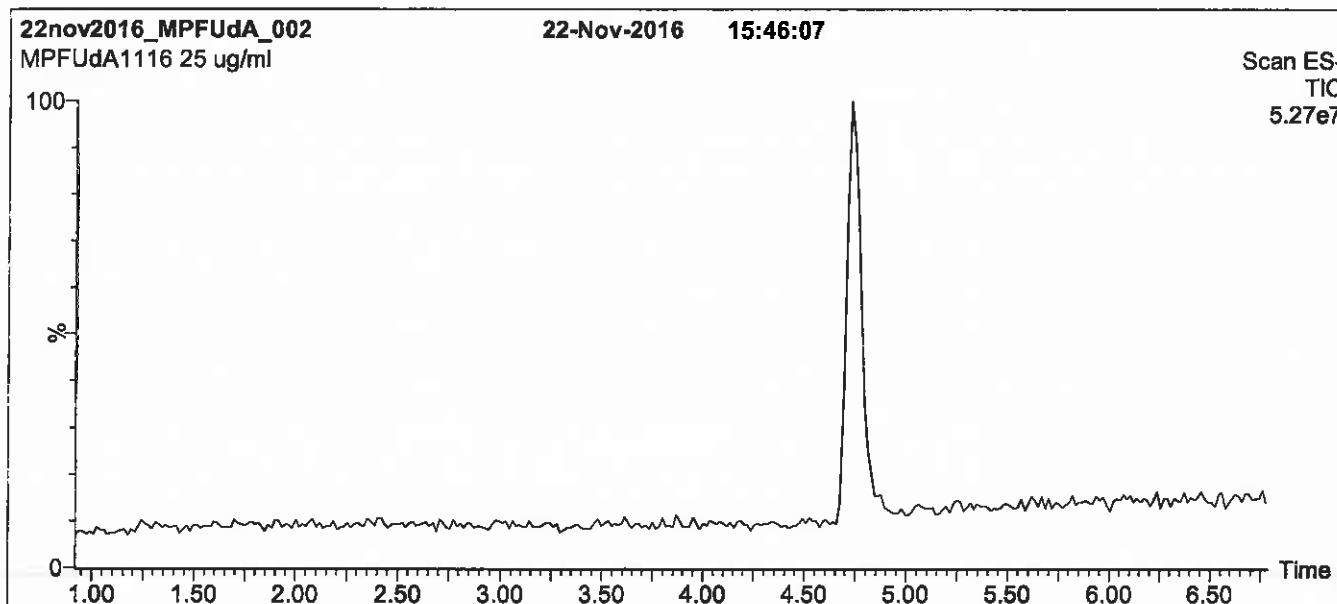
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

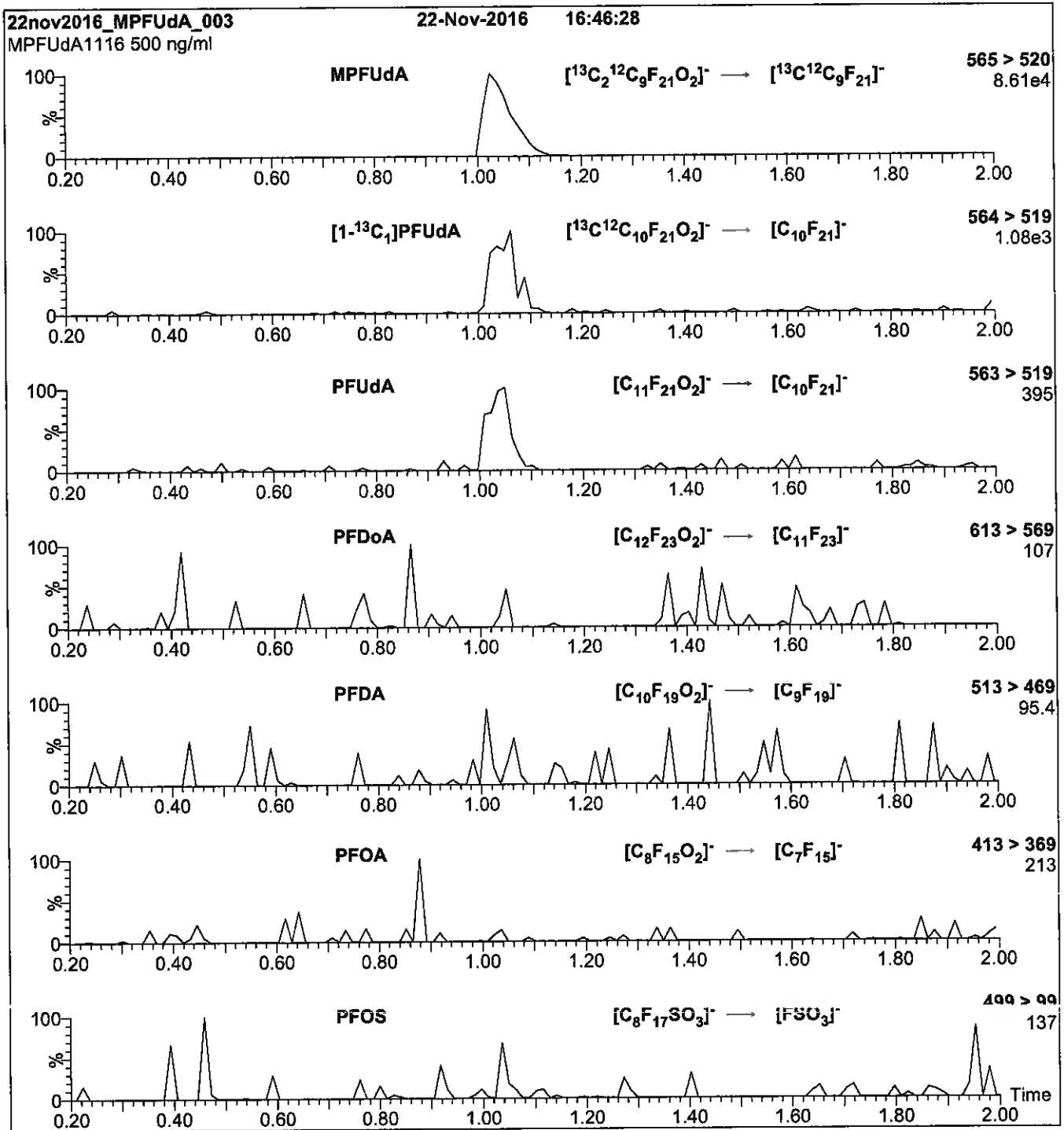
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

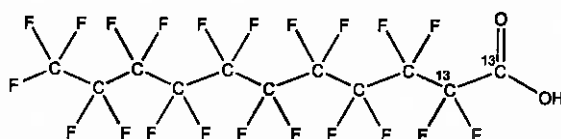
Reagent

LCMPFUdA_00017

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION

PRODUCT CODE: MPFUdA **LOT NUMBER:** MPFUdA1116
COMPOUND: Perfluoro-n-[1,2-¹³C₂]undecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₉HF₂₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
 Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

ISOTOPIC PURITY: ≥99% ¹³C
 (1,2-¹³C₂)

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 1-¹³C₁-PFUdA (~1%; see Figure 2), 2-¹³C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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, \dots, x_n , on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

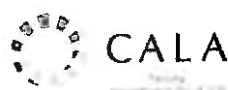
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

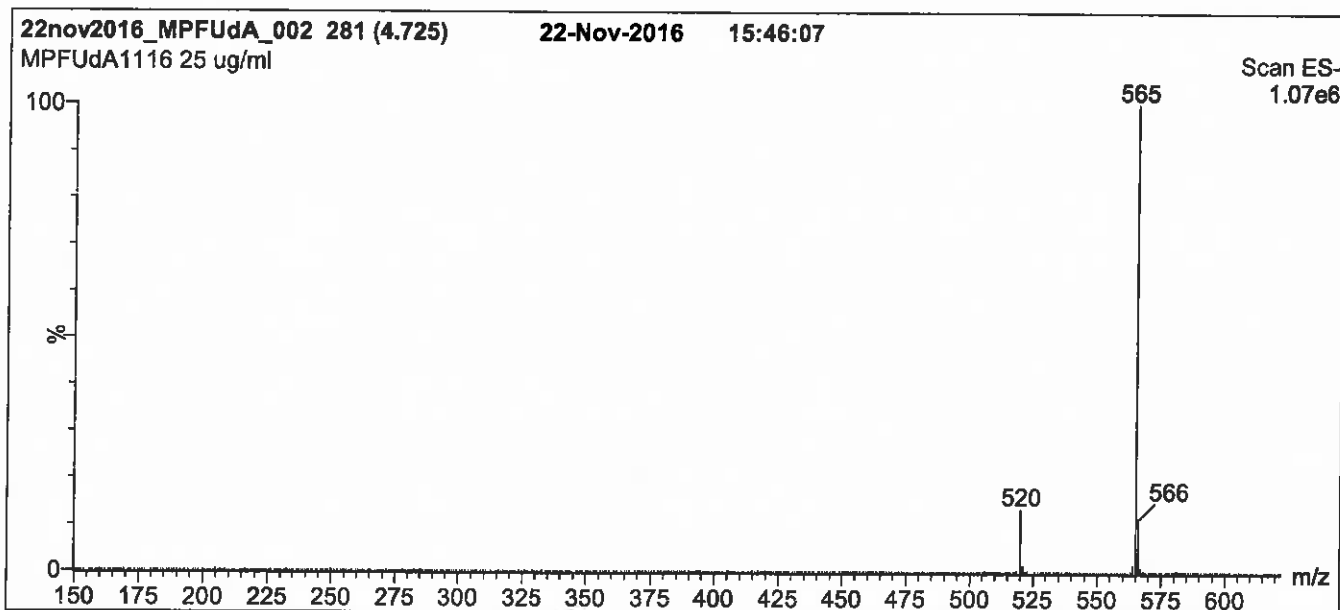
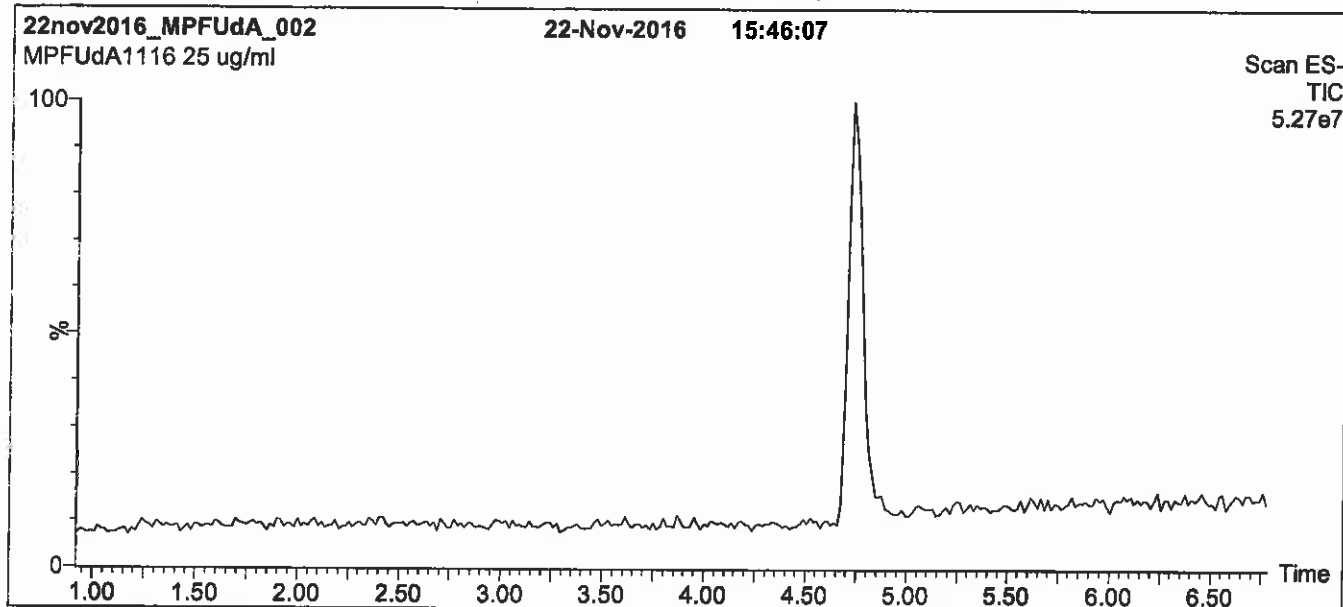
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

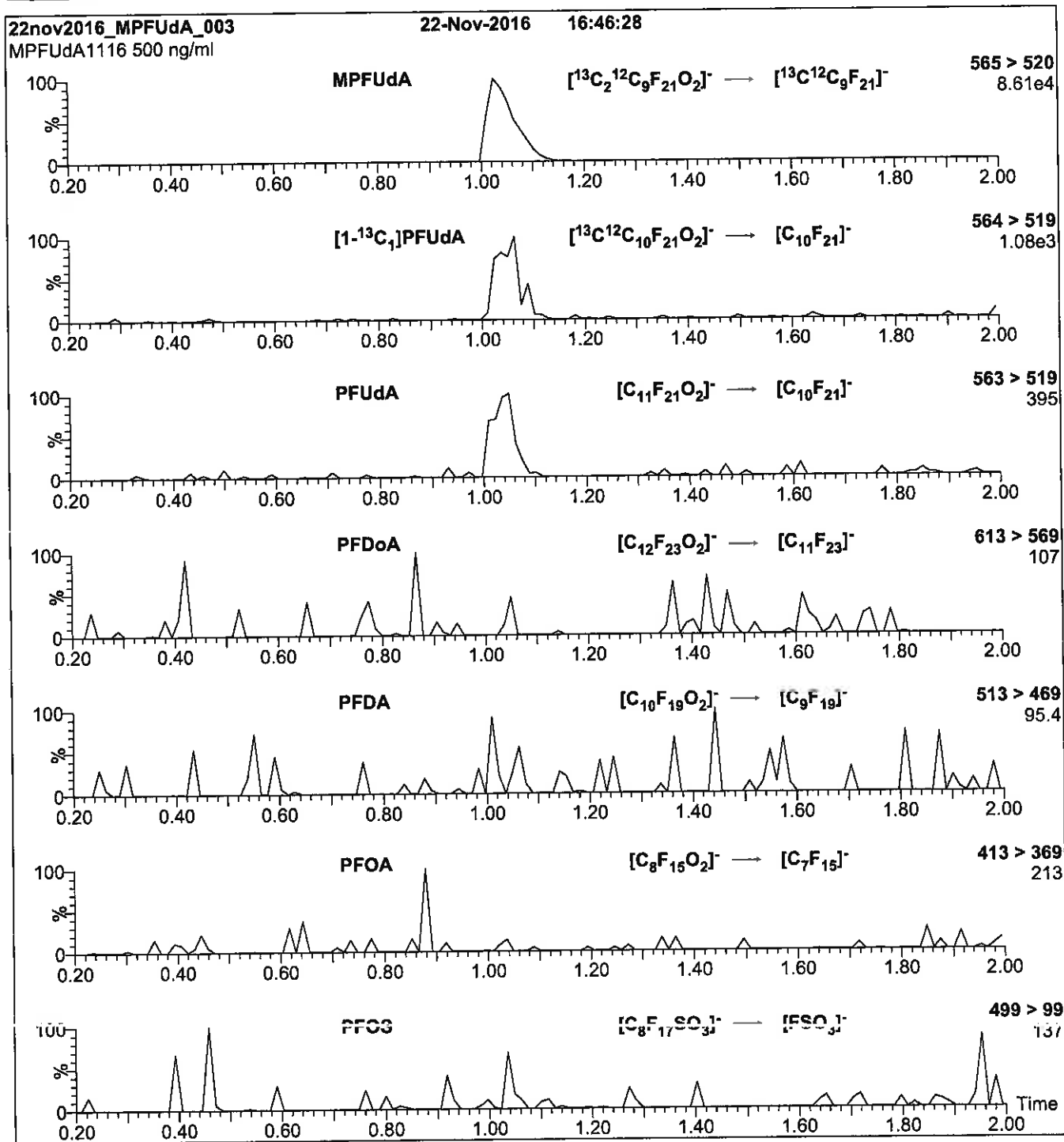
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCPFAC-24PAR_00001



WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PFAC-24PAR

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

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

DESCRIPTION:

PFAC-24PAR is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C₄-C₁₄), seven native perfluoroalkylsulfonates (C₄, C₅, C₇, C₉, and C₁₀ linear; C₆ and C₈ linear and branched), three native telomer sulfonates (4:2, 6:2, and 8:2), two native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide. The components and their concentrations are given in Table A.

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

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Table B: Isomeric Components and Percent Composition of PFHxSK
 Table C: Isomeric Components and Percent Composition of PFOSK
 Figure 1: LC/MS Data (SIR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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).



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
		as the salt	as the anion	
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-butanedisulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-pentadisulfonate	L-PFPeS	2000	1880	F
Potassium perfluorohexadisulfonate*	PFHxSK: linear isomer	1620	1480	I
	PFHxSK: Σ branched isomers	378	344	H
Sodium perfluoro-1-heptadisulfonate	L-PFHpS	2000	1900	L
Potassium perfluorooctadisulfonate**	PFOSK: linear isomer	1580	1460	O
	PFOSK: Σ branched isomers	422	391	N
Sodium perfluoro-1-nonadisulfonate	L-PFNS	2000	1920	R
Sodium perfluoro-1-decadisulfonate	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-decane sulfonate	8:2FTS	2000	1920	P

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

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

Table B: PFHxSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR	
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CFSO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	2.9	18.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}(\text{CF}_3)\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	5.0	
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	8.9	
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CCF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.2	
7	Other Unidentified Isomers		0.5	

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

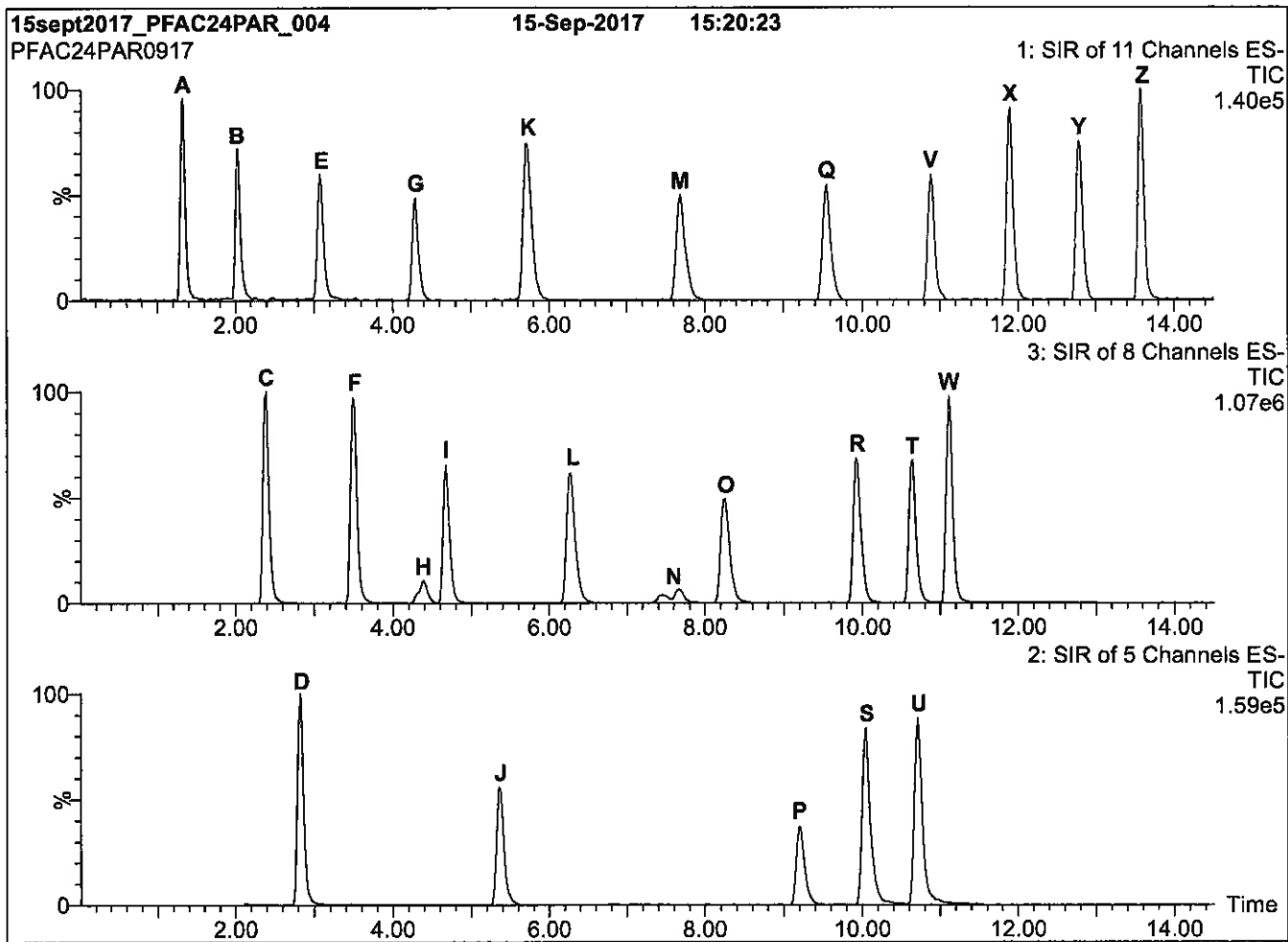
Table C: PFOSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR	
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	78.8	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃ ⁻)K ⁺ CF ₃	1.2	21.1
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(CF ₃)SO ₃ ⁻ K ⁺ CF ₃	0.6	
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺ CF ₃	1.9	
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	2.2	
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	4.5	
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	10.0	
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.2	
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.03	
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF(CF ₃)CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.4	
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.07	

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

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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 55% organic over 3.5 min.
Ramp to 70% organic over 6.5 min.
Ramp to 85% organic over 5 min and hold for
1 min before returning to initial conditions in 0.5 min.
Time: 17 min

Flow: 300 μl/min

MS Parameters

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

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

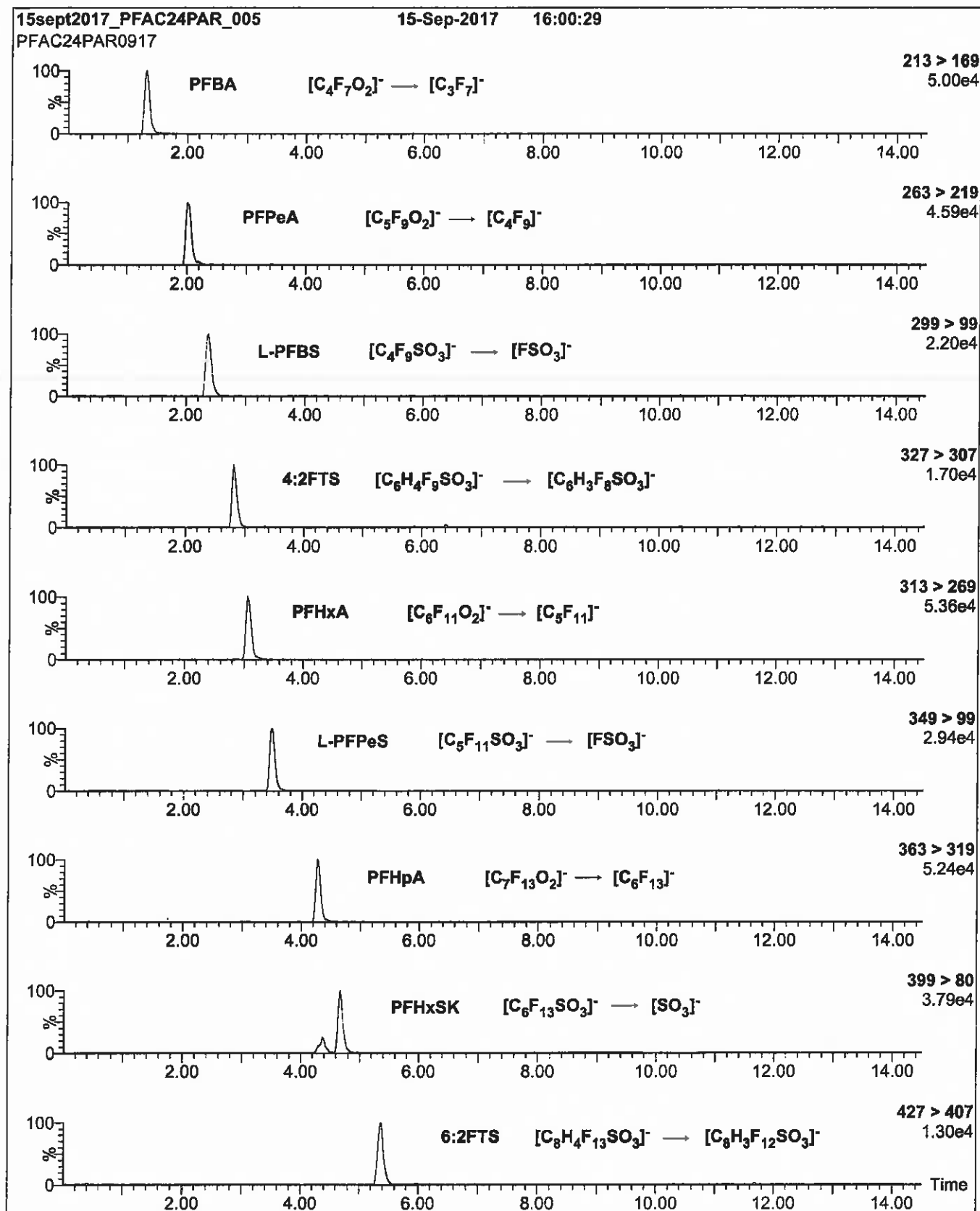


Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)

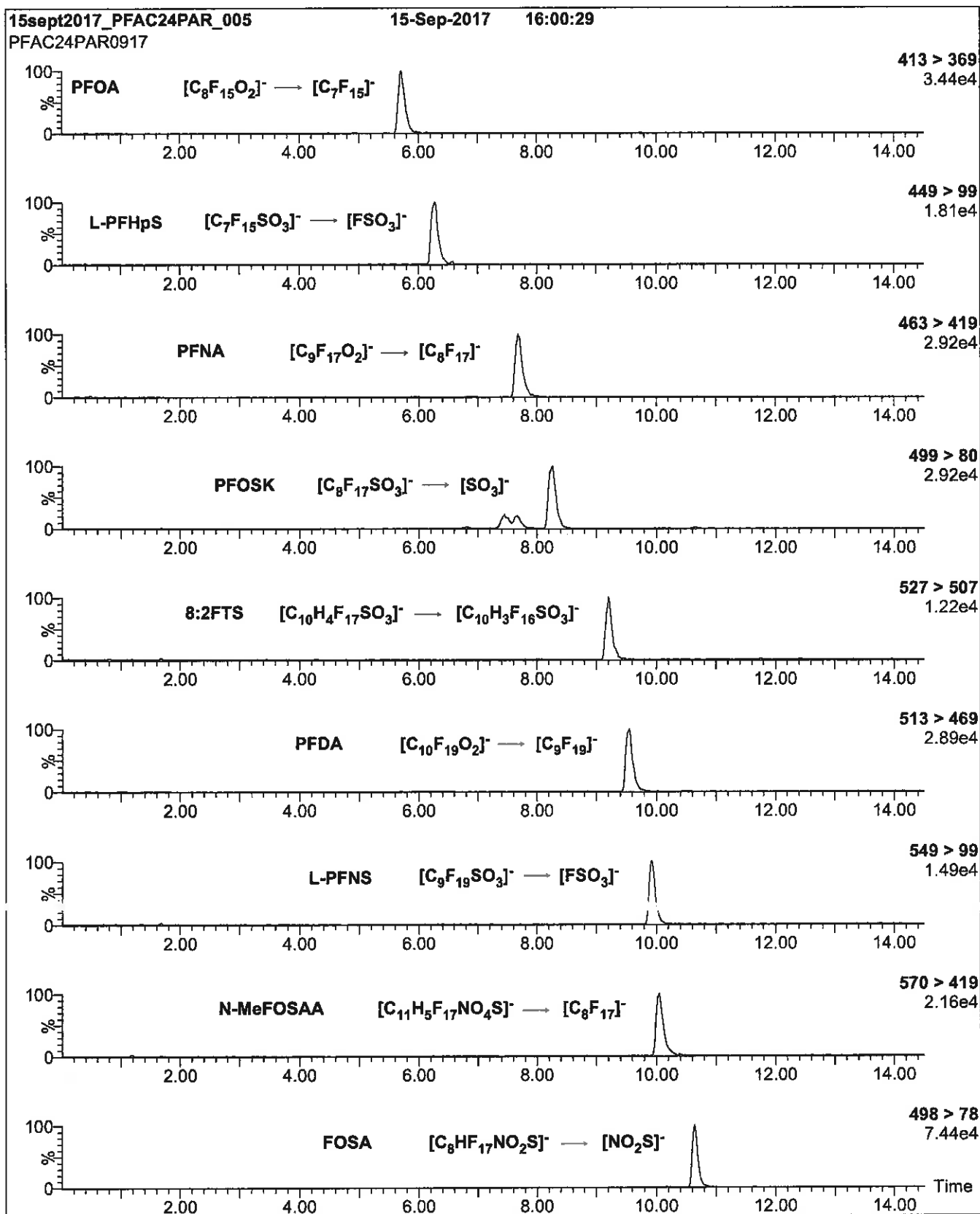
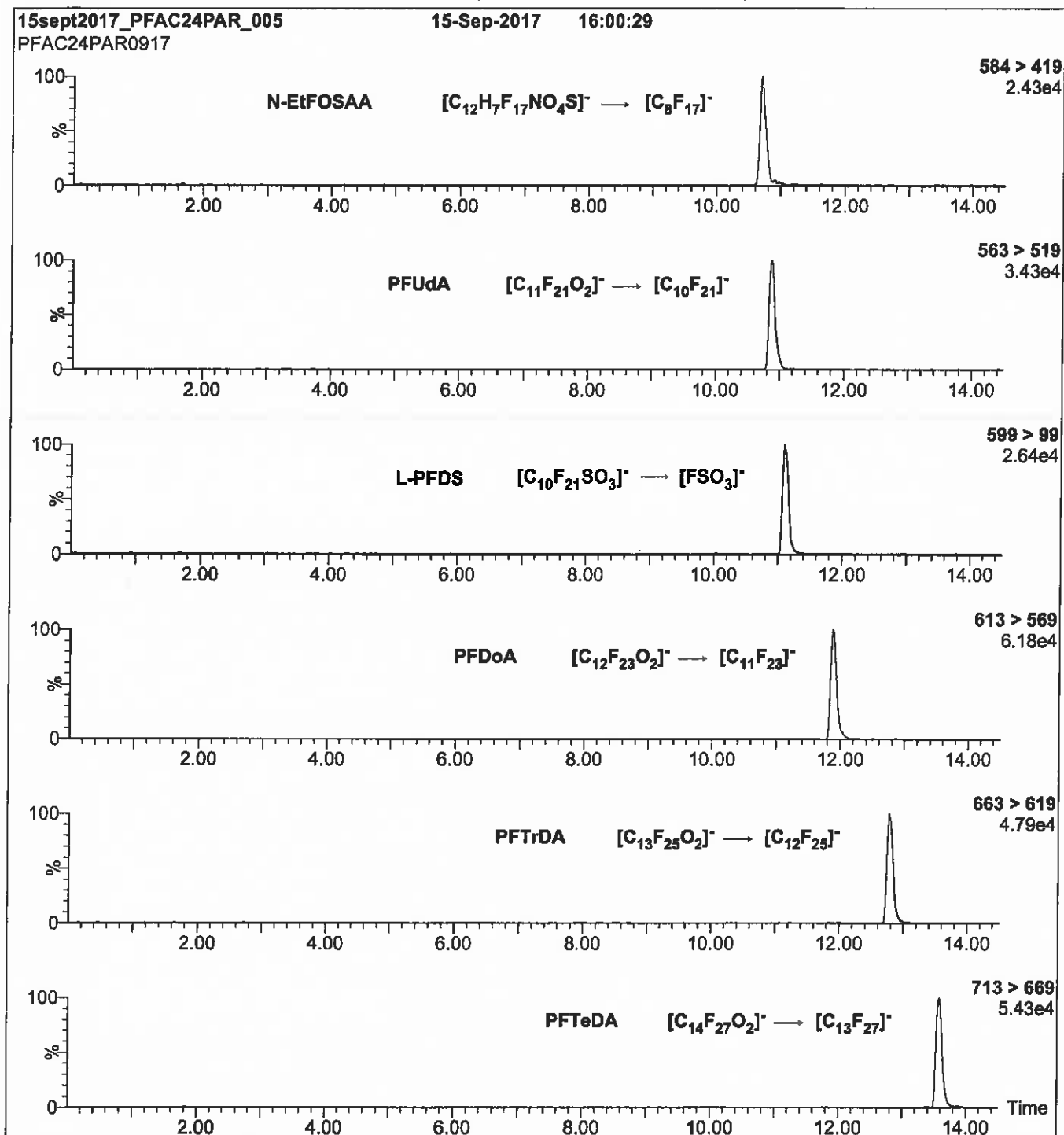


Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: On-column (PFAC-24PAR)

Mobile phase: Same as Figure 1

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3

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

Reagent

LCPFBA_00008

P: 9/21/17 SKV



WELLINGTON LABORATORIES

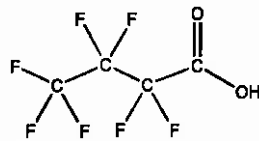
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFBA0517

STRUCTURE:

CAS #: 375-22-4



MOLECULAR FORMULA: C₄HF₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 214.04
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: 
B.G. Chittim, General Manager

Date: 05/30/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

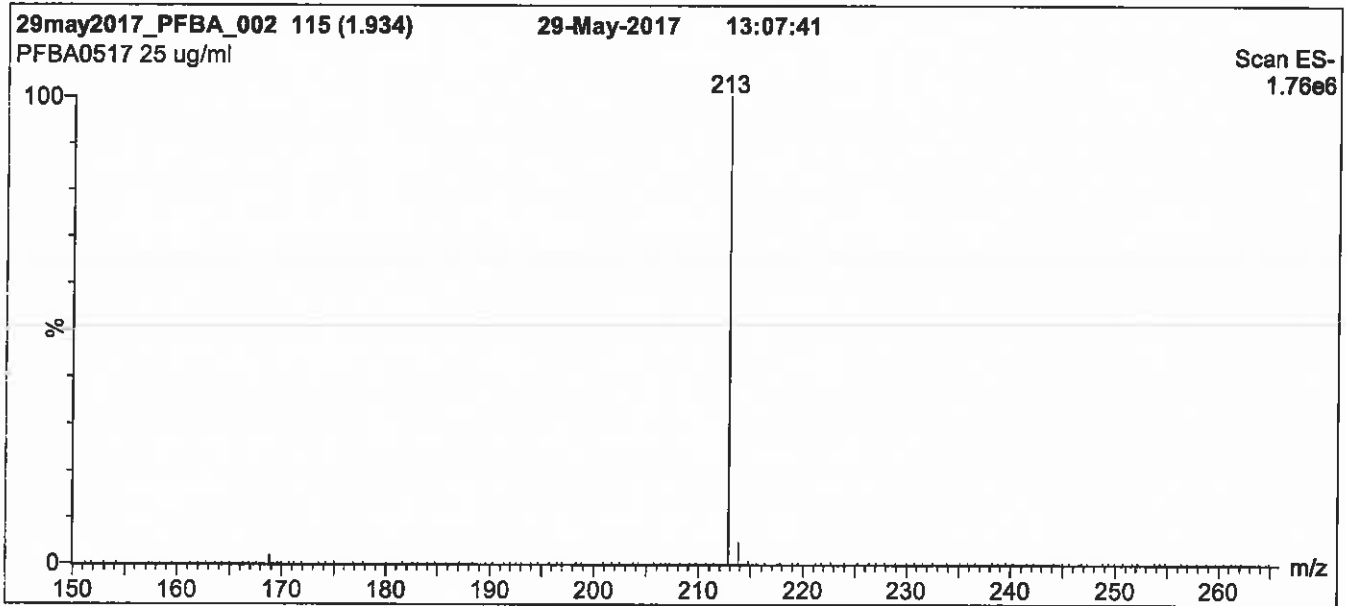
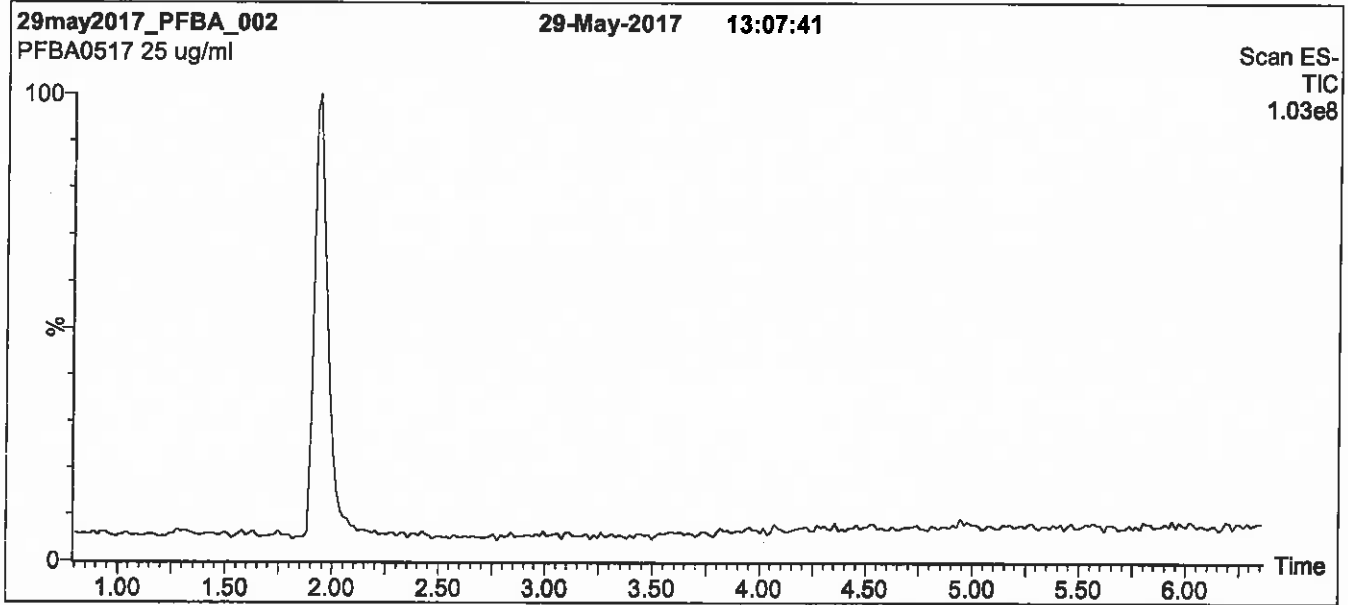
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈,
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 30% (80:20 MeOH:ACN) / 70% H₂O
 (both with 10 mM NH₄OAc 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

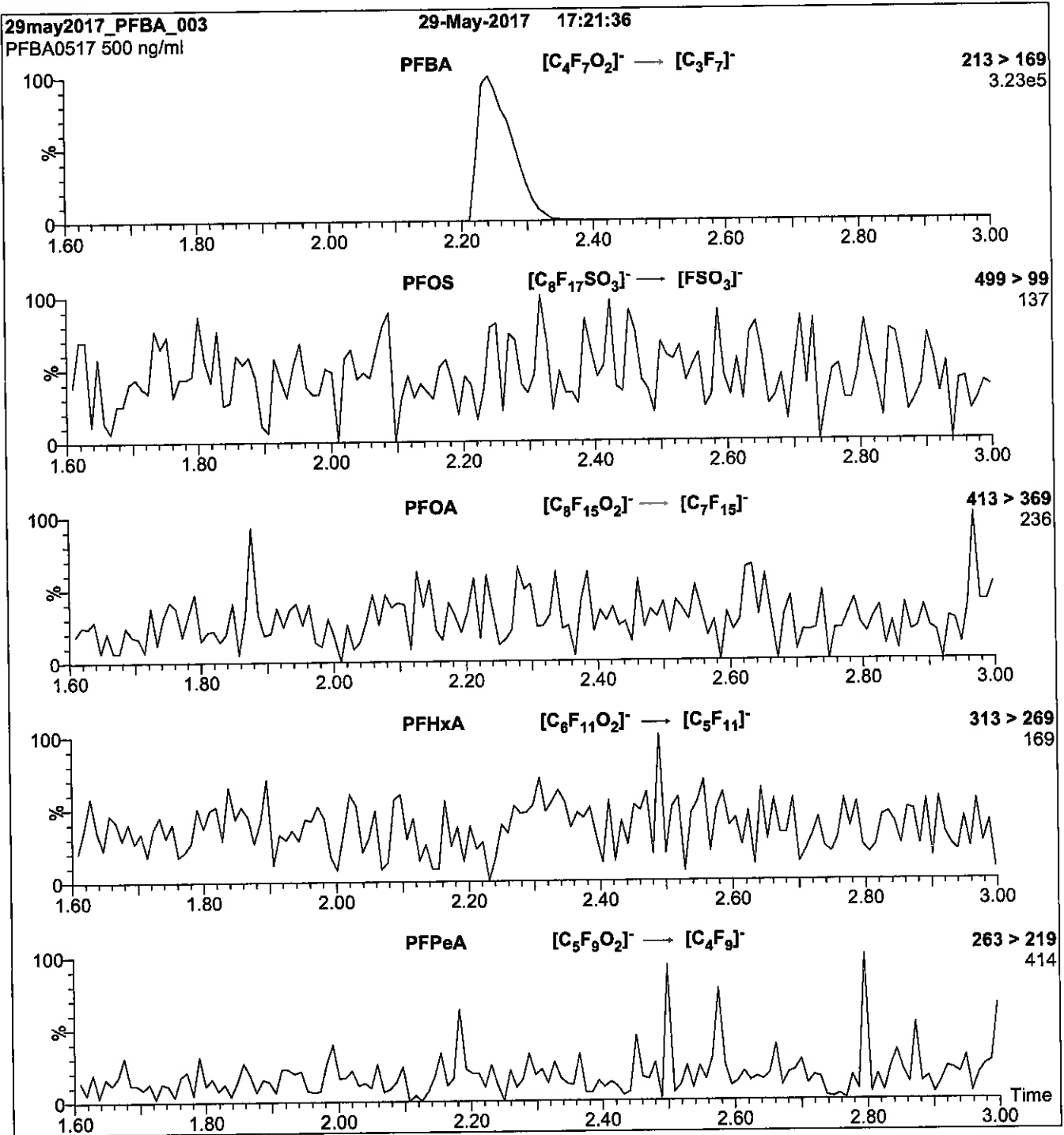
Flow: 300 μ l/min

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 μ l (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFBS_00009

D: 2/16/18 SW

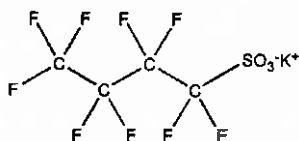


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: CAS #: 29420-49-3



MOLECULAR FORMULA: C4F9SO3K MOLECULAR WEIGHT: 338.19
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt) SOLVENT(S): Methanol
44.2 ± 2.2 µg/ml (PFBS anion)
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

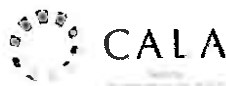
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

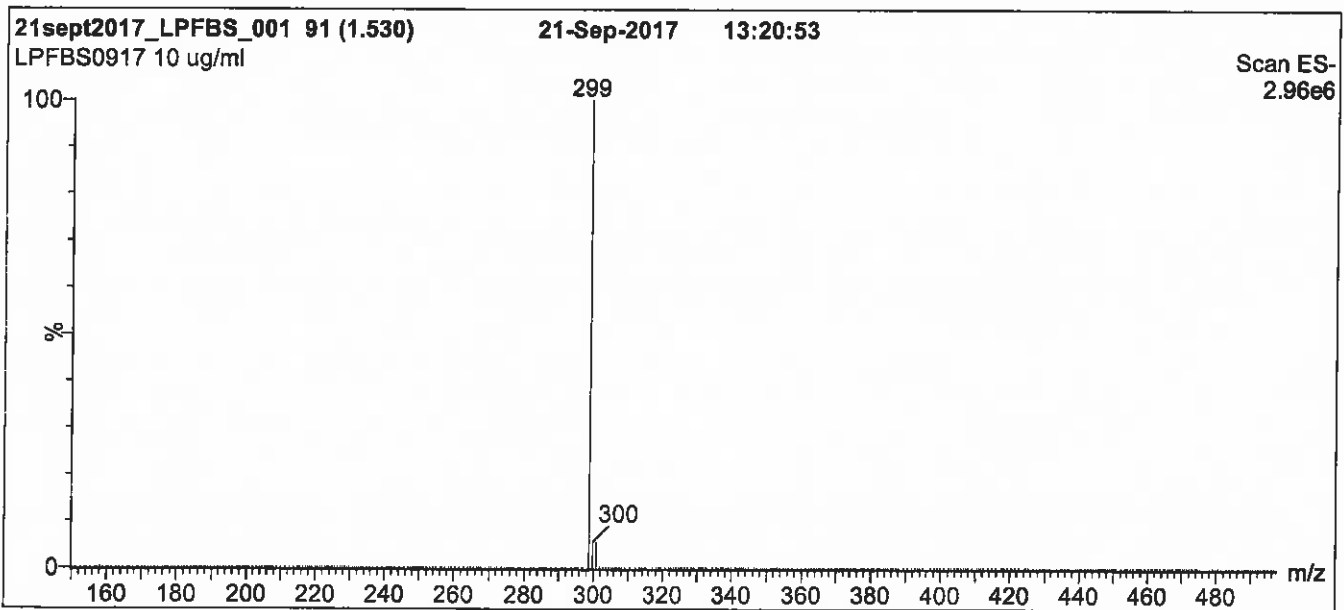
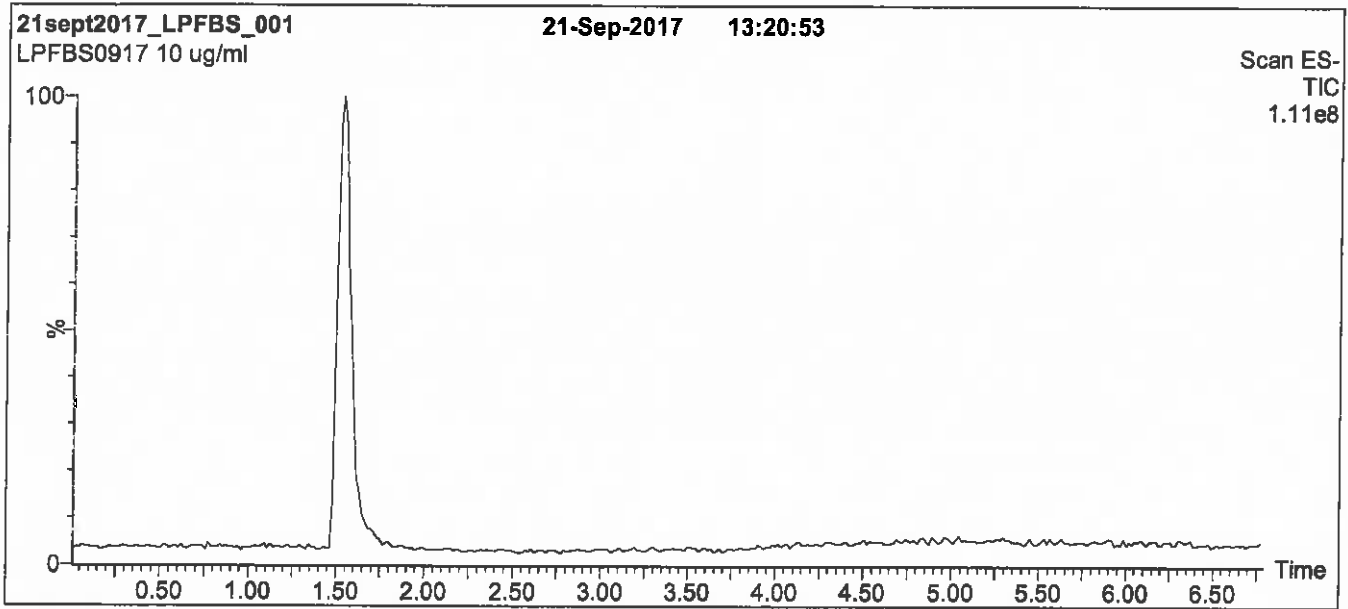
QUALITY MANAGEMENT:

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).



****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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

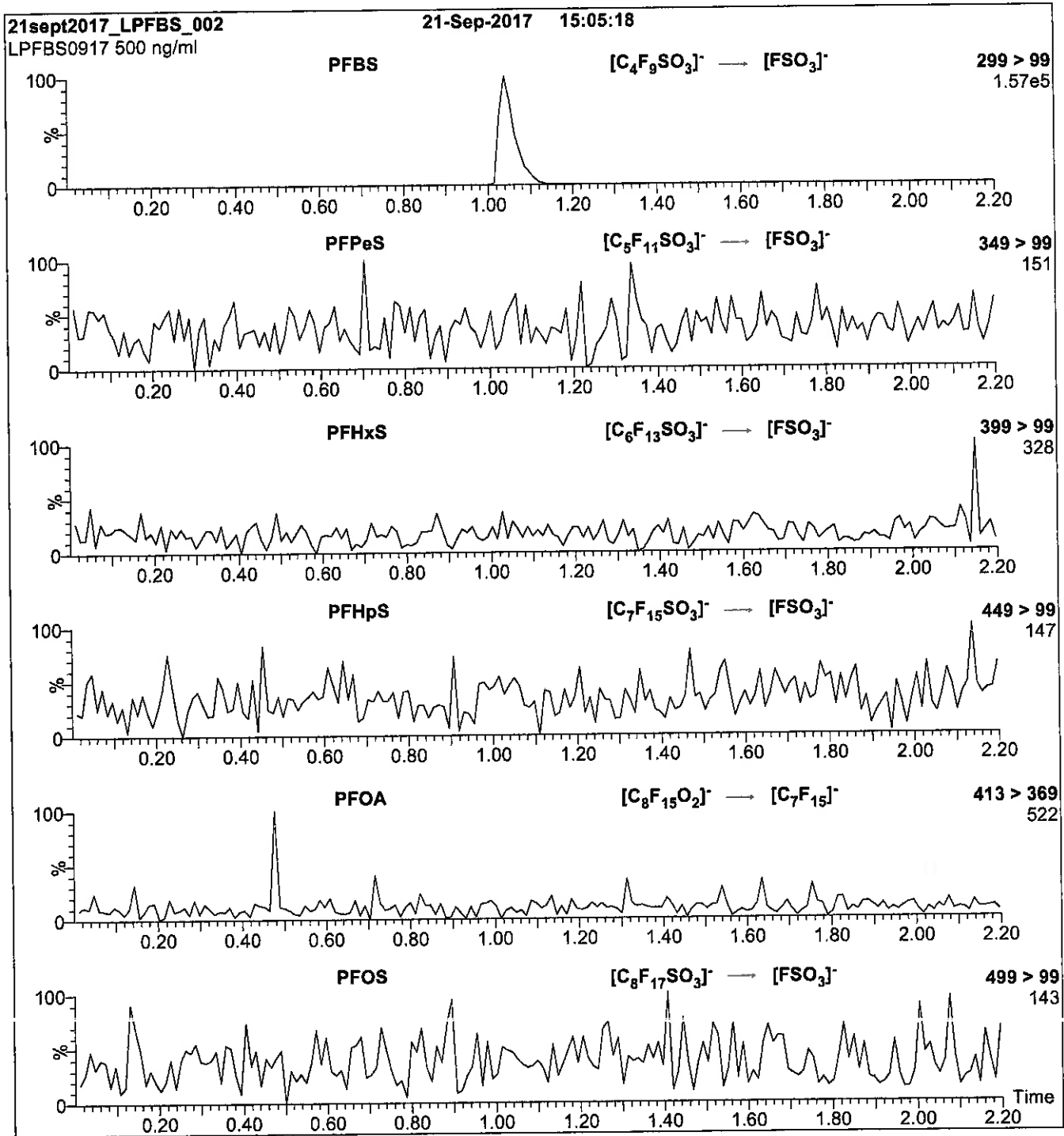
Flow: 300 μ l/min

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 μ l (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3

Collision Energy (eV) = 25

Reagent

LCPFDA_00008

n: 9/2/17 skv

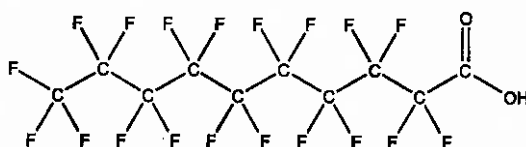


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDA **LOT NUMBER:** PFDA0517
COMPOUND: Perfluoro-n-decanoic acid

STRUCTURE: **CAS #:** 335-76-2



MOLECULAR FORMULA: C₁₀HF₁₉O₂ **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
B.G. Chittim, General Manager (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

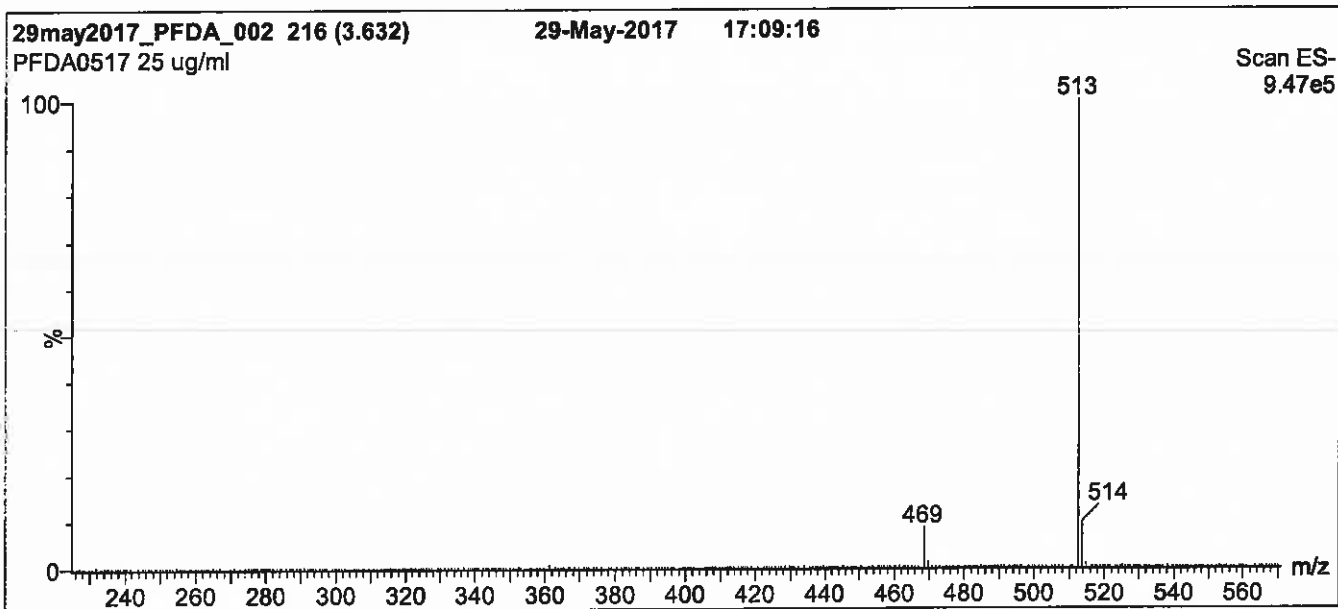
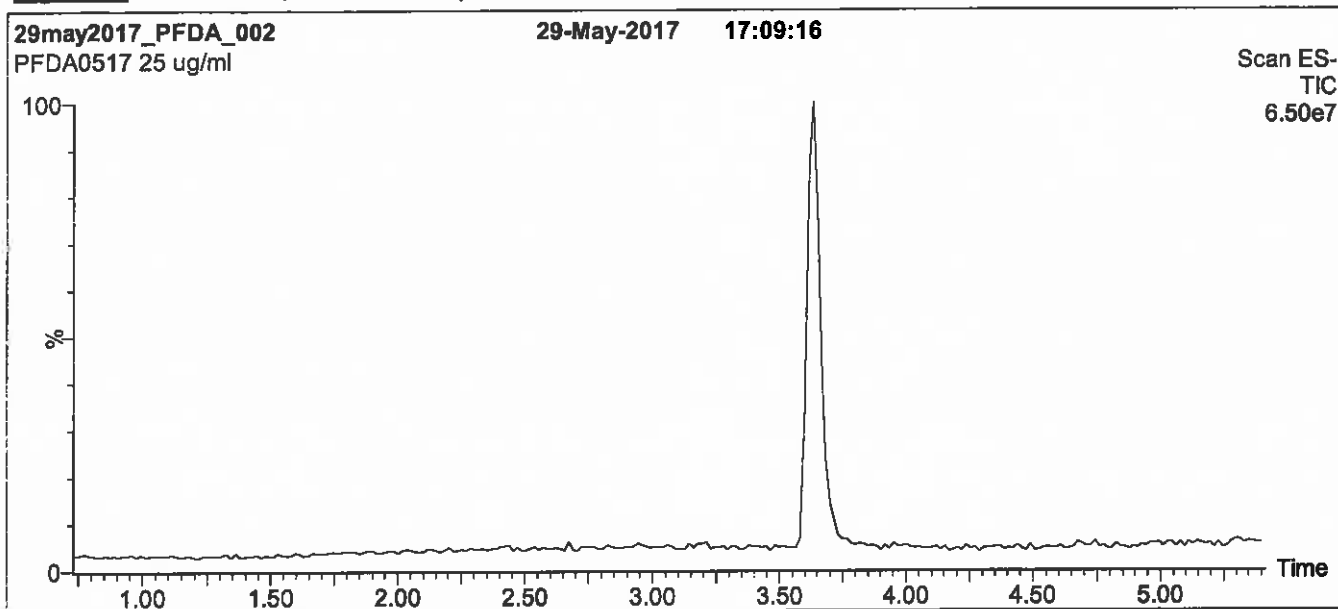
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 60% (80:20 MeOH:ACN) / 40% H₂O
 (both with 10 mM NH₄OAc 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

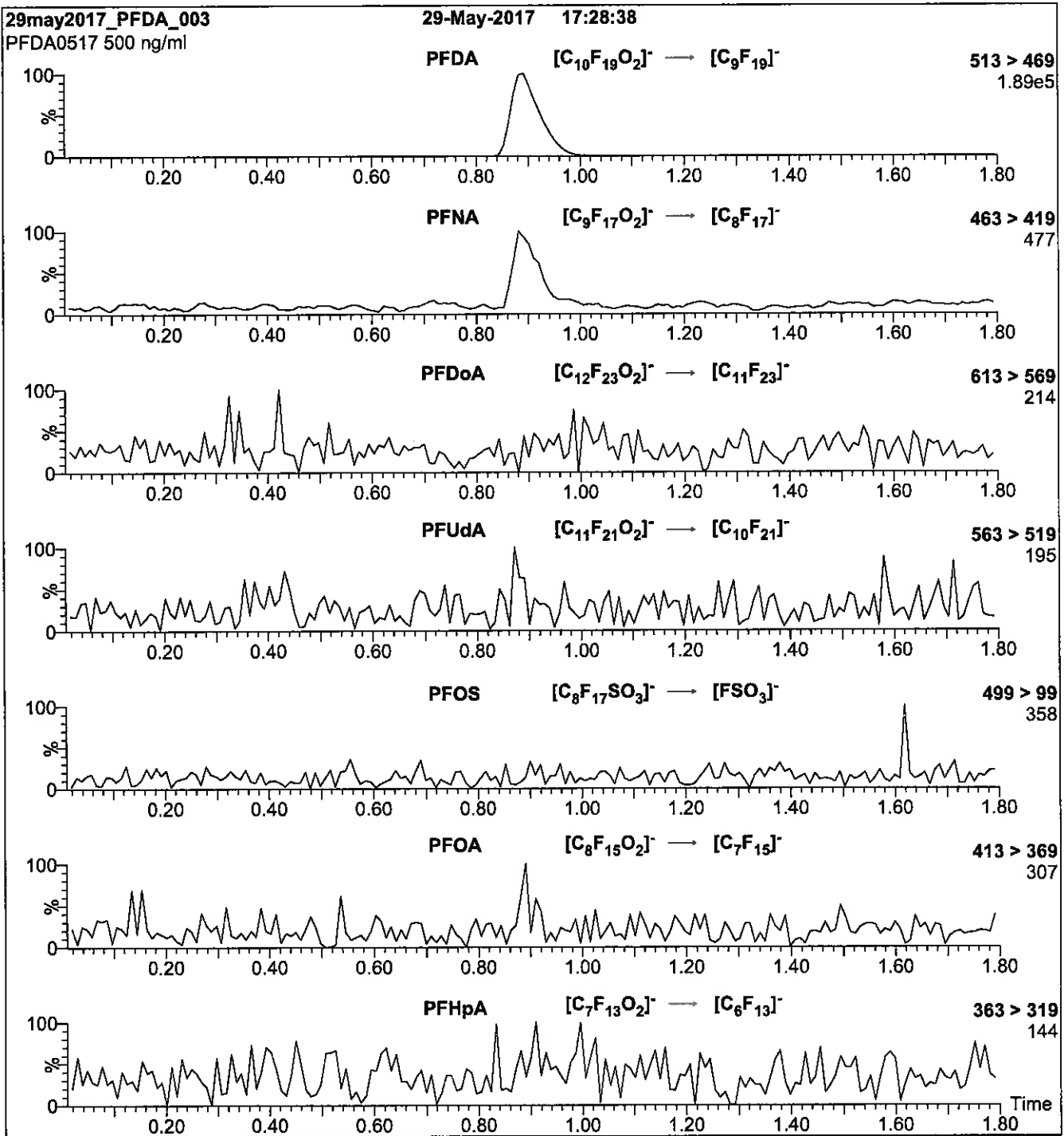
Flow: 300 μ l/min

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 μ l (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
 Collision Energy (eV) = 13

Reagent

LCPFDoA_00008

P: 10/2017 SKV

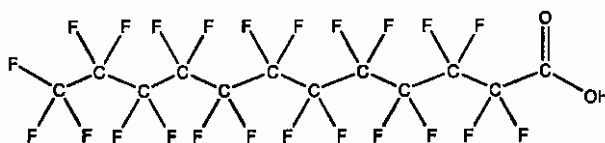


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFD0A **LOT NUMBER:** PFD0A0517
COMPOUND: Perfluoro-n-dodecanoic acid

STRUCTURE: **CAS #:** 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$ **MOLECULAR WEIGHT:** 614.10
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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
B.G. Chittim, General Manager (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

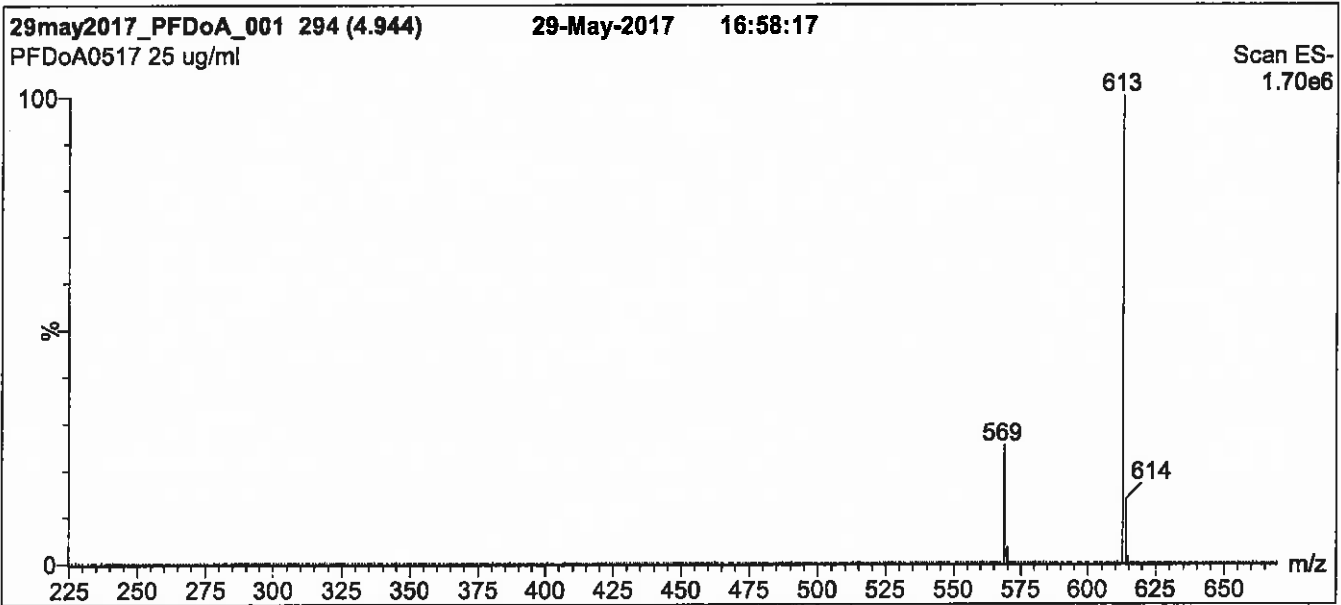
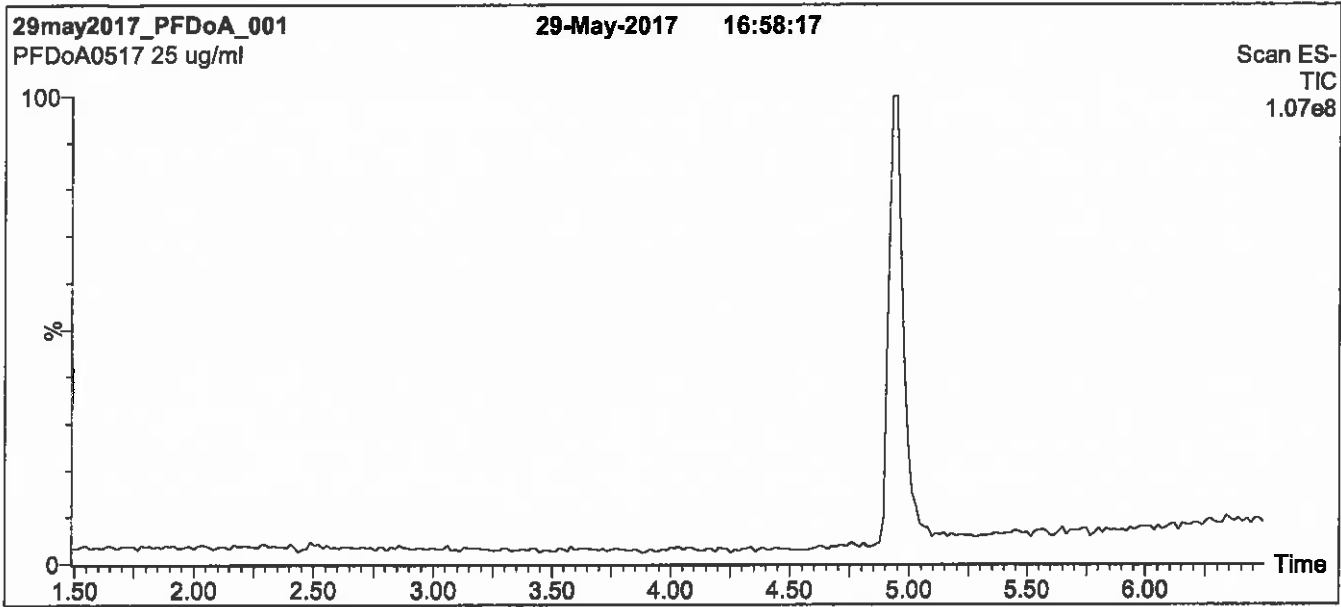
QUALITY MANAGEMENT:

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).



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: PFD_oA; LC/MS 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

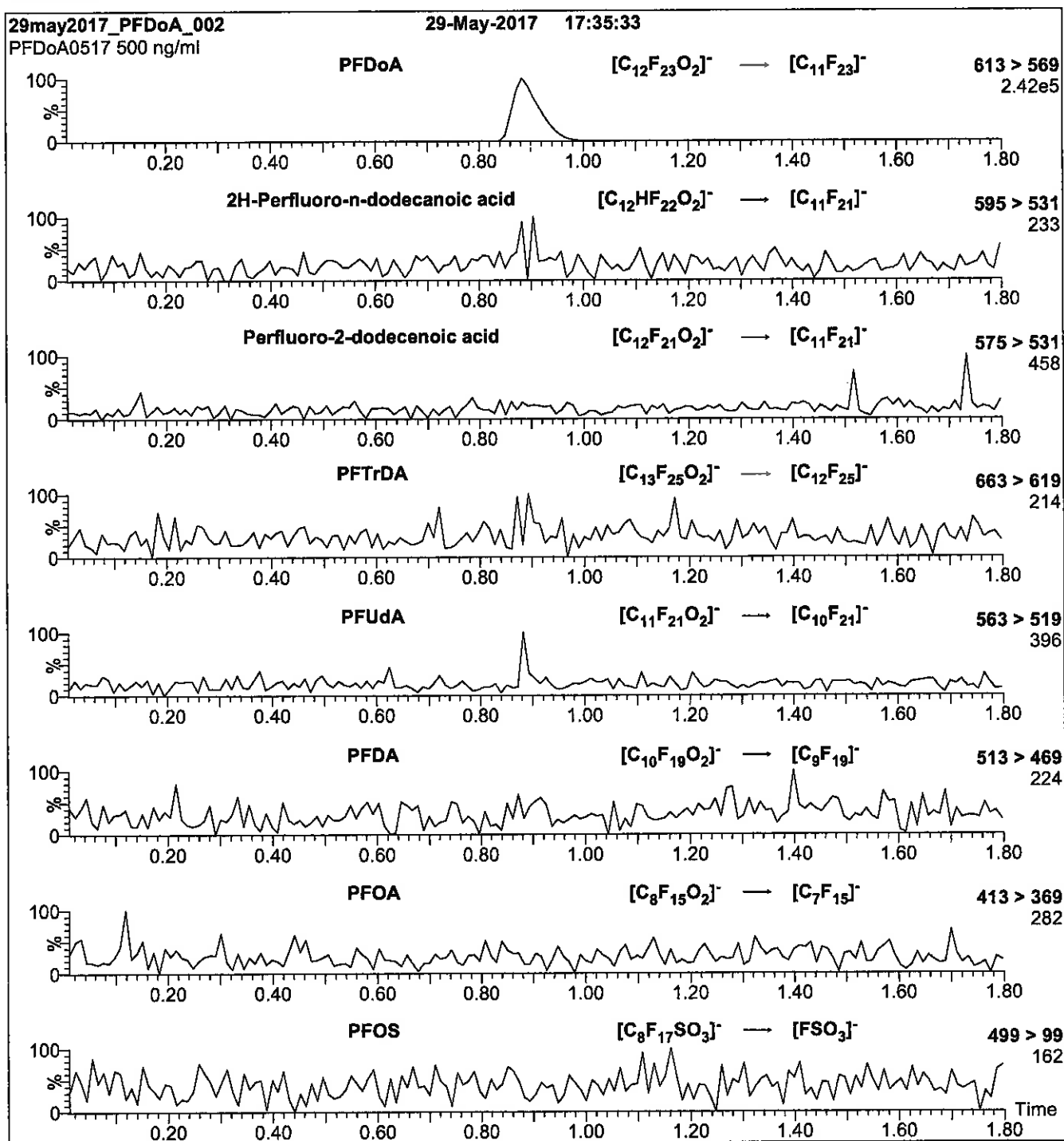
Flow: 300 μ l/min

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 μ l (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
 Collision Energy (eV) = 13

Reagent

LCPFDS_00008

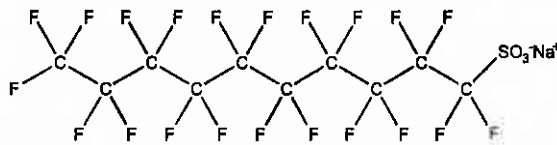


WELLINGTON LABORATORIES

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: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt) **SOLVENT(S):** Methanol
 $48.2 \pm 2.4 \mu\text{g/ml}$ (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: 
 B.G. Chittim, General Manager **Date:** 11/16/2017
 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

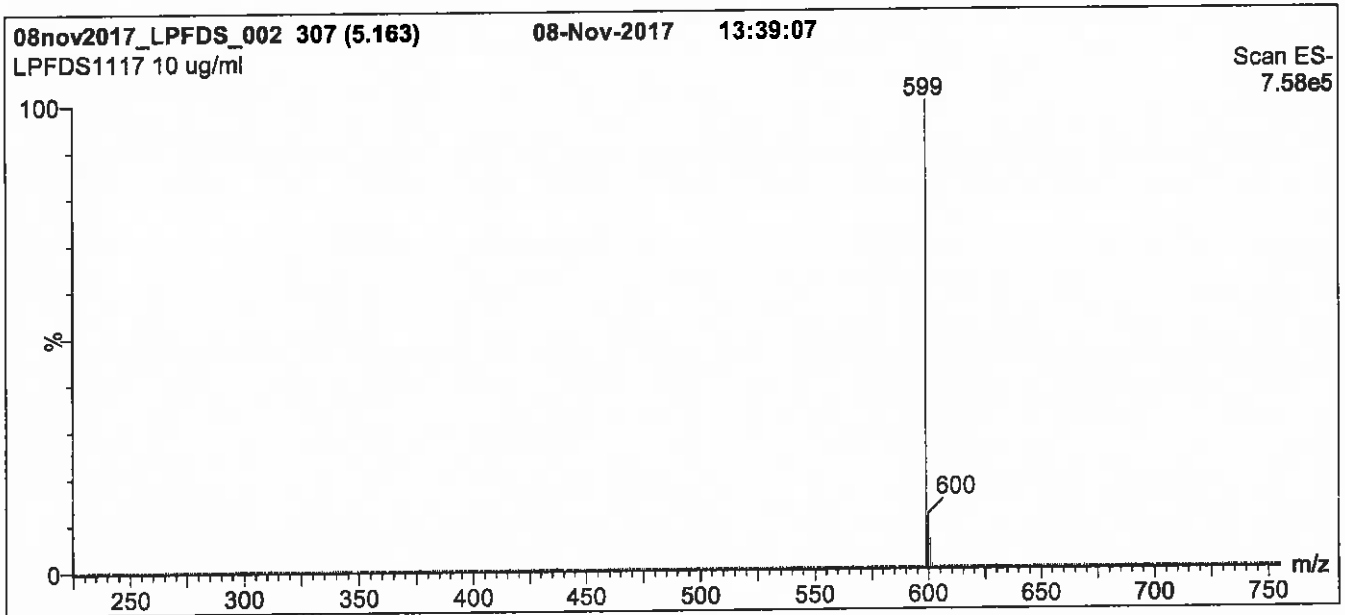
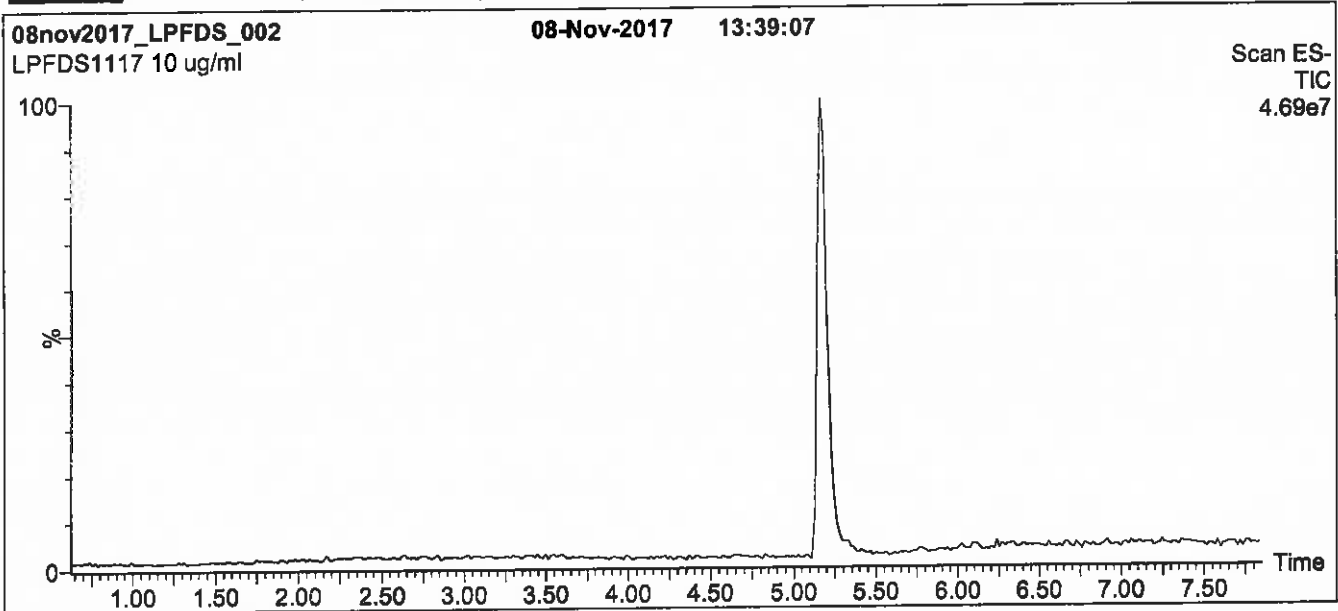
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

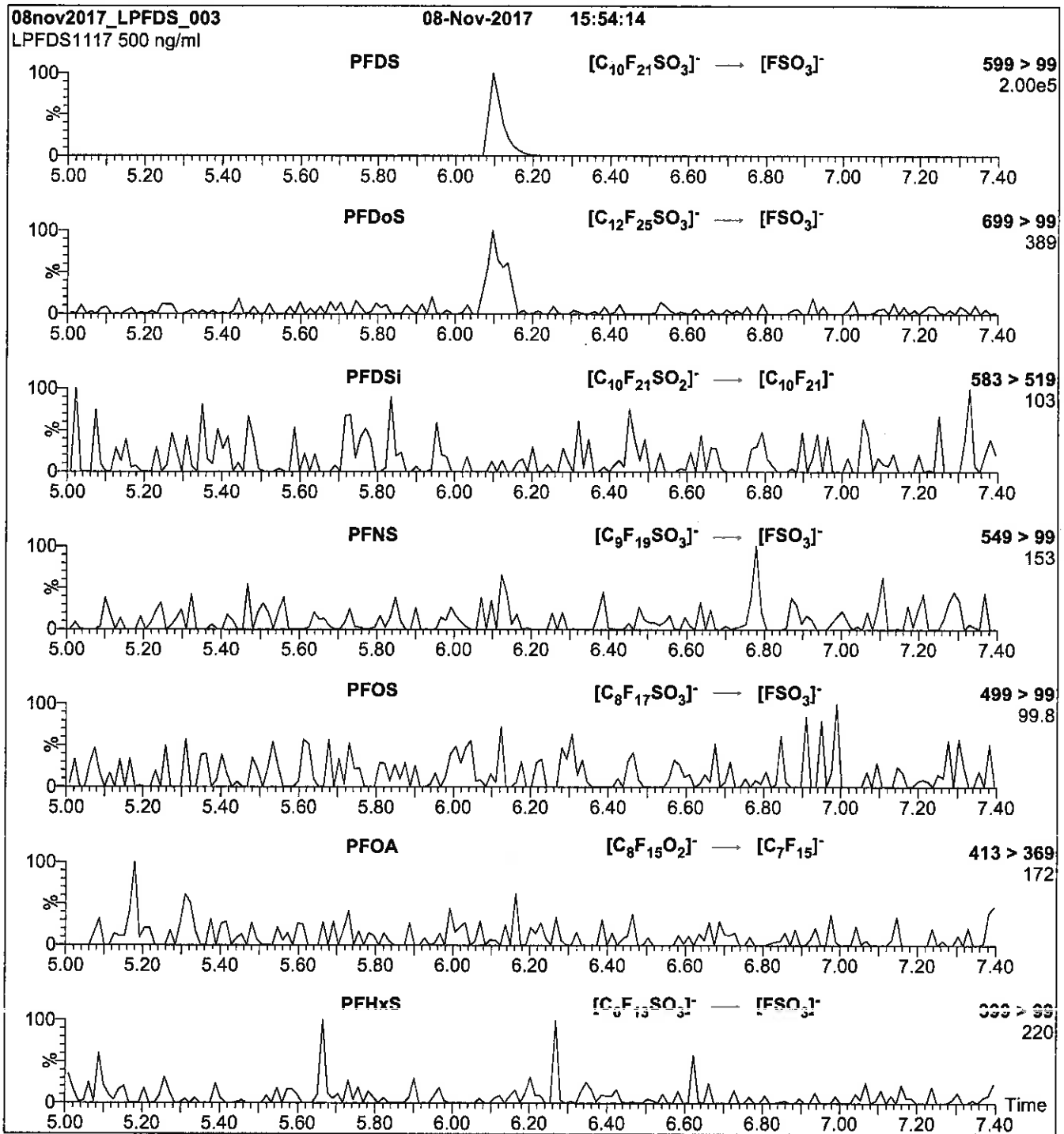
Flow: 300 μ l/min

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 μ l (500 ng/ml L-PFDS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00011

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

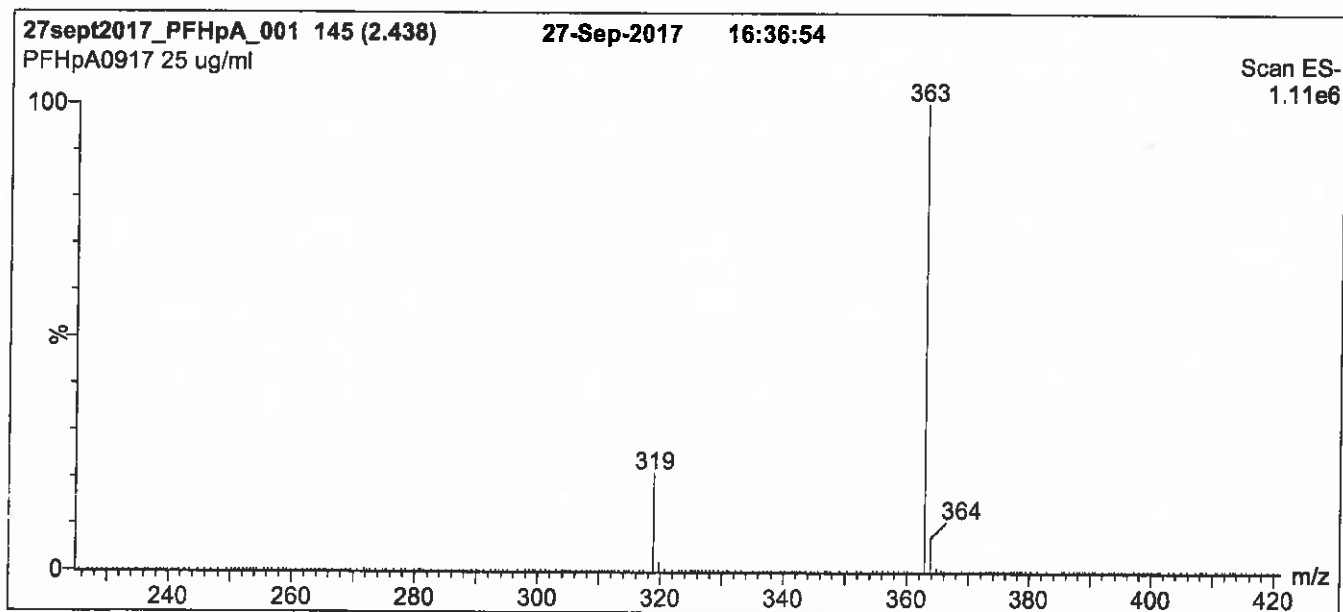
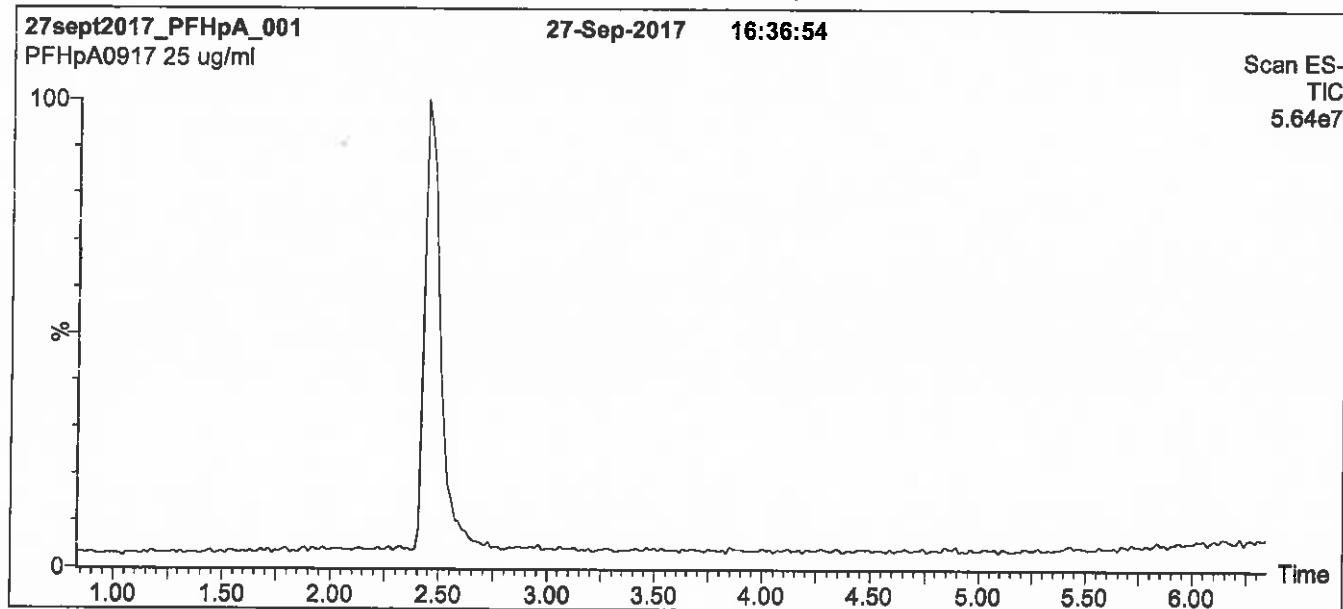
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

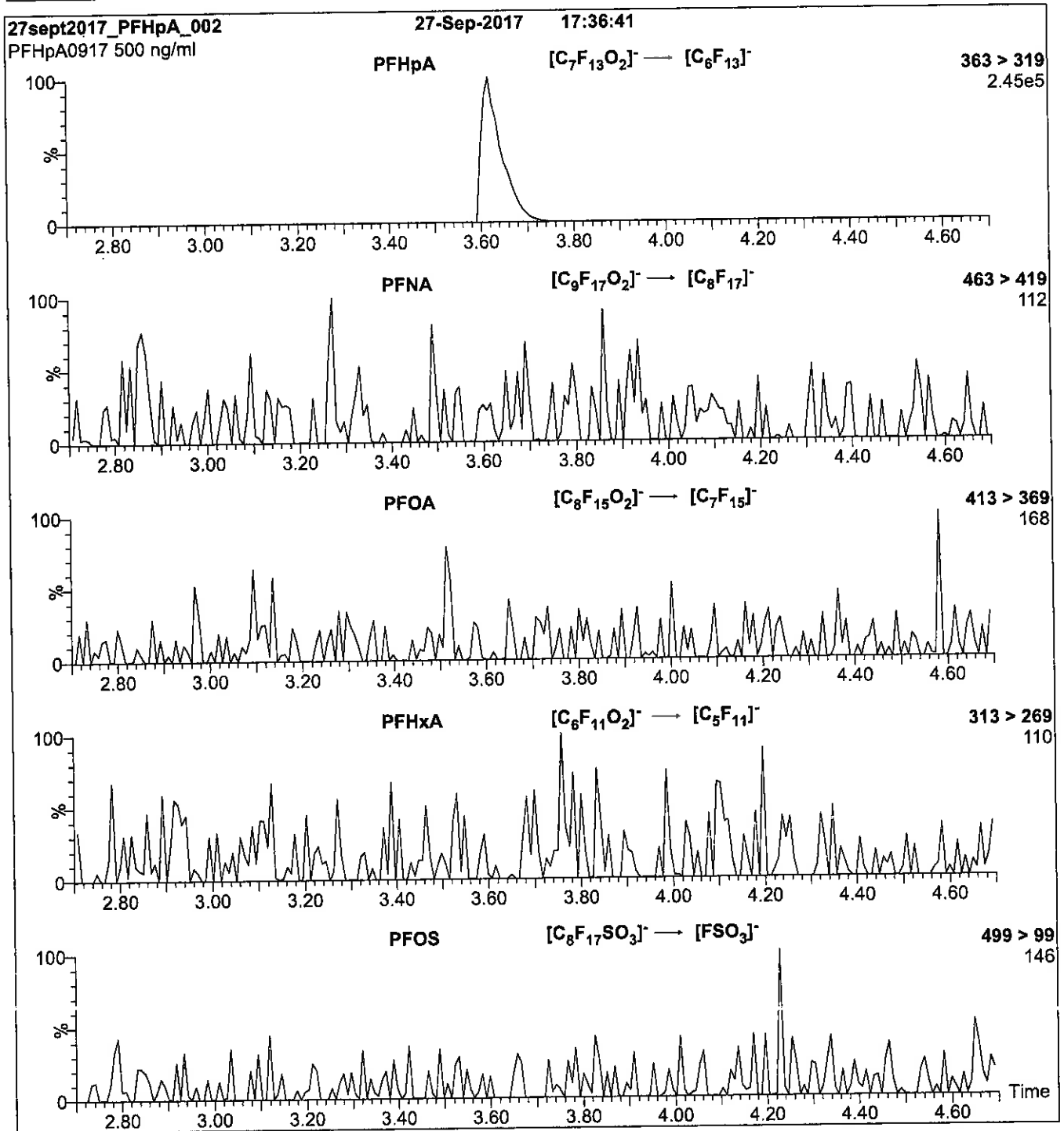
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/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 μ l (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHpSA_00003

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

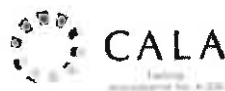
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

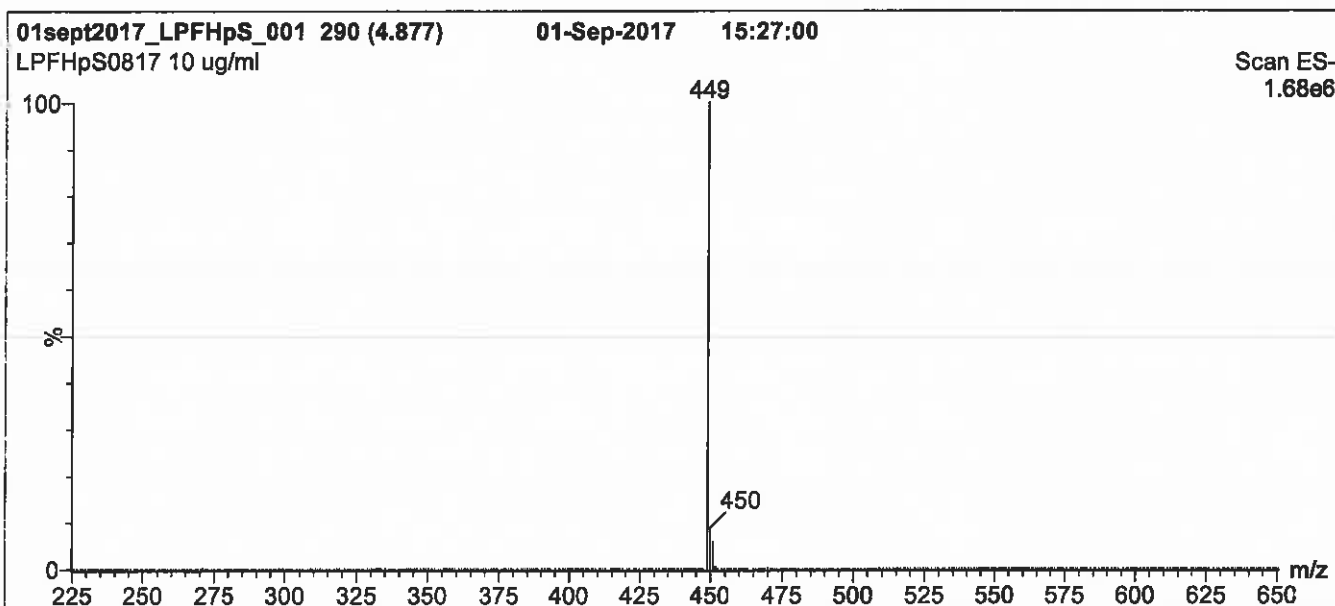
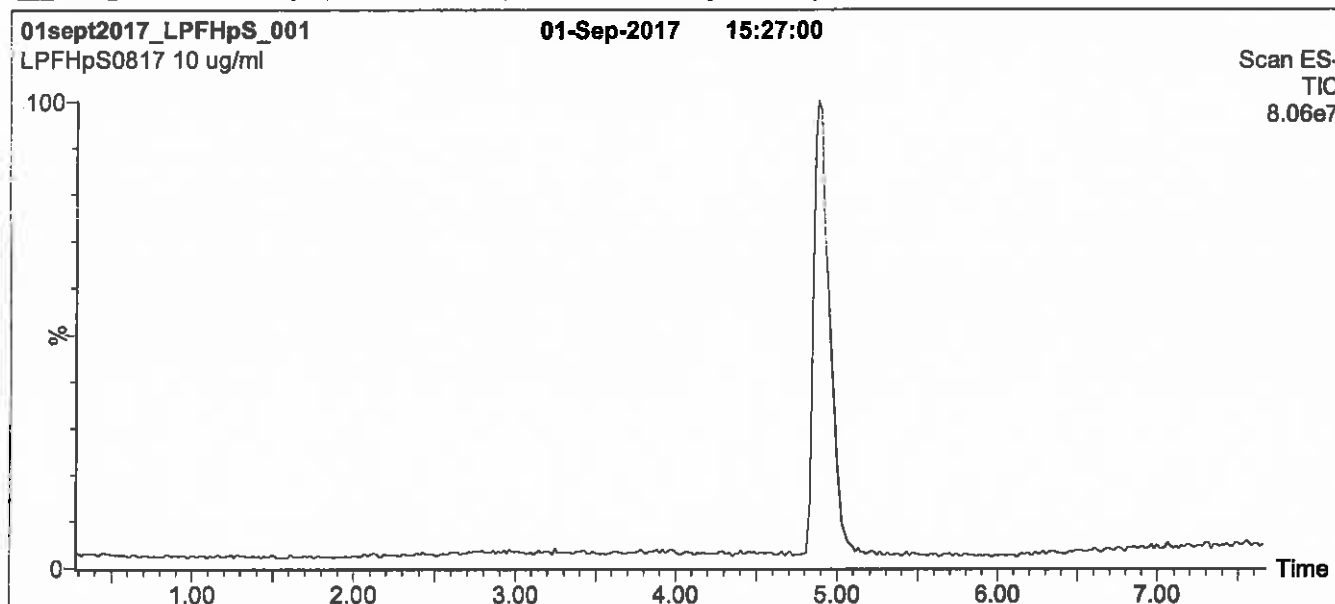
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

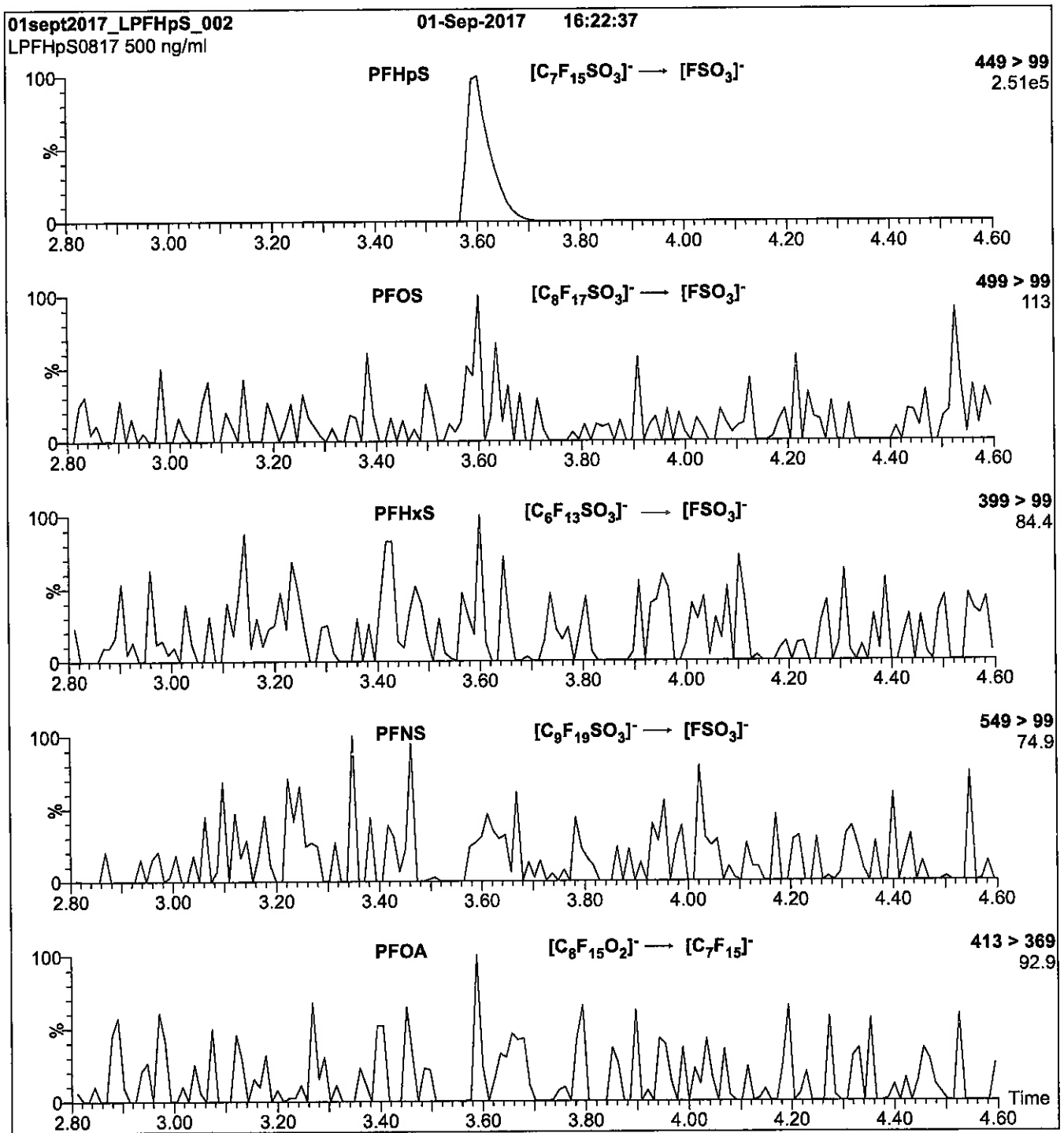
Flow: 300 μ l/min

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 μ l (500 ng/ml L-PFHpS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHxA_00010

r: 2/16/18 Spal



WELLINGTON LABORATORIES

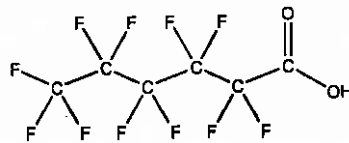
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFHxA0917

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: C₆HF₁₁O₂
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: 
B.G. Chittim, General Manager

Date: 11/01/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

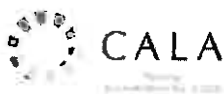
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

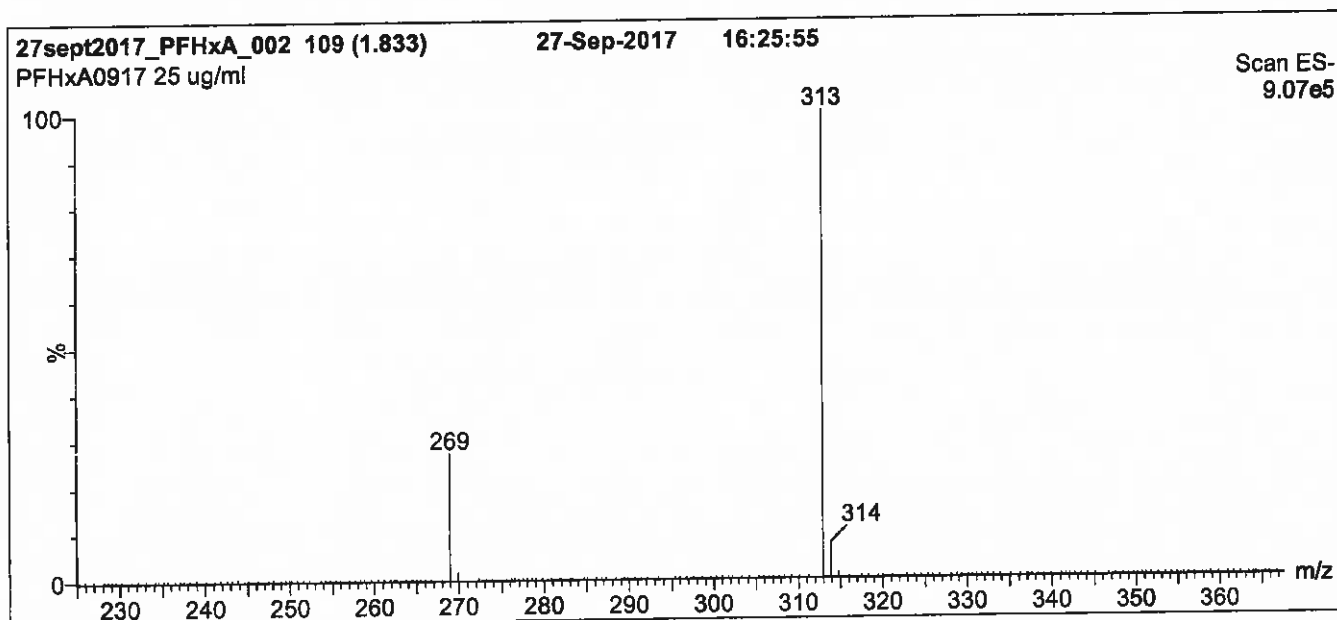
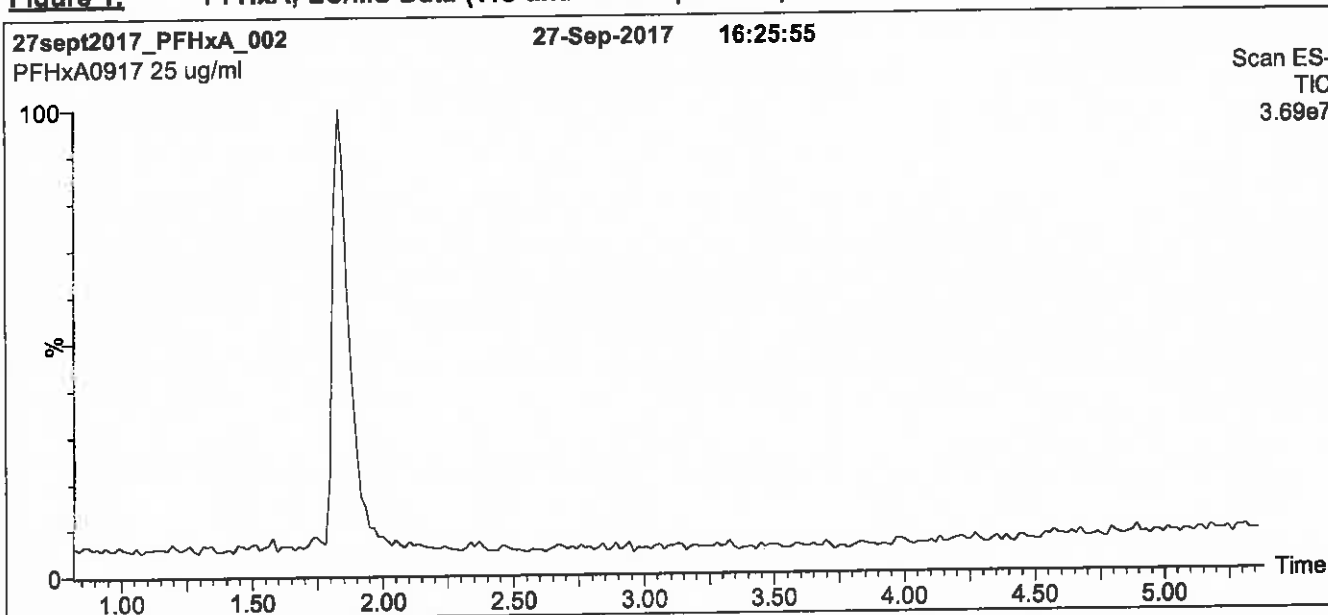
QUALITY MANAGEMENT:

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).



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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

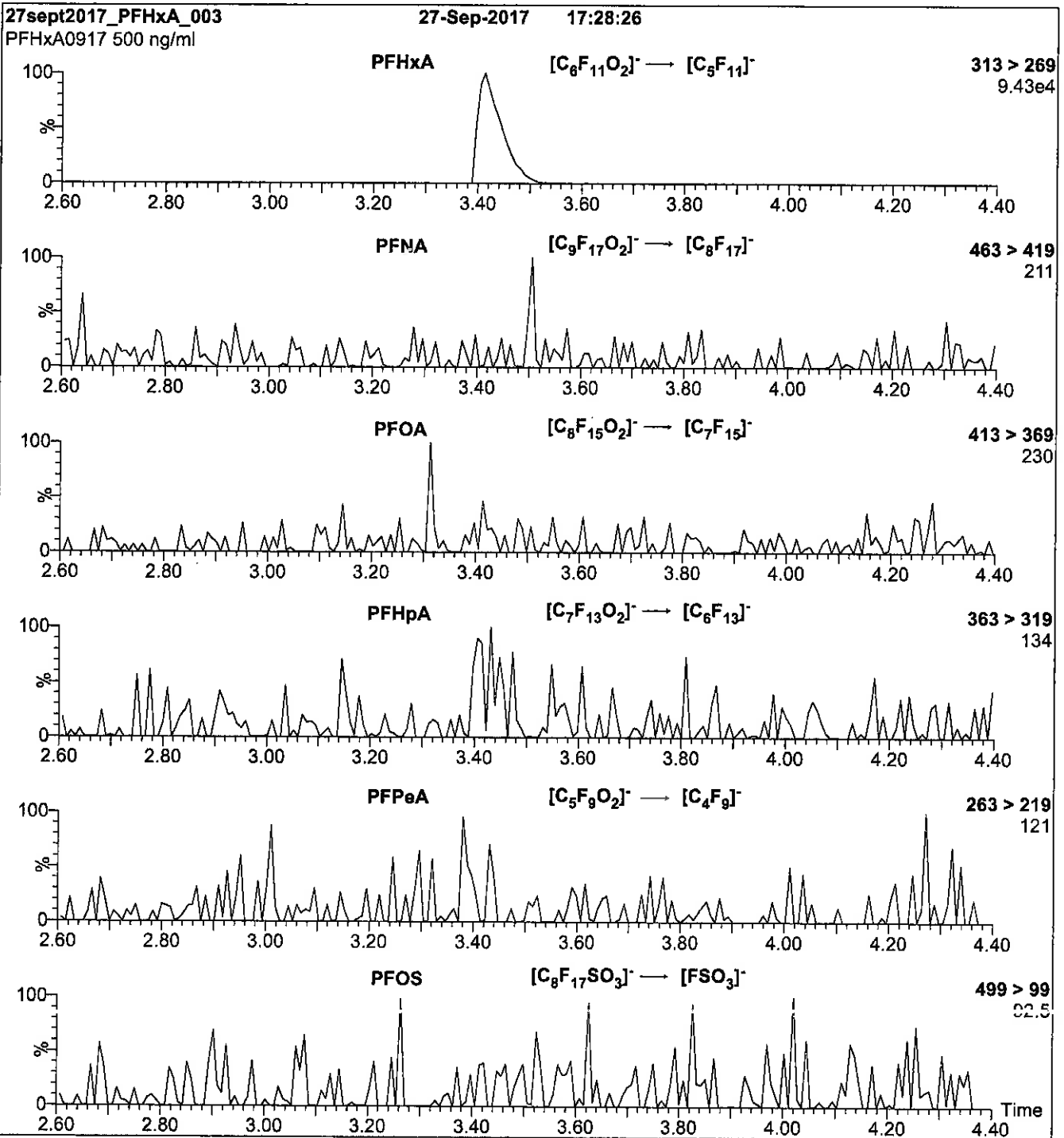
Flow: 300 μ l/min

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 μ l (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCPFHxDA_00010

r: 9/2/17 sw

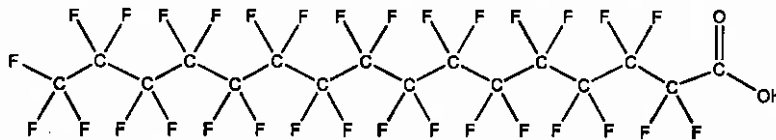


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA **LOT NUMBER:** PFHxDA0717
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE: **CAS #:** 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$ **MOLECULAR WEIGHT:** 814.13
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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: 
B.G. Chittim, General Manager **Date:** 08/04/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

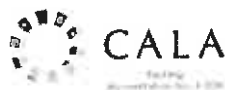
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

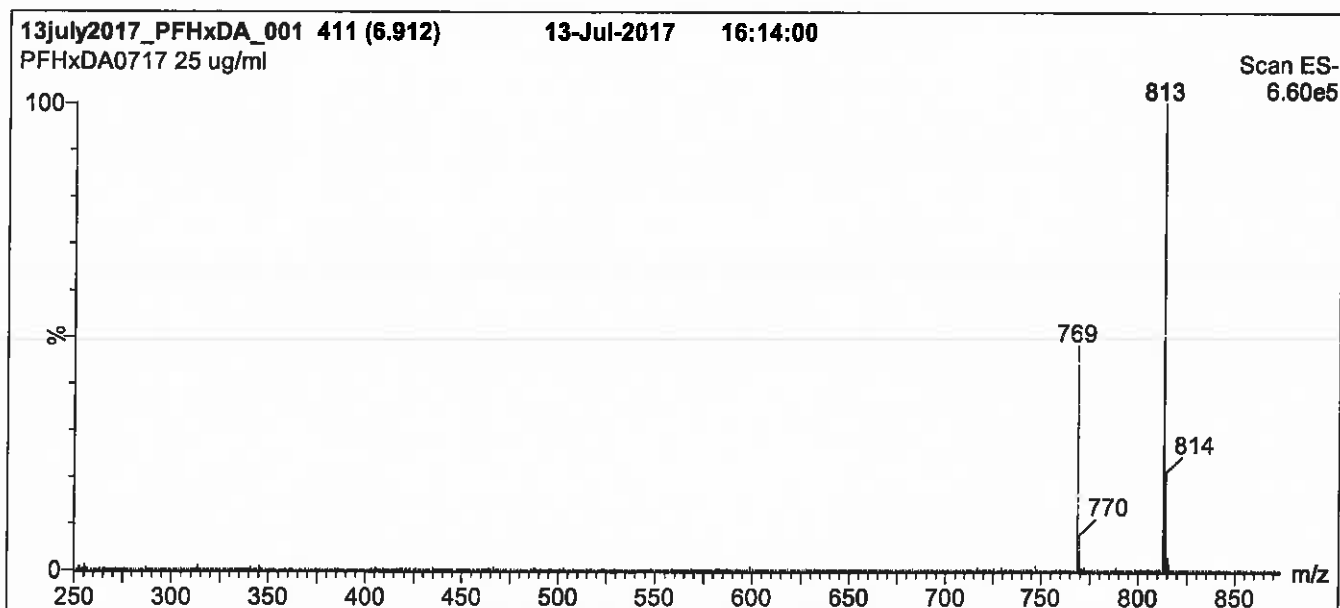
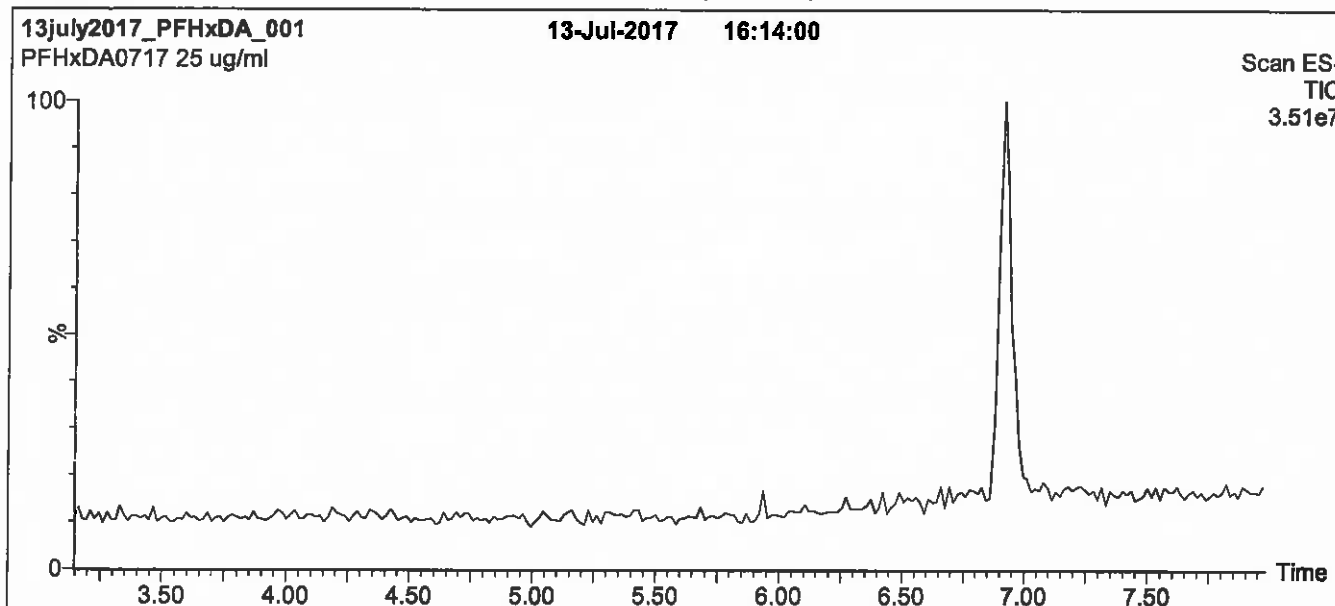
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 55% (80:20 MeOH:ACN) / 45% H₂O
 (both with 10 mM NH₄OAc 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

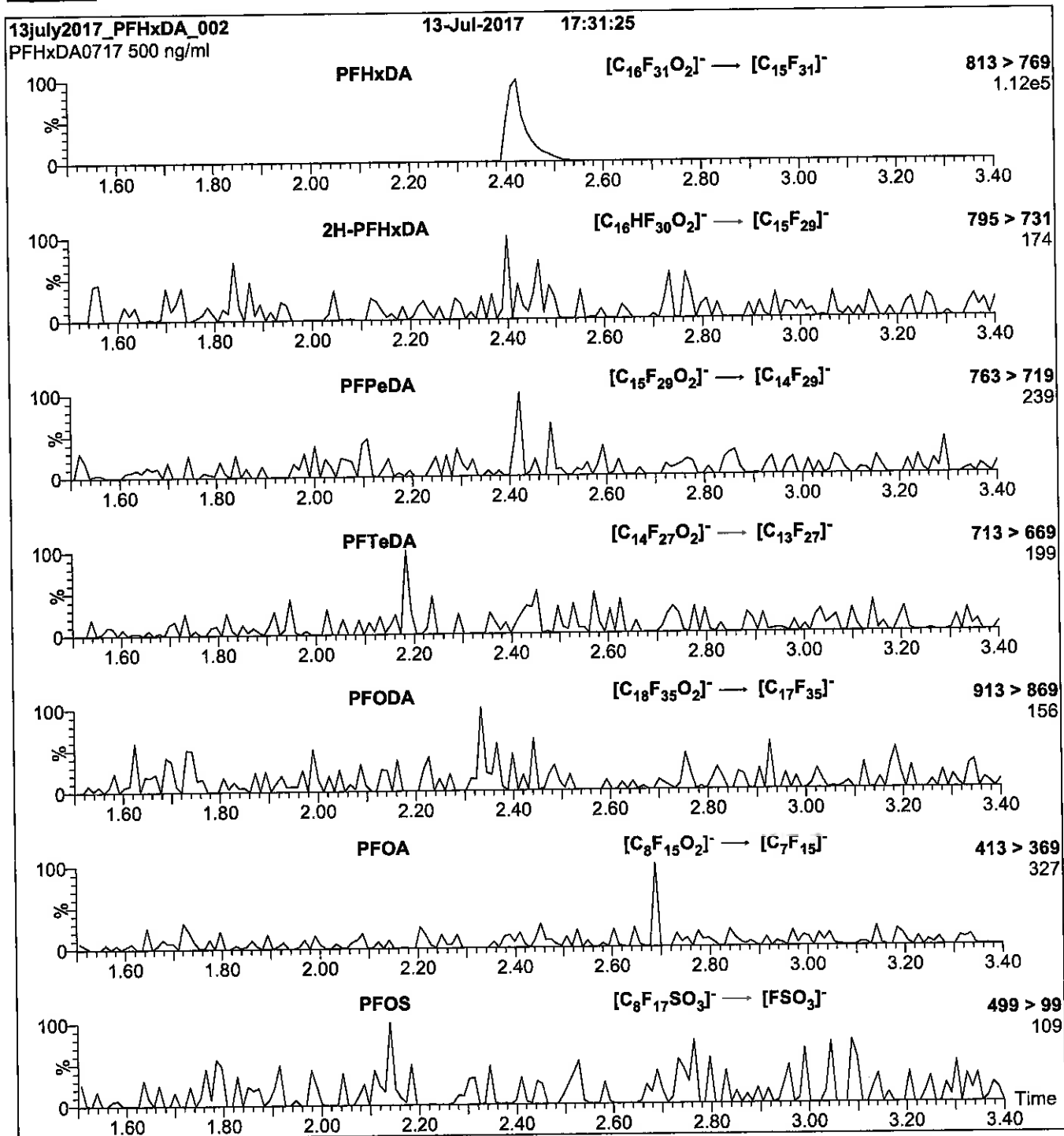
Flow: 300 μ l/min

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 μ l (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.13e-3
 Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00006

P: 10/2017 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 ¹⁹F-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).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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



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

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

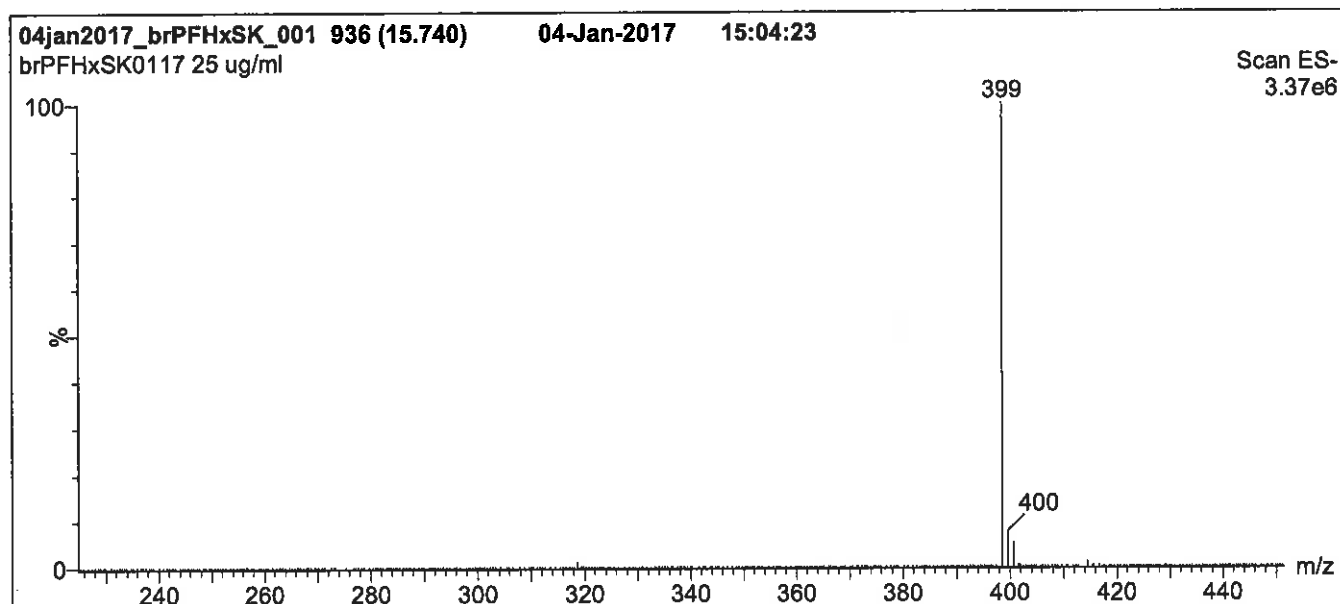
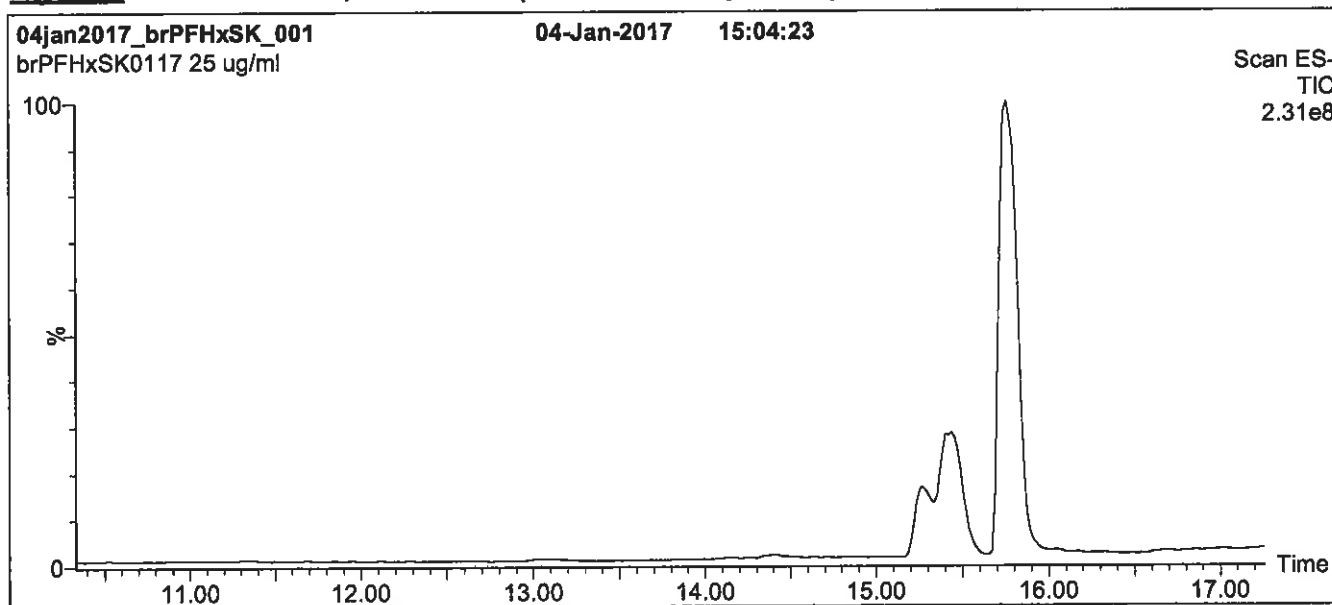
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF(SO ₃ ⁻)K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)SO ₃ ⁻ K ⁺ CF ₃	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺ CF ₃	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: 
 B.G. Chittim

Date: 01/20/2017
 (mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc 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

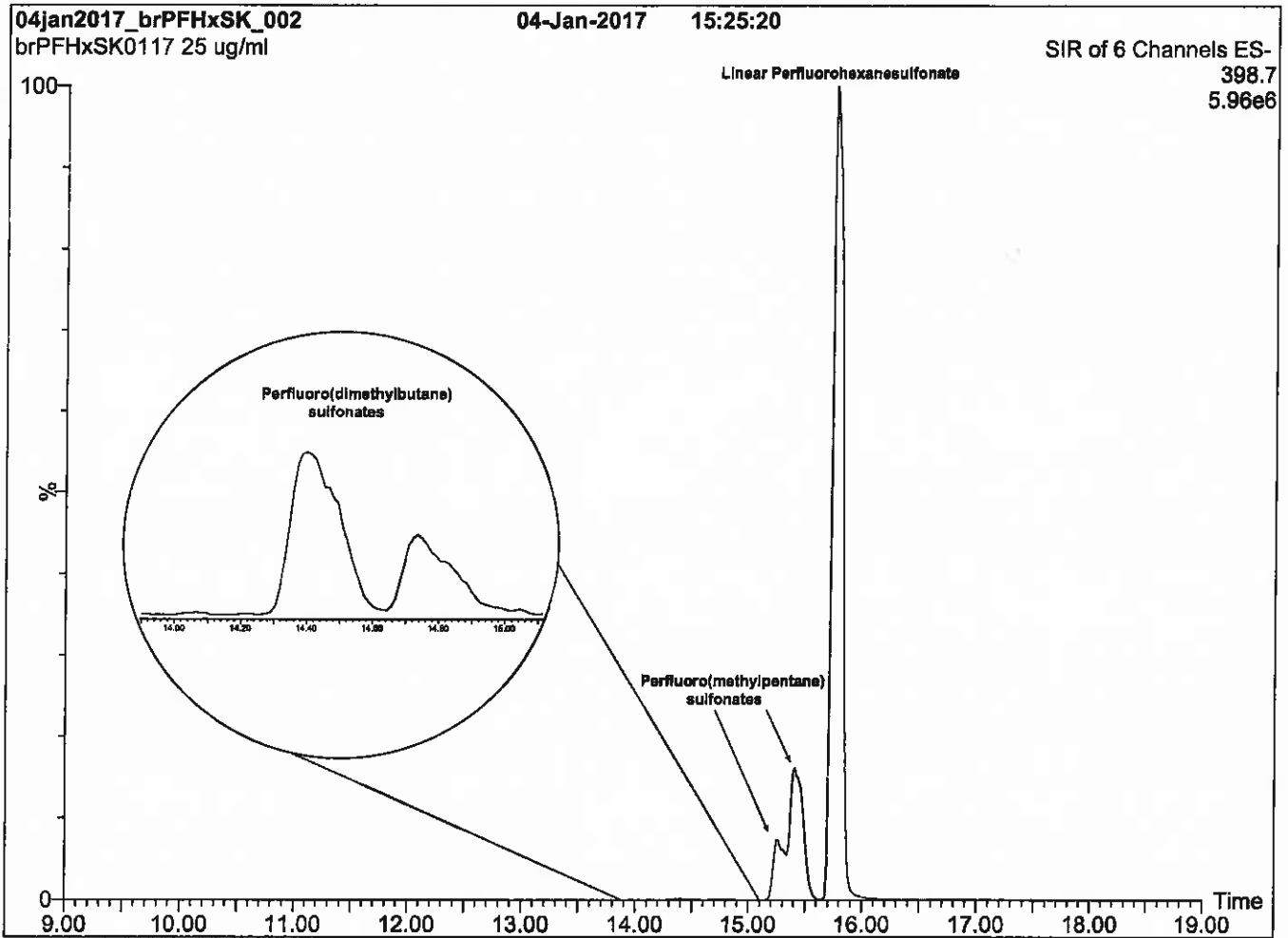
Flow: 300 μ l/min

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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc 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

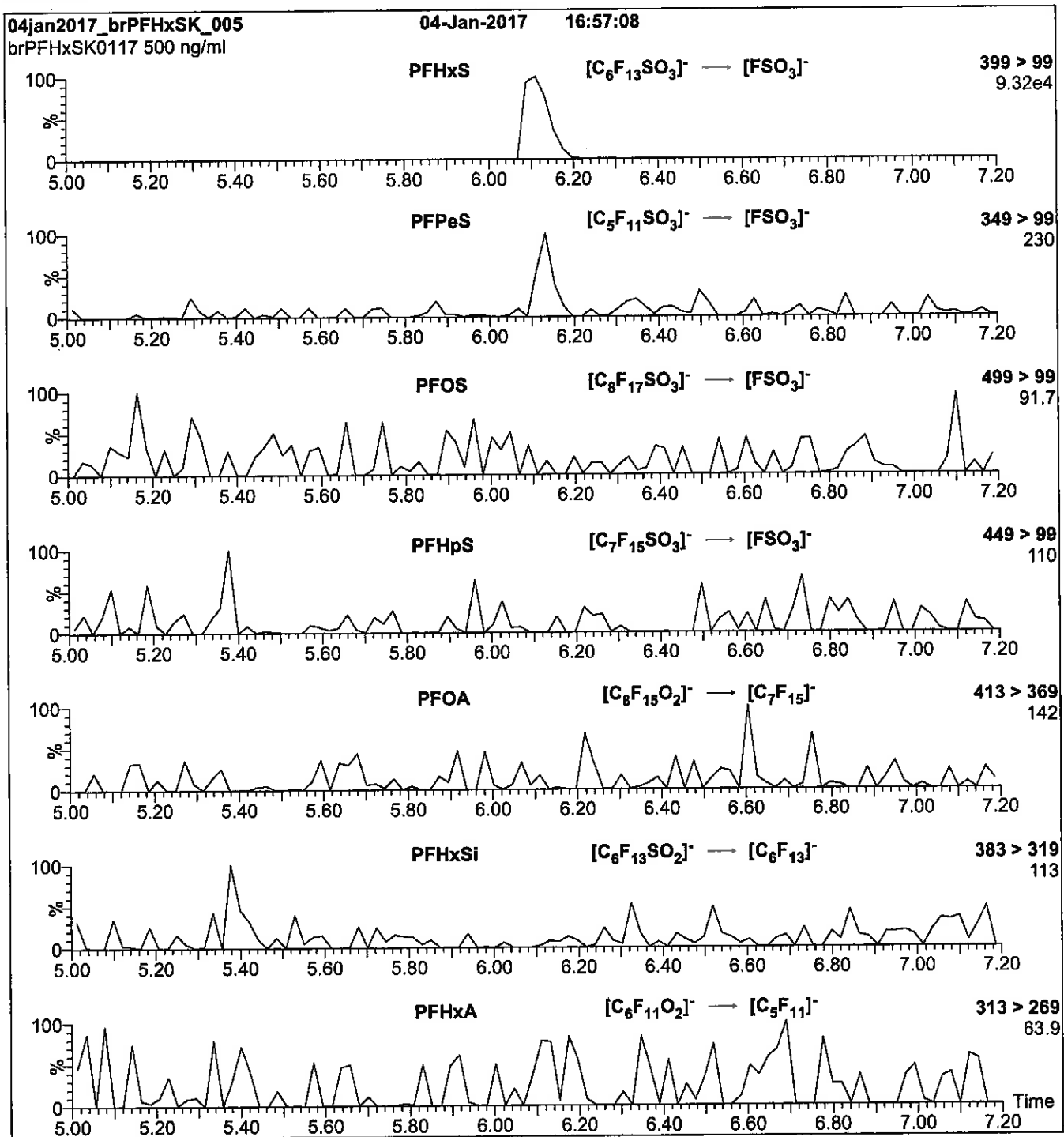
Flow: 300 μ l/min

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 μ l (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00010

r: 2/16/18 SW



WELLINGTON LABORATORIES

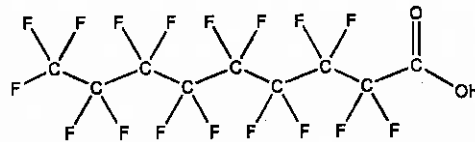
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFNA0717

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$

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: 
B.G. Chittim, General Manager

Date: 07/24/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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:

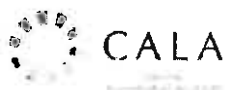
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

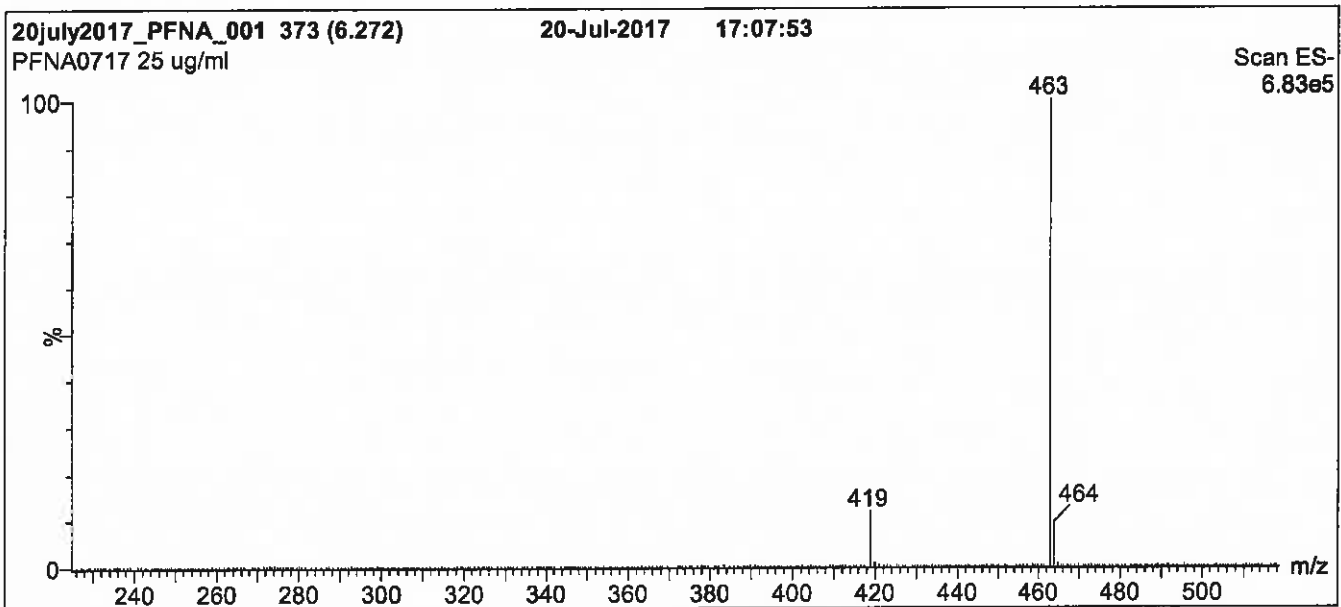
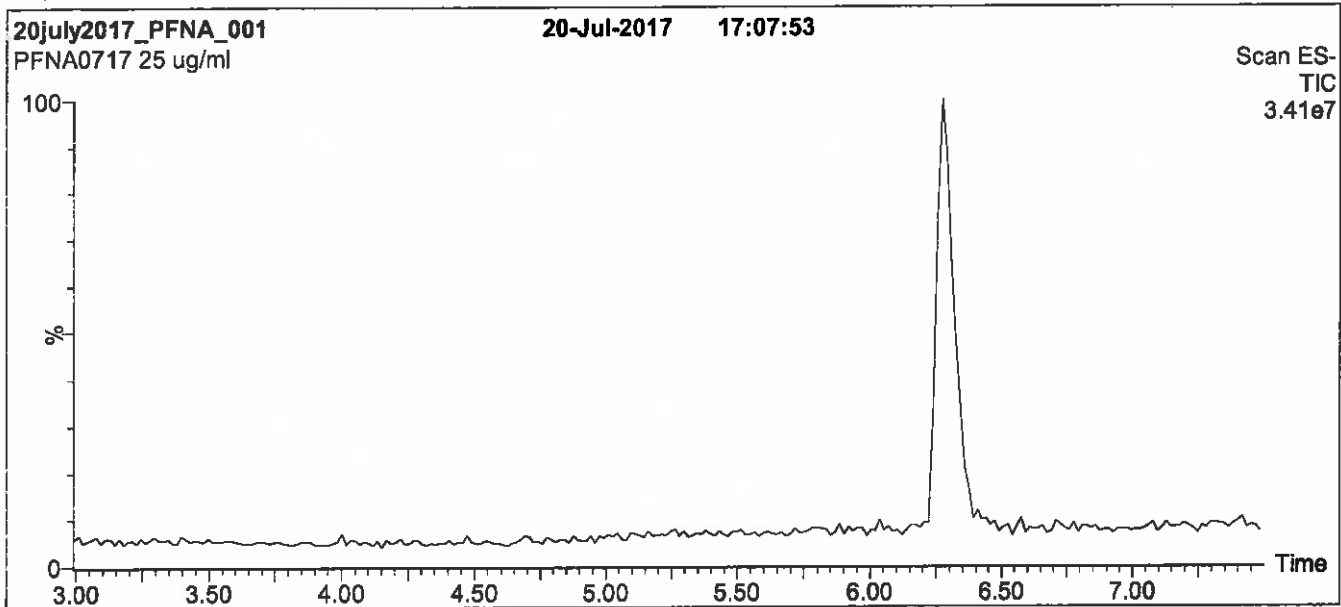
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

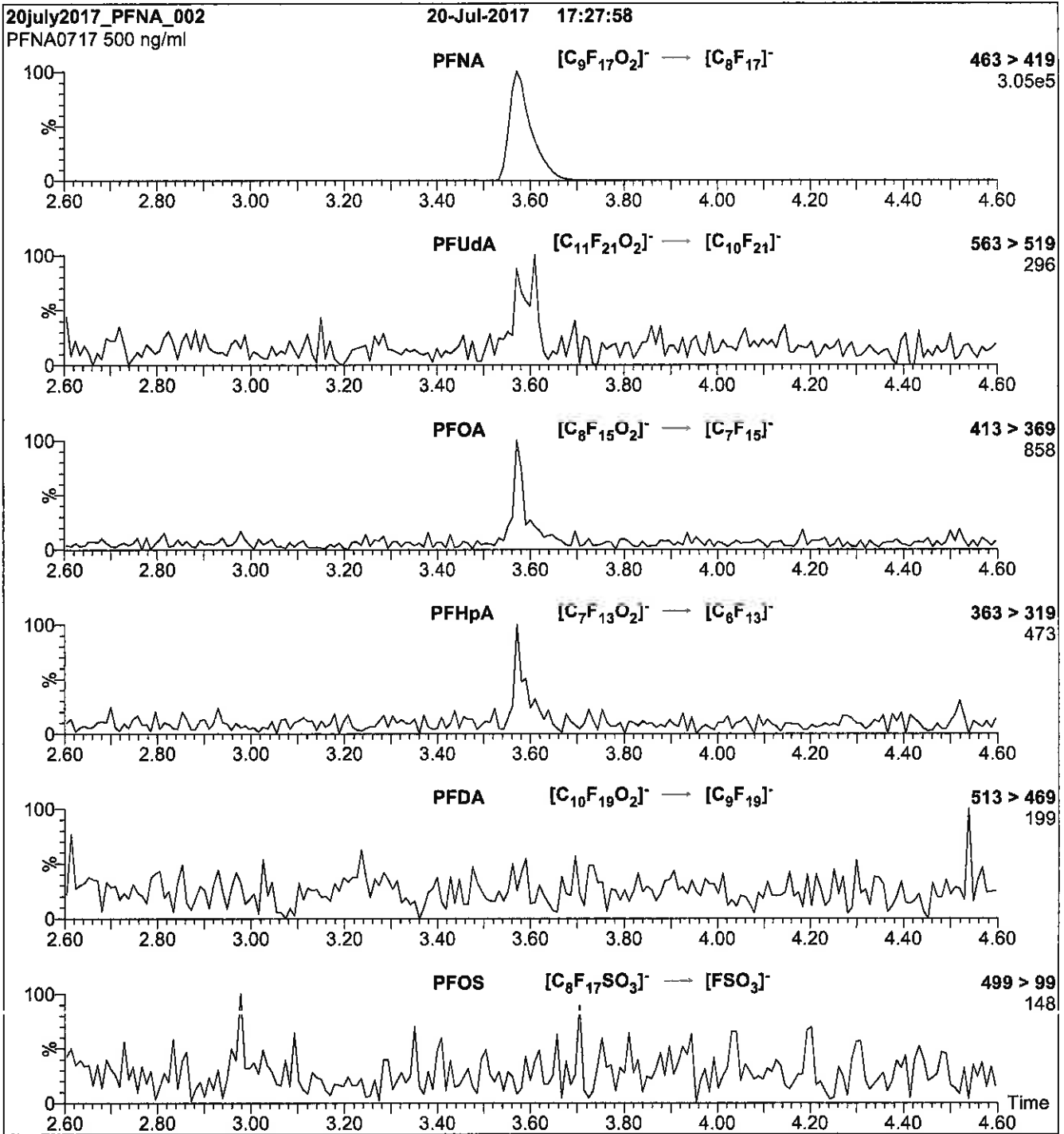
Flow: 300 μ l/min

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 μ l (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFNS_00003

r: 12/4/17 SKV



WELLINGTON LABORATORIES

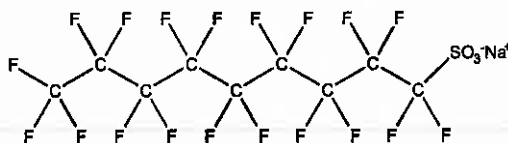
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFNS
COMPOUND: Sodium perfluoro-1-nonesulfonate

LOT NUMBER: LPFNS0917

STRUCTURE:

CAS #: 98789-57-2



MOLECULAR FORMULA: $C_9F_{19}SO_3Na$
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
48.0 ± 2.4 µg/ml (PFNS anion)
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

MOLECULAR WEIGHT: 572.12
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim, General Manager

Date: 09/28/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

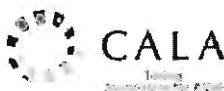
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

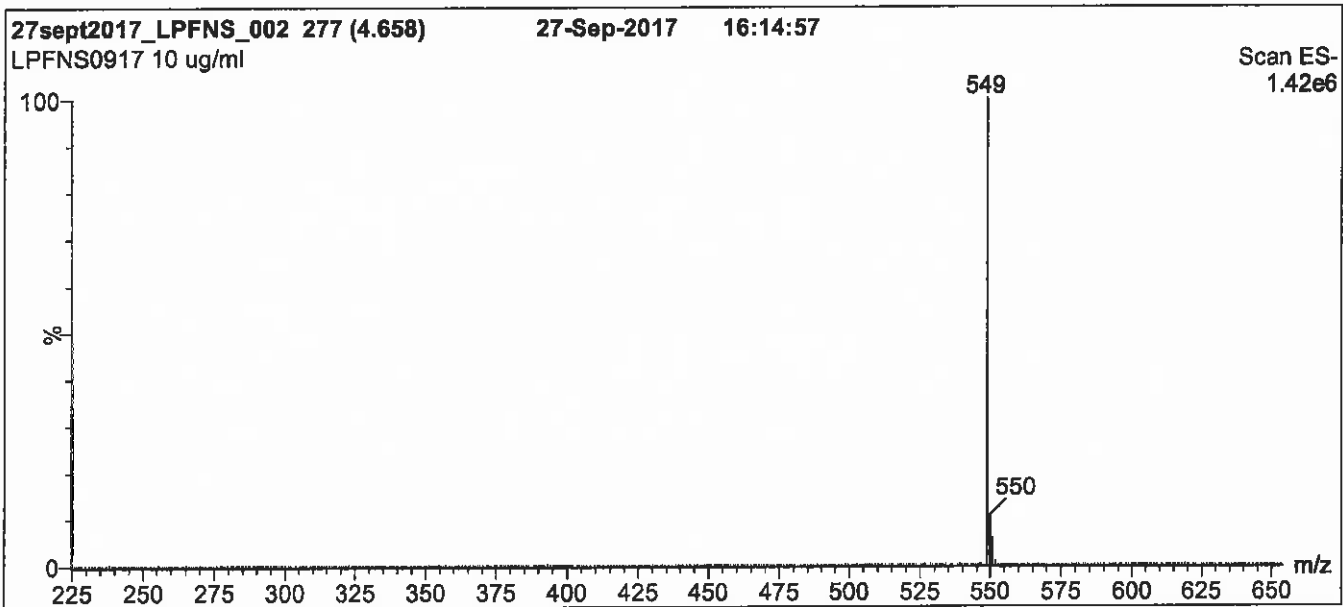
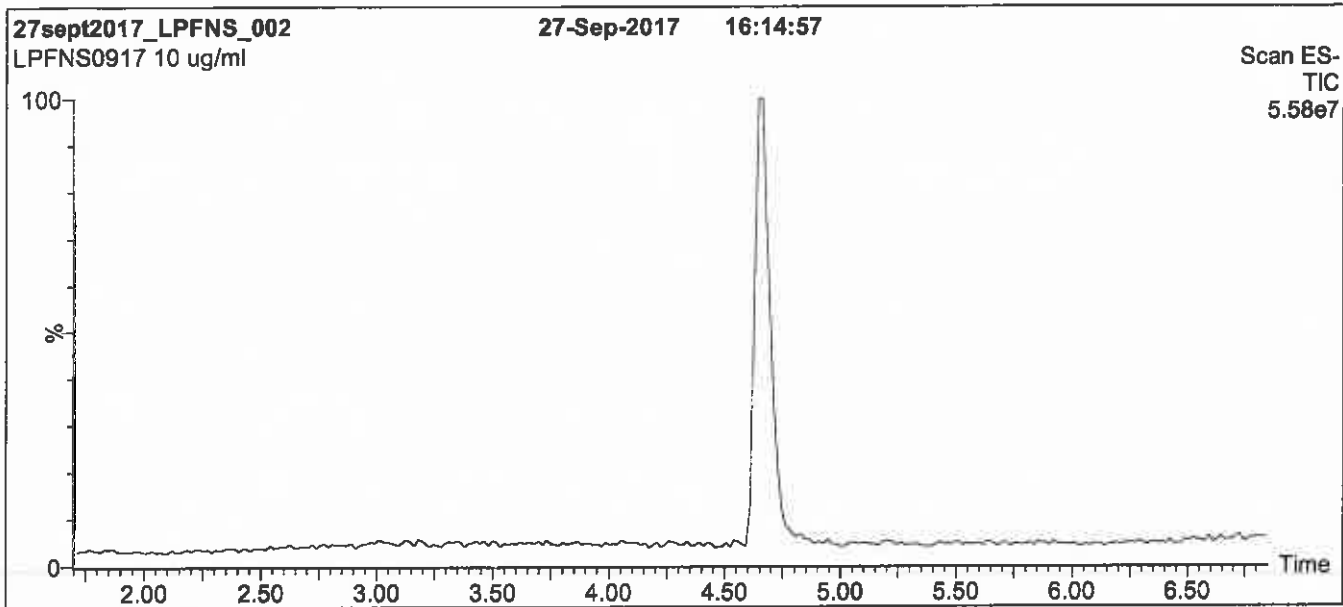
QUALITY MANAGEMENT:

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).



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-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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

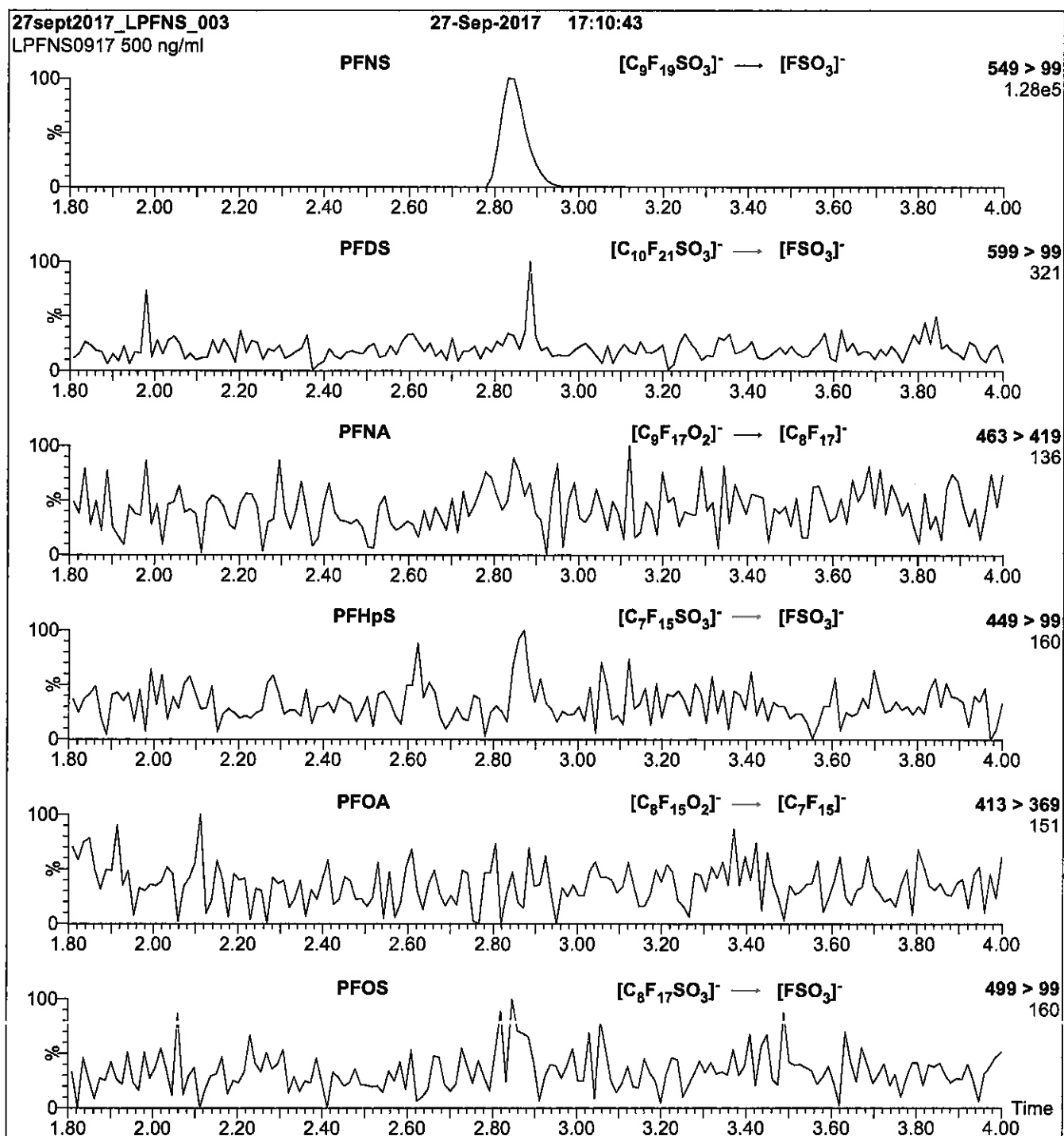
Flow: 300 μ l/min

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 μ l (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/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

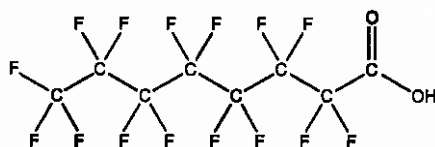
COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1



MOLECULAR FORMULA:

C₈HF₁₅O₂

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:

B.G. Chittim, General Manager

Date: 09/28/2017

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

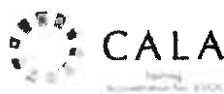
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

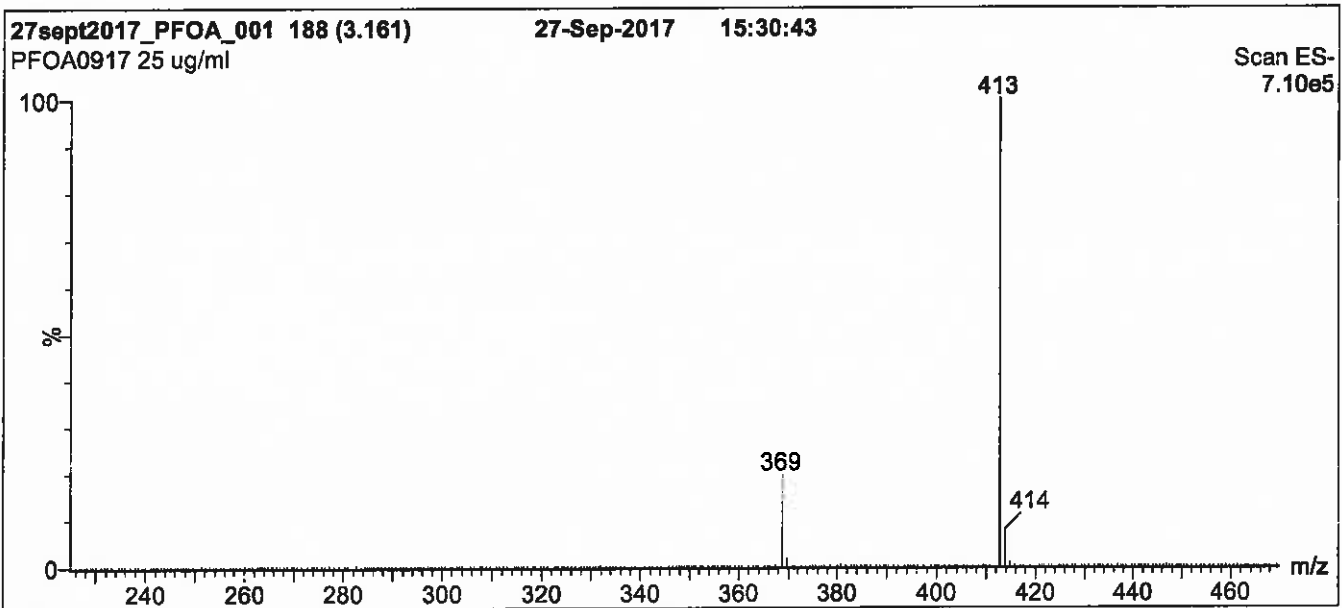
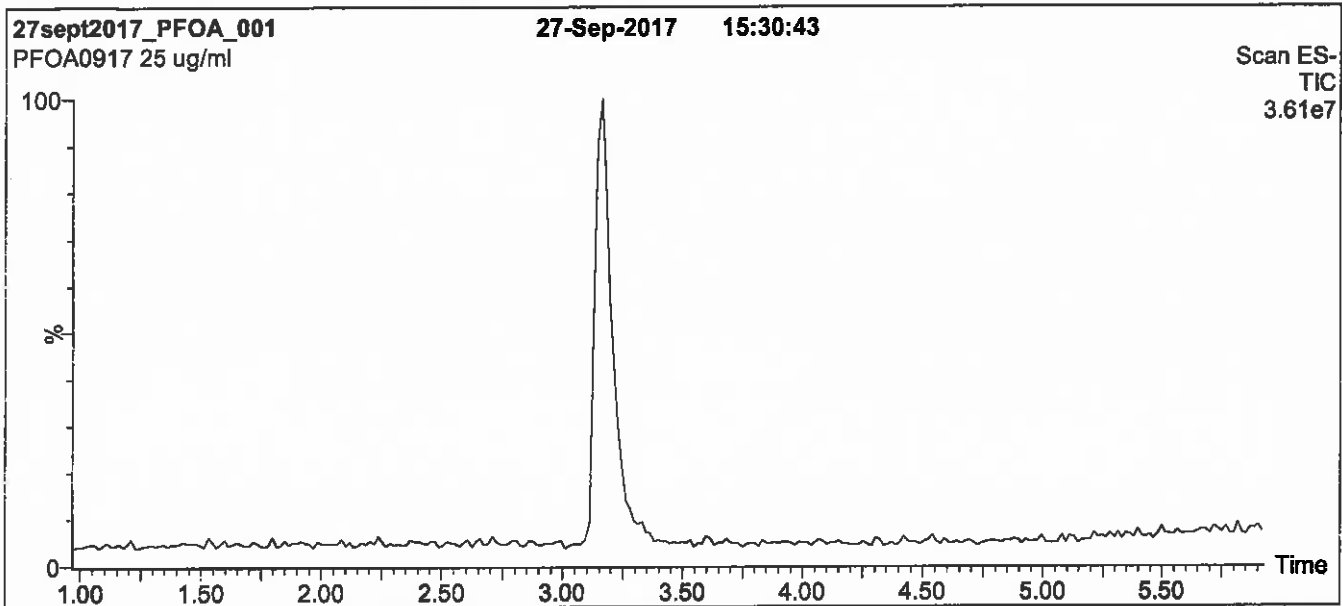
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc 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

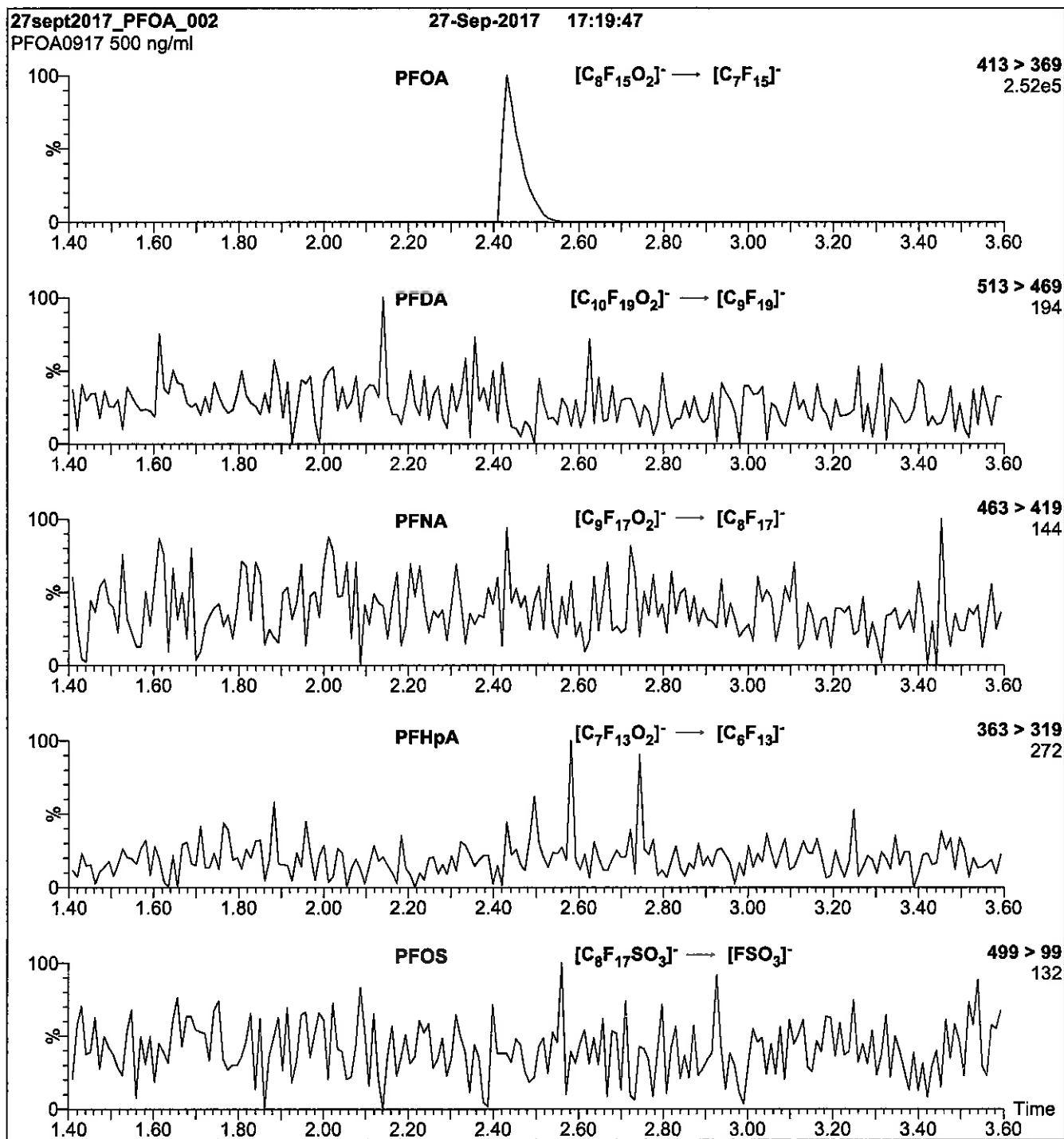
Flow: 300 μ l/min

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 μ l (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFODA_00010

r. 9/2/17 SW

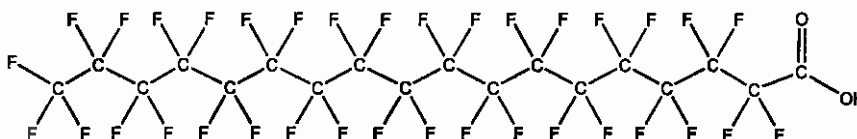


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA **LOT NUMBER:** PFODA0717
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE: **CAS #:** 16517-11-6



MOLECULAR FORMULA: C₁₈HF₃₆O₂ **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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

x_1, x_2, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (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.

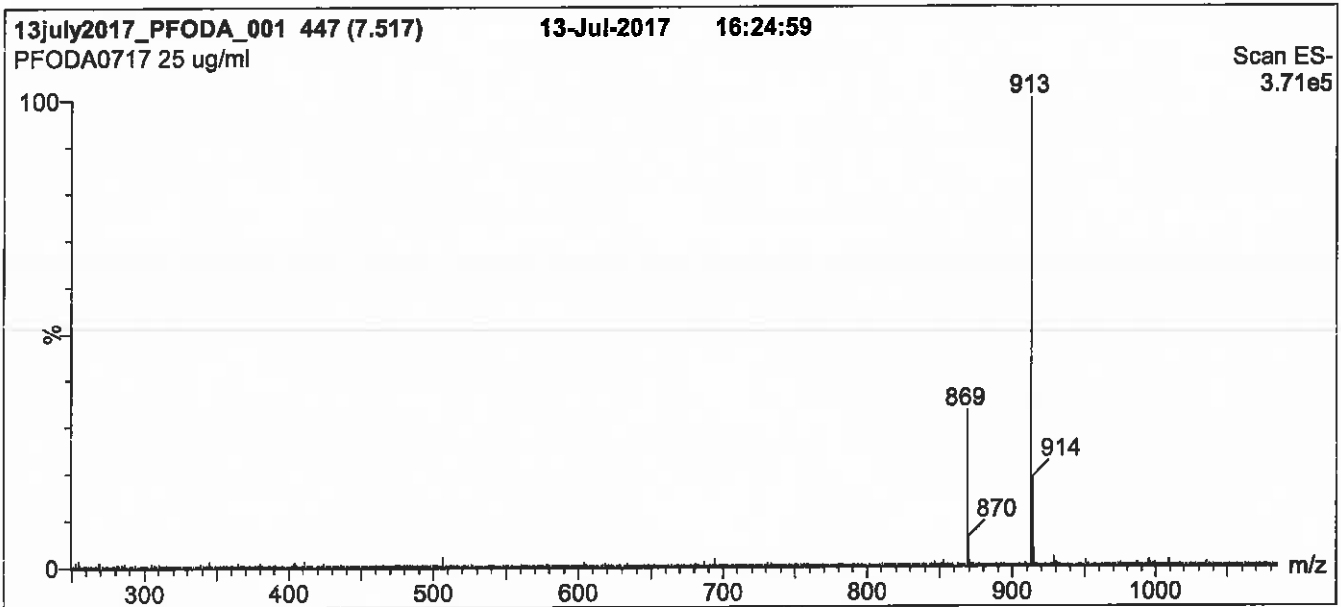
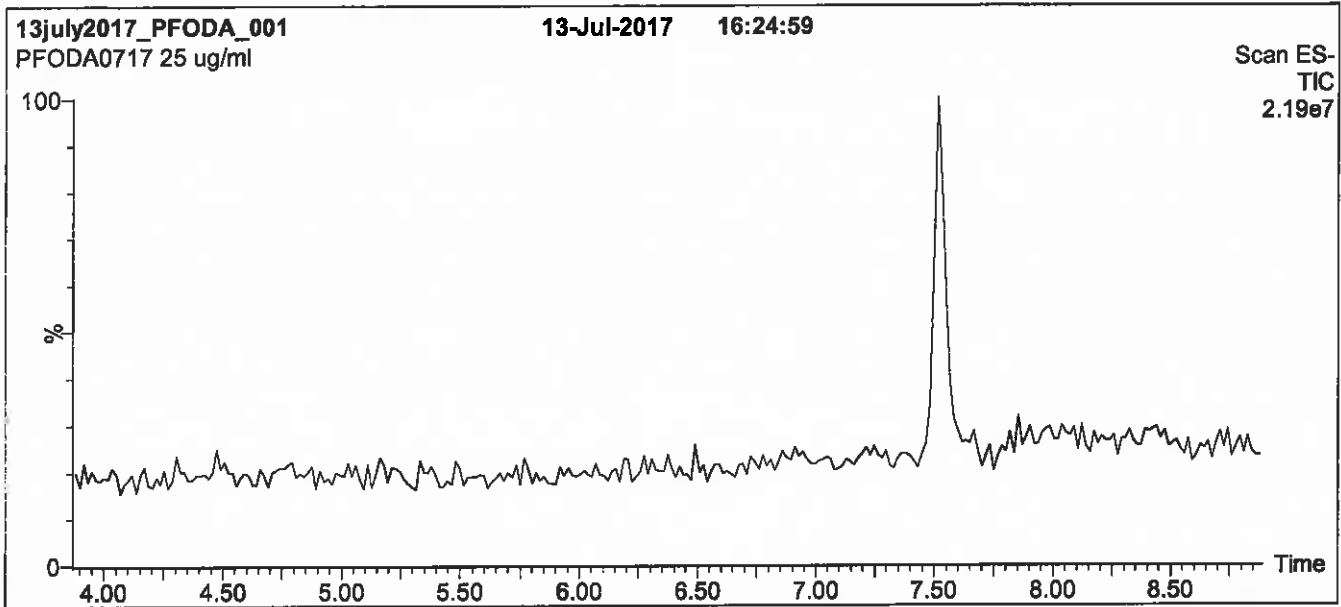
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 55% (80:20 MeOH:ACN) / 45% H₂O
 (both with 10 mM NH₄OAc 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

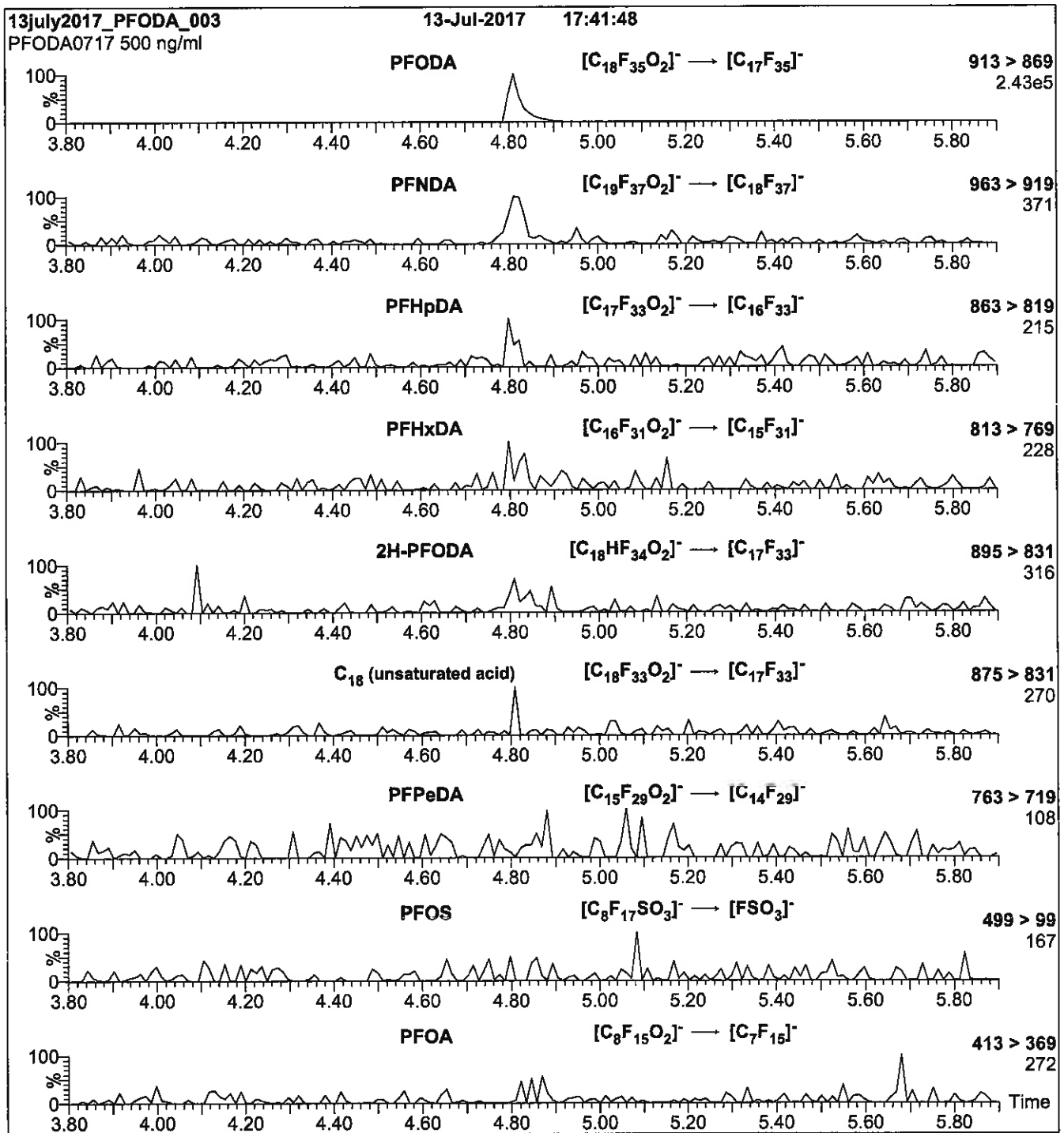
Flow: 300 μ l/min

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 μ l (500 ng/ml PFODA)

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

Flow: 300 μ l/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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

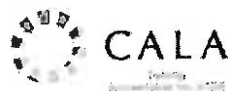
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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



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

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

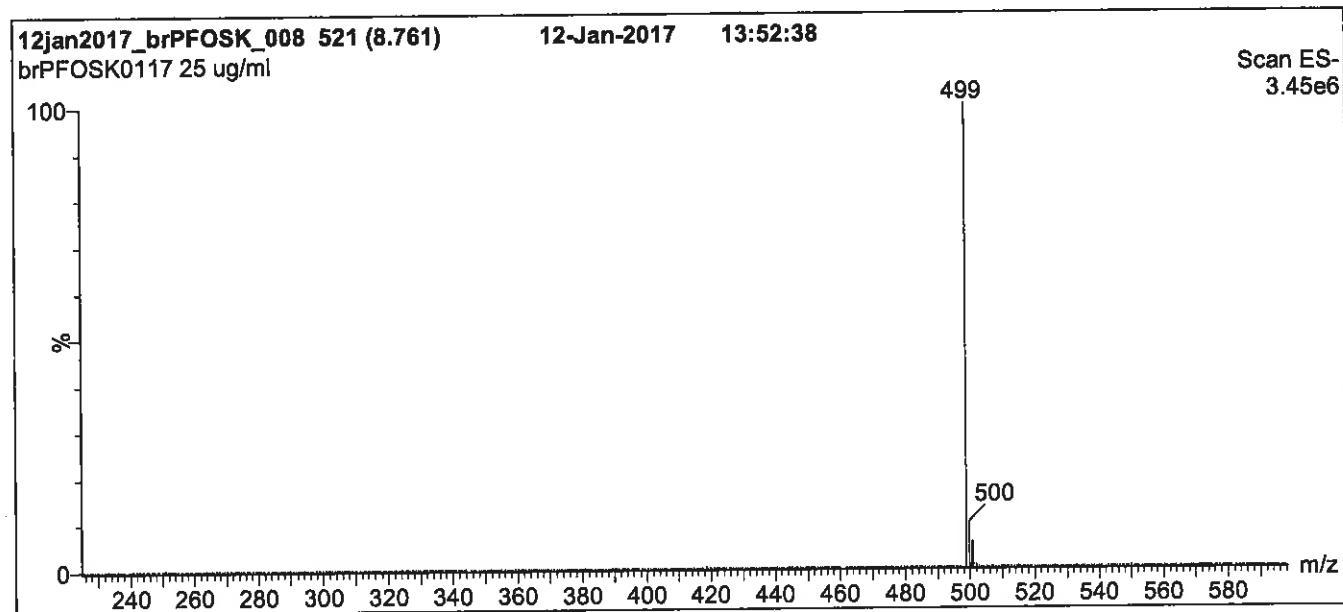
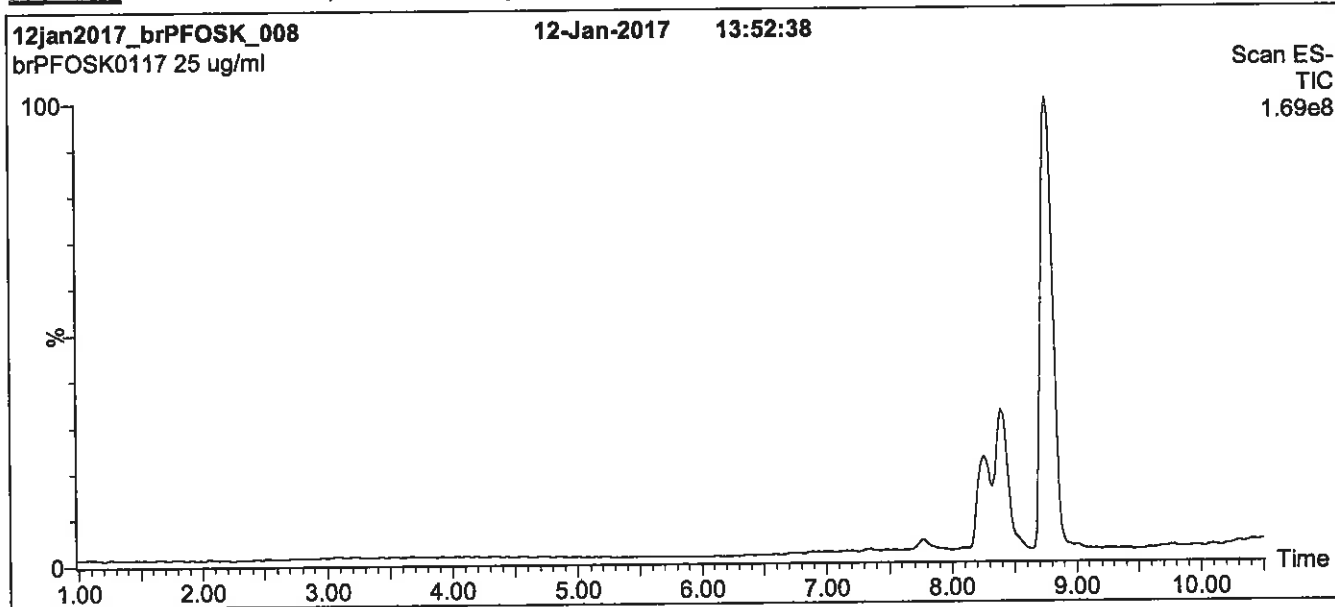
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labeled 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 45% (80:20 MeOH:ACN) / 55% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 12 min and hold for 2 min.
 Return to initial conditions over 0.5 min.
 Time: 16 min

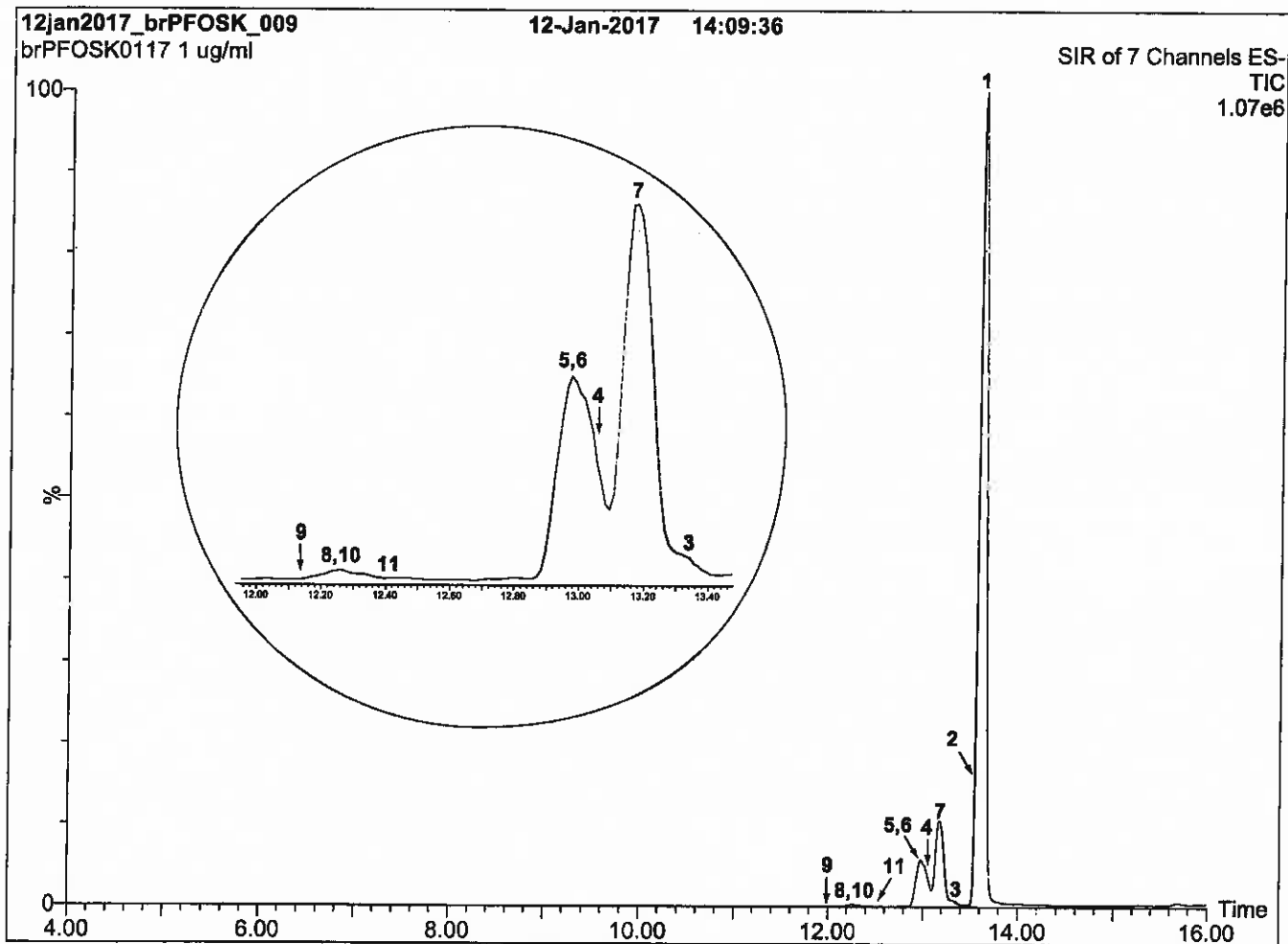
Flow: 300 μ l/min

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

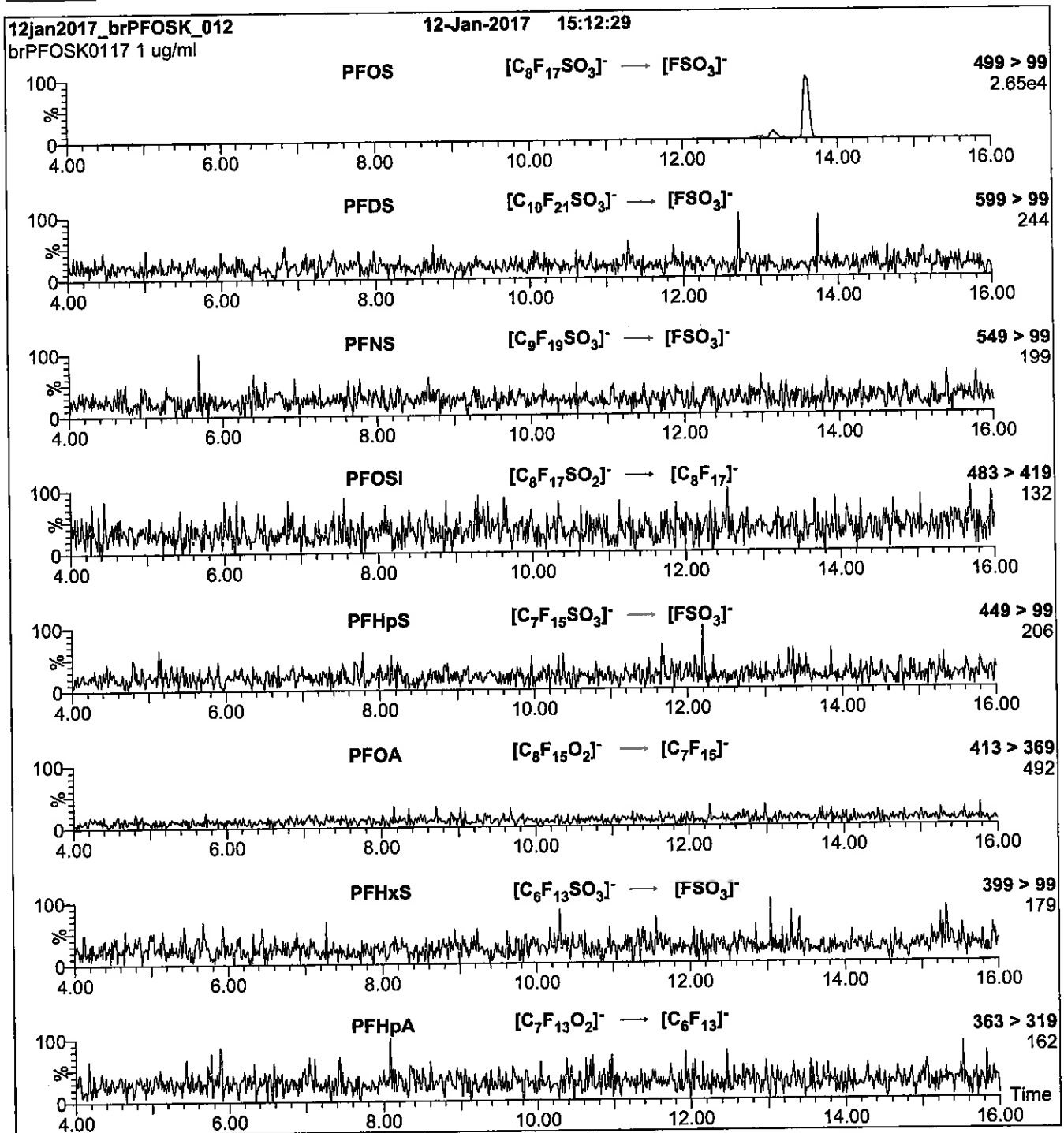
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc 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 μ l/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 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00013

r: 2/2/16 SKJ

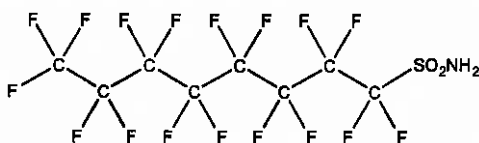


WELLINGTON LABORATORIES

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: $50 \pm 2.5 \mu\text{g/ml}$ **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: 
B.G. Chittim, General Manager

Date: 09/14/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

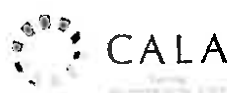
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

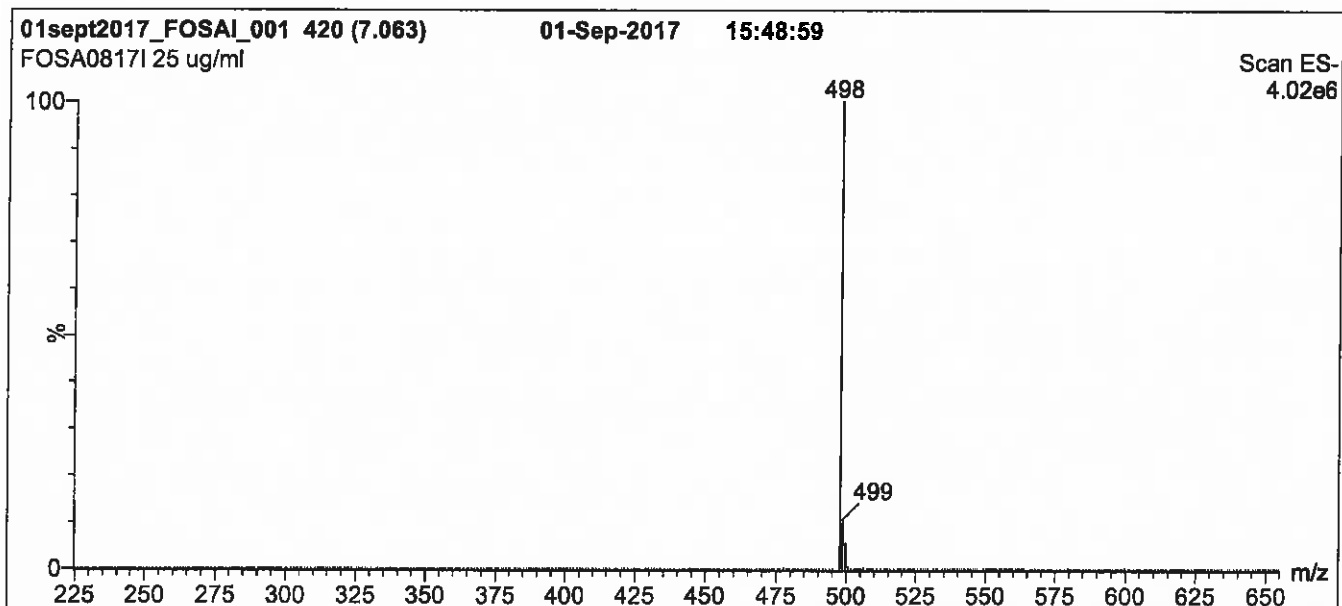
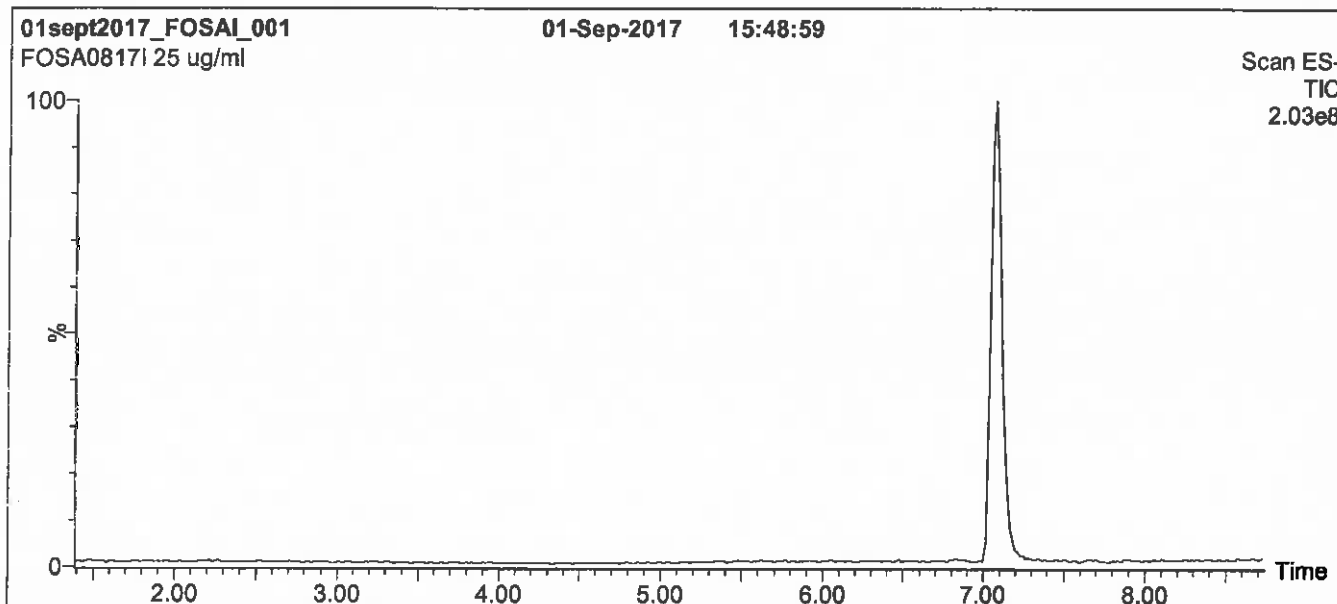
QUALITY MANAGEMENT:

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).



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
 1.7 μ m, 2.1 x 100 mm

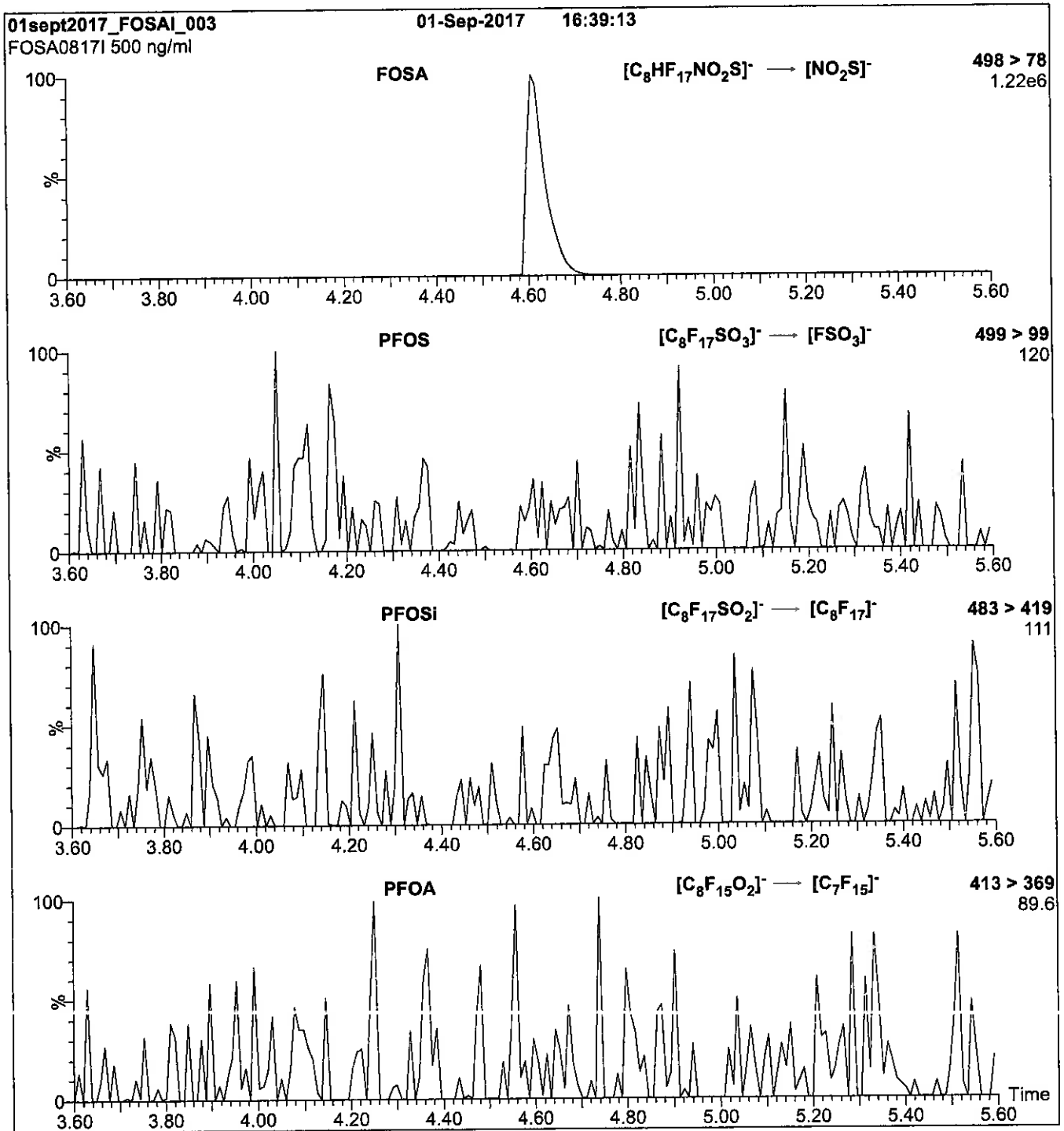
Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 8 min and hold for 1 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/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 μ l (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

Reagent

LCFPeA_00008

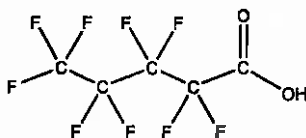
R: 1/20/17 SN



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: $50 \pm 2.5 \mu\text{g/ml}$ **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
B.G. Chittim, General Manager (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

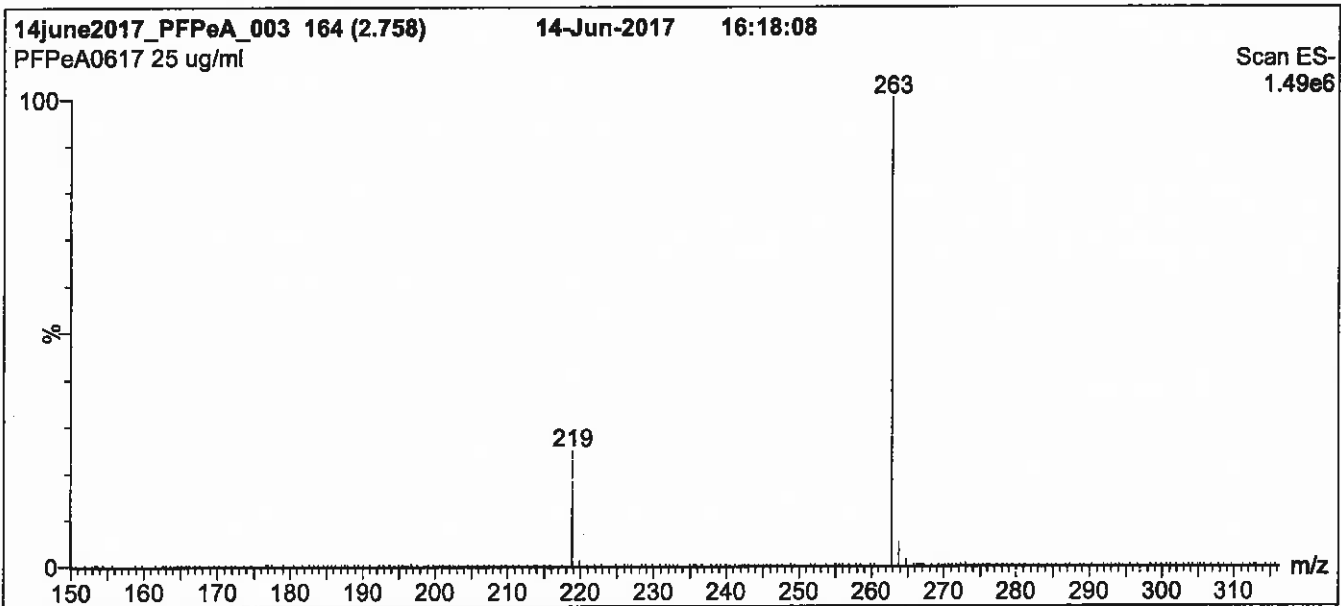
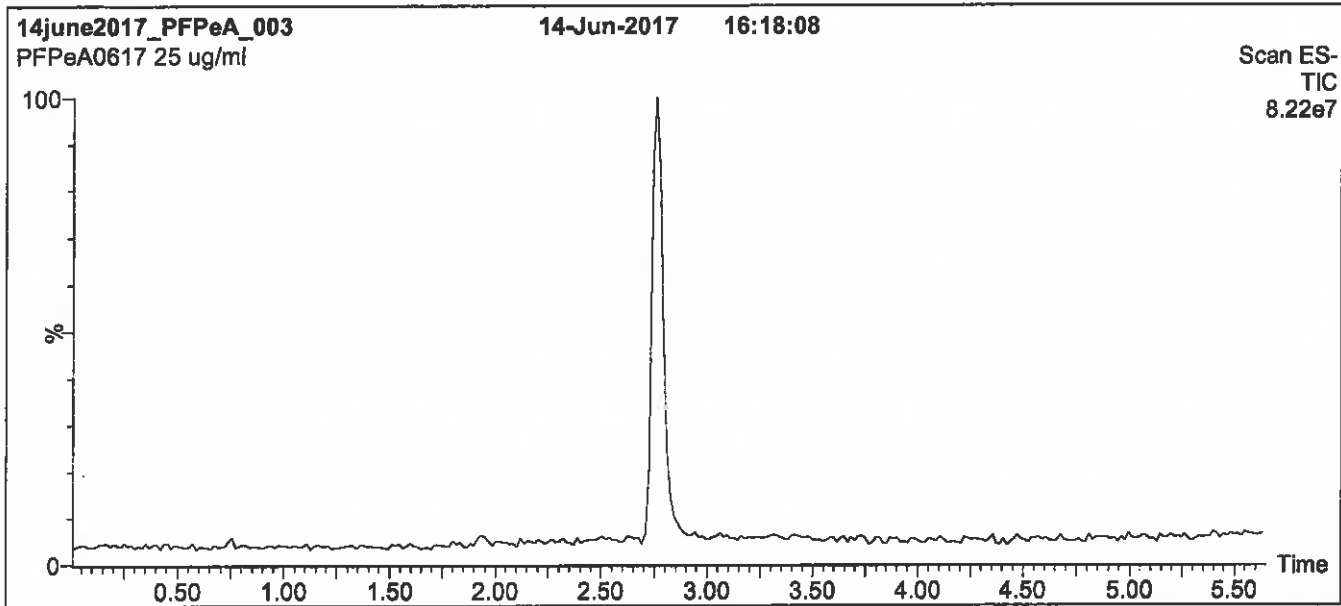
QUALITY MANAGEMENT:

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).



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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc 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

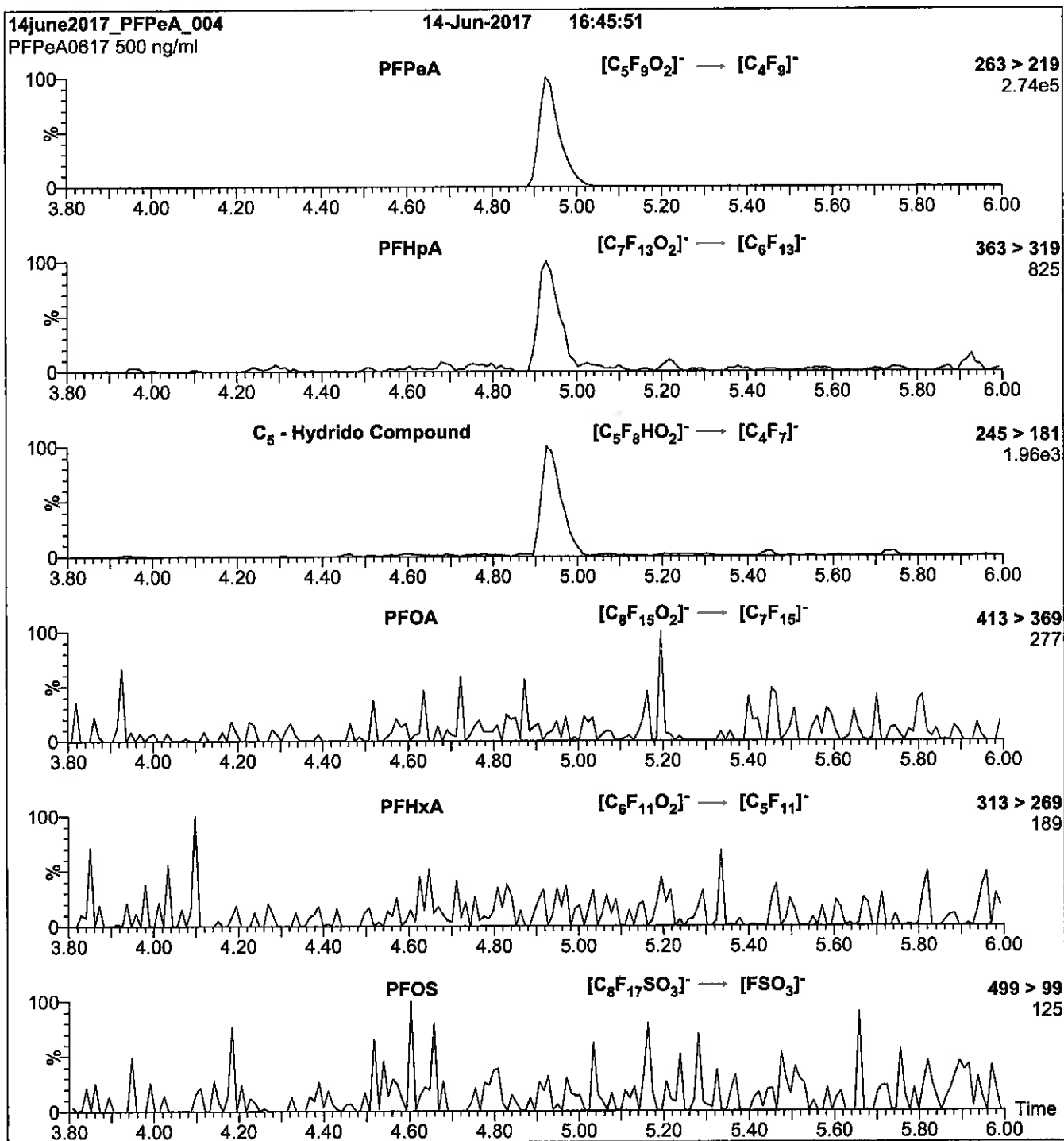
Flow: 300 μ l/min

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% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCFPeS_00003



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

P: 12/4/17 SKV



WELLINGTON LABORATORIES

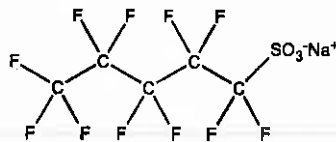
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: LPFPeS0117

STRUCTURE:

CAS #: 630402-22-1



MOLECULAR FORMULA: C₅F₁₁SO₃Na
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
 46.9 ± 2.3 µg/ml (PFPeS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/11/2017
EXPIRY DATE: (mm/dd/yyyy) 01/11/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 372.09
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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.

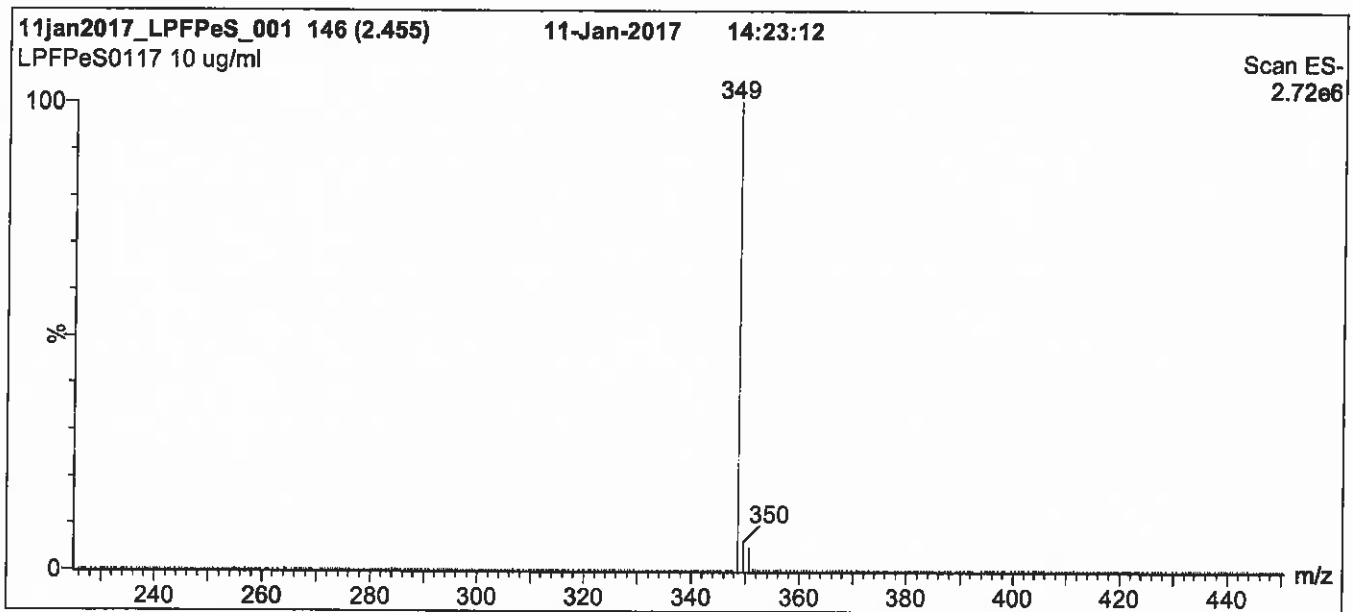
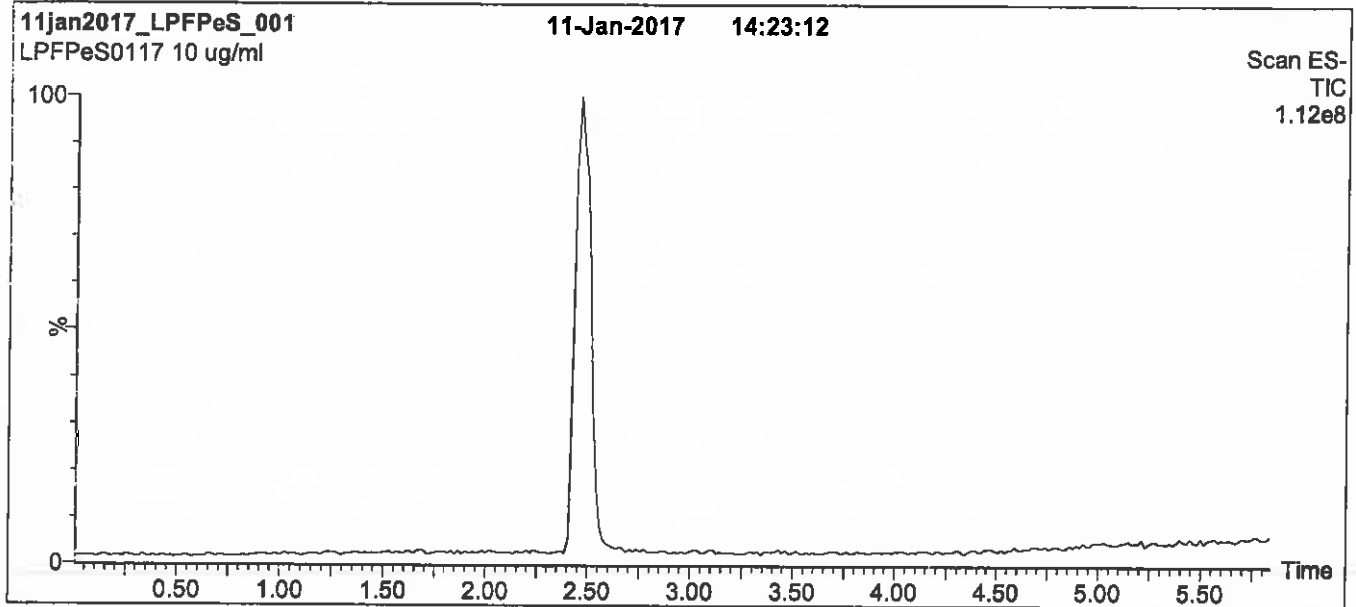
QUALITY MANAGEMENT:

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).



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-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 RP₁₈,
 1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc 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

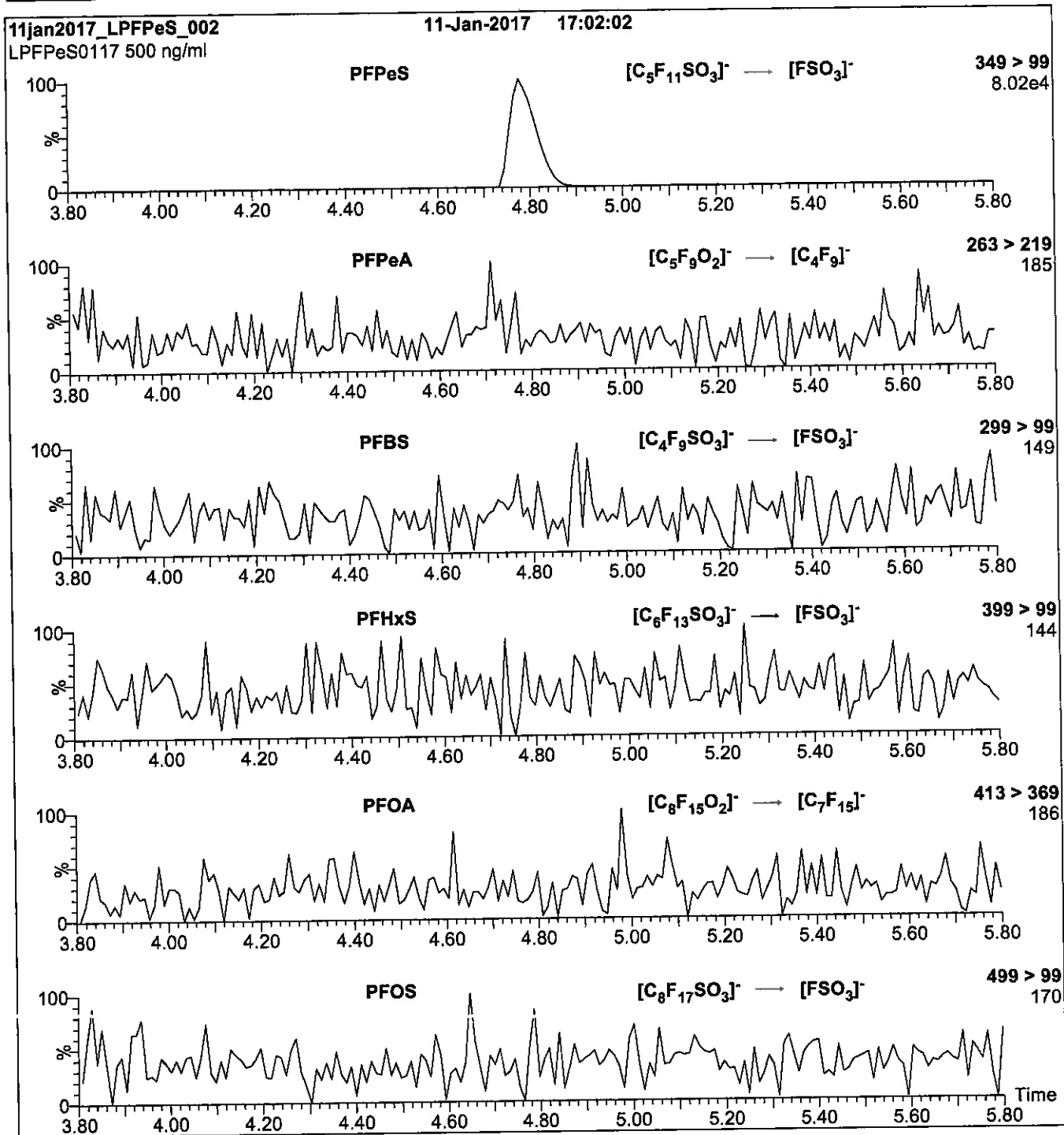
Flow: 300 μl/min

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 μ l (500 ng/ml L-PFPeS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFTeDA_00008

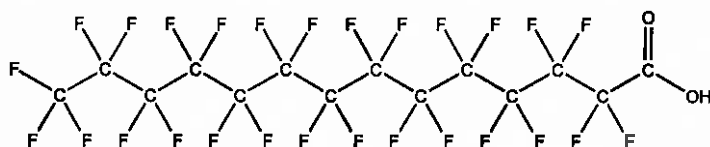


WELLINGTON LABORATORIES

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: $50 \pm 2.5 \mu\text{g/ml}$ **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 PFDcA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

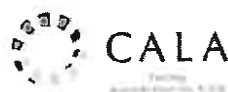
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

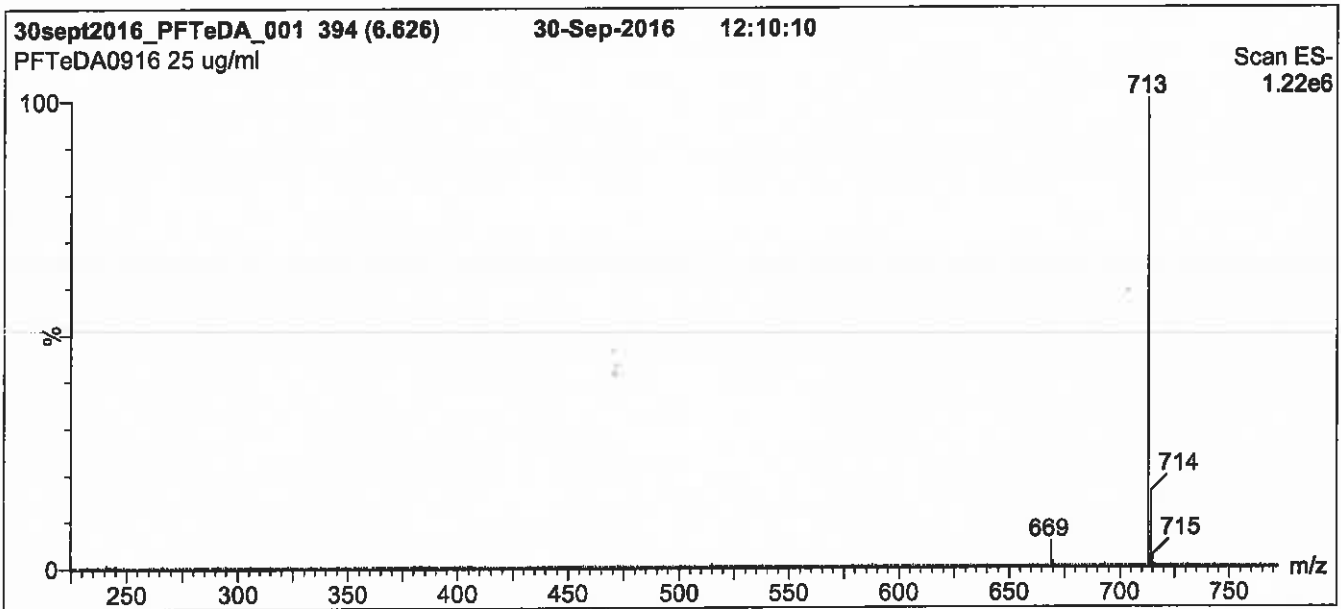
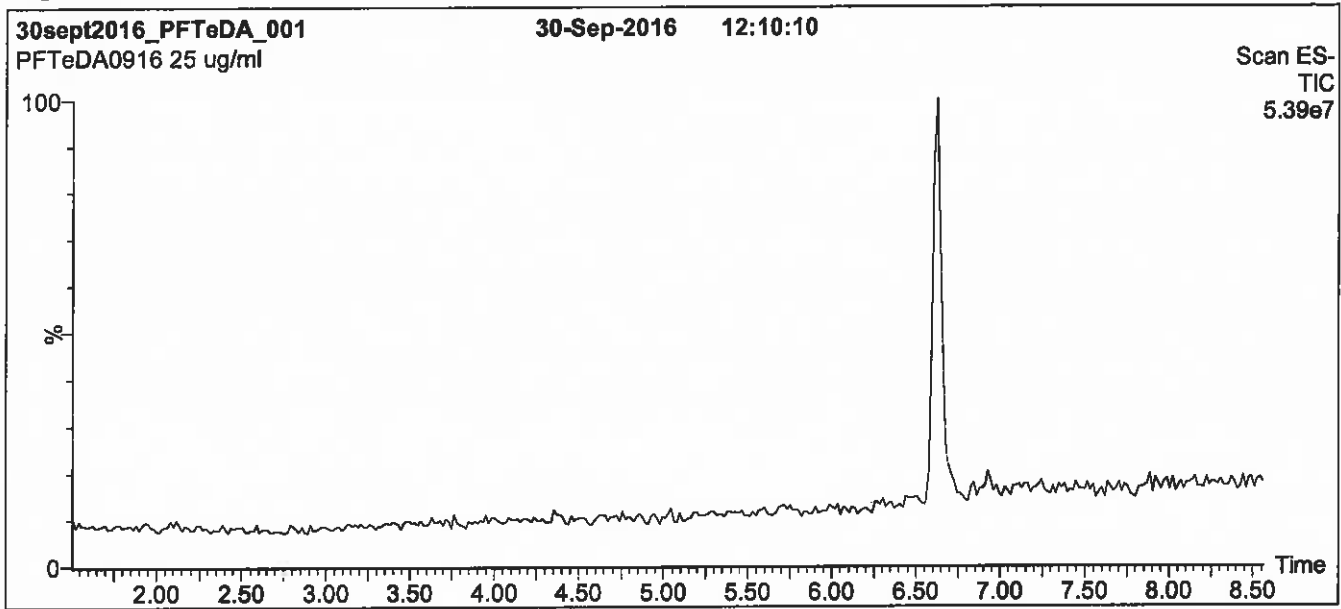
QUALITY MANAGEMENT:

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



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

Figure 1: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc 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

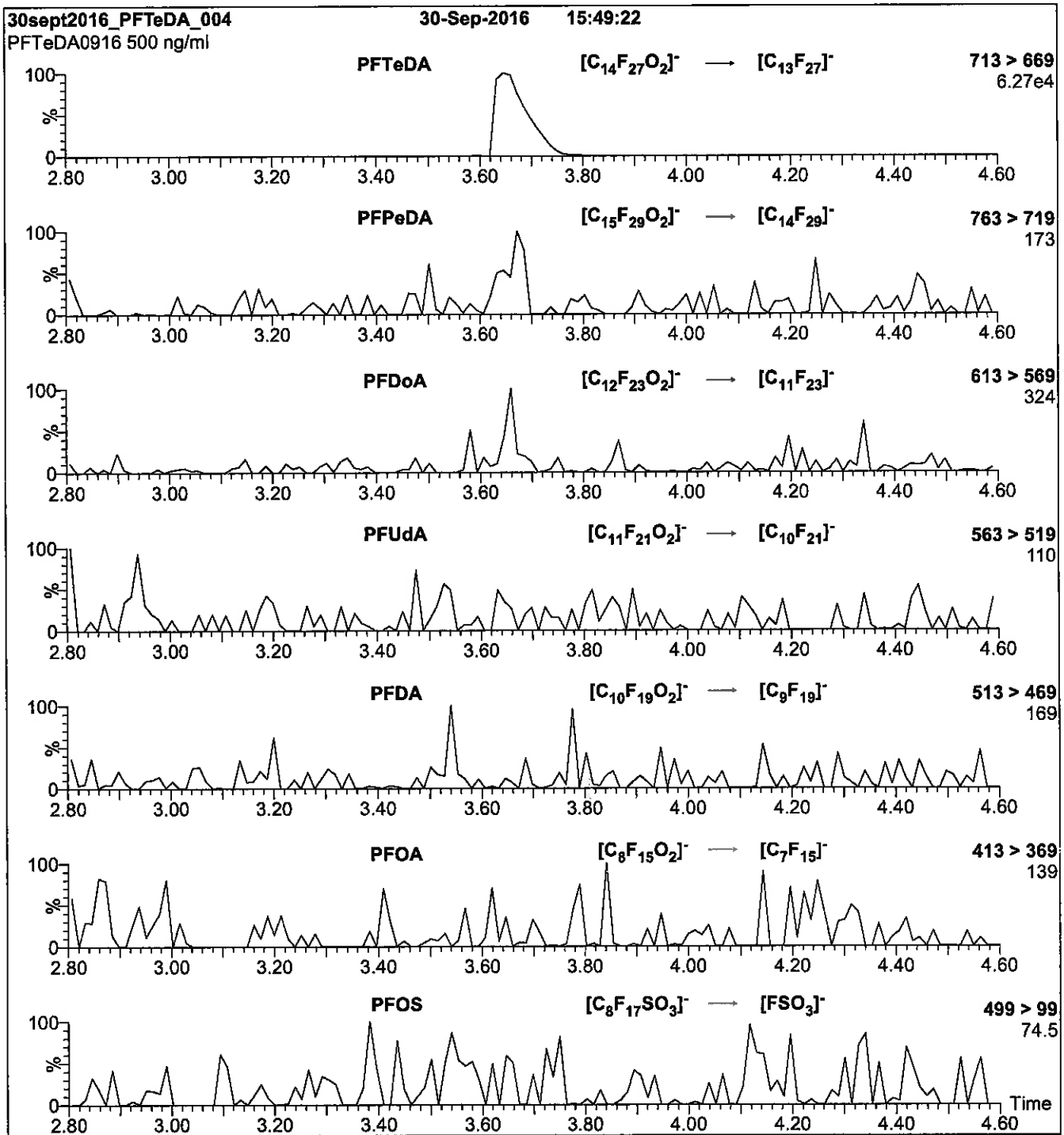
Flow: 300 μ l/min

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 μ l (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFT_rDA_00008

P: 9/21/17 SKV

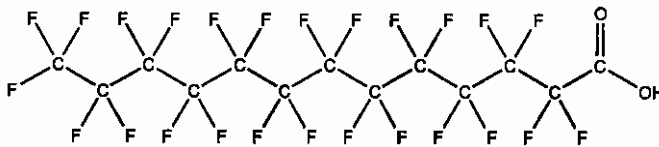


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTrDA **LOT NUMBER:** PFTrDA0517
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE: **CAS #:** 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$ **MOLECULAR WEIGHT:** 664.11
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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
B.G. Chittim, General Manager (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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 $\pm 5\%$ (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:

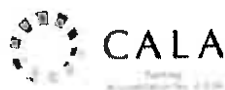
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

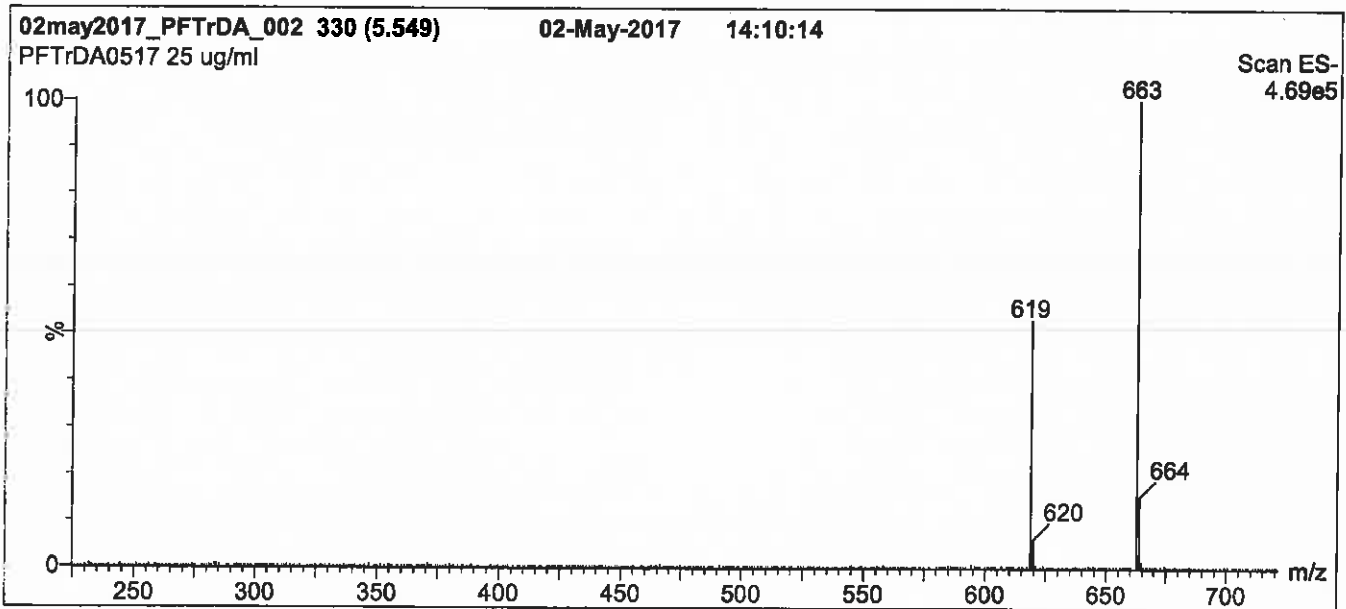
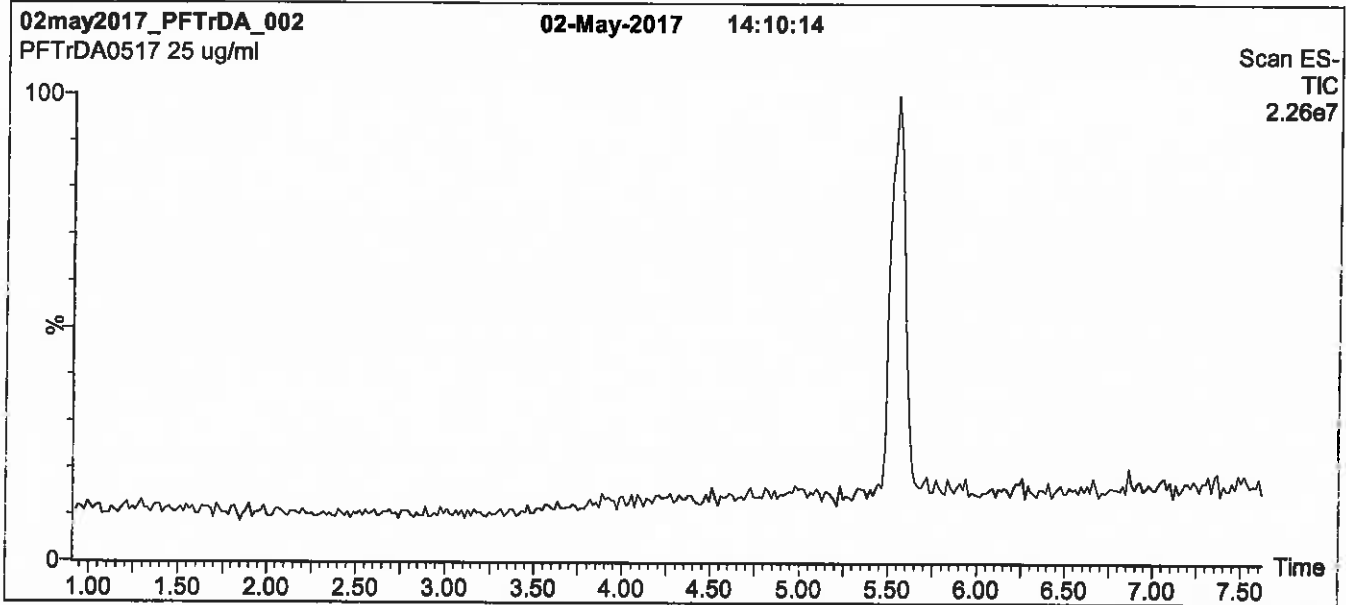
QUALITY MANAGEMENT:

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).



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: PFTTrDA; LC/MS 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

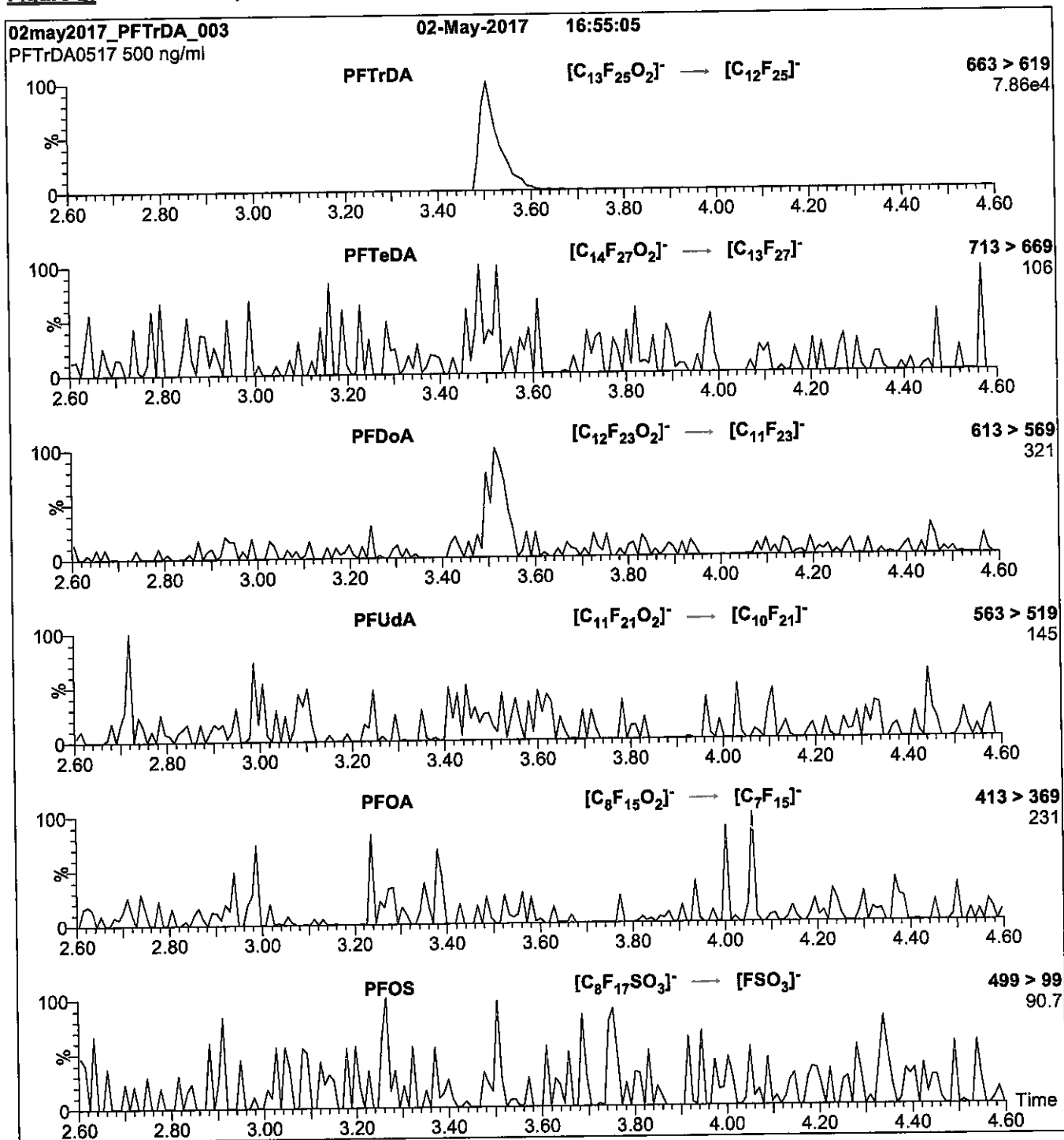
Flow: 300 μ l/min

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) = 850

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFUdA_00008

r: 9/21/17 SW

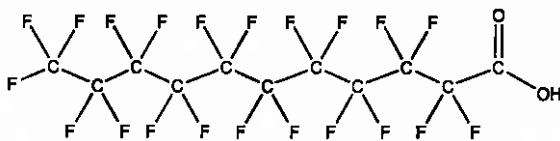


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFUdA **LOT NUMBER:** PFUdA1016
COMPOUND: Perfluoro-n-undecanoic acid

STRUCTURE: **CAS #:** 2058-94-8



MOLECULAR FORMULA: C₁₁HF₂₁O₂ **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, \dots, x_n on which it depends is:

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

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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

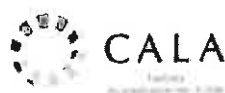
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

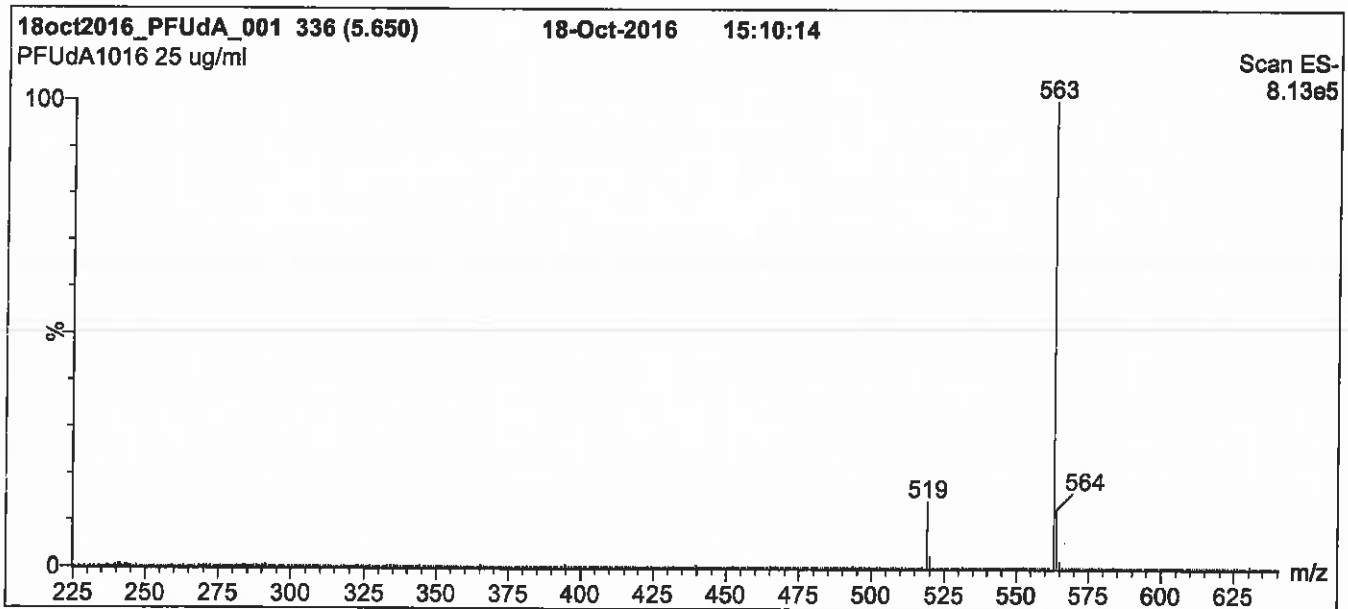
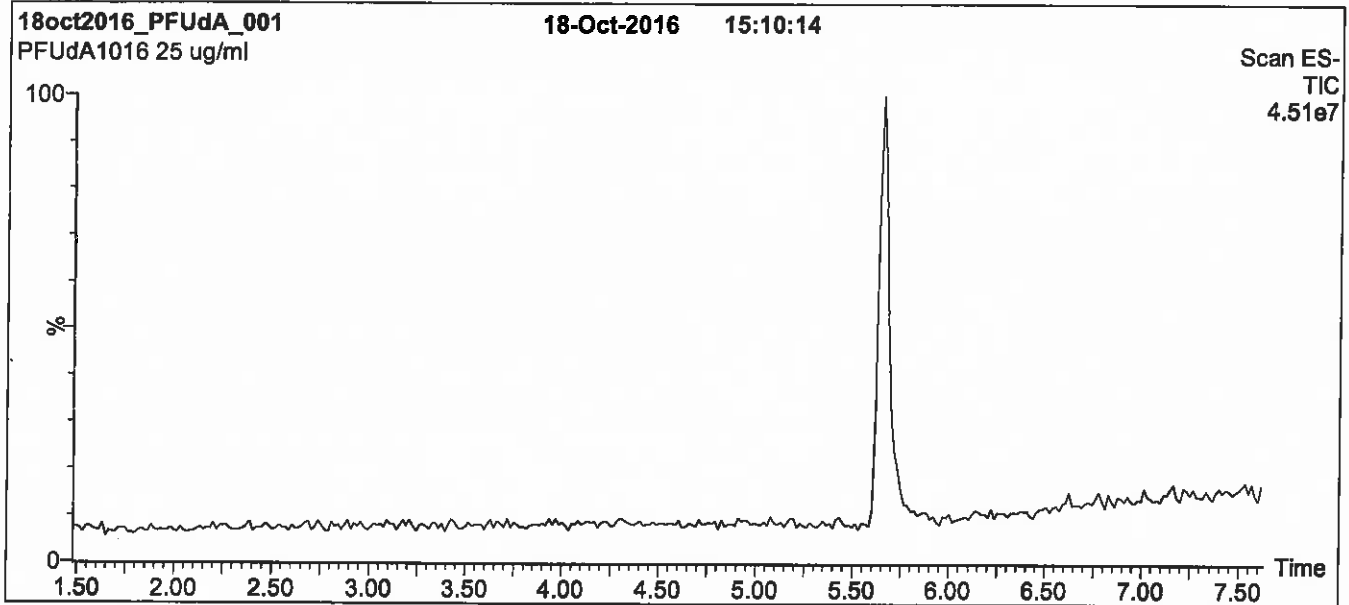
QUALITY MANAGEMENT:

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



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

Figure 1: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc 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

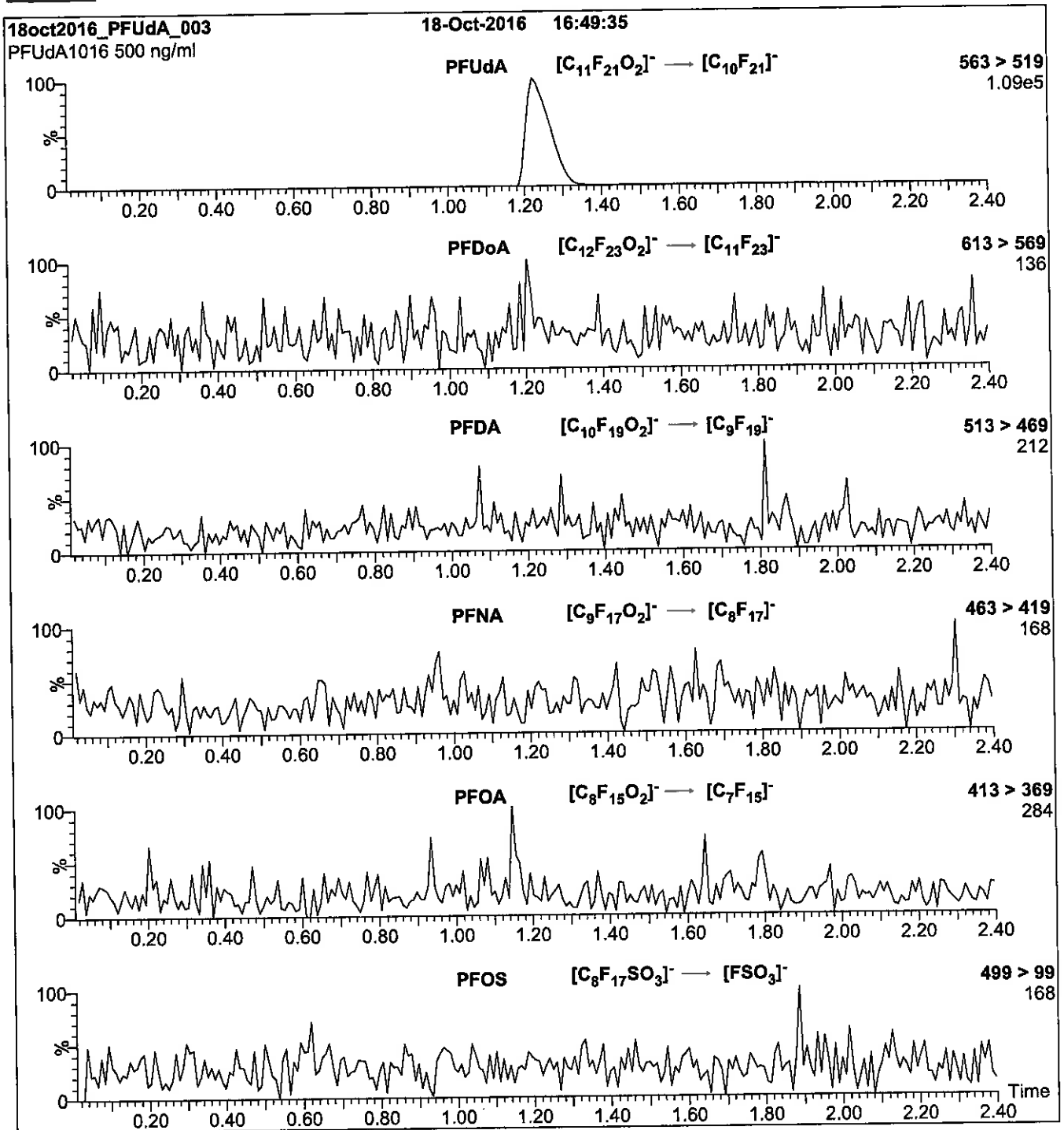
Flow: 300 μ l/min

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 μ l (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
 (both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/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.: 320-40153-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-030-TPI	320-40153-1	110	97	96	99	107	95	87	105
TP-PFC-030-TPI DL	320-40153-1 DL	93	91	83	93	89	95	92	92
TP-PFC-030-MIDCARB ON	320-40153-2	91	79	77	86	94	80	88	86
TP-PFC-030-TPE	320-40153-3	93	82	83	87	94	83	95	87
TP-PFC-030-TPE-D	320-40153-4	91	80	79	83	92	83	91	88
	MB 320-228913/1-A	93	88	82	89	93	81	95	92
	LCS 320-228913/2-A	90	83	78	84	91	78	90	88
	LCSD 320-228913/3-A	93	82	81	90	90	82	89	86

	<u>QC LIMITS</u>
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 1802 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-030-TPI	320-40153-1	103	97	111	109	96	108
TP-PFC-030-TPI DL	320-40153-1 DL	95	86	95	94	91	83
TP-PFC-030-MIDCARB ON	320-40153-2	77	79	90	84	74	80
TP-PFC-030-TPE	320-40153-3	85	79	90	86	78	79
TP-PFC-030-TPE-D	320-40153-4	83	78	87	86	76	77
	MB 320-228913/1-A	85	78	89	90	84	81
	LCS 320-228913/2-A	80	78	88	86	73	69
	LCSD 320-228913/3-A	82	77	92	80	76	74

PFOS = 13C4 PFOS
 PFOSA = 13C8 FOSA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDoA = 13C2 PFDoA
 PFTDA = 13C2-PFTeDA

QC LIMITS

50-150
 50-150
 50-150
 50-150
 50-150
 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.: 320-40153-1

SDG No.: _____

Matrix: Water Level: Low

Lab File ID: 2018.06.26LLC_048.d

Lab ID: LCS 320-228913/2-A

Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	36.1	90	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	33.9	85	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	35.7	89	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	34.4	86	80-113	
Perfluorooctanoic acid (PFOA)	40.0	33.6	84	80-107	
Perfluorononanoic acid (PFNA)	40.0	34.5	86	83-113	
Perfluorodecanoic acid (PFDA)	40.0	37.2	93	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	34.8	87	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	37.9	95	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	41.7	104	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	42.2	105	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	32.4	92	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	31.8	87	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	34.3	90	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3	92	82-112	M
Perfluorodecanesulfonic acid (PFDS)	38.6	32.6	85	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	36.1	90	85-114	
13C8 FOSA	100	78.3	78	50-150	
13C4 PFBA	100	89.9	90	50-150	
13C5 PFPeA	100	83.2	83	50-150	
13C2 PFHxA	100	83.9	84	50-150	
13C4-PFHpA	100	90.6	91	50-150	
13C4 PFOA	100	89.6	90	50-150	
13C5 PFNA	100	88.4	88	50-150	
13C2 PFDA	100	87.5	88	50-150	
13C2 PFUnA	100	86.0	86	50-150	
13C2 PFDoA	100	73.1	73	50-150	
18O2 PFHxS	94.6	74.2	78	50-150	
13C2-PFTeDA	100	69.2	69	50-150	
13C4 PFOS	95.6	76.6	80	50-150	
13C3-PFBS	93.0	72.5	78	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Matrix: Water Level: Low

Lab File ID: 2018.06.26LLC_049.d

Lab ID: LCSD 320-228913/3-A

Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorobutanoic acid (PFBA)	40.0	36.3	91	0	30	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	35.7	89	5	30	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	34.0	85	5	30	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	33.8	85	2	30	80-113	
Perfluorooctanoic acid (PFOA)	40.0	36.4	91	8	30	80-107	
Perfluorononanoic acid (PFNA)	40.0	36.4	91	6	30	83-113	
Perfluorodecanoic acid (PFDA)	40.0	35.2	88	6	30	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	36.9	92	6	30	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	40.1	100	6	30	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	39.5	99	5	30	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	36.7	92	14	30	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	32.3	91	0	30	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	32.4	89	2	30	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	36.4	96	6	30	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.2	92	0	30	82-112	M
Perfluorodecanesulfonic acid (PFDS)	38.6	35.5	92	9	30	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	37.3	93	3	30	85-114	
13C8 FOSA	100	77.5	77			50-150	
13C4 PFBA	100	92.6	93			50-150	
13C5 PFPeA	100	82.4	82			50-150	
13C2 PFHxA	100	90.0	90			50-150	
13C4-PFHpA	100	90.1	90			50-150	
13C4 PFOA	100	88.5	89			50-150	
13C5 PFNA	100	85.8	86			50-150	
13C2 PFDA	100	91.7	92			50-150	
13C2 PFUnA	100	79.6	80			50-150	
13C2 PFDoA	100	75.9	76			50-150	
18O2 PFHxS	94.6	77.7	82			50-150	
13C2-PFTeDA	100	74.5	74			50-150	
13C4 PFOS	95.6	78.5	82			50-150	
13C3-PFBS	93.0	74.9	81			50-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab File ID: 2018.06.26LLC_047.d Lab Sample ID: MB 320-228913/1-A
 Matrix: Water Date Extracted: 06/13/2018 15:12
 Instrument ID: A8_N Date Analyzed: 06/27/2018 05:17
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-228913/2-A	2018.06.26L LC 048.d	06/27/2018 05:25
	LCSD 320-228913/3-A	2018.06.26L LC 049.d	06/27/2018 05:32
TP-PFC-030-TPI	320-40153-1	2018.06.26L LC 050.d	06/27/2018 05:40
TP-PFC-030-MIDCARBON	320-40153-2	2018.06.26L LC 051.d	06/27/2018 05:48
TP-PFC-030-TPE	320-40153-3	2018.06.26L LC 052.d	06/27/2018 05:56
TP-PFC-030-TPE-D	320-40153-4	2018.06.26L LC 053.d	06/27/2018 06:04
TP-PFC-030-TPI DL	320-40153-1 DL	2018.06.29L LBBX 021.d	06/30/2018 01:08

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Sample No.: IC 320-230408/5 Date Analyzed: 06/22/2018 09:41
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.06.022LLICALA Heated Purge: (Y/N) N
 Calibration ID: 39780

	13PFOA					
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT	3755094	2.65				
UPPER LIMIT	5632641	2.85				
LOWER LIMIT	1877547	2.45				
LAB SAMPLE ID	CLIENT SAMPLE ID					
ICB 320-230408/9		3926269	2.65			
ICV 320-230408/10		3781334	2.65			
CCV 320-231134/3 CCVIS		3681597	2.68			

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Sample No.: CCV 320-231134/3 Date Analyzed: 06/26/2018 23:32
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.06.26LLC_003.d Heated Purge: (Y/N) N
 Calibration ID: 39780

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3681597	2.68				
UPPER LIMIT		5522396	2.88				
LOWER LIMIT		1840799	2.48				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-231134/1		3659241	2.68				
CCVL 320-231134/2		3323617	2.68				
CCV 320-231147/1		3773321	2.68				
MB 320-228913/1-A		4307793	2.68				
LCS 320-228913/2-A		4468673	2.68				
LCSD 320-228913/3-A		4426627	2.68				
320-40153-1	TP-PFC-030-TPI	3481814	2.68				
320-40153-2	TP-PFC-030-MIDCARBON	4600570	2.67				
320-40153-3	TP-PFC-030-TPE	4456919	2.68				
320-40153-4	TP-PFC-030-TPE-D	4509533	2.68				
CCV 320-231147/9		3884149	2.67				

13PFOA = 13C2-PFOA
 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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Sample No.: IC 320-231836/5 Date Analyzed: 06/29/2018 21:52
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.06.29LLICALA_0 Heated Purge: (Y/N) N
 Calibration ID: 39860

	13PFOA					
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT	4168201	2.66				
UPPER LIMIT	6252302	2.86				
LOWER LIMIT	2084101	2.46				
LAB SAMPLE ID	CLIENT SAMPLE ID					
ICB 320-231836/9		4109243	2.65			
ICV 320-231836/10		4207014	2.65			
CCV 320-231842/1		4102960	2.65			
320-40153-1 DL	TP-PFC-030-TPI DL	449215Q	2.65			
CCV 320-231842/10		4252257	2.64			

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 I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPI Lab Sample ID: 320-40153-1
 Matrix: Water Lab File ID: 2018.06.26LLC_050.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:35
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 283.7 (mL) Date Analyzed: 06/27/2018 05:40
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	64	M	1.8	1.3	0.52
2706-90-3	Perfluoropentanoic acid (PFPeA)	180		1.8	0.88	0.38
307-24-4	Perfluorohexanoic acid (PFHxA)	330		1.8	0.88	0.41
375-85-9	Perfluoroheptanoic acid (PFHpA)	65		1.8	1.3	0.54
335-67-1	Perfluorooctanoic acid (PFOA)	1300	M E	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	2.4		1.8	1.3	0.46
335-76-2	Perfluorodecanoic acid (PFDA)	0.71	J M	1.8	0.88	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	1.3	0.63
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	1.3	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	2.6	0.67
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	2.6	0.73
375-73-5	Perfluorobutanesulfonic acid (PFBS)	48		1.8	0.88	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	350	E	1.8	0.88	0.33
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.1		1.8	0.88	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	310		3.5	2.6	0.97
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	1.3	0.49
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-40153-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-030-TPI</u>	Lab Sample ID: <u>320-40153-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.06.26LLC_050.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>06/07/2018 09:35</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>06/13/2018 15:12</u>
Sample wt/vol: <u>283.7(mL)</u>	Date Analyzed: <u>06/27/2018 05:40</u>
Con. Extract Vol.: <u>10(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>231147</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	97		50-150
STL00992	13C4 PFBA	110		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	99		50-150
STL01892	13C4-PFHpA	107		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	105		50-150
STL00996	13C2 PFDA	111		50-150
STL00997	13C2 PFUnA	109		50-150
STL00998	13C2 PFDoA	96		50-150
STL00994	18O2 PFHxS	95		50-150
STL02116	13C2-PFTeDA	108		50-150
STL00991	13C4 PFOS	103		50-150
STL02337	13C3-PFBS	96		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_050.d
 Lims ID: 320-40153-A-1-A
 Client ID: TP-PFC-030-TPI
 Sample Type: Client
 Inject. Date: 27-Jun-2018 05:40:35 ALS Bottle#: 36 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-40153-a-1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:04:00 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:04:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid	212.90	1.435	1.436	-0.001	3993783	1.83			930	M
D 1 13C4 PFBA	217.00	1.435	1.441	-0.006	5433633	2.74		110	40346	
4 Perfluoropentanoic acid	262.90	1.702	1.703	-0.001	8476388	5.01			1814	
D 3 13C5-PFPeA	267.90	1.702	1.711	-0.009	3480676	2.43		97.2	31731	
5 Perfluorobutanesulfonic acid	298.90	1.747	1.739	0.008	3660073	1.36			3211	
	298.90	1.747	1.739	0.008	1549509		2.36(1.25-3.74)		3686	
D 47 13C3-PFBS	301.90	1.738	1.747	-0.009	80177	2.22		95.5	381	
6 Perfluorohexanoic acid	313.00	1.991	1.993	-0.002	15078072	9.26			28929	
	313.00	1.991	1.993	-0.002	1247109		12.09(5.03-15.10)		21515	
D 7 13C2 PFHxA	315.00	1.991	2.003	-0.012	3876889	2.48		99.3	61448	
10 Perfluoroheptanoic acid	363.00	2.319	2.308	0.011	3251365	1.85			2284	
	363.00	2.319	2.308	0.011	1237447		2.63(1.13-3.40)		9060	
D 9 13C4-PFHpA	367.00	2.319	2.319	0.0	3784483	2.67		107	50444	
8 Perfluorohexanesulfonic acid	399.00	2.332	2.321	0.011	21977195	10.0			26380	E
	399.00	2.332	2.321	0.011	7436911		2.96(1.50-4.49)		17203	E
D 11 18O2 PFHxS	403.00	2.332	2.345	-0.013	4557575	2.25		95.3	47047	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.682	2.675	0.007	0.880	386743	0.2009			170	
449.00 > 99.00	2.682	2.675	0.007	0.880	120489		3.21(1.94-5.82)		308	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.675	-0.001		3481814	2.50			31488	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.675	-0.001	1.000	51253600	36.2			18147	EM
413.00 > 169.00	2.675	2.675	-0.001	1.000	35744908		1.43(0.84-2.52)		50739	EM M
D 14 13C4 PFOA										
417.00 > 372.00	2.675	2.682	-0.008	1.000	2899592	2.17		86.7	39537	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.049	3.039	0.010	1.000	13746857	8.70			40875	
499.00 > 99.00	3.049	3.039	0.010	1.000	3072229		4.47(2.31-6.93)		29312	
20 Perfluorononanoic acid										
463.00 > 419.00	3.049	3.046	0.003	1.000	80681	0.0670			97.7	
463.00 > 169.00	3.049	3.046	0.003	1.000	19828		4.07(1.90-5.69)		94.3	
D 19 13C5 PFNA										
468.00 > 423.00	3.049	3.055	-0.006	1.140	2772774	2.63		105	40585	
D 18 13C4 PFOS										
503.00 > 80.00	3.049	3.055	-0.006	1.140	3320130	2.47		103	29720	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.375	3.370	0.005	1.000	7805	0.004170			21.8	
D 21 13C8 FOSA										
506.00 > 78.00	3.375	3.384	-0.009	1.262	4649677	2.43		97.4	58767	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.412	3.407	0.005	1.000	18289	0.0203			45.9	M
513.00 > 169.00	3.412	3.407	0.005	1.000	3792		4.82(2.36-7.09)		46.4	M
D 23 13C2 PFDA										
515.00 > 470.00	3.412	3.421	-0.009	1.276	2224339	2.79		111	27732	
D 30 13C2 PFUnA										
565.00 > 520.00	3.743	3.754	-0.011	1.400	1681398	2.73		109	34993	
D 36 13C2 PFDaA										
615.00 > 570.00	4.041	4.055	-0.014	1.511	1494198	2.41		96.3	9315	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.553	4.559	-0.006	1.702	1549959	2.71		108	5752	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_050.d

Injection Date: 27-Jun-2018 05:40:35

Instrument ID: A8_N

Lims ID: 320-40153-A-1-A

Lab Sample ID: 320-40153-1

Client ID: TP-PFC-030-TPI

Operator ID: SACINSTLCMS01

ALS Bottle#: 36

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

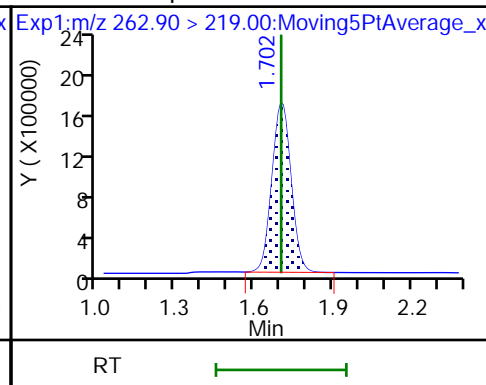
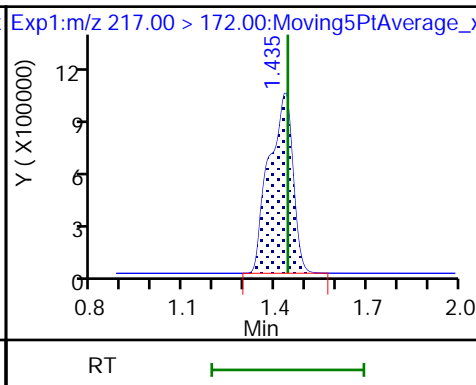
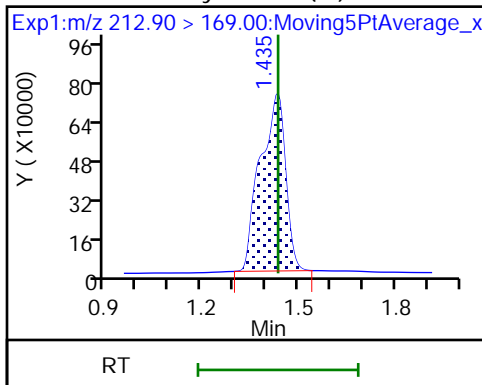
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid (M)

D 1 13C4 PFBA

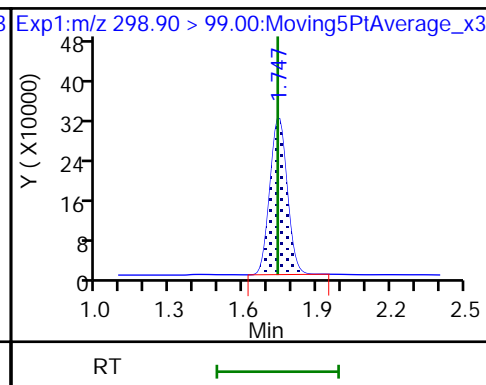
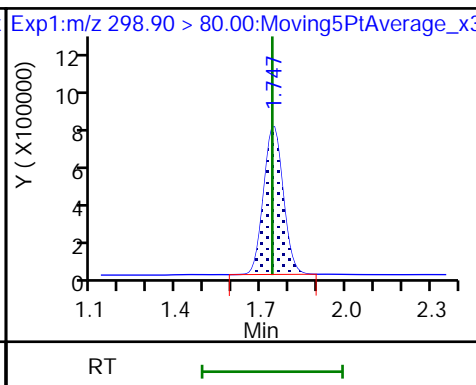
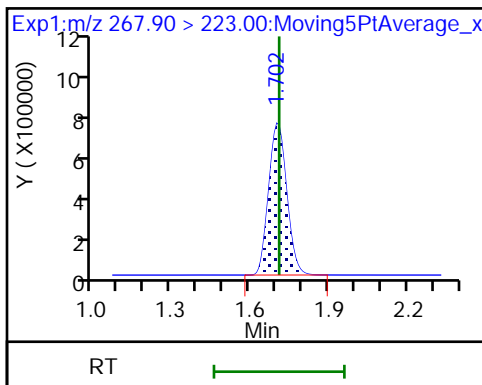
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

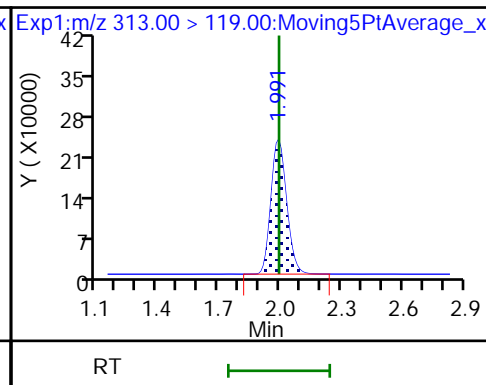
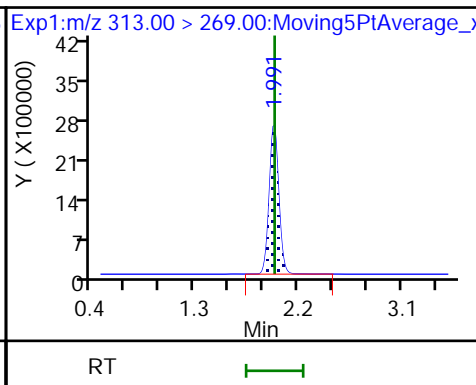
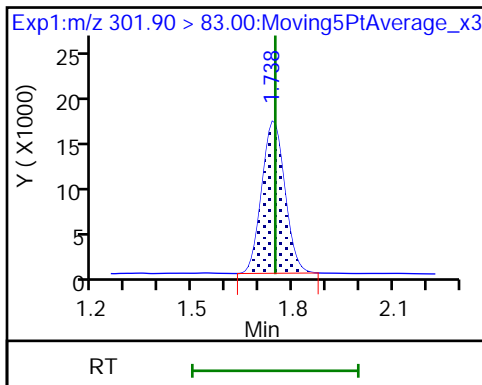
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

6 Perfluorohexanoic acid

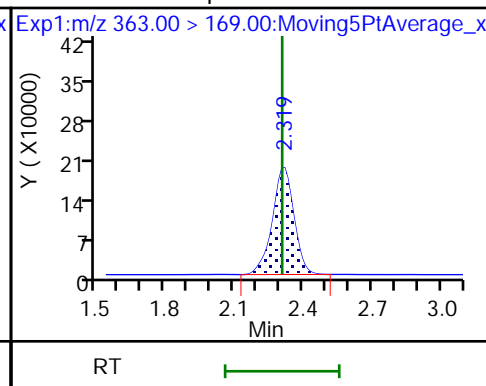
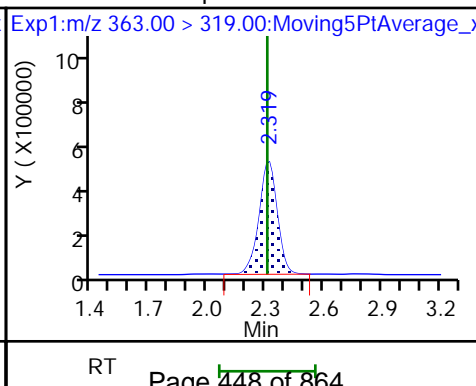
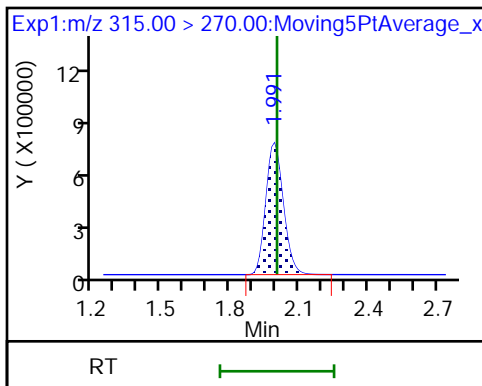
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

10 Perfluoroheptanoic acid

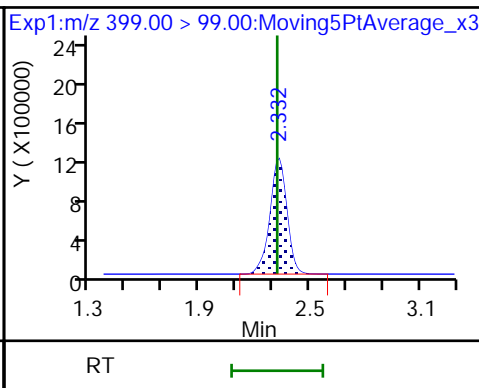
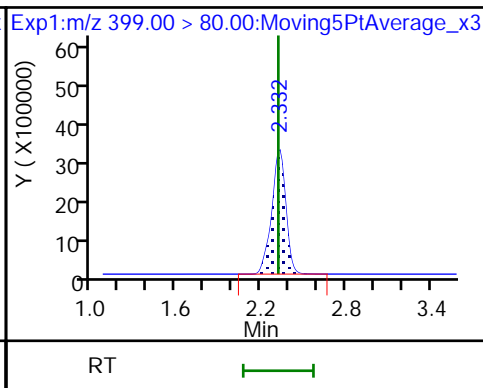
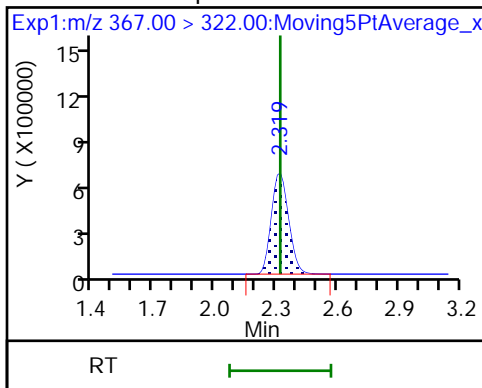
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid

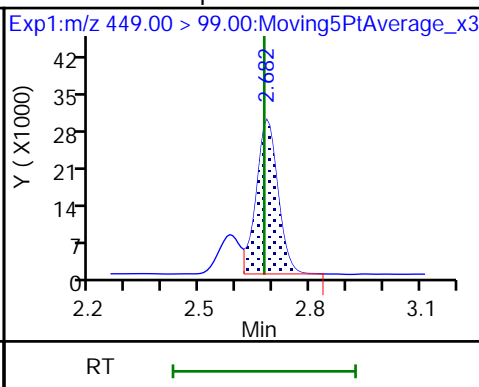
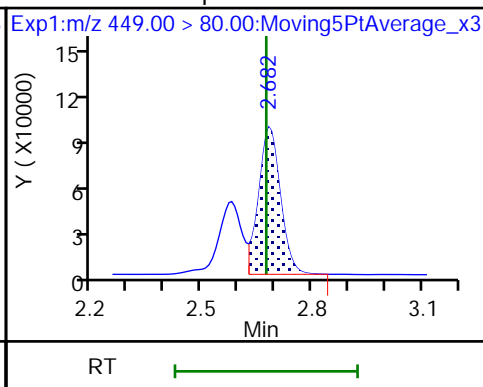
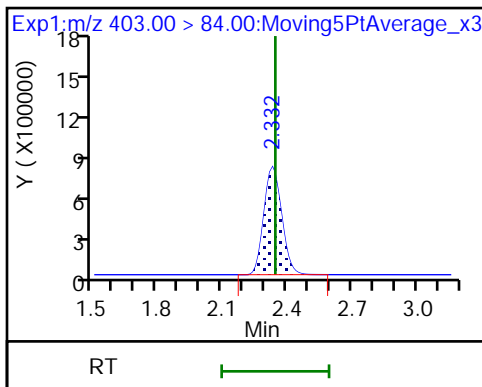
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

16 Perfluoroheptanesulfonic acid

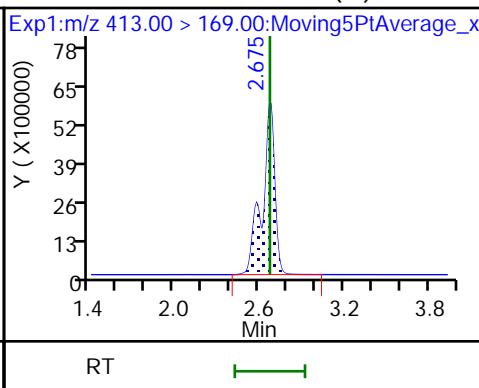
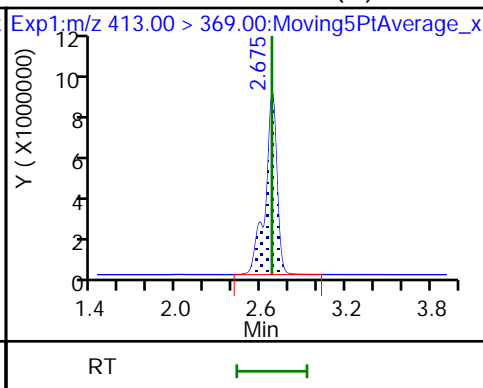
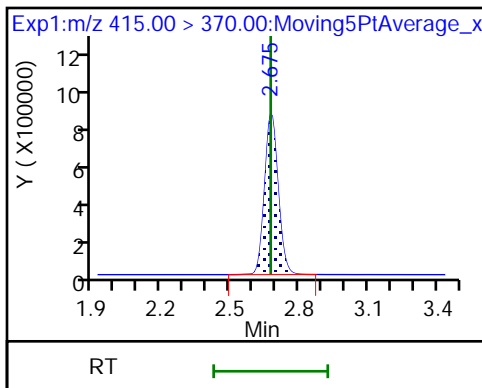
16 Perfluoroheptanesulfonic acid



* 62 13C2-PFOA

15 Perfluorooctanoic acid (M)

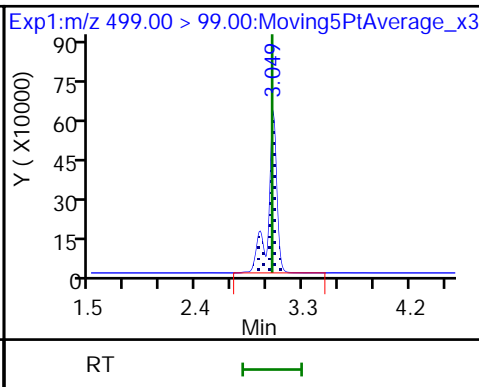
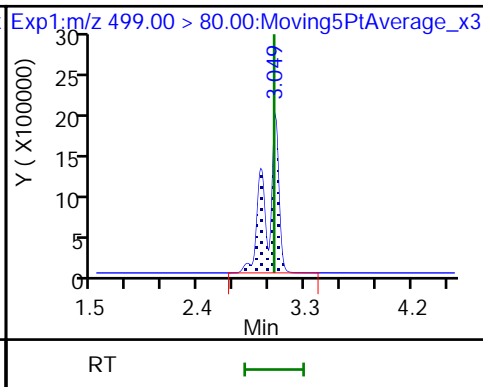
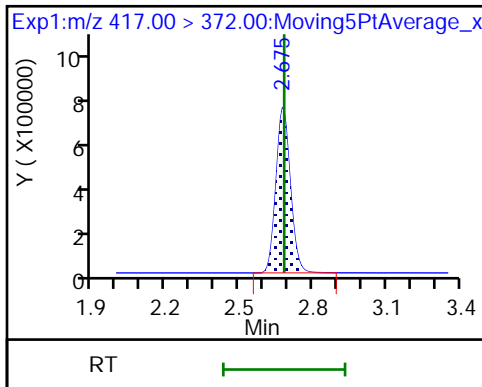
15 Perfluorooctanoic acid (M)

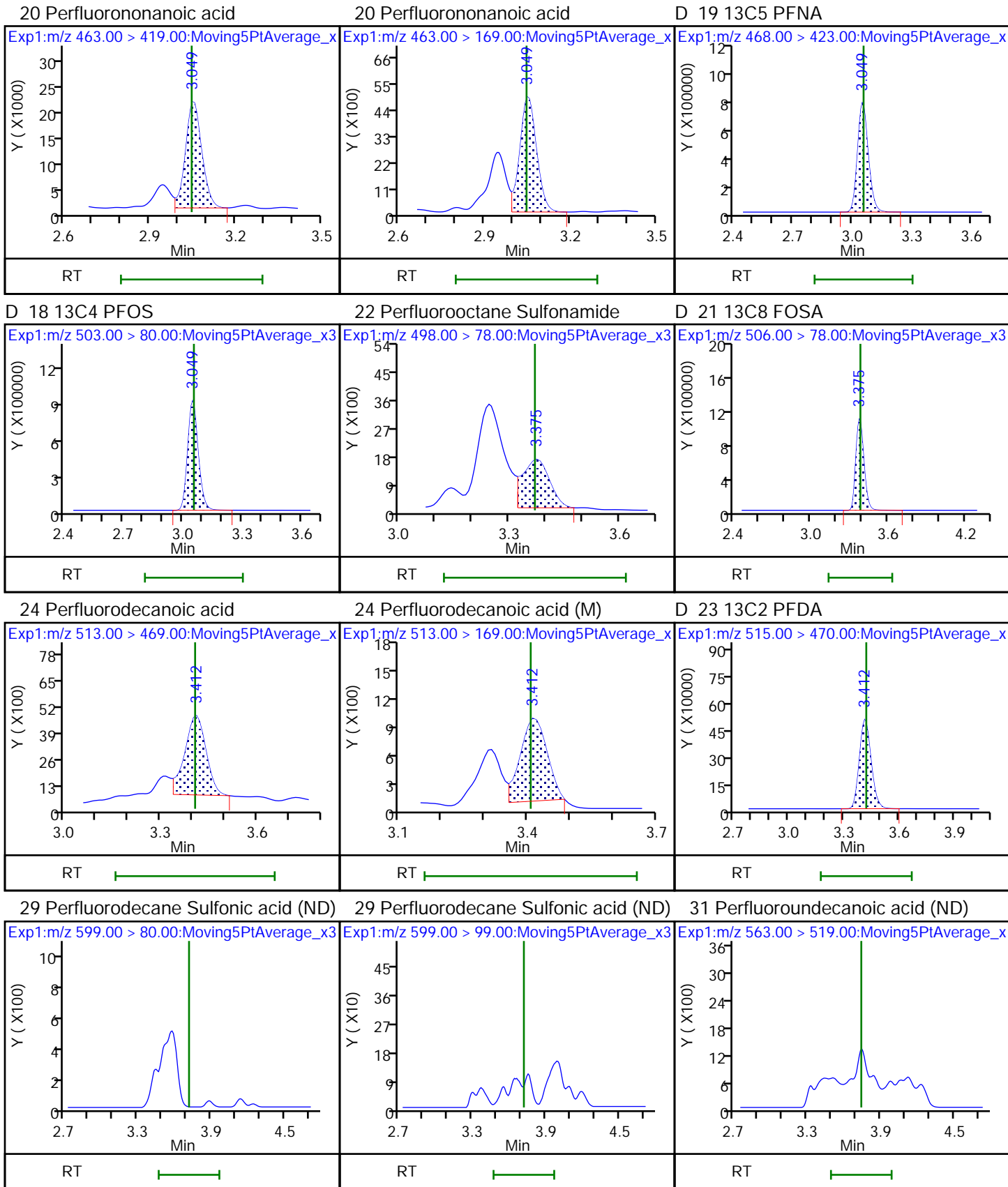


D 14 13C4 PFOA

17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

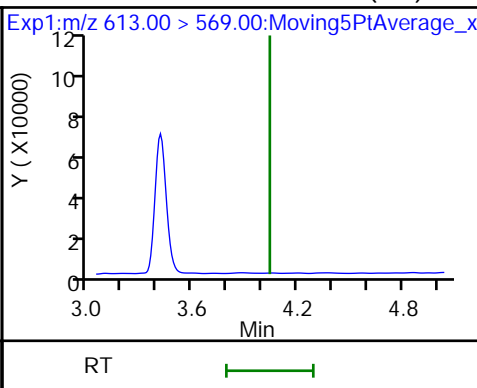
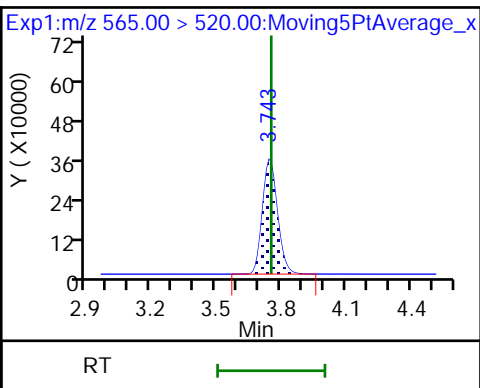
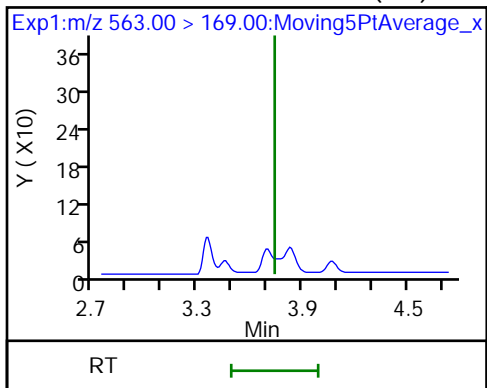




31 Perfluoroundecanoic acid (ND)

D 30 13C2 PFUnA

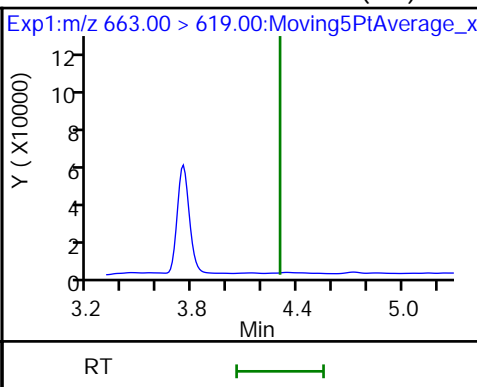
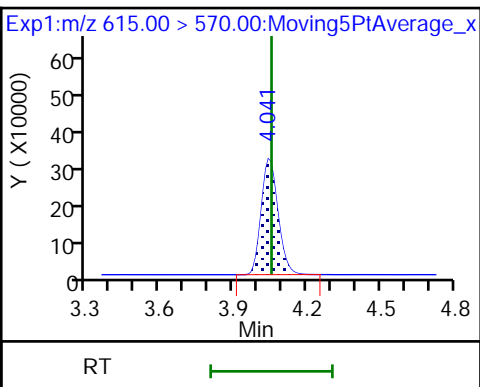
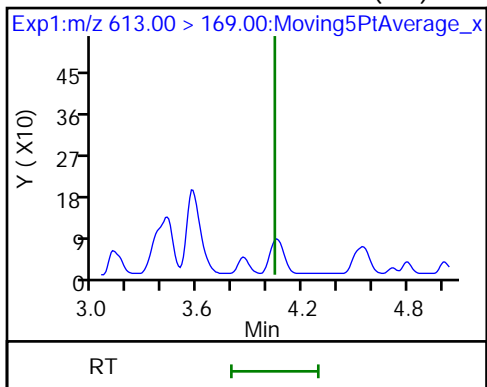
37 Perfluorododecanoic acid (ND)



37 Perfluorododecanoic acid (ND)

D 36 13C2 PFDaA

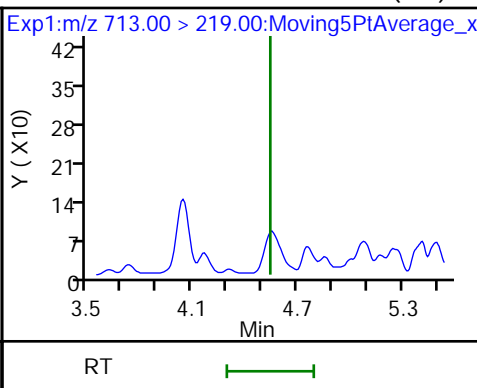
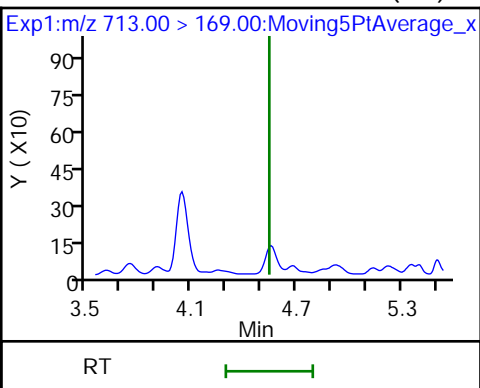
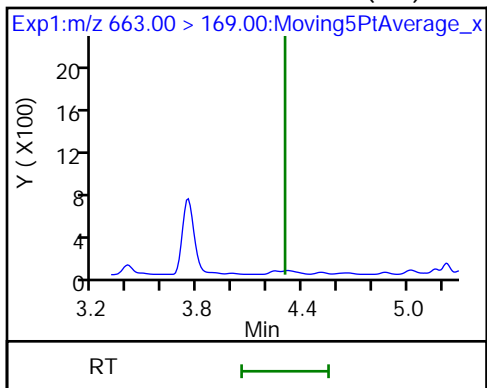
41 Perfluorotridecanoic acid (ND)



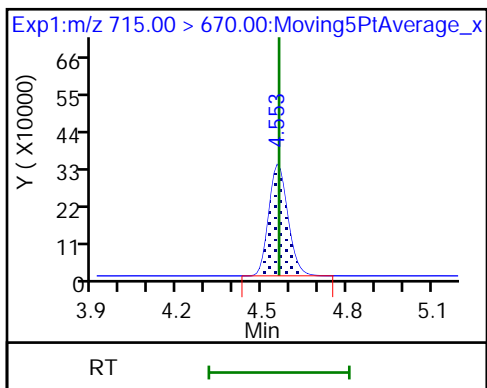
41 Perfluorotridecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



TestAmerica Sacramento

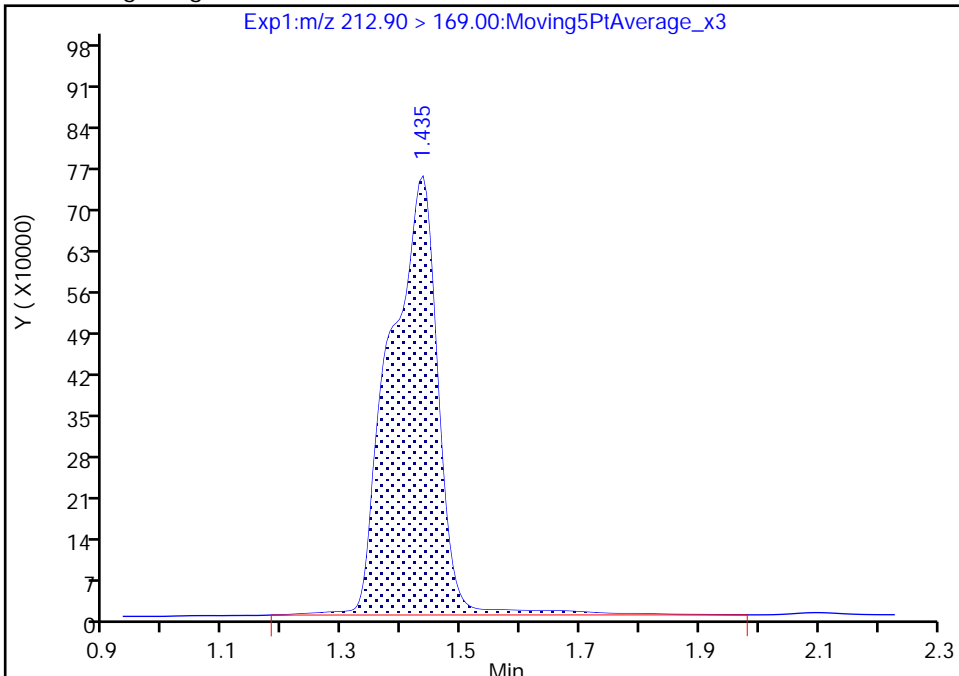
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_050.d
Injection Date: 27-Jun-2018 05:40:35 Instrument ID: A8_N
Lims ID: 320-40153-A-1-A Lab Sample ID: 320-40153-1
Client ID: TP-PFC-030-TPI
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

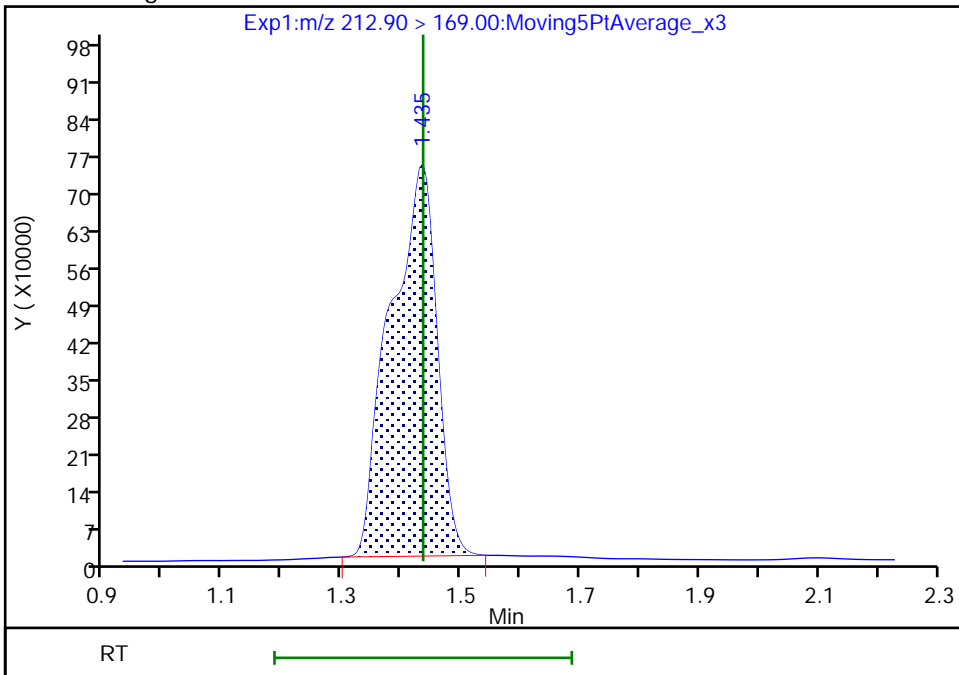
RT: 1.44
Area: 4213835
Amount: 1.928230
Amount Units: ng/ml

Processing Integration Results



RT: 1.44
Area: 3993783
Amount: 1.827536
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

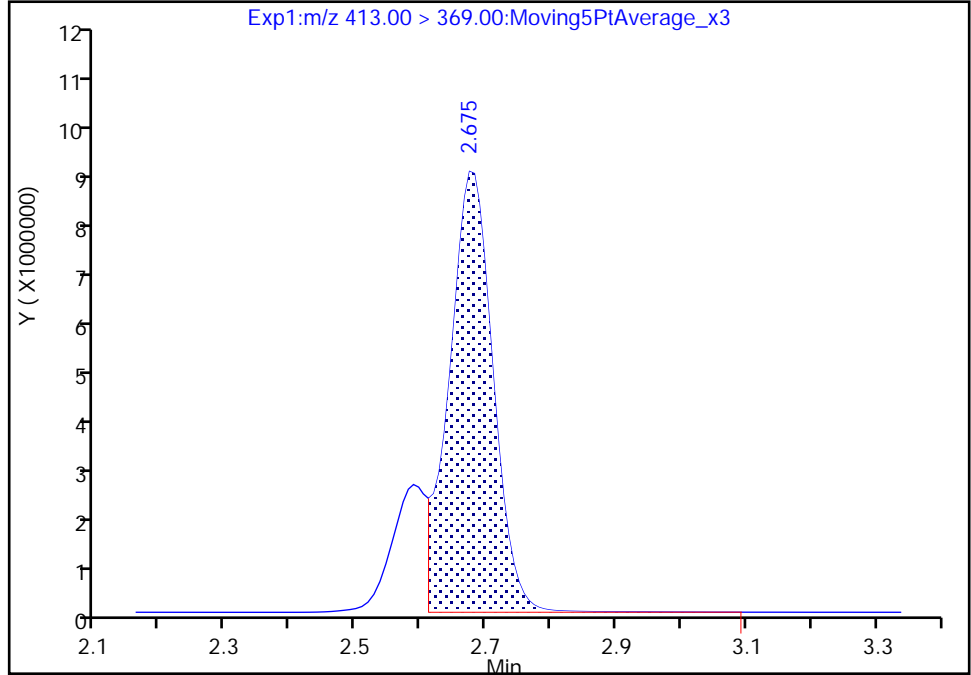
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_050.d
Injection Date: 27-Jun-2018 05:40:35 Instrument ID: A8_N
Lims ID: 320-40153-A-1-A Lab Sample ID: 320-40153-1
Client ID: TP-PFC-030-TPI
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

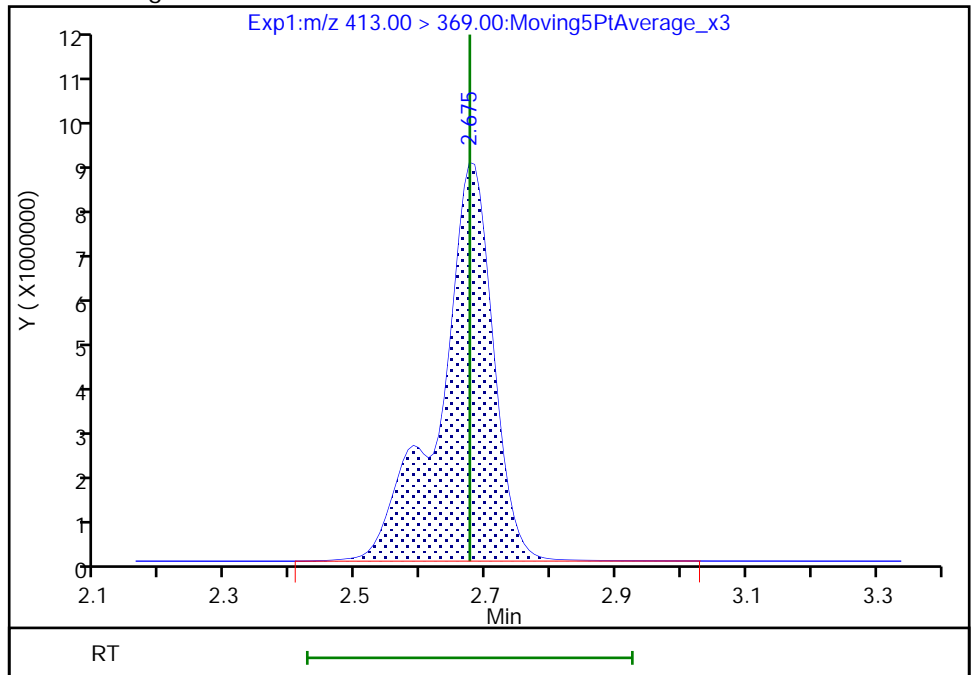
RT: 2.67
Area: 41809664
Amount: 29.543724
Amount Units: ng/ml

Processing Integration Results



RT: 2.67
Area: 51253600
Amount: 36.217038
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

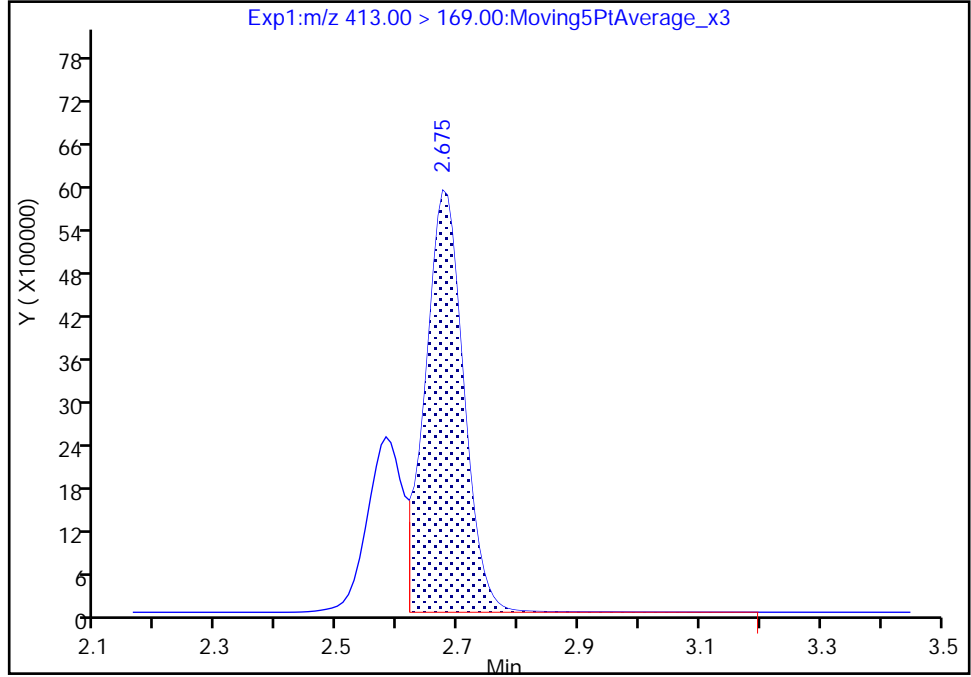
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_050.d
Injection Date: 27-Jun-2018 05:40:35 Instrument ID: A8_N
Lims ID: 320-40153-A-1-A Lab Sample ID: 320-40153-1
Client ID: TP-PFC-030-TPI
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

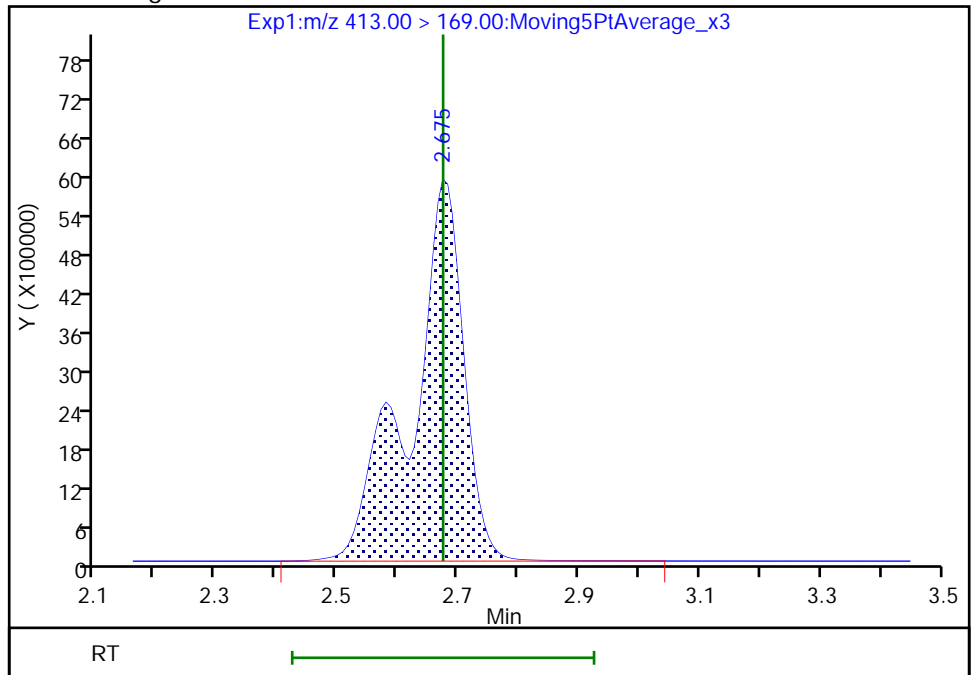
RT: 2.67
Area: 25762889
Amount: 29.543724
Amount Units: ng/ml

Processing Integration Results



RT: 2.67
Area: 35744908
Amount: 36.217038
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

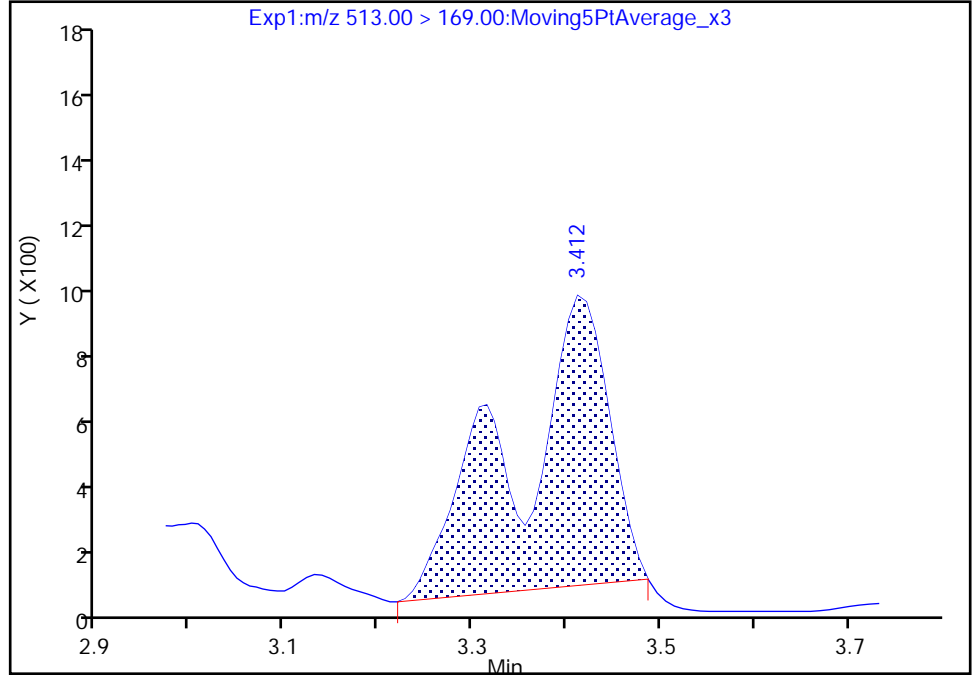
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_050.d
Injection Date: 27-Jun-2018 05:40:35 Instrument ID: A8_N
Lims ID: 320-40153-A-1-A Lab Sample ID: 320-40153-1
Client ID: TP-PFC-030-TPI
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 2

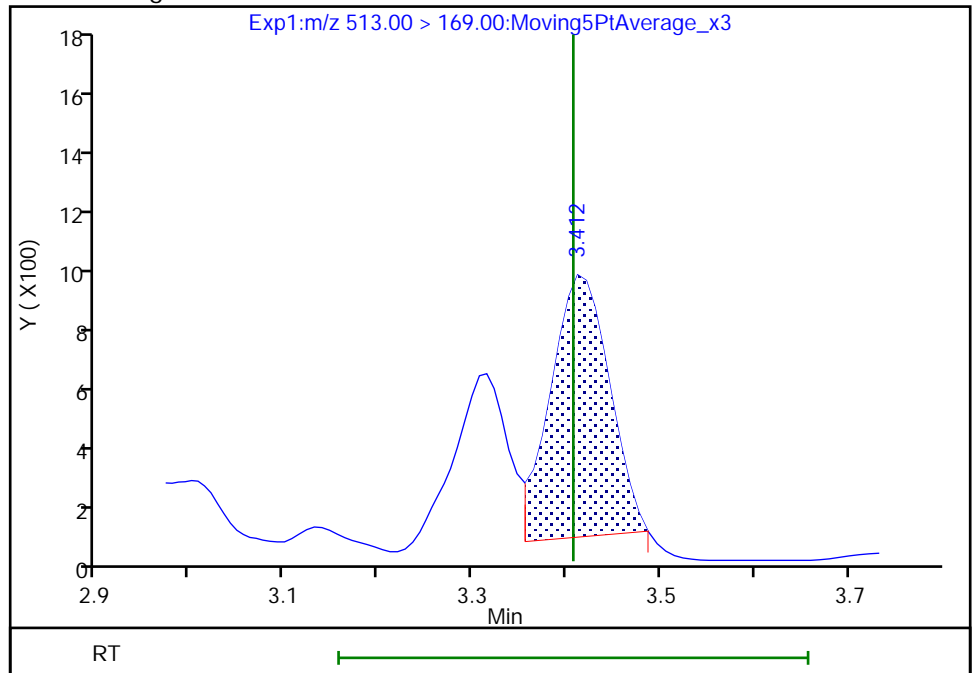
RT: 3.41
Area: 6082
Amount: 0.020270
Amount Units: ng/ml

Processing Integration Results



RT: 3.41
Area: 3792
Amount: 0.020270
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPI DL Lab Sample ID: 320-40153-1 DL
 Matrix: Water Lab File ID: 2018.06.29LLBBX_021.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:35
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 283.7(mL) Date Analyzed: 06/30/2018 01:08
 Con. Extract Vol.: 10(mL) Dilution Factor: 10
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231842 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	67	D M	18	13	5.2
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	D	18	8.8	3.8
307-24-4	Perfluorohexanoic acid (PFHxA)	340	D	18	8.8	4.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	71	D	18	13	5.4
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D	18	13	4.8
375-95-1	Perfluorononanoic acid (PFNA)	13	U	18	13	4.6
335-76-2	Perfluorodecanoic acid (PFDA)	8.8	U	18	8.8	4.2
2058-94-8	Perfluoroundecanoic acid (PFUnA)	13	U	18	13	6.3
307-55-1	Perfluorododecanoic acid (PFDoA)	13	U	18	13	4.6
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	26	U	35	26	6.7
376-06-7	Perfluorotetradecanoic acid (PFTeA)	26	U	35	26	7.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	50	D	18	8.8	4.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	360	D	18	8.8	3.3
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.5	J D	18	8.8	3.3
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	300	D	35	26	9.7
335-77-3	Perfluorodecanesulfonic acid (PFDS)	13	U	18	13	4.9
754-91-6	Perfluorooctane Sulfonamide (FOSA)	26	U	35	26	11

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPI DL Lab Sample ID: 320-40153-1 DL
 Matrix: Water Lab File ID: 2018.06.29LLBBX_021.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:35
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 283.7(mL) Date Analyzed: 06/30/2018 01:08
 Con. Extract Vol.: 10(mL) Dilution Factor: 10
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231842 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	86		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	91		50-150
STL00993	13C2 PFHxA	93		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	95		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	91		50-150
STL00994	18O2 PFHxS	95		50-150
STL02116	13C2-PFTeDA	83		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	83		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\2018.06.29LLBBX_021.d
 Lims ID: 320-40153-A-1-A
 Client ID: TP-PFC-030-TPI
 Sample Type: Client
 Inject. Date: 30-Jun-2018 01:08:19 ALS Bottle#: 21 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 10.0000
 Sample Info: 320-40153-a-1-a 10X (228913)
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 08:28:09 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 08:25:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										M
212.90 > 169.00	1.430	1.424	0.006	1.004	448740	0.1897			210	M
D 1 13C4 PFBA										
217.00 > 172.00	1.425	1.428	-0.003	0.537	581137	0.2315		92.6	4732	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.703	1.702	0.001	1.000	1008810	0.5290			595	
D 3 13C5-PFPeA										
267.90 > 223.00	1.703	1.705	-0.002	0.642	401501	0.2278		91.1	6698	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.738	0.001	1.000	357031	0.1430			1812	
298.90 > 99.00	1.739	1.738	0.001	1.000	158731		2.25(1.25-3.74)		1628	
D 47 13C3-PFBS										
301.90 > 83.00	1.739	1.741	-0.002	0.655	7524	0.1937		83.3	62.9	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.982	1.981	0.001	1.000	1787628	0.9653			4417	
313.00 > 119.00	1.982	1.981	0.001	1.000	144248		12.39(5.03-15.10)		2214	
D 7 13C2 PFHxA										
315.00 > 270.00	1.982	1.984	-0.002	0.747	447592	0.2319		92.8	11869	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.294	2.293	0.001	1.000	355077	0.2002			644	
363.00 > 169.00	2.294	2.293	0.001	1.000	128596		2.76(1.13-3.40)		1052	
D 9 13C4-PFHpA										
367.00 > 322.00	2.294	2.302	-0.008	0.865	399862	0.2237		89.5	8484	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.307	2.306	0.001	1.000	2329211	1.01			11984	
399.00 > 99.00	2.307	2.306	0.001	1.000	737885		3.16(1.50-4.49)		3826	
D 11 18O2 PFHxS										
403.00 > 84.00	2.307	2.317	-0.010	0.870	471365	0.2258		95.5	13370	

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	2.654	2.644	0.010		449215	0.2500		10065	
15 Perfluorooctanoic acid	413.00 > 369.00	2.645	2.644	0.001	1.000	9013586	4.87		3198	
	413.00 > 169.00	2.645	2.644	0.001	1.000	5112106		1.76(0.84-2.52)	40457	
16 Perfluoroheptanesulfonic acid	449.00 > 80.00	2.654	2.652	0.002	0.882	38419	0.0212		172	
	449.00 > 99.00	2.654	2.652	0.002	0.882	12711		3.02(1.94-5.82)	193	
D 14 13C4 PFOA	417.00 > 372.00	2.645	2.653	-0.008	0.997	393444	0.2293		91.7	9585
17 Perfluorooctane sulfonic acid	499.00 > 80.00	3.009	3.010	-0.001	1.000	1327254	0.8570			11106
	499.00 > 99.00	3.009	3.010	-0.001	1.000	301845		4.40(2.31-6.93)		6847
20 Perfluorononanoic acid	463.00 > 419.00	3.016	3.010	0.006	1.002	8402	0.005800			22.4
	463.00 > 169.00	3.016	3.010	0.006	1.002	3421		2.46(1.90-5.69)		97.6
D 18 13C4 PFOS	503.00 > 80.00	3.009	3.017	-0.008	1.134	318329	0.2275		95.2	4801
D 19 13C5 PFNA	468.00 > 423.00	3.009	3.018	-0.009	1.134	325867	0.2294		91.8	8648
D 21 13C8 FOSA	506.00 > 78.00	3.359	3.358	0.001	1.266	395294	0.2150		86.0	9187
D 23 13C2 PFDA	515.00 > 470.00	3.368	3.374	-0.006	1.269	276764	0.2387		95.5	9193
D 30 13C2 PFUnA	565.00 > 520.00	3.696	3.698	-0.002	1.393	224398	0.2355		94.2	5888
D 36 13C2 PFDoA	615.00 > 570.00	3.986	3.992	-0.006	1.502	251118	0.2273		90.9	2804
D 43 13C2-PFTeDA	715.00 > 670.00	4.479	4.490	-0.011	1.688	287137	0.2085		83.4	3188

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\2018.06.29LLBBX_021.d

Injection Date: 30-Jun-2018 01:08:19

Instrument ID: A8_N

Lims ID: 320-40153-A-1-A

Lab Sample ID: 320-40153-1

Client ID: TP-PFC-030-TPI

Operator ID: SACINSTLCMS01

ALS Bottle#: 21

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 10.0000

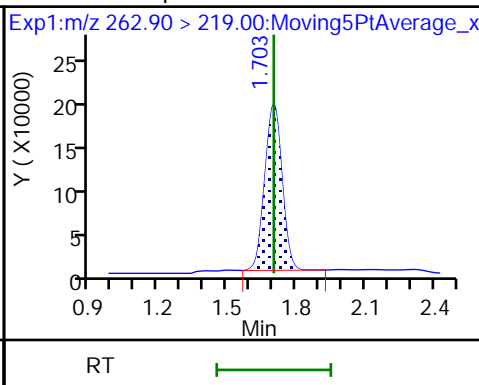
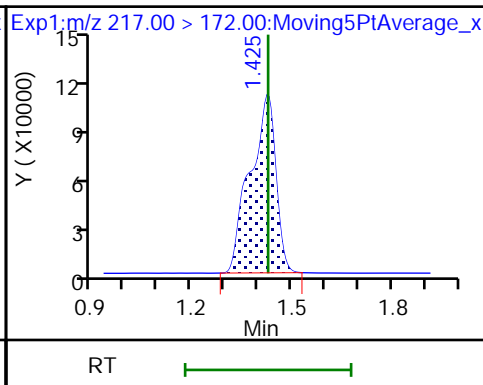
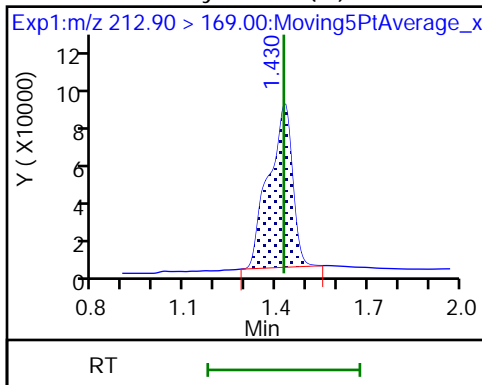
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid (M)

D 1 13C4 PFBA

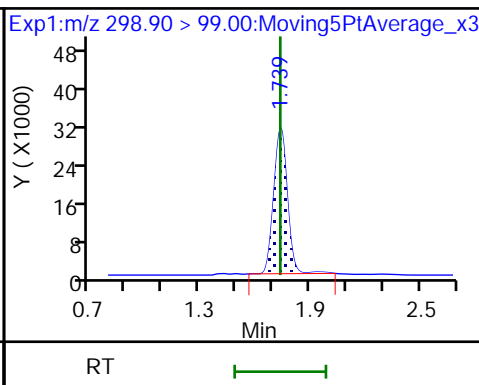
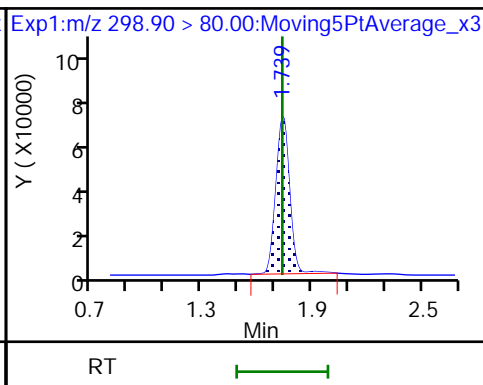
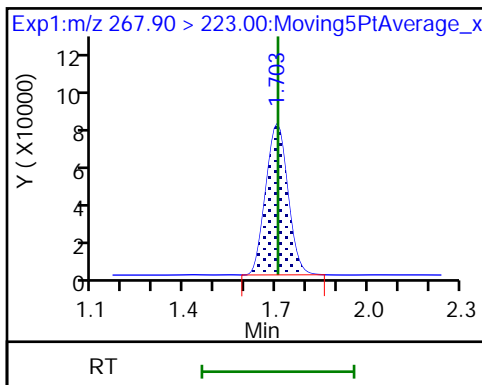
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

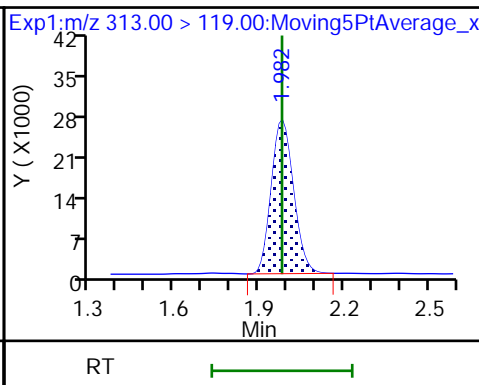
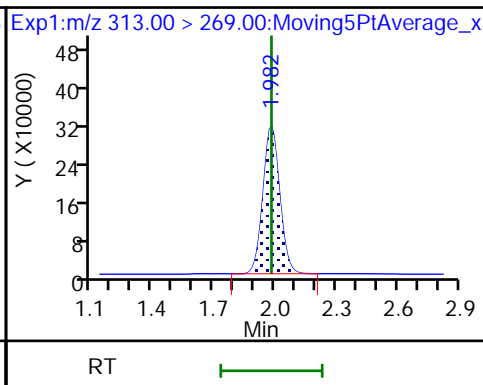
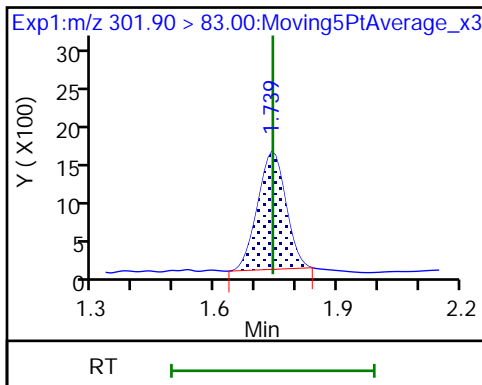
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

6 Perfluorohexanoic acid

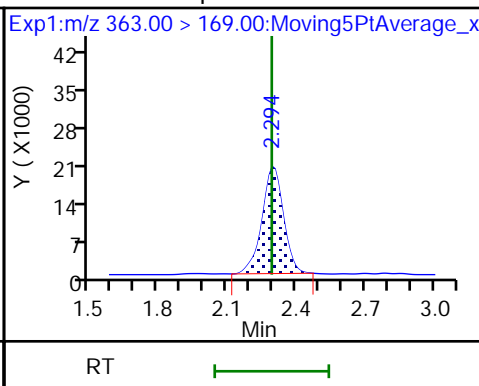
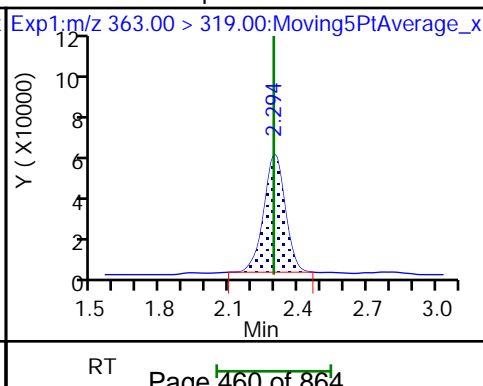
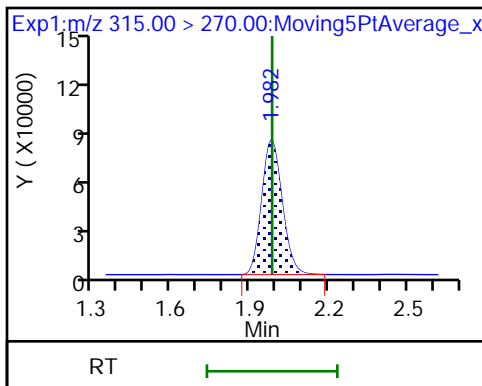
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

10 Perfluoroheptanoic acid

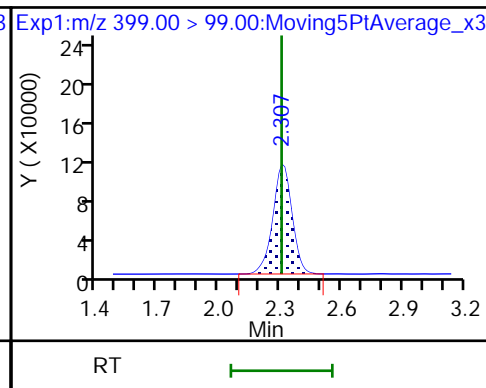
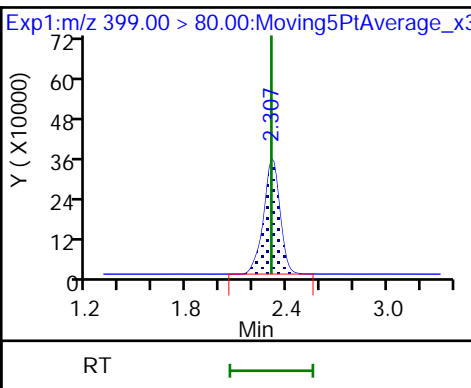
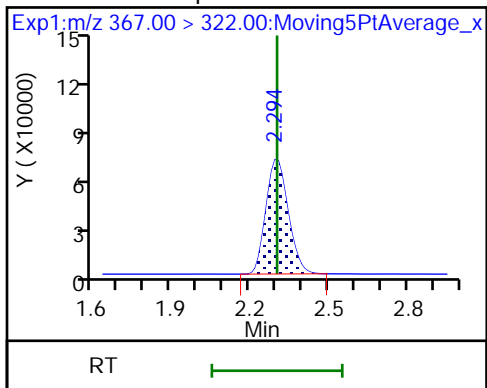
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid

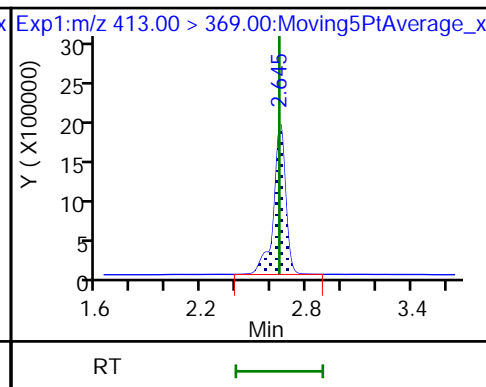
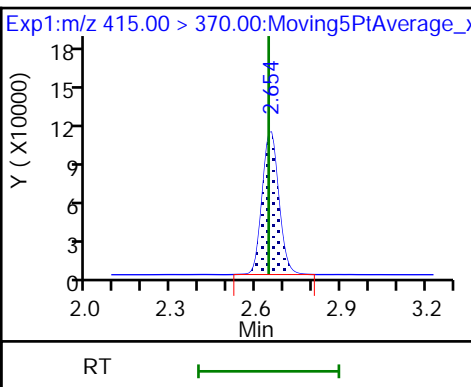
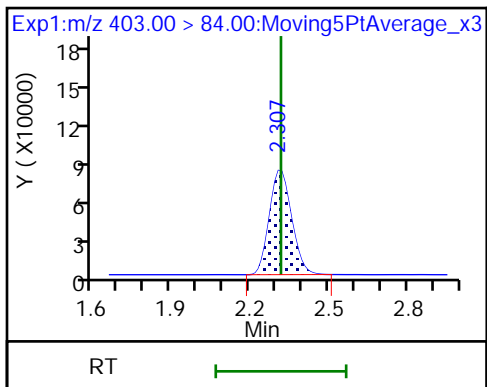
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

* 62 13C2-PFOA

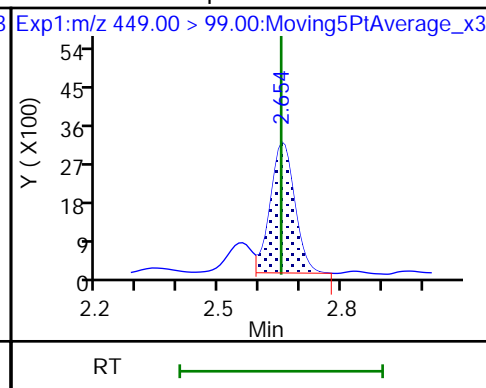
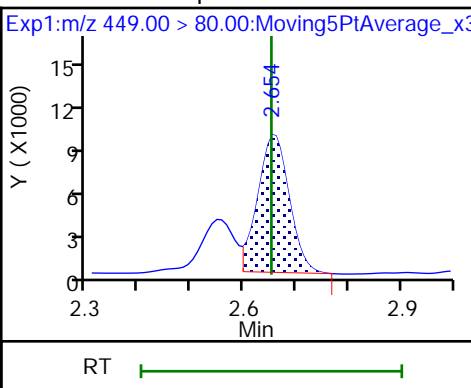
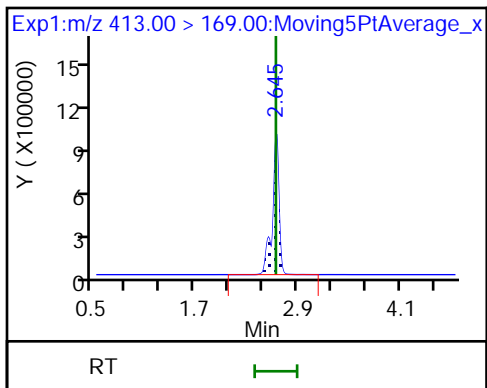
15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

16 Perfluoroheptanesulfonic acid

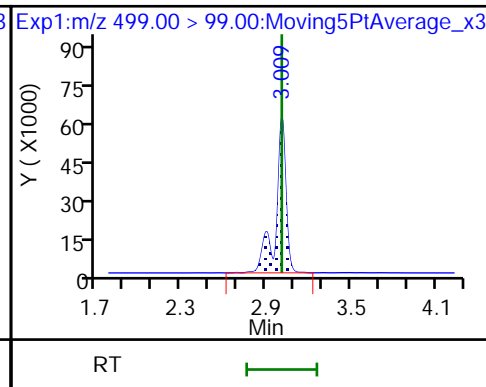
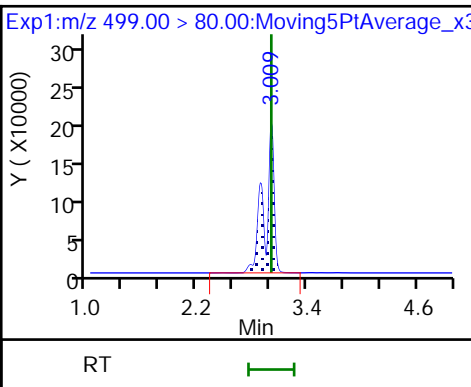
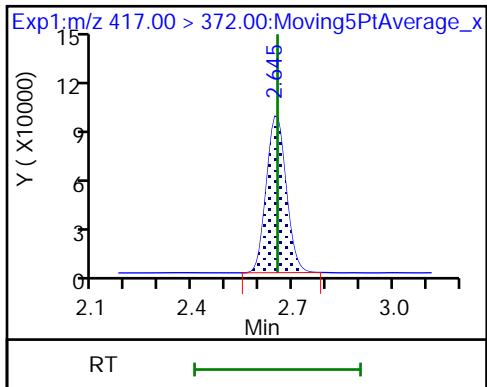
16 Perfluoroheptanesulfonic acid

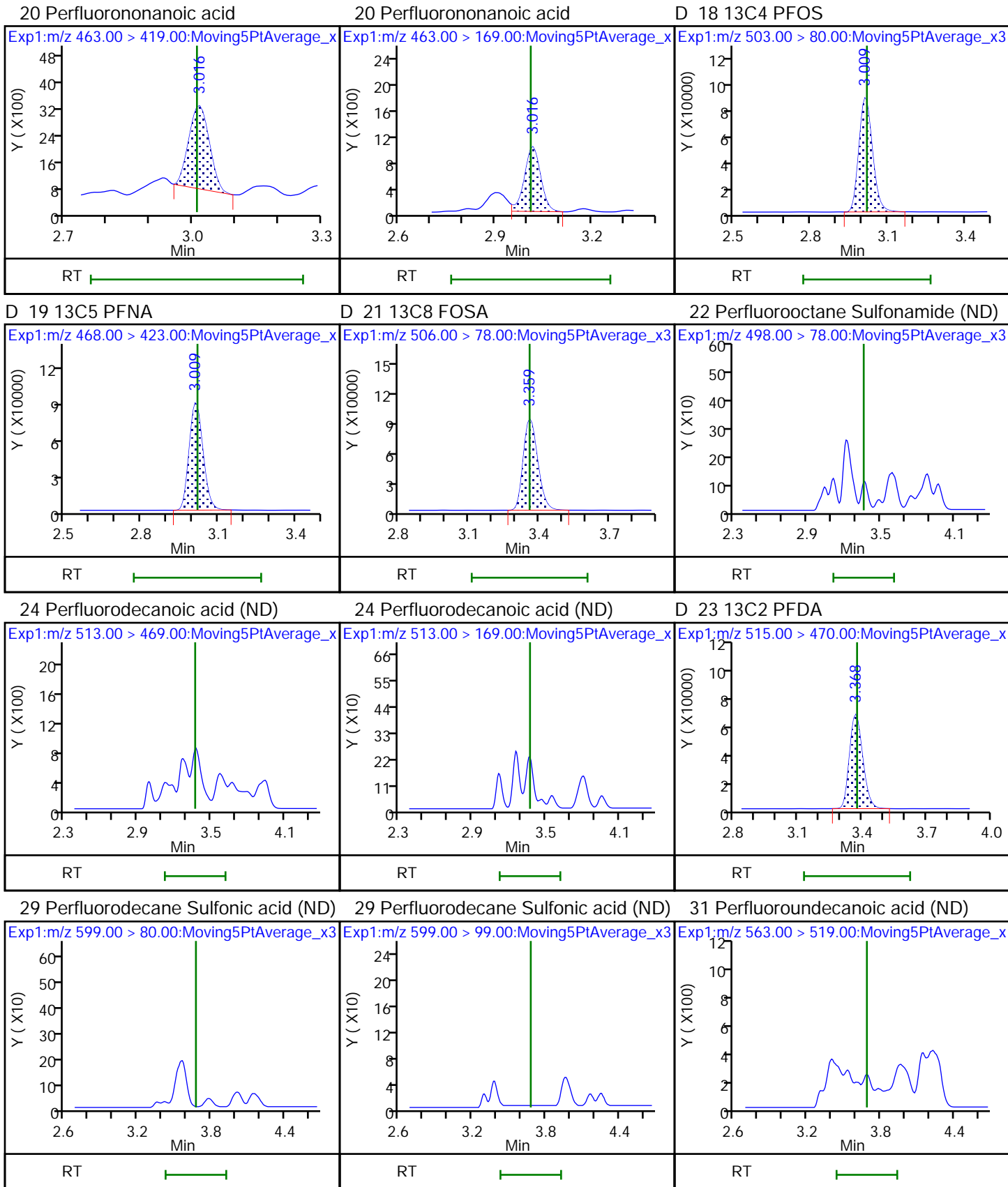


D 14 13C4 PFOA

17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

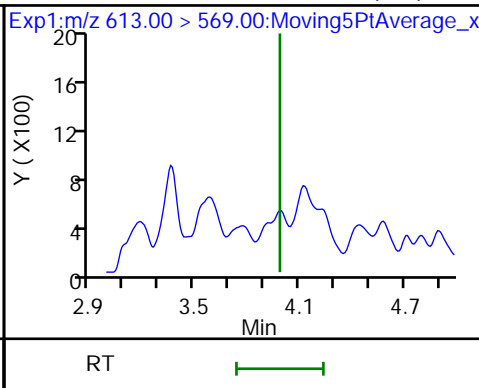
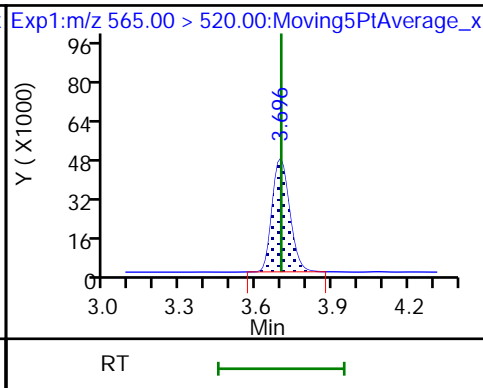
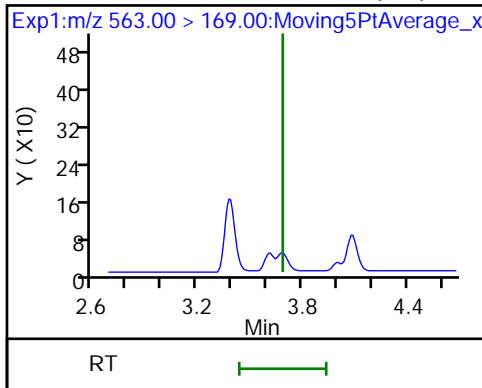




31 Perfluoroundecanoic acid (ND)

D 30 13C2 PFUnA

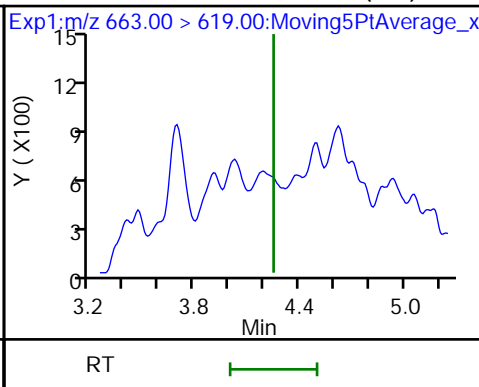
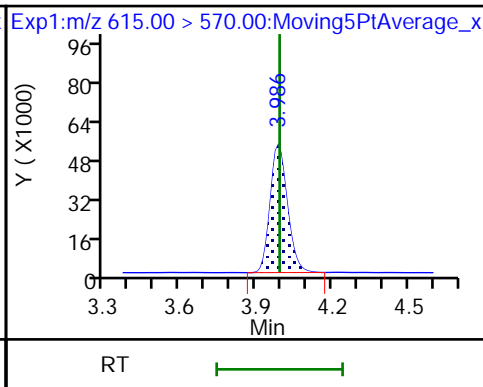
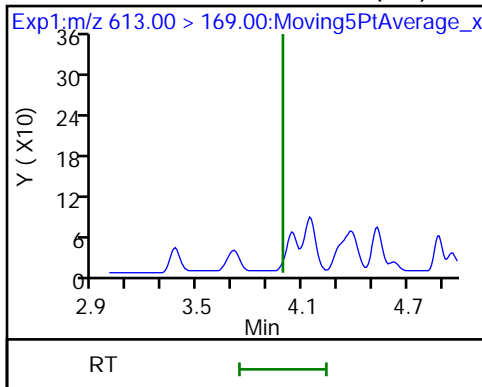
37 Perfluorododecanoic acid (ND)



37 Perfluorododecanoic acid (ND)

D 36 13C2 PFDaA

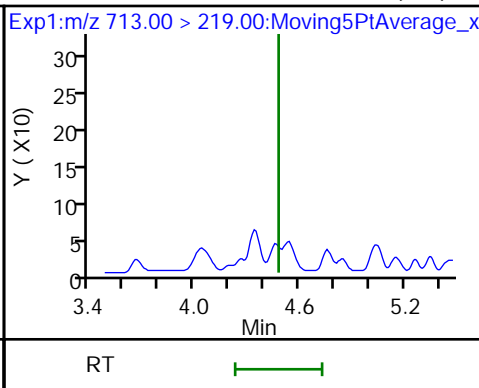
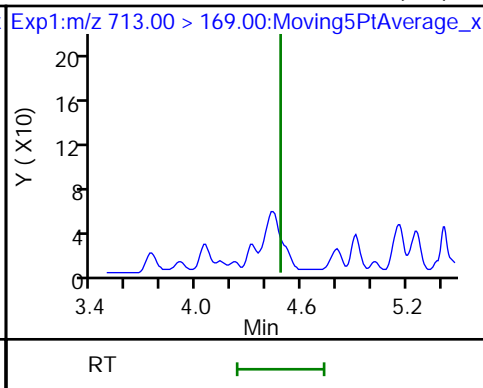
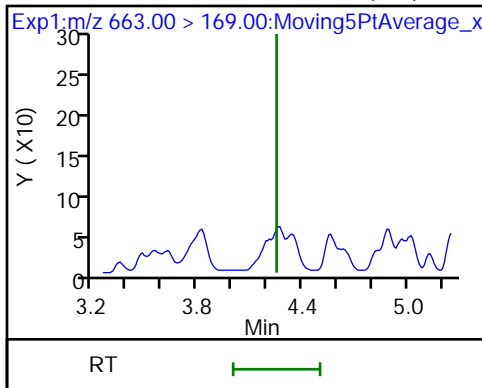
41 Perfluorotridecanoic acid (ND)



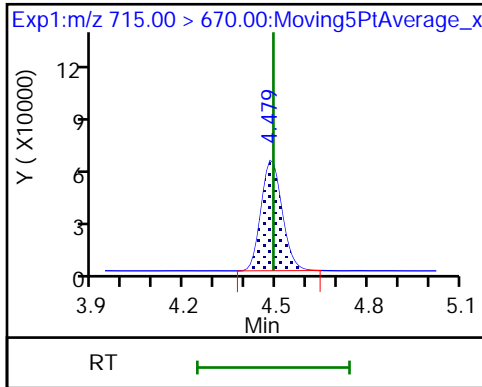
41 Perfluorotridecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



TestAmerica Sacramento

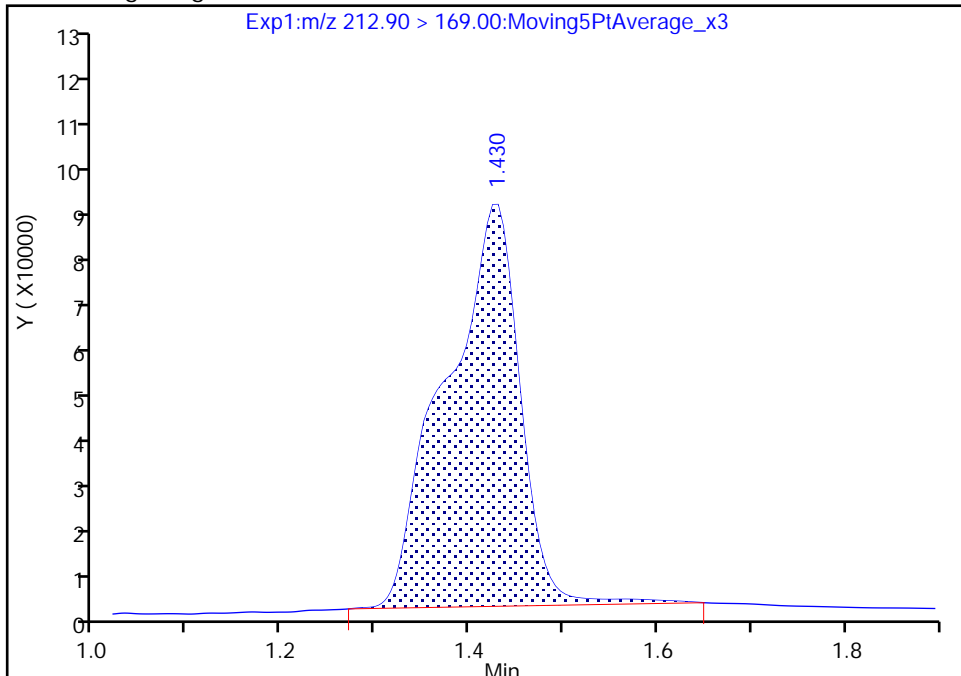
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\2018.06.29LLBBX_021.d
Injection Date: 30-Jun-2018 01:08:19 Instrument ID: A8_N
Lims ID: 320-40153-A-1-A Lab Sample ID: 320-40153-1
Client ID: TP-PFC-030-TPI
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

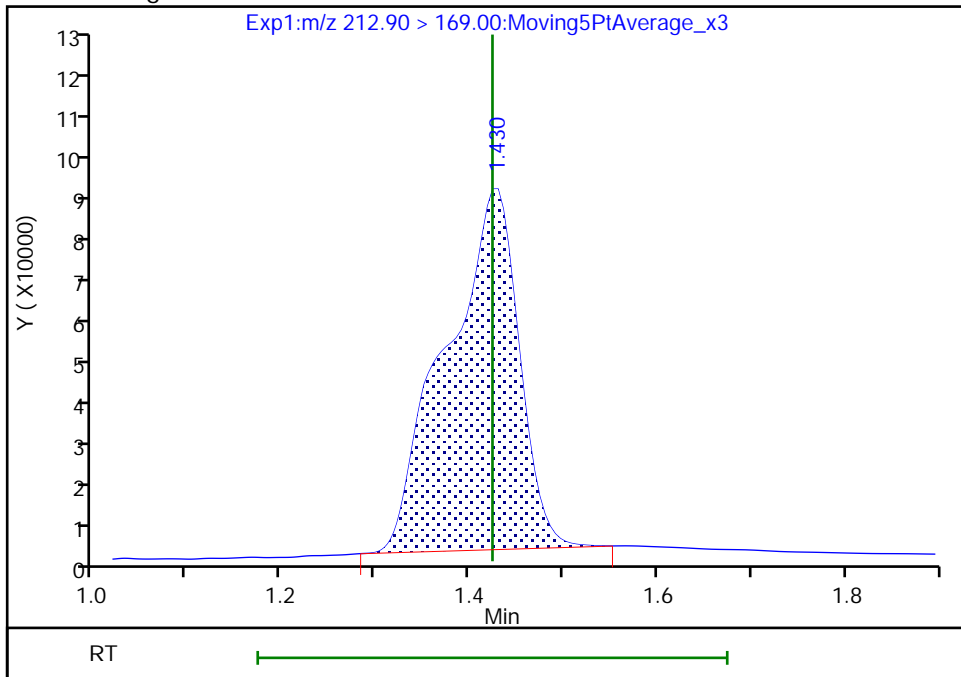
RT: 1.43
Area: 461335
Amount: 0.195067
Amount Units: ng/ml

Processing Integration Results



RT: 1.43
Area: 448740
Amount: 0.189741
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 08:25:17
Audit Action: Manually Integrated

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-MIDCARBON Lab Sample ID: 320-40153-2
 Matrix: Water Lab File ID: 2018.06.26LLC_051.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:40
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 299.3 (mL) Date Analyzed: 06/27/2018 05:48
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.7	1.3	0.49
2706-90-3	Perfluoropentanoic acid (PFPeA)	240		1.7	0.84	0.36
307-24-4	Perfluorohexanoic acid (PFHxA)	190		1.7	0.84	0.39
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.8		1.7	1.3	0.51
335-67-1	Perfluorooctanoic acid (PFOA)	46	M	1.7	1.3	0.45
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	0.84	U	1.7	0.84	0.40
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.60
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	0.63
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.69
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.3		1.7	0.84	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.2		1.7	0.84	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.84	U	1.7	0.84	0.31
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.3	2.5	0.92
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.47
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-40153-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-030-MIDCARBON</u>	Lab Sample ID: <u>320-40153-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.06.26LLC_051.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>06/07/2018 09:40</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>06/13/2018 15:12</u>
Sample wt/vol: <u>299.3 (mL)</u>	Date Analyzed: <u>06/27/2018 05:48</u>
Con. Extract Vol.: <u>10 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>231147</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	91		50-150
STL01893	13C5 PFPeA	79		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	86		50-150
STL00996	13C2 PFDA	90		50-150
STL00997	13C2 PFUnA	84		50-150
STL00998	13C2 PFDoA	74		50-150
STL00994	18O2 PFHxS	80		50-150
STL02116	13C2-PFTeDA	80		50-150
STL00991	13C4 PFOS	77		50-150
STL02337	13C3-PFBS	77		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_051.d
 Lims ID: 320-40153-B-2-A
 Client ID: TP-PFC-030-MIDCARBON
 Sample Type: Client
 Inject. Date: 27-Jun-2018 05:48:25 ALS Bottle#: 37 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-40153-b-2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:04:41 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:04:41

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	1.430	1.436	-0.006	1.004	7803919	3.27			4077	
D 1 13C4 PFBA										
217.00 > 172.00	1.425	1.441	-0.016	0.534	5932028	2.26		90.6	44209	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.703	1.703	0.0	1.000	13263686	7.33			6780	
D 3 13C5-PFPeA										
267.90 > 223.00	1.703	1.711	-0.008	0.638	3721129	1.97		78.7	57385	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.739	0.0	1.000	633139	0.2189			1231	
298.90 > 99.00	1.739	1.739	0.0	1.000	300679		2.11(1.25-3.74)		1148	
D 47 13C3-PFBS										
301.90 > 83.00	1.739	1.747	-0.008	0.652	85870	1.80		77.4	643	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.982	1.993	-0.011	1.000	10346908	5.54			19618	
313.00 > 119.00	1.982	1.993	-0.011	1.000	701150		14.76(5.03-15.10)		17019	
D 7 13C2 PFHxA										
315.00 > 270.00	1.982	2.003	-0.021	0.743	4450712	2.16		86.3	86837	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.308	2.308	0.0	1.000	474375	0.2326			453	
363.00 > 169.00	2.308	2.308	0.0	1.000	180470		2.63(1.13-3.40)		1583	
D 9 13C4-PFHpA										
367.00 > 322.00	2.308	2.319	-0.011	0.865	4400241	2.35		94.1	48317	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.308	2.321	-0.013	0.994	232300	0.0953			2001	
399.00 > 99.00	2.321	2.321	0.0	1.000	78351		2.96(1.50-4.49)		305	
D 11 18O2 PFHxS										
403.00 > 84.00	2.321	2.345	-0.024	0.870	5069487	1.90		80.2	52661	

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	2.669	2.675	-0.006		4600570	2.50		42889	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.669	2.675	-0.006	1.000	2619554	1.38		923	M	
413.00 > 169.00	2.669	2.675	-0.006	1.000	1704177		1.54(0.84-2.52)	7019		
D 14 13C4 PFOA	417.00 > 372.00	2.669	2.682	-0.013	1.000	3894346	2.20	88.2	41240	
D 19 13C5 PFNA	468.00 > 423.00	3.044	3.055	-0.011	1.141	2984789	2.14	85.8	48881	
D 18 13C4 PFOS	503.00 > 80.00	3.037	3.055	-0.018	1.138	3280672	1.85	77.2	35357	
D 21 13C8 FOSA	506.00 > 78.00	3.368	3.384	-0.016	1.262	4971216	1.97	78.8	41117	
D 23 13C2 PFDA	515.00 > 470.00	3.406	3.421	-0.015	1.276	2370440	2.25	89.9	33440	
D 30 13C2 PFUnA	565.00 > 520.00	3.739	3.754	-0.015	1.401	1699459	2.09	83.6	43946	
D 36 13C2 PFDoA	615.00 > 570.00	4.038	4.055	-0.017	1.513	1516591	1.85	73.9	10904	
D 43 13C2-PFTeDA	715.00 > 670.00	4.541	4.559	-0.018	1.702	1522676	2.01	80.5	6304	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_051.d

Injection Date: 27-Jun-2018 05:48:25

Instrument ID: A8_N

Lims ID: 320-40153-B-2-A

Lab Sample ID: 320-40153-2

Client ID: TP-PFC-030-MIDCARBON

Operator ID: SACINSTLCMS01

ALS Bottle#: 37

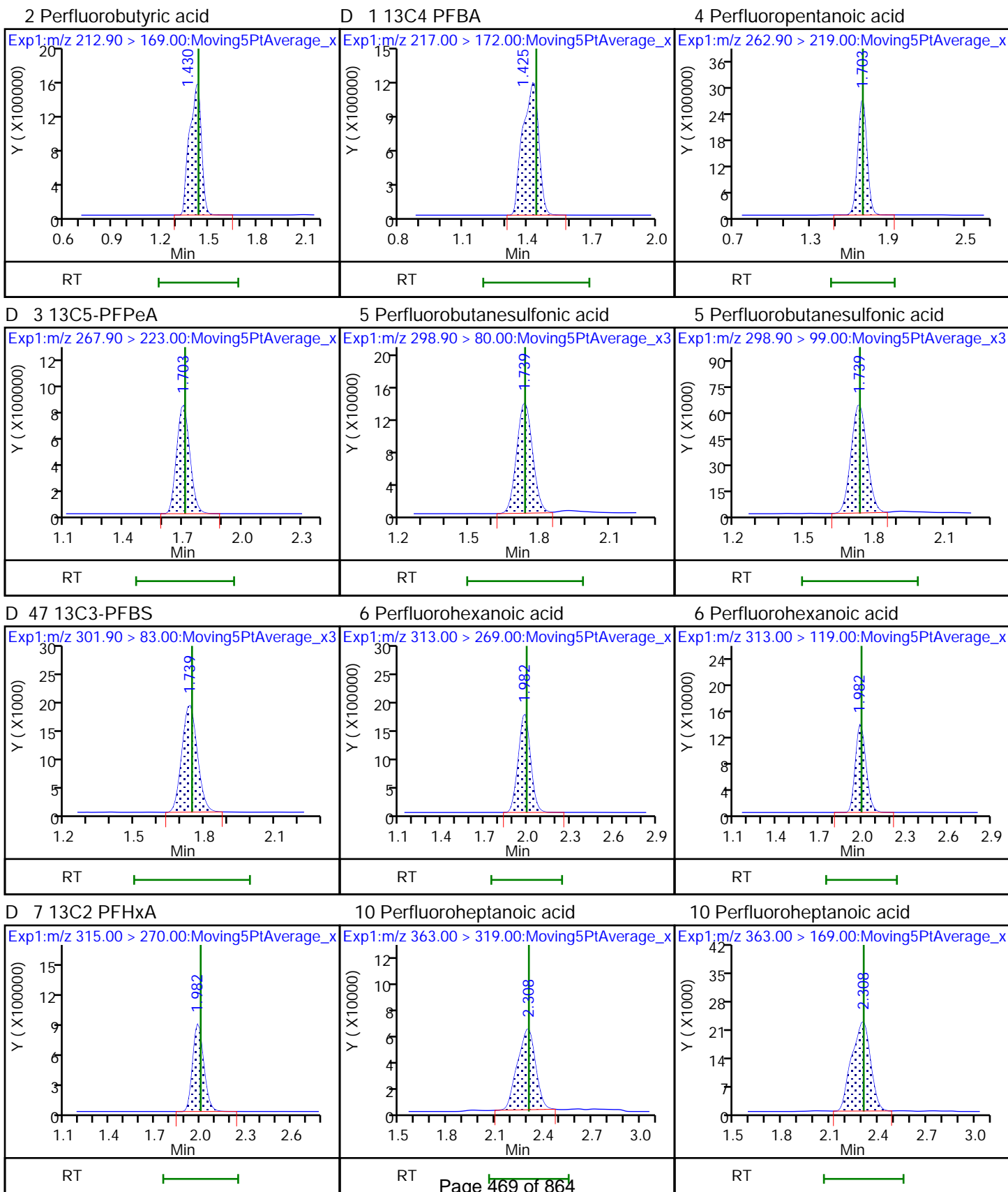
Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8_N

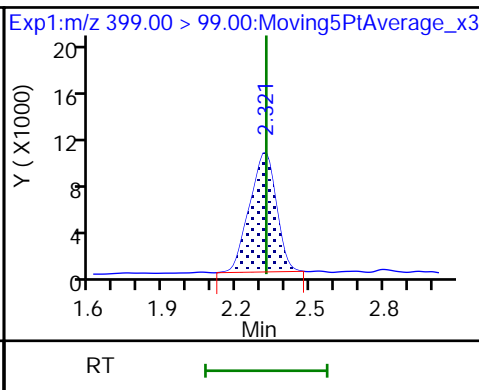
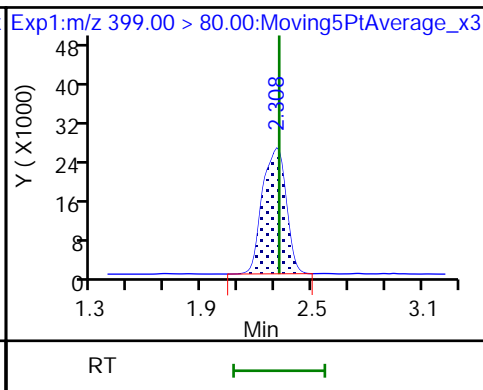
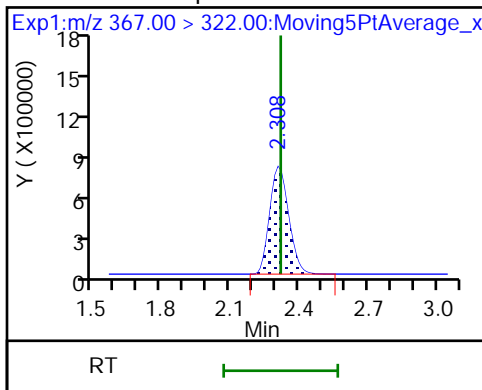
Limit Group: LC PFC_QSM5-1 ICAL



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid

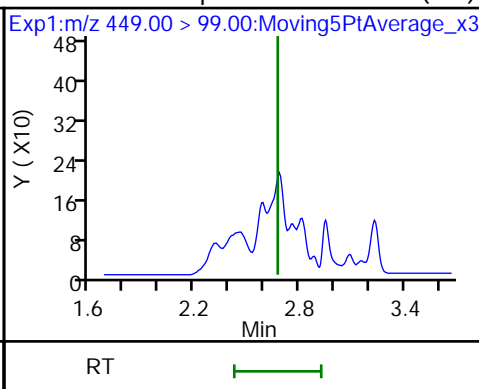
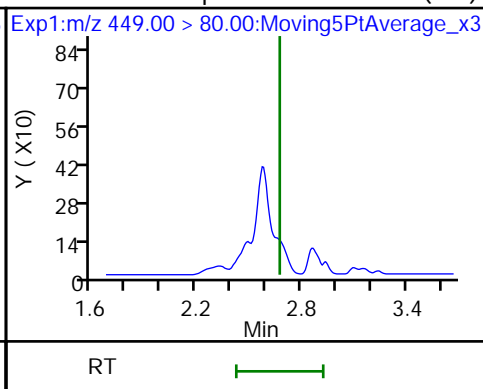
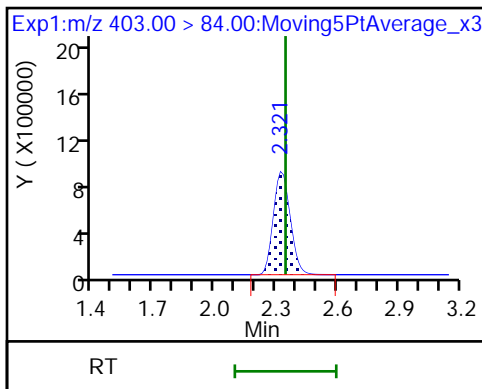
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

16 Perfluoroheptanesulfonic acid (ND)

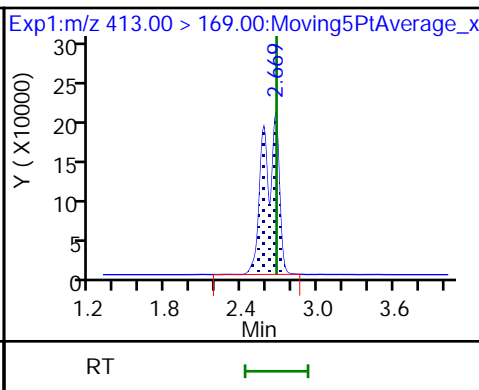
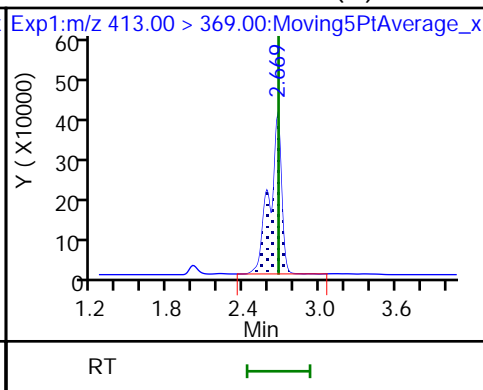
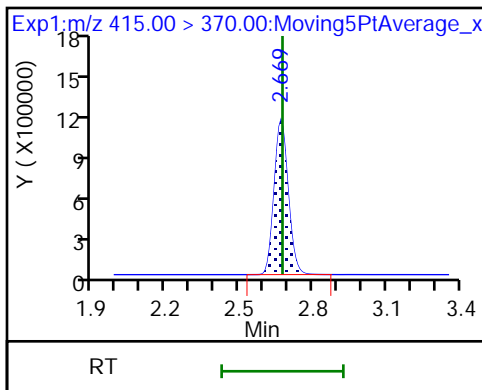
16 Perfluoroheptanesulfonic acid (ND)



* 62 13C2-PFOA

15 Perfluorooctanoic acid (M)

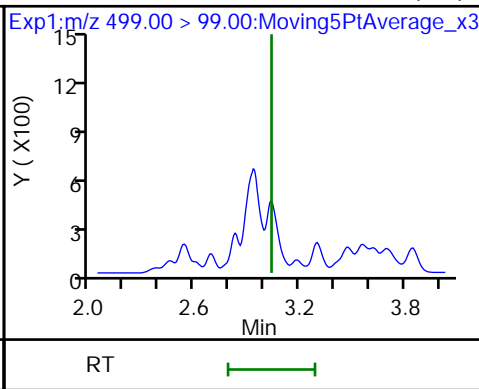
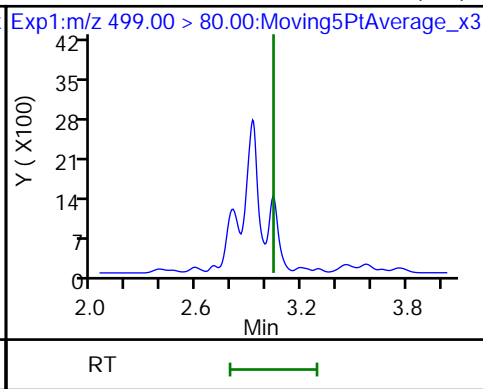
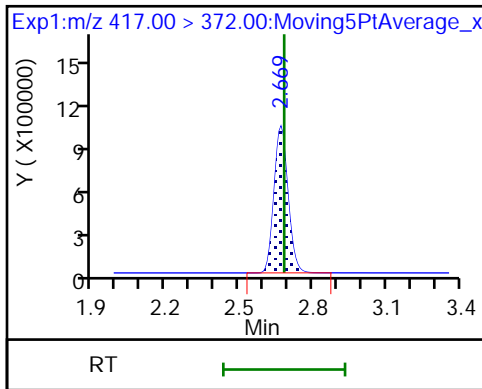
15 Perfluorooctanoic acid

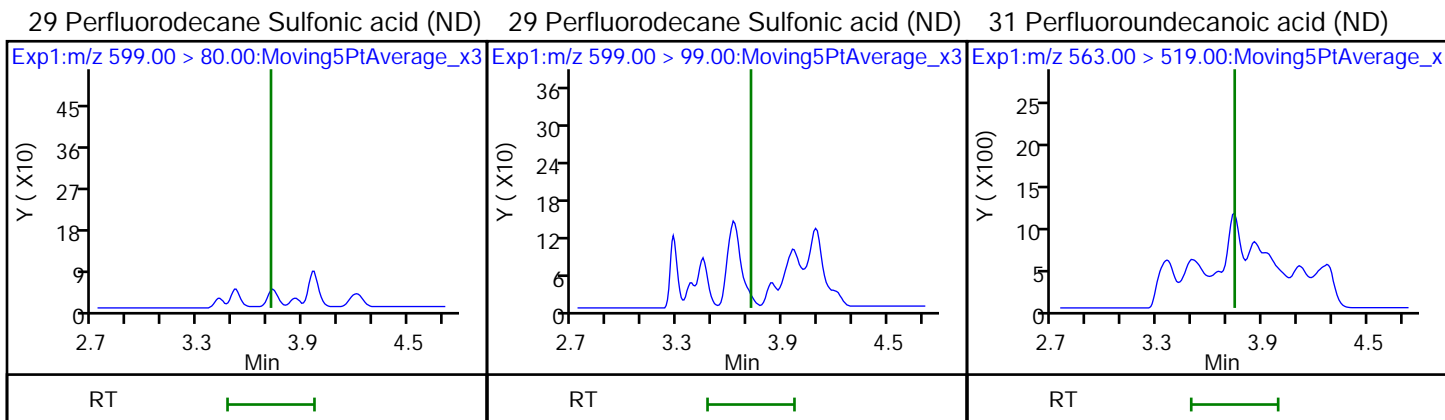
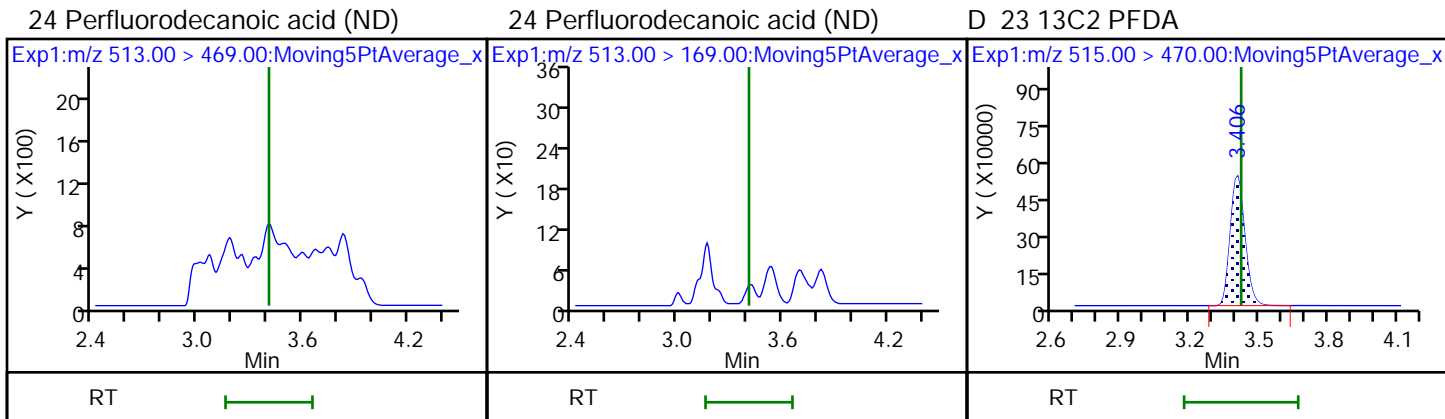
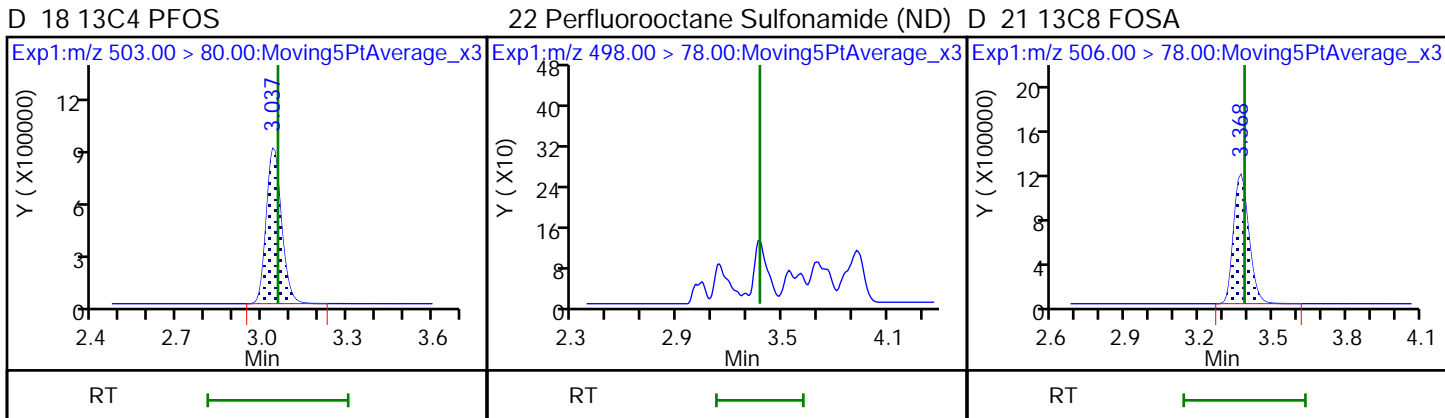
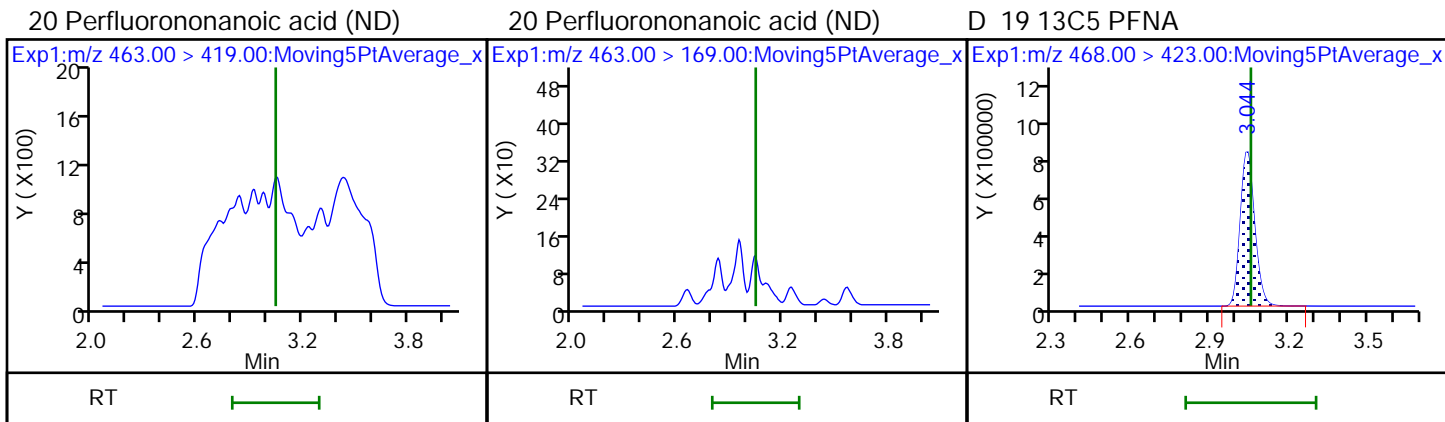


D 14 13C4 PFOA

17 Perfluorooctane sulfonic acid (ND)

17 Perfluorooctane sulfonic acid (ND)

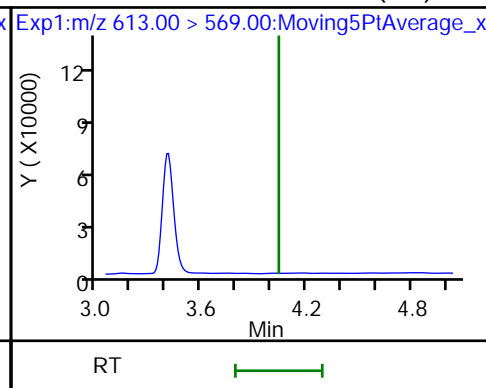
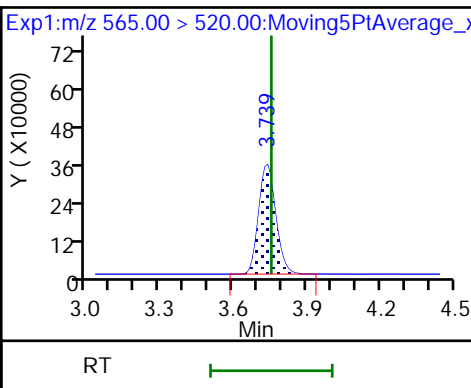
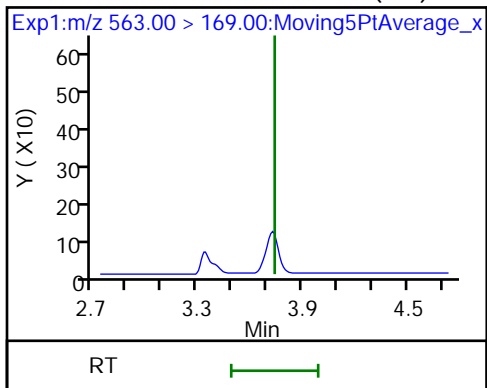




31 Perfluoroundecanoic acid (ND)

D 30 13C2 PFUnA

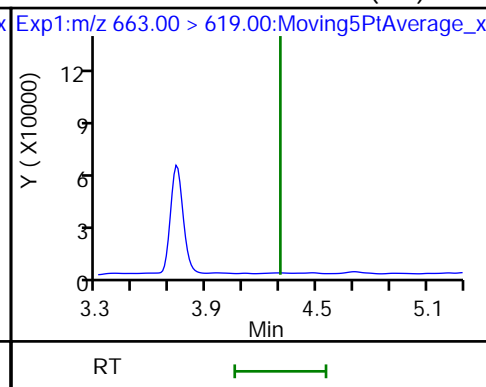
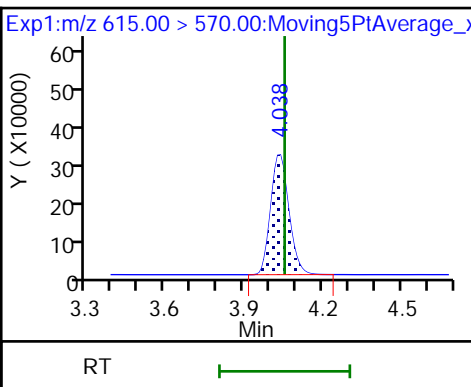
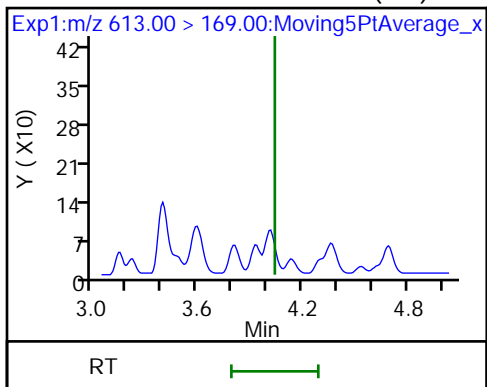
37 Perfluorododecanoic acid (ND)



37 Perfluorododecanoic acid (ND)

D 36 13C2 PFDa

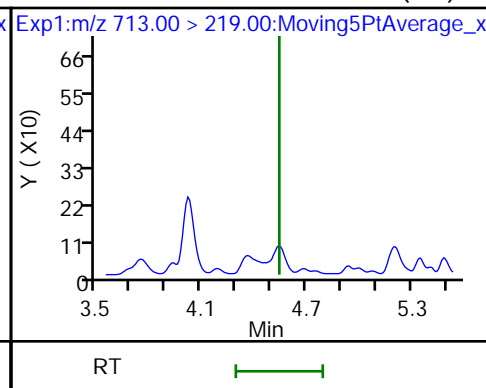
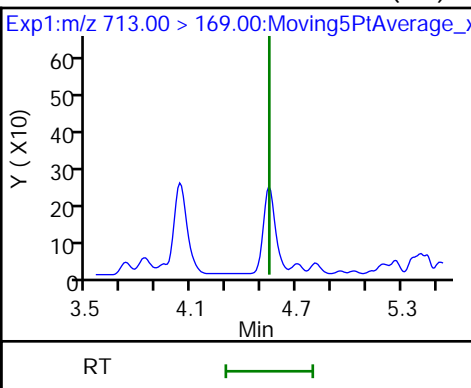
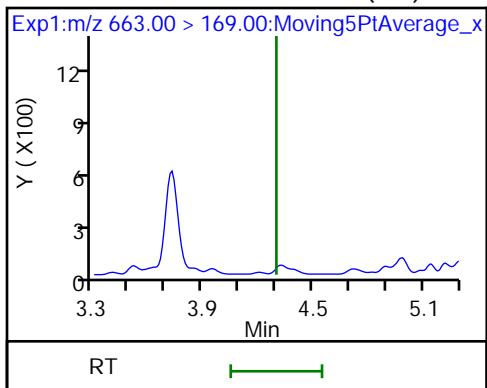
41 Perfluorotridecanoic acid (ND)



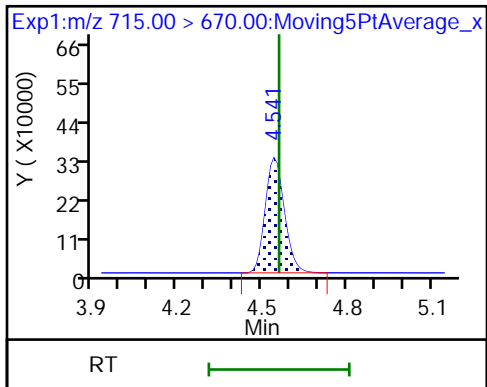
41 Perfluorotridecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



TestAmerica Sacramento

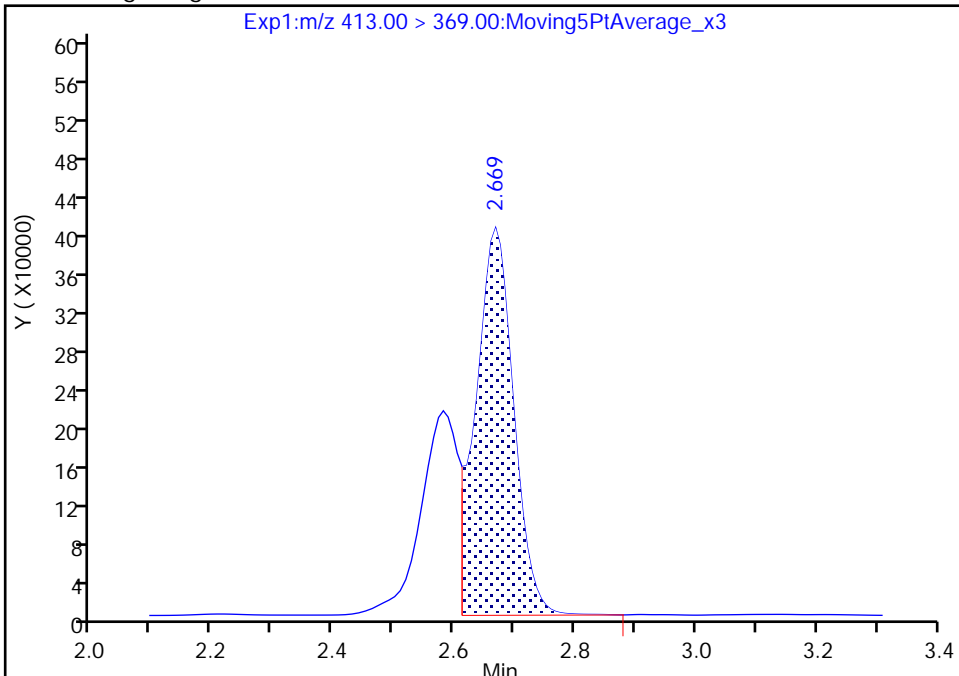
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_051.d
Injection Date: 27-Jun-2018 05:48:25 Instrument ID: A8_N
Lims ID: 320-40153-B-2-A Lab Sample ID: 320-40153-2
Client ID: TP-PFC-030-MIDCARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 37 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

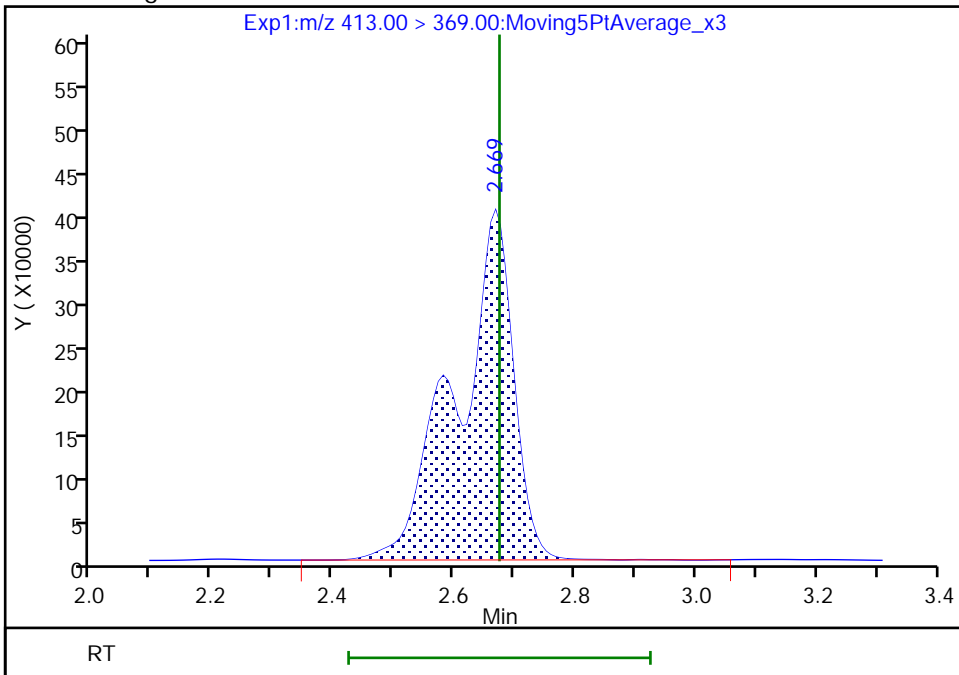
RT: 2.67
Area: 1727889
Amount: 0.909090
Amount Units: ng/ml

Processing Integration Results



RT: 2.67
Area: 2619554
Amount: 1.378219
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPE Lab Sample ID: 320-40153-3
 Matrix: Water Lab File ID: 2018.06.26LLC_052.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:45
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 280.6(mL) Date Analyzed: 06/27/2018 05:56
 Con. Extract Vol.: 10(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.8	1.3	0.53
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		1.8	0.89	0.38
307-24-4	Perfluorohexanoic acid (PFHxA)	88		1.8	0.89	0.42
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	1.3	0.54
335-67-1	Perfluorooctanoic acid (PFOA)	3.7	M	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.8	1.3	0.46
335-76-2	Perfluorodecanoic acid (PFDA)	0.89	U	1.8	0.89	0.43
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	1.3	0.64
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	1.3	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	2.7	0.68
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	2.7	0.74
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8		1.8	0.89	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.40	J	1.8	0.89	0.34
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.89	U	1.8	0.89	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	0.98
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	1.3	0.50
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	2.7	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPE Lab Sample ID: 320-40153-3
 Matrix: Water Lab File ID: 2018.06.26LLC_052.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:45
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 280.6(mL) Date Analyzed: 06/27/2018 05:56
 Con. Extract Vol.: 10(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	82		50-150
STL00993	13C2 PFHxA	87		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	95		50-150
STL00995	13C5 PFNA	87		50-150
STL00996	13C2 PFDA	90		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	78		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	85		50-150
STL02337	13C3-PFBS	83		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_052.d
 Lims ID: 320-40153-D-3-A
 Client ID: TP-PFC-030-TPE
 Sample Type: Client
 Inject. Date: 27-Jun-2018 05:56:16 ALS Bottle#: 38 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-40153-d-3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:05:42 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:05:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.436	1.436	0.0	1.000	7327181	3.10			3960	
D 1 13C4 PFBA										
217.00 > 172.00	1.436	1.441	-0.005	0.537	5879492	2.32		92.7	44994	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.703	1.703	0.0	1.000	9986602	5.48			4511	
D 3 13C5-PFPeA										
267.90 > 223.00	1.703	1.711	-0.008	0.637	3746195	2.04		81.7	59965	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.739	0.0	1.000	149413	0.0496			280	
298.90 > 99.00	1.739	1.739	0.0	1.000	79025		1.89(1.25-3.74)		316	
D 47 13C3-PFBS										
301.90 > 83.00	1.739	1.747	-0.008	0.650	89468	1.94		83.3	752	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.982	1.993	-0.011	0.994	4501043	2.48			10867	R
313.00 > 119.00	1.994	1.993	0.001	1.000	246868		18.23(5.03-15.10)		5833	R
D 7 13C2 PFHxA										
315.00 > 270.00	1.994	2.003	-0.009	0.745	4324438	2.16		86.6	90645	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.282	2.308	-0.026	0.983	92768	0.0470			73.8	
363.00 > 169.00	2.243	2.308	-0.065	0.966	34844		2.66(1.13-3.40)		310	
D 9 13C4-PFHpA										
367.00 > 322.00	2.321	2.319	0.002	0.868	4254466	2.35		93.9	40836	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.321	2.321	0.0	0.994	27435	0.0113			292	
399.00 > 99.00	2.334	2.321	0.013	1.000	8976		3.06(1.50-4.49)		36.2	
D 11 18O2 PFHxS										
403.00 > 84.00	2.334	2.345	-0.011	0.872	5055124	1.95		82.6	35610	

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	2.675	2.675	0.0	4456919	2.50			39094	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.589	2.675	-0.086	0.968	207216	0.1049			42.8	M
413.00 > 169.00	2.581	2.675	-0.094	0.965	152640		1.36(0.84-2.52)		897	
D 14 13C4 PFOA	417.00 > 372.00	2.675	2.682	-0.007	1.000	4047744	2.36		94.6	57374
D 19 13C5 PFNA	468.00 > 423.00	3.050	3.055	-0.005	1.140	2937114	2.18		87.1	55069
D 18 13C4 PFOS	503.00 > 80.00	3.050	3.055	-0.005	1.140	3501002	2.03		85.1	55459
D 21 13C8 FOSA	506.00 > 78.00	3.377	3.384	-0.007	1.262	4840360	1.98		79.2	38144
D 23 13C2 PFDA	515.00 > 470.00	3.414	3.421	-0.007	1.276	2295143	2.25		89.8	36680
D 30 13C2 PFUnA	565.00 > 520.00	3.748	3.754	-0.006	1.401	1687306	2.14		85.6	43344
D 36 13C2 PFDoA	615.00 > 570.00	4.048	4.055	-0.007	1.513	1551654	1.95		78.1	11185
D 43 13C2-PFTeDA	715.00 > 670.00	4.551	4.559	-0.008	1.701	1455645	1.99		79.4	5028

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_052.d

Injection Date: 27-Jun-2018 05:56:16

Instrument ID: A8_N

Lims ID: 320-40153-D-3-A

Lab Sample ID: 320-40153-3

Client ID: TP-PFC-030-TPE

Operator ID: SACINSTLCMS01

ALS Bottle#: 38

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

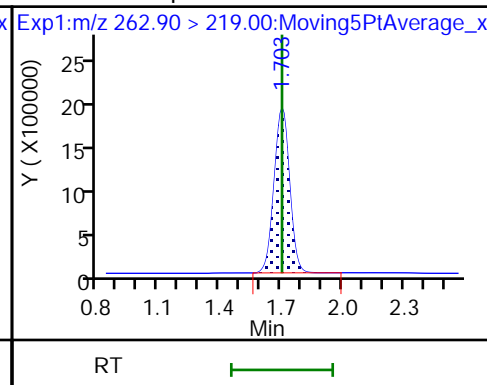
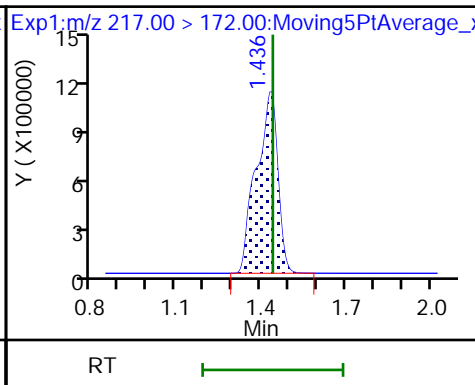
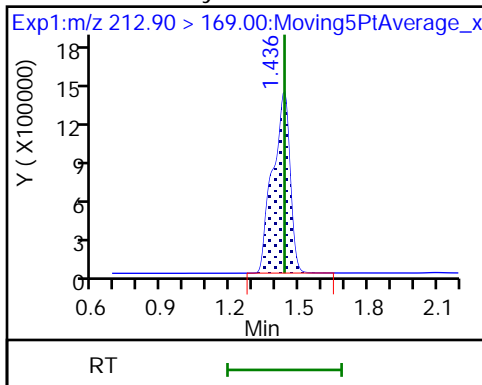
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

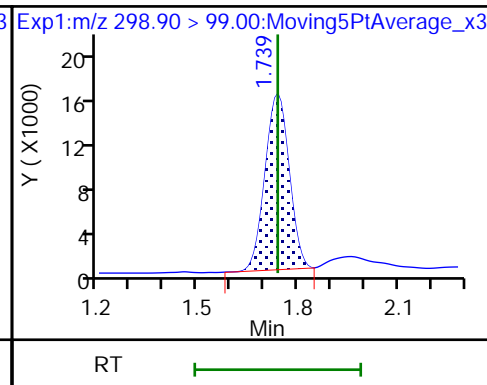
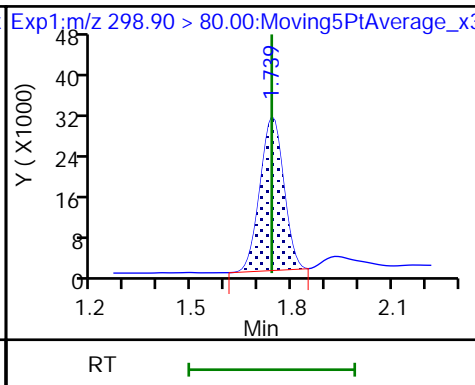
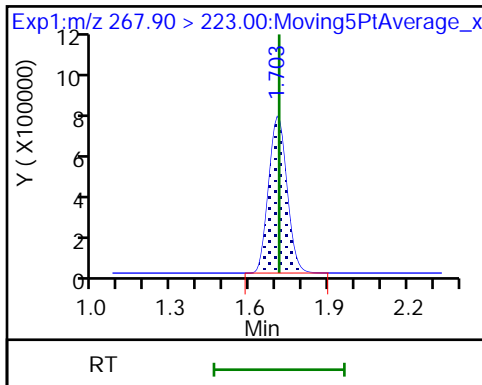
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

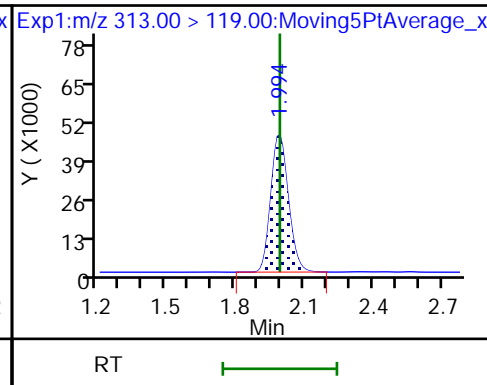
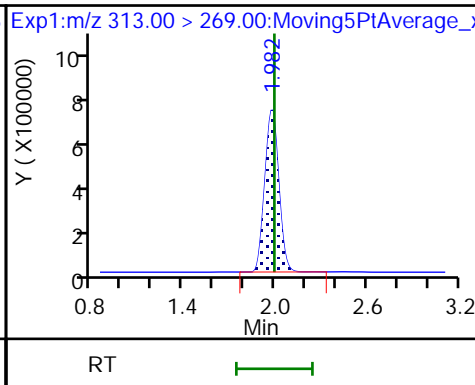
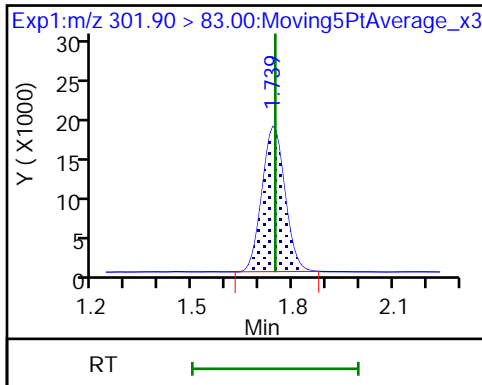
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

6 Perfluorohexanoic acid

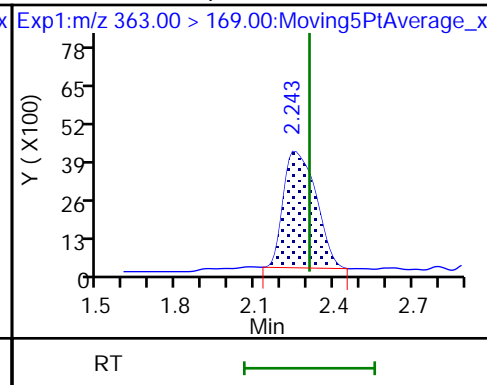
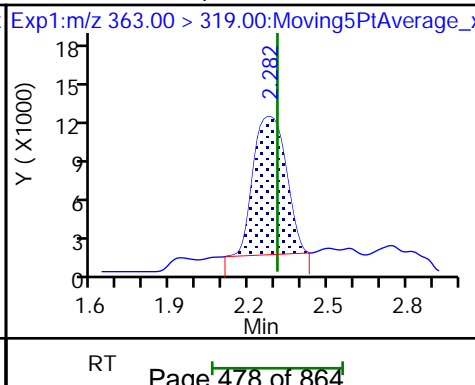
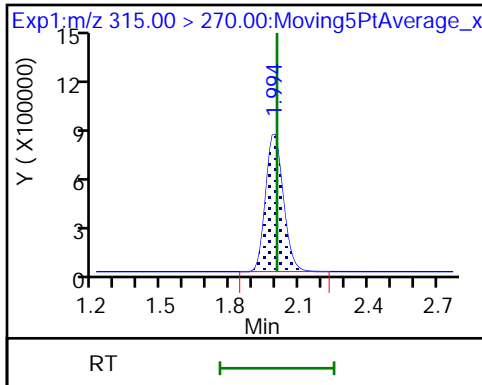
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

10 Perfluoroheptanoic acid

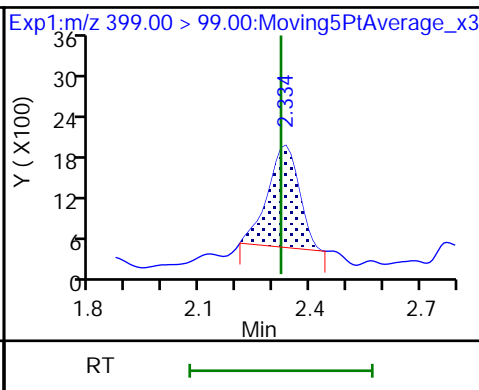
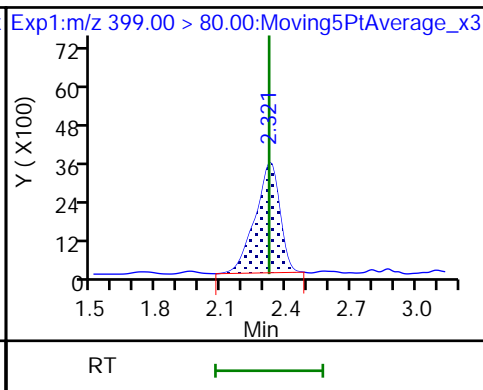
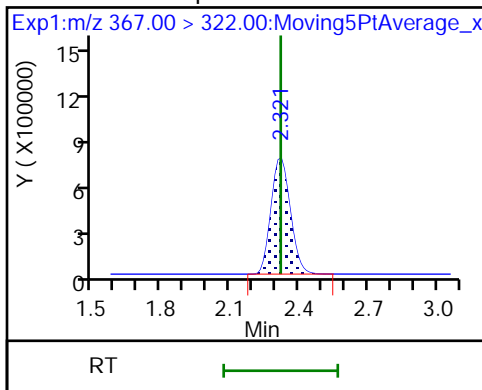
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid

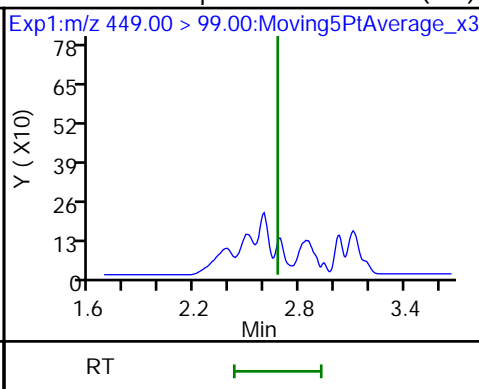
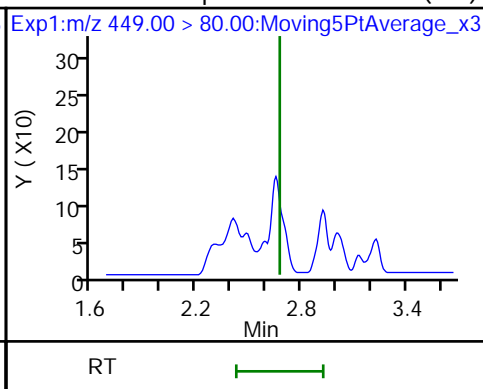
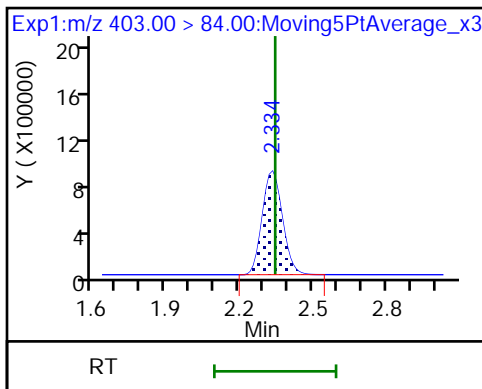
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

16 Perfluoroheptanesulfonic acid (ND)

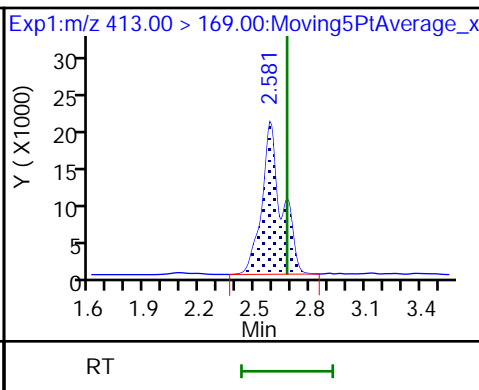
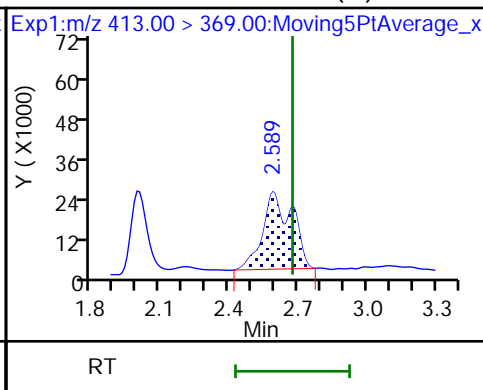
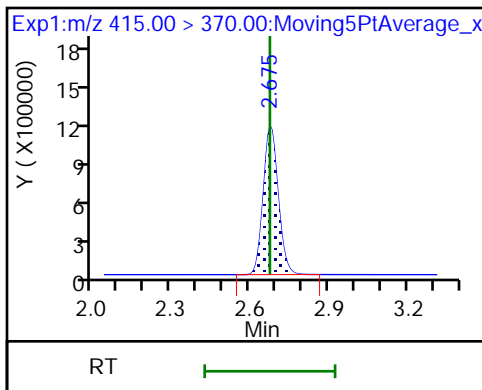
16 Perfluoroheptanesulfonic acid (ND)



* 62 13C2-PFOA

15 Perfluorooctanoic acid (M)

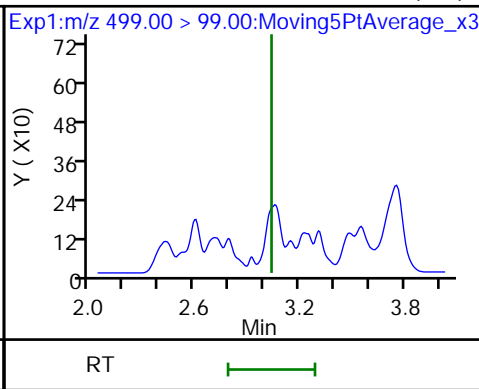
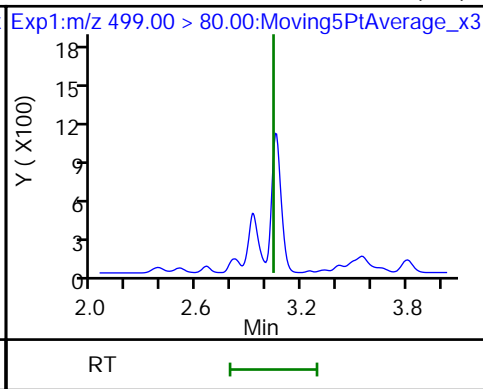
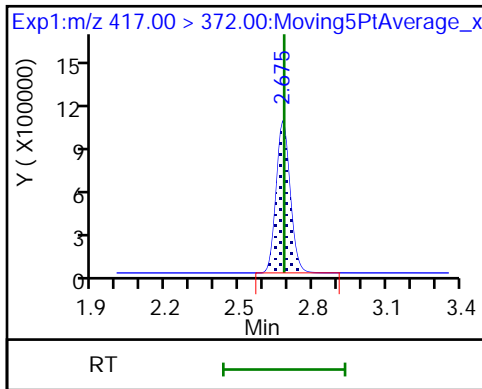
15 Perfluorooctanoic acid

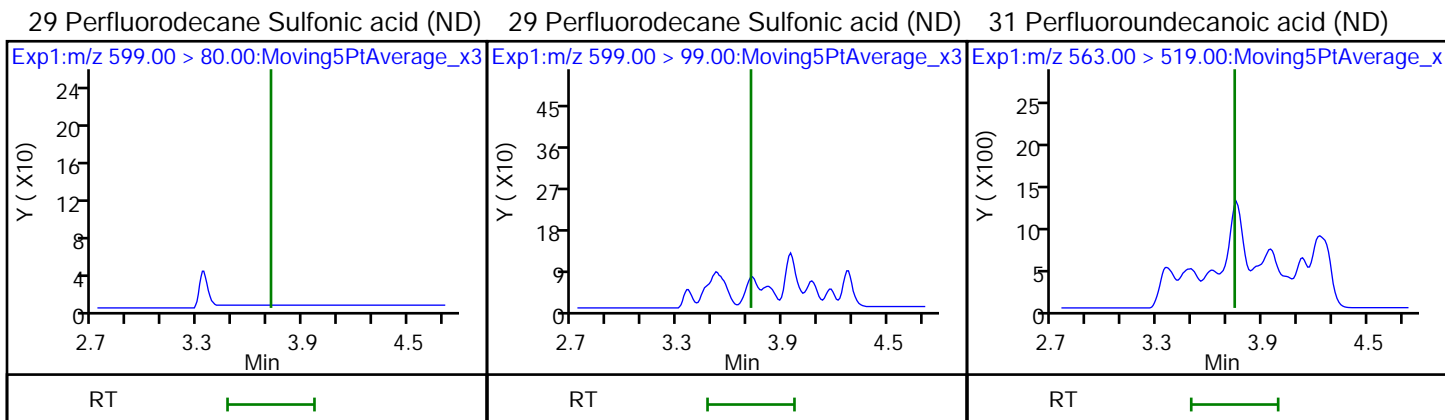
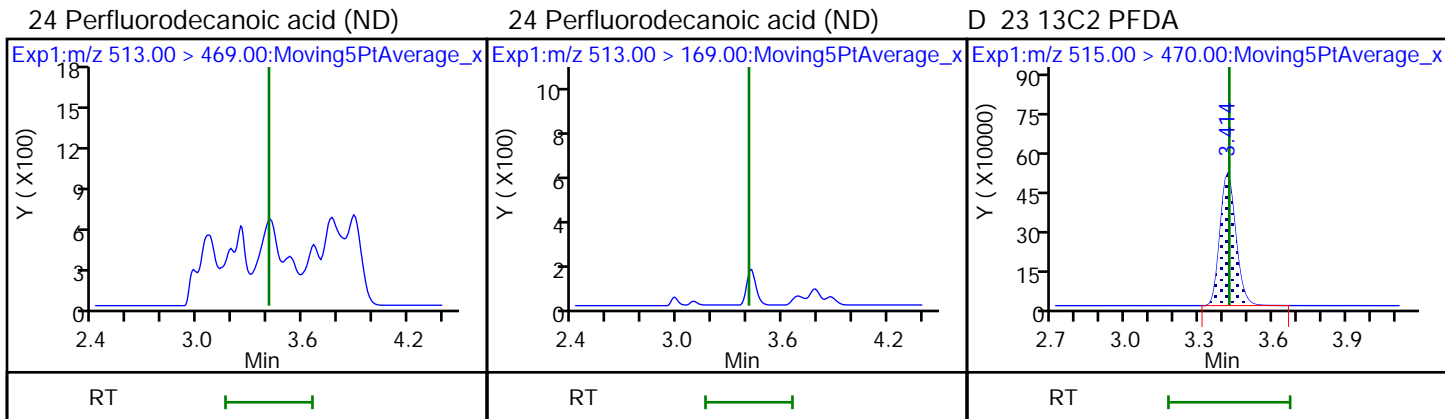
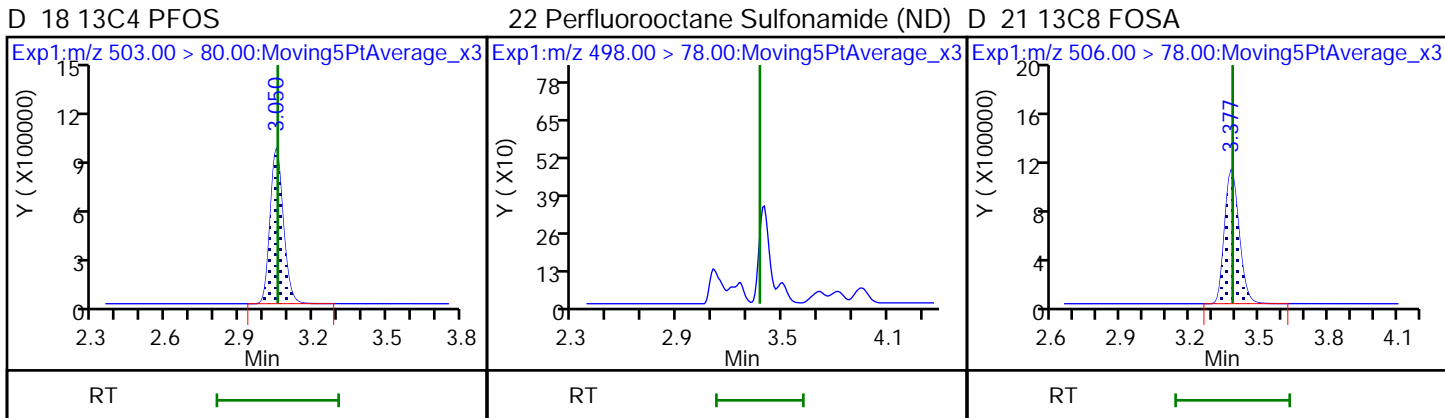
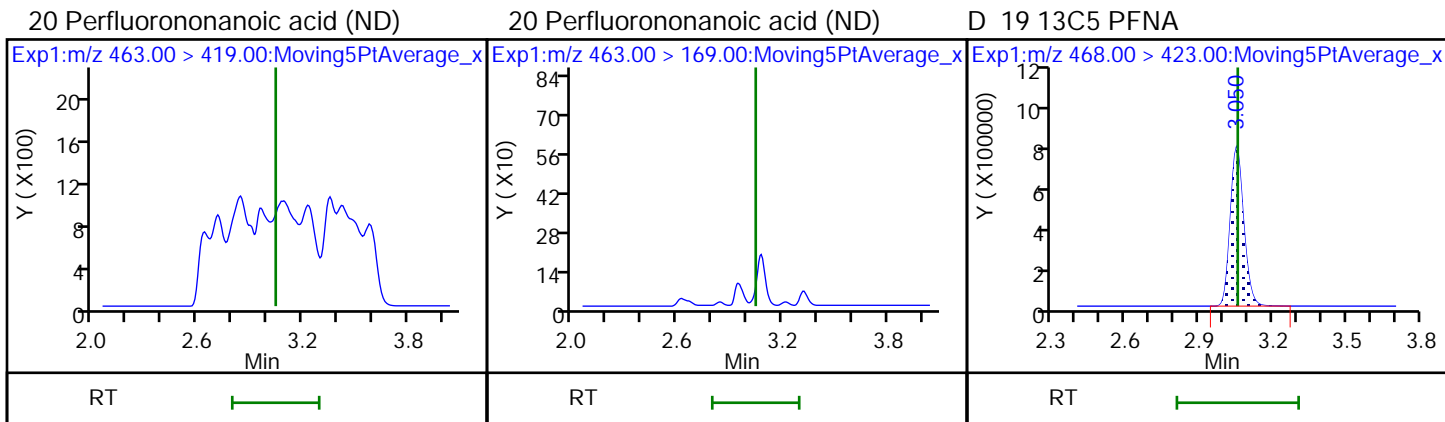


D 14 13C4 PFOA

17 Perfluorooctane sulfonic acid (ND)

17 Perfluorooctane sulfonic acid (ND)

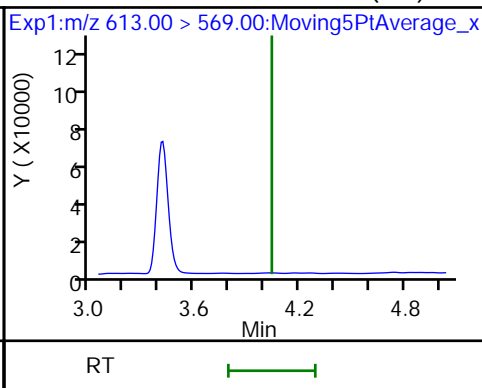
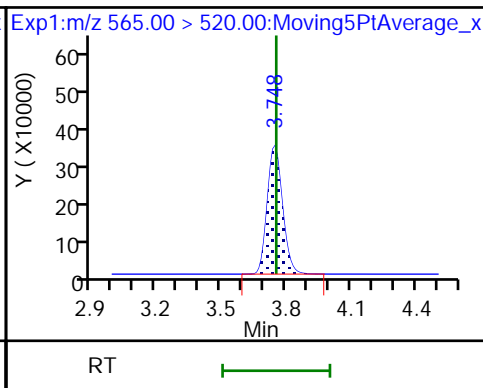
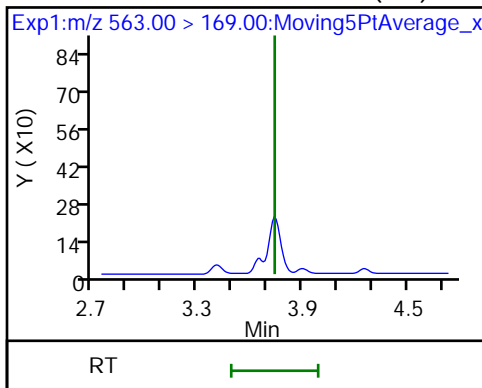




31 Perfluoroundecanoic acid (ND)

D 30 13C2 PFUnA

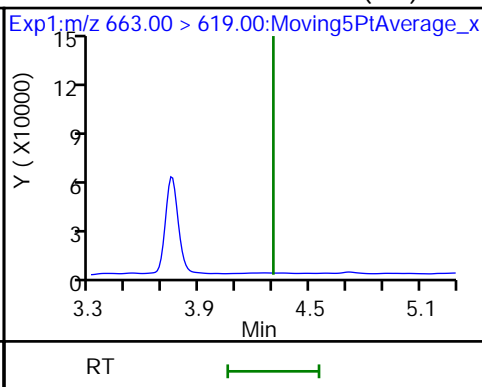
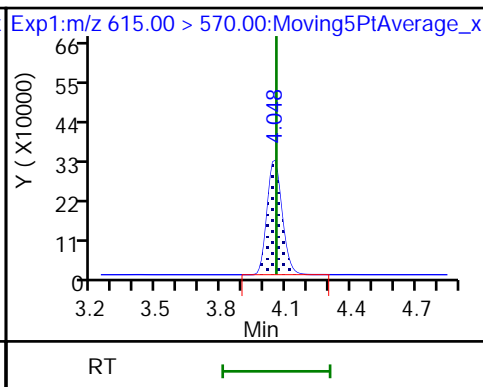
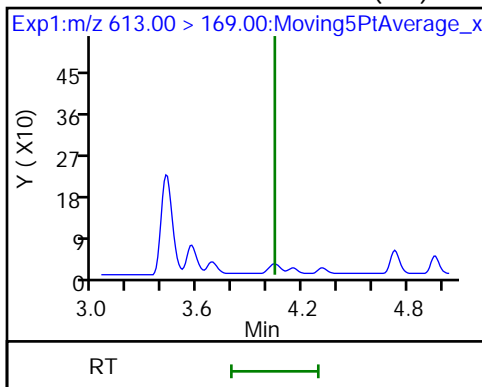
37 Perfluorododecanoic acid (ND)



37 Perfluorododecanoic acid (ND)

D 36 13C2 PFDaA

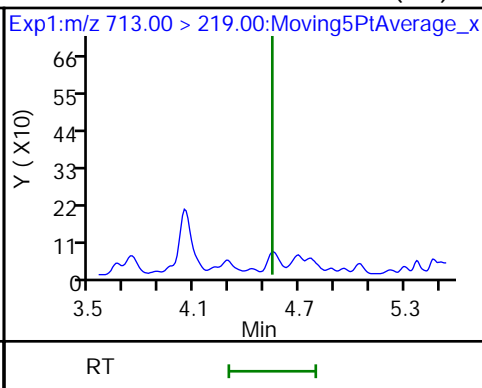
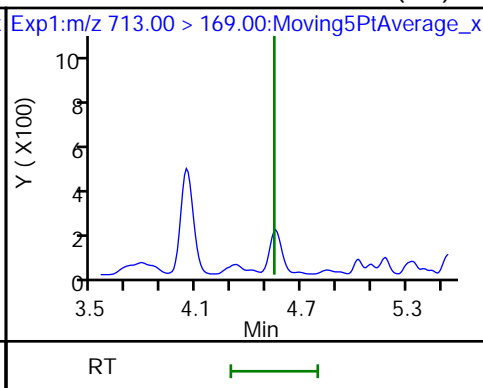
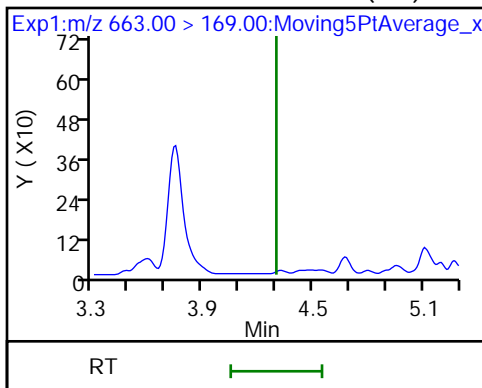
41 Perfluorotridecanoic acid (ND)



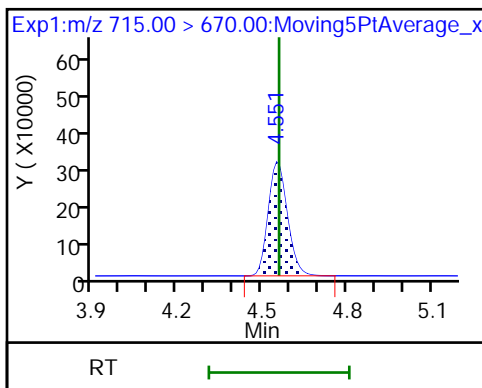
41 Perfluorotridecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



TestAmerica Sacramento

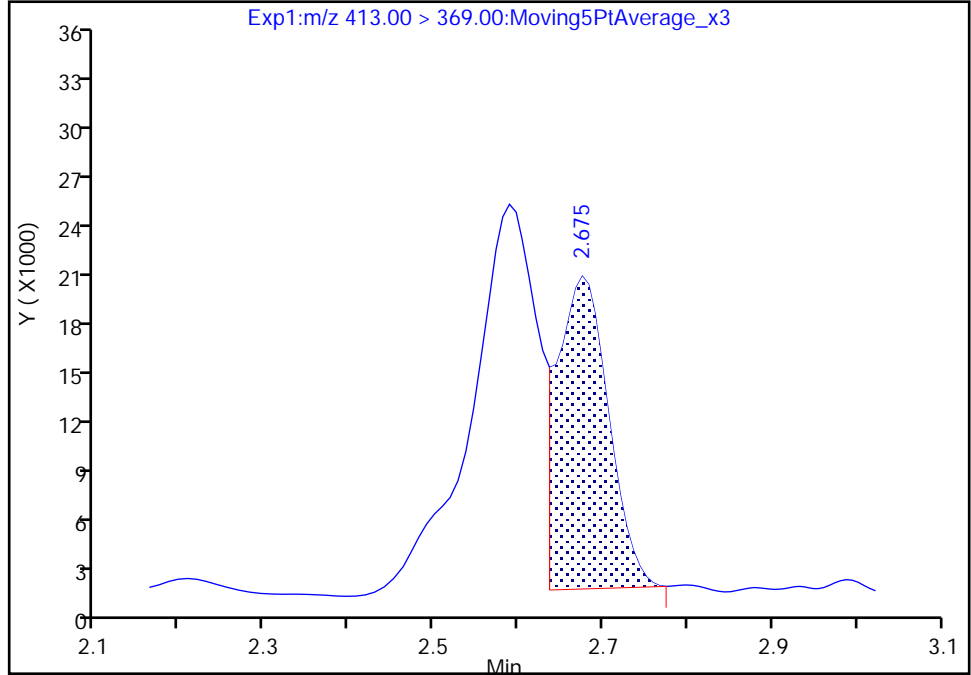
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_052.d
Injection Date: 27-Jun-2018 05:56:16 Instrument ID: A8_N
Lims ID: 320-40153-D-3-A Lab Sample ID: 320-40153-3
Client ID: TP-PFC-030-TPE
Operator ID: SACINSTLCMS01 ALS Bottle#: 38 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

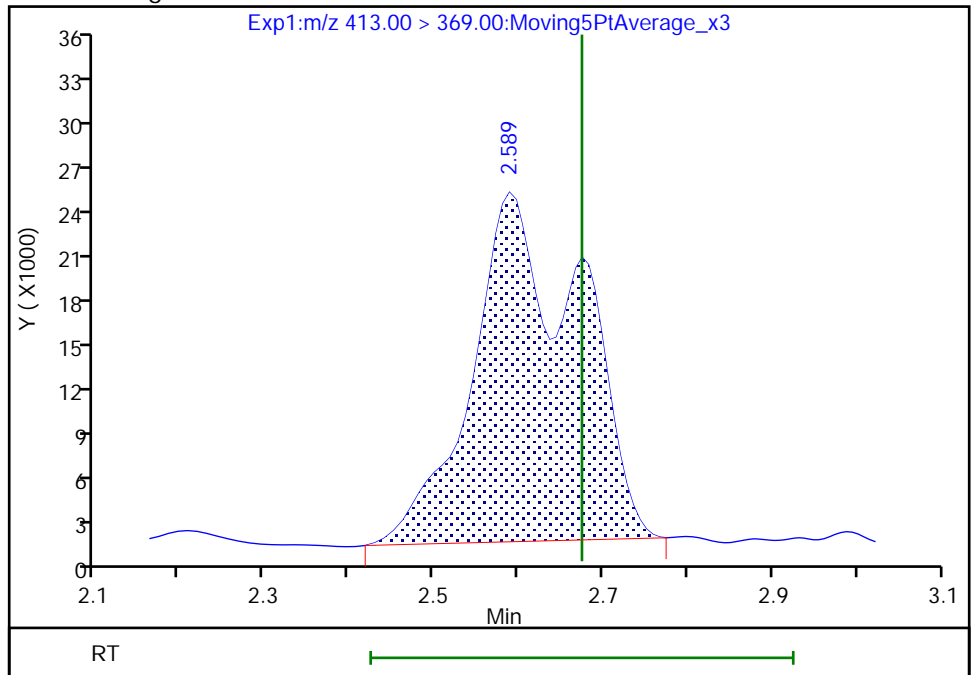
RT: 2.68
Area: 78687
Amount: 0.039830
Amount Units: ng/ml

Processing Integration Results



RT: 2.59
Area: 207216
Amount: 0.104890
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPE-D Lab Sample ID: 320-40153-4
 Matrix: Water Lab File ID: 2018.06.26LLC_053.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 00:00
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 277.1(mL) Date Analyzed: 06/27/2018 06:04
 Con. Extract Vol.: 10(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.8	1.4	0.53
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		1.8	0.90	0.39
307-24-4	Perfluorohexanoic acid (PFHxA)	90		1.8	0.90	0.42
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.6	J	1.8	1.4	0.55
335-67-1	Perfluorooctanoic acid (PFOA)	3.6	M	1.8	1.4	0.49
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U M	1.8	1.4	0.47
335-76-2	Perfluorodecanoic acid (PFDA)	0.90	U	1.8	0.90	0.43
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	U	1.8	1.4	0.65
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	U	1.8	1.4	0.47
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	2.7	0.69
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	2.7	0.75
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8		1.8	0.90	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.37	J	1.8	0.90	0.34
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.90	U	1.8	0.90	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	0.99
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	1.4	0.51
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	2.7	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPE-D Lab Sample ID: 320-40153-4
 Matrix: Water Lab File ID: 2018.06.26LLC_053.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 00:00
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 277.1(mL) Date Analyzed: 06/27/2018 06:04
 Con. Extract Vol.: 10(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	78		50-150
STL00992	13C4 PFBA	91		50-150
STL01893	13C5 PFPeA	80		50-150
STL00993	13C2 PFHxA	83		50-150
STL01892	13C4-PFHpA	92		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	88		50-150
STL00996	13C2 PFDA	87		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	77		50-150
STL00991	13C4 PFOS	83		50-150
STL02337	13C3-PFBS	79		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_053.d
 Lims ID: 320-40153-C-4-A
 Client ID: TP-PFC-030-TPE-D
 Sample Type: Client
 Inject. Date: 27-Jun-2018 06:04:06 ALS Bottle#: 39 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-40153-c-4-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:06:59 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:06:59

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	1.435	1.436	-0.001	1.000	7207230	3.07			3794	
D 1 13C4 PFBA										
217.00 > 172.00	1.435	1.441	-0.006	0.537	5831802	2.27		90.9	44797	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.703	-0.001	1.000	9637781	5.32			4055	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.711	-0.009	0.636	3724385	2.01		80.3	58462	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.738	1.739	-0.001	1.000	145195	0.0505			285	
298.90 > 99.00	1.738	1.739	-0.001	1.000	75012		1.94(1.25-3.74)		266	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.747	-0.009	0.650	85458	1.83		78.6	630	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.981	1.993	-0.012	0.995	4394648	2.50			8775	R
313.00 > 119.00	1.991	1.993	-0.002	1.000	242480		18.12(5.03-15.10)		5077	R
D 7 13C2 PFHxA										
315.00 > 270.00	1.991	2.003	-0.012	0.745	4185617	2.07		82.8	98610	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.280	2.308	-0.028	0.983	84564	0.0433			70.3	
363.00 > 169.00	2.254	2.308	-0.054	0.972	33043		2.56(1.13-3.40)		259	
D 9 13C4-PFHpA										
367.00 > 322.00	2.319	2.319	0.0	0.867	4210996	2.30		91.9	52363	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.332	2.321	0.011	1.000	25404	0.0103			270	
399.00 > 99.00	2.332	2.321	0.011	1.000	8115		3.13(1.50-4.49)		33.4	
D 11 18O2 PFHxS										
403.00 > 84.00	2.332	2.345	-0.013	0.872	5147737	1.97		83.1	47627	

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	2.675	2.675	0.0	4509533	2.50			36513	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.588	2.675	-0.087	0.968	189380	0.0986			48.9	M
413.00 > 169.00	2.580	2.675	-0.095	0.965	147382		1.28(0.84-2.52)		756	
D 14 13C4 PFOA	417.00 > 372.00	2.675	2.682	-0.007	1.000	3934252	2.27		90.9	51749
D 19 13C5 PFNA	468.00 > 423.00	3.049	3.055	-0.006	1.140	3002684	2.20		88.0	46136
D 18 13C4 PFOS	503.00 > 80.00	3.049	3.055	-0.006	1.140	3453409	1.98		82.9	40204
D 21 13C8 FOSA	506.00 > 78.00	3.376	3.384	-0.008	1.262	4849661	1.96		78.4	45594
D 23 13C2 PFDA	515.00 > 470.00	3.413	3.421	-0.008	1.276	2257687	2.18		87.3	29722
D 30 13C2 PFUnA	565.00 > 520.00	3.747	3.754	-0.007	1.401	1705766	2.14		85.6	29395
D 36 13C2 PFDoA	615.00 > 570.00	4.046	4.055	-0.009	1.513	1527916	1.90		76.0	9490
D 43 13C2-PFTeDA	715.00 > 670.00	4.560	4.559	0.001	1.705	1431034	1.93		77.2	6278

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_053.d

Injection Date: 27-Jun-2018 06:04:06

Instrument ID: A8_N

Lims ID: 320-40153-C-4-A

Lab Sample ID: 320-40153-4

Client ID: TP-PFC-030-TPE-D

Operator ID: SACINSTLCMS01

ALS Bottle#: 39 Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

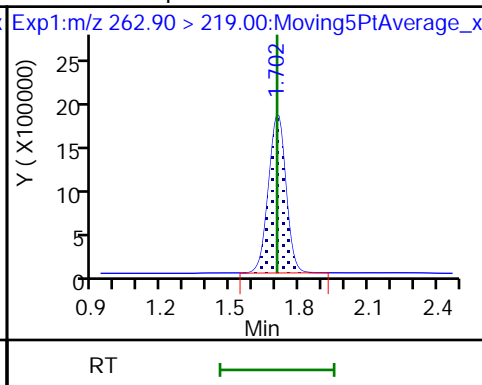
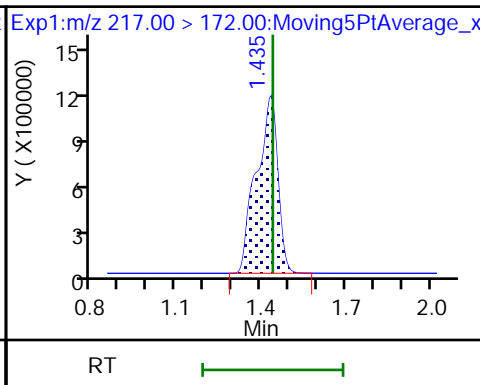
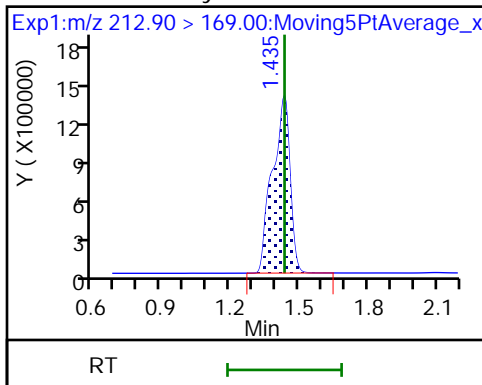
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

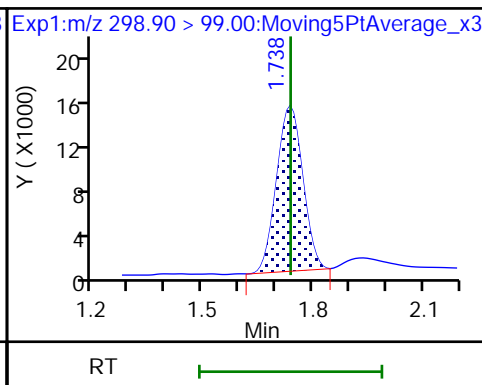
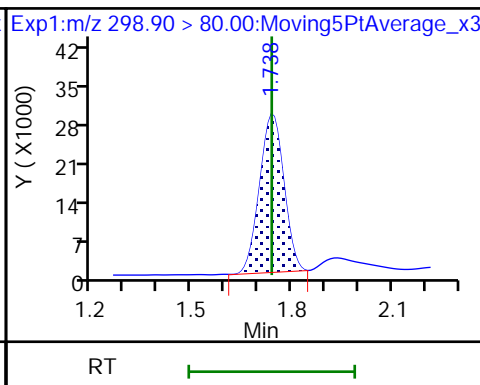
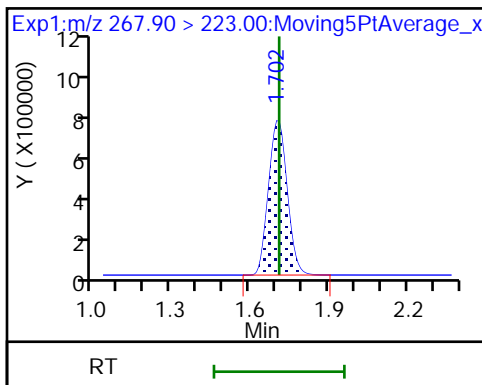
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

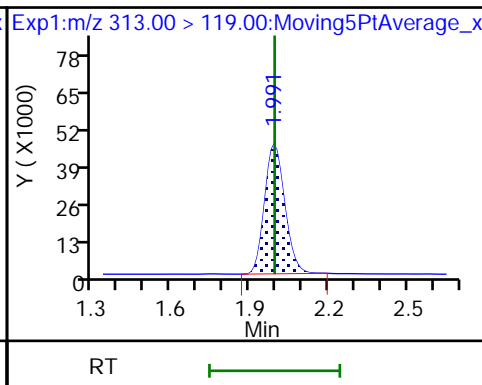
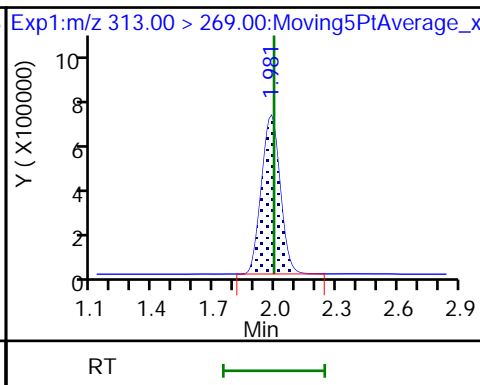
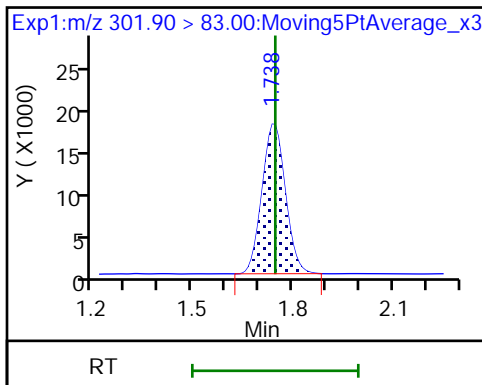
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

6 Perfluorohexanoic acid

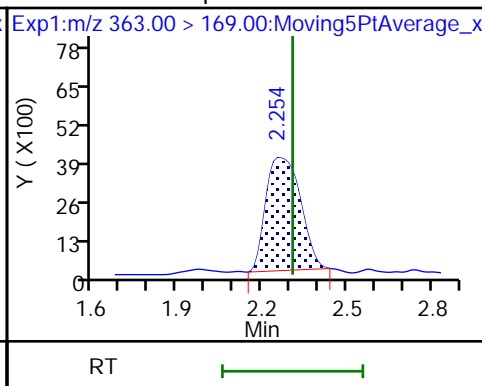
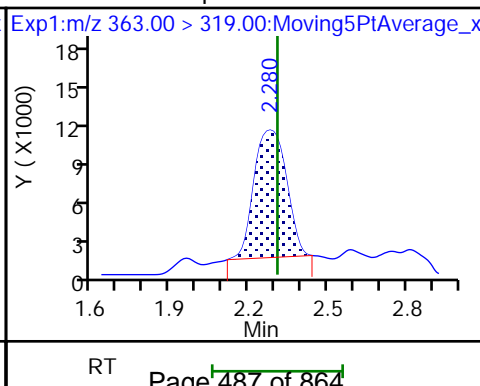
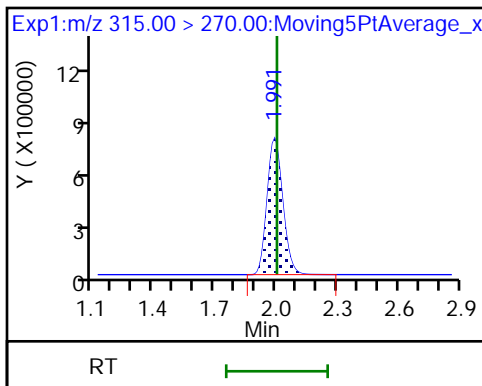
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

10 Perfluoroheptanoic acid

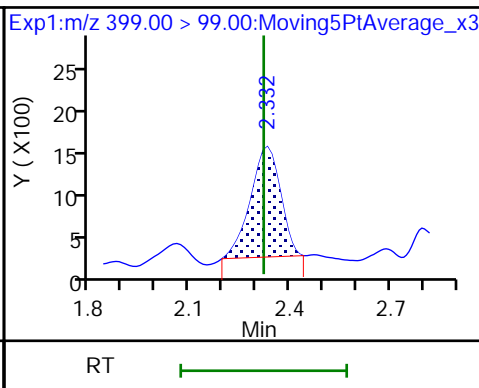
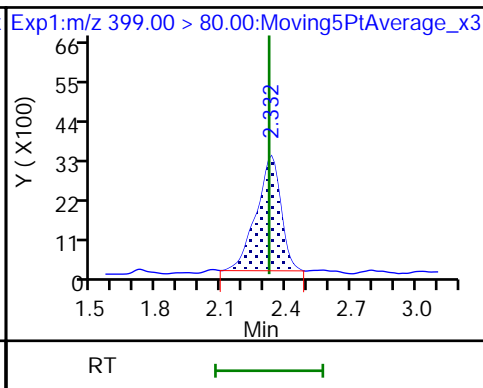
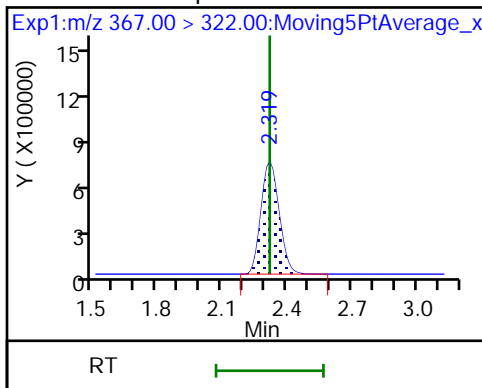
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid

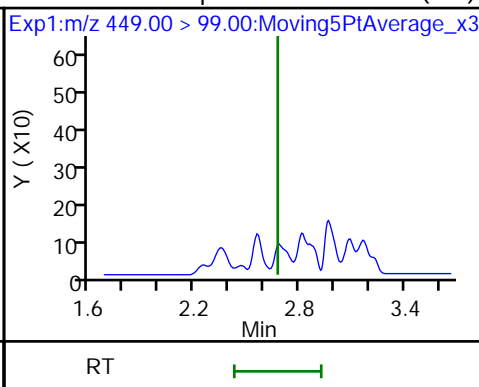
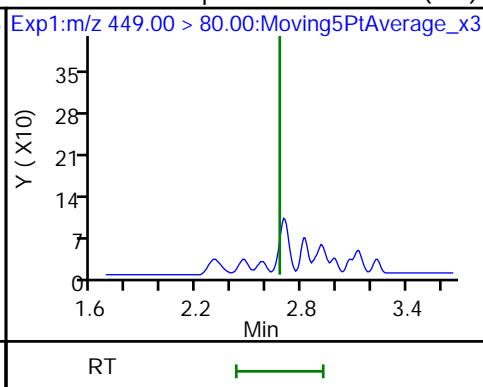
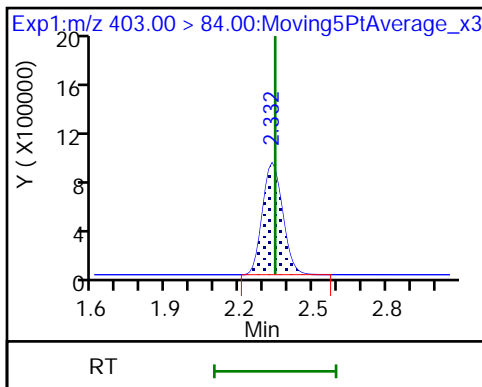
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

16 Perfluoroheptanesulfonic acid (ND)

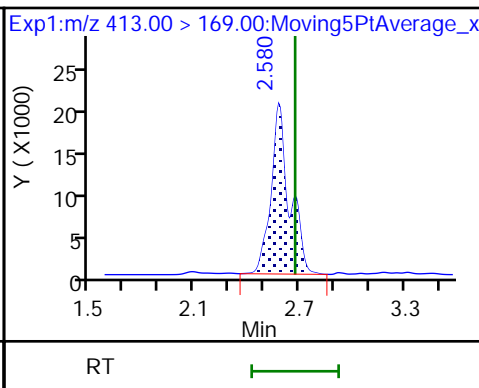
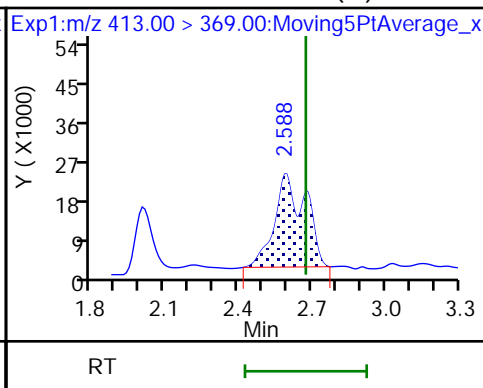
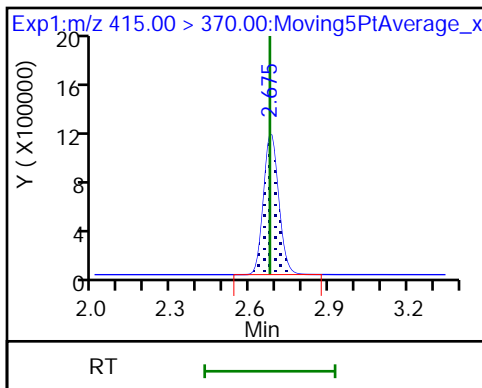
16 Perfluoroheptanesulfonic acid (ND)



* 62 13C2-PFOA

15 Perfluorooctanoic acid (M)

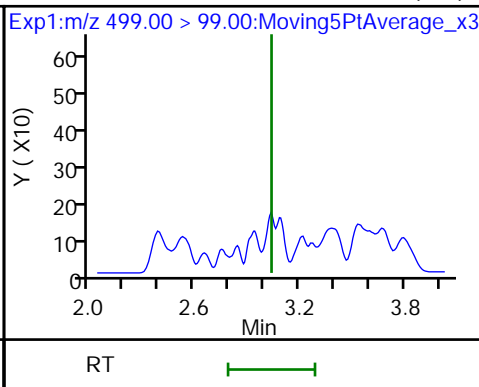
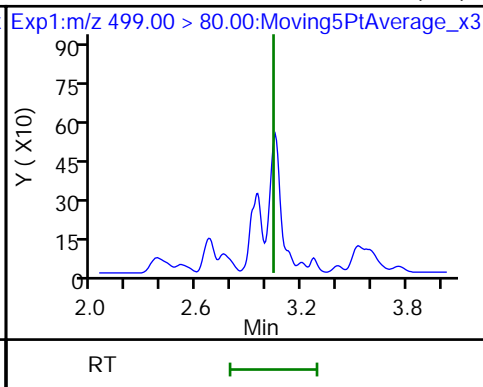
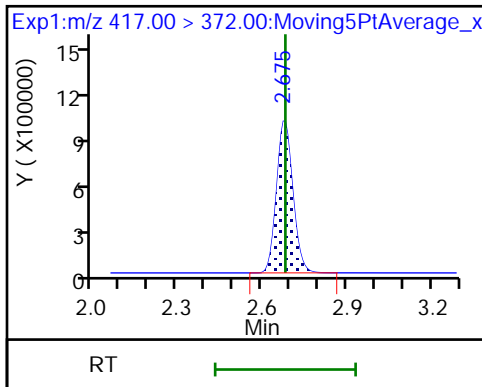
15 Perfluorooctanoic acid

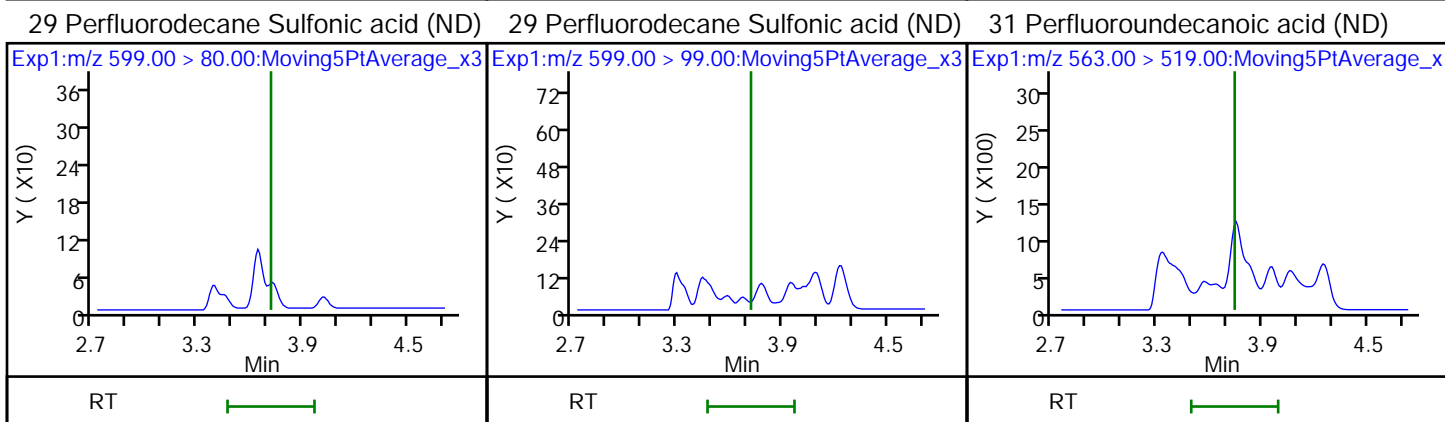
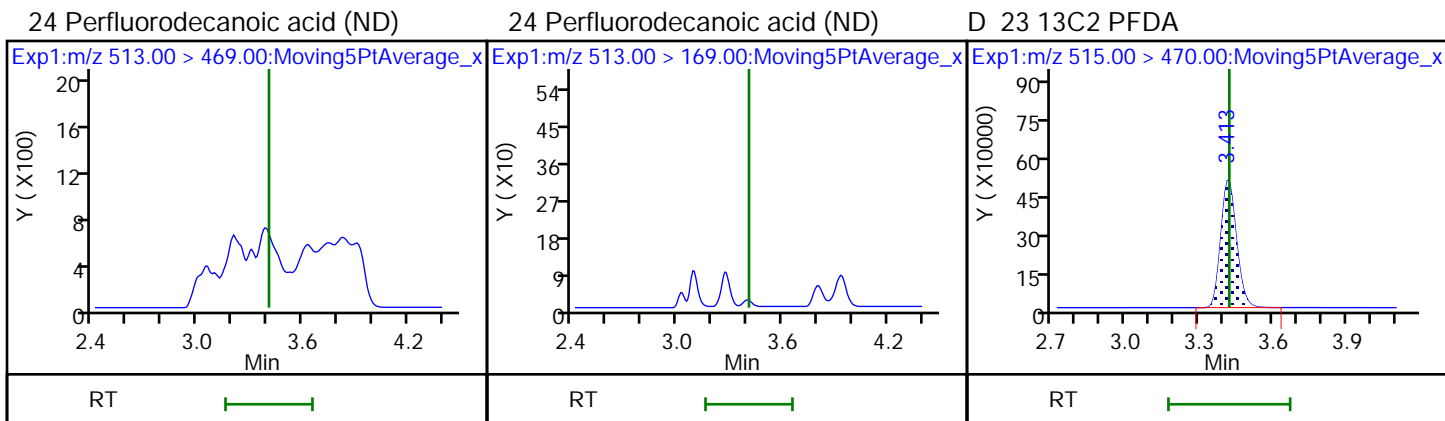
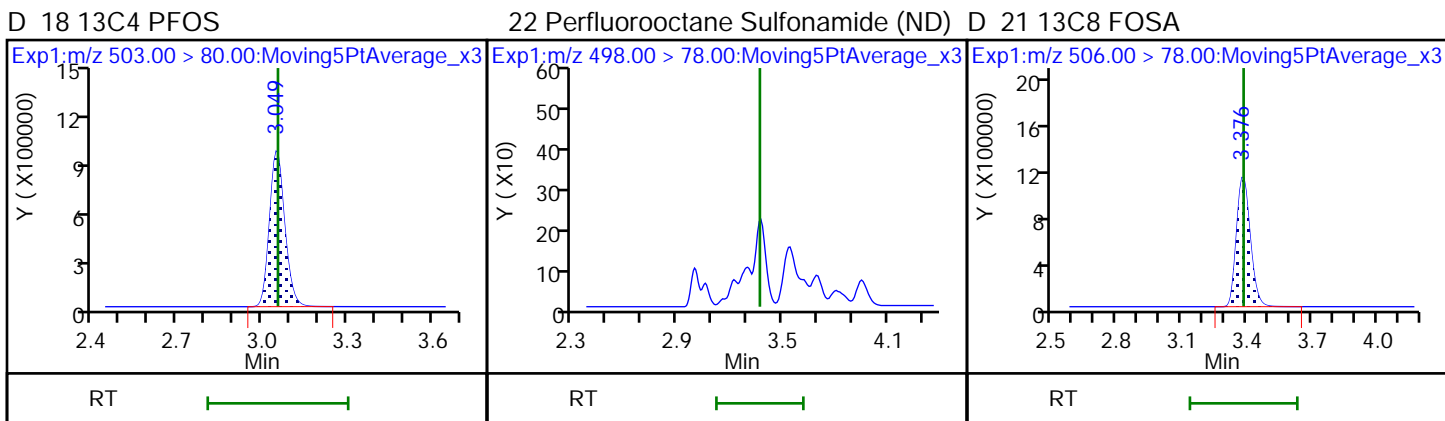
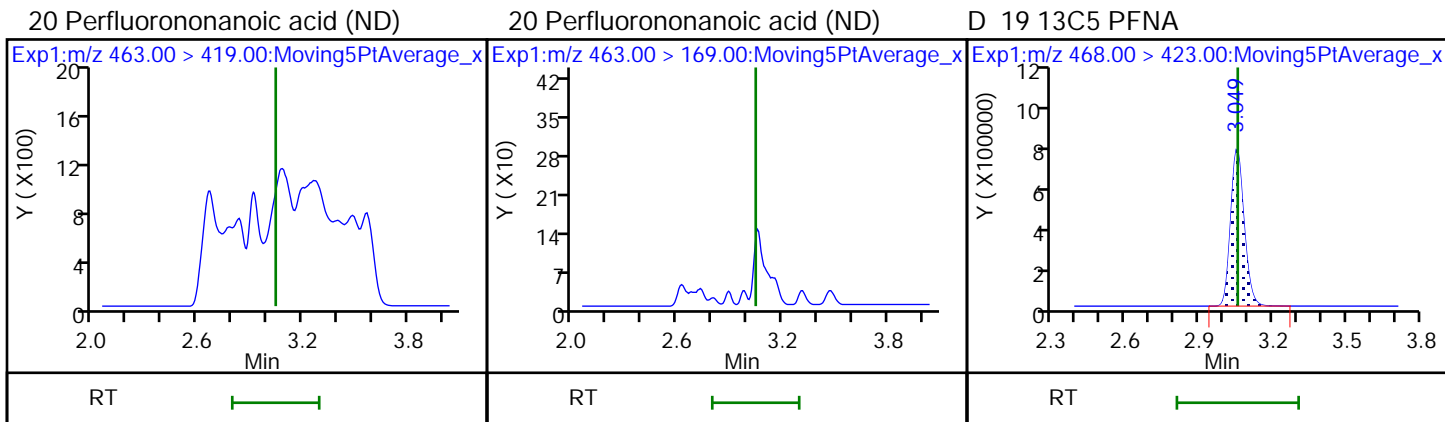


D 14 13C4 PFOA

17 Perfluorooctane sulfonic acid (ND)

17 Perfluorooctane sulfonic acid (ND)

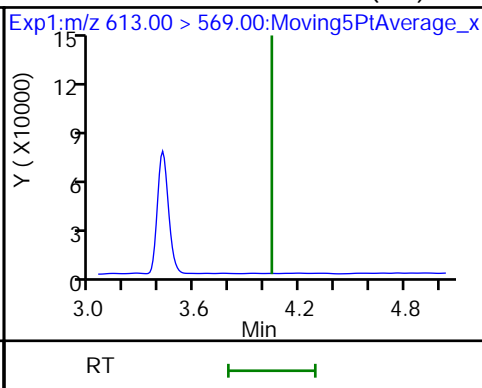
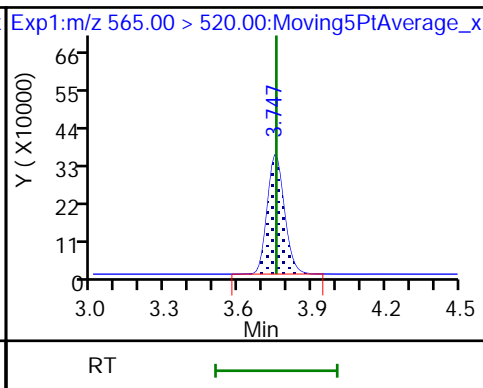
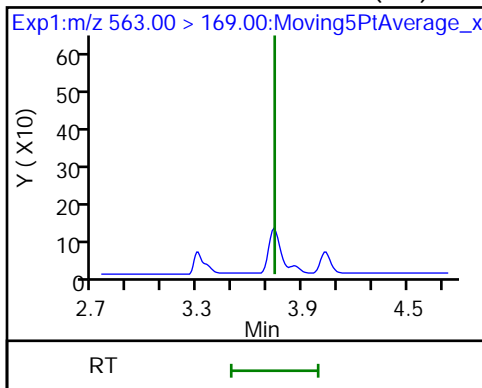




31 Perfluoroundecanoic acid (ND)

D 30 13C2 PFUnA

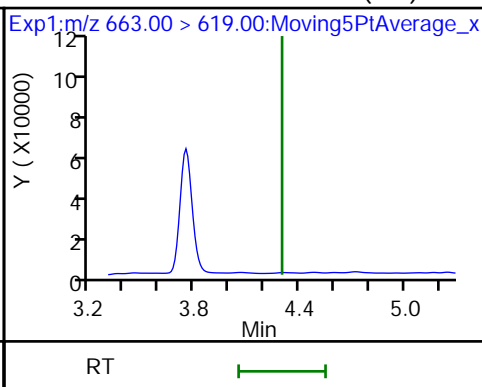
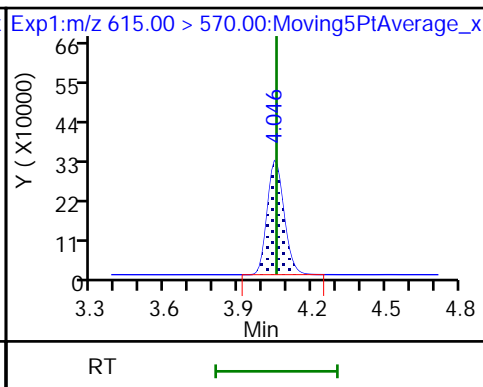
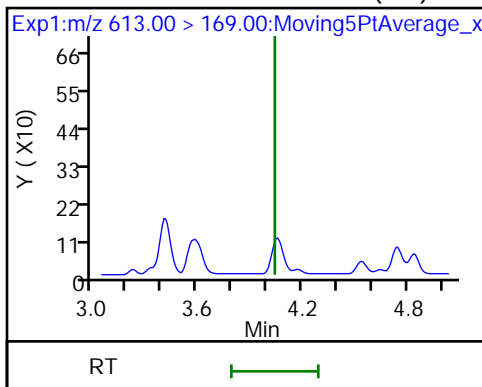
37 Perfluorododecanoic acid (ND)



37 Perfluorododecanoic acid (ND)

D 36 13C2 PFDaA

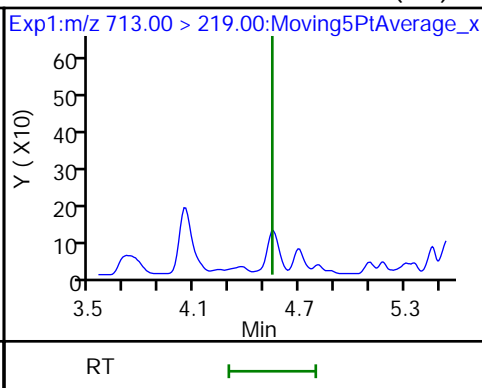
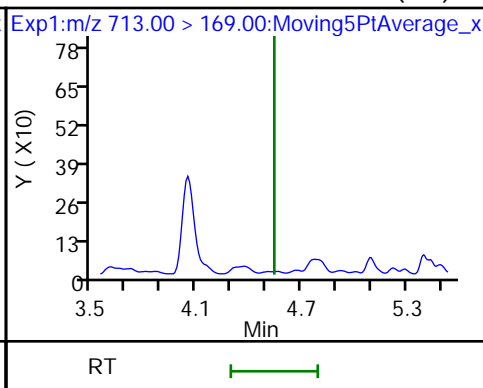
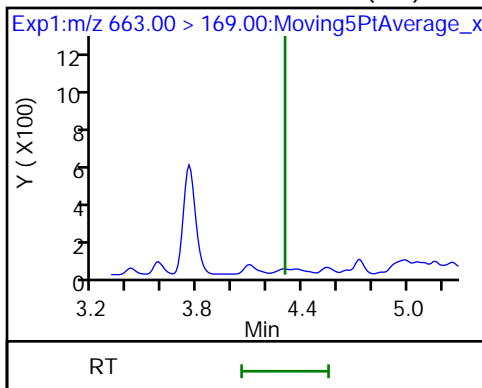
41 Perfluorotridecanoic acid (ND)



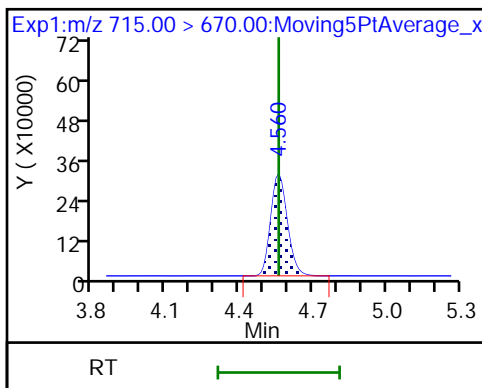
41 Perfluorotridecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



TestAmerica Sacramento

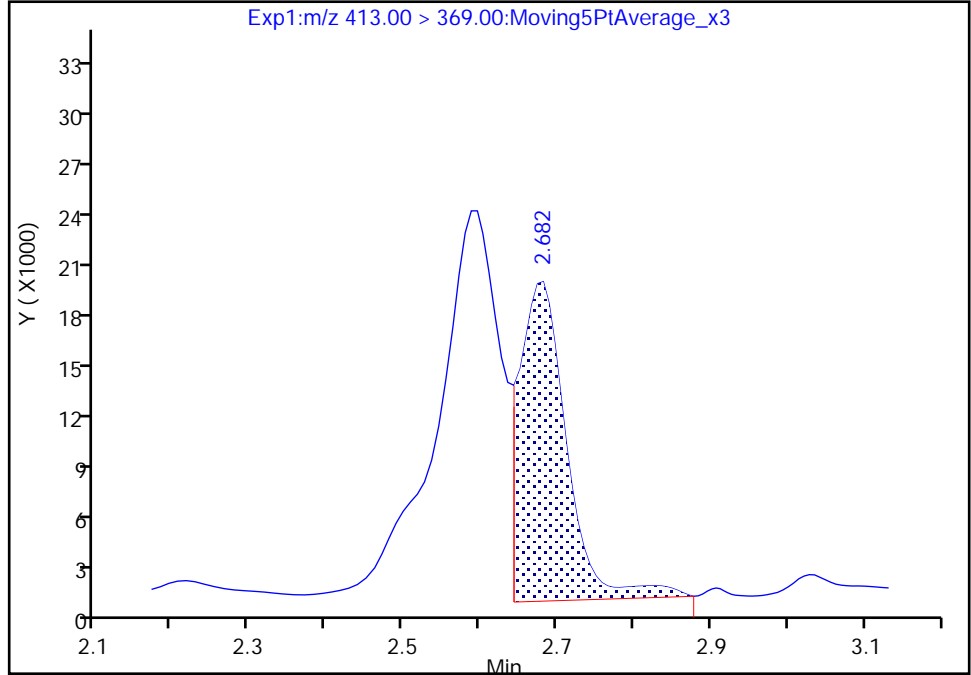
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_053.d
Injection Date: 27-Jun-2018 06:04:06 Instrument ID: A8_N
Lims ID: 320-40153-C-4-A Lab Sample ID: 320-40153-4
Client ID: TP-PFC-030-TPE-D
Operator ID: SACINSTLCMS01 ALS Bottle#: 39 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

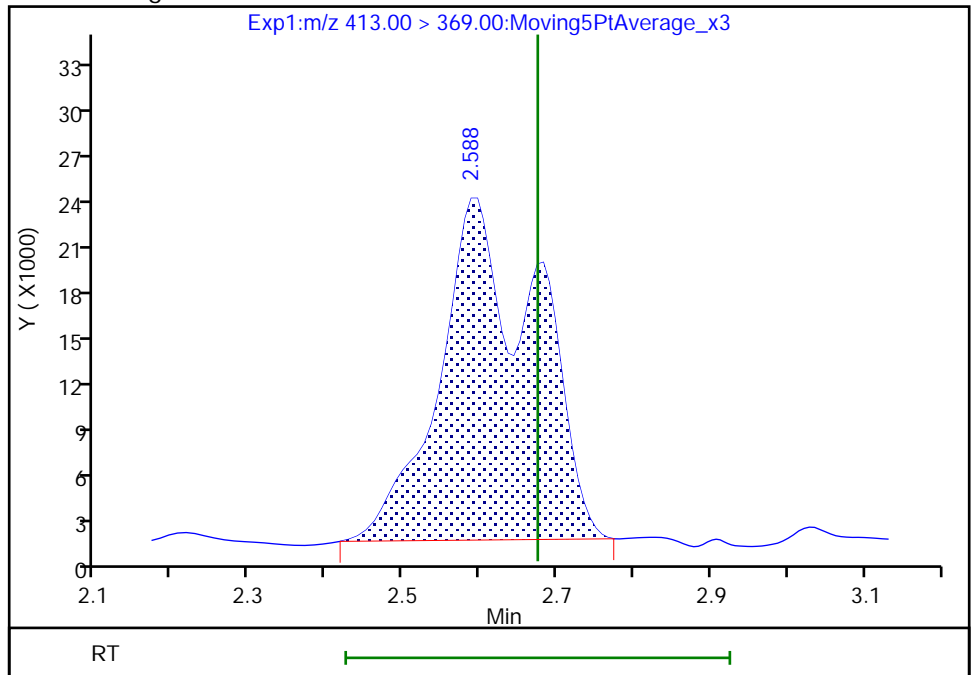
RT: 2.68
Area: 76516
Amount: 0.039849
Amount Units: ng/ml

Processing Integration Results



RT: 2.59
Area: 189380
Amount: 0.098627
Amount Units: ng/ml

Manual Integration Results



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

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-230408/2	2018.06.022LLICALA_002.d
Level 2	IC 320-230408/3	2018.06.022LLICALA_003.d
Level 3	IC 320-230408/4	2018.06.022LLICALA_004.d
Level 4	IC 320-230408/5	2018.06.022LLICALA_005.d
Level 5	IC 320-230408/6	2018.06.022LLICALA_006.d
Level 6	IC 320-230408/7	2018.06.022LLICALA_007.d
Level 7	IC 320-230408/8	2018.06.022LLICALA_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorobutanoic acid (PFBA)	1.0353 1.0170	1.0030 1.0158	0.9823	0.9824	1.0026	AveID		1.0055			1.9		20.0				
Perfluoropentanoic acid (PFPeA)	1.3465 1.1574	1.2972 1.1961	1.1504	1.1539	1.2112	AveID		1.2161			6.3		20.0				
Perfluorobutanesulfonic acid (PFBS)	79.040 77.111	78.583 78.972	76.530	77.150	80.692	AveID		78.297			1.9		20.0				
4:2 FTS	18.329 15.425	16.211 15.353	17.030	16.787	16.971	AveID		16.586			6.2		20.0				
Perfluorohexanoic acid (PFHxA)	1.2603 1.0684	0.9632 1.0186	0.9811	1.0097	1.0450	AveID		1.0495			9.5		20.0				
Perfluoropentanesulfonic acid	72.268 70.822	71.435 70.326	68.453	70.485	75.312	AveID		71.300			3.0		20.0				
Perfluoroheptanoic acid (PFHpA)	1.3654 1.1287	1.1117 1.1412	1.0785	1.1177	1.1682	AveID		1.1587			8.2		20.0				
Perfluorohexanesulfonic acid (PFHxS)	1.2604 1.0842	1.1790 1.0762	1.0621	1.1581	1.1376	AveID		1.1368			6.2		20.0				
6:2 FTS	++++ 1.7070	1.6435 1.6793	1.6959	1.6340	1.6154	AveID		1.6625			2.2		20.0				
Perfluorooctanoic acid (PFOA)	++++ 1.1359	1.5081 1.1369	1.2697	1.1017	1.1686	AveID		1.2202			12.5		20.0				
Perfluoroheptanesulfonic Acid (PFHpS)	1.2752 1.4526	1.3381 1.3781	1.3924	1.4350	1.4275	AveID		1.3856			4.5		20.0				
Perfluorooctanesulfonic acid (PFOS)	1.0565 1.1794	1.1753 1.1621	1.1014	1.1569	1.1307	AveID		1.1375			3.9		20.0				
Perfluorononanoic acid (PFNA)	1.1560 1.0962	1.0441 1.0488	1.0909	1.0770	1.0896	AveID		1.0861			3.4		20.0				
Perfluorononanesulfonic acid	0.7006 0.7928	0.8091 0.7687	0.7555	0.7855	0.7595	AveID		0.7674			4.6		20.0				

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

Analy Batch No.: 230408

SDG No.: _____

Instrument ID: A8_N

GC Column: GeminiC18 3 ID: 3(mm)

Heated Purge: (Y/N) N

Calibration Start Date: 06/22/2018 09:18

Calibration End Date: 06/22/2018 10:05

Calibration ID: 39780

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
8:2 FTS	1.4762 1.3646	1.1544 1.3857	1.2614	1.3184	1.3601	AveID		1.3316			7.6		20.0				
Perfluorooctane Sulfonamide (FOSA)	0.8985 1.0593	0.9977 1.0209	0.9919	1.0049	1.0709	AveID		1.0063			5.6		20.0				
Perfluorodecanoic acid (PFDA)	0.9387 1.0423	1.0394 1.0117	1.0415	0.9720	1.0528	AveID		1.0141			4.2		20.0				
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.8325 1.0151	1.0314 1.0130	0.9277	1.0833	1.0196	AveID		0.9889			8.4		20.0				
Perfluorodecanesulfonic acid (PFDS)	0.6929 0.6790	0.5746 0.6487	0.6429	0.6272	0.6573	AveID		0.6461			6.0		20.0				
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.0582 0.9439	0.9951 0.8884	0.8924	0.8611	0.8593	AveID		0.9284			8.1		20.0				
Perfluoroundecanoic acid (PFUnA)	1.0449 0.7840	0.6477 0.8056	0.7091	0.7793	0.8616	AveID		0.8046			15.7		20.0				
Perfluorododecanoic acid (PFDoA)	1.0519 1.0749	1.1127 1.0585	1.0346	1.0205	1.0526	AveID		1.0579			2.8		20.0				
Perfluorotridecanoic Acid (PFTriA)	0.7927 0.9699	0.9730 1.0049	0.9614	0.9299	0.8857	AveID		0.9311			7.7		20.0				
Perfluorotetradecanoic acid (PFTeA)	0.2603 0.2523	0.2898 0.2509	0.2624	0.2412	0.2392	AveID		0.2566			6.6		20.0				
13C4 PFBA	1.4298 1.4358	1.4078 1.5218	1.3840	1.3480	1.4358	Ave		1.4233			3.8		20.0				
13C5 PFPeA	1.0414 1.0280	1.0376 1.0540	1.0199	0.9901	1.0273	Ave		1.0283			2.0		20.0				
13C3-PFBS	0.0260 0.0266	0.0257 0.0269	0.0256	0.0246	0.0260	Ave		0.0259			2.9		20.0				
13C2 PFHxA	1.1117 1.0902	1.1433 1.1425	1.1559	1.0899	1.1132	Ave		1.1210			2.4		20.0				
13C4-PFHpA	1.0352 0.9834	1.0268 1.0049	1.0501	1.0055	1.0090	Ave		1.0164			2.2		20.0				
18O2 PFHxS	1.4335 1.4827	1.4294 1.5348	1.4865	1.3474	1.4492	Ave		1.4519			4.1		20.0				
M2-6:2FTS	0.2693 0.2581	0.2683 0.2530	0.2643	0.2515	0.2753	Ave		0.2628			3.4		20.0				
13C4 PFOA	0.9578 0.9631	0.9738 0.9510	0.9573	0.9567	0.9608	Ave		0.9601			0.7		20.0				
13C4 PFOS	0.9737 0.9542	0.9681 1.0314	0.9478	0.9121	0.9740	Ave		0.9659			3.7		20.0				
13C5 PFNA	0.7802 0.7391	0.7646 0.7655	0.7526	0.7289	0.7636	Ave		0.7564			2.3		20.0				

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1 Analy Batch No.: 230408
 SDG No.: _____
 Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
 Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
M2-8:2FTS	0.2544 0.2326	0.2467 0.2190	0.2479	0.2301	0.2414	Ave		0.2389			5.1		20.0				
13C8 FOSA	1.4126 1.3407	1.4075 1.3193	1.4048	1.3611	1.3525	Ave		1.3712			2.7		20.0				
13C2 PFDA	0.5737 0.5495	0.5806 0.5651	0.6007	0.5678	0.5755	Ave		0.5733			2.7		20.0				
d3-NMeFOSAA	0.1662 0.1801	0.1674 0.2046	0.1779	0.1639	0.1710	Ave		0.1759			8.0		20.0				
d5-NEtFOSAA	0.1774 0.1807	0.1784 0.1912	0.1809	0.1833	0.1790	Ave		0.1816			2.6		20.0				
13C2 PUnA	0.4438 0.4362	0.4427 0.4545	0.4666	0.4259	0.4249	Ave		0.4421			3.4		20.0				
13C2 PFDoA	0.4498 0.4514	0.4207 0.4618	0.4353	0.4330	0.4685	Ave		0.4458			3.8		20.0				
13C2-PFTeDA	0.4083 0.4127	0.4049 0.4417	0.4038	0.3890	0.4184	Ave		0.4113			3.9		20.0				
13C2-PFHxDA	0.8032 0.6575	0.6895 0.7031	0.6987	0.6519	0.6649	Ave		0.6956			7.4		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.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-230408/2	2018.06.022LLICALA_002.d
Level 2	IC 320-230408/3	2018.06.022LLICALA_003.d
Level 3	IC 320-230408/4	2018.06.022LLICALA_004.d
Level 4	IC 320-230408/5	2018.06.022LLICALA_005.d
Level 5	IC 320-230408/6	2018.06.022LLICALA_006.d
Level 6	IC 320-230408/7	2018.06.022LLICALA_007.d
Level 7	IC 320-230408/8	2018.06.022LLICALA_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorobutanoic acid (PFBA)		AveID	53032 10038407	101417 19649046	494056	1988994	5082569	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	50238 8179819	96672 16023894	426389	1716017	4393072	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	65039 12478112	128130 23901442	628678	2522554	6551841	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	15935 2637247	27927 4909543	147810	579912	1455891	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	50192 8007957	79094 14793082	412137	1652916	4107362	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	63099 12160402	123589 22585045	596678	2445390	6488596	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	50637 7630621	81982 14577124	411542	1687983	4161707	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	58905 10057619	110145 19106190	522113	2132865	5297055	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	++++ 2871537	30024 5120478	154417	585176	1488769	++++ 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	++++ 7528593	105585 13757900	442141	1584645	3968232	++++ 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	42344 9071722	88572 17200801	456597	1871532	4673461	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorooctanesulfonic acid (PFOS)		AveID	34198 7180006	75835 14138725	352073	1470850	3608394	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanoic acid (PFNA)		AveID	32312 5570182	57337 10205563	298376	1179075	2937722	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorononanesulfonic acid		AveID	23459 4992926	54007 9674320	249818	1033122	2507520	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
8:2 FTS		AveID	12889 2089995	19597 3695792	108875	436473	1110703	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

Analy Batch No.: 230408

SDG No.: _____

Instrument ID: A8_N

GC Column: GeminiC18 3 ID: 3(mm)

Heated Purge: (Y/N) N

Calibration Start Date: 06/22/2018 09:18

Calibration End Date: 06/22/2018 10:05

Calibration ID: 39780

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorooctane Sulfonamide (FOSA)		AveID	45469 9763674	100861 17119032	506378	2054520	5113705	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanoic acid (PFDA)		AveID	19293 3937614	43347 7267465	227358	829041	2139115	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	4957 1256655	12404 2634345	59968	266738	615583	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	23300 4293805	38516 8199124	213465	828269	2179207	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	6725 1172882	12753 2158862	58676	237035	542960	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	16614 2350950	20596 4654341	120245	498561	1292539	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	16949 3336019	33622 6212547	163681	663667	1741222	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	12773 3010254	29402 5898236	152090	604768	1465014	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	3808 715874	8429 1408363	38505	140908	353319	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5122345 4935509	5055585 4836014	5029706	5061708	5069506	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	3730951 3533618	3726101 3349234	3706517	3717905	3626987	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	86568 85120	85767 79602	86423	85995	85421	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	3982548 3747484	4105876 3630593	4200709	4092652	3930538	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	3708572 3380419	3687398 3193349	3816037	3775621	3562614	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	4858266 4821638	4856023 4613755	5110525	4786363	4840412	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	916363 842860	915348 763908	912462	897174	923567	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3431350 3310624	3497172 3022175	3478825	3592336	3392211	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3334607 3135647	3323626 3133382	3292910	3274276	3287685	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	2795037 2540754	2745740 2432568	2735161	2736975	2696141	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	873098 765818	848789 666781	863118	827630	816606	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C8 FOSA	13PF OA	Ave	5060678 4608610	5054657 4192257	5105100	5111177	4775273	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
 LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
 RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

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	2055243 1888841	2085206 1795814	2182998	2132271	2031902	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	595413 618999	601308 650146	646446	615584	603767	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	635511 621285	640803 607510	657494	688173	631827	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFunA	13PF OA	Ave	1590058 1499395	1589901 1444430	1695763	1599453	1500246	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	1611289 1551827	1510879 1467364	1581996	1625890	1654135	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTEdA	13PF OA	Ave	1462791 1418685	1454197 1403478	1467413	1460585	1477284	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	2877327 2260290	2476240 2234373	2539173	2447790	2347684	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.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-230408/2	2018.06.022LLICALA_002.d
Level 2	IC 320-230408/3	2018.06.022LLICALA_003.d
Level 3	IC 320-230408/4	2018.06.022LLICALA_004.d
Level 4	IC 320-230408/5	2018.06.022LLICALA_005.d
Level 5	IC 320-230408/6	2018.06.022LLICALA_006.d
Level 6	IC 320-230408/7	2018.06.022LLICALA_007.d
Level 7	IC 320-230408/8	2018.06.022LLICALA_008.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)	3.0 1.0	-0.2	-2.3	-2.3	-0.3	1.1	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	10.7 -1.6	6.7	-5.4	-5.1	-0.4	-4.8	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	0.9 0.9	0.4	-2.3	-1.5	3.1	-1.5	30 30	30	30	30	30	30
4:2 FTS	10.5 -7.4	-2.3	2.7	1.2	2.3	-7.0	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	20.1 -2.9	-8.2	-6.5	-3.8	-0.4	1.8	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	1.4 -1.4	0.2	-4.0	-1.1	5.6	-0.7	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	17.8 -1.5	-4.1	-6.9	-3.5	0.8	-2.6	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	10.9 -5.3	3.7	-6.6	1.9	0.1	-4.6	30 30	30	30	30	30	30
6:2 FTS	++++ 1.0	-1.1	2.0	-1.7	-2.8	2.7	30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	++++ -6.8	23.6	4.1	-9.7	-4.2	-6.9	30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-8.0 -0.5	-3.4	0.5	3.6	3.0	4.8	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-7.1 2.2	3.3	-3.2	1.7	-0.6	3.7	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	6.4 -3.4	-3.9	0.4	-0.8	0.3	0.9	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-8.7 0.2	5.4	-1.5	2.4	-1.0	3.3	30 30	30	30	30	30	30
8:2 FTS	10.9 4.1	-13.3	-5.3	-1.0	2.1	2.5	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.: 320-40153-1 Analy Batch No.: 230408
 SDG No.: _____
 Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
 Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

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
Perfluorooctane Sulfonamide (FOSA)	-10.7 1.4	-0.9	-1.4	-0.1	6.4	5.3	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	-7.4 -0.2	2.5	2.7	-4.1	3.8	2.8	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-15.8 2.4	4.3	-6.2	9.5	3.1	2.6	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	7.2 0.4	-11.1	-0.5	-2.9	1.7	5.1	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	14.0 -4.3	7.2	-3.9	-7.2	-7.4	1.7	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	29.9 0.1	-19.5	-11.9	-3.1	7.1	-2.6	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	-0.6 0.0	5.2	-2.2	-3.5	-0.5	1.6	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	-14.9 7.9	4.5	3.3	-0.1	-4.9	4.2	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	1.5 -2.2	13.0	2.3	-6.0	-6.8	-1.7	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
 Lims ID: IC L1 Full
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 22-Jun-2018 09:18:20 ALS Bottle#: 10 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:44:49 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 10:03:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.430	1.435	-0.005	0.539	5122345	2.51	100	23142	
2 Perfluorobutyric acid	212.90 > 169.00	1.435	1.437	-0.002	1.004	53032	0.0257	103	17.6	
D 3 13C5-PFPeA	267.90 > 223.00	1.701	1.705	-0.004	0.642	3730951	2.53	101	41087	
4 Perfluoropentanoic acid	262.90 > 219.00	1.701	1.707	-0.006	1.000	50238	0.0277	111	19.8	M
D 47 13C3-PFBS	301.90 > 83.00	1.737	1.740	-0.003	0.655	86568	2.33	100	618	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.737	1.743	-0.006	1.000	65039	0.0223	101	1171	
	298.90 > 99.00	1.737	1.743	-0.006	1.000	26139	2.49(1.25-3.74)	101	415	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.948	1.945	0.003	1.121	15935	0.0258	111	469	M
D 60 M2-4:2FTS	329.00 > 81.00	1.948	1.945	0.003	0.735	616505	NC		10055	
D 7 13C2 PFHxA	315.00 > 270.00	1.980	1.982	-0.002	0.747	3982548	2.48	99.2	53978	
6 Perfluorohexanoic acid	313.00 > 269.00	1.980	1.984	-0.004	1.000	50192	0.0300	120	70.5	
	313.00 > 119.00	1.980	1.984	-0.004	1.000	5306	9.46(5.03-15.10)	120	65.6	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.002	2.004	-0.002	1.152	63099	0.0238	101	1104	
	349.00 > 99.00	2.002	2.004	-0.002	1.152	21694	2.91(1.36-4.07)	101	285	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.070	2.076	-0.006	0.781	136717	NC		4756	

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	2.070	2.077	-0.007	1.000	8295	NC	36.4		
D 9 13C4-PFHpA	367.00	> 322.00	2.293	2.301	-0.008	0.865	3708572	2.55	102	40526	
10 Perfluoroheptanoic acid	363.00	> 319.00	2.306	2.302	0.004	1.006	50637	0.0295	118	38.8	M
	363.00	> 169.00	2.293	2.302	-0.009	1.000	16947	2.99(1.13-3.40)	118	106	M
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.306	2.314	-0.008	1.000	58905	0.0252	111	626	
	399.00	> 99.00	2.306	2.314	-0.008	1.000	20590	2.86(1.50-4.49)	111	68.0	
D 11 18O2 PFHxS	403.00	> 84.00	2.306	2.314	-0.008	0.869	4858266	2.34	98.7	37894	
65 Adona	377.00	> 251.00	2.345	2.345	0.0	0.778	104283	NC	1764		
	377.00	> 85.00	2.345	2.345	0.0	0.778	61025	1.71(0.84-2.53)	334		
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.627	2.628	-0.001	1.000	20950	0.0327	138	322	M
D 12 M2-6:2FTS	429.00	> 81.00	2.627	2.628	-0.001	0.991	916363	2.43	102	15188	M
* 62 13C2-PFOA	415.00	> 370.00	2.652	2.654	-0.002		3582479	2.50		27963	
15 Perfluorooctanoic acid	413.00	> 369.00	2.652	2.654	-0.002	1.000	63919	0.0382	153	25.0	
	413.00	> 169.00	2.652	2.654	-0.002	1.000	23154	2.76(0.84-2.52)	153	127	
D 14 13C4 PFOA	417.00	> 372.00	2.652	2.654	-0.002	1.000	3431350	2.49	99.8	29692	
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.659	2.662	-0.003	0.882	42344	0.0219	92.0	1689	
	449.00	> 99.00	2.659	2.662	-0.003	0.882	13046	3.25(1.94-5.82)	92.0	302	
D 18 13C4 PFOS	503.00	> 80.00	3.015	3.018	-0.002	1.137	3334607	2.41	101	37777	
D 19 13C5 PFNA	468.00	> 423.00	3.015	3.018	-0.003	1.137	2795037	2.58	103	42117	
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.015	3.018	-0.003	1.000	34198	0.0215	92.9	733	M
	499.00	> 99.00	3.015	3.018	-0.003	1.000	11078	3.09(2.31-6.93)	92.9	187	M
20 Perfluorononanoic acid	463.00	> 419.00	3.021	3.021	0.0	1.002	32312	0.0266	106	97.2	
	463.00	> 169.00	3.015	3.021	-0.006	1.000	7460	4.33(1.90-5.69)	106	308	
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.228	3.230	-0.002	1.071	55134	NC	804		
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.357	3.362	-0.005	1.114	23459	0.0219	91.3	1875	
	549.00	> 99.00	3.357	3.362	-0.005	1.114	9081	2.58(1.33-3.97)	91.3	88.2	
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.357	3.363	-0.006	0.997	12889	0.0266	111	466	
D 26 M2-8:2FTS	529.00	> 81.00	3.366	3.364	0.002	1.269	873098	2.55	107	17561	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.366	3.370	-0.004	1.269	5060678	2.58		103	56817	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.366	3.371	-0.005	1.000	45469	0.0223		89.3	1143	
D 23 13C2 PFDA										
515.00 > 470.00	3.376	3.376	0.0	1.273	2055243	2.50		100	32866	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.376	3.378	-0.002	1.000	19293	0.0231		92.6	41.9	
513.00 > 169.00	3.376	3.378	-0.002	1.000	2773		6.96(2.36-7.09)	92.6	59.1	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.525	3.528	-0.003	1.329	595413	2.36		94.5	12899	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.525	3.531	-0.006	1.000	4957	0.0210		84.2	67.4	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.683	3.686	-0.003	1.222	23300	0.0258		107	955	R
599.00 > 99.00	3.683	3.686	-0.003	1.222	4781		4.87(1.39-4.16)	107	107	R
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.694	3.697	-0.003	1.393	635511	2.44		97.7	3276	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.694	3.702	-0.008	1.000	16614	0.0325		130	45.2	
563.00 > 169.00	3.694	3.702	-0.008	1.000	3660		4.54(2.12-6.36)	130	150	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.694	3.702	-0.008	1.000	6725	0.0285		114	97.4	M
D 30 13C2 PFUnA										
565.00 > 520.00	3.694	3.702	-0.008	1.393	1590058	2.51		100	32467	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.862	3.860	0.002	1.281	83775	NC			2162	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.995	3.995	0.0	1.000	16949	0.0249		99.4	5.7	
613.00 > 169.00	3.995	3.995	0.0	1.000	5709		2.97(2.13-6.40)	99.4	173	
D 36 13C2 PFDaA										
615.00 > 570.00	3.995	3.995	0.0	1.506	1611289	2.52		101	13418	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.249	4.254	-0.005	1.064	12773	0.0213		85.1	4.5	
663.00 > 169.00	4.249	4.254	-0.005	1.064	4081		3.13(1.25-3.76)	85.1	41.3	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.489	4.490	-0.002	1.000	3808	0.0254		101	50.1	
713.00 > 219.00	4.478	4.490	-0.012	0.998	2889		1.32(0.71-2.13)	101	65.6	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.489	4.490	-0.002	1.693	1462791	2.48		99.3	6108	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.894	4.894	0.0	1.846	2877327	2.89		115	5882	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.894	4.895	-0.001	1.000	51418	NC			7.5	M
813.00 > 169.00	4.894	4.895	-0.001	1.000	7971		6.45(2.86-8.58)		59.5	M
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.239	5.239	0.0	1.070	31858	NC			12.0	
913.00 > 169.00	5.239	5.239	0.0	1.070	3630		8.78(3.83-11.48)		51.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d

Injection Date: 22-Jun-2018 09:18:20

Instrument ID: A8_N

Lims ID: IC L1 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 10

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

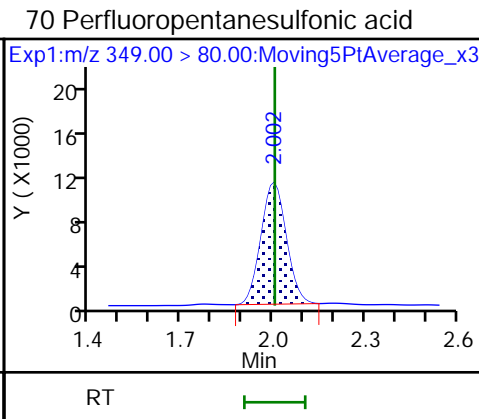
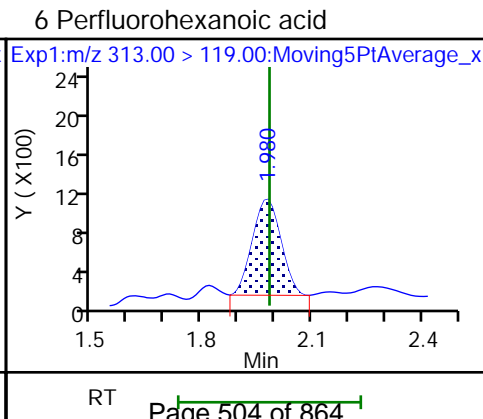
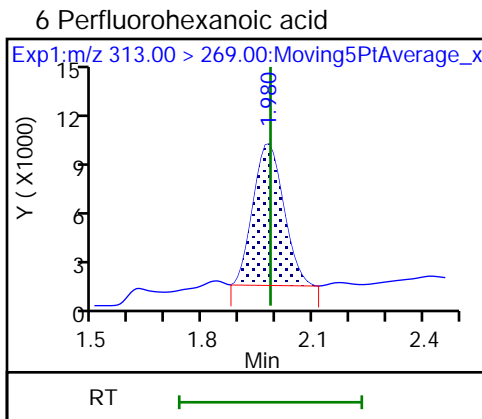
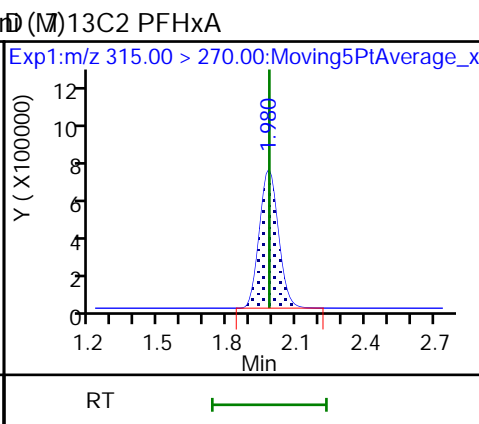
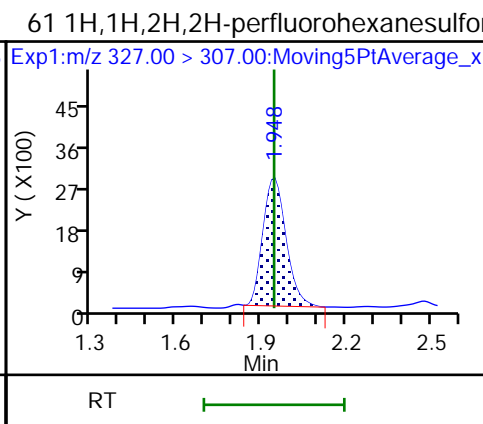
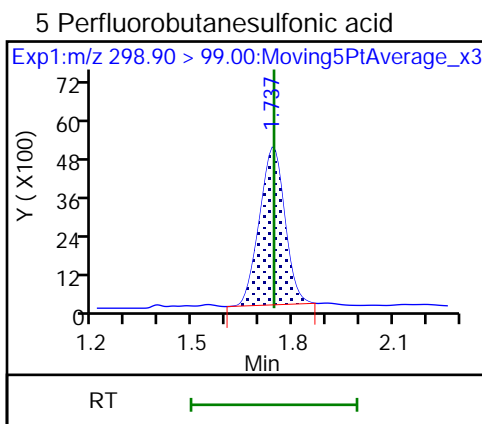
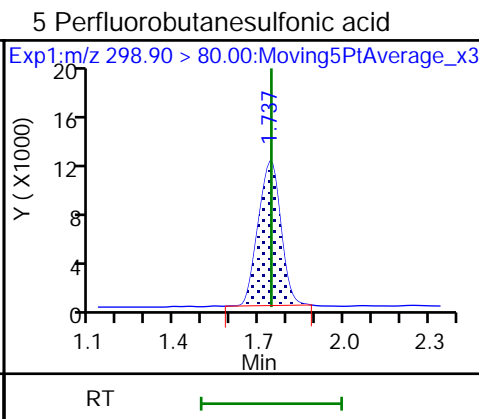
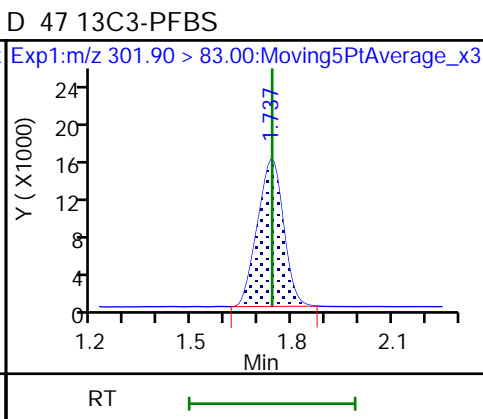
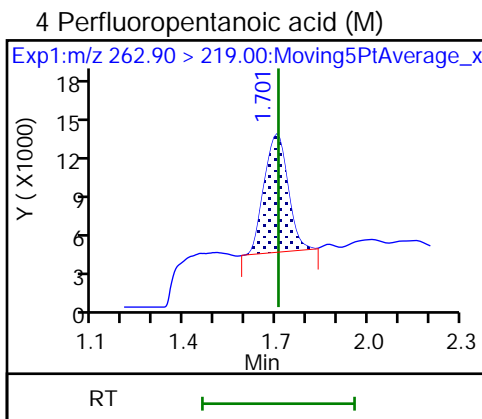
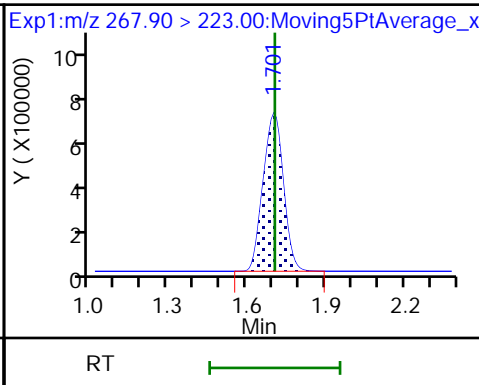
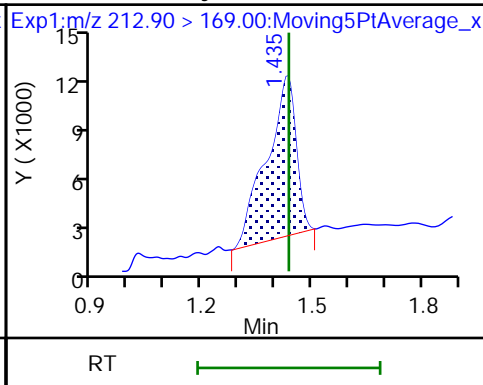
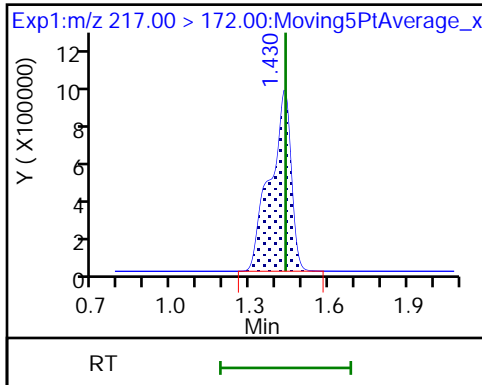
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

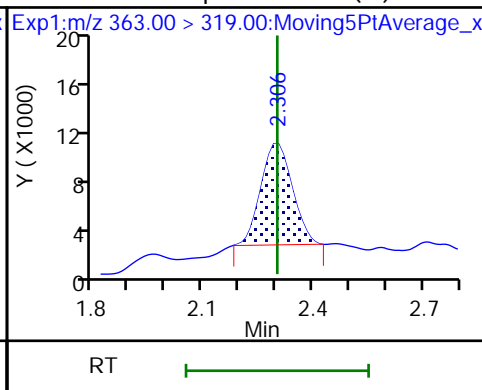
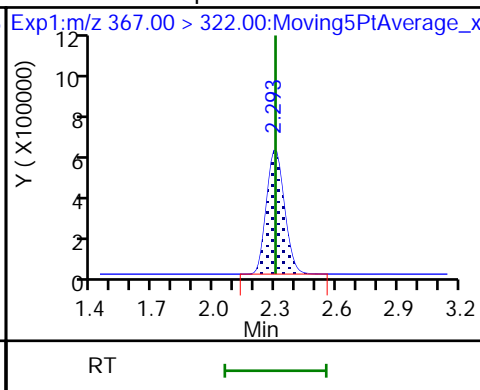
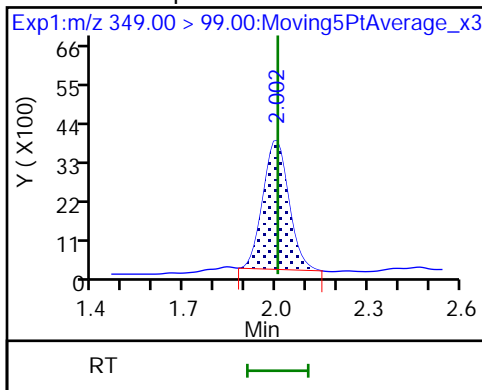
D 3 13C5-PFPeA



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

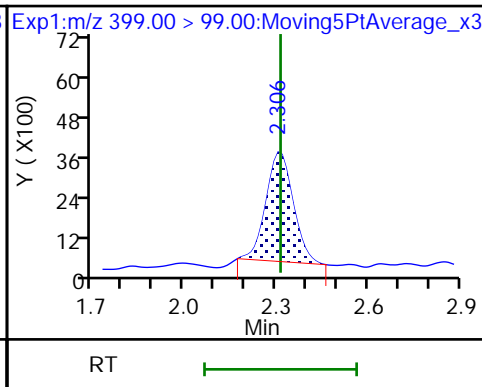
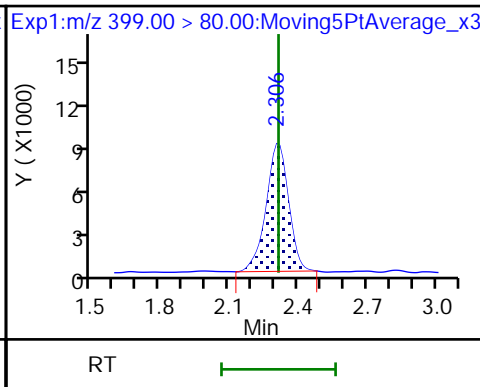
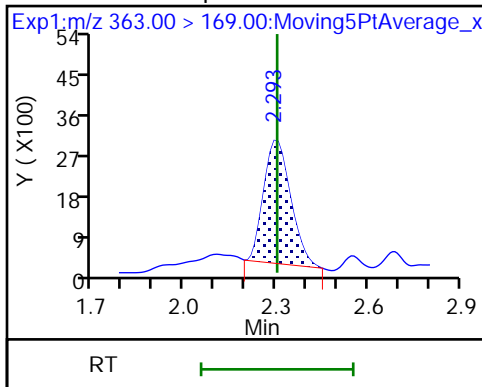
10 Perfluoroheptanoic acid (M)



10 Perfluoroheptanoic acid

8 Perfluorohexanesulfonic acid

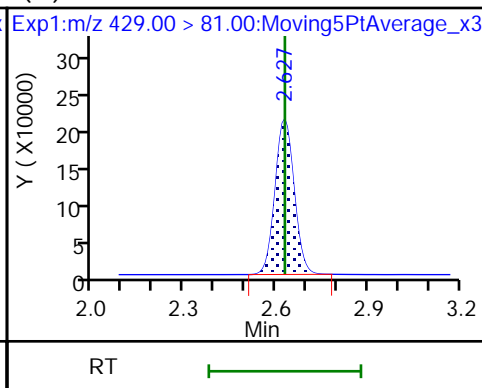
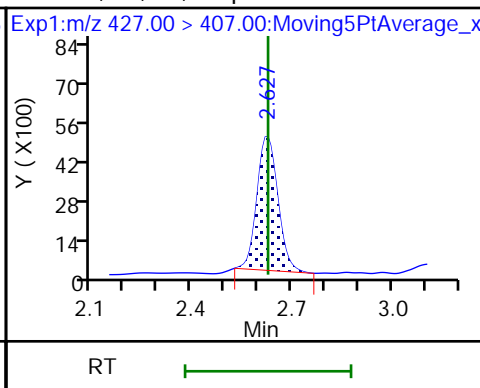
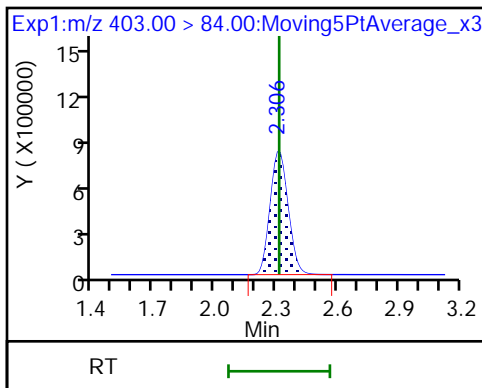
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

13 1H,1H,2H,2H-perfluorooctanesulfonate (M)

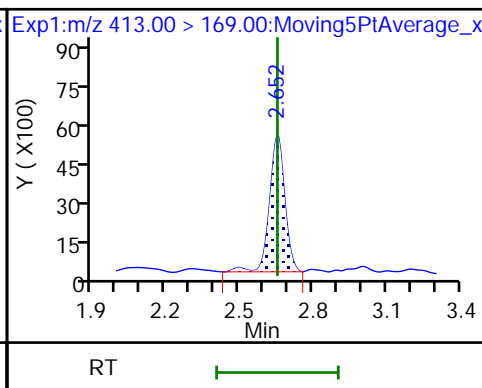
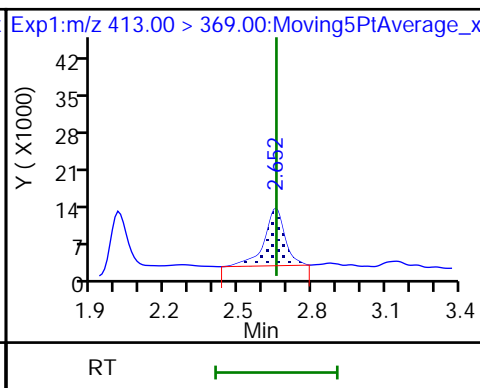
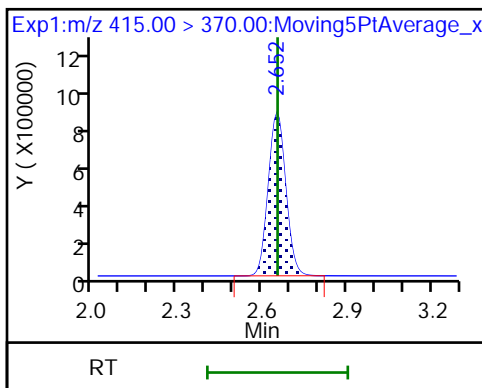
D 12 M2-6:2FTS



* 62 13C2-PFOA

15 Perfluorooctanoic acid

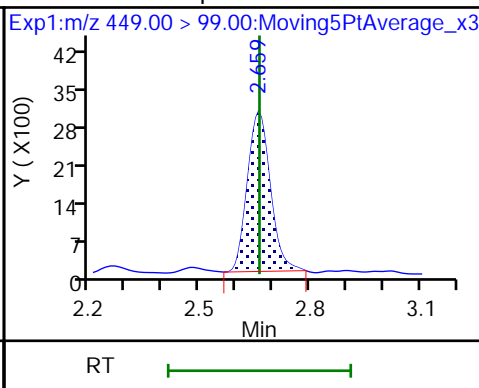
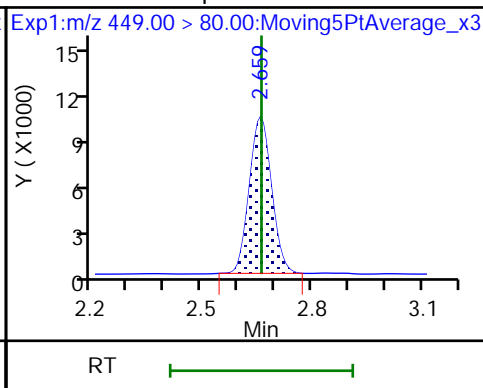
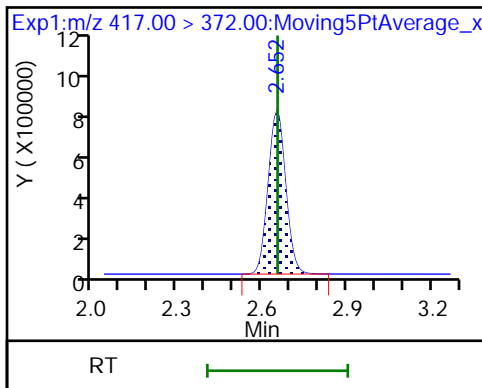
15 Perfluorooctanoic acid



D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

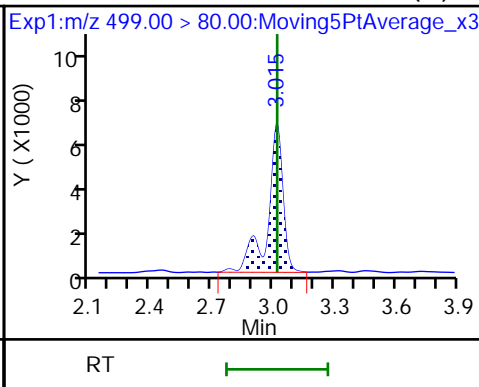
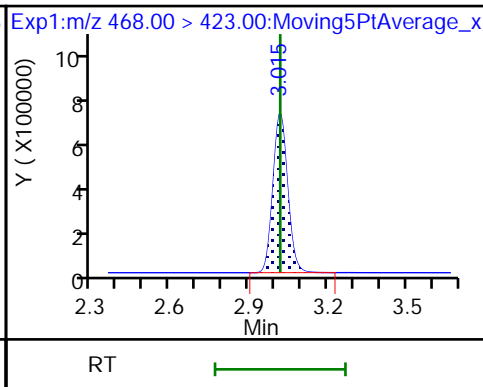
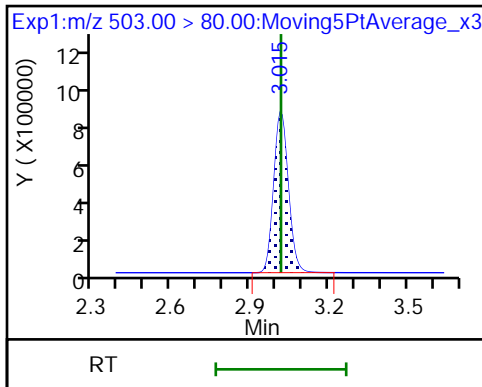
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

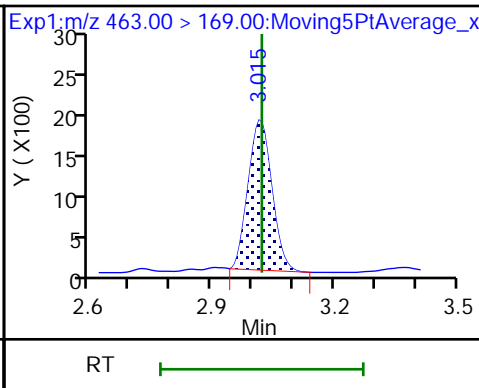
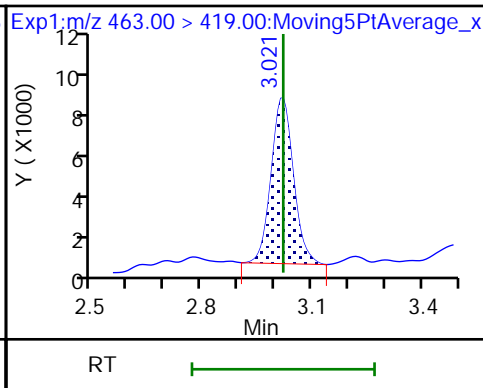
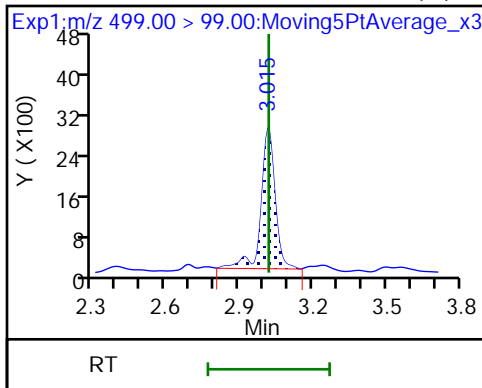
17 Perfluorooctane sulfonic acid (M)



17 Perfluorooctane sulfonic acid (M)

20 Perfluorononanoic acid

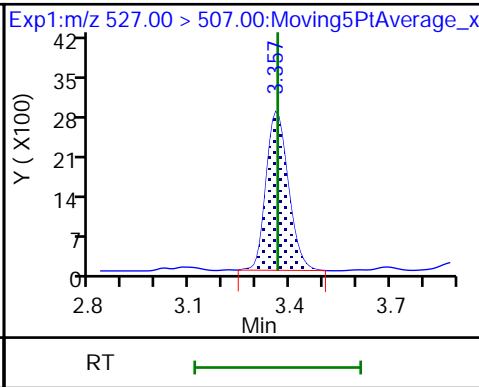
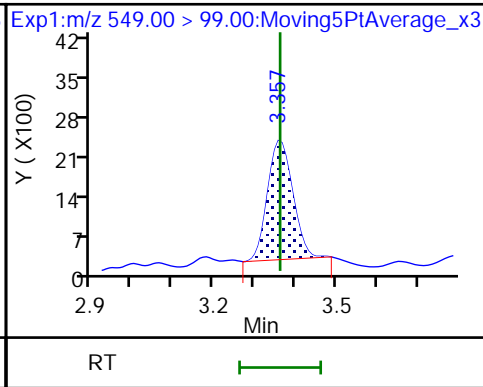
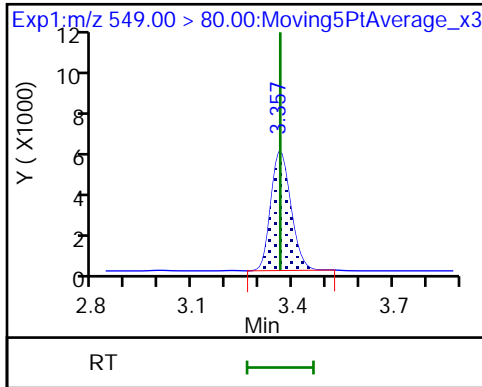
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

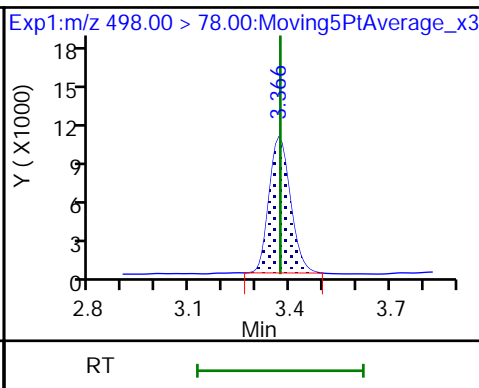
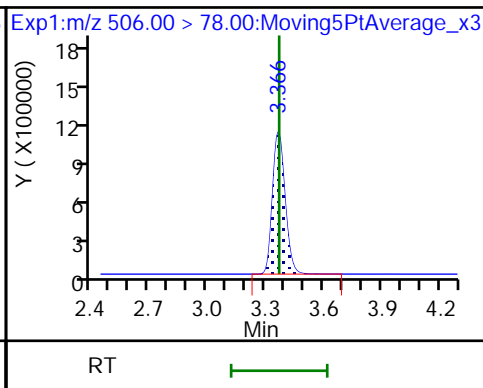
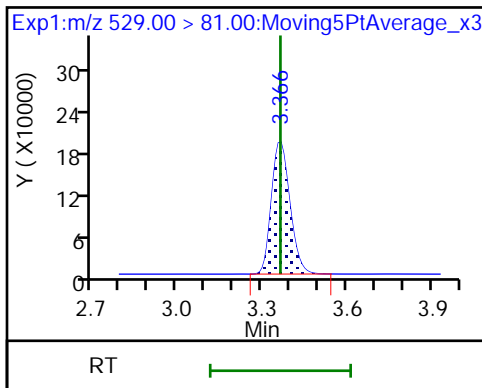
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

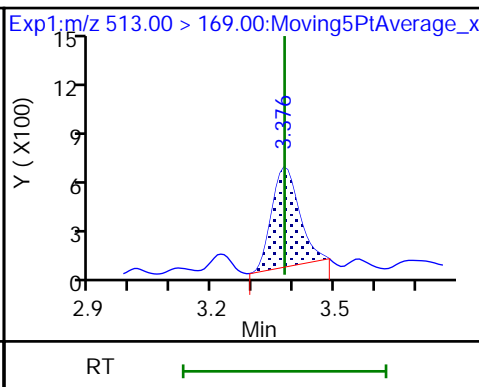
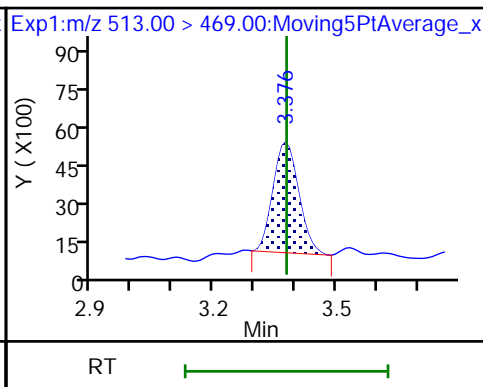
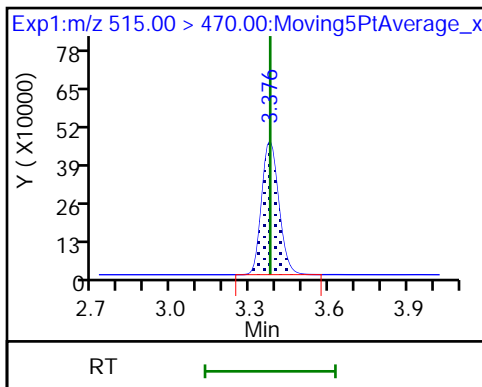
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

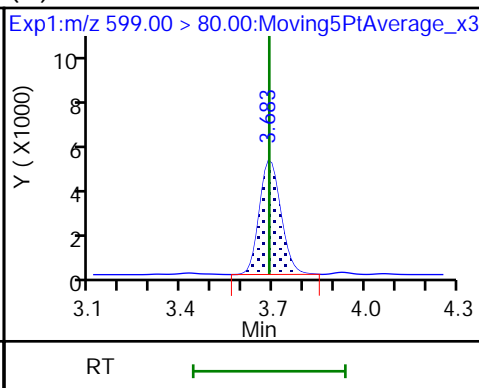
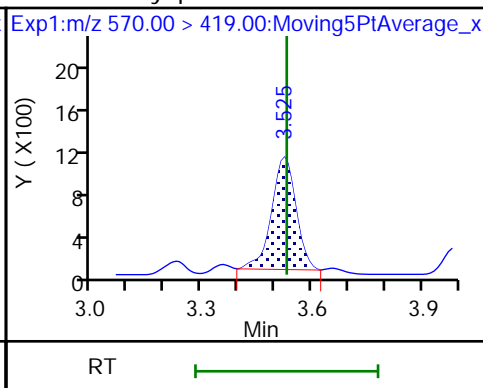
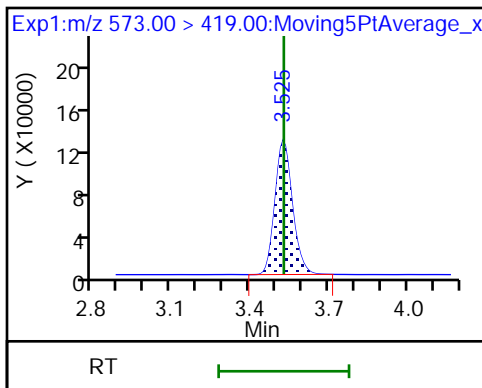
24 Perfluorodecanoic acid

24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

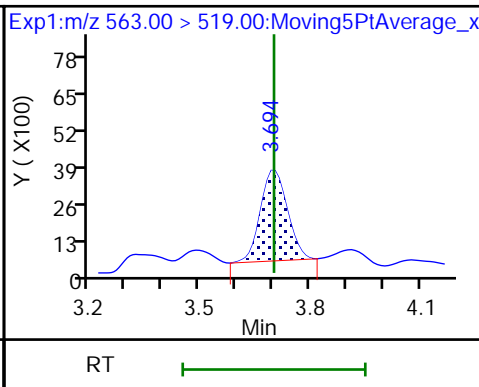
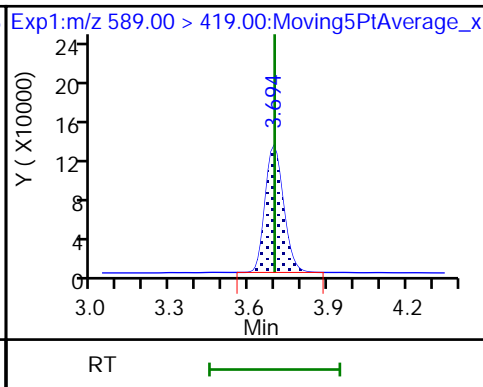
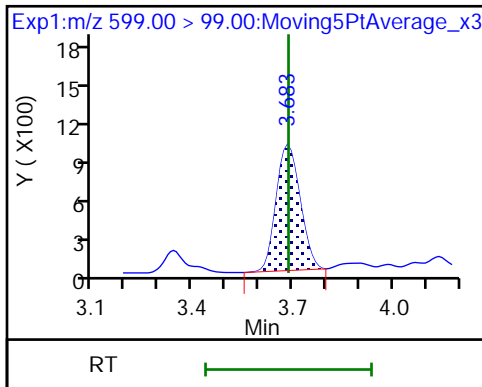
28 N-methyl perfluorooctane sulfonami (M) 29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

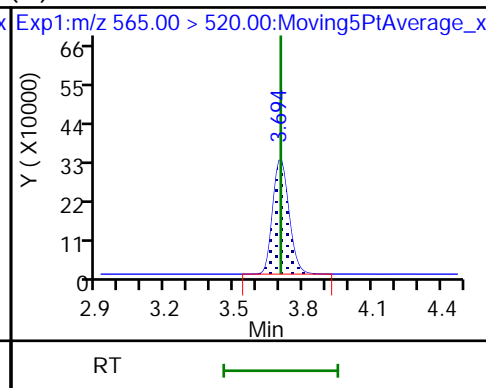
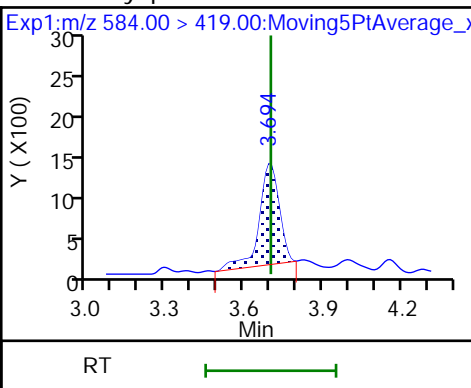
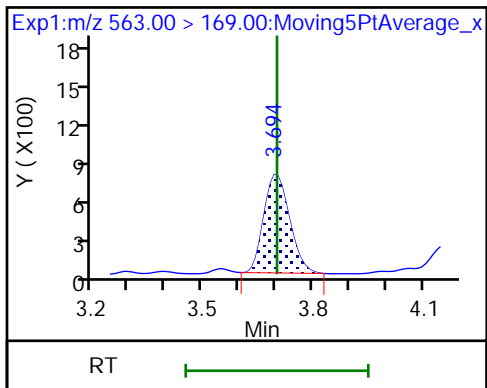
D 32 d5-NEtFOSAA

31 Perfluoroundecanoic acid



31 Perfluoroundecanoic acid

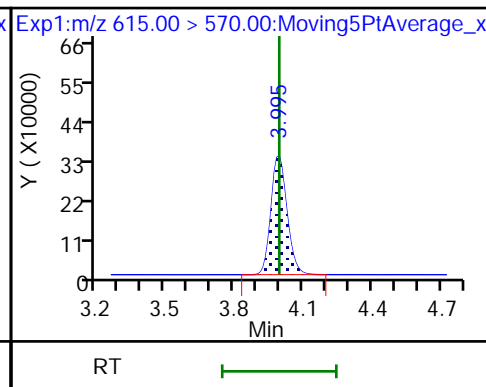
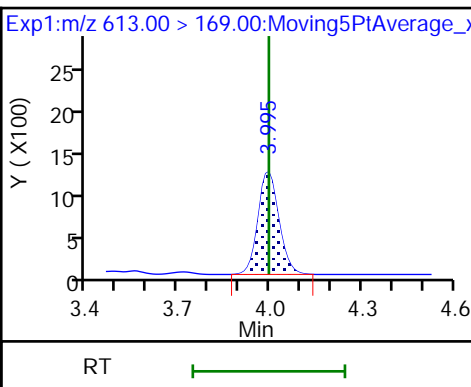
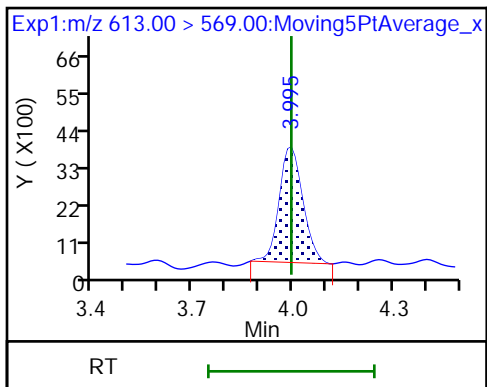
33 N-ethyl perfluorooctane sulfonamid (M)30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

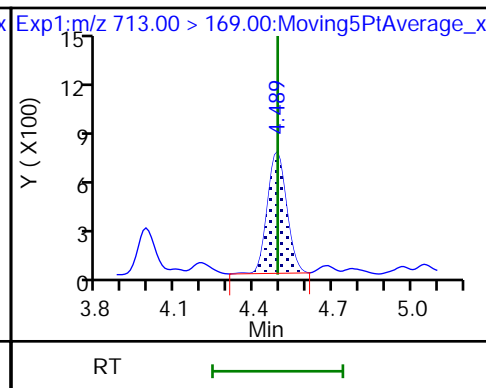
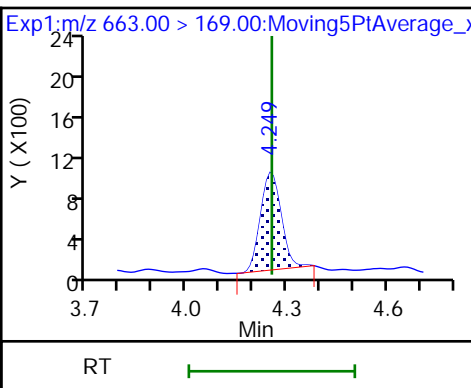
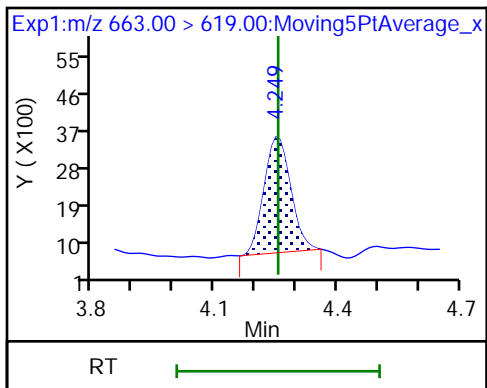
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

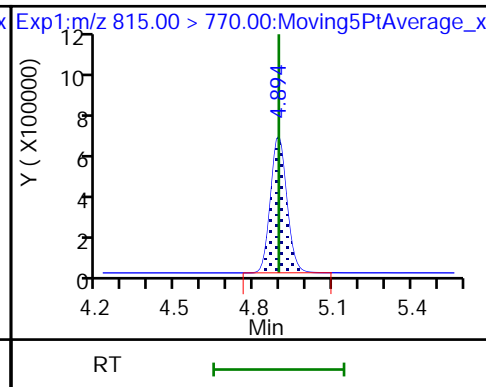
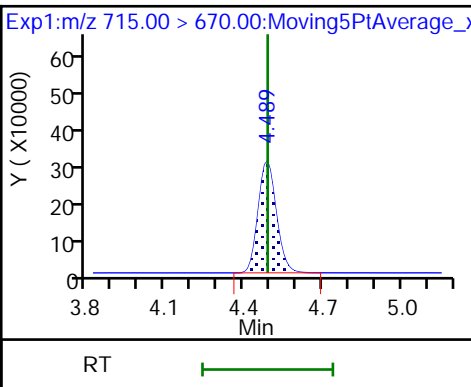
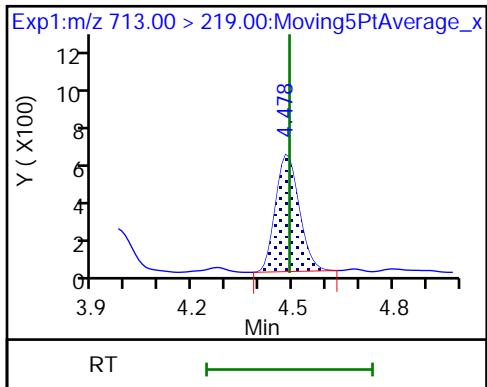
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento

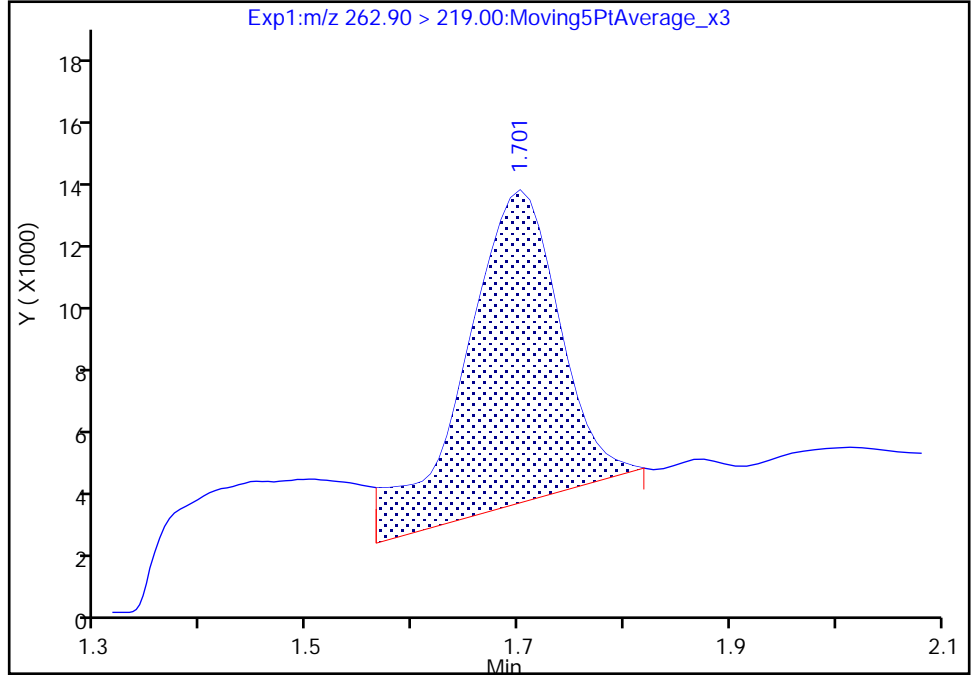
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
Injection Date: 22-Jun-2018 09:18:20 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

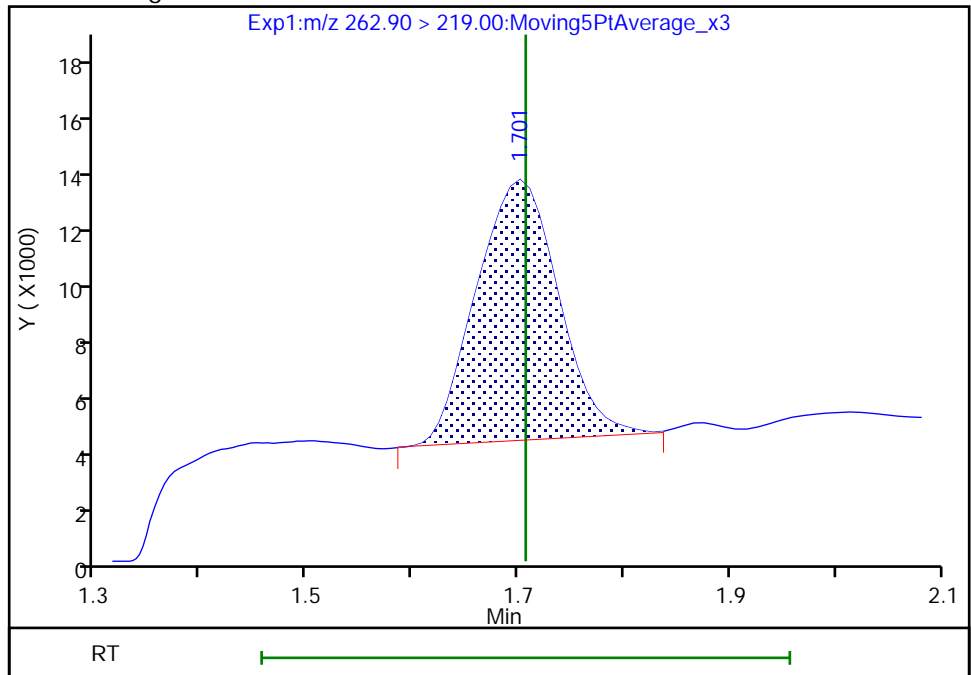
RT: 1.70
Area: 63161
Amount: 0.032528
Amount Units: ng/ml

Processing Integration Results



RT: 1.70
Area: 50238
Amount: 0.027681
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:11:11
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 510 of 864

TestAmerica Sacramento

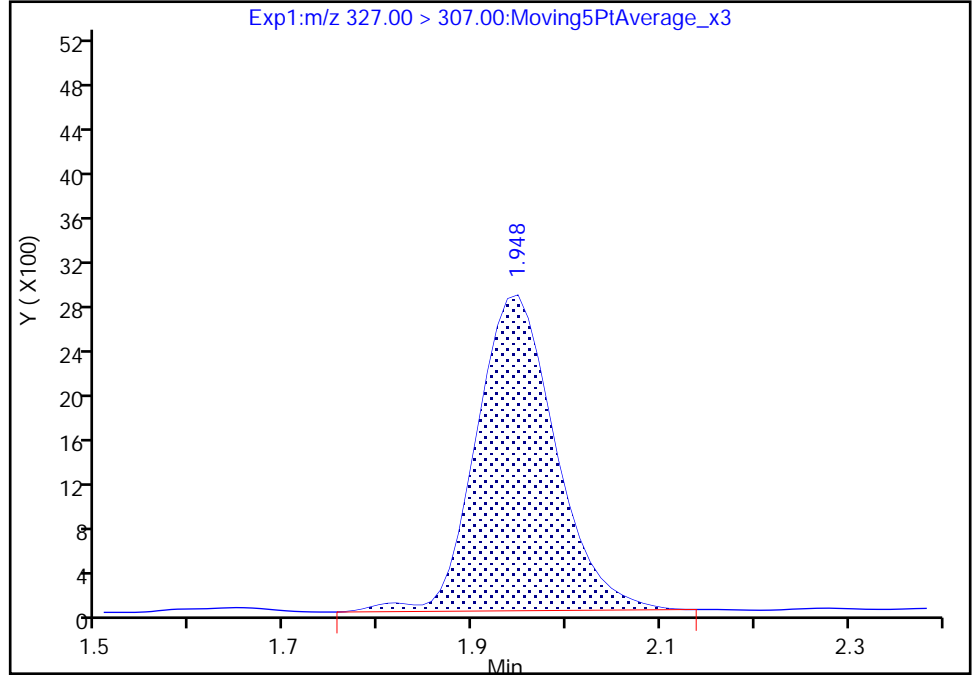
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
Injection Date: 22-Jun-2018 09:18:20 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

61 1H,1H,2H,2H-perfluorohexanesulfonic acid (4-, CAS: 757124-72-4

Signal: 1

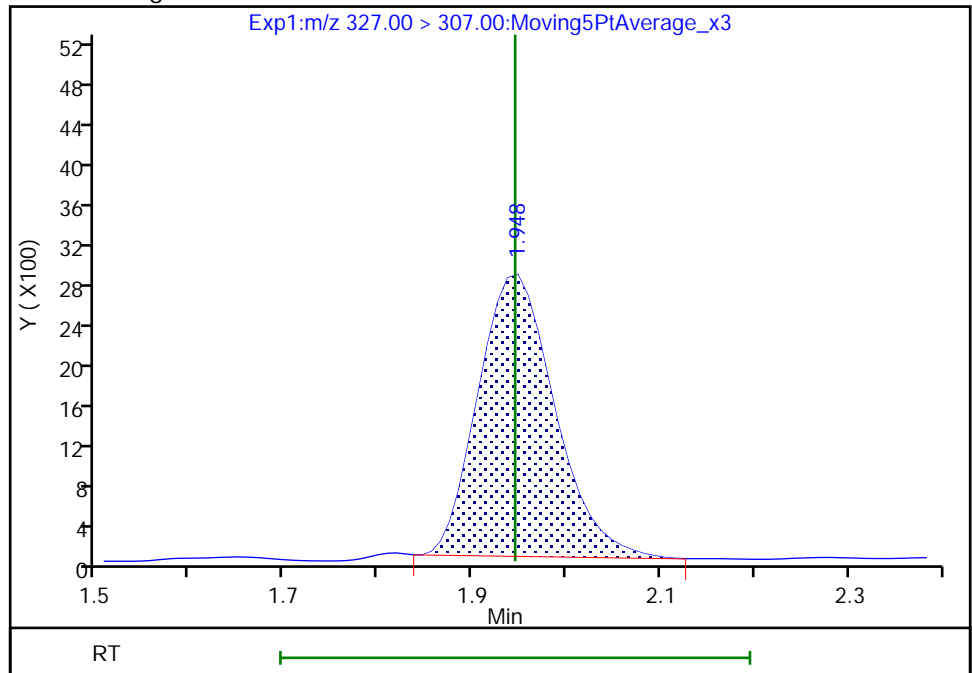
RT: 1.95
Area: 16612
Amount: 0.025908
Amount Units: ng/ml

Processing Integration Results



RT: 1.95
Area: 15935
Amount: 0.025803
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:11:20
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 511 of 864

TestAmerica Sacramento

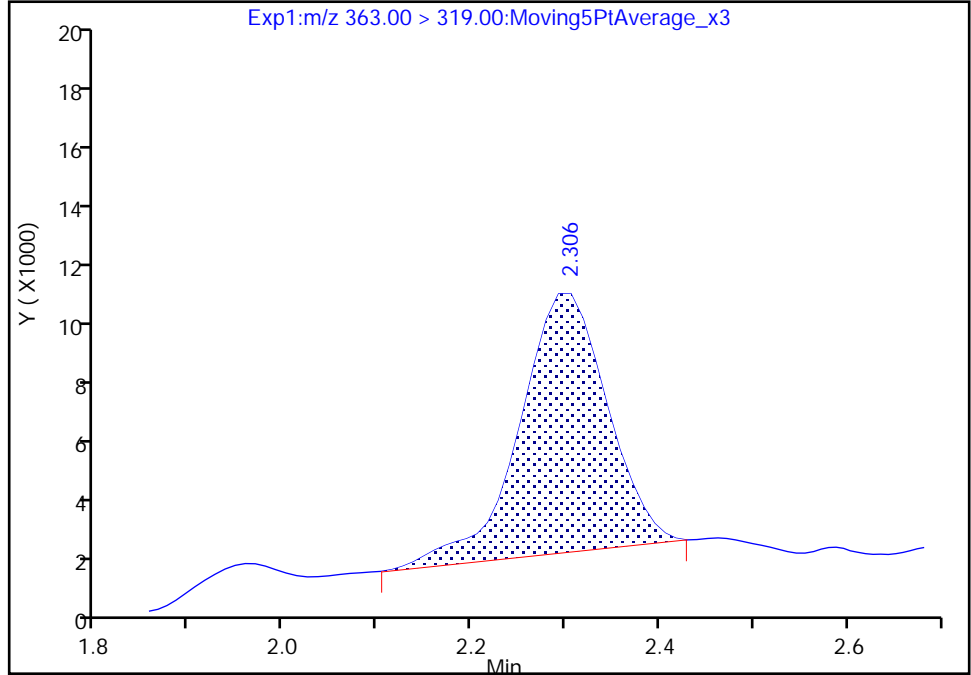
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
Injection Date: 22-Jun-2018 09:18:20 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

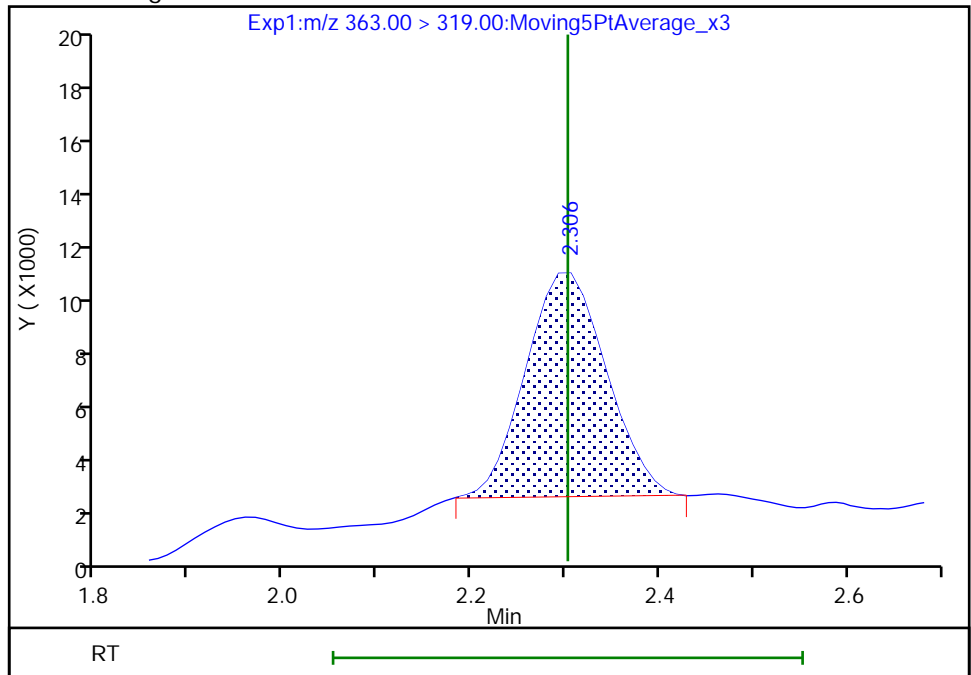
RT: 2.31
Area: 57888
Amount: 0.032321
Amount Units: ng/ml

Processing Integration Results



RT: 2.31
Area: 50637
Amount: 0.029459
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:11:31
Audit Action: Manually Integrated

TestAmerica Sacramento

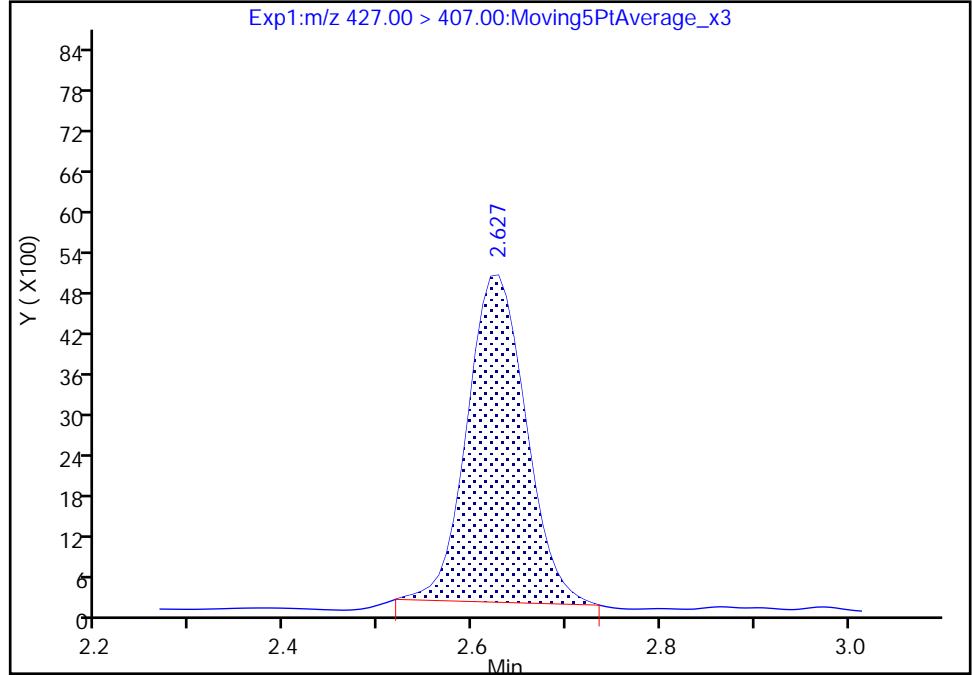
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
Injection Date: 22-Jun-2018 09:18:20 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

13 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:, CAS: 27619-97-2

Signal: 1

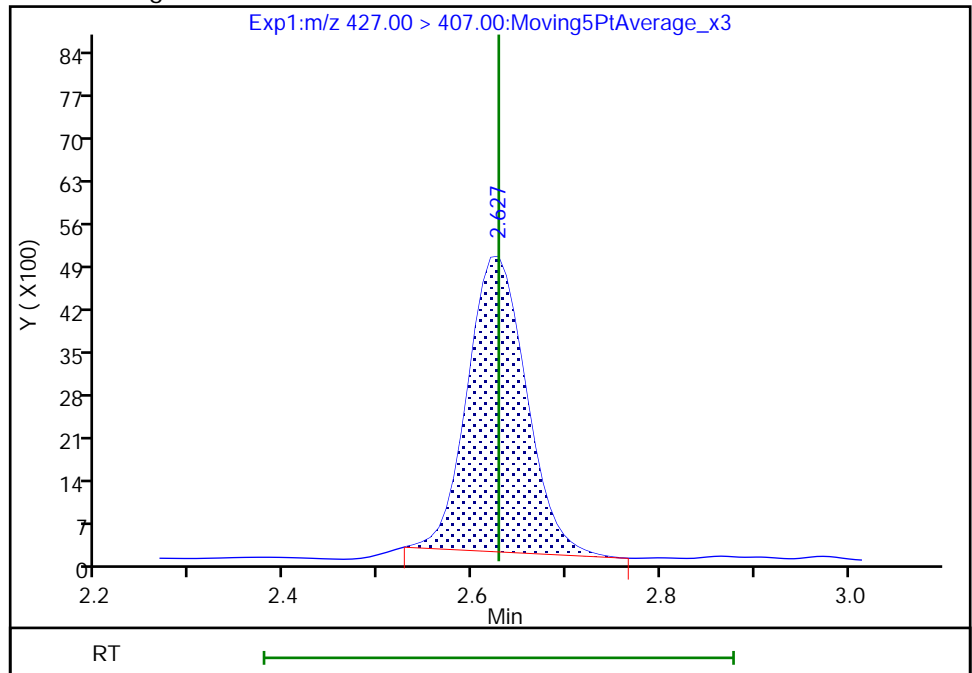
RT: 2.63
Area: 20967
Amount: 0.031007
Amount Units: ng/ml

Processing Integration Results



RT: 2.63
Area: 20950
Amount: 0.032660
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:30:44
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 513 of 864

TestAmerica Sacramento

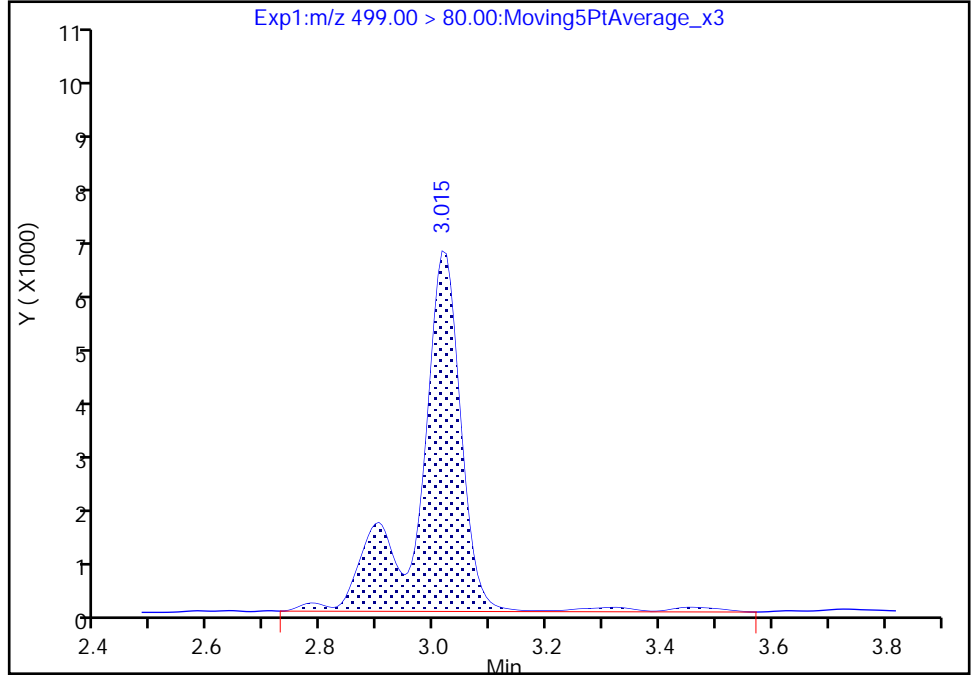
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
Injection Date: 22-Jun-2018 09:18:20 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

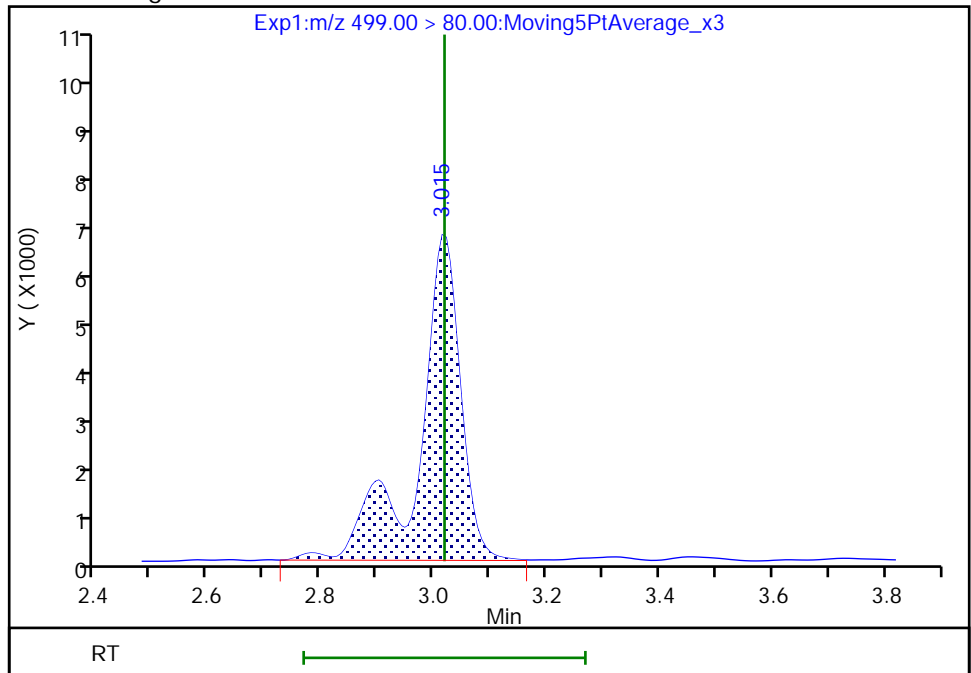
RT: 3.01
Area: 35201
Amount: 0.022320
Amount Units: ng/ml

Processing Integration Results



RT: 3.01
Area: 34198
Amount: 0.021548
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:10:51
Audit Action: Manually Integrated

TestAmerica Sacramento

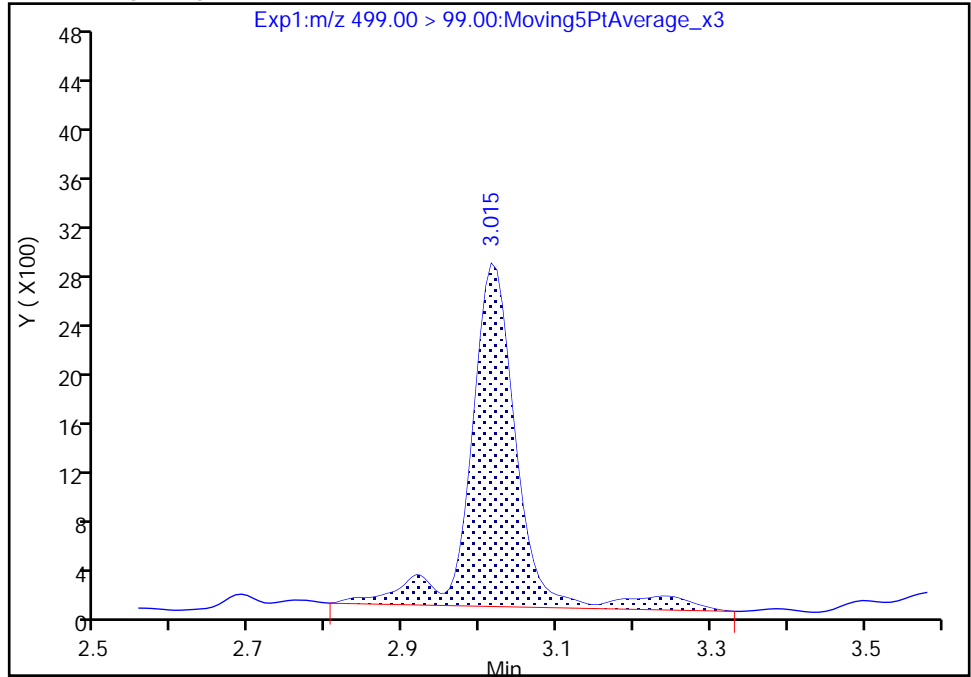
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
Injection Date: 22-Jun-2018 09:18:20 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

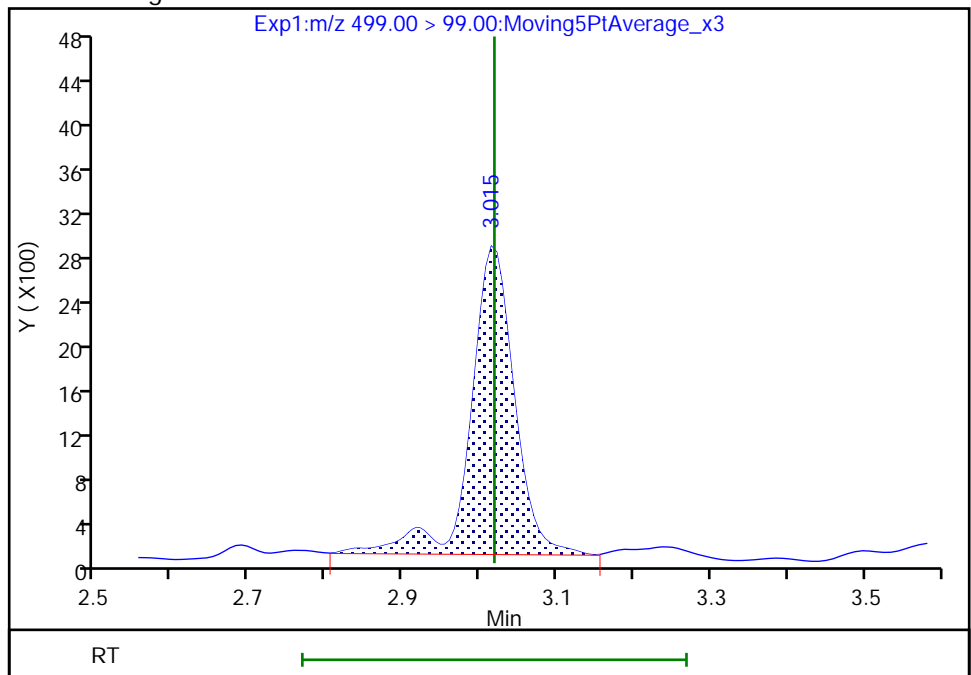
RT: 3.01
Area: 12009
Amount: 0.022320
Amount Units: ng/ml

Processing Integration Results



RT: 3.01
Area: 11078
Amount: 0.021548
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:10:58

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

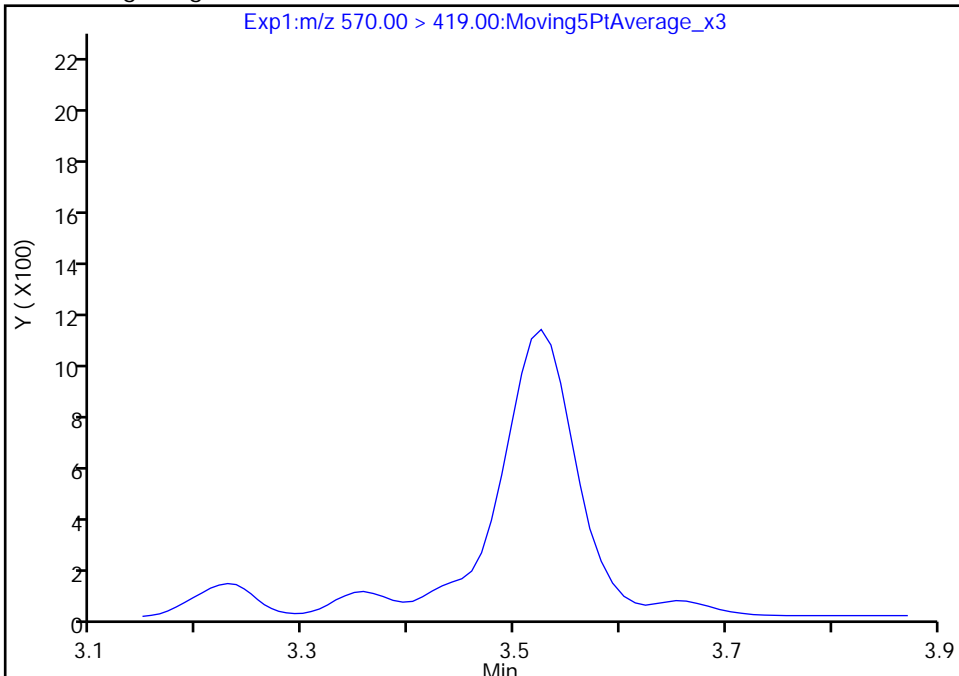
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
Injection Date: 22-Jun-2018 09:18:20 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

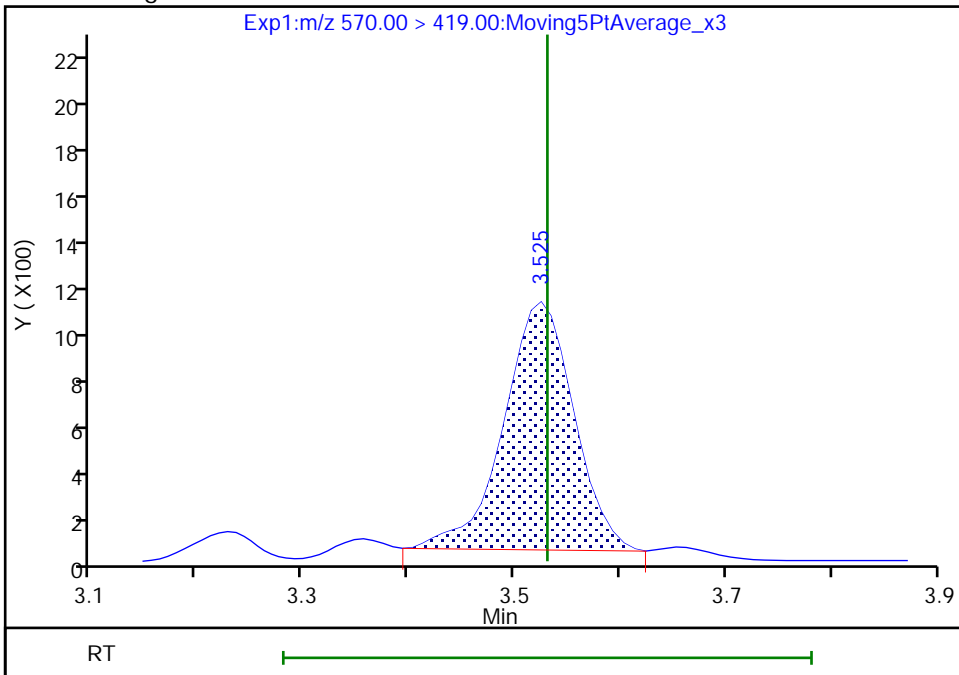
Not Detected
Expected RT: 3.53

Processing Integration Results



RT: 3.53
Area: 4957
Amount: 0.021046
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:11:52
Audit Action: Manually Integrated

Audit Reason: Assign Peak
Page 516 of 864

TestAmerica Sacramento

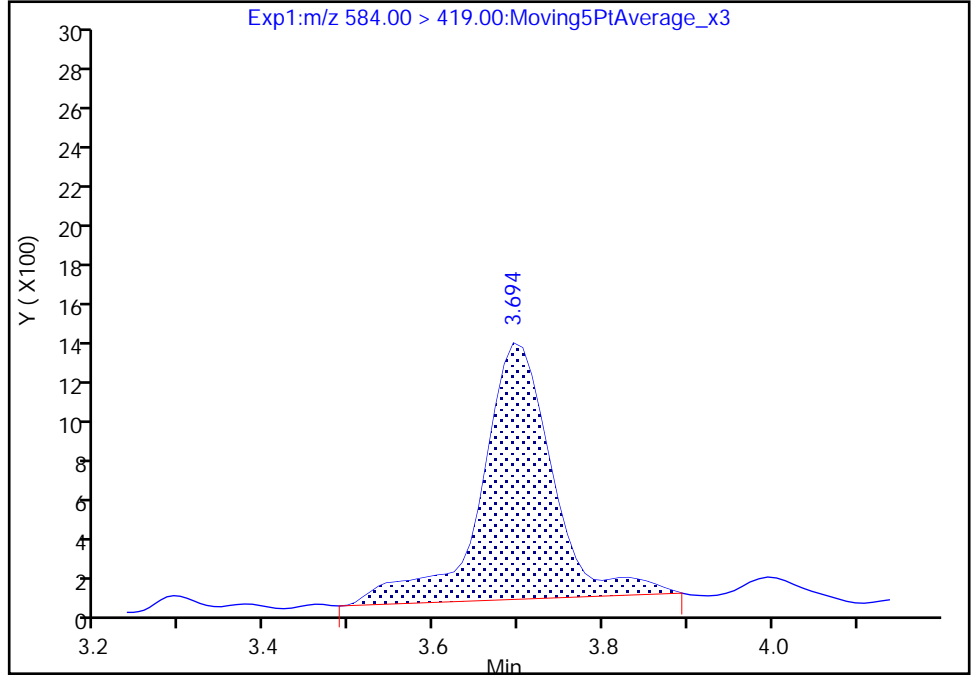
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_002.d
Injection Date: 22-Jun-2018 09:18:20 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

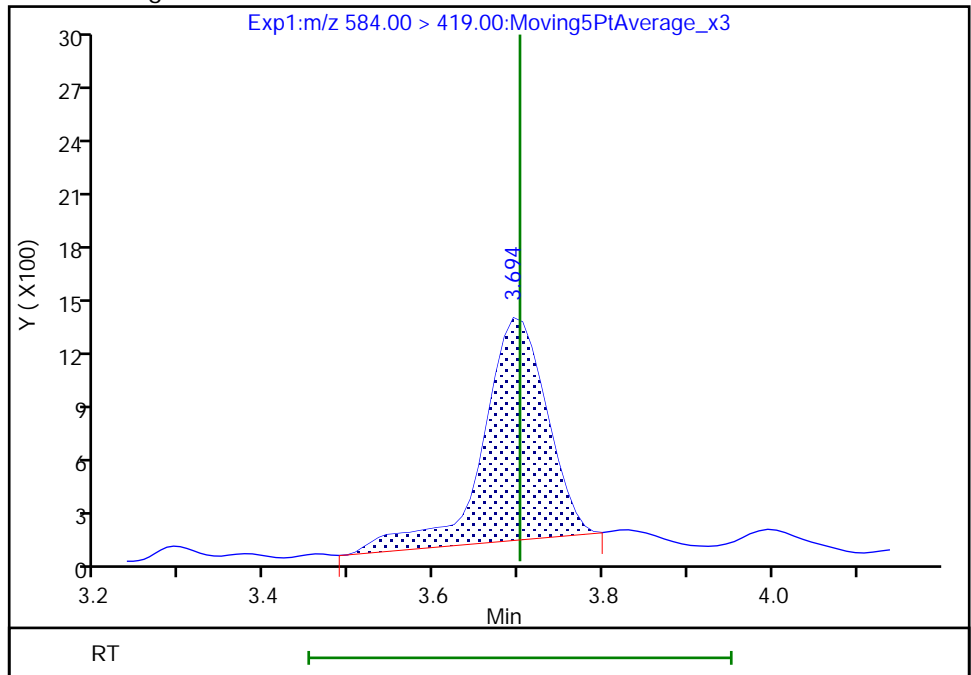
RT: 3.69
Area: 7793
Amount: 0.031319
Amount Units: ng/ml

Processing Integration Results



RT: 3.69
Area: 6725
Amount: 0.028497
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:17:41
Audit Action: Manually Integrated

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_003.d
 Lims ID: IC L2 Full
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 22-Jun-2018 09:26:09 ALS Bottle#: 11 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L2-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:44:54 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 10:17:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.444	1.435	0.009	0.542	5055585	2.47	98.9	25487	
2 Perfluorobutyric acid	212.90 > 169.00	1.444	1.437	0.007	1.000	101417	0.0499	99.8	34.0	
D 3 13C5-PFPeA	267.90 > 223.00	1.716	1.705	0.011	0.644	3726101	2.52	101	50255	
4 Perfluoropentanoic acid	262.90 > 219.00	1.716	1.707	0.009	1.000	96672	0.0533	107	39.8	
D 47 13C3-PFBS	301.90 > 83.00	1.753	1.740	0.012	0.657	85767	2.30	99.1	555	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.753	1.743	0.009	1.000	128130	0.0444	100	3426	
	298.90 > 99.00	1.753	1.743	0.009	1.000	54806	2.34(1.25-3.74)	100	779	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.956	1.945	0.011	1.116	27927	0.0456	97.7	967	
D 60 M2-4:2FTS	329.00 > 81.00	1.956	1.945	0.011	0.734	636108	NC		12524	
D 7 13C2 PFHxA	315.00 > 270.00	1.988	1.982	0.006	0.746	4105876	2.55	102	55087	
6 Perfluorohexanoic acid	313.00 > 269.00	2.000	1.984	0.016	1.006	79094	0.0459	91.8	122	
	313.00 > 119.00	1.988	1.984	0.004	1.000	7848	10.08(5.03-15.10)	91.8	112	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.011	2.004	0.007	1.147	123589	0.0470	100	3557	
	349.00 > 99.00	2.011	2.004	0.007	1.147	46961	2.63(1.36-4.07)	100	620	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.090	2.076	0.014	0.784	153047	NC		5374	

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	2.090	2.077	0.013	1.000	17433	NC	88.3	
D 9 13C4-PFHpA	367.00	> 322.00	2.316	2.301	0.015	0.869	3687398	2.53	101	38074
10 Perfluoroheptanoic acid	363.00	> 319.00	2.316	2.302	0.014	1.000	81982	0.0480	95.9	66.9
	363.00	> 169.00	2.316	2.302	0.014	1.000	31946	2.57(1.13-3.40)	95.9	261
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.329	2.314	0.015	1.000	110145	0.0472	104	1610
	399.00	> 99.00	2.329	2.314	0.015	1.000	40468	2.72(1.50-4.49)	104	146
D 11 18O2 PFHxS	403.00	> 84.00	2.329	2.314	0.015	0.874	4856023	2.33	98.4	36416
65 Adona	377.00	> 251.00	2.355	2.345	0.010	0.778	229078	NC		3504
	377.00	> 85.00	2.355	2.345	0.010	0.778	130737	1.75(0.84-2.53)		696
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.643	2.628	0.015	1.000	30024	0.0469	98.9	460
D 12 M2-6:2FTS	429.00	> 81.00	2.643	2.628	0.015	0.991	915348	2.42	102	16380
* 62 13C2-PFOA	415.00	> 370.00	2.666	2.654	0.012		3591244	2.50		44388
15 Perfluorooctanoic acid	413.00	> 369.00	2.666	2.654	0.012	1.000	105585	0.0619	124	39.2
	413.00	> 169.00	2.666	2.654	0.012	1.000	43756	2.41(0.84-2.52)	124	198
D 14 13C4 PFOA	417.00	> 372.00	2.666	2.654	0.012	1.000	3497172	2.54	101	30772
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.674	2.662	0.012	0.883	88572	0.0460	96.6	2979
	449.00	> 99.00	2.674	2.662	0.012	0.883	23838	3.72(1.94-5.82)	96.6	436
D 18 13C4 PFOS	503.00	> 80.00	3.027	3.018	0.010	1.135	3323626	2.40	100	39001
D 19 13C5 PFNA	468.00	> 423.00	3.027	3.018	0.009	1.135	2745740	2.53	101	33325
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.027	3.018	0.009	1.000	75835	0.0479	103	2500
	499.00	> 99.00	3.027	3.018	0.009	1.000	16324	4.65(2.31-6.93)	103	218
20 Perfluorononanoic acid	463.00	> 419.00	3.034	3.021	0.013	1.002	57337	0.0481	96.1	188
	463.00	> 169.00	3.034	3.021	0.013	1.002	13787	4.16(1.90-5.69)	96.1	600
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.242	3.230	0.012	1.071	113820	NC		1593
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.373	3.362	0.011	1.114	54007	0.0506	105	3034
	549.00	> 99.00	3.373	3.362	0.011	1.114	20098	2.69(1.33-3.97)	105	332
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.373	3.363	0.010	1.000	19597	0.0415	86.7	611
D 26 M2-8:2FTS	529.00	> 81.00	3.373	3.364	0.009	1.265	848789	2.47	103	15647

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.382	3.370	0.012	1.269	5054657	2.57		103	37369	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.382	3.371	0.011	1.000	100861	0.0496		99.1	2059	
D 23 13C2 PFDA										
515.00 > 470.00	3.391	3.376	0.015	1.272	2085206	2.53		101	26913	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.391	3.378	0.013	1.000	43347	0.0512		102	102	
513.00 > 169.00	3.391	3.378	0.013	1.000	8336		5.20(2.36-7.09)	102	223	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.541	3.528	0.013	1.328	601308	2.38		95.2	16443	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.541	3.531	0.010	1.000	12404	0.0521		104	138	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.700	3.686	0.014	1.222	38516	0.0429		88.9	2624	
599.00 > 99.00	3.700	3.686	0.014	1.222	12811		3.01(1.39-4.16)	88.9	250	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.711	3.697	0.014	1.392	640803	2.46		98.3	3501	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.711	3.702	0.009	1.000	20596	0.0403		80.5	64.2	M
563.00 > 169.00	3.711	3.702	0.009	1.000	8424		2.44(2.12-6.36)	80.5	344	M
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.711	3.702	0.009	1.000	12753	0.0536		107	240	
D 30 13C2 PFUnA										
565.00 > 520.00	3.711	3.702	0.009	1.392	1589901	2.50		100	21797	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.868	3.860	0.008	1.278	160290	NC			4785	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.010	3.995	0.015	1.000	33622	0.0526		105	10.7	
613.00 > 169.00	4.010	3.995	0.015	1.000	8648		3.89(2.13-6.40)	105	257	
D 36 13C2 PFDaA										
615.00 > 570.00	4.010	3.995	0.015	1.504	1510879	2.36		94.4	13127	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.263	4.254	0.009	1.063	29402	0.0523		105	8.5	
663.00 > 169.00	4.263	4.254	0.009	1.063	11111		2.65(1.25-3.76)	105	96.1	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.501	4.490	0.011	1.000	8429	0.0565		113	187	
713.00 > 219.00	4.490	4.490	0.0	0.998	6076		1.39(0.71-2.13)	113	125	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.501	4.490	0.011	1.688	1454197	2.46		98.5	5795	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.904	4.894	0.010	1.840	2476240	2.48		99.1	5340	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.904	4.895	0.009	1.000	76743	NC			10.2	
813.00 > 169.00	4.904	4.895	0.009	1.000	11992		6.40(2.86-8.58)		88.8	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.247	5.239	0.008	1.070	57332	NC			21.7	
913.00 > 169.00	5.247	5.239	0.008	1.070	7894		7.26(3.83-11.48)		111	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

[Reagents:](#)

LCPFC_LL2_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_003.d

Injection Date: 22-Jun-2018 09:26:09

Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 11

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

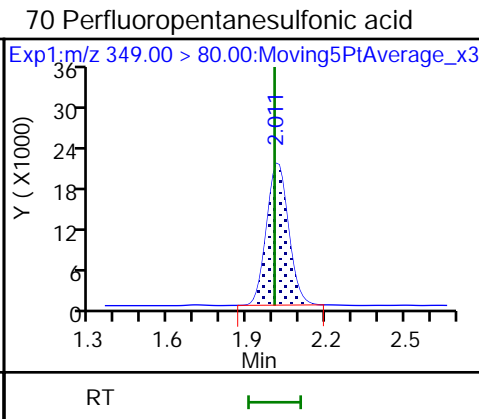
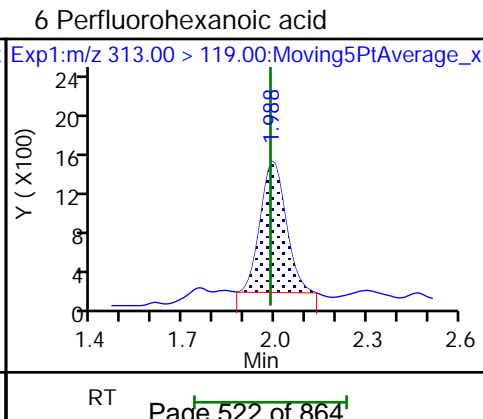
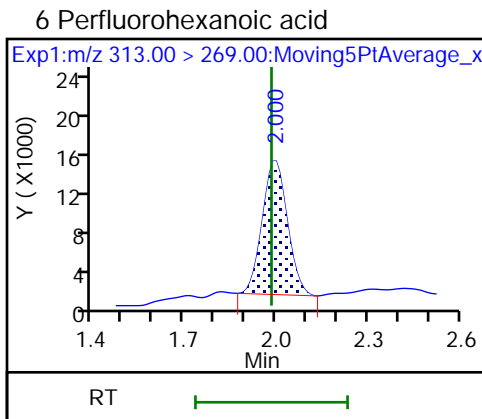
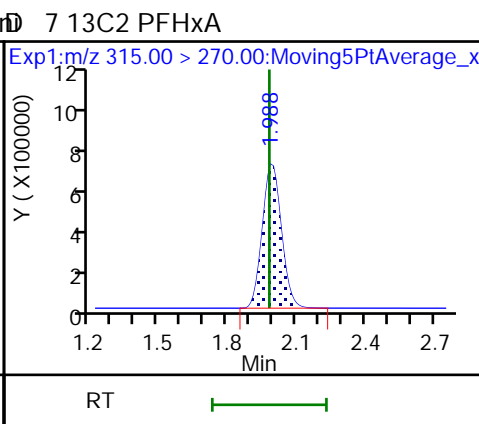
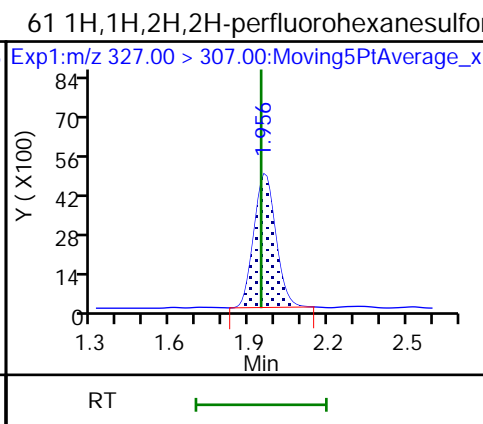
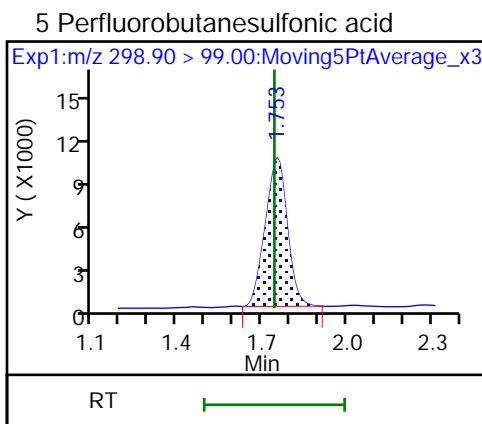
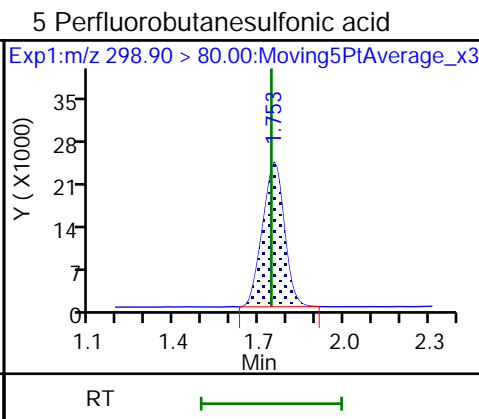
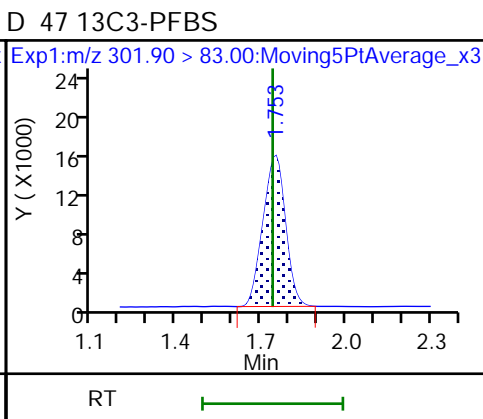
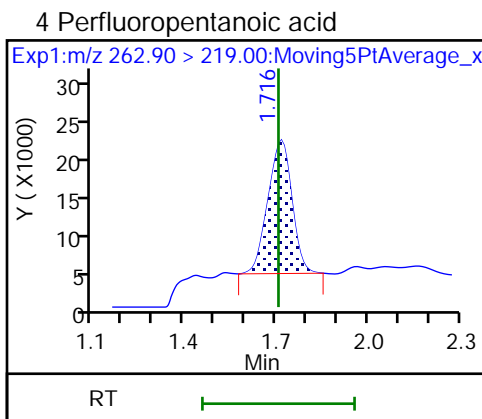
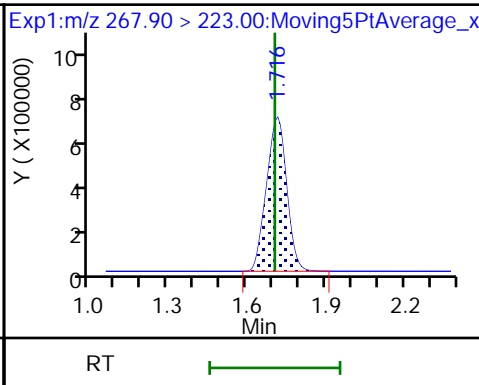
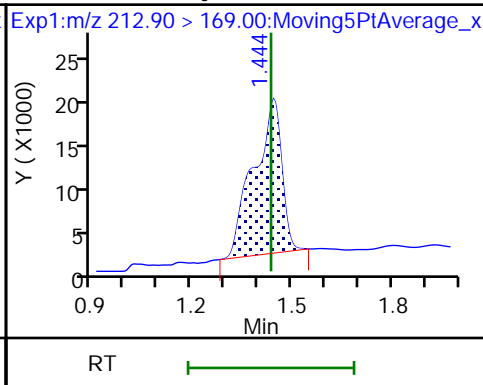
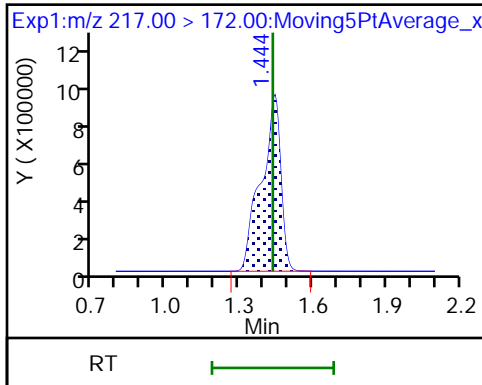
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

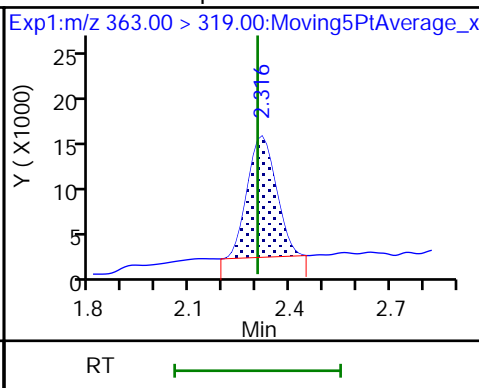
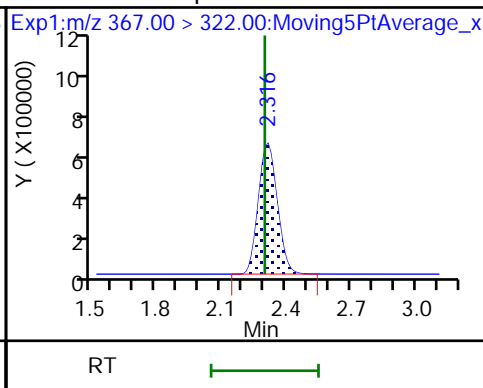
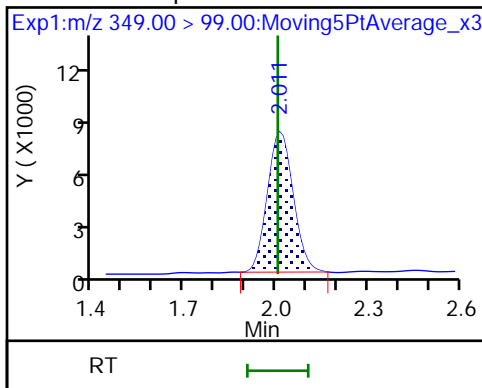
D 3 13C5-PFPeA



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

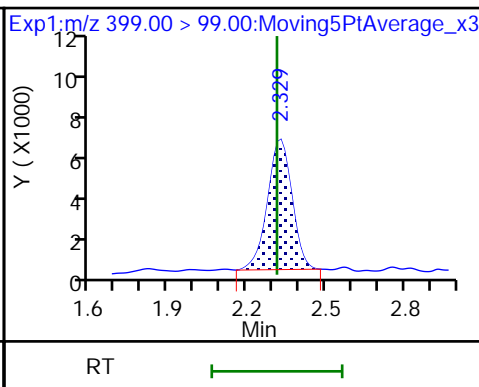
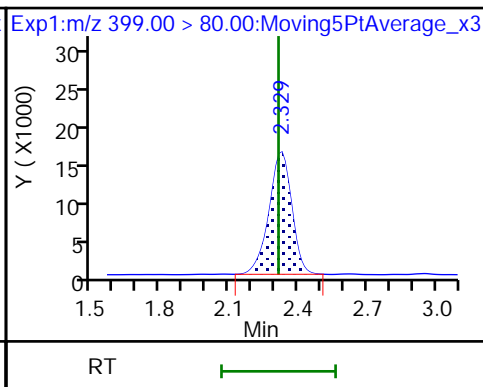
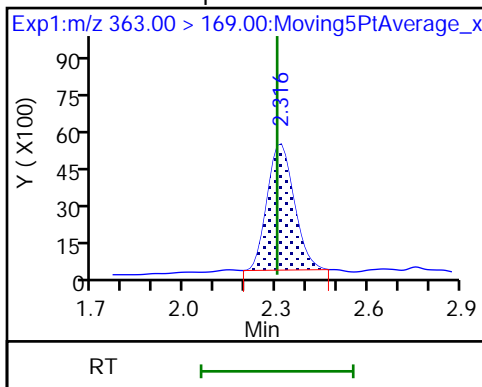
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

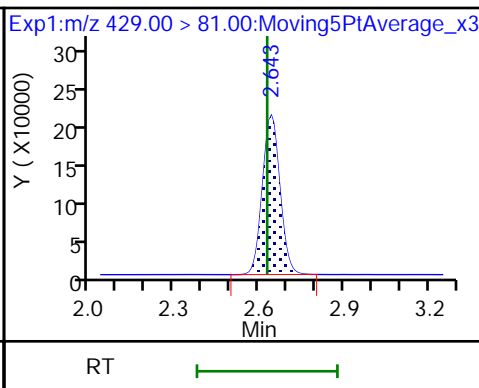
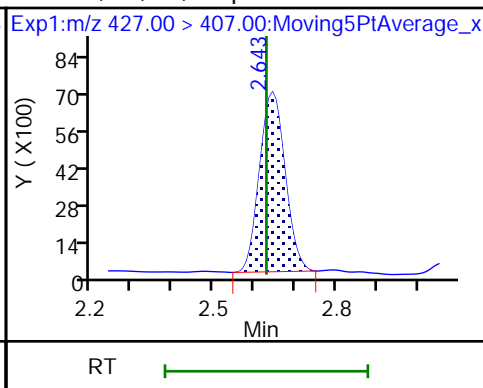
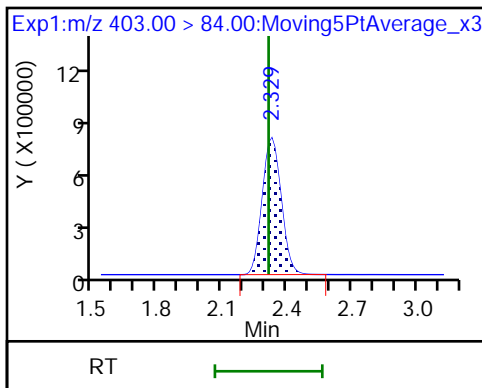
8 Perfluorohexanesulfonic acid

8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

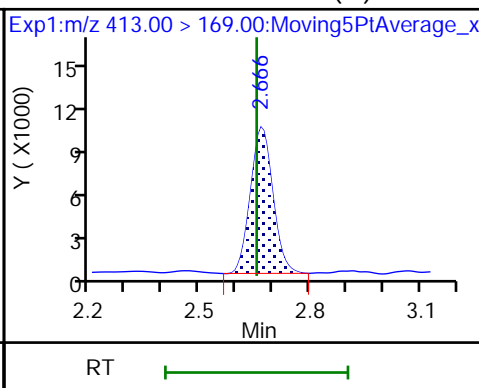
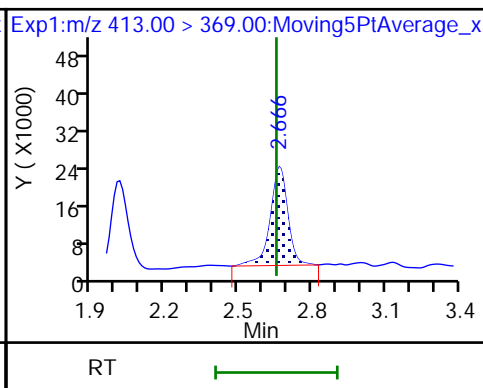
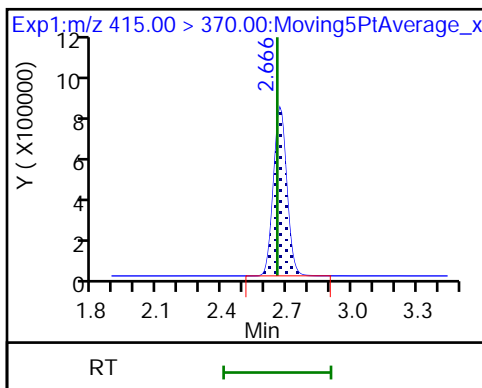
13 1H,1H,2H,2H-perfluorooctanesulfonD 12 M2-6:2FTS



* 62 13C2-PFOA

15 Perfluorooctanoic acid

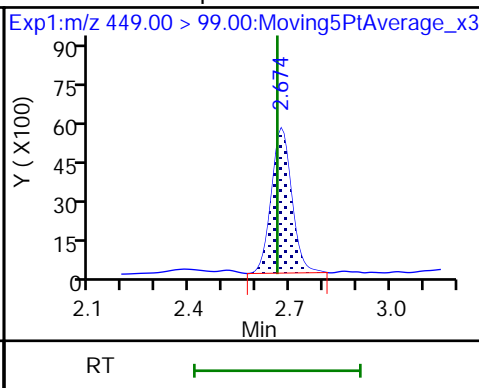
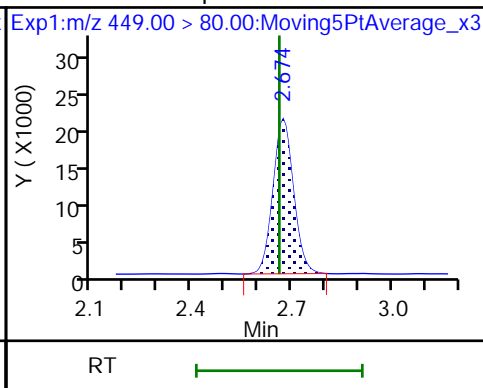
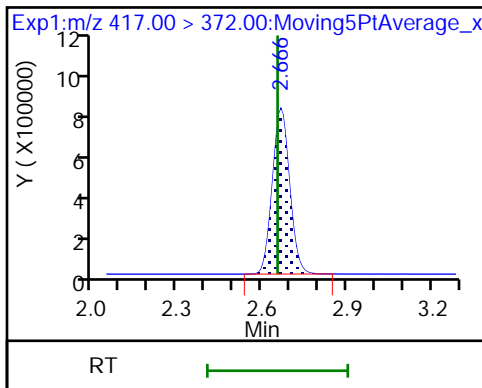
15 Perfluorooctanoic acid (M)



D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

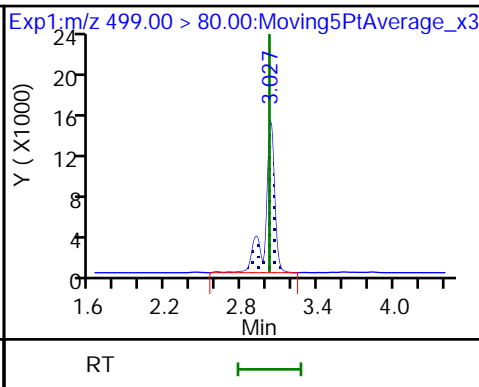
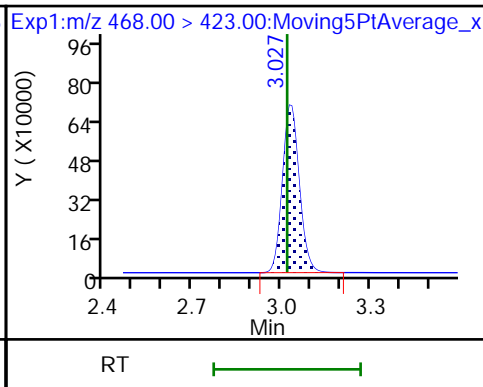
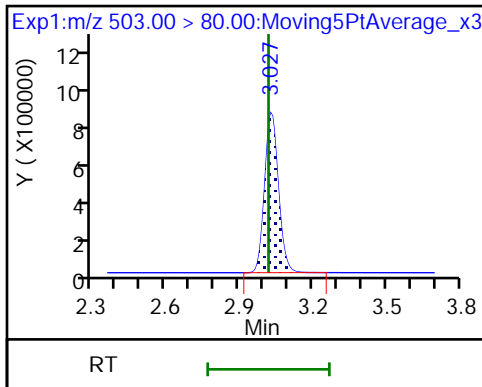
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

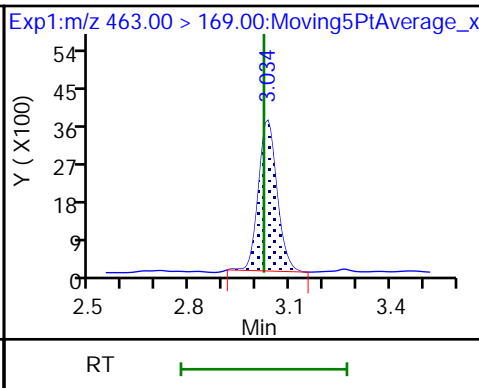
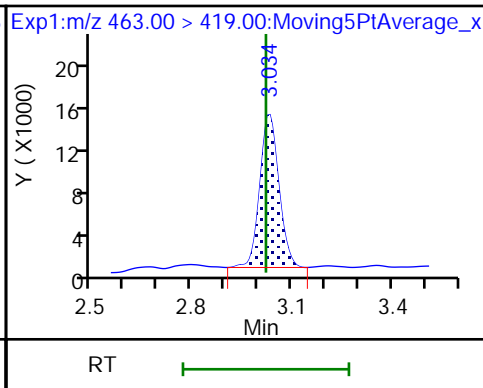
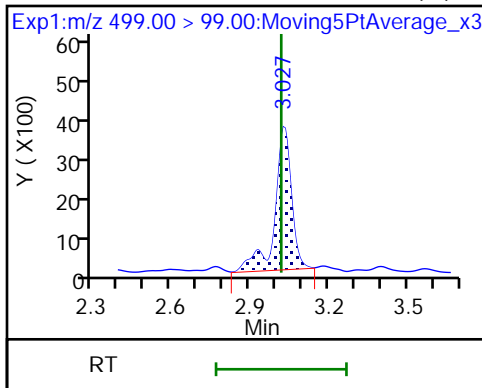
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid (M)

20 Perfluorononanoic acid

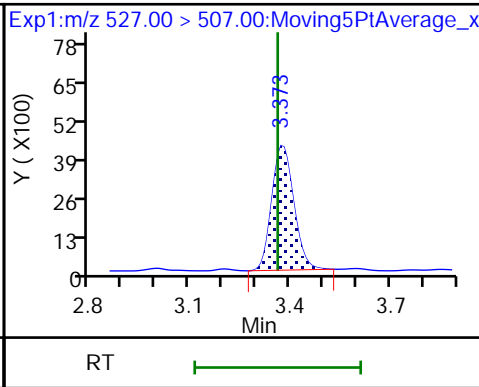
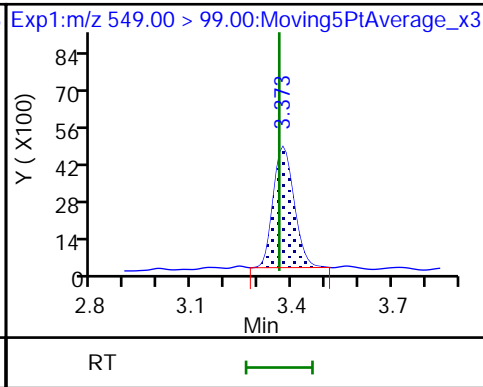
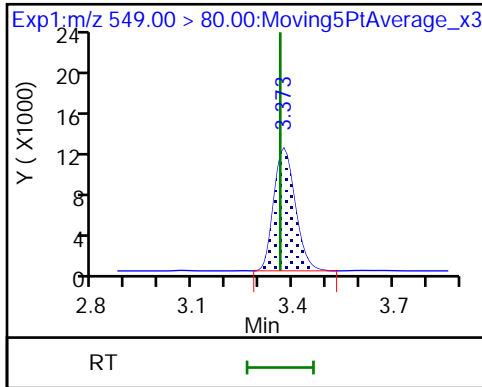
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

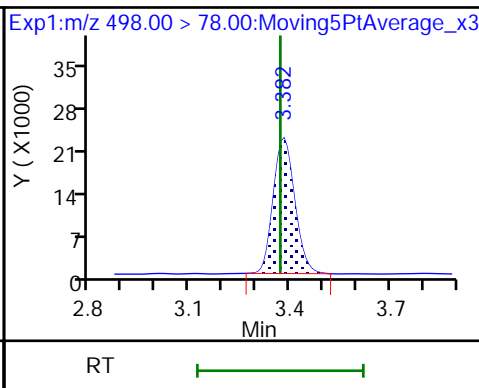
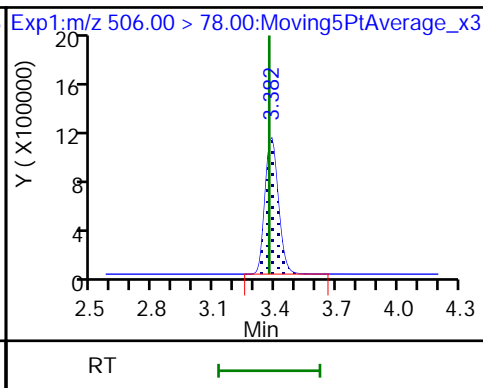
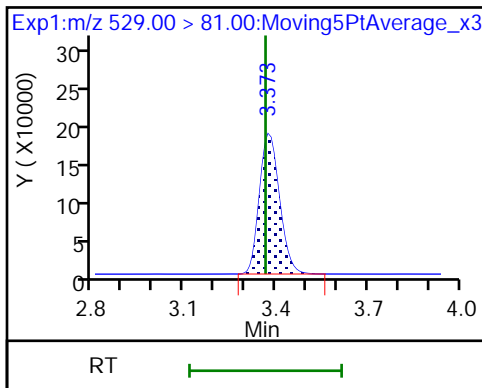
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

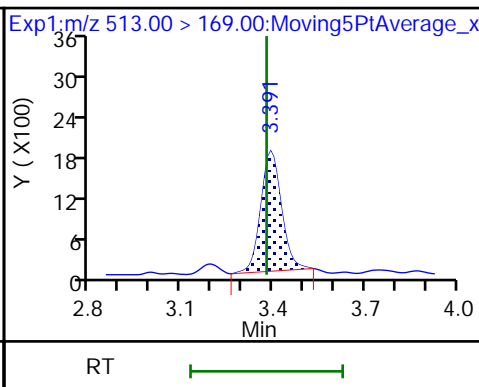
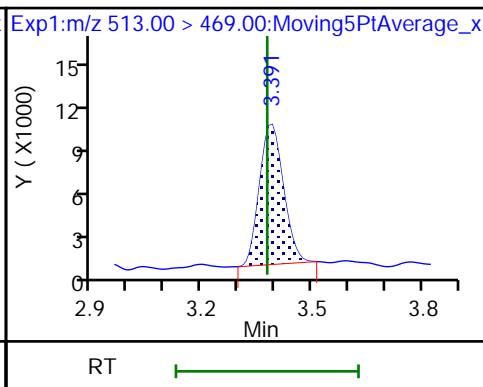
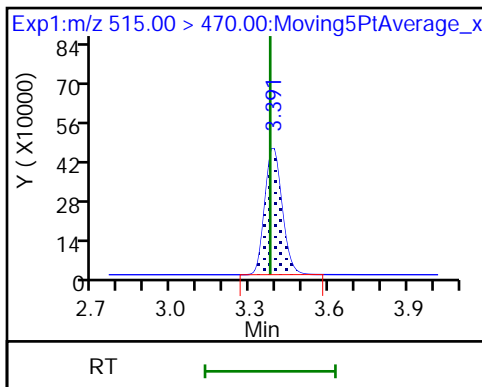
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid

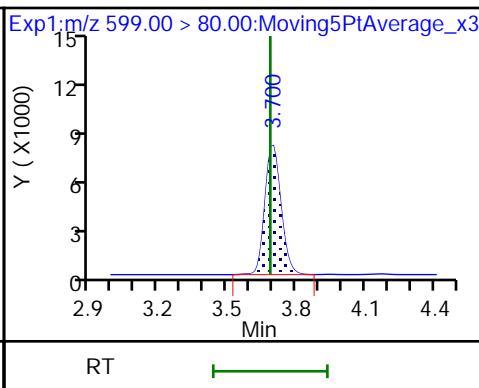
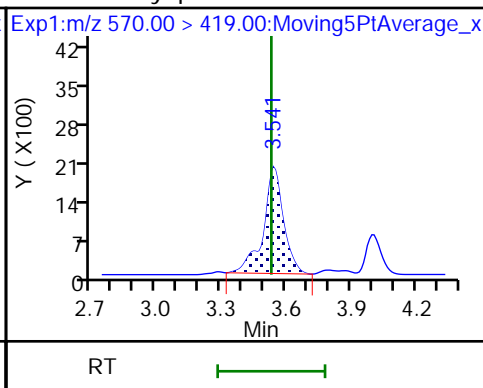
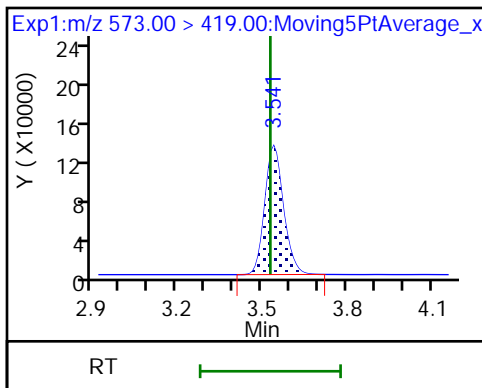
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

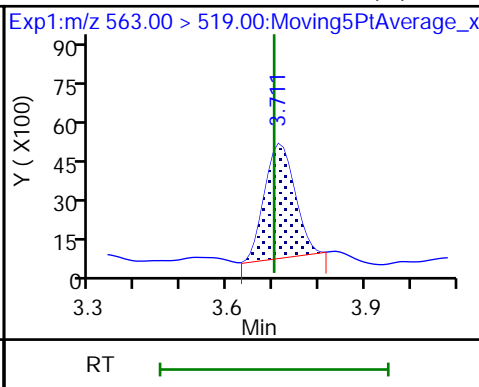
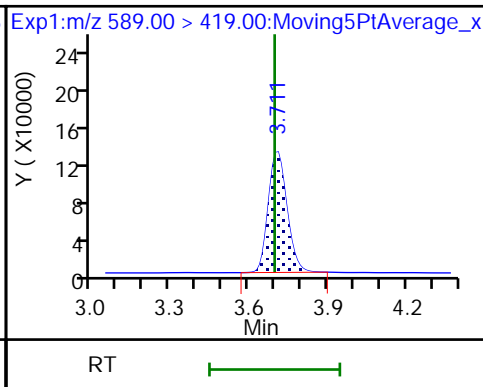
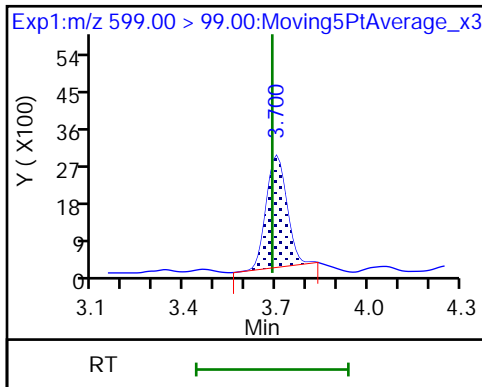
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

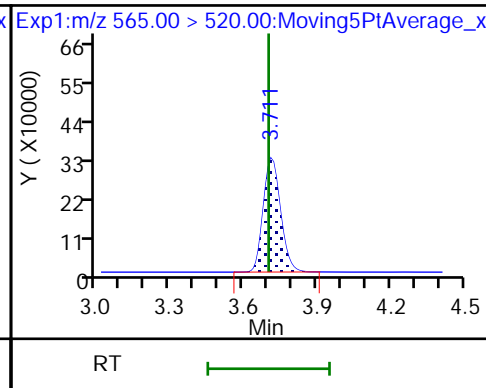
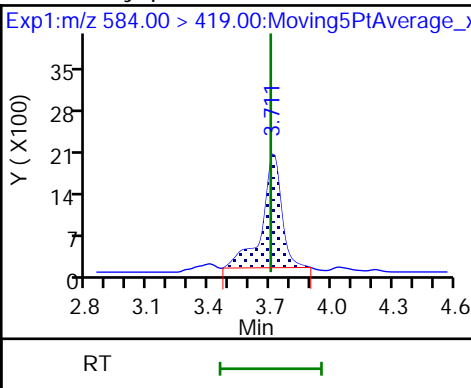
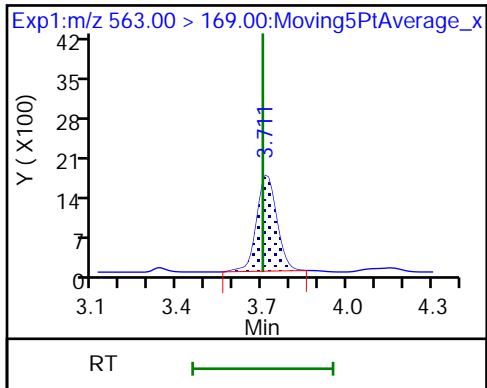
D 32 d5-NEtFOSAA

31 Perfluoroundecanoic acid (M)



31 Perfluoroundecanoic acid

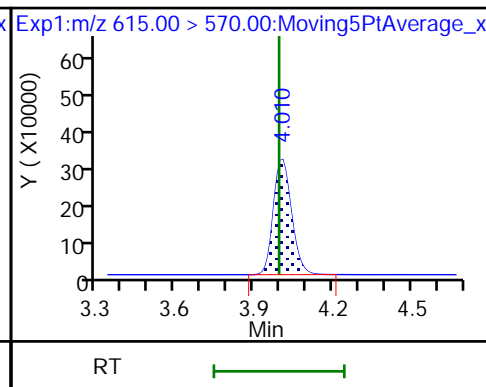
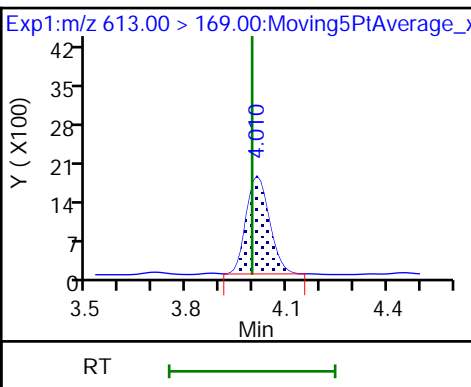
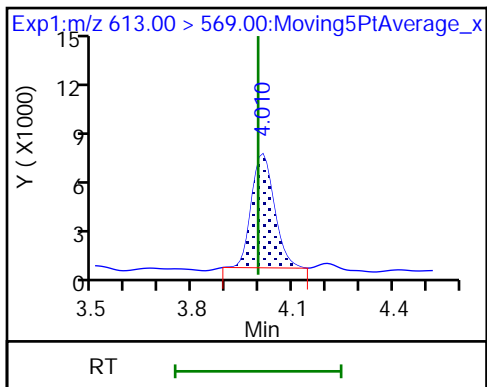
33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

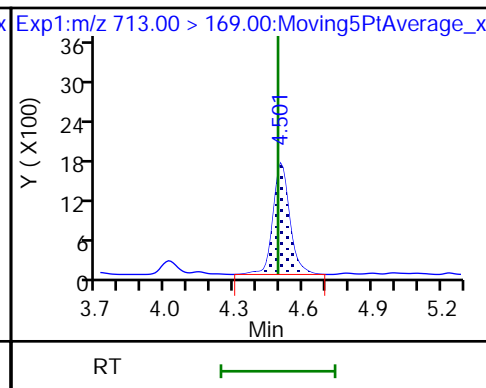
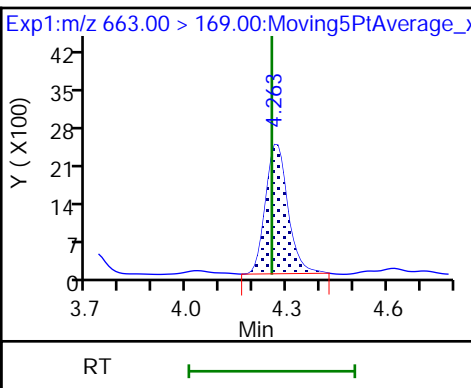
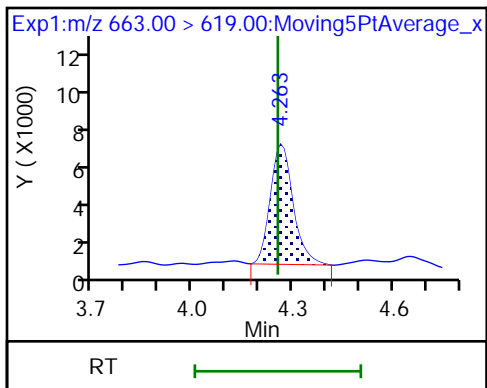
D 36 13C2 PFDa



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

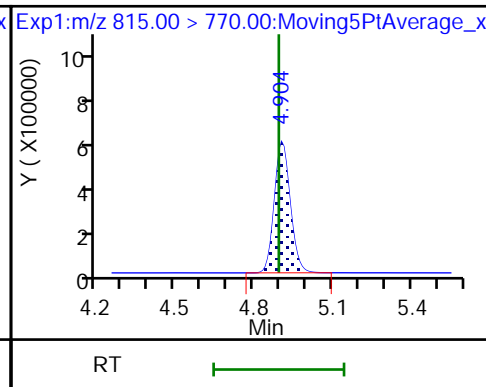
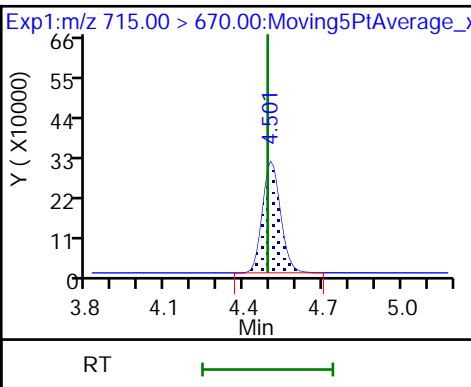
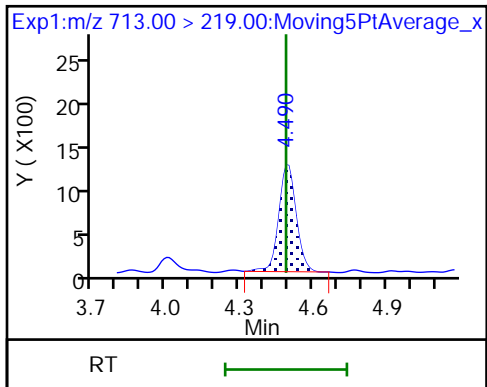
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento

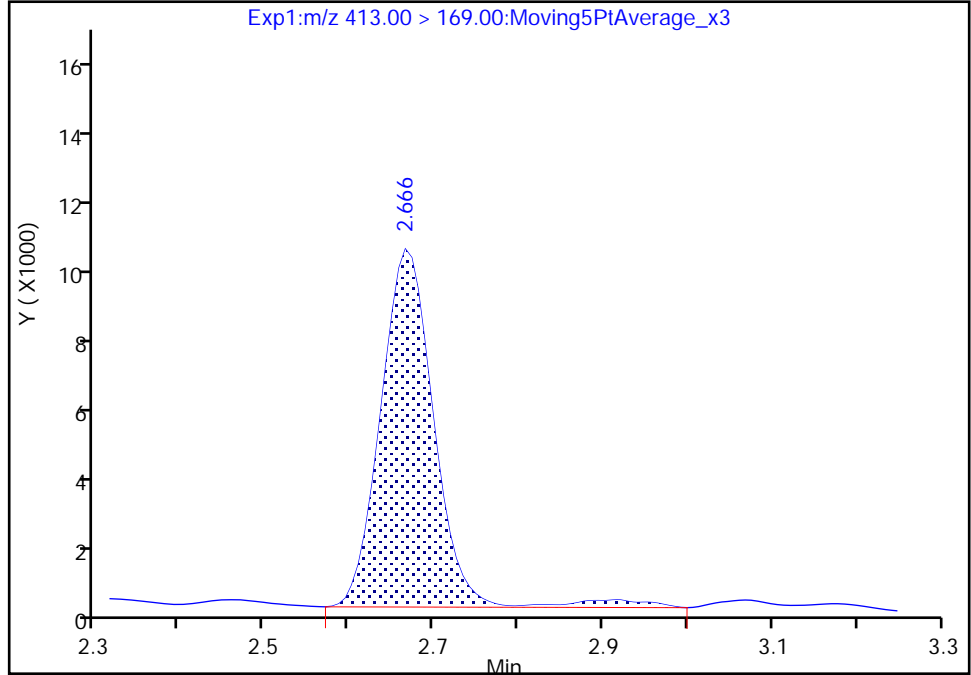
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_003.d
Injection Date: 22-Jun-2018 09:26:09 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

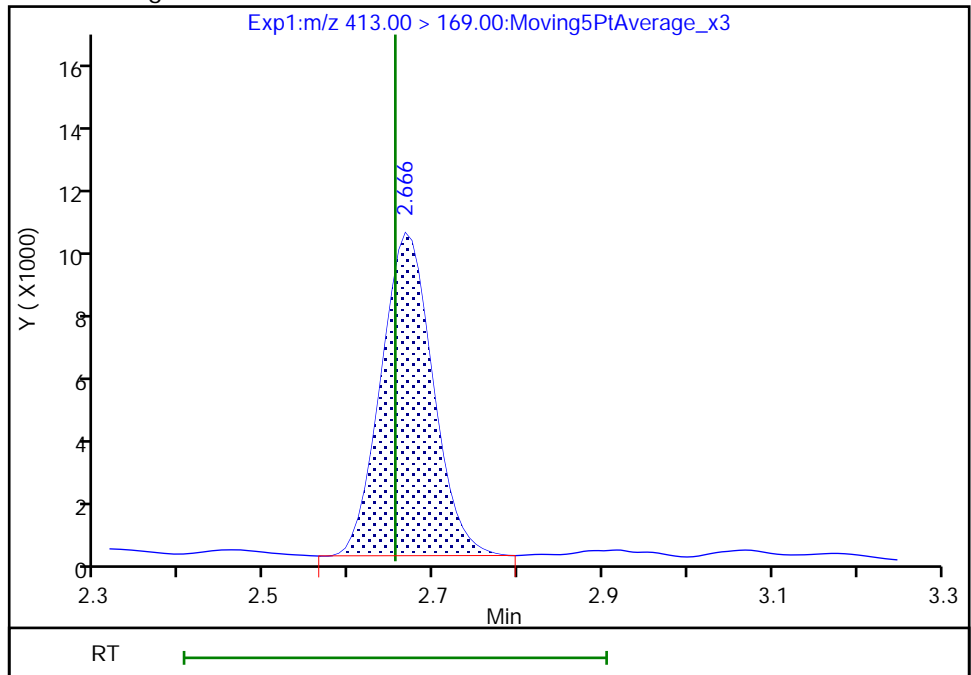
RT: 2.67
Area: 45512
Amount: 0.054623
Amount Units: ng/ml

Processing Integration Results



RT: 2.67
Area: 43756
Amount: 0.061860
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:14:00
Audit Action: Manually Integrated

TestAmerica Sacramento

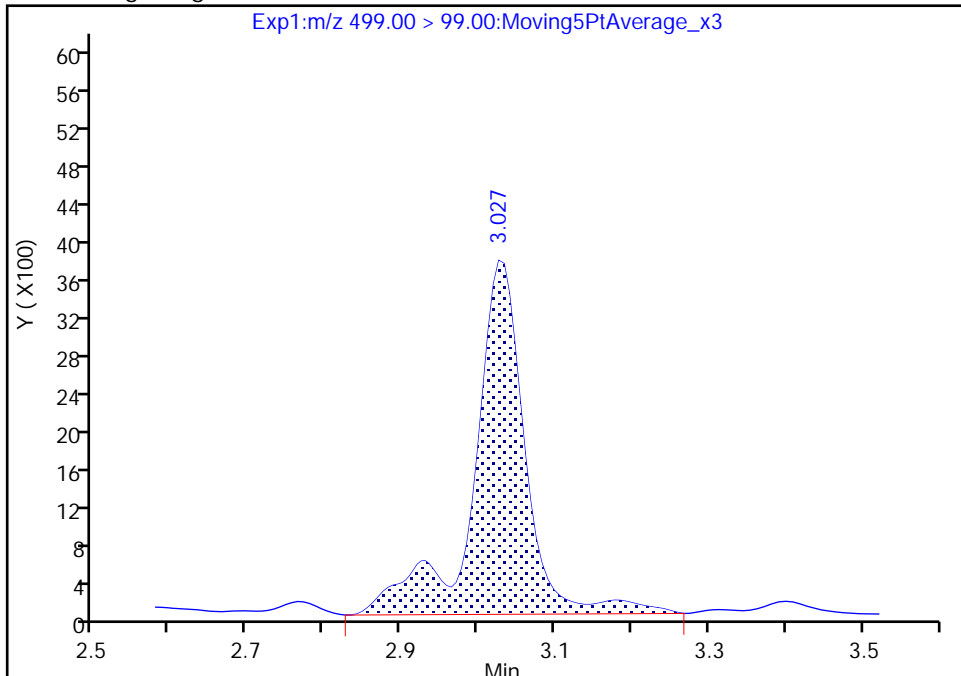
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_003.d
Injection Date: 22-Jun-2018 09:26:09 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

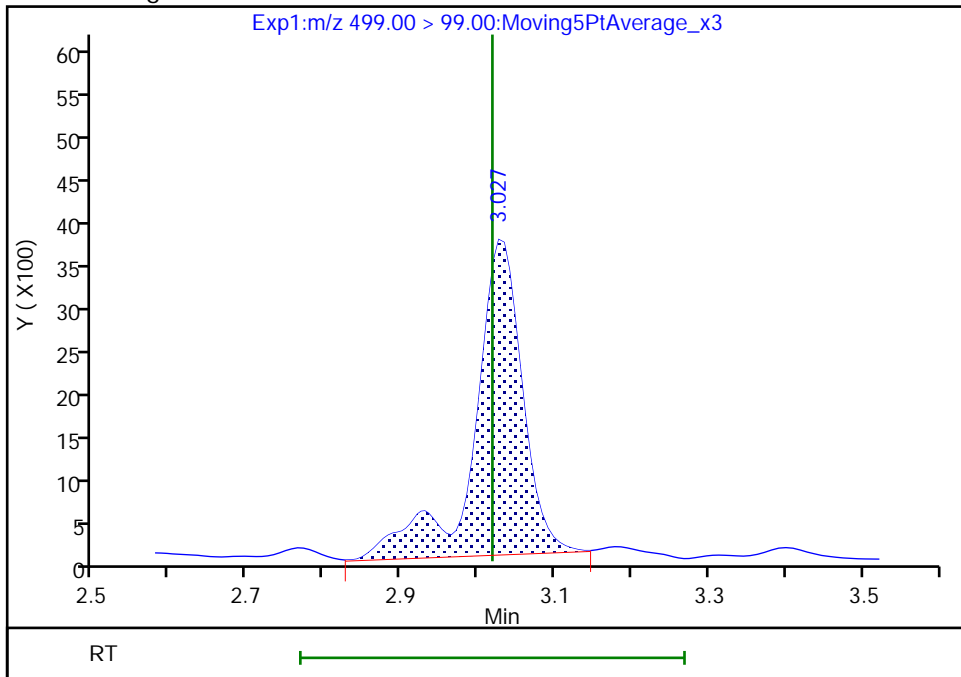
RT: 3.03
Area: 17692
Amount: 0.048510
Amount Units: ng/ml

Processing Integration Results



RT: 3.03
Area: 16324
Amount: 0.047942
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:14:10
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 529 of 864

TestAmerica Sacramento

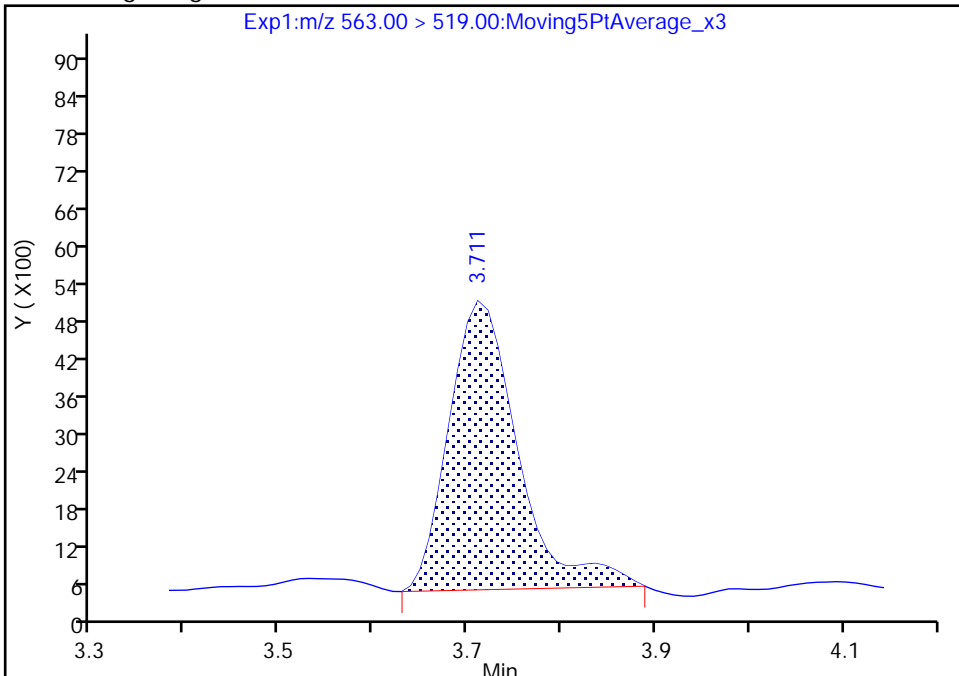
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_003.d
Injection Date: 22-Jun-2018 09:26:09 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

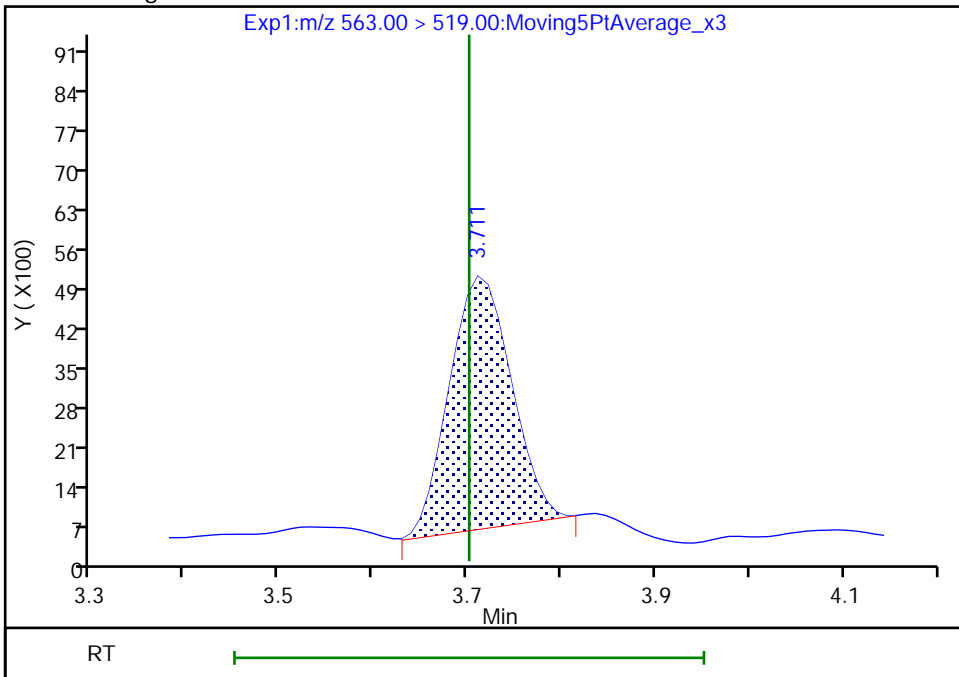
RT: 3.71
Area: 23519
Amount: 0.044724
Amount Units: ng/ml

Processing Integration Results



RT: 3.71
Area: 20596
Amount: 0.040252
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:16:03
Audit Action: Manually Integrated

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_004.d
 Lims ID: IC L3 Full
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 22-Jun-2018 09:33:58 ALS Bottle#: 12 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L3-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:44:58 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 10:19:28

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	1.435	1.435	0.0	0.541	5029706	2.43	97.2	26530	
2 Perfluorobutyric acid	212.90 > 169.00	1.435	1.437	-0.002	1.000	494056	0.2442	97.7	179	
D 3 13C5-PFPeA	267.90 > 223.00	1.711	1.705	0.005	0.645	3706517	2.48	99.2	37558	
4 Perfluoropentanoic acid	262.90 > 219.00	1.711	1.707	0.003	1.000	426389	0.2365	94.6	165	
D 47 13C3-PFBS	301.90 > 83.00	1.738	1.740	-0.002	0.655	86423	2.29	98.7	582	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.747	1.743	0.004	1.005	628678	0.2160	97.7	11577	
	298.90 > 99.00	1.747	1.743	0.004	1.005	268447	2.34(1.25-3.74)	97.7	4109	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.948	1.945	0.003	1.121	147810	0.2397	103	5358	
D 60 M2-4:2FTS	329.00 > 81.00	1.948	1.945	0.003	0.735	611035	NC		9052	
D 7 13C2 PFHxA	315.00 > 270.00	1.980	1.982	-0.002	0.747	4200709	2.58	103	66861	
6 Perfluorohexanoic acid	313.00 > 269.00	1.980	1.984	-0.004	1.000	412137	0.2337	93.5	768	
	313.00 > 119.00	1.991	1.984	0.007	1.005	39958	10.31(5.03-15.10)	93.5	589	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.003	2.004	-0.001	1.153	596678	0.2251	96.0	13027	
	349.00 > 99.00	2.003	2.004	-0.001	1.153	237207	2.52(1.36-4.07)	96.0	3761	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.070	2.076	-0.006	0.781	126034	NC		3656	

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	2.082	2.077	0.005	1.005	65026	NC	309	
D 9 13C4-PFHpA	367.00	> 322.00	2.306	2.301	0.005	0.869	3816037	2.58	103	36863
10 Perfluoroheptanoic acid	363.00	> 319.00	2.306	2.302	0.004	1.000	411542	0.2327	93.1	317
	363.00	> 169.00	2.306	2.302	0.004	1.000	153524	2.68(1.13-3.40)	93.1	1483
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.319	2.314	0.005	1.000	522113	0.2125	93.4	5672
	399.00	> 99.00	2.319	2.314	0.005	1.000	186360	2.80(1.50-4.49)	93.4	749
D 11 18O2 PFHxS	403.00	> 84.00	2.319	2.314	0.005	0.874	5110525	2.42	102	52630
65 Adona	377.00	> 251.00	2.345	2.345	0.0	0.778	1080173	NC	11340	
	377.00	> 85.00	2.345	2.345	0.0	0.778	645735	1.67(0.84-2.53)	3591	
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.628	2.628	0.0	1.000	154417	0.2418	102	2098
D 12 M2-6:2FTS	429.00	> 81.00	2.628	2.628	0.0	0.991	912462	2.39	101	16028
* 62 13C2-PFOA	415.00	> 370.00	2.652	2.654	-0.002		3634132	2.50	36483	
15 Perfluorooctanoic acid	413.00	> 369.00	2.652	2.654	-0.002	1.000	442141	0.2604	104	235
	413.00	> 169.00	2.652	2.654	-0.002	1.000	209052	2.11(0.84-2.52)	104	1053
D 14 13C4 PFOA	417.00	> 372.00	2.652	2.654	-0.002	1.000	3478825	2.49	99.7	47749
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.659	2.662	-0.003	0.882	456597	0.2392	100	11850
	449.00	> 99.00	2.659	2.662	-0.003	0.882	120076	3.80(1.94-5.82)	100	3163
D 18 13C4 PFOS	503.00	> 80.00	3.015	3.018	-0.002	1.137	3292910	2.35	98.1	44621
D 19 13C5 PFNA	468.00	> 423.00	3.022	3.018	0.004	1.139	2735161	2.49	99.5	41151
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.022	3.018	0.004	1.002	352073	0.2247	96.8	13545
	499.00	> 99.00	3.022	3.018	0.004	1.002	81265	4.33(2.31-6.93)	96.8	1016
20 Perfluorononanoic acid	463.00	> 419.00	3.022	3.021	0.001	1.000	298376	0.2511	100	1061
	463.00	> 169.00	3.022	3.021	0.001	1.000	72933	4.09(1.90-5.69)	100	2754
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.228	3.230	-0.002	1.071	543981	NC	9560	
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.366	3.362	0.004	1.117	249818	0.2363	98.5	14019
	549.00	> 99.00	3.366	3.362	0.004	1.117	85136	2.93(1.33-3.97)	98.5	1087
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.366	3.363	0.003	1.000	108875	0.2269	94.7	2673
D 26 M2-8:2FTS	529.00	> 81.00	3.366	3.364	0.002	1.269	863118	2.49	104	16286

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.366	3.370	-0.004	1.269	5105100	2.56		102	25962	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.366	3.371	-0.005	1.000	506378	0.2464		98.6	11317	
D 23 13C2 PFDA										
515.00 > 470.00	3.376	3.376	0.0	1.273	2182998	2.62		105	28849	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.376	3.378	-0.002	1.000	227358	0.2568		103	537	
513.00 > 169.00	3.376	3.378	-0.002	1.000	37648		6.04(2.36-7.09)	103	1049	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.525	3.528	-0.003	1.329	646446	2.53		101	17558	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.534	3.531	0.003	1.003	59968	0.2345		93.8	876	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.683	3.686	-0.003	1.222	213465	0.2398		99.5	10963	
599.00 > 99.00	3.683	3.686	-0.003	1.222	70425		3.03(1.39-4.16)	99.5	1863	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.694	3.697	-0.003	1.393	657494	2.49		99.7	2870	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.705	3.702	0.003	1.000	120245	0.2203		88.1	399	
563.00 > 169.00	3.705	3.702	0.003	1.000	35628		3.38(2.12-6.36)	88.1	1460	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.705	3.702	0.003	1.003	58676	0.2403		96.1	1004	M
D 30 13C2 PFUnA										
565.00 > 520.00	3.705	3.702	0.003	1.397	1695763	2.64		106	29268	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.862	3.860	0.002	1.281	788326	NC			11727	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.995	3.995	0.0	1.000	163681	0.2445		97.8	51.5	
613.00 > 169.00	3.995	3.995	0.0	1.000	42584		3.84(2.13-6.40)	97.8	1460	
D 36 13C2 PFDaA										
615.00 > 570.00	3.995	3.995	0.0	1.506	1581996	2.44		97.7	13308	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.259	4.254	0.005	1.066	152090	0.2581		103	45.7	
663.00 > 169.00	4.259	4.254	0.005	1.066	46131		3.30(1.25-3.76)	103	482	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.489	4.490	-0.001	1.000	38505	0.2557		102	672	
713.00 > 219.00	4.489	4.490	-0.001	1.000	27295		1.41(0.71-2.13)	102	567	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.489	4.490	-0.001	1.693	1467413	2.45		98.2	5661	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.894	4.894	0.0	1.846	2539173	2.51		100	6014	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.894	4.895	-0.001	1.000	274658	NC			39.0	
813.00 > 169.00	4.894	4.895	-0.001	1.000	43484		6.32(2.86-8.58)		304	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.239	5.239	0.0	1.070	283593	NC			96.7	
913.00 > 169.00	5.239	5.239	0.0	1.070	35985		7.88(3.83-11.48)		473	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL3_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_004.d

Injection Date: 22-Jun-2018 09:33:58

Instrument ID: A8_N

Lims ID: IC L3 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 12

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

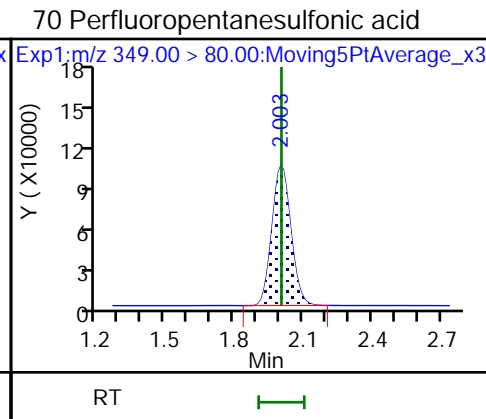
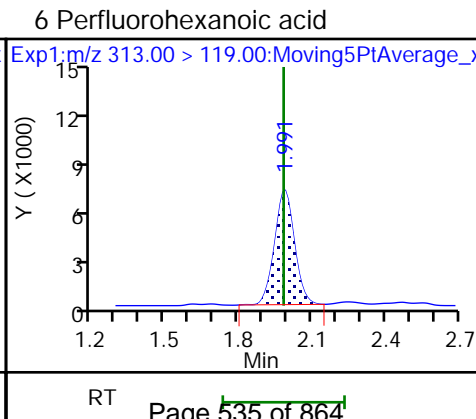
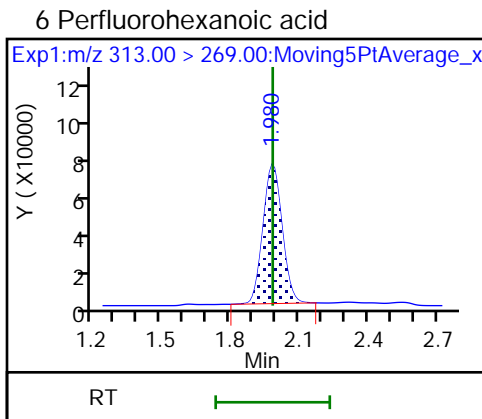
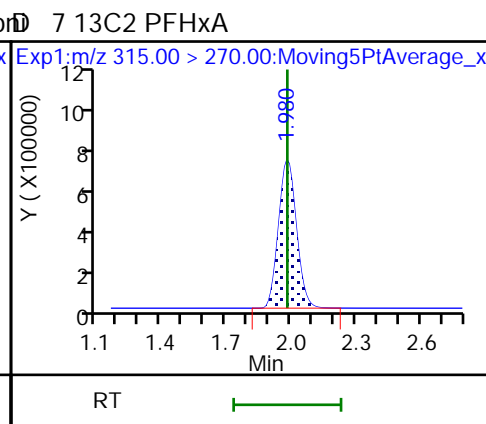
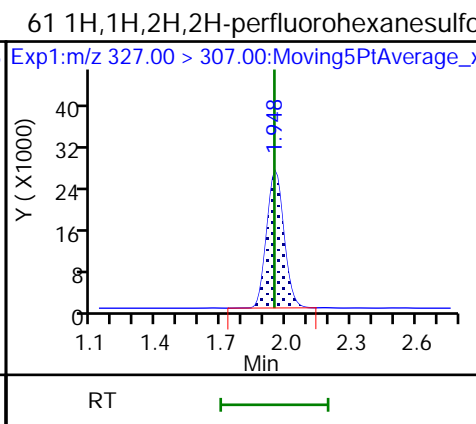
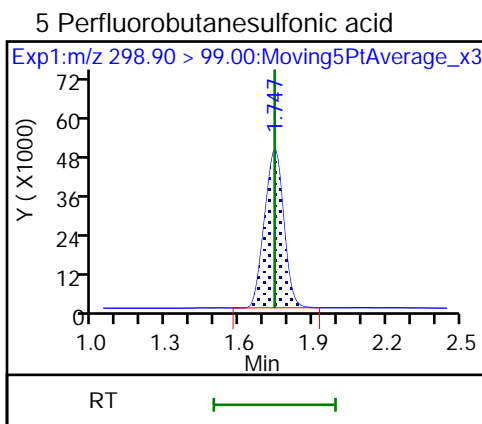
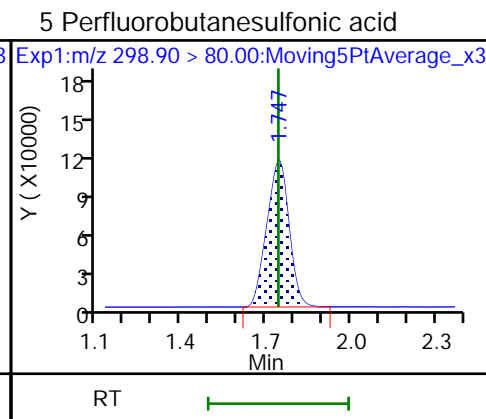
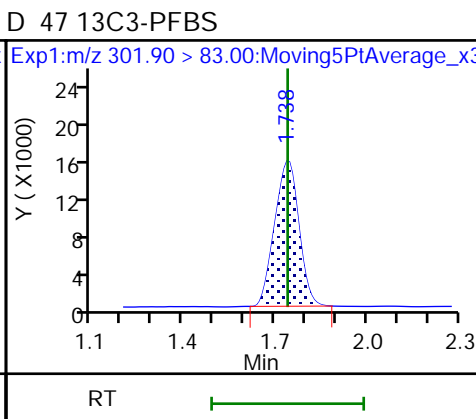
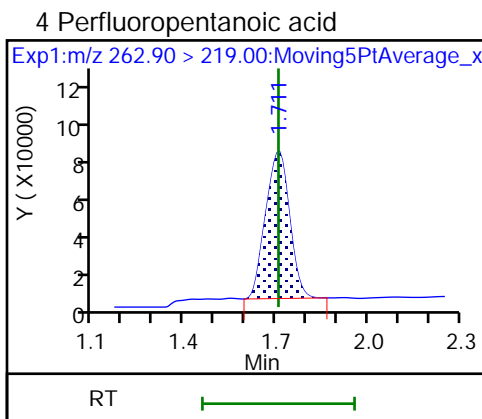
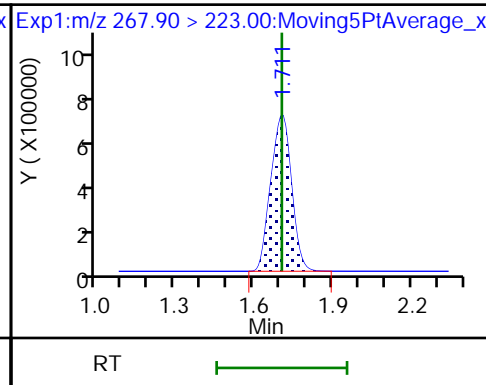
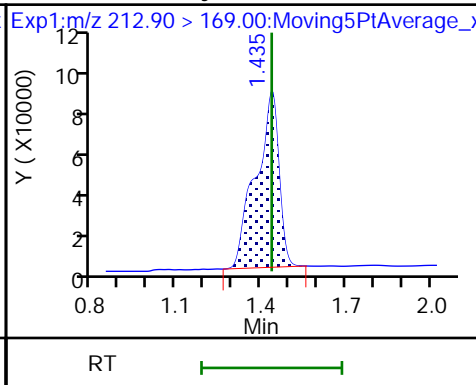
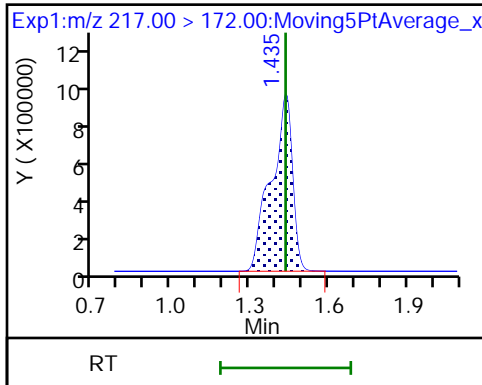
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

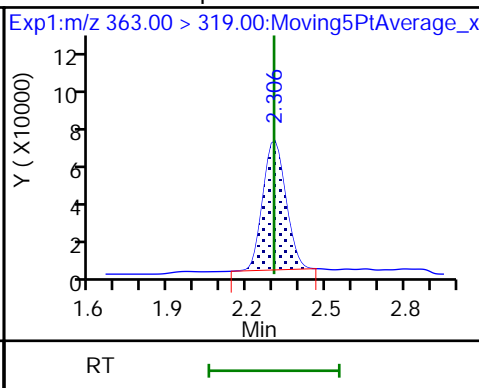
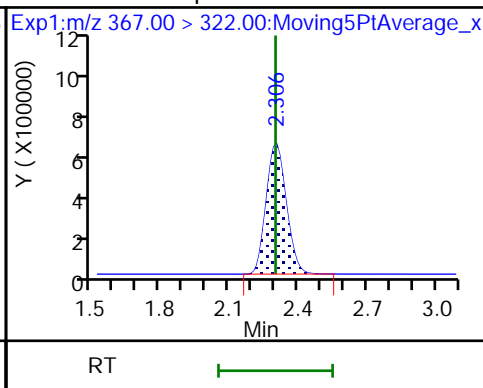
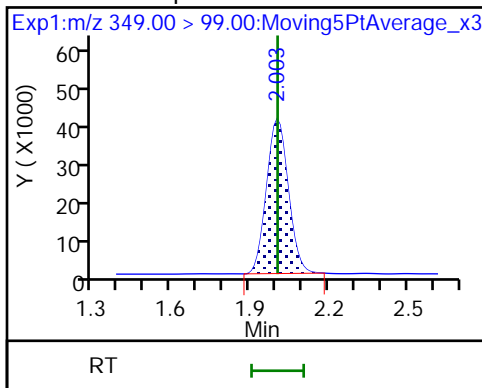
D 3 13C5-PFPeA



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

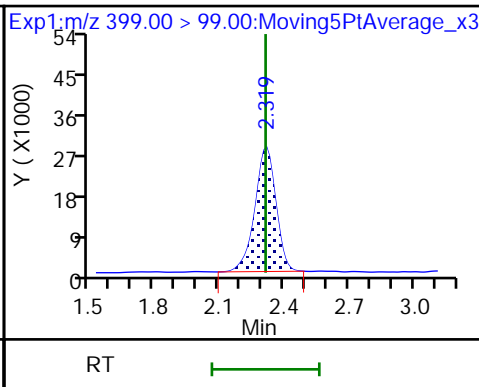
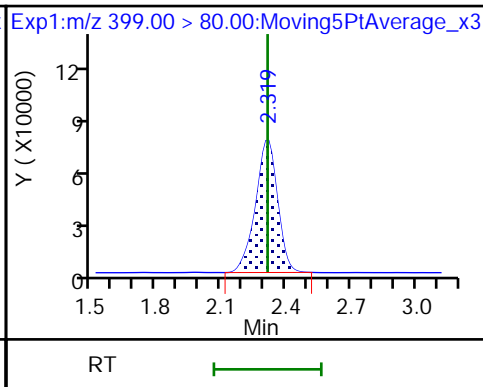
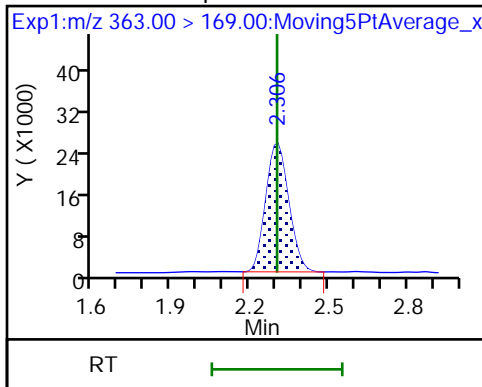
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

8 Perfluorohexanesulfonic acid

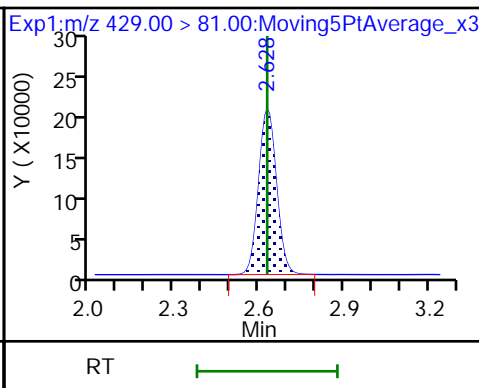
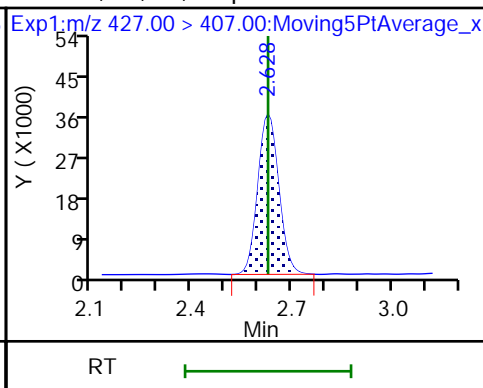
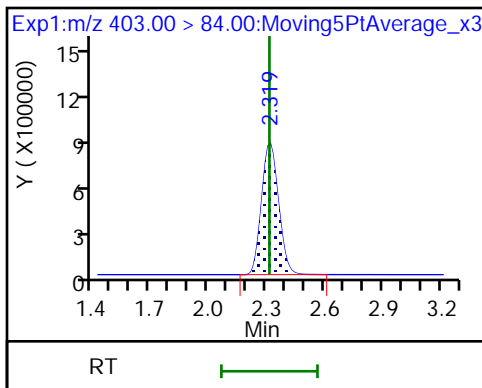
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

13 1H,1H,2H,2H-perfluorooctanesulfonD

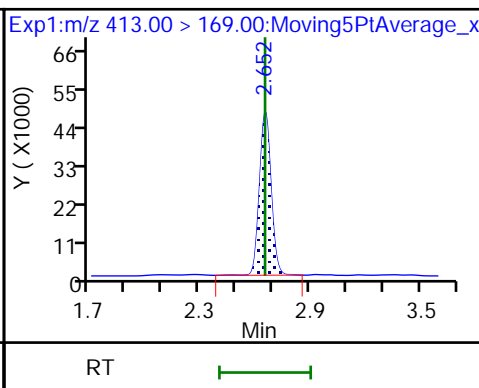
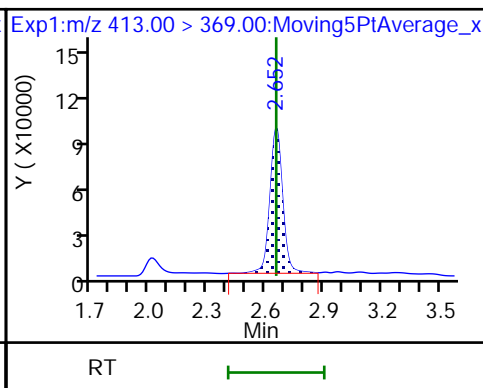
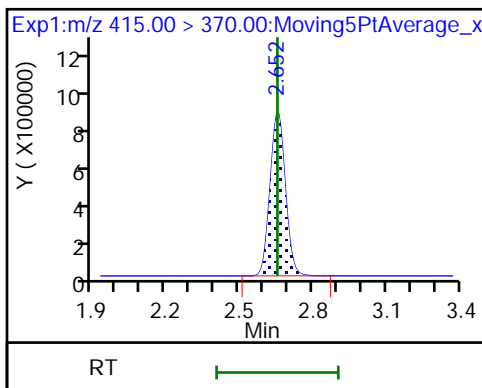
12 M2-6:2FTS



* 62 13C2-PFOA

15 Perfluorooctanoic acid

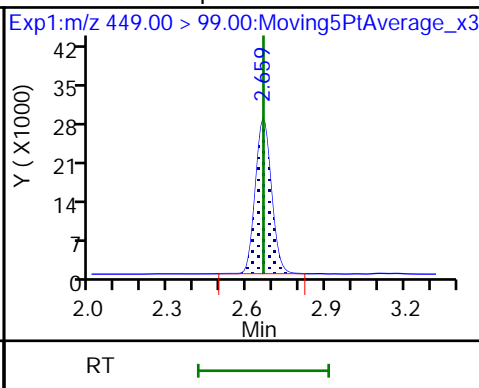
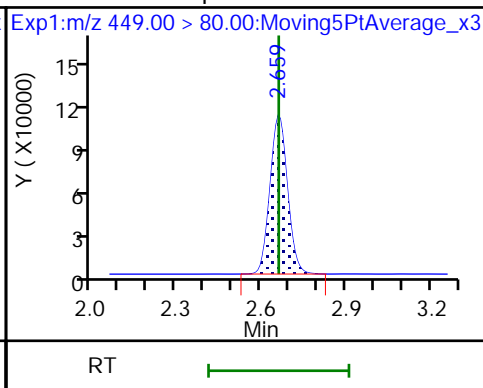
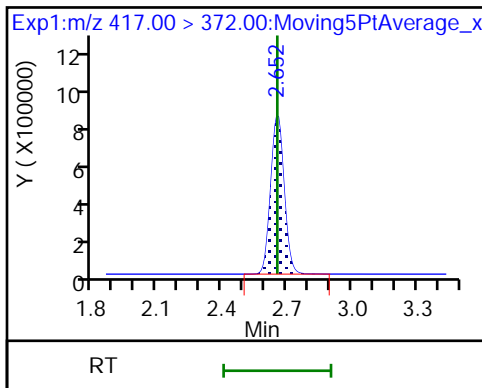
15 Perfluorooctanoic acid



D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

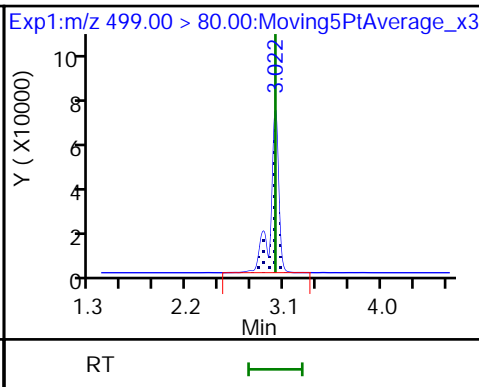
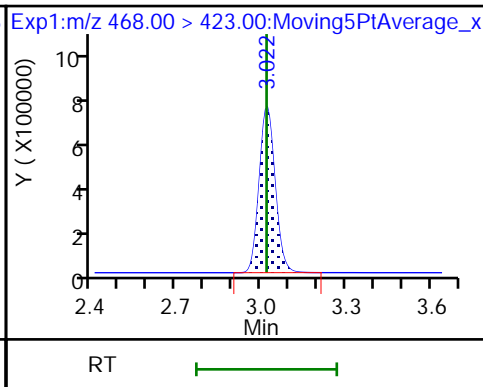
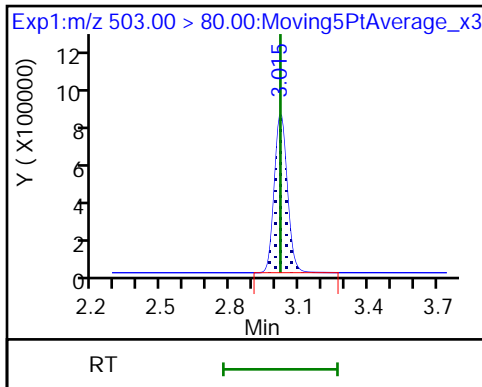
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

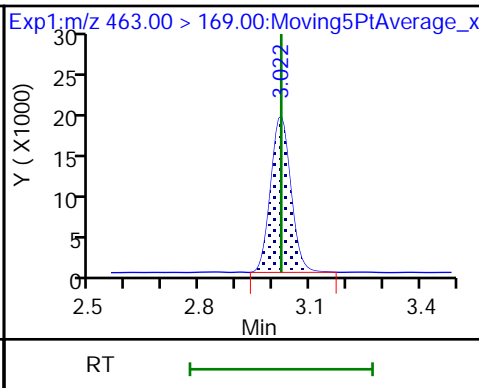
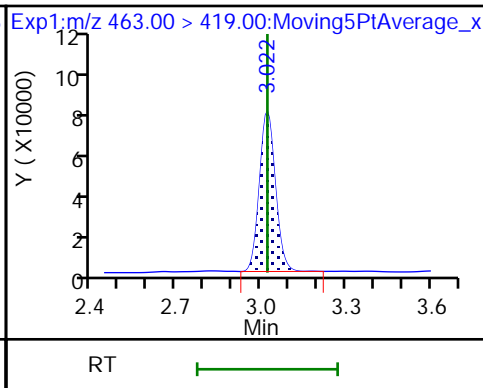
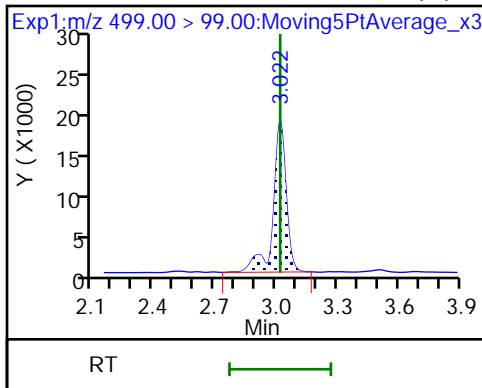
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid (M)

20 Perfluorononanoic acid

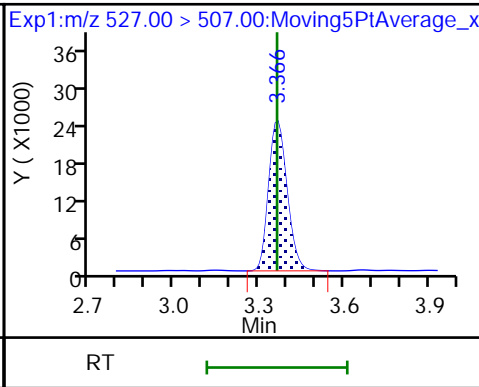
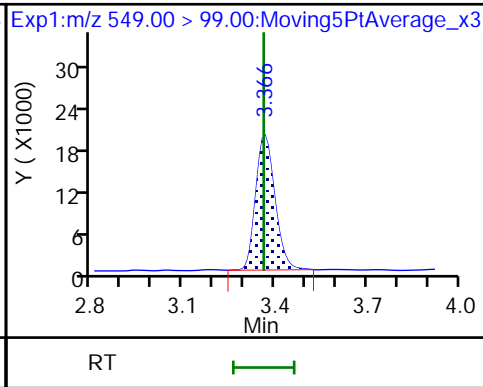
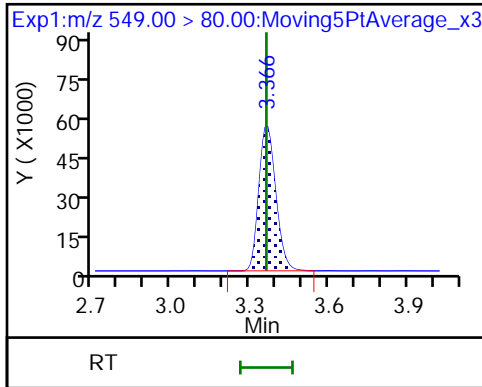
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

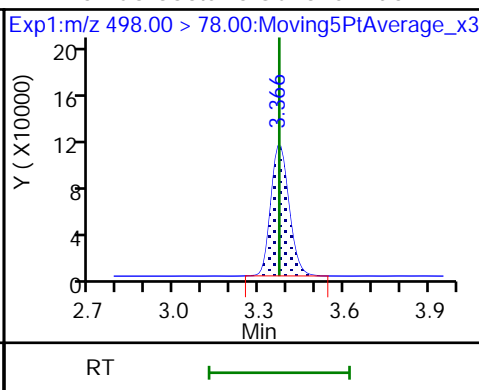
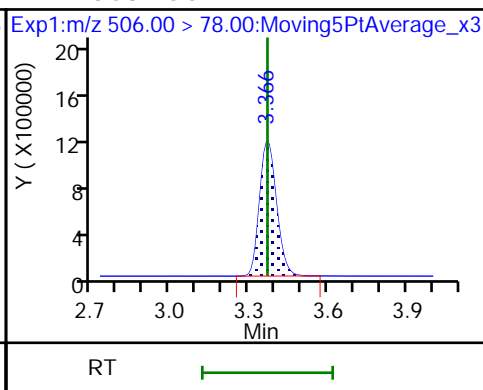
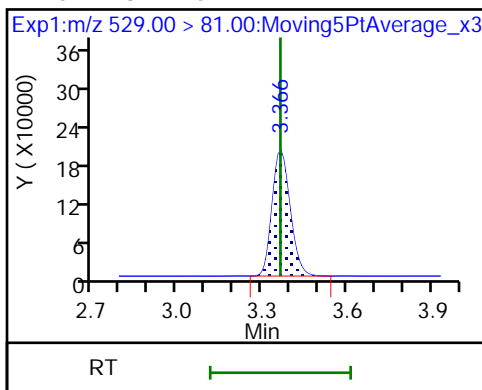
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

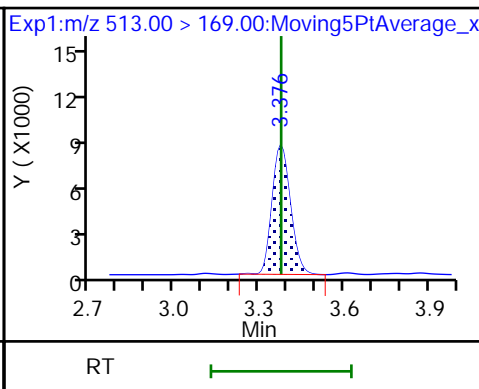
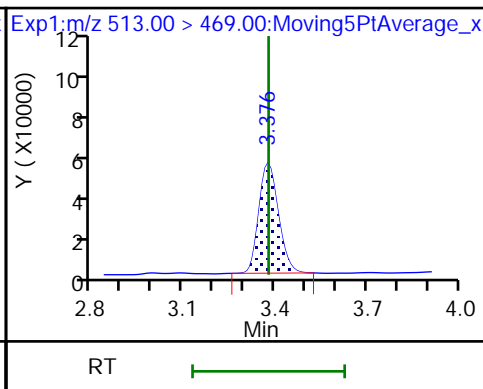
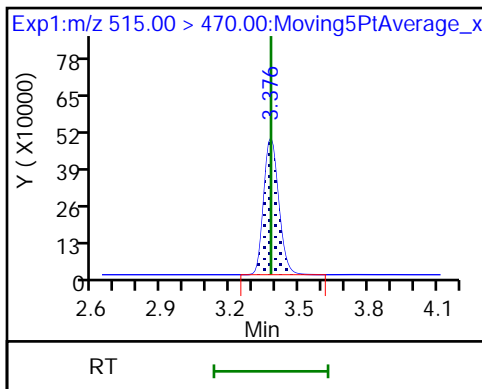
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid

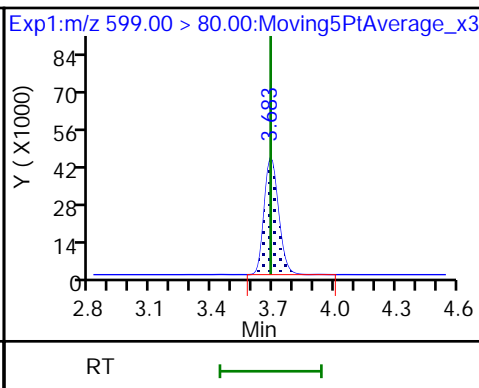
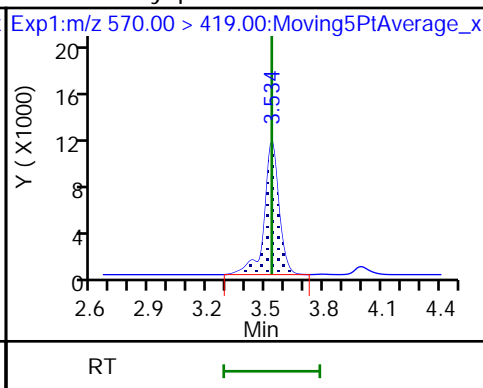
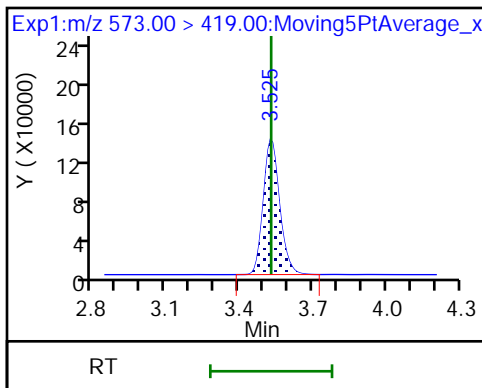
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

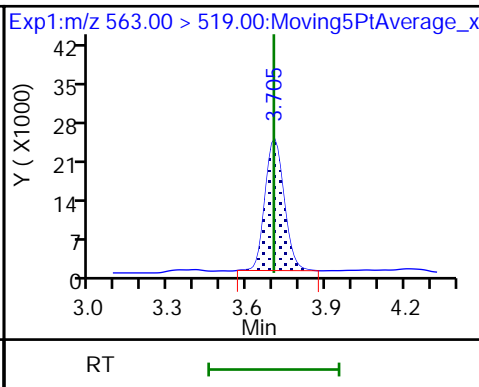
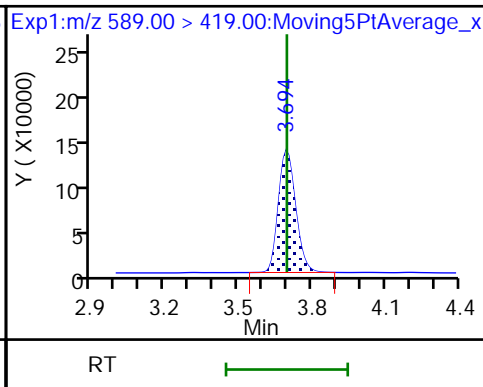
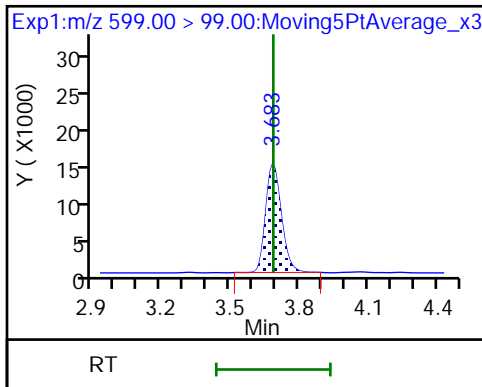
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

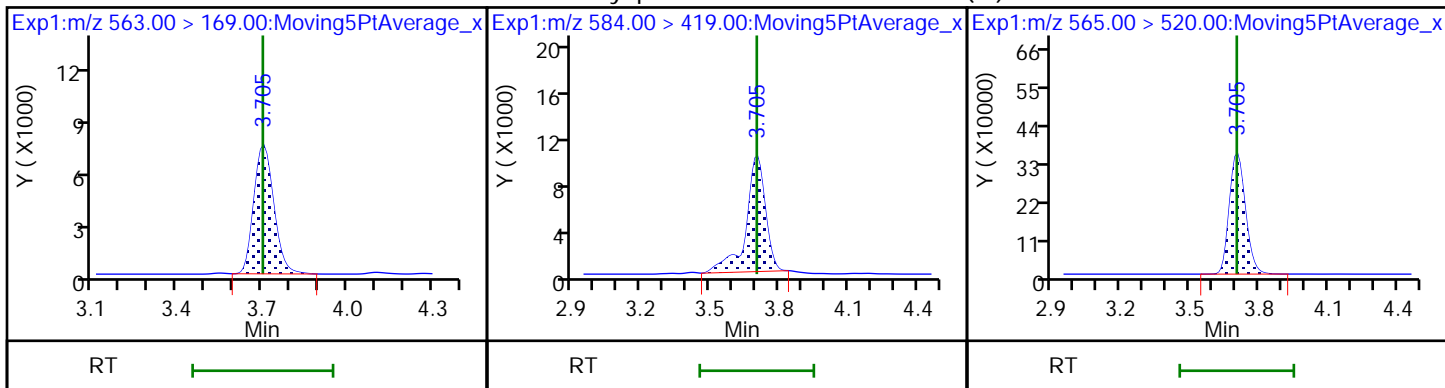
D 32 d5-NEtFOSAA

31 Perfluoroundecanoic acid



31 Perfluoroundecanoic acid

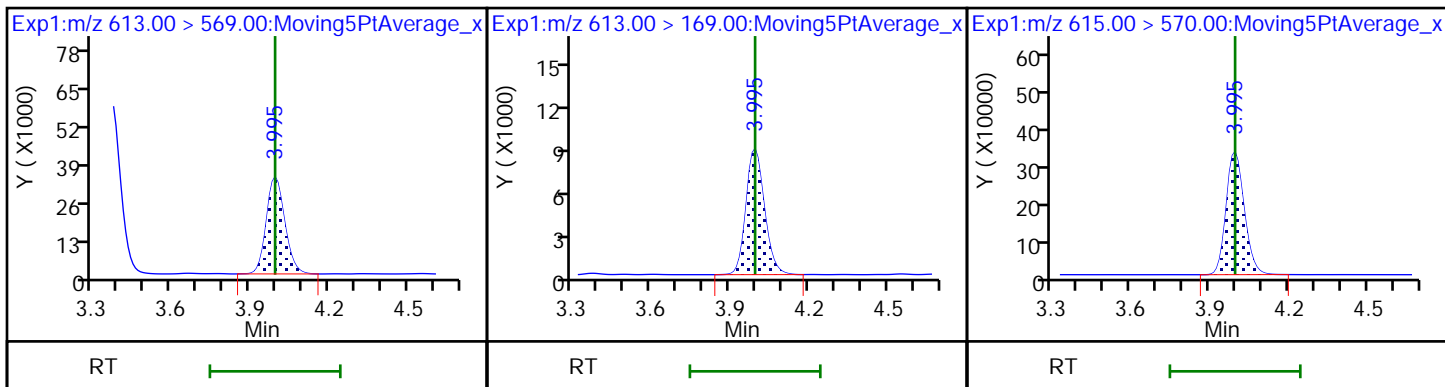
33 N-ethyl perfluorooctane sulfonamid (M)30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

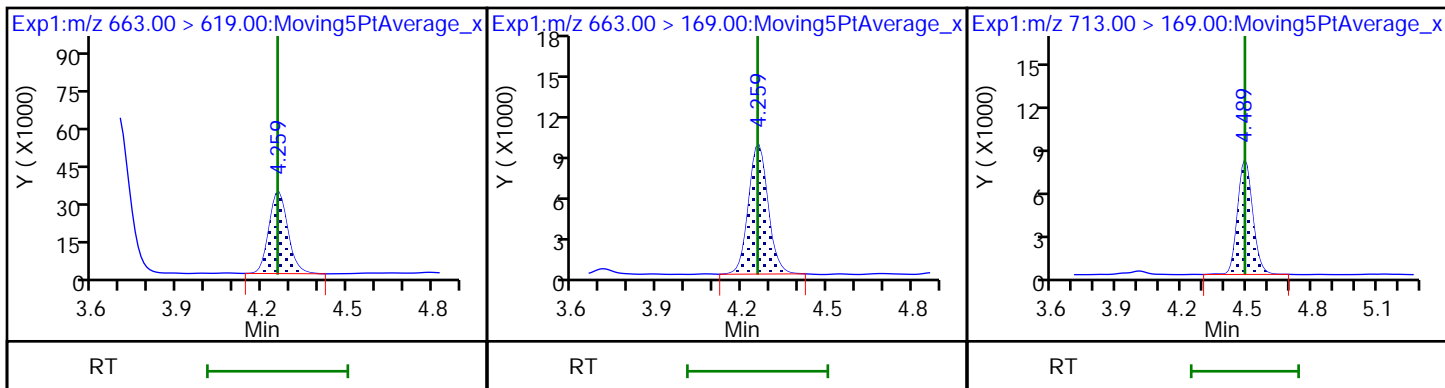
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

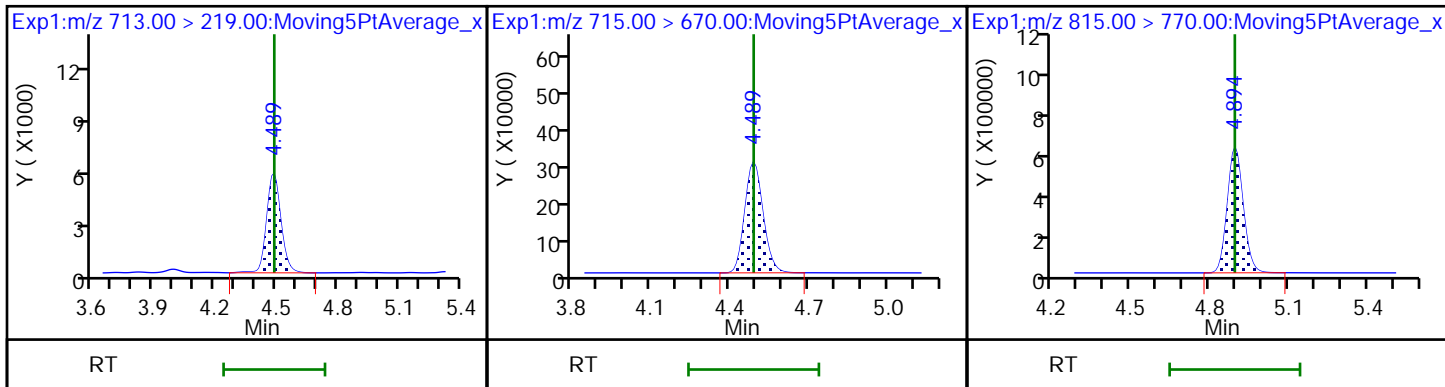
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento

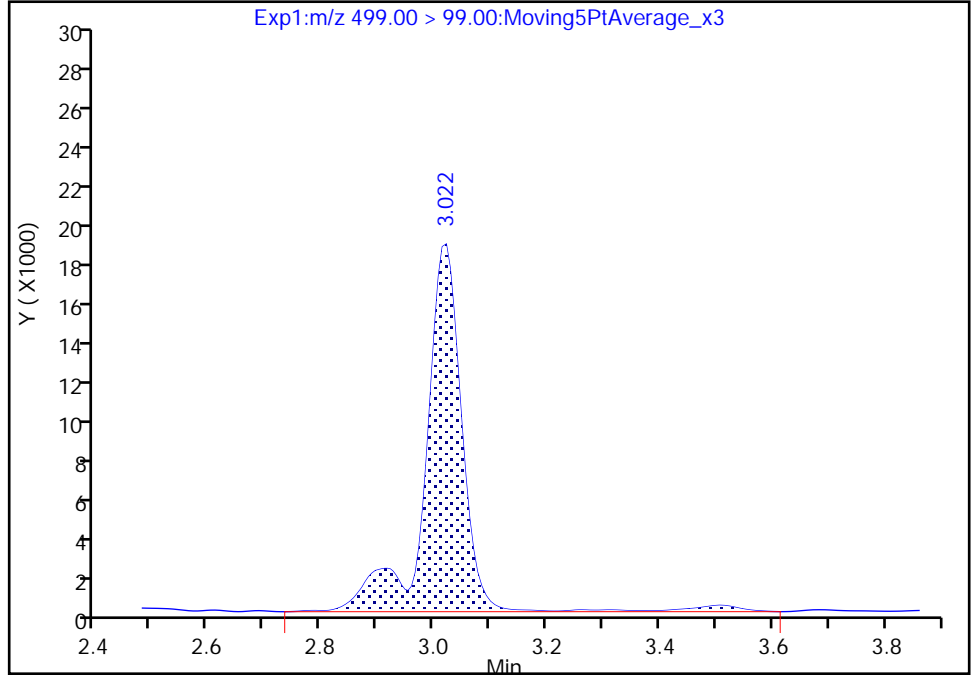
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_004.d
Injection Date: 22-Jun-2018 09:33:58 Instrument ID: A8_N
Lims ID: IC L3 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

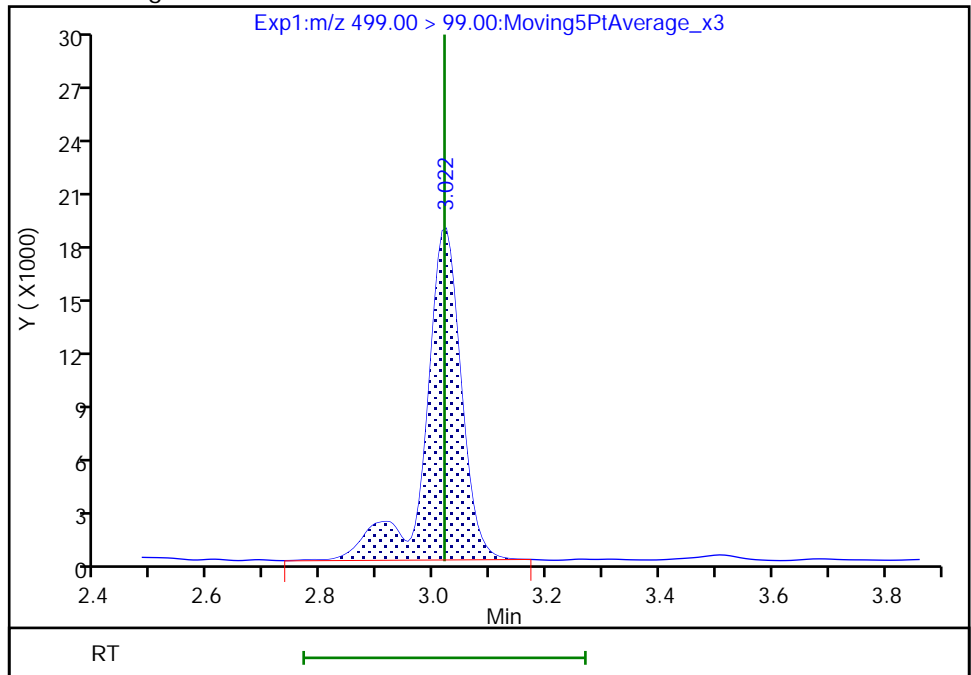
RT: 3.02
Area: 84477
Amount: 0.227313
Amount Units: ng/ml

Processing Integration Results



RT: 3.02
Area: 81265
Amount: 0.224651
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:18:32
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 541 of 864

TestAmerica Sacramento

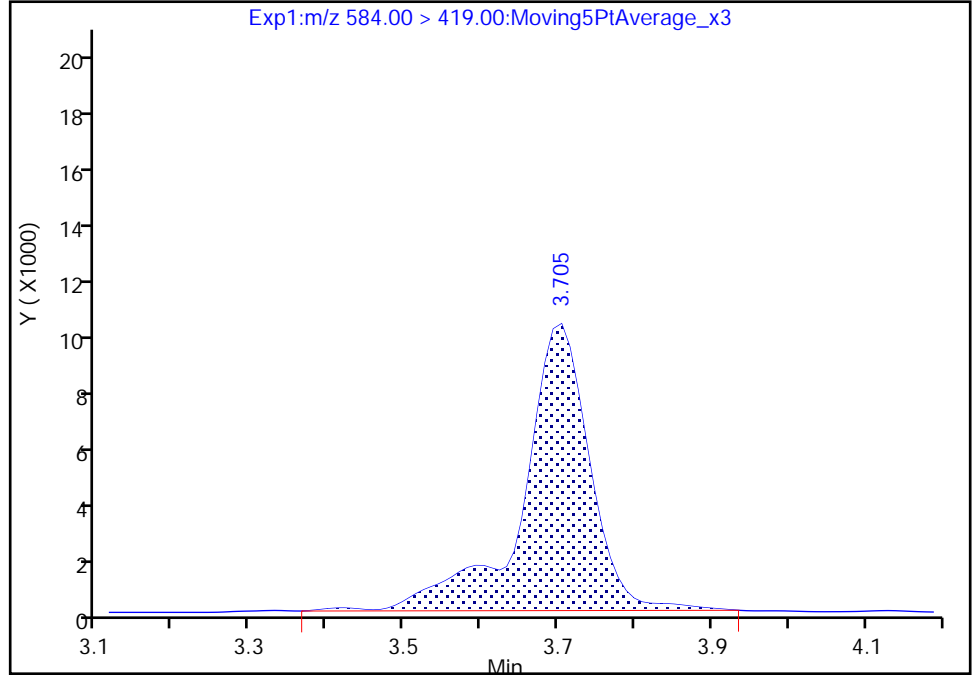
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_004.d
Injection Date: 22-Jun-2018 09:33:58 Instrument ID: A8_N
Lims ID: IC L3 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

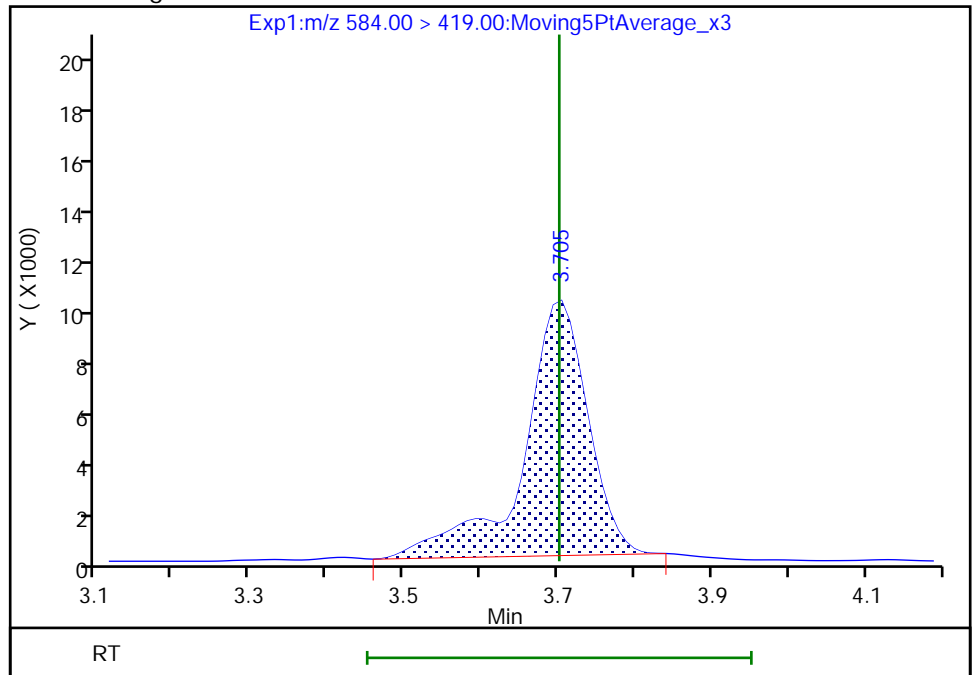
RT: 3.70
Area: 62626
Amount: 0.251917
Amount Units: ng/ml

Processing Integration Results



RT: 3.70
Area: 58676
Amount: 0.240323
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 10:19:07
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 542 of 864

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_005.d
 Lims ID: IC L4 Full
 Client ID:
 Sample Type: ICIS Calib Level: 4
 Inject. Date: 22-Jun-2018 09:41:46 ALS Bottle#: 13 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L4-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:44:44 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 11:44:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.430	1.435	-0.005	0.539	5061708	2.37	94.7	25394	
2 Perfluorobutyric acid	212.90 > 169.00	1.435	1.437	-0.002	1.004	1988994	0.9770	97.7	721	
D 3 13C5-PFPeA	267.90 > 223.00	1.702	1.705	-0.003	0.642	3717905	2.41	96.3	42909	
4 Perfluoropentanoic acid	262.90 > 219.00	1.702	1.707	-0.005	1.000	1716017	0.9488	94.9	833	
D 47 13C3-PFBS	301.90 > 83.00	1.738	1.740	-0.002	0.655	85995	2.21	95.0	629	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.738	1.743	-0.005	1.000	2522554	0.8711	98.5	57823	
	298.90 > 99.00	1.738	1.743	-0.005	1.000	1076648	2.34(1.25-3.74)	98.5	15257	
D 60 M2-4:2FTS	329.00 > 81.00	1.938	1.945	-0.007	0.731	584063	NC		10204	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.938	1.945	-0.007	1.115	579912	0.9453	101	20247	
D 7 13C2 PFHxA	315.00 > 270.00	1.981	1.982	-0.001	0.747	4092652	2.43	97.2	54772	
6 Perfluorohexanoic acid	313.00 > 269.00	1.981	1.984	-0.003	1.000	1652916	0.9621	96.2	2996	
	313.00 > 119.00	1.981	1.984	-0.003	1.000	155843	10.61(5.03-15.10)	96.2	2282	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.003	2.004	-0.001	1.152	2445390	0.9273	98.9	47076	
	349.00 > 99.00	1.992	2.004	-0.012	1.146	918163	2.66(1.36-4.07)	98.9	13063	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.071	2.076	-0.005	0.781	142512	NC		4230	

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	2.071	2.077	-0.006	1.000	251410	NC		1249
D 9 13C4-PFHpA	367.00	> 322.00	2.293	2.301	-0.008	0.865	3775621	2.47	98.9	36527
10 Perfluoroheptanoic acid	363.00	> 319.00	2.293	2.302	-0.009	1.000	1687983	0.9646	96.5	1351
	363.00	> 169.00	2.293	2.302	-0.009	1.000	660032	2.56(1.13-3.40)	96.5	4564
D 11 18O2 PFHxS	403.00	> 84.00	2.306	2.314	-0.008	0.870	4786363	2.19	92.8	32717
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.306	2.314	-0.008	1.000	2132865	0.9270	102	15230
	399.00	> 99.00	2.306	2.314	-0.008	1.000	697706	3.06(1.50-4.49)	102	2165
65 Adona	377.00	> 251.00	2.345	2.345	0.0	0.778	4478147	NC		37280
	377.00	> 85.00	2.332	2.345	-0.013	0.773	2610529	1.72(0.84-2.53)		14468
D 12 M2-6:2FTS	429.00	> 81.00	2.620	2.628	-0.008	0.988	897174	2.27	95.7	14483
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.620	2.628	-0.008	1.000	585176	0.9318	98.3	5294
D 14 13C4 PFOA	417.00	> 372.00	2.652	2.654	-0.002	1.000	3592336	2.49	99.6	31868
15 Perfluorooctanoic acid	413.00	> 369.00	2.652	2.654	-0.002	1.000	1584645	0.9038	90.3	925
	413.00	> 169.00	2.652	2.654	-0.002	1.000	842810	1.88(0.84-2.52)	90.3	4137
* 62 13C2-PFOA	415.00	> 370.00	2.652	2.654	-0.002		3755094	2.50		33568
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.660	2.662	-0.002	0.882	1871532	0.9860	104	24197
	449.00	> 99.00	2.660	2.662	-0.002	0.882	505761	3.70(1.94-5.82)	104	8412
D 18 13C4 PFOS	503.00	> 80.00	3.016	3.018	-0.001	1.137	3274276	2.26	94.4	40473
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.016	3.018	-0.002	1.000	1470850	0.9439	102	25994
	499.00	> 99.00	3.016	3.018	-0.002	1.000	318427	4.62(2.31-6.93)	102	5061
D 19 13C5 PFNA	468.00	> 423.00	3.016	3.018	-0.002	1.137	2736975	2.41	96.4	38981
20 Perfluorononanoic acid	463.00	> 419.00	3.016	3.021	-0.005	1.000	1179075	0.99	99.2	4264
	463.00	> 169.00	3.016	3.021	-0.005	1.000	296391	3.98(1.90-5.69)	99.2	10829
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.222	3.230	-0.008	1.068	2295064	NC		23623
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.359	3.362	-0.003	1.114	1033122	0.9827	102	29741
	549.00	> 99.00	3.359	3.362	-0.003	1.114	387837	2.66(1.33-3.97)	102	4678
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.359	3.363	-0.004	1.000	436473	0.9486	99.0	10845
D 26 M2-8:2FTS	529.00	> 81.00	3.359	3.364	-0.005	1.266	827630	2.31	96.3	16724

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA	506.00	> 78.00	3.368	3.370	-0.002	1.270	5111177	2.48	99.3	36922
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.368	3.371	-0.003	1.000	2054520	1.00	99.9	23091
D 23 13C2 PFDA	515.00	> 470.00	3.368	3.376	-0.008	1.270	2132271	2.48	99.0	31646
24 Perfluorodecanoic acid	513.00	> 469.00	3.368	3.378	-0.010	1.000	829041	0.9585	95.9	1853
	513.00	> 169.00	3.368	3.378	-0.010	1.000	149147	5.56(2.36-7.09)	95.9	4722
D 27 d3-NMeFOSAA	573.00	> 419.00	3.527	3.528	-0.001	1.330	615584	2.33	93.2	14619
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.527	3.531	-0.004	1.000	266738	1.10	110	3897
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.685	3.686	-0.001	1.222	828269	0.9357	97.1	21449
	599.00	> 99.00	3.685	3.686	-0.001	1.222	284077	2.92(1.39-4.16)	97.1	11735
D 32 d5-NEtFOSAA	589.00	> 419.00	3.696	3.697	-0.001	1.393	688173	2.52	101	2903
D 30 13C2 PFUnA	565.00	> 520.00	3.696	3.702	-0.006	1.393	1599453	2.41	96.3	30042
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.696	3.702	-0.006	1.000	237035	0.9276	92.8	5059
31 Perfluoroundecanoic acid	563.00	> 519.00	3.696	3.702	-0.006	1.000	498561	0.9685	96.9	1671
	563.00	> 169.00	3.696	3.702	-0.006	1.000	131265	3.80(2.12-6.36)	96.9	4476
66 11-Chloroeicosafuoro-3-oxaundecan	631.00	> 451.00	3.852	3.860	-0.008	1.277	3340793	NC		68964
D 36 13C2 PFDaA	615.00	> 570.00	3.986	3.995	-0.009	1.503	1625890	2.43	97.1	13585
37 Perfluorododecanoic acid	613.00	> 569.00	3.986	3.995	-0.009	1.000	663667	0.9646	96.5	205
	613.00	> 169.00	3.986	3.995	-0.009	1.000	161171	4.12(2.13-6.40)	96.5	4215
41 Perfluorotridecanoic acid	663.00	> 619.00	4.250	4.254	-0.004	1.066	604768	1.00	99.9	175
	663.00	> 169.00	4.250	4.254	-0.004	1.066	197006	3.07(1.25-3.76)	99.9	2019
D 43 13C2-PFTeDA	715.00	> 670.00	4.490	4.490	0.0	1.693	1460585	2.36	94.6	5950
42 Perfluorotetradecanoic acid	713.00	> 169.00	4.490	4.490	0.0	1.000	140908	0.9400	94.0	2073
	713.00	> 219.00	4.480	4.490	-0.010	0.998	103539	1.36(0.71-2.13)	94.0	1793
D 44 13C2-PFHxDA	815.00	> 770.00	4.887	4.894	-0.007	1.843	2447790	2.34	93.7	5596
45 Perfluorohexadecanoic acid	813.00	> 769.00	4.896	4.895	0.001	1.002	921125	NC		128
	813.00	> 169.00	4.896	4.895	0.001	1.002	153884	5.99(2.86-8.58)		1162
46 Perfluorooctadecanoic acid	913.00	> 869.00	5.240	5.239	0.001	1.072	1091753	NC		356
	913.00	> 169.00	5.233	5.239	-0.006	1.071	138389	7.89(3.83-11.48)		1660

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL4_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_005.d

Injection Date: 22-Jun-2018 09:41:46

Instrument ID: A8_N

Lims ID: IC L4 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 13

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

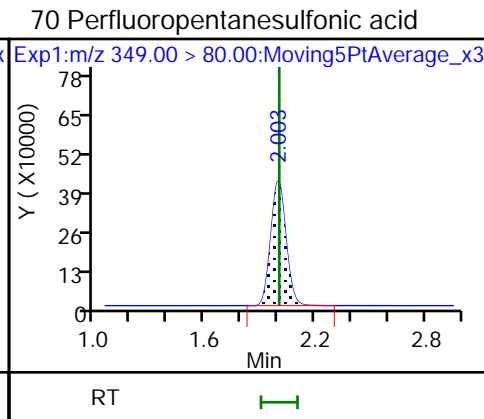
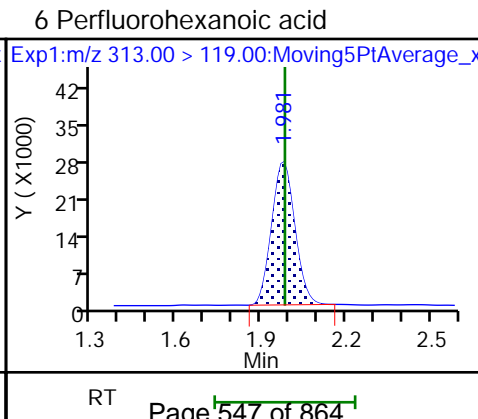
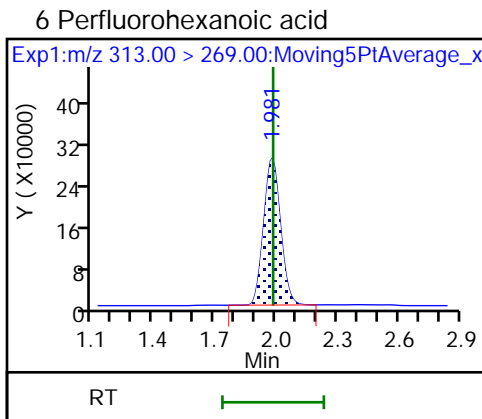
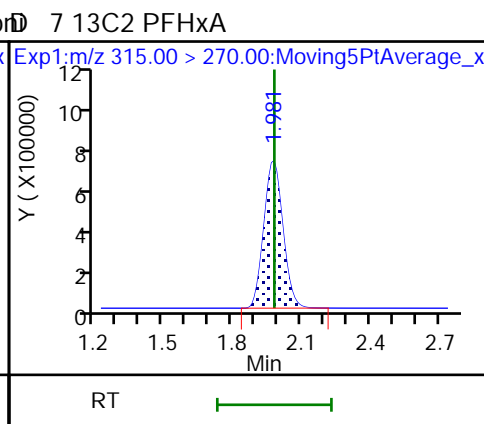
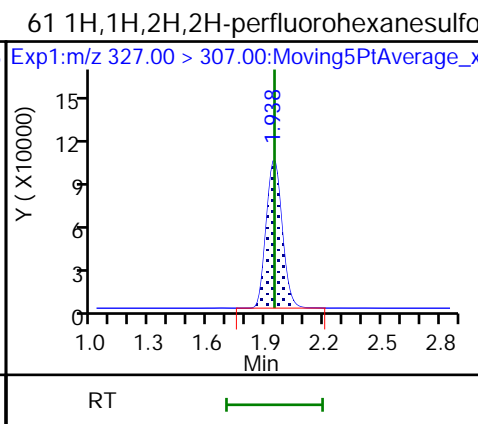
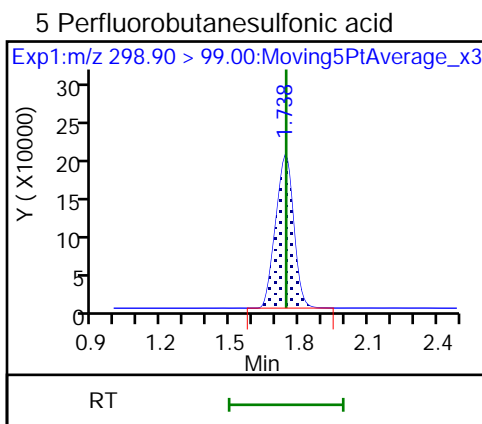
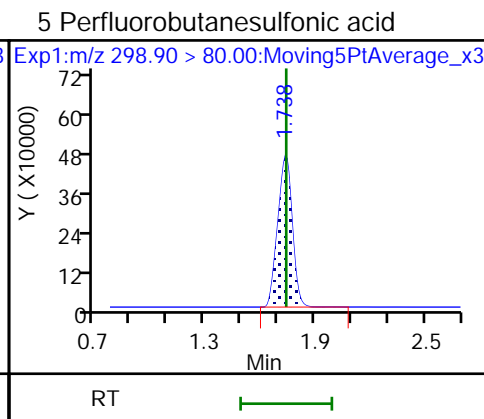
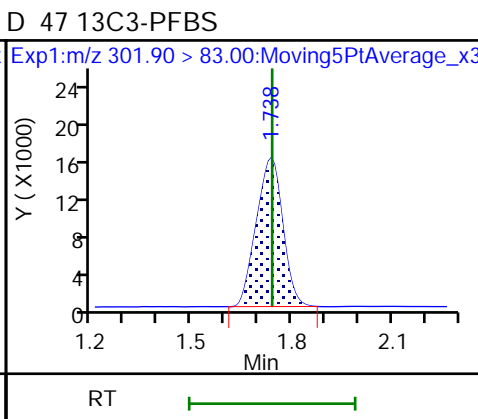
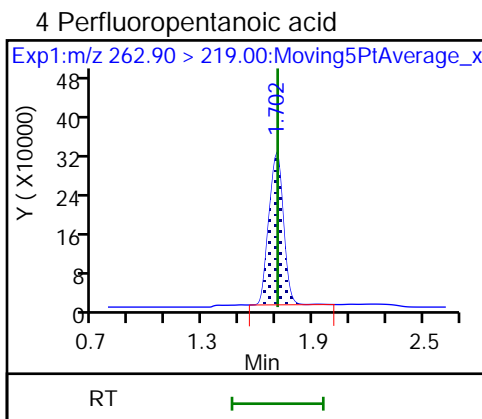
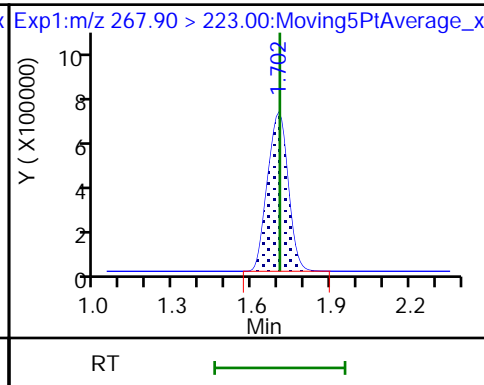
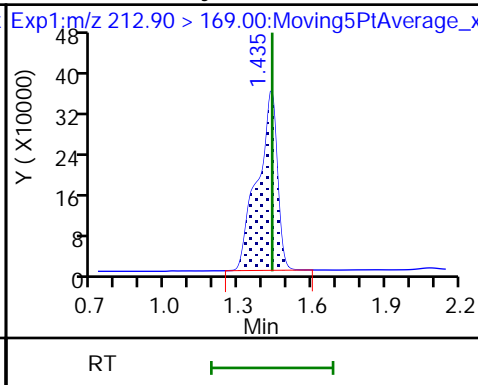
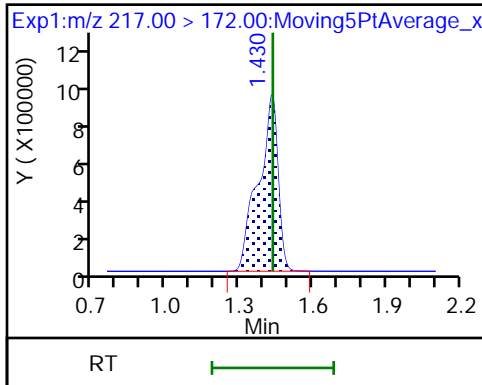
Method: A8_N

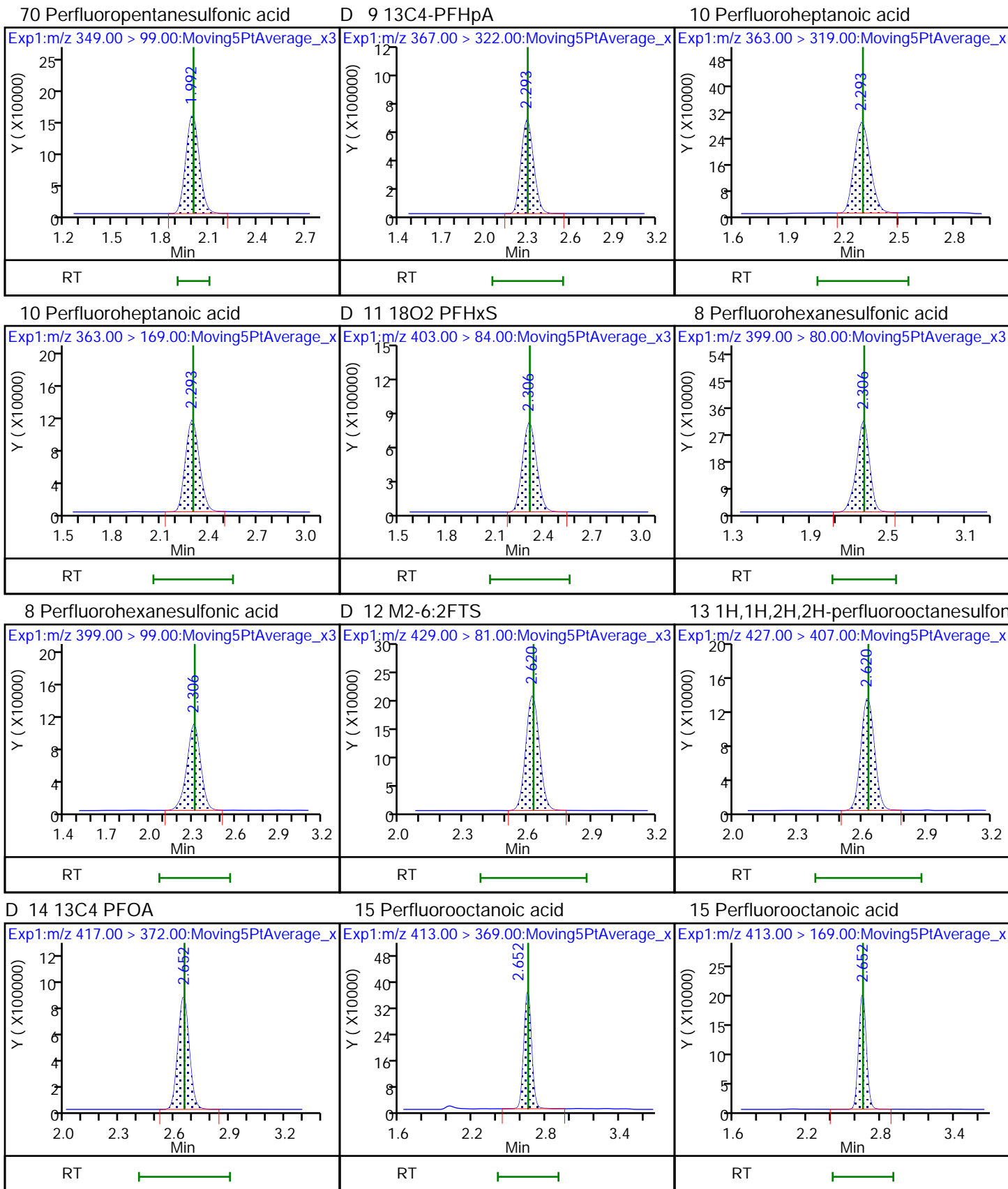
Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

D 3 13C5-PFPeA

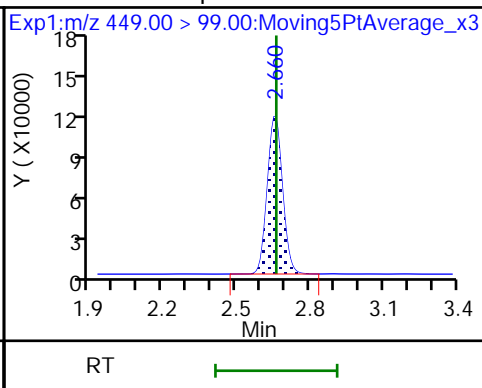
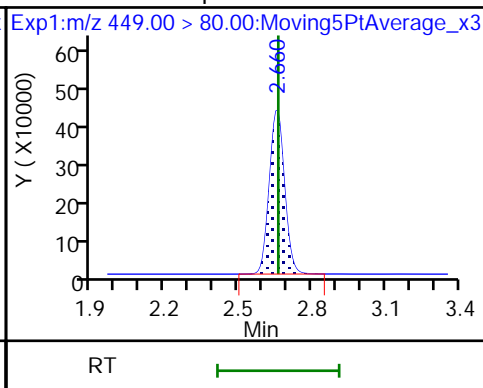
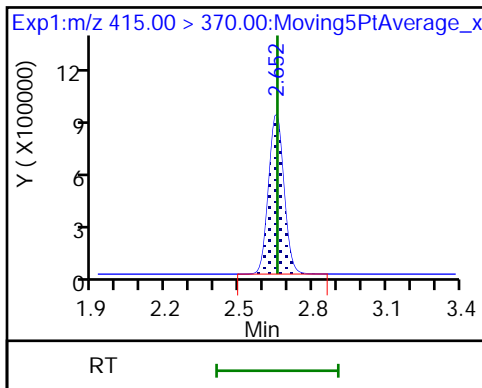




* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

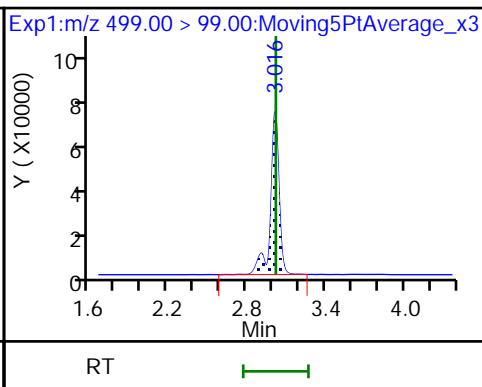
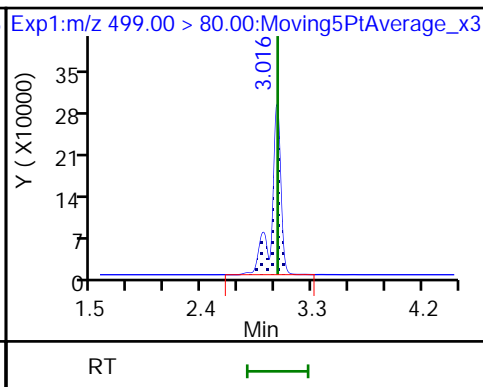
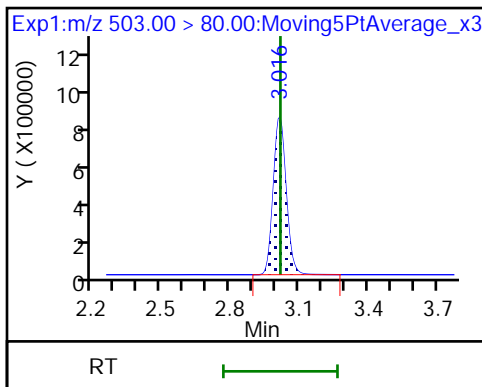
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

17 Perfluorooctane sulfonic acid

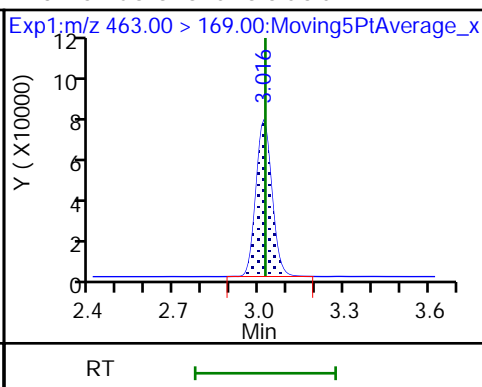
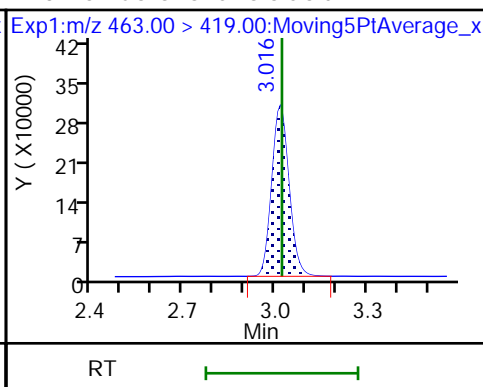
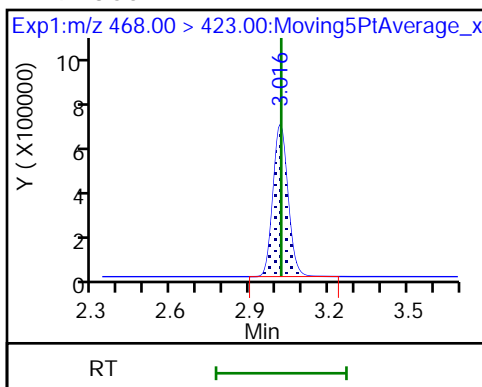
17 Perfluorooctane sulfonic acid



D 19 13C5 PFNA

20 Perfluorononanoic acid

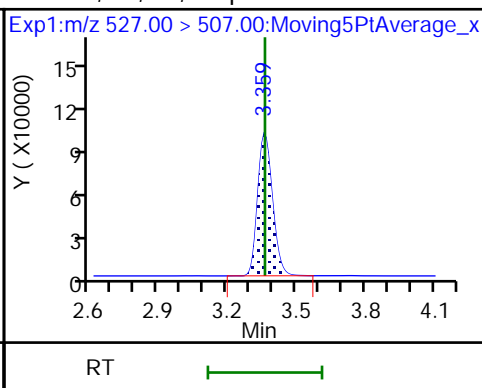
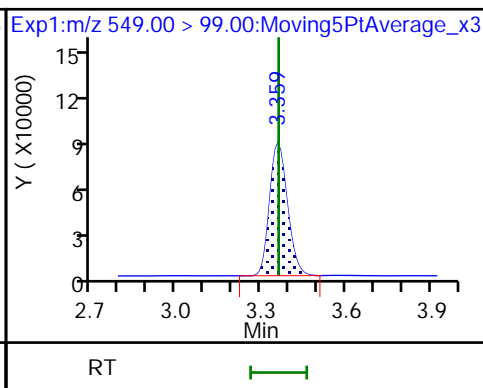
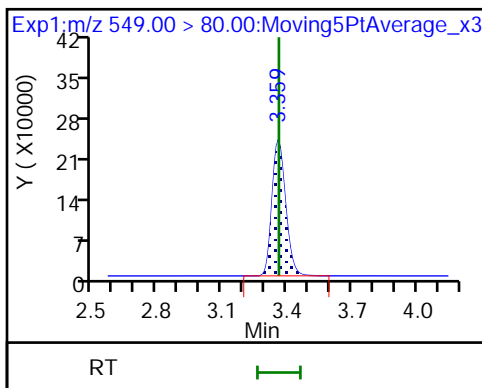
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

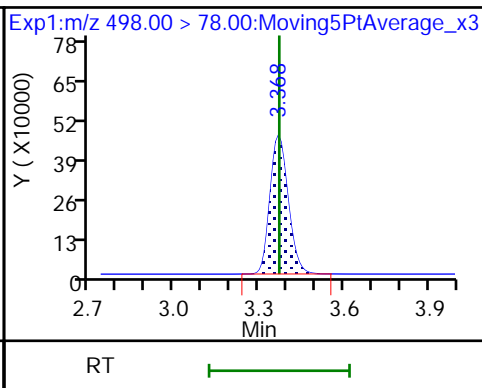
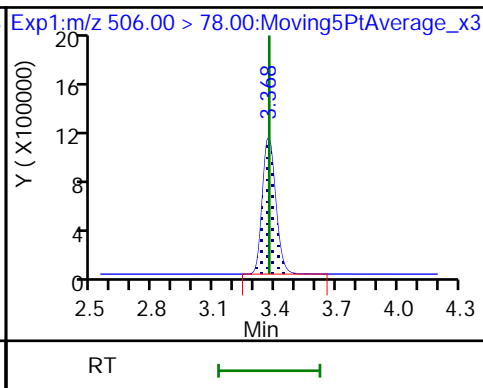
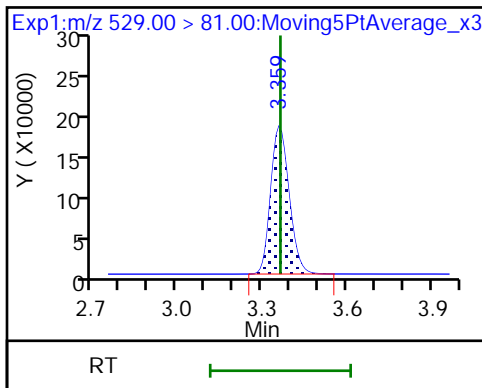
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

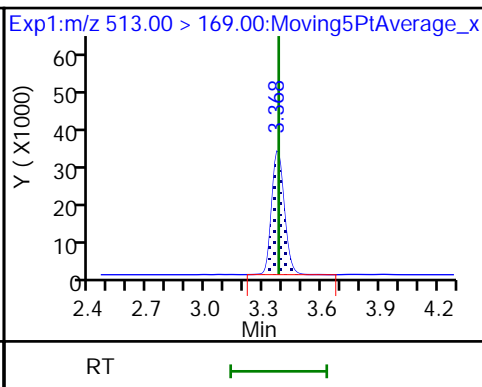
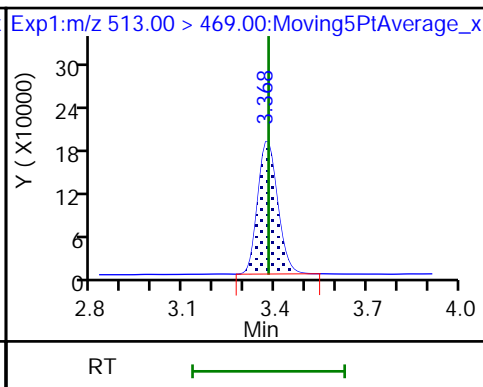
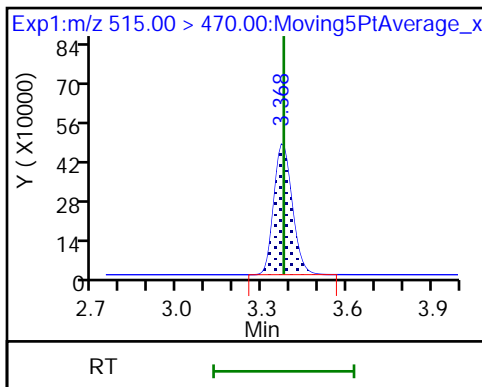
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid

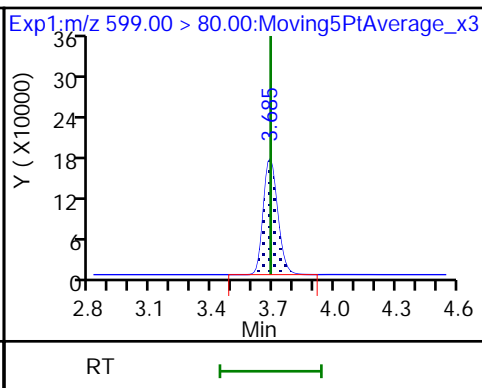
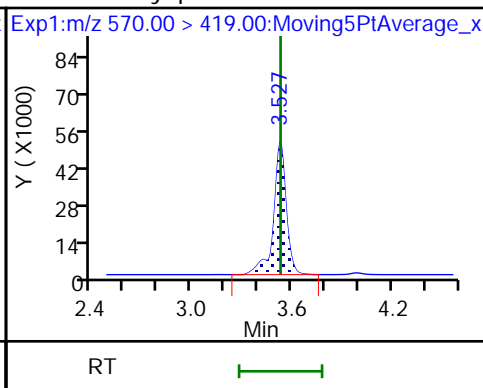
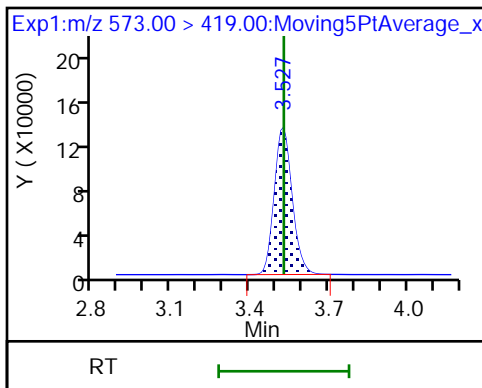
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

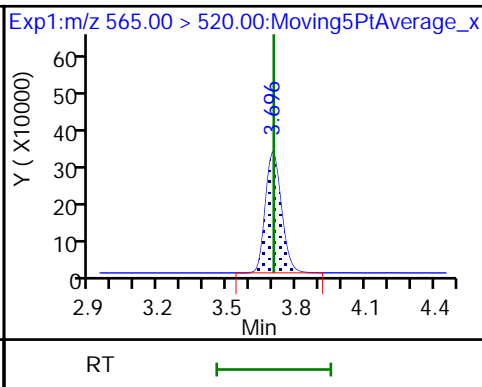
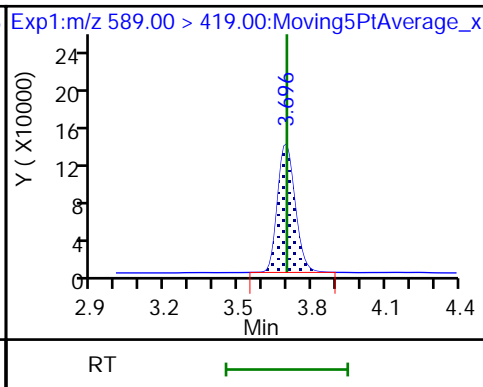
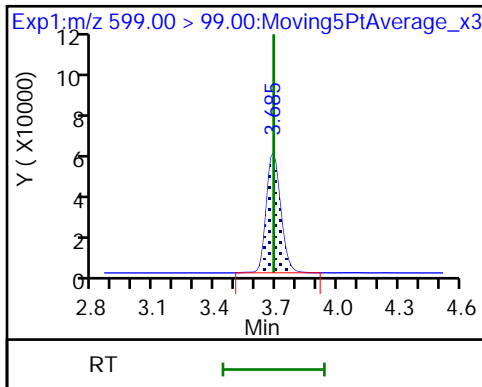
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

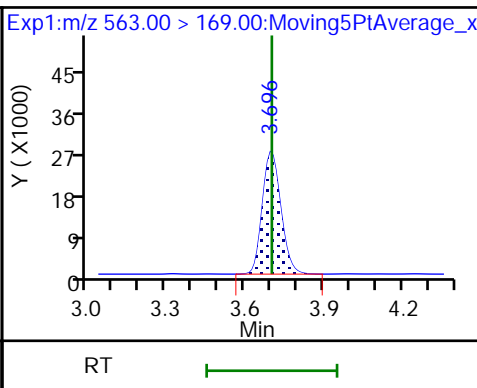
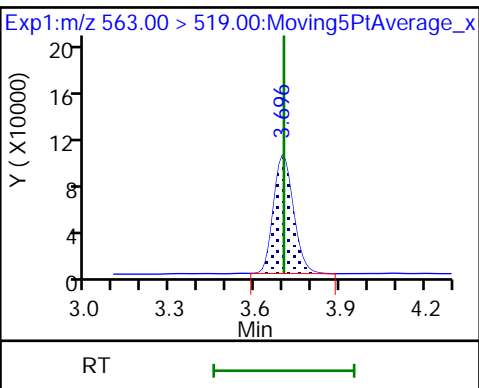
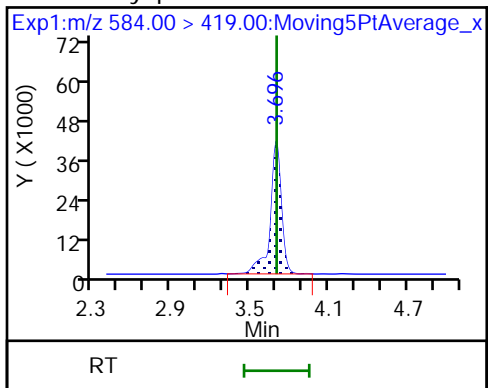
D 30 13C2 PFUnA



33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

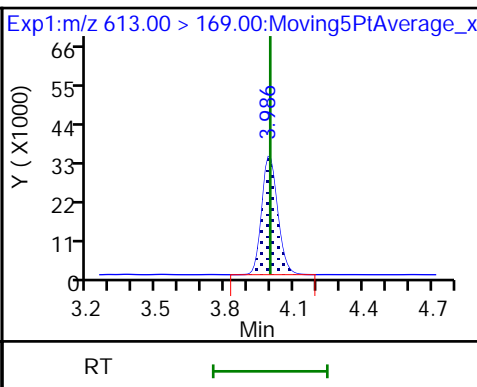
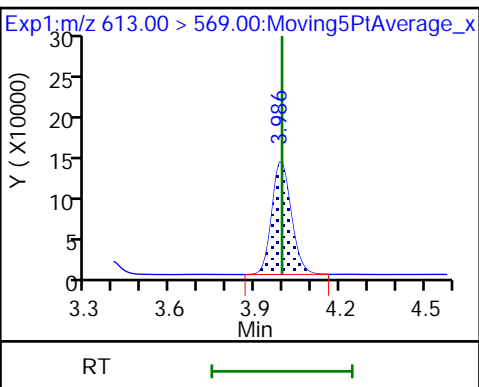
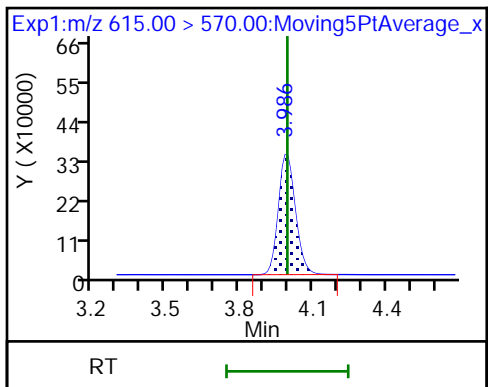
31 Perfluoroundecanoic acid



D 36 13C2 PFDaA

37 Perfluorododecanoic acid

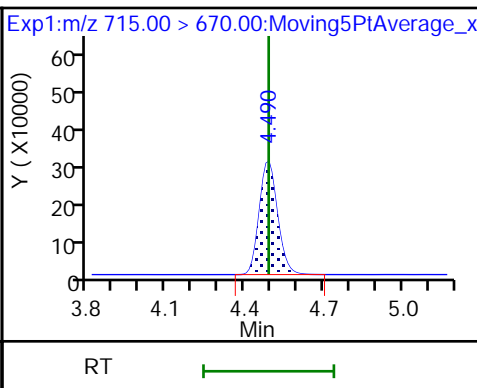
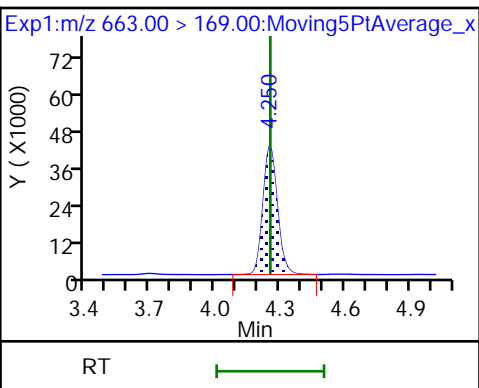
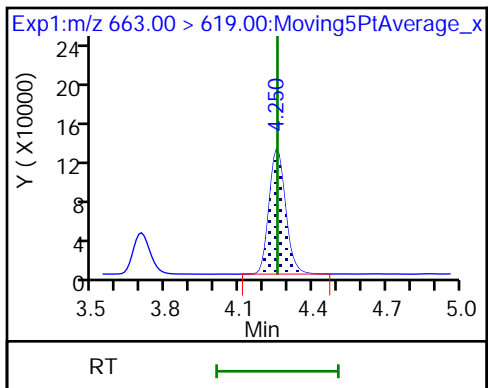
37 Perfluorododecanoic acid



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

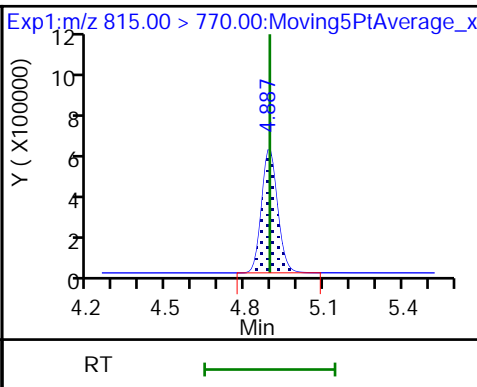
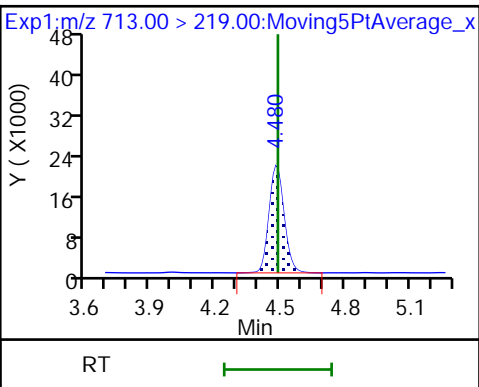
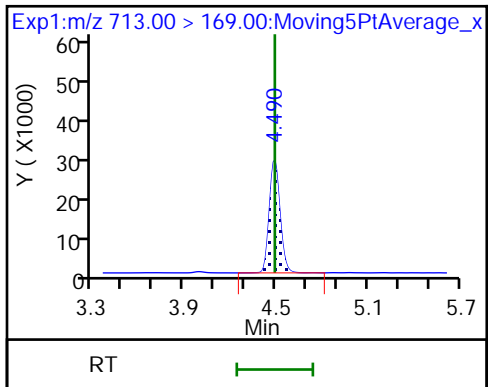
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_006.d
 Lims ID: IC L5 Full
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 22-Jun-2018 09:49:37 ALS Bottle#: 14 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L5-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:45:07 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 10:21:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.430	1.435	-0.005	0.541	5069506	2.52	101	26445	
2 Perfluorobutyric acid	212.90 > 169.00	1.430	1.437	-0.007	1.000	5082569	2.49	99.7	1751	
D 3 13C5-PFPeA	267.90 > 223.00	1.693	1.705	-0.012	0.640	3626987	2.50	99.9	47701	
4 Perfluoropentanoic acid	262.90 > 219.00	1.702	1.707	-0.005	1.005	4393072	2.49	99.6	1812	
D 47 13C3-PFBS	301.90 > 83.00	1.729	1.740	-0.011	0.654	85421	2.33	100	582	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.738	1.743	-0.005	1.005	6551841	2.28	103	71305	
	298.90 > 99.00	1.738	1.743	-0.005	1.005	2670763	2.45(1.25-3.74)	103	28870	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.938	1.945	-0.007	1.121	1455891	2.39	102	32502	
D 60 M2-4:2FTS	329.00 > 81.00	1.938	1.945	-0.007	0.733	566679	NC		8494	
D 7 13C2 PFHxA	315.00 > 270.00	1.970	1.982	-0.012	0.745	3930538	2.48	99.3	53262	
6 Perfluorohexanoic acid	313.00 > 269.00	1.970	1.984	-0.014	1.000	4107362	2.49	99.6	8920	
	313.00 > 119.00	1.970	1.984	-0.014	1.000	368324	11.15(5.03-15.10)	99.6	4040	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	1.992	2.004	-0.012	1.152	6488596	2.48	106	53901	
	349.00 > 99.00	1.992	2.004	-0.012	1.152	2318443	2.80(1.36-4.07)	106	27014	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.072	2.076	-0.004	0.783	129280	NC		4559	

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	2.072	2.077	-0.005	1.000	671470	NC		3186
D 9 13C4-PFHpA	367.00	> 322.00	2.294	2.301	-0.007	0.867	3562614	2.48	99.3	48837
10 Perfluoroheptanoic acid	363.00	> 319.00	2.294	2.302	-0.008	1.000	4161707	2.52	101	3683
	363.00	> 169.00	2.294	2.302	-0.008	1.000	1599190	2.60(1.13-3.40)	101	12004
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.307	2.314	-0.007	1.000	5297055	2.28	100	22231
	399.00	> 99.00	2.307	2.314	-0.007	1.000	1763515	3.00(1.50-4.49)	100	5827
D 11 18O2 PFHxS	403.00	> 84.00	2.307	2.314	-0.007	0.872	4840412	2.36	99.8	36410
65 Adona	377.00	> 251.00	2.333	2.345	-0.012	0.775	11030843	NC		59431
	377.00	> 85.00	2.333	2.345	-0.012	0.775	6590692	1.67(0.84-2.53)		23523
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.621	2.628	-0.007	1.000	1488769	2.30	97.2	14098
D 12 M2-6:2FTS	429.00	> 81.00	2.621	2.628	-0.007	0.991	923567	2.49	105	21218
* 62 13C2-PFOA	415.00	> 370.00	2.645	2.654	-0.009		3530700	2.50		40867
15 Perfluorooctanoic acid	413.00	> 369.00	2.645	2.654	-0.009	1.000	3968232	2.40	95.8	2136
	413.00	> 169.00	2.645	2.654	-0.009	1.000	2035686	1.95(0.84-2.52)	95.8	7131
D 14 13C4 PFOA	417.00	> 372.00	2.645	2.654	-0.009	1.000	3392211	2.50	100	34010
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.653	2.662	-0.009	0.881	4673461	2.45	103	37778
	449.00	> 99.00	2.653	2.662	-0.009	0.881	1279037	3.65(1.94-5.82)	103	30106
D 18 13C4 PFOS	503.00	> 80.00	3.011	3.018	-0.006	1.139	3287685	2.41	101	22139
D 19 13C5 PFNA	468.00	> 423.00	3.011	3.018	-0.007	1.139	2696141	2.52	101	40426
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.011	3.018	-0.007	1.000	3608394	2.31	99.4	39699
	499.00	> 99.00	3.011	3.018	-0.007	1.000	795004	4.54(2.31-6.93)	99.4	11085
20 Perfluorononanoic acid	463.00	> 419.00	3.011	3.021	-0.010	1.000	2937722	2.51	100	10772
	463.00	> 169.00	3.011	3.021	-0.010	1.000	721328	4.07(1.90-5.69)	100	36529
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.225	3.230	-0.005	1.071	5872226	NC		72615
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.351	3.362	-0.011	1.113	2507520	2.38	99.0	43921
	549.00	> 99.00	3.351	3.362	-0.011	1.113	930683	2.69(1.33-3.97)	99.0	13197
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.351	3.363	-0.012	1.000	1110703	2.45	102	35003
D 26 M2-8:2FTS	529.00	> 81.00	3.351	3.364	-0.013	1.267	816606	2.42	101	15122

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.361	3.370	-0.009	1.271	4775273	2.47		98.6	46204	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.361	3.371	-0.010	1.000	5113705	2.66		106	41983	
D 23 13C2 PFDA										
515.00 > 470.00	3.370	3.376	-0.006	1.274	2031902	2.51		100	37798	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.370	3.378	-0.008	1.000	2139115	2.60		104	5668	
513.00 > 169.00	3.370	3.378	-0.008	1.000	393849		5.43(2.36-7.09)	104	12581	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.519	3.528	-0.009	1.331	603767	2.43		97.2	18727	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.519	3.531	-0.012	1.000	615583	2.58		103	5849	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.676	3.686	-0.010	1.221	2179207	2.45		102	75717	
599.00 > 99.00	3.676	3.686	-0.010	1.221	750157		2.91(1.39-4.16)	102	19518	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.687	3.697	-0.010	1.394	631827	2.46		98.6	3176	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.697	3.702	-0.005	1.000	1292539	2.68		107	5375	
563.00 > 169.00	3.697	3.702	-0.005	1.000	330446		3.91(2.12-6.36)	107	16936	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.697	3.702	-0.005	1.003	542960	2.31		92.6	5396	
D 30 13C2 PFUnA										
565.00 > 520.00	3.697	3.702	-0.005	1.398	1500246	2.40		96.1	30791	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.855	3.860	-0.005	1.280	8193483	NC			60394	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.988	3.995	-0.007	1.000	1741222	2.49		99.5	542	
613.00 > 169.00	3.988	3.995	-0.007	1.000	426627		4.08(2.13-6.40)	99.5	8950	
D 36 13C2 PFDaA										
615.00 > 570.00	3.988	3.995	-0.007	1.508	1654135	2.63		105	12297	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.242	4.254	-0.012	1.064	1465014	2.38		95.1	449	
663.00 > 169.00	4.242	4.254	-0.012	1.064	480460		3.05(1.25-3.76)	95.1	4365	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.480	4.490	-0.010	1.000	353319	2.33		93.2	4585	
713.00 > 219.00	4.480	4.490	-0.010	1.000	254055		1.39(0.71-2.13)	93.2	4324	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.480	4.490	-0.010	1.694	1477284	2.54		102	5624	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.894	-0.007	1.848	2347684	2.39		95.6	5534	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.895	-0.008	1.000	2308991	NC			306	
813.00 > 169.00	4.887	4.895	-0.008	1.000	387228		5.96(2.86-8.58)		2468	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.233	5.239	-0.006	1.071	2807876	NC			867	
913.00 > 169.00	5.233	5.239	-0.006	1.071	345578		8.13(3.83-11.48)		3371	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL5_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_006.d

Injection Date: 22-Jun-2018 09:49:37

Instrument ID: A8_N

Lims ID: IC L5 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 14

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

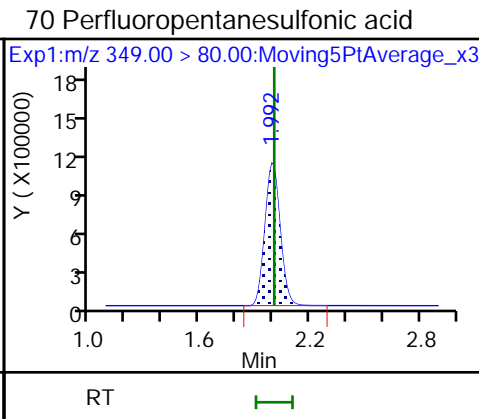
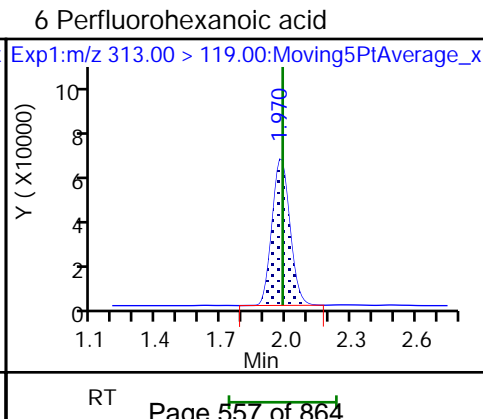
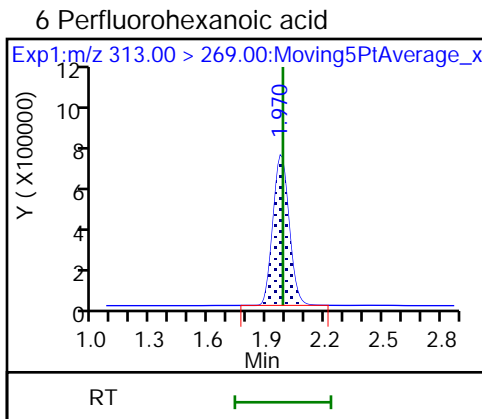
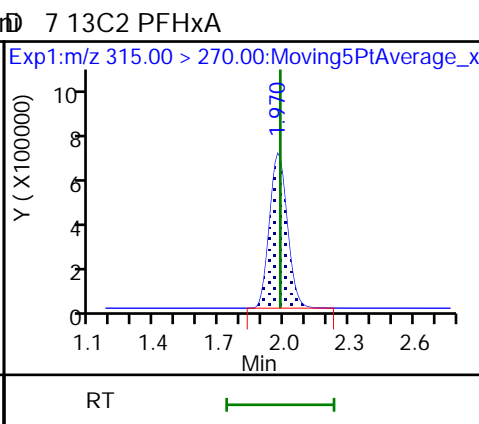
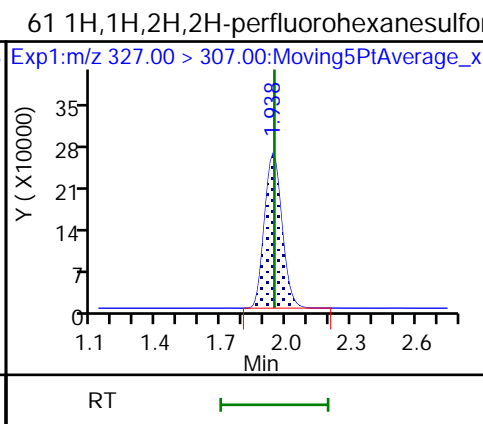
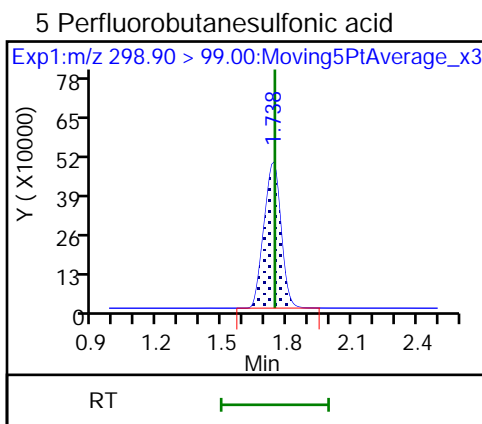
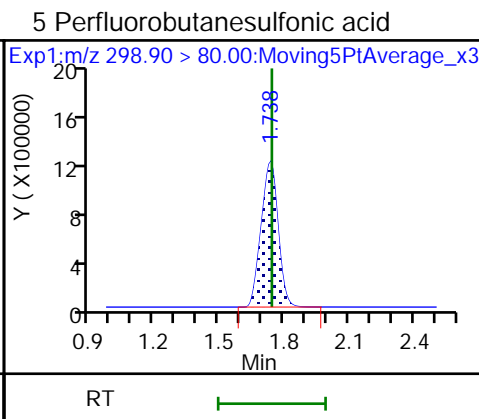
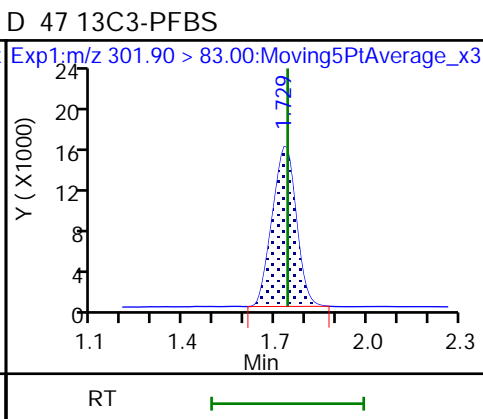
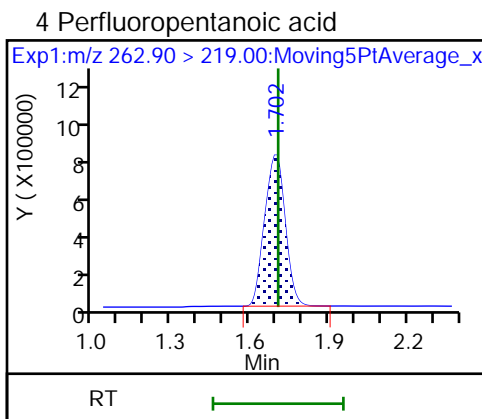
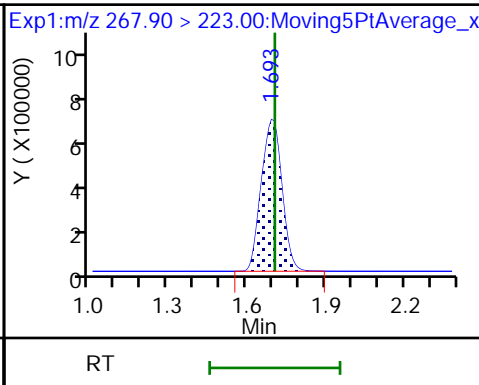
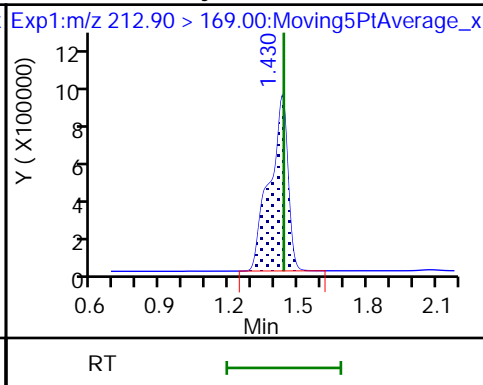
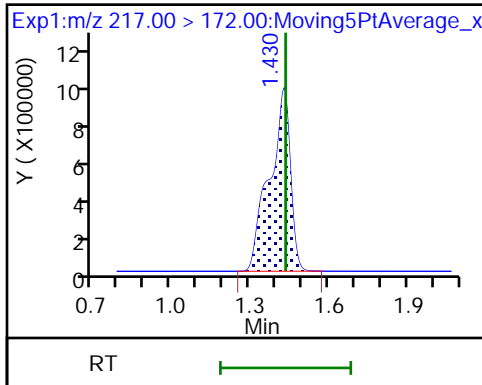
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

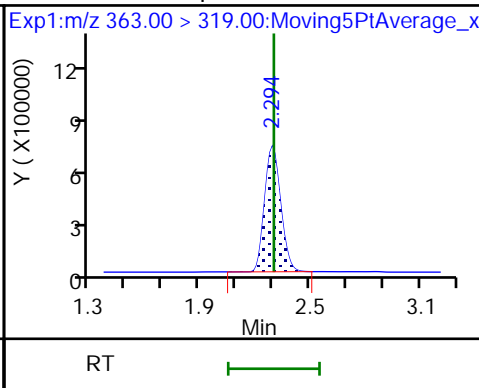
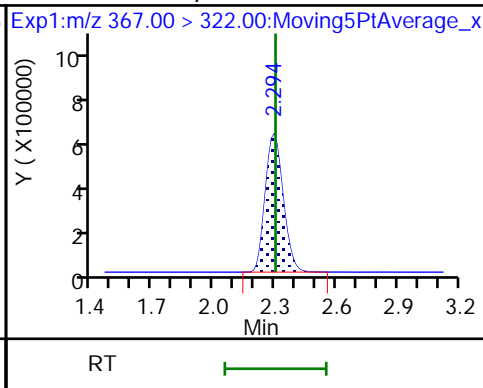
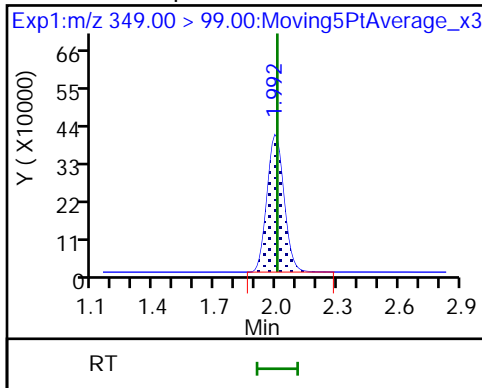
D 3 13C5-PFPeA



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

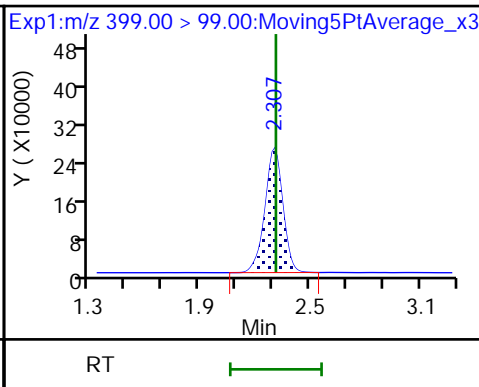
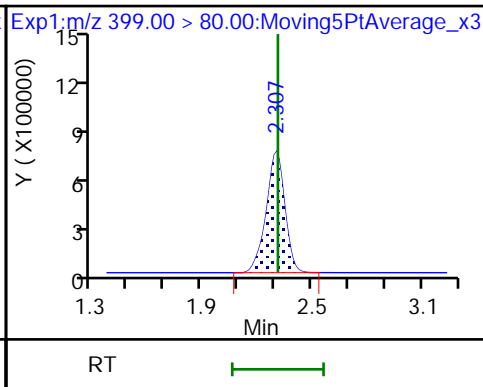
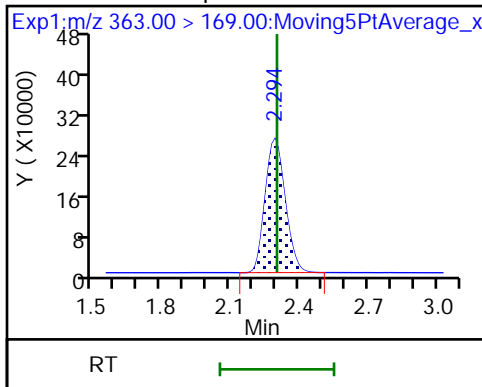
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

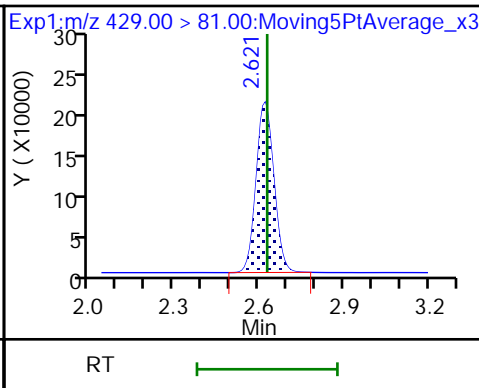
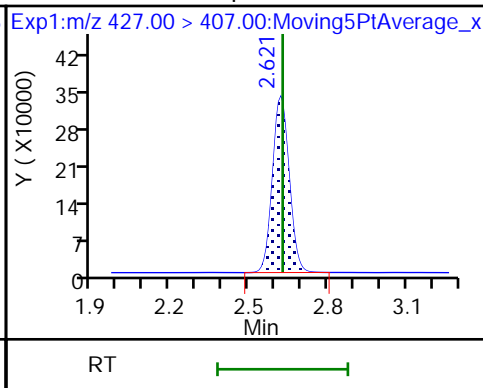
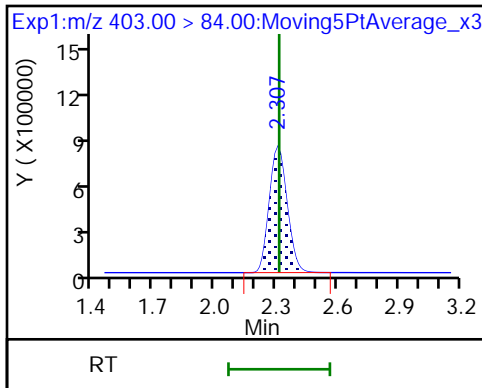
8 Perfluorohexanesulfonic acid

8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

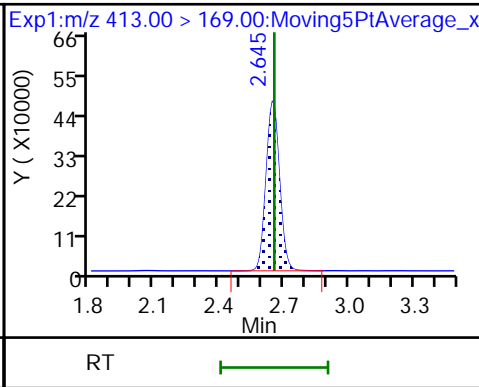
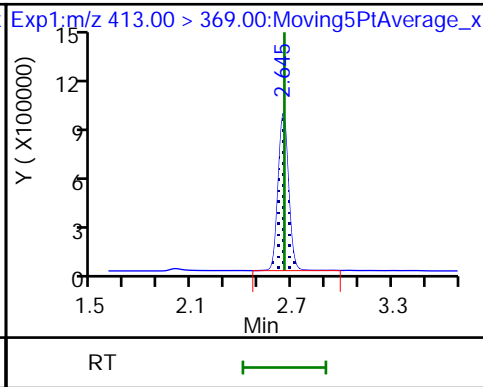
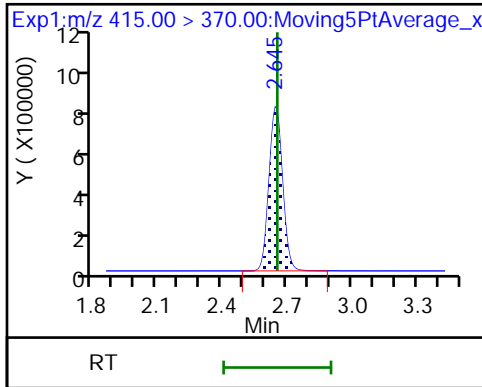
13 1H,1H,2H,2H-perfluorooctanesulfonD 12 M2-6:2FTS



* 62 13C2-PFOA

15 Perfluorooctanoic acid

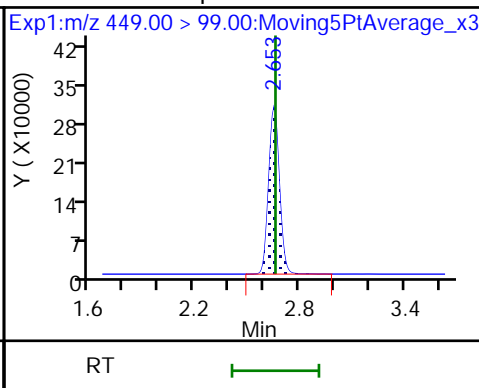
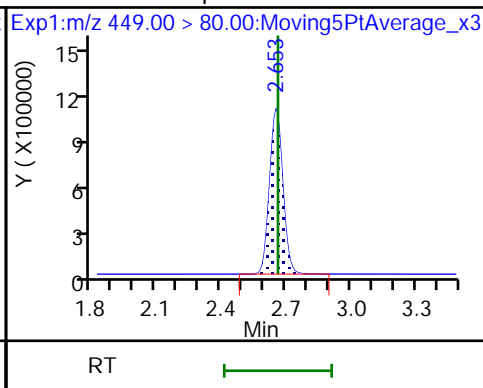
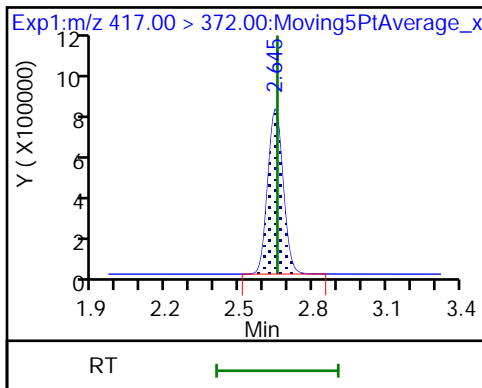
15 Perfluorooctanoic acid



D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

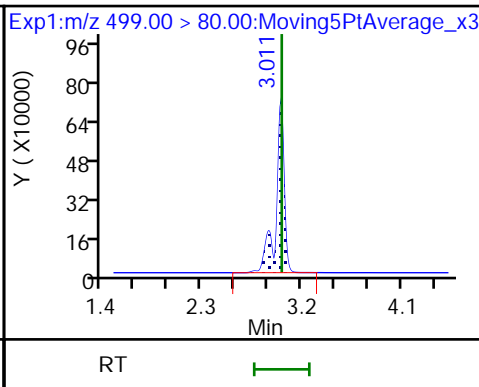
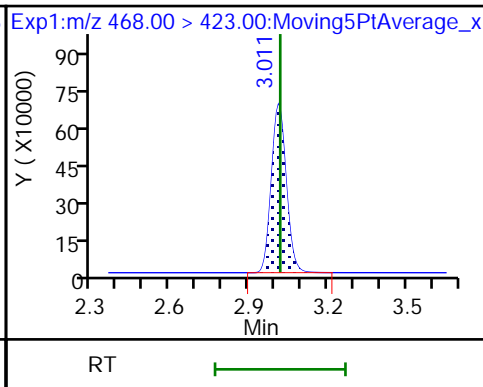
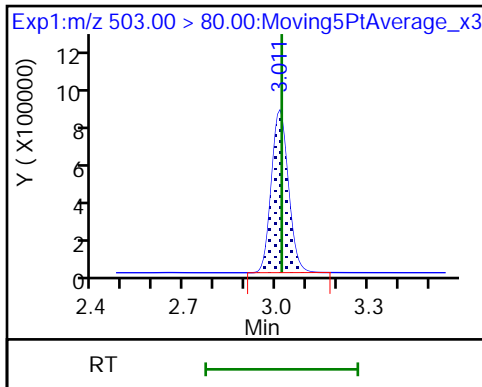
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

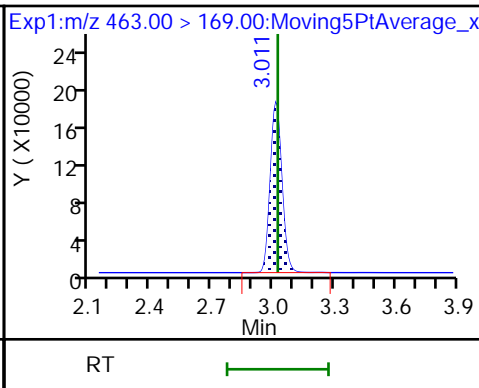
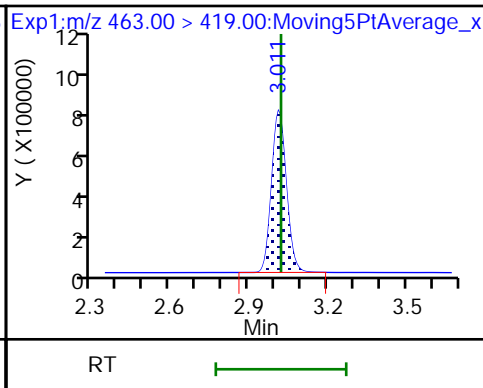
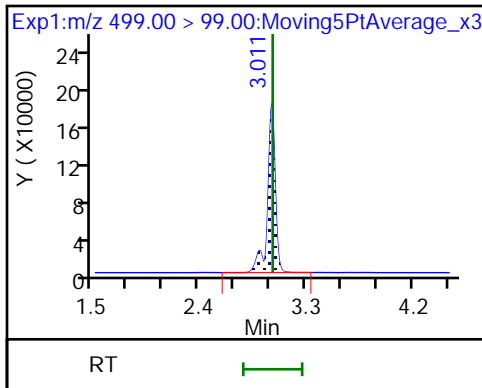
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid

20 Perfluorononanoic acid

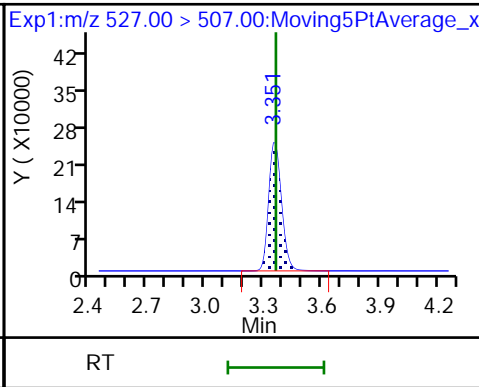
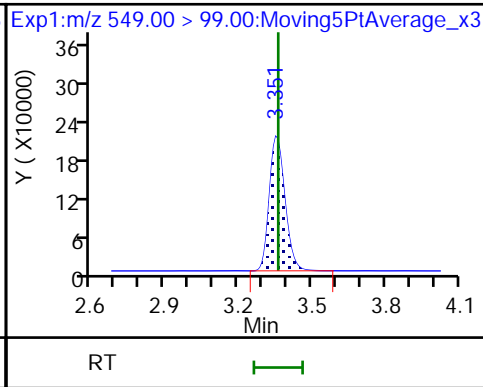
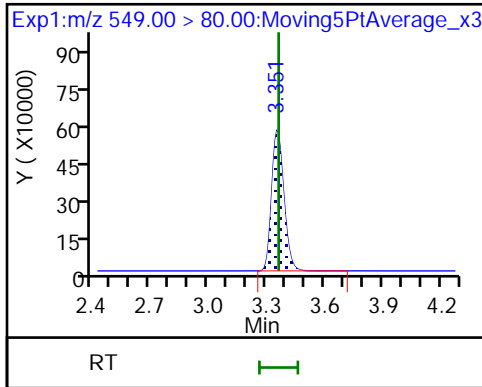
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

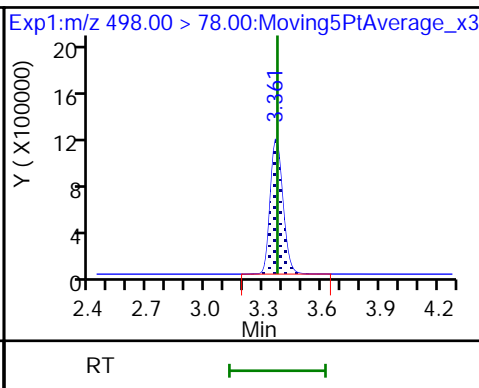
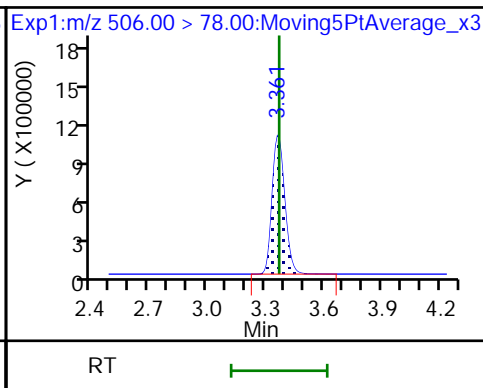
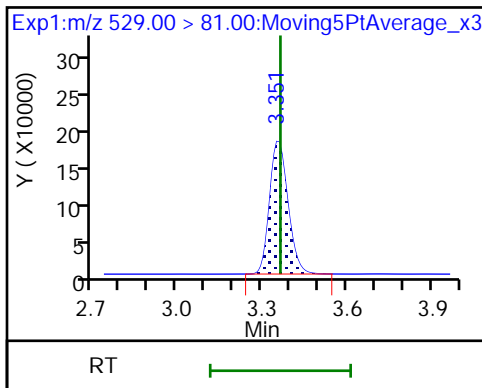
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

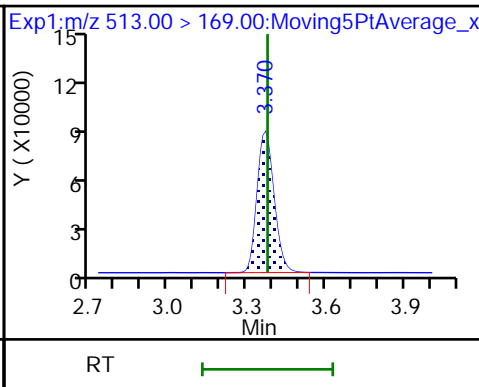
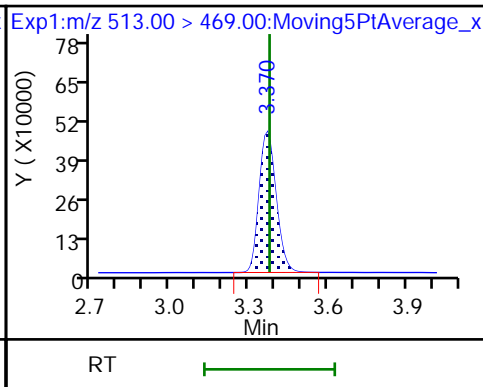
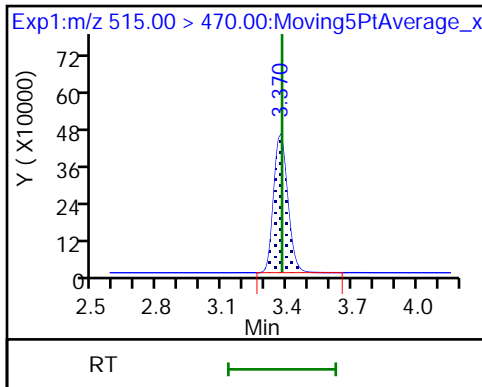
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid

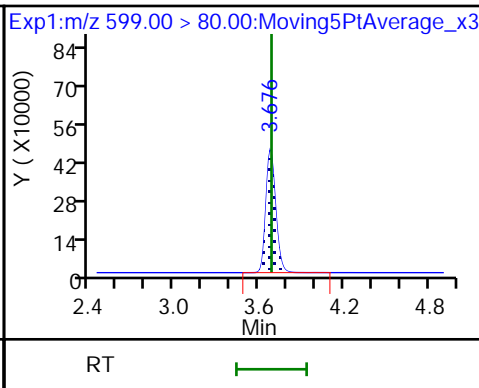
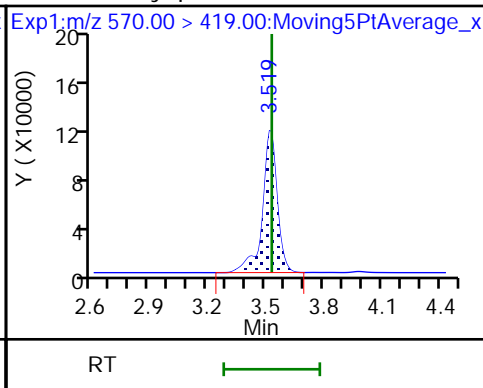
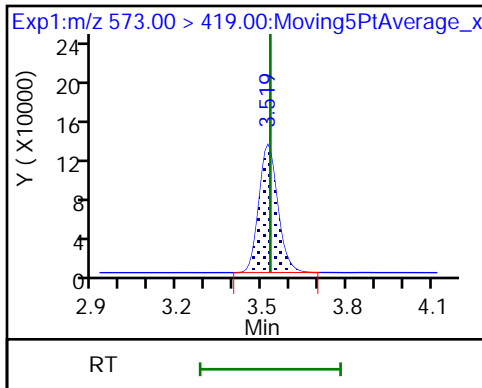
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

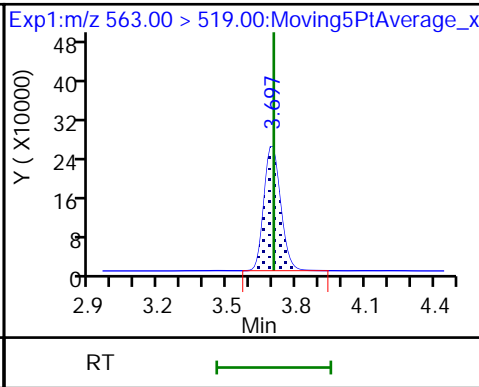
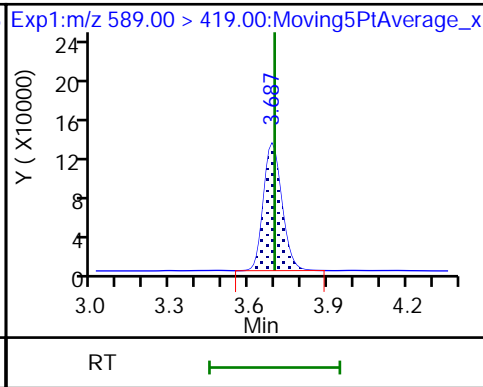
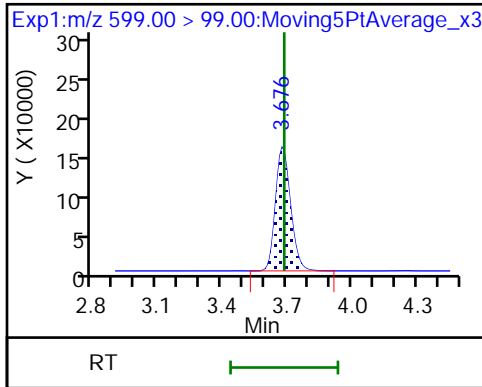
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

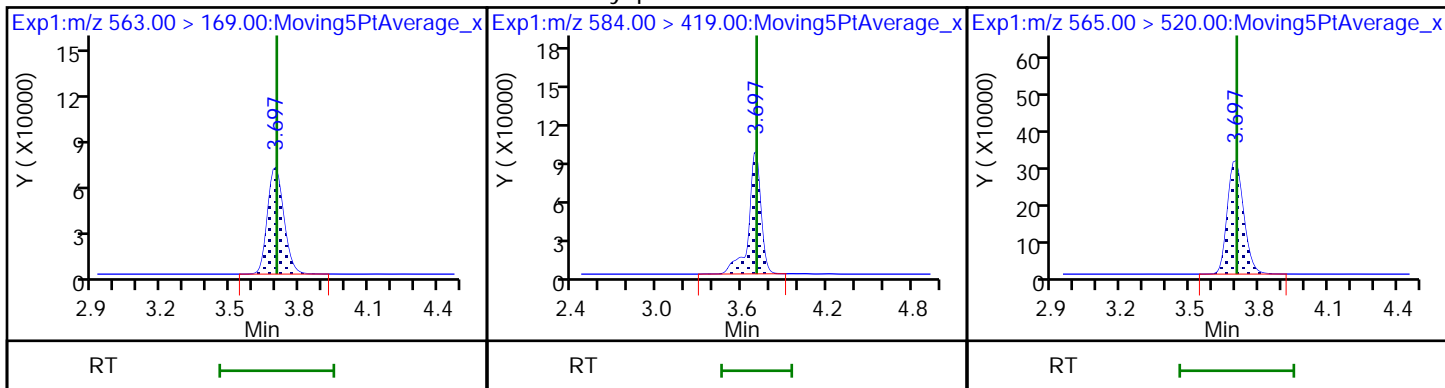
D 32 d5-NEtFOSAA

31 Perfluoroundecanoic acid



31 Perfluoroundecanoic acid

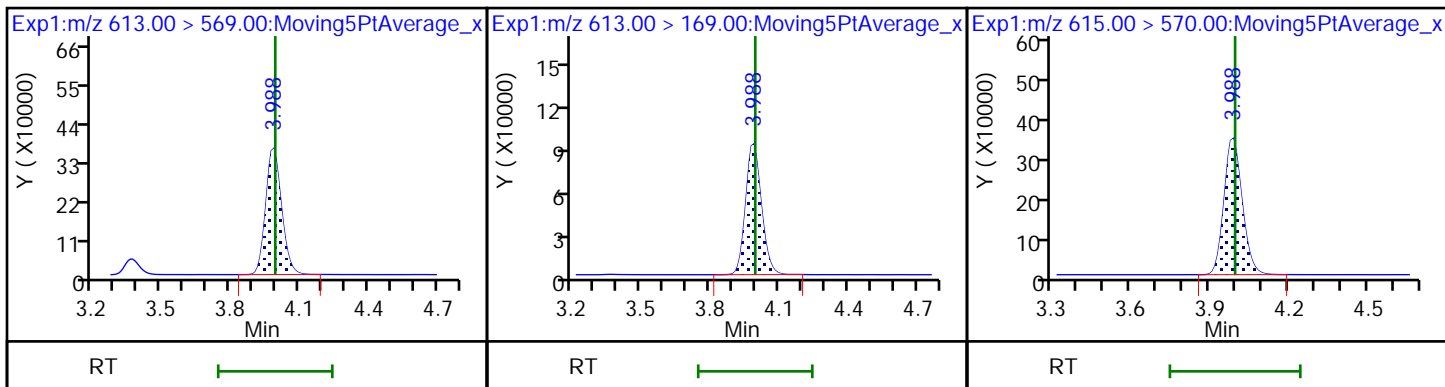
33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

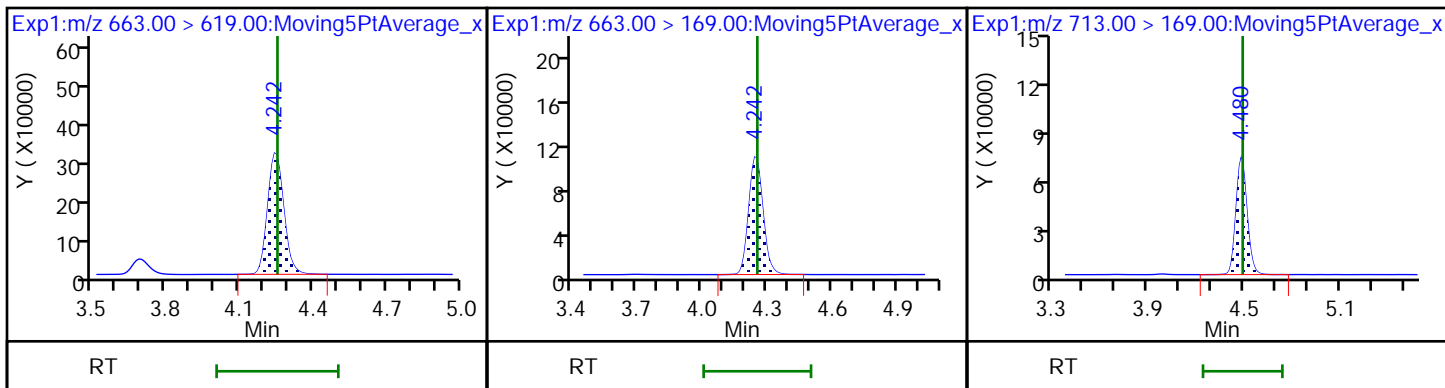
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

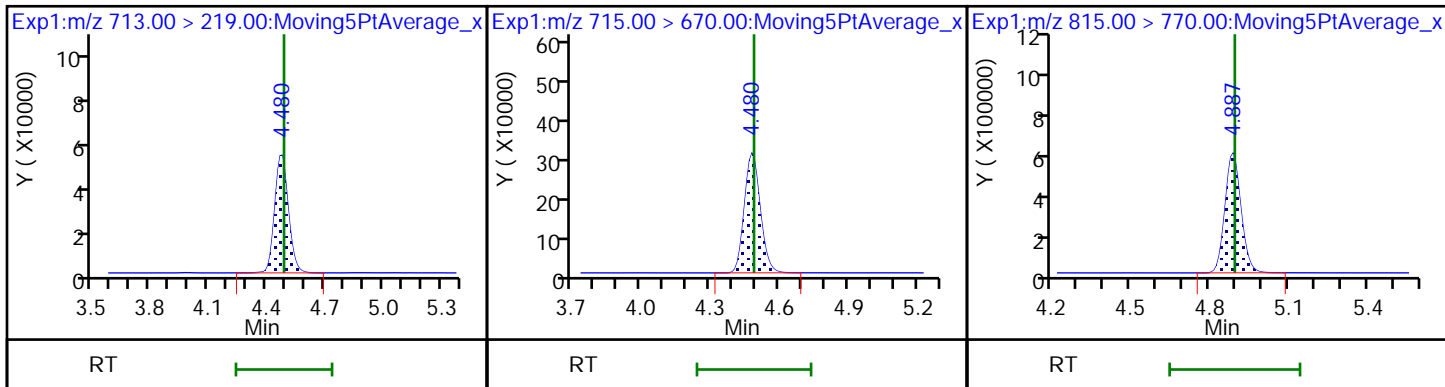
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_007.d
 Lims ID: IC L6 Full
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 22-Jun-2018 09:57:27 ALS Bottle#: 15 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L6-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:45:19 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 10:21:57

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	1.436	1.435	0.001	0.543	4935509	2.52	101	25135	
2 Perfluorobutyric acid	212.90 > 169.00	1.436	1.437	-0.001	1.000	10038407	5.06	101	3202	
D 3 13C5-PFPeA	267.90 > 223.00	1.703	1.705	-0.002	0.644	3533618	2.50	100.0	41053	
4 Perfluoropentanoic acid	262.90 > 219.00	1.703	1.707	-0.004	1.000	8179819	4.76	95.2	3535	
D 47 13C3-PFBS	301.90 > 83.00	1.739	1.740	-0.001	0.658	85120	2.39	103	550	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.739	1.743	-0.004	1.000	12478112	4.35	98.5	99134	
	298.90 > 99.00	1.739	1.743	-0.004	1.000	5368460	2.32(1.25-3.74)	98.5	52064	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.939	1.945	-0.006	1.115	2637247	4.34	93.0	57537	
D 60 M2-4:2FTS	329.00 > 81.00	1.939	1.945	-0.006	0.733	533505	NC		7904	
D 7 13C2 PFHxA	315.00 > 270.00	1.982	1.982	0.0	0.749	3747484	2.43	97.3	59073	
6 Perfluorohexanoic acid	313.00 > 269.00	1.982	1.984	-0.002	1.000	8007957	5.09	102	14400	
	313.00 > 119.00	1.982	1.984	-0.002	1.000	741957	10.79(5.03-15.10)	102	12954	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.004	2.004	0.0	1.153	12160402	4.66	99.3	77923	
	349.00 > 99.00	2.004	2.004	0.0	1.153	4587465	2.65(1.36-4.07)	99.3	41788	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.072	2.076	-0.004	0.784	143794	NC		5090	

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	2.072	2.077	-0.005	1.000	1309373	NC		5743
D 9 13C4-PFHpA	367.00	> 322.00	2.295	2.301	-0.006	0.868	3380419	2.42	96.8	35073
10 Perfluoroheptanoic acid	363.00	> 319.00	2.295	2.302	-0.007	1.000	7630621	4.87	97.4	6115
	363.00	> 169.00	2.295	2.302	-0.007	1.000	3069475	2.49(1.13-3.40)	97.4	17009
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.308	2.314	-0.006	1.000	10057619	4.34	95.4	29674
	399.00	> 99.00	2.308	2.314	-0.006	1.000	3446742	2.92(1.50-4.49)	95.4	9614
D 11 18O2 PFHxS	403.00	> 84.00	2.308	2.314	-0.006	0.873	4821638	2.42	102	42426
65 Adona	377.00	> 251.00	2.334	2.345	-0.011	0.775	19726708	NC		71326
	377.00	> 85.00	2.334	2.345	-0.011	0.775	12386464	1.59(0.84-2.53)		41421
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.620	2.628	-0.008	1.000	2871537	4.87	103	23648
D 12 M2-6:2FTS	429.00	> 81.00	2.620	2.628	-0.008	0.991	842860	2.33	98.2	14827
* 62 13C2-PFOA	415.00	> 370.00	2.644	2.654	-0.010		3437450	2.50		34692
15 Perfluorooctanoic acid	413.00	> 369.00	2.644	2.654	-0.010	1.000	7528593	4.66	93.1	3248
	413.00	> 169.00	2.644	2.654	-0.010	1.000	3983600	1.89(0.84-2.52)	93.1	12608
D 14 13C4 PFOA	417.00	> 372.00	2.644	2.654	-0.010	1.000	3310624	2.51	100	29541
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.652	2.662	-0.010	0.881	9071722	4.99	105	47074
	449.00	> 99.00	2.652	2.662	-0.010	0.881	2501857	3.63(1.94-5.82)	105	29431
D 18 13C4 PFOS	503.00	> 80.00	3.011	3.018	-0.006	1.139	3135647	2.36	98.8	20328
D 19 13C5 PFNA	468.00	> 423.00	3.011	3.018	-0.007	1.139	2540754	2.44	97.7	30704
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.011	3.018	-0.007	1.000	7180006	4.81	104	50309
	499.00	> 99.00	3.011	3.018	-0.007	1.000	1555944	4.61(2.31-6.93)	104	22024
20 Perfluorononanoic acid	463.00	> 419.00	3.011	3.021	-0.010	1.000	5570182	5.05	101	16511
	463.00	> 169.00	3.011	3.021	-0.010	1.000	1322577	4.21(1.90-5.69)	101	33539
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.224	3.230	-0.006	1.071	11196694	NC		58869
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.351	3.362	-0.011	1.113	4992926	4.96	103	42114
	549.00	> 99.00	3.351	3.362	-0.011	1.113	1808623	2.76(1.33-3.97)	103	15319
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.360	3.363	-0.003	1.000	2089995	4.91	102	30881
D 26 M2-8:2FTS	529.00	> 81.00	3.360	3.364	-0.004	1.271	765818	2.33	97.4	15435

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.360	3.370	-0.010	1.271	4608610	2.44		97.8	37843	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.370	3.371	-0.001	1.003	9763674	5.26		105	57995	
D 23 13C2 PFDA										
515.00 > 470.00	3.370	3.376	-0.006	1.274	1888841	2.40		95.8	22118	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.370	3.378	-0.008	1.000	3937614	5.14		103	9845	
513.00 > 169.00	3.370	3.378	-0.008	1.000	704781		5.59(2.36-7.09)	103	14196	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.519	3.528	-0.009	1.331	618999	2.56		102	16890	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.528	3.531	-0.003	1.003	1256655	5.13		103	9341	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.676	3.686	-0.010	1.221	4293805	5.07		105	74926	
599.00 > 99.00	3.676	3.686	-0.010	1.221	1420090		3.02(1.39-4.16)	105	29728	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.687	3.697	-0.010	1.394	621285	2.49		99.6	2792	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.697	3.702	-0.005	1.000	2350950	4.87		97.4	8322	
563.00 > 169.00	3.697	3.702	-0.005	1.000	619482		3.80(2.12-6.36)	97.4	25390	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.697	3.702	-0.005	1.003	1172882	5.08		102	49053	
D 30 13C2 PFUnA										
565.00 > 520.00	3.697	3.702	-0.005	1.398	1499395	2.47		98.7	23855	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.855	3.860	-0.005	1.280	15261948	NC			136718	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.988	3.995	-0.007	1.000	3336019	5.08		102	1130	
613.00 > 169.00	3.988	3.995	-0.007	1.000	825844		4.04(2.13-6.40)	102	17257	
D 36 13C2 PFDaA										
615.00 > 570.00	3.988	3.995	-0.007	1.508	1551827	2.53		101	10862	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.252	4.254	-0.002	1.066	3010254	5.21		104	1017	
663.00 > 169.00	4.242	4.254	-0.012	1.064	960850		3.13(1.25-3.76)	104	9046	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.481	4.490	-0.009	1.000	715874	4.92		98.3	8732	
713.00 > 219.00	4.470	4.490	-0.020	0.998	535775		1.34(0.71-2.13)	98.3	6452	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.481	4.490	-0.009	1.694	1418685	2.51		100	6043	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.888	4.894	-0.006	1.848	2260290	2.36		94.5	5193	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.888	4.895	-0.007	1.000	4484405	NC			581	
813.00 > 169.00	4.888	4.895	-0.007	1.000	700817		6.40(2.86-8.58)		3676	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.233	5.239	-0.006	1.071	5770055	NC			1610	
913.00 > 169.00	5.233	5.239	-0.006	1.071	695200		8.30(3.83-11.48)		5263	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL6_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_007.d

Injection Date: 22-Jun-2018 09:57:27

Instrument ID: A8_N

Lims ID: IC L6 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 15

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

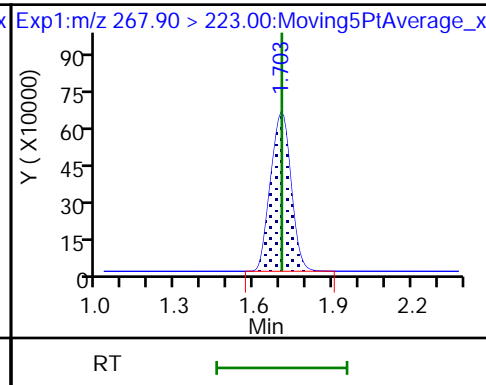
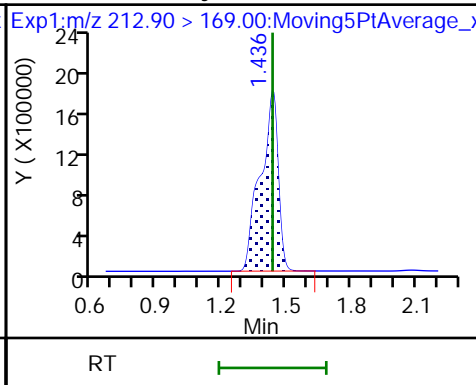
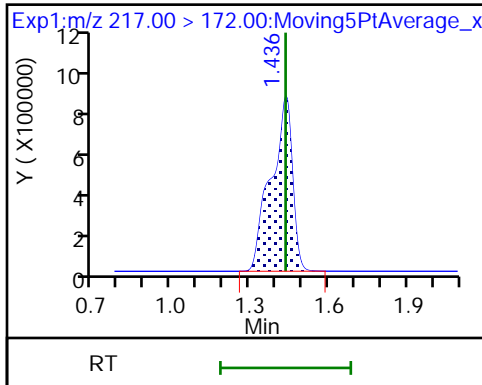
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

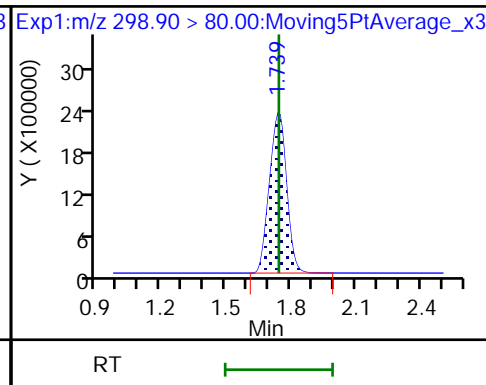
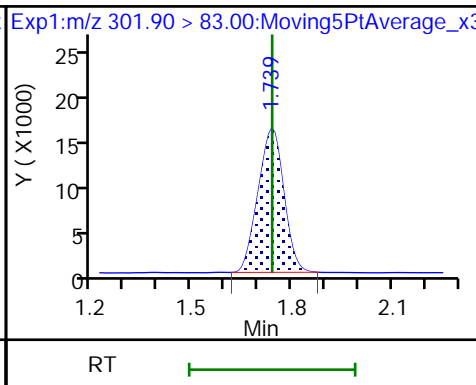
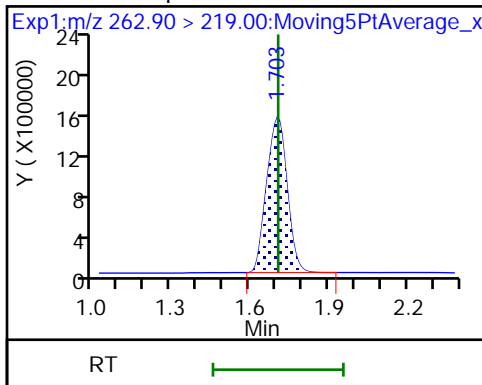
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

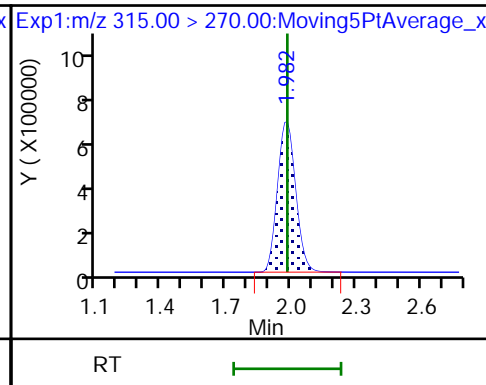
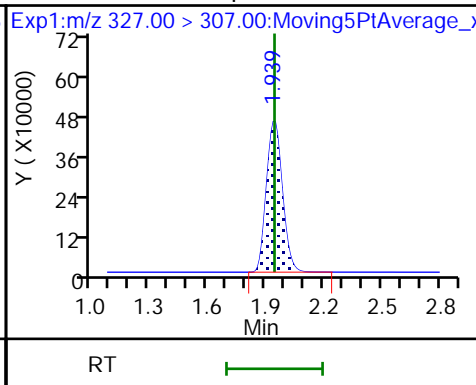
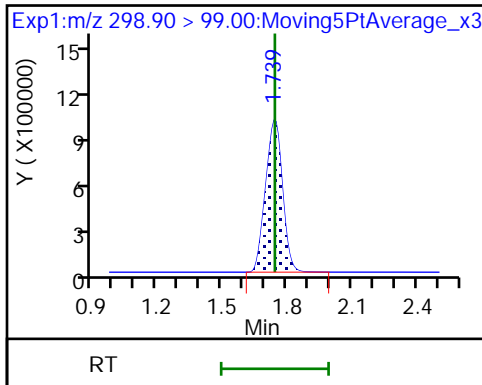
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

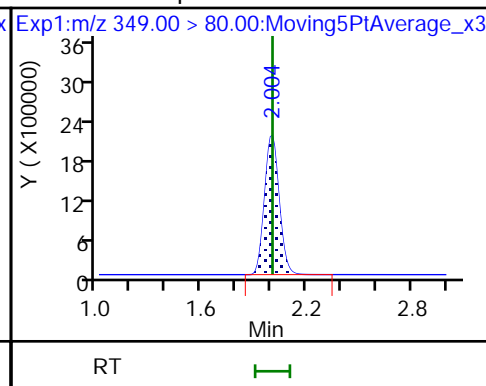
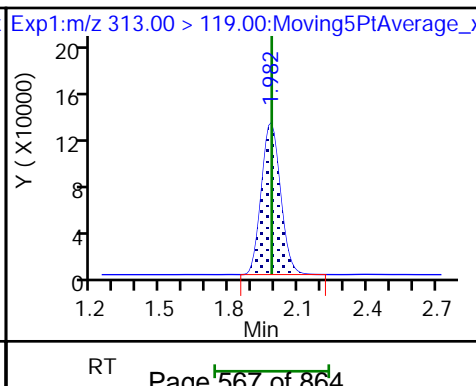
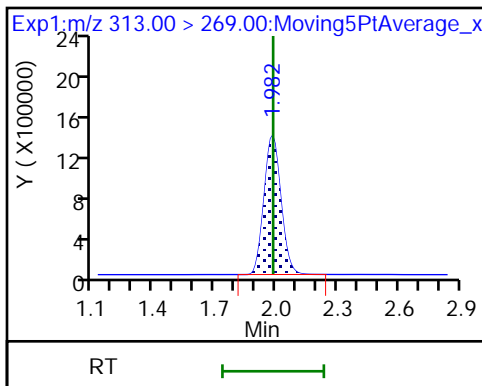
D 7 13C2 PFHxA



6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

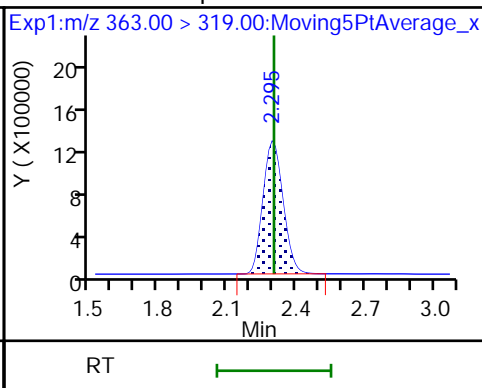
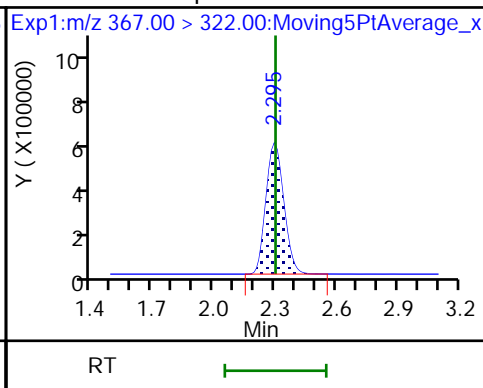
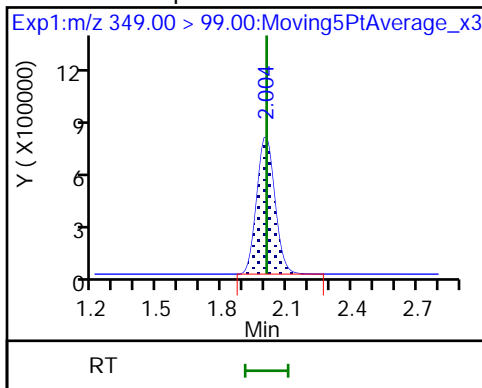
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

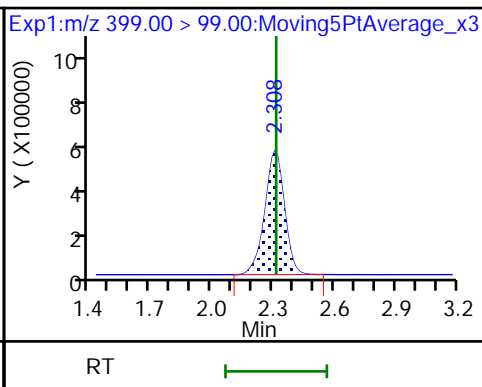
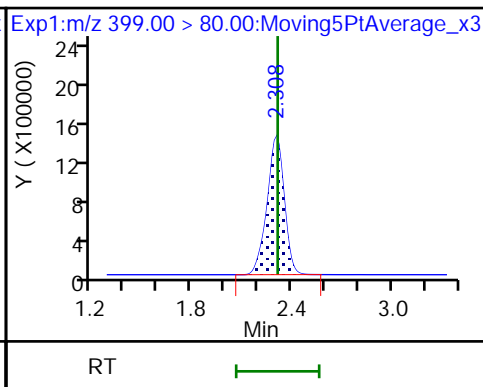
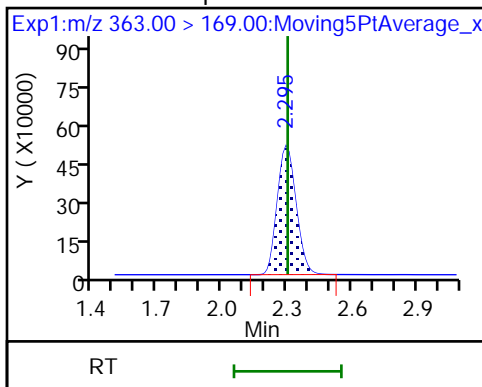
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

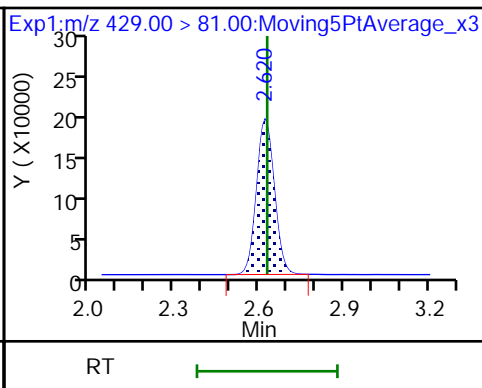
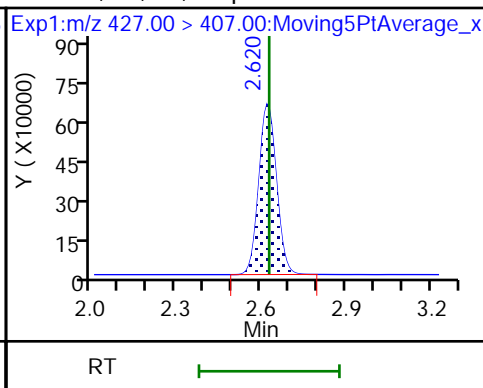
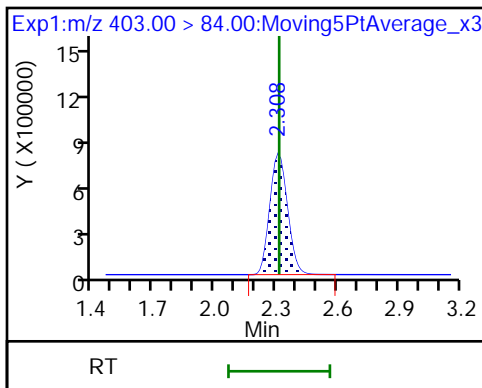
8 Perfluorohexanesulfonic acid

8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

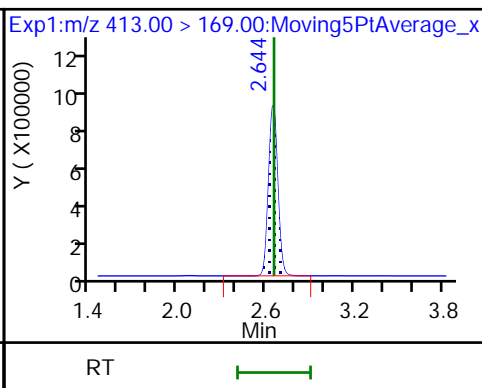
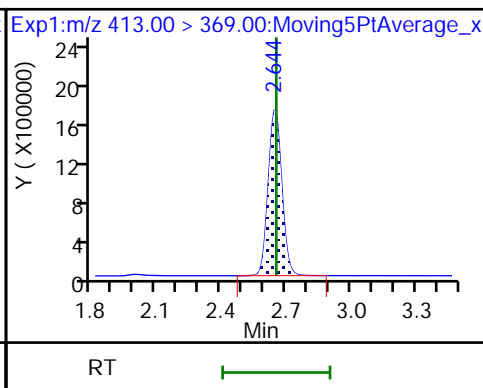
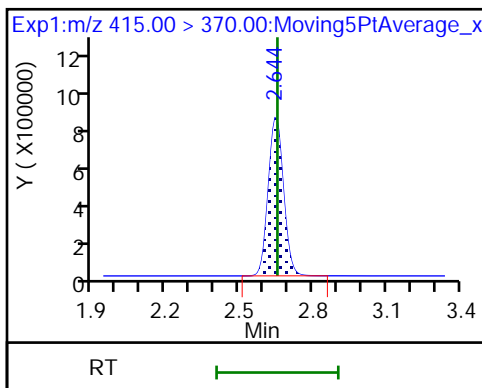
13 1H,1H,2H,2H-perfluorooctanesulfonD 12 M2-6:2FTS



* 62 13C2-PFOA

15 Perfluorooctanoic acid

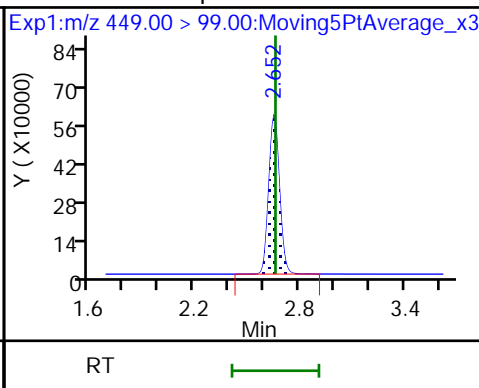
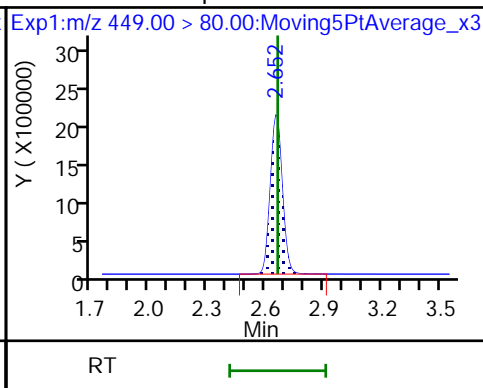
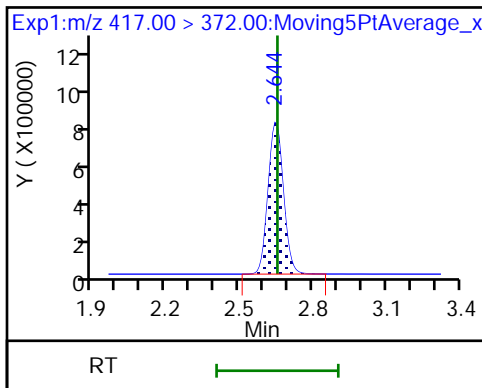
15 Perfluorooctanoic acid



D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

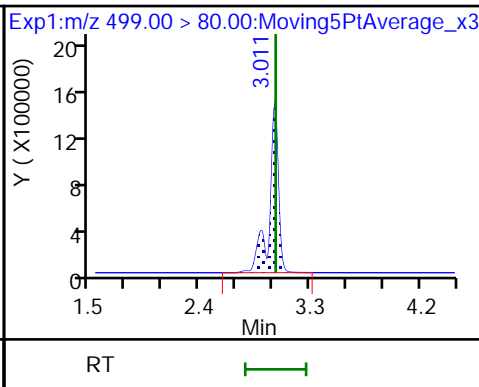
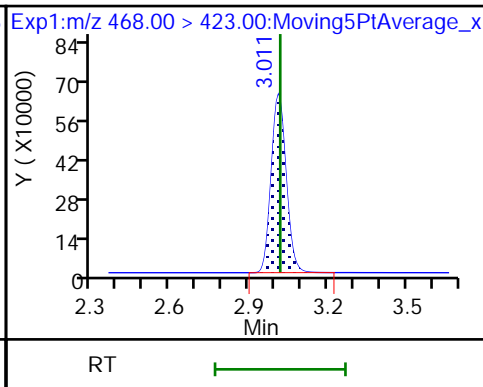
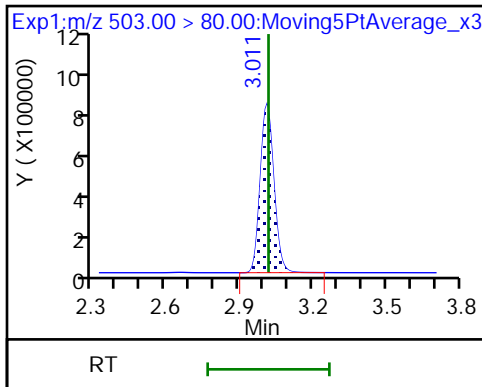
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

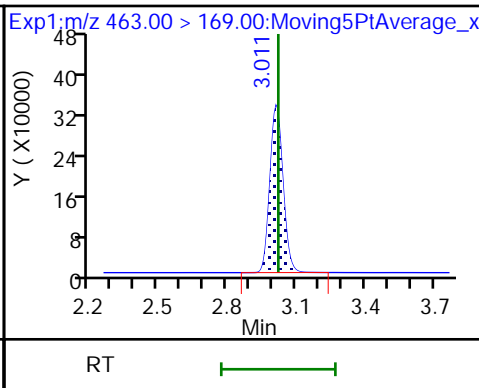
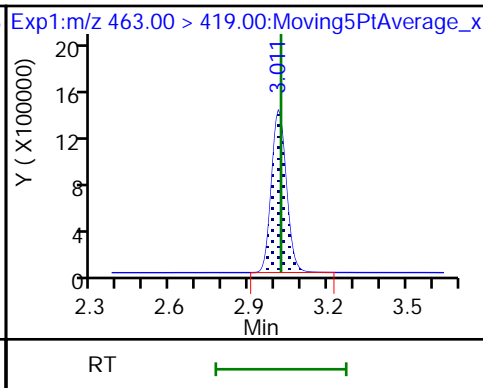
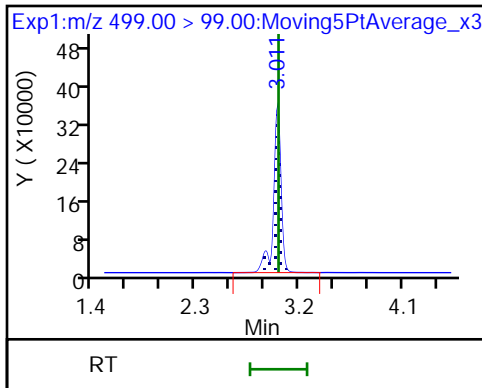
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid

20 Perfluorononanoic acid

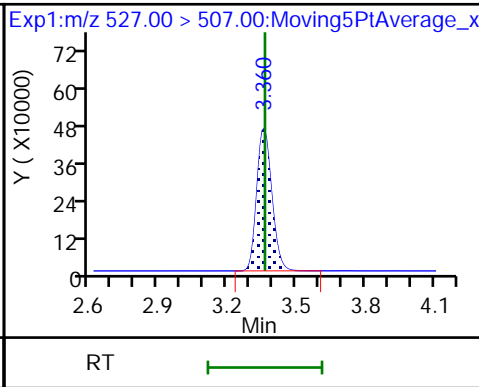
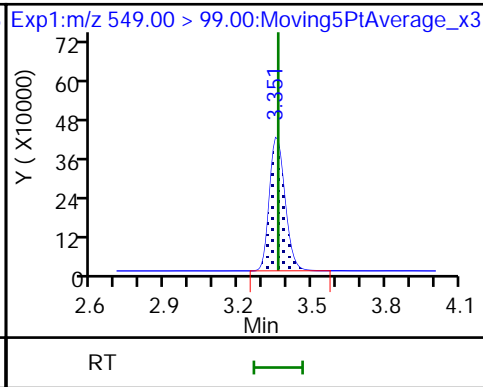
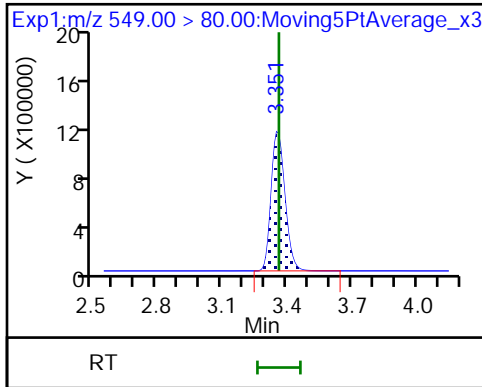
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

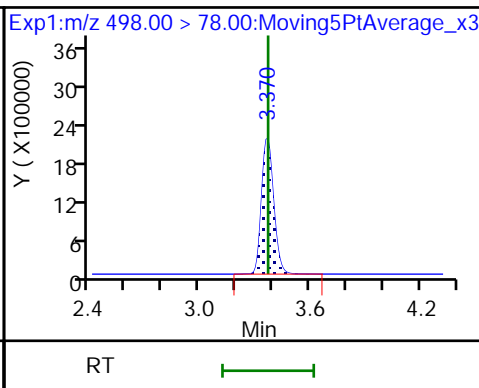
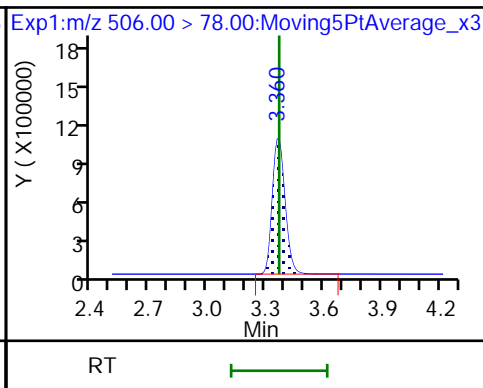
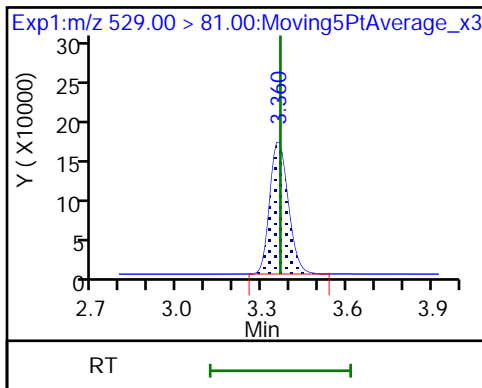
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

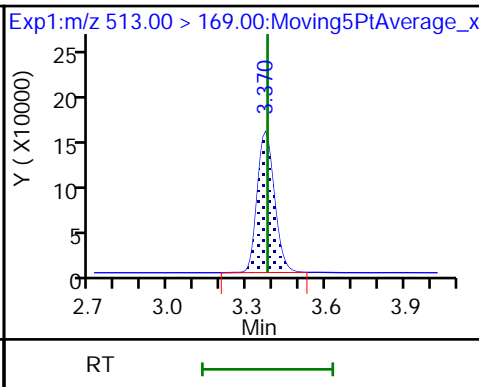
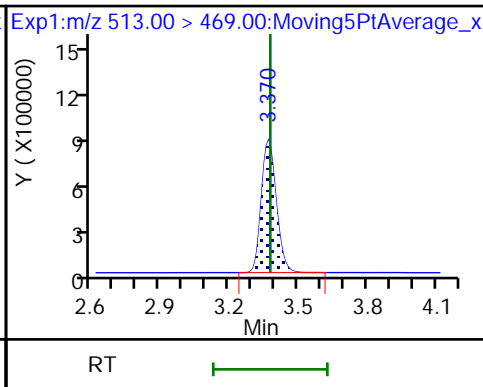
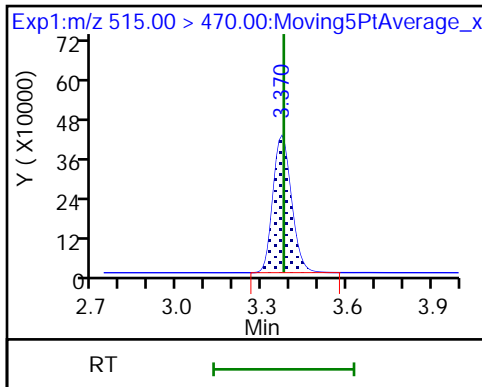
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid

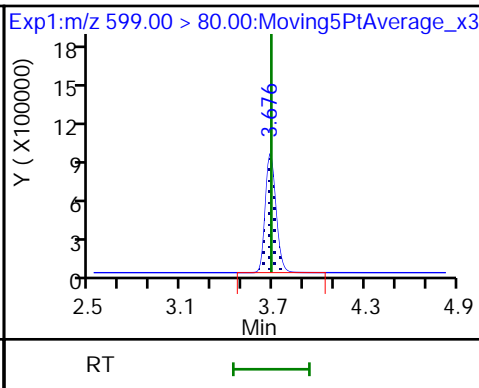
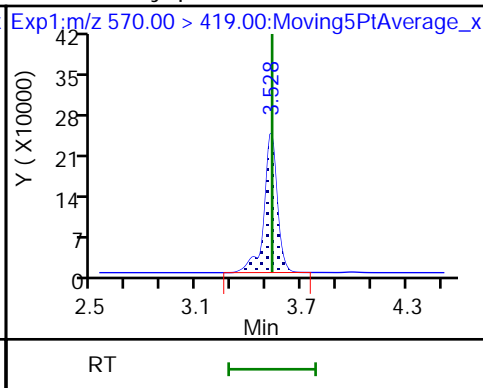
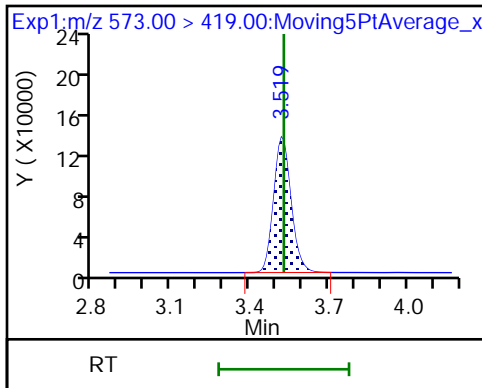
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

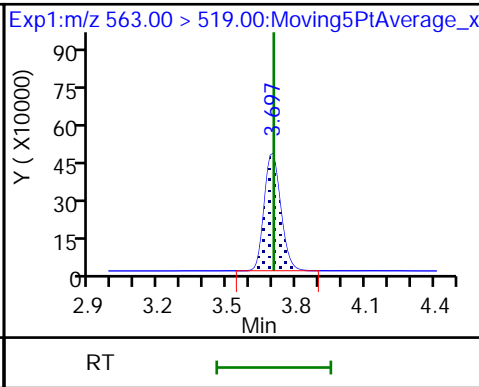
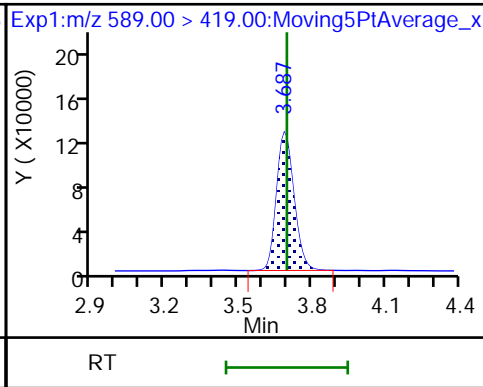
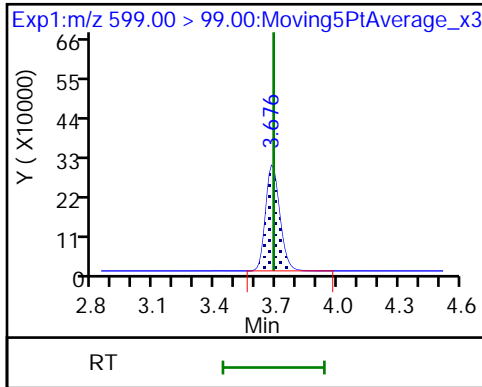
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

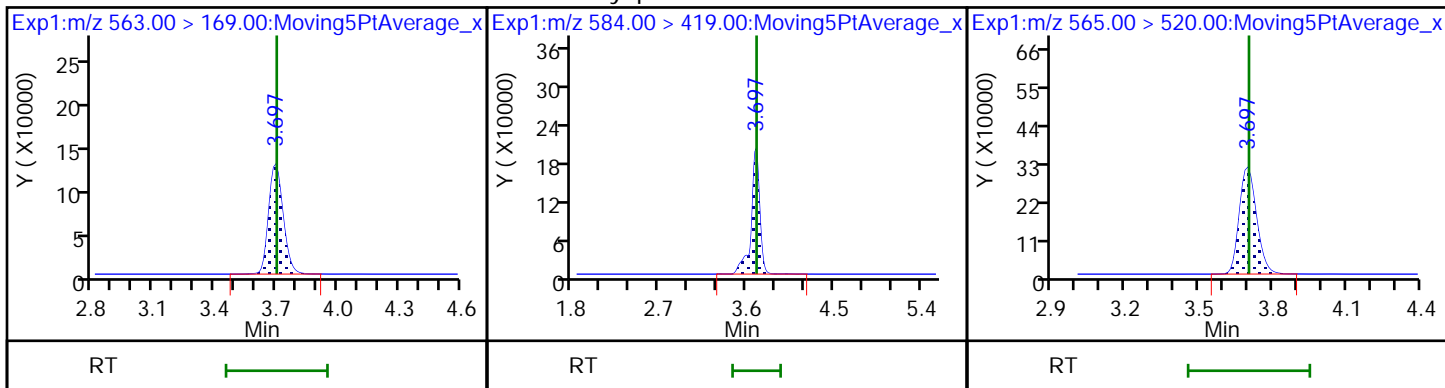
D 32 d5-NEtFOSAA

31 Perfluoroundecanoic acid



31 Perfluoroundecanoic acid

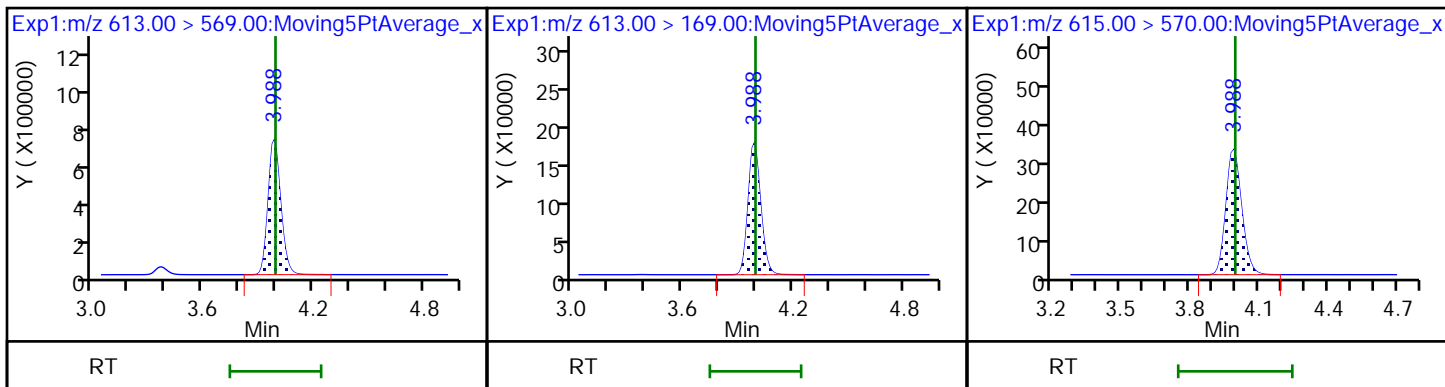
33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUa



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

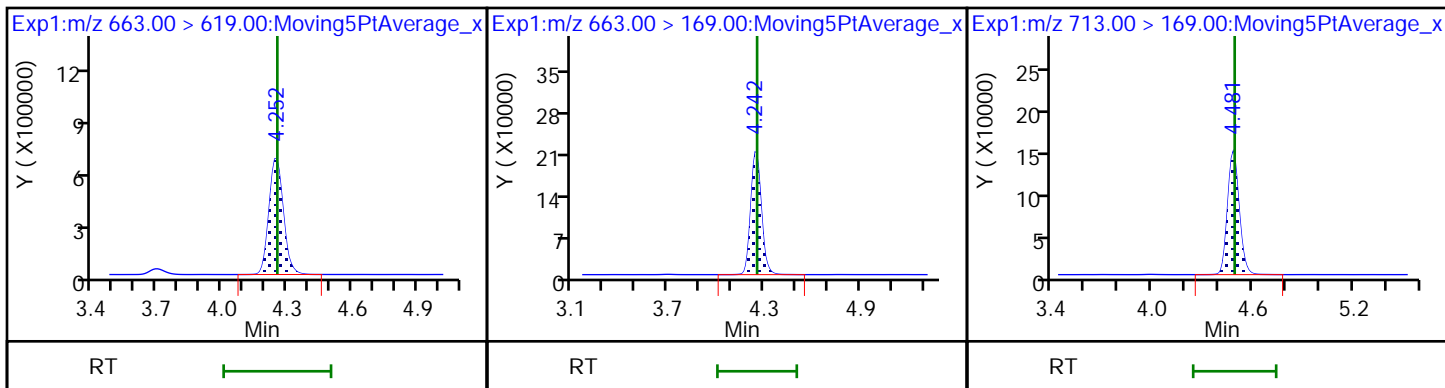
D 36 13C2 PFDa



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

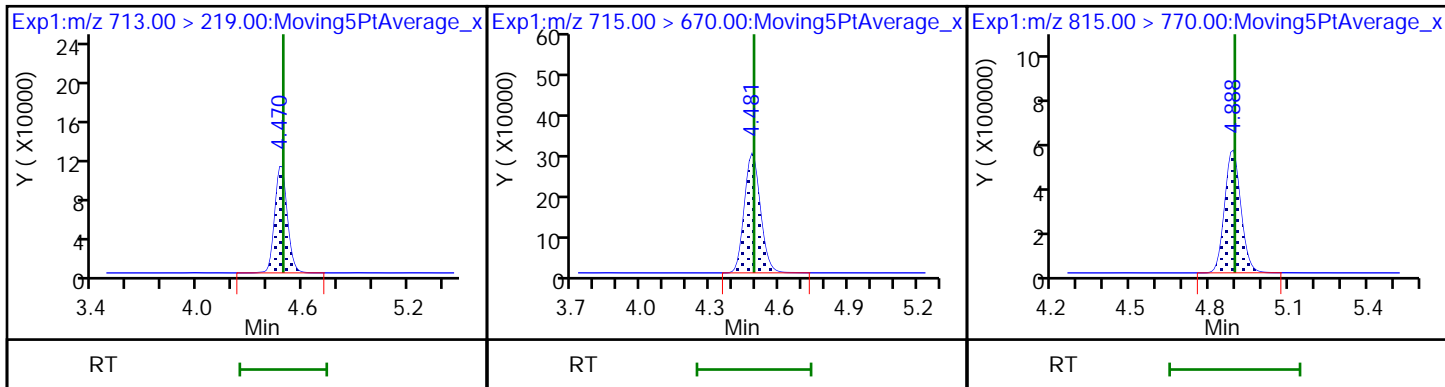
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Lims ID: IC L7 Full
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 22-Jun-2018 10:05:18 ALS Bottle#: 16 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L7-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:45:28 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 10:22:57

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	1.442	1.435	0.007	0.540	4836014	2.67	107	25205	
2 Perfluorobutyric acid	212.90 > 169.00	1.442	1.437	0.005	1.000	19649046	10.1	101	5788	
D 3 13C5-PFPeA	267.90 > 223.00	1.712	1.705	0.007	0.642	3349234	2.56	102	46938	
4 Perfluoropentanoic acid	262.90 > 219.00	1.712	1.707	0.005	1.000	16023894	9.84	98.4	8428	
D 47 13C3-PFBS	301.90 > 83.00	1.748	1.740	0.008	0.655	79602	2.42	104	563	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.748	1.743	0.005	1.000	23901442	8.92	101	139037	
	298.90 > 99.00	1.748	1.743	0.005	1.000	10488272	2.28(1.25-3.74)	101	101074	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.950	1.945	0.005	1.115	4909543	8.65	92.6	78097	
D 60 M2-4:2FTS	329.00 > 81.00	1.950	1.945	0.005	0.731	498850	NC		7842	
D 7 13C2 PFHxA	315.00 > 270.00	1.993	1.982	0.011	0.747	3630593	2.55	102	57082	
6 Perfluorohexanoic acid	313.00 > 269.00	1.993	1.984	0.009	1.000	14793082	9.71	97.1	27214	
	313.00 > 119.00	1.993	1.984	0.009	1.000	1384504	10.68(5.03-15.10)	97.1	19906	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.016	2.004	0.012	1.153	22585045	9.25	98.6	212937	
	349.00 > 99.00	2.016	2.004	0.012	1.153	9216016	2.45(1.36-4.07)	98.6	65953	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.084	2.076	0.008	0.781	153006	NC		4456	

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	2.084	2.077	0.007	1.000	2517887	NC		12242
D 9 13C4-PFHpA	367.00	> 322.00	2.308	2.301	0.007	0.865	3193349	2.47	98.9	30983
10 Perfluoroheptanoic acid	363.00	> 319.00	2.308	2.302	0.006	1.000	14577124	9.85	98.5	11089
	363.00	> 169.00	2.308	2.302	0.006	1.000	5719614	2.55(1.13-3.40)	98.5	27730
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.321	2.314	0.007	1.000	19106190	8.62	94.7	31794
	399.00	> 99.00	2.321	2.314	0.007	1.000	6665856	2.87(1.50-4.49)	94.7	13763
D 11 18O2 PFHxS	403.00	> 84.00	2.321	2.314	0.007	0.870	4613755	2.50	106	40099
65 Adona	377.00	> 251.00	2.360	2.345	0.015	0.779	35148676	NC		76460
	377.00	> 85.00	2.360	2.345	0.015	0.779	22191558	1.58(0.84-2.53)		68051
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.636	2.628	0.008	1.000	5120478	9.58	101	33604
D 12 M2-6:2FTS	429.00	> 81.00	2.636	2.628	0.008	0.988	763908	2.29	96.3	19274
* 62 13C2-PFOA	415.00	> 370.00	2.668	2.654	0.014		3177743	2.50		26131
15 Perfluorooctanoic acid	413.00	> 369.00	2.668	2.654	0.014	1.000	13757900	9.33	93.2	6425
	413.00	> 169.00	2.668	2.654	0.014	1.000	7618200	1.81(0.84-2.52)	93.2	23003
D 14 13C4 PFOA	417.00	> 372.00	2.668	2.654	0.014	1.000	3022175	2.48	99.1	27945
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.675	2.662	0.013	0.883	17200801	9.47	99.5	81363
	449.00	> 99.00	2.675	2.662	0.013	0.883	4850719	3.55(1.94-5.82)	99.5	56750
D 18 13C4 PFOS	503.00	> 80.00	3.028	3.018	0.011	1.135	3133382	2.55	107	13141
D 19 13C5 PFNA	468.00	> 423.00	3.028	3.018	0.010	1.135	2432568	2.53	101	35417
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.028	3.018	0.010	1.000	14138725	9.48	102	52453
	499.00	> 99.00	3.028	3.018	0.010	1.000	3142706	4.50(2.31-6.93)	102	26060
20 Perfluorononanoic acid	463.00	> 419.00	3.035	3.021	0.014	1.002	10205563	9.66	96.6	24629
	463.00	> 169.00	3.035	3.021	0.014	1.002	2504429	4.08(1.90-5.69)	96.6	61751
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.244	3.230	0.014	1.071	22147356	NC		202901
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.374	3.362	0.012	1.114	9674320	9.62	100	51678
	549.00	> 99.00	3.374	3.362	0.012	1.114	3396326	2.85(1.33-3.97)	100	18608
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.374	3.363	0.011	1.000	3695792	9.97	104	61488
D 26 M2-8:2FTS	529.00	> 81.00	3.374	3.364	0.010	1.265	666781	2.20	91.7	13351

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.384	3.370	0.014	1.268	4192257	2.41		96.2	30757	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.384	3.371	0.013	1.000	17119032	10.1		101	76640	
D 23 13C2 PFDA										
515.00 > 470.00	3.384	3.376	0.008	1.268	1795814	2.46		98.6	35058	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.393	3.378	0.015	1.003	7267465	9.98		99.8	20115	
513.00 > 169.00	3.384	3.378	0.006	1.000	1328505		5.47(2.36-7.09)	99.8	28818	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.542	3.528	0.014	1.328	650146	2.91		116	15557	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.542	3.531	0.011	1.000	2634345	10.2		102	21332	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.701	3.686	0.015	1.222	8199124	9.68		100	92865	
599.00 > 99.00	3.701	3.686	0.015	1.222	2668502		3.07(1.39-4.16)	100	38939	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.712	3.697	0.015	1.391	607510	2.63		105	2311	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.712	3.702	0.010	1.000	4654341	10.0		100	21210	
563.00 > 169.00	3.712	3.702	0.010	1.000	1115882		4.17(2.12-6.36)	100	24979	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.712	3.702	0.010	1.000	2158862	9.57		95.7	34911	
D 30 13C2 PFUnA										
565.00 > 520.00	3.712	3.702	0.010	1.391	1444430	2.57		103	36699	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.870	3.860	0.010	1.278	26825430	NC			130243	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.003	3.995	0.008	1.000	6212547	10.0		100	2358	
613.00 > 169.00	4.003	3.995	0.008	1.000	1529443		4.06(2.13-6.40)	100	22593	
D 36 13C2 PFDaA										
615.00 > 570.00	4.003	3.995	0.008	1.500	1467364	2.59		104	10218	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.266	4.254	0.012	1.066	5898236	10.8		108	2041	
663.00 > 169.00	4.266	4.254	0.012	1.066	1815777		3.25(1.25-3.76)	108	12544	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.498	4.490	0.008	1.000	1408363	9.78		97.8	13367	
713.00 > 219.00	4.498	4.490	0.008	1.000	975659		1.44(0.71-2.13)	97.8	11696	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.498	4.490	0.008	1.686	1403478	2.68		107	5370	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.902	4.894	0.008	1.838	2234373	2.53		101	5652	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.902	4.895	0.007	1.000	8476848	NC			1100	
813.00 > 169.00	4.902	4.895	0.007	1.000	1401248		6.05(2.86-8.58)		6811	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.238	5.239	-0.001	1.069	10539691	NC			2623	
913.00 > 169.00	5.238	5.239	-0.001	1.069	1280519		8.23(3.83-11.48)		7731	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL7_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Injection Date: 22-Jun-2018 10:05:18

Instrument ID: A8_N

Lims ID: IC L7 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 16

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

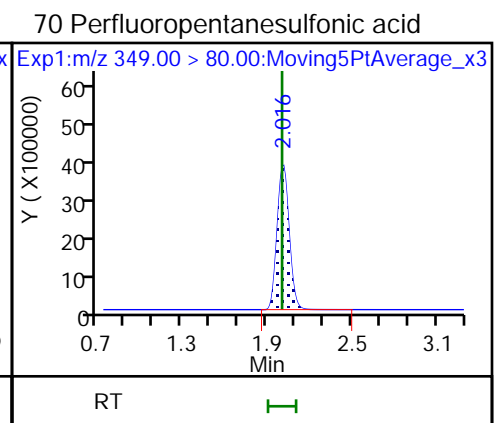
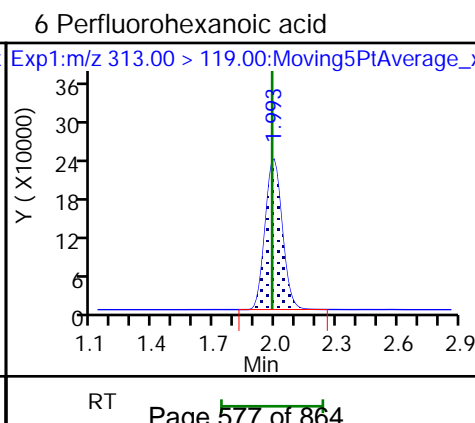
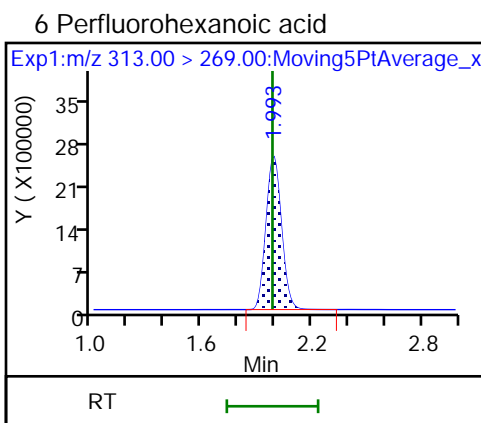
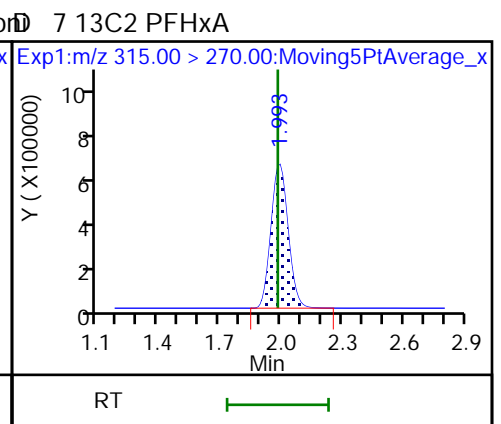
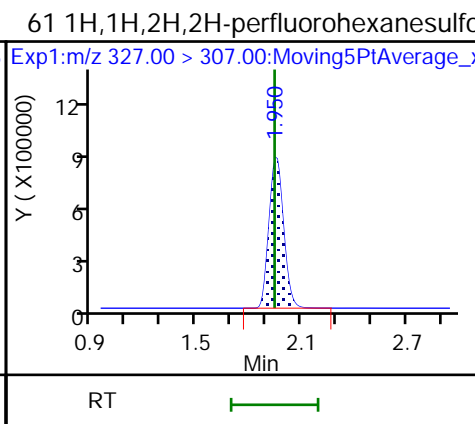
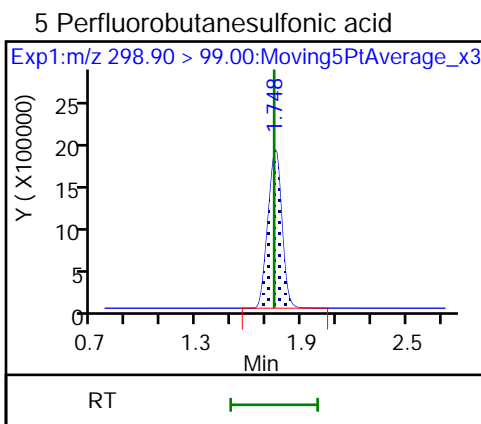
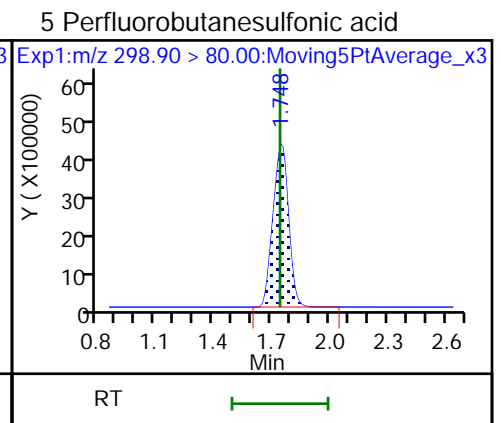
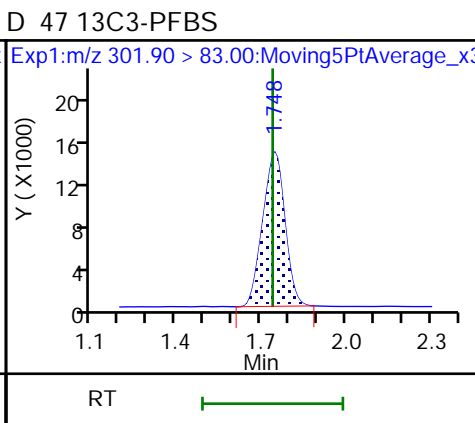
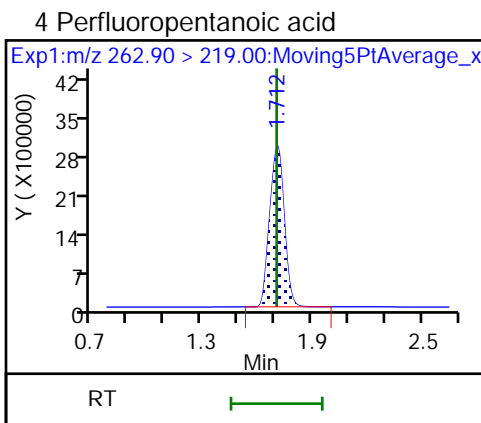
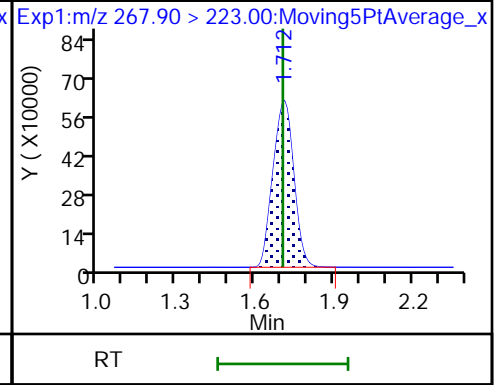
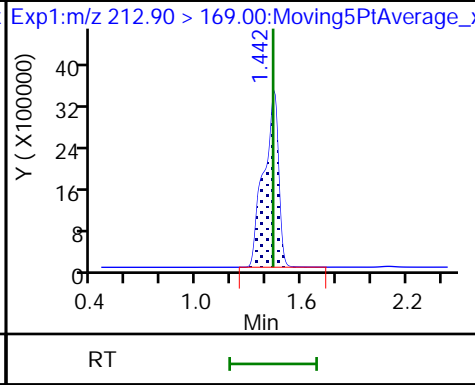
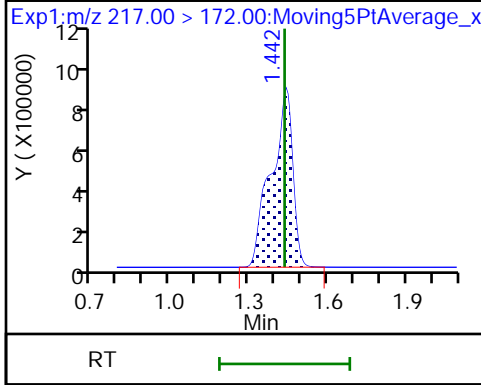
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

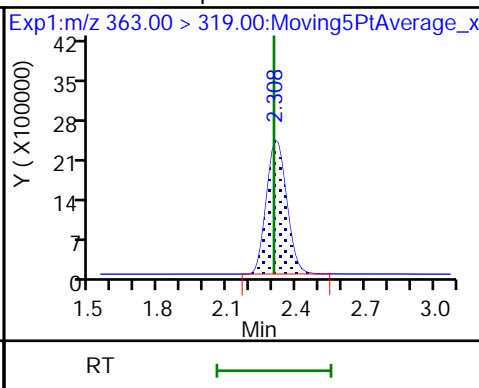
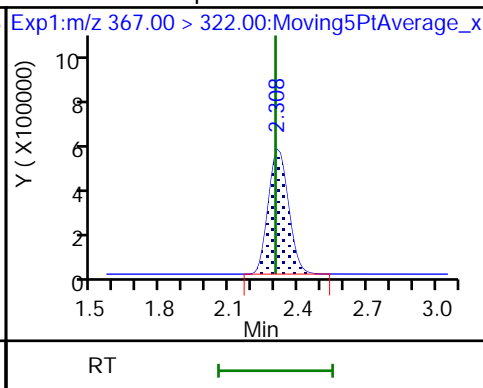
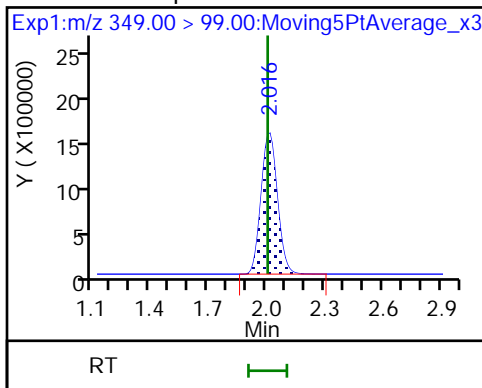
D 3 13C5-PFPeA



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

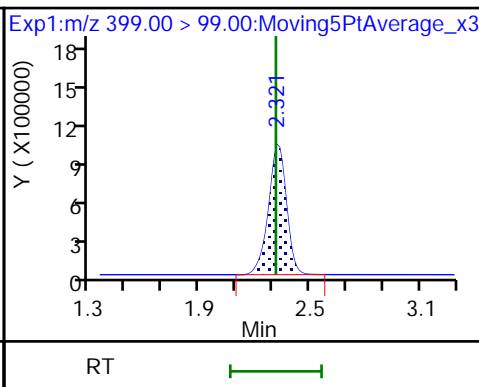
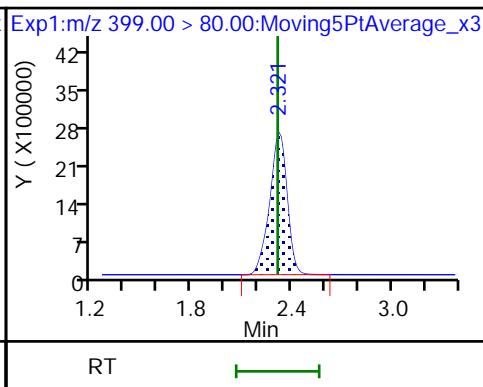
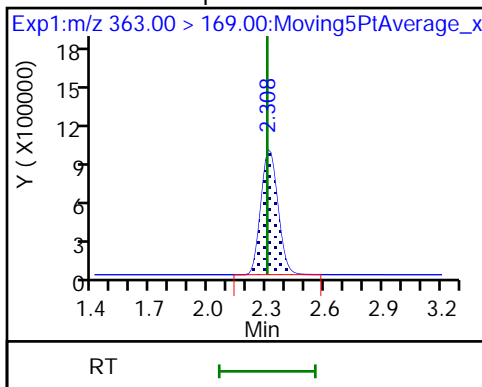
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

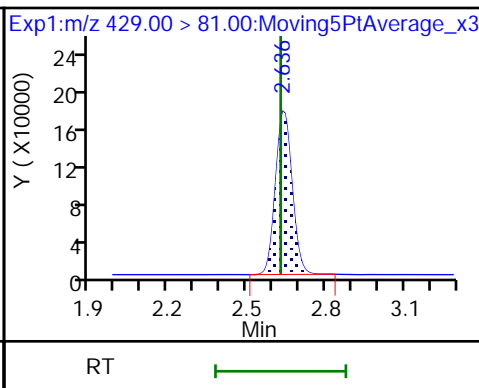
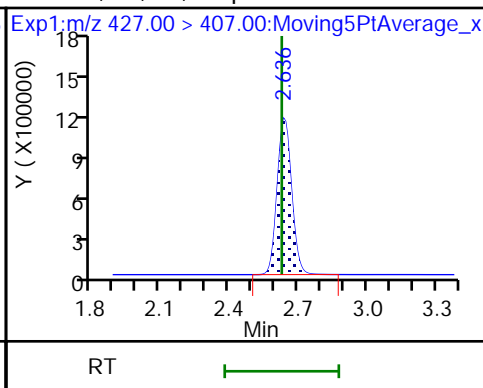
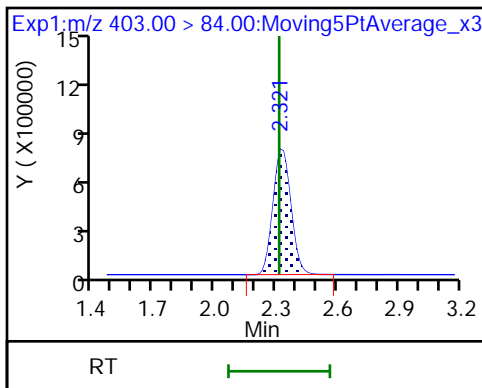
8 Perfluorohexanesulfonic acid

8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

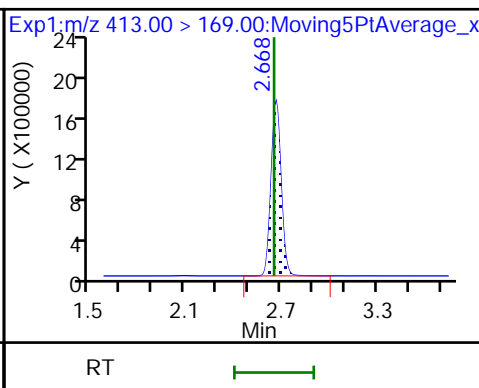
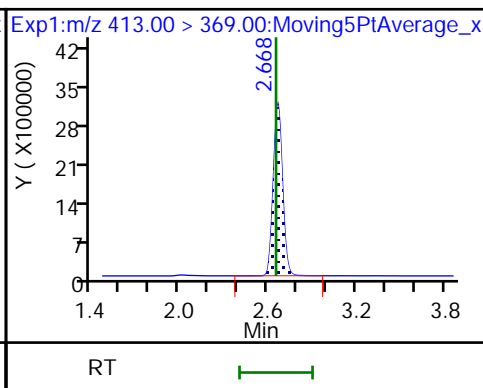
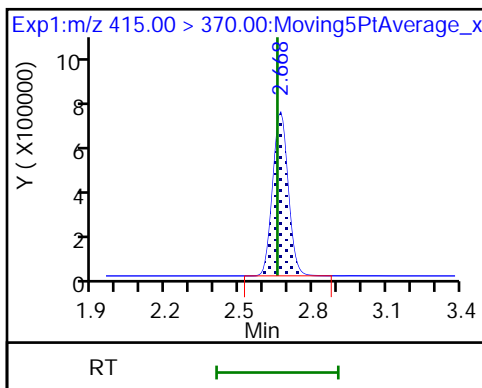
13 1H,1H,2H,2H-perfluorooctanesulfonD 12 M2-6:2FTS



* 62 13C2-PFOA

15 Perfluorooctanoic acid

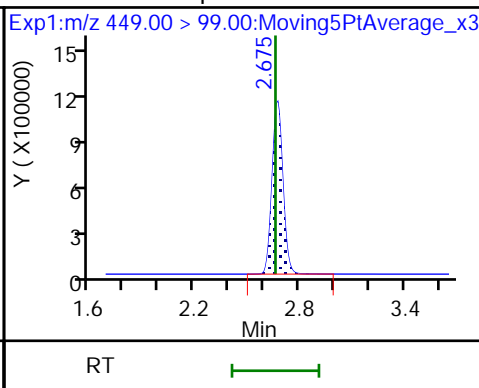
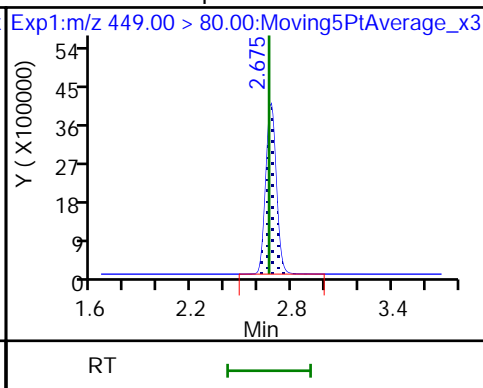
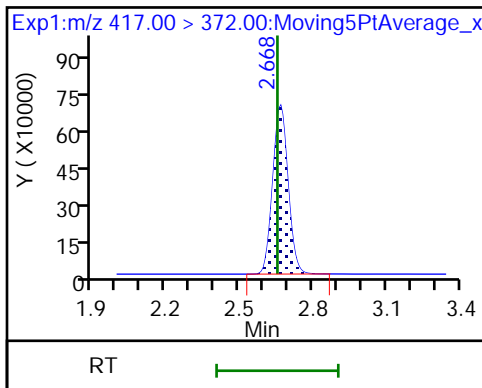
15 Perfluorooctanoic acid



D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

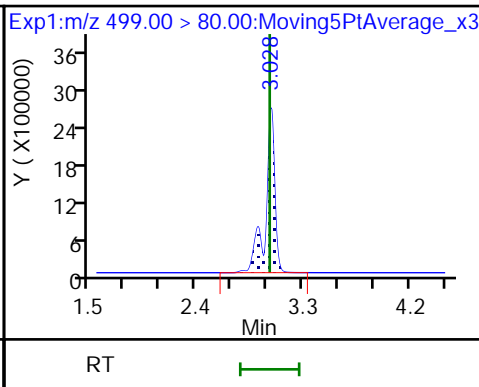
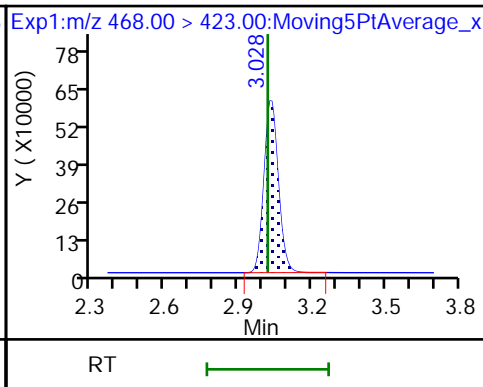
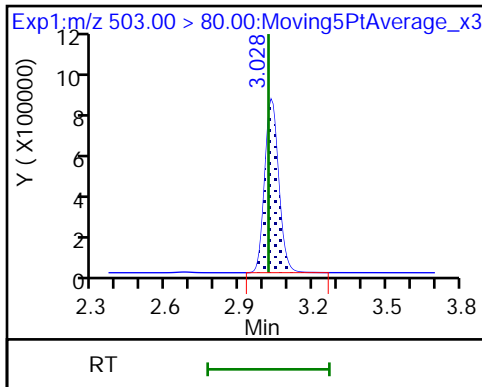
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

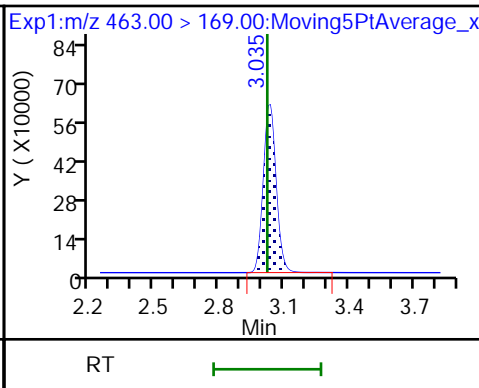
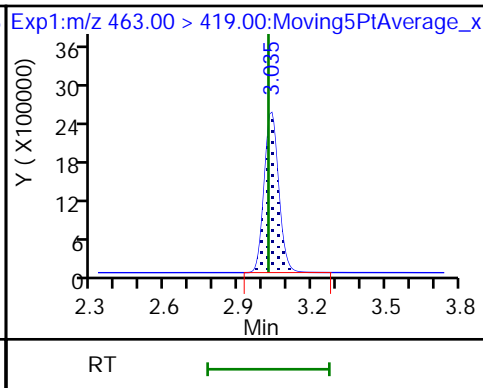
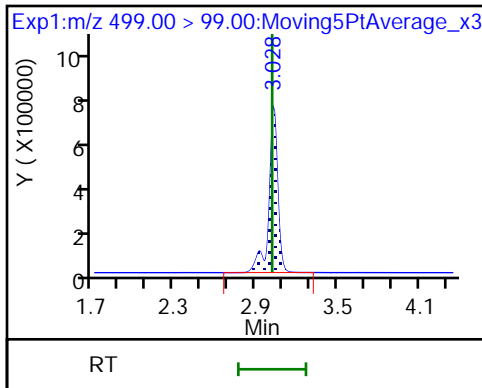
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid

20 Perfluorononanoic acid

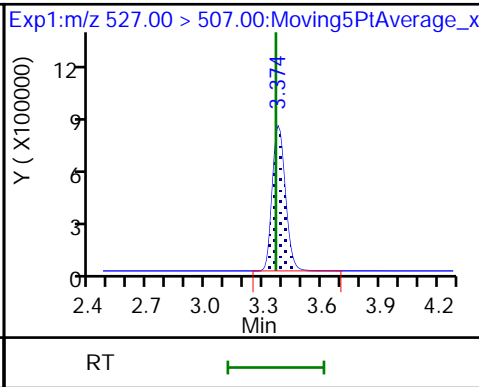
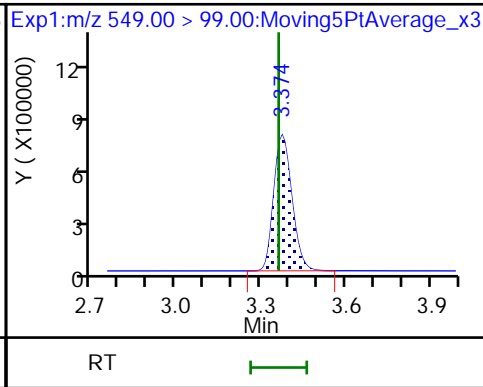
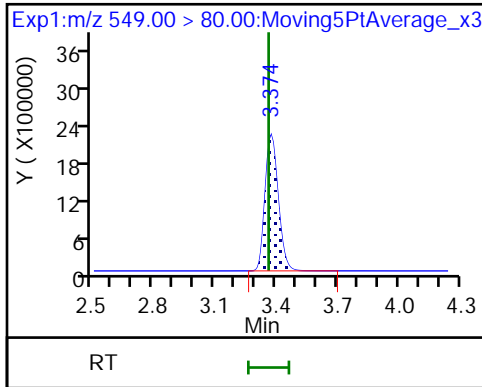
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

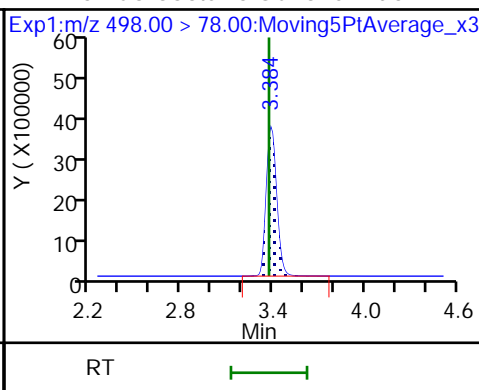
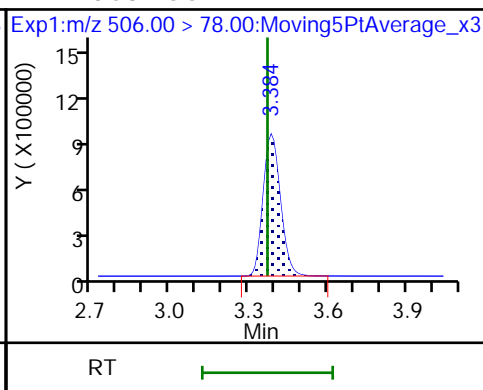
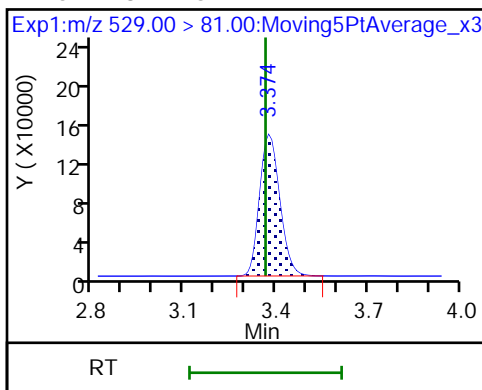
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

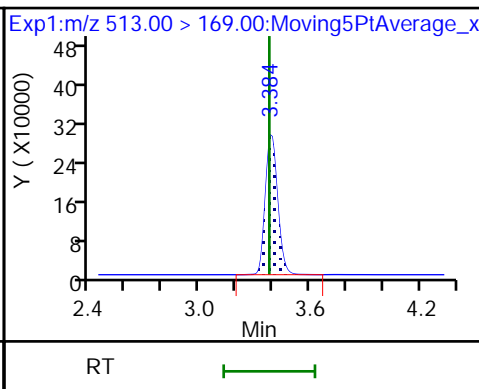
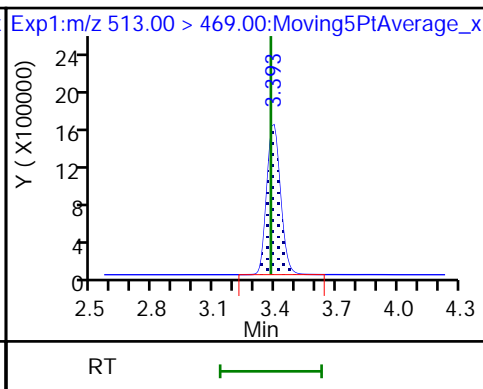
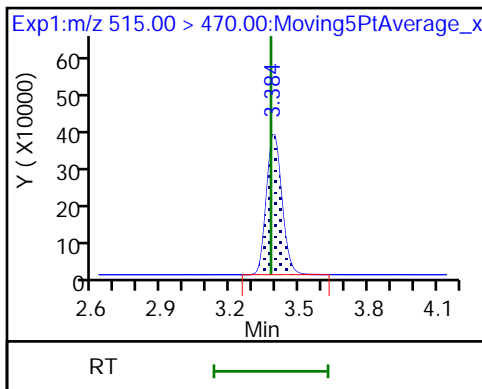
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid

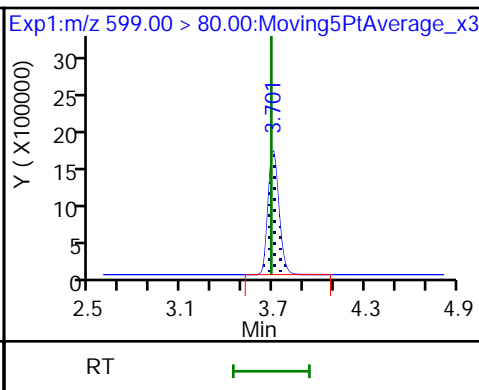
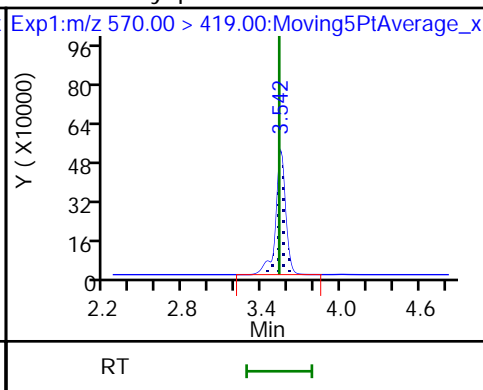
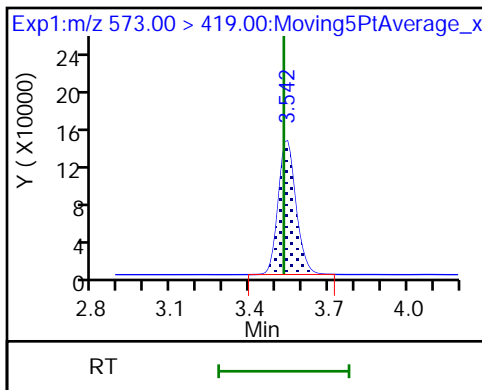
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

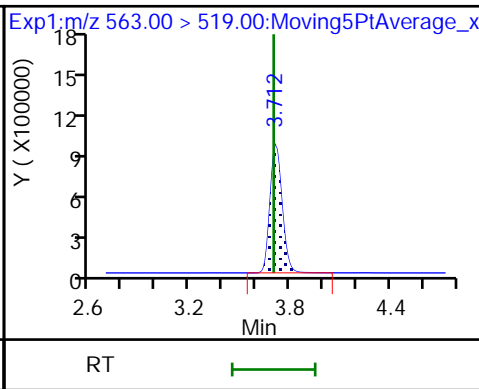
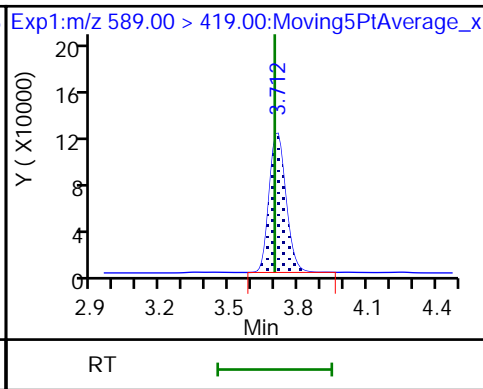
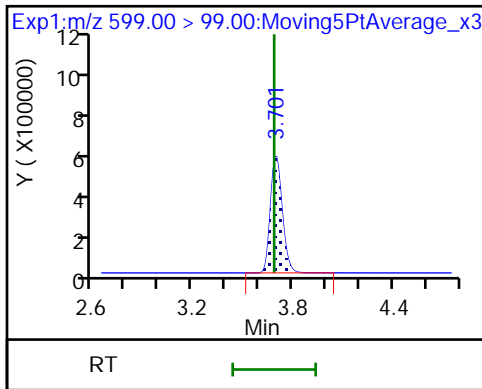
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

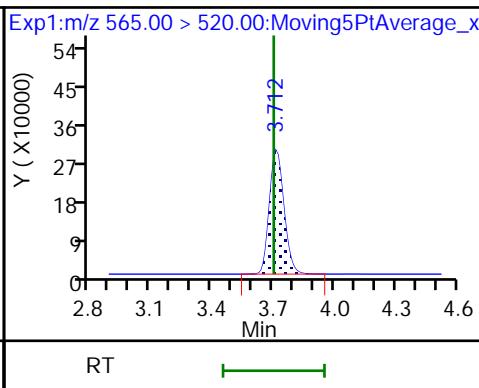
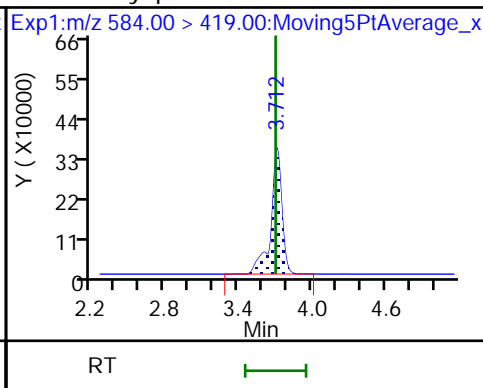
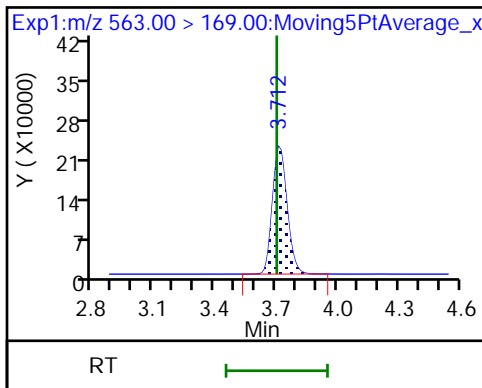
D 32 d5-NEtFOSAA

31 Perfluoroundecanoic acid



31 Perfluoroundecanoic acid

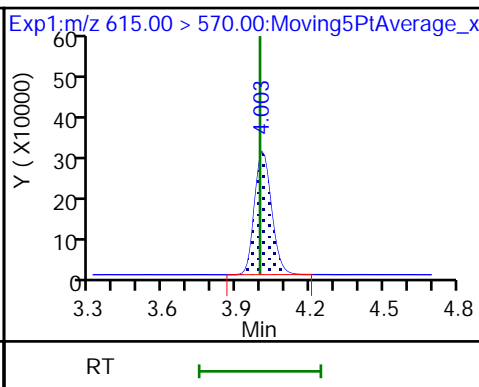
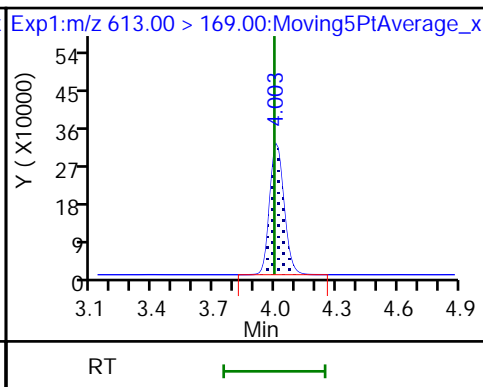
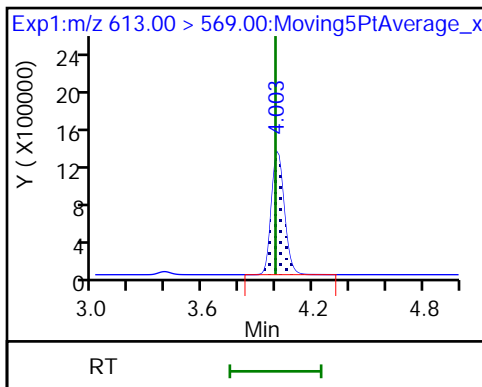
33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

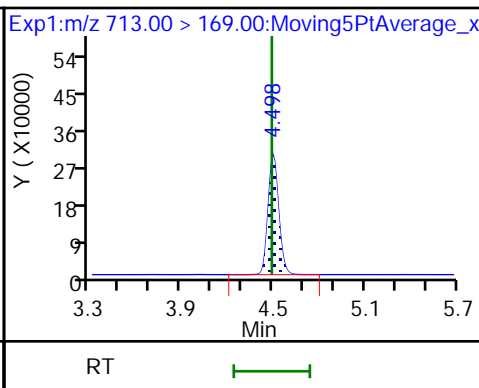
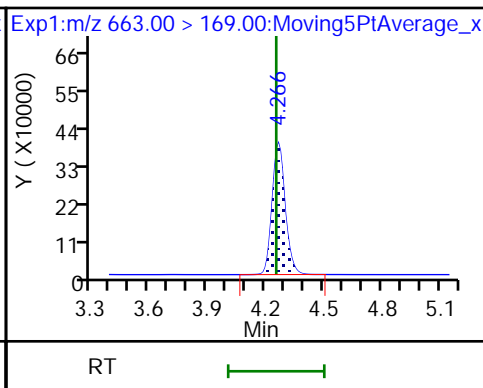
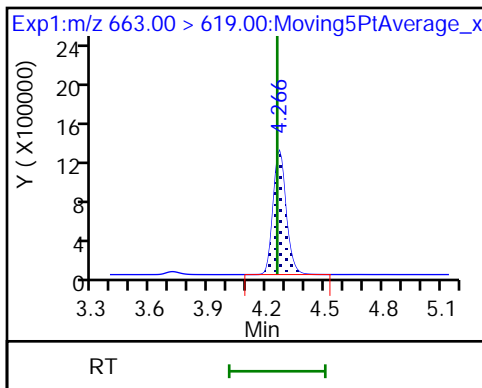
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

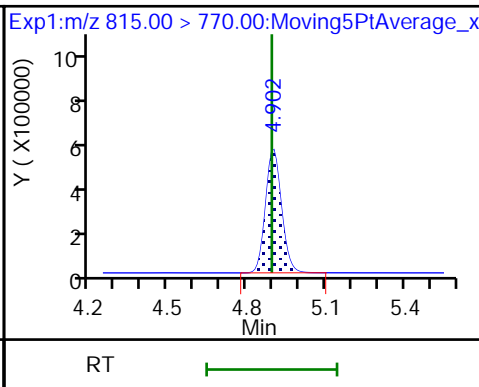
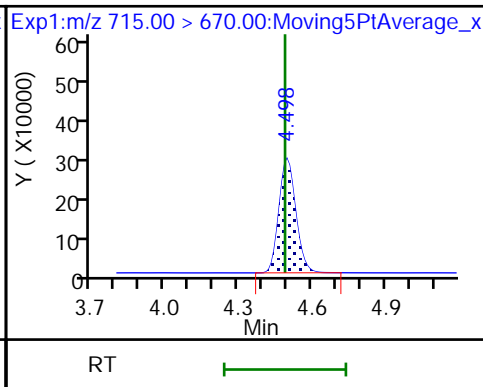
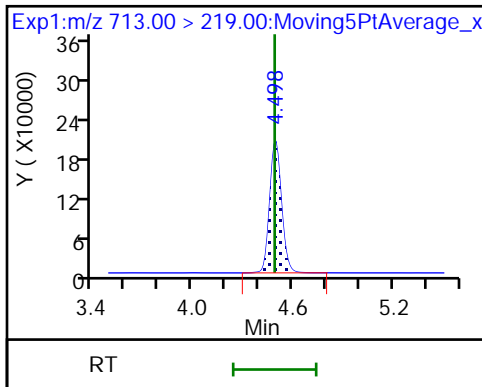
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



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

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-231836/2	2018.06.29LLICALA_002.d
Level 2	IC 320-231836/3	2018.06.29LLICALA_003.d
Level 3	IC 320-231836/4	2018.06.29LLICALA_004.d
Level 4	IC 320-231836/5	2018.06.29LLICALA_005.d
Level 5	IC 320-231836/6	2018.06.29LLICALA_006.d
Level 6	IC 320-231836/7	2018.06.29LLICALA_007.d
Level 7	IC 320-231836/8	2018.06.29LLICALA_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorobutanoic acid (PFBA)	1.1172 1.0147	1.0378 0.9924	0.9746	0.9742	1.0109	AveID		1.0174			4.9		20.0				
Perfluoropentanoic acid (PFPeA)	1.1831 1.1764	1.2809 1.1416	1.1626	1.1873	1.1798	AveID		1.1874			3.7		20.0				
Perfluorobutanesulfonic acid (PFBS)	79.069 78.301	77.680 74.556	75.181	76.908	78.450	AveID		77.163			2.2		20.0				
4:2 FTS	22.926 18.821	20.439 18.373	19.234	18.646	19.569	AveID		19.715			8.0		20.0				
Perfluorohexanoic acid (PFHxA)	0.9740 1.0307	1.1170 1.0482	0.9998	1.0381	1.0327	AveID		1.0344			4.3		20.0				
Perfluoropentanesulfonic acid	71.573 70.160	67.484 65.414	69.342	69.002	71.219	AveID		69.171			3.1		20.0				
Perfluoroheptanoic acid (PFHpA)	1.2725 1.1312	1.0179 1.0825	1.0536	1.1126	1.0932	AveID		1.1091			7.3		20.0				
Perfluorohexanesulfonic acid (PFHxS)	1.3541 1.1133	1.2539 1.1879	1.0335	1.0628	1.1052	AveID		1.1587			9.8		20.0				
6:2 FTS	1.5015 1.6305	1.5781 1.6740	1.6010	1.5976	1.6672	AveID		1.6071			3.7		20.0				
Perfluorooctanoic acid (PFOA)	1.2981 1.1451	1.1933 1.0999	1.1186	1.1664	1.2071	AveID		1.1755			5.6		20.0				
Perfluoroheptanesulfonic Acid (PFHpS)	1.2603 1.4385	1.3364 1.3173	1.3690	1.3812	1.4110	AveID		1.3591			4.4		20.0				
Perfluorononanoic acid (PFNA)	1.3006 1.1390	1.1247 1.1055	1.0619	1.0454	1.0020	AveID		1.1113			8.7		20.0				
Perfluorooctanesulfonic acid (PFOS)	1.1744 1.1875	1.2182 1.1558	1.1195	1.1233	1.1612	AveID		1.1628			3.0		20.0				
Perfluorononanesulfonic acid	0.7933 0.8189	0.8645 0.7890	0.7846	0.7919	0.7943	AveID		0.8052			3.5		20.0				

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

Analy Batch No.: 231836

SDG No.: _____

Instrument ID: A8_N

GC Column: GeminiC18 3 ID: 3(mm)

Heated Purge: (Y/N) N

Calibration Start Date: 06/29/2018 21:29

Calibration End Date: 06/29/2018 22:16

Calibration ID: 39860

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorooctane Sulfonamide (FOSA)	0.9209 0.9897	1.0093 1.0018	1.0079	1.0226	1.0660	AveID		1.0026			4.3		20.0				
8:2 FTS	1.3651 1.3034	1.3378 1.3200	1.3111	1.4039	1.3853	AveID		1.3467			2.9		20.0				
Perfluorodecanoic acid (PFDA)	1.1434 1.0626	1.0656 1.0181	1.0651	0.9934	1.0803	AveID		1.0612			4.5		20.0				
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9972 1.0074	0.8393 0.9793	0.9400	0.9204	1.0028	AveID		0.9552			6.4		20.0				
Perfluorodecanesulfonic acid (PFDS)	0.6679 0.7024	0.6462 0.7045	0.6843	0.6936	0.7190	AveID		0.6883			3.6		20.0				
Perfluoroundecanoic acid (PFUnA)	1.0160 0.8771	0.9333 0.8713	0.8908	0.7937	0.9325	AveID		0.9021			7.6		20.0				
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.8603 0.8826	0.9246 0.9634	0.8969	0.8354	0.8931	AveID		0.8938			4.7		20.0				
Perfluorododecanoic acid (PFDoA)	0.8803 1.0723	1.1610 1.1170	1.1090	1.0943	1.1434	AveID		1.0825			8.7		20.0				
Perfluorotridecanoic Acid (PFTriA)	1.3189 1.1473	1.1343 1.2037	1.0878	1.1059	1.2011	AveID		1.1713			6.7		20.0				
Perfluorotetradecanoic acid (PFTeA)	0.2983 0.2475	0.2357 0.2391	0.2446	0.2456	0.2400	AveID		0.2501			8.7		20.0				
13C4 PFBA	1.3863 1.3876	1.3300 1.5102	1.3550	1.3868	1.4226	Ave		1.3969			4.1		20.0				
13C5 PFPeA	0.9682 0.9686	0.9284 1.0521	0.9535	0.9748	1.0208	Ave		0.9809			4.3		20.0				
13C3-PFBS	0.0213 0.0212	0.0204 0.0227	0.0212	0.0219	0.0227	Ave		0.0216			4.0		20.0				
13C2 PFHxA	1.0894 1.0693	1.0509 1.0792	1.0299	1.0727	1.1271	Ave		1.0741			2.8		20.0				
13C4-PFHpA	1.0103 0.9285	0.9649 1.0337	0.9845	0.9750	1.0680	Ave		0.9950			4.7		20.0				
18O2 PFHxS	1.2140 1.1143	1.1146 1.1204	1.1828	1.1747	1.2103	Ave		1.1616			3.8		20.0				
M2-6:2FTS	0.2505 0.2341	0.2364 0.2377	0.2370	0.2423	0.2494	Ave		0.2411			2.7		20.0				
13C4 PFOA	0.9586 0.9614	0.9358 0.9784	0.9307	0.9510	0.9678	Ave		0.9548			1.8		20.0				
13C4 PFOS	0.7870 0.7450	0.7462 0.7838	0.7760	0.7919	0.8213	Ave		0.7787			3.4		20.0				
13C5 PFNA	0.8244 0.7339	0.7794 0.7798	0.7715	0.7963	0.8488	Ave		0.7906			4.7		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.: 320-40153-1 Analy Batch No.: 231836
 SDG No.: _____
 Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
 Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
13C8 FOSA	1.0769 1.0021	1.0237 0.9933	0.9893	1.0141	1.0645	Ave		1.0234			3.4		20.0				
M2-8:2FTS	0.2813 0.2414	0.2639 0.2541	0.2719	0.2480	0.2737	Ave		0.2621			5.6		20.0				
13C2 PFDA	0.6633 0.6205	0.6194 0.6454	0.6360	0.6697	0.6628	Ave		0.6453			3.2		20.0				
d3-NMeFOSAA	0.3813 0.3793	0.3579 0.4140	0.3827	0.3964	0.3969	Ave		0.3869			4.6		20.0				
d5-NEtFOSAA	0.4059 0.3505	0.3871 0.3625	0.3843	0.3988	0.3880	Ave		0.3825			5.1		20.0				
13C2 PFUnA	0.5402 0.5121	0.5421 0.5155	0.5064	0.5590	0.5360	Ave		0.5302			3.6		20.0				
13C2 PFDoA	0.6148 0.5967	0.5817 0.6172	0.6203	0.6250	0.6480	Ave		0.6148			3.4		20.0				
13C2-PFTeDA	0.7905 0.7344	0.7538 0.7760	0.7400	0.7743	0.7969	Ave		0.7666			3.2		20.0				
13C2-PFHxDA	1.4812 1.4223	1.4101 1.3815	1.3890	1.4499	1.5161	Ave		1.4357			3.4		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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-231836/2	2018.06.29LLICALA_002.d
Level 2	IC 320-231836/3	2018.06.29LLICALA_003.d
Level 3	IC 320-231836/4	2018.06.29LLICALA_004.d
Level 4	IC 320-231836/5	2018.06.29LLICALA_005.d
Level 5	IC 320-231836/6	2018.06.29LLICALA_006.d
Level 6	IC 320-231836/7	2018.06.29LLICALA_007.d
Level 7	IC 320-231836/8	2018.06.29LLICALA_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorobutanoic acid (PFBA)		AveID	63343 11741171	126354 23128489	610361	2252577	5508925	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	46852 9501364	108868 18536324	512335	1929658	4613629	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	60783 12236181	128257 23050057	650349	2478950	6043590	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	18621 3107472	35656 6001471	175795	635002	1592786	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	43400 9190933	107466 17458801	475916	1856655	4458485	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	58382 11633698	118229 21459182	636482	2359989	5821695	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	52584 8757903	89912 17268732	479453	1808556	4472196	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	61184 9413780	116431 18691081	514149	1894329	4662604	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	14584 3017922	32377 5820534	166253	611856	1509731	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	50947 9189211	102335 16625027	481654	1851409	4479330	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	38620 8507357	86914 15169426	467426	1735998	4226190	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	43852 6970772	80249 13304232	378656	1387831	3257852	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	35082 6845858	77229 12974045	372592	1376214	3390238	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanesulfonic acid		AveID	24516 4883680	56695 9162545	270116	1003682	2399114	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
Perfluorooctane Sulfonamide (FOSA)		AveID	40561 8270576	94580 15357897	460857	1729076	4346618	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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

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	15048 2513469	30968 4958739	157827	556151	1391409	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	31018 5498196	60419 10140917	313067	1109123	2743088	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	15552 3186253	27497 6257140	166284	608345	1524413	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	20726 4206492	42559 8214689	236582	882815	2180555	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	22447 3744964	46322 6931775	208512	739739	1914730	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	14281 2579637	32768 5390142	159315	555505	1327250	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	22136 5334947	61822 10640247	317910	1140263	2838470	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	33165 5708249	60399 11465935	311842	1152386	2981566	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	9644 1515366	16269 2863050	83650	317057	732758	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5669907 5785463	6087691 5826550	6262374	5780456	5449346	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	3960055 4038335	4249734 4059427	4406926	4063195	3910355	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	80874 82201	86851 81313	91006	84775	81046	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4455638 4458382	4810563 4163964	4760163	4471278	4317490	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4132240 3871069	4416706 3988277	4550423	4063826	4090923	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	4697015 4395037	4826276 4089199	5171616	4632149	4385789	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	973359 927417	1028014 871081	1040599	959459	907459	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3920686 4008387	4283590 3774933	4301713	3964131	3707106	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3077341 2969473	3265540 2891085	3428587	3155396	3007709	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3371665 3059923	3567496 3008741	3565828	3318974	3251248	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	4404580 4178174	4685651 3832562	4572335	4227113	4077656	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1102336 964231	1157380 939188	1203743	990382	1004377	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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
13C2 PFDA	13PF OA	Ave	2712679 2587120	2835108 2490269	2939262	2791311	2539116	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1559520 1581489	1638012 1597284	1768886	1652411	1520200	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1659993 1461344	1771980 1398706	1776279	1662467	1486190	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFunA	13PF OA	Ave	2209251 2134943	2481505 1989027	2340674	2329895	2053362	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2514542 2487635	2662501 2381403	2866693	2605043	2482377	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3232976 3061795	3450533 2994139	3420305	3227344	3052797	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6058178 5930151	6454693 5329991	6419892	6043418	5807526	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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-231836/2	2018.06.29LLICALA_002.d
Level 2	IC 320-231836/3	2018.06.29LLICALA_003.d
Level 3	IC 320-231836/4	2018.06.29LLICALA_004.d
Level 4	IC 320-231836/5	2018.06.29LLICALA_005.d
Level 5	IC 320-231836/6	2018.06.29LLICALA_006.d
Level 6	IC 320-231836/7	2018.06.29LLICALA_007.d
Level 7	IC 320-231836/8	2018.06.29LLICALA_008.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)	9.8 -2.5	2.0	-4.2	-4.2	-0.6	-0.3	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	-0.4 -3.9	7.9	-2.1	0.0	-0.6	-0.9	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	2.5 -3.4	0.7	-2.6	-0.3	1.7	1.5	30 30	30	30	30	30	30
4:2 FTS	16.3 -6.8	3.7	-2.4	-5.4	-0.7	-4.5	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-5.8 1.3	8.0	-3.3	0.4	-0.2	-0.3	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	3.5 -5.4	-2.4	0.2	-0.2	3.0	1.4	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	14.7 -2.4	-8.2	-5.0	0.3	-1.4	2.0	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	16.9 2.5	8.2	-10.8	-8.3	-4.6	-3.9	30 30	30	30	30	30	30
6:2 FTS	-6.6 4.2	-1.8	-0.4	-0.6	3.7	1.5	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	10.4 -6.4	1.5	-4.8	-0.8	2.7	-2.6	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-7.3 -3.1	-1.7	0.7	1.6	3.8	5.8	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	17.0 -0.5	1.2	-4.4	-5.9	-9.8	2.5	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	1.0 -0.6	4.8	-3.7	-3.4	-0.1	2.1	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-1.5 -2.0	7.4	-2.6	-1.7	-1.4	1.7	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-8.2 -0.1	0.7	0.5	2.0	6.3	-1.3	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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

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	1.4 -2.0	-0.7	-2.6	4.2	2.9	-3.2	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	7.7 -4.1	0.4	0.4	-6.4	1.8	0.1	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	4.4 2.5	-12.1	-1.6	-3.6	5.0	5.5	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-3.0 2.4	-6.1	-0.6	0.8	4.5	2.1	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	12.6 -3.4	3.5	-1.3	-12.0	3.4	-2.8	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	-3.7 7.8	3.5	0.4	-6.5	-0.1	-1.2	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	-18.7 3.2	7.3	2.4	1.1	5.6	-0.9	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	12.6 2.8	-3.2	-7.1	-5.6	2.5	-2.0	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	19.3 -4.4	-5.7	-2.2	-1.8	-4.0	-1.1	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
 Lims ID: IC L1 Full
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 29-Jun-2018 21:29:05 ALS Bottle#: 10 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:52:41 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:14:54

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	1.433	1.428	0.005	0.538	5669907	2.48	99.2	33464	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.433	1.430	0.003	1.000	63343	0.0275		110	30.3	M
D 3 13C5-PFPeA	267.90 > 223.00	1.707	1.705	0.002	0.640	3960055	2.47	98.7	48293	
4 Perfluoropentanoic acid	262.90 > 219.00	1.716	1.706	0.010	1.005	46852	0.0249	99.6	32.4	
D 47 13C3-PFBS	301.90 > 83.00	1.743	1.741	0.002	0.654	80874	2.29	98.4	680	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.752	1.745	0.007	1.005	60783	0.0226	102	233	
298.90 > 99.00	1.752	1.745	0.007	1.005	25290		2.40(1.25-3.74)	102	208	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.956	1.948	0.008	1.122	18621	0.0272	116	1111	
D 60 M2-4:2FTS	329.00 > 81.00	1.956	1.948	0.008	0.734	660383	NC		11732	
6 Perfluorohexanoic acid	313.00 > 269.00	1.988	1.984	0.004	1.000	43400	0.0235	94.2	98.6	M
313.00 > 119.00	1.988	1.984	0.004	1.000	4096		10.60(5.03-15.10)	94.2	108	M
D 7 13C2 PFHxA	315.00 > 270.00	1.988	1.984	0.004	0.746	4455638	2.54	101	56337	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.011	2.004	0.007	1.153	58382	0.0243	103	1433	
349.00 > 99.00	2.011	2.004	0.007	1.153	21858		2.67(1.36-4.07)	103	465	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.090	2.080	0.010	0.784	202662	NC		3569	

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	2.090	2.082	0.008	1.000	6959	NC	58.3		
D 9 13C4-PFHpA	367.00	> 322.00	2.316	2.302	0.014	0.869	4132240	2.54	102	32376	
10 Perfluoroheptanoic acid	363.00	> 319.00	2.316	2.304	0.012	1.000	52584	0.0287	115	93.0	
	363.00	> 169.00	2.302	2.304	-0.002	0.994	20547	2.56(1.13-3.40)	115	208	
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.316	2.314	0.002	0.994	61184	0.0266	117	627	
	399.00	> 99.00	2.329	2.314	0.015	1.000	19230	3.18(1.50-4.49)	117	171	
D 11 18O2 PFHxS	403.00	> 84.00	2.329	2.317	0.012	0.874	4697015	2.47	105	37179	
65 Adona	377.00	> 251.00	2.355	2.345	0.010	0.778	129163	NC	1852		
	377.00	> 85.00	2.355	2.345	0.010	0.778	68275	1.89(0.84-2.53)	1461		
D 12 M2-6:2FTS	429.00	> 81.00	2.634	2.627	0.007	0.988	973359	2.47	104	21025	
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.642	2.629	0.013	1.003	14584	0.0221	93.4	79.2	M
D 14 13C4 PFOA	417.00	> 372.00	2.666	2.653	0.013	1.000	3920686	2.51	100	28127	
* 62 13C2-PFOA	415.00	> 370.00	2.666	2.655	0.011		4089966	2.50		35922	
15 Perfluorooctanoic acid	413.00	> 369.00	2.666	2.657	0.009	1.000	50947	0.0276	110	18.2	M
	413.00	> 169.00	2.666	2.657	0.009	1.000	26879	1.90(0.84-2.52)	110	182	M
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.673	2.663	0.010	0.884	38620	0.0221	92.7	825	M
	449.00	> 99.00	2.673	2.663	0.010	0.884	10718	3.60(1.94-5.82)	92.7	219	M
D 18 13C4 PFOS	503.00	> 80.00	3.025	3.017	0.008	1.135	3077341	2.42	101	23850	
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.025	3.018	0.007	1.000	35082	0.0234	101	373	M
	499.00	> 99.00	3.018	3.018	0.0	0.998	9327	3.76(2.31-6.93)	101	187	M
20 Perfluorononanoic acid	463.00	> 419.00	3.025	3.018	0.007	1.000	43852	0.0293	117	103	
	463.00	> 169.00	3.025	3.018	0.007	1.000	7963	5.51(1.90-5.69)	117	450	
D 19 13C5 PFNA	468.00	> 423.00	3.025	3.018	0.007	1.135	3371665	2.61	104	42112	
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.240	3.229	0.011	1.071	51876	NC	1233		
D 21 13C8 FOSA	506.00	> 78.00	3.370	3.358	0.012	1.264	4404580	2.63	105	34623	
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.370	3.360	0.010	1.114	24516	0.0236	98.5	807	
	549.00	> 99.00	3.370	3.360	0.010	1.114	7305	3.36(1.33-3.97)	98.5	336	
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.370	3.361	0.009	1.000	40561	0.0230	91.8	832	

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	3.370	3.362	0.008	1.264	1102336	2.57		107	28004	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.370	3.364	0.006	1.000	15048	0.0243		101	564	
D 23 13C2 PFDA										
515.00 > 470.00	3.379	3.374	0.005	1.268	2712679	2.57		103	40726	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.379	3.376	0.003	1.000	31018	0.0269		108	180	
513.00 > 169.00	3.379	3.376	0.003	1.000	6039		5.14(2.36-7.09)	108	194	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.538	3.527	0.011	1.327	1559520	2.46		98.5	28262	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.538	3.529	0.009	1.000	15552	0.0261		104	165	
29 Perfluorodecane Sulfonic acid										M
599.00 > 80.00	3.687	3.683	0.004	1.219	20726	0.0234		97.0	539	M
599.00 > 99.00	3.687	3.683	0.004	1.219	6396		3.24(1.39-4.16)	97.0	338	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.697	3.694	0.003	1.387	1659993	2.65		106	16245	
D 30 13C2 PFUnA										
565.00 > 520.00	3.708	3.698	0.010	1.391	2209251	2.55		102	38198	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.708	3.698	0.010	1.000	22447	0.0282		113	119	
563.00 > 169.00	3.708	3.698	0.010	1.000	5943		3.78(2.12-6.36)	113	211	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.708	3.700	0.008	1.003	14281	0.0241		96.3	262	M
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.865	3.858	0.007	1.278	87642	NC			2628	
D 36 13C2 PFDaA										
615.00 > 570.00	3.998	3.992	0.006	1.500	2514542	2.50		100	18316	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.998	3.992	0.006	1.000	22136	0.0203		81.3	32.4	
613.00 > 169.00	3.998	3.992	0.006	1.000	7269		3.05(2.13-6.40)	81.3	196	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.261	4.255	0.006	1.066	33165	0.0282		113	33.2	
663.00 > 169.00	4.261	4.255	0.006	1.066	9995		3.32(1.25-3.76)	113	311	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.500	4.490	0.010	1.688	3232976	2.58		103	12568	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.500	4.490	0.010	1.000	9644	0.0298		119	275	
713.00 > 219.00	4.490	4.490	0.0	0.998	6959		1.39(0.71-2.13)	119	282	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.904	4.899	0.005	1.840	6058178	2.58		103	12847	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.904	4.900	0.004	1.000	104989	NC			54.2	
813.00 > 169.00	4.904	4.900	0.004	1.000	17309		6.07(2.86-8.58)		341	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.261	5.251	0.010	1.073	68099	NC			22.6	
913.00 > 169.00	5.254	5.251	0.003	1.071	7764		8.77(3.83-11.48)		159	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d

Injection Date: 29-Jun-2018 21:29:05

Instrument ID: A8_N

Lims ID: IC L1 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 10

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

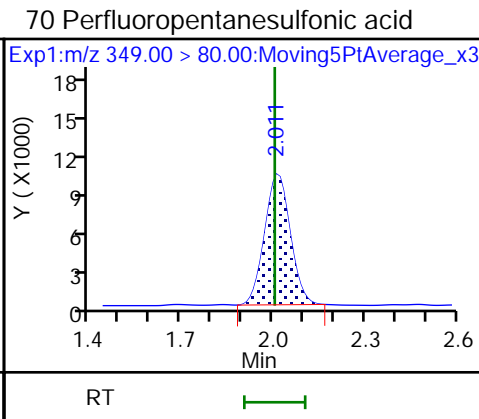
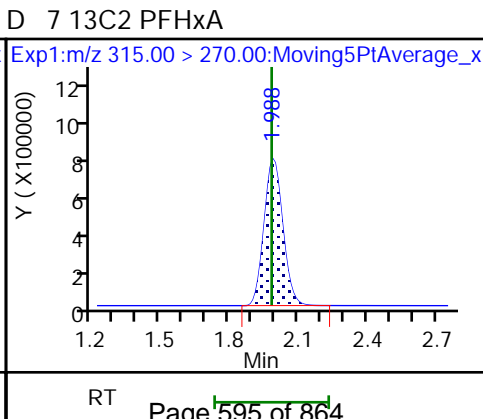
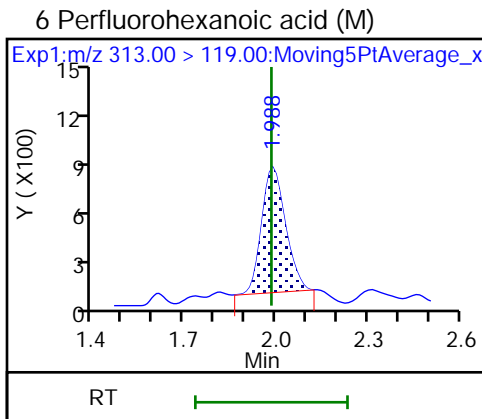
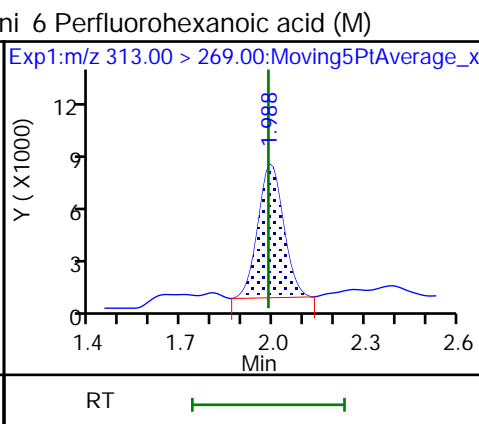
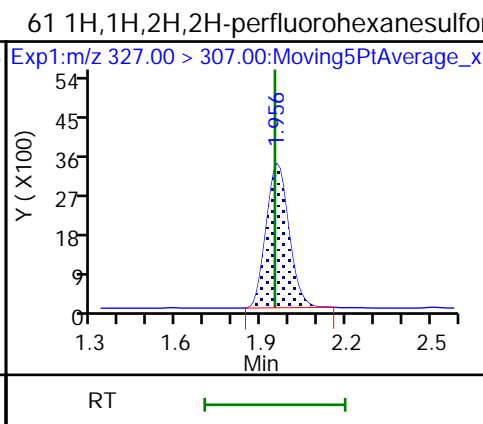
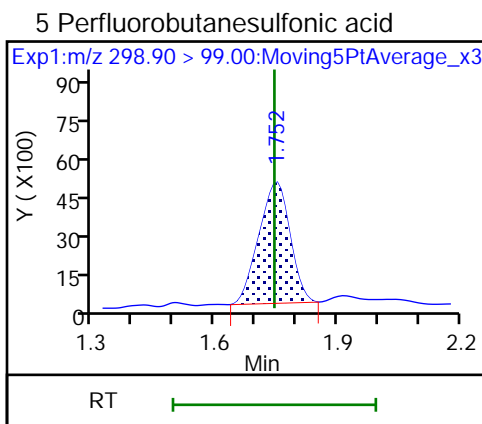
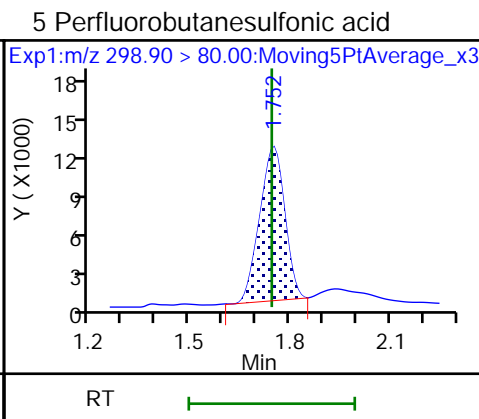
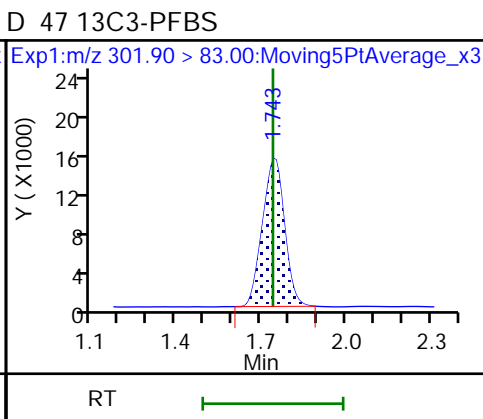
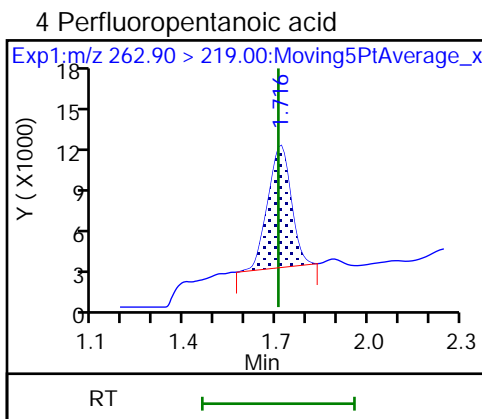
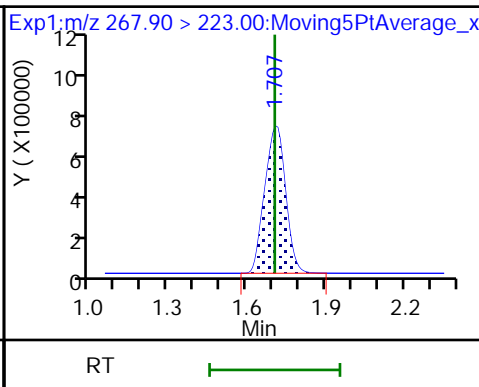
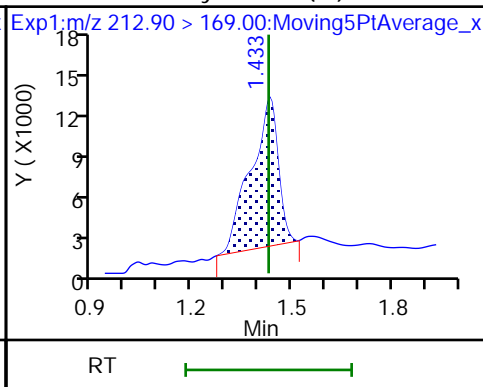
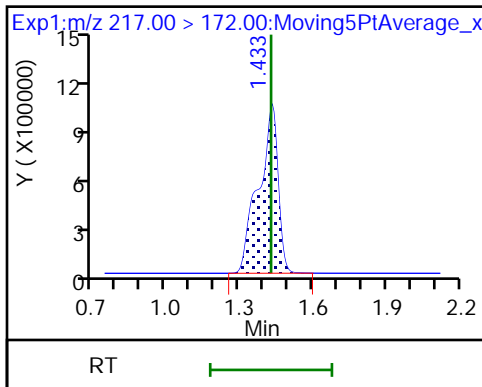
Method: A8_N

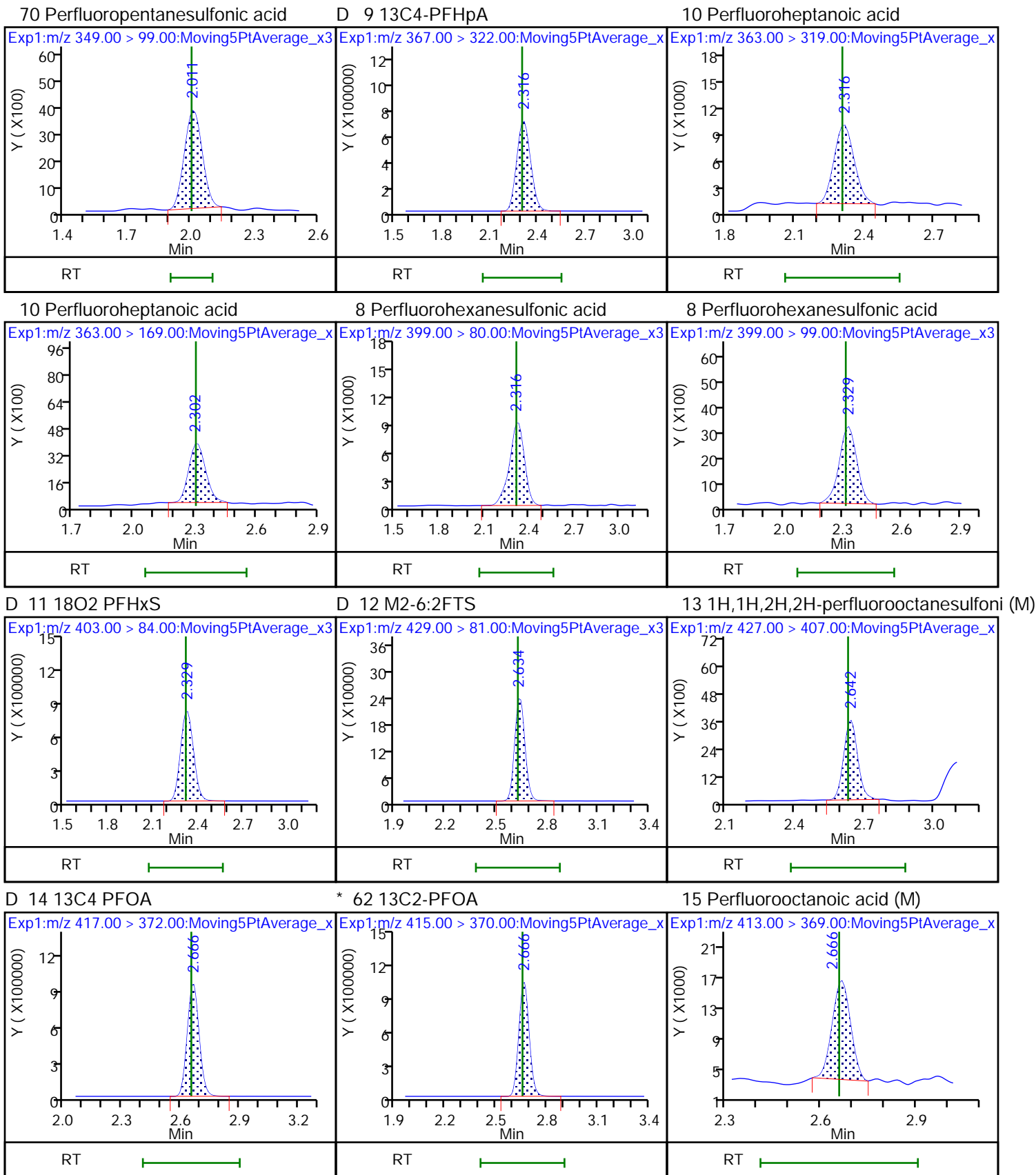
Limit Group: LC PFC_QSM5-1 ICAL

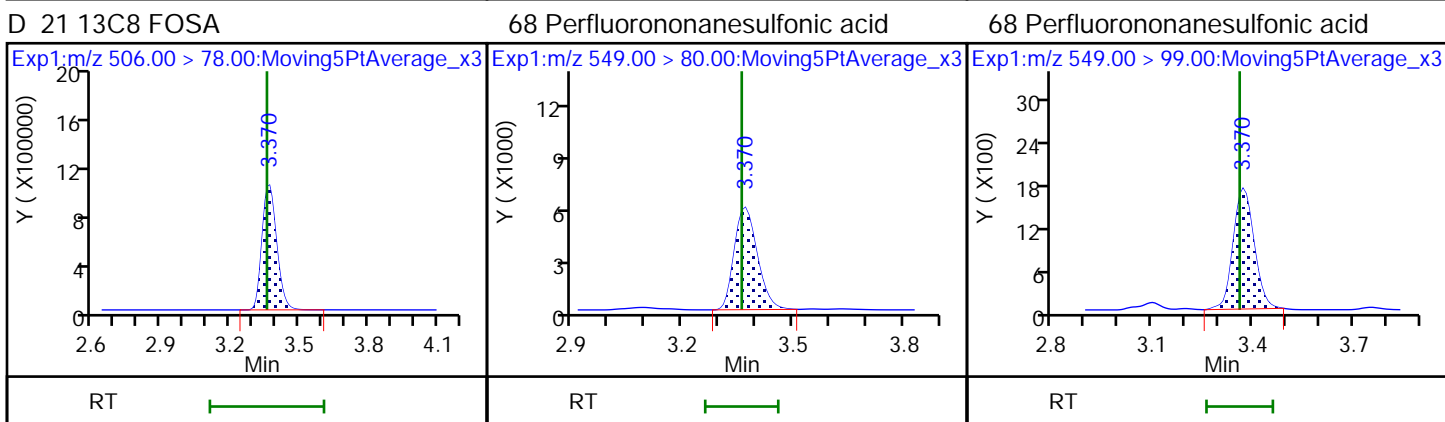
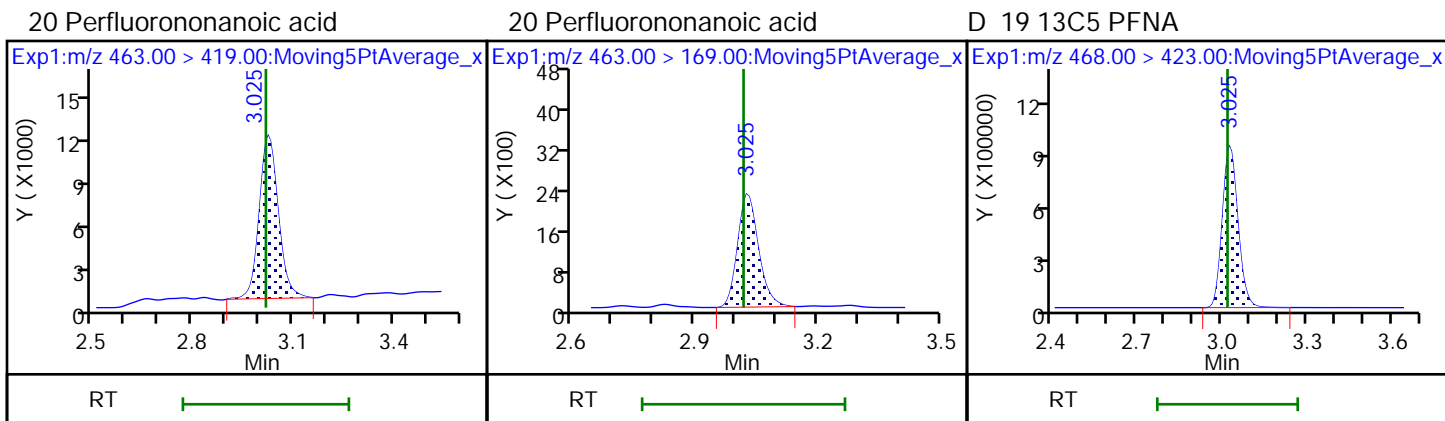
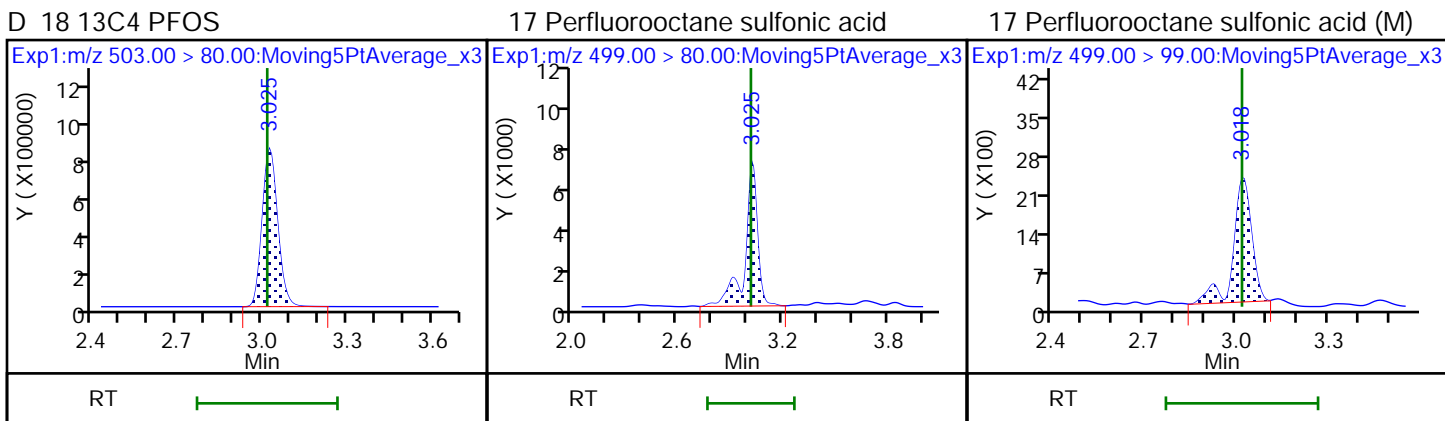
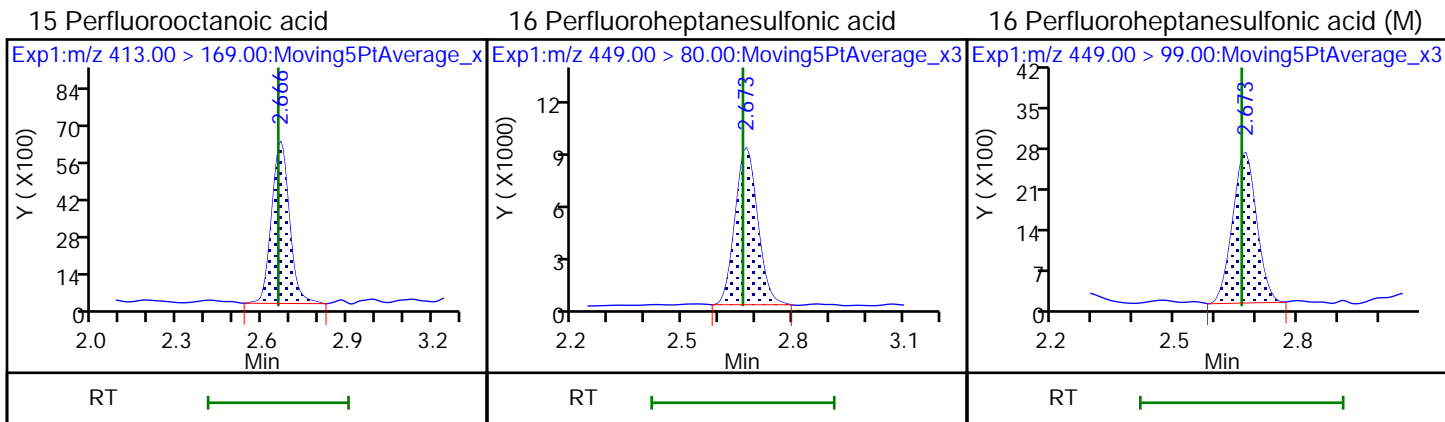
D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

D 3 13C5-PFPeA



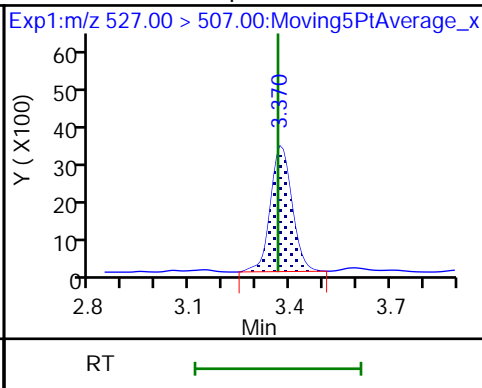
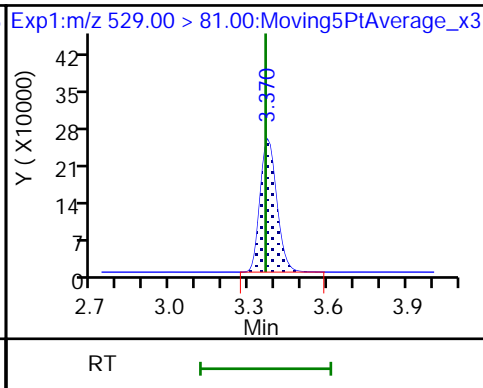
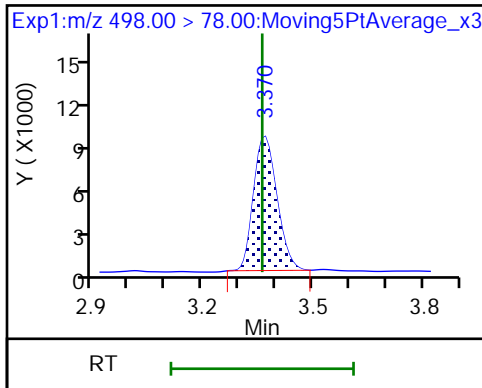




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

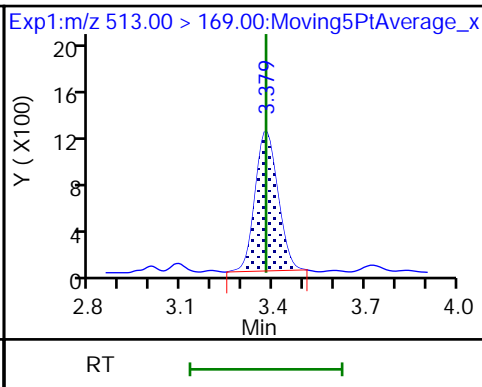
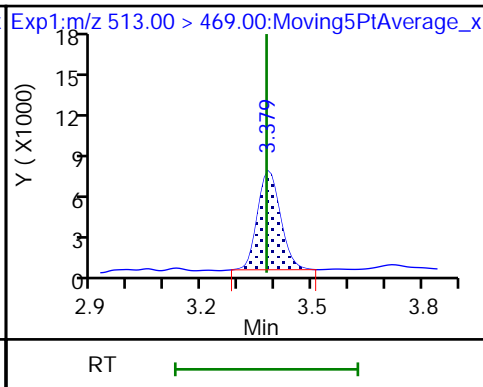
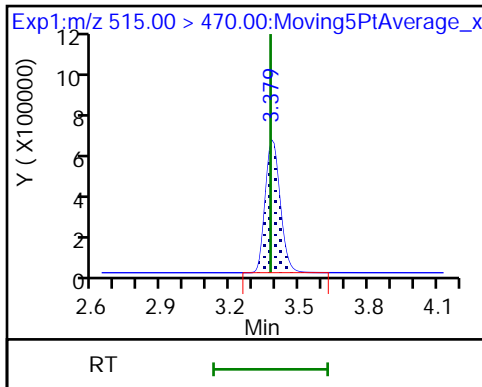
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid

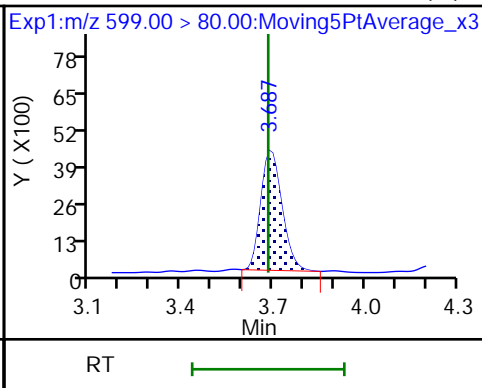
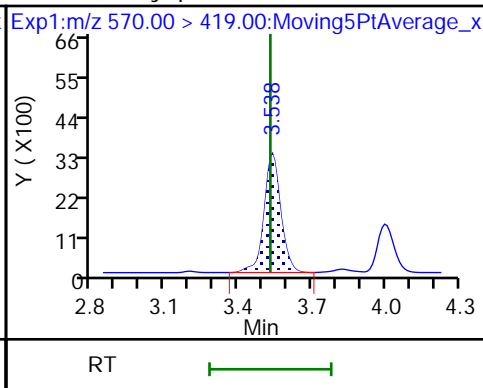
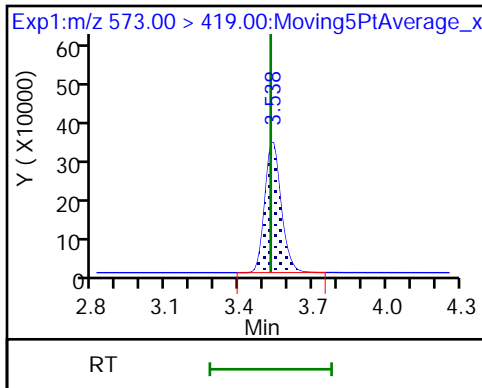
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

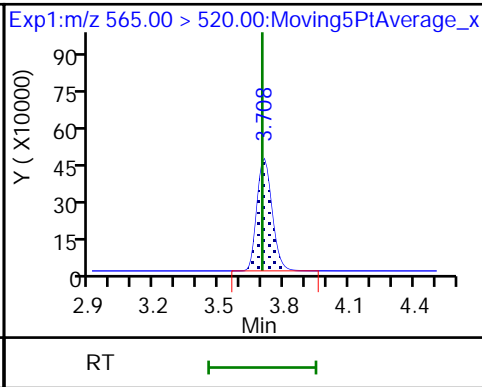
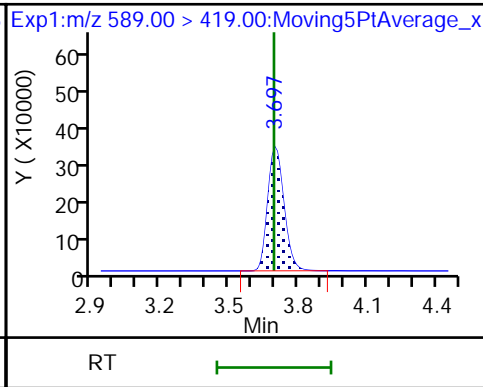
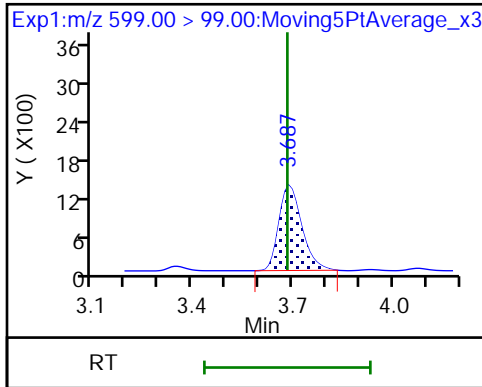
29 Perfluorodecane Sulfonic acid (M)

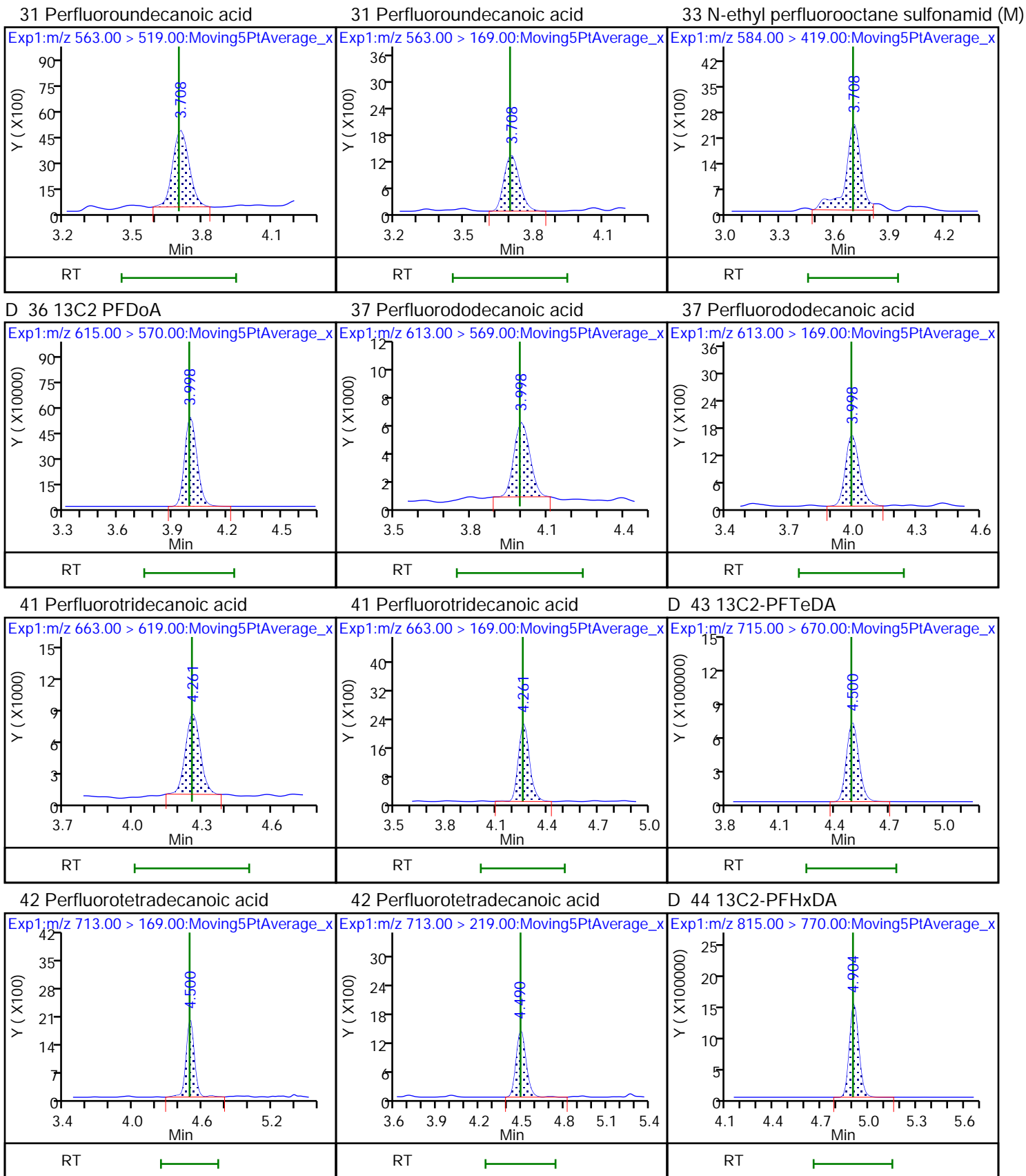


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento

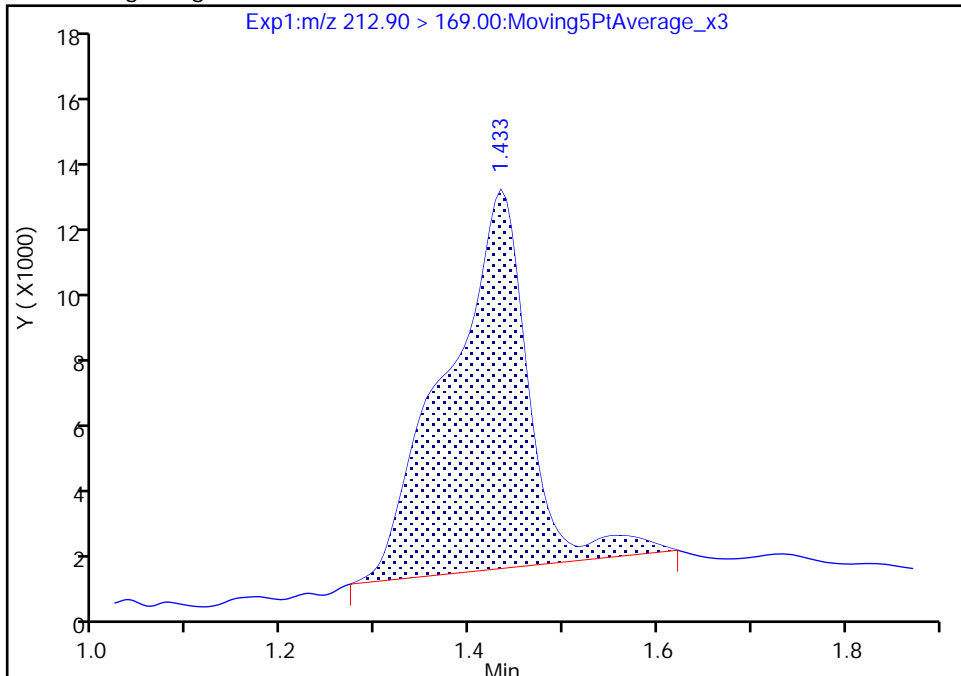
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
Injection Date: 29-Jun-2018 21:29:05 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

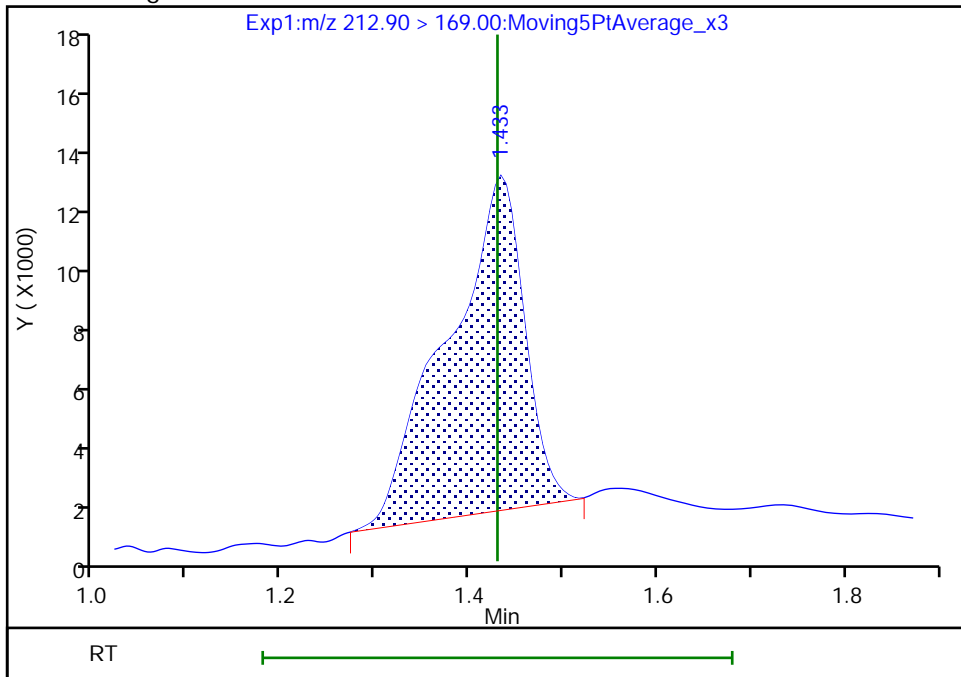
RT: 1.43
Area: 68837
Amount: 0.029190
Amount Units: ng/ml

Processing Integration Results



RT: 1.43
Area: 63343
Amount: 0.027452
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:10:06
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 601 of 864

TestAmerica Sacramento

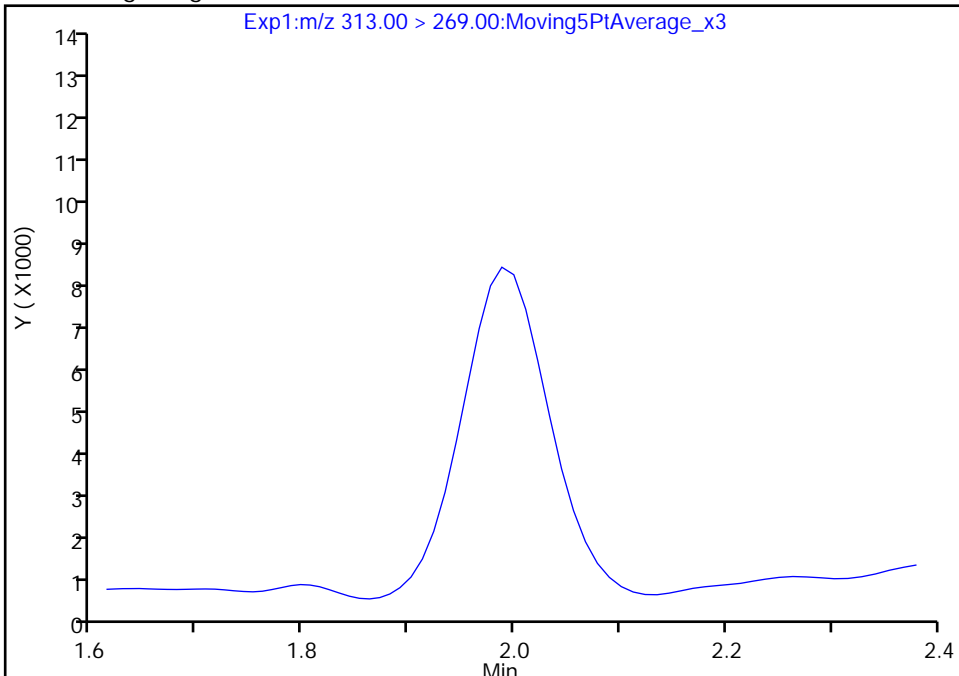
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
Injection Date: 29-Jun-2018 21:29:05 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

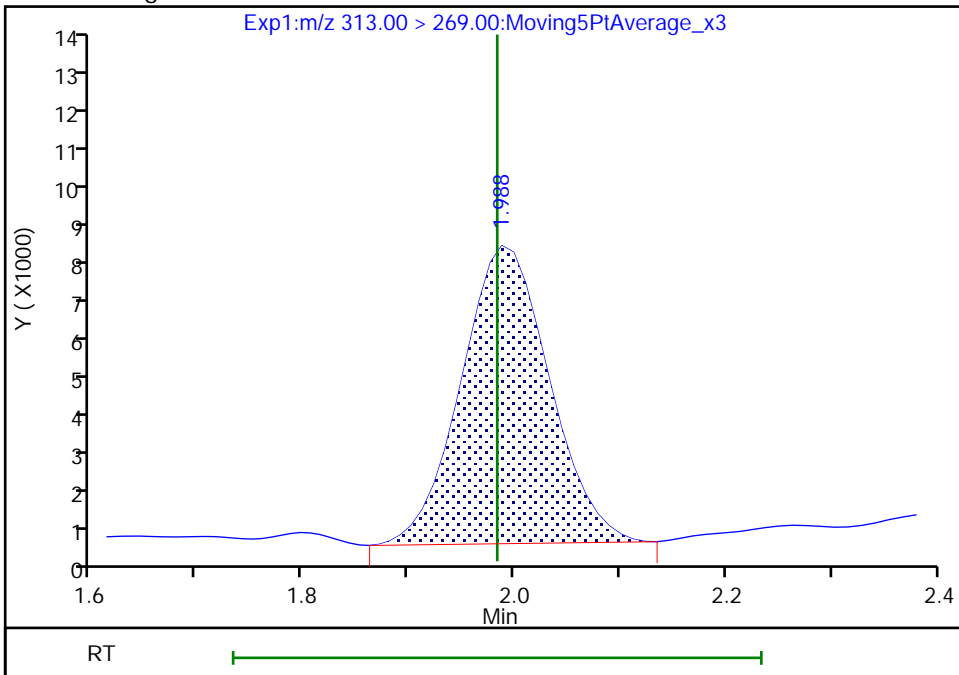
Not Detected
Expected RT: 1.98

Processing Integration Results



Manual Integration Results

RT: 1.99
Area: 43400
Amount: 0.023542
Amount Units: ng/ml



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d

Injection Date: 29-Jun-2018 21:29:05

Instrument ID: A8_N

Lims ID: IC L1 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 10

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

Column:

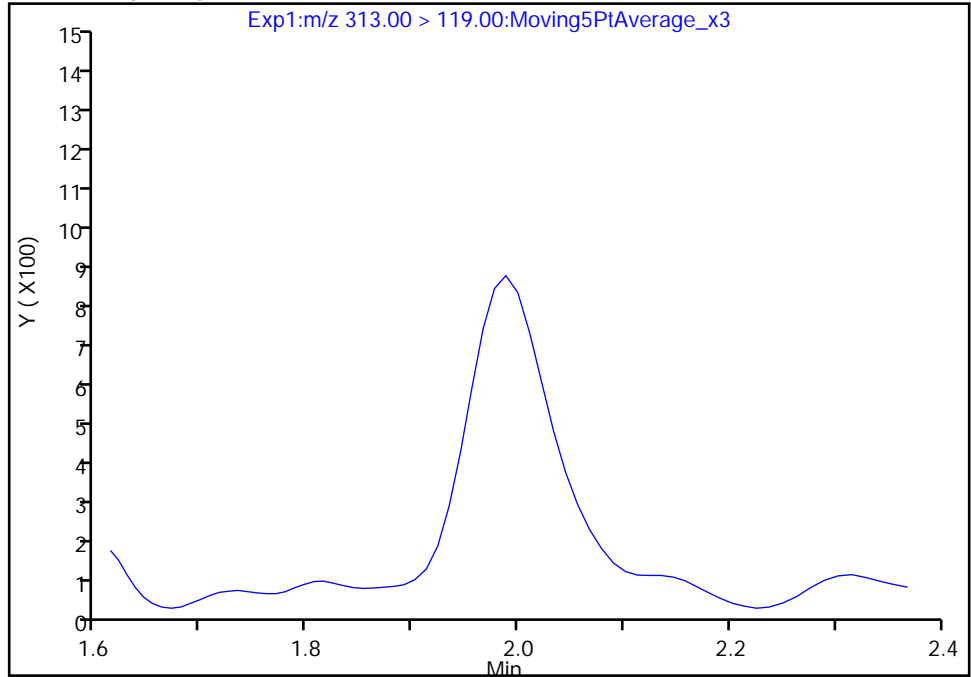
Detector: EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 2

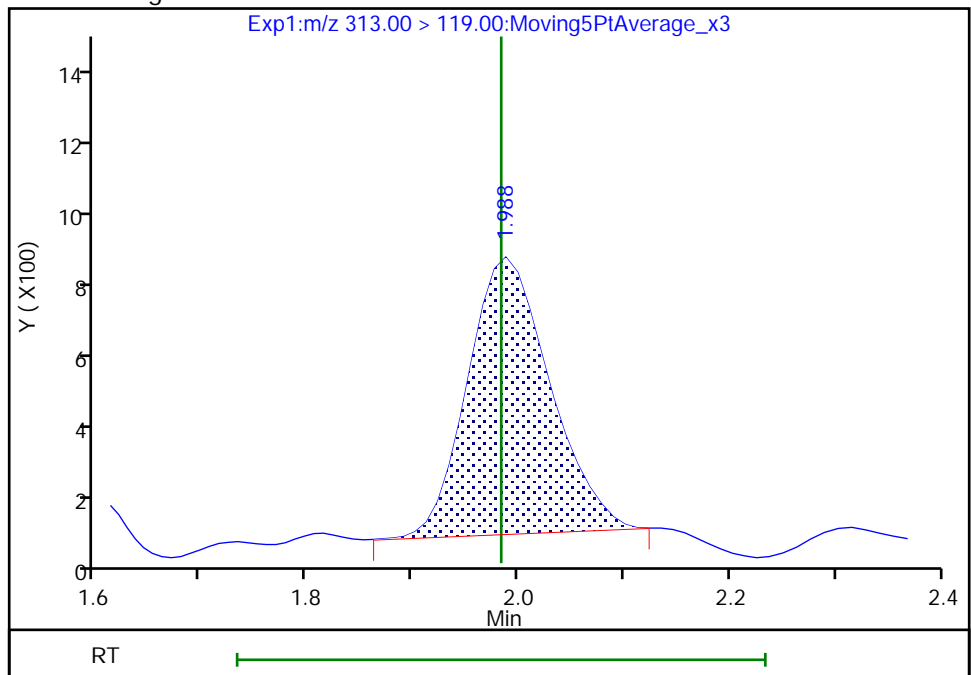
Not Detected
Expected RT: 1.98

Processing Integration Results



Manual Integration Results

RT: 1.99
Area: 4096
Amount: 0.023542
Amount Units: ng/ml



Reviewer: roycea, 30-Jun-2018 07:10:29

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento

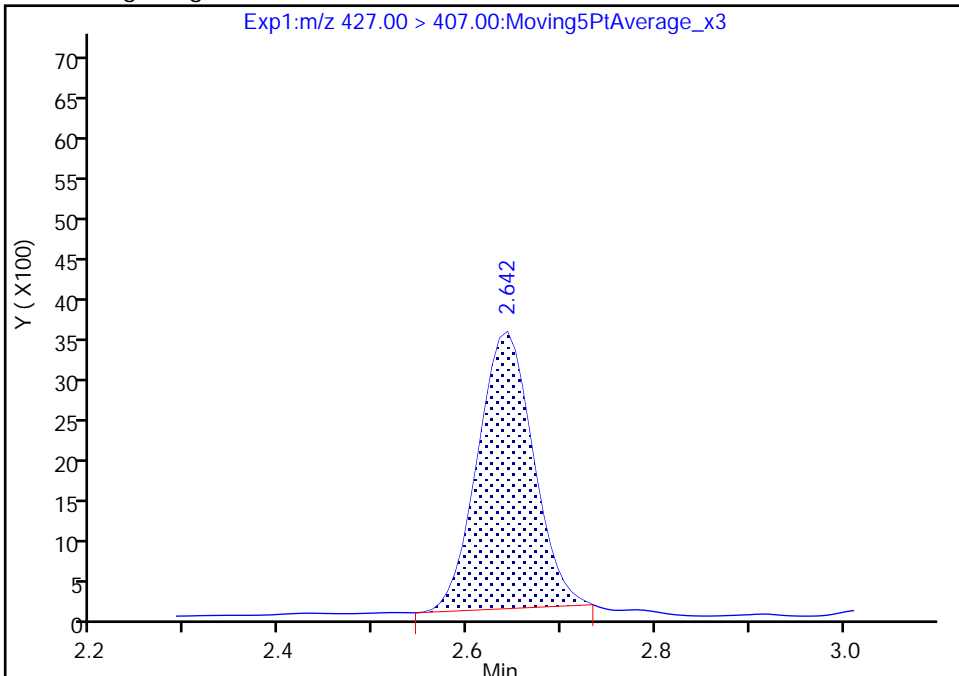
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
Injection Date: 29-Jun-2018 21:29:05 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

13 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:, CAS: 27619-97-2

Signal: 1

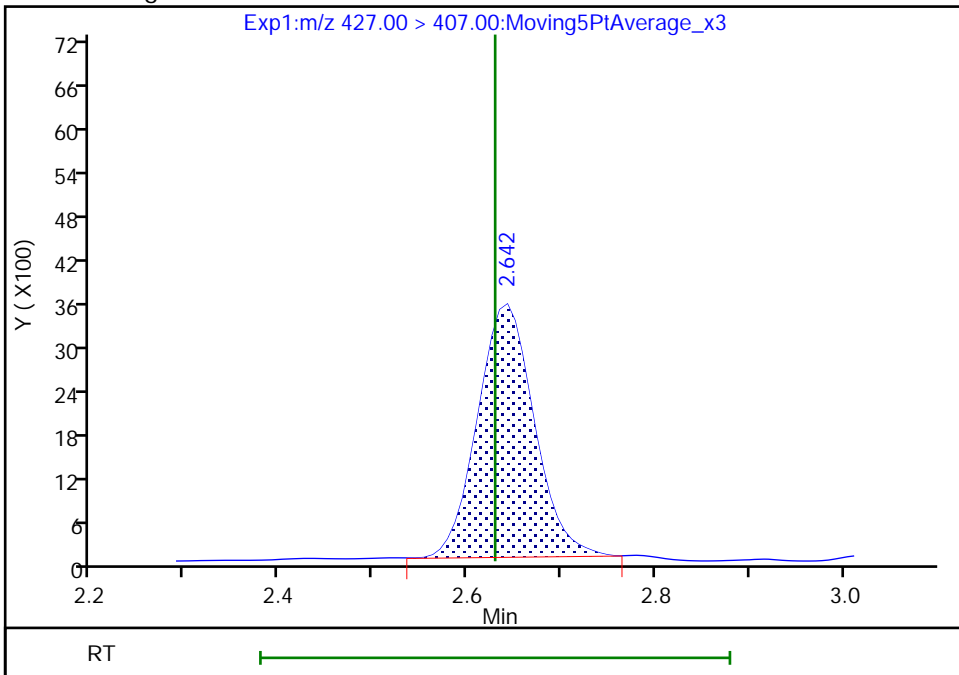
RT: 2.64
Area: 14066
Amount: 0.021457
Amount Units: ng/ml

Processing Integration Results



RT: 2.64
Area: 14584
Amount: 0.022142
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:10:49
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 604 of 864

TestAmerica Sacramento

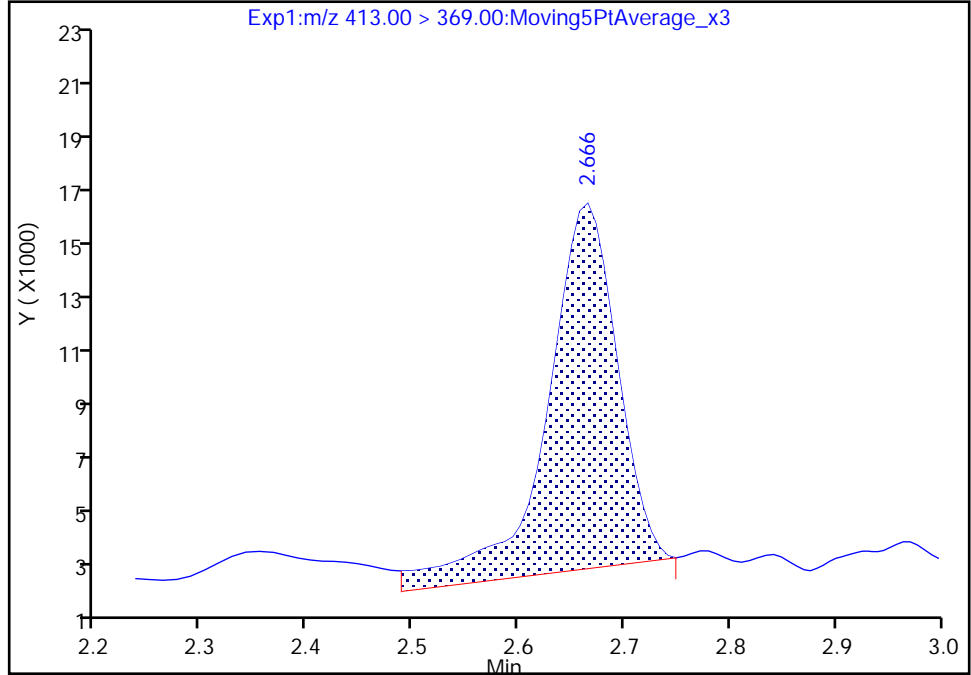
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
Injection Date: 29-Jun-2018 21:29:05 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

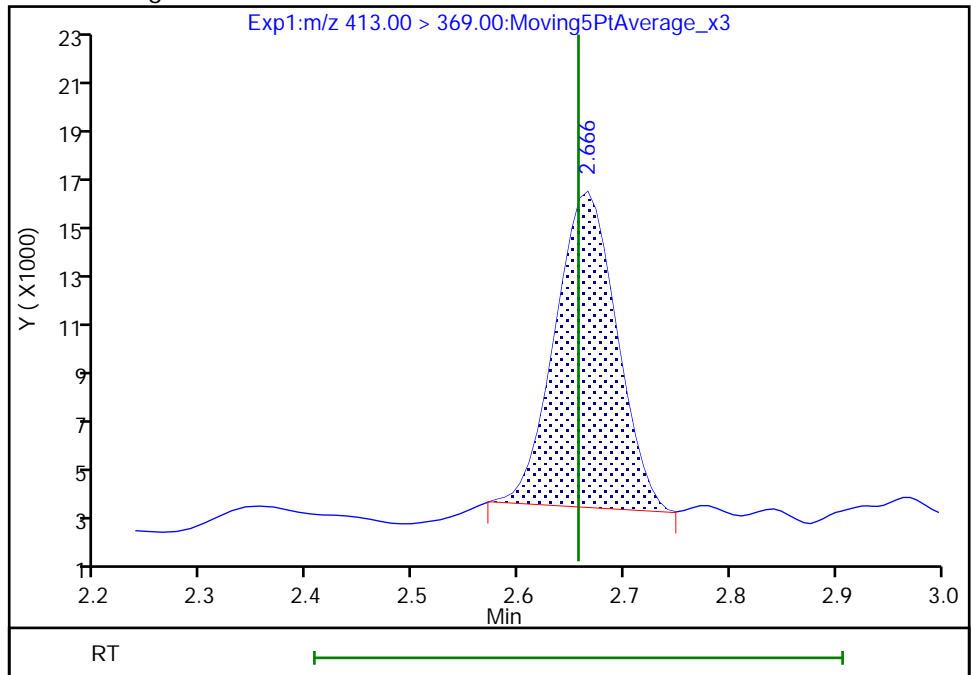
RT: 2.67
Area: 61592
Amount: 0.031828
Amount Units: ng/ml

Processing Integration Results



RT: 2.67
Area: 50947
Amount: 0.027636
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:09:32
Audit Action: Manually Integrated

TestAmerica Sacramento

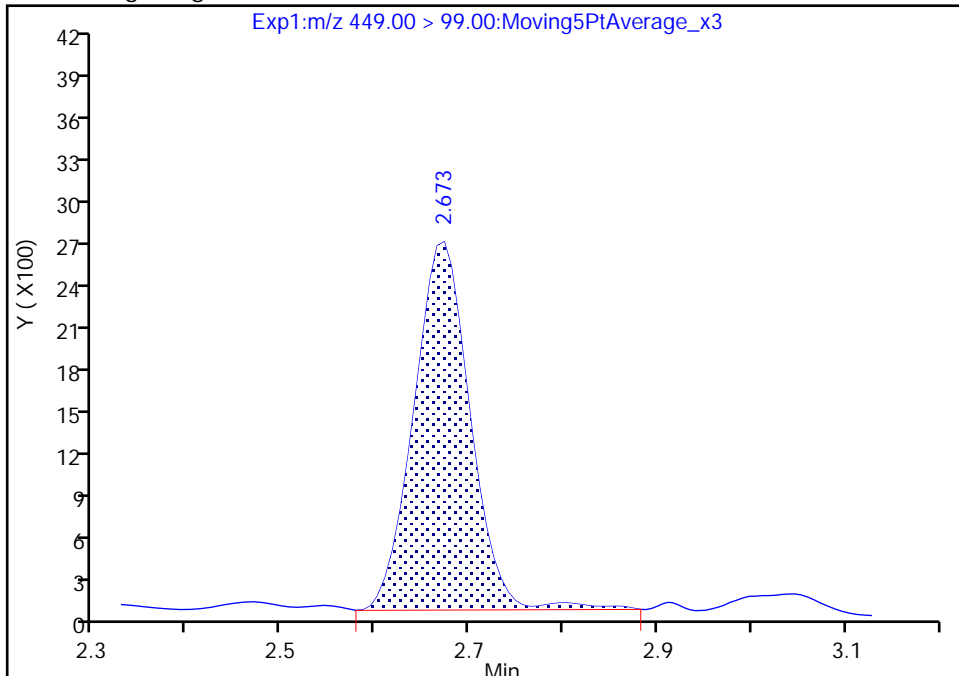
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
Injection Date: 29-Jun-2018 21:29:05 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

16 Perfluoroheptanesulfonic acid, CAS: 375-92-8

Signal: 2

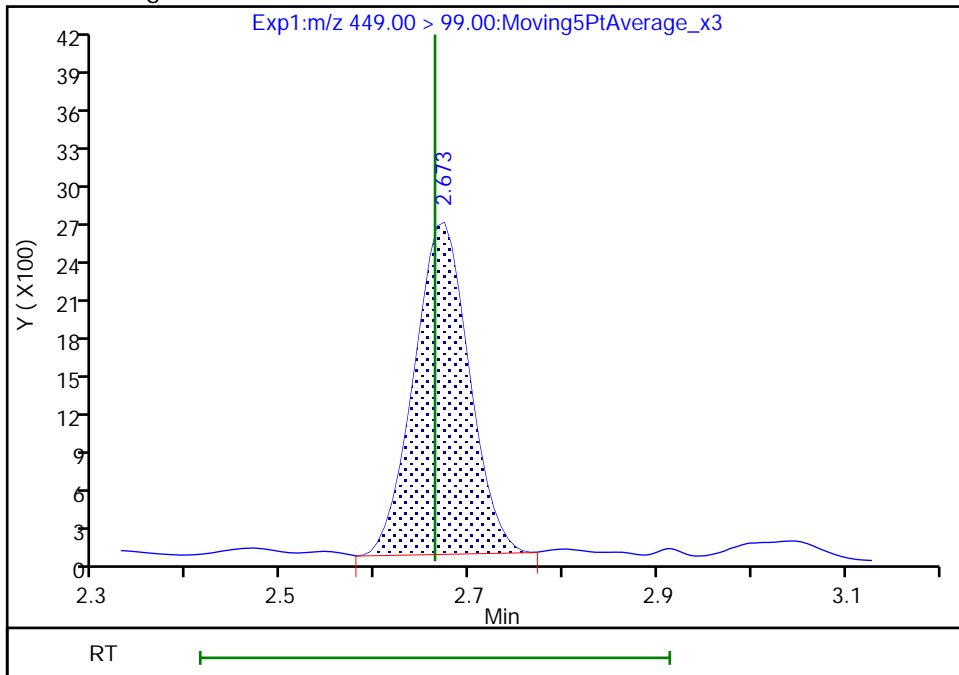
RT: 2.67
Area: 11023
Amount: 0.022069
Amount Units: ng/ml

Processing Integration Results



RT: 2.67
Area: 10718
Amount: 0.022069
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:11:03
Audit Action: Manually Integrated

TestAmerica Sacramento

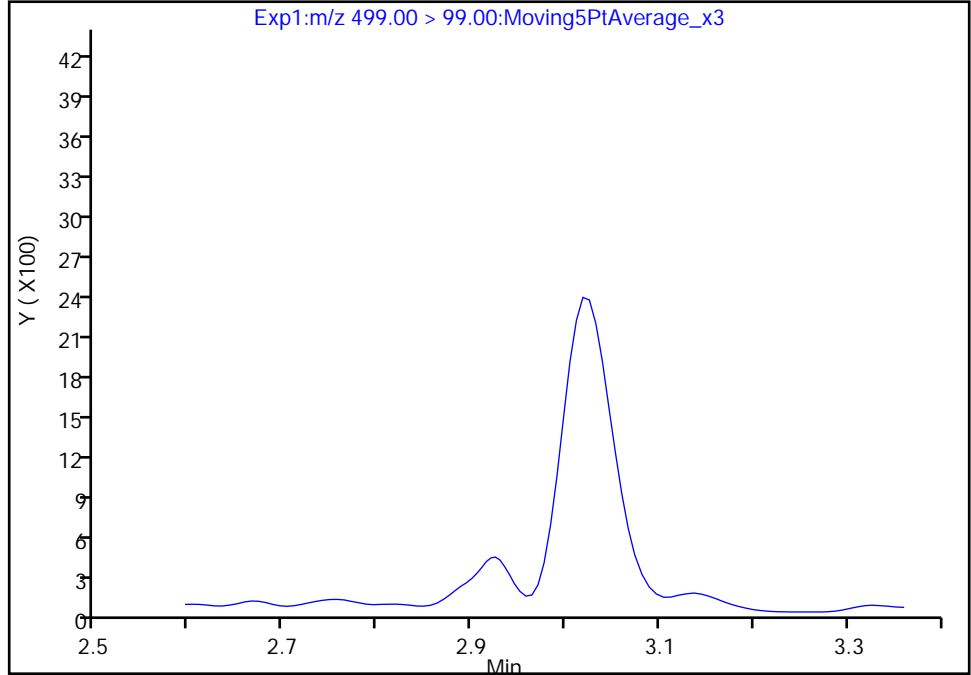
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
Injection Date: 29-Jun-2018 21:29:05 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

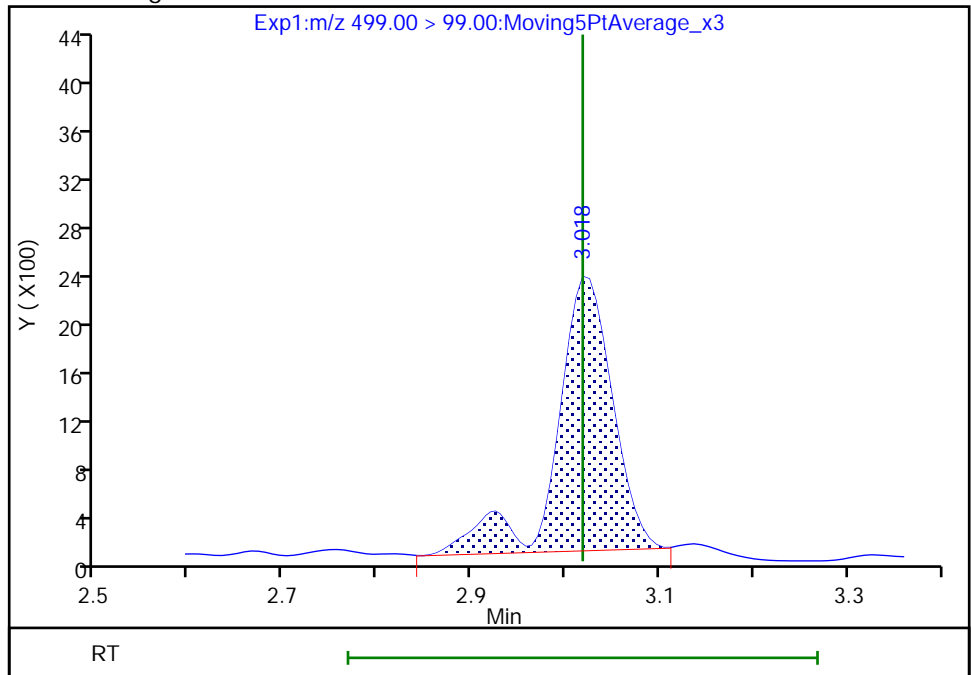
RT: 3.01
Area: 0
Amount: 0.023431
Amount Units: ng/ml

Processing Integration Results



RT: 3.02
Area: 9327
Amount: 0.023431
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

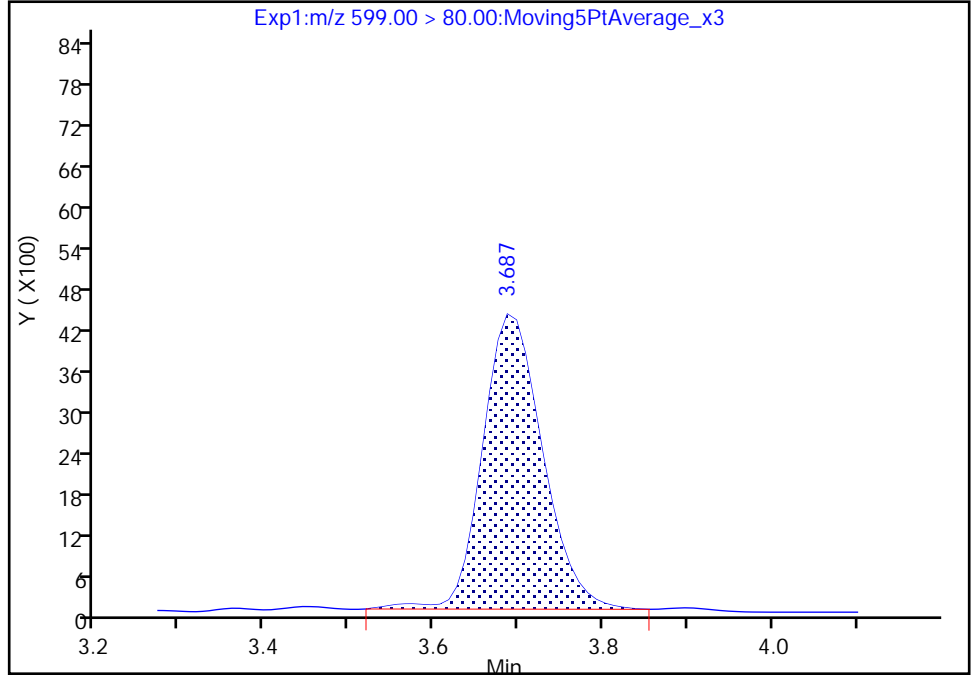
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
Injection Date: 29-Jun-2018 21:29:05 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

29 Perfluorodecane Sulfonic acid, CAS: 335-77-3

Signal: 1

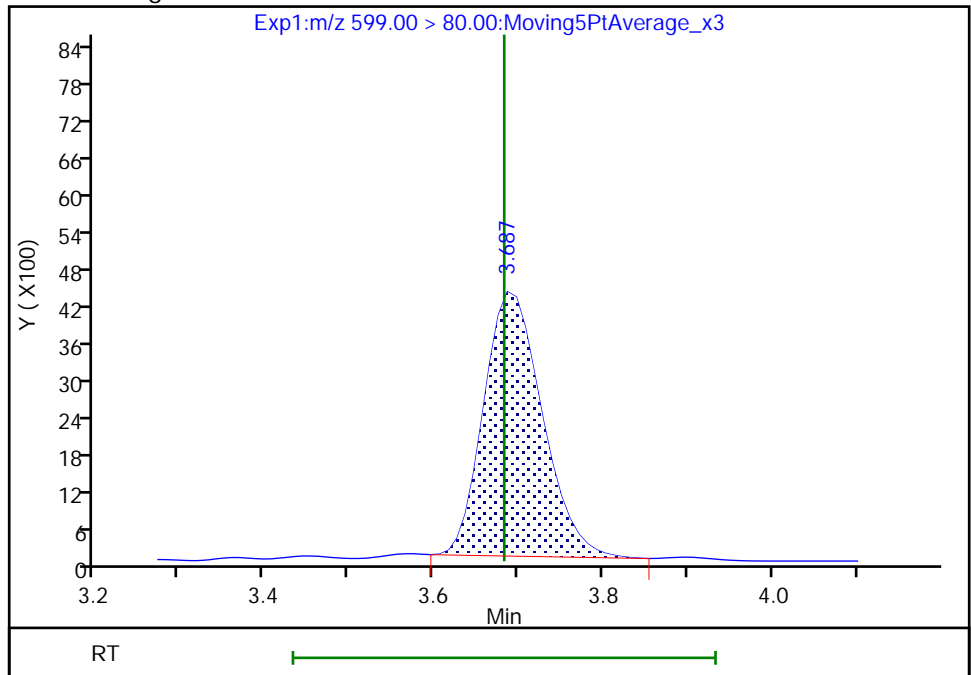
RT: 3.69
Area: 21401
Amount: 0.024040
Amount Units: ng/ml

Processing Integration Results



RT: 3.69
Area: 20726
Amount: 0.023387
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:11:38
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 608 of 864

TestAmerica Sacramento

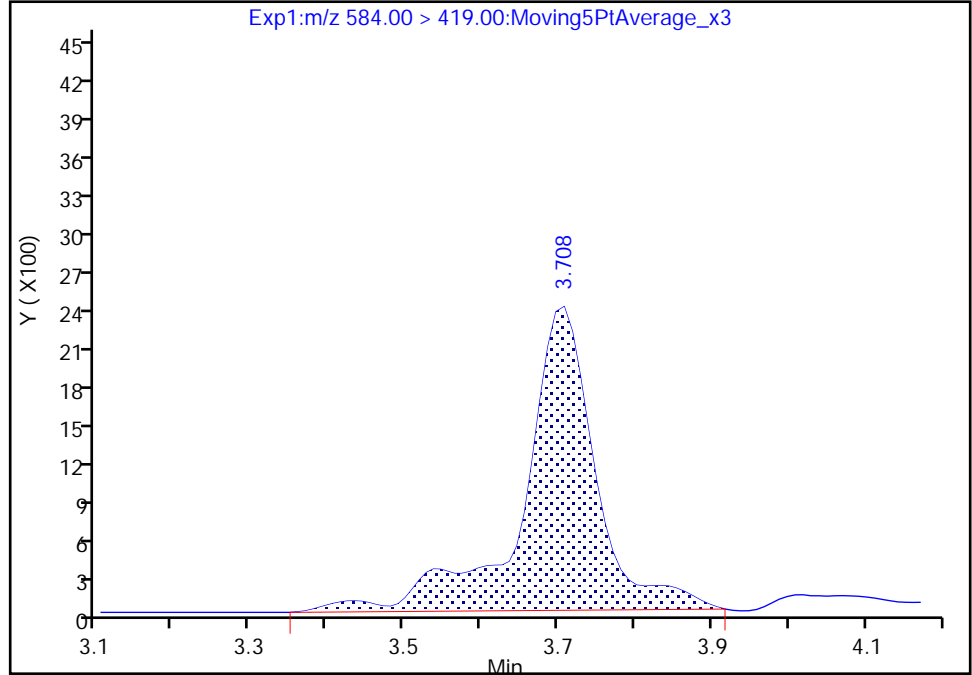
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_002.d
Injection Date: 29-Jun-2018 21:29:05 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

33 N-ethyl perfluorooctane sulfonamidoacetic ac, CAS: 2991-50-6

Signal: 1

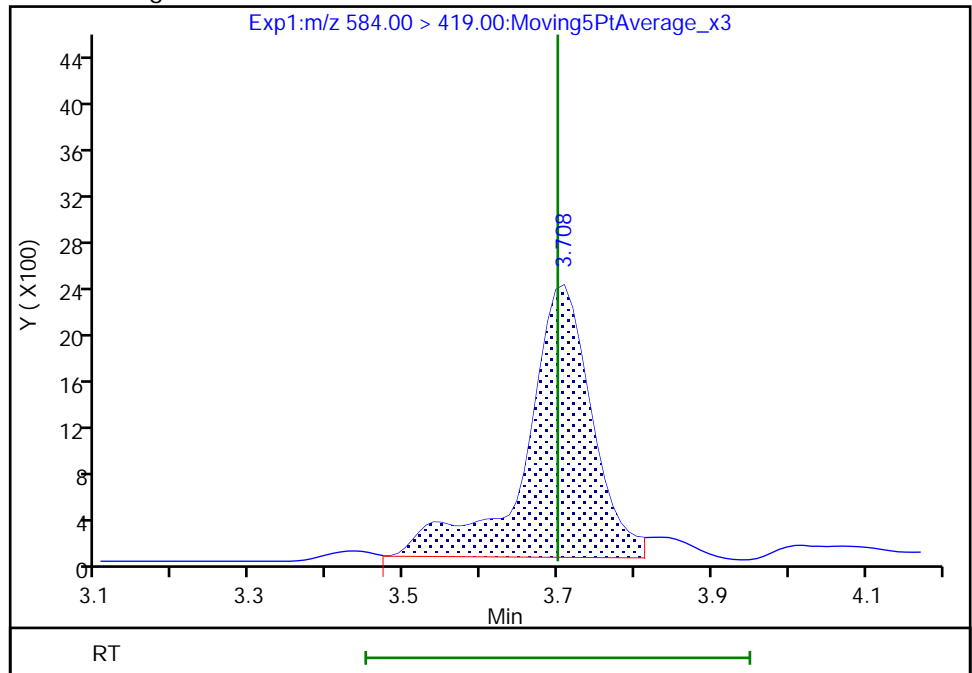
RT: 3.71
Area: 15868
Amount: 0.026336
Amount Units: ng/ml

Processing Integration Results



RT: 3.71
Area: 14281
Amount: 0.024064
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:13:41
Audit Action: Manually Integrated

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_003.d
 Lims ID: IC L2 Full
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 29-Jun-2018 21:36:56 ALS Bottle#: 11 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L2-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:52:46 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:16:46

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	1.425	1.428	-0.003	0.537	6087691	2.38	95.2	34226	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.425	1.430	-0.005	1.000	126354	0.0510		102	59.8	M
D 3 13C5-PFPeA	267.90 > 223.00	1.703	1.705	-0.002	0.642	4249734	2.37	94.6	53198	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.703	1.706	-0.003	1.000	108868	0.0539		108	72.0	
D 47 13C3-PFBS	301.90 > 83.00	1.739	1.741	-0.002	0.656	86851	2.19	94.4	739	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.739	1.745	-0.006	1.000	128257	0.0445		101	566	M
298.90 > 99.00	1.739	1.745	-0.006	1.000	57604		2.23(1.25-3.74)	101	499	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.950	1.948	0.002	1.121	35656	0.0484		104	2197	
D 60 M2-4:2FTS	329.00 > 81.00	1.950	1.948	0.002	0.735	728227	NC		10350	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.982	1.984	-0.002	1.000	107466	0.0540		108	268	
313.00 > 119.00	1.982	1.984	-0.002	1.000	10122		10.62(5.03-15.10)	108	207	
D 7 13C2 PFHxA	315.00 > 270.00	1.982	1.984	-0.002	0.747	4810563	2.45	97.8	66285	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.005	2.004	0.001	1.153	118229	0.0458		97.6	2585	
349.00 > 99.00	2.005	2.004	0.001	1.153	49189		2.40(1.36-4.07)	97.6	988	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.084	2.080	0.004	0.786	243286	NC		5449	

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	2.084	2.082	0.002	1.000	13008	NC	89.0	
D 9 13C4-PFHpA	367.00	> 322.00	2.295	2.302	-0.007	0.865	4416706	2.42	97.0	46158
10 Perfluoroheptanoic acid	363.00	> 319.00	2.308	2.304	0.004	1.006	89912	0.0459	91.8	151
	363.00	> 169.00	2.308	2.304	0.004	1.006	36837	2.44(1.13-3.40)	91.8	347
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.308	2.314	-0.006	0.994	116431	0.0492	108	1398
	399.00	> 99.00	2.321	2.314	0.007	1.000	37494	3.11(1.50-4.49)	108	345
D 11 18O2 PFHxS	403.00	> 84.00	2.321	2.317	0.004	0.875	4826276	2.27	96.0	35121
65 Adona	377.00	> 251.00	2.347	2.345	0.002	0.777	260958	NC		3742
	377.00	> 85.00	2.347	2.345	0.002	0.777	167593	1.56(0.84-2.53)		3222
D 12 M2-6:2FTS	429.00	> 81.00	2.628	2.627	0.001	0.991	1028014	2.33	98.1	17365
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.628	2.629	-0.001	1.000	32377	0.0465	98.2	198
D 14 13C4 PFOA	417.00	> 372.00	2.653	2.653	0.0	1.000	4283590	2.45	98.0	31425
* 62 13C2-PFOA	415.00	> 370.00	2.653	2.655	-0.002		4577348	2.50		46124
15 Perfluorooctanoic acid	413.00	> 369.00	2.660	2.657	0.003	1.003	102335	0.0508	102	35.8
	413.00	> 169.00	2.653	2.657	-0.004	1.000	51342	1.99(0.84-2.52)	102	326
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.660	2.663	-0.003	0.880	86914	0.0468	98.3	1648
	449.00	> 99.00	2.660	2.663	-0.003	0.880	25063	3.47(1.94-5.82)	98.3	824
D 18 13C4 PFOS	503.00	> 80.00	3.022	3.017	0.005	1.139	3265540	2.29	95.8	29483
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.022	3.018	0.004	1.000	77229	0.0486	105	1184
	499.00	> 99.00	3.015	3.018	-0.003	0.998	19196	4.02(2.31-6.93)	105	602
20 Perfluorononanoic acid	463.00	> 419.00	3.022	3.018	0.004	1.000	80249	0.0506	101	231
	463.00	> 169.00	3.022	3.018	0.004	1.000	19578	4.10(1.90-5.69)	101	744
D 19 13C5 PFNA	468.00	> 423.00	3.022	3.018	0.004	1.139	3567496	2.46	98.6	47067
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.229	3.229	0.0	1.068	126398	NC		3553
D 21 13C8 FOSA	506.00	> 78.00	3.357	3.358	-0.001	1.266	4685651	2.50	100	34914
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.357	3.360	-0.003	1.111	56695	0.0515	107	1867
	549.00	> 99.00	3.367	3.360	0.007	1.114	22205	2.55(1.33-3.97)	107	1010
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.357	3.361	-0.004	1.000	94580	0.0503	101	1923

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	3.367	3.362	0.005	1.269	1157380	2.41		101	16484	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.367	3.364	0.003	1.000	30968	0.0476		99.3	897	
D 23 13C2 PFDA										
515.00 > 470.00	3.376	3.374	0.002	1.273	2835108	2.40		96.0	30521	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.376	3.376	0.0	1.000	60419	0.0502		100	321	
513.00 > 169.00	3.376	3.376	0.0	1.000	10755		5.62(2.36-7.09)	100	501	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.526	3.527	-0.001	1.329	1638012	2.31		92.5	32680	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.526	3.529	-0.003	1.000	27497	0.0439		87.9	293	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.684	3.683	0.001	1.219	42559	0.0453		93.9	1108	
599.00 > 99.00	3.684	3.683	0.001	1.219	17461		2.44(1.39-4.16)	93.9	1214	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.694	3.694	0.0	1.393	1771980	2.53		101	15189	
D 30 13C2 PFUnA										
565.00 > 520.00	3.694	3.698	-0.004	1.393	2481505	2.56		102	36578	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.694	3.698	-0.004	1.000	46322	0.0517		103	251	
563.00 > 169.00	3.705	3.698	0.007	1.003	11383		4.07(2.12-6.36)	103	292	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.694	3.700	-0.006	1.000	32768	0.0517		103	884	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.862	3.858	0.004	1.278	191054	NC			3634	
D 36 13C2 PFDaA										
615.00 > 570.00	3.995	3.992	0.003	1.506	2662501	2.37		94.6	18014	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.995	3.992	0.003	1.000	61822	0.0536		107	80.7	
613.00 > 169.00	3.995	3.992	0.003	1.000	14539		4.25(2.13-6.40)	107	375	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.259	4.255	0.004	1.066	60399	0.0484		96.8	53.1	
663.00 > 169.00	4.249	4.255	-0.006	1.064	18878		3.20(1.25-3.76)	96.8	457	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.489	4.490	-0.001	1.692	3450533	2.46		98.3	15162	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.489	4.490	-0.001	1.000	16269	0.0471		94.3	339	
713.00 > 219.00	4.489	4.490	-0.001	1.000	11952		1.36(0.71-2.13)	94.3	485	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.903	4.899	0.004	1.848	6454693	2.46		98.2	13872	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.903	4.900	0.003	1.000	177676	NC			91.0	
813.00 > 169.00	4.903	4.900	0.003	1.000	27075		6.56(2.86-8.58)		537	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.253	5.251	0.002	1.071	146155	NC			49.0	
913.00 > 169.00	5.253	5.251	0.002	1.071	17769		8.23(3.83-11.48)		369	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_003.d

Injection Date: 29-Jun-2018 21:36:56

Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 11

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

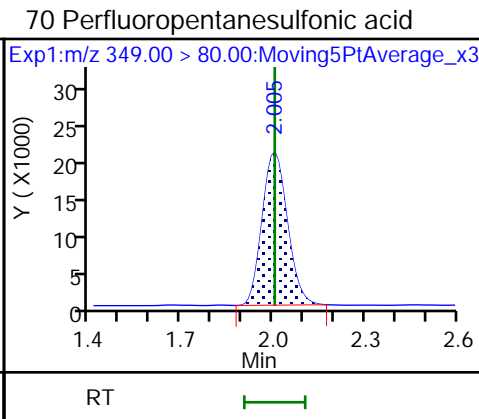
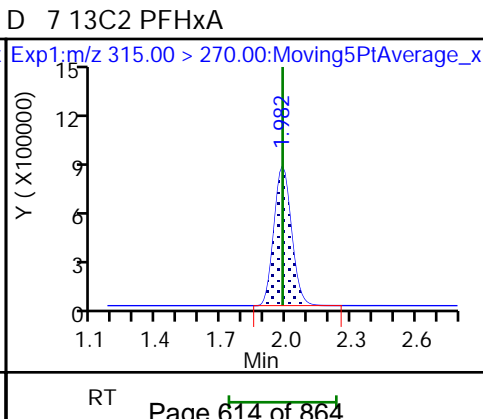
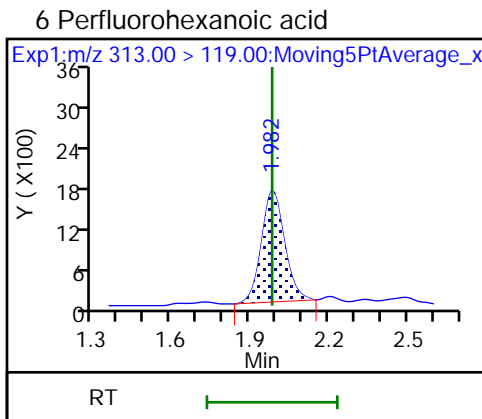
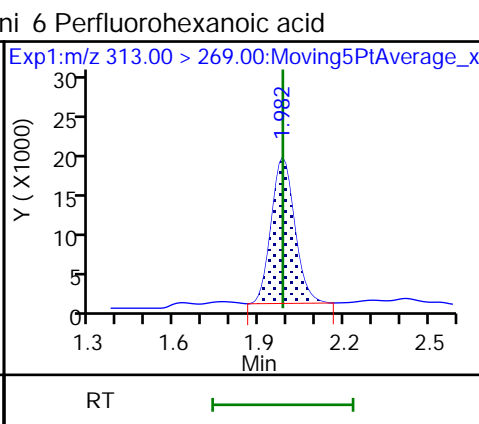
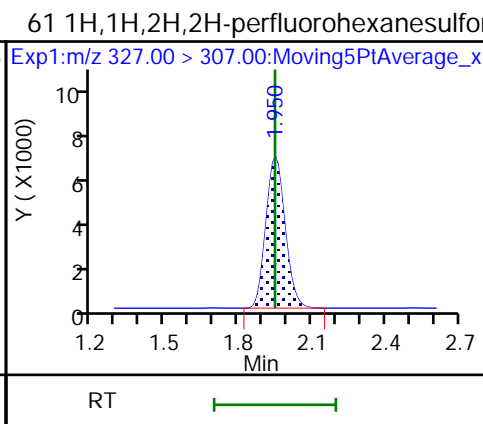
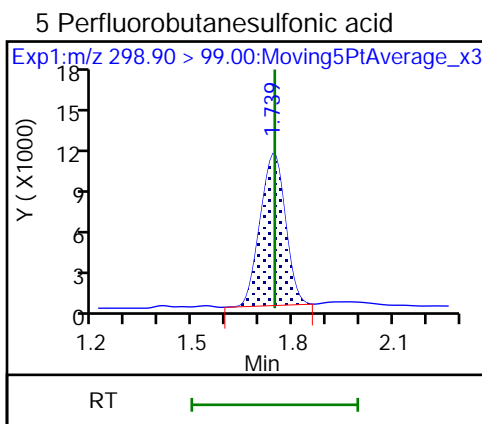
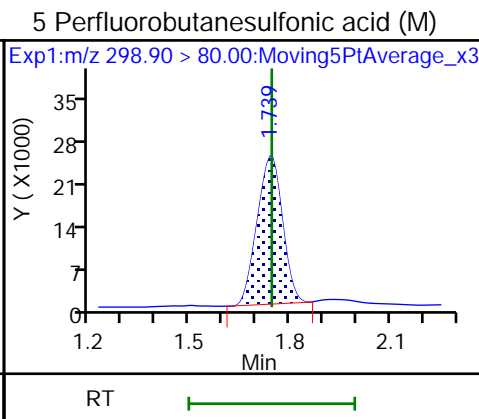
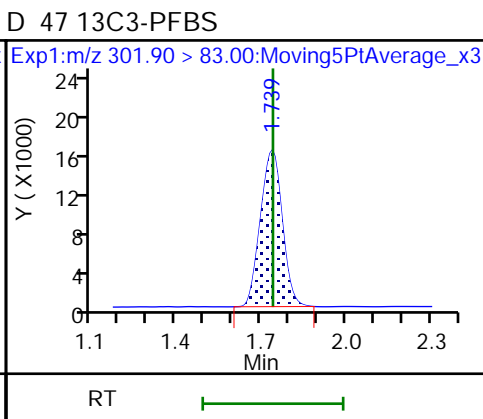
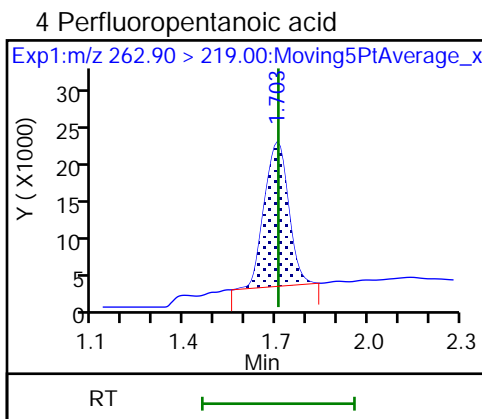
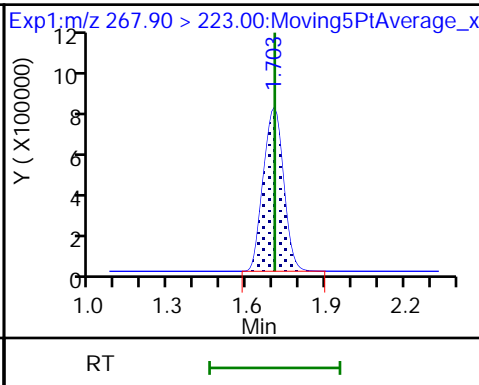
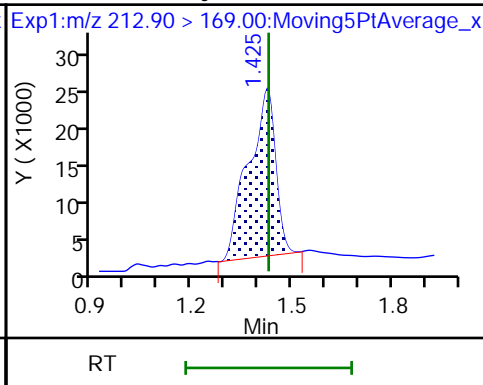
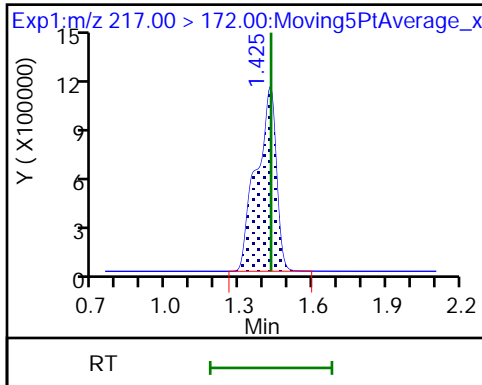
Method: A8_N

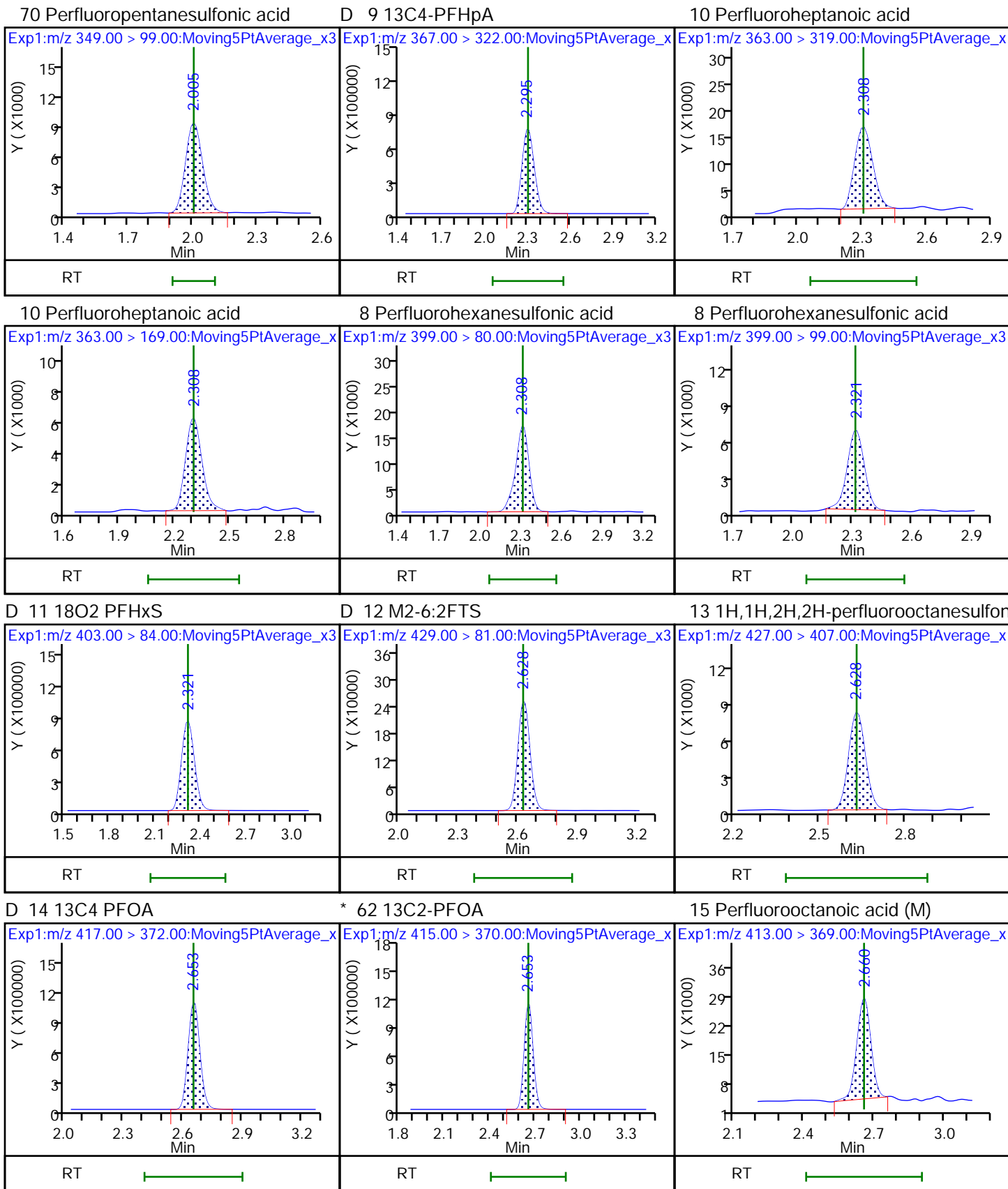
Limit Group: LC PFC_QSM5-1 ICAL

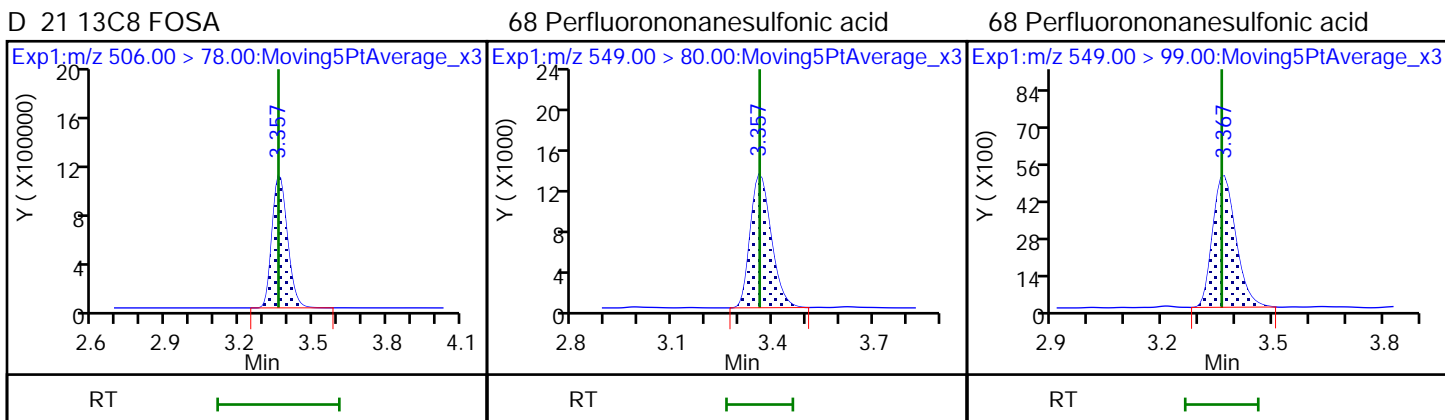
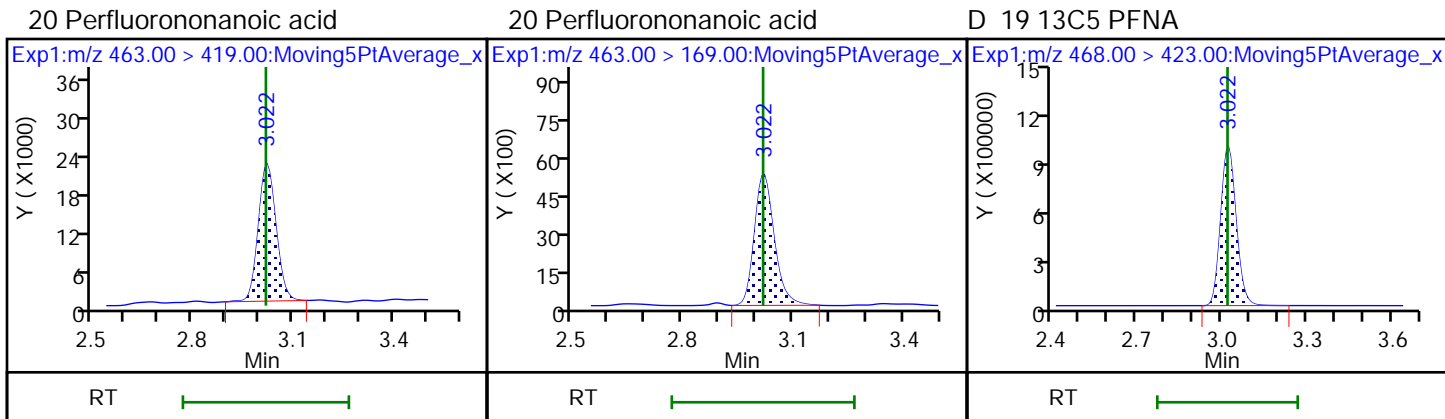
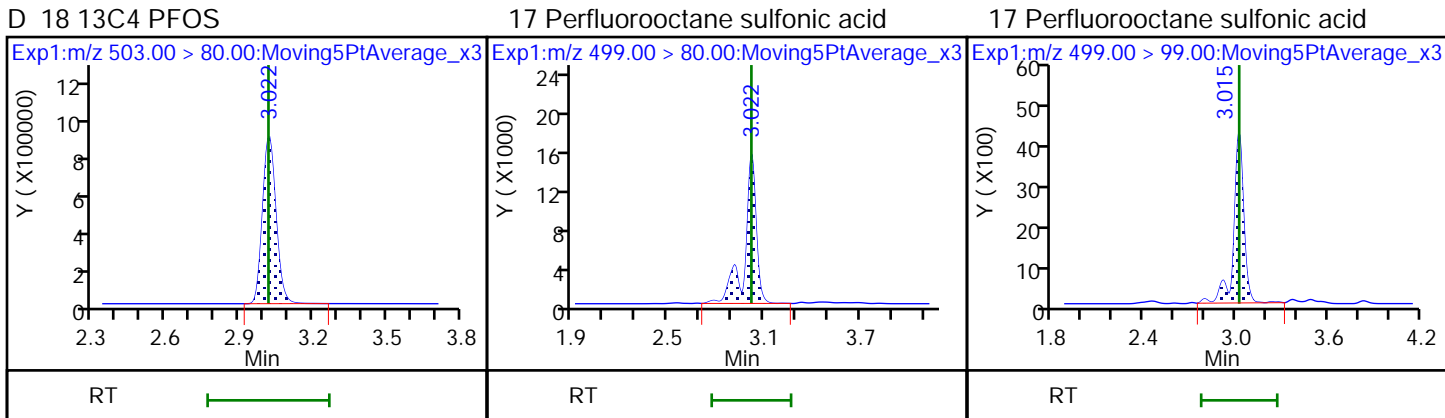
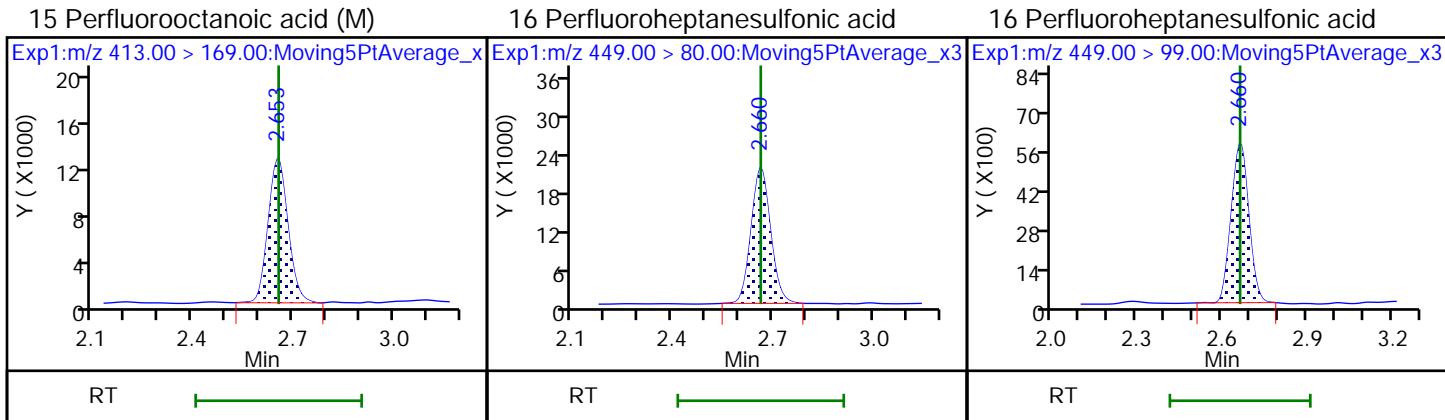
D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

D 3 13C5-PFPeA



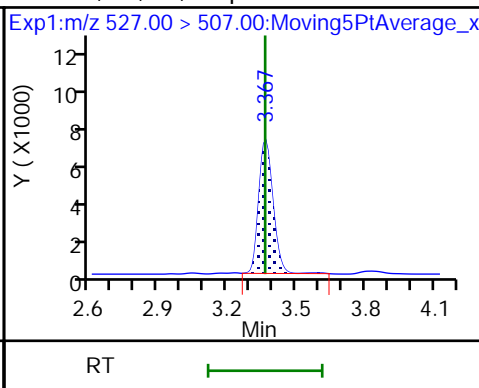
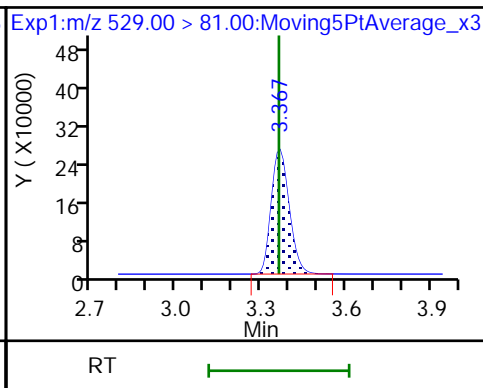
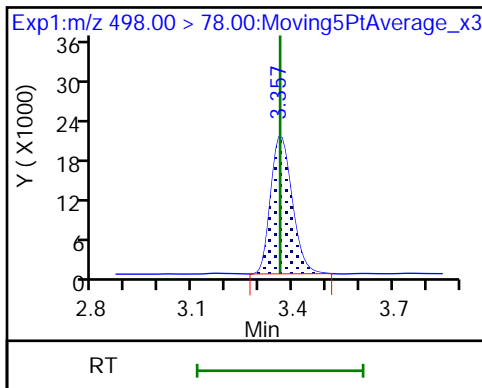




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

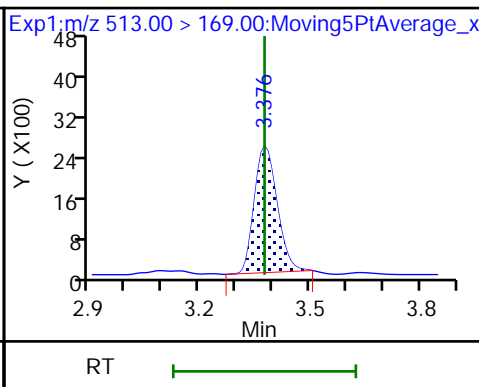
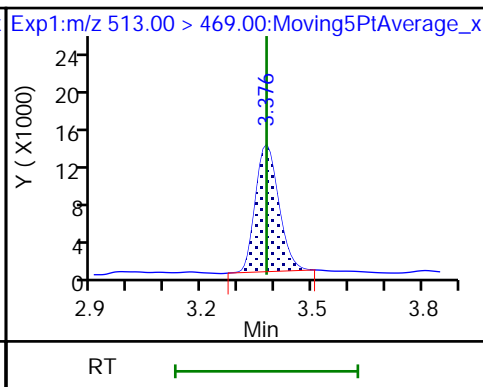
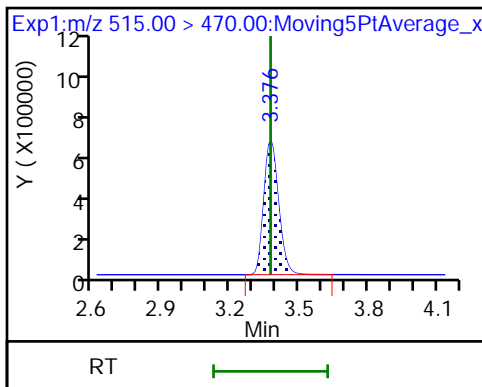
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid

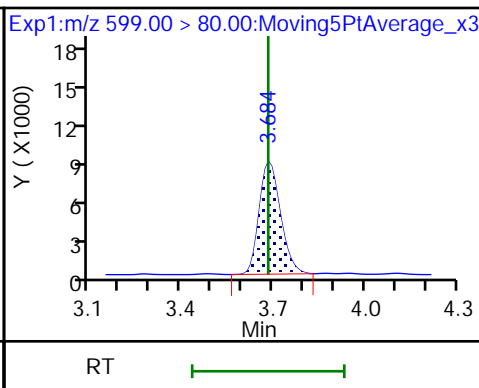
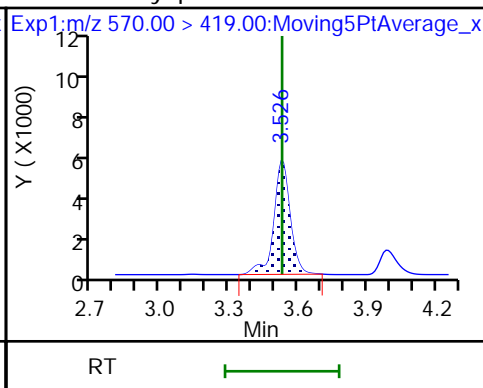
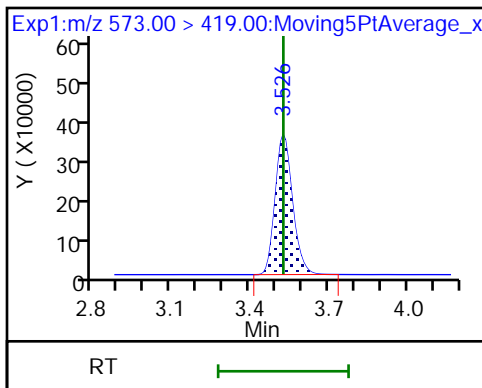
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

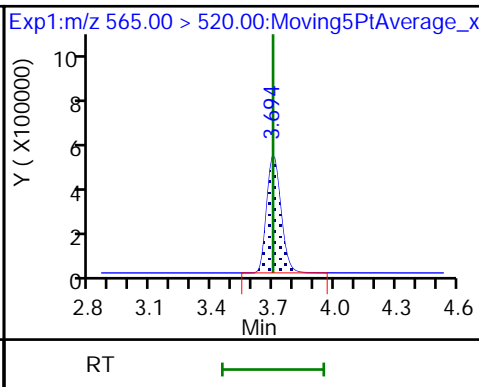
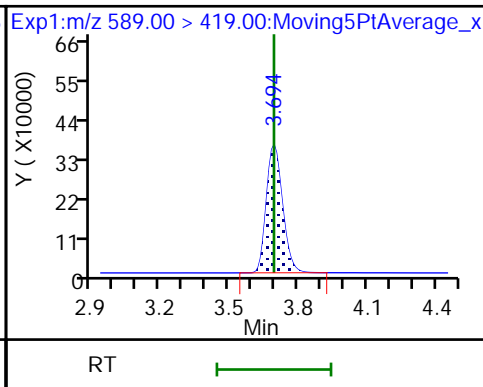
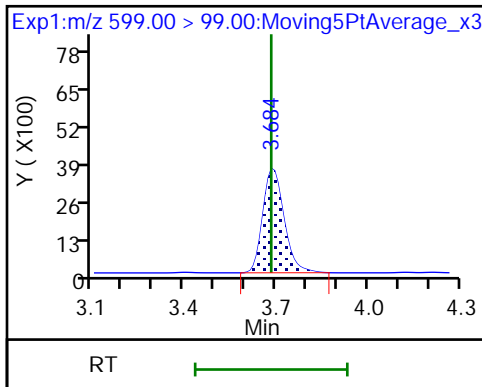
29 Perfluorodecane Sulfonic acid

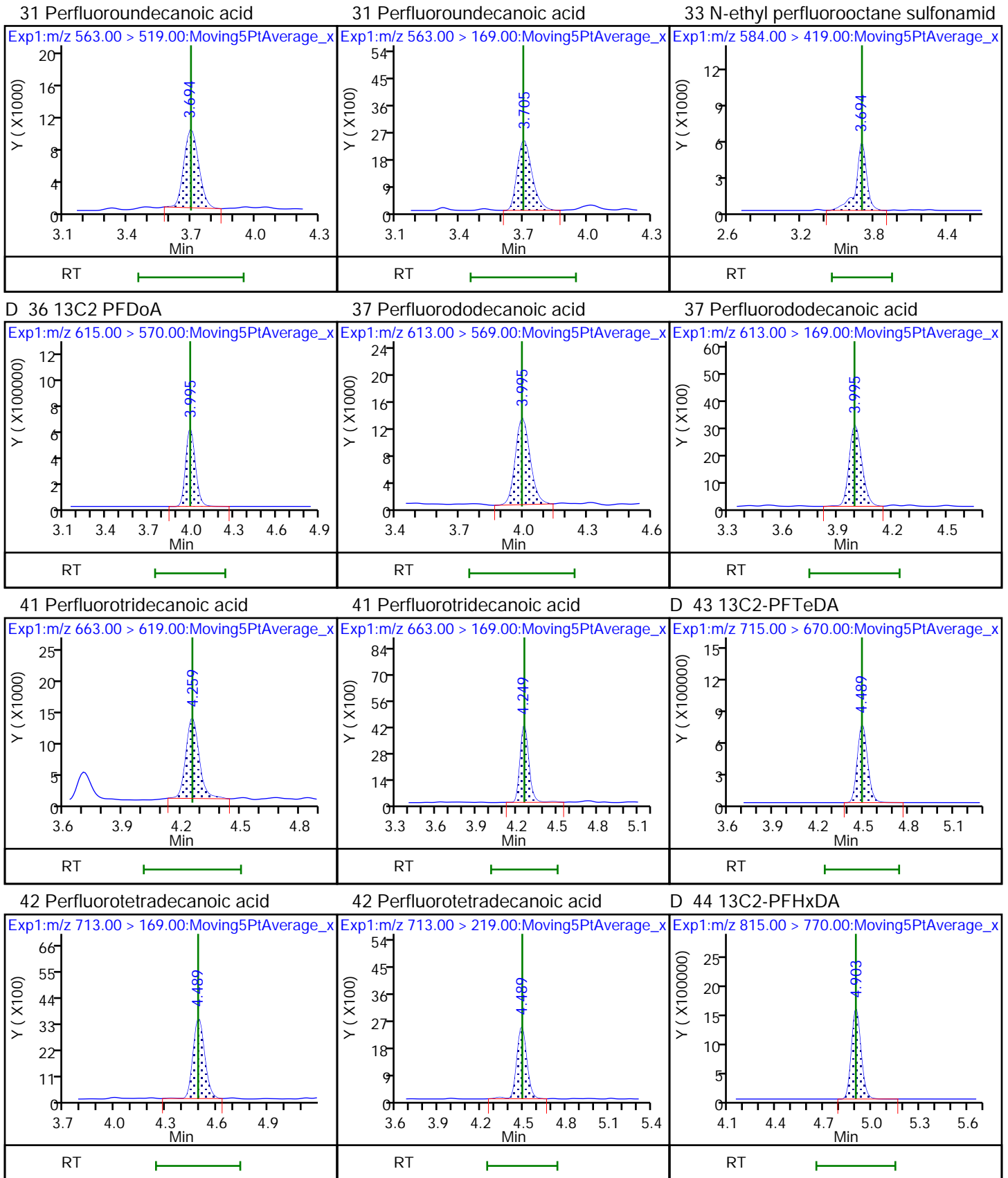


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento

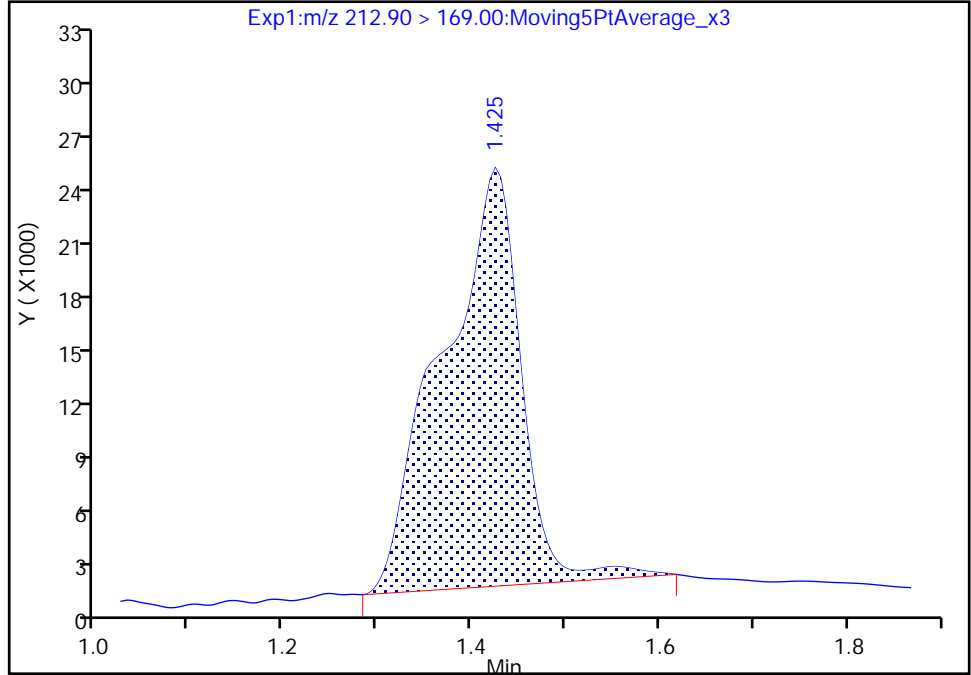
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_003.d
Injection Date: 29-Jun-2018 21:36:56 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

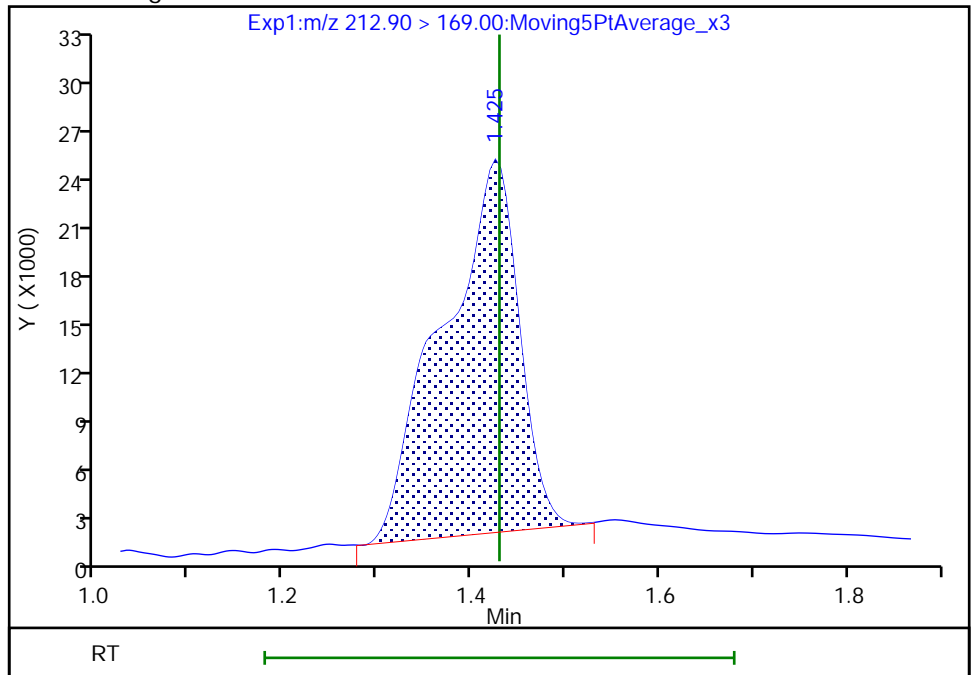
RT: 1.43
Area: 132335
Amount: 0.052969
Amount Units: ng/ml

Processing Integration Results



RT: 1.43
Area: 126354
Amount: 0.051001
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:15:48
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 620 of 864

TestAmerica Sacramento

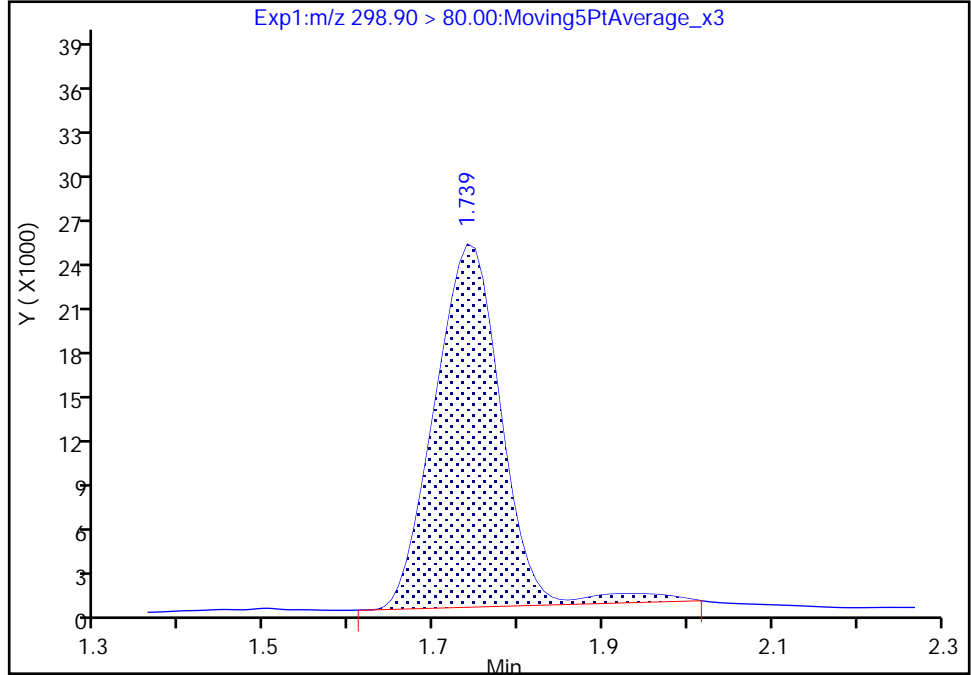
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_003.d
Injection Date: 29-Jun-2018 21:36:56 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

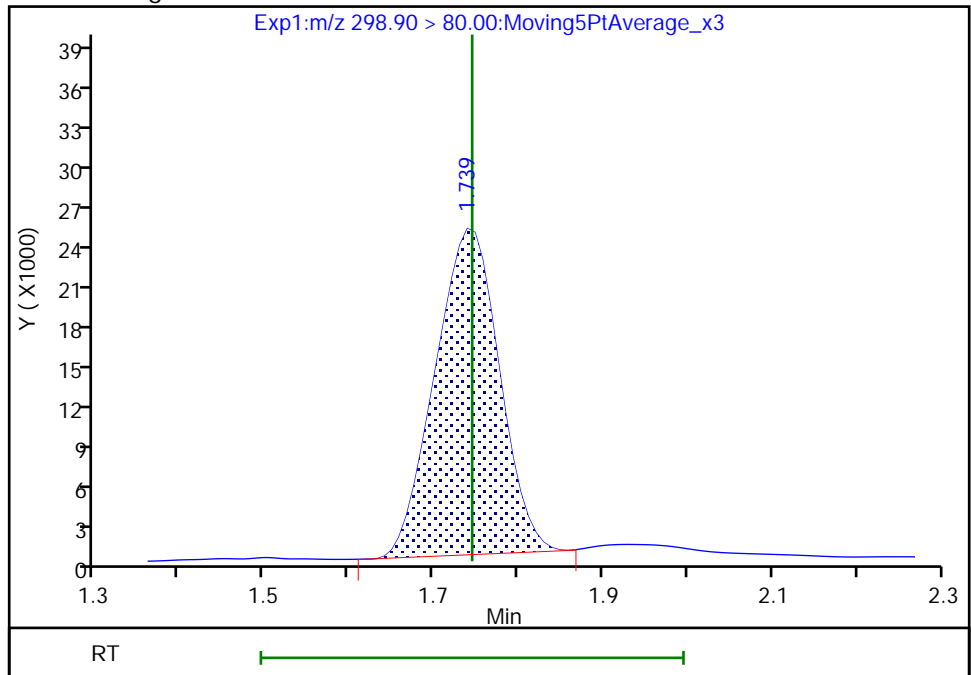
RT: 1.74
Area: 134312
Amount: 0.046282
Amount Units: ng/ml

Processing Integration Results



RT: 1.74
Area: 128257
Amount: 0.044496
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:16:00
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 621 of 864

TestAmerica Sacramento

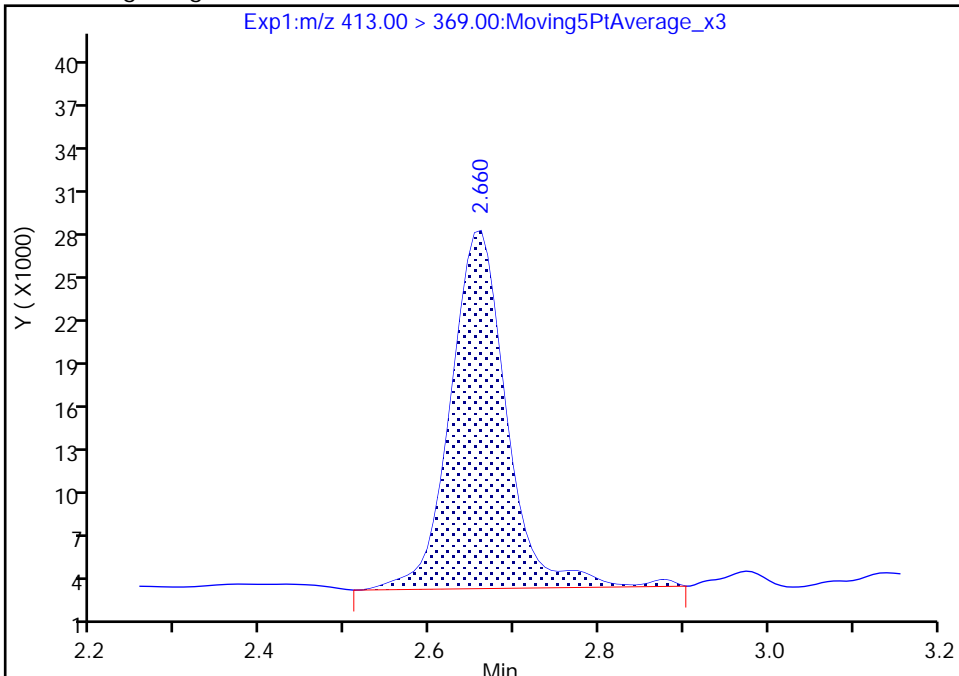
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_003.d
Injection Date: 29-Jun-2018 21:36:56 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

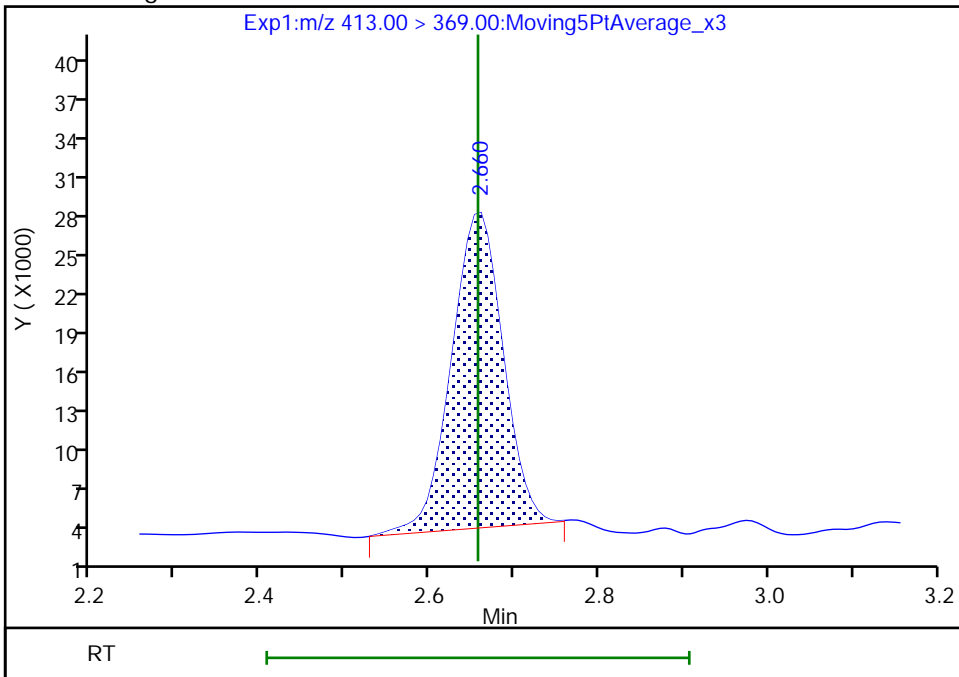
RT: 2.66
Area: 114144
Amount: 0.055738
Amount Units: ng/ml

Processing Integration Results



RT: 2.66
Area: 102335
Amount: 0.050808
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:15:22
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 622 of 864

TestAmerica Sacramento

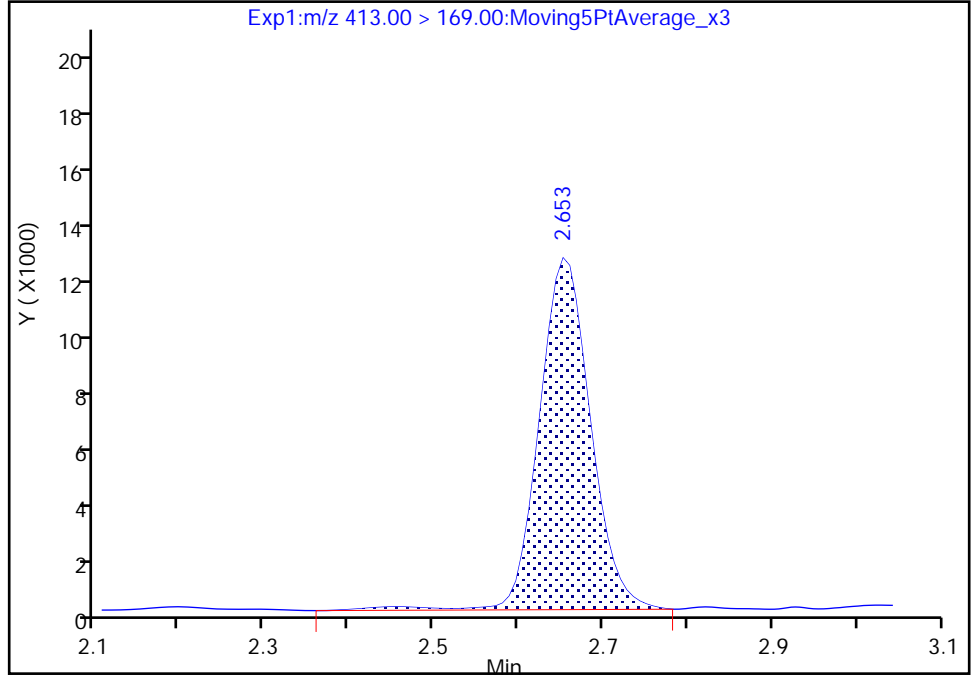
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_003.d
Injection Date: 29-Jun-2018 21:36:56 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

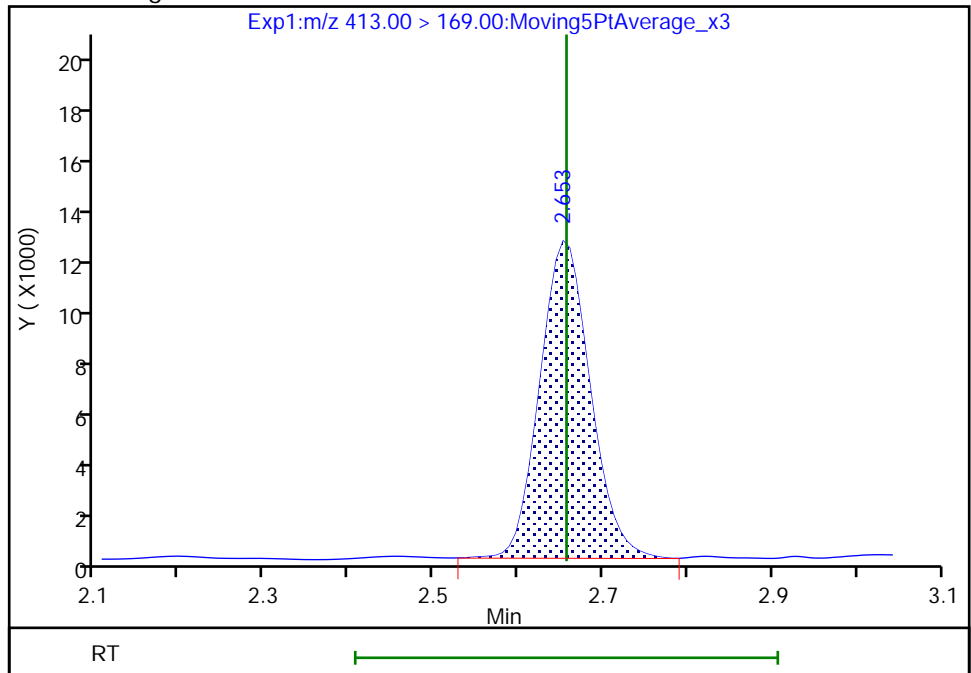
RT: 2.65
Area: 52283
Amount: 0.055738
Amount Units: ng/ml

Processing Integration Results



RT: 2.65
Area: 51342
Amount: 0.050808
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:15:34

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_004.d
 Lims ID: IC L3 Full
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 29-Jun-2018 21:44:45 ALS Bottle#: 12 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L3-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:52:49 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:17:58

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	1.423	1.428	-0.005	0.537	6262374	2.42	97.0	22819	M
2 Perfluorobutyric acid	212.90 > 169.00	1.428	1.430	-0.002	1.004	610361	0.2395	95.8	293	M
D 3 13C5-PFPeA	267.90 > 223.00	1.699	1.705	-0.006	0.641	4406926	2.43	97.2	49183	
4 Perfluoropentanoic acid	262.90 > 219.00	1.699	1.706	-0.007	1.000	512335	0.2448	97.9	353	
D 47 13C3-PFBS	301.90 > 83.00	1.735	1.741	-0.006	0.654	91006	2.28	97.9	1072	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.744	1.745	-0.001	1.005	650349	0.2153	97.4	2505	
	298.90 > 99.00	1.744	1.745	-0.001	1.005	280950	2.31(1.25-3.74)	97.4	3436	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.945	1.948	-0.003	1.121	175795	0.2278	97.6	8073	
D 60 M2-4:2FTS	329.00 > 81.00	1.945	1.948	-0.003	0.734	684729	NC		13647	
6 Perfluorohexanoic acid	313.00 > 269.00	1.978	1.984	-0.006	1.000	475916	0.2416	96.7	1558	
	313.00 > 119.00	1.978	1.984	-0.006	1.000	45242	10.52(5.03-15.10)	96.7	877	
D 7 13C2 PFHxA	315.00 > 270.00	1.978	1.984	-0.006	0.746	4760163	2.40	95.9	65204	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.000	2.004	-0.004	1.153	636482	0.2351	100	12583	
	349.00 > 99.00	2.000	2.004	-0.004	1.153	238200	2.67(1.36-4.07)	100	4673	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.079	2.080	-0.001	0.784	236443	NC		3902	

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	2.079	2.082	-0.003	1.000	76449	NC	508	
D 9 13C4-PFHpA	367.00	> 322.00	2.303	2.302	0.001	0.869	4550423	2.47	99.0	47751
10 Perfluoroheptanoic acid	363.00	> 319.00	2.303	2.304	-0.001	1.000	479453	0.2375	95.0	842
	363.00	> 169.00	2.303	2.304	-0.001	1.000	177813	2.70(1.13-3.40)	95.0	1643
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.316	2.314	0.002	1.000	514149	0.2029	89.2	4350
	399.00	> 99.00	2.316	2.314	0.002	1.000	182348	2.82(1.50-4.49)	89.2	1727
D 11 18O2 PFHxS	403.00	> 84.00	2.316	2.317	-0.001	0.874	5171616	2.41	102	45943
65 Adona	377.00	> 251.00	2.342	2.345	-0.003	0.776	1341342	NC	20940	
	377.00	> 85.00	2.342	2.345	-0.003	0.776	817498	1.64(0.84-2.53)	15572	
D 12 M2-6:2FTS	429.00	> 81.00	2.627	2.627	0.0	0.991	1040599	2.34	98.3	17654
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.627	2.629	-0.002	1.000	166253	0.2361	99.6	955
D 14 13C4 PFOA	417.00	> 372.00	2.651	2.653	-0.002	1.000	4301713	2.44	97.5	41062
* 62 13C2-PFOA	415.00	> 370.00	2.651	2.655	-0.004		4621834	2.50	44241	
15 Perfluorooctanoic acid	413.00	> 369.00	2.658	2.657	0.001	1.003	481654	0.2381	95.2	178
	413.00	> 169.00	2.658	2.657	0.001	1.003	246244	1.96(0.84-2.52)	95.2	1703
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.666	2.663	0.003	0.883	467426	0.2397	101	9338
	449.00	> 99.00	2.658	2.663	-0.005	0.880	122542	3.81(1.94-5.82)	101	3310
D 18 13C4 PFOS	503.00	> 80.00	3.019	3.017	0.002	1.139	3428587	2.38	99.6	36123
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.019	3.018	0.001	1.000	372592	0.2234	96.3	3377
	499.00	> 99.00	3.019	3.018	0.001	1.000	80311	4.64(2.31-6.93)	96.3	1530
20 Perfluorononanoic acid	463.00	> 419.00	3.019	3.018	0.001	1.000	378656	0.2389	95.6	787
	463.00	> 169.00	3.019	3.018	0.001	1.000	90585	4.18(1.90-5.69)	95.6	3811
D 19 13C5 PFNA	468.00	> 423.00	3.019	3.018	0.001	1.139	3565828	2.44	97.6	37844
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.234	3.229	0.005	1.071	612649	NC	12910	
D 21 13C8 FOSA	506.00	> 78.00	3.361	3.358	0.003	1.268	4572335	2.42	96.7	30964
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.361	3.360	0.001	1.113	270116	0.2338	97.4	6308
	549.00	> 99.00	3.361	3.360	0.001	1.113	98024	2.76(1.33-3.97)	97.4	3783
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.361	3.361	0.0	1.000	460857	0.2513	101	10636

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	3.361	3.362	-0.001	1.268	1203743	2.48		104	19504	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.371	3.364	0.007	1.003	157827	0.2332		97.4	7175	
D 23 13C2 PFDA										
515.00 > 470.00	3.380	3.374	0.006	1.275	2939262	2.46		98.6	44093	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.380	3.376	0.004	1.000	313067	0.2509		100	2342	
513.00 > 169.00	3.380	3.376	0.004	1.000	49727		6.30(2.36-7.09)	100	1589	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.529	3.527	0.002	1.331	1768886	2.47		98.9	32891	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.529	3.529	0.0	1.000	166284	0.2460		98.4	1257	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.688	3.683	0.005	1.221	236582	0.2396		99.4	6241	
599.00 > 99.00	3.688	3.683	0.005	1.221	80249		2.95(1.39-4.16)	99.4	2867	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.698	3.694	0.004	1.395	1776279	2.51		100	14551	
D 30 13C2 PFUnA										
565.00 > 520.00	3.698	3.698	0.0	1.395	2340674	2.39		95.5	34522	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.698	3.698	0.0	1.000	208512	0.2469		98.7	1076	
563.00 > 169.00	3.698	3.698	0.0	1.000	49056		4.25(2.12-6.36)	98.7	1724	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.698	3.700	-0.002	1.000	159315	0.2509		100	2993	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.855	3.858	-0.003	1.277	1024495	NC			21479	
D 36 13C2 PFDaA										
615.00 > 570.00	3.989	3.992	-0.003	1.505	2866693	2.52		101	16321	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.989	3.992	-0.003	1.000	317910	0.2561		102	392	
613.00 > 169.00	3.989	3.992	-0.003	1.000	72707		4.37(2.13-6.40)	102	1516	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.252	4.255	-0.003	1.066	311842	0.2322		92.9	308	
663.00 > 169.00	4.252	4.255	-0.003	1.066	96518		3.23(1.25-3.76)	92.9	1760	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.490	4.490	0.0	1.694	3420305	2.41		96.5	15303	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.490	4.490	0.0	1.000	83650	0.2445		97.8	1746	
713.00 > 219.00	4.490	4.490	0.0	1.000	60134		1.39(0.71-2.13)	97.8	1777	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.899	-0.003	1.847	6419892	2.42		96.7	15860	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.904	4.900	0.004	1.002	672010	NC			321	
813.00 > 169.00	4.904	4.900	0.004	1.002	110506		6.08(2.86-8.58)		2031	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.247	5.251	-0.004	1.072	659572	NC			207	
913.00 > 169.00	5.247	5.251	-0.004	1.072	77667		8.49(3.83-11.48)		1486	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL3_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_004.d

Injection Date: 29-Jun-2018 21:44:45

Instrument ID: A8_N

Lims ID: IC L3 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 12

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

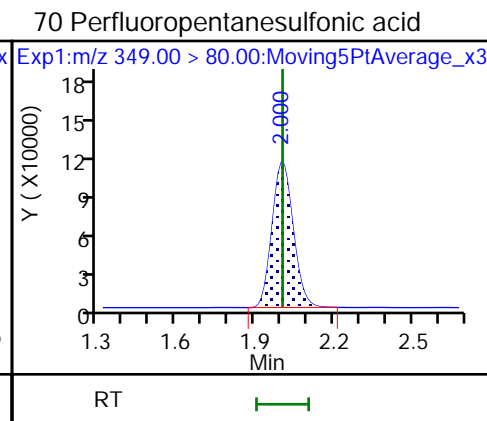
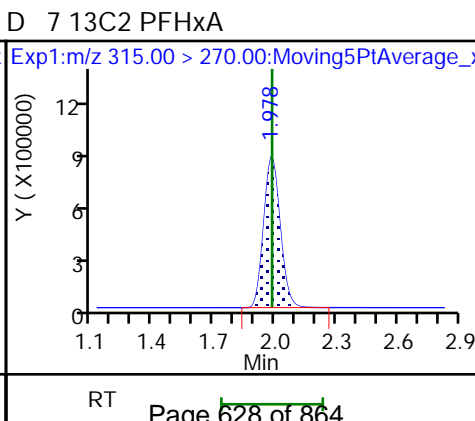
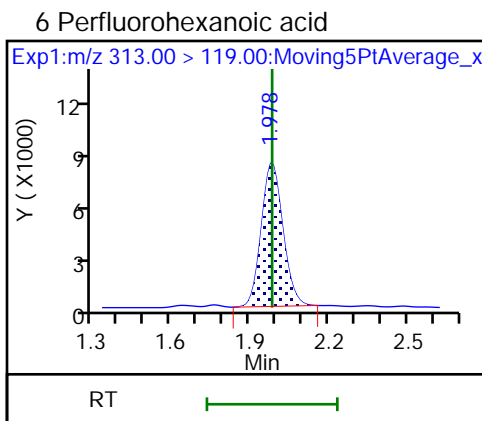
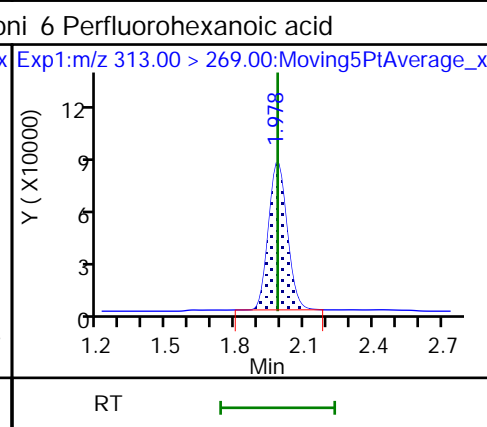
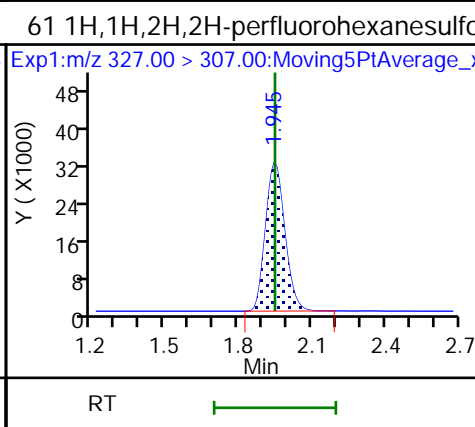
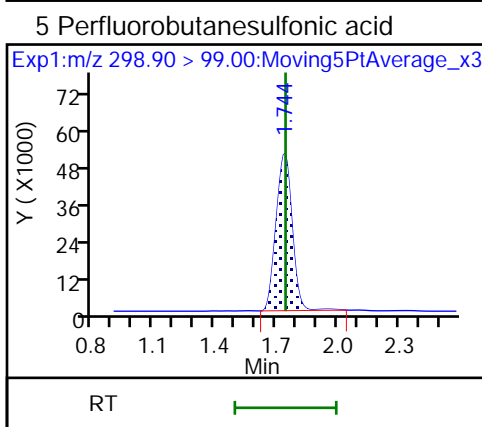
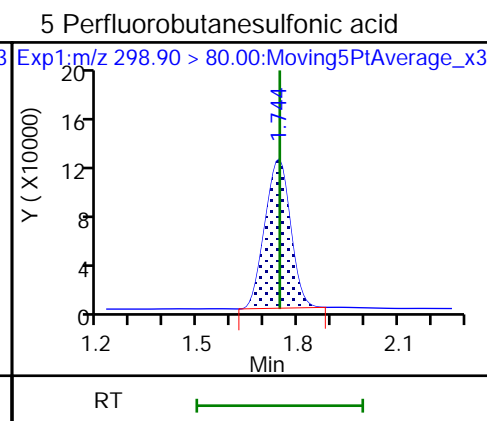
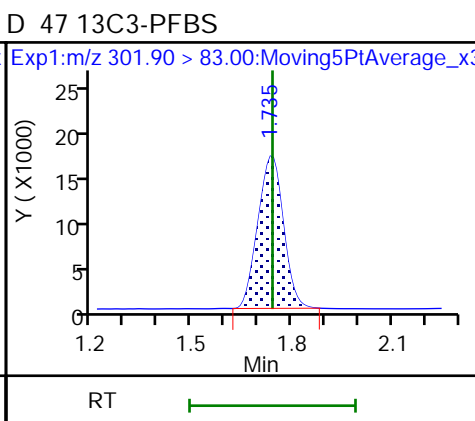
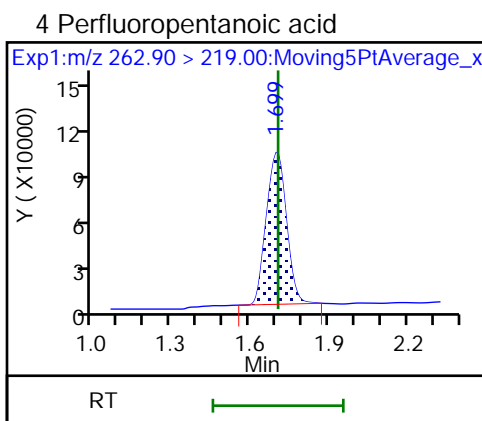
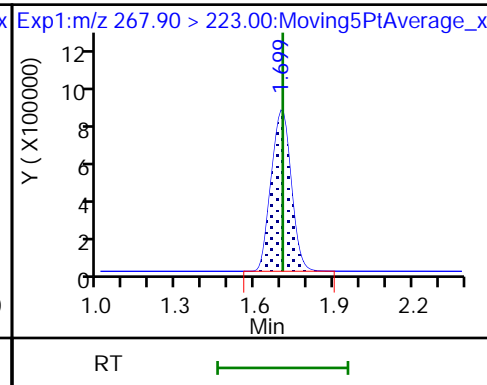
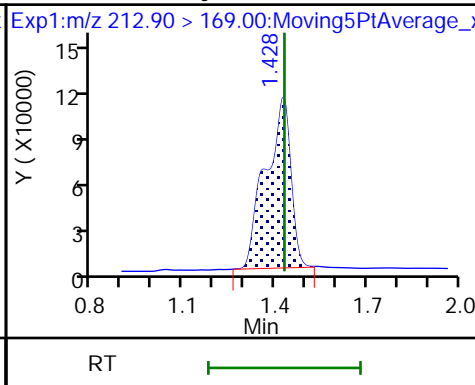
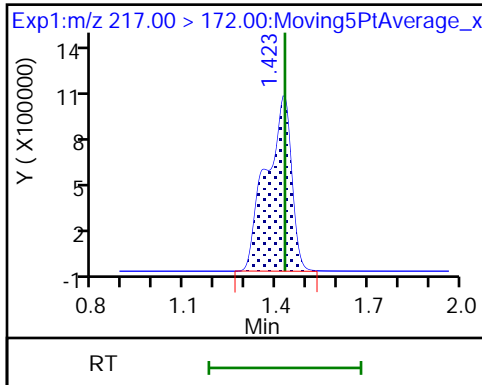
Method: A8_N

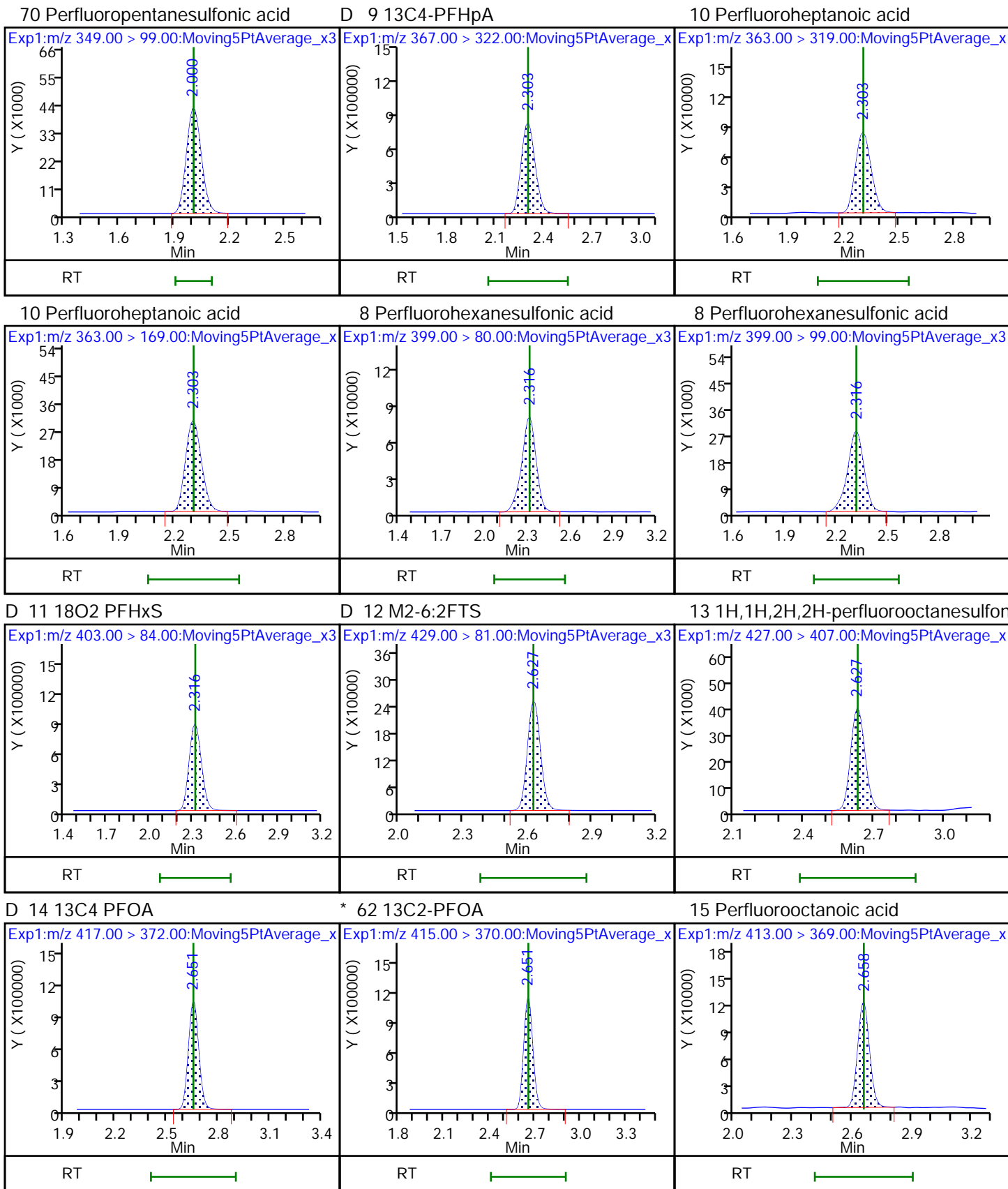
Limit Group: LC PFC_QSM5-1 ICAL

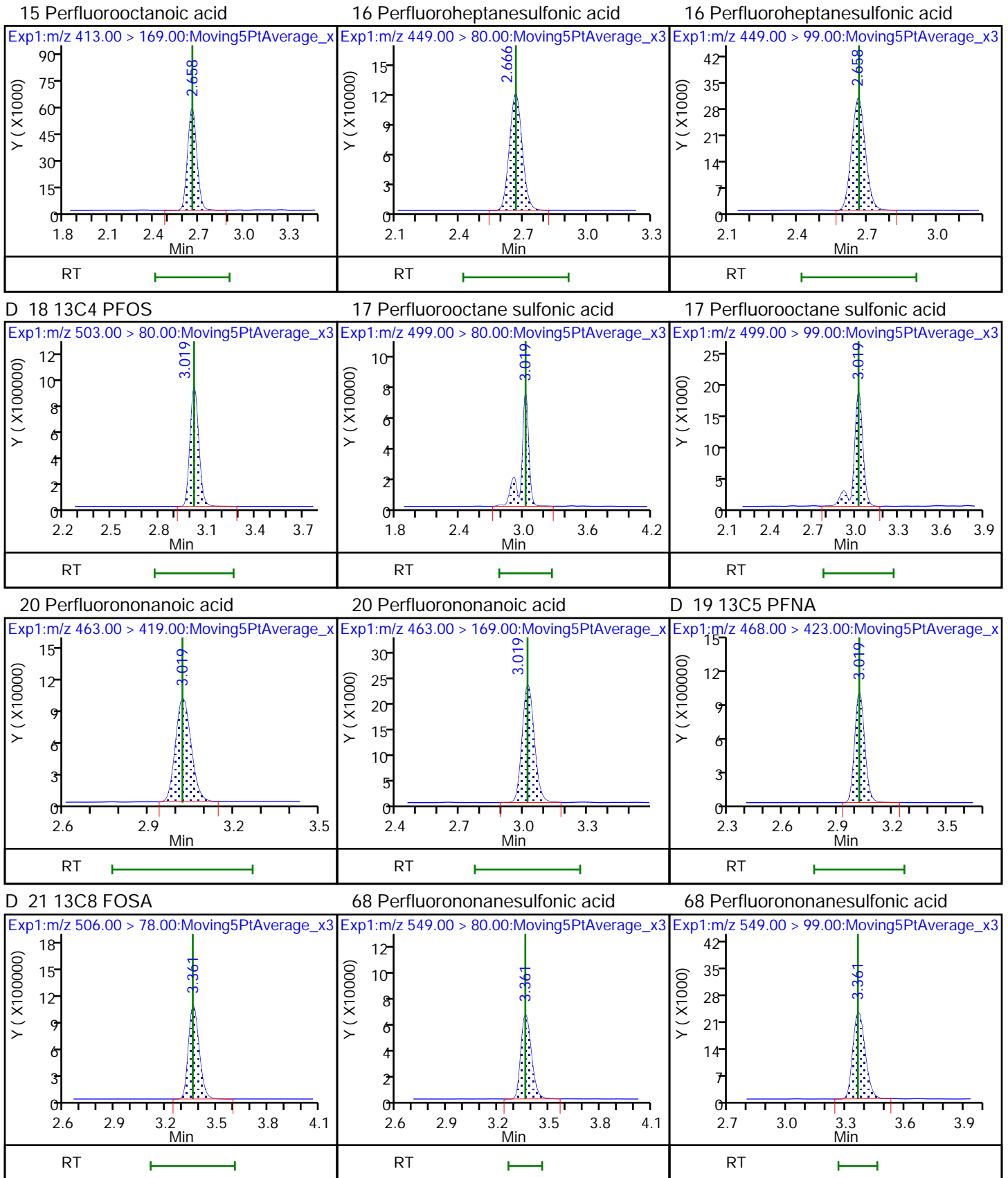
D 1 13C4 PFBA (M)

2 Perfluorobutyric acid (M)

D 3 13C5-PFPeA



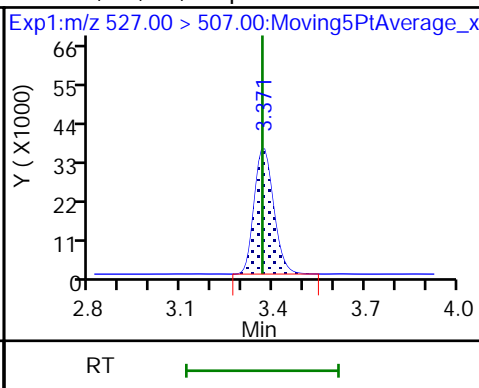
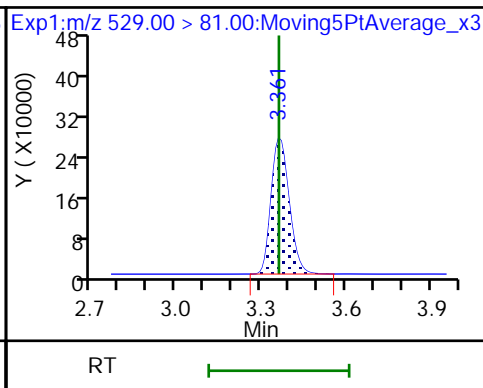
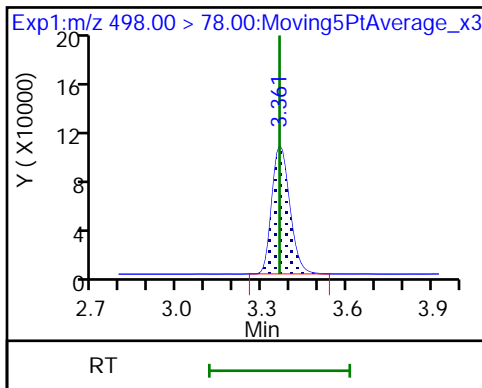




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

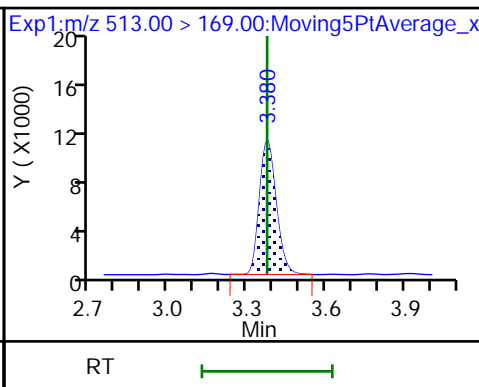
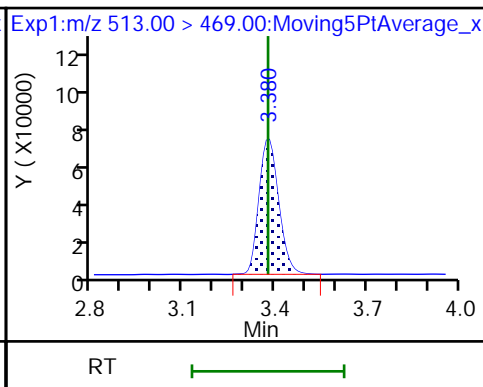
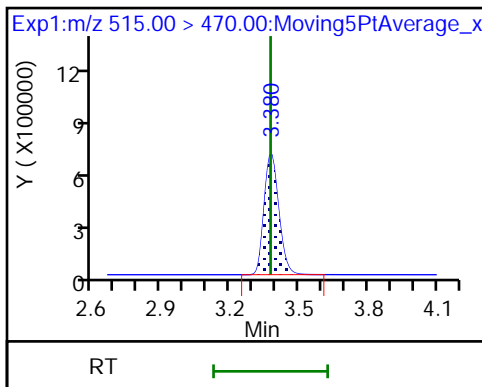
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid

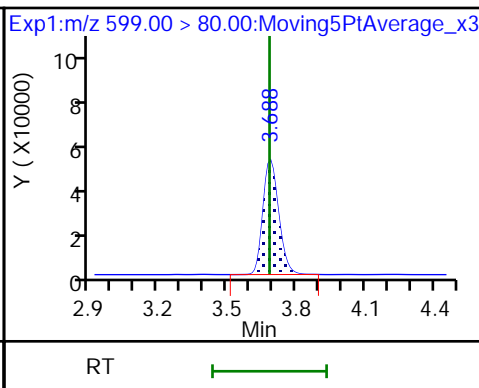
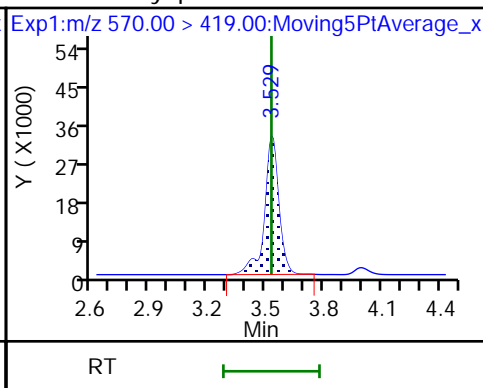
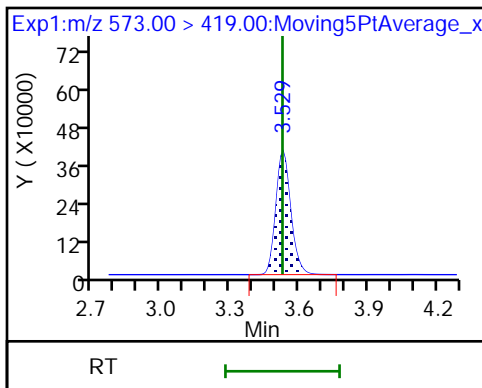
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

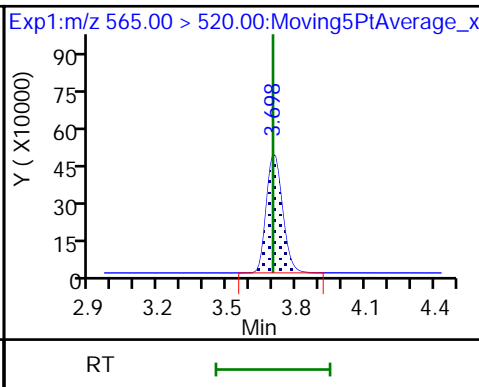
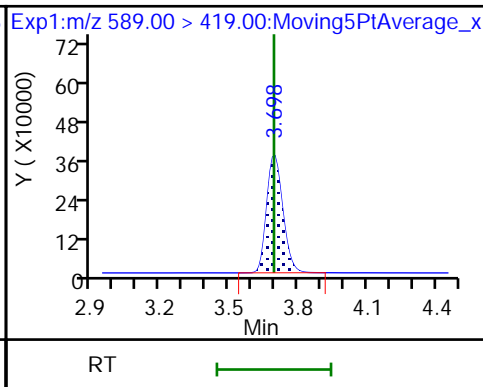
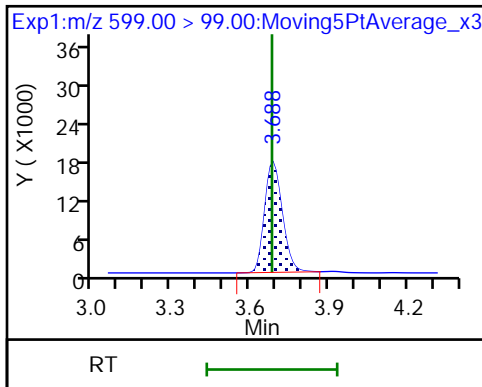
29 Perfluorodecane Sulfonic acid

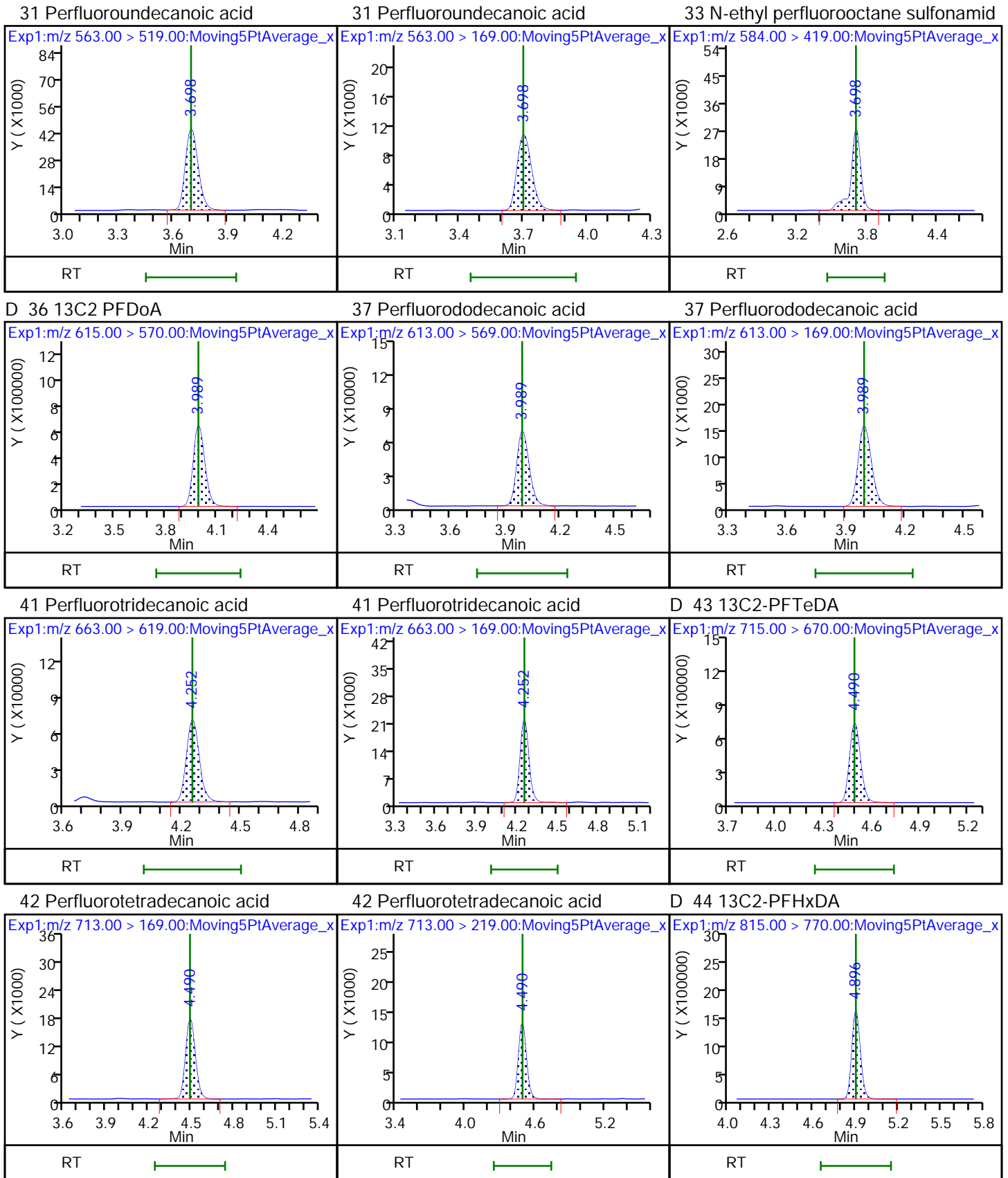


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





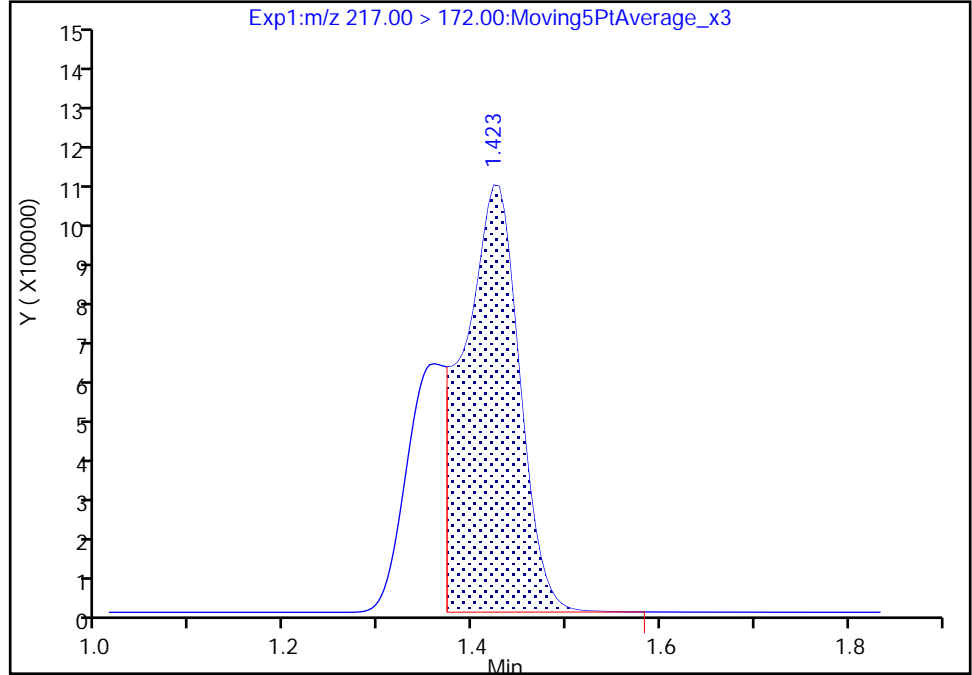
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_004.d
Injection Date: 29-Jun-2018 21:44:45 Instrument ID: A8_N
Lims ID: IC L3 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

D 1 13C4 PFBA, CAS: STL00992
Signal: 1

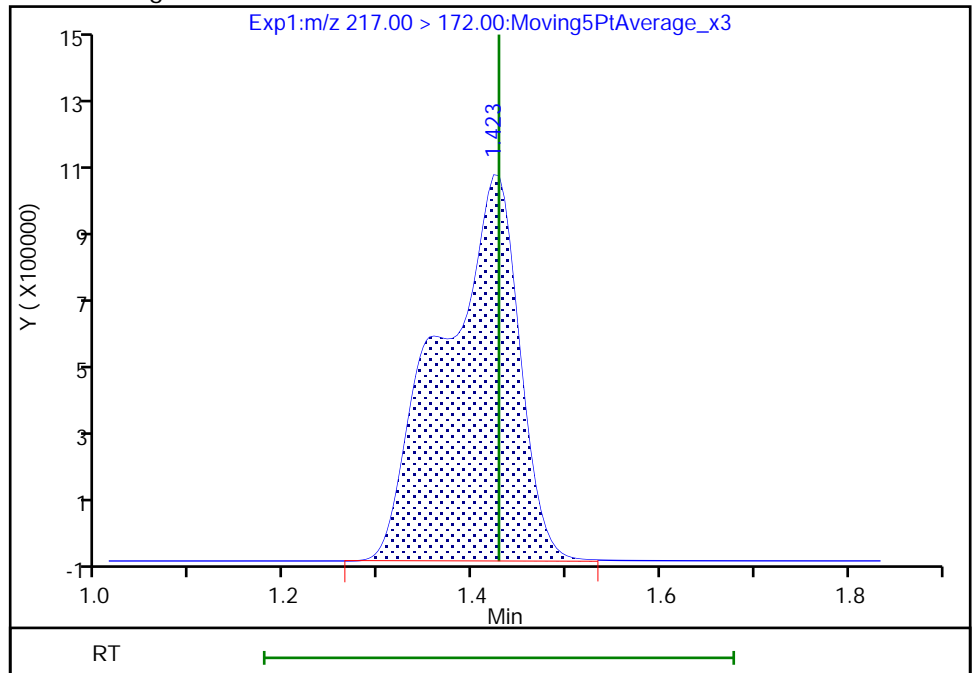
RT: 1.42
Area: 4453378
Amount: 1.796335
Amount Units: ng/ml

Processing Integration Results



RT: 1.42
Area: 6262374
Amount: 2.424911
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:17:04
Audit Action: Manually Integrated

Audit Reason: Incomplete Integration
Page 634 of 864

TestAmerica Sacramento

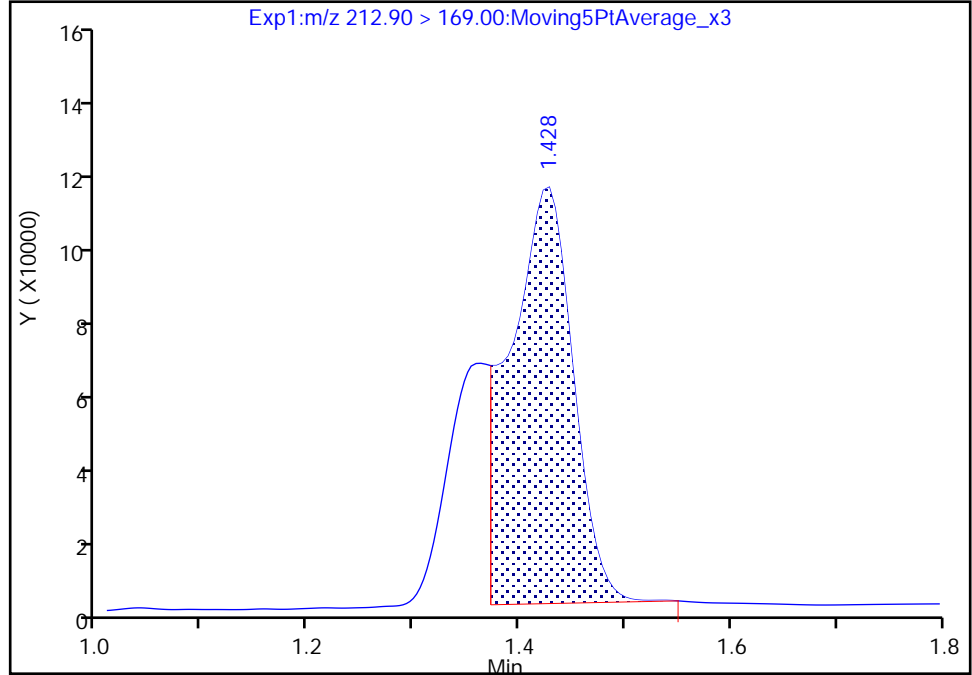
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_004.d
Injection Date: 29-Jun-2018 21:44:45 Instrument ID: A8_N
Lims ID: IC L3 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

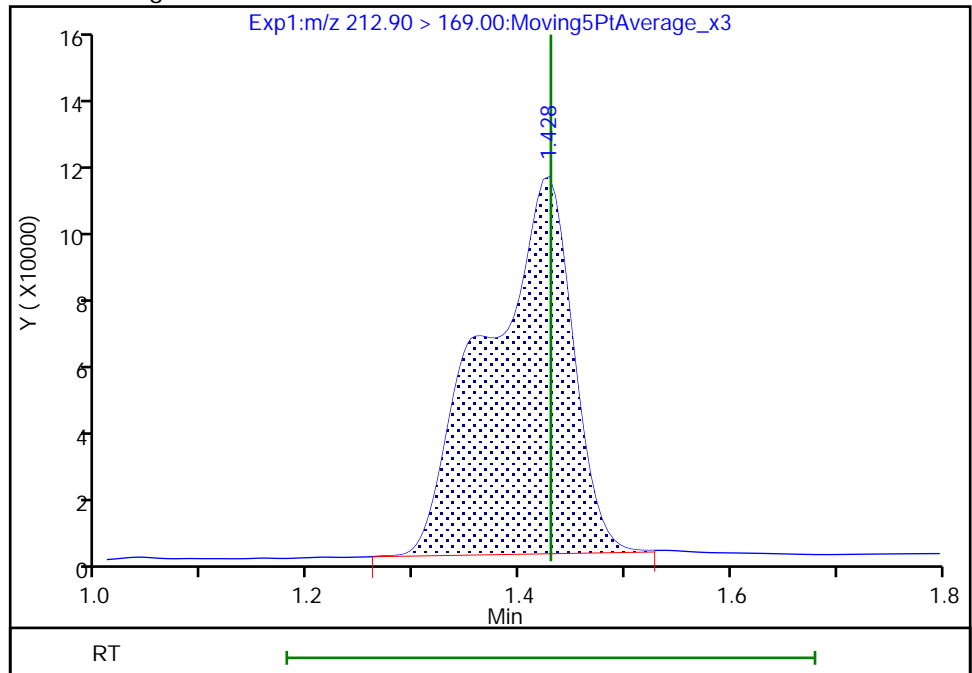
RT: 1.43
Area: 438890
Amount: 0.179097
Amount Units: ng/ml

Processing Integration Results



RT: 1.43
Area: 610361
Amount: 0.239493
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:17:25
Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_005.d
 Lims ID: IC L4 Full
 Client ID:
 Sample Type: ICIS Calib Level: 4
 Inject. Date: 29-Jun-2018 21:52:35 ALS Bottle#: 13 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L4-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:52:53 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:18:39

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	1.430	1.428	0.002	0.538	5780456	2.48	99.3	31823	
2 Perfluorobutyric acid	212.90 > 169.00	1.430	1.430	0.0	1.000	2252577	0.9576	95.8	1165	
D 3 13C5-PFPeA	267.90 > 223.00	1.710	1.705	0.005	0.643	4063195	2.48	99.4	46948	
4 Perfluoropentanoic acid	262.90 > 219.00	1.710	1.706	0.004	1.000	1929658	1.00	100	1302	
D 47 13C3-PFBS	301.90 > 83.00	1.746	1.741	0.005	0.657	84775	2.35	101	771	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.746	1.745	0.001	1.000	2478950	0.8811	99.7	11433	
	298.90 > 99.00	1.746	1.745	0.001	1.000	1039921	2.38(1.25-3.74)	99.7	8634	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.948	1.948	0.0	1.115	635002	0.8833	94.6	38090	
D 60 M2-4:2FTS	329.00 > 81.00	1.948	1.948	0.0	0.733	612236	NC		8409	
6 Perfluorohexanoic acid	313.00 > 269.00	1.991	1.984	0.007	1.000	1856655	1.00	100	5107	
	313.00 > 119.00	1.991	1.984	0.007	1.000	176803	10.50(5.03-15.10)	100	3908	
D 7 13C2 PFHxA	315.00 > 270.00	1.991	1.984	0.007	0.749	4471278	2.50	99.9	78430	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.002	2.004	-0.002	1.147	2359989	0.9357	99.8	33850	
	349.00 > 99.00	2.002	2.004	-0.002	1.147	883898	2.67(1.36-4.07)	99.8	15279	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.081	2.080	0.001	0.783	206597	NC		5246	

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	2.081	2.082	-0.001	1.000	293630	NC		2045
D 9 13C4-PFHpA	367.00	> 322.00	2.305	2.302	0.003	0.867	4063826	2.45	98.0	33865
10 Perfluoroheptanoic acid	363.00	> 319.00	2.305	2.304	0.001	1.000	1808556	1.00	100	3314
	363.00	> 169.00	2.305	2.304	0.001	1.000	705474	2.56(1.13-3.40)	100	6152
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.319	2.314	0.005	1.000	1894329	0.8347	91.7	11702
	399.00	> 99.00	2.319	2.314	0.005	1.000	642174	2.95(1.50-4.49)	91.7	4364
D 11 18O2 PFHxS	403.00	> 84.00	2.319	2.317	0.002	0.872	4632149	2.39	101	36517
65 Adona	377.00	> 251.00	2.345	2.345	0.0	0.777	5312499	NC		45502
	377.00	> 85.00	2.345	2.345	0.0	0.777	3105724	1.71(0.84-2.53)		35536
D 12 M2-6:2FTS	429.00	> 81.00	2.627	2.627	0.0	0.988	959459	2.39	101	18608
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.635	2.629	0.006	1.003	611856	0.9424	99.4	2947
D 14 13C4 PFOA	417.00	> 372.00	2.659	2.653	0.006	1.000	3964131	2.49	99.6	31493
* 62 13C2-PFOA	415.00	> 370.00	2.659	2.655	0.004		4168201	2.50		35315
15 Perfluorooctanoic acid	413.00	> 369.00	2.659	2.657	0.002	1.000	1851409	0.99	99.2	728
	413.00	> 169.00	2.659	2.657	0.002	1.000	940228	1.97(0.84-2.52)	99.2	5730
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.667	2.663	0.003	0.884	1735998	0.9675	102	19651
	449.00	> 99.00	2.667	2.663	0.003	0.884	459811	3.78(1.94-5.82)	102	10954
D 18 13C4 PFOS	503.00	> 80.00	3.016	3.017	-0.001	1.134	3155396	2.43	102	26550
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.023	3.018	0.005	1.002	1376214	0.8964	96.6	12138
	499.00	> 99.00	3.023	3.018	0.005	1.002	296086	4.65(2.31-6.93)	96.6	6008
20 Perfluorononanoic acid	463.00	> 419.00	3.023	3.018	0.005	1.000	1387831	0.9407	94.1	3575
	463.00	> 169.00	3.023	3.018	0.005	1.000	333970	4.16(1.90-5.69)	94.1	12251
D 19 13C5 PFNA	468.00	> 423.00	3.023	3.018	0.005	1.137	3318974	2.52	101	40915
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.231	3.229	0.002	1.071	2407964	NC		30755
D 21 13C8 FOSA	506.00	> 78.00	3.359	3.358	0.001	1.263	4227113	2.48	99.1	35551
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.368	3.360	0.008	1.117	1003682	0.9441	98.3	17740
	549.00	> 99.00	3.368	3.360	0.008	1.117	363132	2.76(1.33-3.97)	98.3	10366
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.368	3.361	0.007	1.003	1729076	1.02	102	26198

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	3.368	3.362	0.006	1.267	990382	2.27		94.6	15927	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.368	3.364	0.004	1.000	556151	1.00		104	13998	
D 23 13C2 PFDA										
515.00 > 470.00	3.378	3.374	0.004	1.270	2791311	2.59		104	31837	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.378	3.376	0.002	1.000	1109123	0.9361		93.6	4998	
513.00 > 169.00	3.378	3.376	0.002	1.000	190357		5.83(2.36-7.09)	93.6	7223	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.527	3.527	0.0	1.327	1652411	2.56		102	27958	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.536	3.529	0.007	1.003	608345	0.9635		96.4	4645	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.685	3.683	0.002	1.222	882815	0.9715		101	22965	
599.00 > 99.00	3.685	3.683	0.002	1.222	282558		3.12(1.39-4.16)	101	10010	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.696	3.694	0.002	1.390	1662467	2.61		104	9851	
D 30 13C2 PFUnA										
565.00 > 520.00	3.707	3.698	0.009	1.394	2329895	2.64		105	28514	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.707	3.698	0.009	1.000	739739	0.8799		88.0	3872	
563.00 > 169.00	3.707	3.698	0.009	1.000	182743		4.05(2.12-6.36)	88.0	7557	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.707	3.700	0.007	1.003	555505	0.9347		93.5	13402	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.864	3.858	0.006	1.281	3677381	NC			45351	
D 36 13C2 PFDaA										
615.00 > 570.00	3.997	3.992	0.005	1.503	2605043	2.54		102	21258	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.997	3.992	0.005	1.000	1140263	1.01		101	1532	
613.00 > 169.00	3.997	3.992	0.005	1.000	263927		4.32(2.13-6.40)	101	4624	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.260	4.255	0.005	1.066	1152386	0.9442		94.4	1113	
663.00 > 169.00	4.260	4.255	0.005	1.066	340399		3.39(1.25-3.76)	94.4	5325	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.490	4.490	0.0	1.689	3227344	2.53		101	12645	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.490	4.490	0.0	1.000	317057	0.9820		98.2	6637	
713.00 > 219.00	4.490	4.490	0.0	1.000	222373		1.43(0.71-2.13)	98.2	6649	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.904	4.899	0.005	1.844	6043418	2.52		101	13439	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.904	4.900	0.004	1.000	2336955	NC			1139	
813.00 > 169.00	4.904	4.900	0.004	1.000	375984		6.22(2.86-8.58)		5356	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.255	5.251	0.004	1.071	2712647	NC			881	
913.00 > 169.00	5.255	5.251	0.004	1.071	314366		8.63(3.83-11.48)		3982	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL4_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_005.d

Injection Date: 29-Jun-2018 21:52:35

Instrument ID: A8_N

Lims ID: IC L4 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 13

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

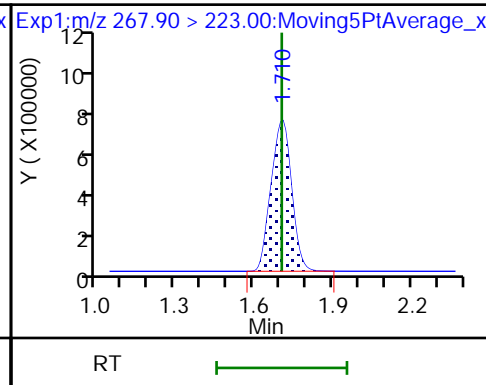
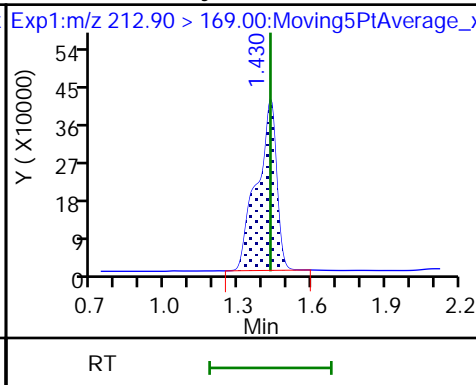
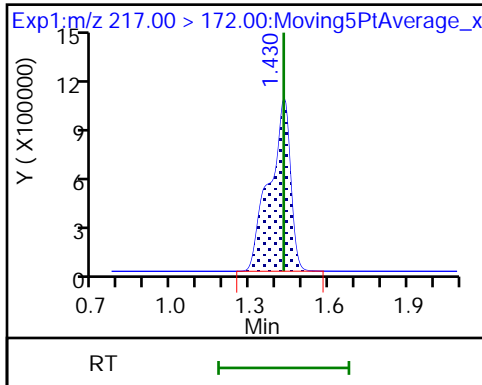
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

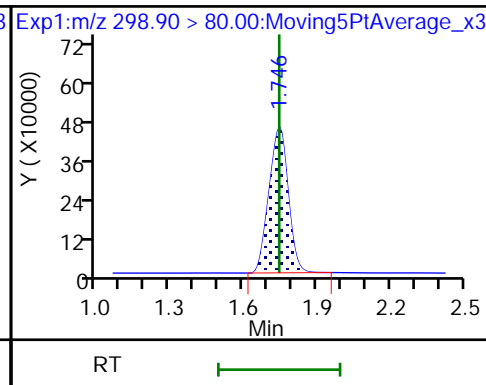
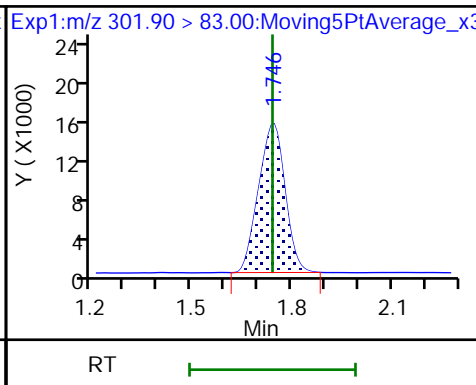
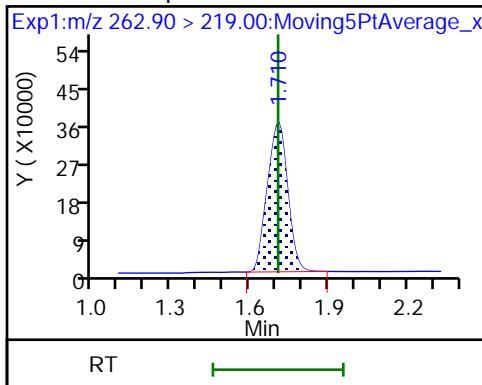
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

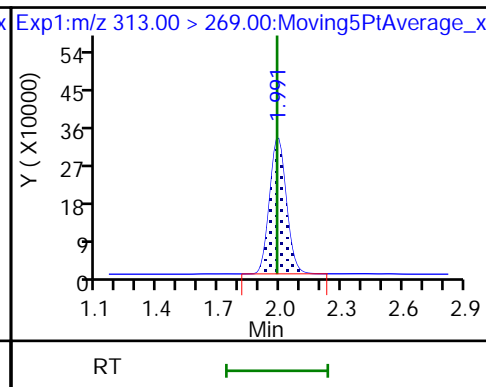
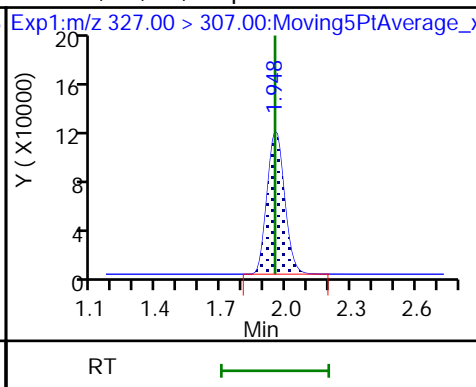
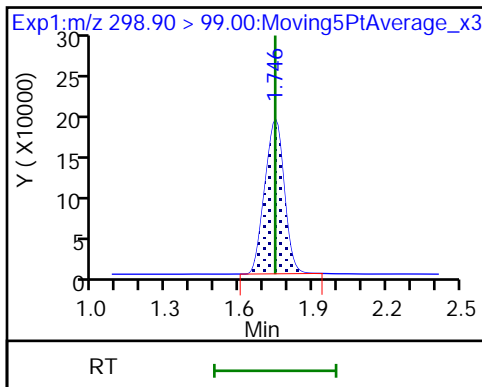
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfoni

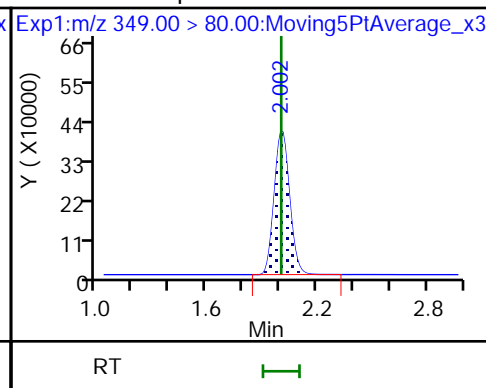
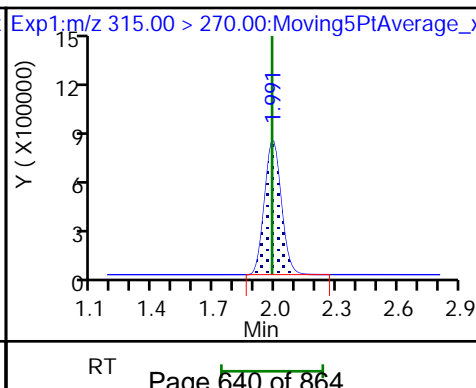
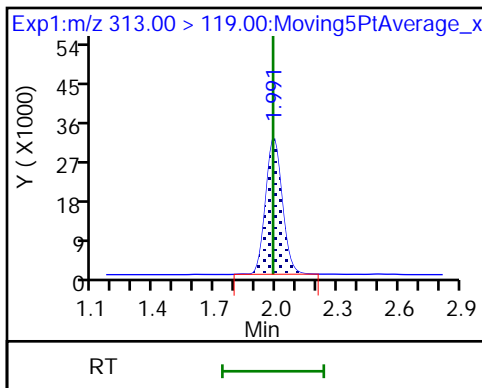
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

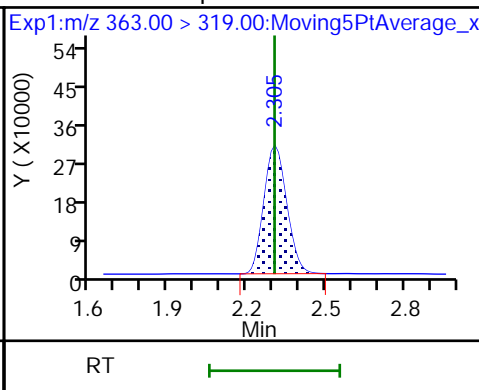
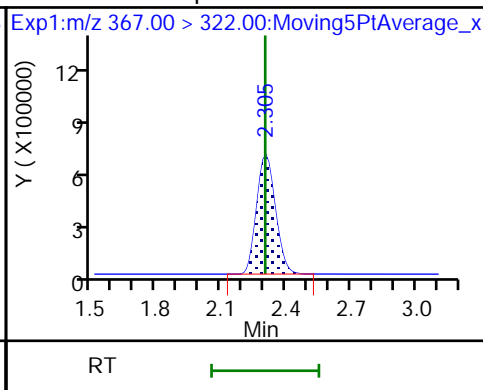
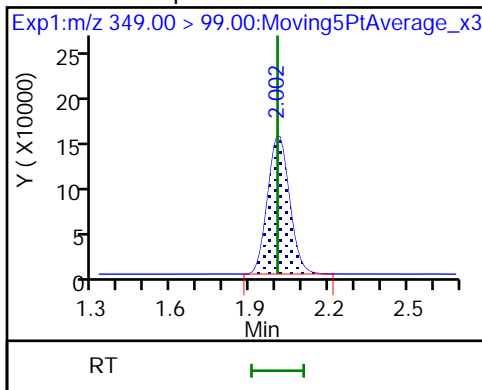
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

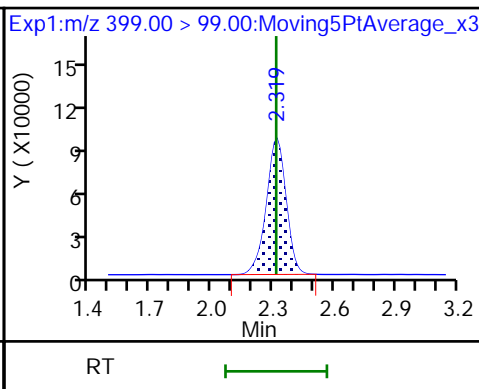
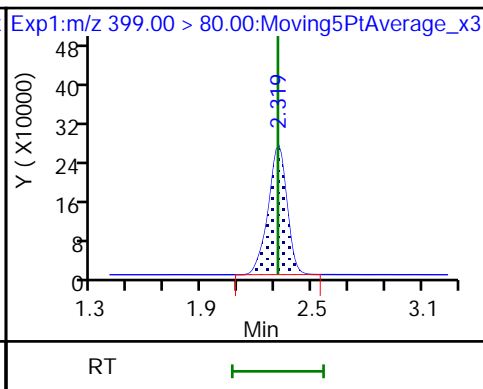
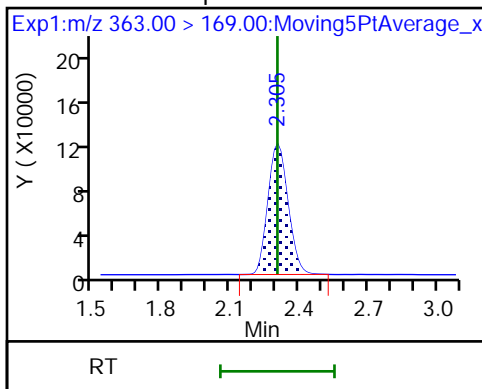
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

8 Perfluorohexanesulfonic acid

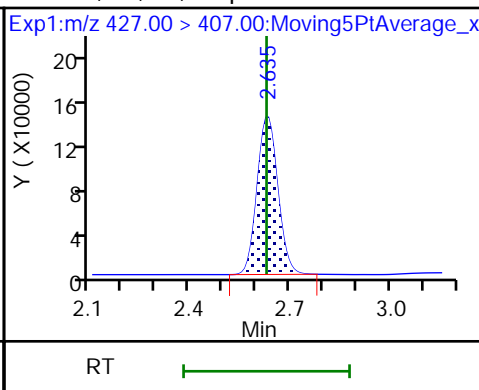
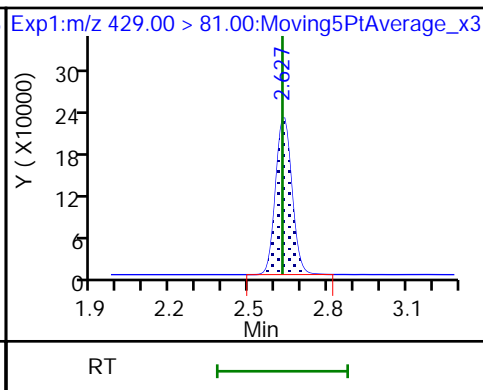
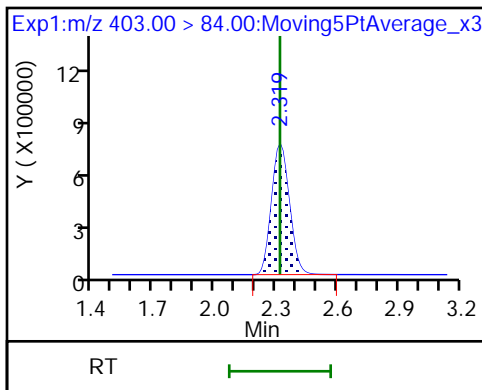
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

D 12 M2-6:2FTS

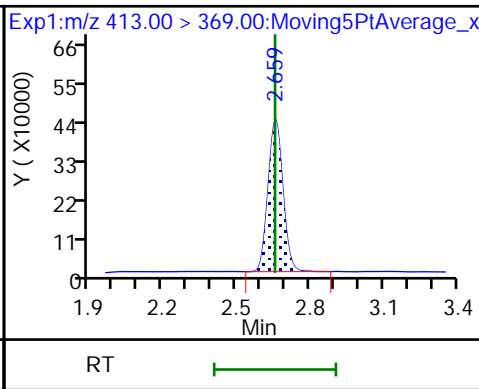
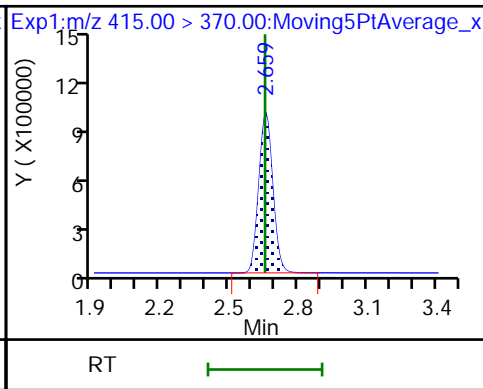
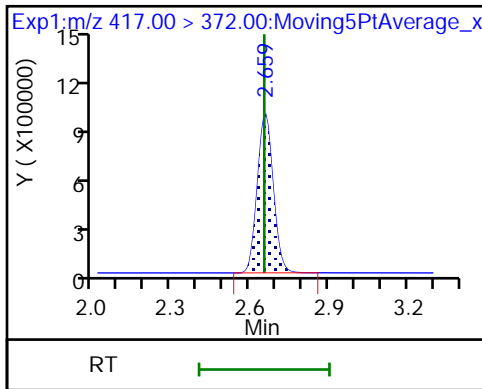
13 1H,1H,2H,2H-perfluorooctanesulfoni

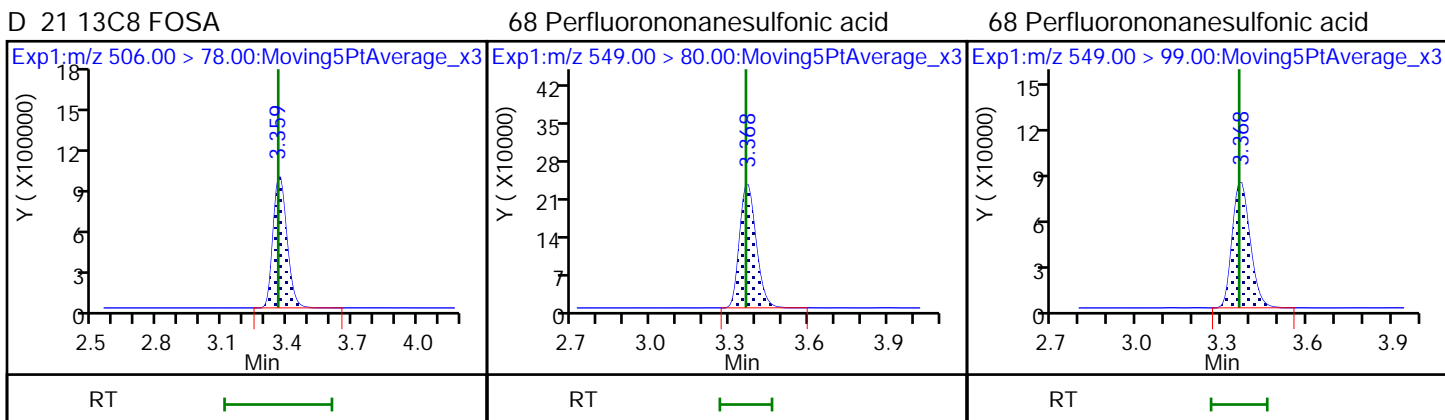
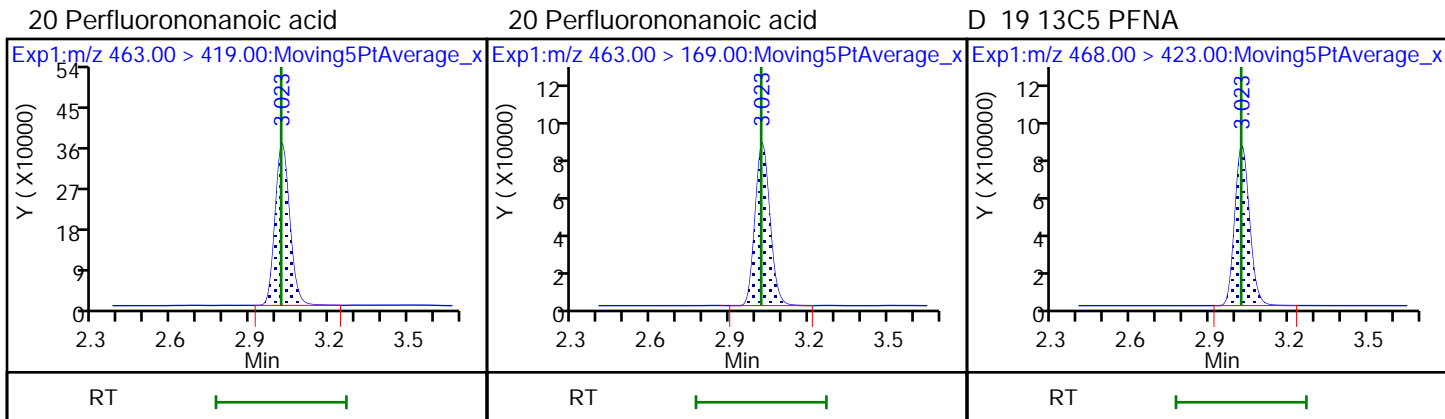
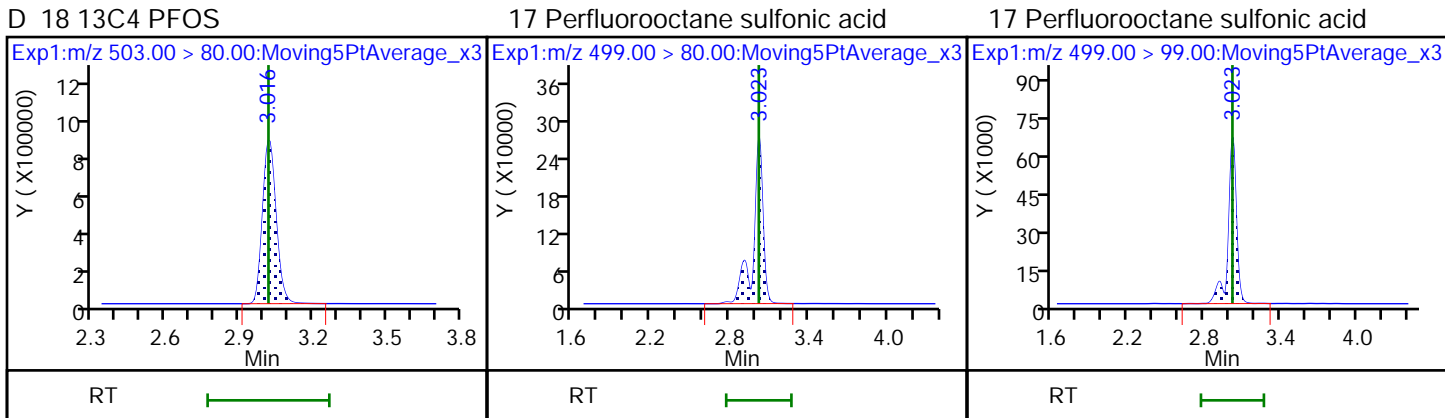
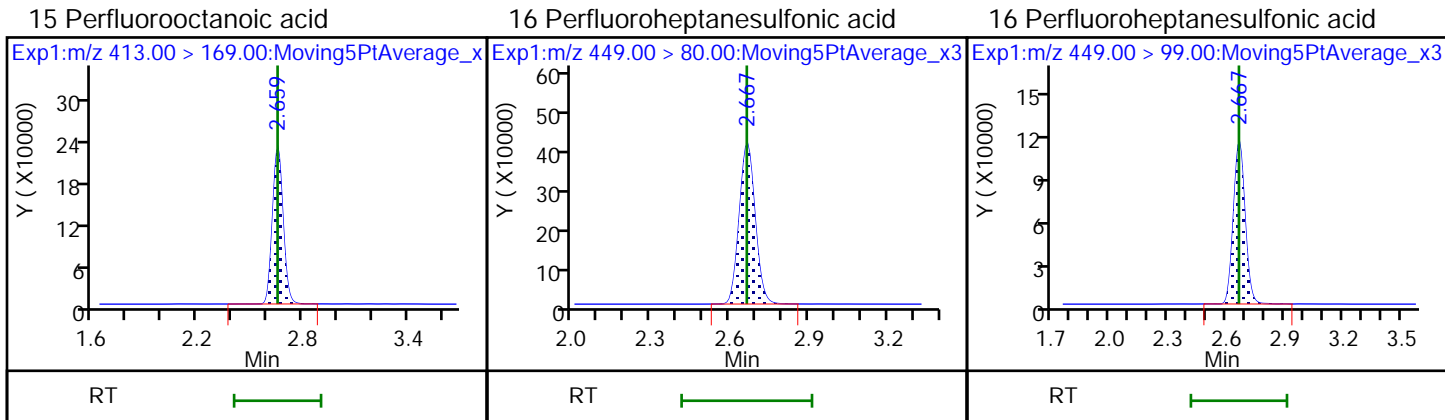


D 14 13C4 PFOA

* 62 13C2-PFOA

15 Perfluorooctanoic acid

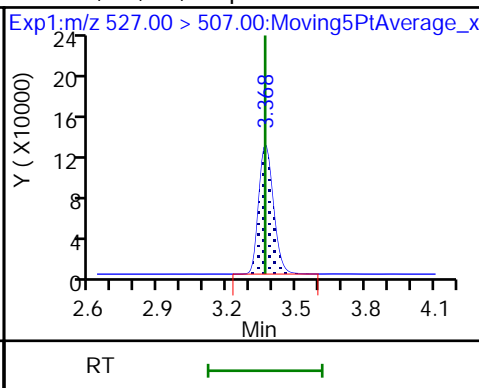
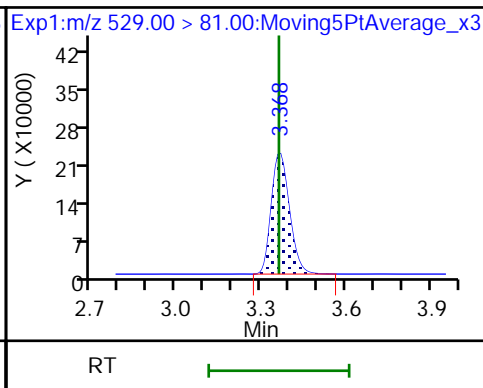
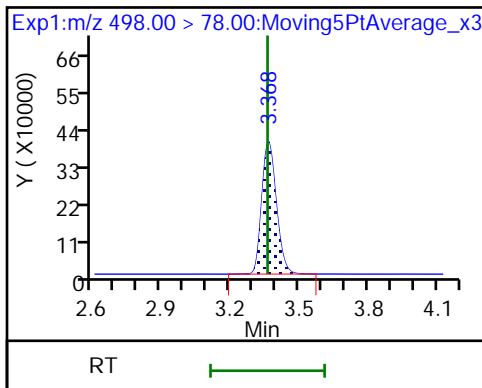




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

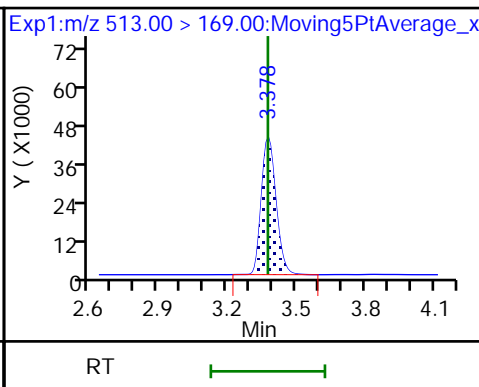
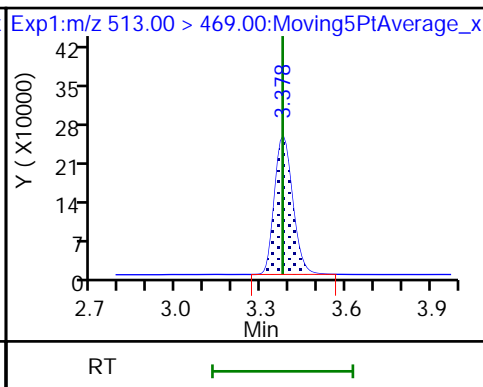
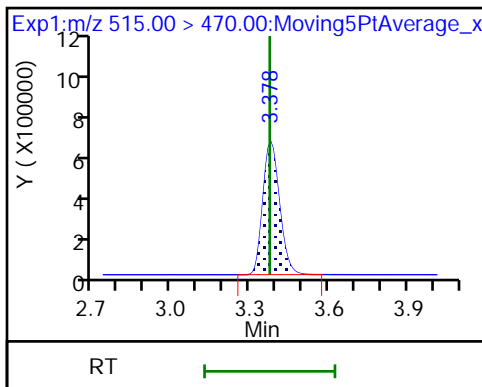
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid

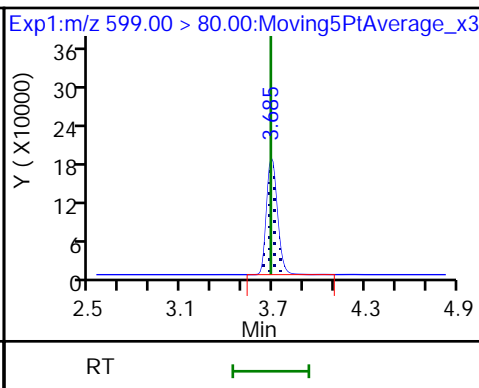
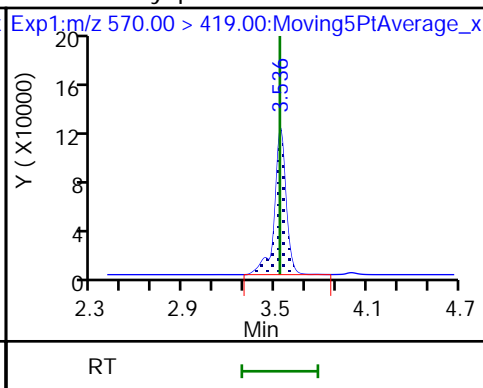
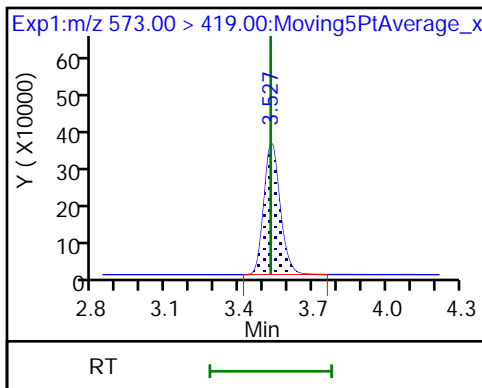
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

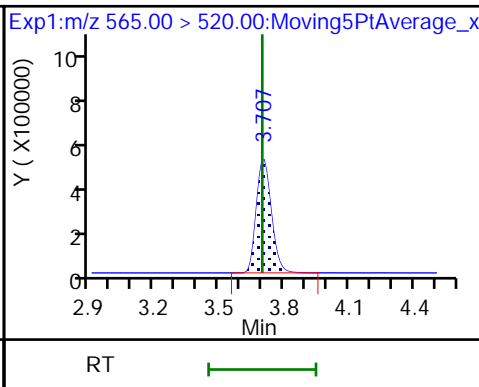
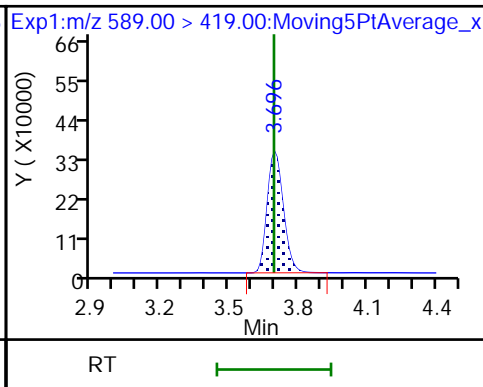
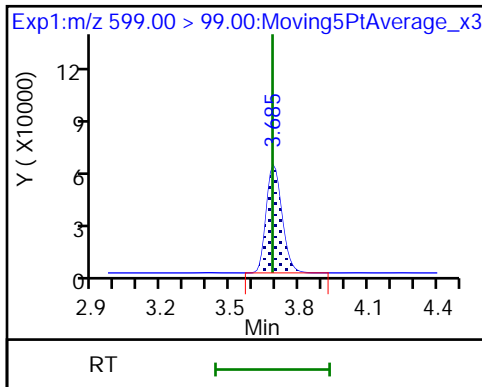
29 Perfluorodecane Sulfonic acid

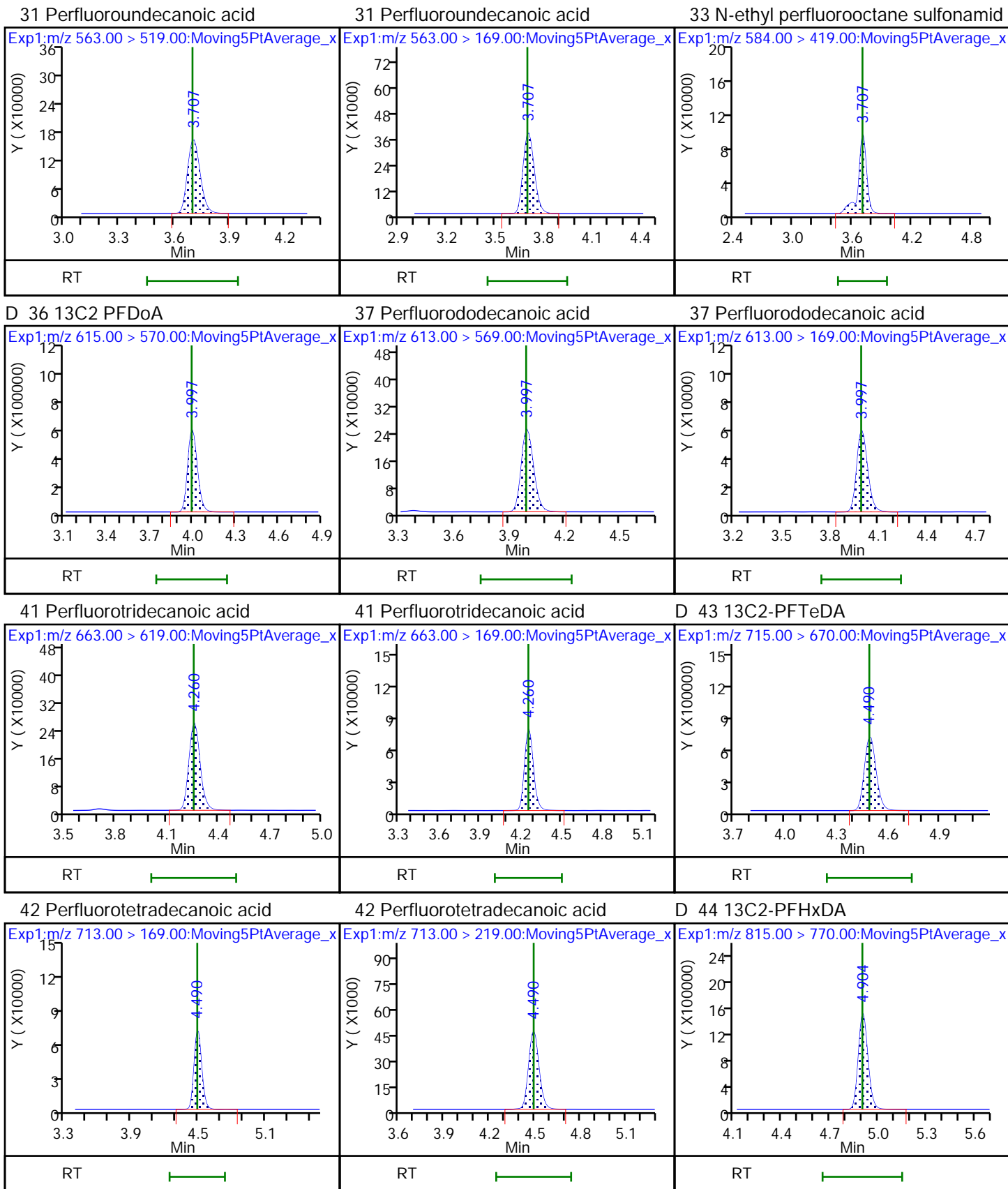


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_006.d
 Lims ID: IC L5 Full
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 29-Jun-2018 22:00:27 ALS Bottle#: 14 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L5-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:52:57 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:19:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.428	1.428	0.0	0.539	5449346	2.55	102	32571	
2 Perfluorobutyric acid	212.90 > 169.00	1.428	1.430	-0.002	1.000	5508925	2.48	99.4	3035	
D 3 13C5-PFPeA	267.90 > 223.00	1.707	1.705	0.002	0.644	3910355	2.60	104	47495	
4 Perfluoropentanoic acid	262.90 > 219.00	1.707	1.706	0.001	1.000	4613629	2.48	99.4	3364	
D 47 13C3-PFBS	301.90 > 83.00	1.743	1.741	0.002	0.658	81046	2.45	105	649	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.743	1.745	-0.002	1.000	6043590	2.25	102	29279	
	298.90 > 99.00	1.743	1.745	-0.002	1.000	2531924	2.39(1.25-3.74)	102	20499	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.945	1.948	-0.003	1.116	1592786	2.32	99.3	57049	
D 60 M2-4:2FTS	329.00 > 81.00	1.945	1.948	-0.003	0.734	618269	NC		10008	
6 Perfluorohexanoic acid	313.00 > 269.00	1.977	1.984	-0.007	1.000	4458485	2.50	99.8	13175	
	313.00 > 119.00	1.977	1.984	-0.007	1.000	374789	11.90(5.03-15.10)	99.8	8137	
D 7 13C2 PFHxA	315.00 > 270.00	1.977	1.984	-0.007	0.746	4317490	2.62	105	75387	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	1.999	2.004	-0.005	1.147	5821695	2.41	103	67083	
	349.00 > 99.00	1.999	2.004	-0.005	1.147	2056045	2.83(1.36-4.07)	103	32381	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.078	2.080	-0.002	0.784	194995	NC		3086	

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	2.078	2.082	-0.004	1.000	720752	NC		5343
D 9 13C4-PFHpA	367.00	> 322.00	2.303	2.302	0.001	0.869	4090923	2.68	107	37704
10 Perfluoroheptanoic acid	363.00	> 319.00	2.303	2.304	-0.001	1.000	4472196	2.46	98.6	7865
	363.00	> 169.00	2.303	2.304	-0.001	1.000	1627820	2.75(1.13-3.40)	98.6	11753
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.316	2.314	0.002	1.000	4662604	2.17	95.4	18738
	399.00	> 99.00	2.316	2.314	0.002	1.000	1577296	2.96(1.50-4.49)	95.4	9749
D 11 18O2 PFHxS	403.00	> 84.00	2.316	2.317	-0.001	0.874	4385789	2.46	104	34626
65 Adona	377.00	> 251.00	2.342	2.345	-0.003	0.776	12146932	NC		60319
	377.00	> 85.00	2.342	2.345	-0.003	0.776	7207387	1.69(0.84-2.53)		45413
D 12 M2-6:2FTS	429.00	> 81.00	2.626	2.627	-0.001	0.991	907459	2.46	103	16097
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.626	2.629	-0.003	1.000	1509731	2.46	104	6987
D 14 13C4 PFOA	417.00	> 372.00	2.651	2.653	-0.002	1.000	3707106	2.53	101	32247
* 62 13C2-PFOA	415.00	> 370.00	2.651	2.655	-0.004		3830613	2.50		34203
15 Perfluorooctanoic acid	413.00	> 369.00	2.651	2.657	-0.006	1.000	4479330	2.57	103	1824
	413.00	> 169.00	2.651	2.657	-0.006	1.000	2220951	2.02(0.84-2.52)	103	10849
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.658	2.663	-0.005	0.881	4226190	2.47	104	25648
	449.00	> 99.00	2.658	2.663	-0.005	0.881	1097347	3.85(1.94-5.82)	104	18467
D 18 13C4 PFOS	503.00	> 80.00	3.016	3.017	-0.001	1.138	3007709	2.52	105	23121
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.016	3.018	-0.002	1.000	3390238	2.32	99.9	21183
	499.00	> 99.00	3.016	3.018	-0.002	1.000	730238	4.64(2.31-6.93)	99.9	16414
20 Perfluorononanoic acid	463.00	> 419.00	3.016	3.018	-0.002	1.000	3257852	2.25	90.2	6329
	463.00	> 169.00	3.016	3.018	-0.002	1.000	789635	4.13(1.90-5.69)	90.2	34459
D 19 13C5 PFNA	468.00	> 423.00	3.016	3.018	-0.002	1.138	3251248	2.68	107	45319
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.231	3.229	0.002	1.071	5640819	NC		48812
D 21 13C8 FOSA	506.00	> 78.00	3.359	3.358	0.001	1.267	4077656	2.60	104	28277
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.359	3.360	-0.001	1.114	2399114	2.37	98.6	29081
	549.00	> 99.00	3.359	3.360	-0.001	1.114	881612	2.72(1.33-3.97)	98.6	20323
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.359	3.361	-0.002	1.000	4346618	2.66	106	28452

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	3.359	3.362	-0.003	1.267	1004377	2.50		104	22832	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.359	3.364	-0.005	1.000	1391409	2.46		103	39392	
D 23 13C2 PFDA										
515.00 > 470.00	3.369	3.374	-0.006	1.271	2539116	2.57		103	38082	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.378	3.376	0.002	1.003	2743088	2.55		102	17443	
513.00 > 169.00	3.369	3.376	-0.008	1.000	447530		6.13(2.36-7.09)	102	16692	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.527	3.527	0.0	1.331	1520200	2.56		103	30210	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.527	3.529	-0.002	1.000	1524413	2.62		105	12745	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.685	3.683	0.002	1.222	2180555	2.52		104	35374	
599.00 > 99.00	3.685	3.683	0.002	1.222	740097		2.95(1.39-4.16)	104	17233	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.696	3.694	0.002	1.394	1486190	2.54		101	7965	
D 30 13C2 PFUnA										
565.00 > 520.00	3.696	3.698	-0.002	1.394	2053362	2.53		101	32586	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.696	3.698	-0.002	1.000	1914730	2.58		103	8467	
563.00 > 169.00	3.696	3.698	-0.002	1.000	462129		4.14(2.12-6.36)	103	31988	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.696	3.700	-0.004	1.000	1327250	2.50		99.9	27607	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.853	3.858	-0.005	1.277	9415700	NC			93848	
D 36 13C2 PFDaA										
615.00 > 570.00	3.987	3.992	-0.005	1.504	2482377	2.64		105	15489	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.987	3.992	-0.005	1.000	2838470	2.64		106	3591	
613.00 > 169.00	3.987	3.992	-0.005	1.000	644883		4.40(2.13-6.40)	106	12354	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.250	4.255	-0.005	1.066	2981566	2.56		103	2900	
663.00 > 169.00	4.250	4.255	-0.005	1.066	865087		3.45(1.25-3.76)	103	10557	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.490	4.490	0.0	1.694	3052797	2.60		104	14029	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.490	4.490	0.0	1.000	732758	2.40		96.0	11026	
713.00 > 219.00	4.480	4.490	-0.010	0.998	514728		1.42(0.71-2.13)	96.0	7594	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.895	4.899	-0.004	1.847	5807526	2.64		106	14141	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.895	4.900	-0.005	1.000	5618411	NC			2520	
813.00 > 169.00	4.895	4.900	-0.005	1.000	870452		6.45(2.86-8.58)		7439	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.247	5.251	-0.004	1.072	6428481	NC			2009	
913.00 > 169.00	5.247	5.251	-0.004	1.072	749554		8.58(3.83-11.48)		6916	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL5_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_006.d

Injection Date: 29-Jun-2018 22:00:27

Instrument ID: A8_N

Lims ID: IC L5 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 14

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

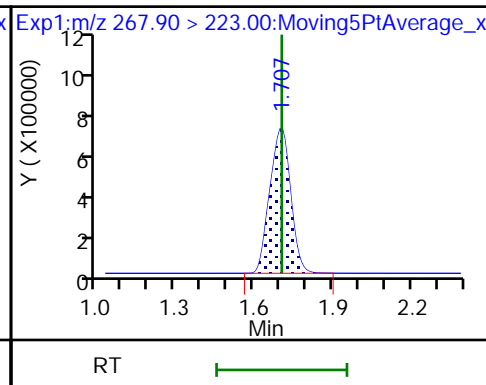
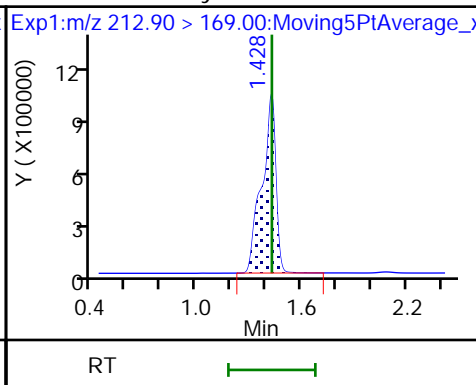
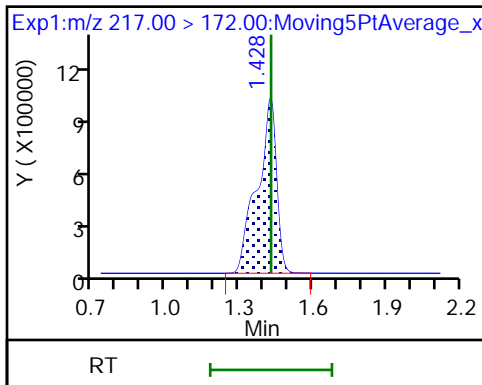
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

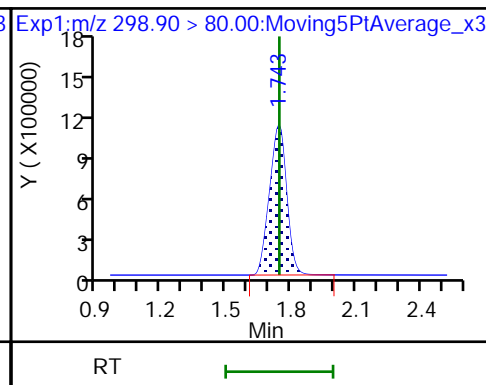
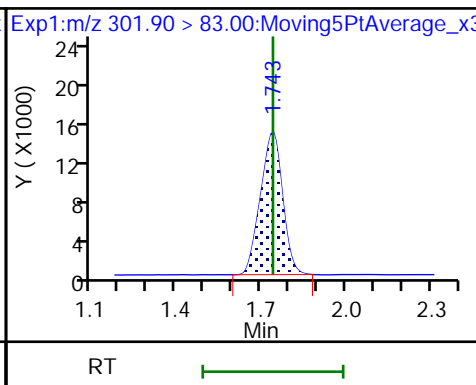
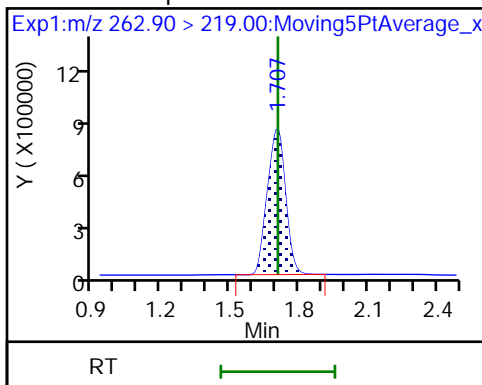
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

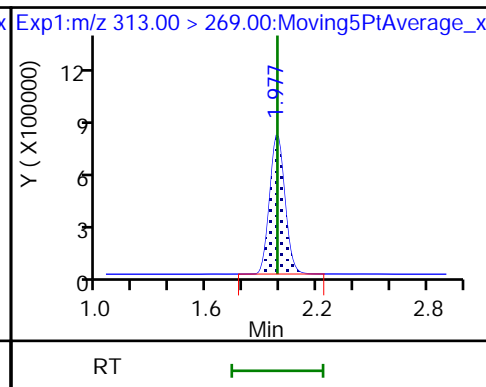
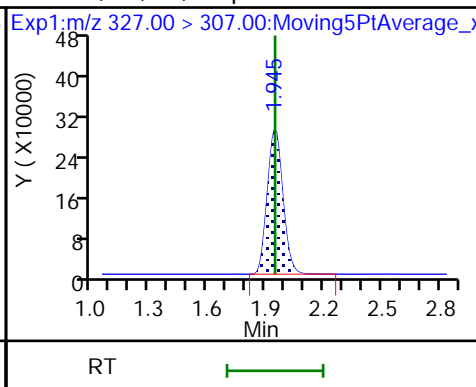
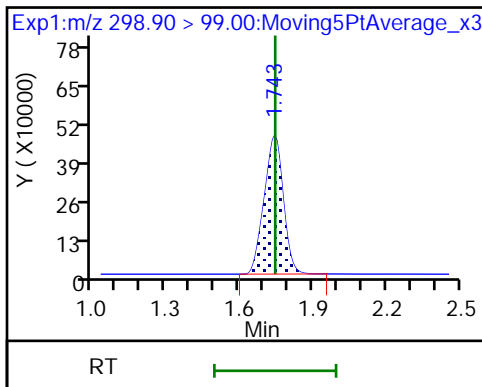
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfoni

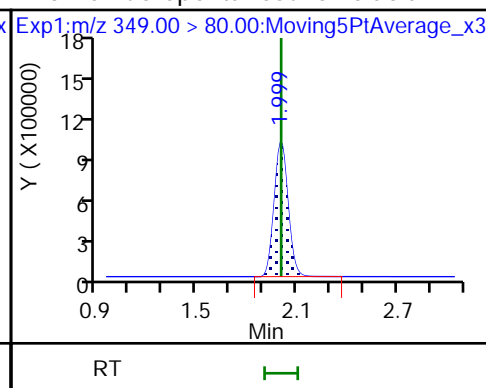
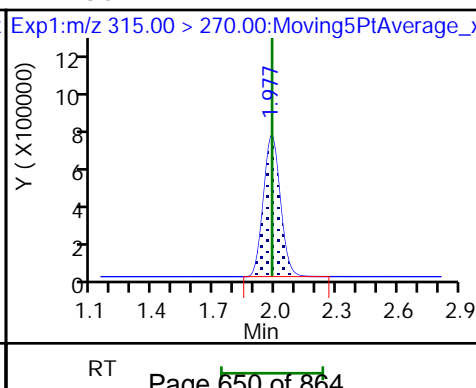
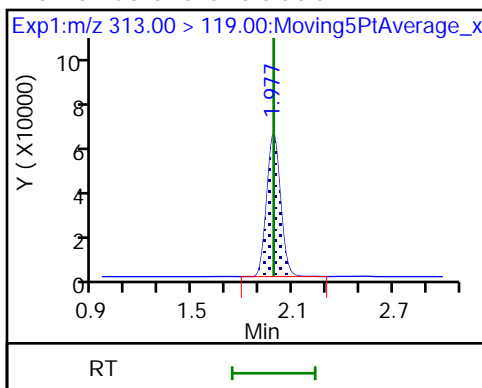
6 Perfluorohexanoic acid

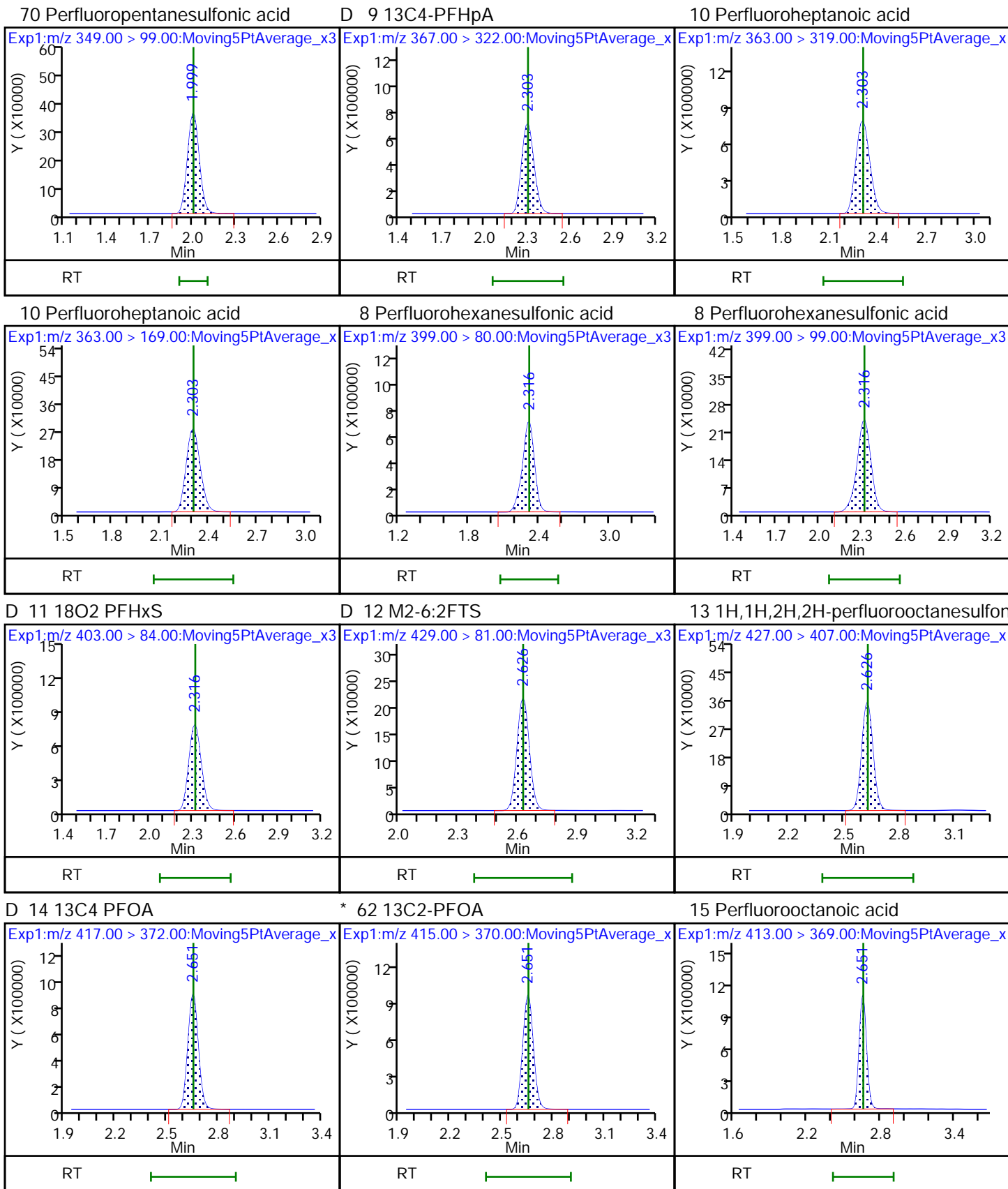


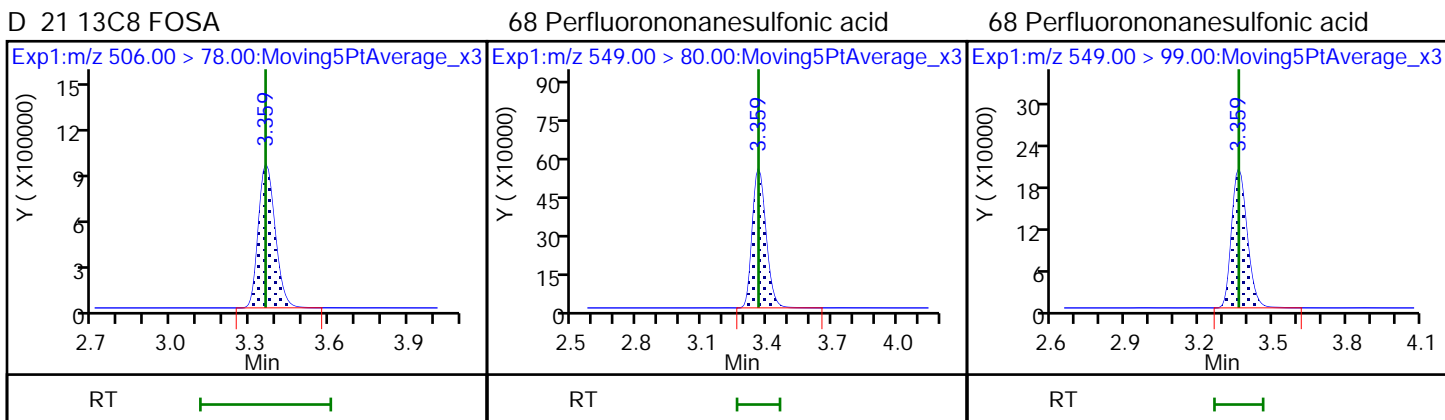
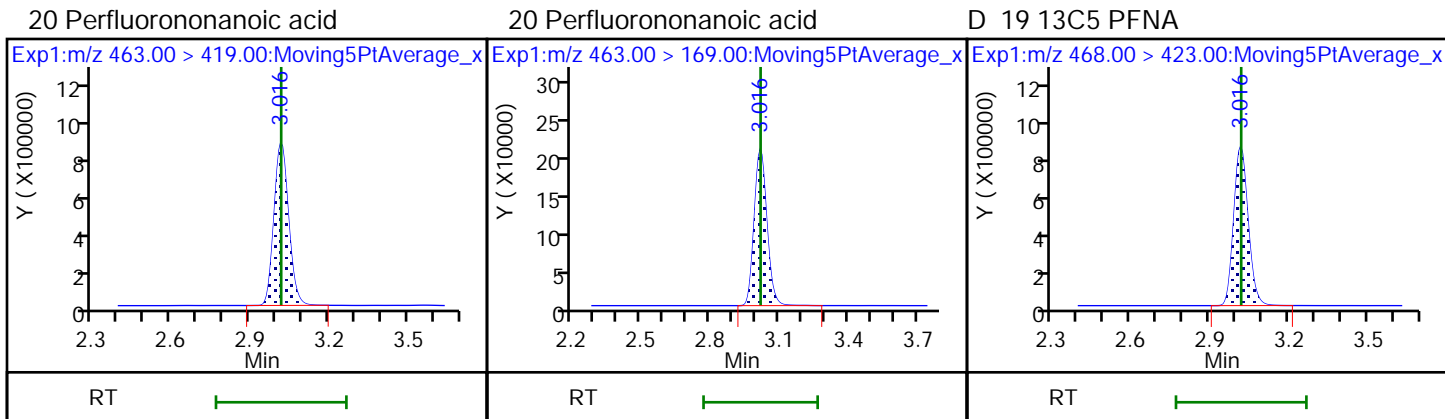
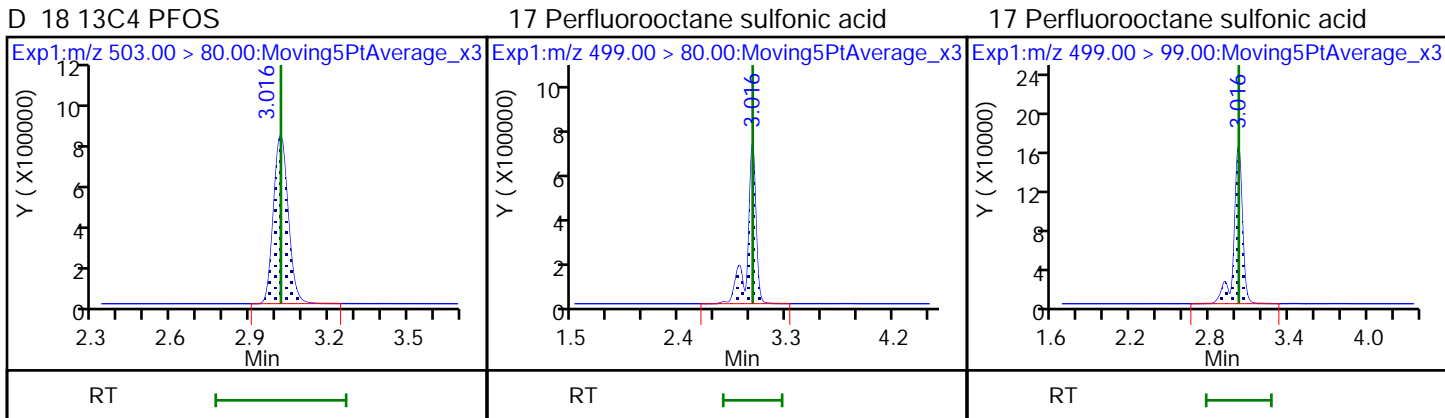
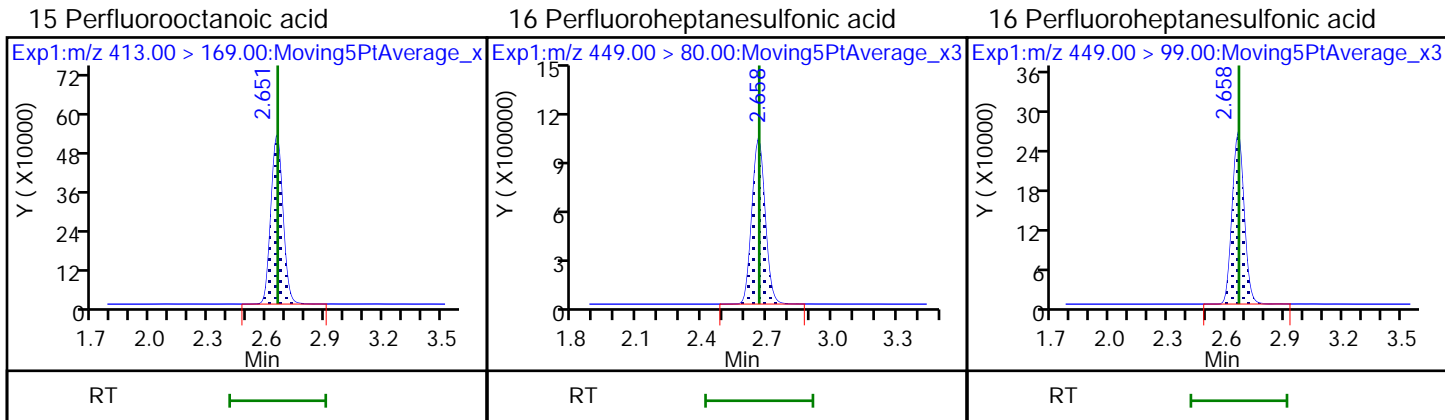
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



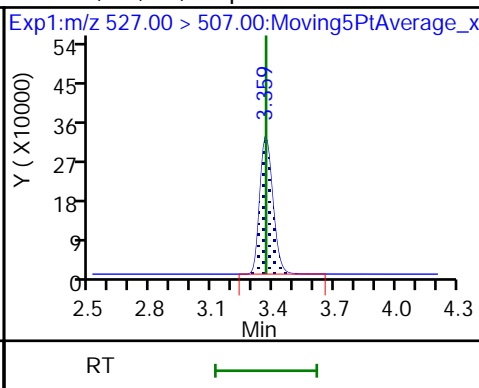
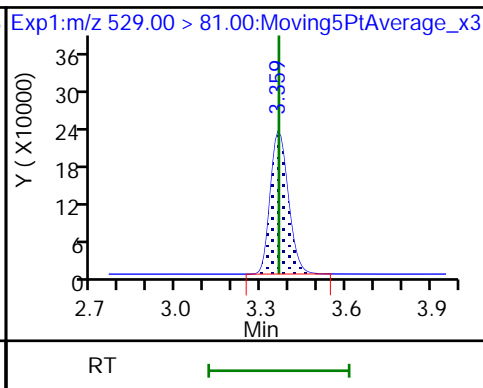
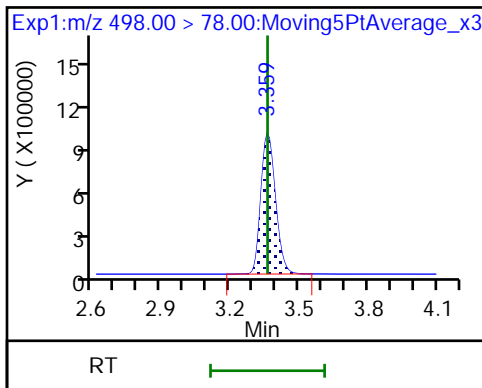




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

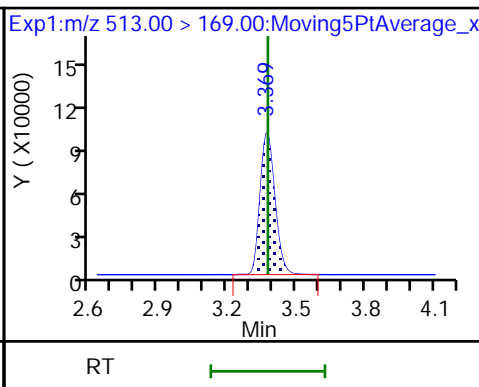
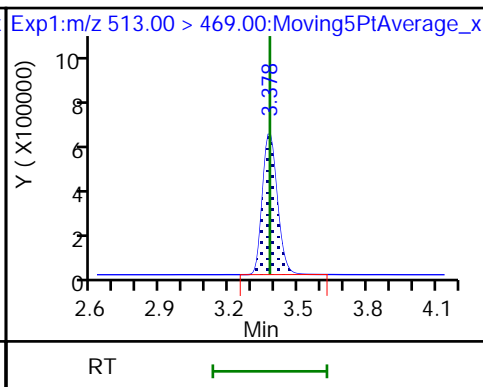
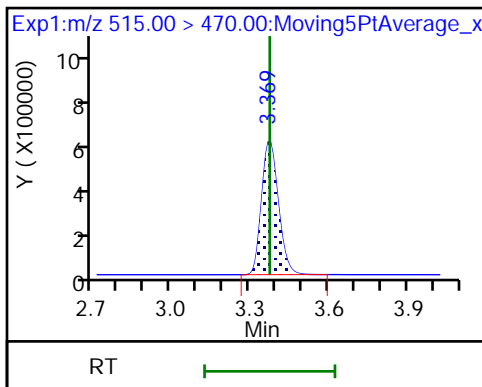
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid

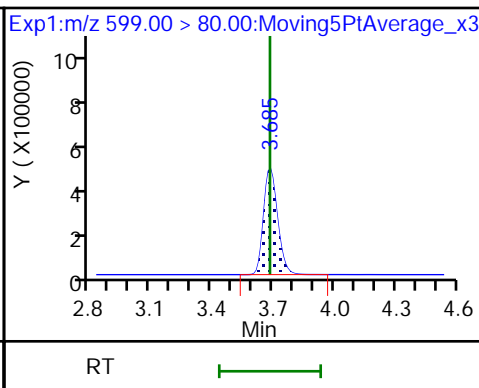
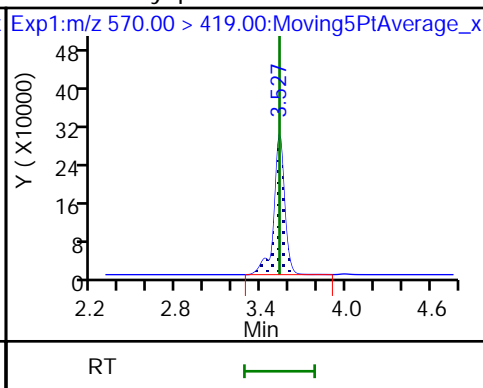
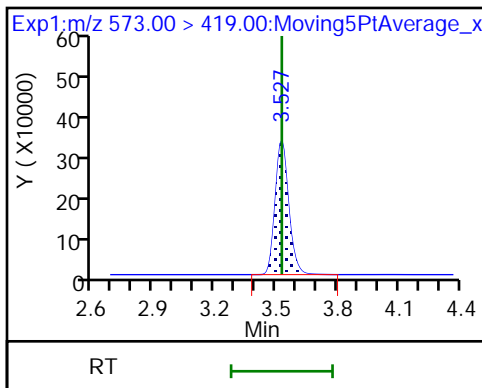
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

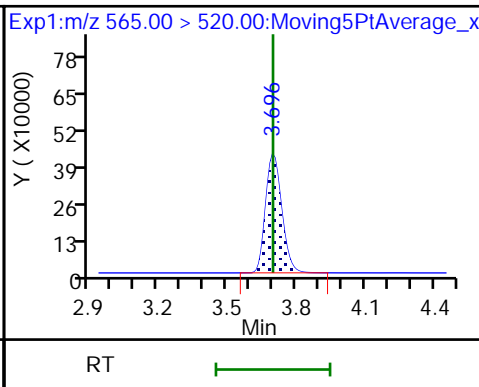
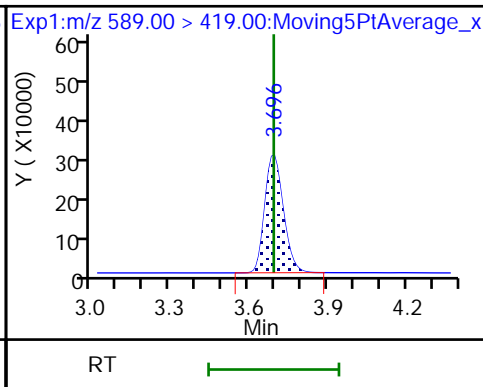
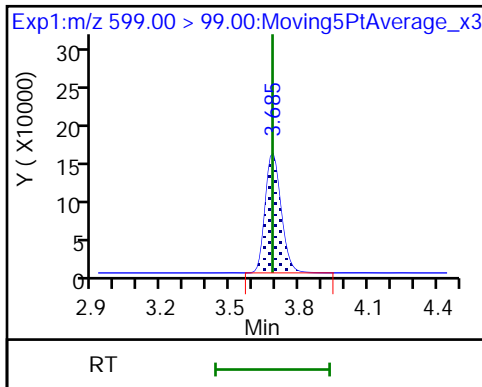
29 Perfluorodecane Sulfonic acid

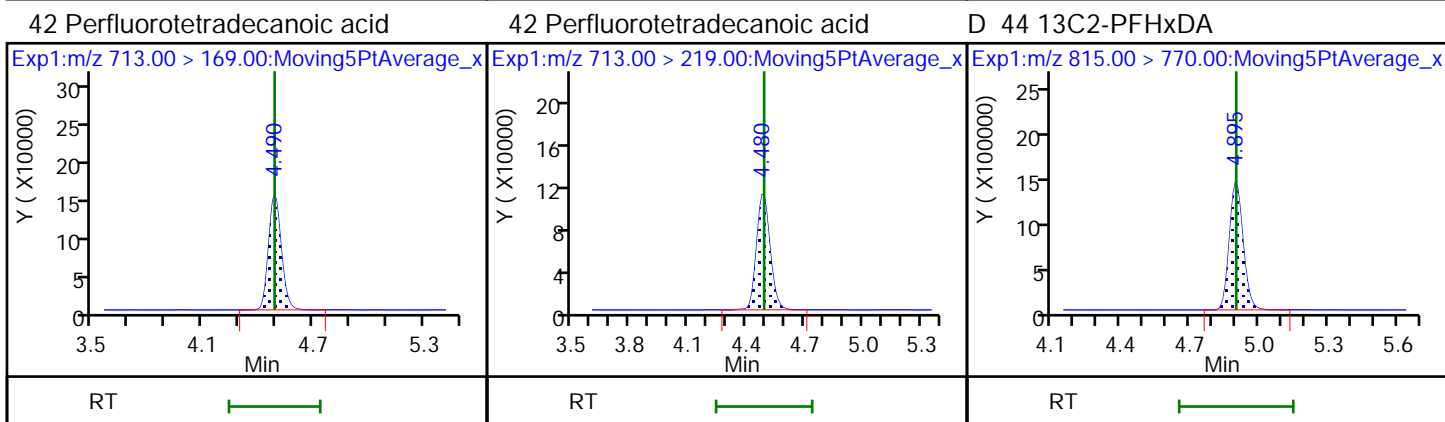
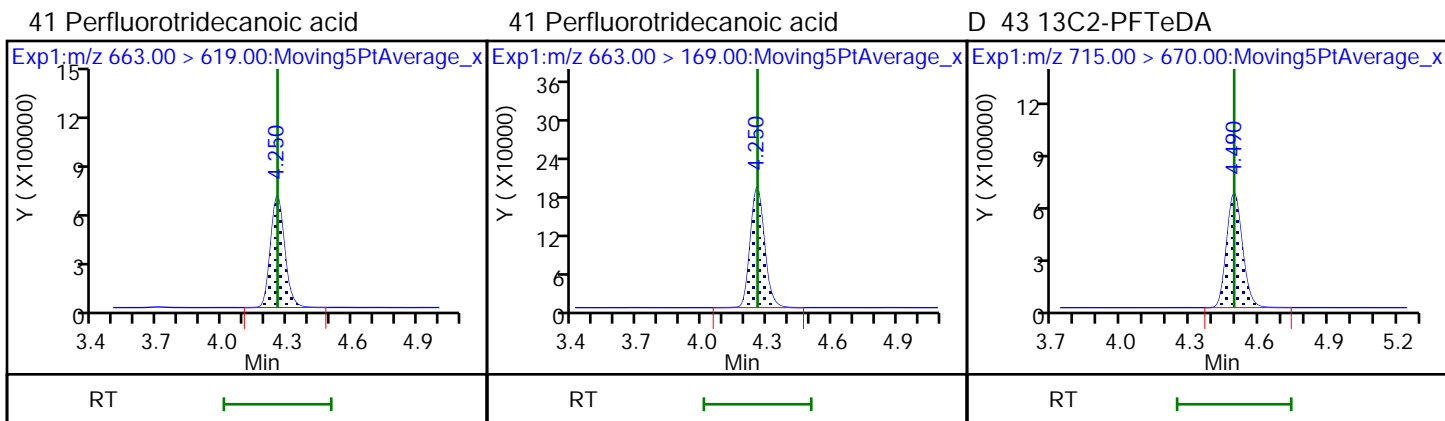
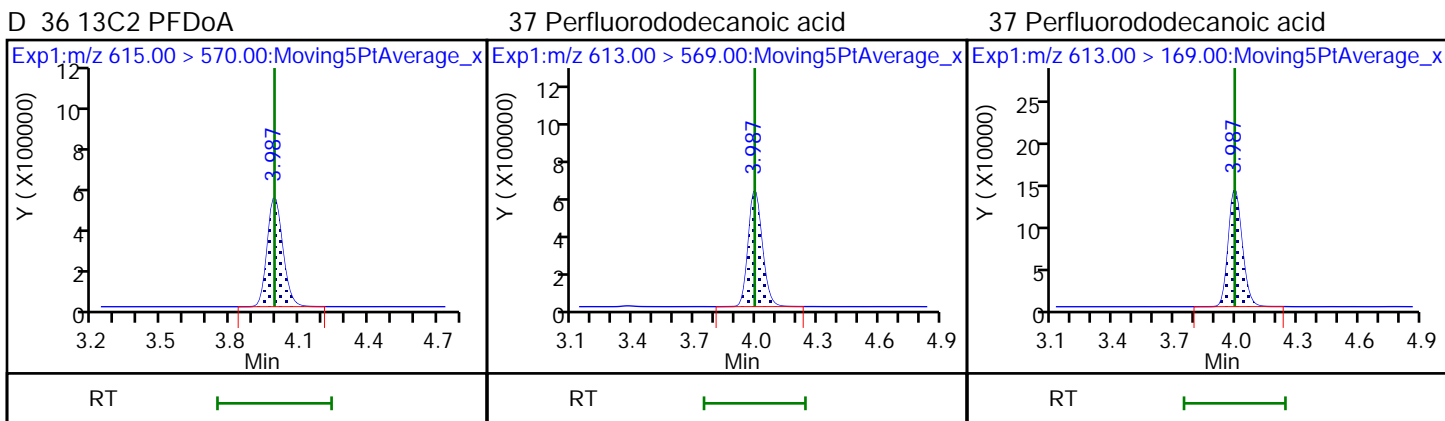
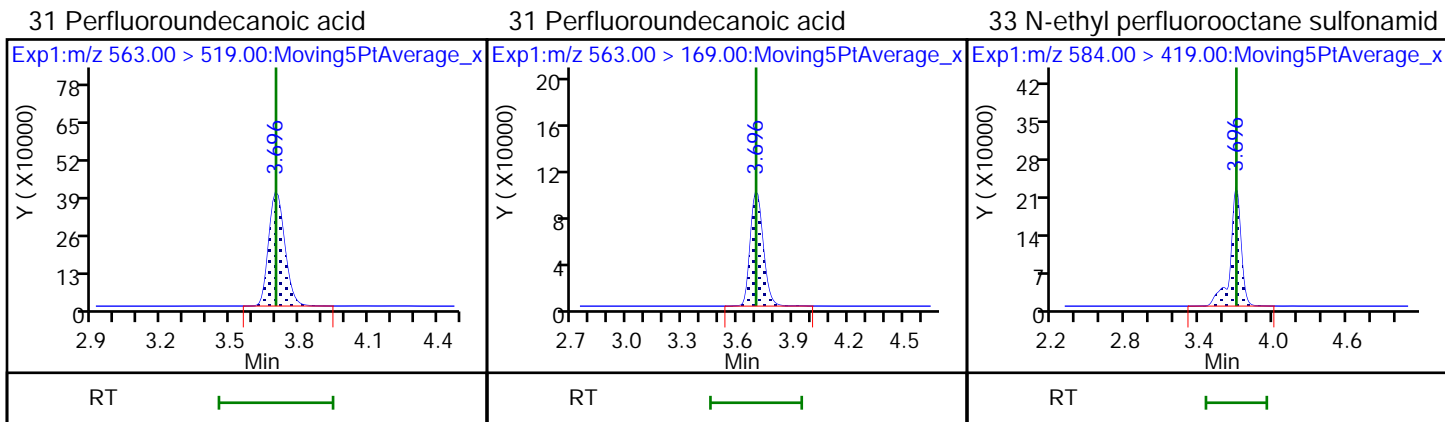


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_007.d
 Lims ID: IC L6 Full
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 29-Jun-2018 22:08:17 ALS Bottle#: 15 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L6-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:53:00 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:19:50

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	1.428	1.428	0.0	0.539	5785463	2.48	99.3	33974	
2 Perfluorobutyric acid	212.90 > 169.00	1.433	1.430	0.003	1.004	11741171	4.99	99.7	6759	
D 3 13C5-PFPeA	267.90 > 223.00	1.707	1.705	0.002	0.644	4038335	2.47	98.7	50398	
4 Perfluoropentanoic acid	262.90 > 219.00	1.707	1.706	0.001	1.000	9501364	4.95	99.1	7834	
D 47 13C3-PFBS	301.90 > 83.00	1.743	1.741	0.002	0.658	82201	2.28	98.1	561	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.743	1.745	-0.002	1.000	12236181	4.49	101	44861	
	298.90 > 99.00	1.743	1.745	-0.002	1.000	5104122	2.40(1.25-3.74)	101	37849	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.945	1.948	-0.003	1.116	3107472	4.46	95.5	110842	
D 60 M2-4:2FTS	329.00 > 81.00	1.945	1.948	-0.003	0.734	616394	NC		11106	
6 Perfluorohexanoic acid	313.00 > 269.00	1.988	1.984	0.004	1.000	9190933	4.98	99.7	22618	
	313.00 > 119.00	1.988	1.984	0.004	1.000	826604	11.12(5.03-15.10)	99.7	13100	
D 7 13C2 PFHxA	315.00 > 270.00	1.988	1.984	0.004	0.750	4458382	2.49	99.6	98344	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.010	2.004	0.006	1.153	11633698	4.76	101	87583	
	349.00 > 99.00	1.999	2.004	-0.005	1.147	4361650	2.67(1.36-4.07)	101	37969	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.078	2.080	-0.002	0.784	203116	NC		3219	

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	2.078	2.082	-0.004	1.000	1498805	NC		14042
D 9 13C4-PFHpA	367.00	> 322.00	2.302	2.302	0.0	0.869	3871069	2.33	93.3	34000
10 Perfluoroheptanoic acid	363.00	> 319.00	2.302	2.304	-0.002	1.000	8757903	5.10	102	13604
	363.00	> 169.00	2.302	2.304	-0.002	1.000	3327587	2.63(1.13-3.40)	102	21357
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.315	2.314	0.001	1.000	9413780	4.37	96.1	21875
	399.00	> 99.00	2.315	2.314	0.001	1.000	3189396	2.95(1.50-4.49)	96.1	15851
D 11 18O2 PFHxS	403.00	> 84.00	2.315	2.317	-0.002	0.874	4395037	2.27	95.9	22197
65 Adona	377.00	> 251.00	2.341	2.345	-0.004	0.778	23257472	NC		78818
	377.00	> 85.00	2.341	2.345	-0.004	0.778	13782700	1.69(0.84-2.53)		61503
D 12 M2-6:2FTS	429.00	> 81.00	2.626	2.627	-0.001	0.991	927417	2.31	97.1	16425
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.626	2.629	-0.003	1.000	3017922	4.81	101	11837
D 14 13C4 PFOA	417.00	> 372.00	2.650	2.653	-0.003	1.000	4008387	2.52	101	32098
* 62 13C2-PFOA	415.00	> 370.00	2.650	2.655	-0.005		4169291	2.50		38114
15 Perfluorooctanoic acid	413.00	> 369.00	2.650	2.657	-0.007	1.000	9189211	4.88	97.4	4470
	413.00	> 169.00	2.650	2.657	-0.007	1.000	4633530	1.98(0.84-2.52)	97.4	18291
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.658	2.663	-0.005	0.883	8507357	5.04	106	40484
	449.00	> 99.00	2.658	2.663	-0.005	0.883	2288716	3.72(1.94-5.82)	106	24630
D 18 13C4 PFOS	503.00	> 80.00	3.010	3.017	-0.007	1.136	2969473	2.29	95.7	18572
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.010	3.018	-0.008	1.000	6845858	4.74	102	30718
	499.00	> 99.00	3.010	3.018	-0.008	1.000	1494296	4.58(2.31-6.93)	102	67301
20 Perfluorononanoic acid	463.00	> 419.00	3.010	3.018	-0.008	1.000	6970772	5.12	102	15102
	463.00	> 169.00	3.010	3.018	-0.008	1.000	1606451	4.34(1.90-5.69)	102	38120
D 19 13C5 PFNA	468.00	> 423.00	3.010	3.018	-0.008	1.136	3059923	2.32	92.8	29272
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.223	3.229	-0.006	1.071	11567093	NC		82557
D 21 13C8 FOSA	506.00	> 78.00	3.351	3.358	-0.007	1.264	4178174	2.45	97.9	35455
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.351	3.360	-0.009	1.113	4883680	4.88	102	56447
	549.00	> 99.00	3.351	3.360	-0.009	1.113	1750280	2.79(1.33-3.97)	102	25061
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.360	3.361	-0.001	1.003	8270576	4.94	98.7	69222

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	3.360	3.362	-0.002	1.268	964231	2.21		92.1	16809	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.360	3.364	-0.004	1.000	2513469	4.64		96.8	34664	
D 23 13C2 PFDA										
515.00 > 470.00	3.370	3.374	-0.004	1.271	2587120	2.40		96.2	38943	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.370	3.376	-0.006	1.000	5498196	5.01		100	37827	
513.00 > 169.00	3.370	3.376	-0.006	1.000	956870		5.75(2.36-7.09)	100	27058	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.519	3.527	-0.008	1.328	1581489	2.45		98.0	23243	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.528	3.529	-0.001	1.003	3186253	5.27		105	19433	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.676	3.683	-0.007	1.221	4206492	4.92		102	58674	
599.00 > 99.00	3.676	3.683	-0.007	1.221	1376828		3.06(1.39-4.16)	102	32007	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.686	3.694	-0.008	1.391	1461344	2.29		91.6	8376	
D 30 13C2 PFUnA										
565.00 > 520.00	3.697	3.698	-0.001	1.395	2134943	2.41		96.6	29945	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.697	3.698	-0.001	1.000	3744964	4.86		97.2	20788	
563.00 > 169.00	3.697	3.698	-0.001	1.000	859436		4.36(2.12-6.36)	97.2	19976	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.697	3.700	-0.003	1.003	2579637	4.94		98.8	27076	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.854	3.858	-0.004	1.281	16988504	NC			146318	
D 36 13C2 PFDaA										
615.00 > 570.00	3.988	3.992	-0.004	1.505	2487635	2.43		97.0	11964	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.988	3.992	-0.004	1.000	5334947	4.95		99.1	6900	
613.00 > 169.00	3.988	3.992	-0.004	1.000	1295340		4.12(2.13-6.40)	99.1	19717	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.252	4.255	-0.003	1.066	5708249	4.90		98.0	5078	
663.00 > 169.00	4.252	4.255	-0.003	1.066	1650016		3.46(1.25-3.76)	98.0	18167	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.490	4.490	0.0	1.694	3061795	2.39		95.8	11770	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.490	4.490	0.0	1.000	1515366	4.95		98.9	17784	
713.00 > 219.00	4.480	4.490	-0.010	0.998	1093396		1.39(0.71-2.13)	98.9	15091	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.899	-0.003	1.847	5930151	2.48		99.1	14212	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.900	-0.004	1.000	10991709	NC			4839	
813.00 > 169.00	4.896	4.900	-0.004	1.000	1729504		6.36(2.86-8.58)		11090	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.247	5.251	-0.004	1.072	13072405	NC			3327	
913.00 > 169.00	5.247	5.251	-0.004	1.072	1516222		8.62(3.83-11.48)		8735	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL6_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_007.d

Injection Date: 29-Jun-2018 22:08:17

Instrument ID: A8_N

Lims ID: IC L6 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 15

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

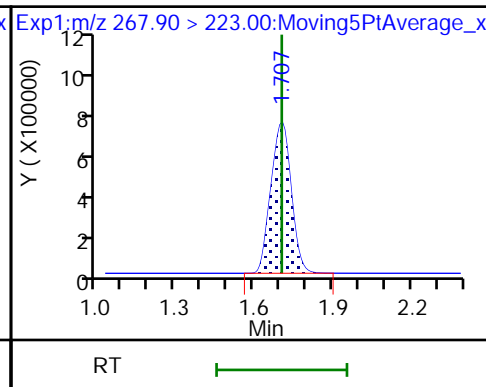
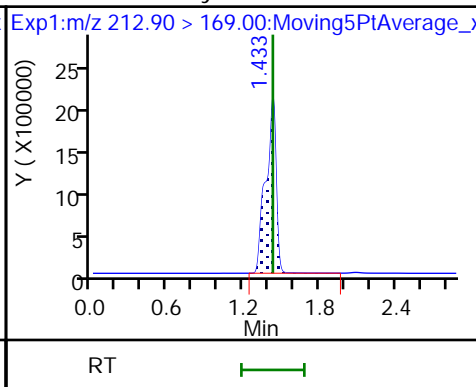
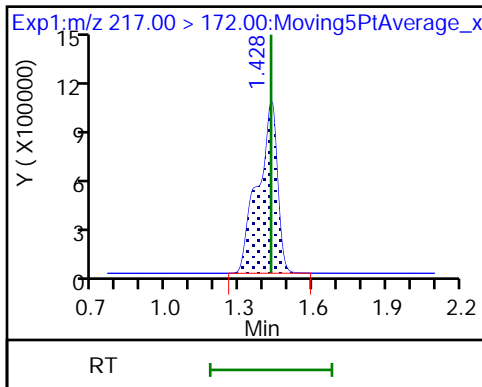
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

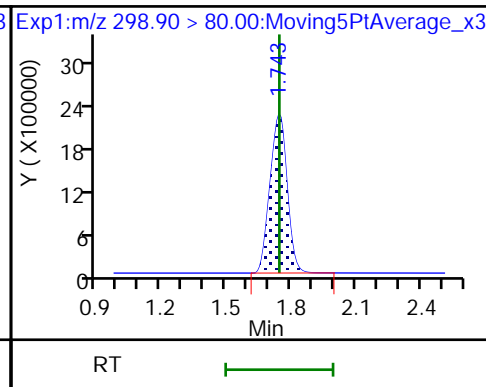
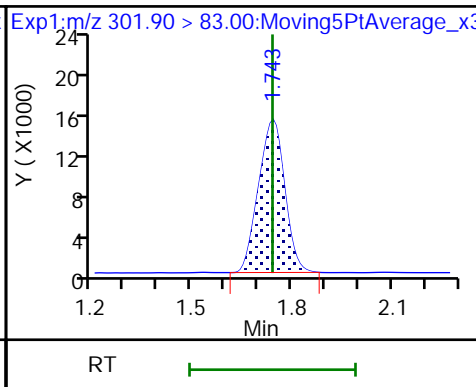
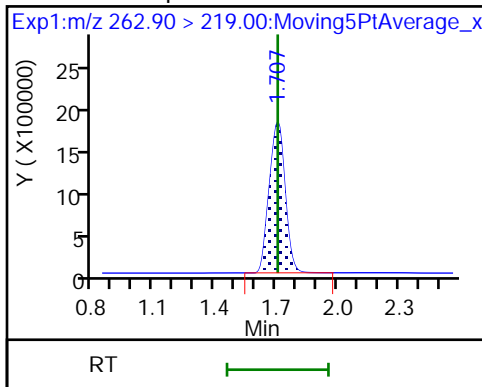
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

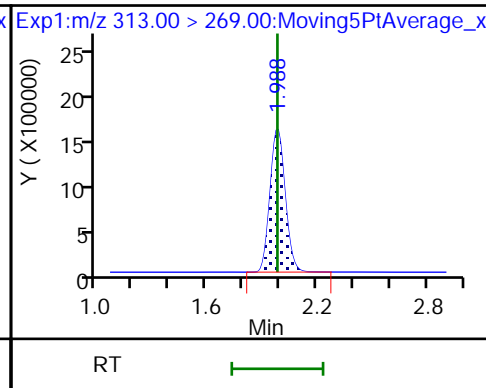
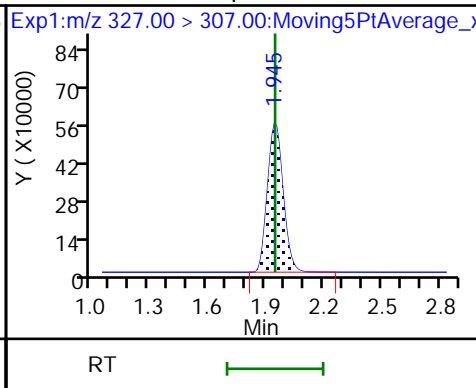
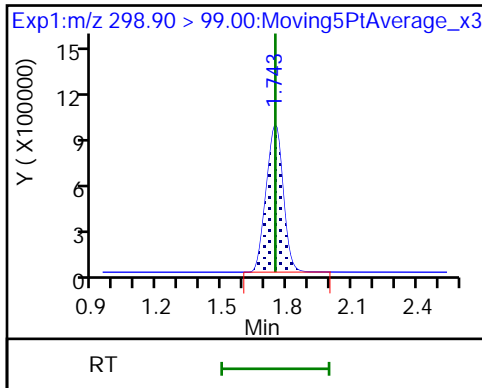
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfoni

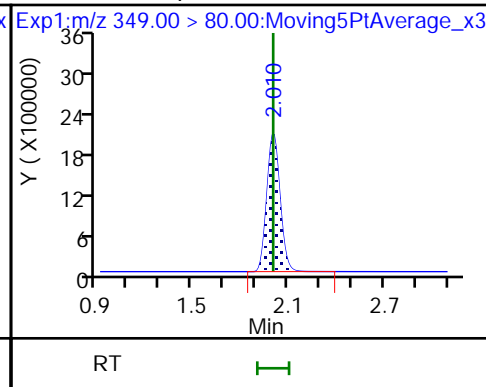
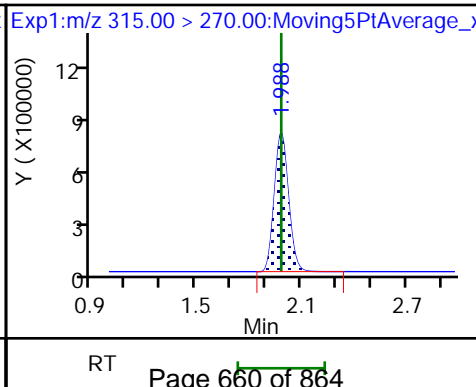
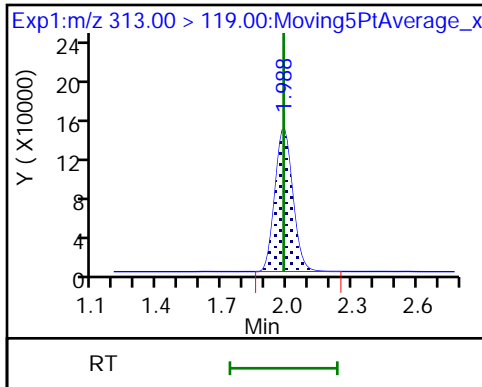
6 Perfluorohexanoic acid

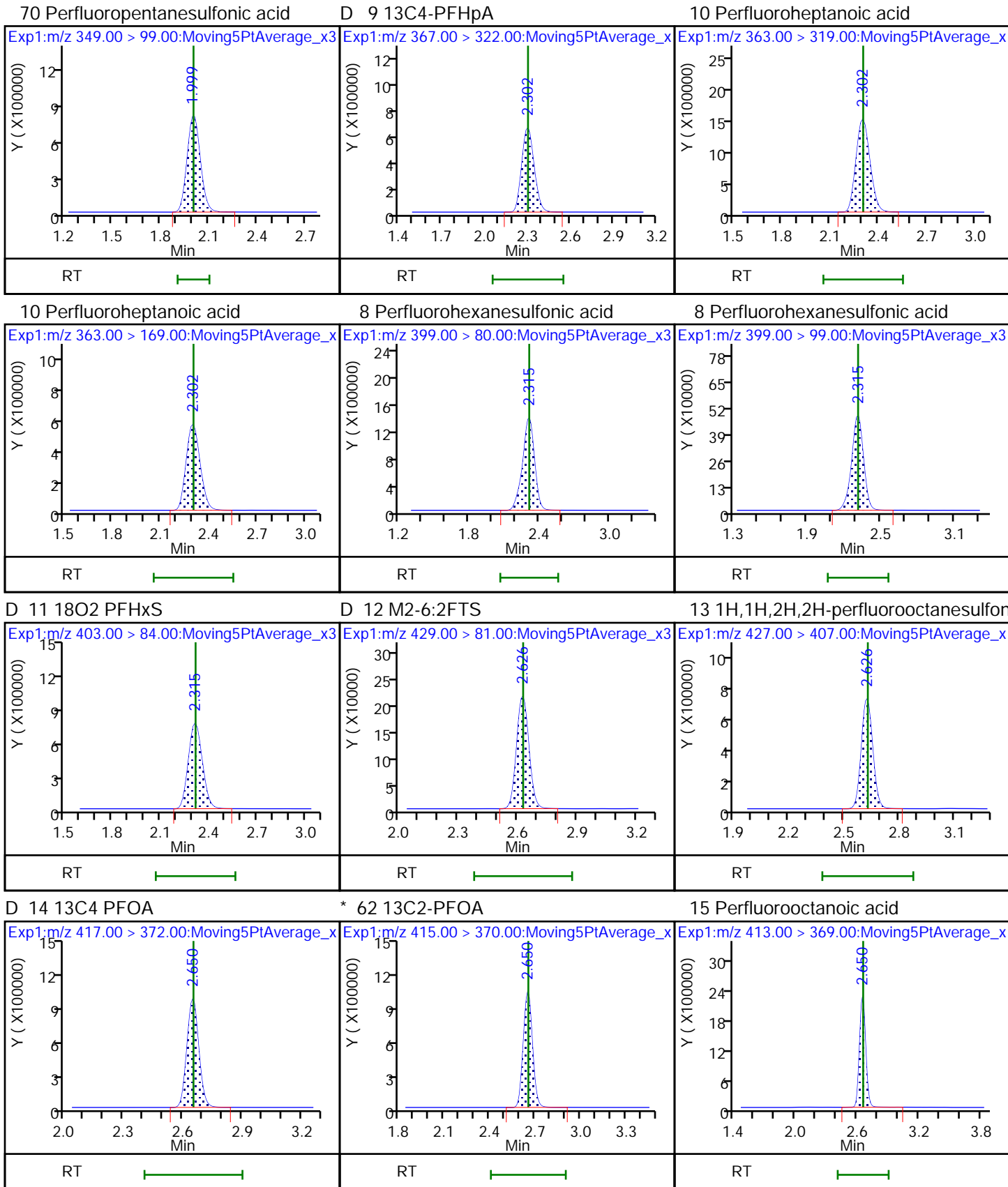


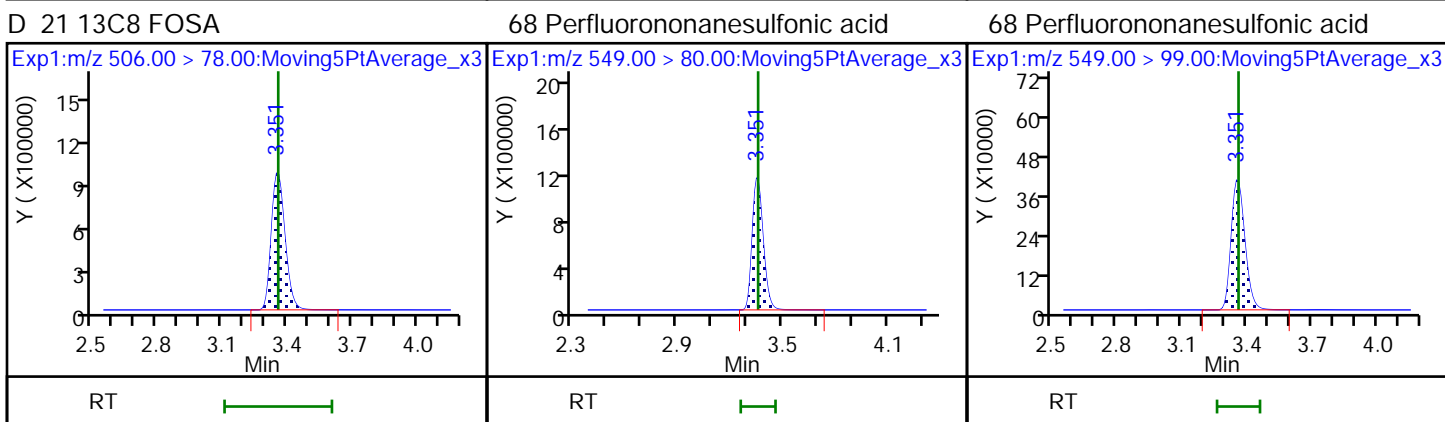
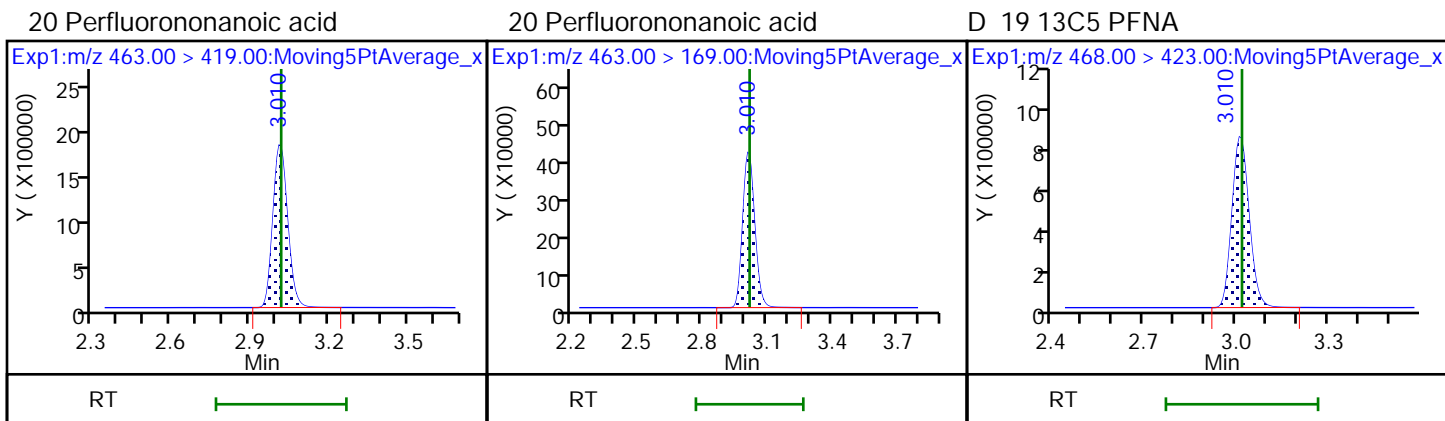
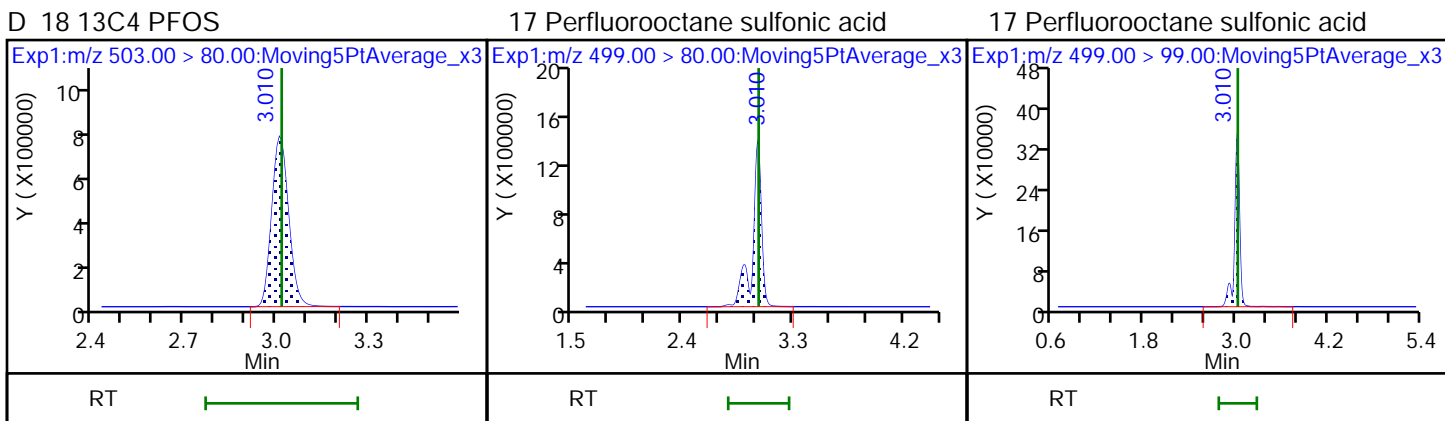
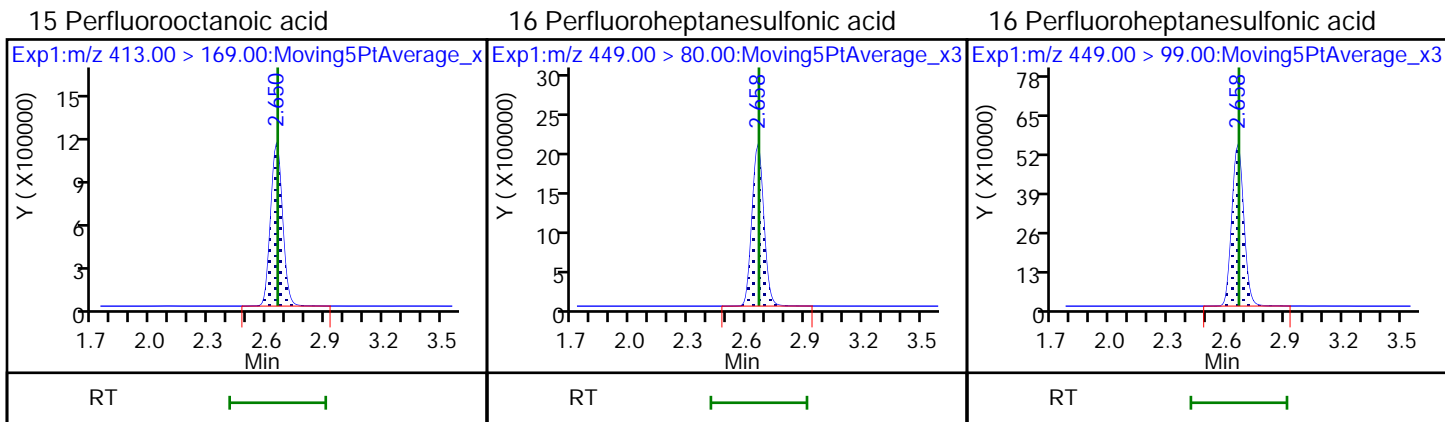
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



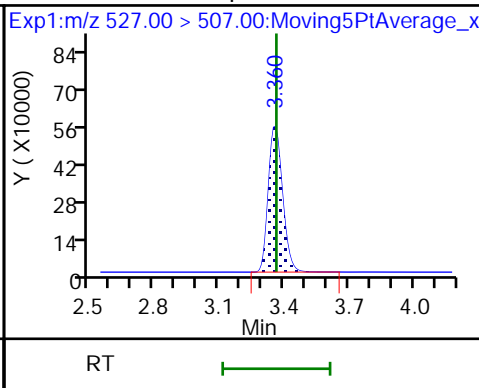
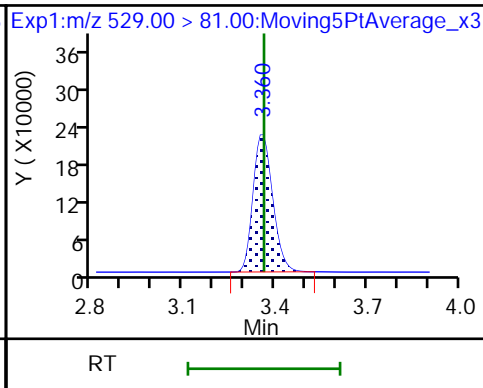
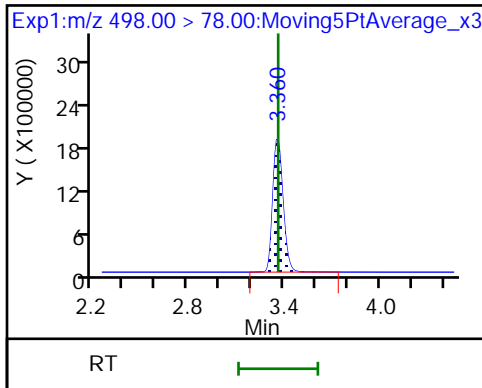




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

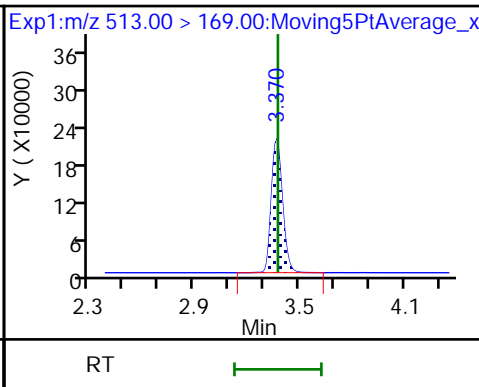
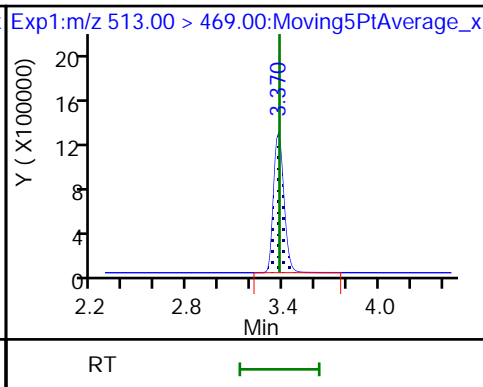
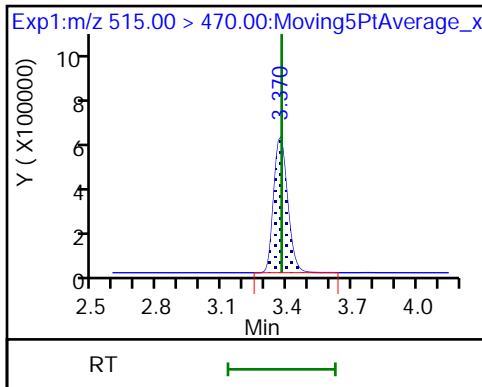
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid

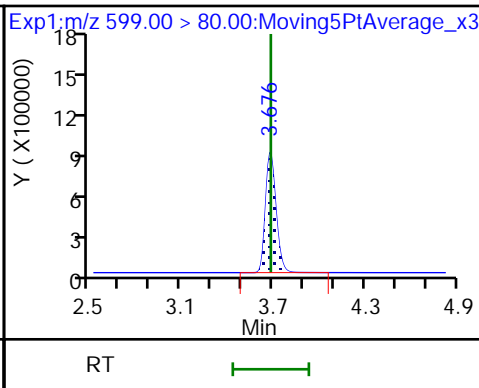
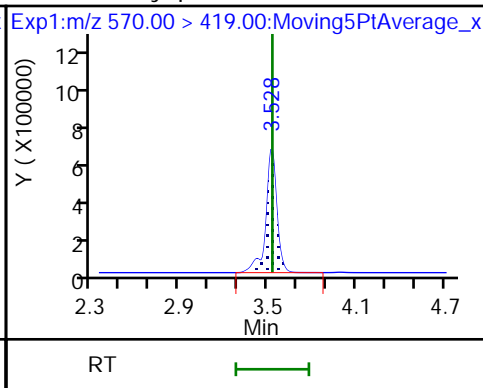
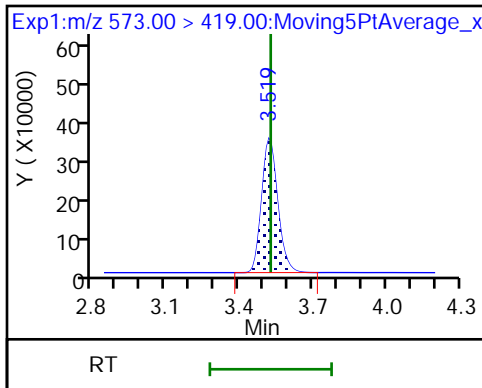
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

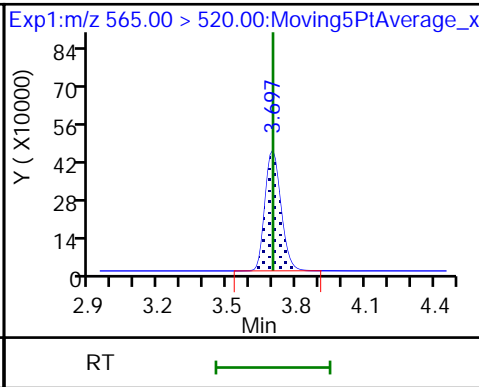
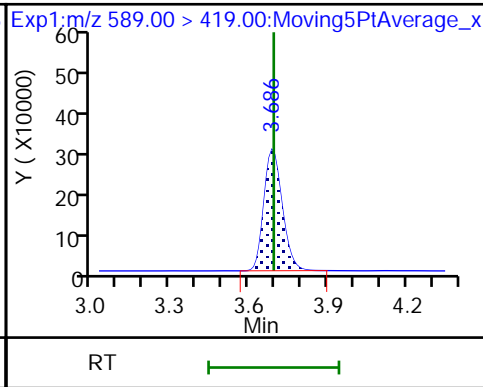
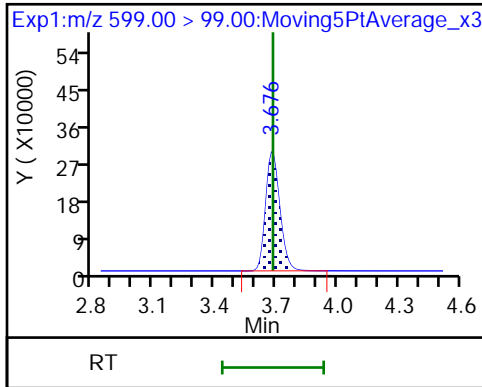
29 Perfluorodecane Sulfonic acid

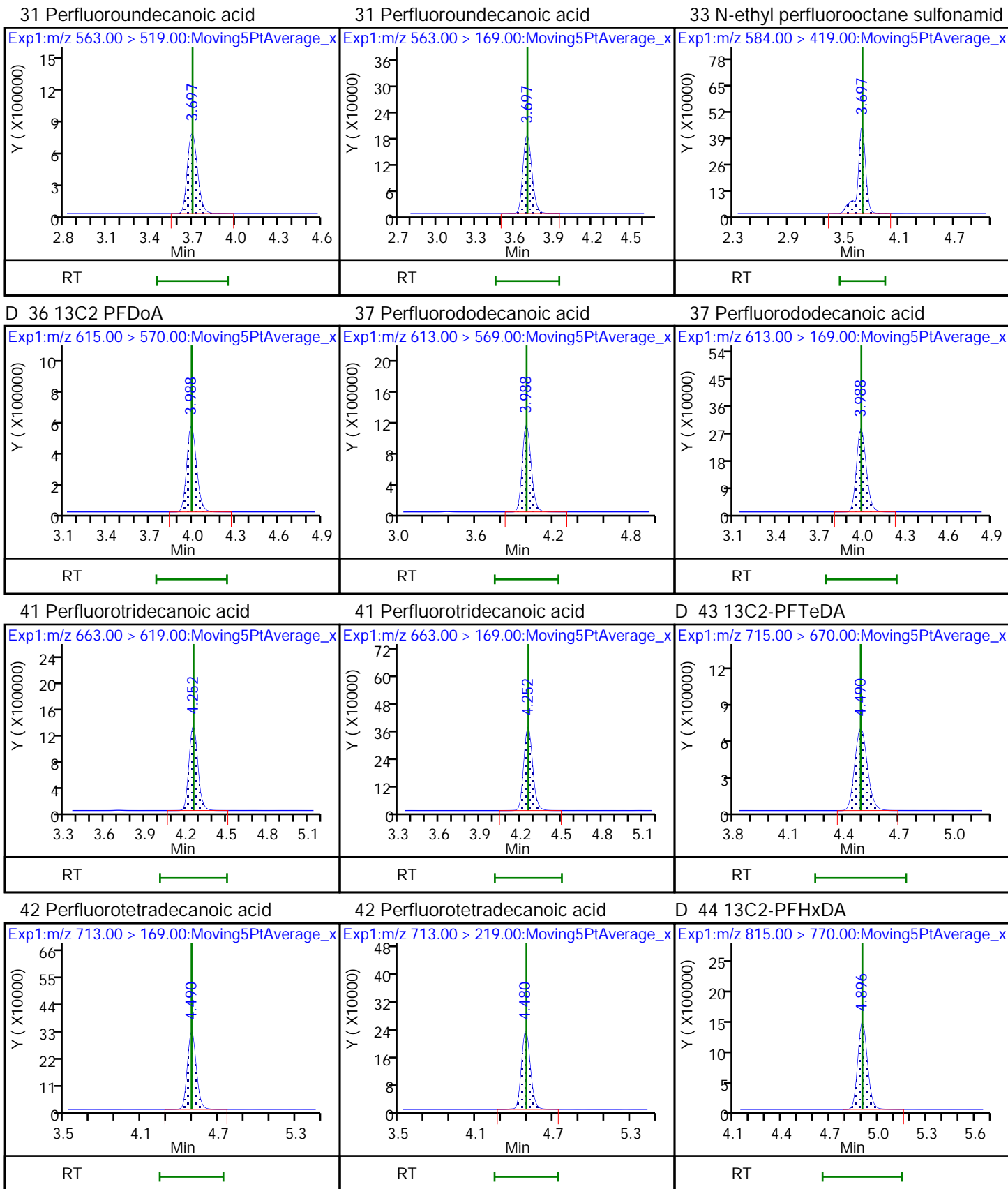


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d
 Lims ID: IC L7 Full
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 29-Jun-2018 22:16:07 ALS Bottle#: 16 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L7-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:53:04 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:20:28

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	1.430	1.428	0.002	0.539	5826550	2.70	108	31917	
2 Perfluorobutyric acid	212.90 > 169.00	1.430	1.430	0.0	1.000	23128489	9.75	97.5	10699	
D 3 13C5-PFPeA	267.90 > 223.00	1.702	1.705	-0.003	0.642	4059427	2.68	107	45309	
4 Perfluoropentanoic acid	262.90 > 219.00	1.702	1.706	-0.004	1.000	18536324	9.61	96.1	14472	
D 47 13C3-PFBS	301.90 > 83.00	1.738	1.741	-0.003	0.655	81313	2.44	105	728	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.747	1.745	0.002	1.005	23050057	8.54	96.6	91636	
	298.90 > 99.00	1.747	1.745	0.002	1.005	10384980	2.22(1.25-3.74)	96.6	74376	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.949	1.948	0.001	1.121	6001471	8.70	93.2	135057	
D 60 M2-4:2FTS	329.00 > 81.00	1.949	1.948	0.001	0.735	589051	NC		8971	
6 Perfluorohexanoic acid	313.00 > 269.00	1.981	1.984	-0.003	1.000	17458801	10.1	101	106358	
	313.00 > 119.00	1.981	1.984	-0.003	1.000	1581068	11.04(5.03-15.10)	101	23537	
D 7 13C2 PFHxA	315.00 > 270.00	1.981	1.984	-0.003	0.747	4163964	2.51	100	61963	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.004	2.004	-0.001	1.153	21459182	8.87	94.6	150590	
	349.00 > 99.00	2.004	2.004	-0.001	1.153	8690554	2.47(1.36-4.07)	94.6	96289	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.071	2.080	-0.009	0.781	203387	NC		3245	

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	2.083	2.082	0.001	1.005	3044328	NC	18069	
D 9 13C4-PFHpA	367.00	> 322.00	2.294	2.302	-0.008	0.865	3988277	2.60	104	41594
10 Perfluoroheptanoic acid	363.00	> 319.00	2.294	2.304	-0.010	1.000	17268732	9.76	97.6	24656
	363.00	> 169.00	2.294	2.304	-0.010	1.000	7066539	2.44(1.13-3.40)	97.6	38290
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.307	2.314	-0.007	1.000	18691081	9.33	103	31498
	399.00	> 99.00	2.307	2.314	-0.007	1.000	6348106	2.94(1.50-4.49)	103	23154
D 11 18O2 PFHxS	403.00	> 84.00	2.307	2.317	-0.010	0.870	4089199	2.28	96.5	35588
65 Adona	377.00	> 251.00	2.346	2.345	0.001	0.779	38162957	NC	371366	
	377.00	> 85.00	2.346	2.345	0.001	0.779	25047909	1.52(0.84-2.53)	89033	
D 12 M2-6:2FTS	429.00	> 81.00	2.620	2.627	-0.007	0.988	871081	2.34	98.6	15693
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.620	2.629	-0.009	1.000	5820534	9.87	104	20407
D 14 13C4 PFOA	417.00	> 372.00	2.645	2.653	-0.008	0.997	3774933	2.56	102	29625
* 62 13C2-PFOA	415.00	> 370.00	2.653	2.655	-0.002		3858245	2.50		43175
15 Perfluorooctanoic acid	413.00	> 369.00	2.653	2.657	-0.004	1.003	16625027	9.37	93.6	7528
	413.00	> 169.00	2.653	2.657	-0.004	1.003	8968548	1.85(0.84-2.52)	93.6	23930
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.660	2.663	-0.003	0.883	15169426	9.23	96.9	39162
	449.00	> 99.00	2.660	2.663	-0.003	0.883	4394035	3.45(1.94-5.82)	96.9	51836
D 18 13C4 PFOS	503.00	> 80.00	3.012	3.017	-0.005	1.135	2891085	2.41	101	18909
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.012	3.018	-0.006	1.000	12974045	9.22	99.4	35386
	499.00	> 99.00	3.012	3.018	-0.006	1.000	2866689	4.53(2.31-6.93)	99.4	33993
20 Perfluorononanoic acid	463.00	> 419.00	3.012	3.018	-0.006	1.000	13304232	9.95	99.5	28890
	463.00	> 169.00	3.012	3.018	-0.006	1.000	3158814	4.21(1.90-5.69)	99.5	63491
D 19 13C5 PFNA	468.00	> 423.00	3.012	3.018	-0.006	1.135	3008741	2.47	98.6	39470
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.217	3.229	-0.012	1.068	21145191	NC	273423	
D 21 13C8 FOSA	506.00	> 78.00	3.352	3.358	-0.006	1.263	3832562	2.43	97.1	32494
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.352	3.360	-0.008	1.113	9162545	9.41	98.0	53973
	549.00	> 99.00	3.352	3.360	-0.008	1.113	3423338	2.68(1.33-3.97)	98.0	39527
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.352	3.361	-0.009	1.000	15357897	10.0	99.9	58390

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	3.352	3.362	-0.010	1.263	939188	2.32		97.0	23668	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.352	3.364	-0.012	1.000	4958739	9.39		98.0	140335	
D 23 13C2 PFDA										
515.00 > 470.00	3.370	3.374	-0.004	1.270	2490269	2.50		100	33098	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.370	3.376	-0.006	1.000	10140917	9.59		95.9	37621	
513.00 > 169.00	3.370	3.376	-0.006	1.000	1817135		5.58(2.36-7.09)	95.9	81807	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.520	3.527	-0.007	1.327	1597284	2.67		107	31925	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.520	3.529	-0.009	1.000	6257140	10.3		103	29528	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.676	3.683	-0.007	1.221	8214689	9.87		102	59422	
599.00 > 99.00	3.676	3.683	-0.007	1.221	2725272		3.01(1.39-4.16)	102	44060	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.687	3.694	-0.007	1.390	1398706	2.37		94.8	10654	
D 30 13C2 PFUnA										
565.00 > 520.00	3.687	3.698	-0.011	1.390	1989027	2.43		97.2	34095	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.687	3.698	-0.011	1.000	6931775	9.66		96.6	28191	
563.00 > 169.00	3.687	3.698	-0.011	1.000	1552628		4.46(2.12-6.36)	96.6	44973	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.698	3.700	-0.002	1.003	5390142	10.8		108	47555	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.855	3.858	-0.003	1.280	29528990	NC			136136	
D 36 13C2 PFDaA										
615.00 > 570.00	3.989	3.992	-0.003	1.504	2381403	2.51		100	17796	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.989	3.992	-0.003	1.000	10640247	10.3		103	12221	
613.00 > 169.00	3.989	3.992	-0.003	1.000	2491846		4.27(2.13-6.40)	103	22741	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.252	4.255	-0.003	1.066	11465935	10.3		103	9753	
663.00 > 169.00	4.252	4.255	-0.003	1.066	3300242		3.47(1.25-3.76)	103	23106	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.481	4.490	-0.009	1.689	2994139	2.53		101	14160	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.481	4.490	-0.009	1.000	2863050	9.56		95.6	21860	
713.00 > 219.00	4.481	4.490	-0.009	1.000	2080191		1.38(0.71-2.13)	95.6	16677	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.899	-0.003	1.846	5329991	2.41		96.2	14713	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.900	-0.004	1.000	19777832	NC			7337	
813.00 > 169.00	4.896	4.900	-0.004	1.000	3400925		5.82(2.86-8.58)		17704	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.248	5.251	-0.003	1.072	23160118	NC			5154	
913.00 > 169.00	5.248	5.251	-0.003	1.072	2947881		7.86(3.83-11.48)		11821	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL7_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Injection Date: 29-Jun-2018 22:16:07

Instrument ID: A8_N

Lims ID: IC L7 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 16

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

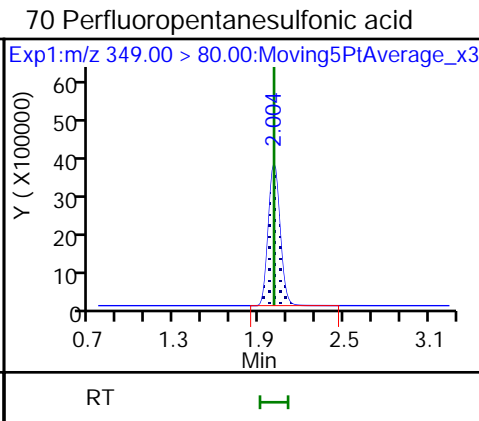
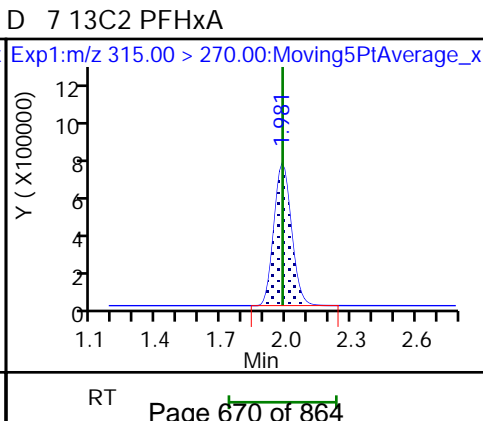
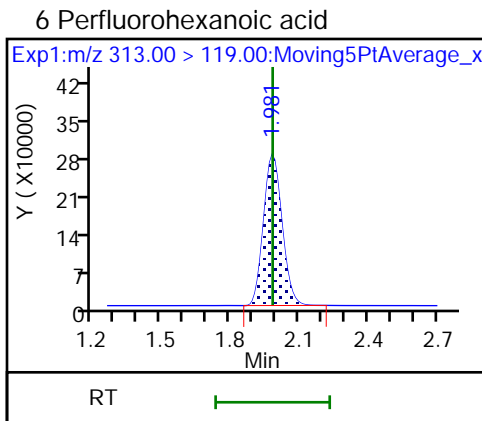
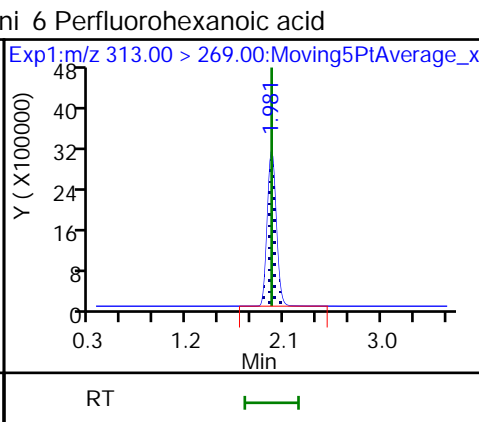
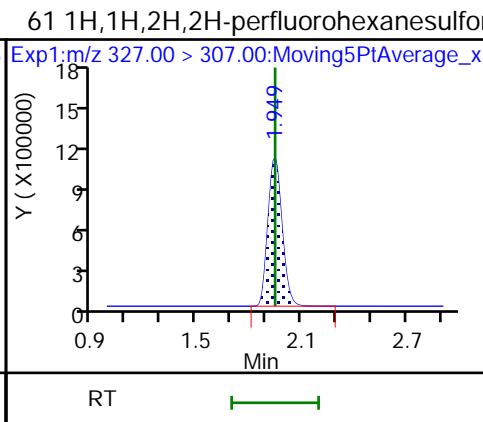
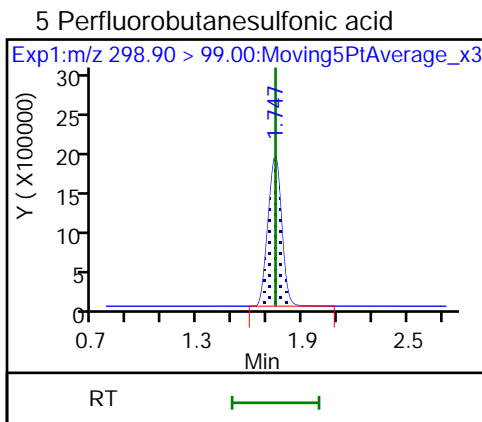
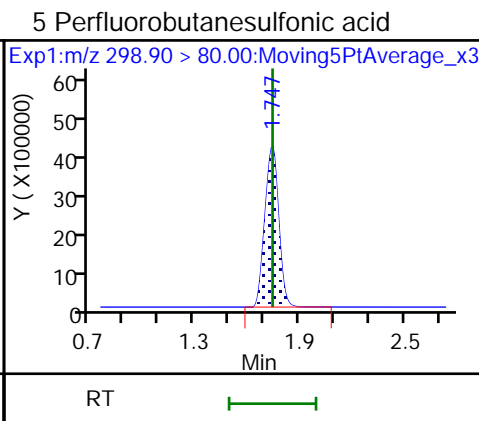
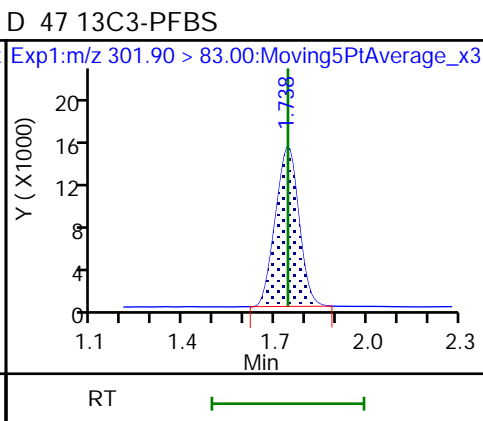
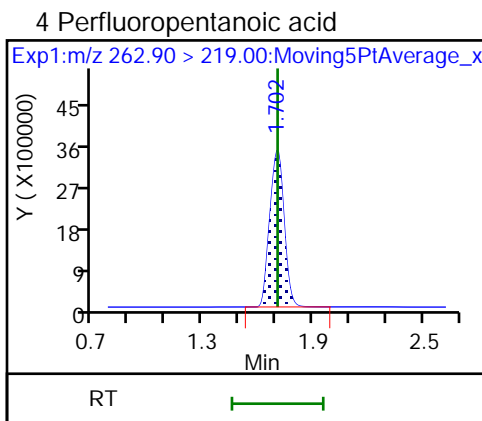
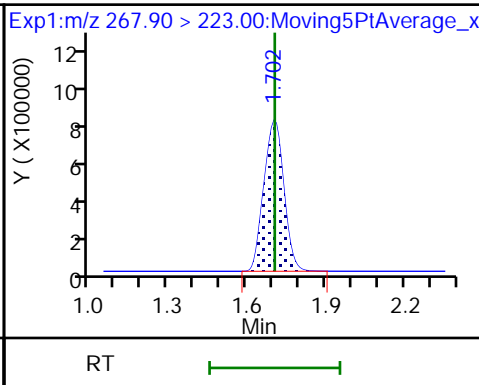
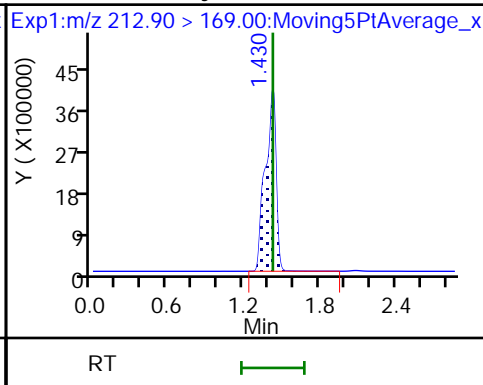
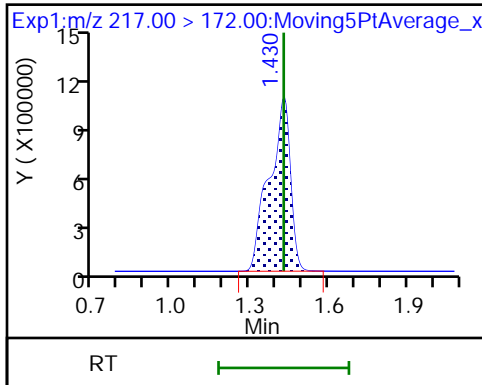
Method: A8_N

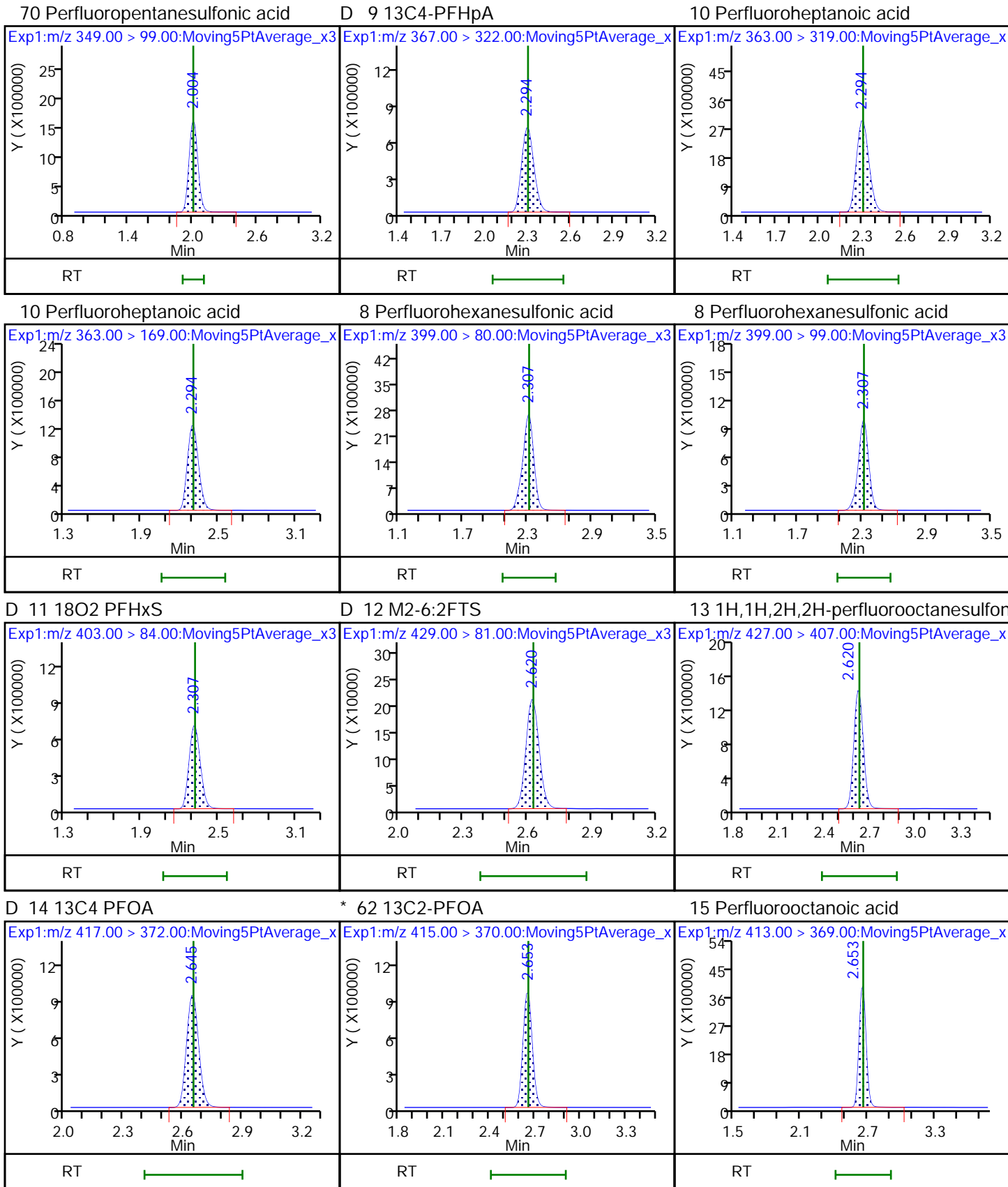
Limit Group: LC PFC_QSM5-1 ICAL

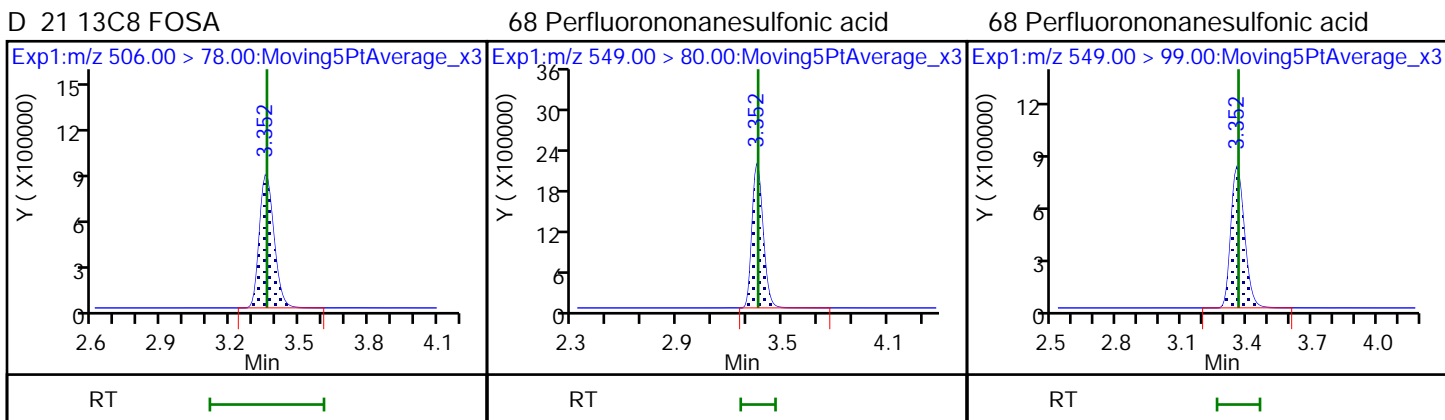
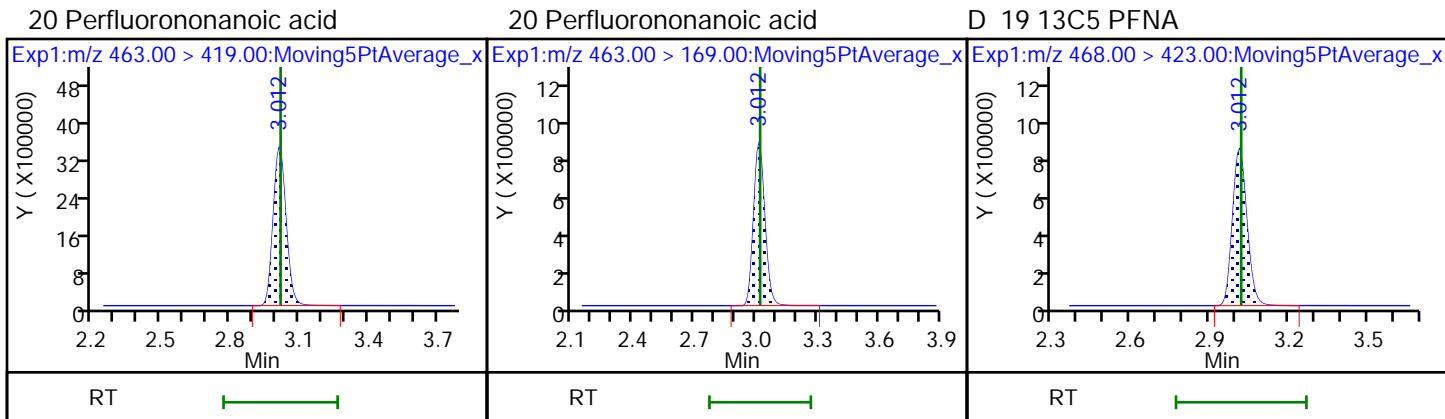
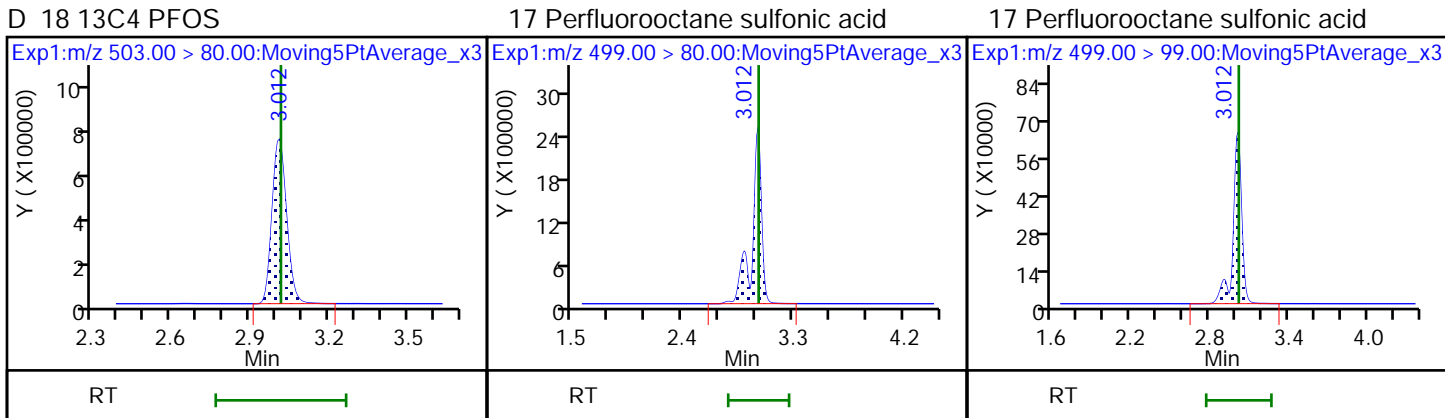
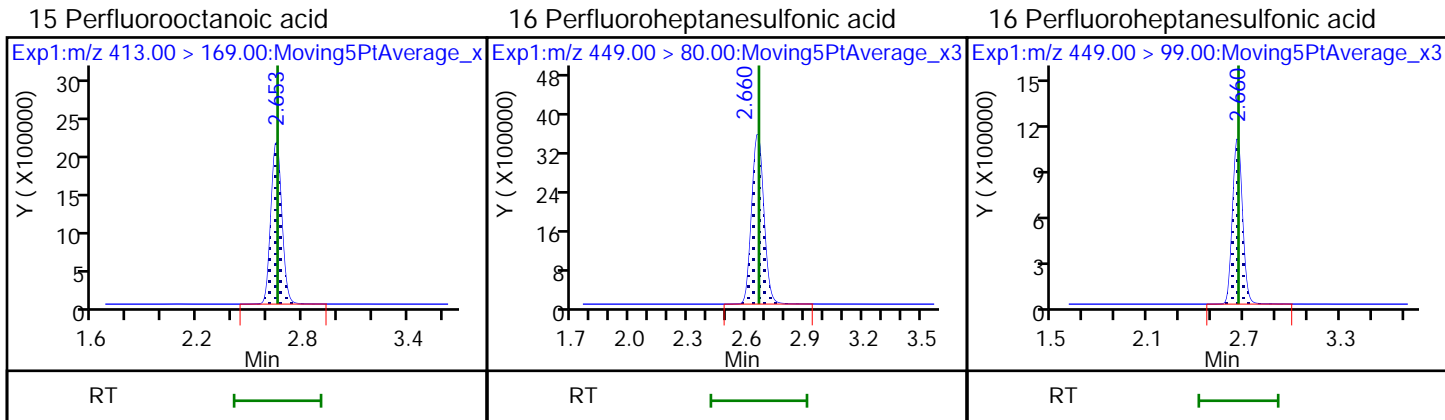
D 1 13C4 PFBA

2 Perfluorobutyric acid

D 3 13C5-PFPeA



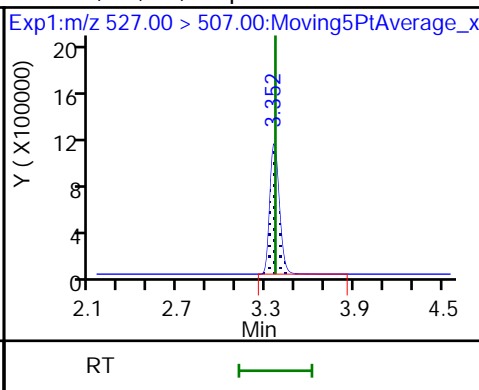
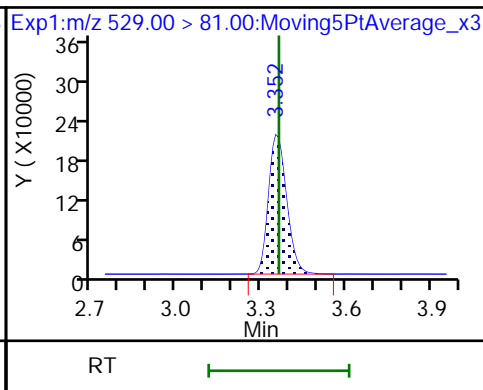
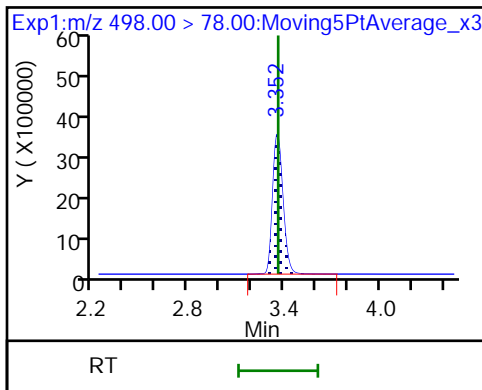




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

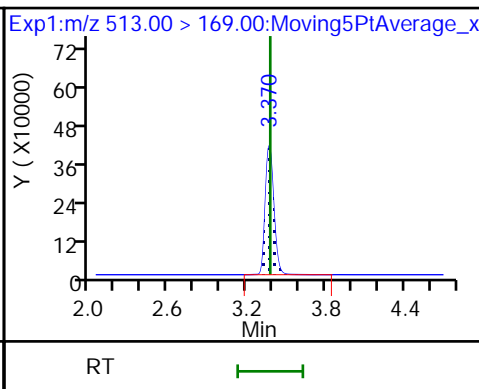
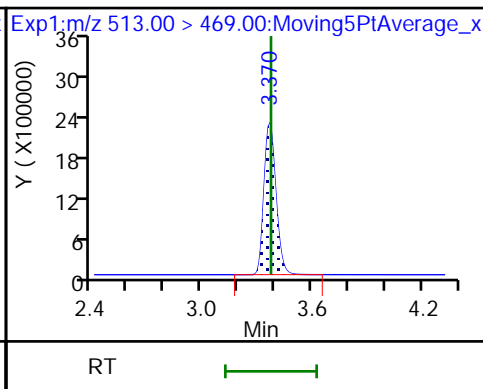
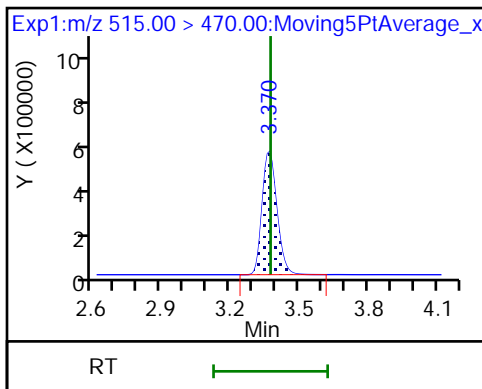
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid

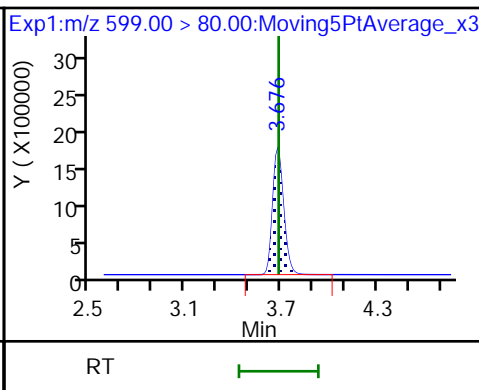
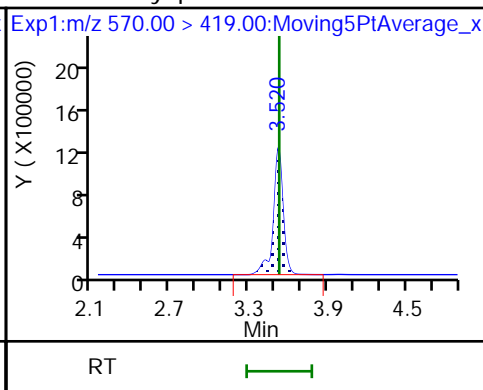
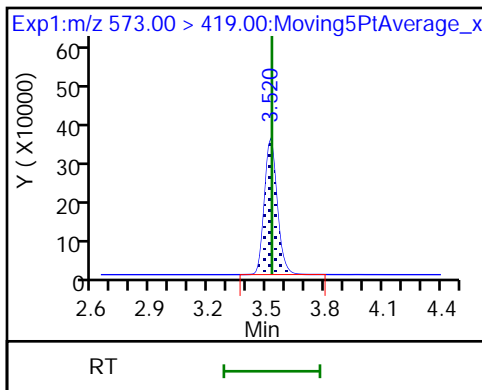
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

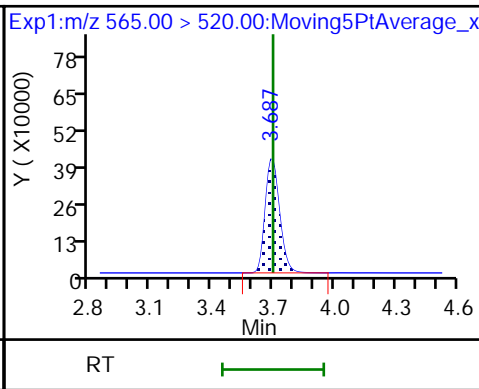
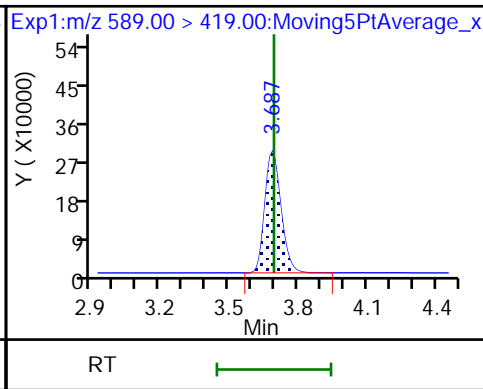
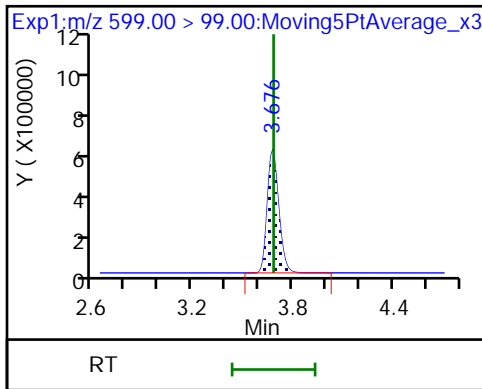
29 Perfluorodecane Sulfonic acid

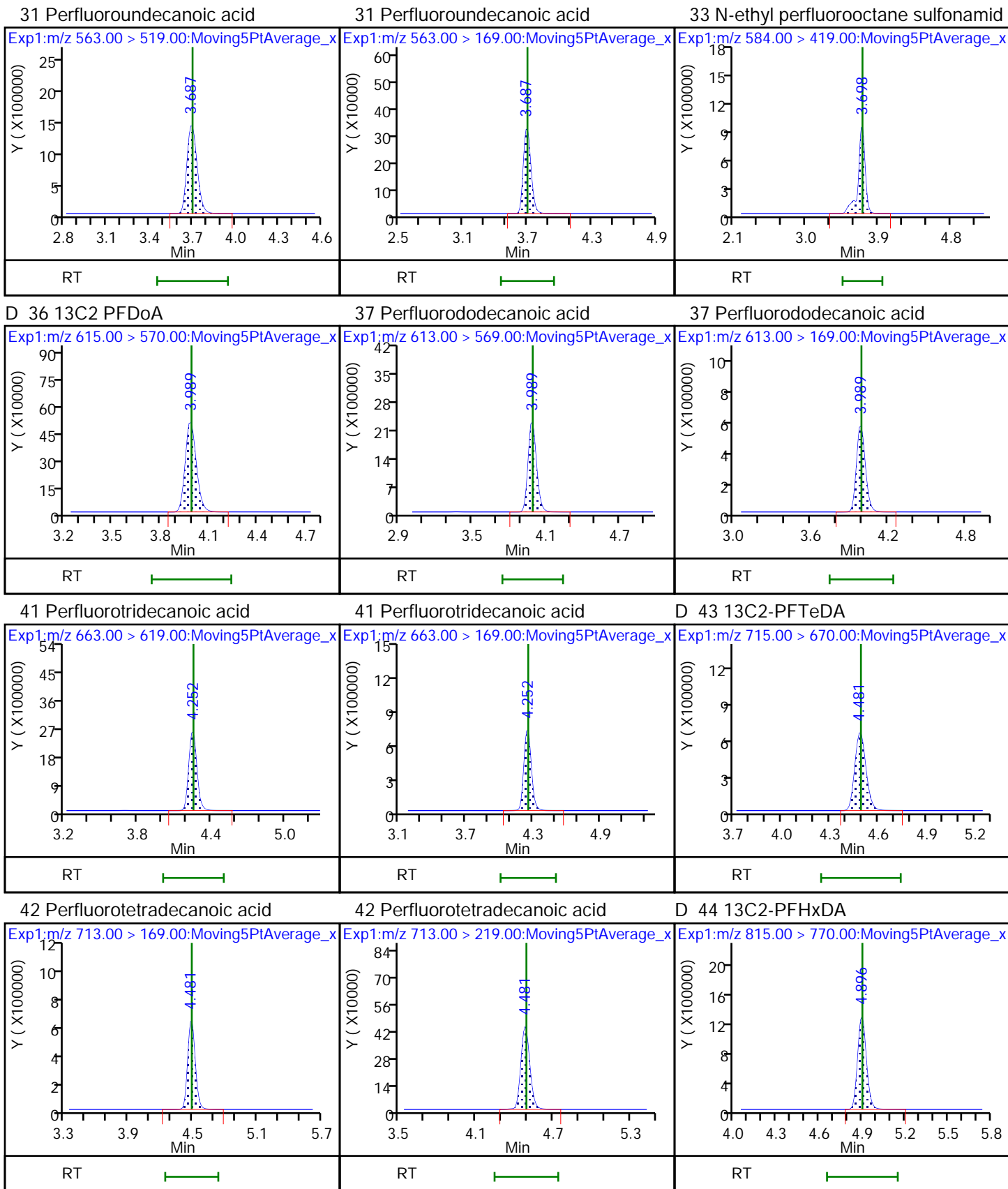


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: ICV 320-230408/10 Calibration Date: 06/22/2018 10:20
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.022LLICALA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	0.9819		2.44	2.50	-2.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.164		2.39	2.50	-4.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	81.70		2.31	2.21	4.3	30.0
4:2 FTS	AveID	16.59	16.59		2.34	2.34	0.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	1.003		2.39	2.50	-4.5	30.0
Perfluoropentanesulfonic acid	AveID	71.30	73.54		2.42	2.35	3.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.089		2.35	2.50	-6.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.065		2.14	2.28	-6.3	30.0
6:2 FTS	AveID	1.663	1.644		2.35	2.38	-1.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.137		2.33	2.50	-6.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.341		2.30	2.38	-3.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.044		2.40	2.50	-3.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.079		2.20	2.31	-5.1	30.0
8:2 FTS	AveID	1.332	1.295		2.33	2.40	-2.7	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.7482		2.34	2.40	-2.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	1.065		2.65	2.50	5.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	0.9647		2.38	2.50	-4.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	1.020		2.58	2.50	3.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6444		2.41	2.41	-0.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.9650		2.60	2.50	3.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.7480		2.32	2.50	-7.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.080		2.55	2.50	2.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	0.9467		2.54	2.50	1.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2368		2.31	2.50	-7.7	30.0
13C4 PFBA	Ave	1.423	1.349		2.37	2.50	-5.2	30.0
13C5 PFPeA	Ave	1.028	0.9649		2.35	2.50	-6.2	30.0
13C3-PFBS	Ave	0.0259	0.0234		2.10	2.33	-9.7	30.0
13C2 PFHxA	Ave	1.121	1.106		2.47	2.50	-1.4	30.0
13C4-PFHpA	Ave	1.016	0.9912		2.44	2.50	-2.5	30.0
18O2 PFHxS	Ave	1.452	1.375		2.24	2.37	-5.3	30.0
M2-6:2FTS	Ave	0.2628	0.2439		2.20	2.38	-7.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: ICV 320-230408/10 Calibration Date: 06/22/2018 10:20
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.022LLICALA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9334		2.43	2.50	-2.8	30.0
13C4 PFOS	Ave	0.9659	0.9264		2.29	2.39	-4.1	30.0
13C5 PFNA	Ave	0.7564	0.7111		2.35	2.50	-6.0	30.0
M2-8:2FTS	Ave	0.2389	0.2358		2.36	2.40	-1.3	30.0
13C8 FOSA	Ave	1.371	1.268		2.31	2.50	-7.5	30.0
13C2 PFDA	Ave	0.5733	0.5571		2.43	2.50	-2.8	30.0
d3-NMeFOSAA	Ave	0.1759	0.1840		2.62	2.50	4.6	30.0
13C2 PFUnA	Ave	0.4421	0.4299		2.43	2.50	-2.8	30.0
d5-NEtFOSAA	Ave	0.1816	0.1773		2.44	2.50	-2.4	30.0
13C2 PFDoA	Ave	0.4458	0.4223		2.37	2.50	-5.3	30.0
13C2-PFTeDA	Ave	0.4113	0.4131		2.51	2.50	0.4	30.0
13C2-PFHxDA	Ave	0.6956	0.6292		2.26	2.50	-9.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_010.d
 Lims ID: ICV Full
 Client ID:
 Sample Type: ICV
 Inject. Date: 22-Jun-2018 10:20:57 ALS Bottle#: 17 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist:
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:26:14 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 11:24:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.430	1.435	-0.005	0.539	5102651	2.37	94.8	25069	
2 Perfluorobutyric acid	212.90 > 169.00	1.430	1.437	-0.007	1.000	5010336	2.44		1715	
D 3 13C5-PFPeA	267.90 > 223.00	1.703	1.705	-0.002	0.642	3648458	2.35	93.8	47882	
4 Perfluoropentanoic acid	262.90 > 219.00	1.703	1.707	-0.004	1.000	4247982	2.39		1741	
D 47 13C3-PFBS	301.90 > 83.00	1.739	1.740	-0.001	0.655	82305	2.10	90.3	594	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.739	1.743	-0.004	1.000	6398970	2.31		77882	
	298.90 > 99.00	1.739	1.743	-0.004	1.000	2646050	2.42(1.25-3.74)		29951	
D 60 M2-4:2FTS	329.00 > 81.00	1.939	1.945	-0.006	0.731	578358	NC		9244	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.939	1.945	-0.006	1.115	1372441	2.34		40509	
D 7 13C2 PFHxA	315.00 > 270.00	1.971	1.982	-0.011	0.743	4181252	2.47	98.6	59768	
6 Perfluorohexanoic acid	313.00 > 269.00	1.982	1.984	-0.002	1.005	4192525	2.39		8625	
	313.00 > 119.00	1.971	1.984	-0.013	1.000	387726	10.81(5.03-15.10)		6669	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	1.993	2.004	-0.011	1.146	6117931	2.42		47412	
	349.00 > 99.00	1.993	2.004	-0.011	1.146	2299538	2.66(1.36-4.07)		26168	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.072	2.076	-0.004	0.781	130806	NC		3803	

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	2.072	2.077	-0.005	1.000	612024	NC		3056
D 9 13C4-PFHpA	367.00	> 322.00	2.295	2.301	-0.006	0.865	3747942	2.44	97.5	34236
10 Perfluoroheptanoic acid	363.00	> 319.00	2.295	2.302	-0.007	1.000	4080033	2.35		3648
	363.00	> 169.00	2.295	2.302	-0.007	1.000	1514474	2.69(1.13-3.40)		11802
D 11 18O2 PFHxS	403.00	> 84.00	2.308	2.314	-0.006	0.870	4918794	2.24	94.7	33464
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.308	2.314	-0.006	1.000	5049313	2.14		24628
	399.00	> 99.00	2.308	2.314	-0.006	1.000	1680492	3.00(1.50-4.49)		4887
65 Adona	377.00	> 251.00	2.334	2.345	-0.011	0.773	10842306	NC		69002
	377.00	> 85.00	2.334	2.345	-0.011	0.773	6208957	1.75(0.84-2.53)		21424
D 12 M2-6:2FTS	429.00	> 81.00	2.621	2.628	-0.007	0.988	876186	2.20	92.8	14073
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.621	2.628	-0.007	1.000	1440462	2.35		11809
D 14 13C4 PFOA	417.00	> 372.00	2.654	2.654	0.0	1.000	3529359	2.43	97.2	45039
15 Perfluorooctanoic acid	413.00	> 369.00	2.654	2.654	0.0	1.000	4012141	2.33		1796
	413.00	> 169.00	2.654	2.654	0.0	1.000	2094874	1.92(0.84-2.52)		8725
* 62 13C2-PFOA	415.00	> 370.00	2.654	2.654	0.0		3781334	2.50		34735
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.661	2.662	-0.001	0.882	4463092	2.30		35566
	449.00	> 99.00	2.661	2.662	-0.001	0.882	1172483	3.81(1.94-5.82)		16049
D 18 13C4 PFOS	503.00	> 80.00	3.018	3.018	0.001	1.137	3348736	2.29	95.9	25636
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.018	3.018	0.0	1.000	3498591	2.20		42610
	499.00	> 99.00	3.018	3.018	0.0	1.000	782403	4.47(2.31-6.93)		13465
D 19 13C5 PFNA	468.00	> 423.00	3.018	3.018	0.0	1.137	2688706	2.35	94.0	34037
20 Perfluorononanoic acid	463.00	> 419.00	3.018	3.021	-0.003	1.000	2807012	2.40		7735
	463.00	> 169.00	3.018	3.021	-0.003	1.000	684004	4.10(1.90-5.69)		17232
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.233	3.230	0.003	1.071	5692700	NC		44422
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.361	3.362	-0.001	1.113	2515842	2.34		27221
	549.00	> 99.00	3.361	3.362	-0.001	1.113	885320	2.84(1.33-3.97)		7735
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.361	3.363	-0.002	1.000	1108696	2.33		34746
D 26 M2-8:2FTS	529.00	> 81.00	3.361	3.364	-0.003	1.266	854064	2.36	98.7	21091

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.370	3.370	0.0	1.270	4796224	2.31		92.5	37885	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.370	3.371	-0.001	1.000	5107190	2.65			53636	
D 23 13C2 PFDA										
515.00 > 470.00	3.379	3.376	0.003	1.273	2106525	2.43		97.2	35947	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.379	3.378	0.001	1.000	2032098	2.38			5519	
513.00 > 169.00	3.379	3.378	0.001	1.000	374355		5.43(2.36-7.09)		11790	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.529	3.528	0.001	1.330	695898	2.62		105	13816	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.529	3.531	-0.002	1.000	709812	2.58			10009	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.687	3.686	0.001	1.221	2178115	2.41			90546	
599.00 > 99.00	3.687	3.686	0.001	1.221	670334		3.25(1.39-4.16)		11666	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.698	3.697	0.001	1.393	670333	2.44		97.6	2842	
D 30 13C2 PFUnA										
565.00 > 520.00	3.698	3.702	-0.004	1.393	1625713	2.43		97.2	32956	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.698	3.702	-0.004	1.000	646862	2.60			10016	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.698	3.702	-0.004	1.000	1215995	2.32			4406	
563.00 > 169.00	3.698	3.702	-0.004	1.000	320203		3.80(2.12-6.36)		12961	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.855	3.860	-0.005	1.277	7980943	NC			91121	
D 36 13C2 PFDaA										
615.00 > 570.00	3.989	3.995	-0.006	1.503	1597005	2.37		94.7	12780	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.999	3.995	0.004	1.003	1725081	2.55			489	
613.00 > 169.00	3.989	3.995	-0.006	1.000	420383		4.10(2.13-6.40)		7946	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.252	4.254	-0.002	1.066	1511902	2.54			462	
663.00 > 169.00	4.252	4.254	-0.002	1.066	501002		3.02(1.25-3.76)		5222	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.491	4.490	0.001	1.692	1561971	2.51		100	6912	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.491	4.490	0.001	1.000	369875	2.31			5152	
713.00 > 219.00	4.481	4.490	-0.009	0.998	254992		1.45(0.71-2.13)		4805	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.888	4.894	-0.006	1.842	2379102	2.26		90.5	5805	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.888	4.895	-0.007	1.000	2223880	NC			292	
813.00 > 169.00	4.888	4.895	-0.007	1.000	352723		6.30(2.86-8.58)		2251	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.234	5.239	-0.005	1.071	2897226	NC			757	
913.00 > 169.00	5.234	5.239	-0.005	1.071	344050		8.42(3.83-11.48)		3144	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFCIC_FULL_00011

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_010.d

Injection Date: 22-Jun-2018 10:20:57

Instrument ID: A8_N

Lims ID: ICV Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 17

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

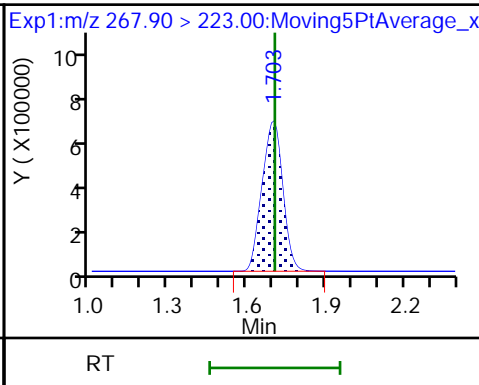
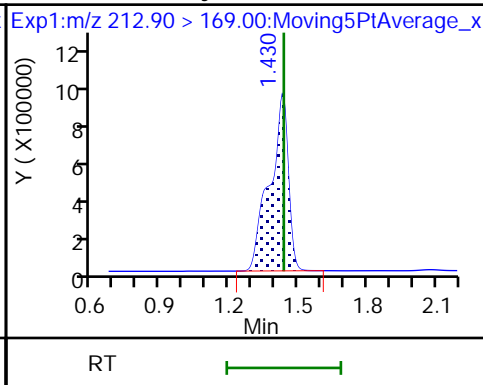
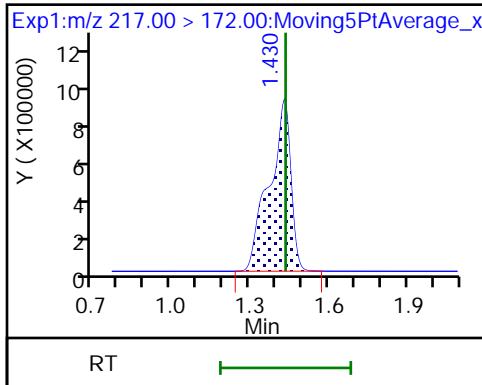
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

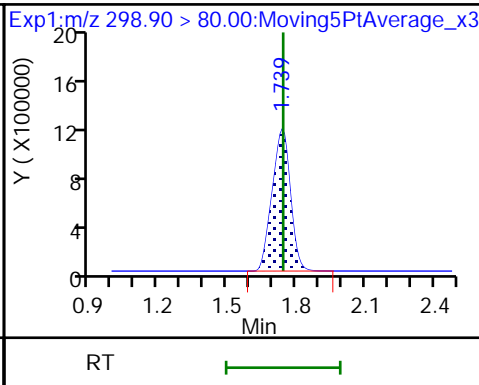
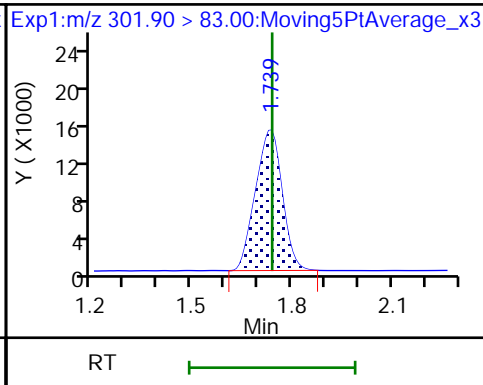
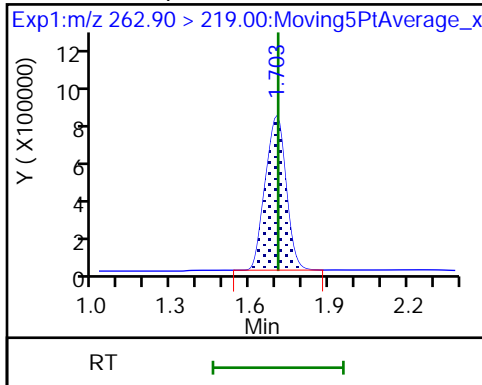
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

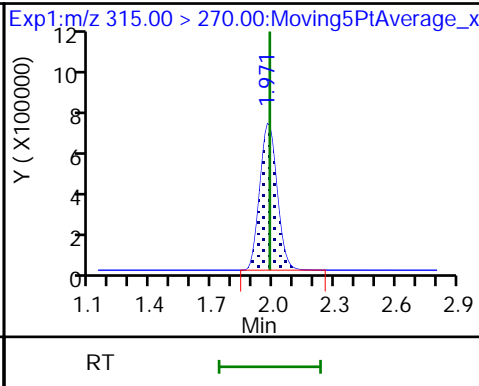
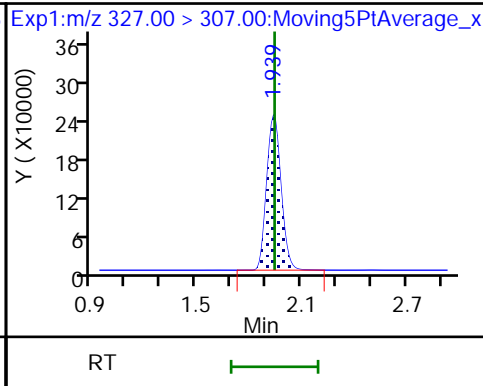
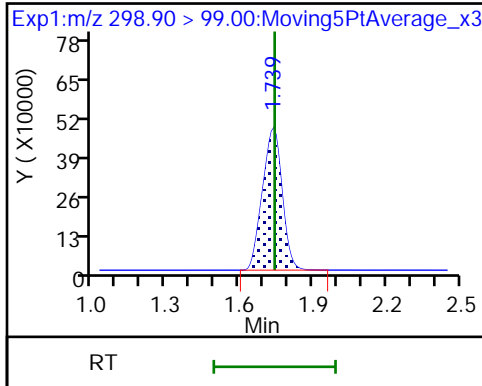
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

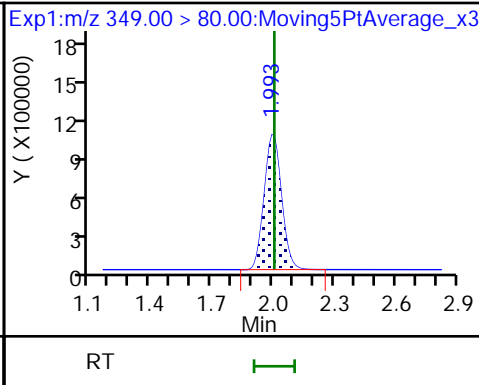
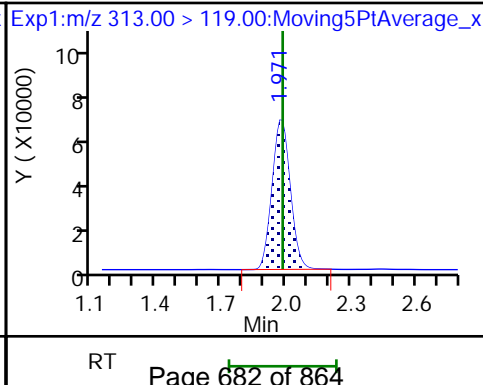
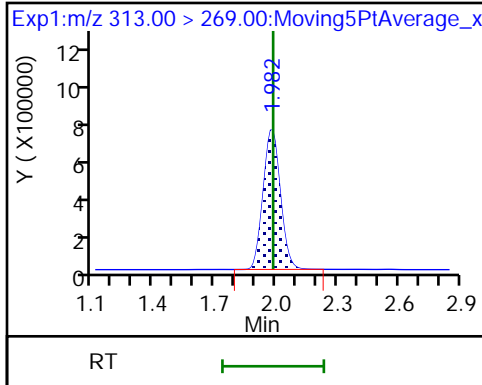
D 7 13C2 PFHxA

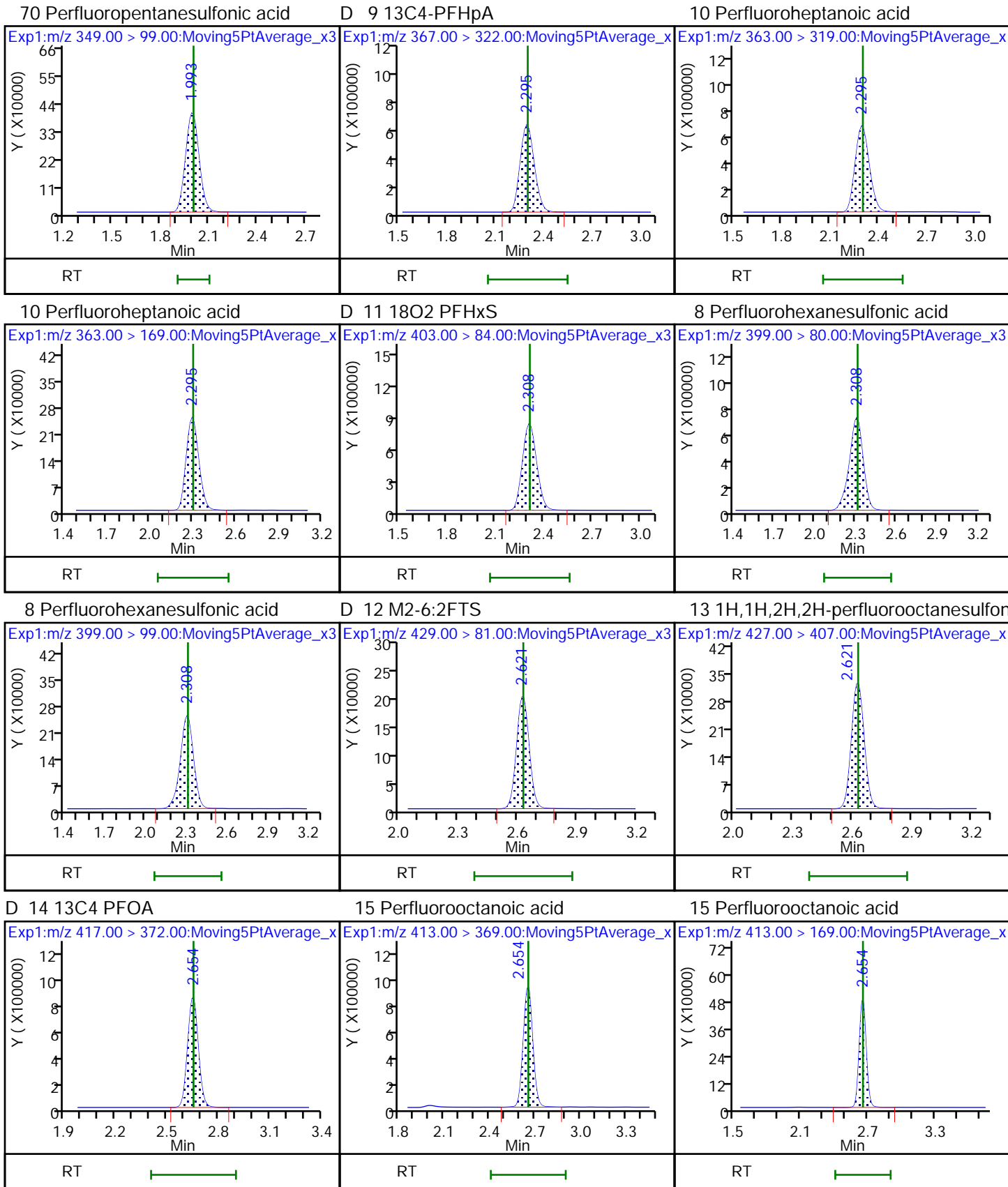


6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

70 Perfluoropentanesulfonic acid

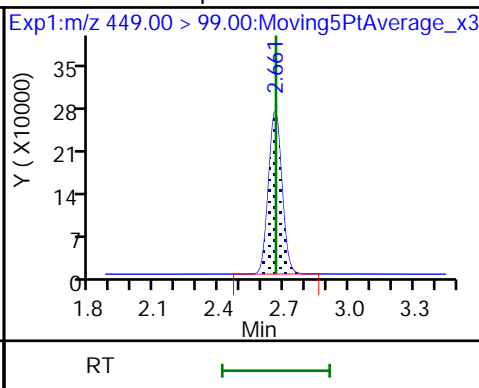
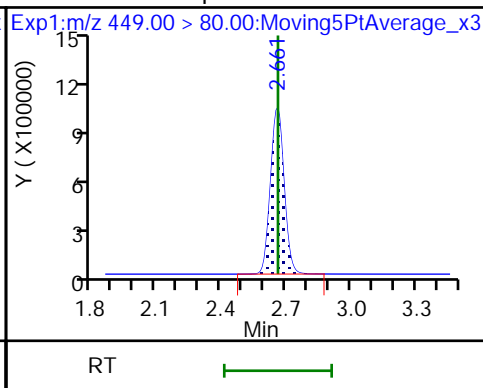
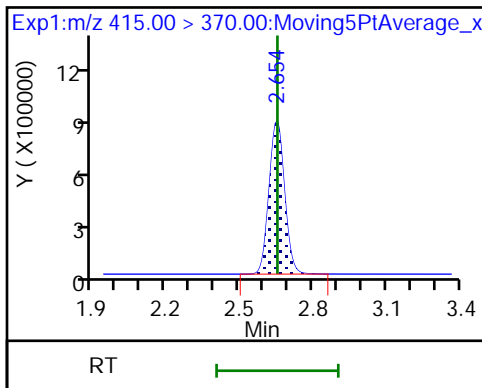




* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

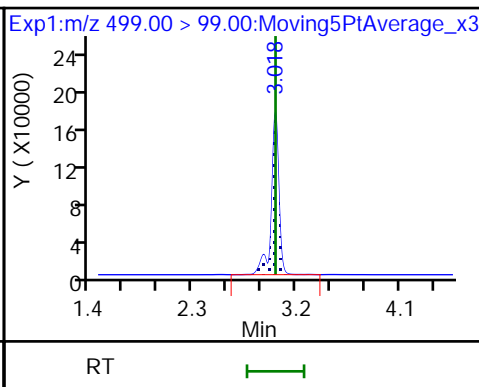
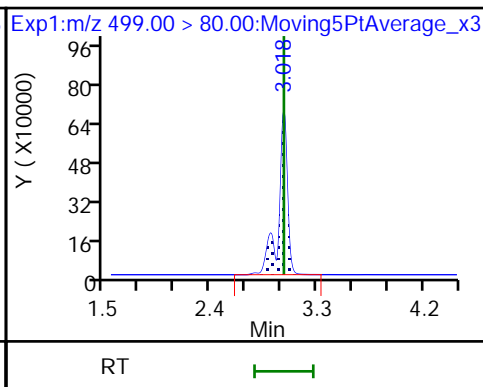
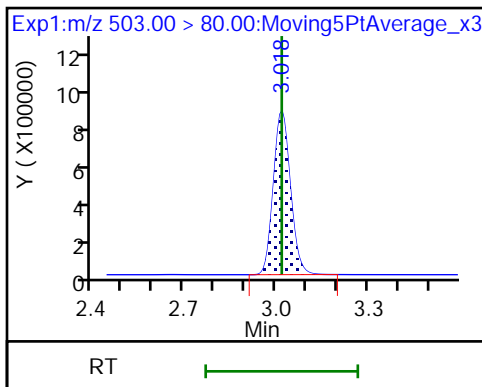
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

17 Perfluorooctane sulfonic acid

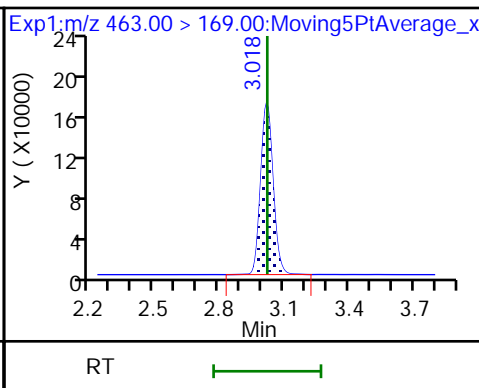
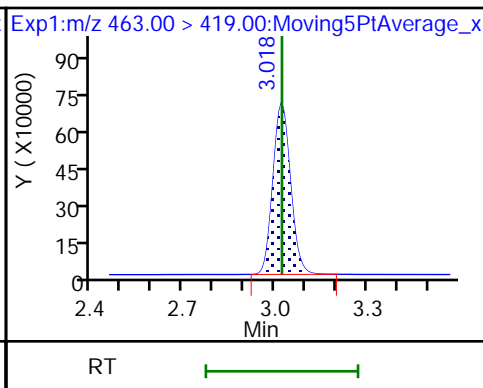
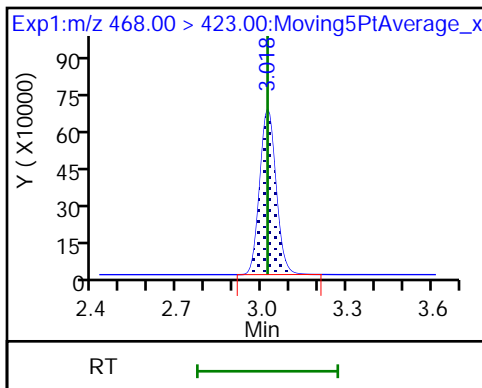
17 Perfluorooctane sulfonic acid



D 19 13C5 PFNA

20 Perfluorononanoic acid

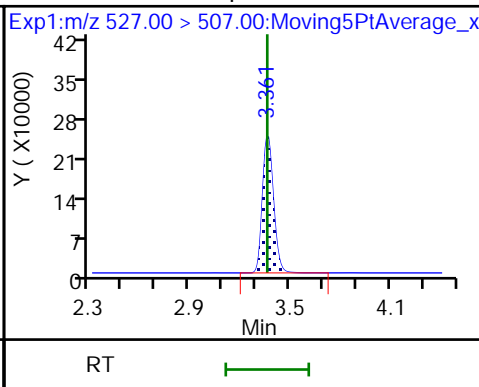
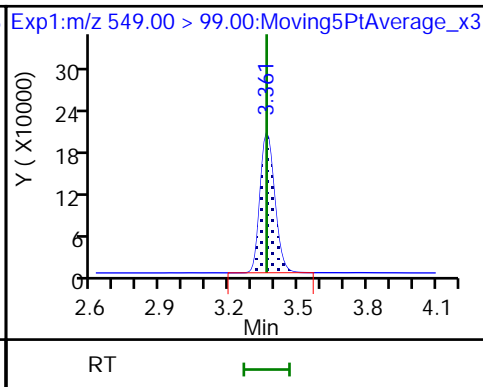
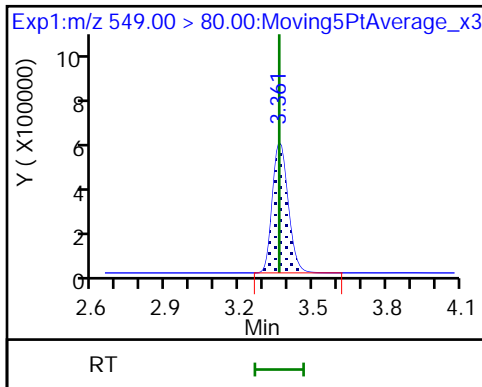
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

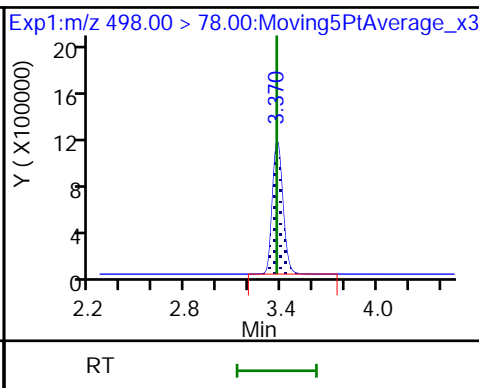
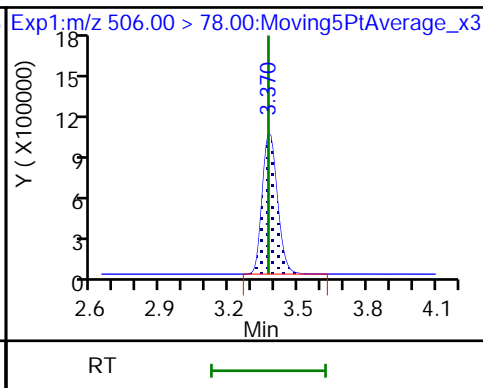
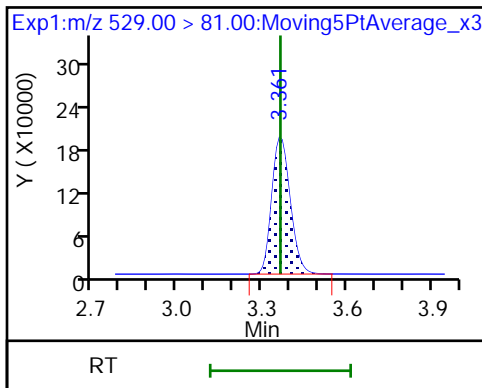
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

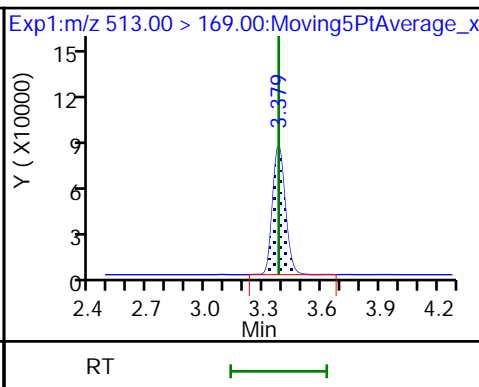
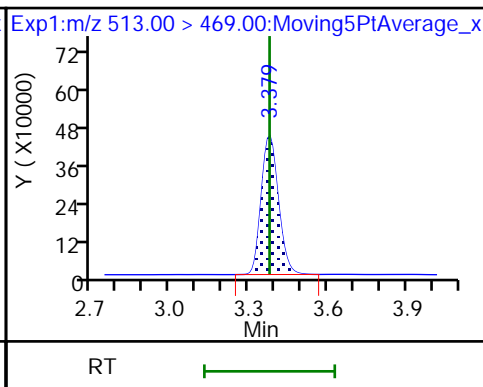
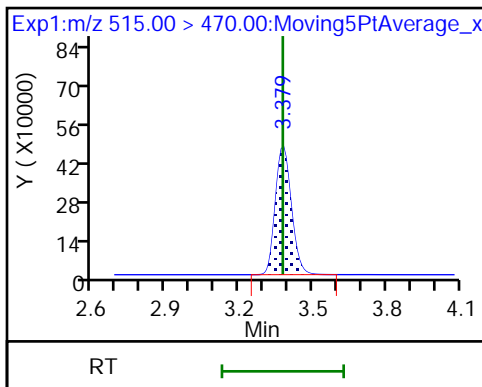
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid

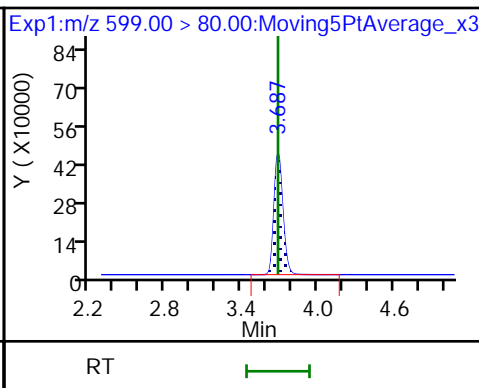
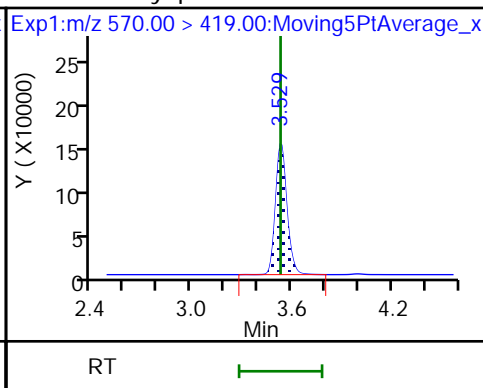
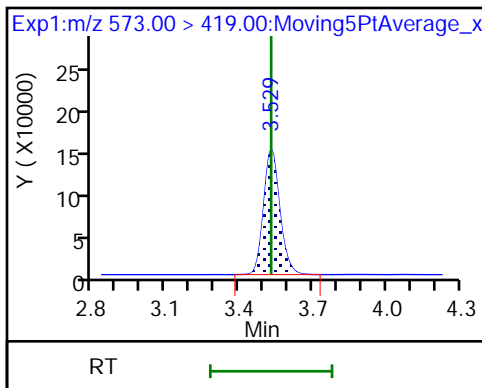
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

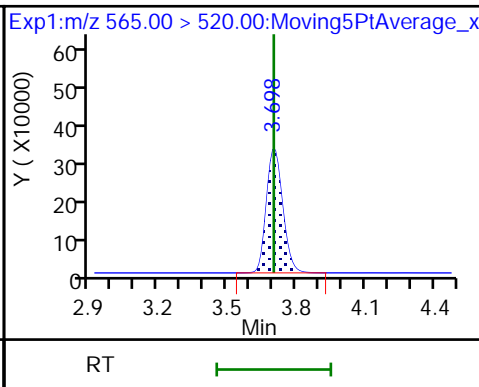
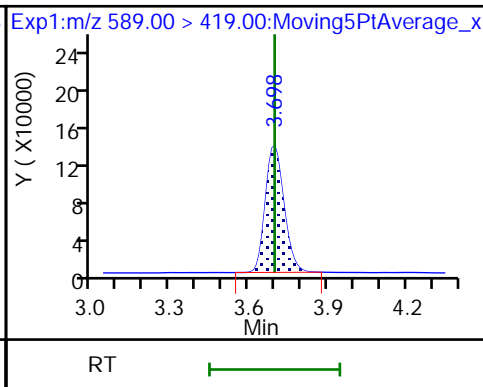
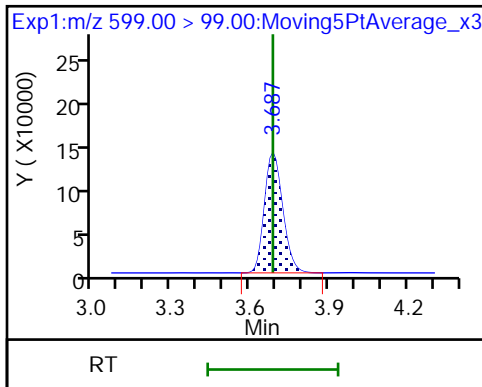
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

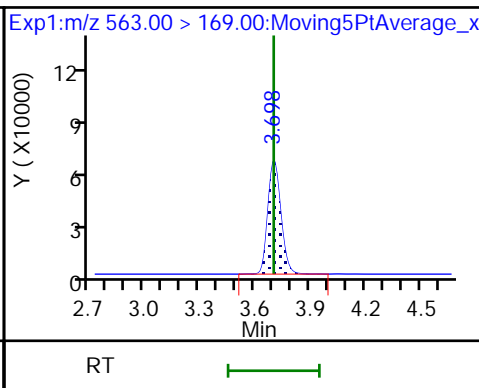
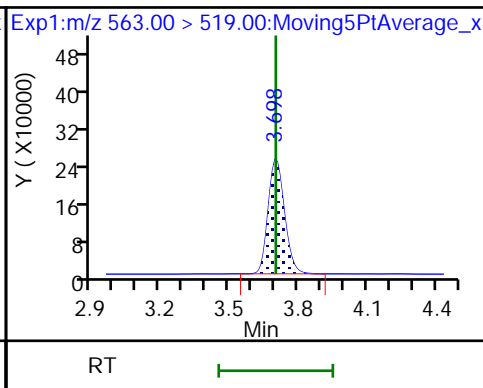
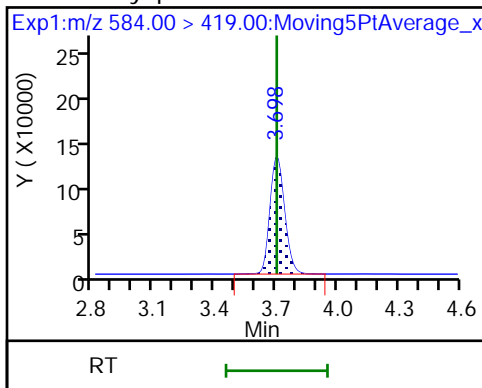
D 30 13C2 PFUnA



33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

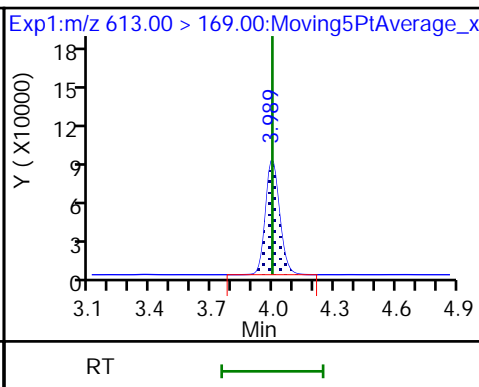
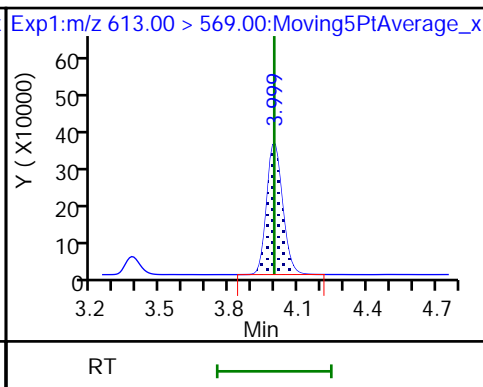
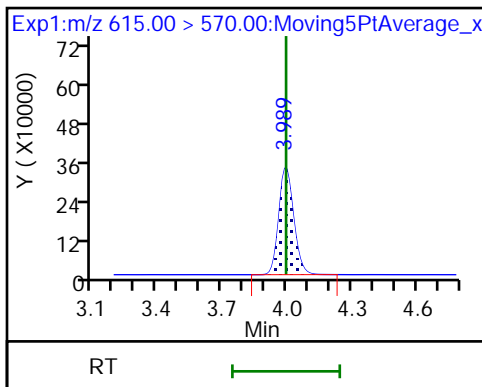
31 Perfluoroundecanoic acid



D 36 13C2 PFDoA

37 Perfluorododecanoic acid

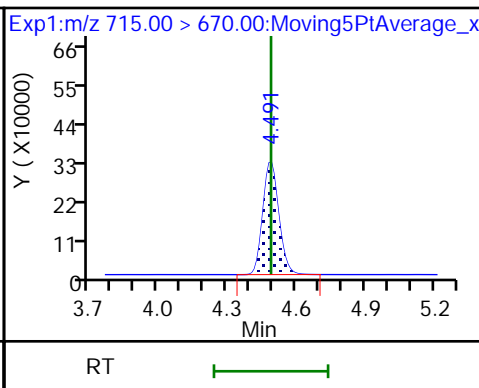
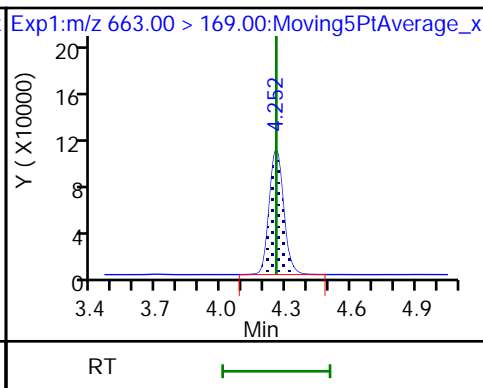
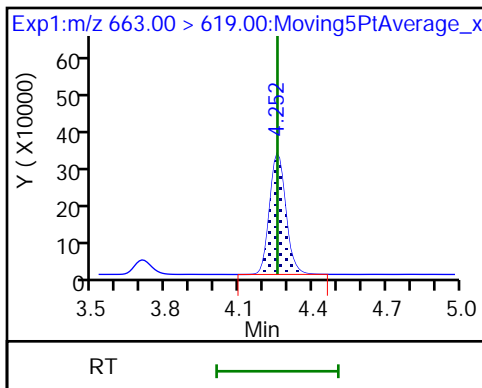
37 Perfluorododecanoic acid



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

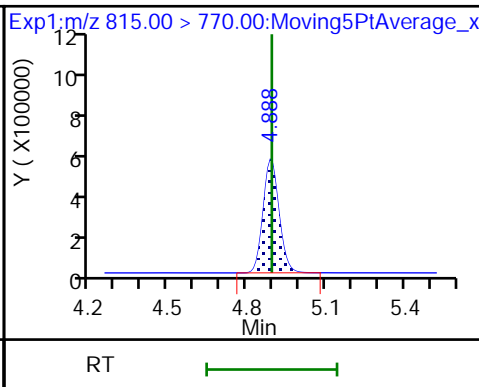
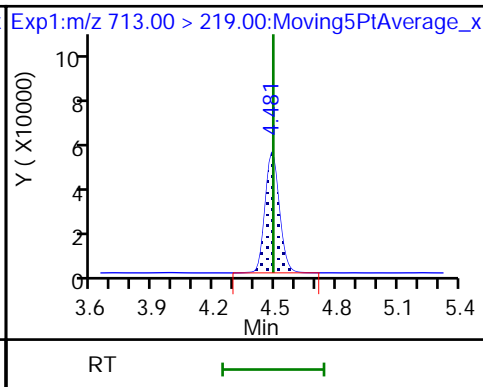
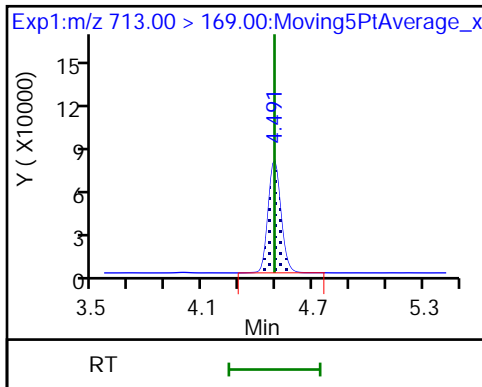
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-231134/2 Calibration Date: 06/26/2018 23:24
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	0.996		0.0495	0.0500	-1.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.271		0.0523	0.0500	4.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	74.78		0.0422	0.0442	-4.5	30.0
4:2 FTS	AveID	16.59	18.25		0.400	0.0467	10.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	1.102		0.0525	0.0500	5.0	30.0
Perfluoropentanesulfonic acid	AveID	71.30	71.31		0.0469	0.0469	0.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.123		0.0485	0.0500	-3.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.247		0.0499	0.0455	9.7	30.0
6:2 FTS	AveID	1.663	1.826		0.0520	0.0474	9.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.235		0.0507	0.0501	1.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.454		0.0500	0.0476	4.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.172		0.0539	0.0500	7.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.230		0.0502	0.0464	8.1	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	0.9636		0.0479	0.0500	-4.2	30.0
8:2 FTS	AveID	1.332	1.402		0.0504	0.0479	5.3	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.7606		0.0476	0.0480	-0.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	0.9942		0.0490	0.0500	-2.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	1.135		0.400	0.0500	14.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6778		0.0506	0.0482	4.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.9667		0.0521	0.0500	4.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.8648		0.0537	0.0500	7.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.181		0.0558	0.0500	11.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	1.137		0.0610	0.0500	22.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2996		0.0584	0.0500	16.8	30.0
13C4 PFBA	Ave	1.423	1.395		2.45	2.50	-2.0	30.0
13C5 PFPeA	Ave	1.028	1.033		2.51	2.50	0.5	30.0
13C3-PFBS	Ave	0.0259	0.0256		2.29	2.33	-1.4	30.0
13C2 PFHxA	Ave	1.121	1.130		2.52	2.50	0.8	30.0
13C4-PFHpA	Ave	1.016	1.051		2.59	2.50	3.4	30.0
1802 PFHxS	Ave	1.452	1.418		2.31	2.37	-2.3	30.0
M2-6:2FTS	Ave	0.2628	0.2597		2.35	2.38	-1.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-231134/2 Calibration Date: 06/26/2018 23:24
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9736		2.54	2.50	1.4	30.0
13C4 PFOS	Ave	0.9659	0.9495		2.35	2.39	-1.7	30.0
13C5 PFNA	Ave	0.7564	0.7541		2.49	2.50	-0.3	30.0
13C8 FOSA	Ave	1.371	1.380		2.52	2.50	0.6	30.0
M2-8:2FTS	Ave	0.2389	0.2689		2.70	2.40	12.6	30.0
13C2 PFDA	Ave	0.5733	0.5907		2.58	2.50	3.0	30.0
d3-NMeFOSAA	Ave	0.1759	0.1919		2.73	2.50	9.1	30.0
13C2 PFUnA	Ave	0.4421	0.4468		2.53	2.50	1.1	30.0
d5-NEtFOSAA	Ave	0.1816	0.2111		2.91	2.50	16.2	30.0
13C2 PFDoA	Ave	0.4458	0.4110		2.30	2.50	-7.8	30.0
13C2-PFTeDA	Ave	0.4113	0.3900		2.37	2.50	-5.2	30.0
13C2-PFHxDA	Ave	0.6956	0.6557		2.36	2.50	-5.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_002.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 26-Jun-2018 23:24:51 ALS Bottle#: 21 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCVL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 27-Jun-2018 13:49:41 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK028

First Level Reviewer: ruangyotsakuld Date: 27-Jun-2018 13:49:41

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	1.441	1.441	0.0	1.000	92333	0.0495		99.0	48.6	
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.447	-0.006	0.537	4637252	2.45		98.0	40361	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.712	1.711	0.001	1.000	87306	0.0523		105	29.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.712	1.721	-0.009	0.638	3434164	2.51		100	55239	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.748	1.747	0.001	1.000	112358	0.0422		95.5	208	
298.90 > 99.00	1.748	1.747	0.001	1.000	46555		2.41(1.25-3.74)		186	
D 47 13C3-PFBS										
301.90 > 83.00	1.748	1.757	-0.009	0.651	79031	2.29		98.6	578	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.960	1.959	0.001	1.122	28964	0.0514		110	1260	
D 60 M2-4:2FTS										
329.00 > 81.00	1.960	1.971	-0.011	0.731	565459	NC			10078	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.993	1.992	0.001	1.000	82782	0.0525		105	177	
313.00 > 119.00	1.993	1.992	0.001	1.000	9941		8.33(5.03-15.10)		238	
D 7 13C2 PFHxA										
315.00 > 270.00	1.993	2.005	-0.012	0.743	3755669	2.52		101	93450	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.016	2.014	0.002	1.153	113685	0.0469		100	2507	
349.00 > 99.00	2.016	2.014	0.002	1.153	44289		2.57(1.36-4.07)		781	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.095	2.093	0.002	1.000	15013	NC			68.4	

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	2.095	2.106	-0.011	0.781	121693	NC			3520	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.321	2.319	0.002	1.000	78466	0.0485		96.9	93.1	
363.00 > 169.00	2.321	2.319	0.002	1.000	32144		2.44(1.13-3.40)		360	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.334	2.332	0.002	1.000	107002	0.0499		110	1444	
399.00 > 99.00	2.334	2.332	0.002	1.000	33826		3.16(1.50-4.49)		140	
D 9 13C4-PFHpA										
367.00 > 322.00	2.321	2.334	-0.013	0.865	3493979	2.59		103	36365	
D 11 18O2 PFHxS										
403.00 > 84.00	2.334	2.347	-0.013	0.870	4458669	2.31		97.7	41284	
65 Adona										
377.00 > 251.00	2.373	2.372	0.001	0.778	193699	NC			3299	
377.00 > 85.00	2.373	2.372	0.001	0.778	121727		1.59(0.84-2.53)		494	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.660	2.660	0.0	1.000	29879	0.0520		110	491	
D 12 M2-6:2FTS										
429.00 > 81.00	2.660	2.667	-0.007	0.992	820104	2.35		98.8	17590	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.683	2.682	0.001	1.000	80016	0.0507		101	26.3	
413.00 > 169.00	2.683	2.682	0.001	1.000	38510		2.08(0.84-2.52)		367	
* 62 13C2-PFOA										
415.00 > 370.00	2.683	2.682	0.001		3323617	2.50			31633	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.690	2.690	0.0	0.882	87370	0.0500		105	3055	
449.00 > 99.00	2.690	2.690	0.0	0.882	22556		3.87(1.94-5.82)		593	
D 14 13C4 PFOA										
417.00 > 372.00	2.683	2.690	-0.007	1.000	3235724	2.54		101	42792	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.057	3.051	0.006	1.002	72022	0.0502		108	2041	M
499.00 > 99.00	3.057	3.051	0.006	1.002	15341		4.69(2.31-6.93)		259	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.057	3.058	-0.001	1.000	58738	0.0539		108	114	
463.00 > 169.00	3.057	3.058	-0.001	1.000	14270		4.12(1.90-5.69)		1230	
D 18 13C4 PFOS										
503.00 > 80.00	3.050	3.060	-0.010	1.137	3016837	2.35		98.3	38444	
D 19 13C5 PFNA										
468.00 > 423.00	3.057	3.066	-0.009	1.139	2506204	2.49		99.7	39902	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.264	3.265	-0.001	1.070	111764	NC			1373	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.376	3.379	-0.003	1.000	88389	0.0479		95.8	2429	
D 21 13C8 FOSA										
506.00 > 78.00	3.376	3.389	-0.013	1.258	4586632	2.52		101	60342	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.404	3.407	-0.003	1.116	46082	0.0476		99.1	2610	
549.00 > 99.00	3.404	3.407	-0.003	1.116	19469		2.37(1.33-3.97)		199	

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	3.404	3.407	-0.003	1.000	24005	0.0504	105	725
24 Perfluorodecanoic acid	513.00	> 469.00	3.423	3.416	0.007	1.003	39036	0.0490	98.0	134
	513.00	> 169.00	3.413	3.416	-0.003	1.000	6881	5.67(2.36-7.09)		383
D 26 M2-8:2FTS	529.00	> 81.00	3.404	3.417	-0.013	1.269	856066	2.70	113	31576
D 23 13C2 PFDA	515.00	> 470.00	3.413	3.427	-0.014	1.272	1963195	2.58	103	36391
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.572	3.574	-0.002	1.000	14473	0.0574	115	223
D 27 d3-NMeFOSAA	573.00	> 419.00	3.572	3.576	-0.004	1.331	637665	2.73	109	22672
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.737	3.729	0.008	1.225	41239	0.0506	105	2841
	599.00	> 99.00	3.727	3.729	-0.002	1.222	14071	2.93(1.39-4.16)		578
31 Perfluoroundecanoic acid	563.00	> 519.00	3.748	3.750	-0.002	1.000	25685	0.0537	107	88.6
	563.00	> 169.00	3.758	3.750	0.008	1.003	5720	4.49(2.12-6.36)		364
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.748	3.750	-0.002	1.000	13562	0.0521	104	133
D 32 d5-NEtFOSAA	589.00	> 419.00	3.748	3.751	-0.003	1.397	701470	2.91	116	1761
D 30 13C2 PFUnA	565.00	> 520.00	3.748	3.751	-0.003	1.397	1485015	2.53	101	38850
66 11-Chloroeicosafuoro-3-oxaundecan	631.00	> 451.00	3.904	3.907	-0.003	1.280	137276	NC		4809
37 Perfluorododecanoic acid	613.00	> 569.00	4.047	4.050	-0.003	1.000	32261	0.0558	112	7.4
	613.00	> 169.00	4.047	4.050	-0.003	1.000	8266	3.90(2.13-6.40)		217
D 36 13C2 PFDaA	615.00	> 570.00	4.047	4.051	-0.004	1.509	1366038	2.30	92.2	9900
41 Perfluorotridecanoic acid	663.00	> 619.00	4.317	4.318	-0.001	1.067	31054	0.0610	122	7.5
	663.00	> 169.00	4.306	4.318	-0.012	1.064	9058	3.43(1.25-3.76)		137
42 Perfluorotetradecanoic acid	713.00	> 169.00	4.561	4.563	-0.002	1.002	7767	0.0584	117	117
	713.00	> 219.00	4.551	4.563	-0.012	1.000	4946	1.57(0.71-2.13)		95.1
D 43 13C2-PFTeDA	715.00	> 670.00	4.551	4.564	-0.013	1.696	1296182	2.37	94.8	5634
45 Perfluorohexadecanoic acid	813.00	> 769.00	4.982	4.984	-0.002	1.000	60686	NC		7.1
	813.00	> 169.00	4.982	4.984	-0.002	1.000	9976	6.08(2.86-8.58)		173
D 44 13C2-PFHxDA	815.00	> 770.00	4.982	4.984	-0.002	1.857	2179186	2.36	94.3	6670
46 Perfluorooctadecanoic acid	913.00	> 869.00	5.362	5.364	-0.002	1.076	52494	NC		10.5
	913.00	> 169.00	5.355	5.364	-0.009	1.075	6634	7.91(3.83-11.48)		120

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_002.d

Injection Date: 26-Jun-2018 23:24:51

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 21

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

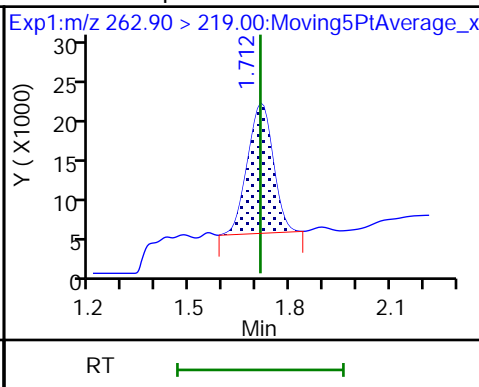
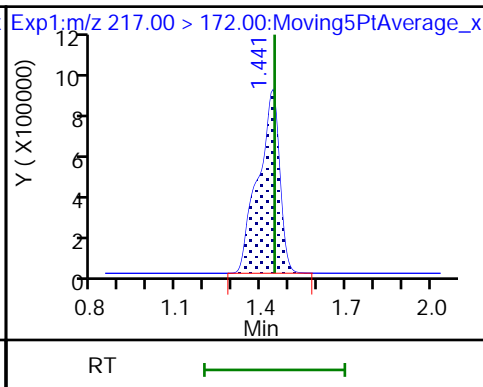
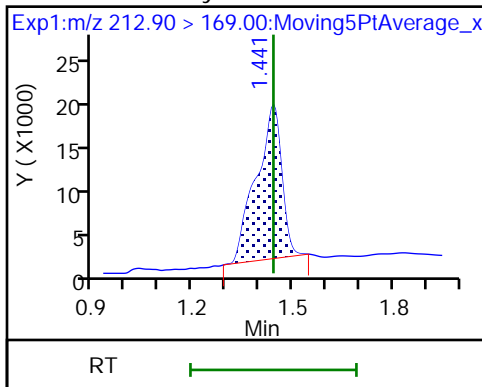
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

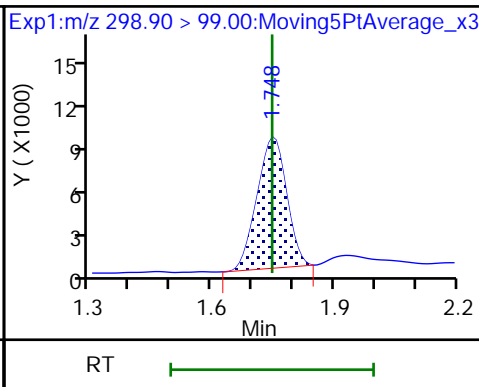
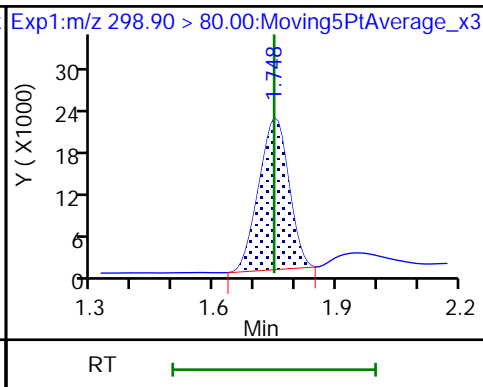
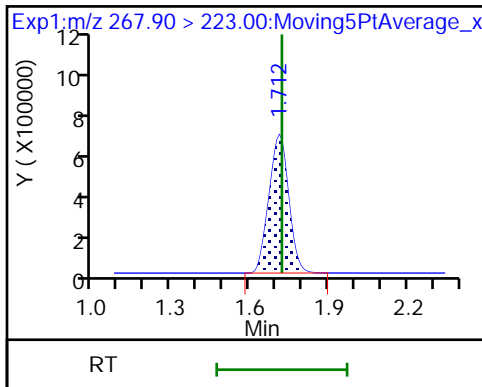
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

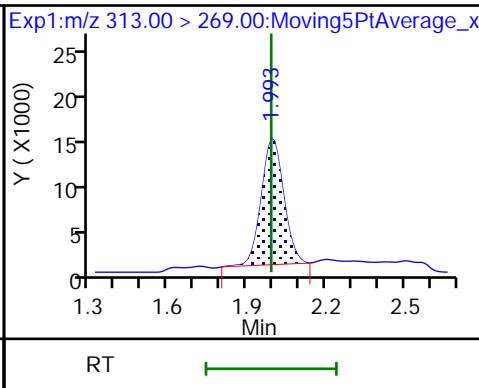
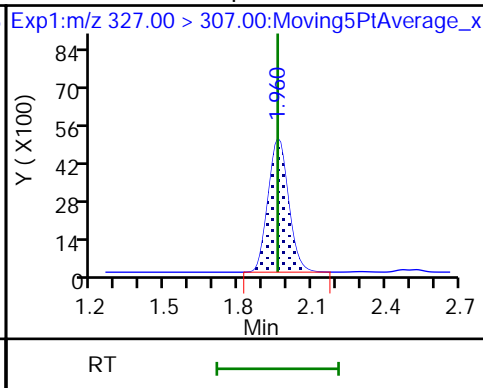
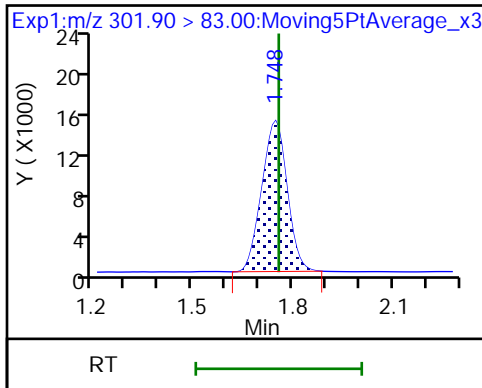
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

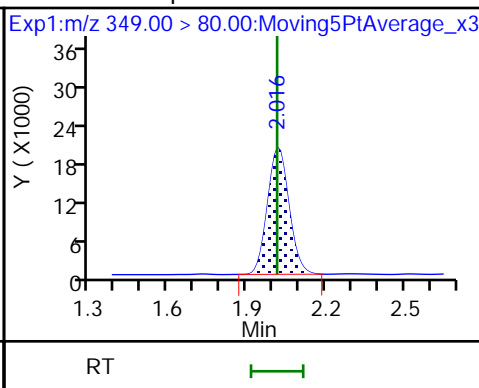
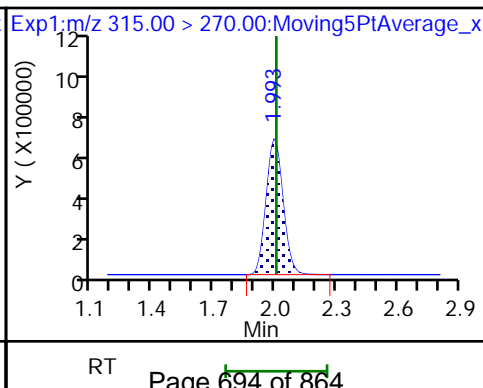
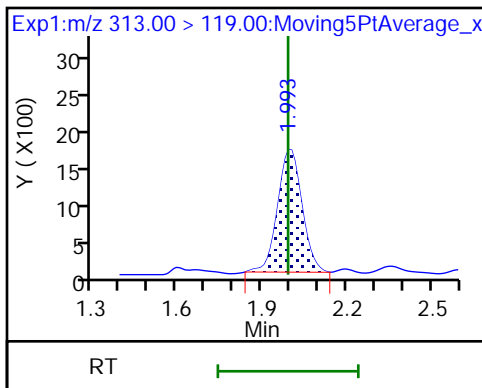
6 Perfluorohexanoic acid

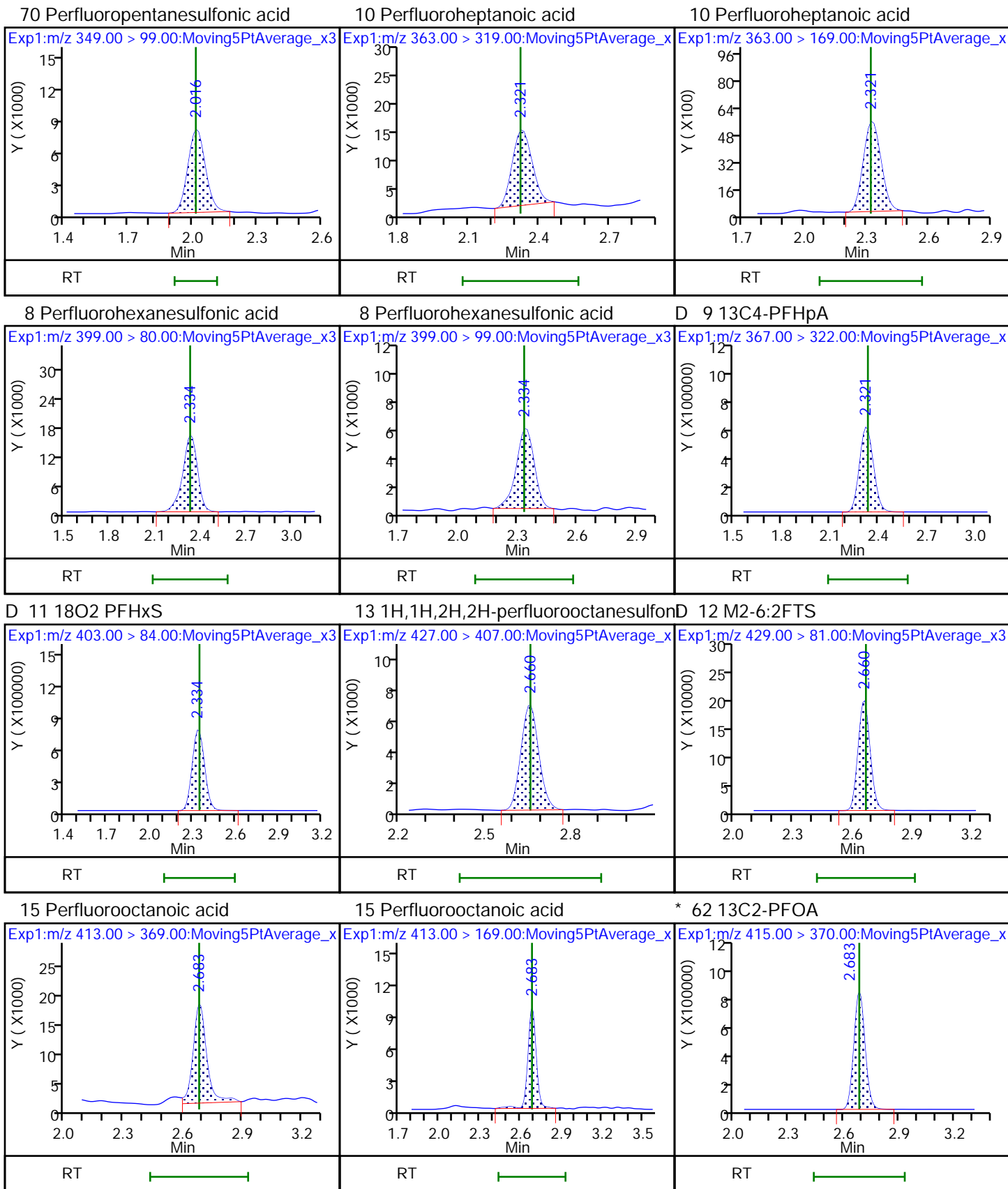


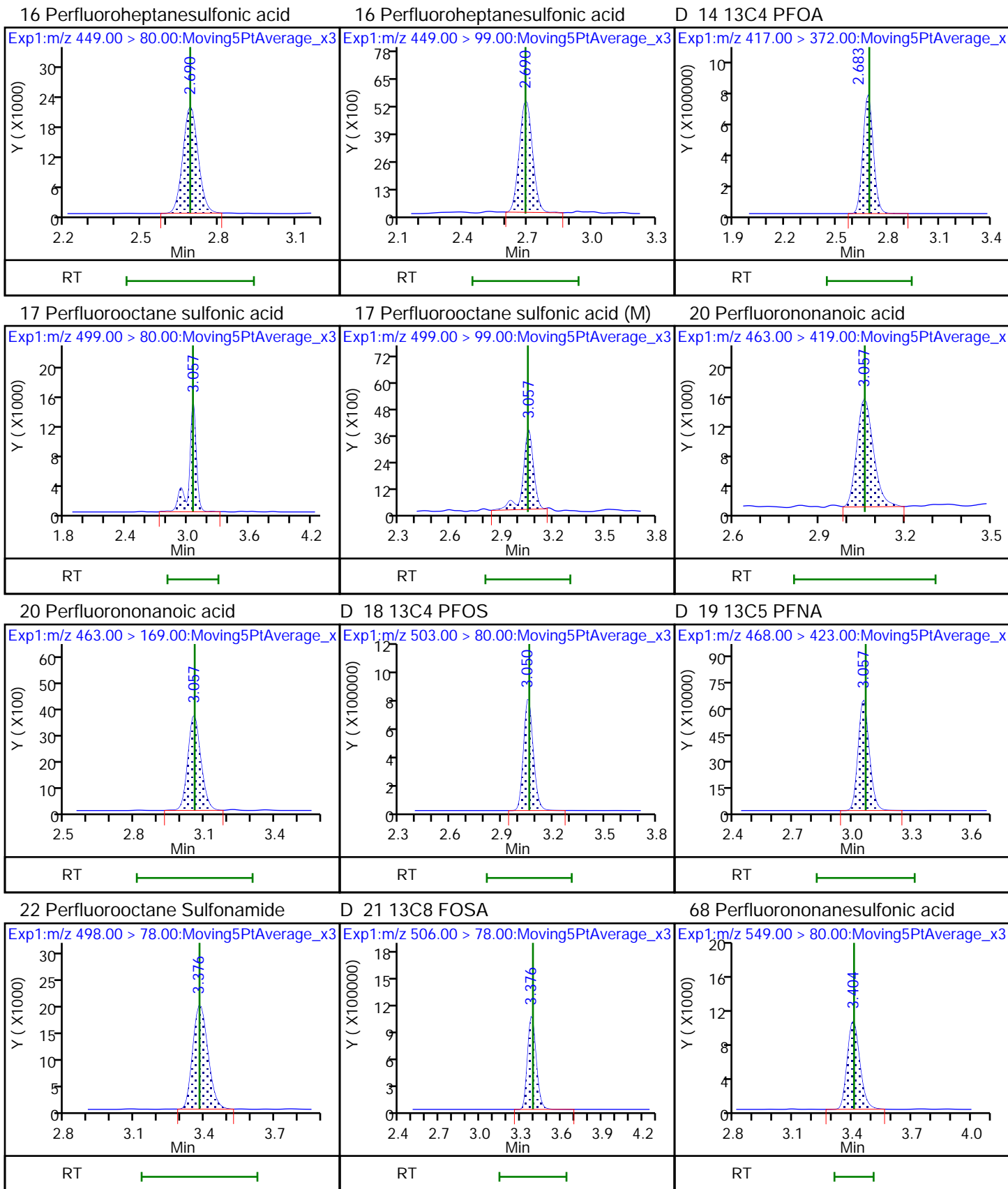
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



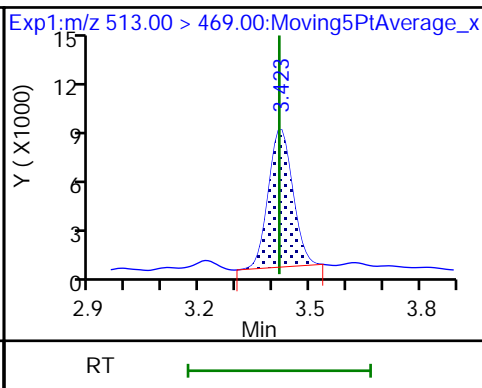
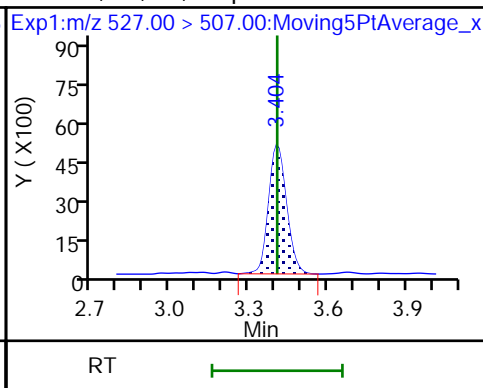
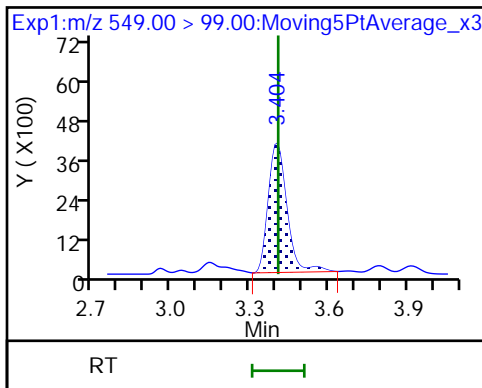




68 Perfluorononanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

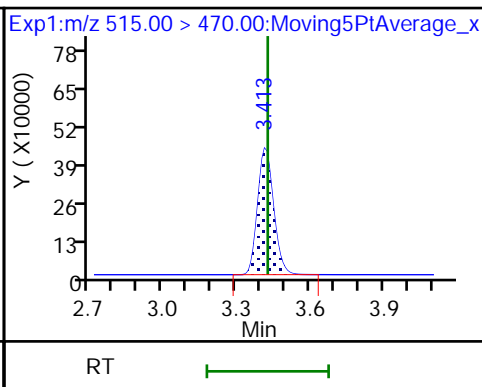
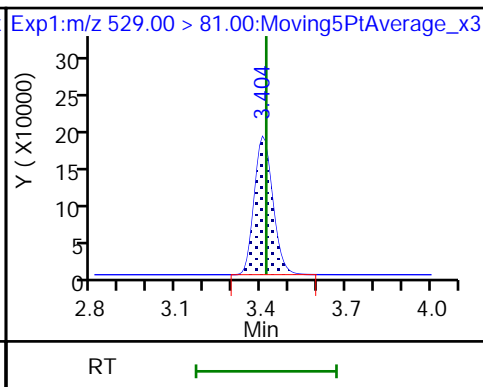
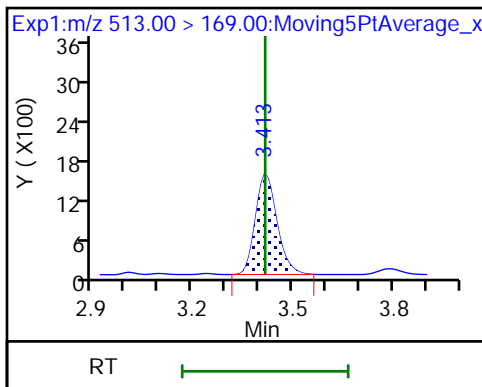
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 26 M2-8:2FTS

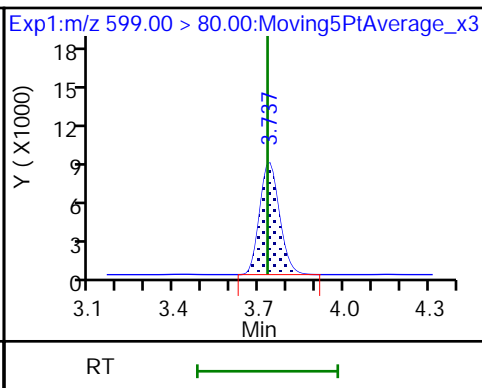
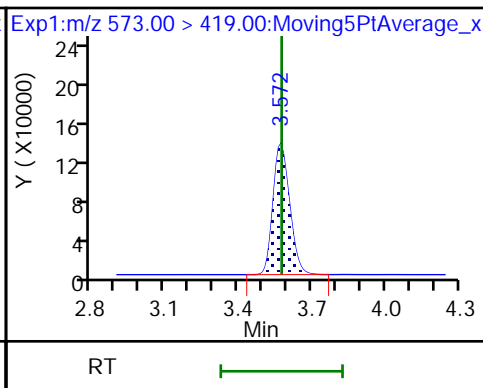
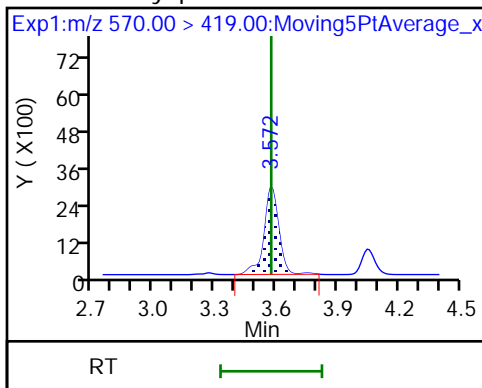
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamiD

27 d3-NMeFOSAA

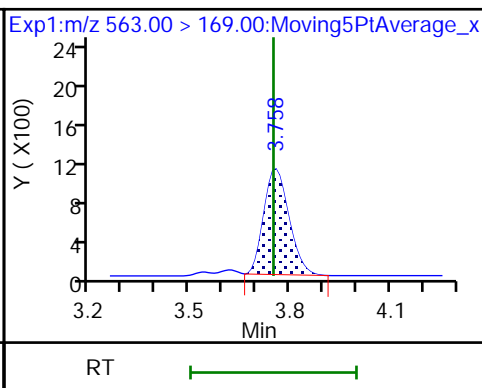
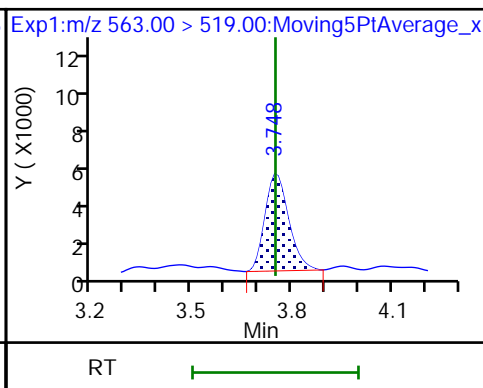
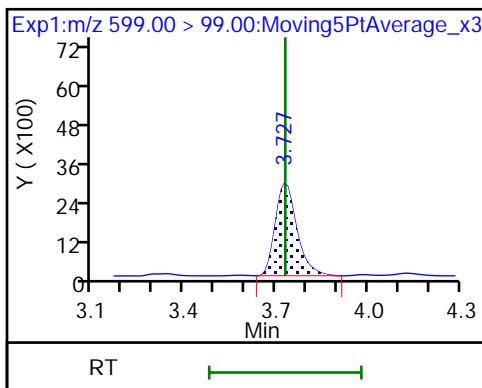
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

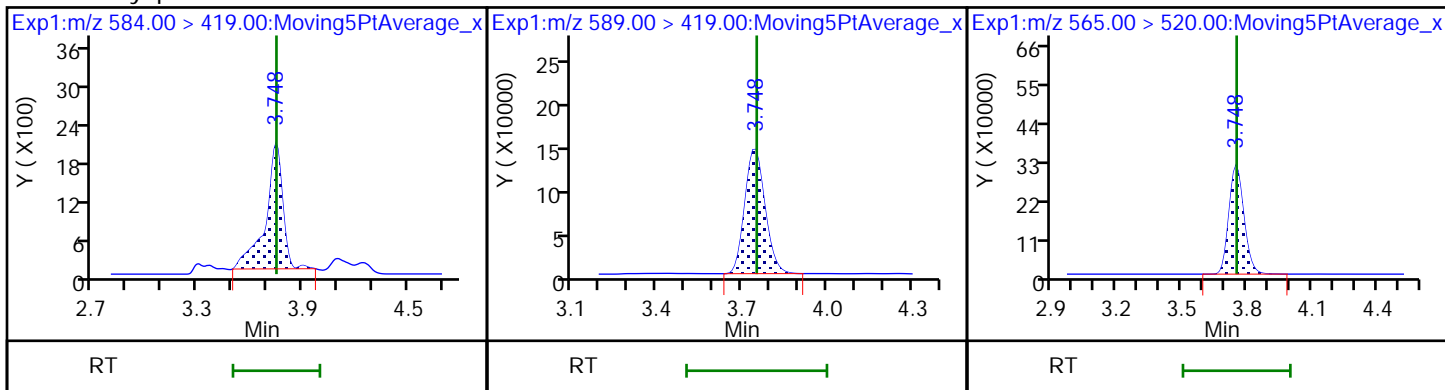
31 Perfluoroundecanoic acid

31 Perfluoroundecanoic acid



33 N-ethyl perfluorooctane sulfonamid D 32 d5-NEtFOSAA

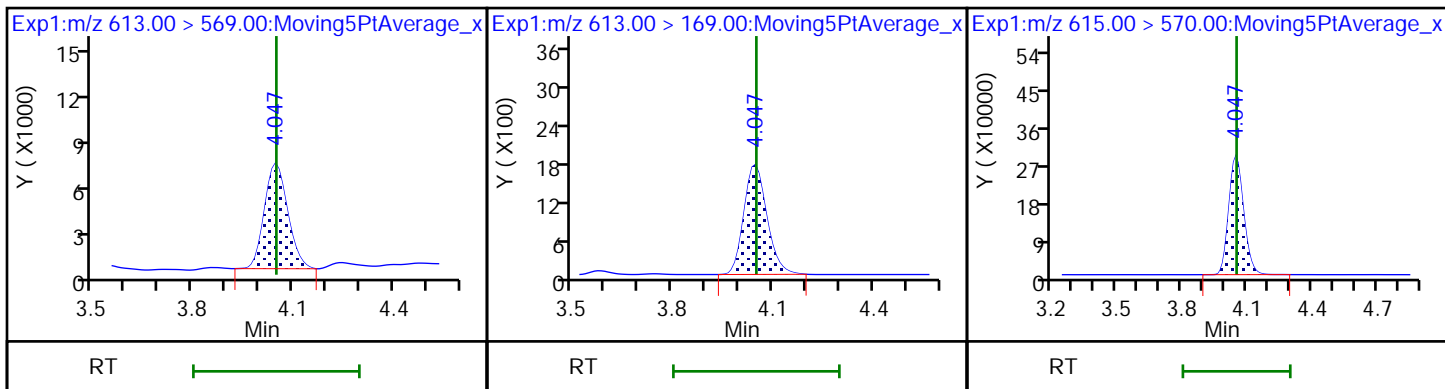
D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

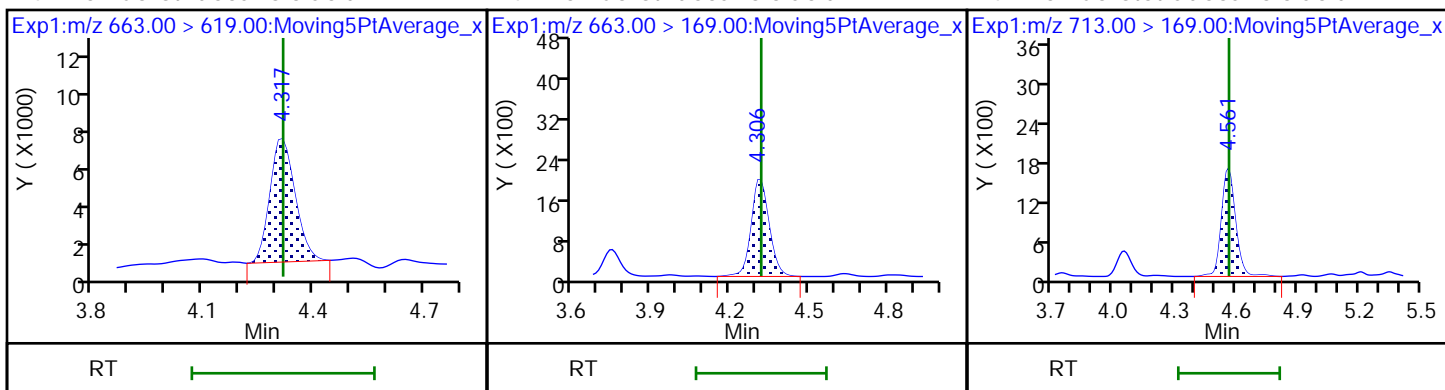
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

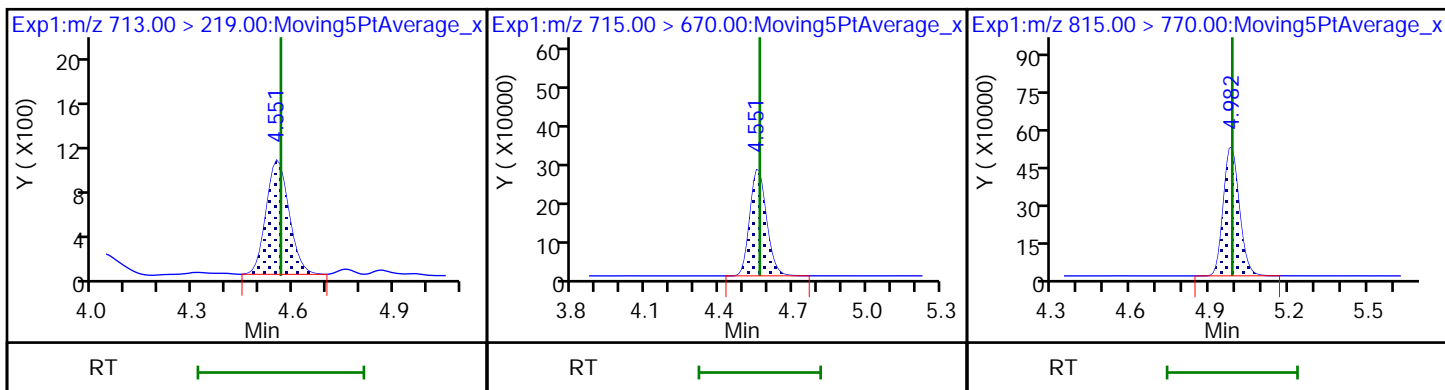
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento

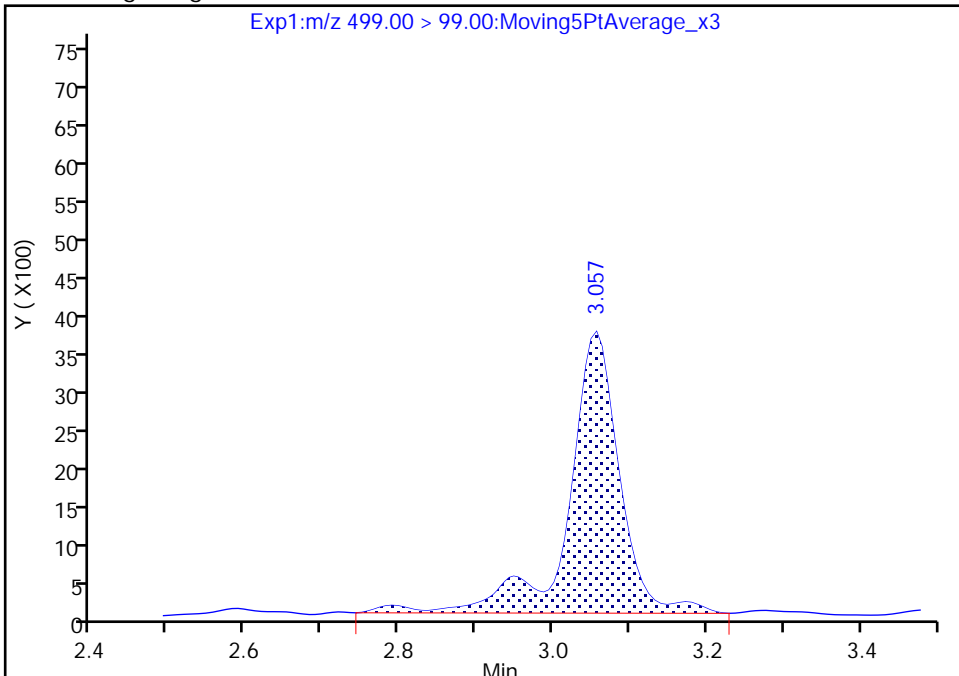
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_002.d
Injection Date: 26-Jun-2018 23:24:51 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

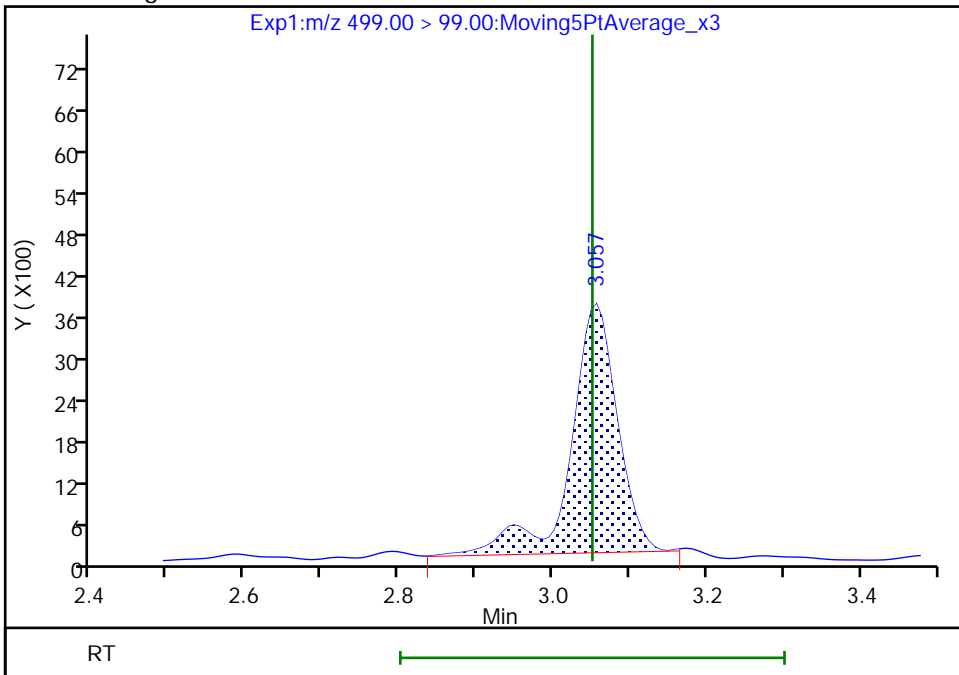
RT: 3.06
Area: 17265
Amount: 0.050161
Amount Units: ng/ml

Processing Integration Results



RT: 3.06
Area: 15341
Amount: 0.050161
Amount Units: ng/ml

Manual Integration Results



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231134/3 Calibration Date: 06/26/2018 23:32
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	0.9751		0.970	1.00	-3.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.131		0.930	1.00	-7.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	76.87		0.868	0.884	-1.8	30.0
4:2 FTS	AveID	16.59	17.33		0.976	0.934	4.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	1.021		0.973	1.00	-2.7	30.0
Perfluoropentanesulfonic acid	AveID	71.30	68.07		0.896	0.938	-4.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.132		0.977	1.00	-2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.095		0.877	0.910	-3.7	30.0
6:2 FTS	AveID	1.663	1.623		0.926	0.948	-2.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.229		1.01	1.00	0.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.375		0.945	0.952	-0.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.143		0.933	0.928	0.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.060		0.976	1.00	-2.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	0.9897		0.984	1.00	-1.6	30.0
8:2 FTS	AveID	1.332	1.348		0.970	0.958	1.2	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.7692		0.962	0.960	0.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	1.053		1.04	1.00	3.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	0.9509		0.961	1.00	-3.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6540		0.976	0.964	1.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.8788		0.947	1.00	-5.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.7502		0.932	1.00	-6.8	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.064		1.01	1.00	0.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	0.9903		1.06	1.00	6.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2519		0.982	1.00	-1.8	30.0
13C4 PFBA	Ave	1.423	1.399		2.46	2.50	-1.7	30.0
13C5 PFPeA	Ave	1.028	1.048		2.55	2.50	1.9	30.0
13C3-PFBS	Ave	0.0259	0.0261		2.34	2.33	0.6	30.0
13C2 PFHxA	Ave	1.121	1.161		2.59	2.50	3.6	30.0
13C4-PFHpA	Ave	1.016	1.033		2.54	2.50	1.7	30.0
18O2 PFHxS	Ave	1.452	1.413		2.30	2.37	-2.7	30.0
M2-6:2FTS	Ave	0.2628	0.2723		2.46	2.38	3.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231134/3 Calibration Date: 06/26/2018 23:32
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9412		2.45	2.50	-2.0	30.0
13C4 PFOS	Ave	0.9659	0.9760		2.41	2.39	1.0	30.0
13C5 PFNA	Ave	0.7564	0.7411		2.45	2.50	-2.0	30.0
13C8 FOSA	Ave	1.371	1.397		2.55	2.50	1.9	30.0
M2-8:2FTS	Ave	0.2389	0.2464		2.47	2.40	3.1	30.0
13C2 PFDA	Ave	0.5733	0.5452		2.38	2.50	-4.9	30.0
d3-NMeFOSAA	Ave	0.1759	0.1962		2.79	2.50	11.5	30.0
d5-NEtFOSAA	Ave	0.1816	0.2087		2.87	2.50	15.0	30.0
13C2 PFUnA	Ave	0.4421	0.4201		2.38	2.50	-5.0	30.0
13C2 PFDoA	Ave	0.4458	0.4102		2.30	2.50	-8.0	30.0
13C2-PFTeDA	Ave	0.4113	0.3887		2.36	2.50	-5.5	30.0
13C2-PFHxDA	Ave	0.6956	0.6640		2.39	2.50	-4.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_003.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 26-Jun-2018 23:32:39 ALS Bottle#: 13 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 27-Jun-2018 13:51:01 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK028

First Level Reviewer: ruangyotsakuld Date: 27-Jun-2018 13:51:01

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	1.441	1.441	0.0	1.004	2008500	0.9698	97.0	1007	
D 1 13C4 PFBA	217.00 > 172.00	1.435	1.447	-0.012	0.535	5149316	2.46	98.3	40102	
4 Perfluoropentanoic acid	262.90 > 219.00	1.711	1.711	0.0	1.000	1745423	0.9300	93.0	648	
D 3 13C5-PFPeA	267.90 > 223.00	1.711	1.721	-0.010	0.638	3858322	2.55	102	49506	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.747	1.747	0.0	1.000	2608492	0.8679	98.2	8793	
	298.90 > 99.00	1.747	1.747	0.0	1.000	1103944	2.36(1.25-3.74)		4955	
D 47 13C3-PFBS	301.90 > 83.00	1.747	1.757	-0.010	0.651	89251	2.34	101	553	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.959	1.959	0.0	1.122	621525	0.9761	105	28325	
D 60 M2-4:2FTS	329.00 > 81.00	1.959	1.971	-0.012	0.730	656826	NC		14901	
6 Perfluorohexanoic acid	313.00 > 269.00	1.992	1.992	0.0	1.000	1745851	0.9726	97.3	3813	
	313.00 > 119.00	1.992	1.992	0.0	1.000	157455	11.09(5.03-15.10)		4050	
D 7 13C2 PFHxA	315.00 > 270.00	1.992	2.005	-0.013	0.742	4276001	2.59	104	70210	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.014	2.014	0.0	1.153	2451109	0.8955	95.5	54207	
	349.00 > 99.00	2.014	2.014	0.0	1.153	933618	2.63(1.36-4.07)		12791	
67 Perfluoro(2-propoxypropanoic) acid	329.10 > 285.00	2.093	2.093	0.0	1.000	271776	NC		1315	

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	2.093	2.106	-0.013	0.780	127886	NC			4555	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.319	2.319	0.0	1.000	1723270	0.9772		97.7	1982	
363.00 > 169.00	2.319	2.319	0.0	1.000	657472		2.62(1.13-3.40)		6941	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.332	2.332	0.0	1.000	2073033	0.8767		96.3	15127	
399.00 > 99.00	2.332	2.332	0.0	1.000	678437		3.06(1.50-4.49)		3018	
D 9 13C4-PFHpA										
367.00 > 322.00	2.319	2.334	-0.015	0.865	3804862	2.54		102	42787	
D 11 18O2 PFHxS										
403.00 > 84.00	2.332	2.347	-0.015	0.869	4919454	2.30		97.3	30763	
65 Adona										
377.00 > 251.00	2.372	2.372	0.0	0.777	4531092	NC			45976	
377.00 > 85.00	2.372	2.372	0.0	0.777	2660423		1.70(0.84-2.53)		11203	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.660	2.660	0.0	1.003	617159	0.9257		97.6	10560	
D 12 M2-6:2FTS										
429.00 > 81.00	2.652	2.667	-0.015	0.989	952414	2.46		104	22440	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.682	2.682	0.0	1.000	1705864	1.01		101	829	
413.00 > 169.00	2.682	2.682	0.0	1.000	851574		2.00(0.84-2.52)		5609	
* 62 13C2-PFOA										
415.00 > 370.00	2.682	2.682	0.0		3681597	2.50			40325	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.690	2.690	0.0	0.882	1881152	0.9446		99.2	25308	
449.00 > 99.00	2.690	2.690	0.0	0.882	491375		3.83(1.94-5.82)		11766	
D 14 13C4 PFOA										
417.00 > 372.00	2.682	2.690	-0.008	1.000	3465215	2.45		98.0	51775	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.051	3.051	0.0	1.000	1525132	0.9329		101	20047	M
499.00 > 99.00	3.051	3.051	0.0	1.000	339496		4.49(2.31-6.93)		6888	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.058	3.058	0.0	1.002	1157167	0.9762		97.6	2672	
463.00 > 169.00	3.058	3.058	0.0	1.002	296469		3.90(1.90-5.69)		12458	
D 18 13C4 PFOS										
503.00 > 80.00	3.051	3.060	-0.009	1.138	3435040	2.41		101	26956	
D 19 13C5 PFNA										
468.00 > 423.00	3.051	3.066	-0.015	1.138	2728572	2.45		98.0	53696	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.265	3.265	0.0	1.070	2485120	NC			27154	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.379	3.379	0.0	1.000	2035723	0.9835		98.4	30721	
D 21 13C8 FOSA										
506.00 > 78.00	3.379	3.389	-0.010	1.260	5142146	2.55		102	52965	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.407	3.407	0.0	1.117	1061296	0.9623		100	29833	
549.00 > 99.00	3.407	3.407	0.0	1.117	384955		2.76(1.33-3.97)		3563	

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	3.407	3.407	0.0	1.000	468451	0.9696	101	14874
24 Perfluorodecanoic acid	513.00	> 469.00	3.416	3.416	0.0	1.000	845101	1.04	104	2966
	513.00	> 169.00	3.416	3.416	0.0	1.000	147589	5.73(2.36-7.09)		6431
D 26 M2-8:2FTS	529.00	> 81.00	3.407	3.417	-0.010	1.270	869022	2.47	103	19200
D 23 13C2 PFDA	515.00	> 470.00	3.416	3.427	-0.011	1.274	2007134	2.38	95.1	49481
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.574	3.574	0.0	1.000	274683	0.9615	96.1	3657
D 27 d3-NMeFOSAA	573.00	> 419.00	3.574	3.576	-0.002	1.333	722202	2.79	112	13928
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.729	3.729	0.0	1.222	906185	0.9759	101	23184
	599.00	> 99.00	3.740	3.729	0.011	1.226	300117	3.02(1.39-4.16)		7642
31 Perfluoroundecanoic acid	563.00	> 519.00	3.750	3.750	0.0	1.000	464146	0.9325	93.2	1891
	563.00	> 169.00	3.750	3.750	0.0	1.000	134576	3.45(2.12-6.36)		6899
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.750	3.750	0.0	1.003	270118	0.9466	94.7	5024
D 32 d5-NEtFOSAA	589.00	> 419.00	3.740	3.751	-0.011	1.394	768451	2.87	115	2409
D 30 13C2 PFUnA	565.00	> 520.00	3.750	3.751	-0.001	1.398	1546679	2.38	95.0	22718
66 11-Chloroeicosafuoro-3-oxaundecan	631.00	> 451.00	3.907	3.907	0.0	1.280	3562335	NC		75013
37 Perfluorododecanoic acid	613.00	> 569.00	4.050	4.050	0.0	1.000	642715	1.01	101	147
	613.00	> 169.00	4.050	4.050	0.0	1.000	153128	4.20(2.13-6.40)		2896
D 36 13C2 PFDaA	615.00	> 570.00	4.050	4.051	-0.001	1.510	1510345	2.30	92.0	10283
41 Perfluorotridecanoic acid	663.00	> 619.00	4.318	4.318	0.0	1.066	598251	1.06	106	133
	663.00	> 169.00	4.318	4.318	0.0	1.066	180213	3.32(1.25-3.76)		2896
42 Perfluorotetradecanoic acid	713.00	> 169.00	4.563	4.563	0.0	1.000	144214	0.9818	98.2	2020
	713.00	> 219.00	4.553	4.563	-0.010	0.998	107102	1.35(0.71-2.13)		1904
D 43 13C2-PFTeDA	715.00	> 670.00	4.563	4.564	-0.001	1.701	1431141	2.36	94.5	5091
45 Perfluorohexadecanoic acid	813.00	> 769.00	4.984	4.984	0.0	1.000	941375	NC		104
	813.00	> 169.00	4.984	4.984	0.0	1.000	157732	5.97(2.86-8.58)		1799
D 44 13C2-PFHxDA	815.00	> 770.00	4.984	4.984	0.0	1.858	2444646	2.39	95.5	6928
46 Perfluorooctadecanoic acid	913.00	> 869.00	5.364	5.364	0.0	1.076	1200654	NC		223
	913.00	> 169.00	5.357	5.364	-0.007	1.075	145053	8.28(3.83-11.48)		2026

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

[Reagents:](#)

LCPFC_LL4_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_003.d

Injection Date: 26-Jun-2018 23:32:39

Instrument ID: A8_N

Lims ID: CCV L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 13

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

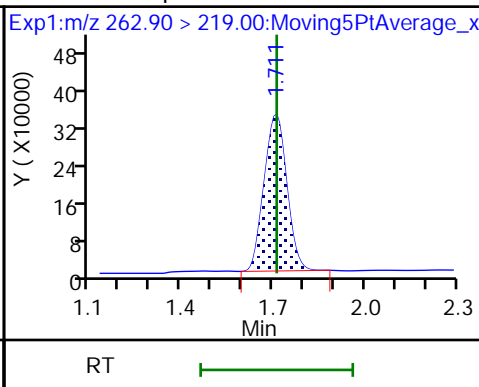
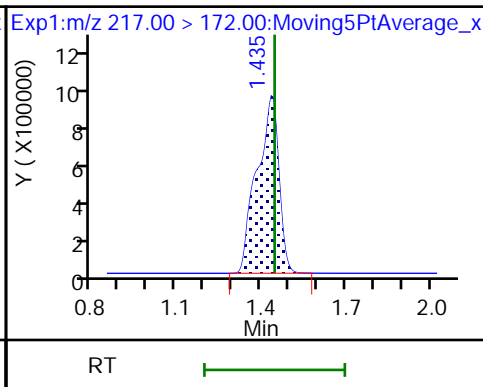
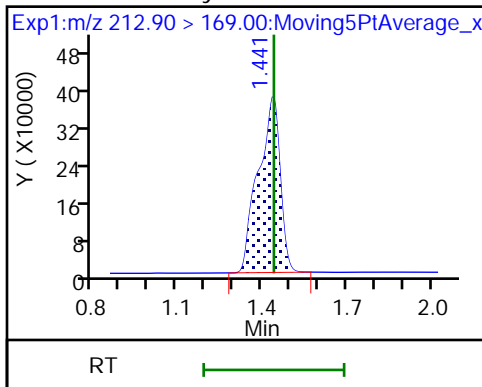
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

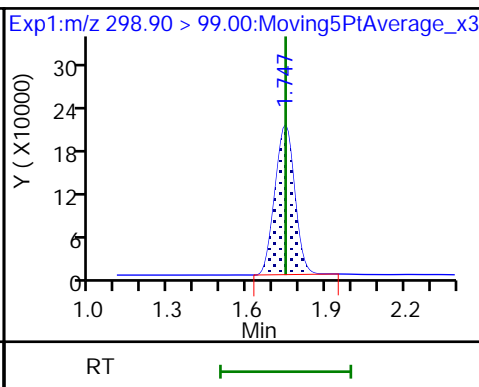
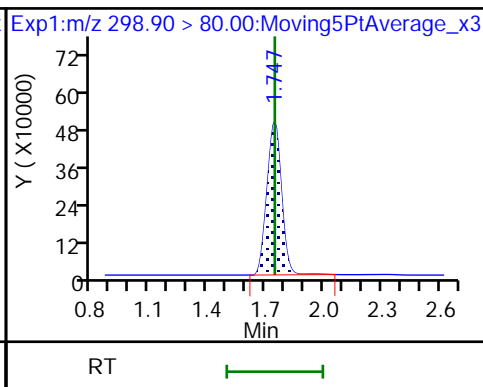
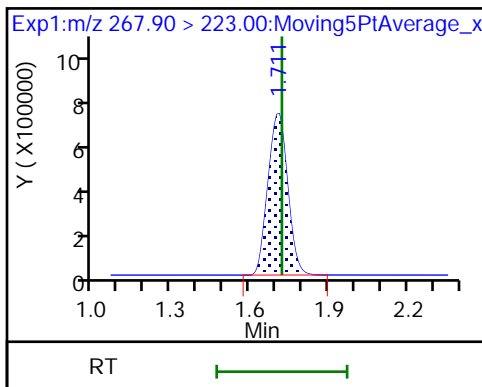
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

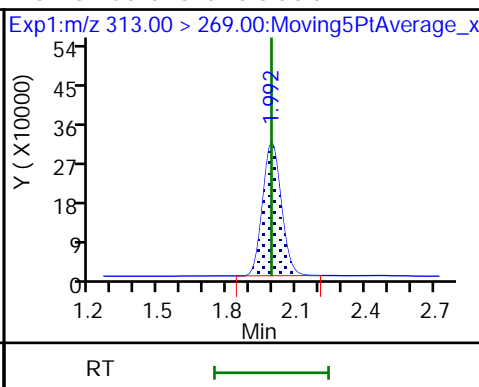
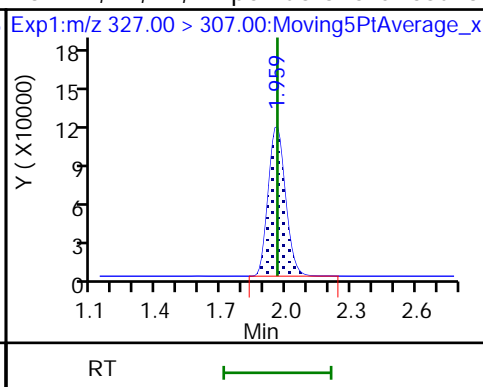
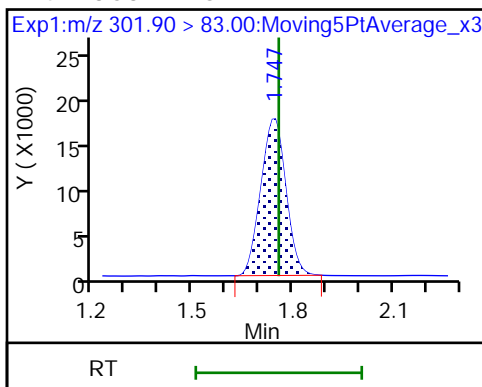
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

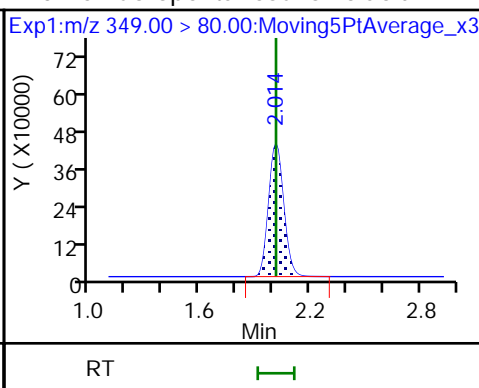
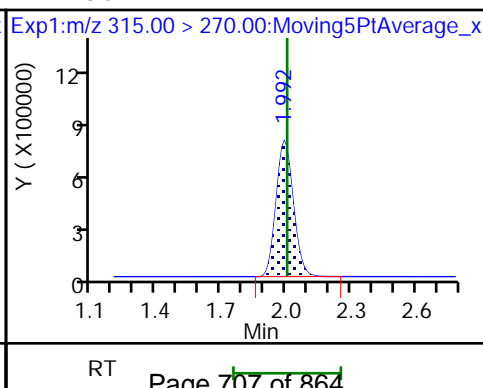
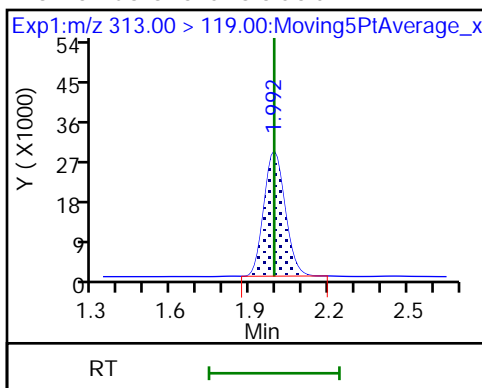
6 Perfluorohexanoic acid

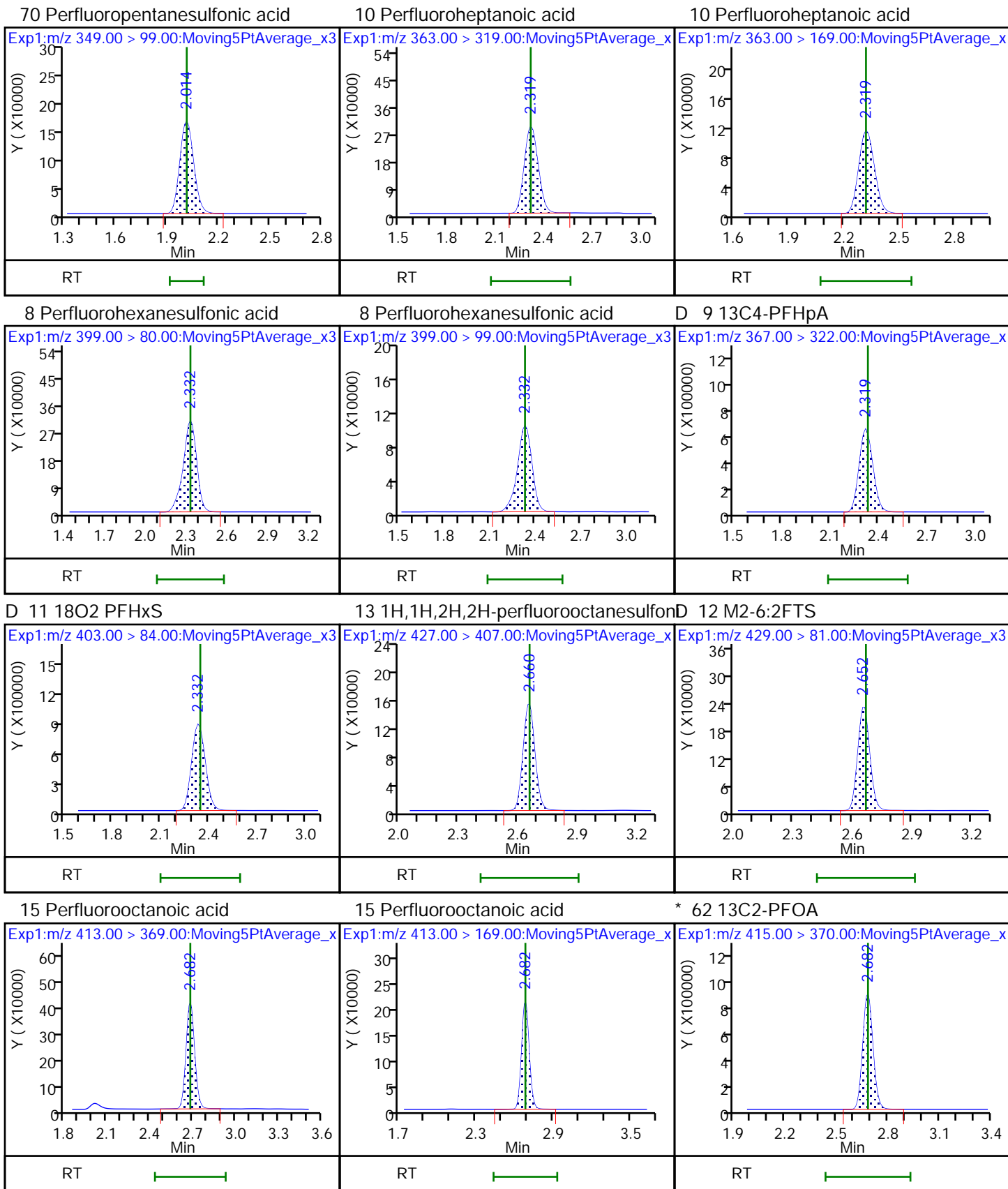


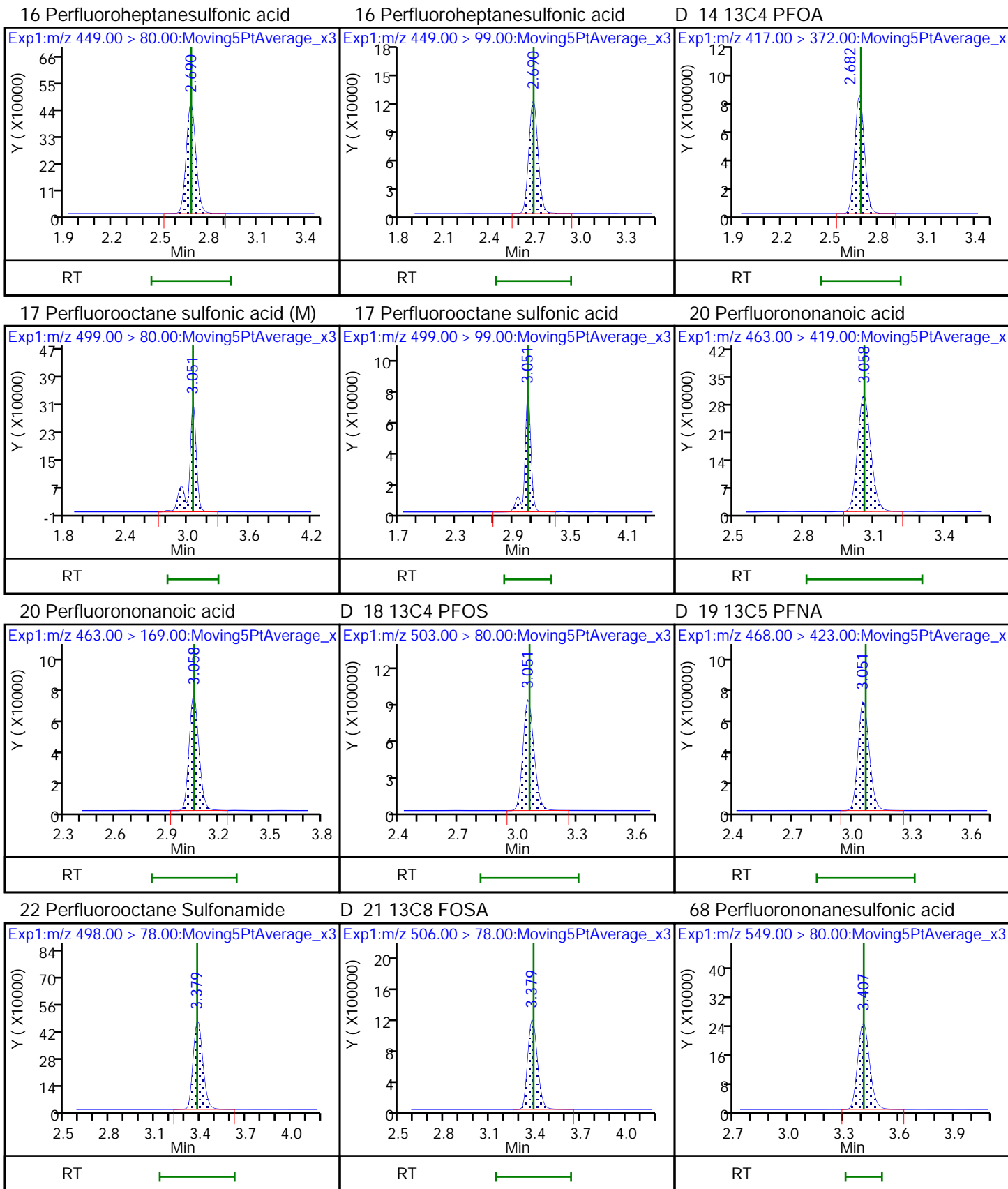
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



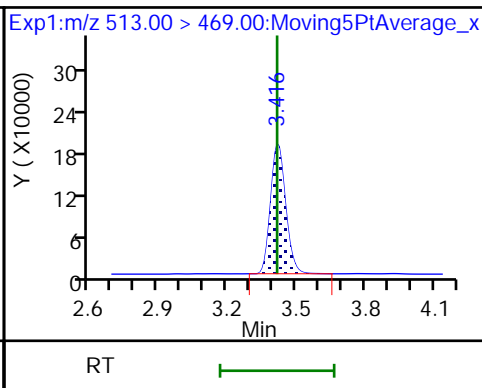
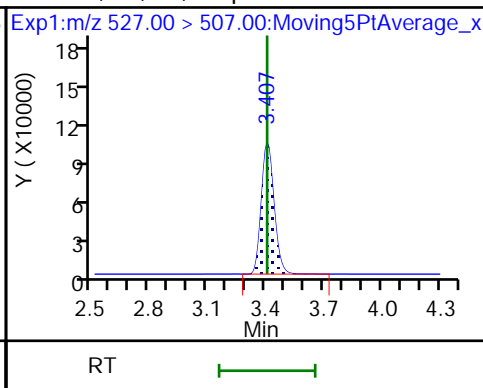
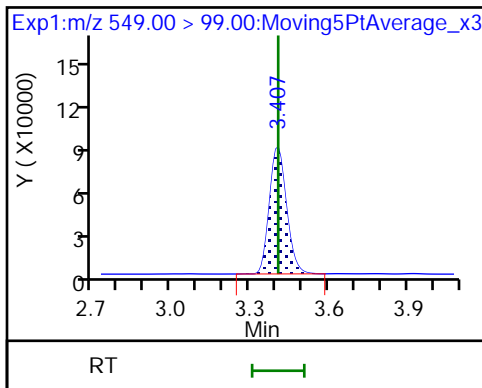




68 Perfluorononanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

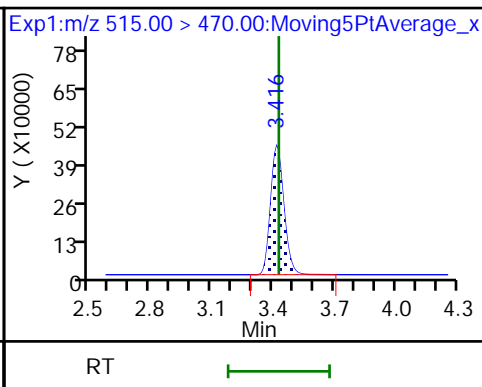
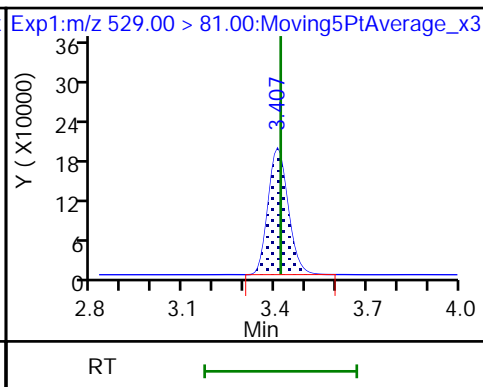
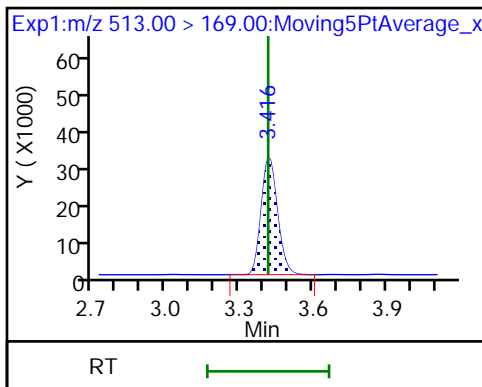
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 26 M2-8:2FTS

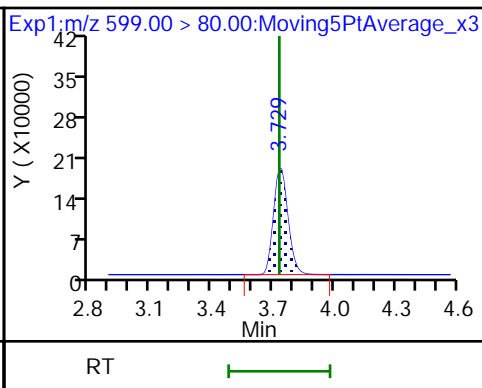
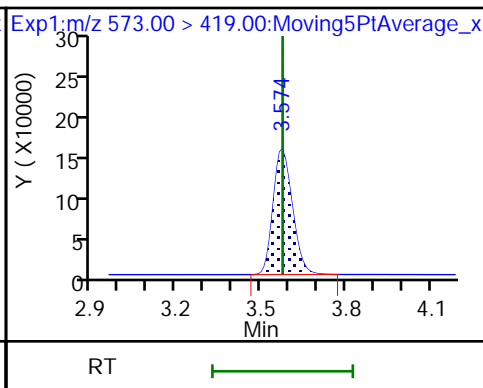
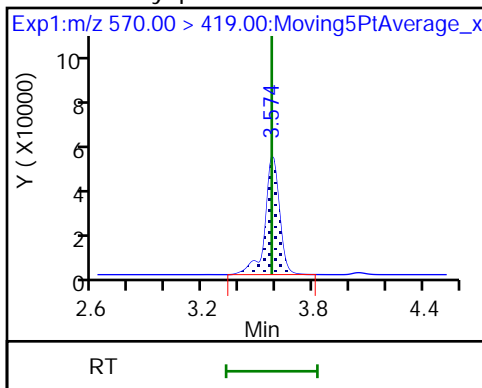
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamiD

27 d3-NMeFOSAA

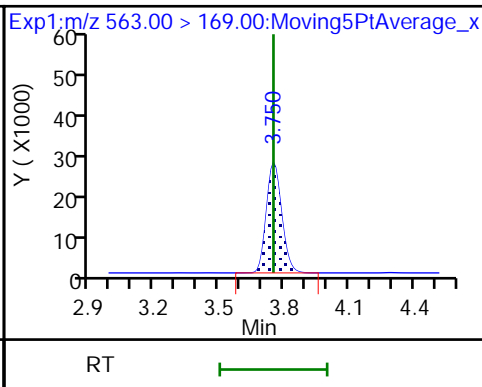
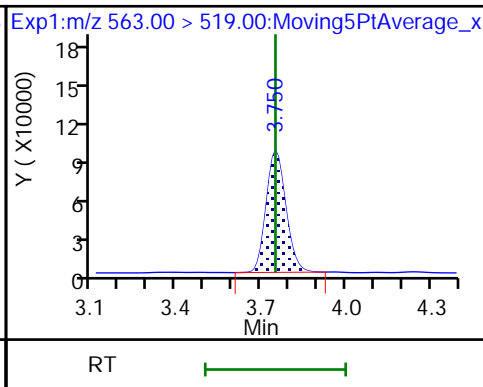
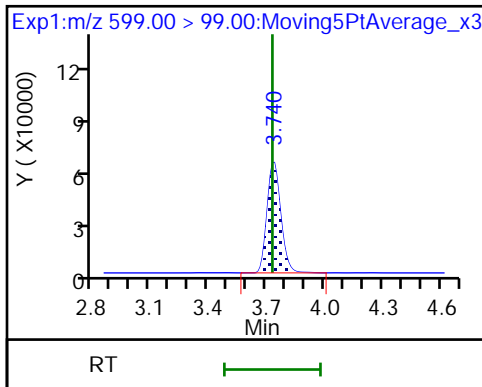
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

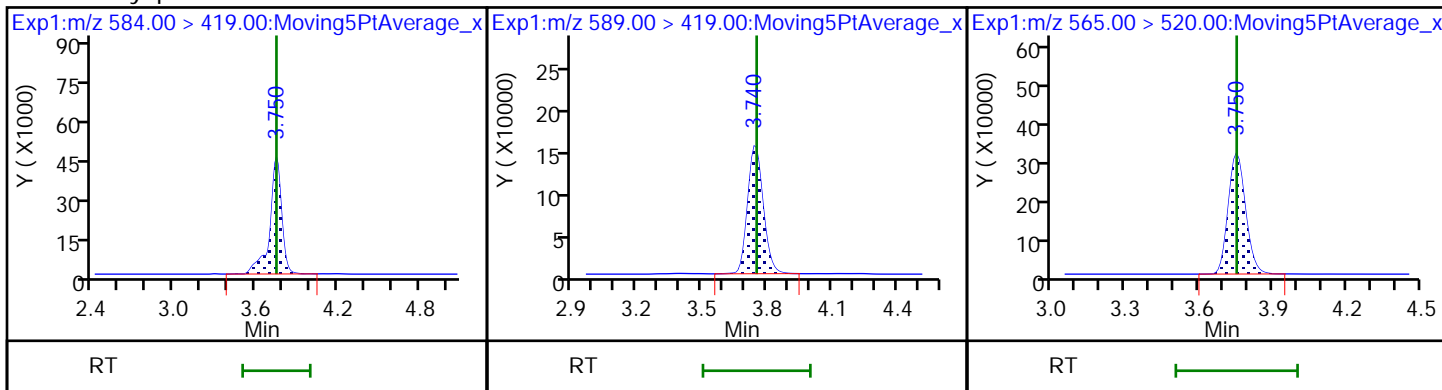
31 Perfluoroundecanoic acid

31 Perfluoroundecanoic acid



33 N-ethyl perfluorooctane sulfonamid D 32 d5-NEtFOSAA

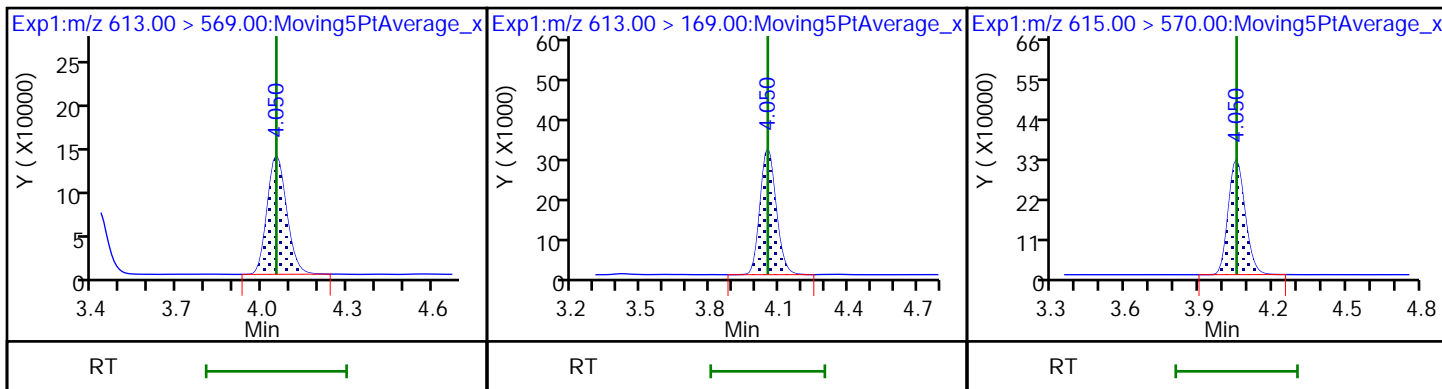
D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

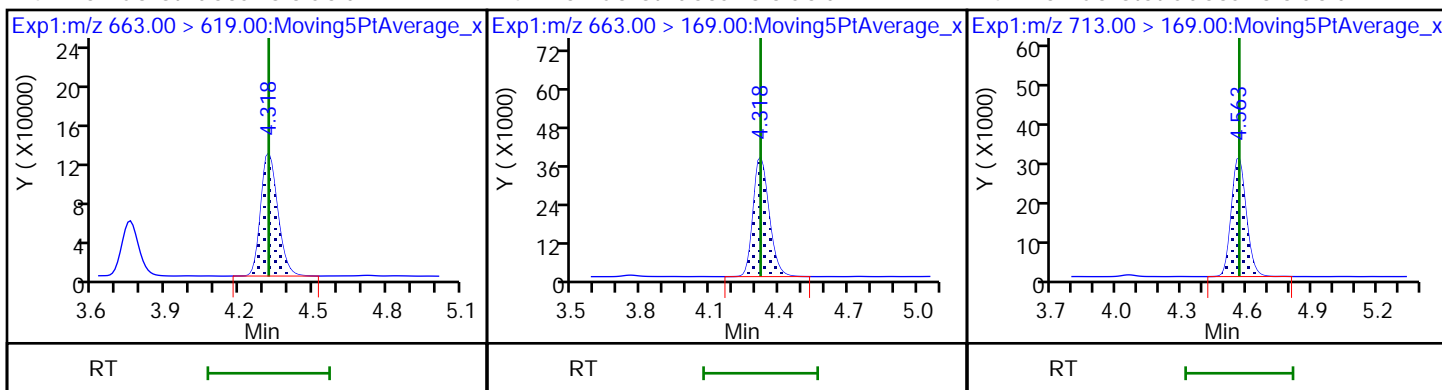
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

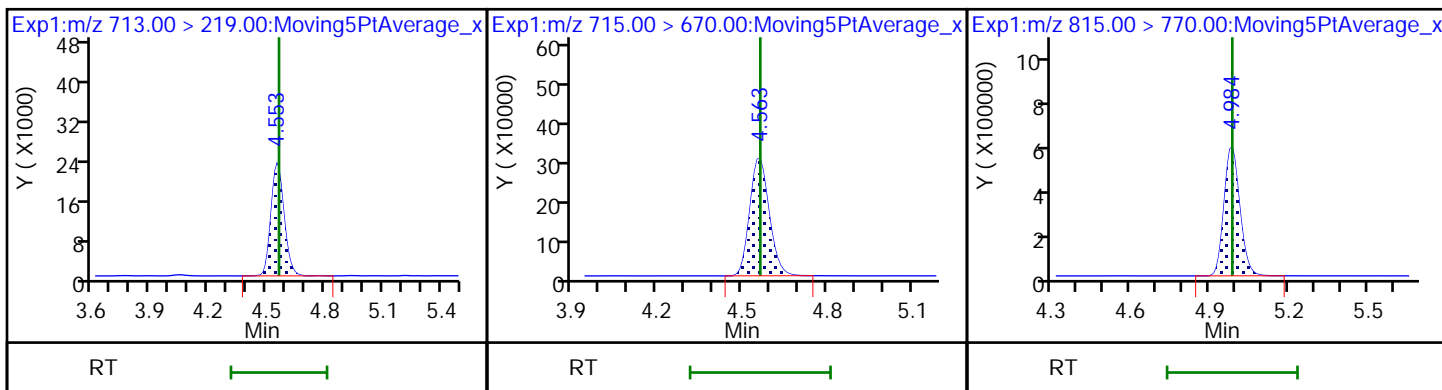
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento

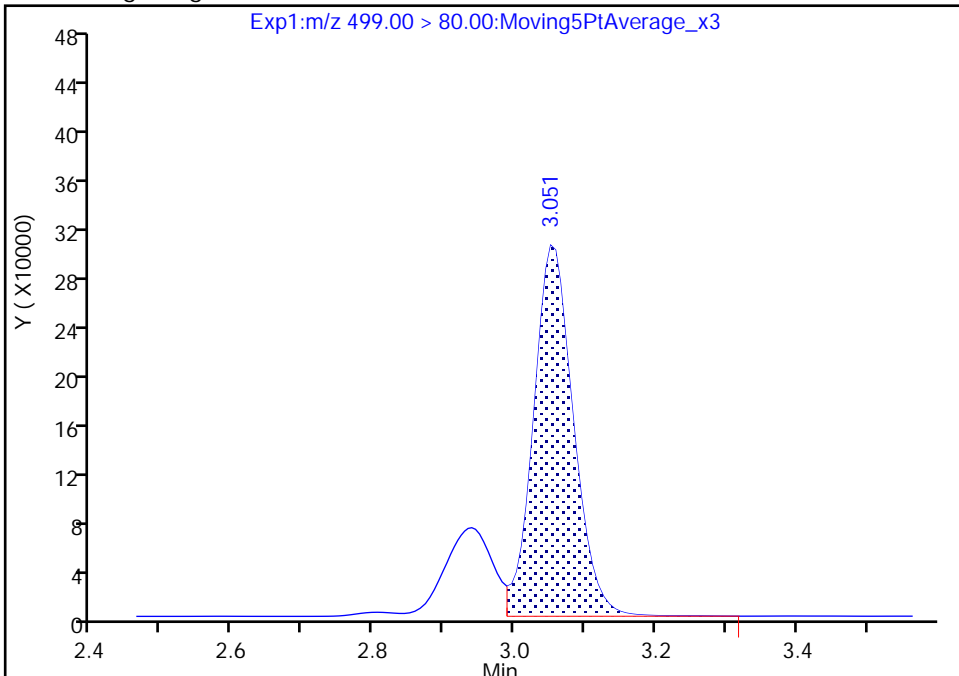
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_003.d
Injection Date: 26-Jun-2018 23:32:39 Instrument ID: A8_N
Lims ID: CCV L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

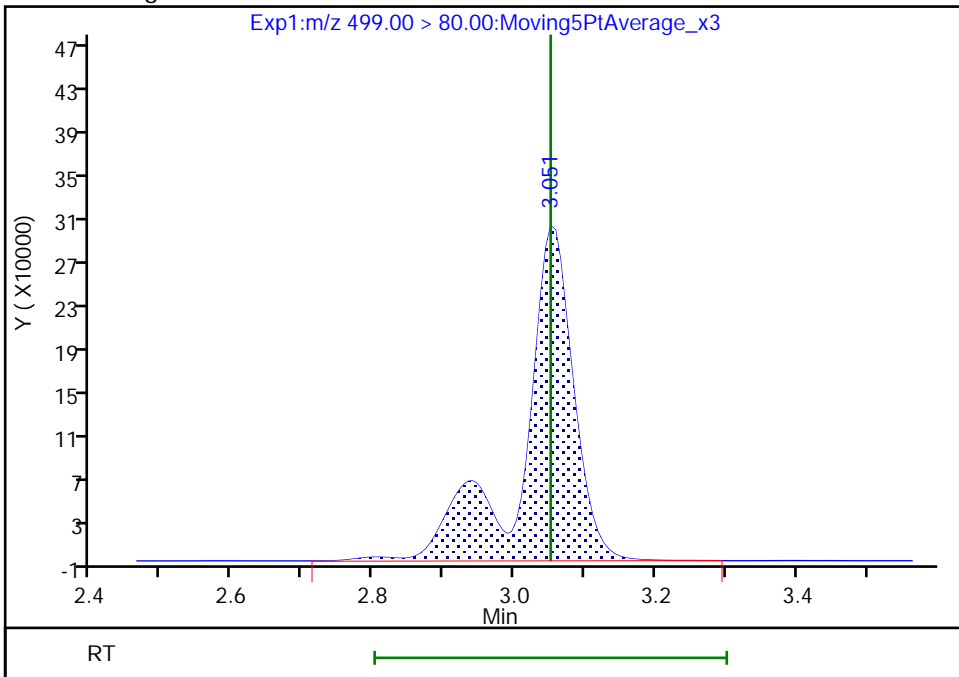
RT: 3.05
Area: 1175545
Amount: 0.719056
Amount Units: ng/ml

Processing Integration Results



RT: 3.05
Area: 1525132
Amount: 0.932891
Amount Units: ng/ml

Manual Integration Results



Reviewer: ruangyotsakuld, 27-Jun-2018 13:50:25
Audit Action: Manually Integrated

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231147/1 Calibration Date: 06/27/2018 05:09
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	1.005		2.50	2.50	-0.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.186		2.44	2.50	-2.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	77.74		2.19	2.21	-0.7	30.0
4:2 FTS	AveID	16.59	19.42		2.73	2.34	17.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	1.010		2.40	2.50	-3.8	30.0
Perfluoropentanesulfonic acid	AveID	71.30	71.90		2.36	2.35	0.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.199		2.59	2.50	3.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.158		2.32	2.28	1.9	30.0
6:2 FTS	AveID	1.663	1.693		2.41	2.37	1.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.419		2.44	2.38	2.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.161		2.38	2.50	-4.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.171		2.39	2.32	3.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.109		2.55	2.50	2.1	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	1.046		2.60	2.50	3.9	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.8317		2.60	2.40	8.4	30.0
8:2 FTS	AveID	1.332	1.380		2.48	2.40	3.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	1.043		2.57	2.50	2.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	1.012		2.56	2.50	2.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6720		2.51	2.41	4.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.9089		2.45	2.50	-2.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.7539		2.34	2.50	-6.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.034		2.44	2.50	-2.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	1.081		2.90	2.50	16.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2692		2.62	2.50	4.9	30.0
13C4 PFBA	Ave	1.423	1.378		2.42	2.50	-3.2	30.0
13C5 PFPeA	Ave	1.028	0.9784		2.38	2.50	-4.9	30.0
13C3-PFBS	Ave	0.0259	0.0251		2.25	2.33	-3.1	30.0
13C2 PFHxA	Ave	1.121	1.128		2.52	2.50	0.6	30.0
13C4-PFHpA	Ave	1.016	1.017		2.50	2.50	0.0	30.0
1802 PFHxS	Ave	1.452	1.322		2.15	2.37	-9.0	30.0
M2-6:2FTS	Ave	0.2628	0.2952		2.67	2.38	12.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231147/1 Calibration Date: 06/27/2018 05:09
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9612		2.50	2.50	0.1	30.0
13C4 PFOS	Ave	0.9659	0.9361		2.32	2.39	-3.1	30.0
13C5 PFNA	Ave	0.7564	0.7475		2.47	2.50	-1.2	30.0
13C8 FOSA	Ave	1.371	1.334		2.43	2.50	-2.7	30.0
M2-8:2FTS	Ave	0.2389	0.2634		2.64	2.40	10.3	30.0
13C2 PFDA	Ave	0.5733	0.5535		2.41	2.50	-3.4	30.0
d3-NMeFOSAA	Ave	0.1759	0.2015		2.86	2.50	14.6	30.0
d5-NEtFOSAA	Ave	0.1816	0.2098		2.89	2.50	15.6	30.0
13C2 PFUnA	Ave	0.4421	0.4393		2.48	2.50	-0.6	30.0
13C2 PFDoA	Ave	0.4458	0.4244		2.38	2.50	-4.8	30.0
13C2-PFTeDA	Ave	0.4113	0.4396		2.67	2.50	6.9	30.0
13C2-PFHxDA	Ave	0.6956	0.9910		3.56	2.50	42.5*	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_046.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 27-Jun-2018 05:09:21 ALS Bottle#: 14 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:00:15 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:00:15

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	1.436	1.436	0.0	1.000	5223652	2.50	99.9	3038	
D 1 13C4 PFBA	217.00 > 172.00	1.436	1.441	-0.005	0.537	5200209	2.42	96.8	39451	
4 Perfluoropentanoic acid	262.90 > 219.00	1.703	1.703	0.0	1.000	4377223	2.44	97.5	1780	
D 3 13C5-PFPeA	267.90 > 223.00	1.703	1.711	-0.008	0.637	3691797	2.38	95.1	55322	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.739	1.739	0.0	1.000	6509912	2.19	99.3	14080	
	298.90 > 99.00	1.748	1.739	0.009	1.005	2653595	2.45(1.25-3.74)		11361	
D 47 13C3-PFBS	301.90 > 83.00	1.739	1.747	-0.008	0.650	88099	2.25	96.9	593	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.950	1.950	0.0	1.121	1718507	2.73	117	78019	
D 60 M2-4:2FTS	329.00 > 81.00	1.950	1.959	-0.009	0.729	640578	NC		10718	
6 Perfluorohexanoic acid	313.00 > 269.00	1.993	1.993	0.0	1.006	4297445	2.40	96.2	10874	
	313.00 > 119.00	1.982	1.993	-0.011	1.000	391205	10.99(5.03-15.10)		8641	
D 7 13C2 PFHxA	315.00 > 270.00	1.982	2.003	-0.021	0.741	4257002	2.52	101	76026	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.004	2.004	0.0	1.153	6389157	2.36	101	63149	
	349.00 > 99.00	2.004	2.004	0.0	1.153	2331558	2.74(1.36-4.07)		34439	
67 Perfluoro(2-propoxypropanoic) acid	329.10 > 285.00	2.084	2.084	0.0	1.000	694257	NC		4232	

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	2.084	2.093	-0.009	0.779	134238	NC			3935	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.308	2.308	0.0	1.000	4597823	2.59		103	5144	
363.00 > 169.00	2.308	2.308	0.0	1.000	1658318		2.77(1.13-3.40)		13853	
D 9 13C4-PFHpA										
367.00 > 322.00	2.308	2.319	-0.011	0.863	3836199	2.50		100	45827	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.321	2.321	0.0	1.000	5256912	2.32		102	24758	
399.00 > 99.00	2.321	2.321	0.0	1.000	1725929		3.05(1.50-4.49)		6589	
D 11 18O2 PFHxS										
403.00 > 84.00	2.321	2.345	-0.024	0.868	4717963	2.15		91.0	41690	
65 Adona										
377.00 > 251.00	2.360	2.360	0.0	0.777	11789601	NC			85538	
377.00 > 85.00	2.360	2.360	0.0	0.777	6896918		1.71(0.84-2.53)		21951	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.644	2.644	0.0	1.000	1787905	2.41		102	16792	
D 12 M2-6:2FTS										
429.00 > 81.00	2.644	2.659	-0.015	0.989	1058042	2.67		112	17684	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.675	2.675	0.0	0.880	4771305	2.44		102	33204	
449.00 > 99.00	2.675	2.675	0.0	0.880	1251795		3.81(1.94-5.82)		18857	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.675	0.0		3773321	2.50			55655	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.675	0.0	1.003	4215566	2.38		95.2	1903	
413.00 > 169.00	2.675	2.675	0.0	1.003	2238100		1.88(0.84-2.52)		10841	
D 14 13C4 PFOA										
417.00 > 372.00	2.667	2.682	-0.015	0.997	3626803	2.50		100	39622	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.039	3.039	0.0	1.000	3839326	2.39		103	37937	
499.00 > 99.00	3.039	3.039	0.0	1.000	818842		4.69(2.31-6.93)		12467	
20 Perfluorononanoic acid										
463.00 > 419.00	3.046	3.046	0.0	1.002	3128675	2.55		102	7635	
463.00 > 169.00	3.046	3.046	0.0	1.002	744400		4.20(1.90-5.69)		23756	
D 19 13C5 PFNA										
468.00 > 423.00	3.039	3.055	-0.016	1.136	2820711	2.47		98.8	47820	
D 18 13C4 PFOS										
503.00 > 80.00	3.039	3.055	-0.016	1.136	3376937	2.32		96.9	19734	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.253	3.253	0.0	1.070	6515346	NC			56807	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.370	3.370	0.0	1.000	5266966	2.60		104	33215	
D 21 13C8 FOSA										
506.00 > 78.00	3.370	3.384	-0.014	1.260	5035195	2.43		97.3	47348	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.389	3.389	0.0	1.115	2820207	2.60		108	39705	
549.00 > 99.00	3.389	3.389	0.0	1.115	1006690		2.80(1.33-3.97)		11319	

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	3.398	3.398	0.0	1.000	1313568	2.48	104	41043
24 Perfluorodecanoic acid	513.00	> 469.00	3.407	3.407	0.0	1.000	2178543	2.57	103	9496
	513.00	> 169.00	3.407	3.407	0.0	1.000	376299	5.79(2.36-7.09)		20821
D 26 M2-8:2FTS	529.00	> 81.00	3.398	3.411	-0.013	1.270	952009	2.64	110	19063
D 23 13C2 PFDA	515.00	> 470.00	3.407	3.421	-0.014	1.274	2088693	2.41	96.6	27313
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.566	3.566	0.0	1.003	769854	2.56	102	8943
D 27 d3-NMeFOSAA	573.00	> 419.00	3.556	3.570	-0.014	1.329	760389	2.86	115	16210
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.719	3.719	0.0	1.224	2288399	2.51	104	39338
	599.00	> 99.00	3.719	3.719	0.0	1.224	774177	2.96(1.39-4.16)		14408
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.740	3.740	0.0	1.003	719489	2.45	97.9	10910
31 Perfluoroundecanoic acid	563.00	> 519.00	3.740	3.740	0.0	1.000	1249556	2.34	93.7	4531
	563.00	> 169.00	3.740	3.740	0.0	1.000	330224	3.78(2.12-6.36)		13388
D 32 d5-NEtFOSAA	589.00	> 419.00	3.729	3.743	-0.014	1.394	791643	2.89	116	2291
D 30 13C2 PFUnA	565.00	> 520.00	3.740	3.754	-0.014	1.398	1657463	2.48	99.4	28174
66 11-Chloroeicosafuoro-3-oxaundecan	631.00	> 451.00	3.898	3.898	0.0	1.282	9272180	NC		57196
37 Perfluorododecanoic acid	613.00	> 569.00	4.041	4.041	0.0	1.000	1655118	2.44	97.7	405
	613.00	> 169.00	4.041	4.041	0.0	1.000	421008	3.93(2.13-6.40)		7968
D 36 13C2 PFDaA	615.00	> 570.00	4.041	4.055	-0.014	1.511	1601233	2.38	95.2	9708
41 Perfluorotridecanoic acid	663.00	> 619.00	4.300	4.300	0.0	1.064	1730834	2.90	116	441
	663.00	> 169.00	4.300	4.300	0.0	1.064	535358	3.23(1.25-3.76)		6391
42 Perfluorotetradecanoic acid	713.00	> 169.00	4.544	4.544	0.0	1.000	446520	2.62	105	5555
	713.00	> 219.00	4.544	4.544	0.0	1.000	315882	1.41(0.71-2.13)		5542
D 43 13C2-PFTeDA	715.00	> 670.00	4.544	4.559	-0.015	1.699	1658862	2.67	107	6203
45 Perfluorohexadecanoic acid	813.00	> 769.00	4.976	4.976	0.0	1.002	3614637	NC		454
	813.00	> 169.00	4.976	4.976	0.0	1.002	579022	6.24(2.86-8.58)		4600
D 44 13C2-PFHxDA	815.00	> 770.00	4.967	4.989	-0.022	1.857	3739335	3.56	142	8627
46 Perfluorooctadecanoic acid	913.00	> 869.00	5.350	5.350	0.0	1.077	3834953	NC		766
	913.00	> 169.00	5.350	5.350	0.0	1.077	466630	8.22(3.83-11.48)		4050

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL5_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_046.d

Injection Date: 27-Jun-2018 05:09:21

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 14

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

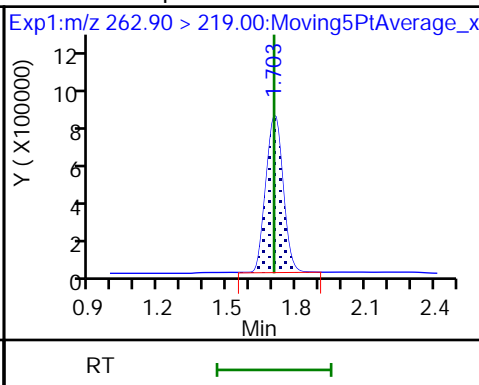
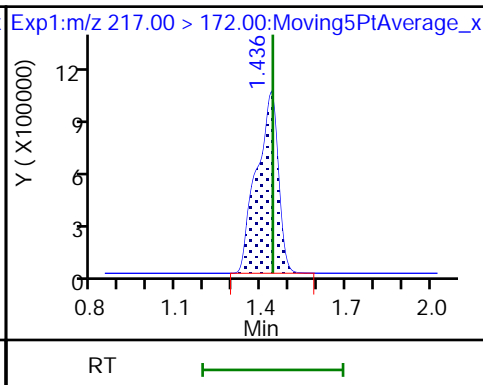
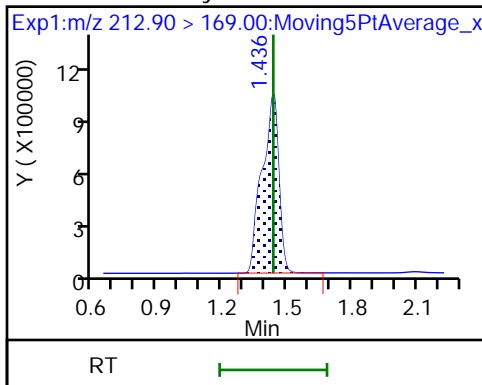
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

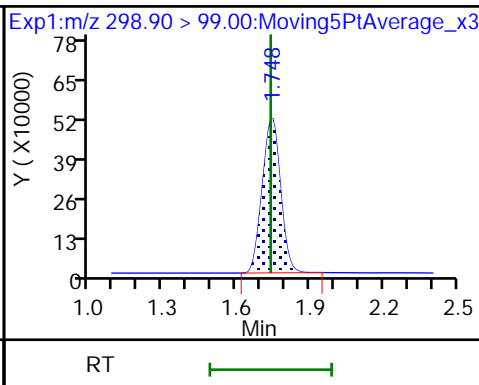
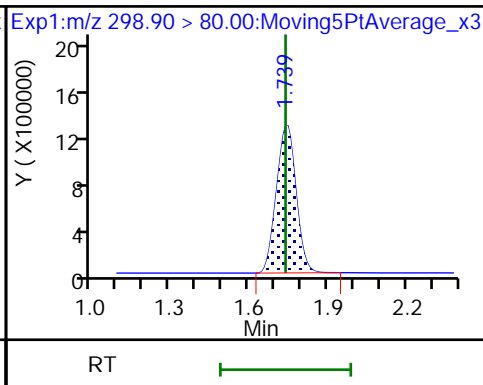
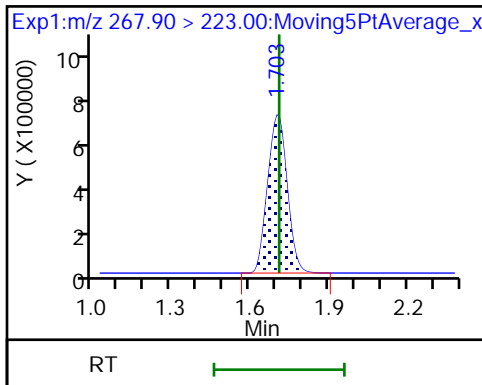
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

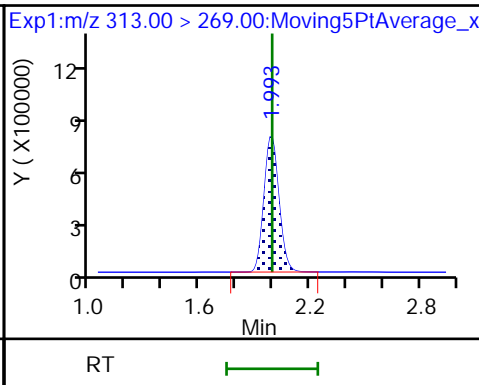
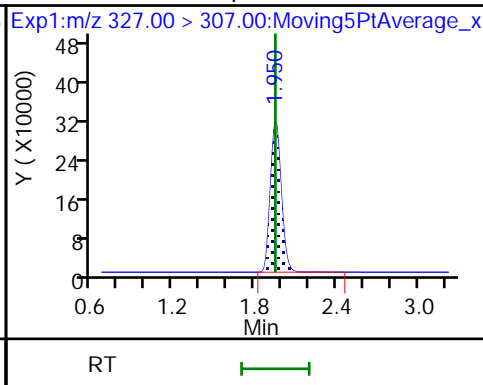
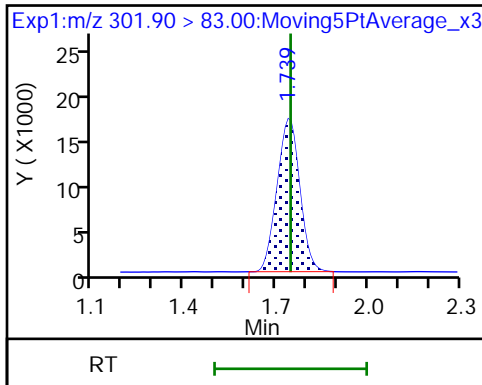
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

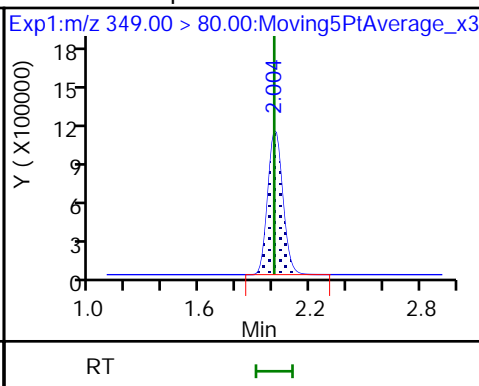
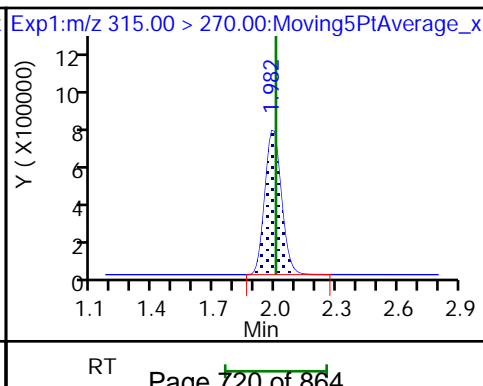
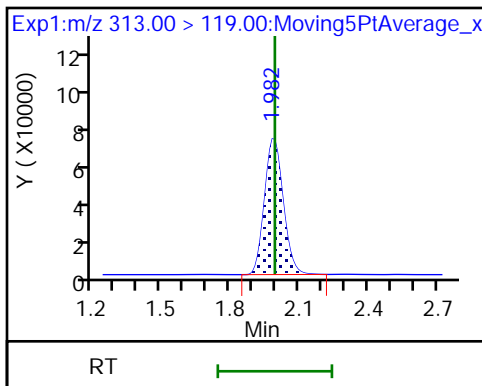
6 Perfluorohexanoic acid

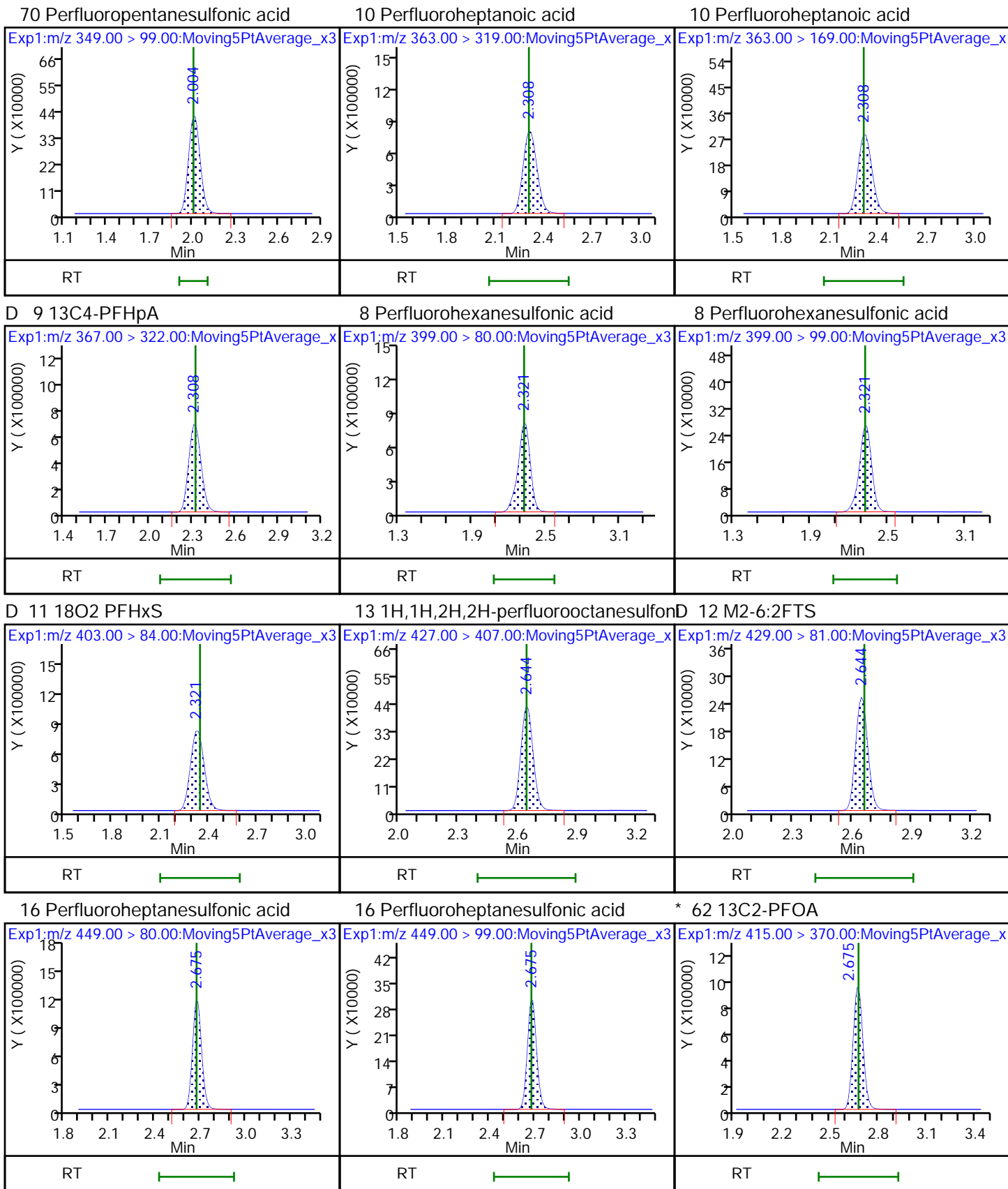


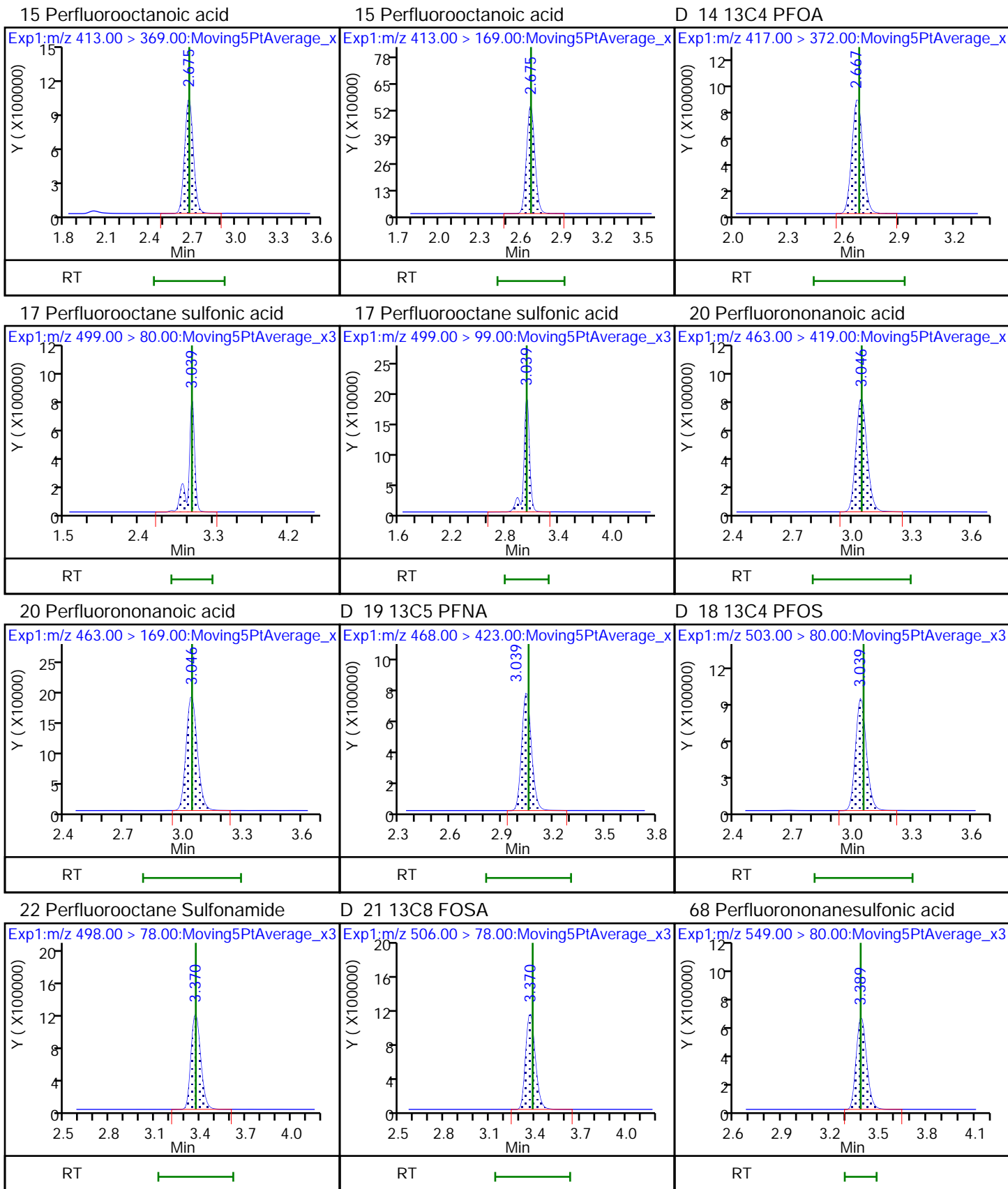
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



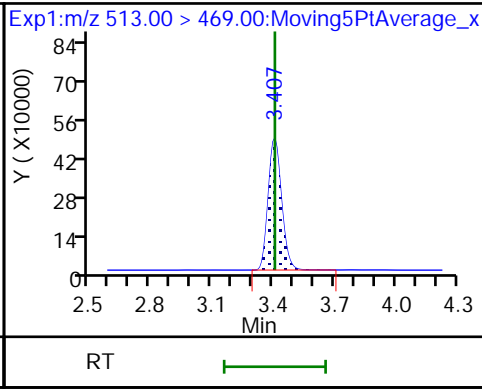
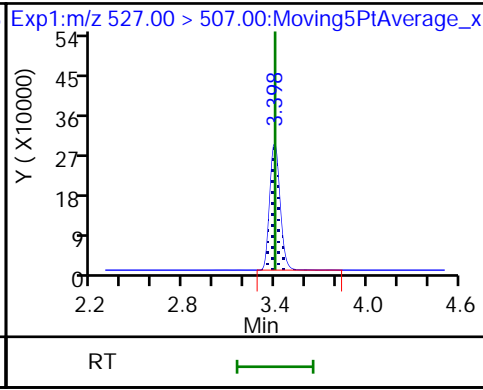
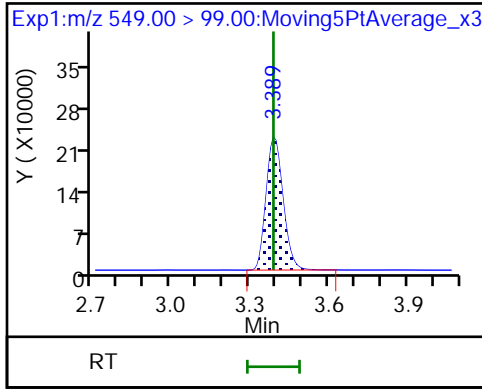




68 Perfluorononanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

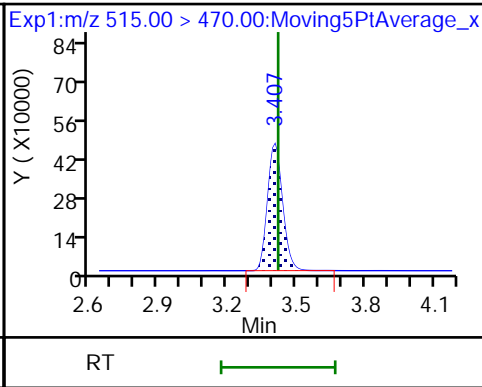
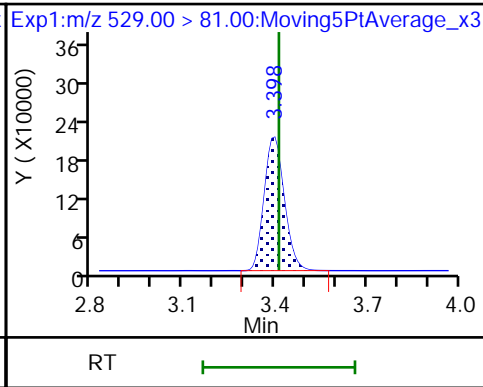
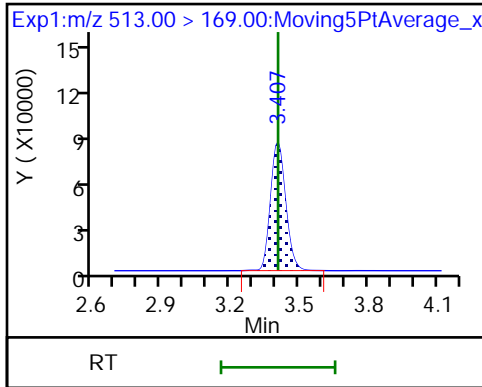
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 26 M2-8:2FTS

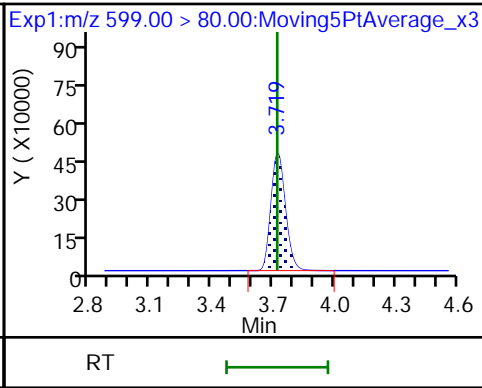
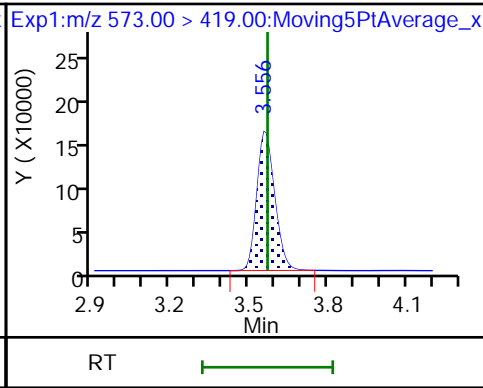
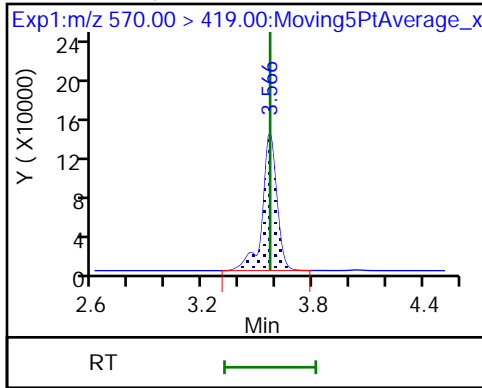
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamid

D 27 d3-NMeFOSAA

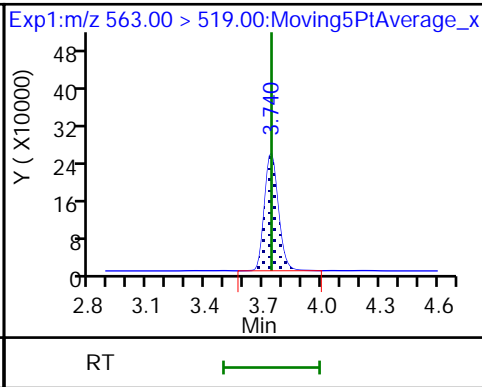
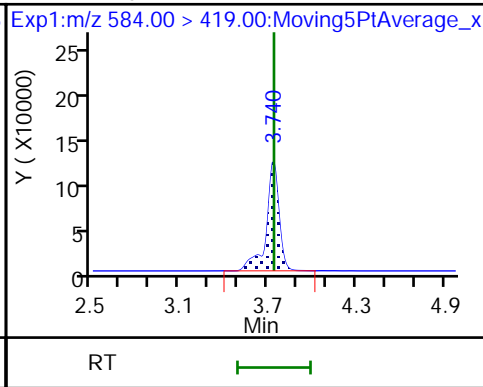
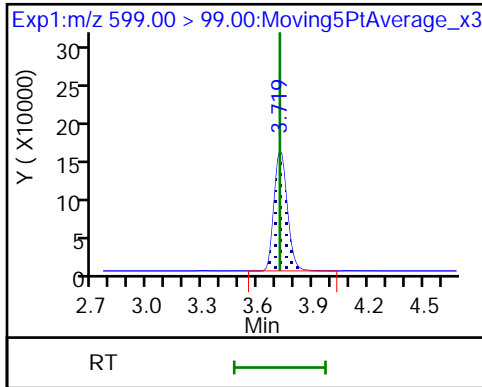
29 Perfluorodecane Sulfonic acid

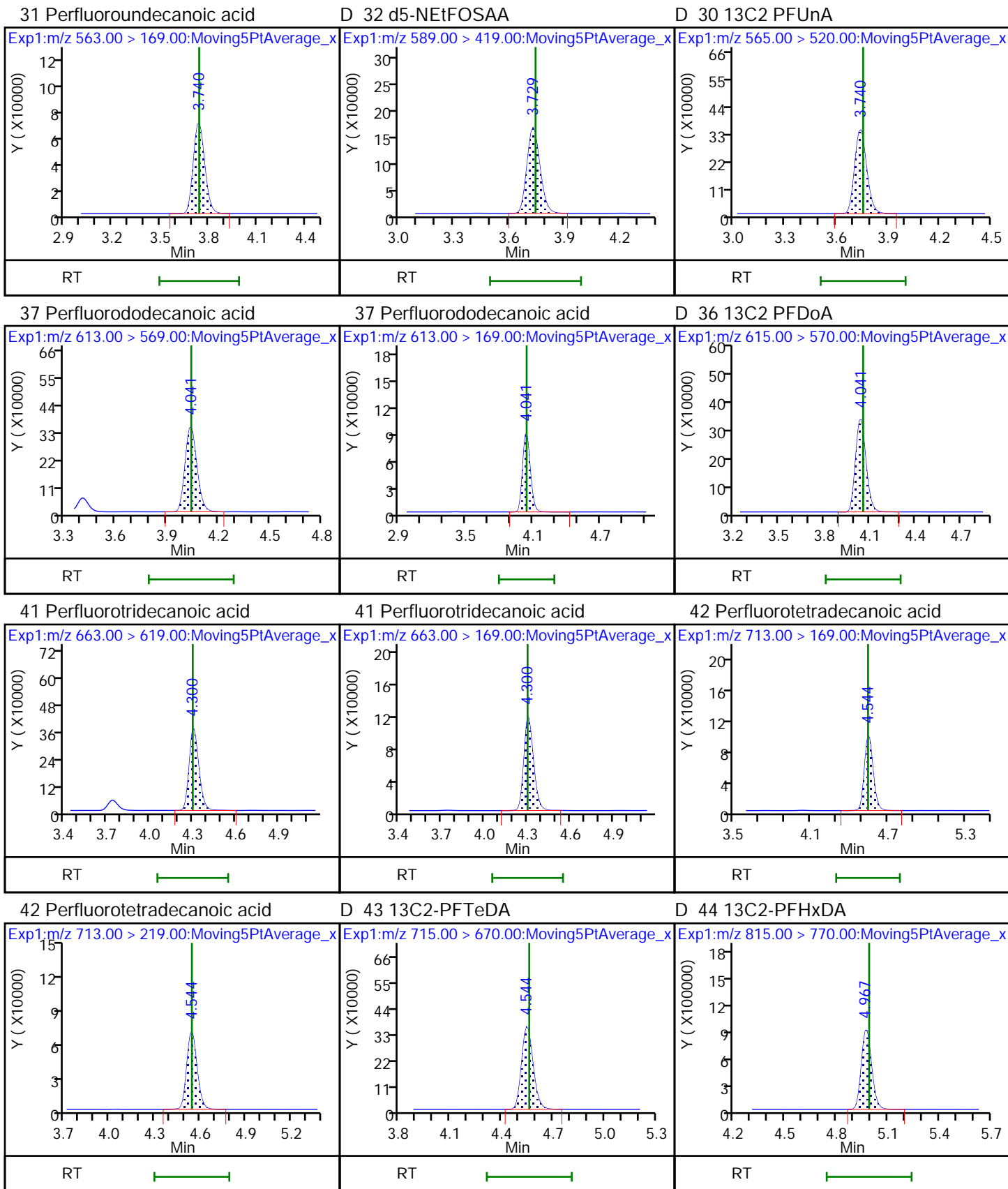


29 Perfluorodecane Sulfonic acid

33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231147/9 Calibration Date: 06/27/2018 06:11
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	0.9763		0.971	1.00	-2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.148		0.944	1.00	-5.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	80.62		0.910	0.884	3.0	30.0
4:2 FTS	AveID	16.59	18.58		1.05	0.934	12.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	0.9484		0.904	1.00	-9.6	30.0
Perfluoropentanesulfonic acid	AveID	71.30	69.57		0.915	0.938	-2.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.140		0.984	1.00	-1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.093		0.875	0.910	-3.9	30.0
6:2 FTS	AveID	1.663	1.676		0.955	0.948	0.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.370		0.941	0.952	-1.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.212		0.994	1.00	-0.7	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.053		0.970	1.00	-3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.138		0.928	0.928	0.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	1.034		1.03	1.00	2.8	30.0
8:2 FTS	AveID	1.332	1.367		0.984	0.958	2.7	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.7790		0.974	0.960	1.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	1.060		1.04	1.00	4.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	0.9632		0.974	1.00	-2.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6634		0.990	0.964	2.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.9043		0.974	1.00	-2.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.7394		0.919	1.00	-8.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.130		1.07	1.00	6.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	1.102		1.18	1.00	18.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2542		0.991	1.00	-0.9	30.0
13C4 PFBA	Ave	1.423	1.358		2.39	2.50	-4.6	30.0
13C5 PFPeA	Ave	1.028	0.9774		2.38	2.50	-5.0	30.0
13C3-PFBS	Ave	0.0259	0.0246		2.20	2.33	-5.3	30.0
13C2 PFHxA	Ave	1.121	1.173		2.62	2.50	4.7	30.0
13C4-PFHpA	Ave	1.016	1.036		2.55	2.50	2.0	30.0
1802 PFHxS	Ave	1.452	1.367		2.23	2.37	-5.9	30.0
M2-6:2FTS	Ave	0.2628	0.3032		2.74	2.38	15.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231147/9 Calibration Date: 06/27/2018 06:11
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9309		2.42	2.50	-3.0	30.0
13C4 PFOS	Ave	0.9659	0.9222		2.28	2.39	-4.5	30.0
13C5 PFNA	Ave	0.7564	0.7428		2.46	2.50	-1.8	30.0
13C8 FOSA	Ave	1.371	1.342		2.45	2.50	-2.1	30.0
M2-8:2FTS	Ave	0.2389	0.2691		2.70	2.40	12.6	30.0
13C2 PFDA	Ave	0.5733	0.5796		2.53	2.50	1.1	30.0
d3-NMeFOSAA	Ave	0.1759	0.2065		2.94	2.50	17.4	30.0
13C2 PFUnA	Ave	0.4421	0.4454		2.52	2.50	0.7	30.0
d5-NEtFOSAA	Ave	0.1816	0.2078		2.86	2.50	14.5	30.0
13C2 PFDoA	Ave	0.4458	0.4041		2.27	2.50	-9.3	30.0
13C2-PFTeDA	Ave	0.4113	0.4094		2.49	2.50	-0.4	30.0
13C2-PFHxDA	Ave	0.6956	0.8385		3.01	2.50	20.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_054.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 27-Jun-2018 06:11:56 ALS Bottle#: 13 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:07:48 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:07:48

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	1.436	1.436	0.0	1.000	2059742	0.9710	97.1	1049
D 1 13C4 PFBA	217.00	> 172.00	1.436	1.441	-0.005	0.538	5274373	2.39	95.4	42285
4 Perfluoropentanoic acid	262.90	> 219.00	1.703	1.703	0.0	1.000	1743753	0.9443	94.4	655
D 3 13C5-PFPeA	267.90	> 223.00	1.703	1.711	-0.008	0.638	3796305	2.38	95.0	52709
5 Perfluorobutanesulfonic acid	298.90	> 80.00	1.739	1.739	0.0	1.000	2718852	0.9102	103	9432
	298.90	> 99.00	1.739	1.739	0.0	1.000	1091084	2.49(1.25-3.74)		3919
D 47 13C3-PFBS	301.90	> 83.00	1.739	1.747	-0.008	0.652	88701	2.20	94.7	608
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00	> 307.00	1.950	1.950	0.0	1.121	661947	1.05	112	30055
D 60 M2-4:2FTS	329.00	> 81.00	1.950	1.959	-0.009	0.731	653760	NC		10847
6 Perfluorohexanoic acid	313.00	> 269.00	1.982	1.982	0.0	1.000	1728527	0.9037	90.4	4278
	313.00	> 119.00	1.982	1.982	0.0	1.000	162120	10.66(5.03-15.10)		4168
D 7 13C2 PFHxA	315.00	> 270.00	1.982	2.003	-0.021	0.743	4556573	2.62	105	74299
70 Perfluoropentanesulfonic acid	349.00	> 80.00	2.005	2.005	0.0	1.153	2489510	0.9152	97.6	40337
	349.00	> 99.00	2.005	2.005	0.0	1.153	955894	2.60(1.36-4.07)		14169
67 Perfluoro(2-propoxypropanoic) acid	329.10	> 285.00	2.084	2.084	0.0	1.000	282230	NC		1538

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	2.084	2.093	-0.009	0.781	140360	NC			5007	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.308	2.308	0.0	1.000	1835827	0.9838		98.4	2078	
363.00 > 169.00	2.308	2.308	0.0	1.000	714411		2.57(1.13-3.40)		7941	
D 9 13C4-PFHpA										
367.00 > 322.00	2.308	2.319	-0.011	0.865	4025897	2.55		102	51850	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.321	2.321	0.0	1.000	2111898	0.8747		96.1	12827	
399.00 > 99.00	2.321	2.321	0.0	1.000	705620		2.99(1.50-4.49)		3569	
D 11 18O2 PFHxS										
403.00 > 84.00	2.321	2.345	-0.024	0.870	5022719	2.23		94.1	40127	
65 Adona										
377.00 > 251.00	2.360	2.360	0.0	0.775	4938429	NC			37031	
377.00 > 85.00	2.360	2.360	0.0	0.775	2777581		1.78(0.84-2.53)		10872	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.645	2.645	0.0	1.000	748261	0.9554		101	8764	
D 12 M2-6:2FTS										
429.00 > 81.00	2.645	2.659	-0.014	0.991	1118787	2.74		115	20528	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.675	2.675	0.0	0.879	1868483	0.9412		98.9	22511	
449.00 > 99.00	2.675	2.675	0.0	0.879	507039		3.69(1.94-5.82)		13640	
* 62 13C2-PFOA										
415.00 > 370.00	2.668	2.668	0.0		3884149	2.50			42217	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.675	0.0	1.003	1754125	0.99		99.3	820	
413.00 > 169.00	2.668	2.675	-0.007	1.000	915345		1.92(0.84-2.52)		5904	
D 14 13C4 PFOA										
417.00 > 372.00	2.668	2.682	-0.014	1.000	3615782	2.42		97.0	50687	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.044	3.044	0.0	1.000	1512662	0.9281		100	37256	M
499.00 > 99.00	3.044	3.044	0.0	1.000	330033		4.58(2.31-6.93)		6825	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.044	3.044	0.0	1.000	1215381	0.9697		97.0	2903	
463.00 > 169.00	3.044	3.044	0.0	1.000	290262		4.19(1.90-5.69)		12234	
D 19 13C5 PFNA										
468.00 > 423.00	3.044	3.055	-0.011	1.141	2884972	2.46		98.2	35013	
D 18 13C4 PFOS										
503.00 > 80.00	3.044	3.055	-0.011	1.141	3424378	2.28		95.5	32949	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.259	3.259	0.0	1.071	2579938	NC			27148	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.370	3.370	0.0	1.000	2156725	1.03		103	32726	
D 21 13C8 FOSA										
506.00 > 78.00	3.370	3.384	-0.014	1.263	5213537	2.45		97.9	42223	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.398	3.398	0.0	1.116	1071453	0.9745		102	26624	
549.00 > 99.00	3.398	3.398	0.0	1.116	399504		2.68(1.33-3.97)		5255	

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	3.398	3.398	0.0	1.000	547533	0.9837	103	13561
24 Perfluorodecanoic acid	513.00	> 469.00	3.407	3.407	0.0	1.000	954042	1.04	104	3264
	513.00	> 169.00	3.407	3.407	0.0	1.000	167155	5.71(2.36-7.09)		6183
D 26 M2-8:2FTS	529.00	> 81.00	3.398	3.411	-0.013	1.274	1001184	2.70	113	17099
D 23 13C2 PFDA	515.00	> 470.00	3.407	3.421	-0.014	1.277	2251095	2.53	101	31335
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.565	3.565	0.0	1.000	309063	0.9740	97.4	3572
D 27 d3-NMeFOSAA	573.00	> 419.00	3.565	3.570	-0.005	1.336	802199	2.94	117	21281
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.729	3.729	0.0	1.225	916309	0.9898	103	26866
	599.00	> 99.00	3.729	3.729	0.0	1.225	322920	2.84(1.39-4.16)		6641
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.740	3.740	0.0	1.000	291993	0.9741	97.4	7030
31 Perfluoroundecanoic acid	563.00	> 519.00	3.740	3.740	0.0	1.000	511678	0.9190	91.9	1852
	563.00	> 169.00	3.740	3.740	0.0	1.000	144477	3.54(2.12-6.36)		6004
D 32 d5-NEtFOSAA	589.00	> 419.00	3.740	3.743	-0.003	1.402	807202	2.86	114	2578
D 30 13C2 PFUnA	565.00	> 520.00	3.740	3.754	-0.014	1.402	1729966	2.52	101	23807
66 11-Chloroeicosafuoro-3-oxaundecan	631.00	> 451.00	3.907	3.907	0.0	1.283	3693483	NC		51413
37 Perfluorododecanoic acid	613.00	> 569.00	4.040	4.040	0.0	1.000	709245	1.07	107	169
	613.00	> 169.00	4.040	4.040	0.0	1.000	176830	4.01(2.13-6.40)		3711
D 36 13C2 PFDaA	615.00	> 570.00	4.040	4.055	-0.015	1.514	1569606	2.27	90.7	10041
41 Perfluorotridecanoic acid	663.00	> 619.00	4.307	4.307	0.0	1.066	691944	1.18	118	154
	663.00	> 169.00	4.307	4.307	0.0	1.066	220280	3.14(1.25-3.76)		3095
42 Perfluorotetradecanoic acid	713.00	> 169.00	4.553	4.553	0.0	1.000	161687	0.99	99.1	2020
	713.00	> 219.00	4.553	4.553	-0.010	0.998	111883	1.45(0.71-2.13)		1806
D 43 13C2-PFTeDA	715.00	> 670.00	4.553	4.559	-0.006	1.707	1590199	2.49	99.6	5576
45 Perfluorohexadecanoic acid	813.00	> 769.00	4.984	4.984	0.0	1.002	1220566	NC		146
	813.00	> 169.00	4.984	4.984	0.0	1.002	209236	5.83(2.86-8.58)		1891
D 44 13C2-PFHxDA	815.00	> 770.00	4.975	4.989	-0.014	1.865	3256943	3.01	121	7413
46 Perfluorooctadecanoic acid	913.00	> 869.00	5.363	5.363	0.0	1.078	1627315	NC		301
	913.00	> 169.00	5.363	5.363	0.0	1.078	208485	7.81(3.83-11.48)		2568

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_054.d

Injection Date: 27-Jun-2018 06:11:56

Instrument ID: A8_N

Lims ID: CCV L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 13

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

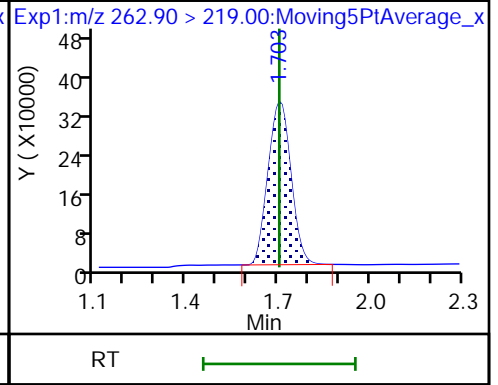
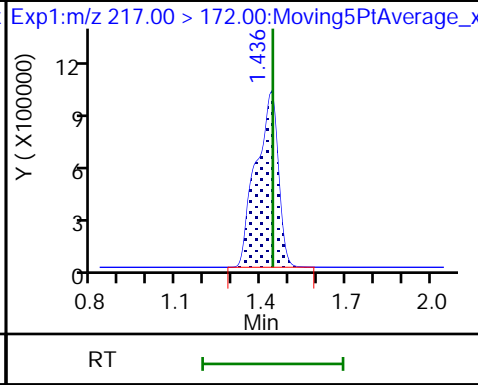
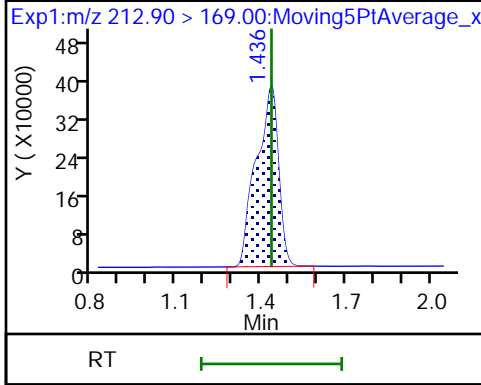
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

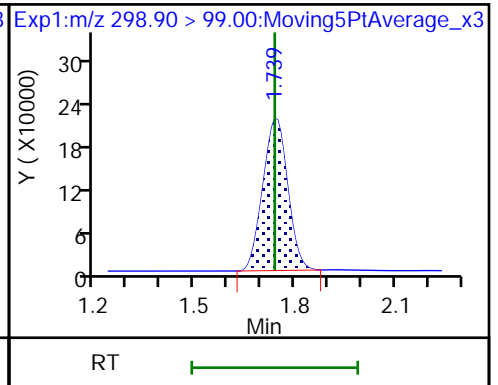
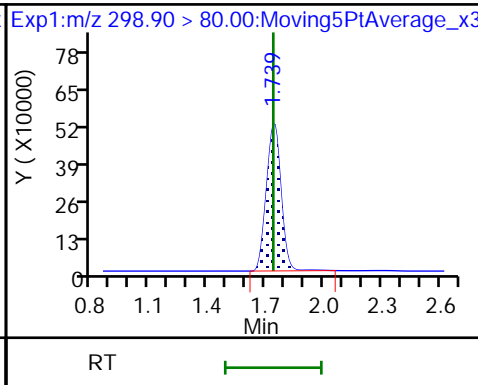
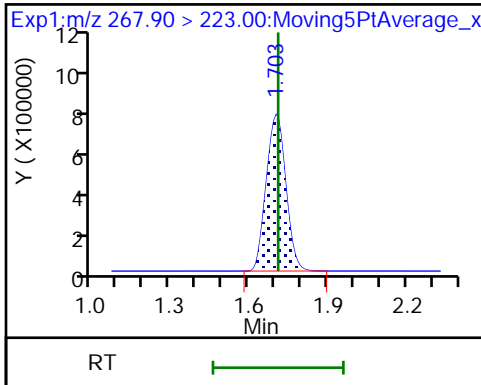
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

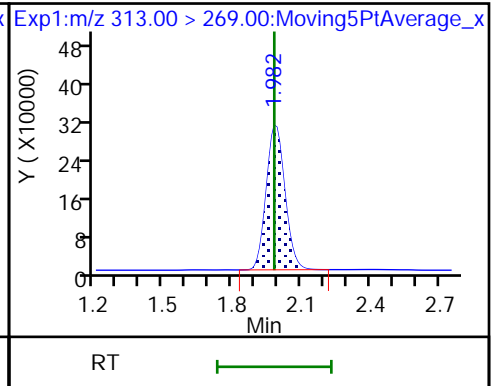
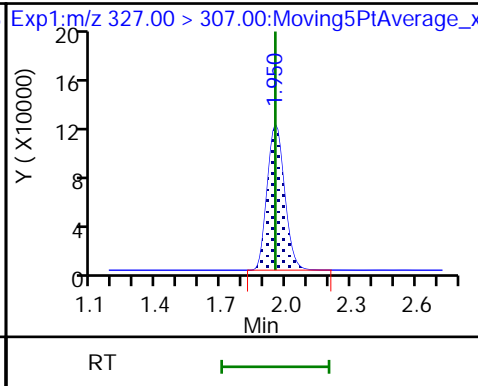
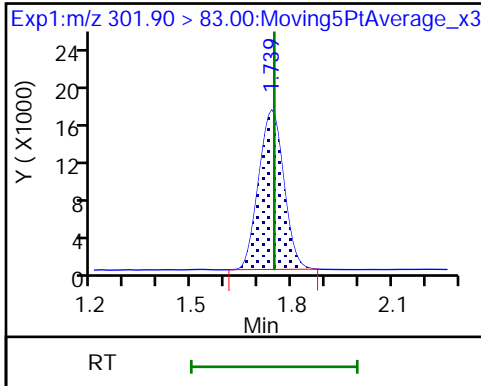
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

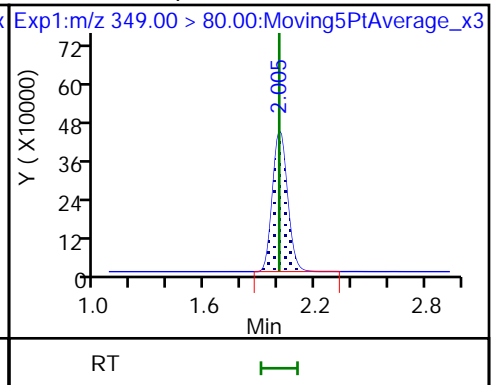
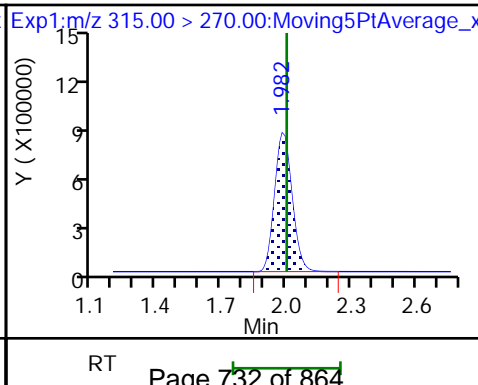
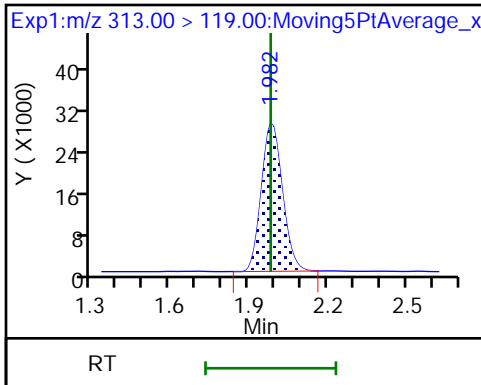
6 Perfluorohexanoic acid

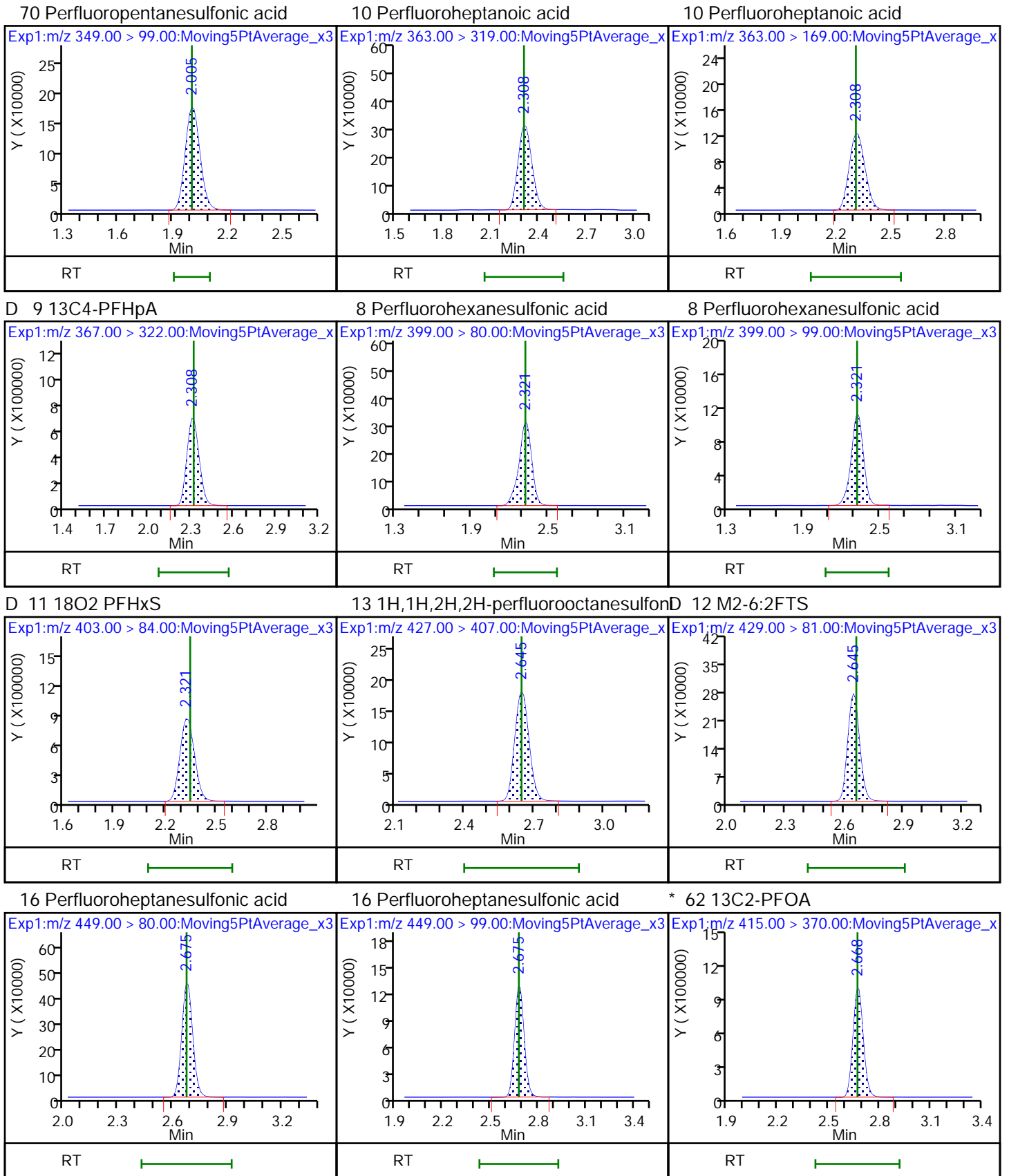


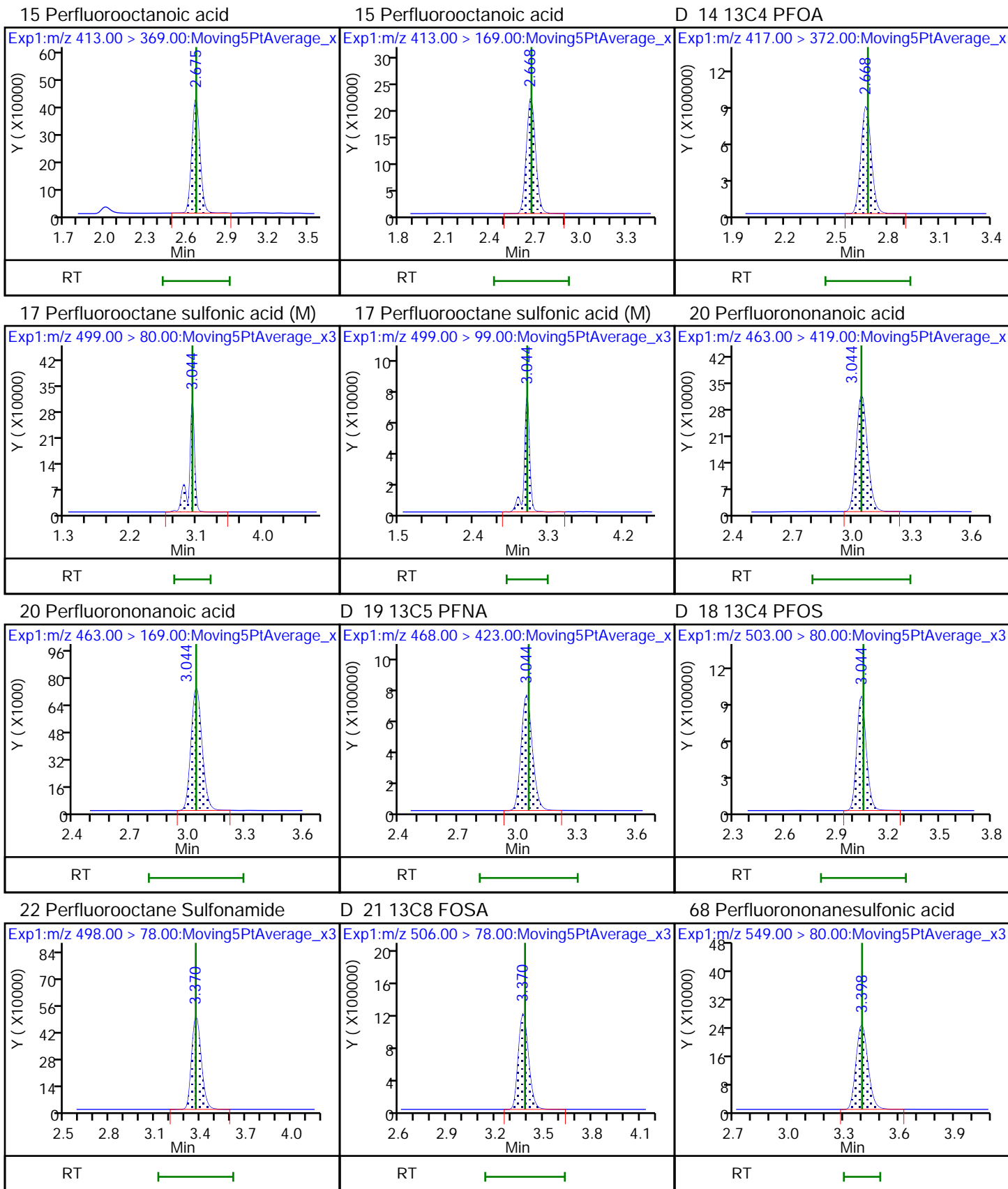
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



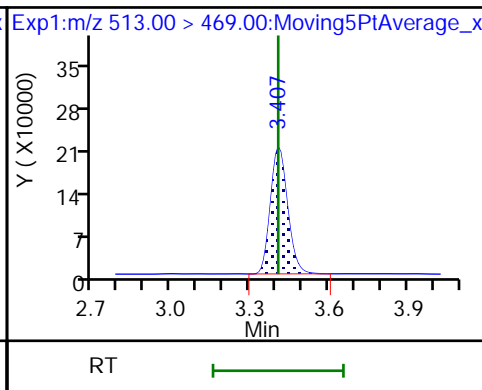
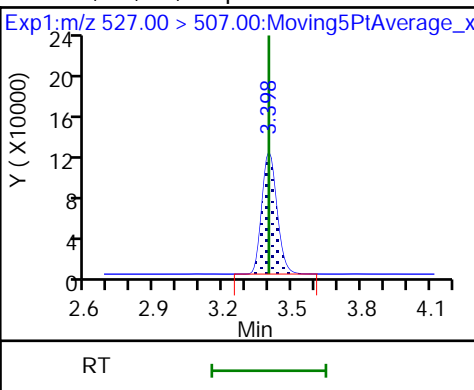
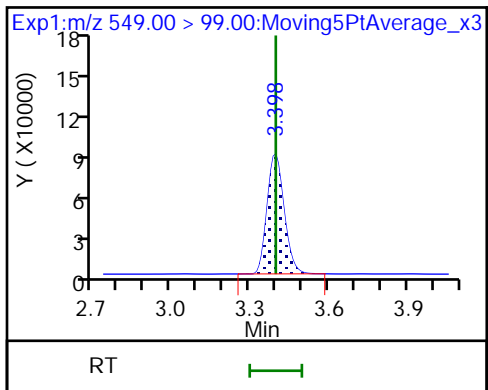




68 Perfluorononanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

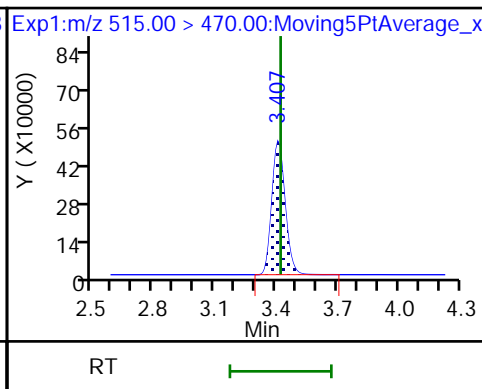
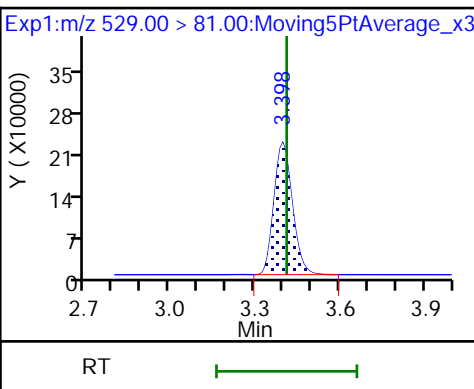
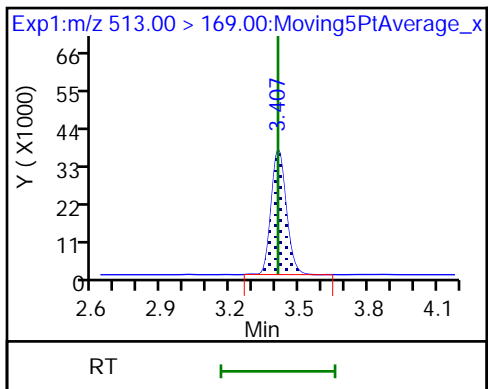
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 26 M2-8:2FTS

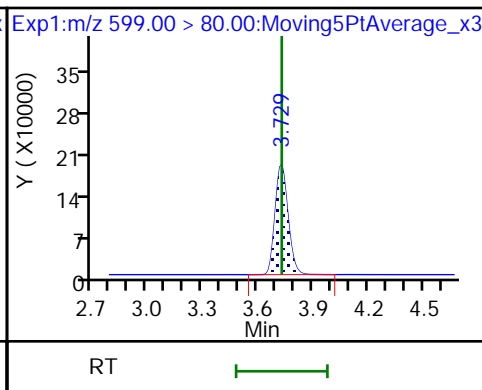
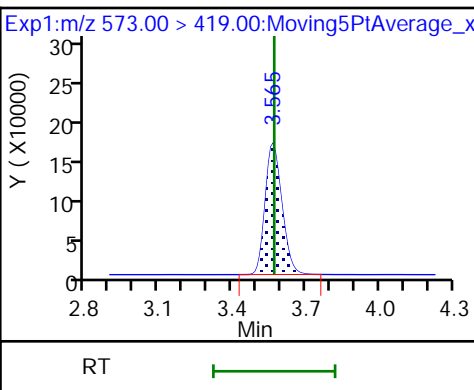
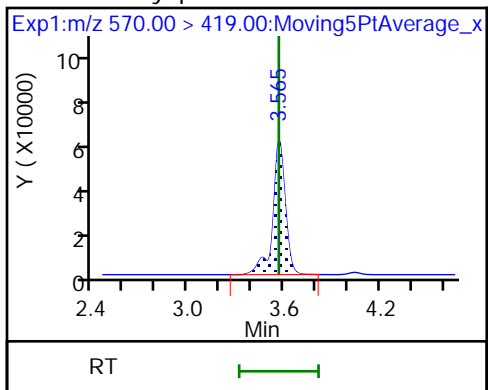
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamid

D 27 d3-NMeFOSAA

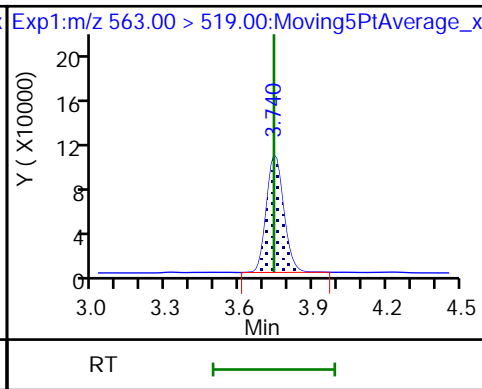
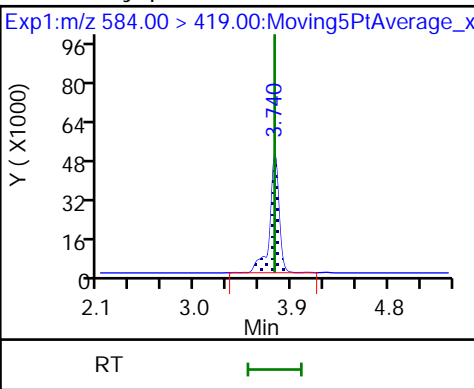
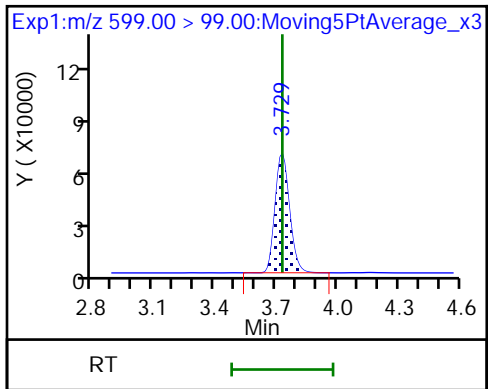
29 Perfluorodecane Sulfonic acid

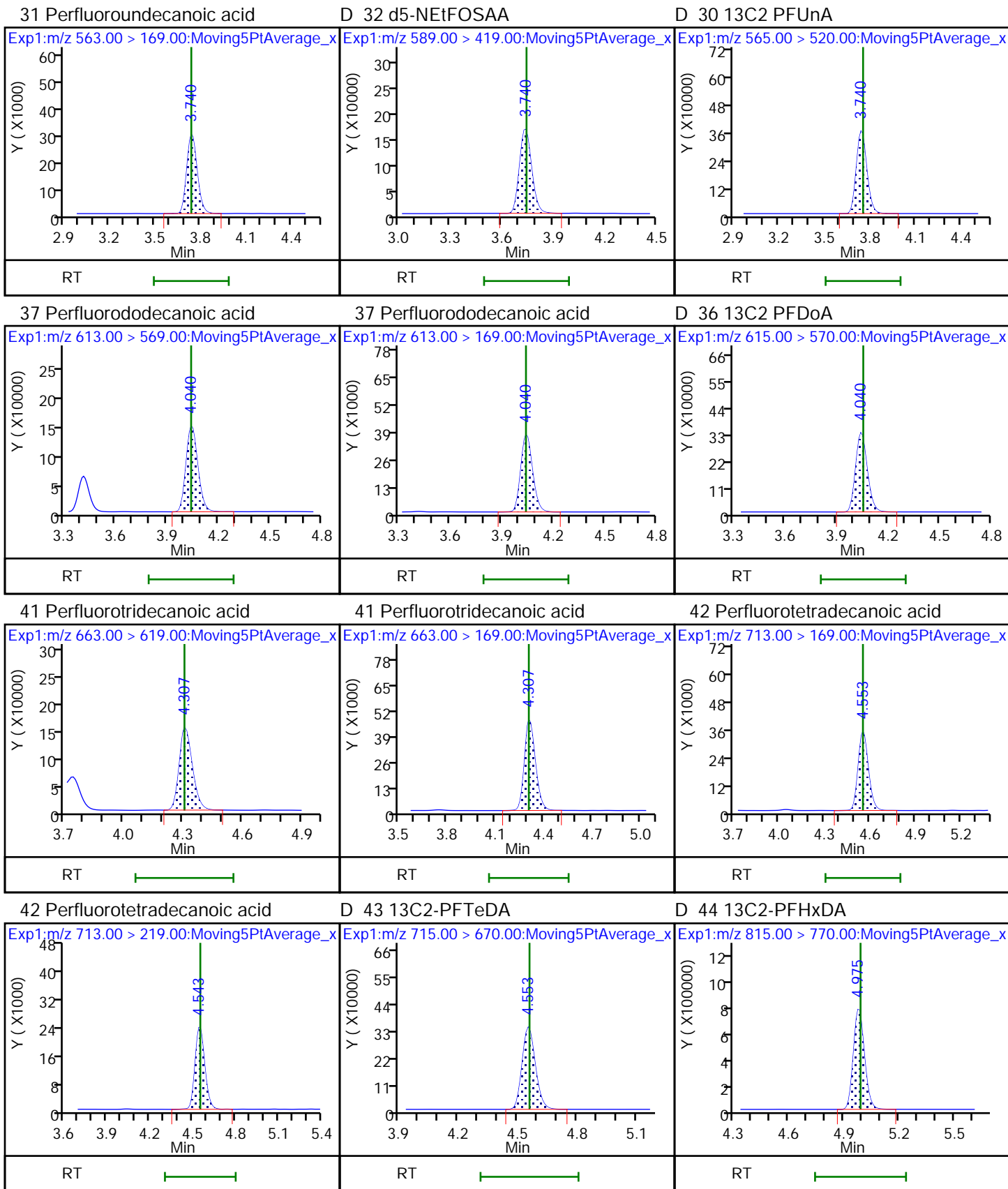


29 Perfluorodecane Sulfonic acid

33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid





TestAmerica Sacramento

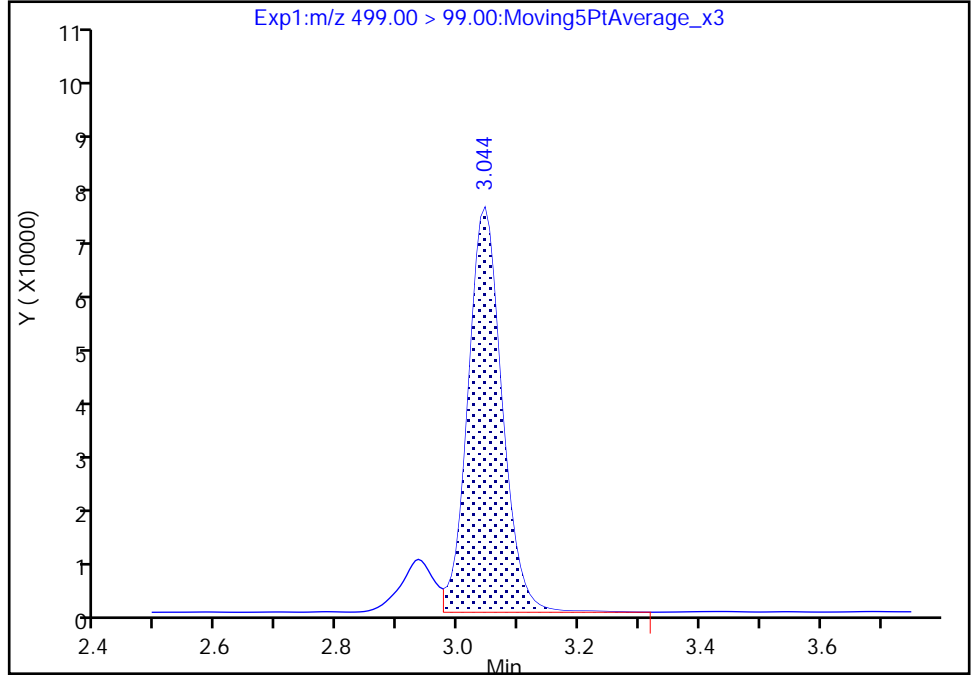
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_054.d
Injection Date: 27-Jun-2018 06:11:56 Instrument ID: A8_N
Lims ID: CCV L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 2

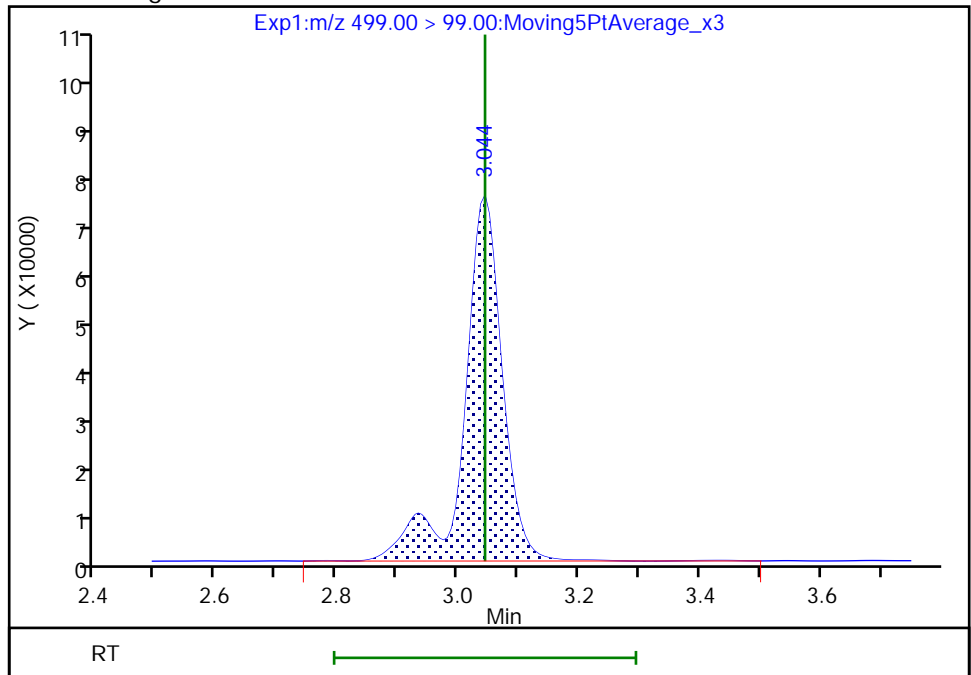
RT: 3.04
Area: 292305
Amount: 0.708796
Amount Units: ng/ml

Processing Integration Results



RT: 3.04
Area: 330033
Amount: 0.928144
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

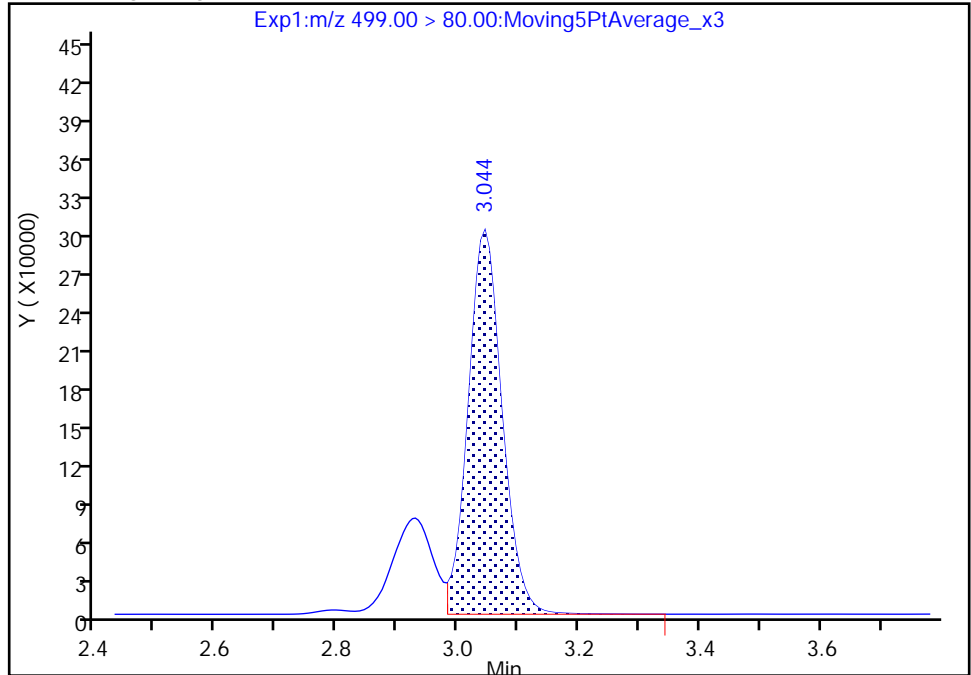
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_054.d
Injection Date: 27-Jun-2018 06:11:56 Instrument ID: A8_N
Lims ID: CCV L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

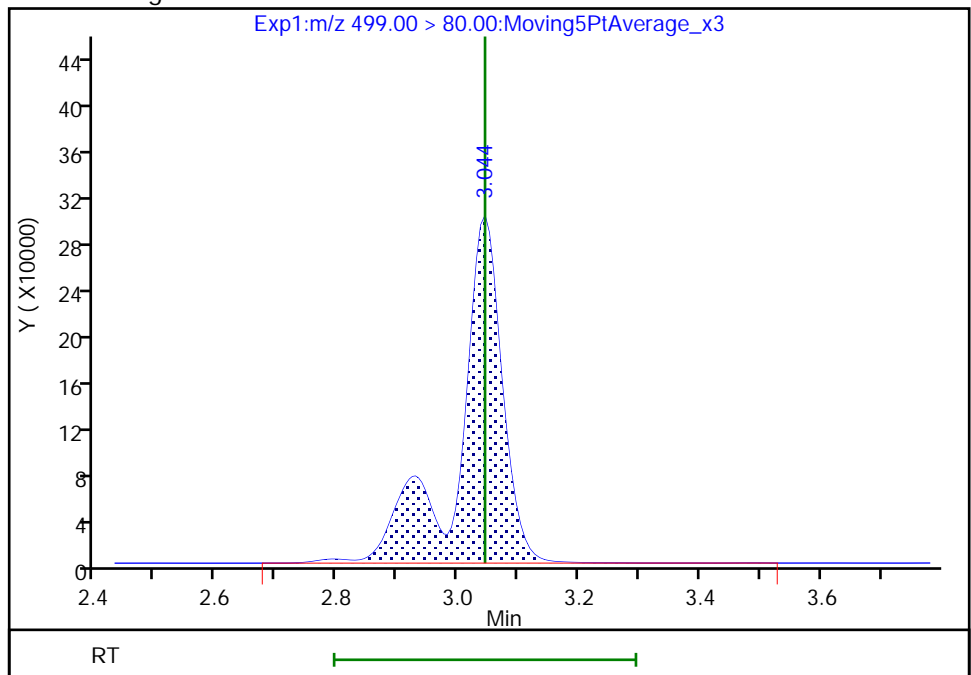
RT: 3.04
Area: 1155175
Amount: 0.708796
Amount Units: ng/ml

Processing Integration Results



RT: 3.04
Area: 1512662
Amount: 0.928144
Amount Units: ng/ml

Manual Integration Results



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: ICV 320-231836/10 Calibration Date: 06/29/2018 22:31
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLICALA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.017	0.9762		2.40	2.50	-4.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.187	1.133		2.38	2.50	-4.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.16	79.50		2.28	2.21	3.0	30.0
4:2 FTS	AveID	19.72	18.05		2.14	2.34	-8.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.034	0.996		2.41	2.50	-3.7	30.0
Perfluoropentanesulfonic acid	AveID	69.17	70.12		2.38	2.35	1.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.109	1.053		2.37	2.50	-5.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.159	1.051		2.07	2.28	-9.3	30.0
6:2 FTS	AveID	1.607	1.632		2.41	2.38	1.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.176	1.105		2.35	2.50	-6.0	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.359	1.358		2.37	2.38	-0.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.111	1.016		2.29	2.50	-8.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.163	1.127		2.24	2.31	-3.1	30.0
Perfluorononanesulfonic acid	AveID	0.8052	0.8228		2.45	2.40	2.2	30.0
8:2 FTS	AveID	1.347	1.304		2.32	2.40	-3.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.003	1.042		2.60	2.50	3.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.061	1.072		2.53	2.50	1.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9552	1.063		2.78	2.50	11.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6883	0.6713		2.35	2.41	-2.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8938	1.054		2.95	2.50	17.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9021	0.8398		2.33	2.50	-6.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.044		2.41	2.50	-3.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.171	1.103		2.35	2.50	-5.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2501	0.2474		2.47	2.50	-1.1	30.0
13C4 PFBA	Ave	1.397	1.399		2.50	2.50	0.2	30.0
13C5 PFPeA	Ave	0.9809	0.9778		2.49	2.50	-0.3	30.0
13C3-PFBS	Ave	0.0216	0.0215		2.31	2.33	-0.4	30.0
13C2 PFHxA	Ave	1.074	1.091		2.54	2.50	1.5	30.0
13C4-PFHpA	Ave	0.9950	1.020		2.56	2.50	2.5	30.0
18O2 PFHxS	Ave	1.162	1.164		2.37	2.37	0.2	30.0
M2-6:2FTS	Ave	0.2411	0.2325		2.29	2.38	-3.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: ICV 320-231836/10 Calibration Date: 06/29/2018 22:31
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLICALA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9548	0.9644		2.53	2.50	1.0	30.0
13C4 PFOS	Ave	0.7787	0.7730		2.37	2.39	-0.7	30.0
13C5 PFNA	Ave	0.7906	0.7773		2.46	2.50	-1.7	30.0
M2-8:2FTS	Ave	0.2621	0.2612		2.39	2.40	-0.3	30.0
13C8 FOSA	Ave	1.023	1.009		2.47	2.50	-1.4	30.0
13C2 PFDA	Ave	0.6453	0.6490		2.51	2.50	0.6	30.0
d3-NMeFOSAA	Ave	0.3869	0.3878		2.51	2.50	0.2	30.0
d5-NEtFOSAA	Ave	0.3825	0.3475		2.27	2.50	-9.1	30.0
13C2 PFUnA	Ave	0.5302	0.5307		2.50	2.50	0.0	30.0
13C2 PFDoA	Ave	0.6148	0.6200		2.52	2.50	0.8	30.0
13C2-PFTeDA	Ave	0.7666	0.7512		2.45	2.50	-2.0	30.0
13C2-PFHxDA	Ave	1.436	1.434		2.50	2.50	-0.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_010.d
 Lims ID: ICV Full
 Client ID:
 Sample Type: ICV
 Inject. Date: 29-Jun-2018 22:31:41 ALS Bottle#: 17 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist:
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:54:33 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:27:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.428	1.428	0.0	0.539	5885947	2.50	100	32852	
2 Perfluorobutyric acid	212.90 > 169.00	1.428	1.430	-0.002	1.000	5745573	2.40		3257	
D 3 13C5-PFPeA	267.90 > 223.00	1.699	1.705	-0.006	0.641	4113623	2.49	99.7	47257	
4 Perfluoropentanoic acid	262.90 > 219.00	1.708	1.706	0.002	1.005	4659568	2.38		3106	
D 47 13C3-PFBS	301.90 > 83.00	1.735	1.741	-0.006	0.654	84197	2.31	99.6	717	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.744	1.745	-0.001	1.005	6370052	2.28		26868	
	298.90 > 99.00	1.744	1.745	-0.001	1.005	2634065	2.42(1.25-3.74)		23960	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.945	1.948	-0.003	1.121	1527563	2.14		67729	
D 60 M2-4:2FTS	329.00 > 81.00	1.945	1.948	-0.003	0.734	667790	NC		10729	
6 Perfluorohexanoic acid	313.00 > 269.00	1.978	1.984	-0.006	1.000	4569851	2.41		12626	
	313.00 > 119.00	1.978	1.984	-0.006	1.000	413355	11.06(5.03-15.10)		7272	
D 7 13C2 PFHxA	315.00 > 270.00	1.978	1.984	-0.006	0.746	4588359	2.54	102	115177	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.000	2.004	-0.004	1.153	5967295	2.38		53965	
	349.00 > 99.00	2.000	2.004	-0.004	1.153	2180635	2.74(1.36-4.07)		34099	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.079	2.080	-0.001	0.784	226179	NC		3918	

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	2.079	2.082	-0.003	1.000	658695	NC		4964
D 9 13C4-PFHpA	367.00	> 322.00	2.290	2.302	-0.012	0.864	4292542	2.56	103	43980
10 Perfluoroheptanoic acid	363.00	> 319.00	2.303	2.304	-0.001	1.006	4521842	2.37		8049
	363.00	> 169.00	2.303	2.304	-0.001	1.006	1711437	2.64(1.13-3.40)		15556
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.303	2.314	-0.011	1.000	4697238	2.07		15771
	399.00	> 99.00	2.303	2.314	-0.011	1.000	1583282	2.97(1.50-4.49)		7999
D 11 18O2 PFHxS	403.00	> 84.00	2.303	2.317	-0.014	0.869	4634093	2.37	100	23571
65 Adona	377.00	> 251.00	2.342	2.345	-0.003	0.778	12171679	NC		81799
	377.00	> 85.00	2.342	2.345	-0.003	0.778	7154335	1.70(0.84-2.53)		47925
D 12 M2-6:2FTS	429.00	> 81.00	2.619	2.627	-0.008	0.988	929160	2.29	96.4	16453
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.619	2.629	-0.010	1.000	1516547	2.41		7496
D 14 13C4 PFOA	417.00	> 372.00	2.651	2.653	-0.002	1.000	4057218	2.53	101	37932
* 62 13C2-PFOA	415.00	> 370.00	2.651	2.655	-0.004		4207014	2.50		33841
15 Perfluorooctanoic acid	413.00	> 369.00	2.651	2.657	-0.006	1.000	4483819	2.35		1583
	413.00	> 169.00	2.651	2.657	-0.006	1.000	2330954	1.92(0.84-2.52)		14386
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.659	2.663	-0.005	0.883	4196854	2.37		23382
	449.00	> 99.00	2.651	2.663	-0.012	0.881	1118018	3.75(1.94-5.82)		12397
D 18 13C4 PFOS	503.00	> 80.00	3.009	3.017	-0.008	1.135	3109113	2.37	99.3	27078
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.009	3.018	-0.009	1.000	3390922	2.24		18586
	499.00	> 99.00	3.009	3.018	-0.009	1.000	758409	4.47(2.31-6.93)		18886
20 Perfluorononanoic acid	463.00	> 419.00	3.009	3.018	-0.009	1.000	3322232	2.29		8667
	463.00	> 169.00	3.009	3.018	-0.009	1.000	785283	4.23(1.90-5.69)		14625
D 19 13C5 PFNA	468.00	> 423.00	3.009	3.018	-0.009	1.135	3270287	2.46	98.3	47308
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.223	3.229	-0.006	1.071	5445147	NC		50039
D 21 13C8 FOSA	506.00	> 78.00	3.359	3.358	0.001	1.267	4246720	2.47	98.6	32251
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.350	3.360	-0.010	1.113	2568845	2.45		35244
	549.00	> 99.00	3.350	3.360	-0.010	1.113	905138	2.84(1.33-3.97)		19187
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.359	3.361	-0.002	1.000	4424633	2.60		25885

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	3.350	3.362	-0.012	1.264	1052618	2.39		99.7	21779	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.359	3.364	-0.005	1.003	1375609	2.32			20858	
D 23 13C2 PFDA										
515.00 > 470.00	3.368	3.374	-0.006	1.271	2730136	2.51		101	31169	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.368	3.376	-0.008	1.000	2927287	2.53			18057	
513.00 > 169.00	3.368	3.376	-0.008	1.000	506601		5.78(2.36-7.09)		19099	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.518	3.527	-0.009	1.327	1631473	2.51		100	25570	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.527	3.529	-0.002	1.003	1734639	2.78			13484	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.675	3.683	-0.008	1.221	2106639	2.35			49218	
599.00 > 99.00	3.675	3.683	-0.008	1.221	742635		2.84(1.39-4.16)		31382	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.685	3.694	-0.009	1.390	1461842	2.27		90.9	11110	
D 30 13C2 PFUnA										
565.00 > 520.00	3.696	3.698	-0.002	1.394	2232462	2.50		100	35892	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.696	3.698	-0.002	1.000	1874873	2.33			9564	
563.00 > 169.00	3.696	3.698	-0.002	1.000	441308		4.25(2.12-6.36)		15273	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.696	3.700	-0.004	1.003	1540236	2.95			52075	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.853	3.858	-0.005	1.280	8735430	NC			64881	
D 36 13C2 PFDaA										
615.00 > 570.00	3.986	3.992	-0.006	1.504	2608279	2.52		101	15900	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.986	3.992	-0.006	1.000	2723855	2.41			3584	
613.00 > 169.00	3.986	3.992	-0.006	1.000	679388		4.01(2.13-6.40)		13088	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.250	4.255	-0.005	1.066	2876770	2.35			2630	
663.00 > 169.00	4.250	4.255	-0.005	1.066	845127		3.40(1.25-3.76)		12243	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.490	4.490	0.0	1.694	3160120	2.45		98.0	12645	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.490	4.490	0.0	1.000	781703	2.47			11573	
713.00 > 219.00	4.480	4.490	-0.010	0.998	557382		1.40(0.71-2.13)		10586	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.899	-0.003	1.847	6031926	2.50		99.9	15643	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.900	-0.004	1.000	5791398	NC			2628	
813.00 > 169.00	4.896	4.900	-0.004	1.000	902812		6.41(2.86-8.58)		8035	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.247	5.251	-0.004	1.072	6733693	NC			1854	
913.00 > 169.00	5.247	5.251	-0.004	1.072	816929		8.24(3.83-11.48)		6800	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFCIC_FULL_00011

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_010.d

Injection Date: 29-Jun-2018 22:31:41

Instrument ID: A8_N

Lims ID: ICV Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 17

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

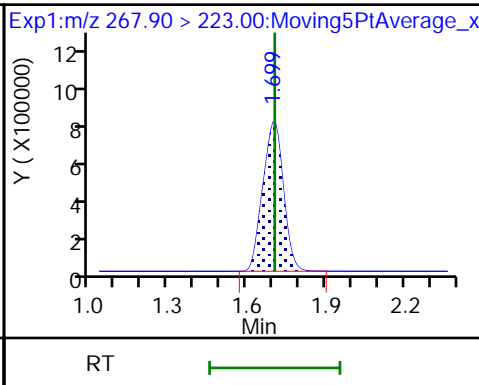
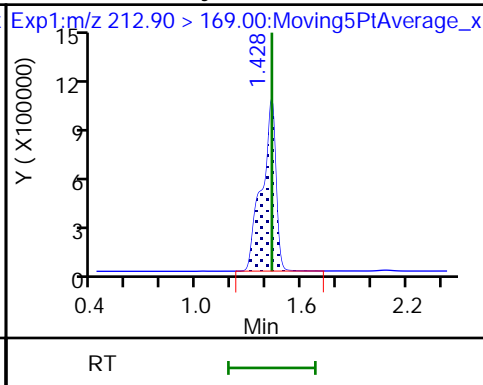
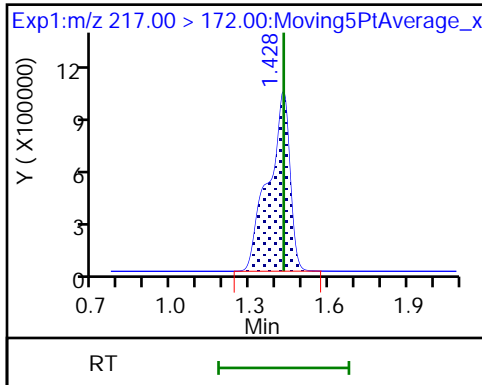
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

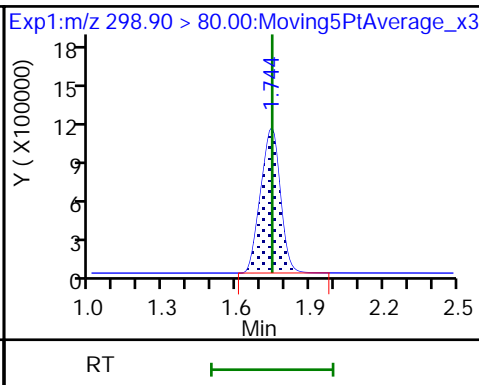
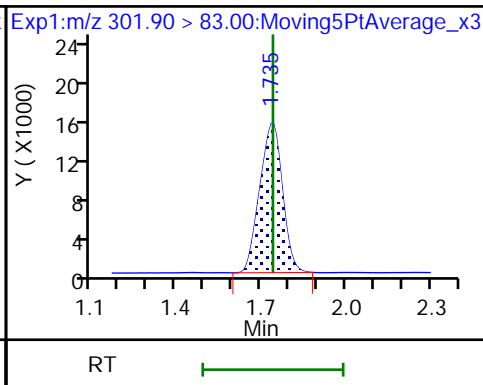
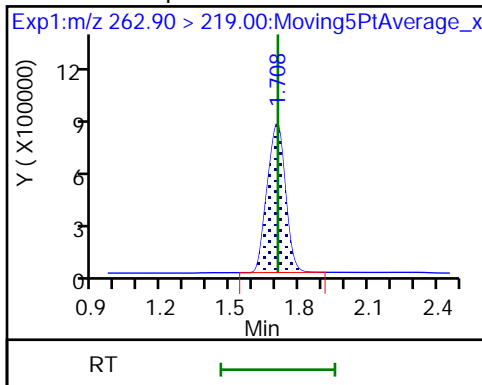
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

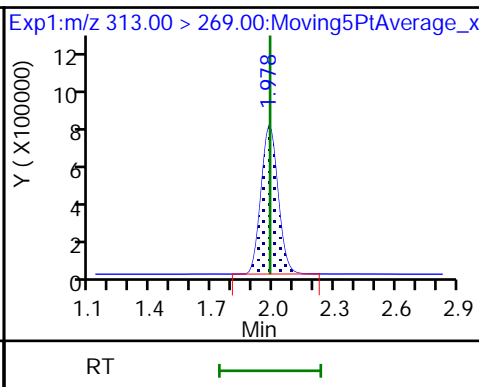
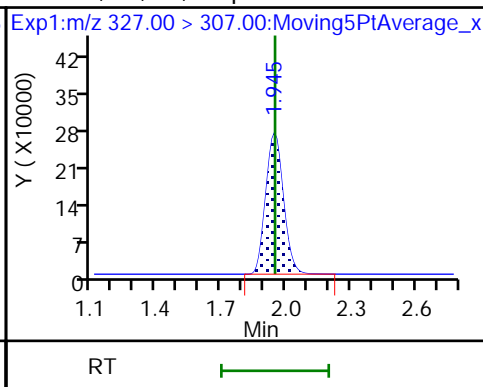
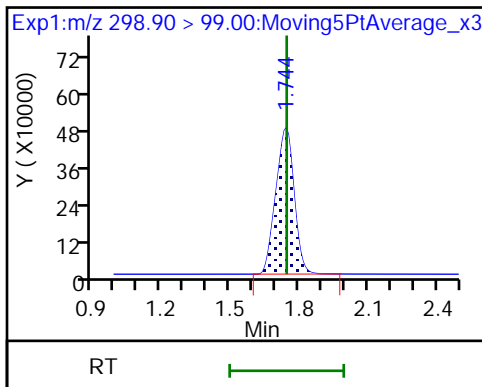
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfoni

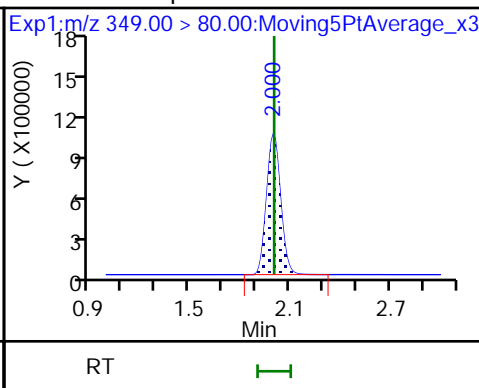
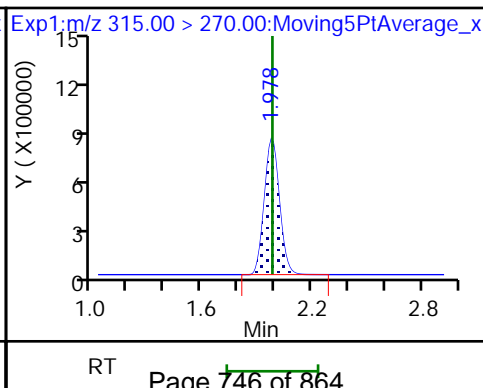
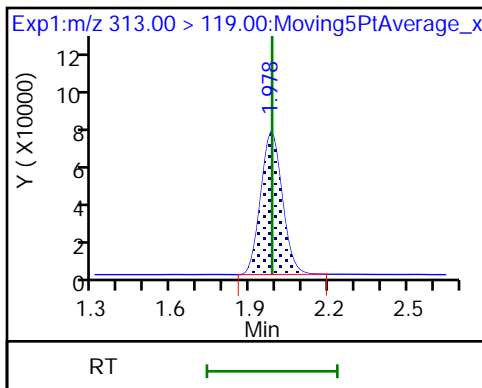
6 Perfluorohexanoic acid

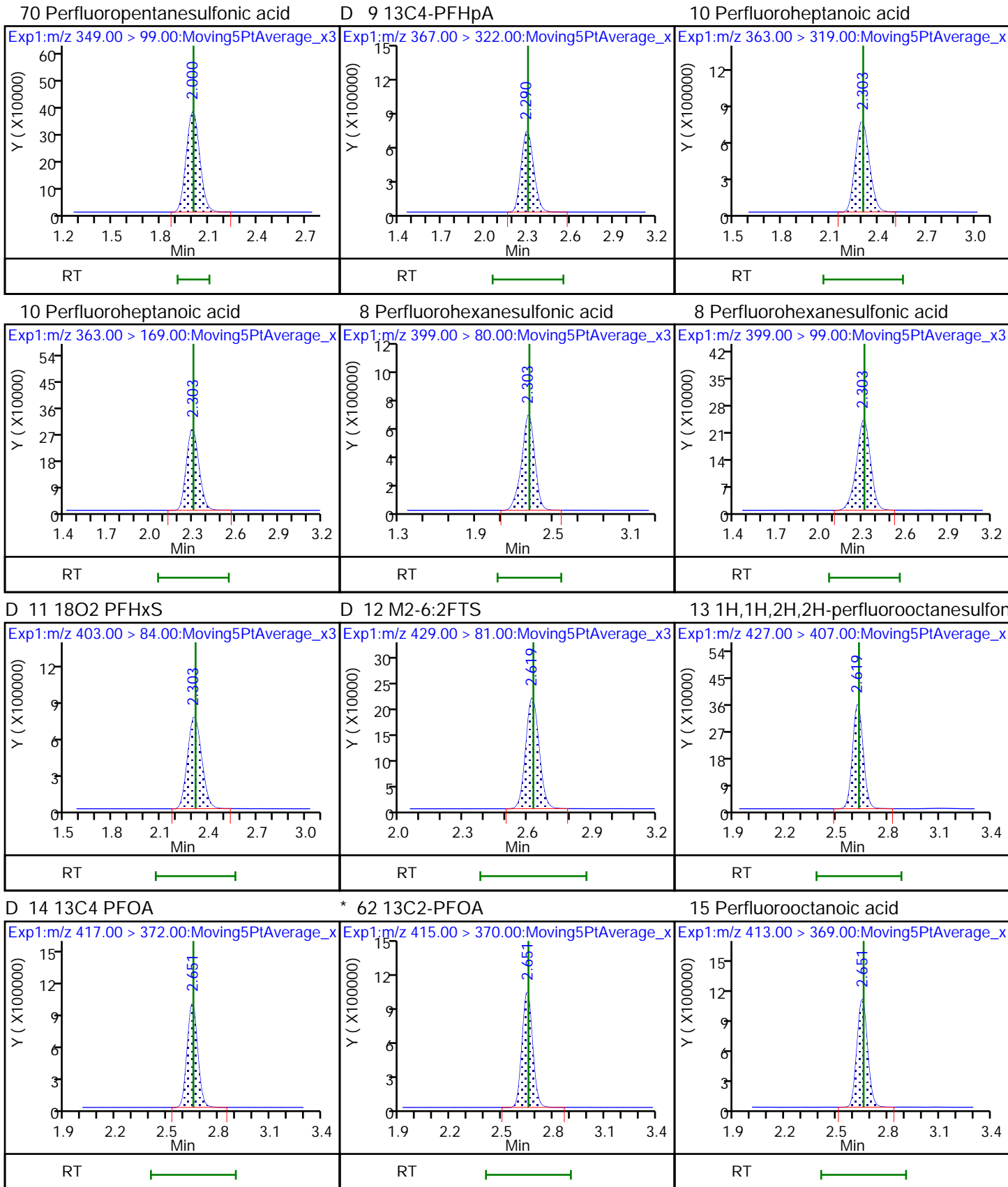


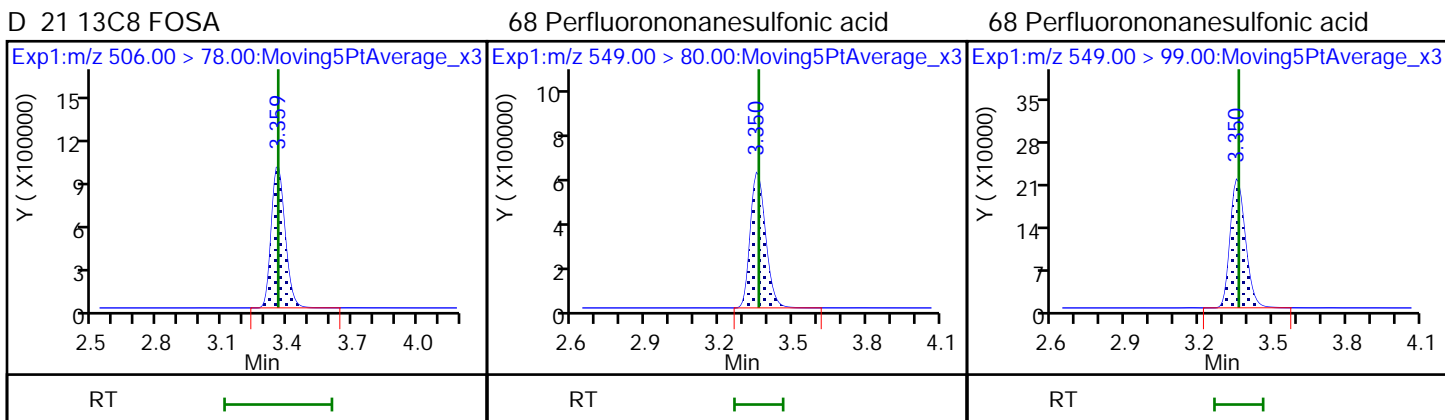
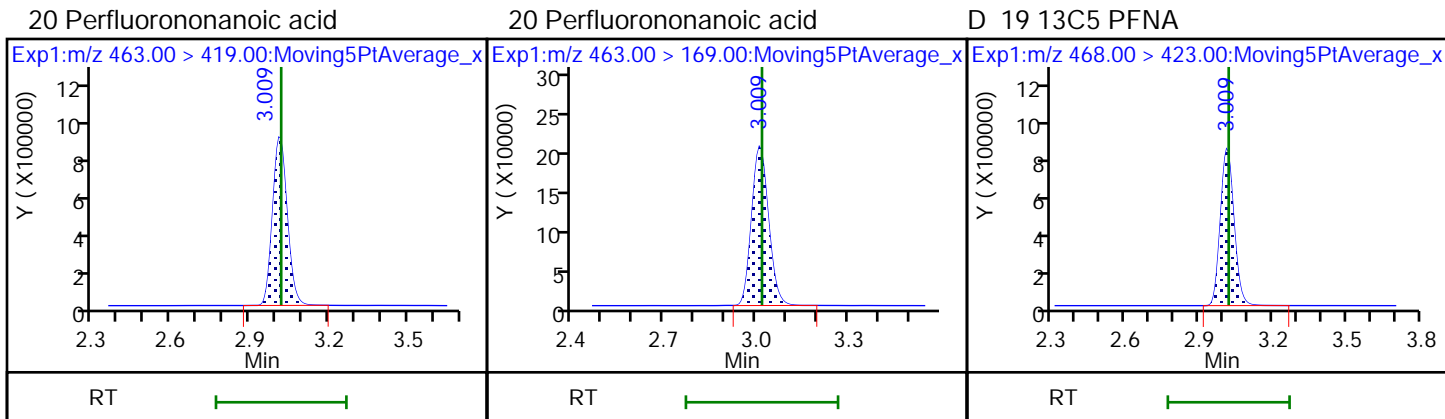
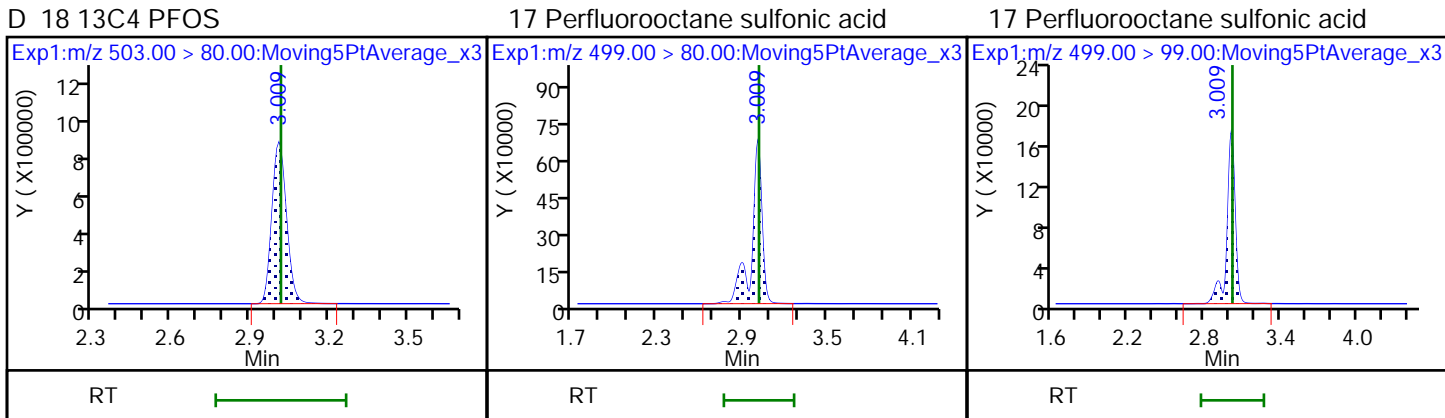
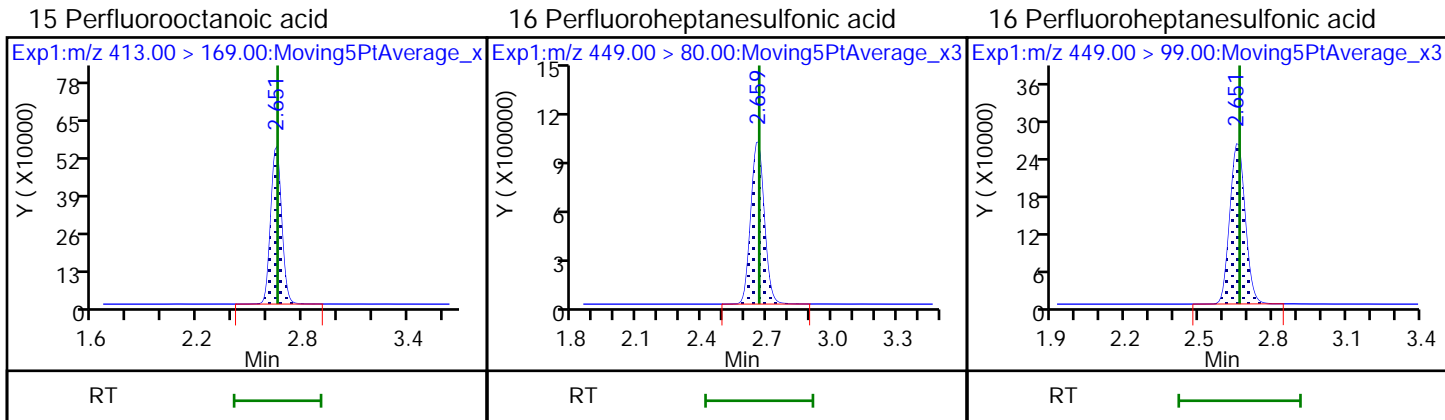
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



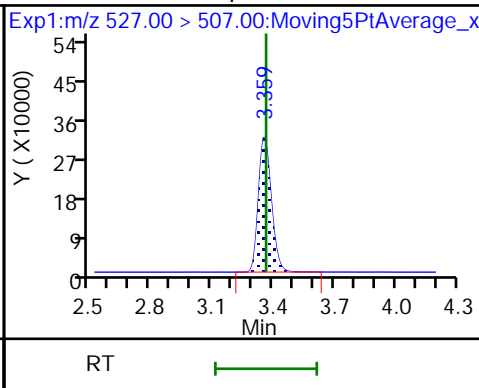
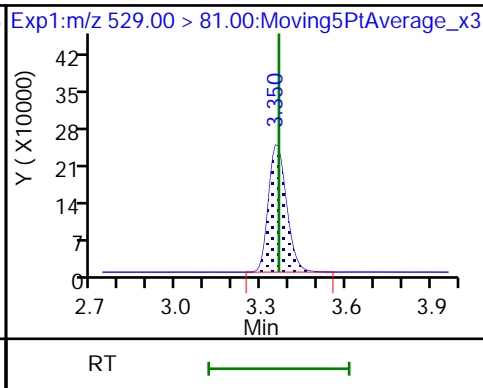
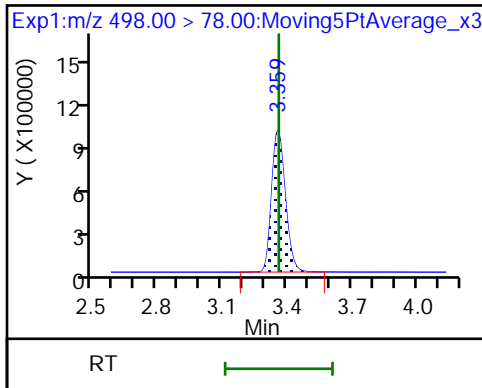




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

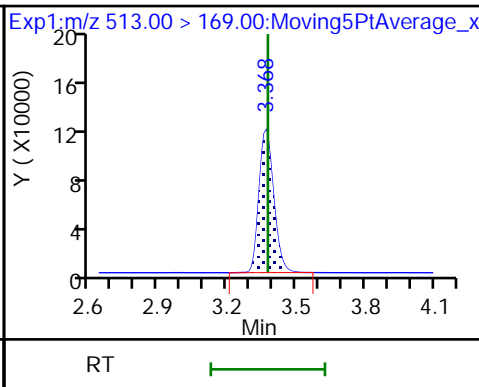
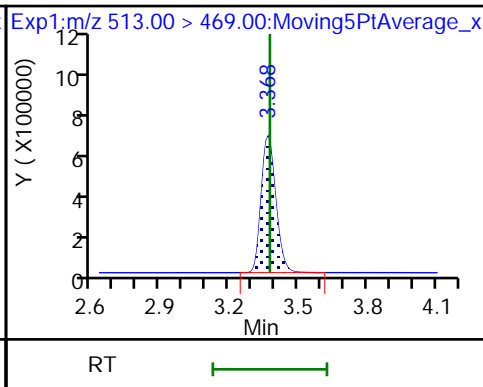
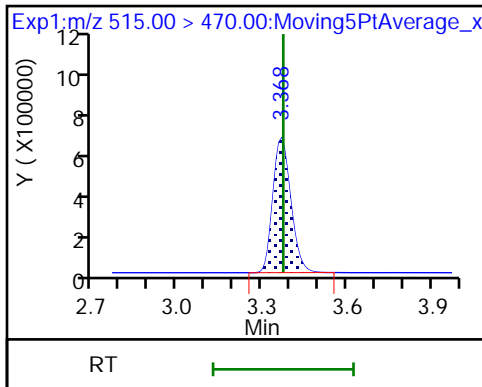
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid

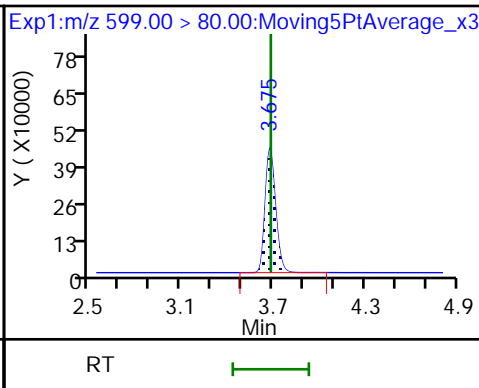
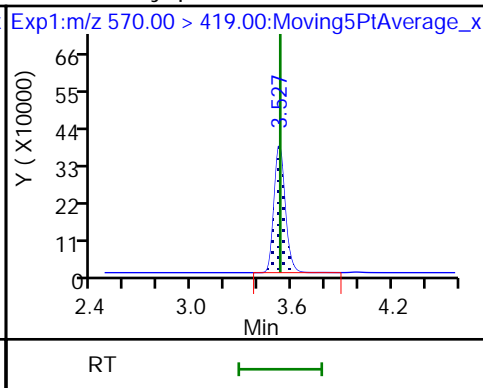
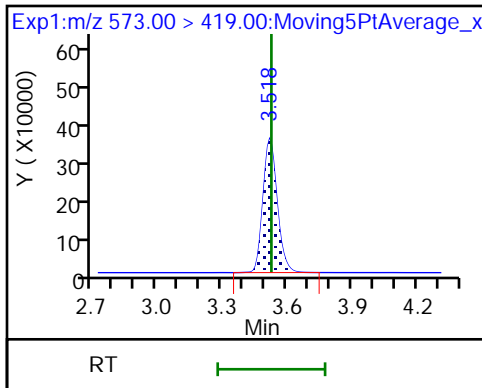
24 Perfluorodecanoic acid



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

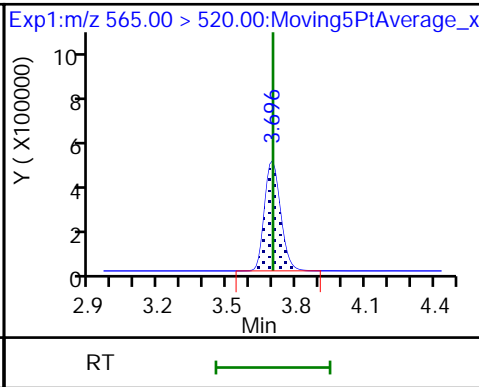
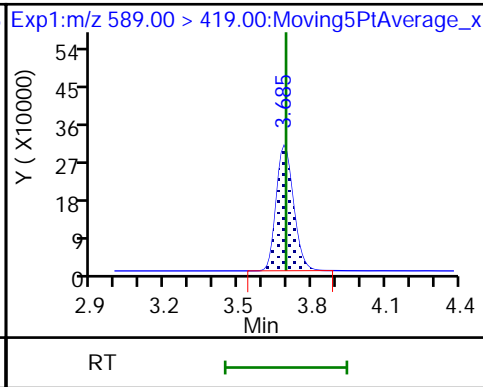
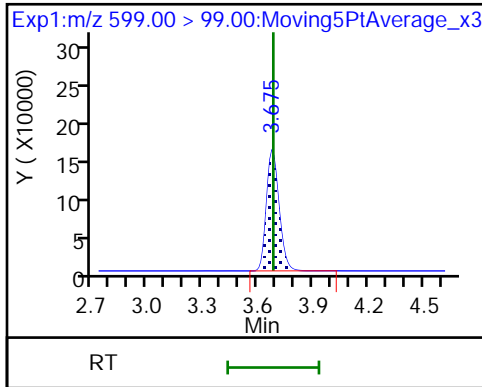
29 Perfluorodecane Sulfonic acid

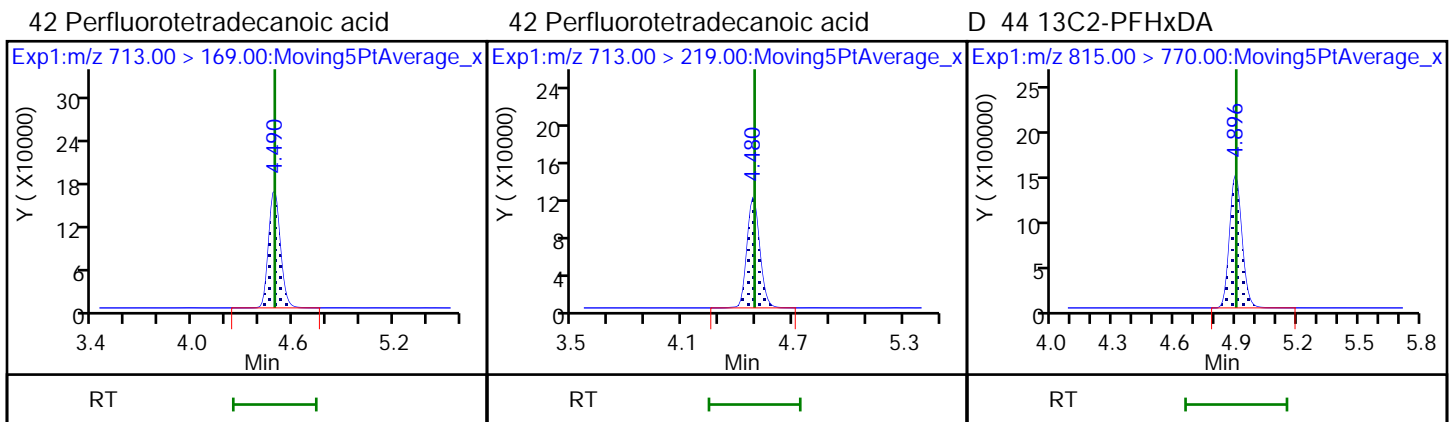
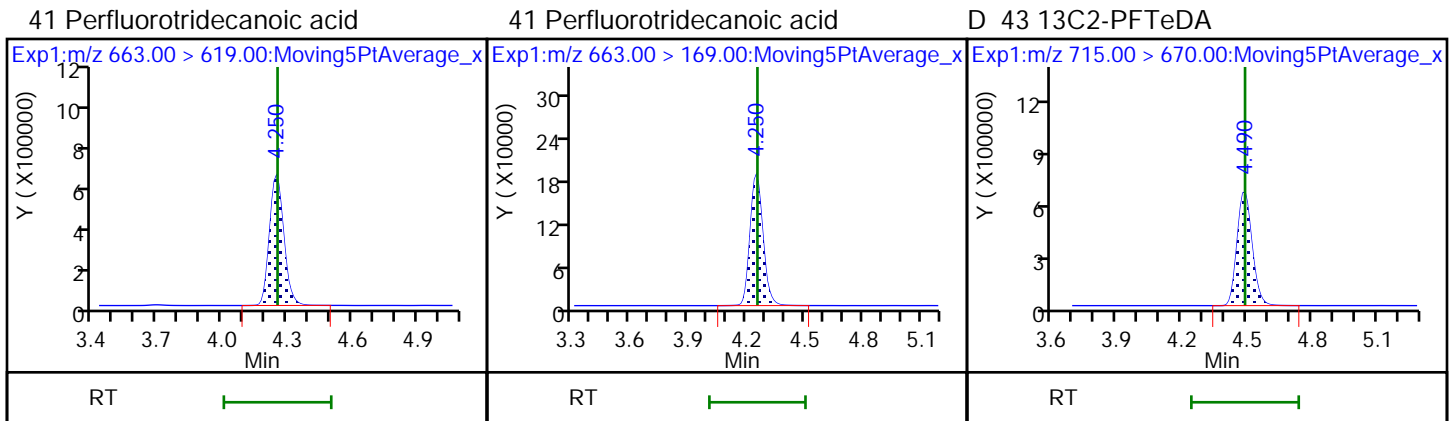
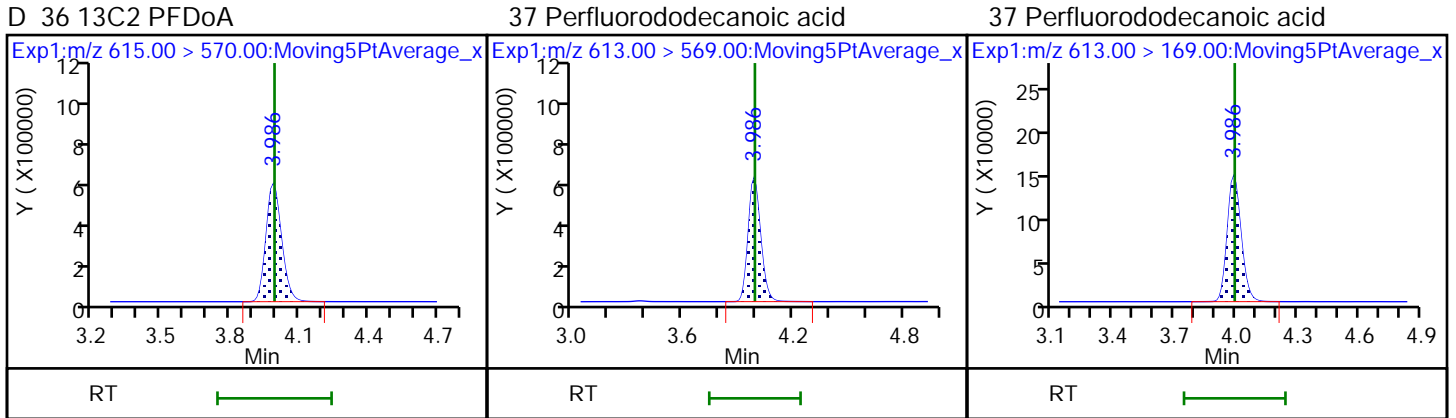
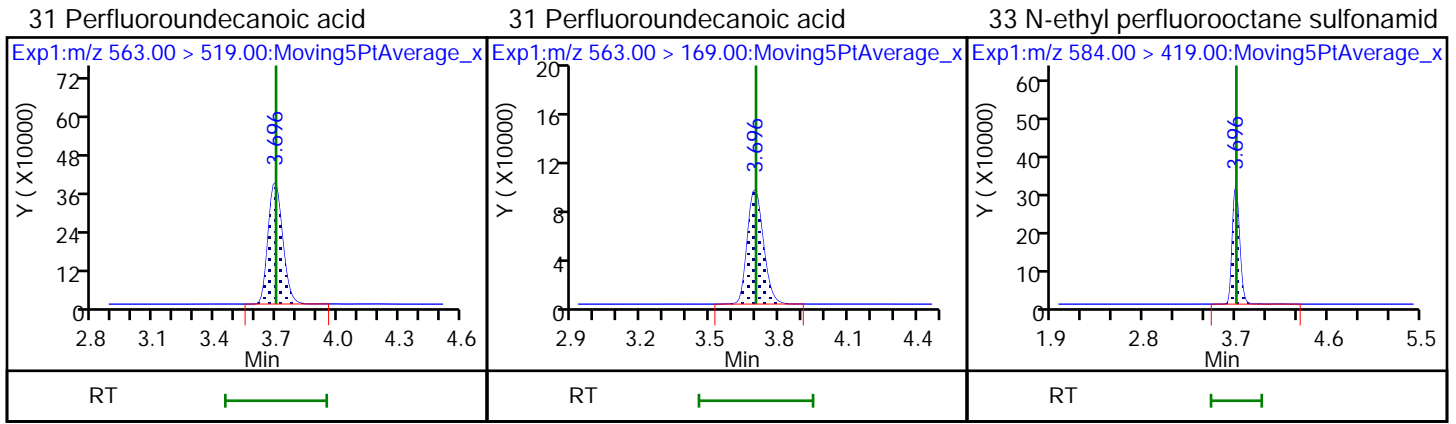


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231842/1 Calibration Date: 06/30/2018 00:13
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLBBX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.017	0.9875		0.971	1.00	-2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.187	1.146		0.965	1.00	-3.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.16	75.88		0.869	0.884	-1.7	30.0
4:2 FTS	AveID	19.72	18.72		0.887	0.934	-5.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.034	1.045		1.01	1.00	1.0	30.0
Perfluoropentanesulfonic acid	AveID	69.17	68.80		0.933	0.938	-0.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.109	1.095		0.987	1.00	-1.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.159	1.063		0.835	0.910	-8.3	30.0
6:2 FTS	AveID	1.607	1.763		1.04	0.948	9.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.176	1.111		0.946	1.00	-5.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.359	1.390		0.974	0.952	2.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.111	1.065		0.959	1.00	-4.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.163	1.123		0.896	0.928	-3.4	30.0
8:2 FTS	AveID	1.347	1.431		1.02	0.958	6.3	30.0
Perfluorononanesulfonic acid	AveID	0.8052	0.7879		0.939	0.960	-2.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.061	1.112		1.05	1.00	4.8	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.003	1.041		1.04	1.00	3.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9552	0.995		1.04	1.00	4.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6883	0.7158		1.00	0.964	4.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8938	0.8530		0.954	1.00	-4.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9021	0.9863		1.09	1.00	9.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.056		0.975	1.00	-2.5	30.0
Perfluorotridecanoic Acid (PFTrIA)	AveID	1.171	1.061		0.906	1.00	-9.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2501	0.2489		0.995	1.00	-0.5	30.0
13C4 PFBA	Ave	1.397	1.393		2.49	2.50	-0.3	30.0
13C5 PFPeA	Ave	0.9809	1.010		2.57	2.50	3.0	30.0
13C3-PFBS	Ave	0.0216	0.0222		2.38	2.33	2.5	30.0
13C2 PFHxA	Ave	1.074	1.090		2.54	2.50	1.5	30.0
13C4-PFHpA	Ave	0.9950	1.010		2.54	2.50	1.5	30.0
18O2 PFHxS	Ave	1.162	1.214		2.47	2.37	4.5	30.0
M2-6:2FTS	Ave	0.2411	0.2432		2.40	2.38	0.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231842/1 Calibration Date: 06/30/2018 00:13
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLBBX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9548	0.995		2.61	2.50	4.2	30.0
13C4 PFOS	Ave	0.7787	0.7961		2.44	2.39	2.2	30.0
13C5 PFNA	Ave	0.7906	0.7875		2.49	2.50	-0.4	30.0
13C8 FOSA	Ave	1.023	1.044		2.55	2.50	2.0	30.0
M2-8:2FTS	Ave	0.2621	0.2573		2.35	2.40	-1.8	30.0
13C2 PFDA	Ave	0.6453	0.6280		2.43	2.50	-2.7	30.0
d3-NMeFOSAA	Ave	0.3869	0.3746		2.42	2.50	-3.2	30.0
13C2 PFUnA	Ave	0.5302	0.4973		2.35	2.50	-6.2	30.0
d5-NEtFOSAA	Ave	0.3825	0.3993		2.61	2.50	4.4	30.0
13C2 PFDoA	Ave	0.6148	0.6396		2.60	2.50	4.0	30.0
13C2-PFTeDA	Ave	0.7666	0.7527		2.45	2.50	-1.8	30.0
13C2-PFHxDA	Ave	1.436	1.437		2.50	2.50	0.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\2018.06.29LLBBX_014.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 30-Jun-2018 00:13:26 ALS Bottle#: 28 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 08:15:51 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 08:04:37

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	1.428	1.428	0.0	0.539	5713659	2.49	99.7	34534	
2 Perfluorobutyric acid	212.90 > 169.00	1.433	1.433	0.0	1.004	2256912	0.9706	97.1	1202	
D 3 13C5-PFPeA	267.90 > 223.00	1.707	1.705	0.002	0.644	4144391	2.57	103	48167	
4 Perfluoropentanoic acid	262.90 > 219.00	1.707	1.707	0.0	1.000	1898967	0.9647	96.5	1407	
D 47 13C3-PFBS	301.90 > 83.00	1.743	1.741	0.002	0.658	84514	2.38	102	597	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.743	1.743	0.0	1.000	2438251	0.8693	98.3	10280	
	298.90 > 99.00	1.743	1.743	0.0	1.000	1020940	2.39(1.25-3.74)		9324	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.945	1.945	0.0	1.116	635685	0.8870	95.0	37847	
D 60 M2-4:2FTS	329.00 > 81.00	1.945	1.948	-0.003	0.734	671928	NC		12078	
6 Perfluorohexanoic acid	313.00 > 269.00	1.977	1.977	0.0	1.000	1868953	1.01	101	5358	
	313.00 > 119.00	1.977	1.977	0.0	1.000	168335	11.10(5.03-15.10)		4220	
D 7 13C2 PFHxA	315.00 > 270.00	1.977	1.984	-0.007	0.746	4473185	2.54	102	87426	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	1.999	1.999	0.0	1.147	2345931	0.9330	99.5	33842	
	349.00 > 99.00	1.999	1.999	0.0	1.147	858508	2.73(1.36-4.07)		16625	
67 Perfluoro(2-propoxypropanoic) acid	329.10 > 285.00	2.078	2.078	0.0	1.000	330545	NC		2638	

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	2.078	2.080	-0.002	0.784	196831	NC	2918	
D 9 13C4-PFHpA	367.00	> 322.00	2.303	2.302	0.001	0.869	4145025	2.54	102	48890
10 Perfluoroheptanoic acid	363.00	> 319.00	2.303	2.303	0.0	1.000	1814712	0.9869	98.7	3466
	363.00	> 169.00	2.303	2.303	0.0	1.000	660939	2.75(1.13-3.40)		5442
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.303	2.303	0.0	0.994	1926901	0.8348	91.7	11354
	399.00	> 99.00	2.303	2.303	0.0	0.994	630073	3.06(1.50-4.49)		4437
D 11 18O2 PFHxS	403.00	> 84.00	2.316	2.317	-0.001	0.874	4711420	2.47	104	37104
65 Adona	377.00	> 251.00	2.342	2.342	0.0	0.779	5227518	NC		52314
	377.00	> 85.00	2.342	2.342	0.0	0.779	2957984	1.77(0.84-2.53)		31289
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.626	2.626	0.0	1.003	667228	1.04	110	3307
D 12 M2-6:2FTS	429.00	> 81.00	2.618	2.627	-0.009	0.988	948096	2.40	101	16821
* 62 13C2-PFOA	415.00	> 370.00	2.651	2.651	0.0		4102960	2.50		37203
15 Perfluorooctanoic acid	413.00	> 369.00	2.651	2.651	0.0	1.000	1815748	0.9457	94.5	741
	413.00	> 169.00	2.651	2.651	0.0	1.000	949975	1.91(0.84-2.52)		6041
D 14 13C4 PFOA	417.00	> 372.00	2.651	2.653	-0.002	1.000	4083212	2.61	104	31902
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.658	2.658	0.0	0.884	1729285	0.9738	102	15782
	449.00	> 99.00	2.658	2.658	0.0	0.884	458233	3.77(1.94-5.82)		7762
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.014	3.014	0.0	1.002	1361728	0.8963	96.6	9510
	499.00	> 99.00	3.014	3.014	0.0	1.002	297633	4.58(2.31-6.93)		6734
20 Perfluorononanoic acid	463.00	> 419.00	3.014	3.014	0.0	1.000	1376629	0.9585	95.9	3673
	463.00	> 169.00	3.014	3.014	0.0	1.000	331283	4.16(1.90-5.69)		21583
D 18 13C4 PFOS	503.00	> 80.00	3.007	3.017	-0.010	1.134	3122784	2.44	102	34013
D 19 13C5 PFNA	468.00	> 423.00	3.014	3.018	-0.004	1.137	3230890	2.49	99.6	46597
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.219	3.219	0.0	1.070	2339817	NC		34876
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.355	3.355	0.0	1.116	988304	0.9394	97.9	19385
	549.00	> 99.00	3.355	3.355	0.0	1.116	368646	2.68(1.33-3.97)		12300
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.355	3.355	0.0	1.000	579083	1.02	106	16541
D 21 13C8 FOSA	506.00	> 78.00	3.355	3.358	-0.003	1.266	4282454	2.55	102	32515

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	3.355	3.362	-0.007	1.266	1011479	2.35		98.2	22863	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.364	3.364	0.0	1.003	1783312	1.04		104	28951	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.364	3.364	0.0	1.000	1146201	1.05		105	6525	
513.00 > 169.00	3.364	3.364	0.0	1.000	199268		5.75(2.36-7.09)		9016	
D 23 13C2 PFDA										
515.00 > 470.00	3.364	3.374	-0.010	1.269	2576575	2.43		97.3	32391	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.523	3.523	0.0	1.000	611792	1.04		104	4659	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.523	3.527	-0.004	1.329	1537118	2.42		96.8	33560	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.678	3.678	0.0	1.223	901602	1.00		104	21200	
599.00 > 99.00	3.678	3.678	0.0	1.223	272506		3.31(1.39-4.16)		11633	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.689	3.689	0.0	1.000	805015	1.09		109	4039	
563.00 > 169.00	3.689	3.689	0.0	1.000	189386		4.25(2.12-6.36)		6644	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.689	3.689	0.0	1.000	558948	0.9544		95.4	12078	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.689	3.694	-0.005	1.392	1638104	2.61		104	11565	
D 30 13C2 PFUnA										
565.00 > 520.00	3.689	3.698	-0.009	1.392	2040496	2.35		93.8	26686	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.846	3.846	0.0	1.279	4045872	NC			47338	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.989	3.989	0.0	1.003	1108029	0.9752		97.5	1238	
613.00 > 169.00	3.978	3.989	-0.011	1.000	265963		4.17(2.13-6.40)		7008	
D 36 13C2 PFDaA										
615.00 > 570.00	3.978	3.992	-0.014	1.501	2624047	2.60		104	13540	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.243	4.243	0.0	1.067	1113749	0.9059		90.6	1050	
663.00 > 169.00	4.243	4.243	0.0	1.067	364705		3.05(1.25-3.76)		5349	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.481	4.481	0.0	1.000	307398	0.99		99.5	5862	
713.00 > 219.00	4.481	4.481	0.0	1.000	235558		1.30(0.71-2.13)		6154	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.481	4.490	-0.009	1.690	3088164	2.45		98.2	12044	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.888	4.888	0.0	1.000	2365869	NC			1173	
813.00 > 169.00	4.888	4.888	0.0	1.000	362529		6.53(2.86-8.58)		5421	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.888	4.899	-0.011	1.844	5894996	2.50		100	15567	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.233	5.233	0.0	1.071	2573004	NC			824	
913.00 > 169.00	5.233	5.233	0.0	1.071	317512		8.10(3.83-11.48)		4512	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL4_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\2018.06.29LLBBX_014.d

Injection Date: 30-Jun-2018 00:13:26

Instrument ID: A8_N

Lims ID: CCV L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 28

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

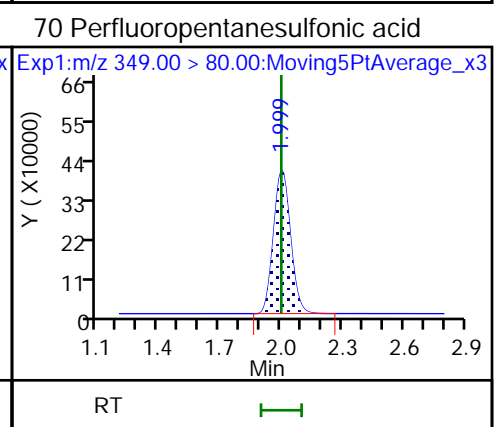
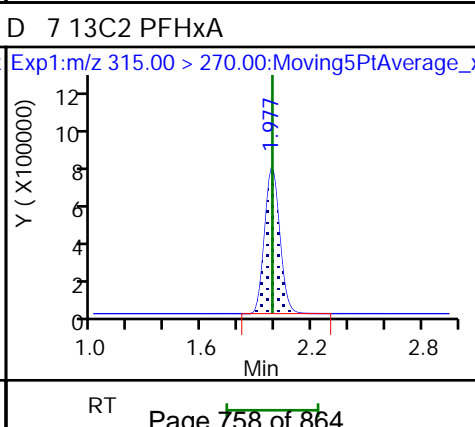
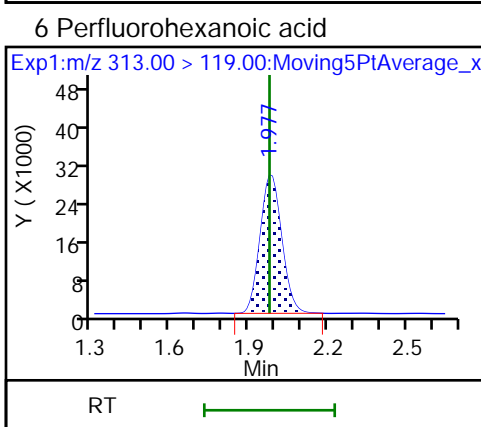
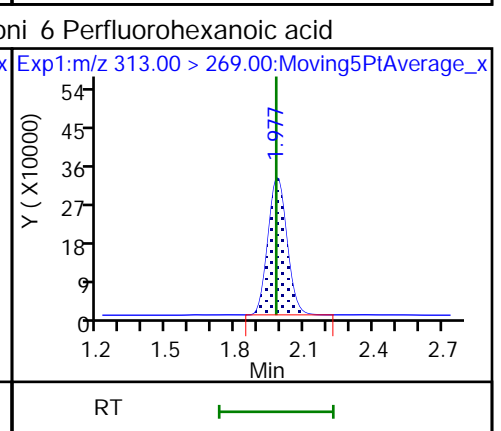
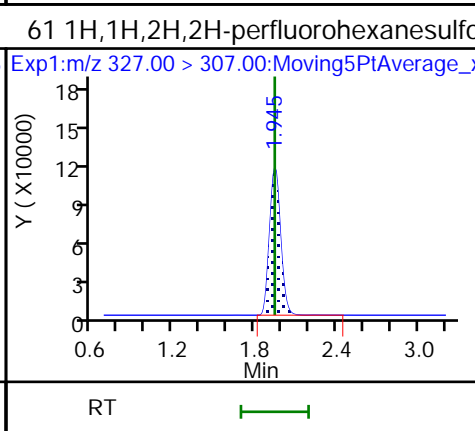
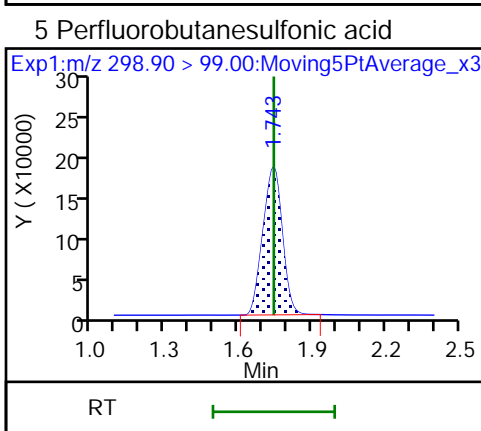
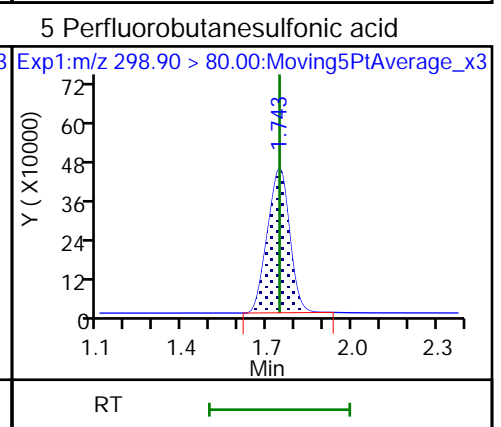
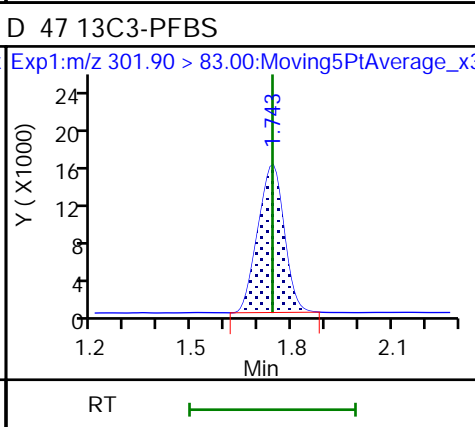
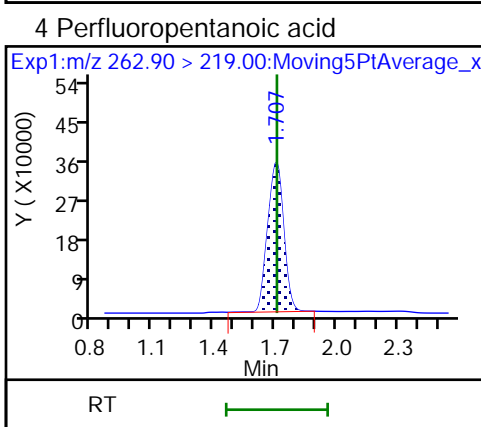
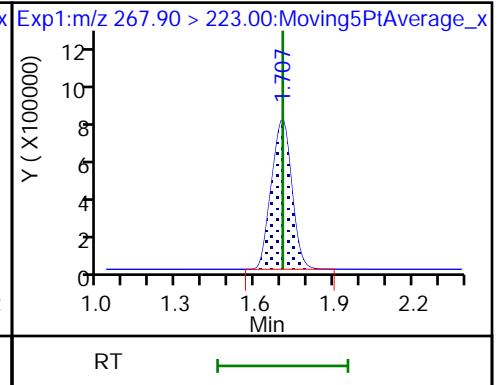
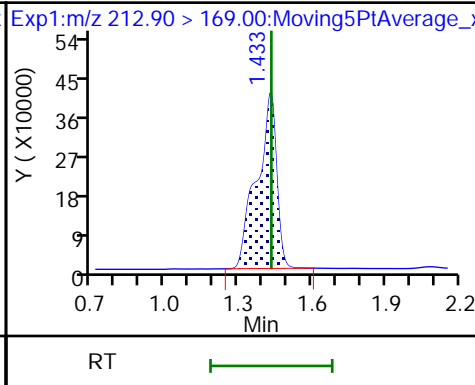
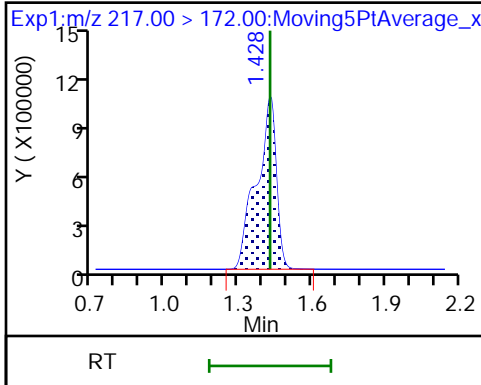
Method: A8_N

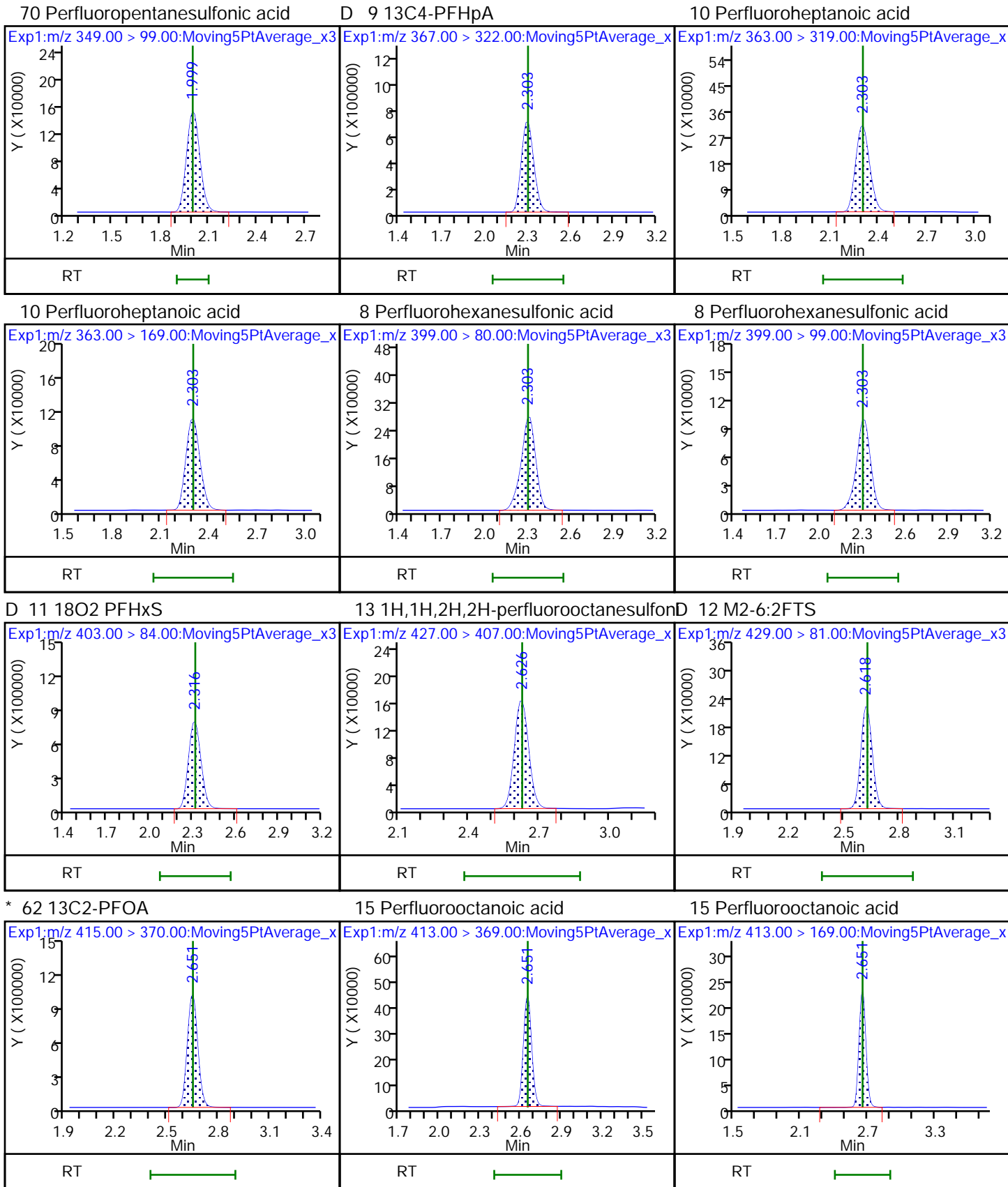
Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

D 3 13C5-PFPeA

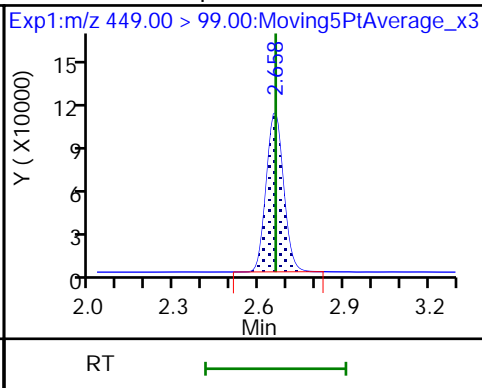
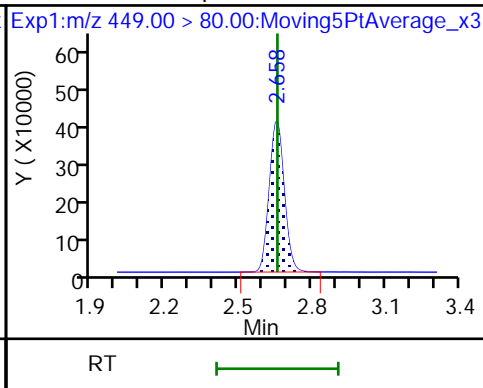
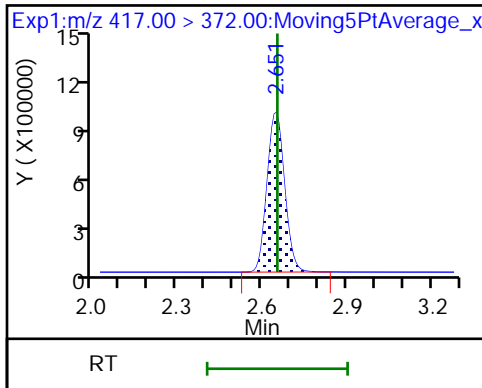




D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

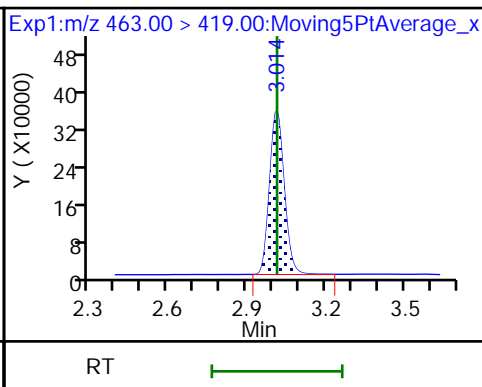
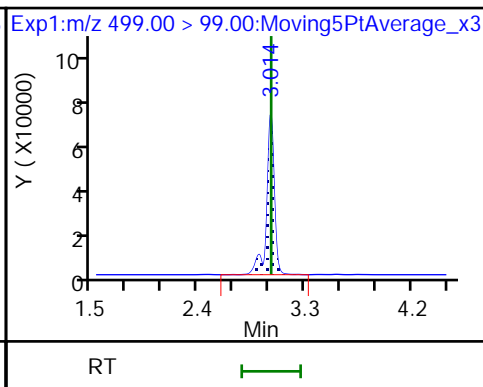
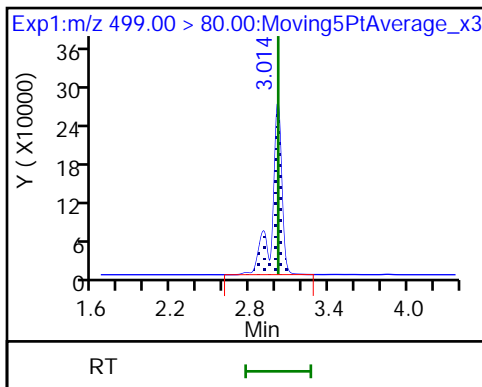
16 Perfluoroheptanesulfonic acid



17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

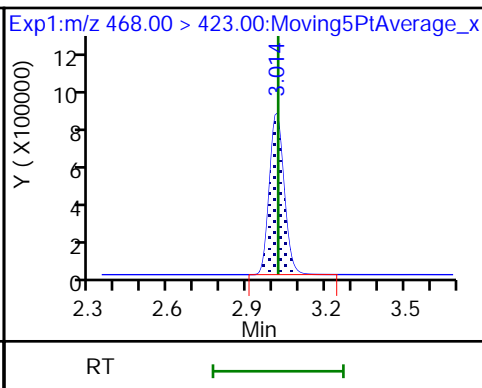
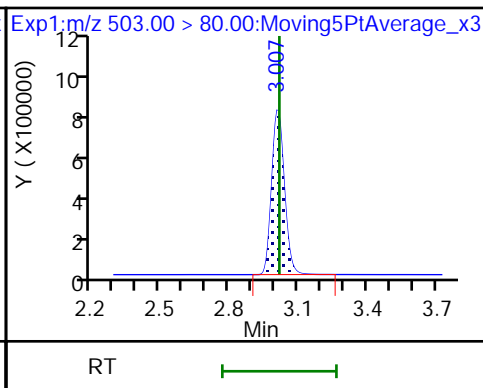
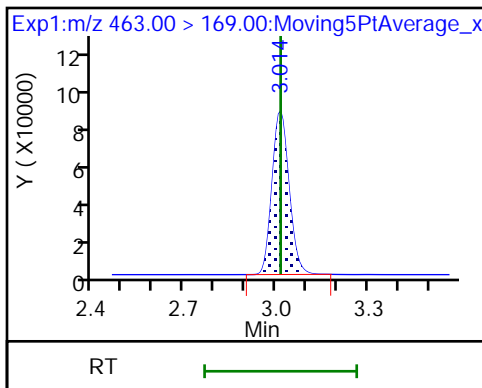
20 Perfluorononanoic acid



20 Perfluorononanoic acid

D 18 13C4 PFOS

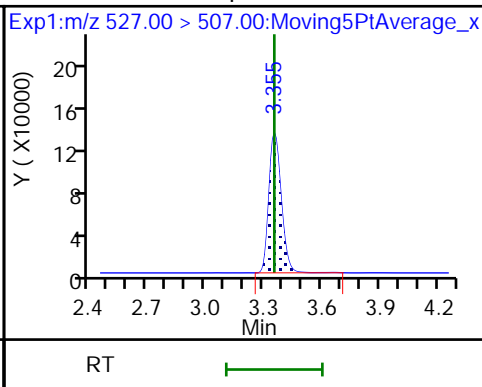
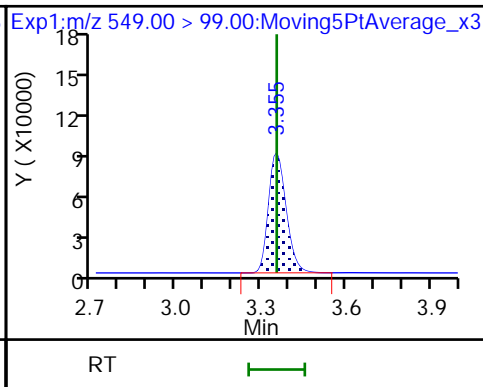
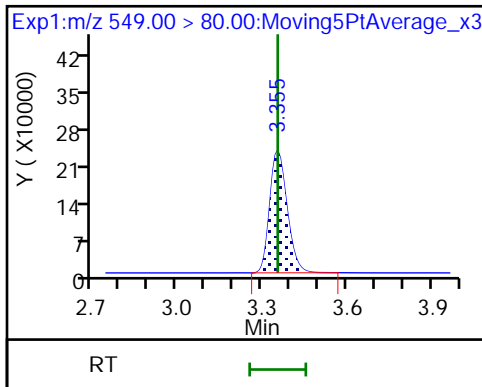
D 19 13C5 PFNA



68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid

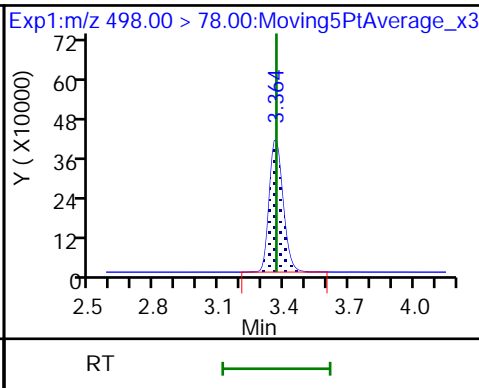
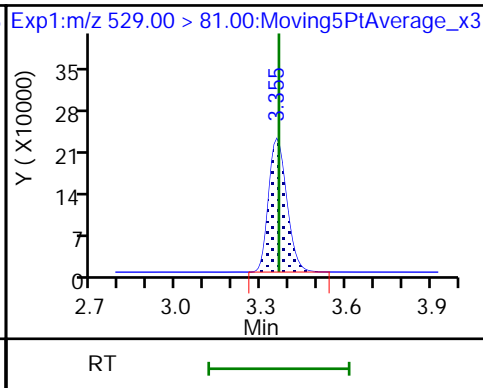
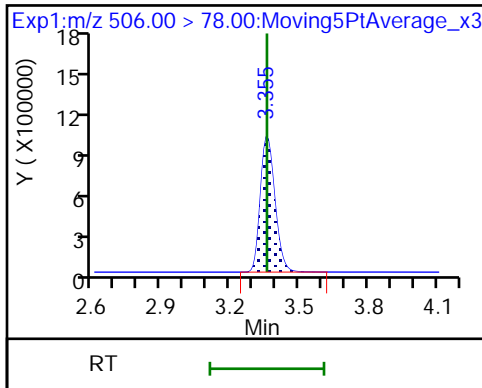
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 21 13C8 FOSA

D 26 M2-8:2FTS

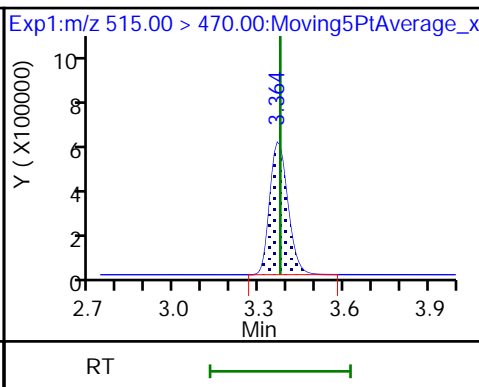
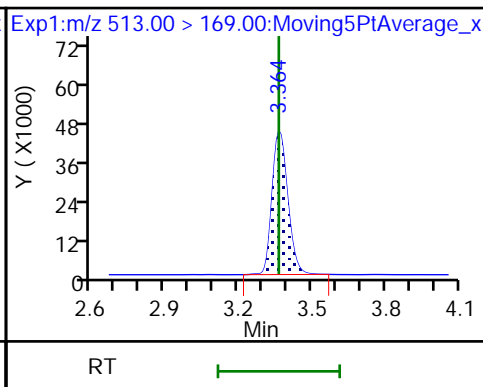
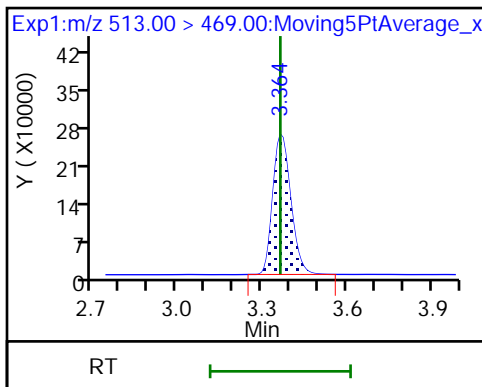
22 Perfluorooctane Sulfonamide



24 Perfluorodecanoic acid

24 Perfluorodecanoic acid

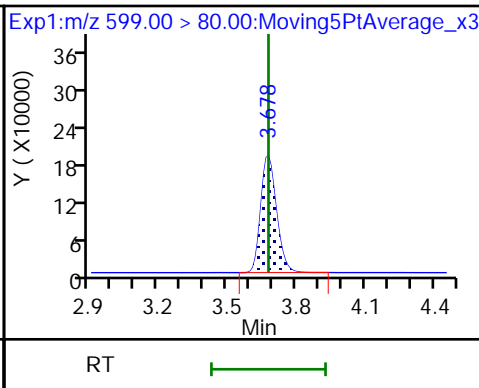
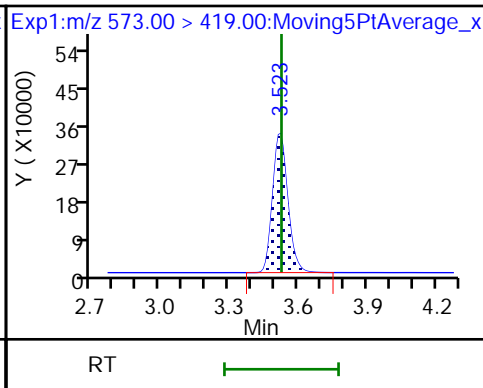
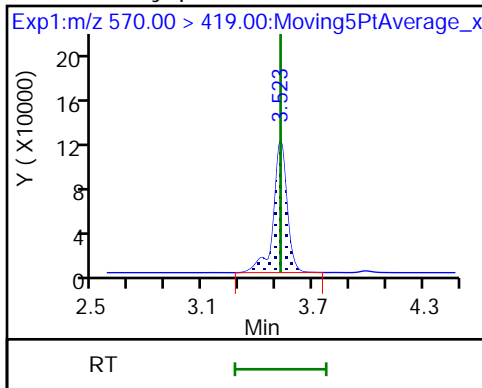
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamide

D 27 d3-NMeFOSAA

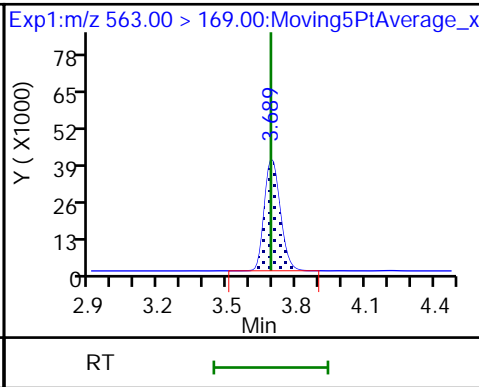
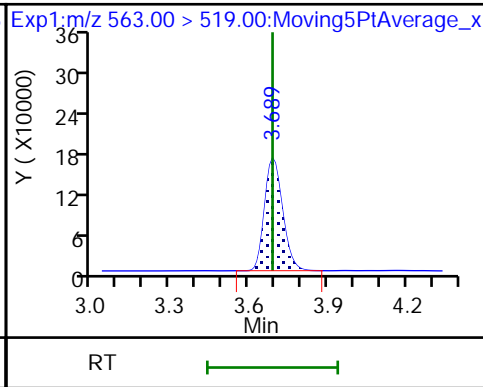
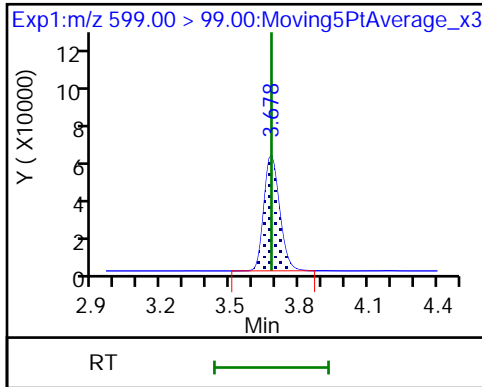
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

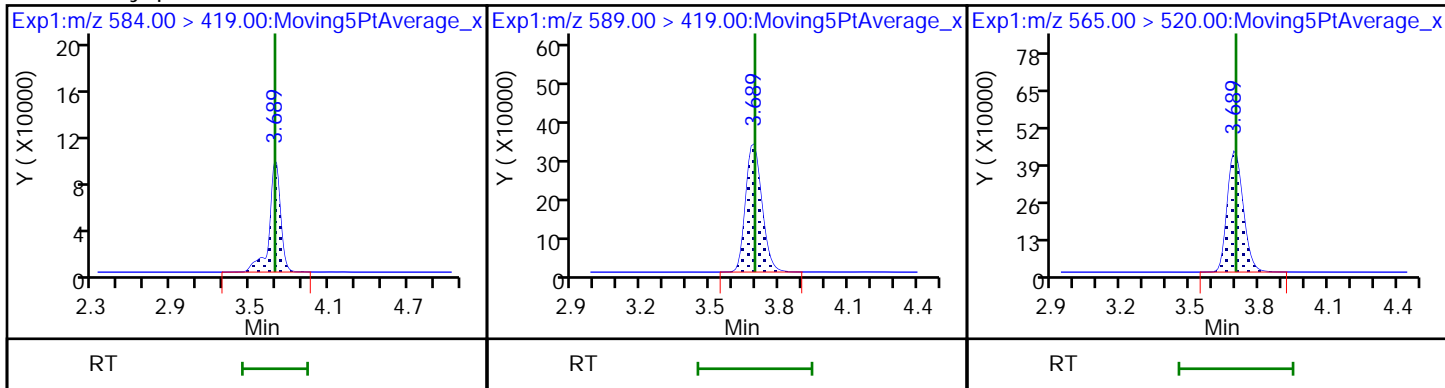
31 Perfluoroundecanoic acid

31 Perfluoroundecanoic acid



33 N-ethyl perfluorooctane sulfonamid D 32 d5-NEtFOSAA

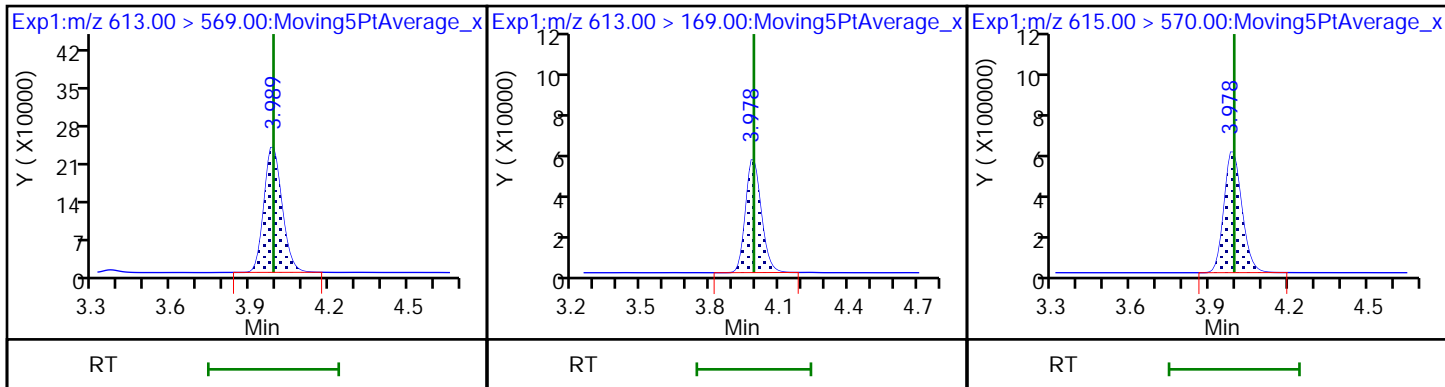
D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

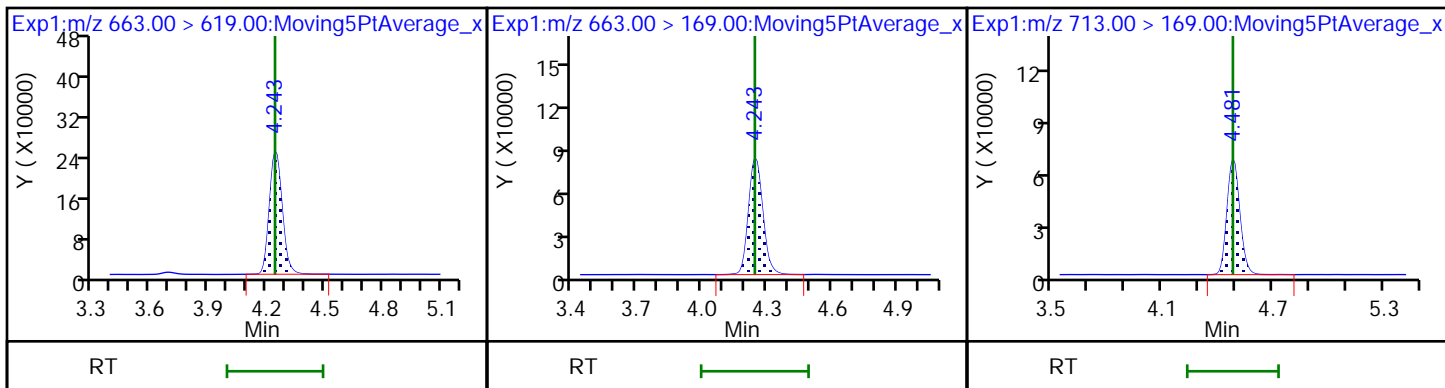
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

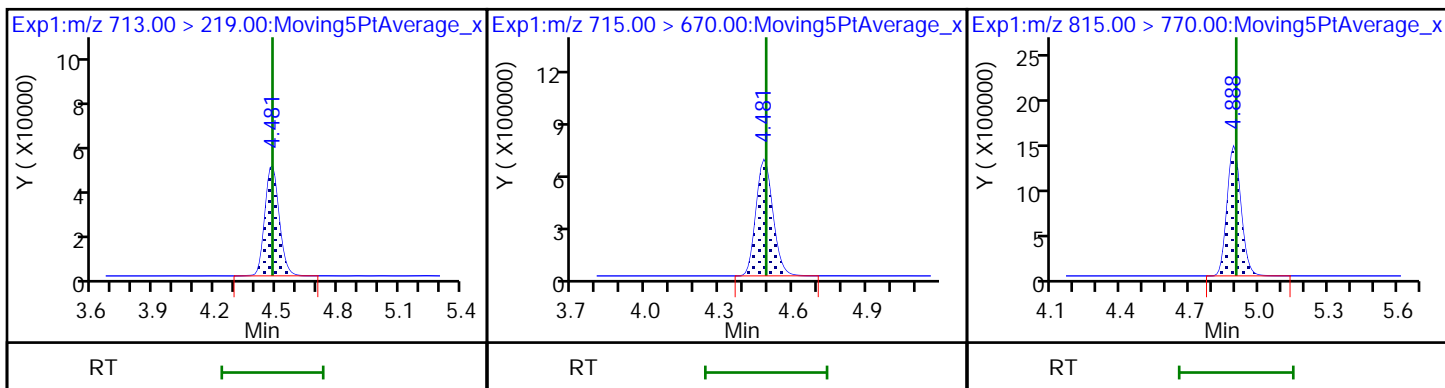
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231842/10 Calibration Date: 06/30/2018 01:24
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLBBX_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.017	1.021		2.51	2.50	0.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.187	1.155		2.43	2.50	-2.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.16	78.34		2.24	2.21	1.5	30.0
4:2 FTS	AveID	19.72	19.21		2.27	2.34	-2.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.034	1.000		2.42	2.50	-3.4	30.0
Perfluoropentanesulfonic acid	AveID	69.17	71.08		2.41	2.35	2.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.109	1.128		2.54	2.50	1.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.159	1.122		2.20	2.28	-3.1	30.0
6:2 FTS	AveID	1.607	1.637		2.41	2.37	1.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.176	1.161		2.47	2.50	-1.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.359	1.459		2.55	2.38	7.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.111	1.081		2.43	2.50	-2.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.163	1.172		2.34	2.32	0.7	30.0
8:2 FTS	AveID	1.347	1.375		2.45	2.40	2.1	30.0
Perfluorononanesulfonic acid	AveID	0.8052	0.8211		2.45	2.40	2.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.003	1.041		2.60	2.50	3.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.061	1.069		2.52	2.50	0.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9552	1.047		2.74	2.50	9.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6883	0.7080		2.48	2.41	2.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9021	0.8535		2.37	2.50	-5.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8938	0.8809		2.46	2.50	-1.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.134		2.62	2.50	4.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.171	1.111		2.37	2.50	-5.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2501	0.2505		2.50	2.50	0.2	30.0
13C4 PFBA	Ave	1.397	1.373		2.46	2.50	-1.7	30.0
13C5 PFPeA	Ave	0.9809	0.9762		2.49	2.50	-0.5	30.0
13C3-PFBS	Ave	0.0216	0.0213		2.29	2.33	-1.6	30.0
13C2 PFHxA	Ave	1.074	1.069		2.49	2.50	-0.5	30.0
13C4-PFHpA	Ave	0.9950	0.9760		2.45	2.50	-1.9	30.0
18O2 PFHxS	Ave	1.162	1.150		2.34	2.37	-1.0	30.0
M2-6:2FTS	Ave	0.2411	0.2411		2.38	2.38	0.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231842/10 Calibration Date: 06/30/2018 01:24
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLBBX_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9548	0.9399		2.46	2.50	-1.6	30.0
13C4 PFOS	Ave	0.7787	0.7609		2.34	2.39	-2.3	30.0
13C5 PFNA	Ave	0.7906	0.7470		2.36	2.50	-5.5	30.0
13C8 FOSA	Ave	1.023	1.002		2.45	2.50	-2.1	30.0
M2-8:2FTS	Ave	0.2621	0.2593		2.37	2.40	-1.1	30.0
13C2 PFDA	Ave	0.6453	0.6222		2.41	2.50	-3.6	30.0
d3-NMeFOSAA	Ave	0.3869	0.3687		2.38	2.50	-4.7	30.0
d5-NEtFOSAA	Ave	0.3825	0.3901		2.55	2.50	2.0	30.0
13C2 PFUnA	Ave	0.5302	0.5238		2.47	2.50	-1.2	30.0
13C2 PFDoA	Ave	0.6148	0.5890		2.40	2.50	-4.2	30.0
13C2-PFTeDA	Ave	0.7666	0.7207		2.35	2.50	-6.0	30.0
13C2-PFHxDA	Ave	1.436	1.387		2.41	2.50	-3.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\2018.06.29LLBBX_023.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 30-Jun-2018 01:24:04 ALS Bottle#: 29 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 08:28:28 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 08:28:09

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	1.424	1.424	0.0	1.000	5960469	2.51	100	3267	
D 1 13C4 PFBA	217.00 > 172.00	1.424	1.428	-0.004	0.539	5836876	2.46	98.3	33236	
4 Perfluoropentanoic acid	262.90 > 219.00	1.702	1.702	0.0	1.000	4794872	2.43	97.3	3346	
D 3 13C5-PFPeA	267.90 > 223.00	1.702	1.705	-0.003	0.644	4150858	2.49	99.5	51583	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.738	1.738	0.0	1.000	6266644	2.24	102	30347	
	298.90 > 99.00	1.738	1.738	0.0	1.000	2576109	2.43(1.25-3.74)		21397	
D 47 13C3-PFBS	301.90 > 83.00	1.738	1.741	-0.003	0.657	84152	2.29	98.4	648	
61 1H,1H,2H,2H-perfluorohexanesulfoni	327.00 > 307.00	1.938	1.938	0.0	1.115	1623105	2.27	97.4	73012	
D 60 M2-4:2FTS	329.00 > 81.00	1.938	1.948	-0.010	0.733	647851	NC		8893	
6 Perfluorohexanoic acid	313.00 > 269.00	1.981	1.981	0.0	1.000	4544334	2.42	96.6	13266	
	313.00 > 119.00	1.970	1.981	-0.011	0.995	407941	11.14(5.03-15.10)		7921	
D 7 13C2 PFHxA	315.00 > 270.00	1.981	1.984	-0.003	0.749	4546270	2.49	99.5	79987	
70 Perfluoropentanesulfonic acid	349.00 > 80.00	2.003	2.003	0.0	1.152	6032822	2.41	103	61544	
	349.00 > 99.00	2.003	2.003	0.0	1.152	2220390	2.72(1.36-4.07)		32057	
67 Perfluoro(2-propoxypropanoic) acid	329.10 > 285.00	2.070	2.070	0.0	1.000	726720	NC		5357	

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	2.070	2.080	-0.010	0.783	214639	NC			4287	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.293	2.293	0.0	1.000	4682162	2.54		102	8051	
363.00 > 169.00	2.293	2.293	0.0	1.000	1781591		2.63(1.13-3.40)		14795	
D 9 13C4-PFHpA										
367.00 > 322.00	2.293	2.302	-0.009	0.867	4150357	2.45		98.1	57424	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.306	2.306	0.0	1.000	4994419	2.20		96.9	19347	
399.00 > 99.00	2.306	2.306	0.0	1.000	1635485		3.05(1.50-4.49)		9085	
D 11 18O2 PFHxS										
403.00 > 84.00	2.306	2.317	-0.011	0.872	4626022	2.34		99.0	28603	
65 Adona										
377.00 > 251.00	2.332	2.332	0.0	0.775	13205165	NC			69462	
377.00 > 85.00	2.332	2.332	0.0	0.775	7890410		1.67(0.84-2.53)		51257	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.619	2.619	0.0	1.000	1590552	2.41		102	6561	
D 12 M2-6:2FTS										
429.00 > 81.00	2.619	2.627	-0.008	0.991	973974	2.38		100	18787	
* 62 13C2-PFOA										
415.00 > 370.00	2.644	2.644	0.0		4252257	2.50			43797	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.644	2.644	0.0	1.000	4645643	2.47		98.8	1636	
413.00 > 169.00	2.644	2.644	0.0	1.000	2327553		2.00(0.84-2.52)		12427	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.652	2.652	0.0	0.881	4493574	2.55		107	35407	
449.00 > 99.00	2.652	2.652	0.0	0.881	1165427		3.86(1.94-5.82)		18408	
D 14 13C4 PFOA										
417.00 > 372.00	2.644	2.653	-0.009	1.000	3996744	2.46		98.4	36229	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.010	3.010	0.0	1.000	3517595	2.34		101	25978	
499.00 > 99.00	3.010	3.010	0.0	1.000	748932		4.70(2.31-6.93)		12289	
20 Perfluorononanoic acid										
463.00 > 419.00	3.010	3.010	0.0	1.000	3432998	2.43		97.3	12372	
463.00 > 169.00	3.010	3.010	0.0	1.000	842284		4.08(1.90-5.69)		24643	
D 18 13C4 PFOS										
503.00 > 80.00	3.010	3.017	-0.007	1.138	3093149	2.34		97.7	24696	
D 19 13C5 PFNA										
468.00 > 423.00	3.010	3.018	-0.008	1.138	3176385	2.36		94.5	41629	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.223	3.223	0.0	1.071	5810958	NC			47404	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.351	3.351	0.0	1.113	2550458	2.45		102	49218	
549.00 > 99.00	3.351	3.351	0.0	1.113	951258		2.68(1.33-3.97)		18274	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.351	3.351	0.0	0.997	1452169	2.45		102	36064	
D 21 13C8 FOSA										
506.00 > 78.00	3.360	3.358	0.002	1.271	4260069	2.45		97.9	32538	

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	3.360	3.360	0.0	1.000	4436640	2.60	104	33816
D 26 M2-8:2FTS	529.00	> 81.00	3.360	3.362	-0.002	1.271	1056295	2.37	98.9	18474
24 Perfluorodecanoic acid	513.00	> 469.00	3.369	3.369	0.0	1.000	2829290	2.52	101	16443
	513.00	> 169.00	3.369	3.369	0.0	1.000	483002	5.86(2.36-7.09)		10933
D 23 13C2 PFDA	515.00	> 470.00	3.369	3.374	-0.005	1.274	2645689	2.41	96.4	59912
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.519	3.519	0.0	1.000	1642000	2.74	110	9647
D 27 d3-NMeFOSAA	573.00	> 419.00	3.519	3.527	-0.008	1.331	1567893	2.38	95.3	34132
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.676	3.676	0.0	1.221	2208323	2.48	103	35900
	599.00	> 99.00	3.676	3.676	0.0	1.221	724311	3.05(1.39-4.16)		21796
31 Perfluoroundecanoic acid	563.00	> 519.00	3.686	3.686	0.0	0.997	1900928	2.37	94.6	8875
	563.00	> 169.00	3.697	3.686	0.011	1.000	428669	4.43(2.12-6.36)		17796
D 32 d5-NEtFOSAA	589.00	> 419.00	3.686	3.694	-0.008	1.394	1658659	2.55	102	14175
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.697	3.697	0.0	1.003	1461086	2.46	98.6	22868
D 30 13C2 PFUnA	565.00	> 520.00	3.697	3.698	-0.001	1.398	2227162	2.47	98.8	28742
66 11-Chloroeicosafuoro-3-oxaundecan	631.00	> 451.00	3.854	3.854	0.0	1.280	9487347	NC		65700
37 Perfluorododecanoic acid	613.00	> 569.00	3.987	3.987	0.0	1.000	2840507	2.62	105	3788
	613.00	> 169.00	3.987	3.987	0.0	1.000	651650	4.36(2.13-6.40)		12379
D 36 13C2 PFDaA	615.00	> 570.00	3.987	3.992	-0.005	1.508	2504652	2.40	95.8	13463
41 Perfluorotridecanoic acid	663.00	> 619.00	4.251	4.251	0.0	1.066	2781593	2.37	94.8	2406
	663.00	> 169.00	4.241	4.251	-0.010	1.064	872272	3.19(1.25-3.76)		14622
42 Perfluorotetradecanoic acid	713.00	> 169.00	4.480	4.480	0.0	1.000	767744	2.50	100	14485
	713.00	> 219.00	4.480	4.480	0.0	1.000	571849	1.34(0.71-2.13)		8484
D 43 13C2-PFTeDA	715.00	> 670.00	4.480	4.490	-0.010	1.695	3064624	2.35	94.0	14052
45 Perfluorohexadecanoic acid	813.00	> 769.00	4.887	4.887	0.0	1.000	5951897	NC		2777
	813.00	> 169.00	4.887	4.887	0.0	1.000	992652	6.00(2.86-8.58)		10371
D 44 13C2-PFHxDA	815.00	> 770.00	4.887	4.899	-0.012	1.848	5897302	2.41	96.6	14167
46 Perfluorooctadecanoic acid	913.00	> 869.00	5.232	5.232	0.0	1.071	6929738	NC		2170
	913.00	> 169.00	5.232	5.232	0.0	1.071	817105	8.48(3.83-11.48)		7616

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

[Reagents:](#)

LCPFC_LL5_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60482.b\2018.06.29LLBBX_023.d

Injection Date: 30-Jun-2018 01:24:04

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 29

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

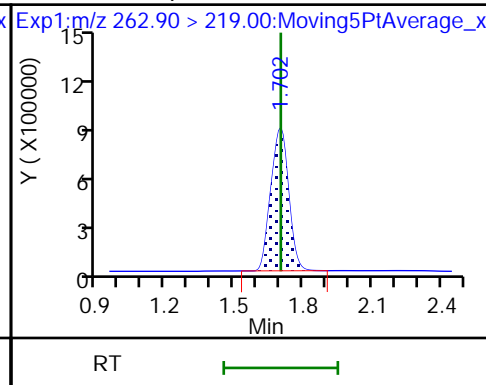
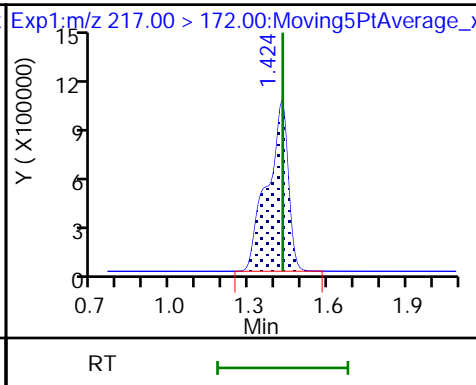
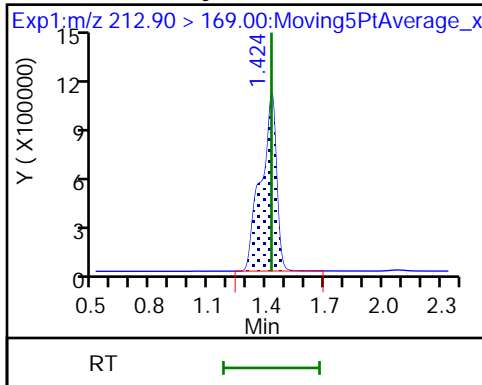
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

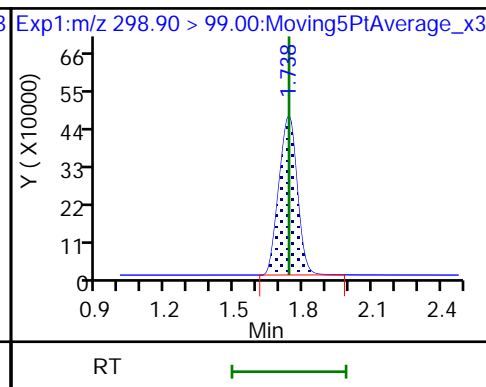
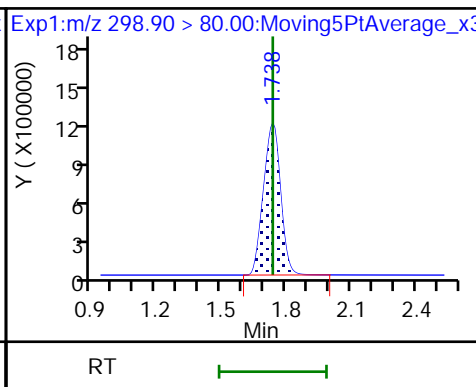
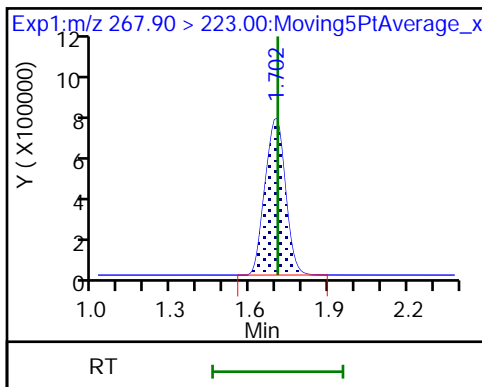
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

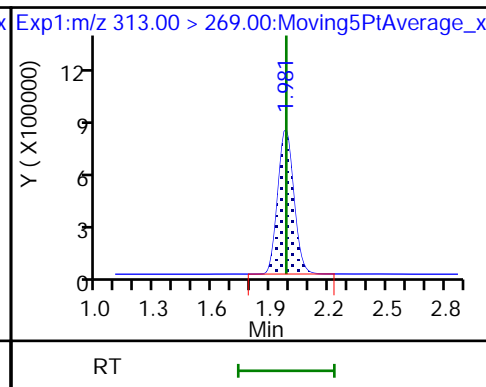
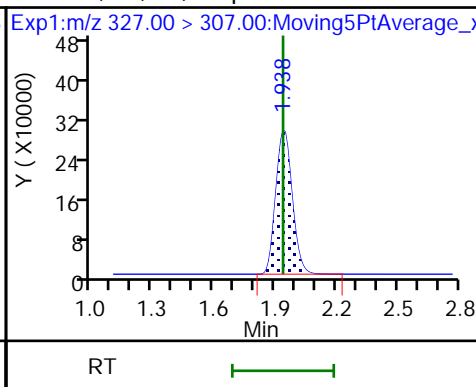
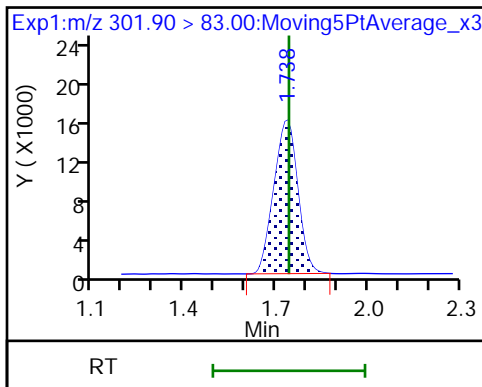
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

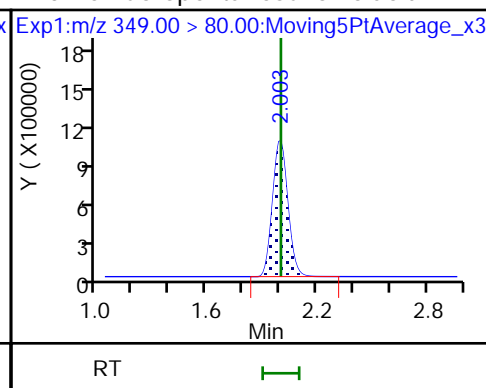
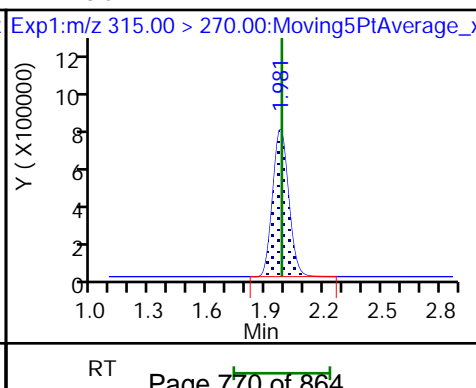
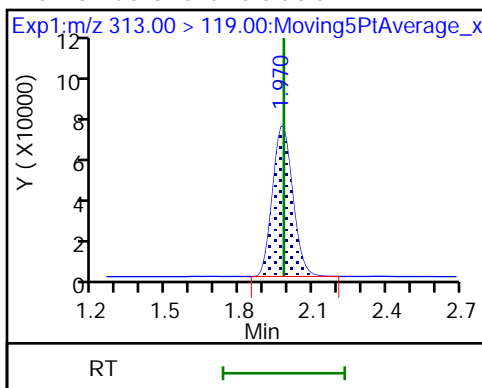
6 Perfluorohexanoic acid

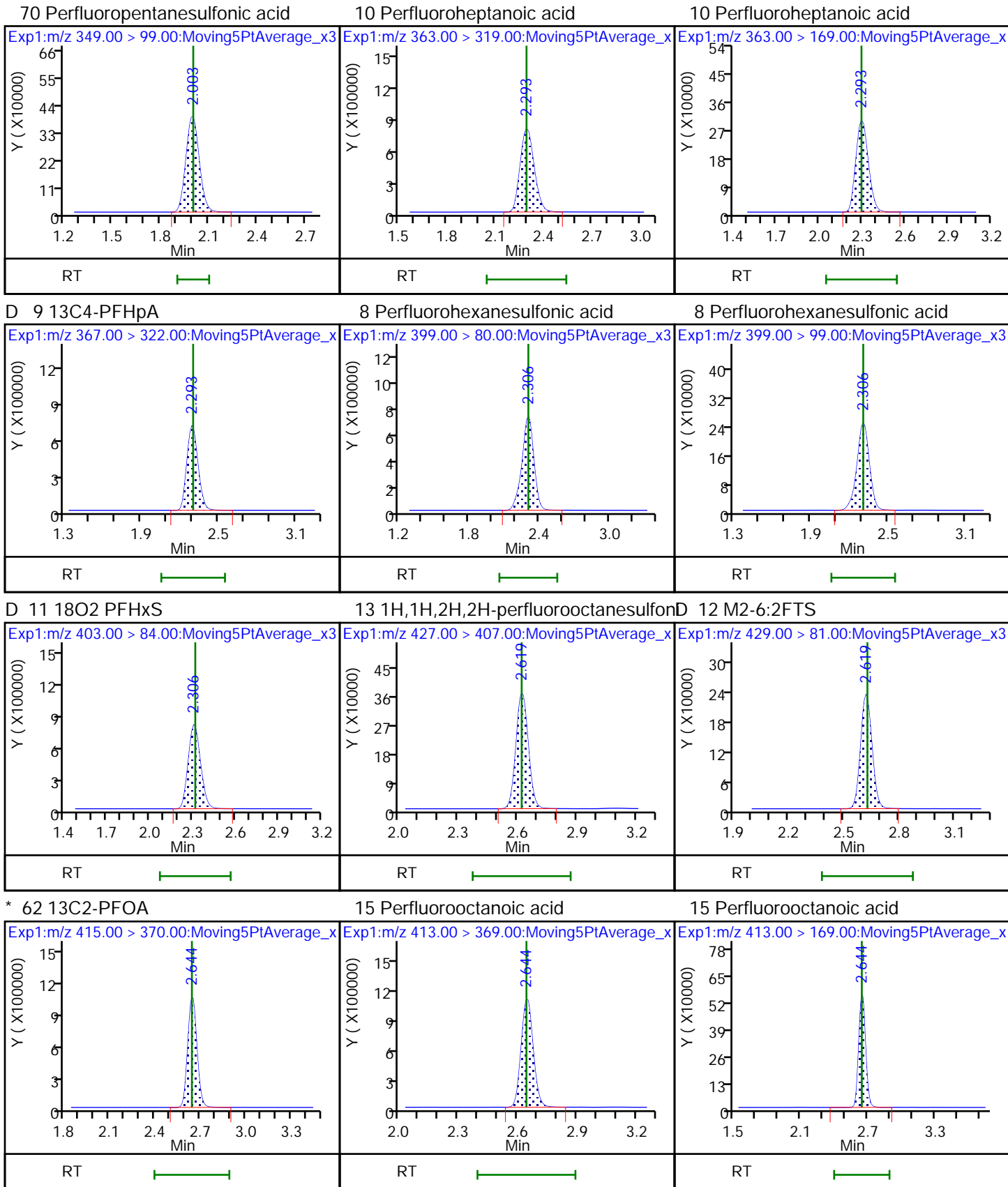


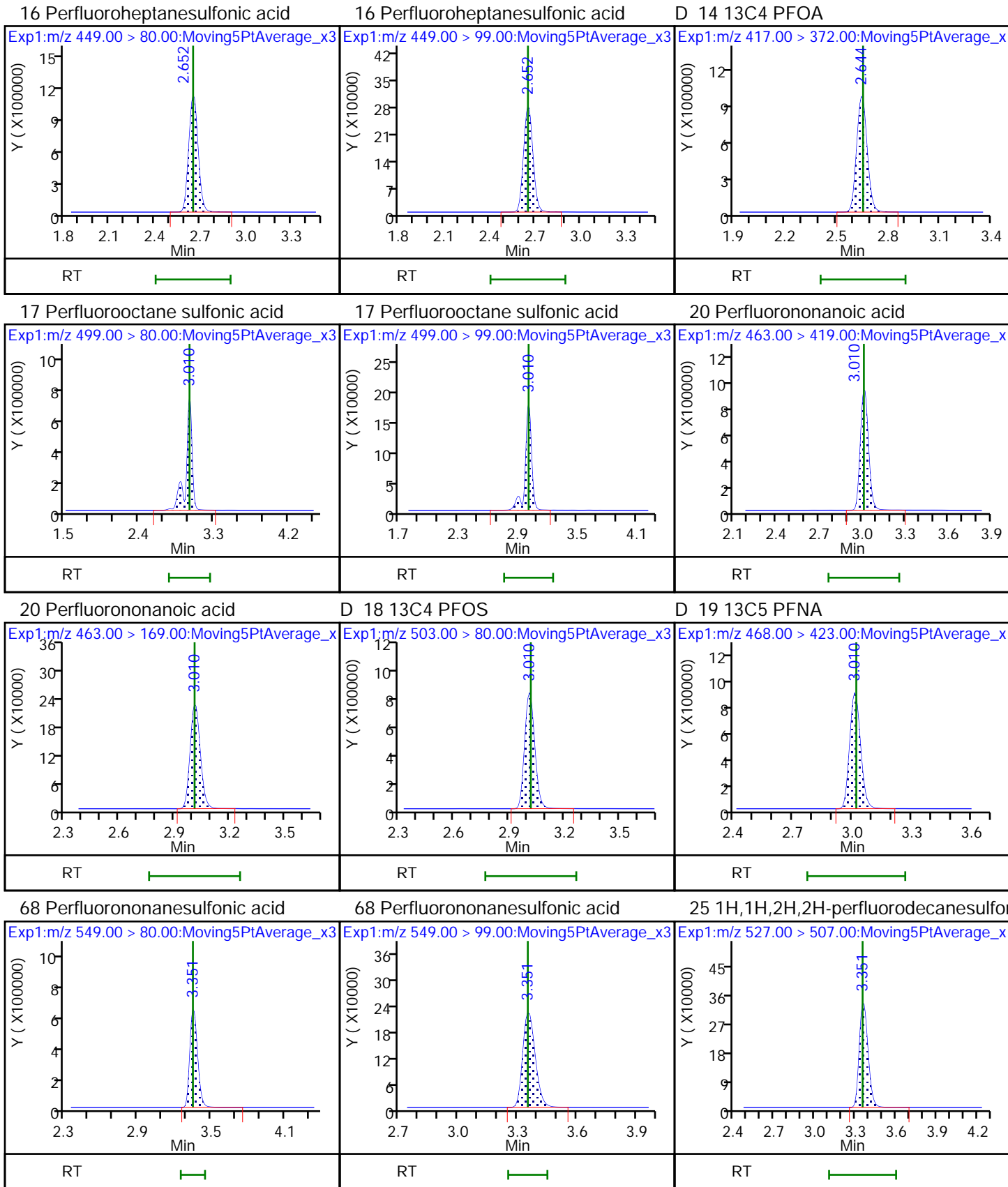
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



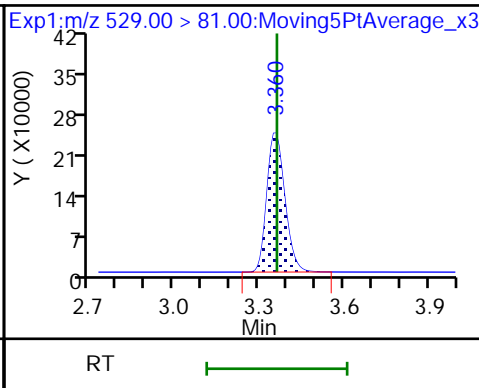
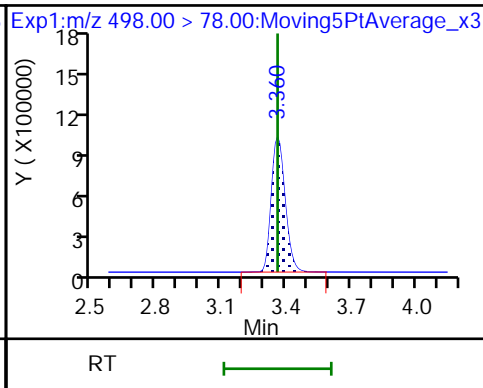
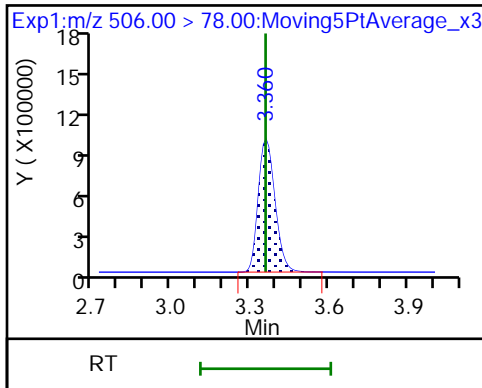




D 21 13C8 FOSA

22 Perfluorooctane Sulfonamide

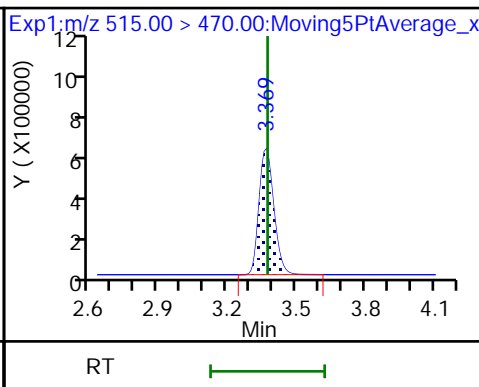
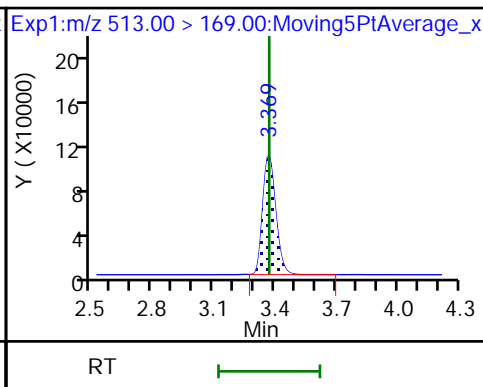
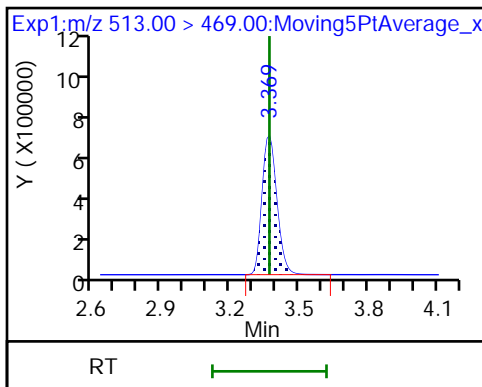
D 26 M2-8:2FTS



24 Perfluorodecanoic acid

24 Perfluorodecanoic acid

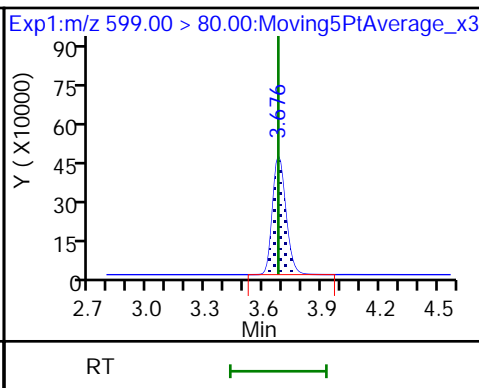
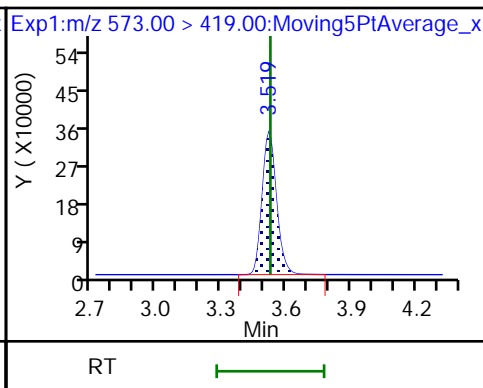
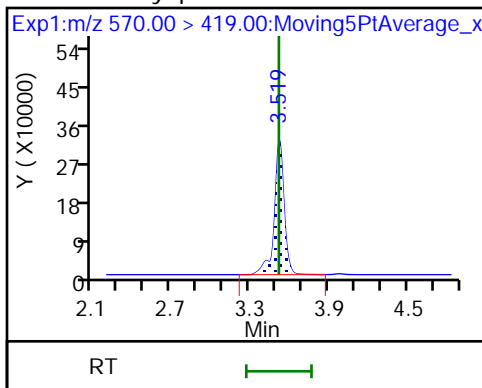
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamide

D 27 d3-NMeFOSAA

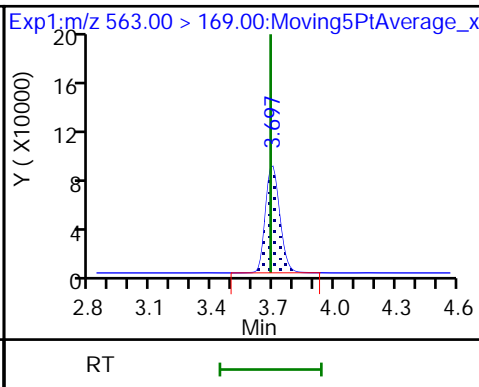
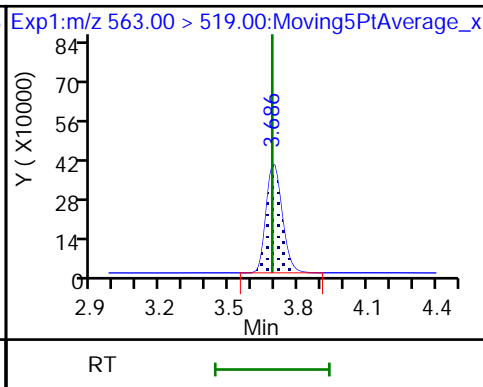
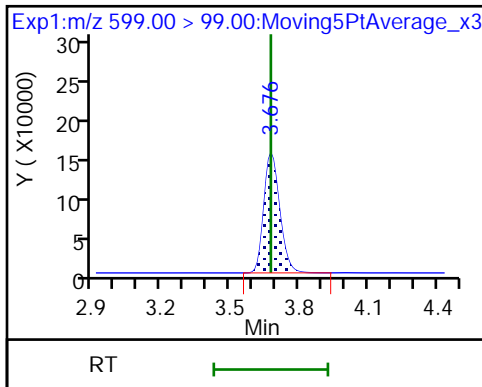
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

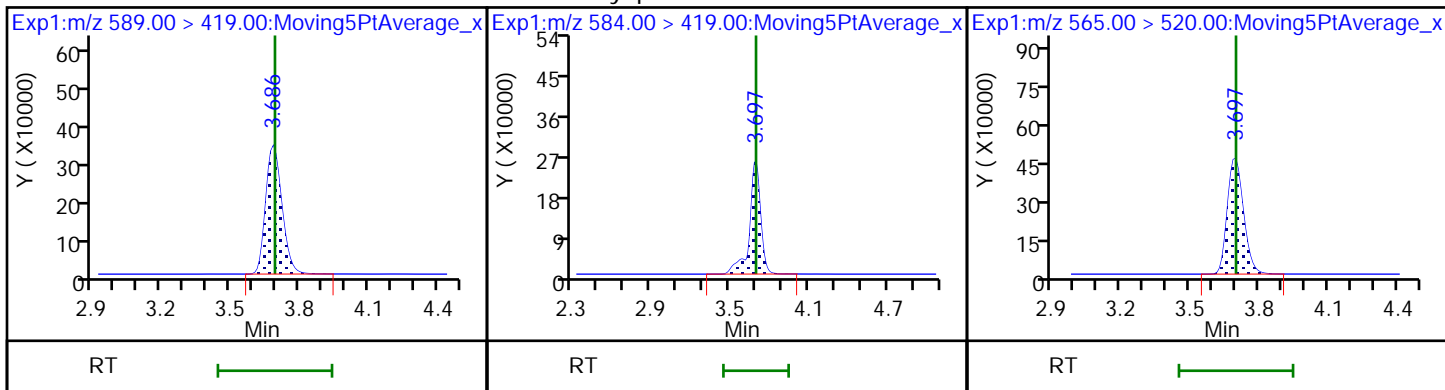
31 Perfluoroundecanoic acid

31 Perfluoroundecanoic acid



D 32 d5-NEtFOSAA

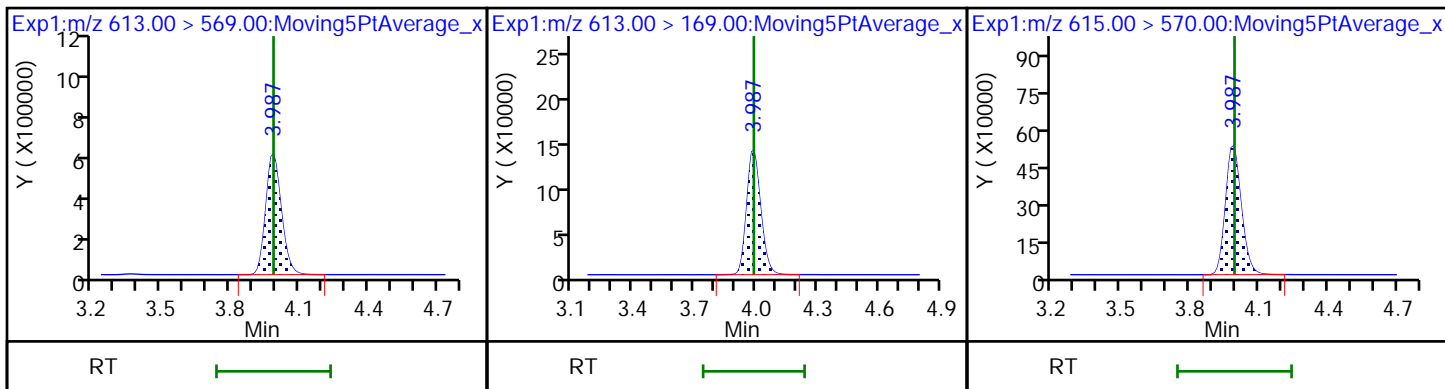
33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

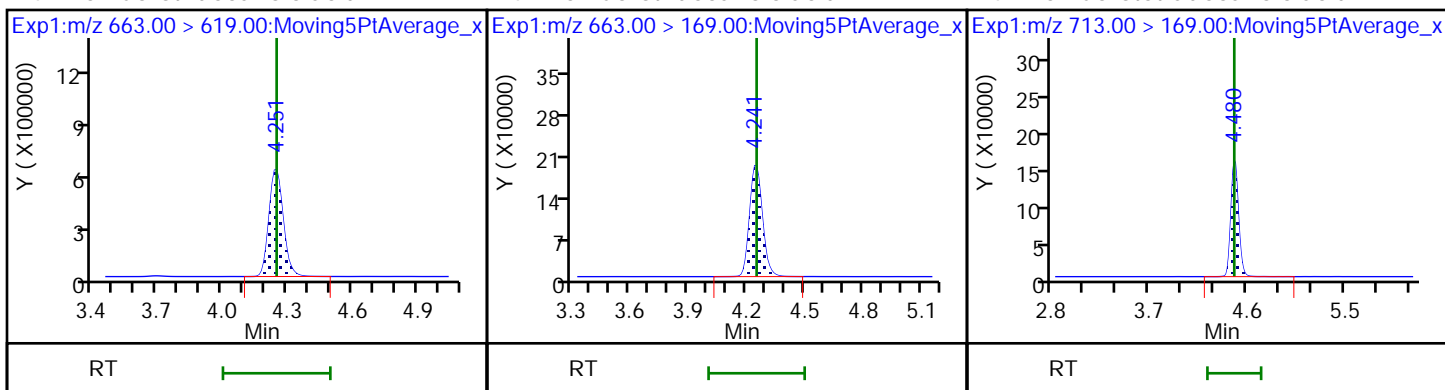
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

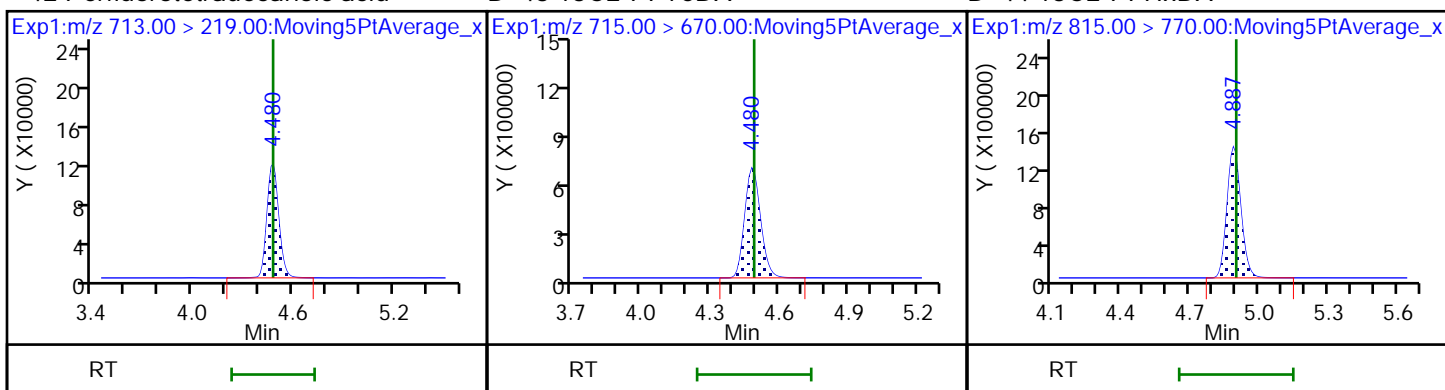
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-228913/1-A
 Matrix: Water Lab File ID: 2018.06.26LLC_047.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 250 (mL) Date Analyzed: 06/27/2018 05:17
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.5	U	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.5	U	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-228913/1-A
 Matrix: Water Lab File ID: 2018.06.26LLC_047.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 250 (mL) Date Analyzed: 06/27/2018 05:17
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	78		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	88		50-150
STL00993	13C2 PFHxA	89		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	95		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	89		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	84		50-150
STL00994	18O2 PFHxS	81		50-150
STL02116	13C2-PFTeDA	81		50-150
STL00991	13C4 PFOS	85		50-150
STL02337	13C3-PFBS	82		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_047.d
 Lims ID: MB 320-228913/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 27-Jun-2018 05:17:10 ALS Bottle#: 33 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-228913/1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:00:15 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:00:46

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	1.436	1.436	0.0	1.000	25511	0.0112			11.1	
D 1 13C4 PFBA										
217.00 > 172.00	1.436	1.441	-0.005	0.535	5683788	2.32		92.7	44277	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.712	1.703	0.009	1.000	13215	0.007002			3.6	
D 3 13C5-PFPeA										
267.90 > 223.00	1.712	1.711	0.001	0.638	3879724	2.19		87.6	57615	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.950	1.739	0.211	1.115	9659	0.003350			21.0	
298.90 > 99.00	1.961	1.739	0.222	1.122	5902		1.64(1.25-3.74)		26.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.748	1.747	0.001	0.652	85614	1.92		82.4	734	
D 7 13C2 PFHxA										
315.00 > 270.00	1.993	2.003	-0.010	0.743	4295875	2.22		89.0	68001	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.095	2.093	0.002	0.781	160834	NC			5961	
D 9 13C4-PFHpA										
367.00 > 322.00	2.321	2.319	0.002	0.865	4057001	2.32		92.7	39679	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.334	2.321	0.013	1.000	16594	0.007178			205	R
399.00 > 99.00	2.334	2.321	0.013	1.000	3459		4.80(1.50-4.49)		19.7	R
D 11 18O2 PFHxS										
403.00 > 84.00	2.334	2.345	-0.011	0.870	4809443	1.92		81.3	40571	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.660	2.644	0.016	1.003	2130	0.002505			44.9	
D 12 M2-6:2FTS										
429.00 > 81.00	2.653	2.659	-0.006	0.989	1214800	2.68		113	23046	

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	2.683	2.675	0.008	4307793	2.50		34220	
15 Perfluorooctanoic acid	413.00	> 369.00	2.675	2.675	0.0	0.997	14408	0.007522	4.5	
	413.00	> 169.00	2.683	2.675	0.008	1.000	7475	1.93(0.84-2.52)	48.8	
D 14 13C4 PFOA	417.00	> 372.00	2.683	2.682	0.001	1.000	3924692	2.37	94.9	61512
20 Perfluorononanoic acid	463.00	> 419.00	3.057	3.046	0.011	1.002	1711	0.001307	4.3	
	463.00	> 169.00	3.050	3.046	0.004	1.000	688	2.49(1.90-5.69)	49.0	
D 19 13C5 PFNA	468.00	> 423.00	3.050	3.055	-0.005	1.137	3013621	2.31	92.5	47322
D 18 13C4 PFOS	503.00	> 80.00	3.050	3.055	-0.005	1.137	3367083	2.02	84.6	29022
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.264	3.253	0.011	1.070	1773	NC	26.6	
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.385	3.370	0.015	1.003	1925	0.001034	51.4	
D 21 13C8 FOSA	506.00	> 78.00	3.376	3.384	-0.008	1.258	4623086	1.96	78.3	35213
D 26 M2-8:2FTS	529.00	> 81.00	3.404	3.411	-0.007	1.269	1040930	2.53	106	21155
D 23 13C2 PFDA	515.00	> 470.00	3.413	3.421	-0.008	1.272	2205682	2.23	89.3	23795
D 27 d3-NMeFOSAA	573.00	> 419.00	3.562	3.570	-0.008	1.328	735557	2.43	97.1	12101
D 32 d5-NEtFOSAA	589.00	> 419.00	3.737	3.743	-0.006	1.393	722650	2.31	92.4	2649
D 30 13C2 PFUnA	565.00	> 520.00	3.747	3.754	-0.007	1.397	1713255	2.25	90.0	44182
66 11-Chloroeicosafuoro-3-oxaundecan	631.00	> 451.00	3.894	3.898	-0.004	1.277	2518	NC	101	
D 36 13C2 PFDoA	615.00	> 570.00	4.037	4.055	-0.018	1.505	1610824	2.10	83.9	11154
D 43 13C2-PFTeDA	715.00	> 670.00	4.551	4.559	-0.008	1.696	1436136	2.03	81.1	5672
45 Perfluorohexadecanoic acid	813.00	> 769.00	4.973	4.976	-0.003	1.000	21330	NC	3.3	
	813.00	> 169.00	4.982	4.976	0.006	1.002	3789	5.63(2.86-8.58)	38.8	
D 44 13C2-PFHxDA	815.00	> 770.00	4.973	4.989	-0.016	1.854	2181489	1.82	72.8	5669

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_047.d

Injection Date: 27-Jun-2018 05:17:10

Instrument ID: A8_N

Lims ID: MB 320-228913/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 33

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

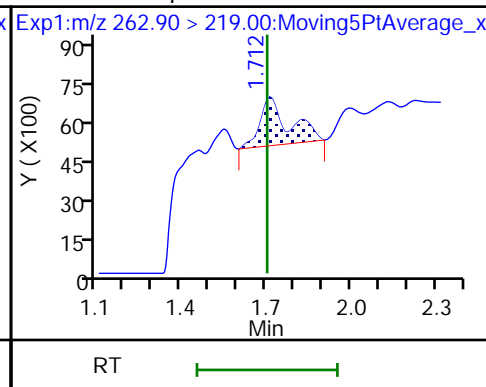
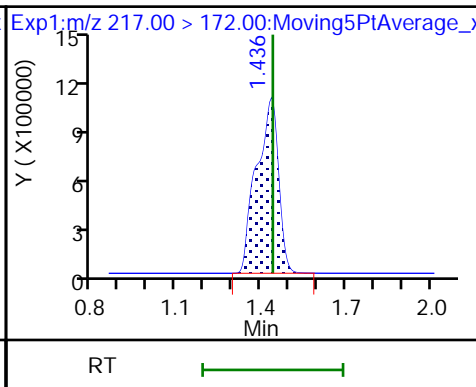
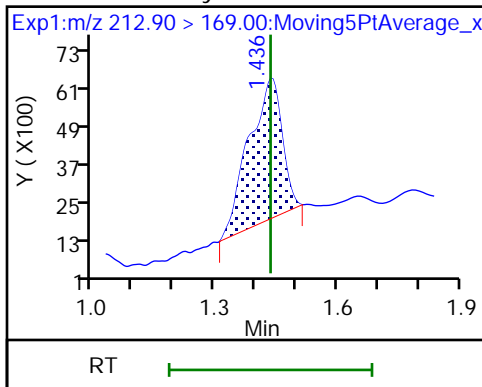
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

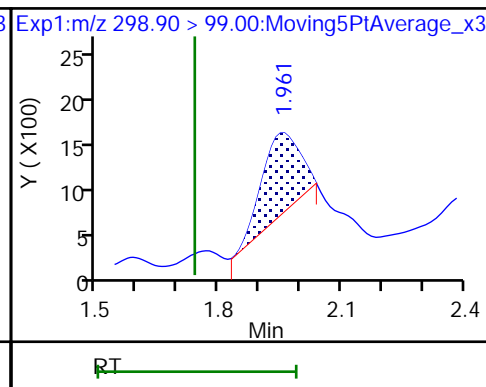
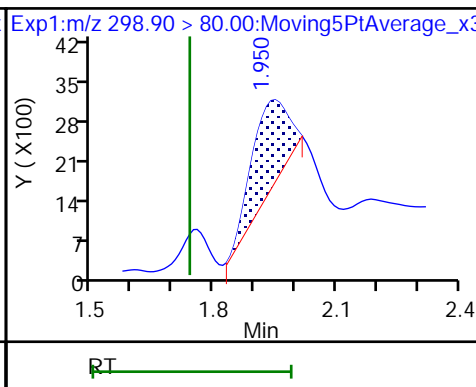
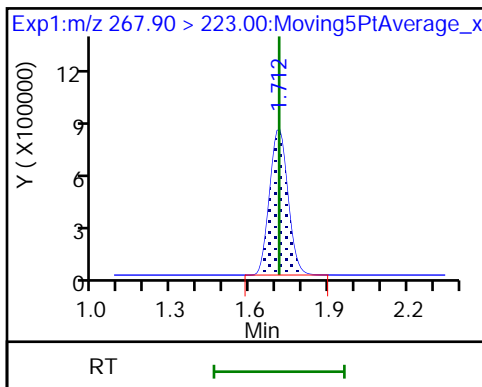
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

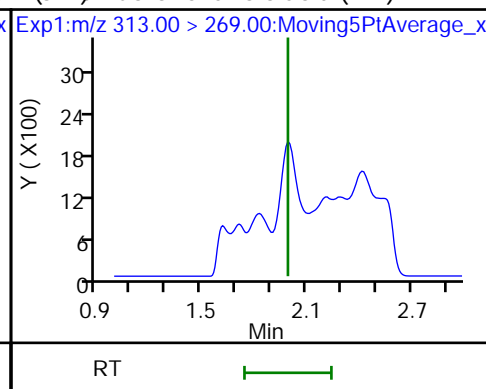
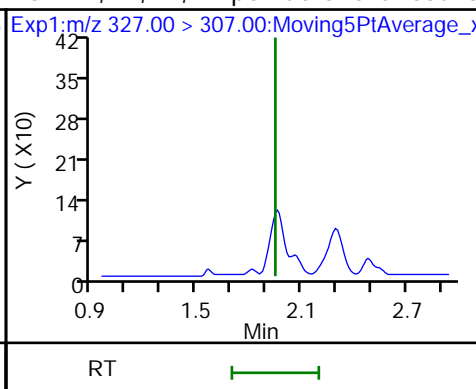
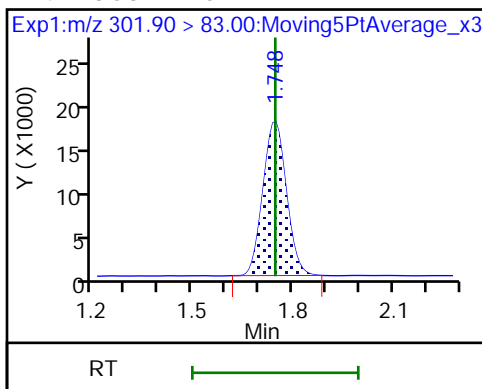
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)

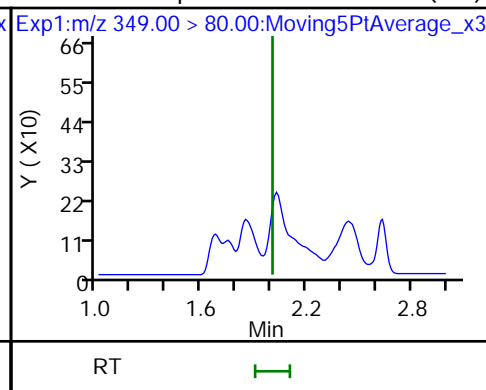
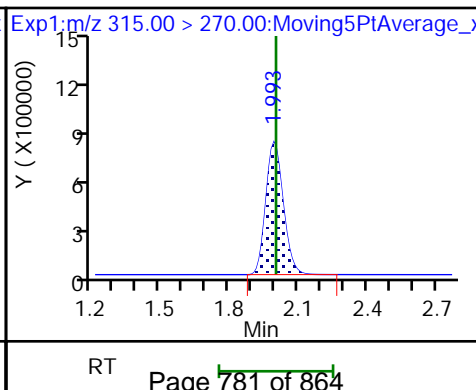
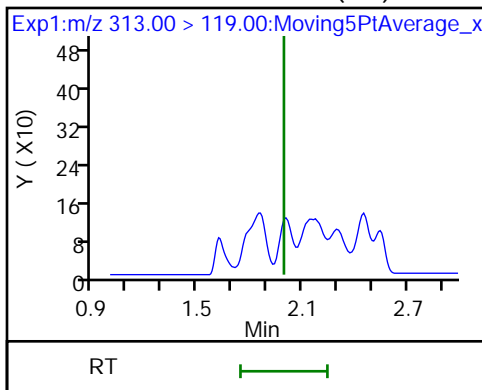
61 Perfluorohexanoic acid (ND)



6 Perfluorohexanoic acid (ND)

D 7 13C2 PFHxA

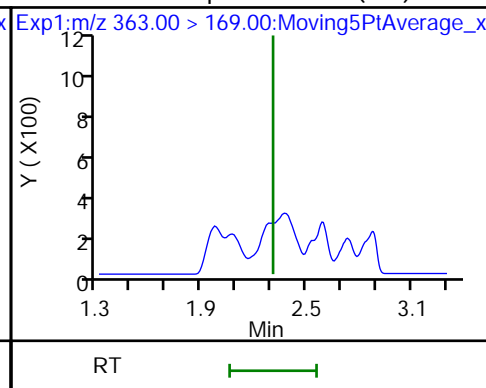
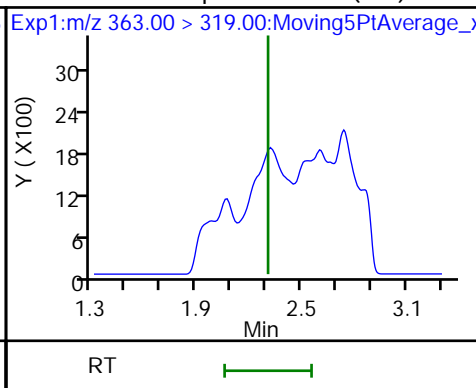
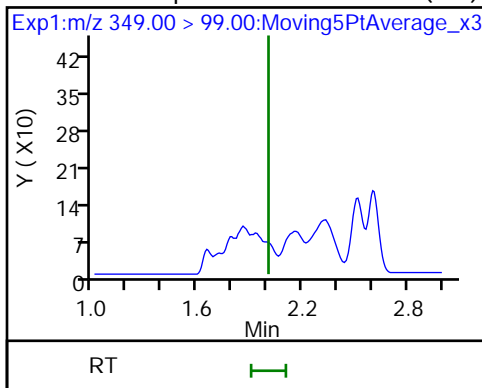
70 Perfluoropentanesulfonic acid (ND)



70 Perfluoropentanesulfonic acid (ND)

10 Perfluoroheptanoic acid (ND)

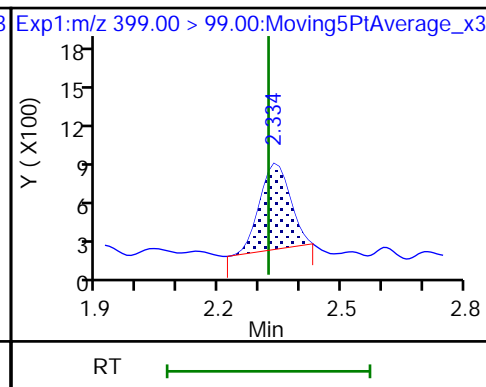
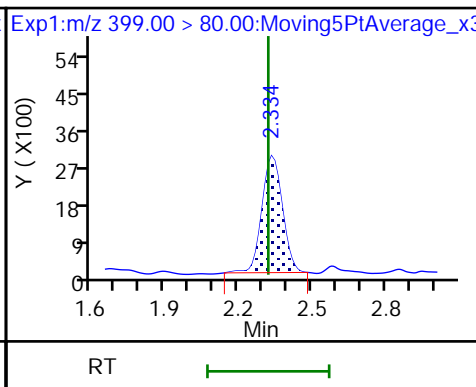
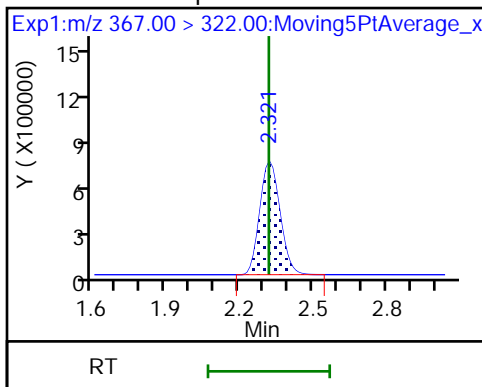
10 Perfluoroheptanoic acid (ND)



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid

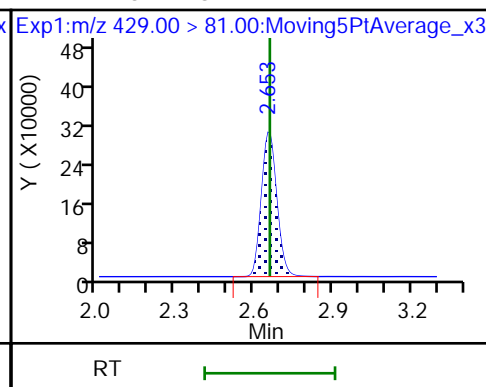
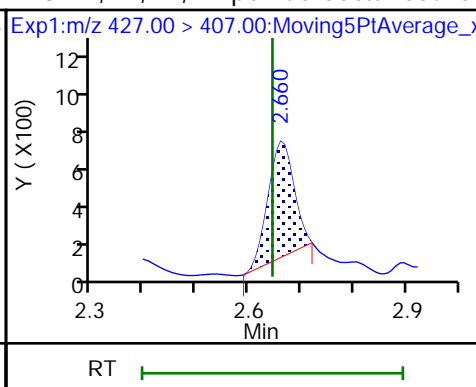
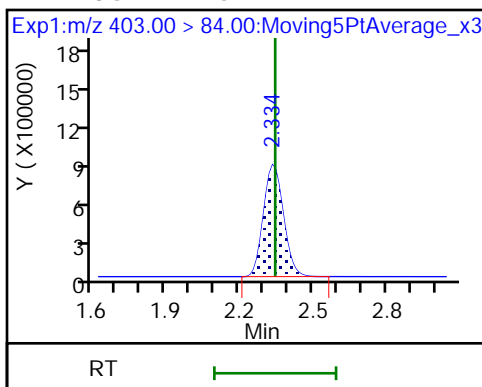
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

13 1H,1H,2H,2H-perfluorooctanesulfonD

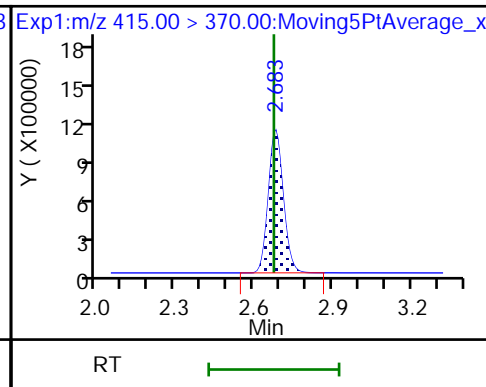
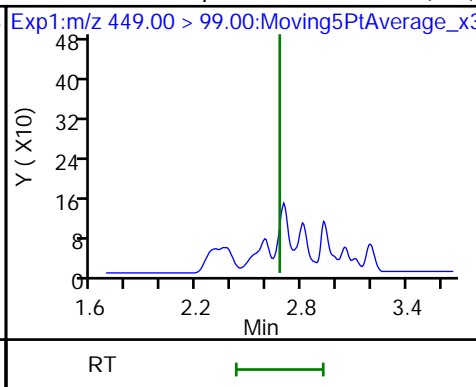
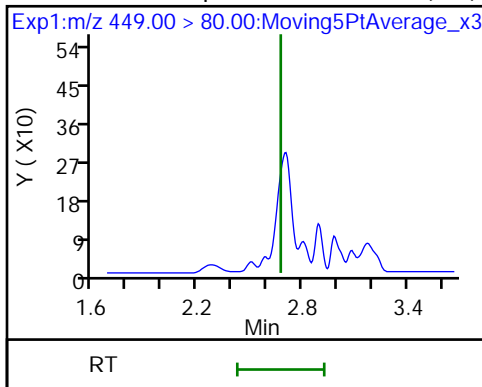
12 M2-6:2FTS

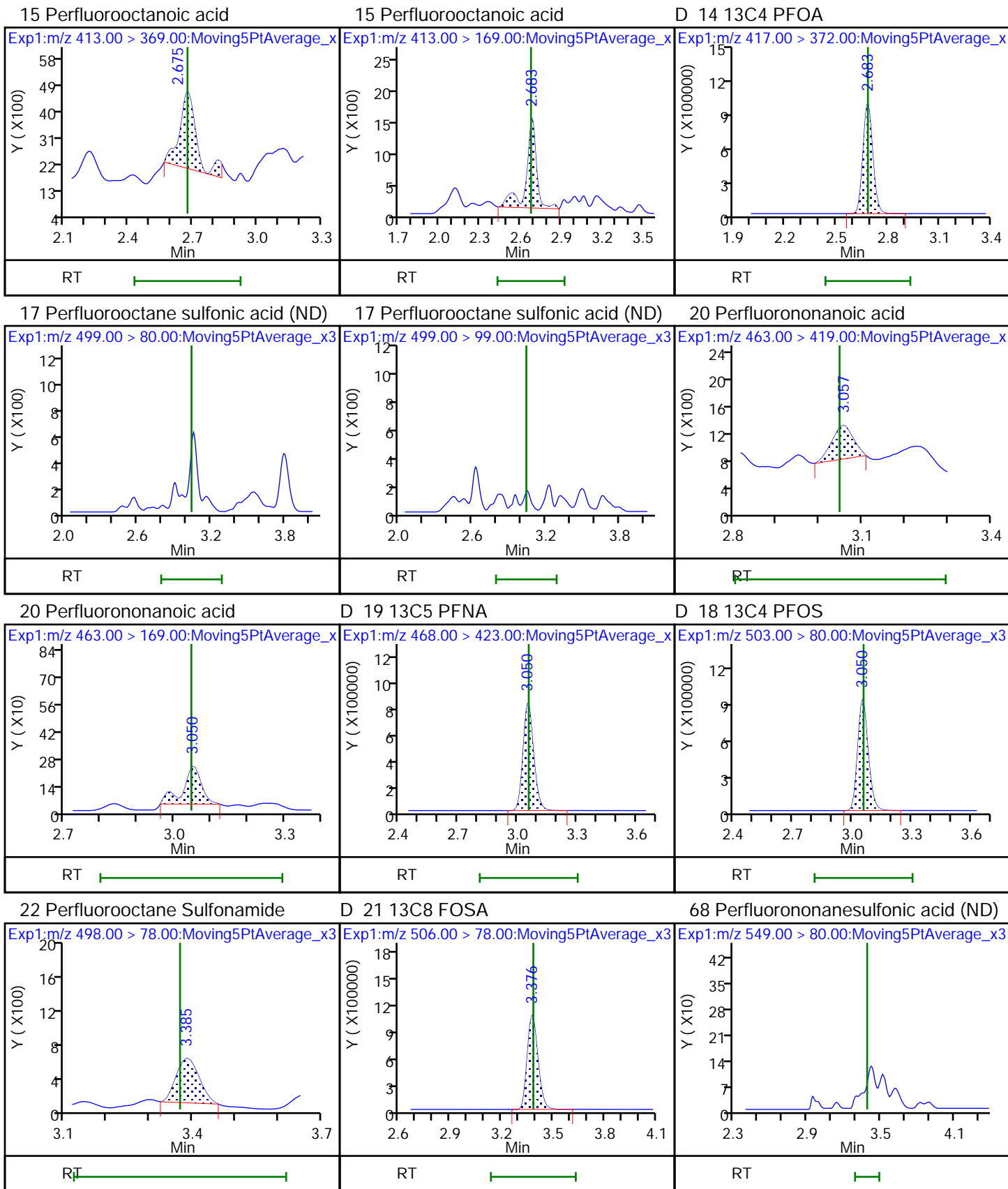


16 Perfluoroheptanesulfonic acid (ND)

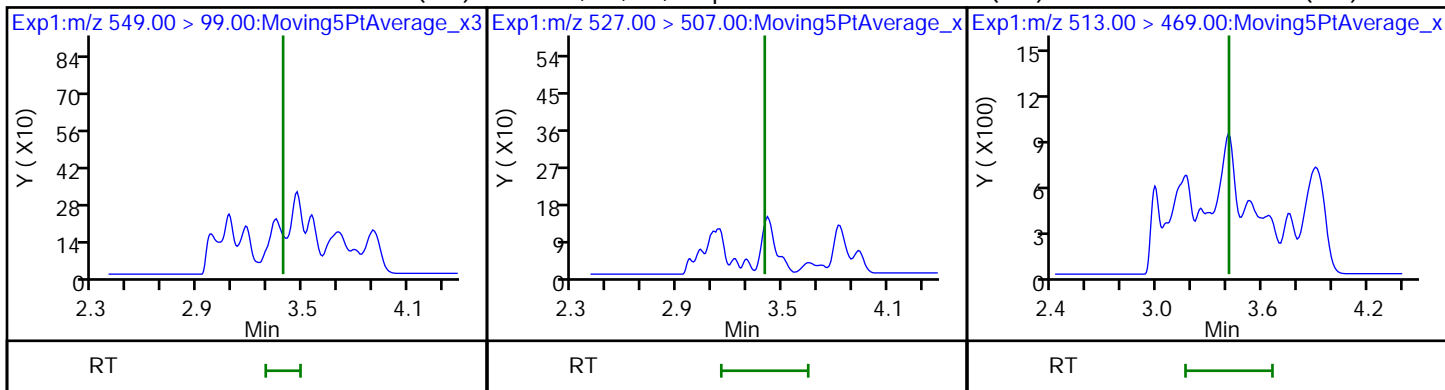
16 Perfluoroheptanesulfonic acid (ND)

* 62 13C2-PFOA

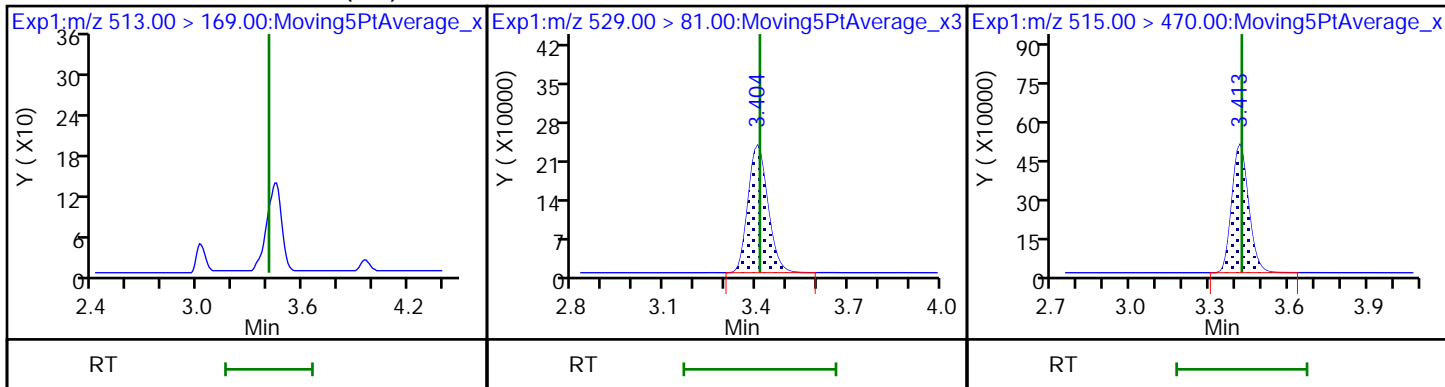




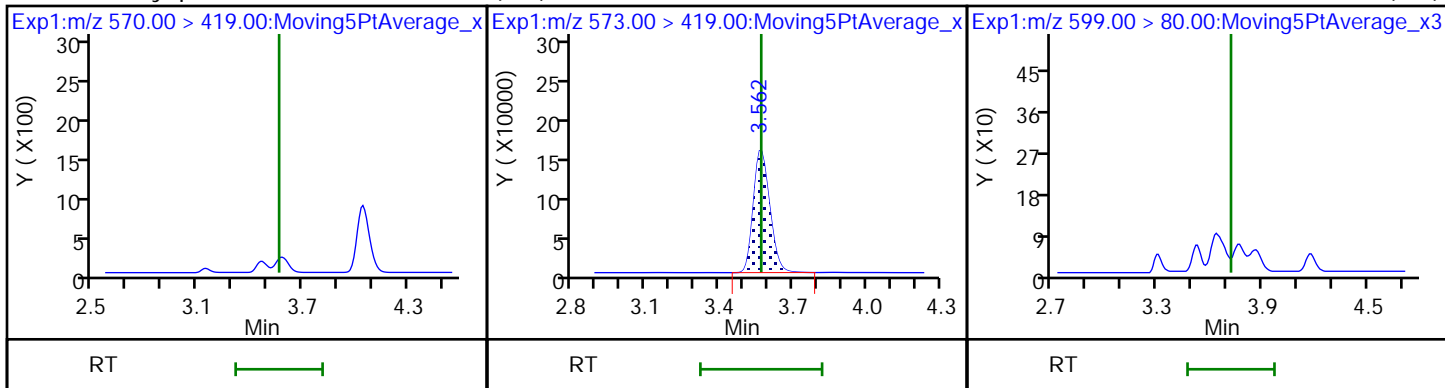
68 Perfluoronanesulfonic acid (ND) 25 1H,1H,2H,2H-perfluorodecanesulfonic acid (ND) Perfluorodecanoic acid (ND)



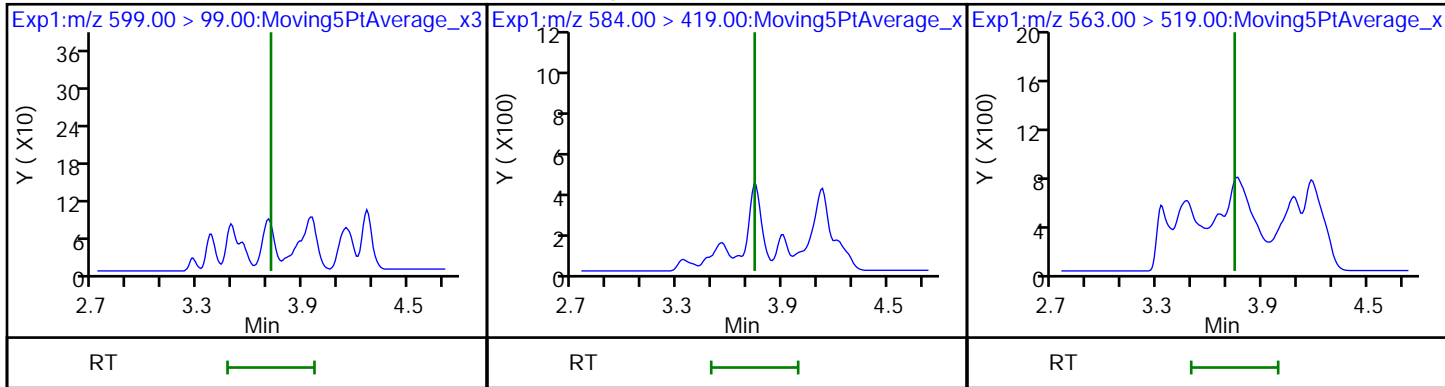
24 Perfluorodecanoic acid (ND) D 26 M2-8:2FTS D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamide (ND) d3-NMeFOSAA 29 Perfluorodecane Sulfonic acid (ND)



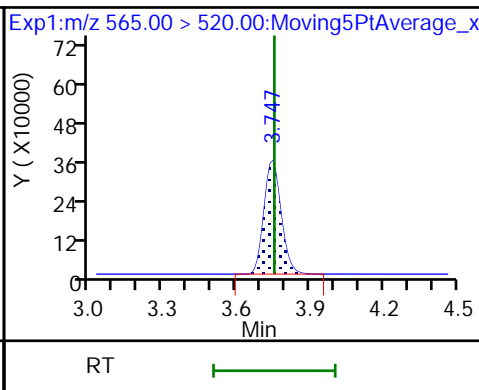
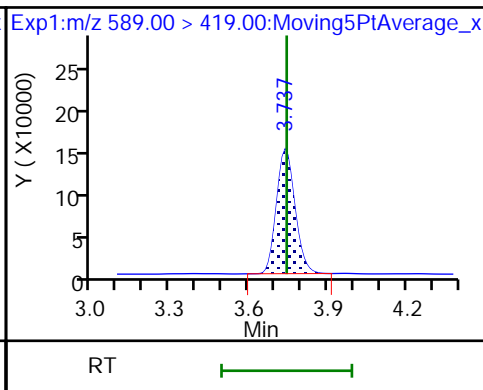
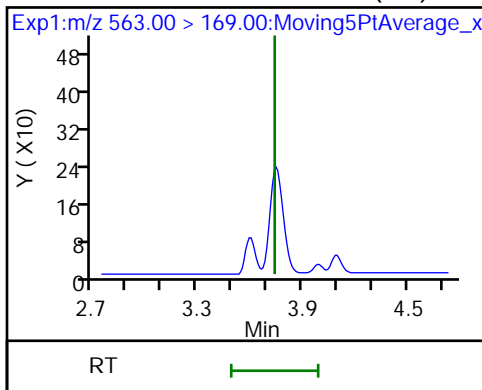
29 Perfluorodecane Sulfonic acid (ND) 33 N-ethyl perfluorooctane sulfonamide (ND) Perfluoroundecanoic acid (ND)



31 Perfluoroundecanoic acid (ND)

D 32 d5-NEtFOSAA

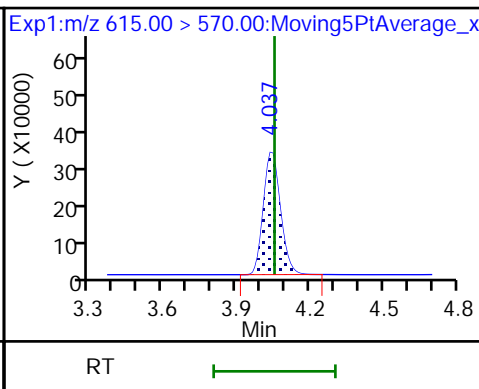
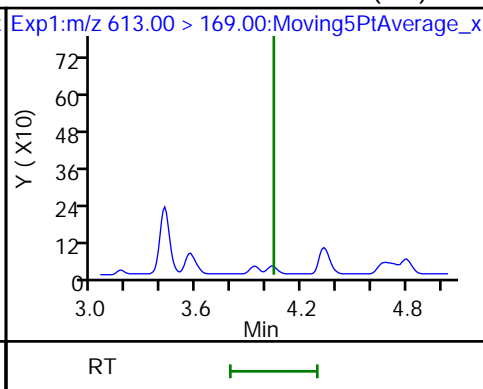
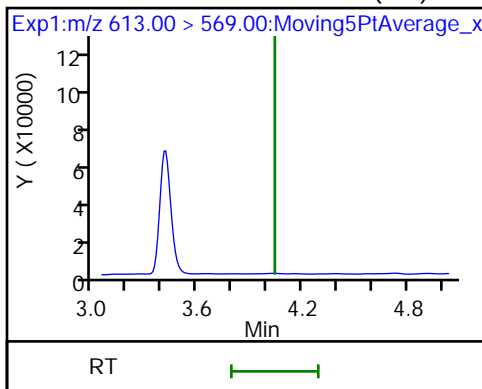
D 30 13C2 PFUnA



37 Perfluorododecanoic acid (ND)

37 Perfluorododecanoic acid (ND)

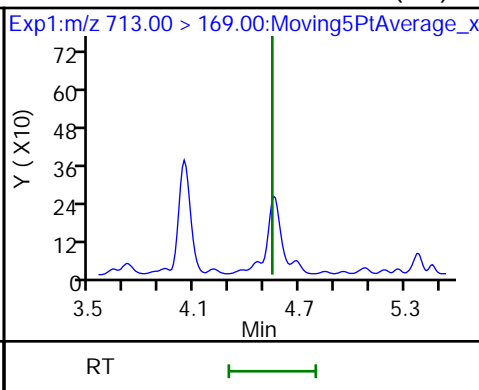
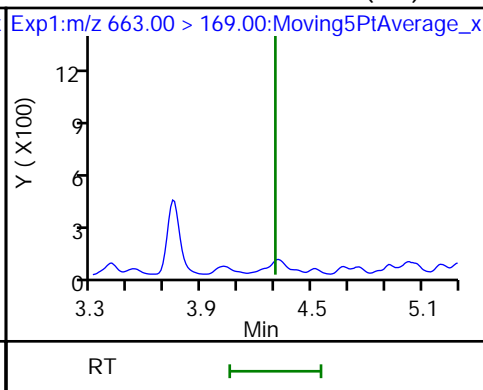
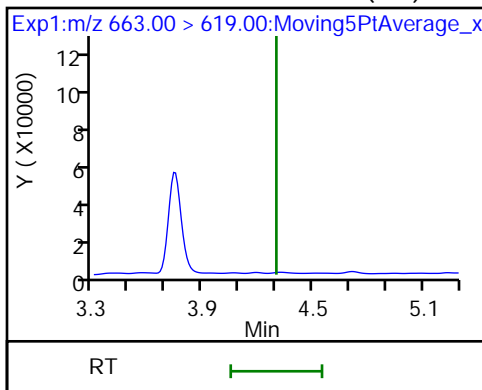
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid (ND)

41 Perfluorotridecanoic acid (ND)

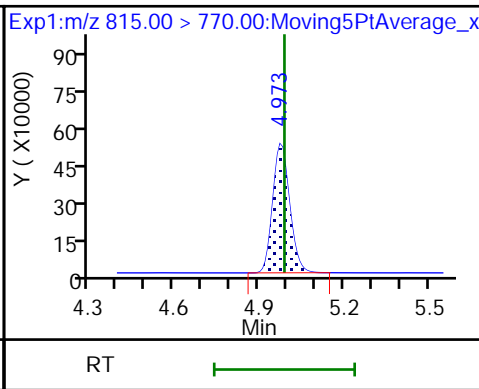
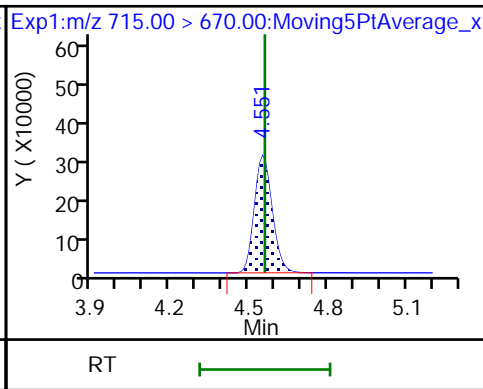
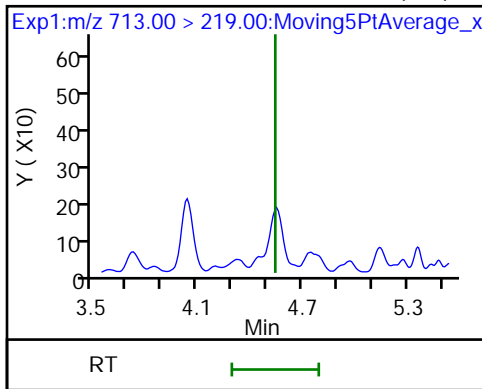
42 Perfluorotetradecanoic acid (ND)



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.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 320-231134/1
 Matrix: Water Lab File ID: 2018.06.26LLC_001.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/26/2018 23:17
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231134 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	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 M	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00860	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 320-231134/1
 Matrix: Water Lab File ID: 2018.06.26LLC_001.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/26/2018 23:17
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231134 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		50-150
STL00992	13C4 PFBA	97		50-150
STL01893	13C5 PFPeA	103		50-150
STL00993	13C2 PFHxA	99		50-150
STL01892	13C4-PFHpA	100		50-150
STL00990	13C4 PFOA	100		50-150
STL00995	13C5 PFNA	97		50-150
STL00996	13C2 PFDA	101		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	18O2 PFHxS	96		50-150
STL02116	13C2-PFTeDA	100		50-150
STL00991	13C4 PFOS	98		50-150
STL02337	13C3-PFBS	98		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_001.d
 Lims ID: CCB
 Client ID:
 Sample Type: CCB
 Inject. Date: 26-Jun-2018 23:17:03 ALS Bottle#: 20 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCB
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 27-Jun-2018 13:48:27 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK028

First Level Reviewer: ruangyotsakuld Date: 27-Jun-2018 13:48:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.441	1.447	-0.006	0.537	5053284	2.43	97.0	41899	
D 3 13C5-PFPeA	267.90 > 223.00	1.711	1.721	-0.010	0.638	3874325	2.57	103	68804	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.756	1.747	0.009	1.005	2789	0.000954		6.4		M
298.90 > 99.00	1.756	1.747	0.009	1.005	1595		1.75(1.25-3.74)	6.3		M
D 47 13C3-PFBS	301.90 > 83.00	1.747	1.757	-0.010	0.651	86846	2.29	98.5	667	
D 60 M2-4:2FTS	329.00 > 81.00	1.959	1.971	-0.012	0.730	669238	NC		12206	
D 7 13C2 PFHxA	315.00 > 270.00	2.003	2.005	-0.002	0.747	4050140	2.47	98.7	65315	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.094	2.106	-0.012	0.780	143903	NC		5168	
8 Perfluorohexanesulfonic acid										R
399.00 > 80.00	2.346	2.332	0.014	1.000	19859	0.008602		421		R
399.00 > 99.00	2.346	2.332	0.014	1.000	3690		5.38(1.50-4.49)	16.4		
D 9 13C4-PFHpA	367.00 > 322.00	2.333	2.334	-0.001	0.870	3721112	2.50	100	56522	
D 11 18O2 PFHxS	403.00 > 84.00	2.346	2.347	-0.001	0.874	4803095	2.26	95.6	42835	
D 12 M2-6:2FTS	429.00 > 81.00	2.660	2.667	-0.007	0.992	937472	2.44	103	28145	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.683	2.682	0.001	1.000	11300	0.006583		2.4		M
413.00 > 169.00	2.690	2.682	0.008	1.003	4339		2.60(0.84-2.52)	36.3		M
* 62 13C2-PFOA										
415.00 > 370.00	2.683	2.682	0.001		3659241	2.50		40048		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA	417.00 > 372.00	2.683	2.690	-0.007	1.000	3517302	2.50	100	52839	
D 18 13C4 PFOS	503.00 > 80.00	3.057	3.060	-0.003	1.139	3295173	2.33	97.5	47467	
D 19 13C5 PFNA	468.00 > 423.00	3.057	3.066	-0.009	1.139	2672214	2.41	96.5	52641	
D 21 13C8 FOSA	506.00 > 78.00	3.385	3.389	-0.004	1.262	5048637	2.52	101	34466	
D 26 M2-8:2FTS	529.00 > 81.00	3.404	3.417	-0.013	1.269	900980	2.58	108	19918	
D 23 13C2 PFDA	515.00 > 470.00	3.423	3.427	-0.004	1.276	2108596	2.51	101	24770	
D 27 d3-NMeFOSAA	573.00 > 419.00	3.572	3.576	-0.004	1.331	663755	2.58	103	28210	
D 32 d5-NEtFOSAA	589.00 > 419.00	3.747	3.751	-0.004	1.397	724179	2.73	109	2050	
D 30 13C2 PFUnA	565.00 > 520.00	3.747	3.751	-0.004	1.397	1513358	2.34	93.5	31216	
D 36 13C2 PFDaA	615.00 > 570.00	4.047	4.051	-0.004	1.509	1457034	2.23	89.3	9670	
D 43 13C2-PFTeDA	715.00 > 670.00	4.551	4.564	-0.013	1.696	1497694	2.49	99.5	6001	
45 Perfluorohexadecanoic acid	813.00 > 769.00	4.982	4.984	-0.002	1.000	21735	NC		2.5	
	813.00 > 169.00	4.982	4.984	-0.002	1.000	3403	6.39(2.86-8.58)		42.7	
D 44 13C2-PFHxDA	815.00 > 770.00	4.982	4.984	-0.002	1.857	2398288	2.36	94.2	6494	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_001.d

Injection Date: 26-Jun-2018 23:17:03

Instrument ID: A8_N

Lims ID: CCB

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 20

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

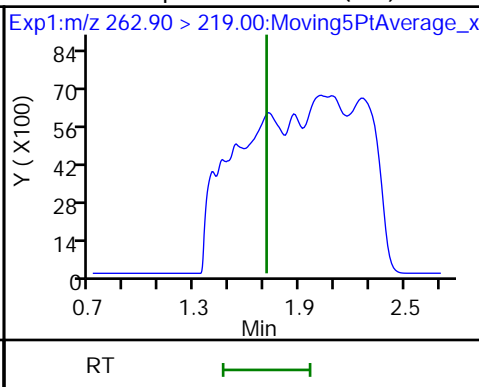
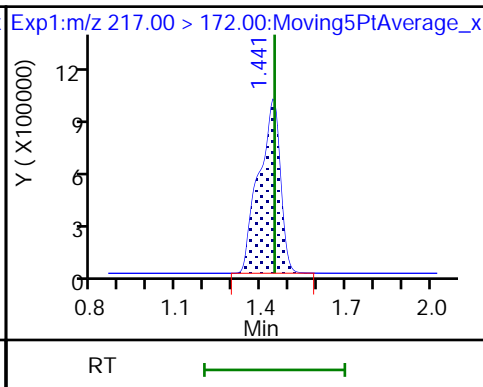
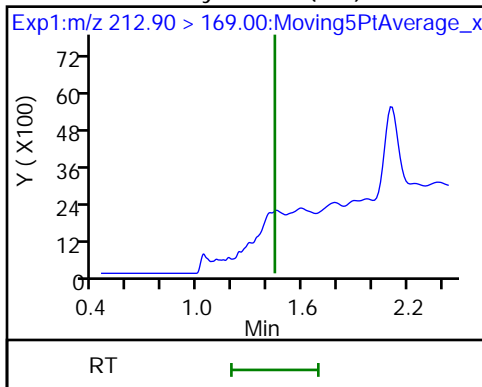
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid (ND)

D 1 13C4 PFBA

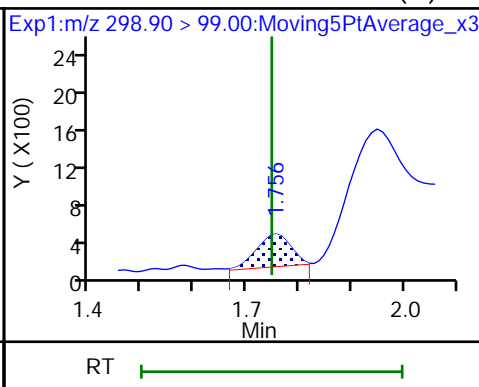
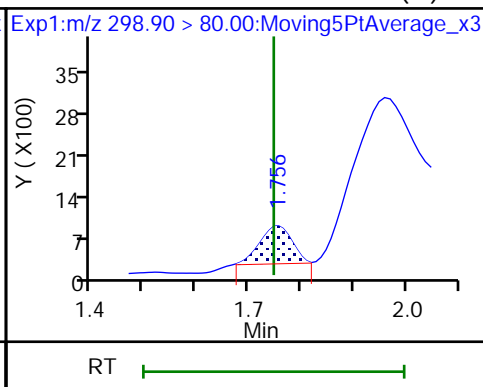
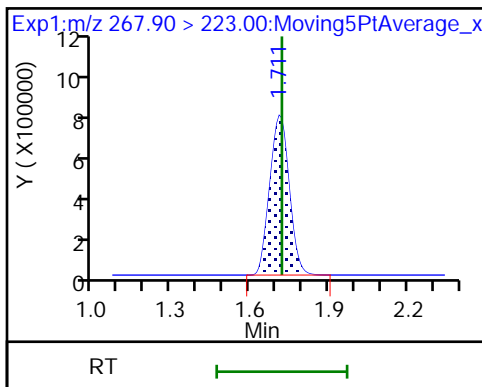
4 Perfluoropentanoic acid (ND)



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid (M)

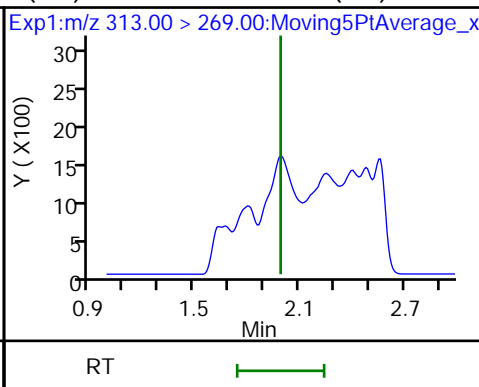
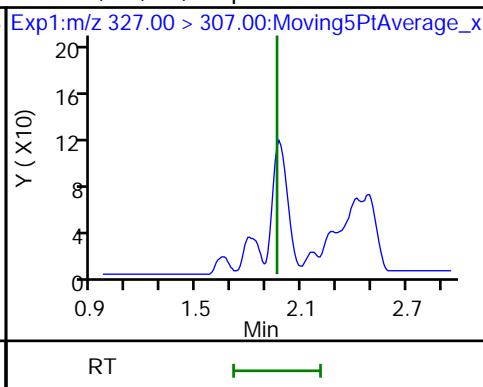
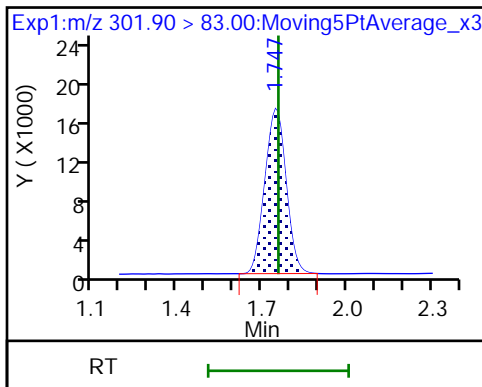
5 Perfluorobutanesulfonic acid (M)



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)

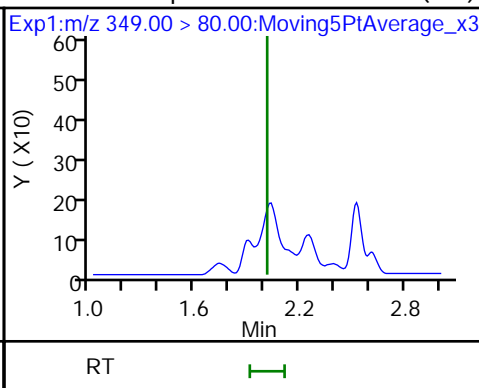
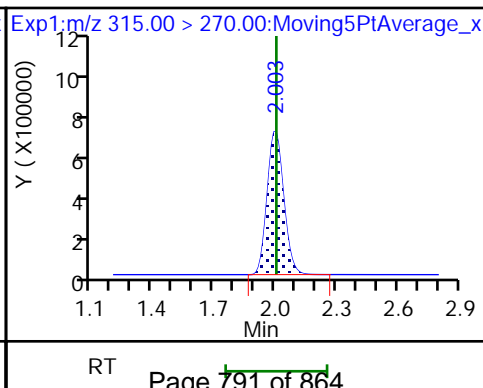
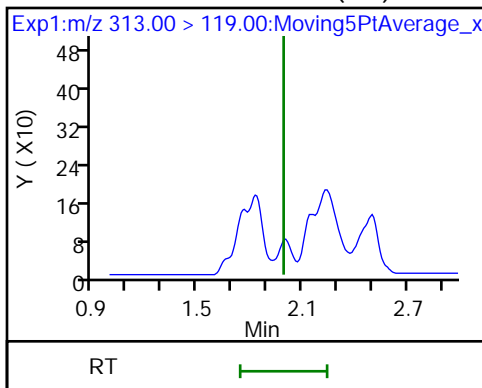
61 Perfluorohexanoic acid (ND)



6 Perfluorohexanoic acid (ND)

D 7 13C2 PFHxA

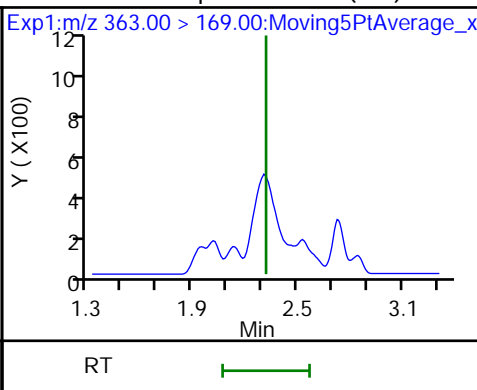
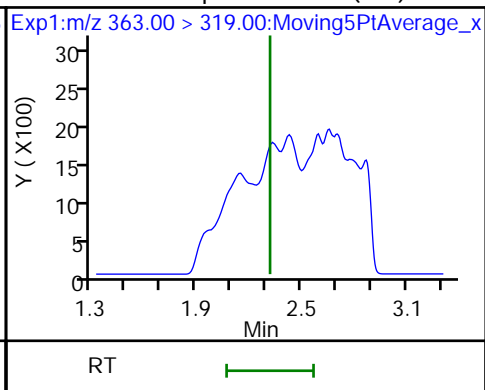
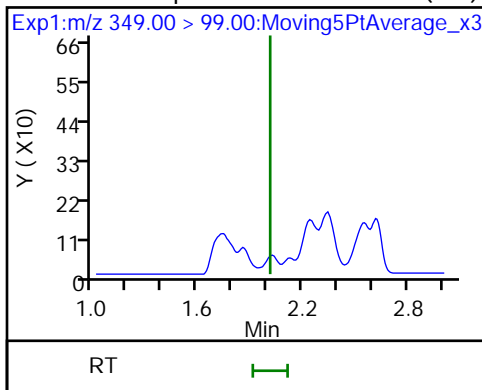
70 Perfluoropentanesulfonic acid (ND)



70 Perfluoropentanesulfonic acid (ND)

10 Perfluoroheptanoic acid (ND)

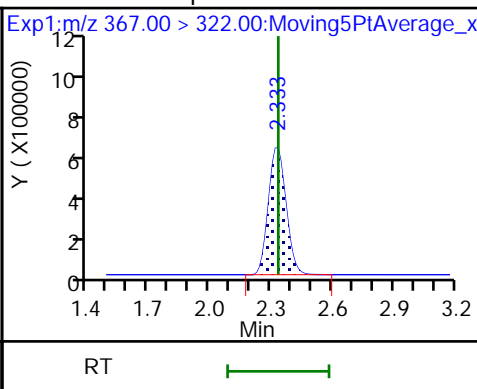
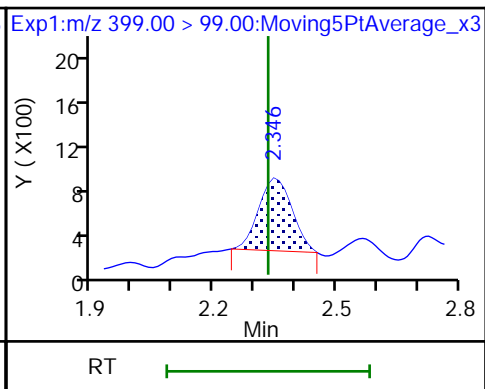
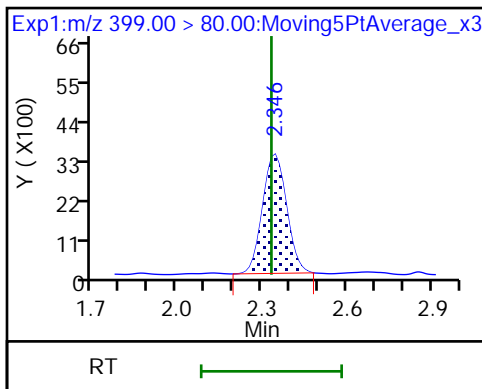
10 Perfluoroheptanoic acid (ND)



8 Perfluorohexanesulfonic acid

8 Perfluorohexanesulfonic acid

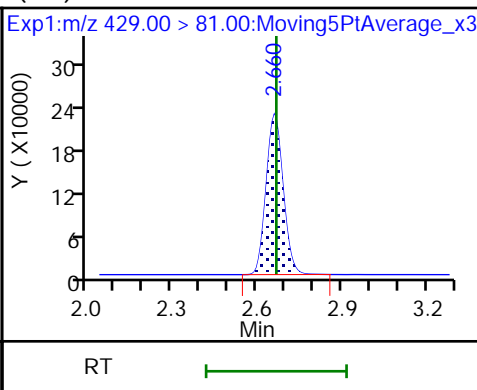
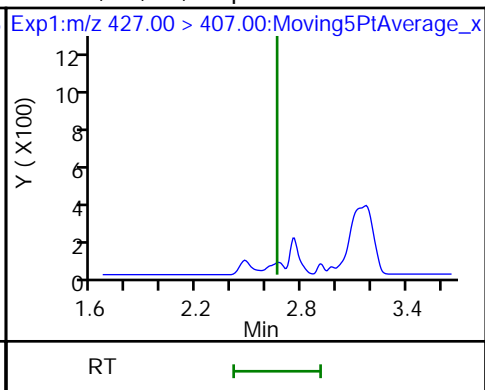
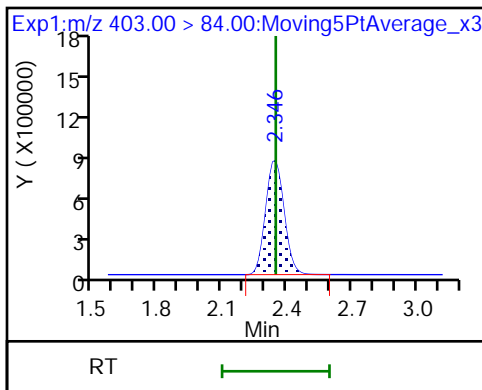
D 9 13C4-PFHpA



D 11 18O2 PFHxS

13 1H,1H,2H,2H-perfluorooctanesulfonate (ND)

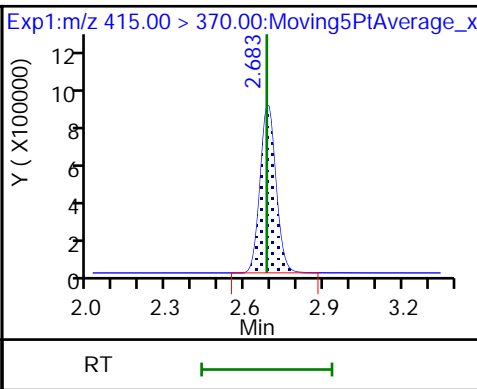
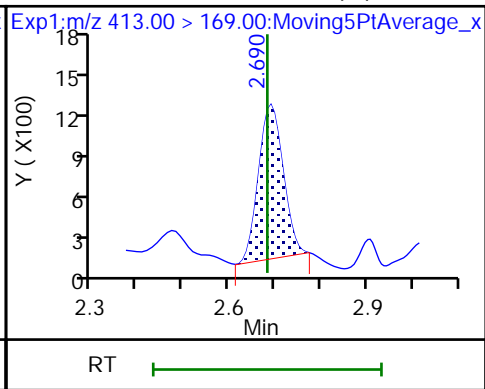
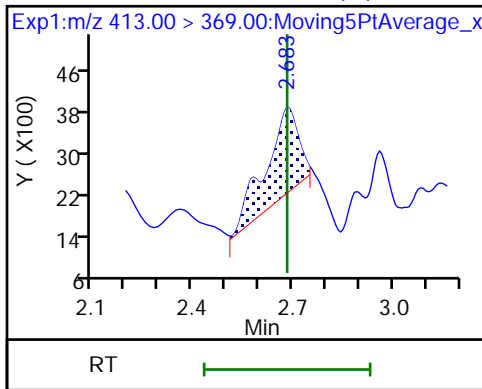
D(M2)-6:2FTS



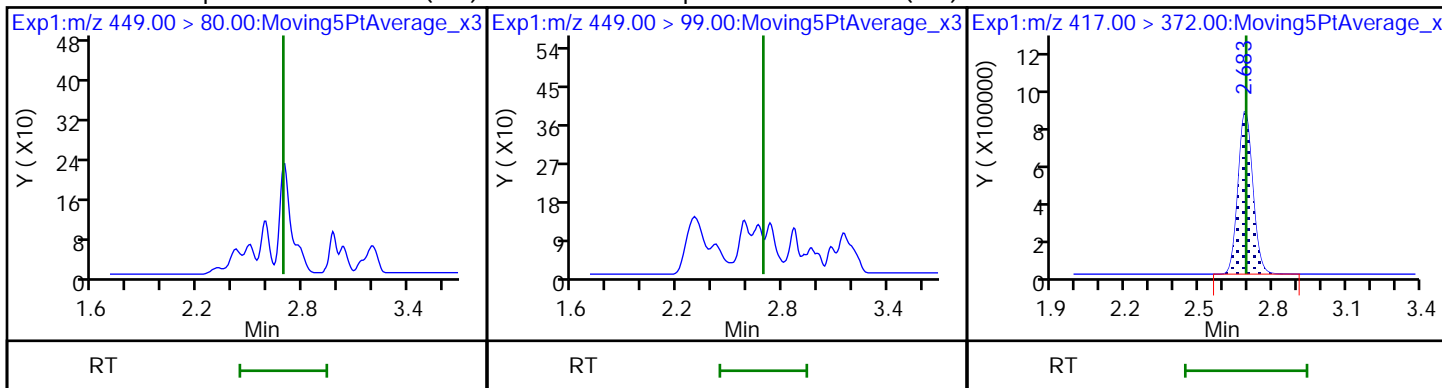
15 Perfluorooctanoic acid (M)

15 Perfluorooctanoic acid (M)

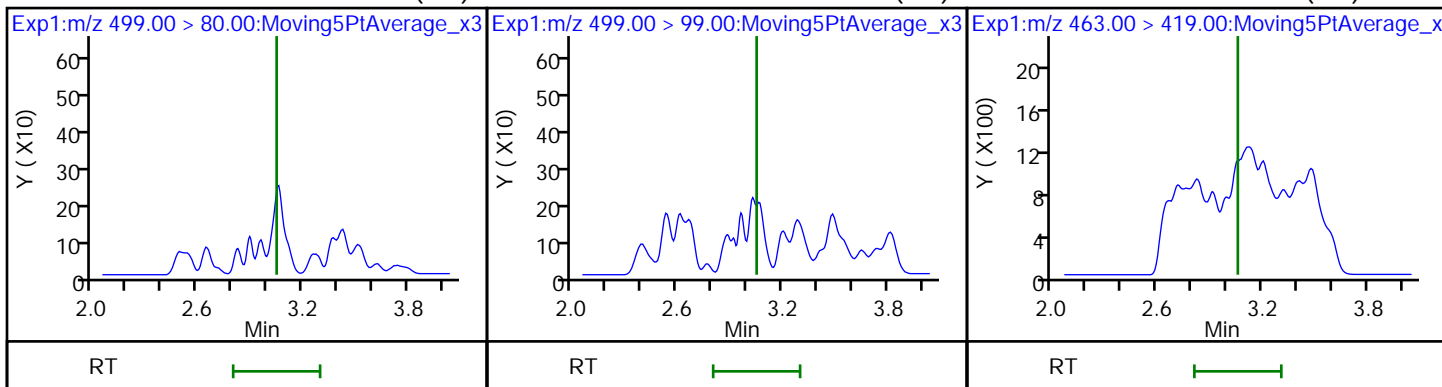
* 62 13C2-PFOA



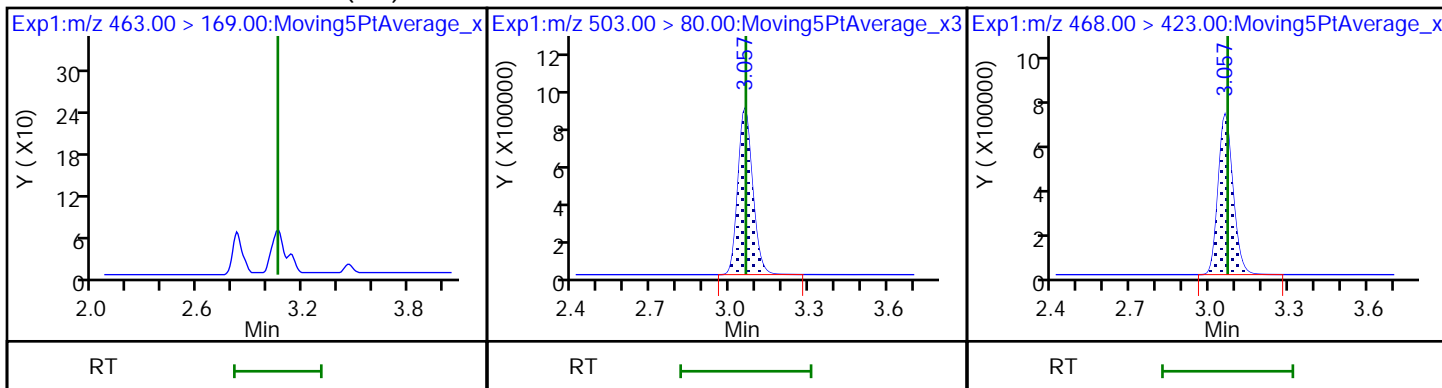
16 Perfluoroheptanesulfonic acid (ND) 16 Perfluoroheptanesulfonic acid (ND) D 14 13C4 PFOA



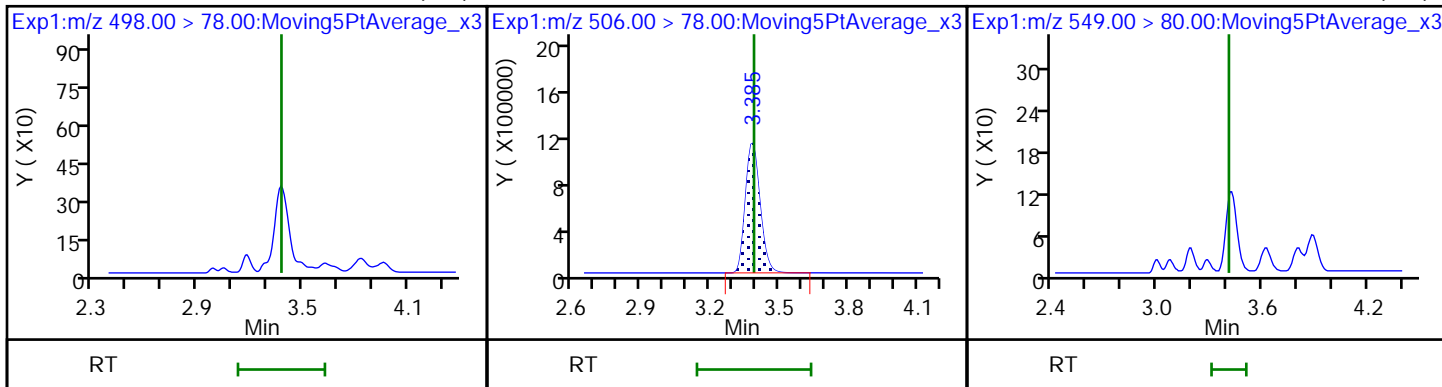
17 Perfluorooctane sulfonic acid (ND) 17 Perfluorooctane sulfonic acid (ND) 20 Perfluorononanoic acid (ND)



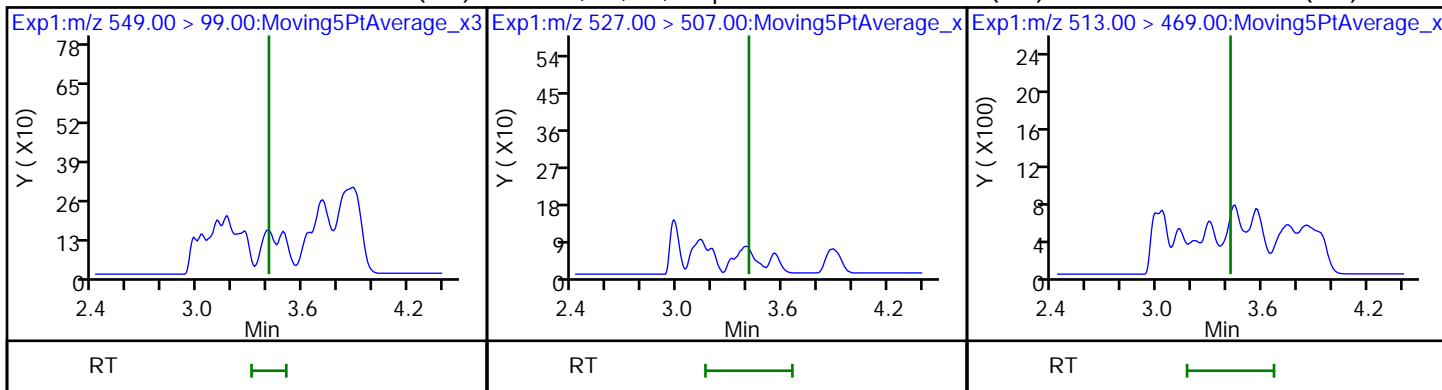
20 Perfluorononanoic acid (ND) D 18 13C4 PFOS D 19 13C5 PFNA



22 Perfluorooctane Sulfonamide (ND) D 21 13C8 FOSA 68 Perfluorononanesulfonic acid (ND)



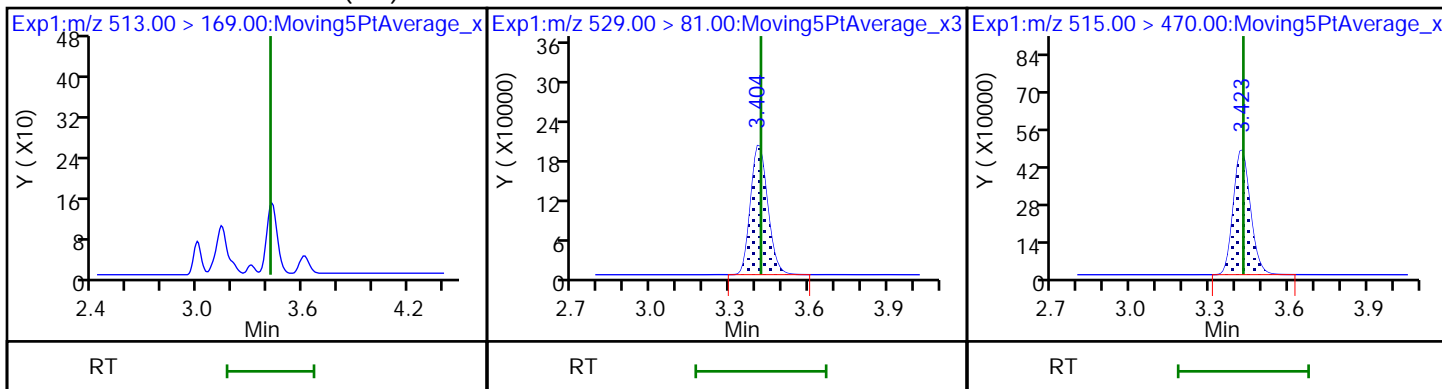
68 Perfluorononanesulfonic acid (ND) 25 1H,1H,2H,2H-perfluorodecanesulfonic acid (ND) 24 Perfluorodecanoic acid (ND)



24 Perfluorodecanoic acid (ND)

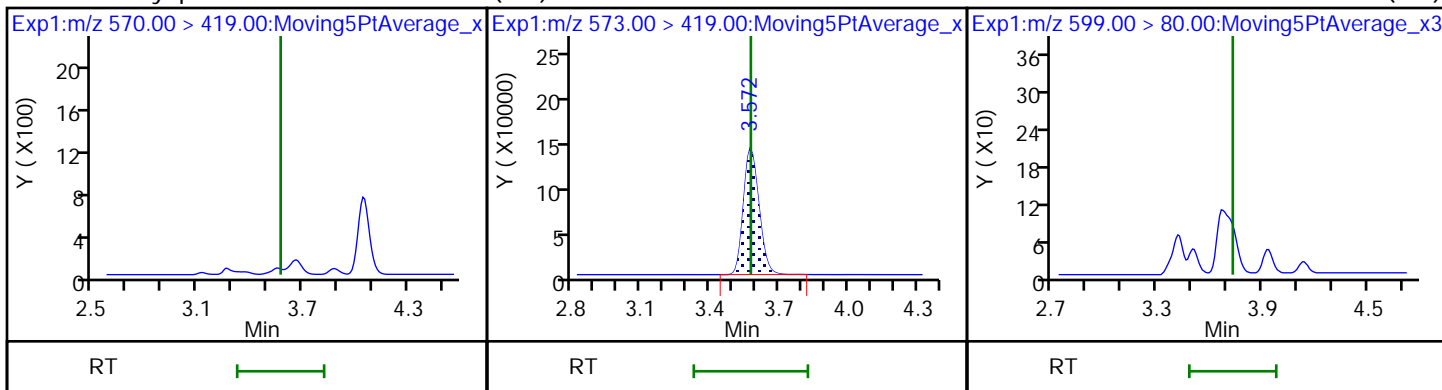
D 26 M2-8:2FTS

D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamide (ND) d3-NMeFOSAA

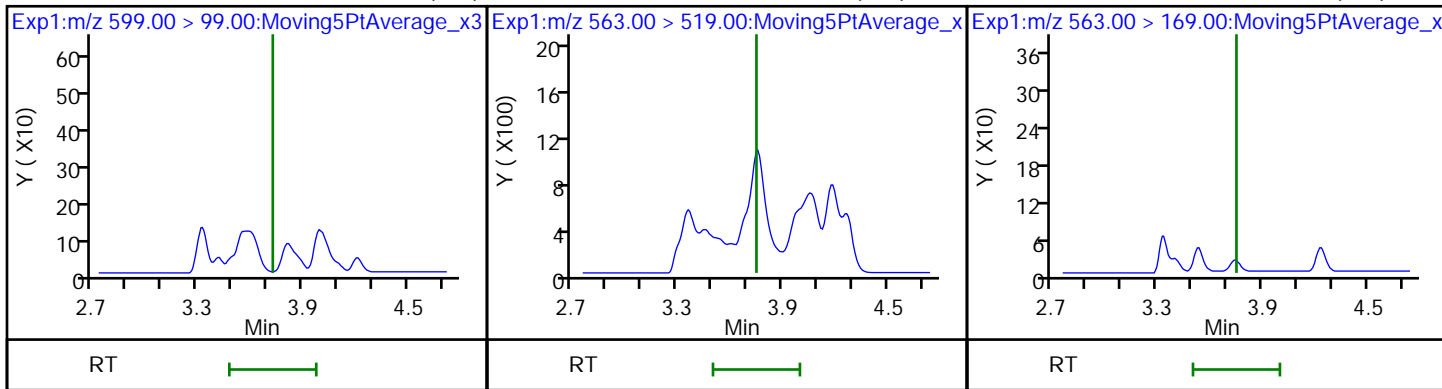
29 Perfluorodecane Sulfonic acid (ND)



29 Perfluorodecane Sulfonic acid (ND)

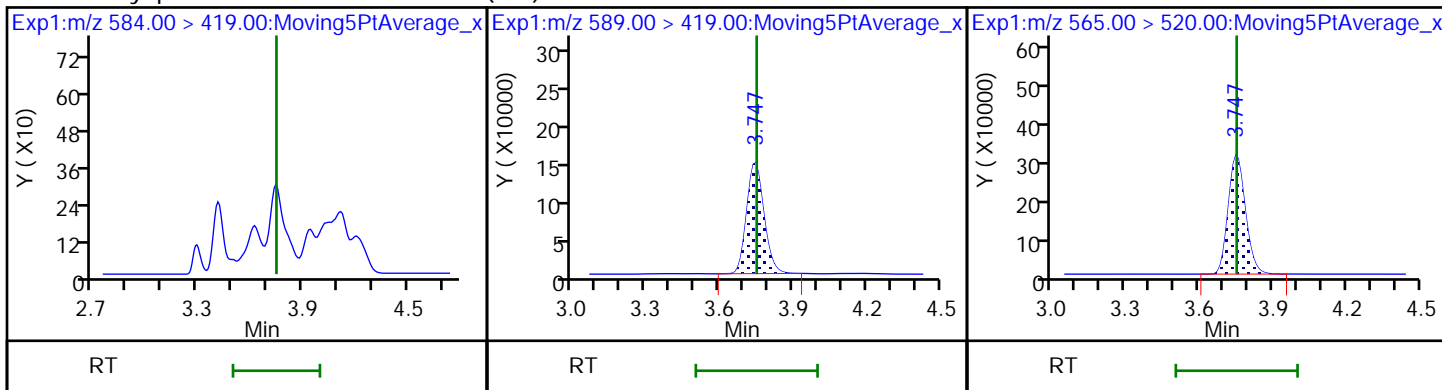
31 Perfluoroundecanoic acid (ND)

31 Perfluoroundecanoic acid (ND)



33 N-ethyl perfluorooctane sulfonamid (ND) d5-NEtFOSAA

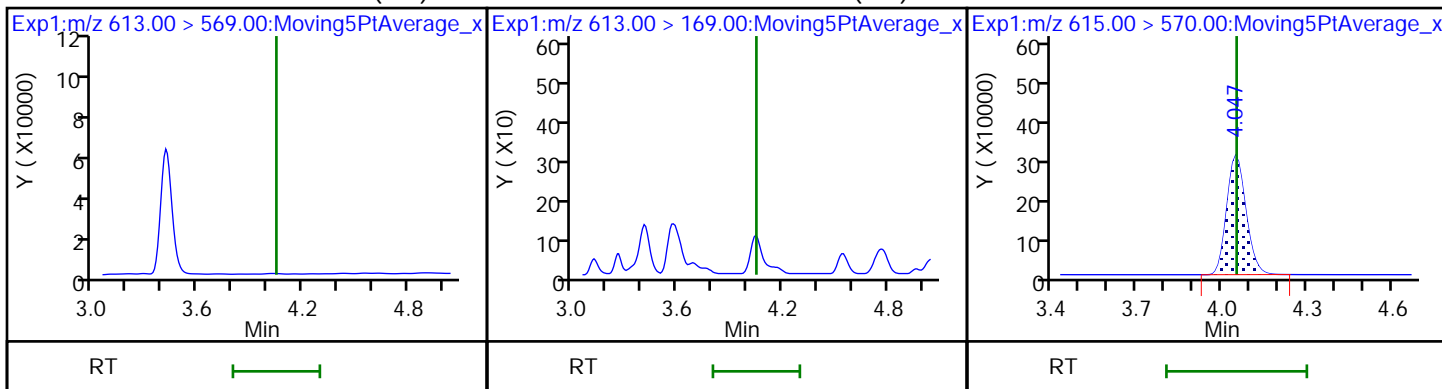
D 30 13C2 PFUnA



37 Perfluorododecanoic acid (ND)

37 Perfluorododecanoic acid (ND)

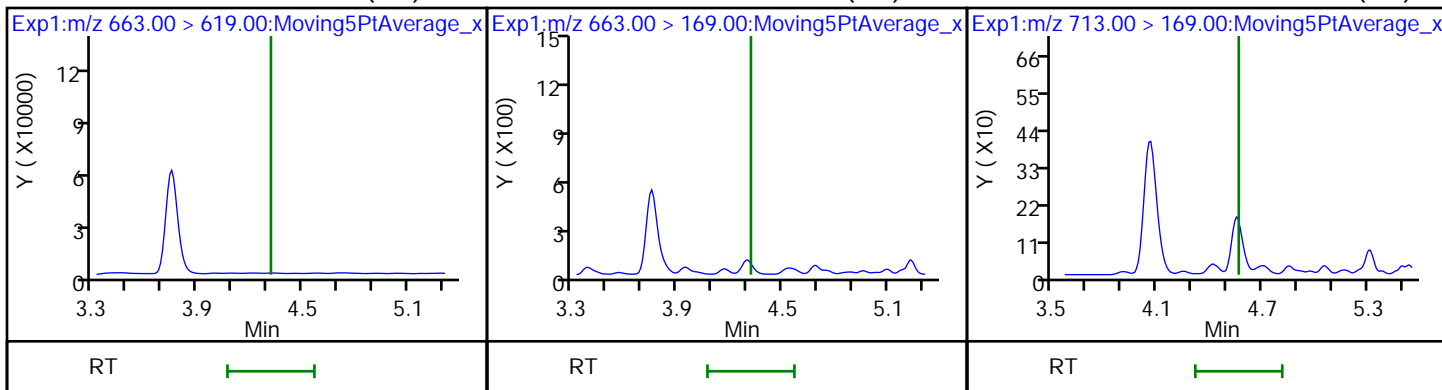
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid (ND)

41 Perfluorotridecanoic acid (ND)

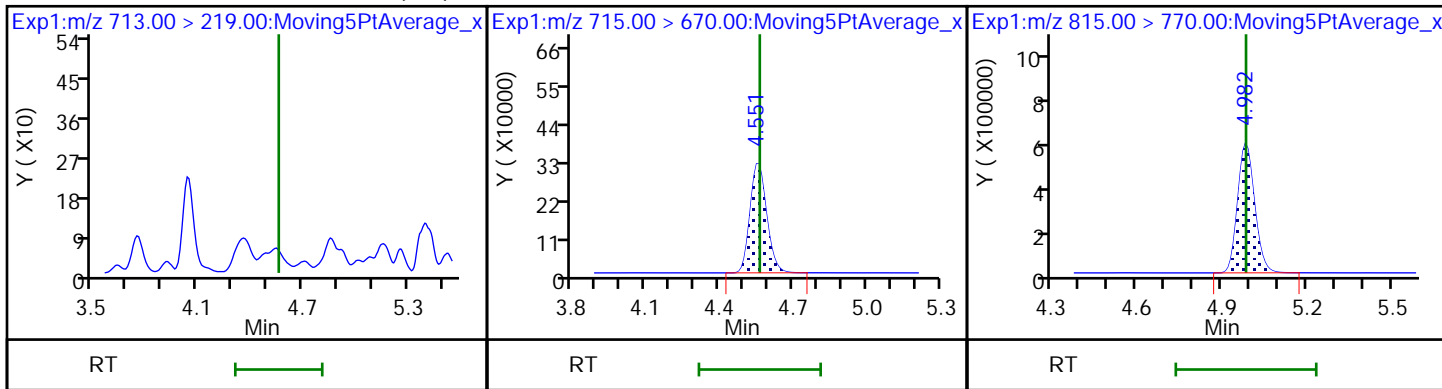
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento

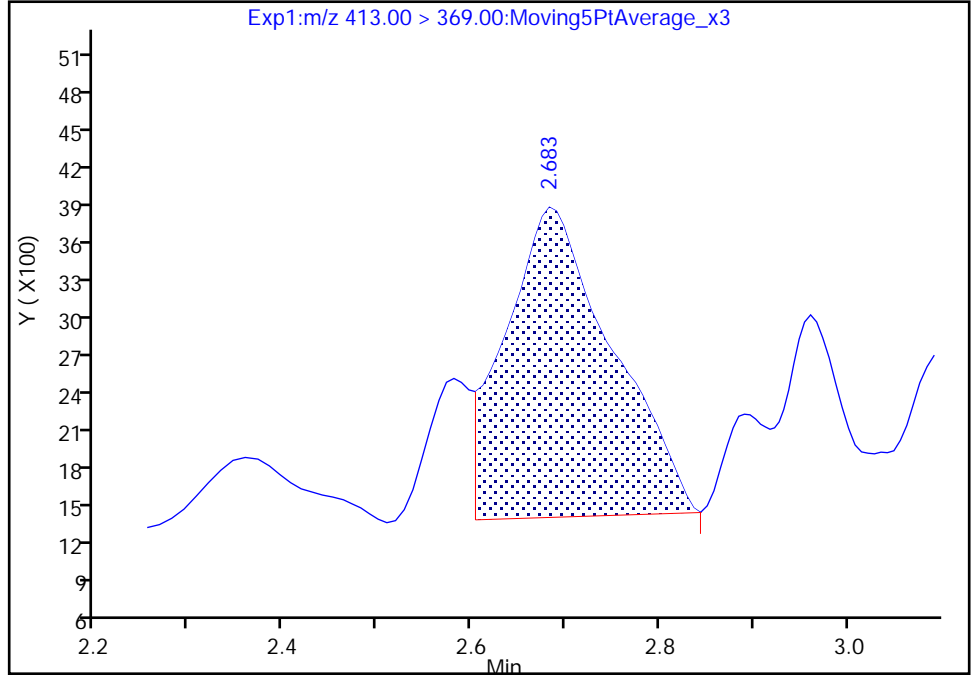
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_001.d
Injection Date: 26-Jun-2018 23:17:03 Instrument ID: A8_N
Lims ID: CCB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

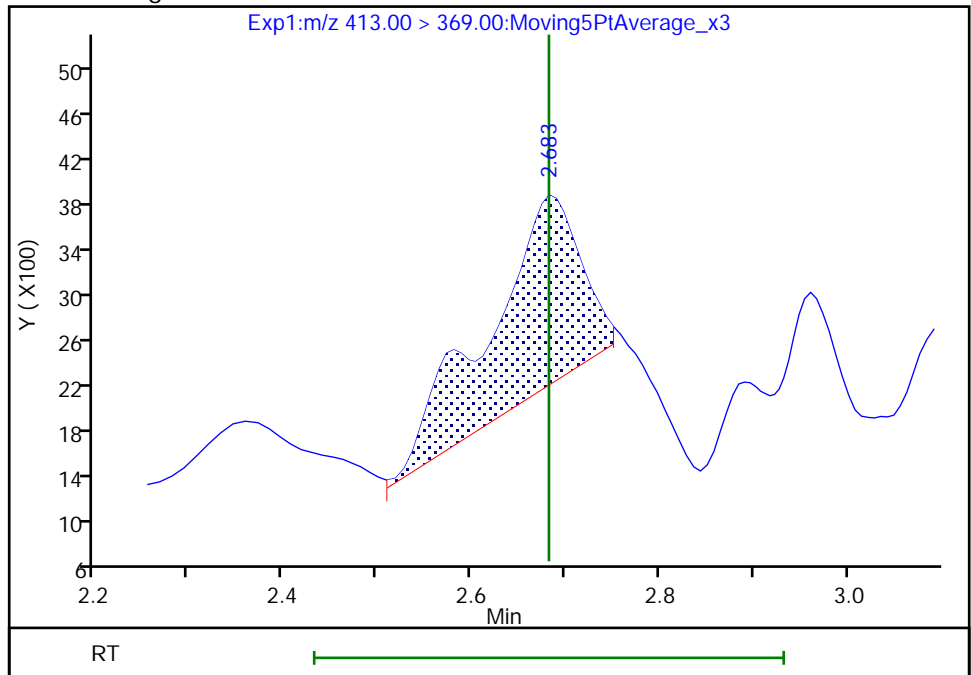
RT: 2.68
Area: 18890
Amount: 0.011004
Amount Units: ng/ml

Processing Integration Results



RT: 2.68
Area: 11300
Amount: 0.006583
Amount Units: ng/ml

Manual Integration Results



Reviewer: ruangyotsakuld, 27-Jun-2018 13:47:37

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

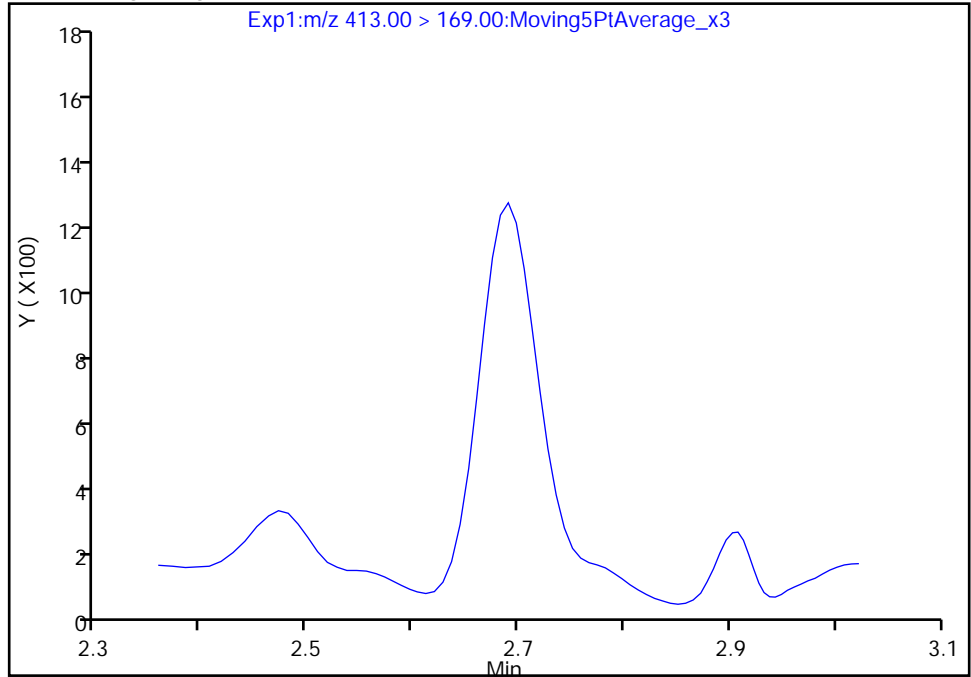
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_001.d
Injection Date: 26-Jun-2018 23:17:03 Instrument ID: A8_N
Lims ID: CCB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

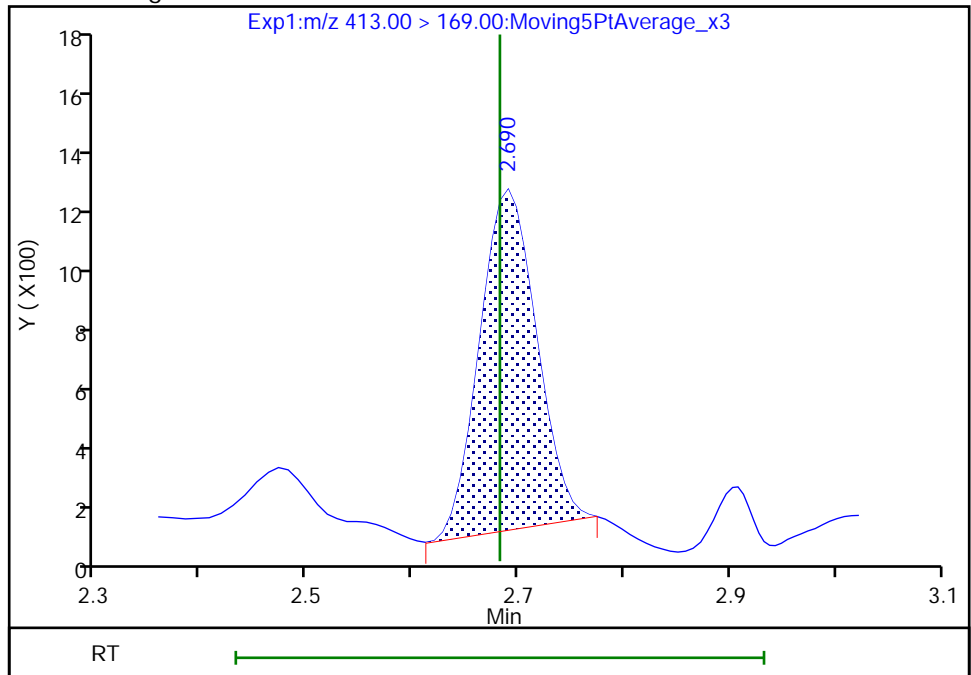
RT: 2.69
Area: 0
Amount: 0.011004
Amount Units: ng/ml

Processing Integration Results



RT: 2.69
Area: 4339
Amount: 0.006583
Amount Units: ng/ml

Manual Integration Results



Reviewer: ruangyotsakuld, 27-Jun-2018 13:47:46

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento

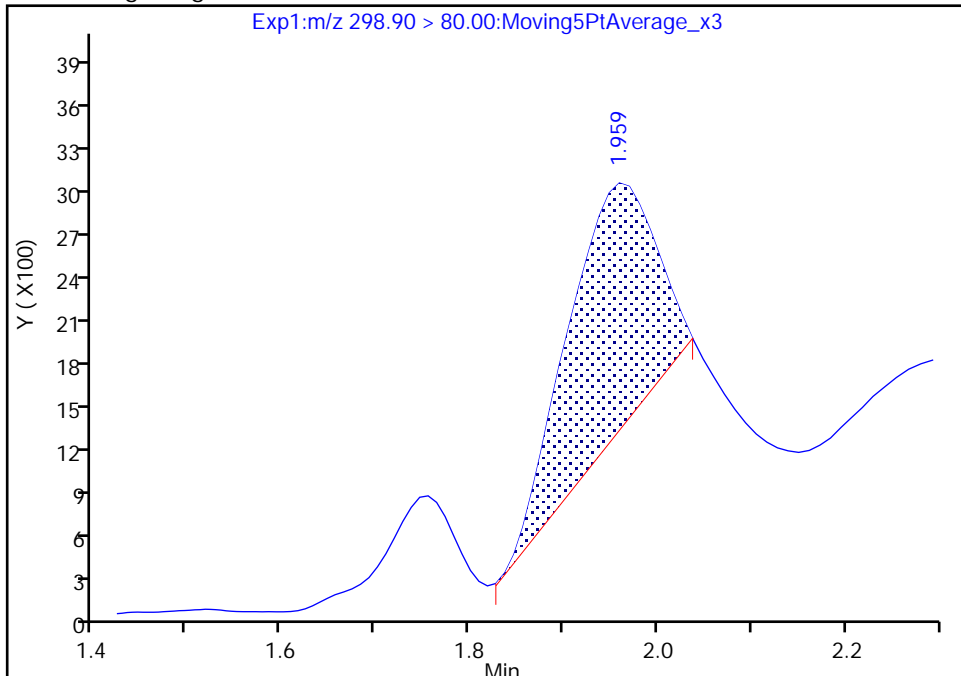
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_001.d
Injection Date: 26-Jun-2018 23:17:03 Instrument ID: A8_N
Lims ID: CCB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

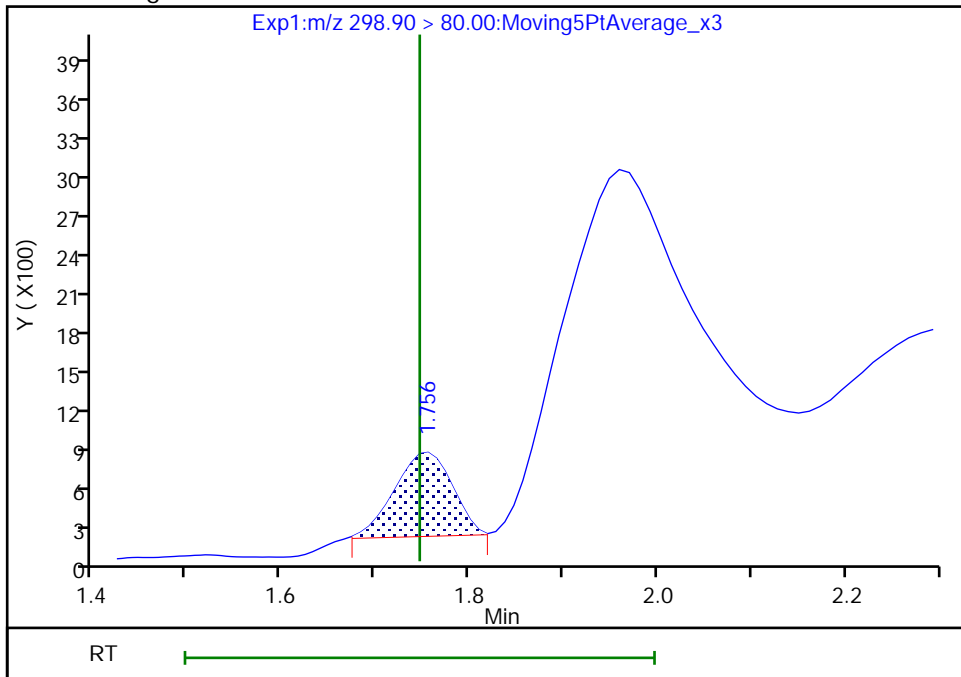
RT: 1.96
Area: 11512
Amount: 0.003936
Amount Units: ng/ml

Processing Integration Results



RT: 1.76
Area: 2789
Amount: 0.000954
Amount Units: ng/ml

Manual Integration Results



Reviewer: ruangyotsakuld, 27-Jun-2018 13:47:07

Audit Action: Manually Integrated

Audit Reason: Wrong peak

TestAmerica Sacramento

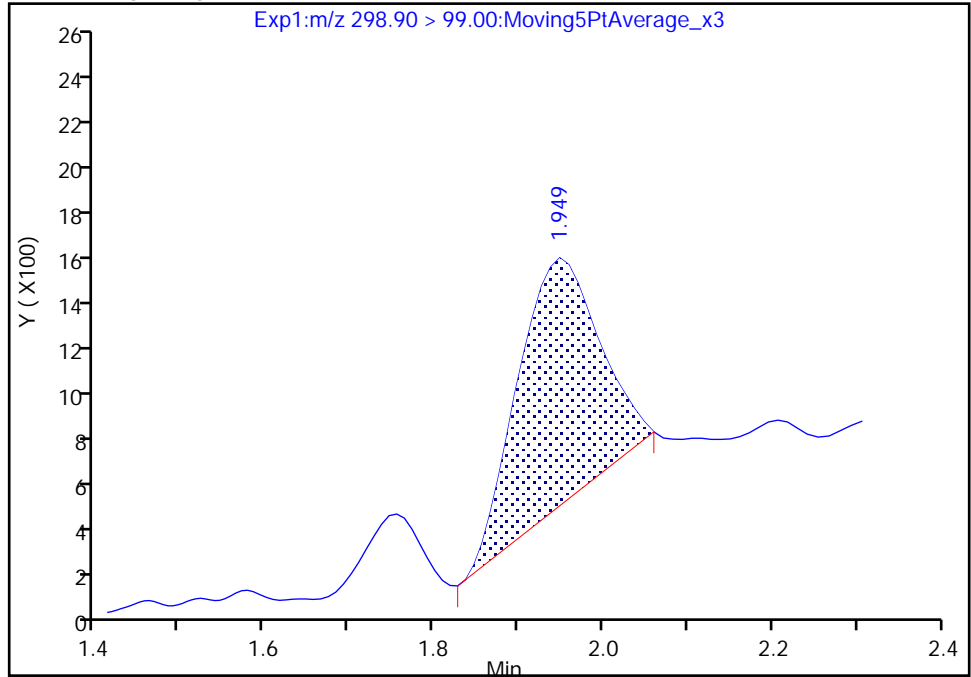
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60280.b\2018.06.26LLC_001.d
Injection Date: 26-Jun-2018 23:17:03 Instrument ID: A8_N
Lims ID: CCB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

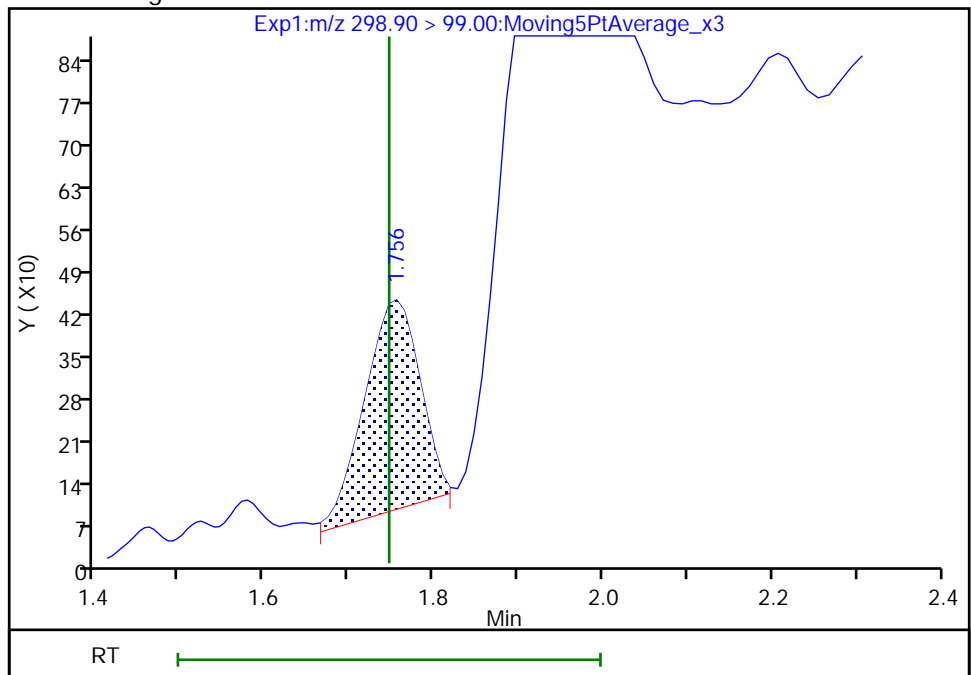
RT: 1.95
Area: 7290
Amount: 0.003936
Amount Units: ng/ml

Processing Integration Results



RT: 1.76
Area: 1595
Amount: 0.000954
Amount Units: ng/ml

Manual Integration Results



Reviewer: ruangyotsakuld, 27-Jun-2018 13:47:12

Audit Action: Manually Integrated

Audit Reason: Wrong peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-230408/9
 Matrix: Water Lab File ID: 2018.06.022LLICALA_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/22/2018 10:13
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 230408 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	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 M	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U M	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)	0.00804	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-230408/9
 Matrix: Water Lab File ID: 2018.06.022LLICALA_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/22/2018 10:13
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 230408 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	97		50-150
STL00992	13C4 PFBA	96		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	101		50-150
STL01892	13C4-PFHpA	100		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	103		50-150
STL00996	13C2 PFDA	100		50-150
STL00997	13C2 PFUnA	98		50-150
STL00998	13C2 PFDoA	95		50-150
STL00994	18O2 PFHxS	95		50-150
STL02116	13C2-PFTeDA	89		50-150
STL00991	13C4 PFOS	97		50-150
STL02337	13C3-PFBS	94		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_009.d
 Lims ID: ICB
 Client ID:
 Sample Type: ICB
 Inject. Date: 22-Jun-2018 10:13:09 ALS Bottle#: 20 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICB
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 22-Jun-2018 11:25:41 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK017

First Level Reviewer: roycea Date: 22-Jun-2018 11:16:40

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	1.431	1.435	-0.004	0.539	5376275	2.41	96.2	27691	
D 3 13C5-PFPeA	267.90 > 223.00	1.703	1.705	-0.002	0.642	3968156	2.46	98.3	47242	
D 47 13C3-PFBS	301.90 > 83.00	1.730	1.740	-0.010	0.652	88964	2.19	94.0	703	
D 60 M2-4:2FTS	329.00 > 81.00	1.939	1.945	-0.006	0.731	637870	NC		11703	
D 7 13C2 PFHxA	315.00 > 270.00	1.971	1.982	-0.011	0.743	4431311	2.52	101	52629	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.073	2.076	-0.003	0.781	144161	NC		4236	
D 9 13C4-PFHpA	367.00 > 322.00	2.295	2.301	-0.006	0.865	3975724	2.49	99.6	41616	
D 11 18O2 PFHxS	403.00 > 84.00	2.308	2.314	-0.006	0.870	5129907	2.25	95.1	41040	
8 Perfluorohexanesulfonic acid	399.00 > 80.00	2.308	2.314	-0.006	1.000	19837	0.008045		281	
	399.00 > 99.00	2.308	2.314	-0.006	1.000	6574	3.02(1.50-4.49)		23.6	
65 Adona	377.00 > 251.00	2.347	2.345	0.002	0.778	8446	NC		113	
	377.00 > 85.00	2.334	2.345	-0.011	0.774	5697	1.48(0.84-2.53)		29.0	
D 12 M2-6:2FTS	429.00 > 81.00	2.620	2.628	-0.008	0.988	982794	2.38	100	18980	
D 14 13C4 PFOA	417.00 > 372.00	2.645	2.654	-0.009	0.997	3717458	2.47	98.6	39706	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.645	2.654	-0.009	1.000	27354	0.0151			7.7	M
413.00 > 169.00	2.653	2.654	-0.001	1.003	5464		5.01(0.84-2.52)		25.6	M
* 62 13C2-PFOA										
415.00 > 370.00	2.653	2.654	-0.001		3926269	2.50			36870	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.660	2.662	-0.002	0.882	3469	0.001705			113	
449.00 > 99.00	2.653	2.662	-0.009	0.880	1410		2.46(1.94-5.82)		41.8	
D 18 13C4 PFOS										
503.00 > 80.00	3.015	3.018	-0.002	1.137	3509748	2.31		96.8	48471	
D 19 13C5 PFNA										
468.00 > 423.00	3.015	3.018	-0.003	1.137	3052517	2.57		103	37937	
20 Perfluorononanoic acid										
463.00 > 419.00	3.015	3.021	-0.006	1.000	2671	0.002014			9.3	
463.00 > 169.00	3.015	3.021	-0.006	1.000	1234		2.16(1.90-5.69)		54.4	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.229	3.230	-0.001	1.071	4578	NC			72.2	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.367	3.363	0.004	1.003	1577	0.003154			42.1	
D 26 M2-8:2FTS										
529.00 > 81.00	3.357	3.364	-0.007	1.266	899219	2.40		100	20117	
D 21 13C8 FOSA										
506.00 > 78.00	3.367	3.370	-0.003	1.269	5225687	2.43		97.1	51455	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.376	3.371	0.005	1.003	6896	0.003278			72.9	
D 23 13C2 PFDA										
515.00 > 470.00	3.367	3.376	-0.009	1.269	2242358	2.49		99.6	29425	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.526	3.528	-0.002	1.329	687827	2.49		99.6	16480	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.535	3.531	0.004	1.003	5385	0.0198			61.0	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.684	3.697	-0.013	1.389	685617	2.40		96.2	2744	
D 30 13C2 PFUnA										
565.00 > 520.00	3.695	3.702	-0.008	1.393	1702619	2.45		98.1	31711	
33 N-ethyl perfluorooctane sulfonamid										M
584.00 > 419.00	3.695	3.702	-0.008	1.003	5508	0.0216			64.9	M
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.851	3.860	-0.009	1.277	7133	NC			204	
D 36 13C2 PFDoA										
615.00 > 570.00	3.985	3.995	-0.010	1.502	1665188	2.38		95.1	12887	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.478	4.490	-0.012	1.688	1445059	2.24		89.5	5925	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.886	4.894	-0.008	1.842	2218330	2.03		81.2	5960	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.886	4.895	-0.009	1.000	25108	NC			3.3	
813.00 > 169.00	4.886	4.895	-0.009	1.000	3937		6.38(2.86-8.58)		28.9	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.225	5.239	-0.014	1.069	12459	NC			3.7	
913.00 > 169.00	5.225	5.239	-0.014	1.069	1512		8.24(3.83-11.48)		16.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LLO_00007

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_009.d

Injection Date: 22-Jun-2018 10:13:09

Instrument ID: A8_N

Lims ID: ICB

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 20

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

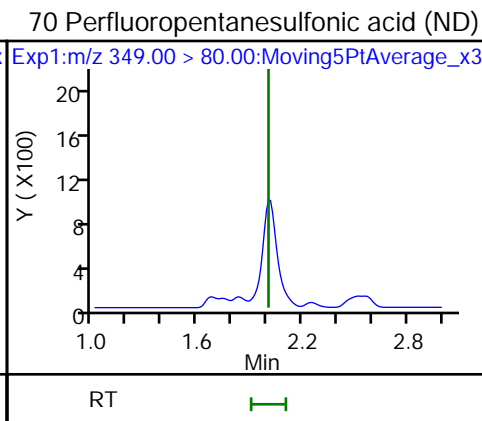
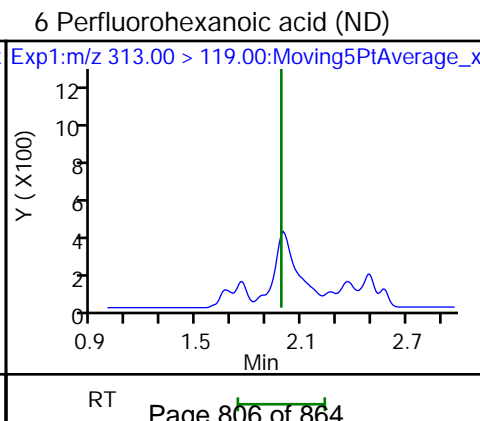
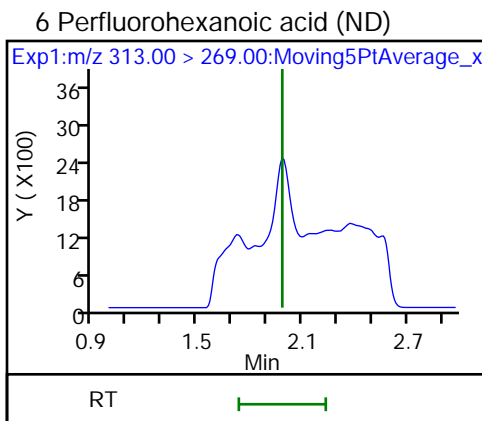
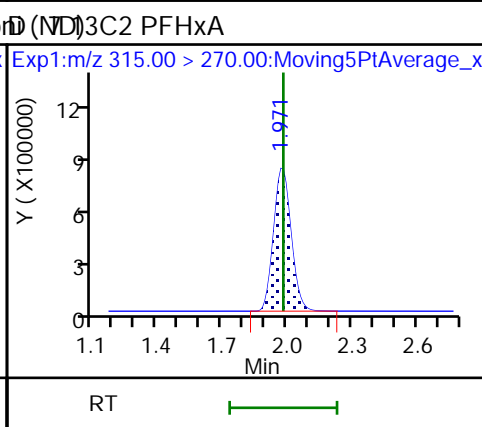
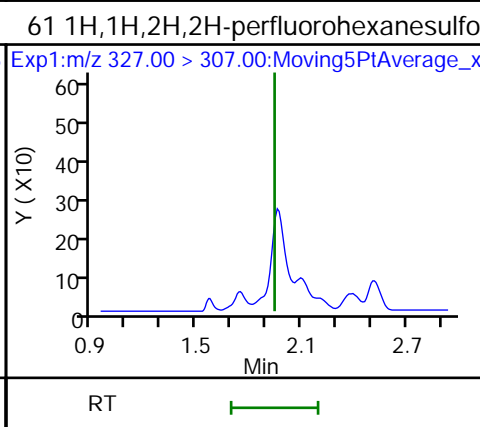
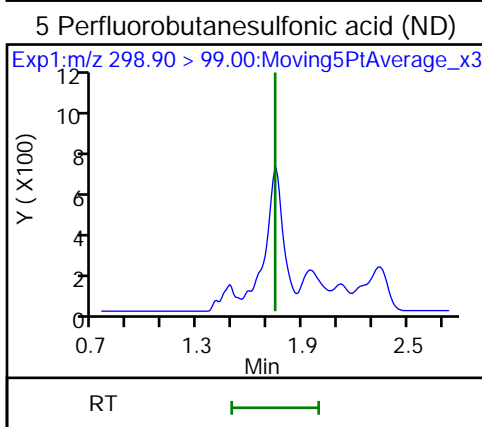
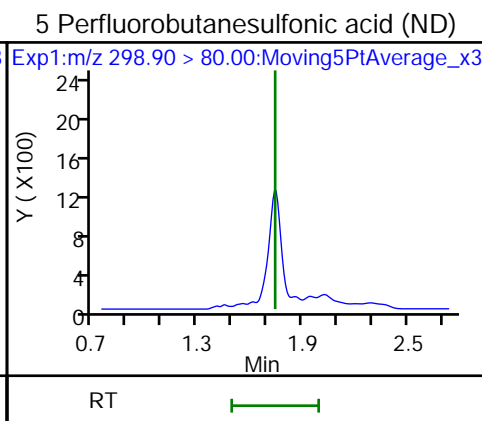
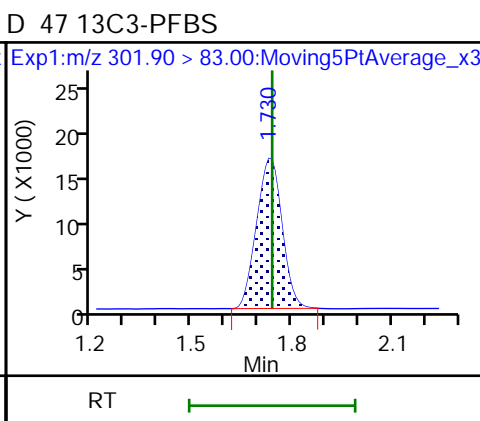
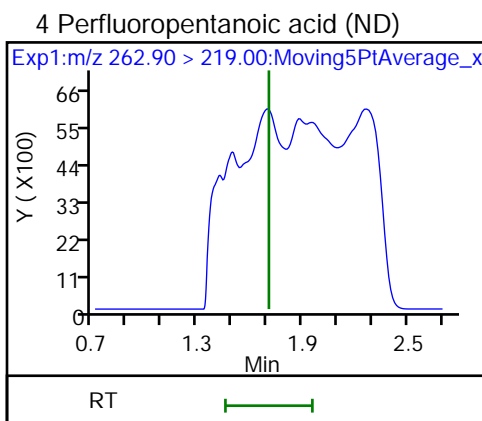
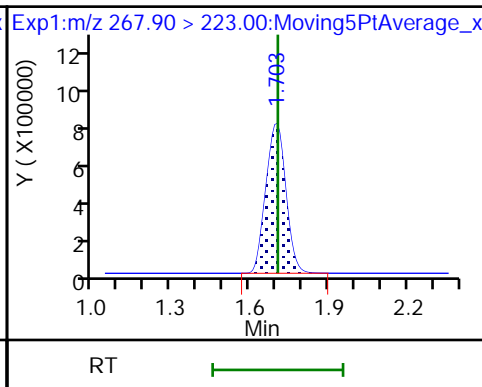
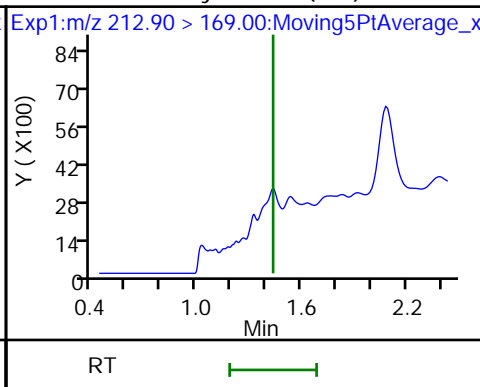
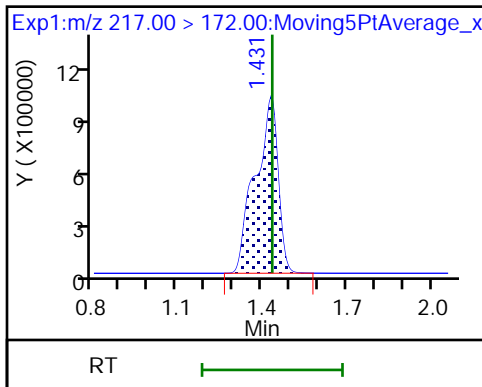
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

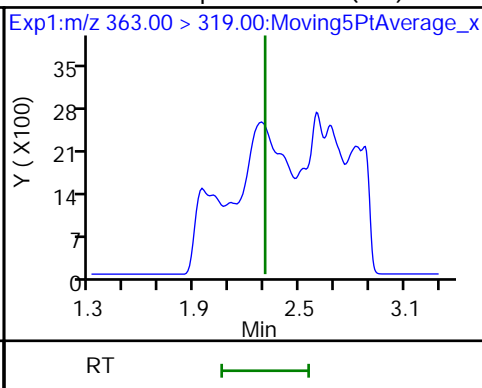
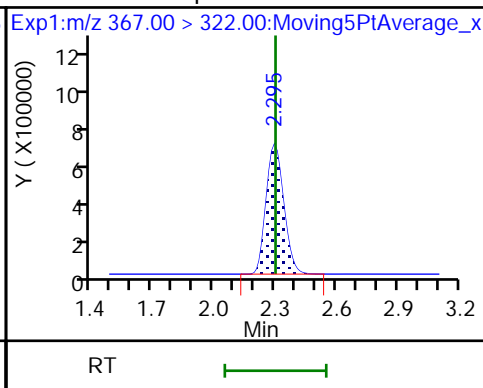
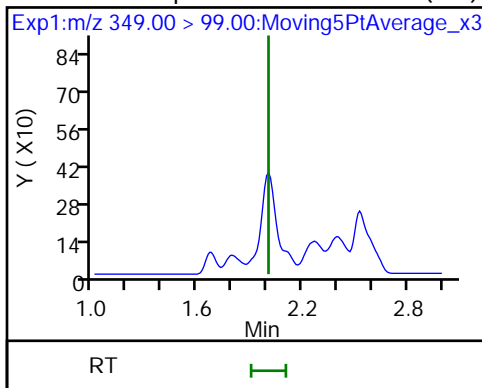
2 Perfluorobutyric acid (ND)

D 3 13C5-PFPeA



70 Perfluoropentanesulfonic acid (ND) D 9 13C4-PFHpA

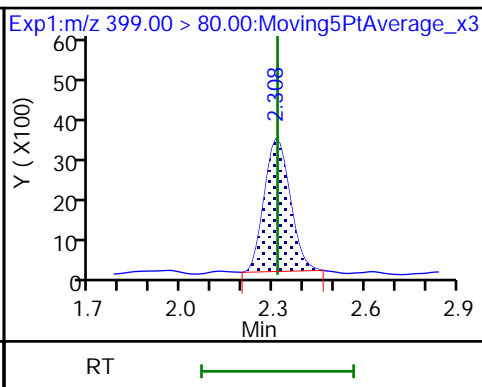
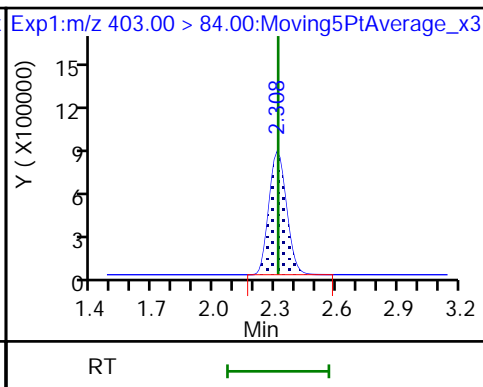
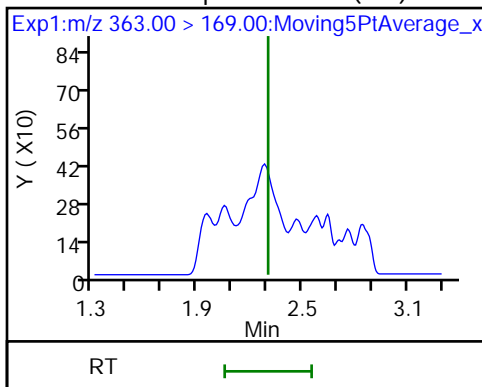
10 Perfluoroheptanoic acid (ND)



10 Perfluoroheptanoic acid (ND)

D 11 18O2 PFHxS

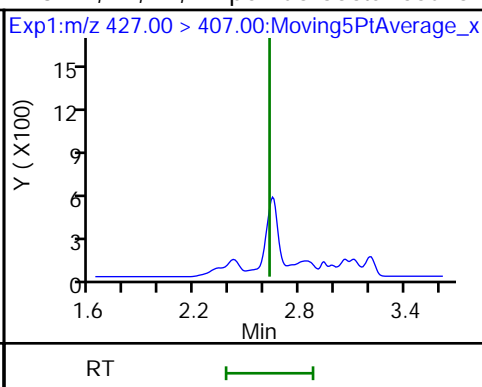
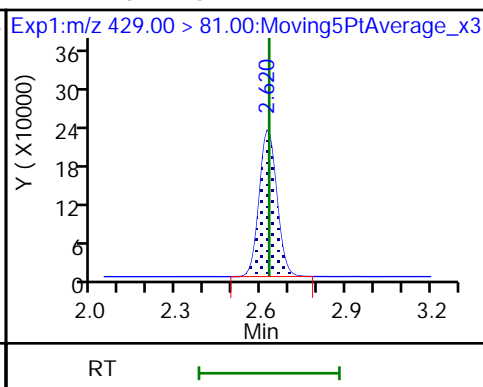
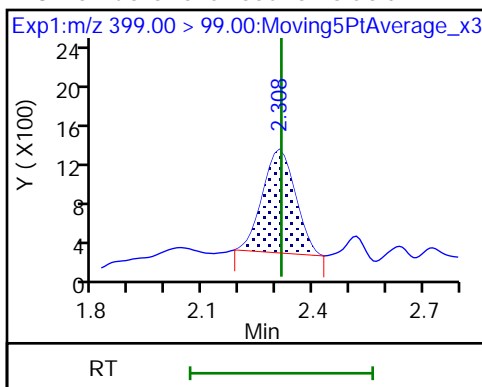
8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

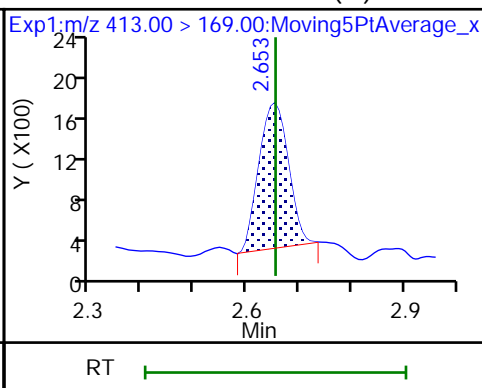
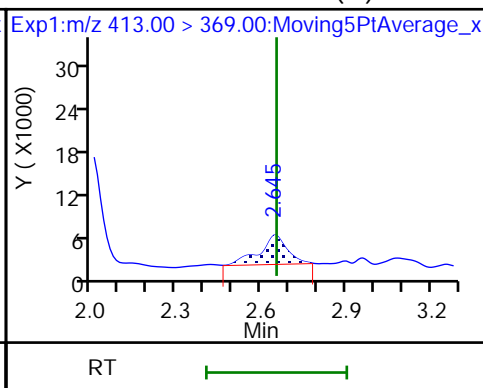
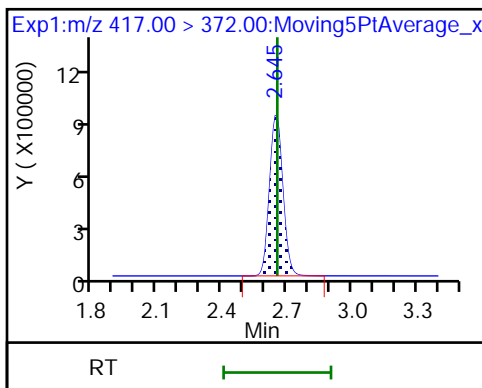
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



D 14 13C4 PFOA

15 Perfluorooctanoic acid (M)

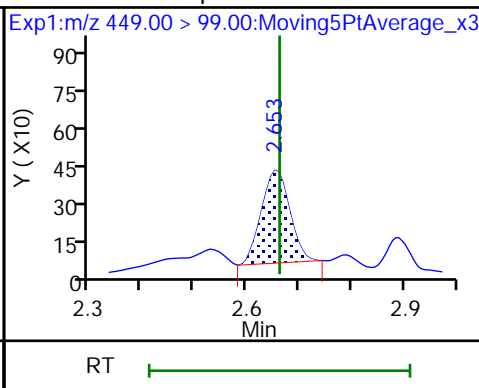
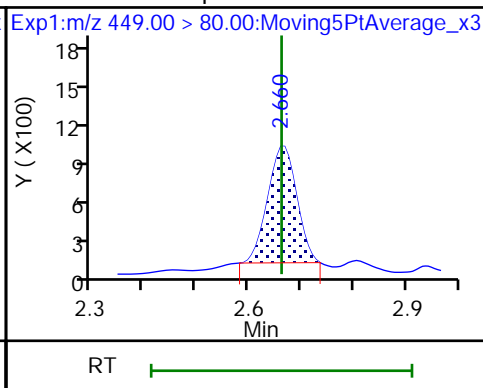
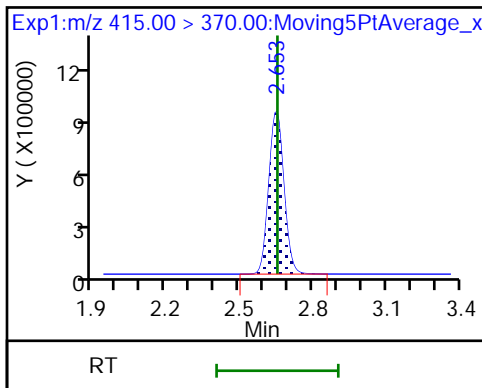
15 Perfluorooctanoic acid (M)



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

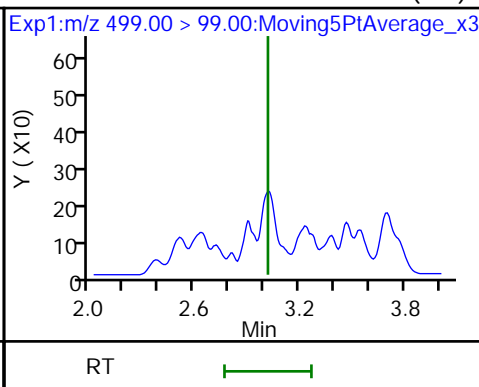
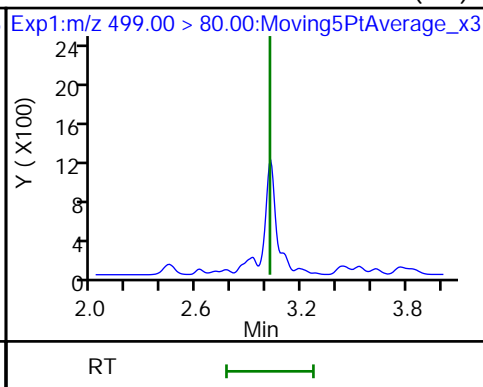
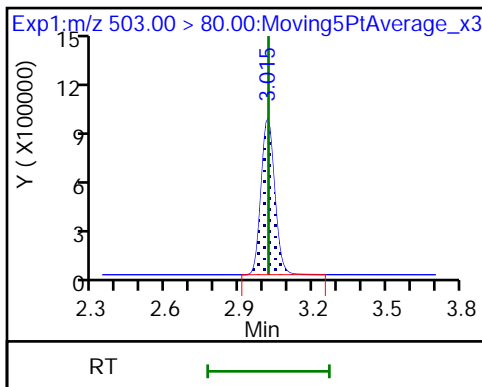
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

17 Perfluorooctane sulfonic acid (ND)

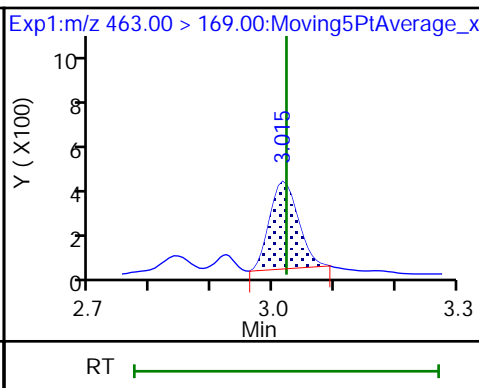
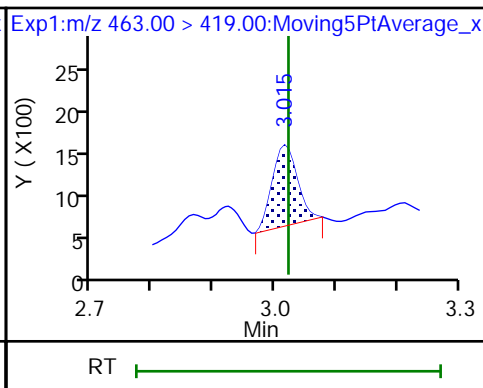
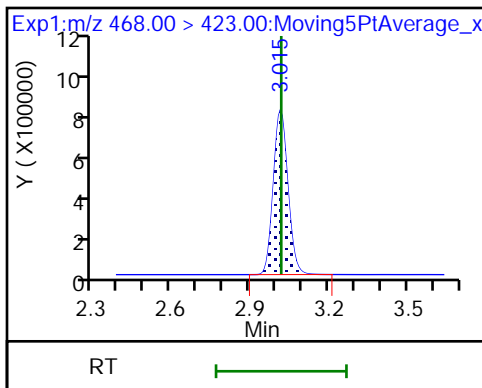
17 Perfluorooctane sulfonic acid (ND)



D 19 13C5 PFNA

20 Perfluorononanoic acid

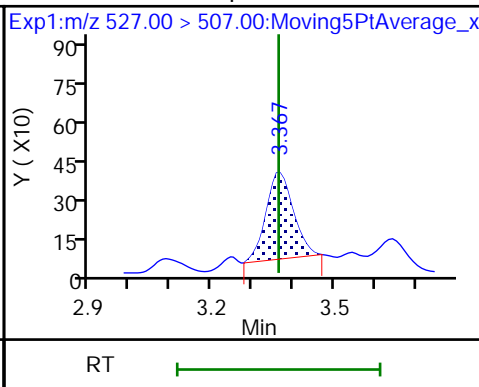
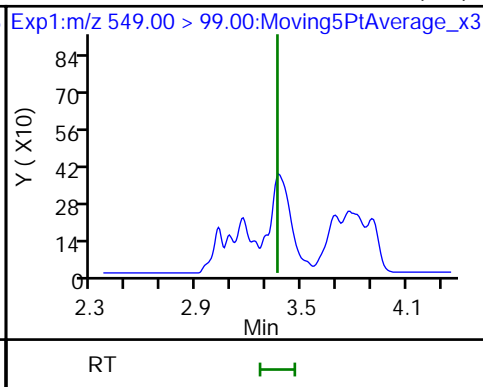
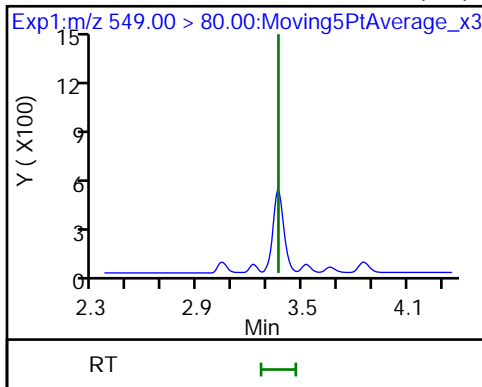
20 Perfluorononanoic acid



68 Perfluorononanesulfonic acid (ND)

68 Perfluorononanesulfonic acid (ND)

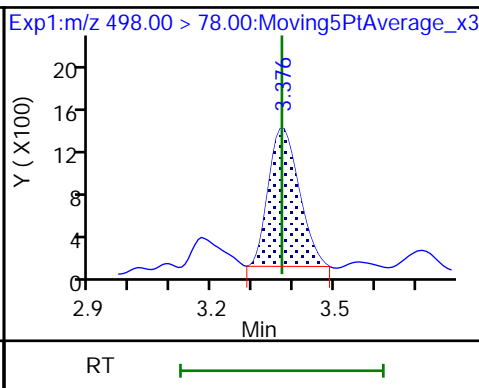
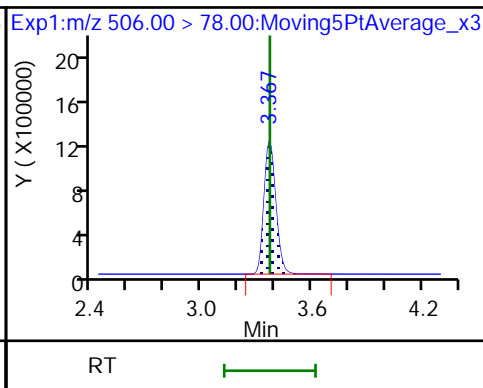
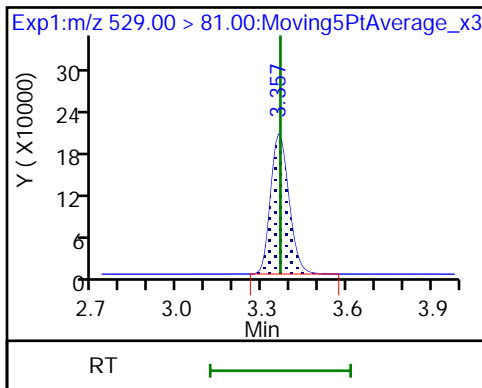
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 26 M2-8:2FTS

D 21 13C8 FOSA

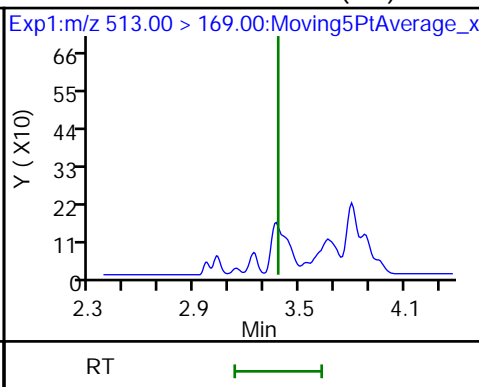
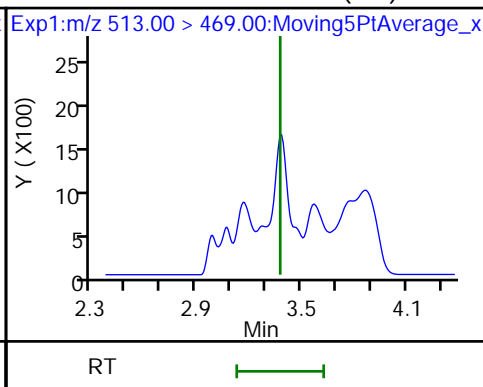
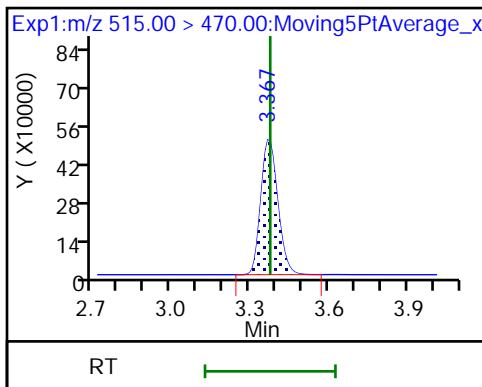
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid (ND)

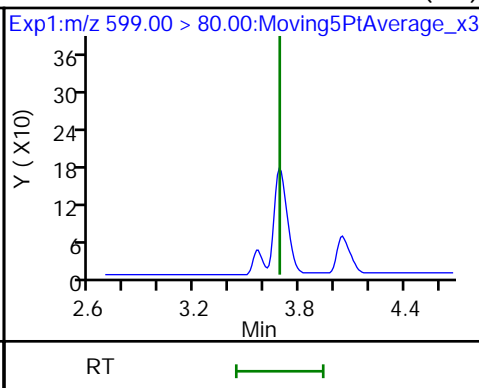
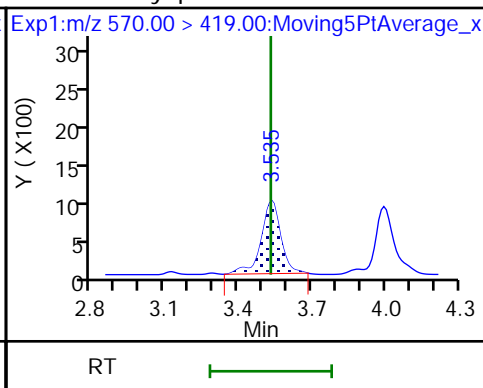
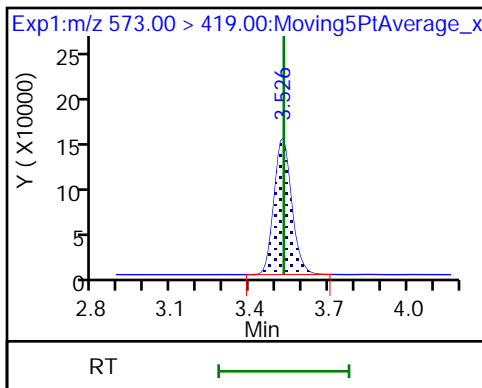
24 Perfluorodecanoic acid (ND)



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

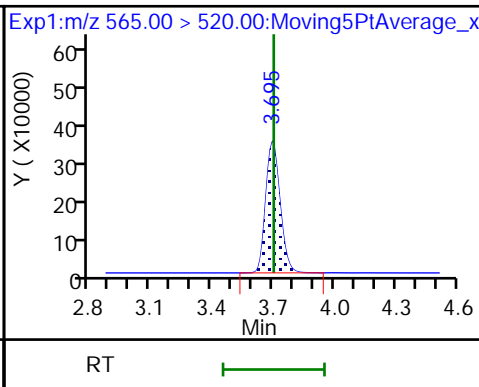
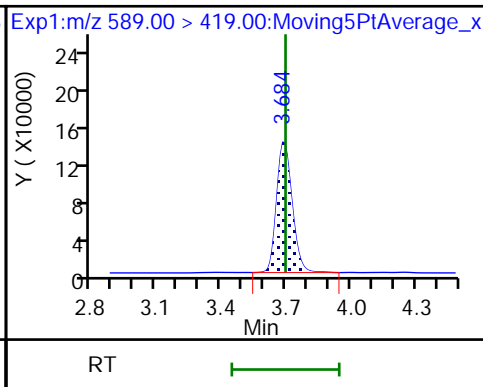
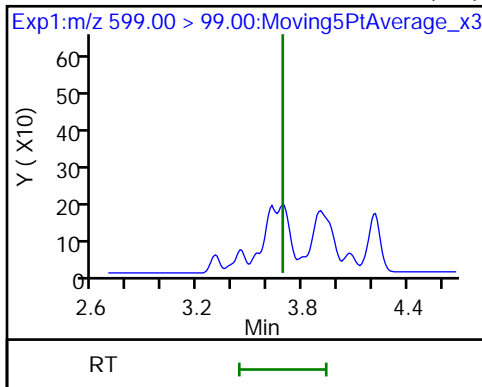
29 Perfluorodecane Sulfonic acid (ND)



29 Perfluorodecane Sulfonic acid (ND)

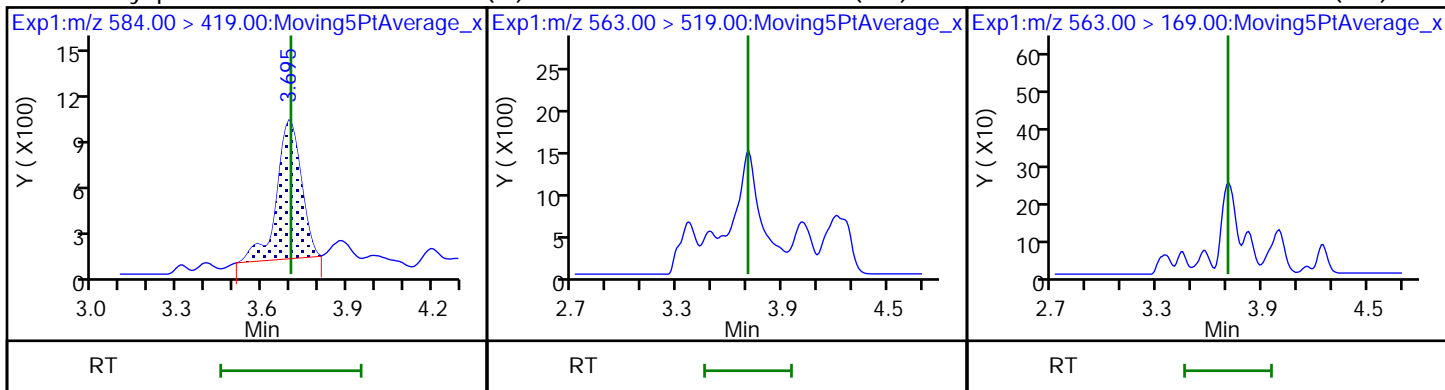
D 32 d5-NEtFOSAA

D 30 13C2 PFUnA



33 N-ethyl perfluorooctane sulfonamid (M) 31 Perfluoroundecanoic acid (ND)

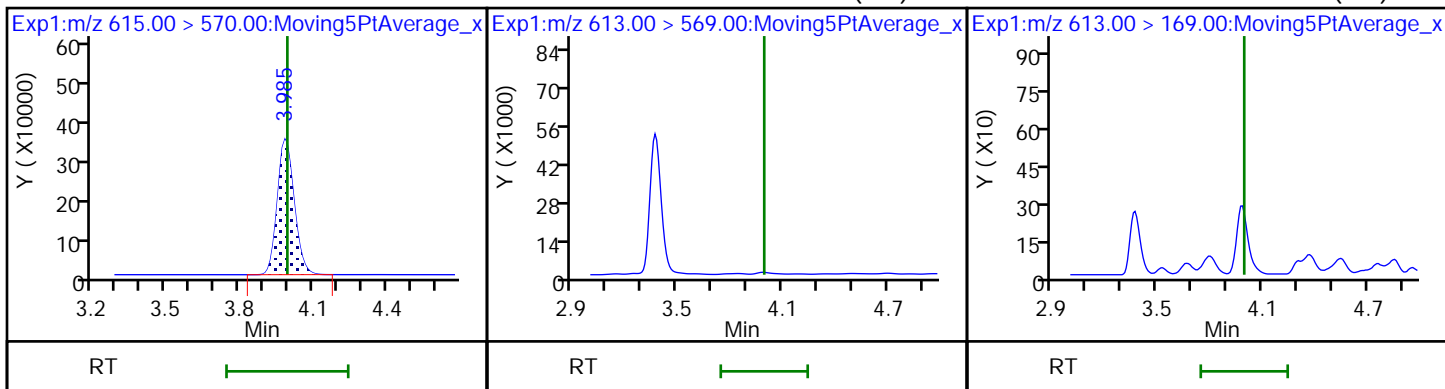
31 Perfluoroundecanoic acid (ND)



D 36 13C2 PFDaA

37 Perfluorododecanoic acid (ND)

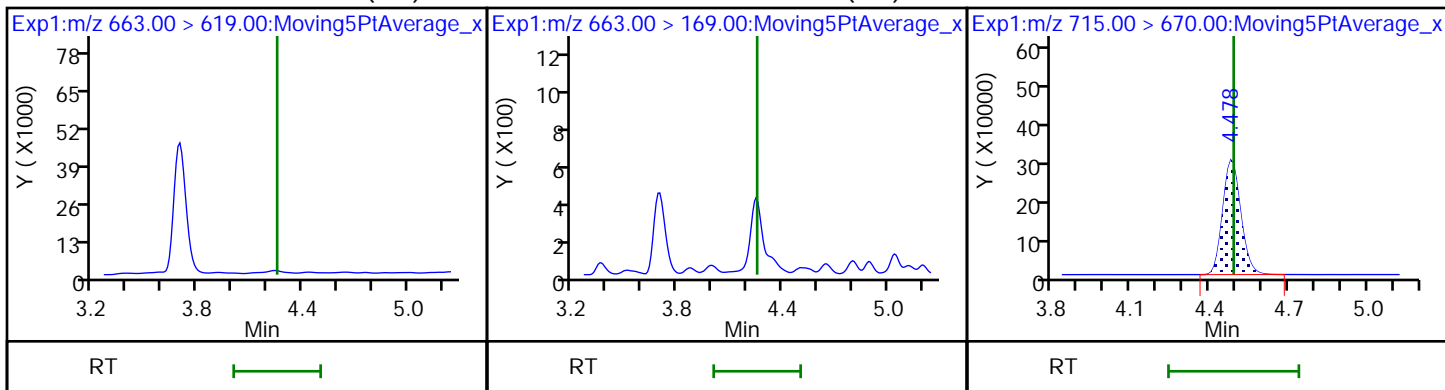
37 Perfluorododecanoic acid (ND)



41 Perfluorotridecanoic acid (ND)

41 Perfluorotridecanoic acid (ND)

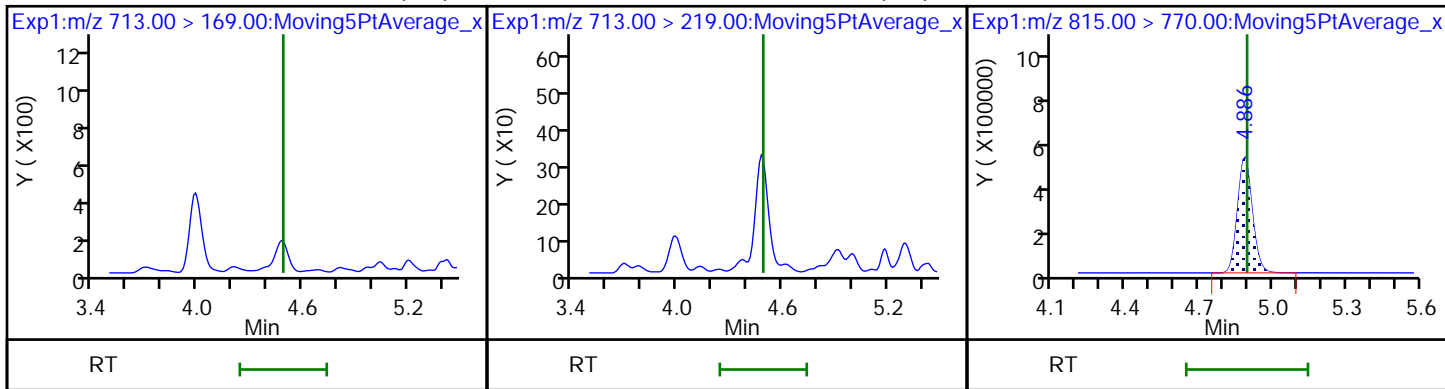
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

D 44 13C2-PFHxDA



TestAmerica Sacramento

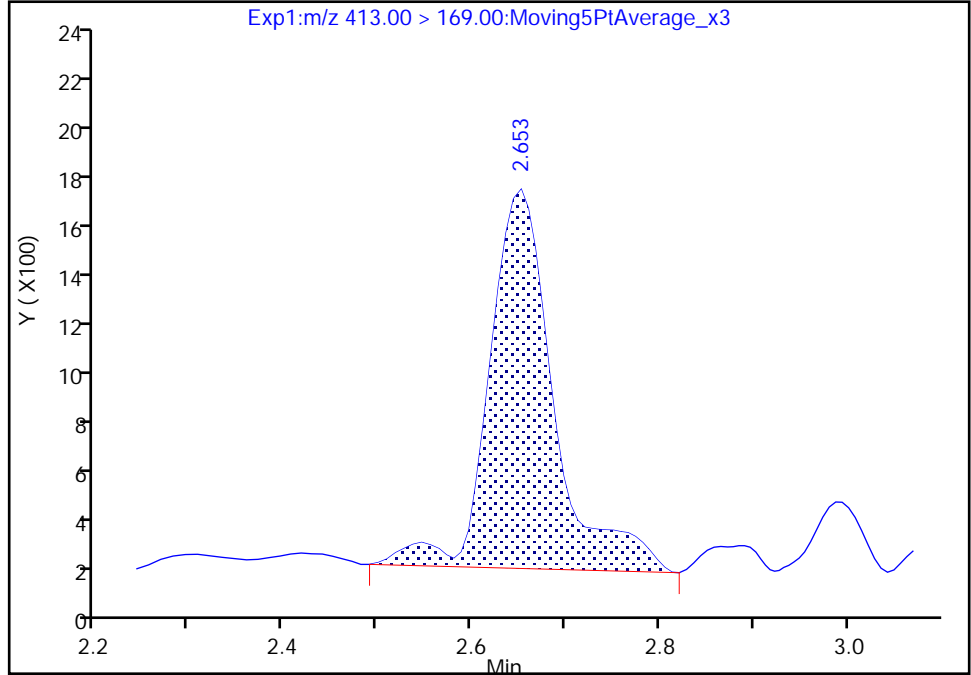
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_009.d
Injection Date: 22-Jun-2018 10:13:09 Instrument ID: A8_N
Lims ID: ICB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

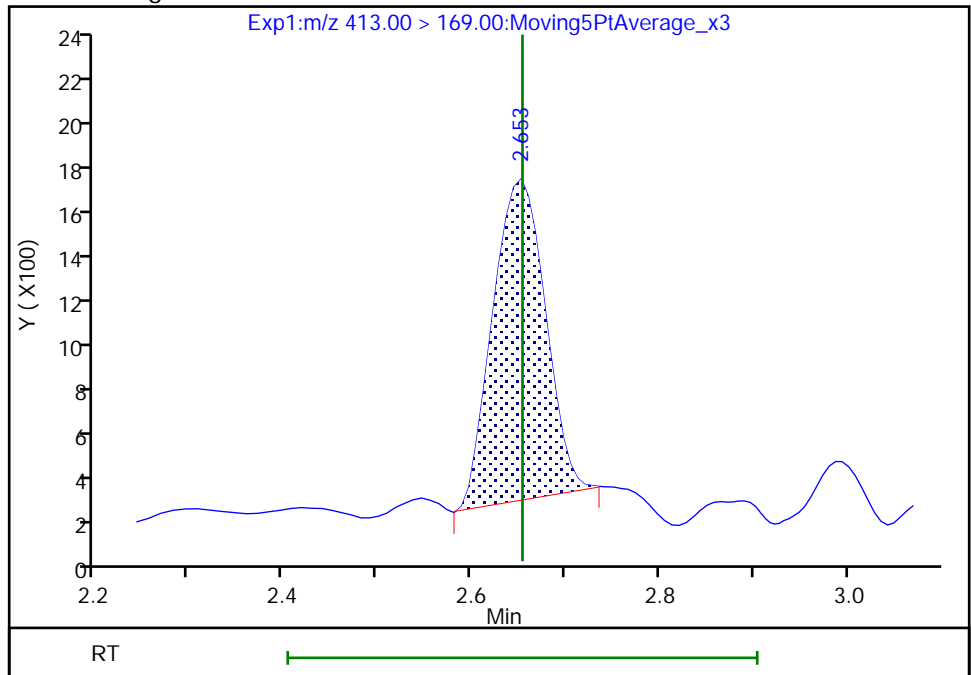
RT: 2.65
Area: 7186
Amount: 0.012185
Amount Units: ng/ml

Processing Integration Results



RT: 2.65
Area: 5464
Amount: 0.015076
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 11:14:41
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 812 of 864

TestAmerica Sacramento

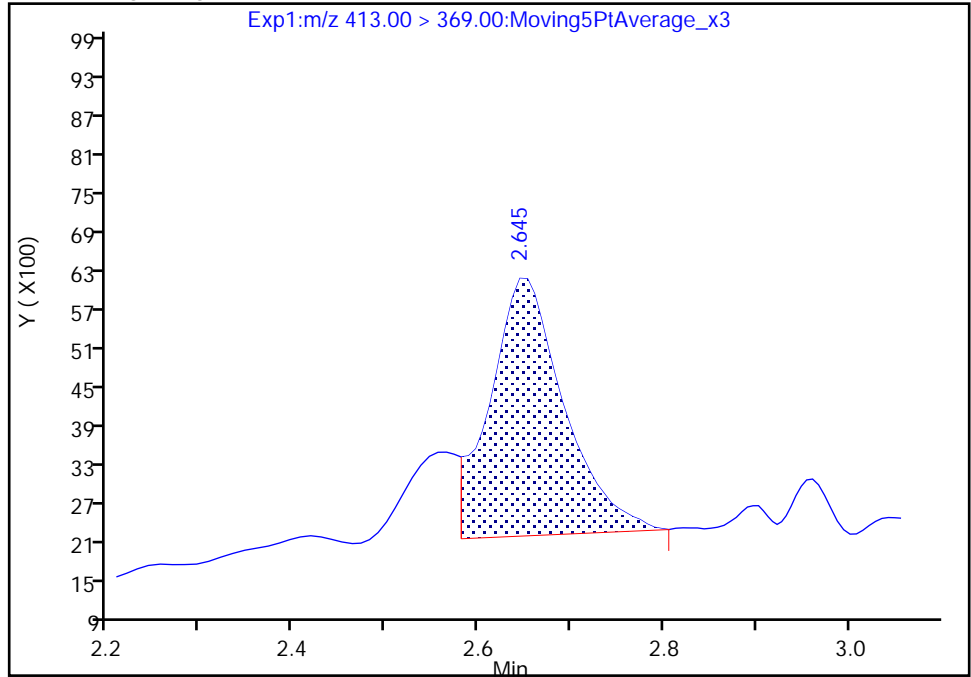
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_009.d
Injection Date: 22-Jun-2018 10:13:09 Instrument ID: A8_N
Lims ID: ICB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

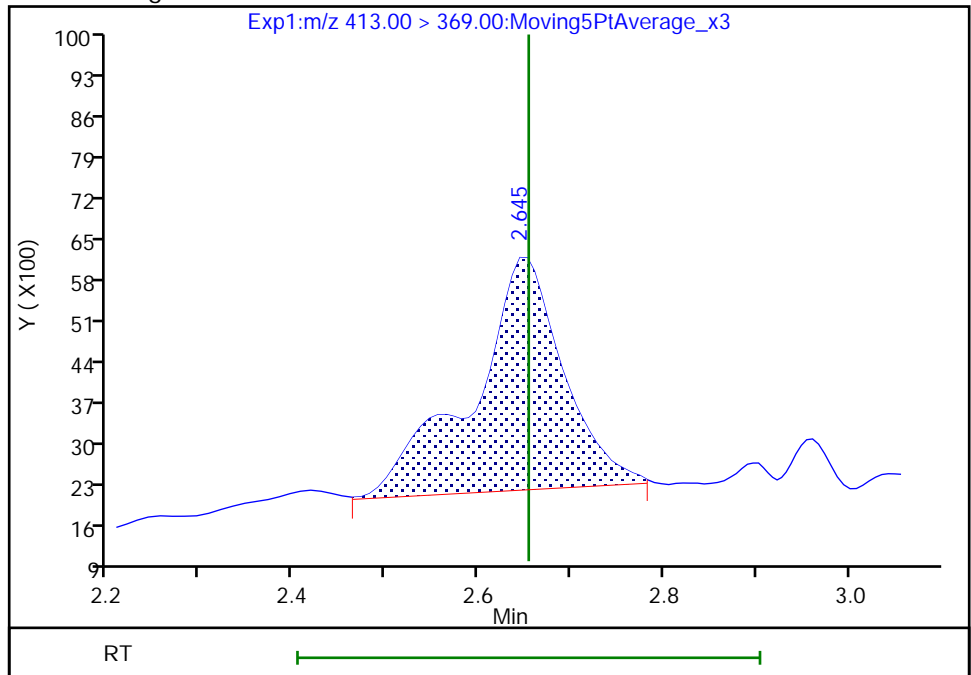
RT: 2.64
Area: 22107
Amount: 0.012185
Amount Units: ng/ml

Processing Integration Results



RT: 2.64
Area: 27354
Amount: 0.015076
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 22-Jun-2018 11:14:53

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-231836/9
 Matrix: Water Lab File ID: 2018.06.29LLICALA_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/29/2018 22:23
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231836 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	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 M	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00962	J	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)	0.00870	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-231836/9
 Matrix: Water Lab File ID: 2018.06.29LLICALA_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/29/2018 22:23
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231836 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	104		50-150
STL00992	13C4 PFBA	99		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	98		50-150
STL01892	13C4-PFHpA	101		50-150
STL00990	13C4 PFOA	98		50-150
STL00995	13C5 PFNA	99		50-150
STL00996	13C2 PFDA	109		50-150
STL00997	13C2 PFUnA	103		50-150
STL00998	13C2 PFDoA	103		50-150
STL00994	18O2 PFHxS	103		50-150
STL02116	13C2-PFTeDA	97		50-150
STL00991	13C4 PFOS	104		50-150
STL02337	13C3-PFBS	98		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_009.d
 Lims ID: ICB
 Client ID:
 Sample Type: ICB
 Inject. Date: 29-Jun-2018 22:23:54 ALS Bottle#: 20 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICB
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 30-Jun-2018 07:53:04 Calib Date: 29-Jun-2018 22:16:07
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK025

First Level Reviewer: roycea Date: 30-Jun-2018 07:25:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.425	1.428	-0.003	0.539	5664204	2.47	98.7	38572	
2 Perfluorobutyric acid	212.90 > 169.00	1.425	1.430	-0.005	1.000	7856	0.003408		4.8	
D 3 13C5-PFPeA	267.90 > 223.00	1.703	1.705	-0.002	0.644	3934213	2.44	97.6	48923	
4 Perfluoropentanoic acid	262.90 > 219.00	1.703	1.706	-0.003	1.000	6154	0.003293		3.8	
D 47 13C3-PFBS	301.90 > 83.00	1.739	1.741	-0.002	0.657	81094	2.28	98.2	673	
D 60 M2-4:2FTS	329.00 > 81.00	1.939	1.948	-0.009	0.733	609112	NC		9020	
D 7 13C2 PFHxA	315.00 > 270.00	1.982	1.984	-0.002	0.749	4324709	2.45	98.0	76950	
D 64 13C3 HFPO-DA	332.10 > 287.00	2.072	2.080	-0.008	0.783	201861	NC		3992	
D 9 13C4-PFHpA	367.00 > 322.00	2.294	2.302	-0.008	0.867	4113792	2.52	101	40464	
8 Perfluorohexanesulfonic acid	399.00 > 80.00	2.321	2.314	0.007	1.006	19821	0.008697		212	
	399.00 > 99.00	2.321	2.314	0.007	1.006	6857	2.89(1.50-4.49)		72.6	
D 11 18O2 PFHxS	403.00 > 84.00	2.308	2.317	-0.009	0.872	4651848	2.44	103	40932	
65 Adona	377.00 > 251.00	2.347	2.345	0.002	0.780	11326	NC		171	
	377.00 > 85.00	2.347	2.345	0.002	0.780	6869	1.65(0.84-2.53)		127	
D 12 M2-6:2FTS	429.00 > 81.00	2.621	2.627	-0.006	0.991	1021228	2.58	109	18592	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00	> 407.00	2.629	2.629	0.0	1.003	1825	0.002641	15.0	
D 14 13C4 PFOA	417.00	> 372.00	2.645	2.653	-0.008	1.000	3829300	2.44	97.6	36189
* 62 13C2-PFOA	415.00	> 370.00	2.645	2.655	-0.010		4109243	2.50		23080
15 Perfluorooctanoic acid	413.00	> 369.00	2.654	2.657	-0.003	1.003	19221	0.0107	5.4	M
	413.00	> 169.00	2.654	2.657	-0.003	1.003	7191	2.67(0.84-2.52)	49.8	M
16 Perfluoroheptanesulfonic acid	449.00	> 80.00	2.661	2.663	-0.002	0.884	5451	0.003026	131	
	449.00	> 99.00	2.669	2.663	0.006	0.887	1292	4.22(1.94-5.82)	36.6	
D 18 13C4 PFOS	503.00	> 80.00	3.009	3.017	-0.008	1.138	3167823	2.47	104	27242
20 Perfluorononanoic acid	463.00	> 419.00	3.016	3.018	-0.002	1.002	5249	0.003662	13.1	
	463.00	> 169.00	3.009	3.018	-0.009	1.000	1572	3.34(1.90-5.69)	67.6	
D 19 13C5 PFNA	468.00	> 423.00	3.009	3.018	-0.009	1.138	3224554	2.48	99.3	34099
69 9-Chlorohexadecafluoro-3-oxanonane	531.00	> 351.00	3.223	3.229	-0.006	1.071	7854	NC	141	
D 21 13C8 FOSA	506.00	> 78.00	3.359	3.358	0.001	1.270	4355125	2.59	104	32366
68 Perfluorononanesulfonic acid	549.00	> 80.00	3.350	3.360	-0.010	1.113	3148	0.002950	78.9	
	549.00	> 99.00	3.359	3.360	-0.001	1.116	834	3.77(1.33-3.97)	35.9	
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.359	3.361	-0.002	1.000	7143	0.004090	87.0	
D 26 M2-8:2FTS	529.00	> 81.00	3.359	3.362	-0.003	1.270	1106343	2.57	107	25513
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00	> 507.00	3.359	3.364	-0.005	1.000	1811	0.002911	39.6	
D 23 13C2 PFDA	515.00	> 470.00	3.368	3.374	-0.006	1.273	2882231	2.72	109	30141
D 27 d3-NMeFOSAA	573.00	> 419.00	3.518	3.527	-0.009	1.330	1575880	2.48	99.1	28741
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.527	3.529	-0.002	1.003	9828	0.0163	97.5	M
D 32 d5-NEtFOSAA	589.00	> 419.00	3.685	3.694	-0.009	1.393	1656526	2.64	105	12836
D 30 13C2 PFUnA	565.00	> 520.00	3.696	3.698	-0.002	1.397	2234146	2.56	103	35577
31 Perfluoroundecanoic acid	563.00	> 519.00	3.696	3.698	-0.002	1.000	8298	0.0103	40.8	M
	563.00	> 169.00	3.696	3.698	-0.002	1.000	2324	3.57(2.12-6.36)	115	M
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.696	3.700	-0.004	1.003	10889	0.0184	171	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.853	3.858	-0.005	1.280	13468	NC			210	
D 36 13C2 PFDaA										
615.00 > 570.00	3.986	3.992	-0.006	1.507	2597388	2.57		103	24097	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.986	3.992	-0.006	1.000	9169	0.008153			10.5	
613.00 > 169.00	3.997	3.992	0.005	1.003	1904		4.82(2.13-6.40)		39.7	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.240	4.255	-0.015	1.064	7147	0.005873			6.0	
663.00 > 169.00	4.250	4.255	-0.005	1.066	2567		2.78(1.25-3.76)		57.2	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.479	4.490	-0.011	1.693	3054989	2.42		97.0	13278	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.479	4.490	-0.011	1.000	2940	0.009619			51.0	
713.00 > 219.00	4.479	4.490	-0.011	1.000	1668		1.76(0.71-2.13)		58.0	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.895	4.899	-0.004	1.850	6219873	2.64		105	16210	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.895	4.900	-0.005	1.000	70404	NC			35.0	
813.00 > 169.00	4.895	4.900	-0.005	1.000	11692		6.02(2.86-8.58)		151	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.240	5.251	-0.011	1.070	27697	NC			8.7	
913.00 > 169.00	5.240	5.251	-0.011	1.070	3174		8.73(3.83-11.48)		35.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00007

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_009.d

Injection Date: 29-Jun-2018 22:23:54

Instrument ID: A8_N

Lims ID: ICB

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 20

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

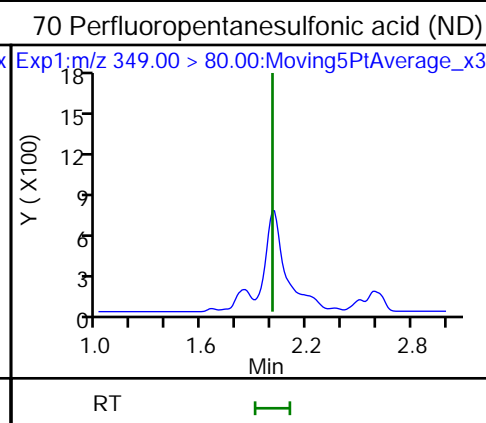
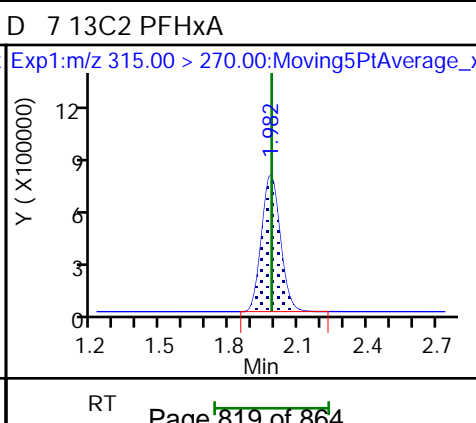
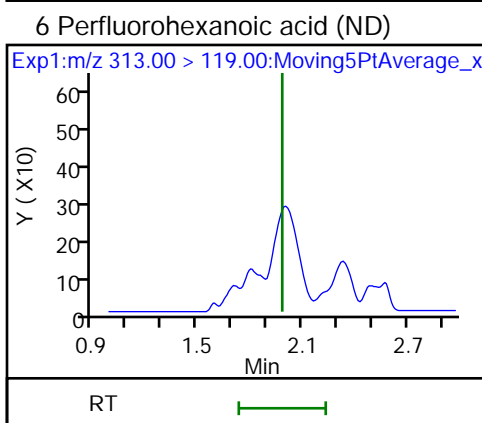
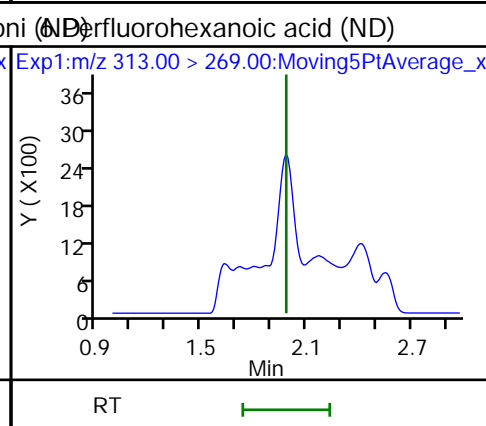
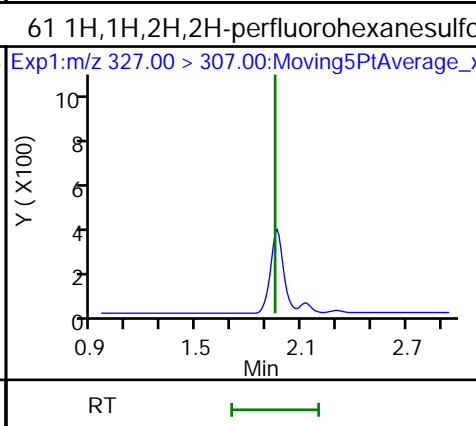
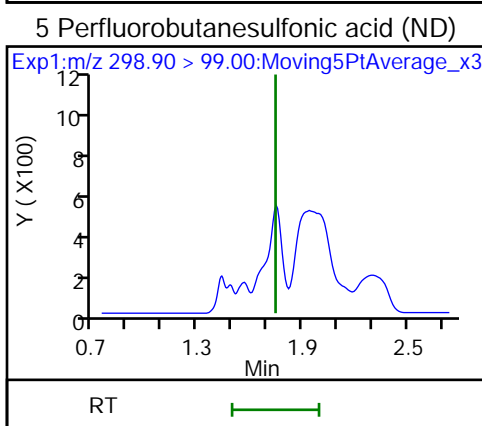
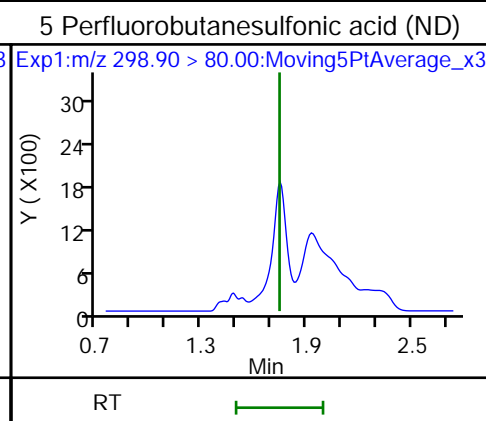
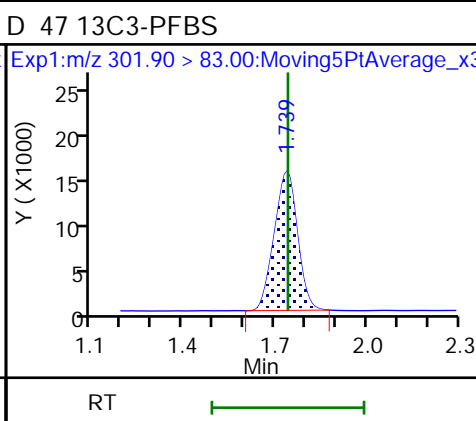
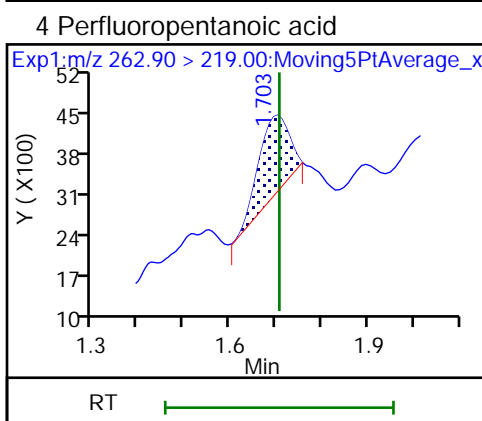
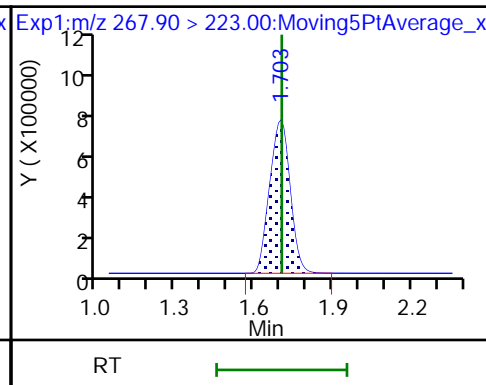
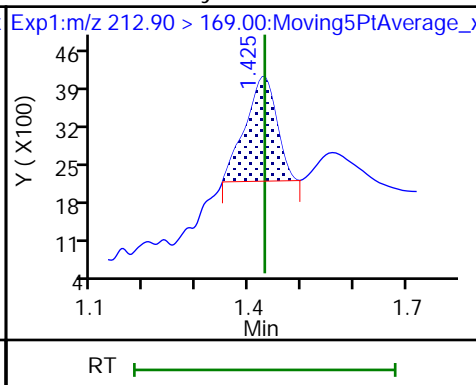
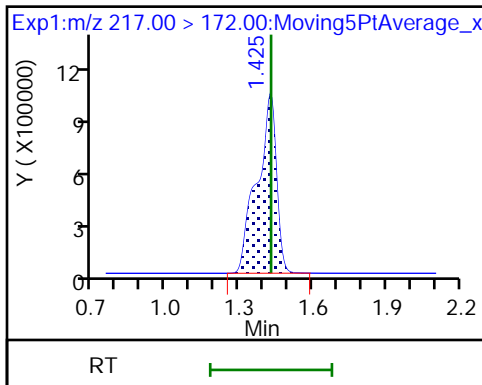
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

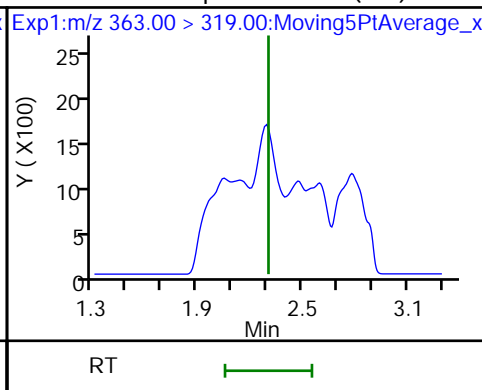
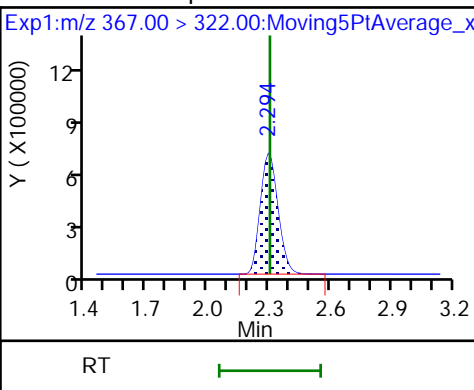
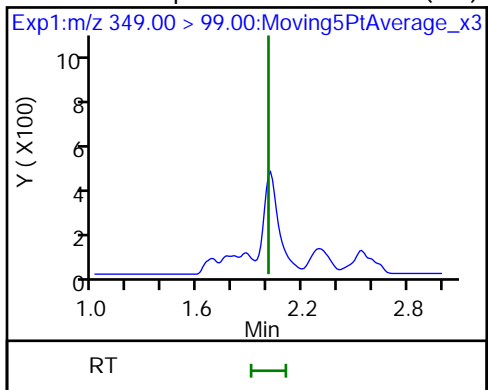
2 Perfluorobutyric acid

D 3 13C5-PFPeA



70 Perfluoropentanesulfonic acid (ND) D 9 13C4-PFHpA

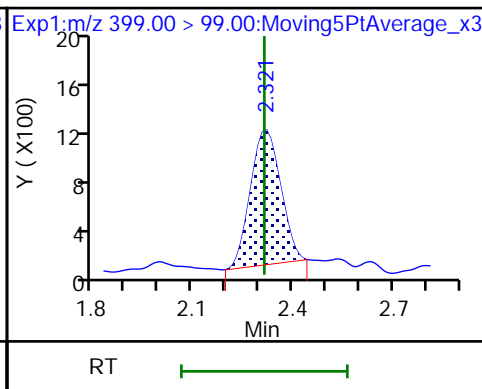
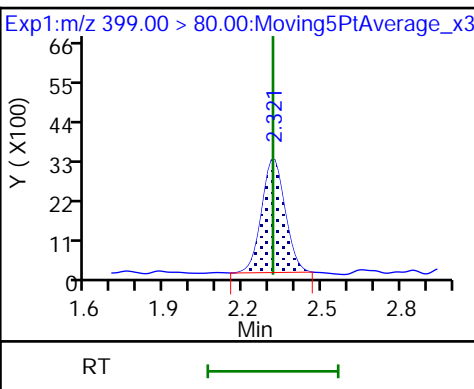
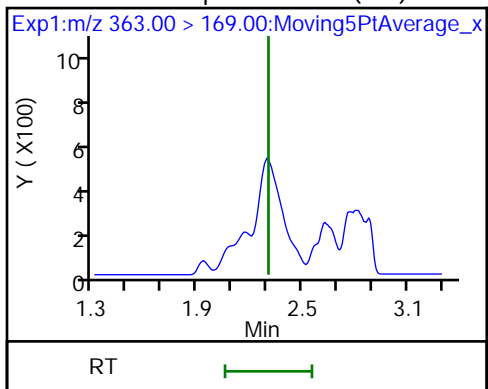
10 Perfluoroheptanoic acid (ND)



10 Perfluoroheptanoic acid (ND)

8 Perfluorohexanesulfonic acid

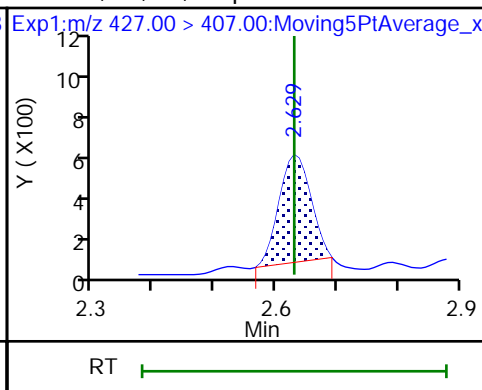
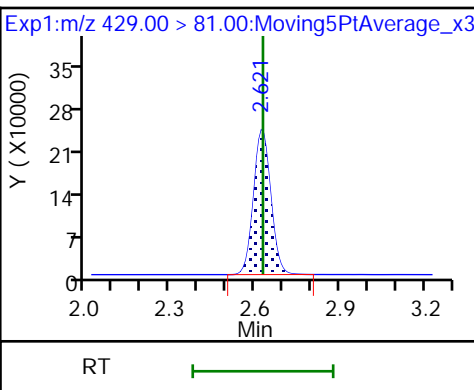
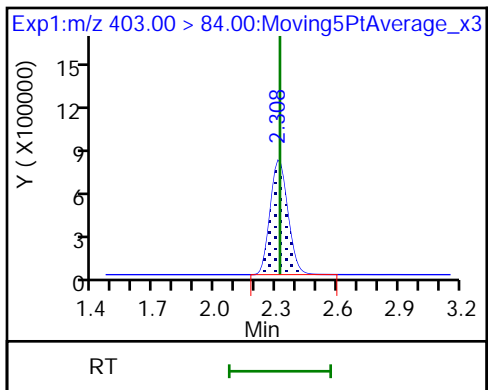
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

D 12 M2-6:2FTS

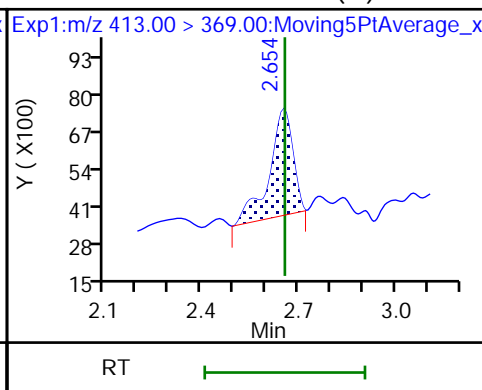
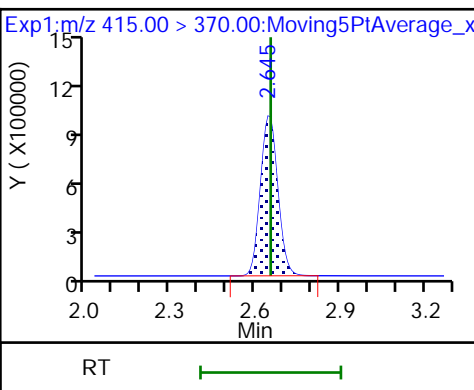
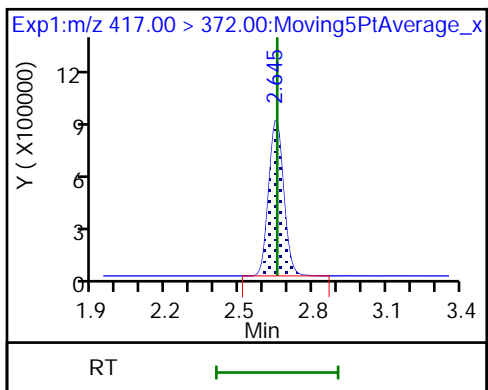
13 1H,1H,2H,2H-perfluorooctanesulfoni

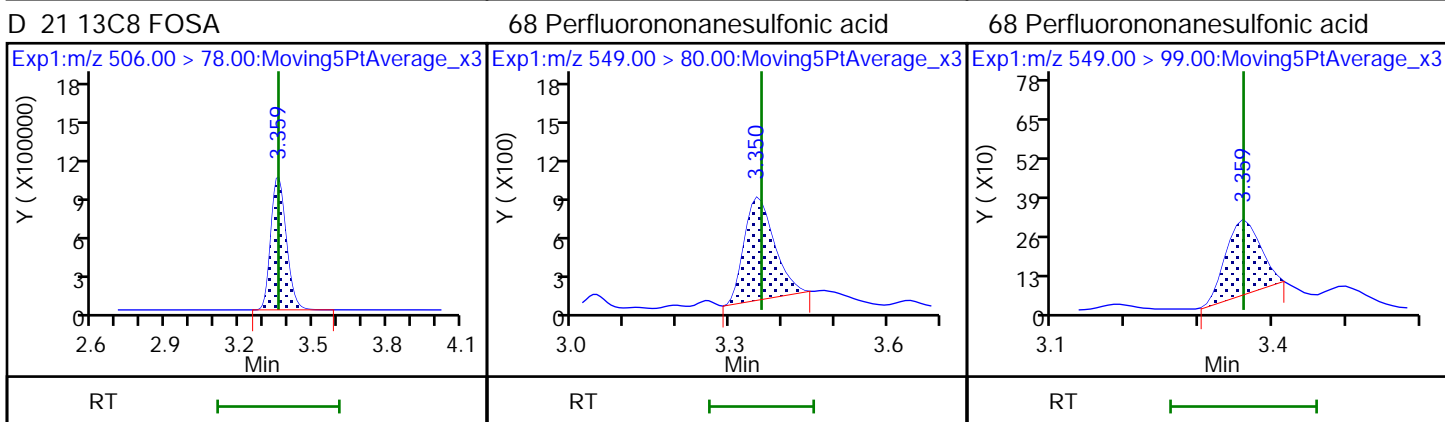
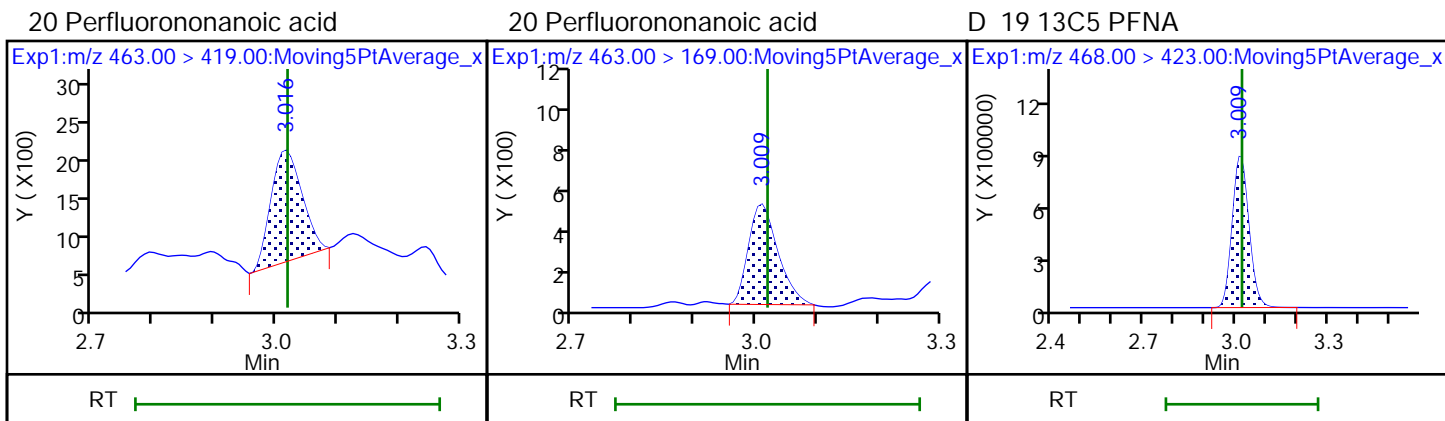
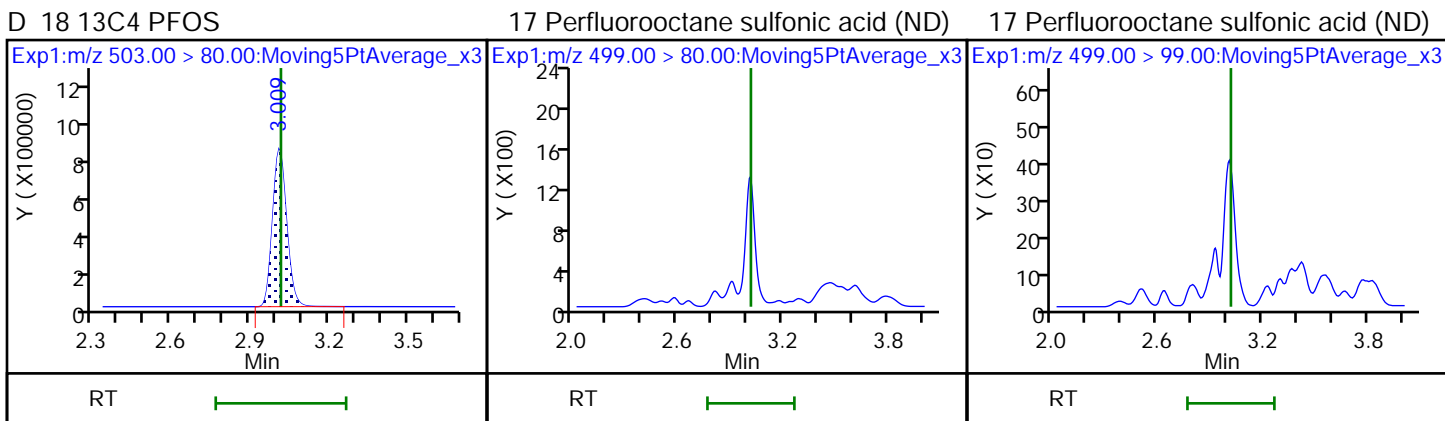
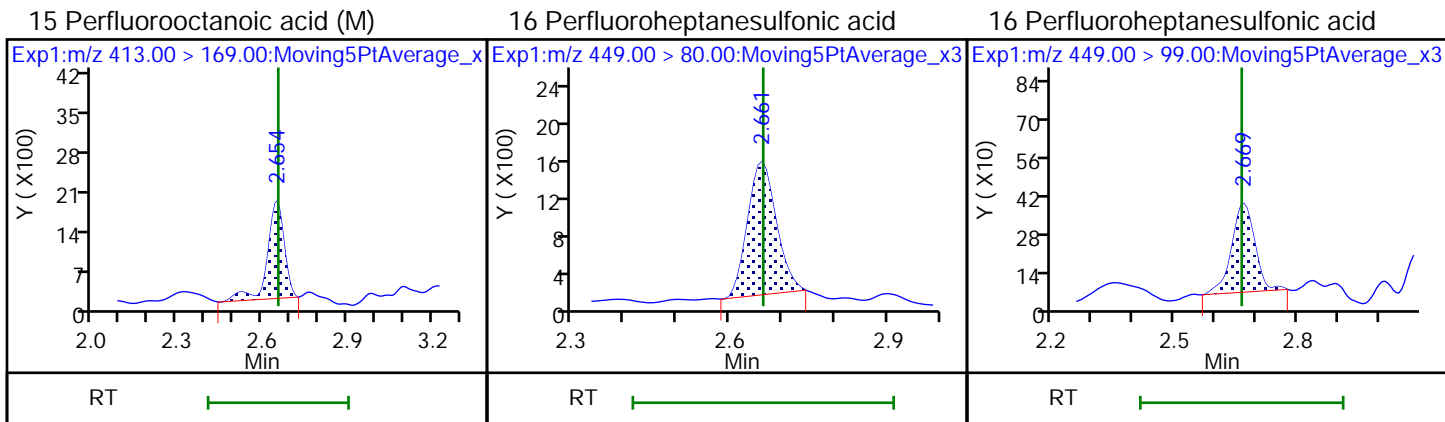


D 14 13C4 PFOA

* 62 13C2-PFOA

15 Perfluorooctanoic acid (M)

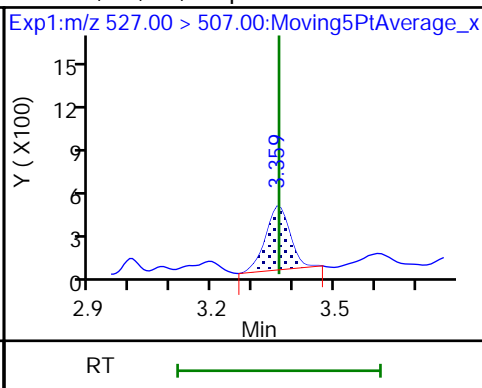
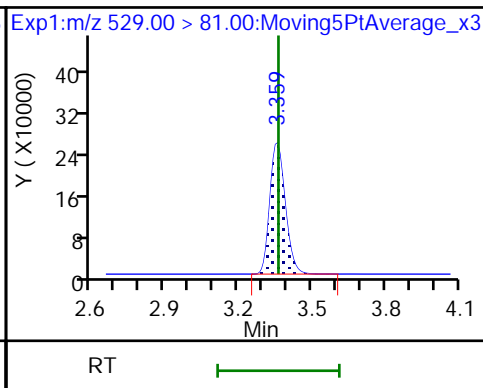
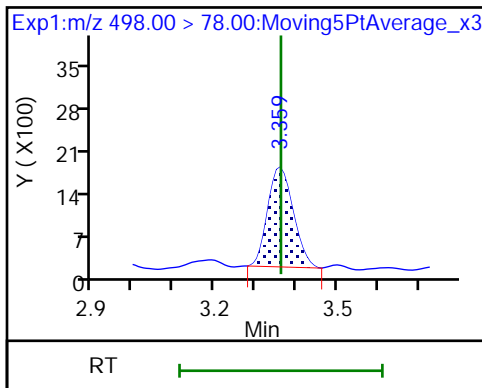




22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

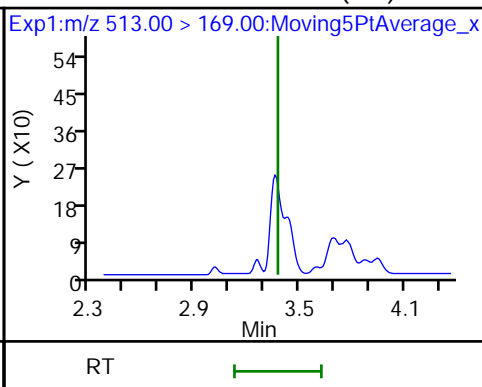
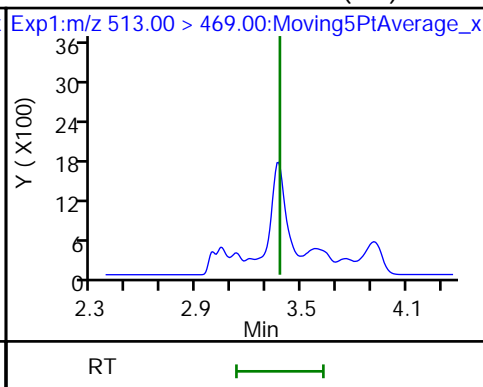
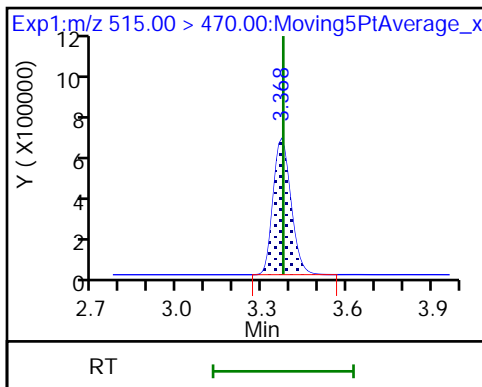
25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid (ND)

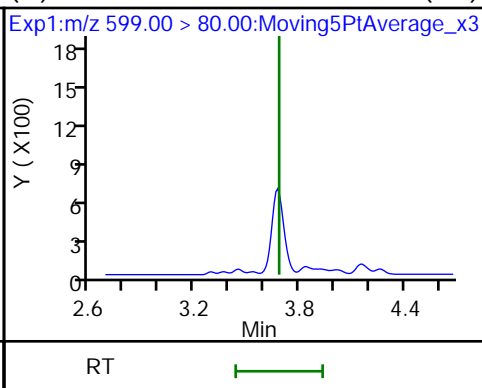
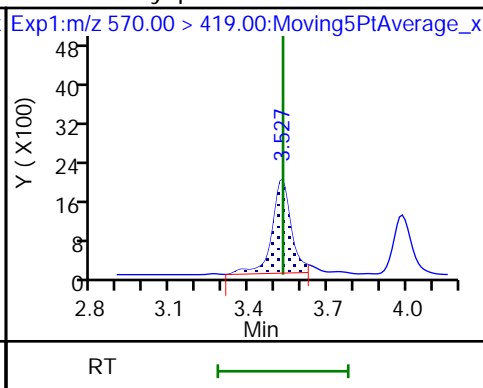
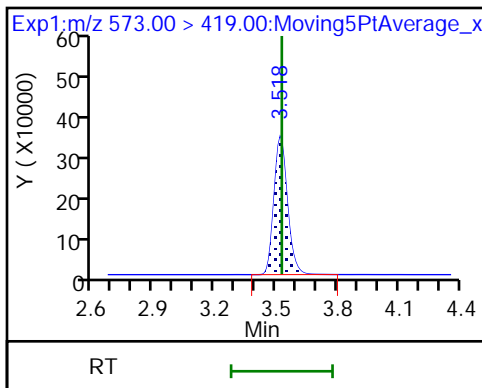
24 Perfluorodecanoic acid (ND)



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

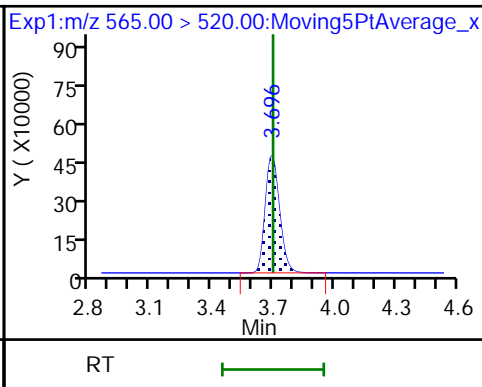
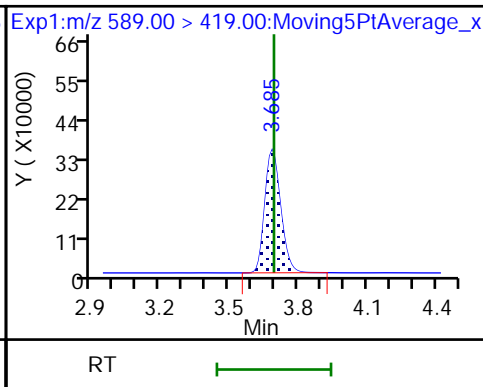
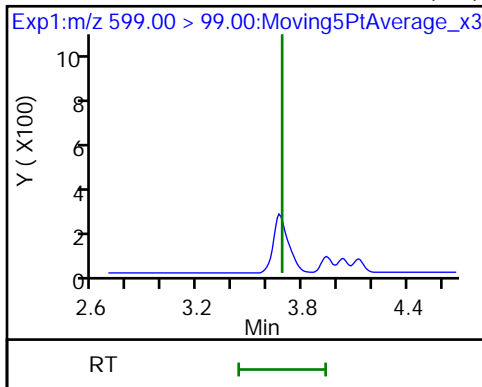
29 Perfluorodecane Sulfonic acid (ND)

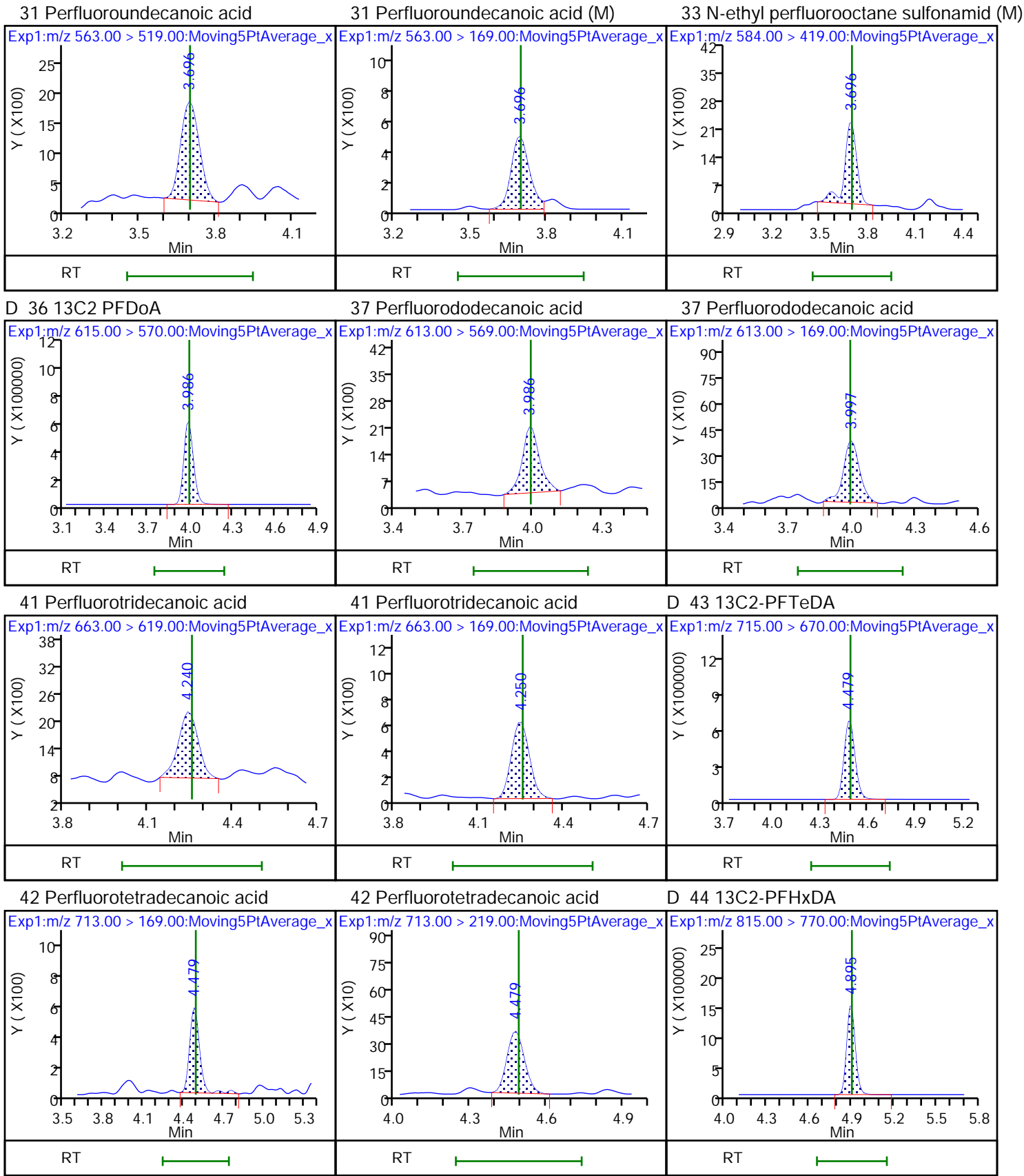


29 Perfluorodecane Sulfonic acid (ND)

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento

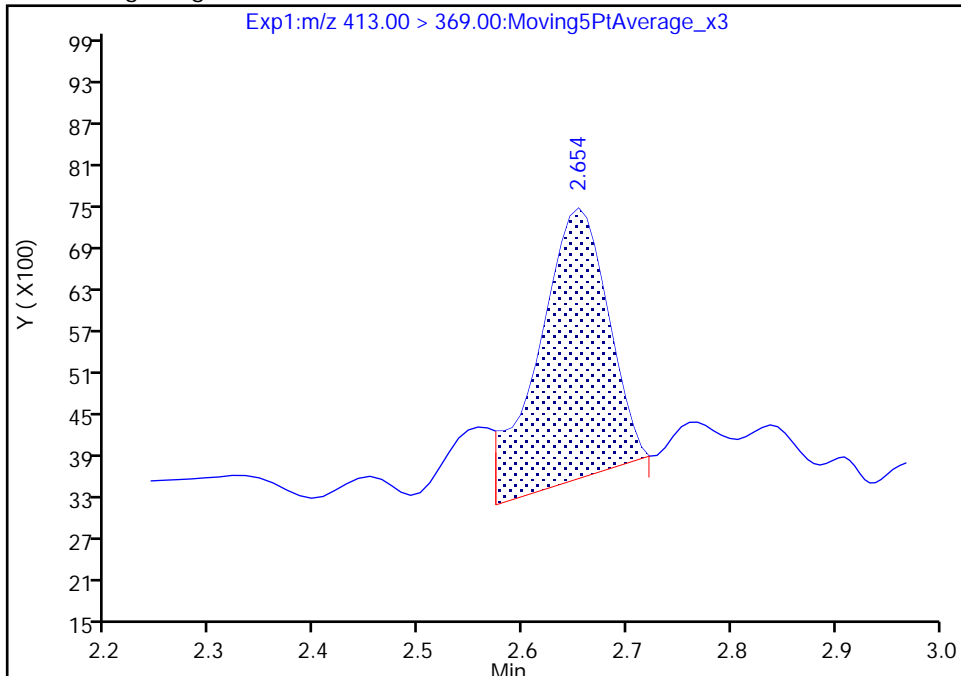
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_009.d
Injection Date: 29-Jun-2018 22:23:54 Instrument ID: A8_N
Lims ID: ICB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

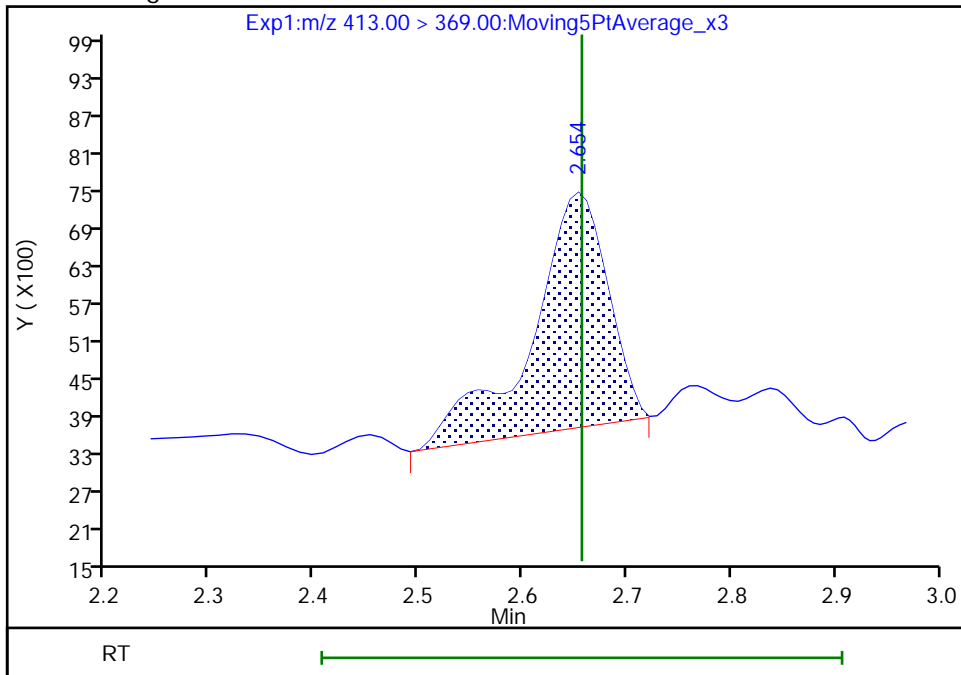
RT: 2.65
Area: 18187
Amount: 0.010101
Amount Units: ng/ml

Processing Integration Results



RT: 2.65
Area: 19221
Amount: 0.010675
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:22:41
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 825 of 864

TestAmerica Sacramento

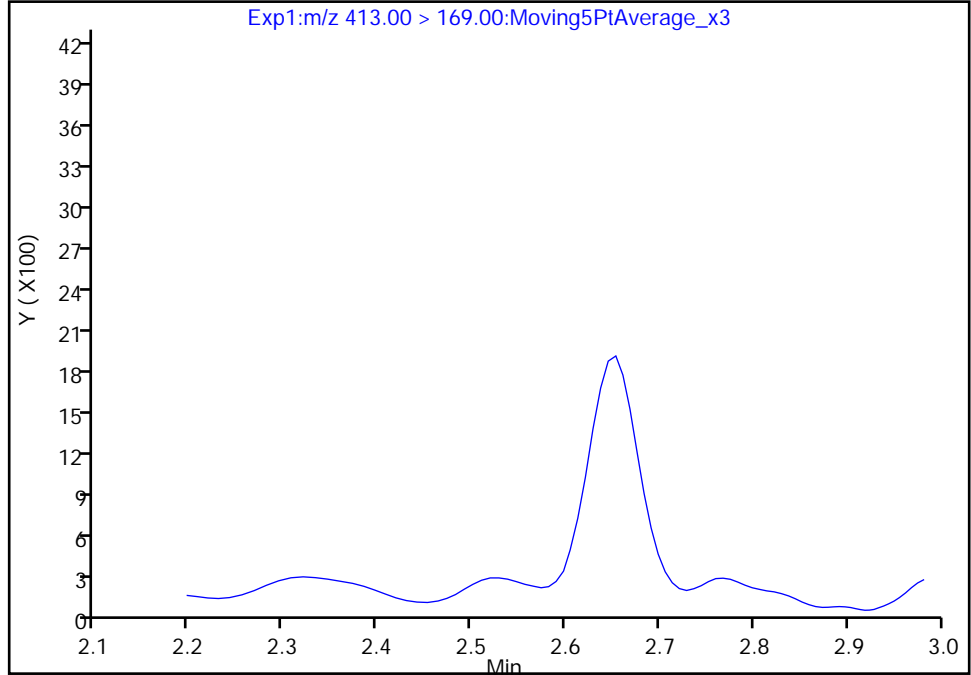
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_009.d
Injection Date: 29-Jun-2018 22:23:54 Instrument ID: A8_N
Lims ID: ICB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

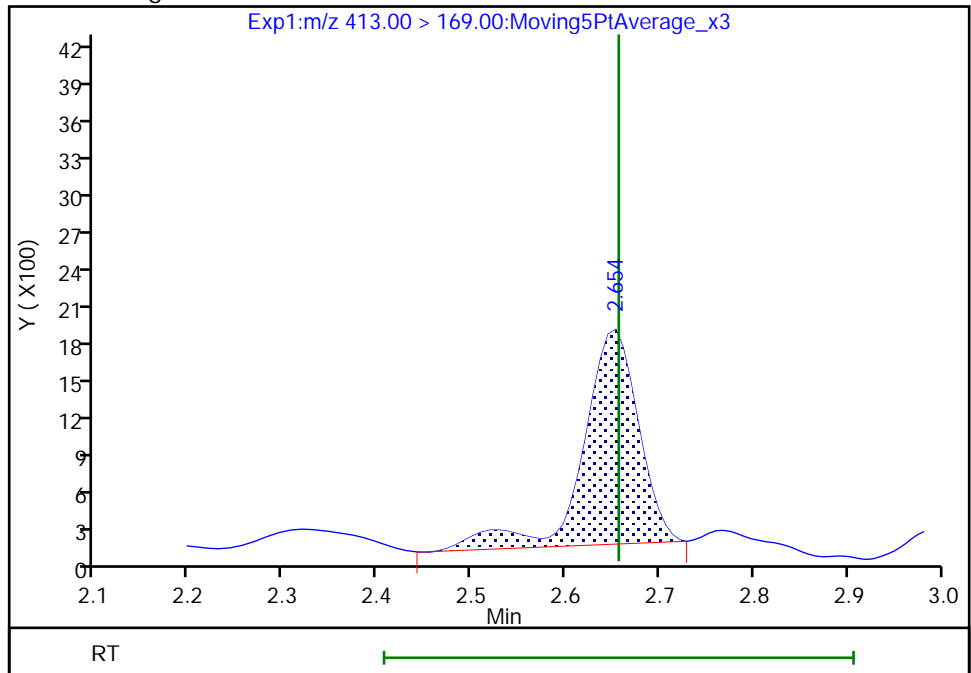
RT: 2.66
Area: 0
Amount: 0.010101
Amount Units: ng/ml

Processing Integration Results



RT: 2.65
Area: 7191
Amount: 0.010675
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

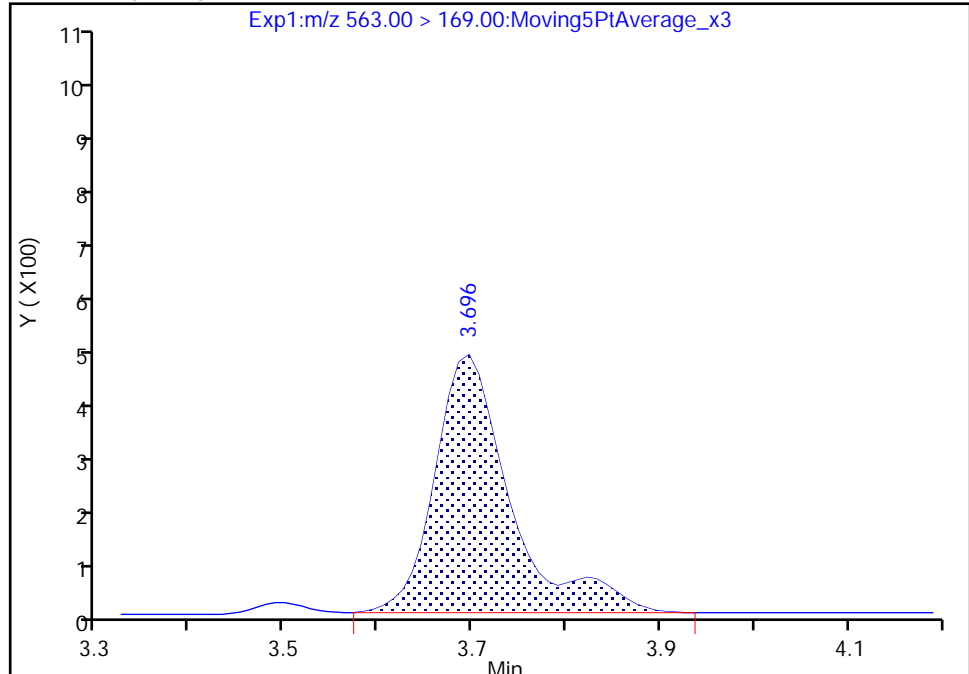
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180630-60479.b\2018.06.29LLICALA_009.d
Injection Date: 29-Jun-2018 22:23:54 Instrument ID: A8_N
Lims ID: ICB
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

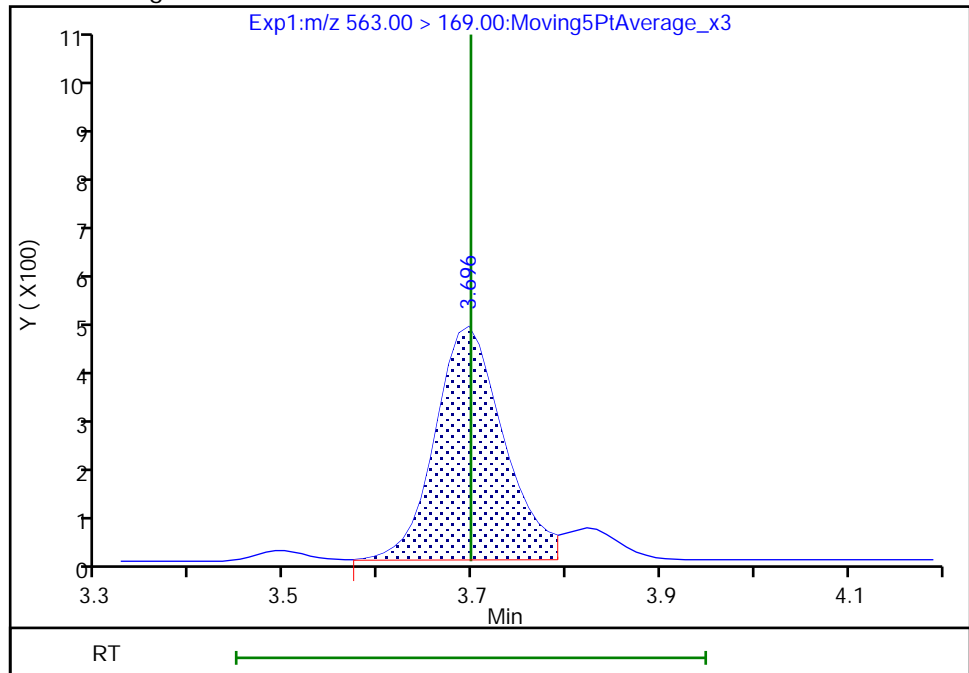
RT: 3.70
Area: 2570
Amount: 0.010293
Amount Units: ng/ml

Processing Integration Results



RT: 3.70
Area: 2324
Amount: 0.010293
Amount Units: ng/ml

Manual Integration Results



Reviewer: roycea, 30-Jun-2018 07:23:52
Audit Action: Manually Integrated

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-228913/2-A
 Matrix: Water Lab File ID: 2018.06.26LLC_048.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 250 (mL) Date Analyzed: 06/27/2018 05:25
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	36.1		2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	33.9		2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	35.7		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	34.4		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	33.6		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	34.5		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	37.2		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	34.8		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	37.9		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	41.7		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	42.2		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32.4		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	31.8		2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	34.3		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34.3	M	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	32.6		2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	36.1		4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-228913/2-A
 Matrix: Water Lab File ID: 2018.06.26LLC_048.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 250 (mL) Date Analyzed: 06/27/2018 05:25
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	78		50-150
STL00992	13C4 PFBA	90		50-150
STL01893	13C5 PFPeA	83		50-150
STL00993	13C2 PFHxA	84		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	88		50-150
STL00996	13C2 PFDA	88		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	73		50-150
STL00994	18O2 PFHxS	78		50-150
STL02116	13C2-PFTeDA	69		50-150
STL00991	13C4 PFOS	80		50-150
STL02337	13C3-PFBS	78		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_048.d
 Lims ID: LCS 320-228913/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 27-Jun-2018 05:25:00 ALS Bottle#: 34 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-228913/2
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:01:22 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:01:22

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	1.436	1.436	0.0	1.000	2076366	0.9027		90.3	1029	
D 1 13C4 PFBA										
217.00 > 172.00	1.436	1.441	-0.005	0.537	5719224	2.25		89.9	45459	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.711	1.703	0.008	1.000	1576022	0.8471		84.7	620	
D 3 13C5-PFPeA										
267.90 > 223.00	1.711	1.711	0.0	0.639	3824700	2.08		83.2	56413	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.747	1.739	0.008	1.005	2289458	0.8096		91.6	4686	
298.90 > 99.00	1.747	1.739	0.008	1.005	996683		2.30(1.25-3.74)		6727	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.747	-0.009	0.650	83973	1.81		78.0	671	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.959	1.950	0.009	1.127	674258	1.13		121	32370	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.992	1.993	-0.001	1.000	1573969	0.8917		89.2	3570	
313.00 > 119.00	1.992	1.993	-0.001	1.000	143113		11.00(5.03-15.10)		3368	
D 7 13C2 PFHxA										
315.00 > 270.00	1.992	2.003	-0.011	0.745	4204678	2.10		83.9	89551	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.015	2.004	0.011	1.159	2218279	0.8614		91.8	47210	
349.00 > 99.00	2.015	2.004	0.011	1.159	781941		2.84(1.36-4.07)		10644	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.094	2.084	0.010	1.000	235576	NC			1579	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.094	2.093	0.001	0.783	159427	NC			5037	

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	2.320	2.308	0.012	1.000	1642152	0.8609		86.1	1899	
363.00 > 169.00	2.320	2.308	0.012	1.000	621678		2.64(1.13-3.40)		5723	
D 9 13C4-PFHpA										
367.00 > 322.00	2.320	2.319	0.001	0.867	4115195	2.27		90.6	51407	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.333	2.321	0.012	1.000	1839873	0.7952		87.4	16315	
399.00 > 99.00	2.333	2.321	0.012	1.000	617210		2.98(1.50-4.49)		2740	
D 11 18O2 PFHxS										
403.00 > 84.00	2.333	2.345	-0.012	0.872	4813562	1.85		78.4	56676	
65 Adona										
377.00 > 251.00	2.359	2.360	-0.001	0.773	4135738	NC			37095	
377.00 > 85.00	2.359	2.360	-0.001	0.773	2477172		1.67(0.84-2.53)		14341	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.653	2.644	0.009	1.000	732596	0.9209		97.1	8352	
D 12 M2-6:2FTS										
429.00 > 81.00	2.653	2.659	-0.006	0.992	1136458	2.42		102	20227	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.683	2.675	0.008	0.879	1641760	0.8564		90.0	26090	
449.00 > 99.00	2.683	2.675	0.008	0.879	447582		3.67(1.94-5.82)		9532	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.675	0.0		4468673	2.50			56162	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.675	0.0	1.000	1576891	0.8409		84.0	703	
413.00 > 169.00	2.675	2.675	0.0	1.000	816414		1.93(0.84-2.52)		6339	
D 14 13C4 PFOA										
417.00 > 372.00	2.675	2.682	-0.007	1.000	3842009	2.24		89.6	38587	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.053	3.039	0.014	1.000	1347740	0.8563		92.3	19623	M
499.00 > 99.00	3.053	3.039	0.014	1.000	276727		4.87(2.31-6.93)		7007	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.053	3.046	0.007	1.000	1118671	0.8618		86.2	2795	
463.00 > 169.00	3.053	3.046	0.007	1.000	271046		4.13(1.90-5.69)		10237	
D 19 13C5 PFNA										
468.00 > 423.00	3.053	3.055	-0.002	1.141	2987997	2.21		88.4	43852	
D 18 13C4 PFOS										
503.00 > 80.00	3.053	3.055	-0.002	1.141	3306906	1.92		80.1	34224	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.265	3.253	0.012	1.070	2226997	NC			23913	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.379	3.370	0.009	1.000	1741273	0.9014		90.1	33142	
D 21 13C8 FOSA										
506.00 > 78.00	3.379	3.384	-0.005	1.263	4799414	1.96		78.3	52256	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.398	3.389	0.009	1.113	919404	0.8659		90.2	29507	
549.00 > 99.00	3.398	3.389	0.009	1.113	325601		2.82(1.33-3.97)		4309	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.407	3.398	0.009	1.000	474421	0.8803		91.9	10434	

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	3.416	3.407	0.009	1.000	845063	0.9294		92.9	3250	
513.00 > 169.00	3.416	3.407	0.009	1.000	153765		5.50(2.36-7.09)		6913	
D 26 M2-8:2FTS										
529.00 > 81.00	3.407	3.411	-0.004	1.273	969311	2.27		94.8	17932	
D 23 13C2 PFDA										
515.00 > 470.00	3.416	3.421	-0.005	1.277	2241621	2.19		87.5	33727	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.575	3.566	0.009	1.003	248949	0.9243		92.4	3553	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.565	3.570	-0.005	1.333	680851	2.17		86.6	20678	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.729	3.719	0.010	1.222	728502	0.8149		84.5	15090	
599.00 > 99.00	3.729	3.719	0.010	1.222	253738		2.87(1.39-4.16)		5857	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.750	3.740	0.010	1.003	220101	0.8270		82.7	3272	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.750	3.740	0.010	1.000	476094	0.8704		87.0	1594	
563.00 > 169.00	3.750	3.740	0.010	1.000	130487		3.65(2.12-6.36)		6813	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.740	3.743	-0.003	1.398	716732	2.21		88.3	2086	
D 30 13C2 PFUnA										
565.00 > 520.00	3.750	3.754	-0.004	1.402	1699507	2.15		86.0	58674	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.907	3.898	0.009	1.280	3008556	NC			37712	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.050	4.041	0.009	1.000	584621	0.9484		94.8	145	
613.00 > 169.00	4.050	4.041	0.009	1.000	137496		4.25(2.13-6.40)		3146	
D 36 13C2 PFDoA										
615.00 > 570.00	4.050	4.055	-0.005	1.514	1456659	1.83		73.1	8147	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.307	4.300	0.007	1.063	565389	1.04		104	132	
663.00 > 169.00	4.318	4.300	0.018	1.066	159373		3.55(1.25-3.76)		2081	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.553	4.544	0.009	1.000	137712	1.05		105	1746	
713.00 > 219.00	4.553	4.544	0.009	1.000	92718		1.49(0.71-2.13)		1784	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.553	4.559	-0.006	1.702	1271939	1.73		69.2	5420	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.983	4.976	0.007	1.002	724036	NC			108	
813.00 > 169.00	4.983	4.976	0.007	1.002	118120		6.13(2.86-8.58)		1284	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.975	4.989	-0.014	1.859	1932627	1.55		62.2	5577	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.356	5.350	0.006	1.077	372122	NC			123	
913.00 > 169.00	5.356	5.350	0.006	1.077	46684		7.97(3.83-11.48)		711	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_048.d

Injection Date: 27-Jun-2018 05:25:00

Instrument ID: A8_N

Lims ID: LCS 320-228913/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 34

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

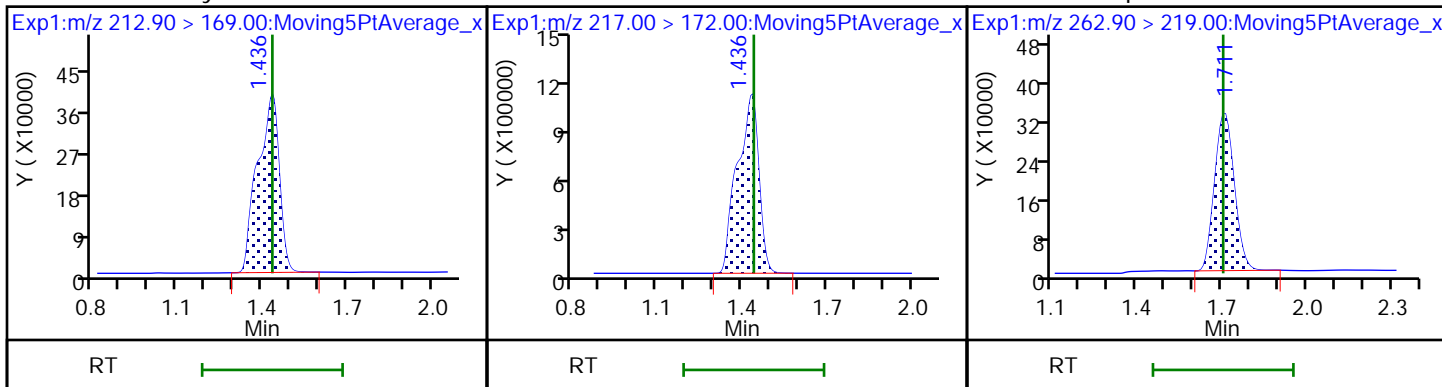
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

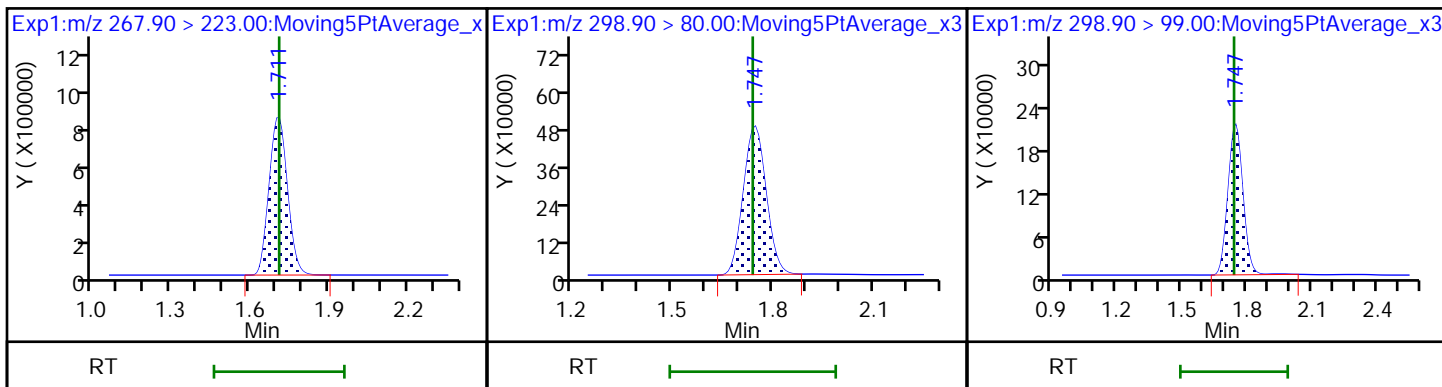
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

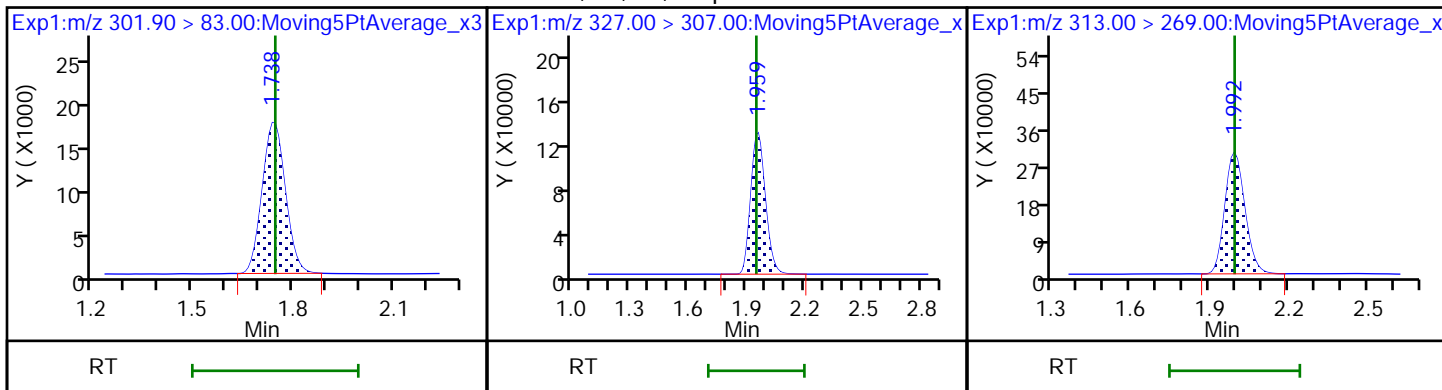
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

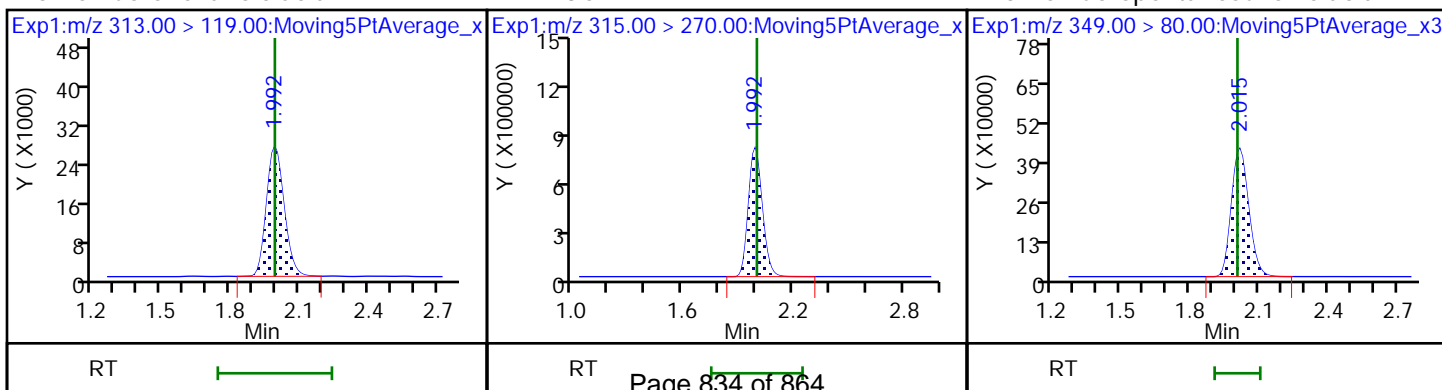
6 Perfluorohexanoic acid

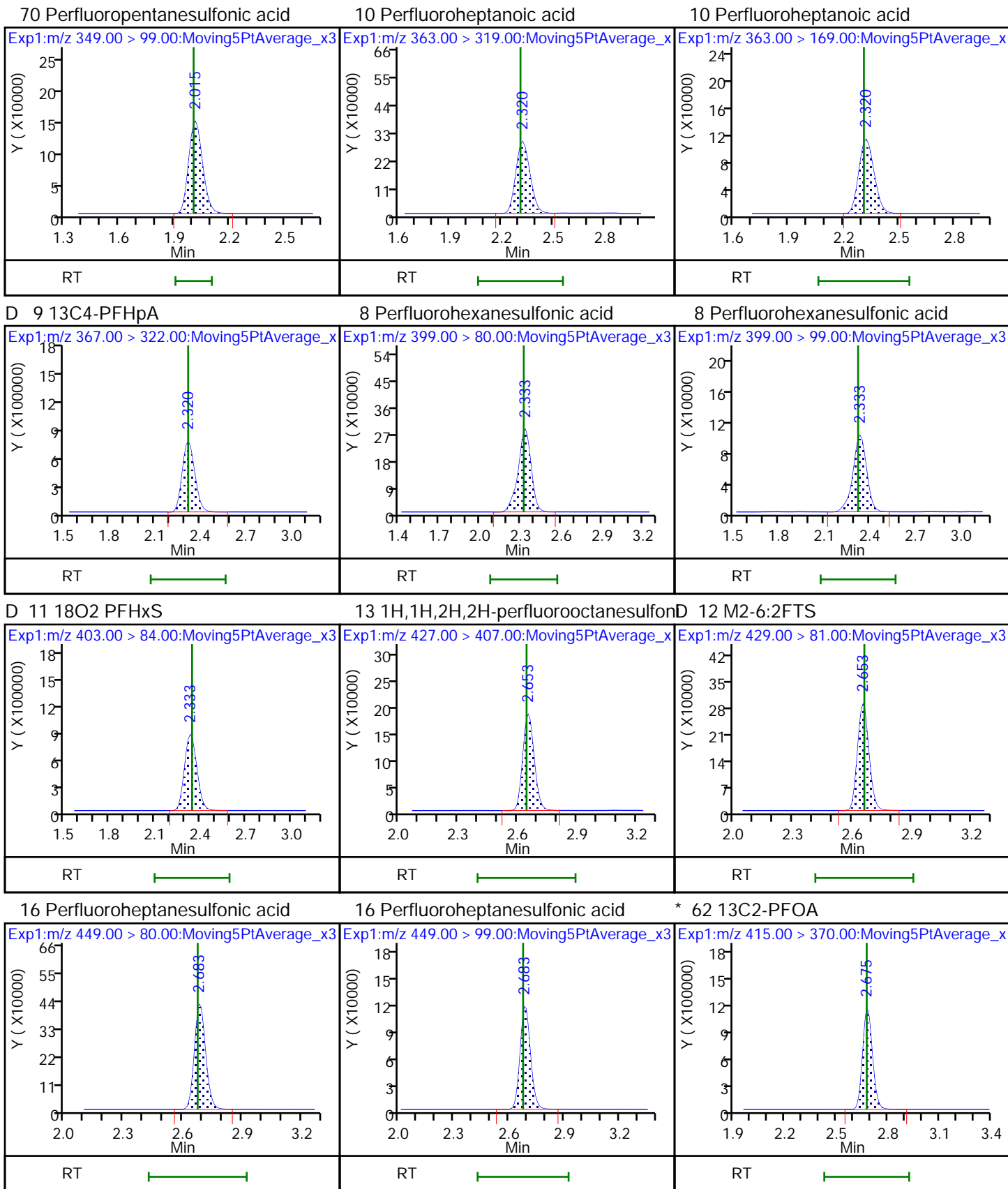


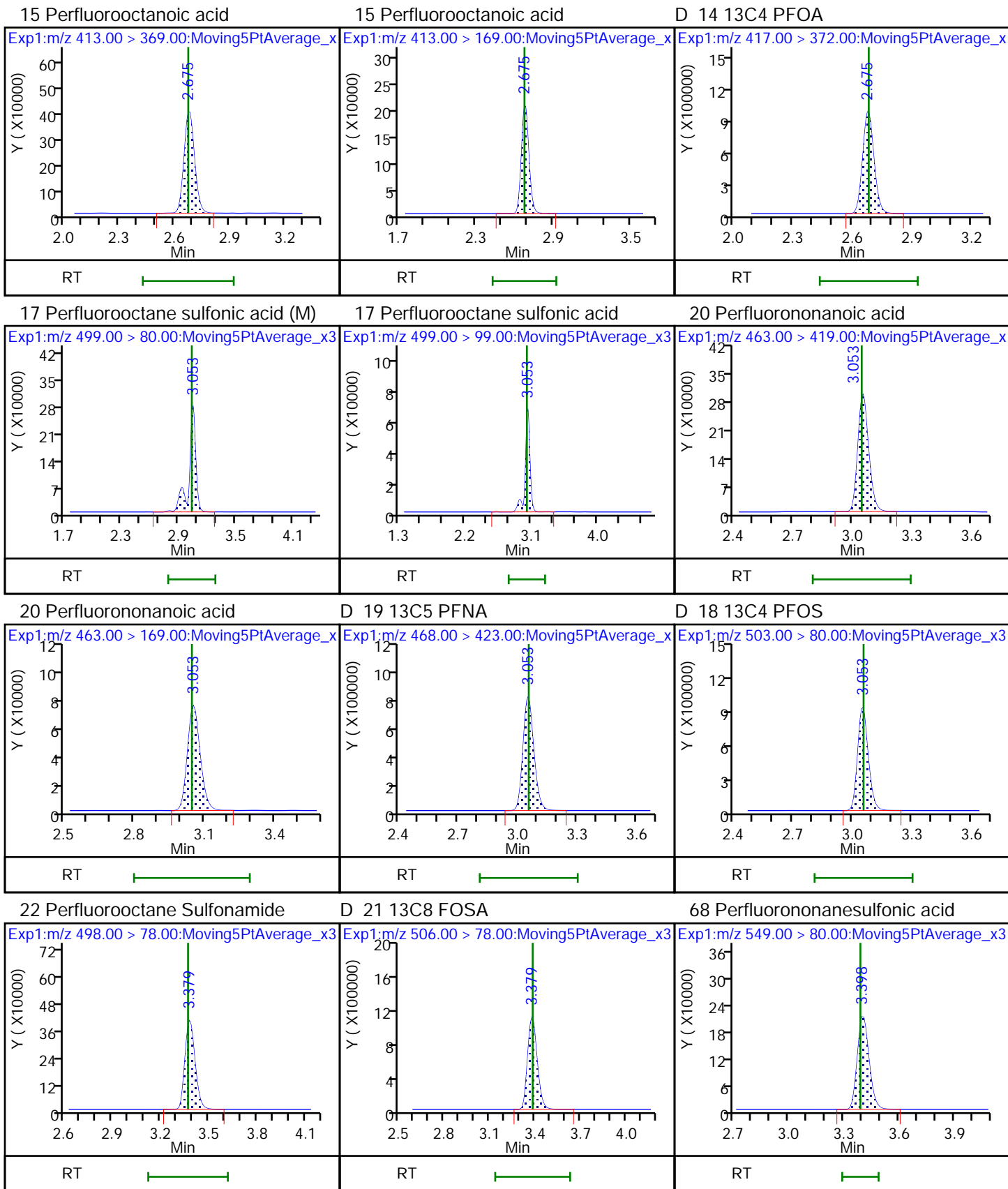
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



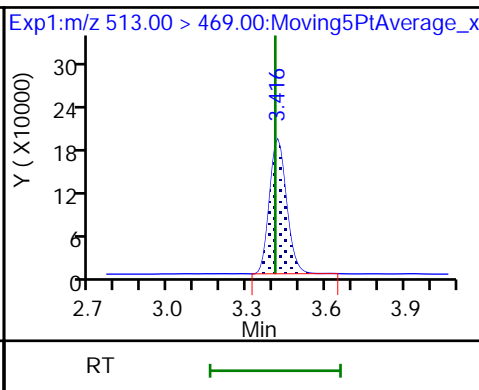
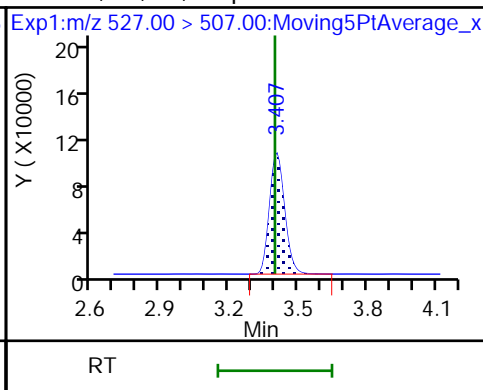
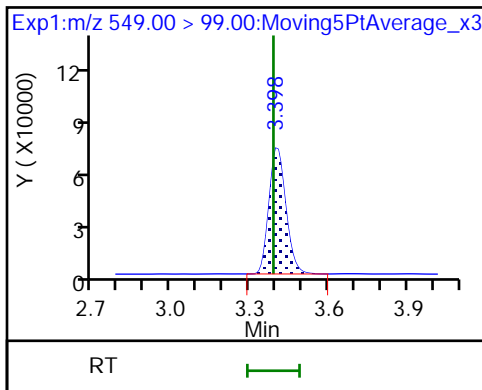




68 Perfluorononanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

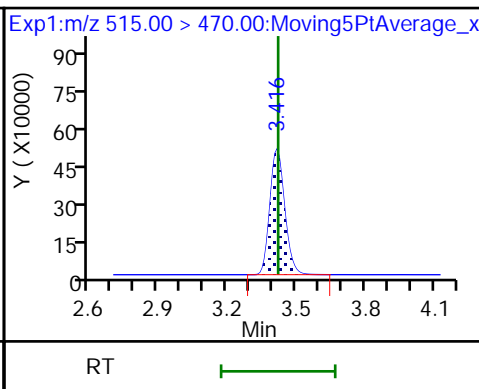
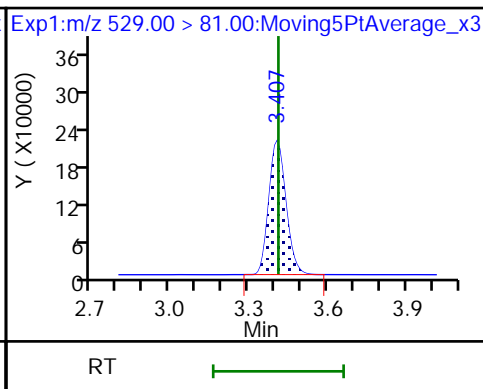
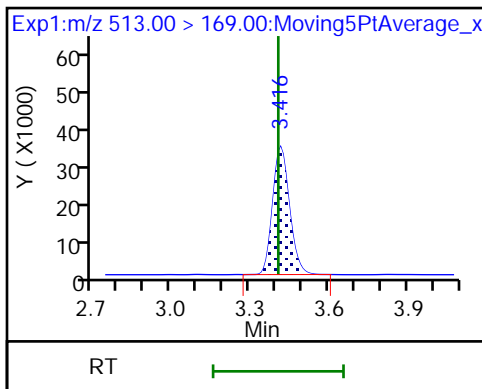
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 26 M2-8:2FTS

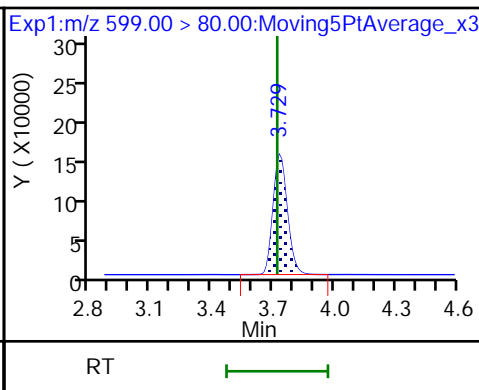
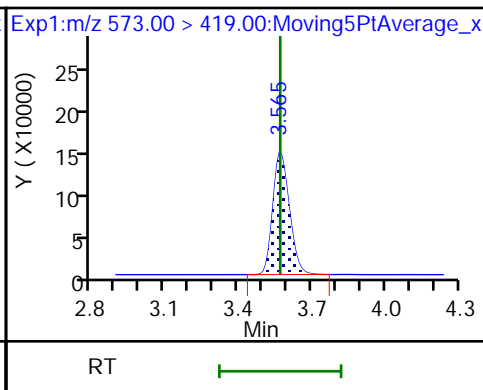
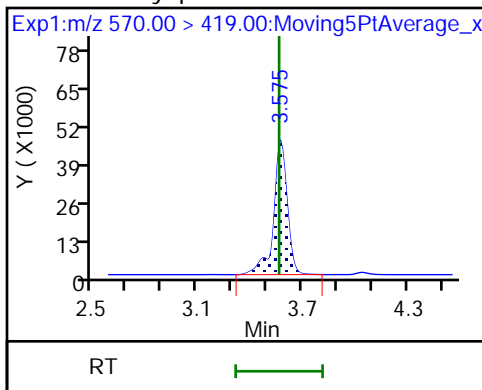
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamid

D 27 d3-NMeFOSAA

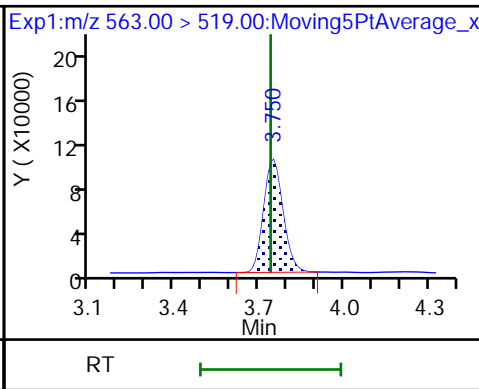
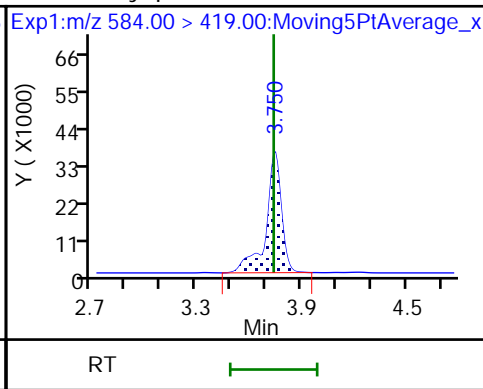
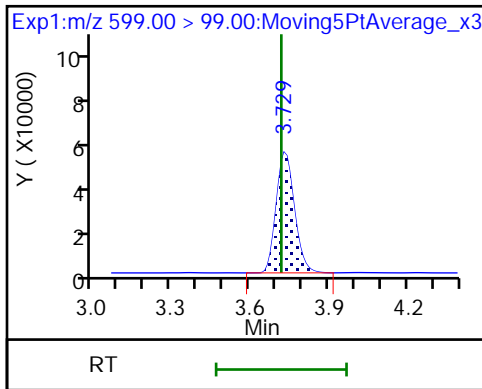
29 Perfluorodecane Sulfonic acid

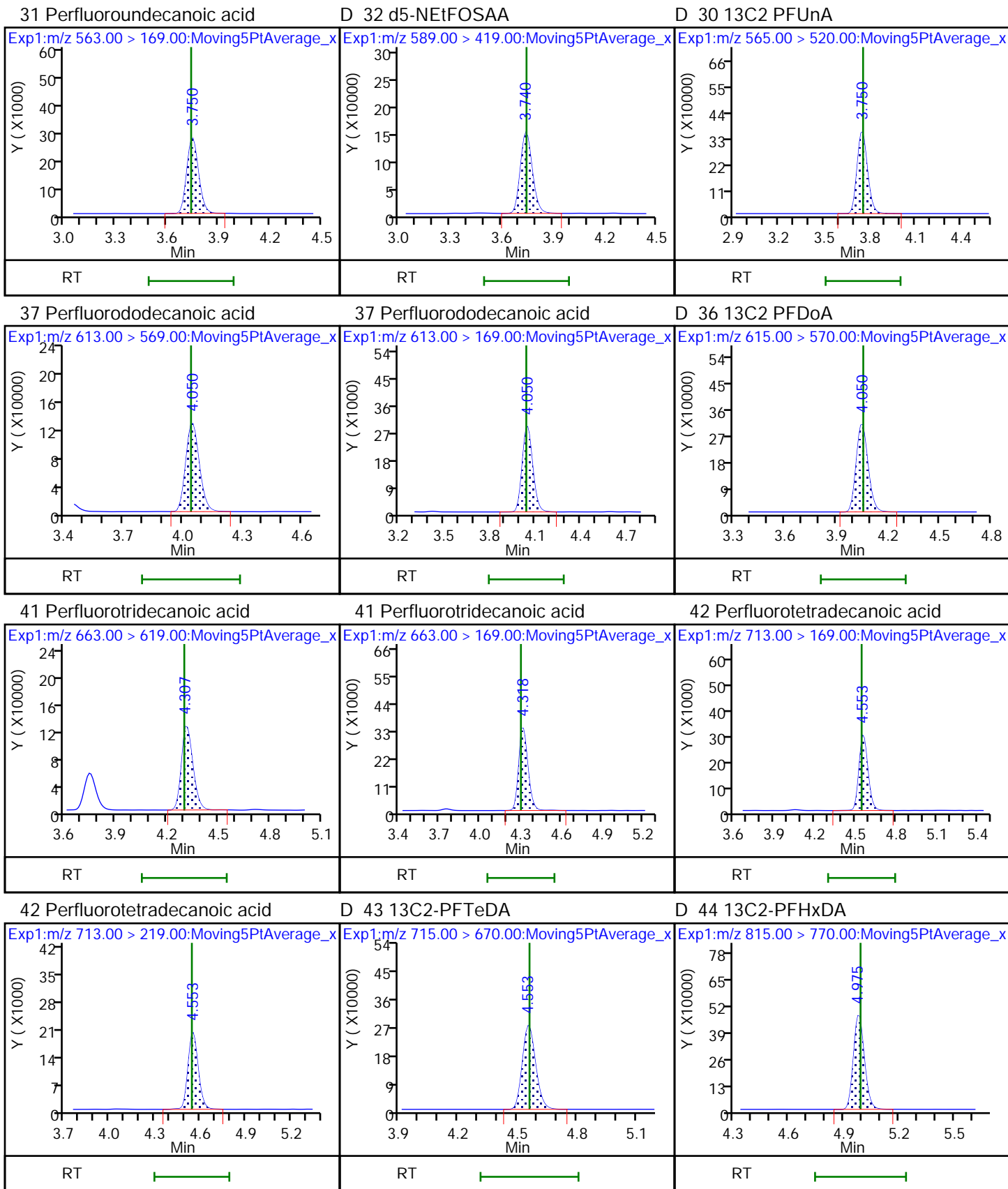


29 Perfluorodecane Sulfonic acid

33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid





TestAmerica Sacramento

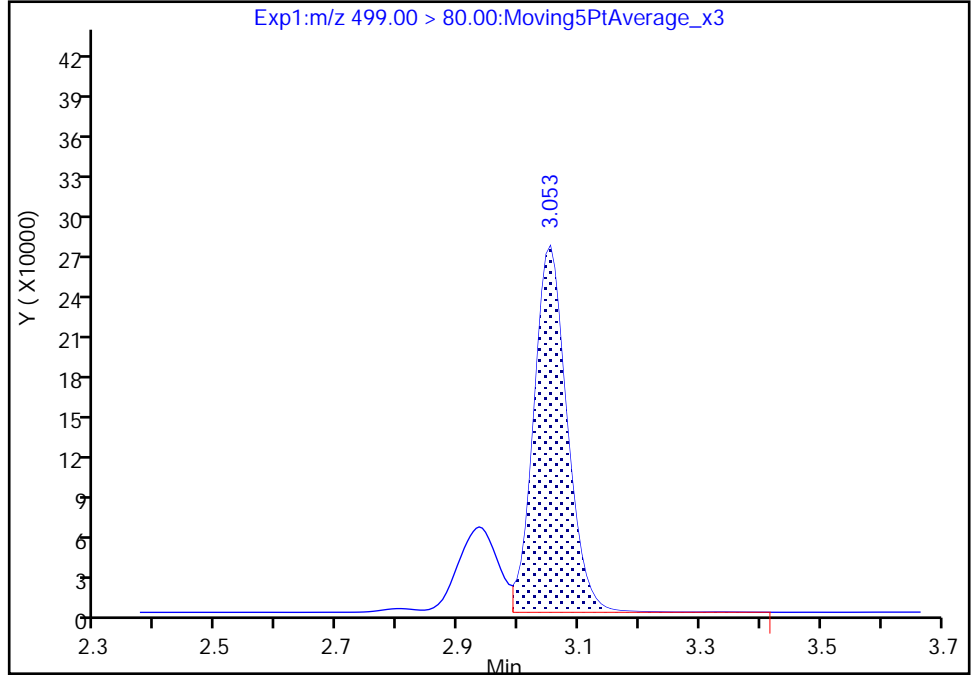
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_048.d
Injection Date: 27-Jun-2018 05:25:00 Instrument ID: A8_N
Lims ID: LCS 320-228913/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 34 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

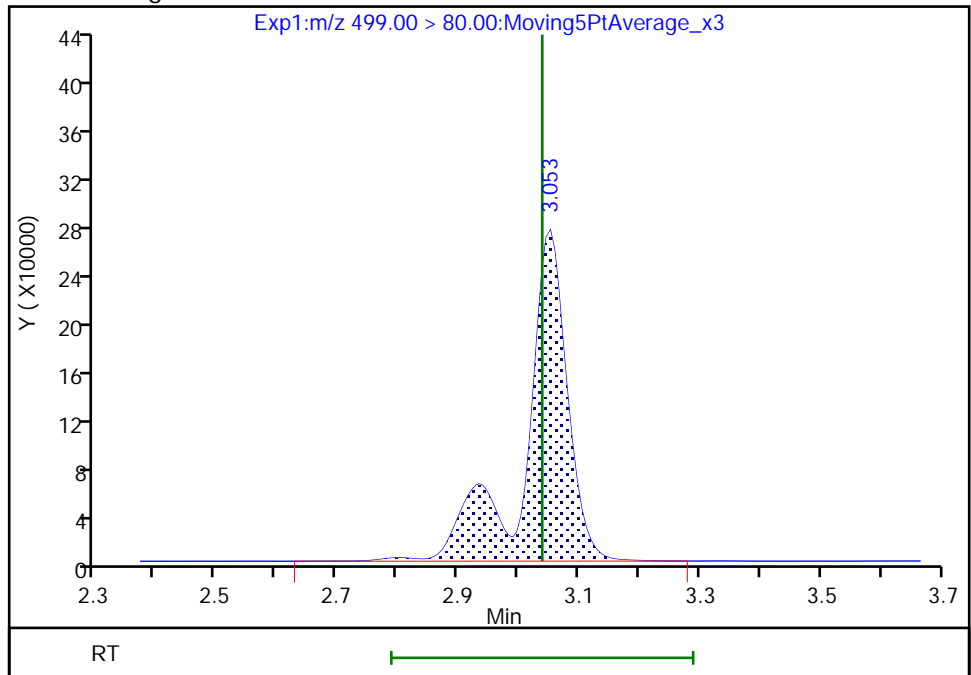
RT: 3.05
Area: 1045274
Amount: 0.664146
Amount Units: ng/ml

Processing Integration Results



RT: 3.05
Area: 1347740
Amount: 0.856326
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-228913/3-A
 Matrix: Water Lab File ID: 2018.06.26LLC_049.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 250 (mL) Date Analyzed: 06/27/2018 05:32
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	36.3		2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	35.7		2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	34.0		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	33.8		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	36.4		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	36.4		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	35.2		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	36.9		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	40.1		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	39.5		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	36.7		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32.3		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	32.4		2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	36.4		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34.2	M	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	35.5		2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	37.3		4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-228913/3-A
 Matrix: Water Lab File ID: 2018.06.26LLC_049.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 250 (mL) Date Analyzed: 06/27/2018 05:32
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	77		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	82		50-150
STL00993	13C2 PFHxA	90		50-150
STL01892	13C4-PFHpA	90		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	86		50-150
STL00996	13C2 PFDA	92		50-150
STL00997	13C2 PFUnA	80		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	18O2 PFHxS	82		50-150
STL02116	13C2-PFTeDA	74		50-150
STL00991	13C4 PFOS	82		50-150
STL02337	13C3-PFBS	81		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_049.d
 Lims ID: LCSD 320-228913/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 27-Jun-2018 05:32:48 ALS Bottle#: 35 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-228913
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:02:02 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:02:29

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	1.435	1.436	-0.001	1.000	2127499	0.9065		90.6	1121	
D 1 13C4 PFBA										
217.00 > 172.00	1.435	1.441	-0.006	0.537	5835711	2.32		92.6	42639	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.711	1.703	0.008	1.005	1629293	0.8928		89.3	646	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.711	-0.009	0.636	3751561	2.06		82.4	60389	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.747	1.739	0.008	1.005	2339125	0.8086		91.5	10360	
298.90 > 99.00	1.747	1.739	0.008	1.005	976202		2.40(1.25-3.74)		3924	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.747	-0.009	0.650	85900	1.87		80.5	628	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.959	1.950	0.009	1.127	647625	1.06		113	25033	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.991	1.993	-0.002	1.000	1593133	0.8494		84.9	4008	
313.00 > 119.00	1.991	1.993	-0.002	1.000	150819		10.56(5.03-15.10)		4131	
D 7 13C2 PFHxA										
315.00 > 270.00	1.991	2.003	-0.012	0.745	4467934	2.25		90.0	108178	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.014	2.004	0.010	1.159	2224222	0.8443		90.0	35797	
349.00 > 99.00	2.014	2.004	0.010	1.159	828054		2.69(1.36-4.07)		17782	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.093	2.084	0.009	1.000	269250	NC			1682	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.093	2.093	0.0	0.783	161598	NC			5038	

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	2.319	2.308	0.011	1.000	1588600	0.8451		84.5	1808	
363.00 > 169.00	2.319	2.308	0.011	1.000	644479		2.46(1.13-3.40)		8024	
D 9 13C4-PFHpA										
367.00 > 322.00	2.319	2.319	0.0	0.867	4055827	2.25		90.1	44320	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.332	2.321	0.011	1.000	1945066	0.8098		89.0	15749	
399.00 > 99.00	2.332	2.321	0.011	1.000	644277		3.02(1.50-4.49)		2729	
D 11 18O2 PFHxS										
403.00 > 84.00	2.332	2.345	-0.013	0.872	4997124	1.94		82.2	73852	
65 Adona										
377.00 > 251.00	2.358	2.360	-0.002	0.774	4372474	NC			32605	
377.00 > 85.00	2.358	2.360	-0.002	0.774	2678983		1.63(0.84-2.53)		10948	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.652	2.644	0.008	1.000	687364	0.8467		89.3	10173	
D 12 M2-6:2FTS										
429.00 > 81.00	2.652	2.659	-0.007	0.992	1159658	2.49		105	20830	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.682	2.675	0.007	0.881	1770279	0.9094		95.5	25333	
449.00 > 99.00	2.682	2.675	0.007	0.881	464338		3.81(1.94-5.82)		10760	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.675	0.0		4426627	2.50			39895	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.675	0.0	1.000	1671691	0.9104		90.9	870	
413.00 > 169.00	2.675	2.675	0.0	1.000	827674		2.02(0.84-2.52)		5357	
D 14 13C4 PFOA										
417.00 > 372.00	2.675	2.682	-0.007	1.000	3762316	2.21		88.5	49926	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.046	3.039	0.007	1.000	1365806	0.8546		92.1	27274	M
499.00 > 99.00	3.046	3.039	0.007	1.000	280049		4.88(2.31-6.93)		4070	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.053	3.046	0.007	1.002	1137552	0.9111		91.1	2800	
463.00 > 169.00	3.053	3.046	0.007	1.002	267324		4.26(1.90-5.69)		17713	
D 19 13C5 PFNA										
468.00 > 423.00	3.046	3.055	-0.009	1.139	2873793	2.15		85.8	44312	
D 18 13C4 PFOS										
503.00 > 80.00	3.046	3.055	-0.009	1.139	3357819	1.96		82.1	32049	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.259	3.253	0.006	1.070	2340604	NC			31429	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.379	3.370	0.009	1.000	1763697	0.9320		93.2	36746	
D 21 13C8 FOSA										
506.00 > 78.00	3.379	3.384	-0.005	1.263	4701133	1.94		77.5	48938	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.398	3.389	0.009	1.116	935974	0.8681		90.4	26667	
549.00 > 99.00	3.398	3.389	0.009	1.116	363178		2.58(1.33-3.97)		4107	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.398	3.398	0.0	1.000	488142	0.8950		93.4	12120	

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	3.416	3.407	0.009	1.000	829787	0.8791		87.9	2483	
513.00 > 169.00	3.416	3.407	0.009	1.000	153527		5.40(2.36-7.09)		5662	
D 26 M2-8:2FTS										
529.00 > 81.00	3.398	3.411	-0.013	1.270	980972	2.32		96.8	21709	
D 23 13C2 PFDA										
515.00 > 470.00	3.416	3.421	-0.005	1.277	2326926	2.29		91.7	24753	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.575	3.566	0.009	1.003	277992	0.9249		92.5	4043	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.566	3.570	-0.004	1.333	759853	2.44		97.6	27243	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.729	3.719	0.010	1.224	806060	0.8880		92.1	33261	
599.00 > 99.00	3.729	3.719	0.010	1.224	254504		3.17(1.39-4.16)		10431	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.740	3.740	0.0	1.000	226264	0.8107		81.1	6213	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.740	3.740	0.0	1.000	462121	0.9216		92.2	1623	
563.00 > 169.00	3.740	3.740	0.0	1.000	111633		4.14(2.12-6.36)		3804	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.740	3.743	-0.003	1.398	751600	2.34		93.5	2328	
D 30 13C2 PFUnA										
565.00 > 520.00	3.740	3.754	-0.014	1.398	1558018	1.99		79.6	26494	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.908	3.898	0.010	1.283	3149830	NC			38909	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.041	4.041	0.0	1.000	635257	1.00		100	144	
613.00 > 169.00	4.041	4.041	0.0	1.000	141937		4.48(2.13-6.40)		2736	
D 36 13C2 PFDoA										
615.00 > 570.00	4.041	4.055	-0.014	1.511	1497742	1.90		75.9	9844	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.308	4.300	0.008	1.066	551495	0.9887		98.9	125	
663.00 > 169.00	4.308	4.300	0.008	1.066	171400		3.22(1.25-3.76)		2623	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.554	4.544	0.010	1.000	127676	0.9178		91.8	1419	
713.00 > 219.00	4.543	4.544	-0.001	0.998	102499		1.25(0.71-2.13)		1777	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.554	4.559	-0.005	1.702	1355381	1.86		74.5	4942	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.976	4.976	0.0	1.000	755562	NC			105	
813.00 > 169.00	4.976	4.976	0.0	1.000	124894		6.05(2.86-8.58)		1159	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.976	4.989	-0.013	1.860	2054099	1.67		66.7	5128	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.357	5.350	0.007	1.077	412272	NC			123	
913.00 > 169.00	5.357	5.350	0.007	1.077	52812		7.81(3.83-11.48)		797	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_049.d

Injection Date: 27-Jun-2018 05:32:48

Instrument ID: A8_N

Lims ID: LCSD 320-228913/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 35

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

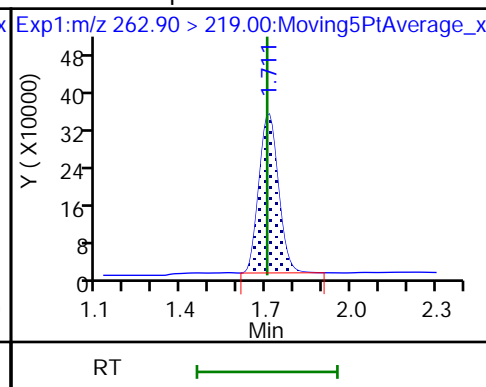
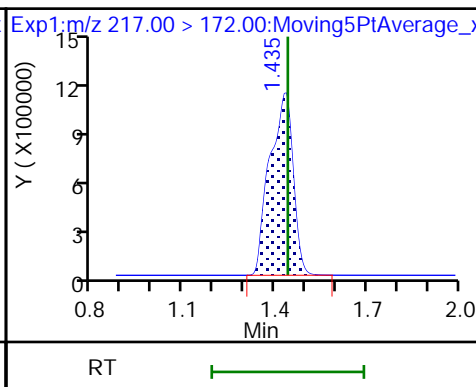
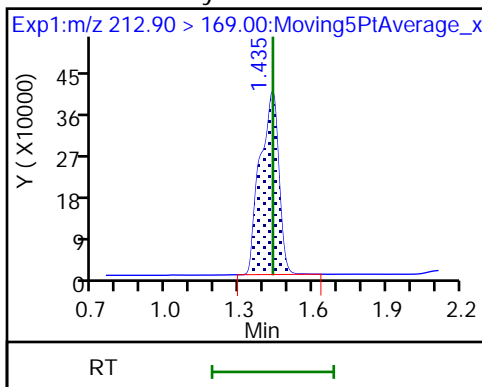
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

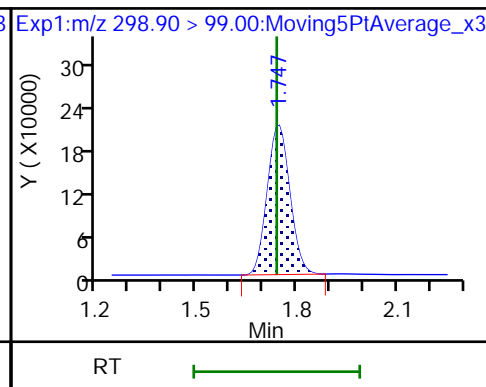
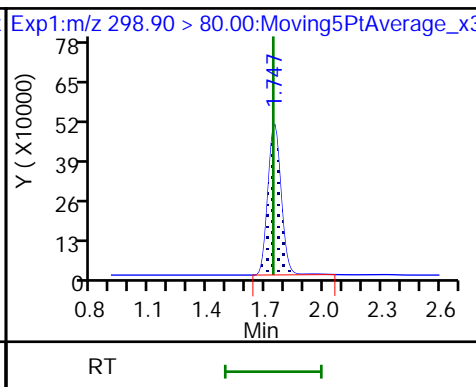
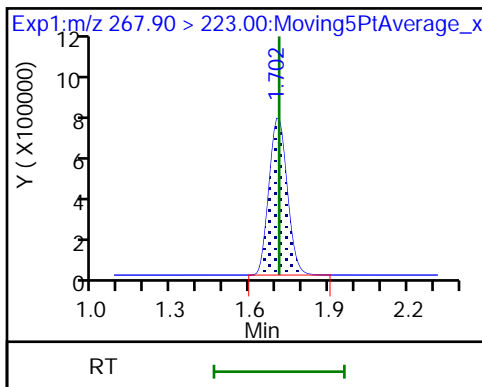
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

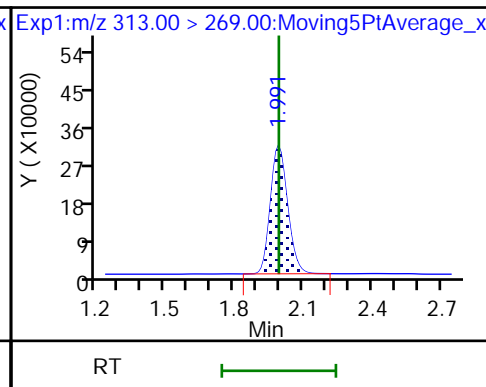
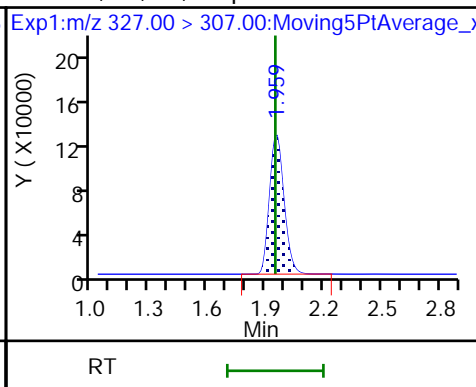
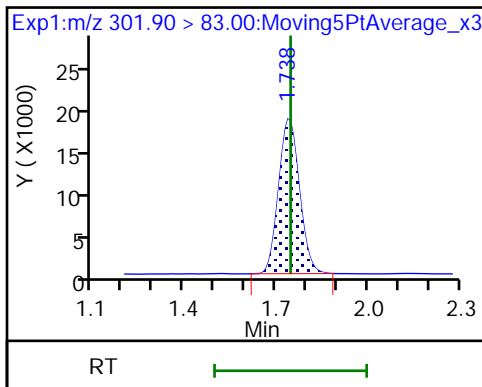
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

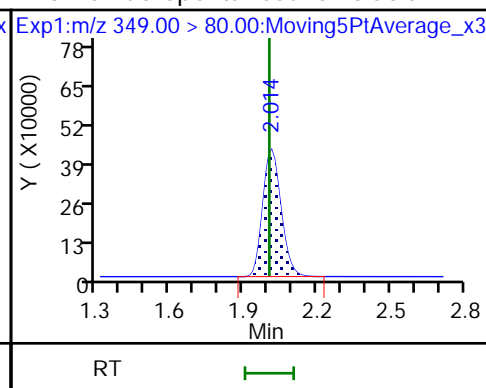
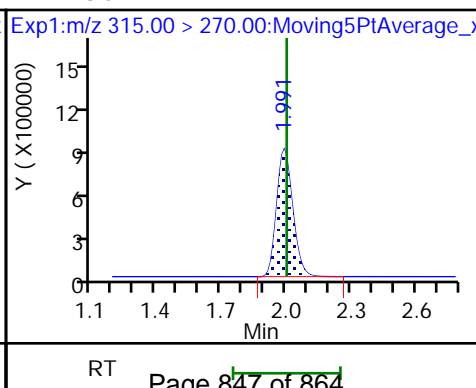
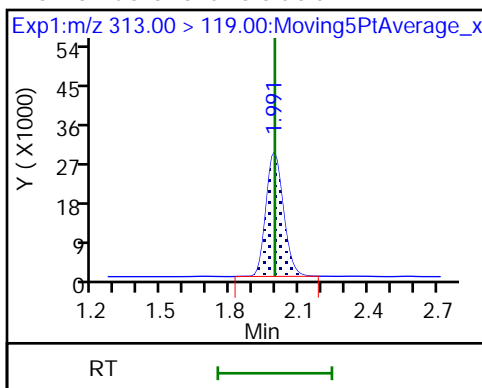
6 Perfluorohexanoic acid

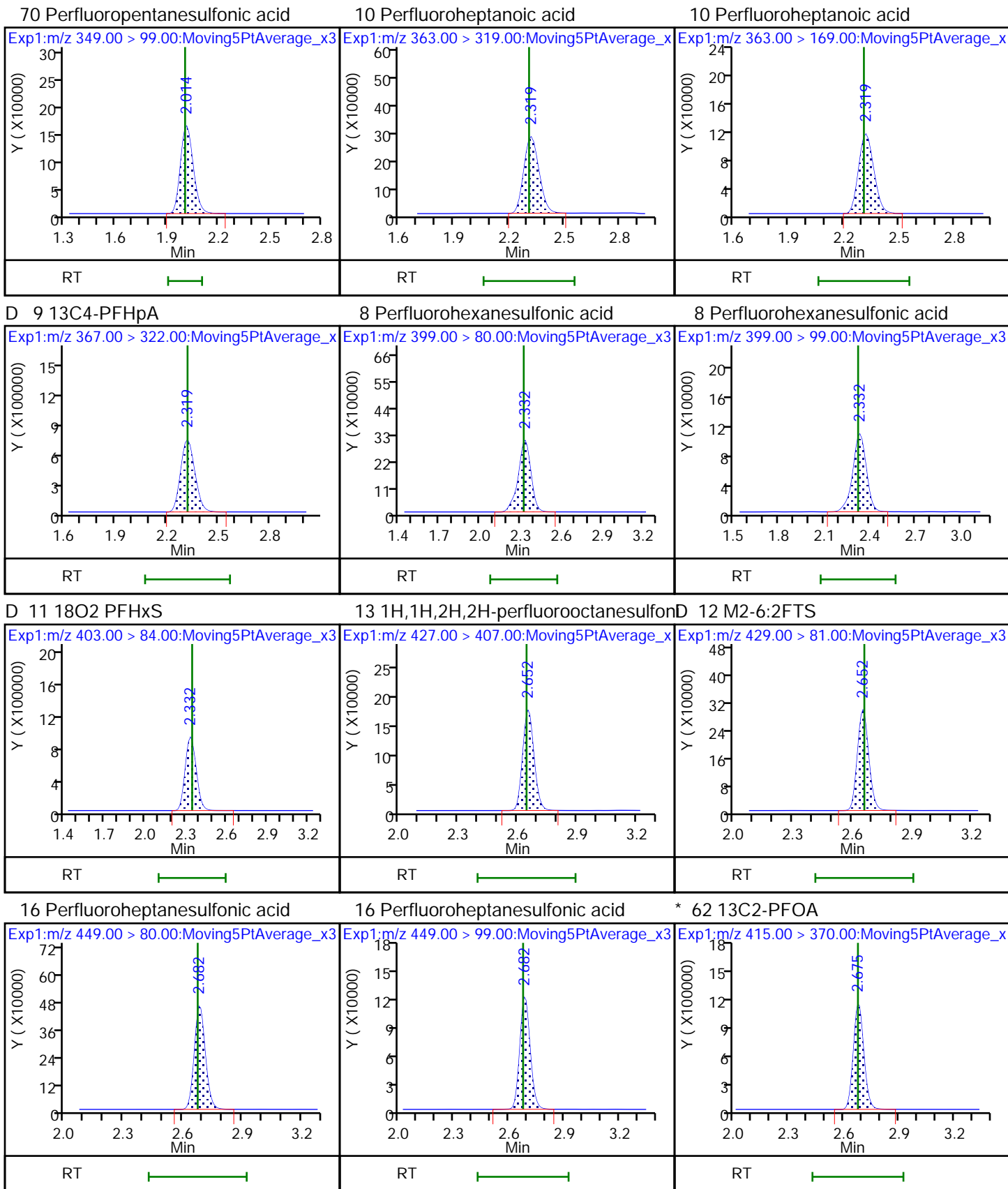


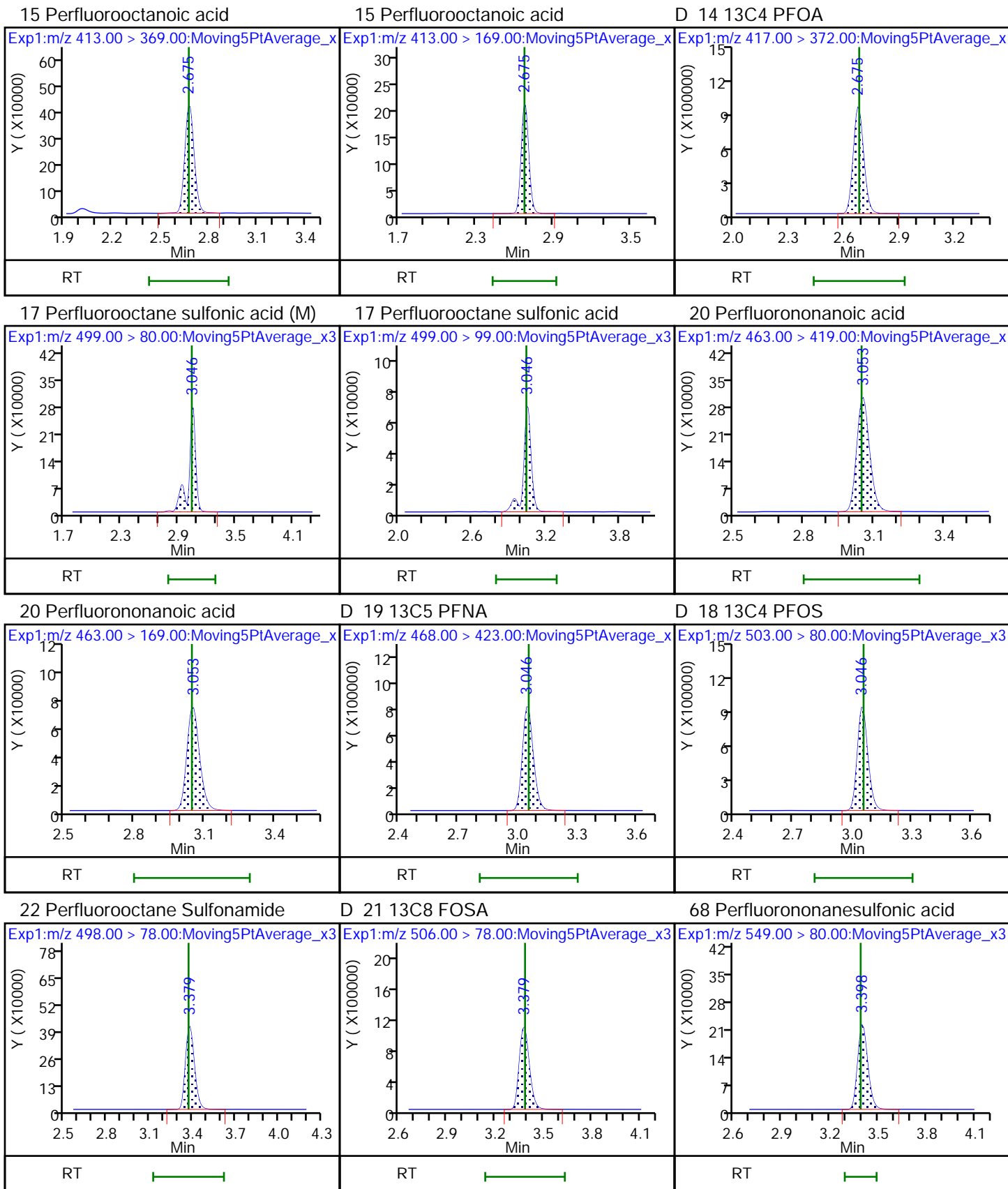
6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid



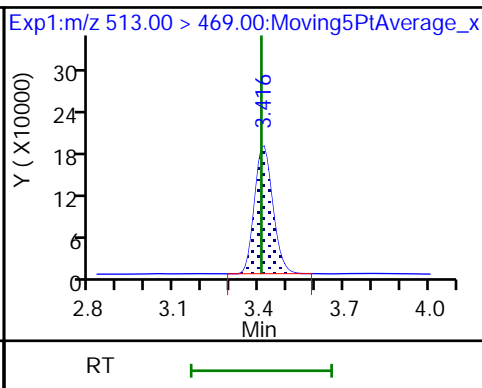
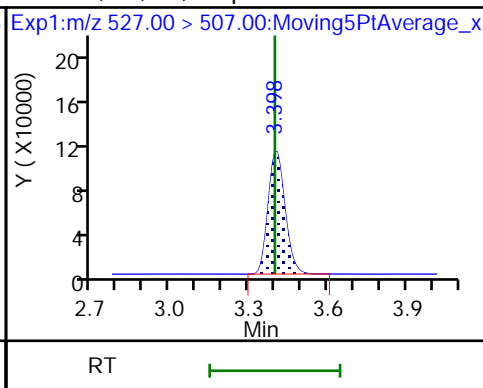
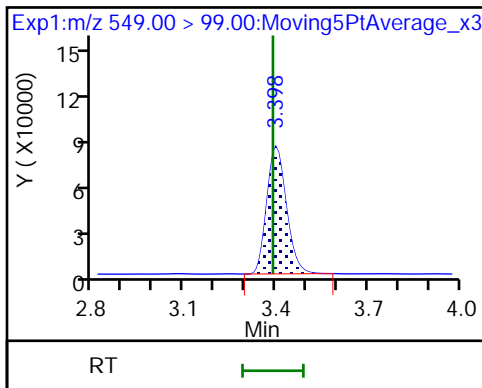




68 Perfluoronanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

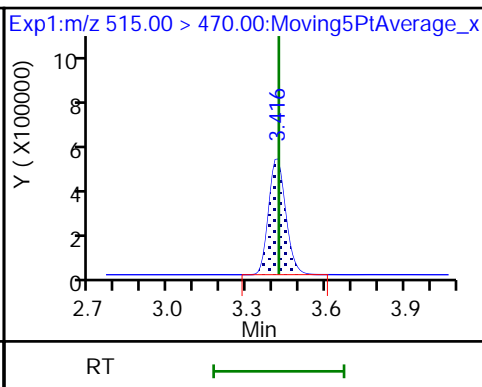
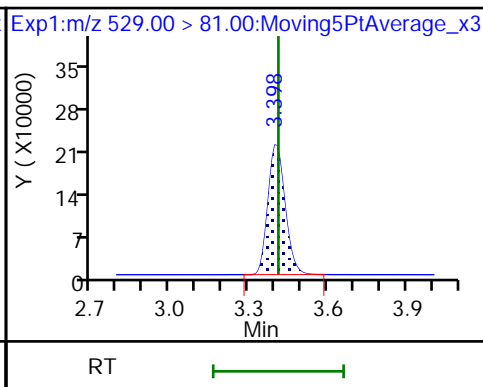
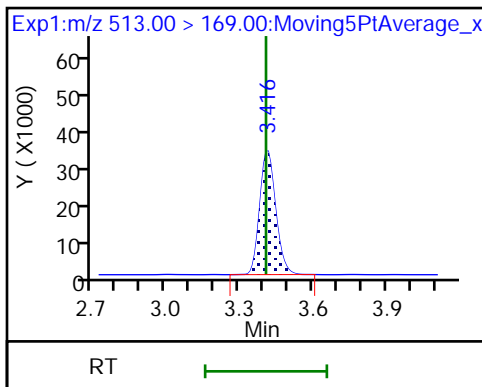
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 26 M2-8:2FTS

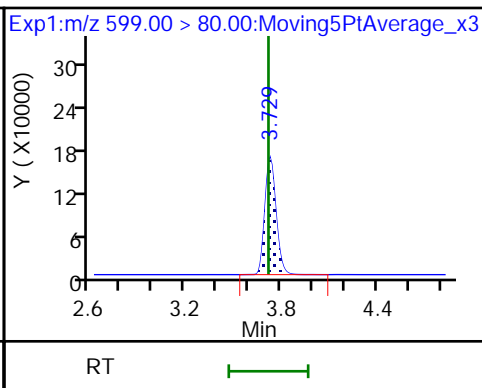
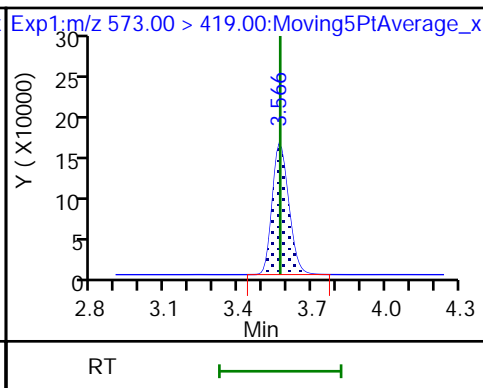
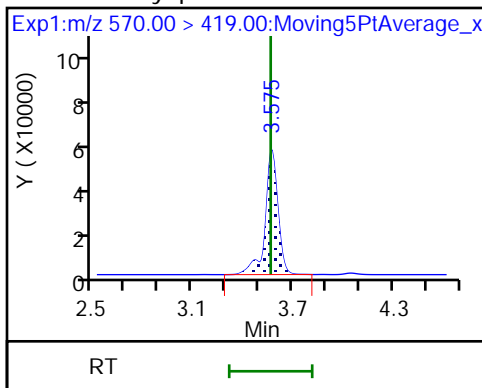
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamid

D 27 d3-NMeFOSAA

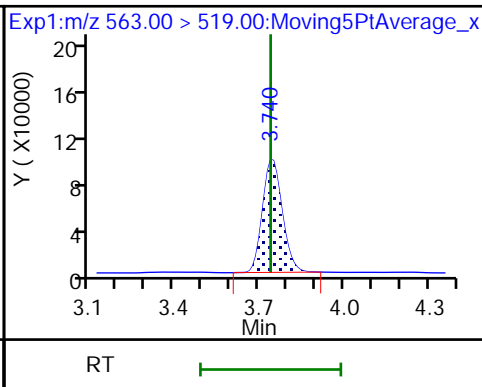
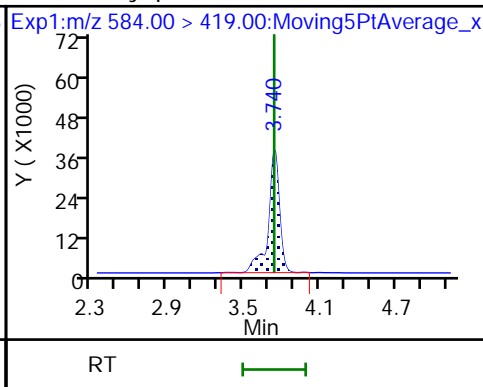
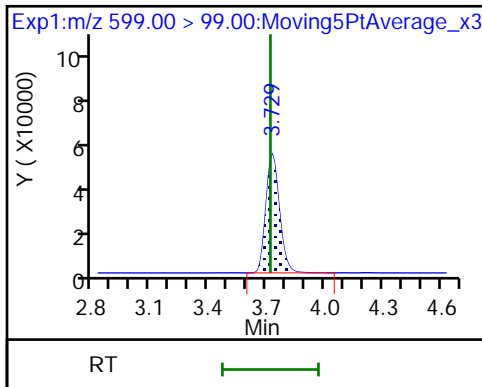
29 Perfluorodecane Sulfonic acid

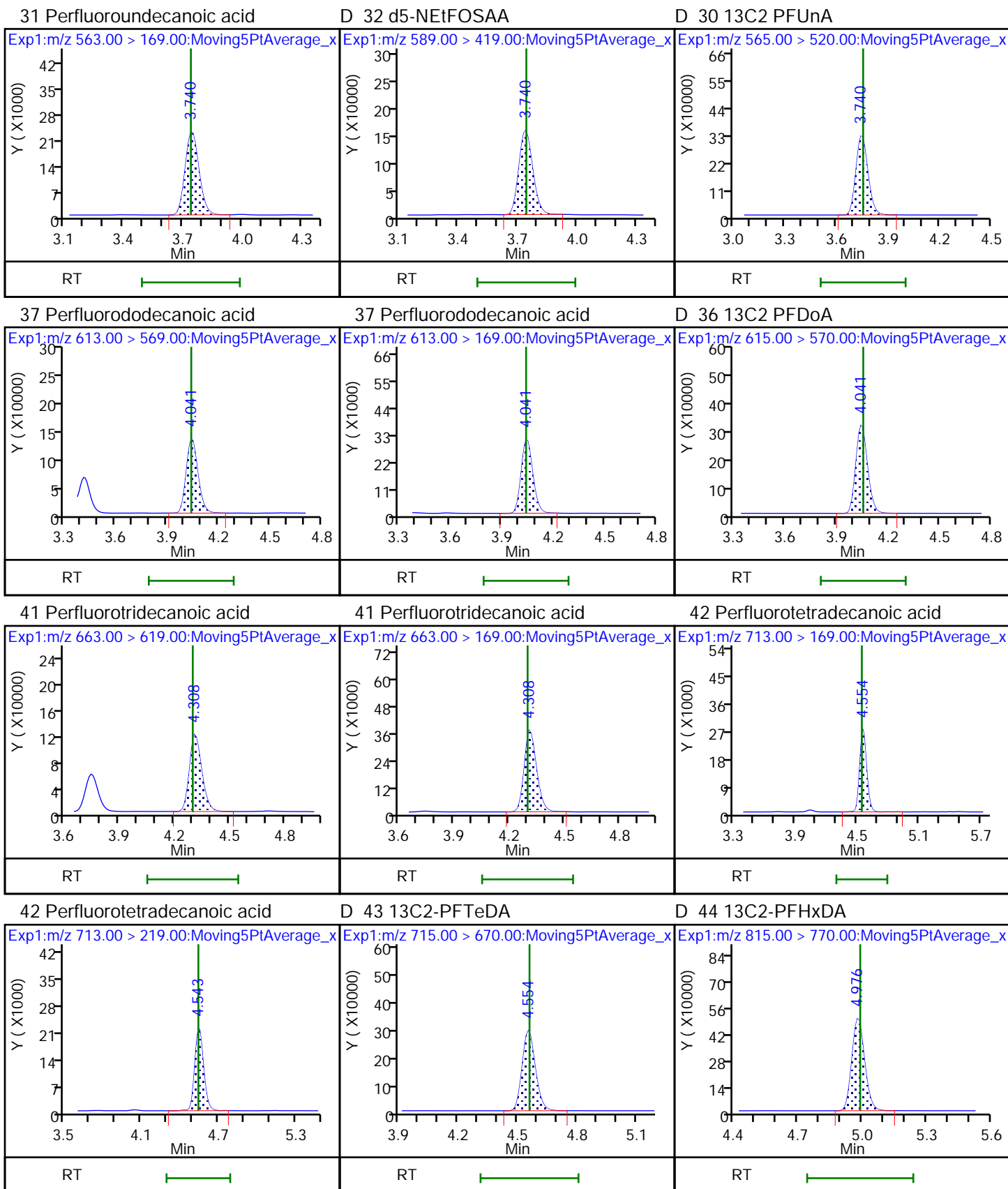


29 Perfluorodecane Sulfonic acid

33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid





TestAmerica Sacramento

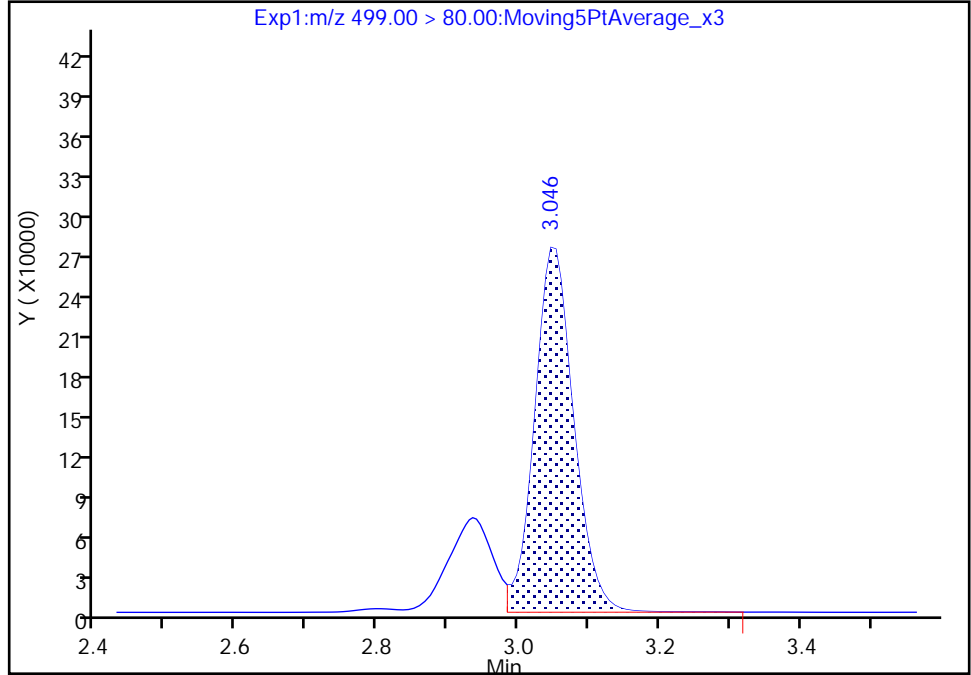
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_049.d
Injection Date: 27-Jun-2018 05:32:48 Instrument ID: A8_N
Lims ID: LCSD 320-228913/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

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

Signal: 1

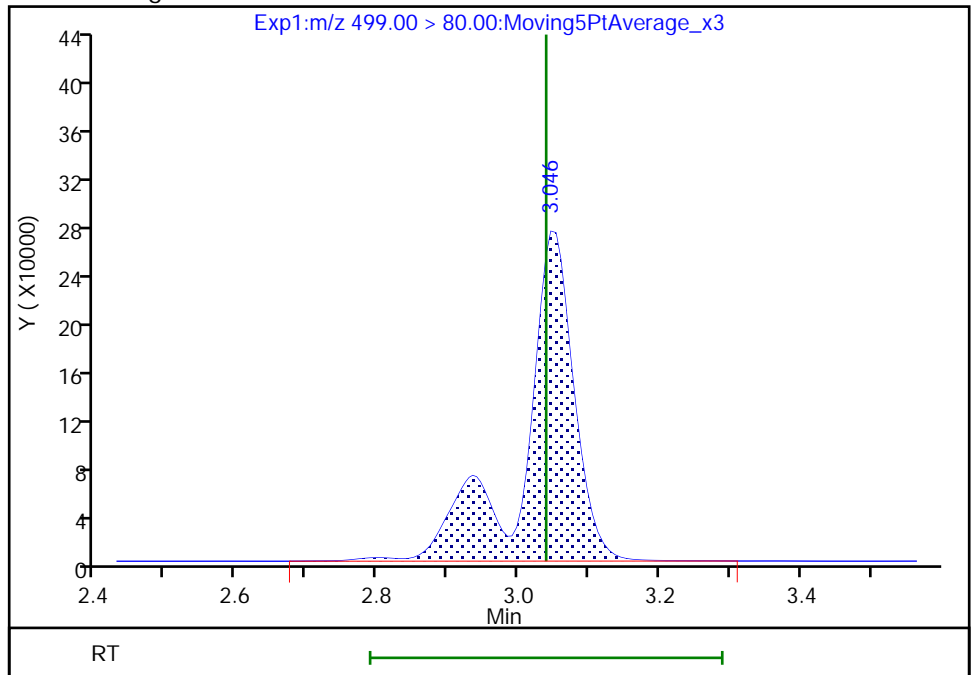
RT: 3.05
Area: 1047909
Amount: 0.655724
Amount Units: ng/ml

Processing Integration Results



RT: 3.05
Area: 1365806
Amount: 0.854647
Amount Units: ng/ml

Manual Integration Results



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/22/2018 09:18

Analysis Batch Number: 230408 End Date: 06/22/2018 10:28

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-230408/2		06/22/2018 09:18	1	2018.06.022LLIC ALA 002.d	GeminiC18 3x100 3(mm)
IC 320-230408/3		06/22/2018 09:26	1	2018.06.022LLIC ALA 003.d	GeminiC18 3x100 3(mm)
IC 320-230408/4		06/22/2018 09:33	1	2018.06.022LLIC ALA 004.d	GeminiC18 3x100 3(mm)
IC 320-230408/5 ICIS		06/22/2018 09:41	1	2018.06.022LLIC ALA 005.d	GeminiC18 3x100 3(mm)
IC 320-230408/6		06/22/2018 09:49	1	2018.06.022LLIC ALA 006.d	GeminiC18 3x100 3(mm)
IC 320-230408/7		06/22/2018 09:57	1	2018.06.022LLIC ALA 007.d	GeminiC18 3x100 3(mm)
IC 320-230408/8		06/22/2018 10:05	1	2018.06.022LLIC ALA 008.d	GeminiC18 3x100 3(mm)
ICB 320-230408/9		06/22/2018 10:13	1	2018.06.022LLIC ALA 009.d	GeminiC18 3x100 3(mm)
ICV 320-230408/10		06/22/2018 10:20	1	2018.06.022LLIC ALA 010.d	GeminiC18 3x100 3(mm)
CCB 320-230408/11		06/22/2018 10:28	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/26/2018 23:17

Analysis Batch Number: 231134 End Date: 06/26/2018 23:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-231134/1		06/26/2018 23:17	1	2018.06.26LLC_001.d	GeminiC18 3x100 3(mm)
CCVL 320-231134/2		06/26/2018 23:24	1	2018.06.26LLC_002.d	GeminiC18 3x100 3(mm)
CCV 320-231134/3 CCVIS		06/26/2018 23:32	1	2018.06.26LLC_003.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/26/2018 23:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/26/2018 23:48	10		GeminiC18 3x100 3(mm)
CCV 320-231134/6		06/26/2018 23:56	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/27/2018 05:09

Analysis Batch Number: 231147 End Date: 06/27/2018 06:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-231147/1		06/27/2018 05:09	1	2018.06.26LLC_0 46.d	GeminiC18 3x100 3(mm)
MB 320-228913/1-A		06/27/2018 05:17	1	2018.06.26LLC_0 47.d	GeminiC18 3x100 3(mm)
LCS 320-228913/2-A		06/27/2018 05:25	1	2018.06.26LLC_0 48.d	GeminiC18 3x100 3(mm)
LCSD 320-228913/3-A		06/27/2018 05:32	1	2018.06.26LLC_0 49.d	GeminiC18 3x100 3(mm)
320-40153-1		06/27/2018 05:40	1	2018.06.26LLC_0 50.d	GeminiC18 3x100 3(mm)
320-40153-2		06/27/2018 05:48	1	2018.06.26LLC_0 51.d	GeminiC18 3x100 3(mm)
320-40153-3		06/27/2018 05:56	1	2018.06.26LLC_0 52.d	GeminiC18 3x100 3(mm)
320-40153-4		06/27/2018 06:04	1	2018.06.26LLC_0 53.d	GeminiC18 3x100 3(mm)
CCV 320-231147/9		06/27/2018 06:11	1	2018.06.26LLC_0 54.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/29/2018 21:29

Analysis Batch Number: 231836 End Date: 06/29/2018 22:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-231836/2		06/29/2018 21:29	1	2018.06.29LLICA LA 002.d	GeminiC18 3x100 3(mm)
IC 320-231836/3		06/29/2018 21:36	1	2018.06.29LLICA LA 003.d	GeminiC18 3x100 3(mm)
IC 320-231836/4		06/29/2018 21:44	1	2018.06.29LLICA LA 004.d	GeminiC18 3x100 3(mm)
IC 320-231836/5 ICIS		06/29/2018 21:52	1	2018.06.29LLICA LA 005.d	GeminiC18 3x100 3(mm)
IC 320-231836/6		06/29/2018 22:00	1	2018.06.29LLICA LA 006.d	GeminiC18 3x100 3(mm)
IC 320-231836/7		06/29/2018 22:08	1	2018.06.29LLICA LA 007.d	GeminiC18 3x100 3(mm)
IC 320-231836/8		06/29/2018 22:16	1	2018.06.29LLICA LA 008.d	GeminiC18 3x100 3(mm)
ICB 320-231836/9		06/29/2018 22:23	1	2018.06.29LLICA LA 009.d	GeminiC18 3x100 3(mm)
ICV 320-231836/10		06/29/2018 22:31	1	2018.06.29LLICA LA 010.d	GeminiC18 3x100 3(mm)
CCB 320-231836/11		06/29/2018 22:39	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/30/2018 00:13

Analysis Batch Number: 231842 End Date: 06/30/2018 01:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-231842/1		06/30/2018 00:13	1	2018.06.29LLBBX 014.d	GeminiC18 3x100 3(mm)
320-40153-1 DL		06/30/2018 01:08	10	2018.06.29LLBBX 021.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/30/2018 01:16	1		GeminiC18 3x100 3(mm)
CCV 320-231842/10		06/30/2018 01:24	1	2018.06.29LLBBX 023.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Batch Number: 228913 Batch Start Date: 06/13/18 15:12 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 06/13/18 21:50

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00073	LCPFC-IS 00056
MB 320-228913/1		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
LCS 320-228913/2		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
LCSD 320-228913/3		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
320-40153-A-1	TP-PFC-030-TPI	3535, EPA 537 (Mod)	T	312.32 g	28.65 g	283.7 mL	10 mL	500 uL	500 uL
320-40153-B-2	TP-PFC-030-MIDCA RBON	3535, EPA 537 (Mod)	T	328.18 g	28.92 g	299.3 mL	10 mL	500 uL	500 uL
320-40153-D-3	TP-PFC-030-TPE	3535, EPA 537 (Mod)	T	308.50 g	27.87 g	280.6 mL	10 mL	500 uL	500 uL
320-40153-C-4	TP-PFC-030-TPE-D	3535, EPA 537 (Mod)	T	304.85 g	27.75 g	277.1 mL	10 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00150					
MB 320-228913/1		3535, EPA 537 (Mod)							
LCS 320-228913/2		3535, EPA 537 (Mod)		500 uL					
LCSD 320-228913/3		3535, EPA 537 (Mod)		500 uL					
320-40153-A-1	TP-PFC-030-TPI	3535, EPA 537 (Mod)	T						
320-40153-B-2	TP-PFC-030-MIDCA RBON	3535, EPA 537 (Mod)	T						
320-40153-D-3	TP-PFC-030-TPE	3535, EPA 537 (Mod)	T						
320-40153-C-4	TP-PFC-030-TPE-D	3535, EPA 537 (Mod)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Batch Number: 228913 Batch Start Date: 06/13/18 15:12 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 06/13/18 21:50

Batch Notes	
Analyst ID - Aliquot Step	AME
Balance ID	QA-070
Batch Comment	Client labels match lab labels: AME, Envicarb Lot # 99684
Analyst ID - Final Volume Step	AME
H2O ID	6/12/18
Hexane ID	1270832
Internal Standard ID#	1265443
Manifold ID	10
Methanol ID	1270809
Sodium Hydroxide ID	1265514
Pipette ID	I46345G
Analyst ID - Reagent Drop	JER
Analyst ID - IS Reagent Drop	JER
Analyst ID - IS Reagent Drop Witness	AME
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	AME
Solvent Lot #	1271770
Solvent Name	0.3% NH3OH/ MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	Wax 500 mg
Solid Phase Extraction Disk ID	003637254A

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.

Method ID PFL

Analyst (Print Name) Lan / Alyssa

Reagent ID LC_80:20_0007

Date 6/28/18


Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
82 40455	1	10,000	15	300	20
40444	13	10,000	60	300	5
190-16512	1	10,000	60	300	20
↓	2	10,000	60	300	20
39942	6 6	10,000	60	300	20 5 ^{HW} 6/28/18
↓	22	10,000	150	300	2
190-16450	1	10,000	30	300	10
↓	2	↓	↓	↓	↓
↓	3	↓	↓	↓	↓
↓	4	↓	↓	↓	↓
↓	5	↓	↓	↓	↓
↓	6	↓	↓	↓	↓
30-40153	1	10,000	30	300	10
LW 6/28/18					

Comments:

Shipping and Receiving Documents

West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: <u>Jeff Orient</u>		Site Contact: <u>Kevin Lamontagne</u>		Date: <u>6/7/2018</u>		COC No: <u>240497</u>	
Company Name: <u>Tetra Tech</u>		Tel/Fax: <u>412-921-8650</u>		Lab Contact: <u>Rind Alltrick</u>		Carrier: <u>Fed Ex</u>		1 of 1 COCs	
Address: <u>881 Anderson Dr Foster Plaza</u>		Analysis Turnaround Time <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below _____ <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day							
City/State/Zip: <u>Pittsburg, PA 015210</u>									
Phone: <u>412-921-8650</u>									
Fax:									
Project Name: <u>Brunswick GWETS</u>									
Site: <u>Former NAS Brunswick</u>		Sample Date		Sample Time		Sample Type (C=Comp, G=Grab)		Matrix	
PO# <u>112608005-WE21</u>		Sample Date		Sample Time		Sample Type (C=Comp, G=Grab)		Matrix	
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=Grab)		Matrix	
TP-PFC-030-TPI		6/7/18		0935		G		W	
TP-PFC-030-MIDCARBON				0940					
TP-PFC-030-TPE				0945					
TP-PFC-030-TPE-D				0000					
Sample Specific Notes:		KPL		KPU		PFC (E-1115)			
 320-40153 Chain of Custody									
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____									
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown					<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months				
Special Instructions/QC Requirements & Comments:									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: <u>5.0</u> Corr'd: _____		Therm ID No.: <u>AK-6</u>			
Relinquished by: <u>[Signature]</u>		Company: <u>Tetra Tech</u>		Date/Time: <u>6/7/18 1430</u>		Received by: <u>[Signature]</u>		Company: <u>[Signature]</u>	
Relinquished by:		Company:		Date/Time:		Received by:		Company:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:	

Page 863 of 864

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-40153-1

SDG Number:

Login Number: 40153

List Number: 1

Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","300","ng/L","D","9.7","DL","","TRG","","","35","LOQ","NO",-99","","283.7","10","26",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","13","ng/L","U","6.3","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","13",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","190","ng/L","D","3.8","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","8.8",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","340","ng/L","D","4.1","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","8.8",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","13","ng/L","U","4.6","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","13",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1700","ng/L","D","4.8","DL","","TRG","","","18","LOQ","YES",-99","","283.7","10","13",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","8.8","ng/L","U","4.2","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","8.8",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","13","ng/L","U","4.9","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","13",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","360","ng/L","D","3.3","DL","","TRG","","","18","LOQ","YES",-99","","283.7","10","8.8",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","67","ng/L","D M","5.2","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","13",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","50","ng/L","D","4.1","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","8.8",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","71","ng/L","D","5.4","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","13",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","7.5","ng/L","J D","3.3","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","8.8",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","13","ng/L","U","4.6","DL","","TRG","","","18","LOQ","NO",-99","","283.7","10","13",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","26","ng/L","U","7.3","DL","","TRG","","","35","LOQ","NO",-99","","283.7","10","26",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","26","ng/L","U","6.7","DL","","TRG","","","35","LOQ","NO",-99","","283.7","10","26",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","26","ng/L","U","11","DL","","TRG","","","35","LOQ","NO",-99","","283.7","10","26",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00990","13C4 PFOA","81","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","88.1","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00991","13C4 PFOS","80","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","84.2","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00992","13C4 PFBA","82","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","88.1","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00993","13C2 PFHxA","82","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","88.1","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00994","18O2 PFHxS","80","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","83.4","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00995","13C5 PFNA","81","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","88.1","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00996","13C2 PFDA","84","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","88.1","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00997","13C2 PFUnA","83","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","88.1","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL00998","13C2 PFDoA","80","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","88.1","","283.7","10","880",""

"TP-PFC-030-TPI","EPA 537 (Mod)","DL","320-40153-1","TALSAC","STL01056","13C8

FOSA", "76", "ng/L", "", "-99", "DL", "", "TRG", "86", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "880", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "DL", "320-40153-1", "TALSAC", "STL01892", "13C4-
PFH_pA", "79", "ng/L", "", "-99", "DL", "", "TRG", "89", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "880", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "DL", "320-40153-1", "TALSAC", "STL01893", "13C5
PFPeA", "80", "ng/L", "", "-99", "DL", "", "TRG", "91", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "880", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "DL", "320-40153-1", "TALSAC", "STL02116", "13C2-
PFTeDA", "73", "ng/L", "", "-99", "DL", "", "TRG", "83", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "880", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "DL", "320-40153-1", "TALSAC", "STL02337", "13C3-
PFBS", "68", "ng/L", "", "-99", "DL", "", "TRG", "83", "", "-99", "LOQ", "YES", "82.0", "", "283.7", "10", "880", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)", "310", "ng/L", "", "0.97", "DL", "", "TRG", "", "", "3.5", "LOQ", "YES", "-99", "", "283.7", "10", "2.6", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)", "1.3", "ng/L", "U", "0.63", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "1.3", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)", "180", "ng/L", "", "0.38", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "0.88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFH_xA)", "330", "ng/L", "", "0.41", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "0.88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)", "1.3", "ng/L", "U", "0.46", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "1.3", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "1300", "ng/L", "M E", "0.48", "DL", "", "TRG", "", "", "1.8", "LOQ", "NO", "-99", "", "283.7", "10", "1.3", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)", "0.71", "ng/L", "J M", "0.42", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "0.88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)", "1.3", "ng/L", "U", "0.49", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "1.3", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFH_xS)", "350", "ng/L", "E", "0.33", "DL", "", "TRG", "", "", "1.8", "LOQ", "NO", "-99", "", "283.7", "10", "0.88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)", "64", "ng/L", "M", "0.52", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "1.3", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "48", "ng/L", "", "0.41", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "0.88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFH_pA)", "65", "ng/L", "", "0.54", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "1.3", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid
(PFH_pS)", "7.1", "ng/L", "", "0.33", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "0.88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "2.4", "ng/L", "", "0.46", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "283.7", "10", "1.3", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)", "2.6", "ng/L", "U", "0.73", "DL", "", "TRG", "", "", "3.5", "LOQ", "YES", "-99", "", "283.7", "10", "2.6", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)", "2.6", "ng/L", "U", "0.67", "DL", "", "TRG", "", "", "3.5", "LOQ", "YES", "-99", "", "283.7", "10", "2.6", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide
(FOSA)", "2.6", "ng/L", "U", "1.1", "DL", "", "TRG", "", "", "3.5", "LOQ", "YES", "-99", "", "283.7", "10", "2.6", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00990", "13C4
PFOA", "76", "ng/L", "", "-99", "DL", "", "TRG", "87", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00991", "13C4
PFOS", "87", "ng/L", "", "-99", "DL", "", "TRG", "103", "", "-99", "LOQ", "YES", "84.2", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00992", "13C4
PFBA", "97", "ng/L", "", "-99", "DL", "", "TRG", "110", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00993", "13C2
PFH_xA", "88", "ng/L", "", "-99", "DL", "", "TRG", "99", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00994", "18O2
PFH_xS", "79", "ng/L", "", "-99", "DL", "", "TRG", "95", "", "-99", "LOQ", "YES", "83.4", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00995", "13C5

PFNA", "93", "ng/L", "", "-99", "DL", "", "TRG", "105", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00996", "13C2
PFDA", "98", "ng/L", "", "-99", "DL", "", "TRG", "111", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00997", "13C2
PFUnA", "96", "ng/L", "", "-99", "DL", "", "TRG", "109", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL00998", "13C2
PFDaA", "85", "ng/L", "", "-99", "DL", "", "TRG", "96", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL01056", "13C8
FOSA", "86", "ng/L", "", "-99", "DL", "", "TRG", "97", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL01892", "13C4-
PFHpA", "94", "ng/L", "", "-99", "DL", "", "TRG", "107", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL01893", "13C5
PFPeA", "86", "ng/L", "", "-99", "DL", "", "TRG", "97", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL02116", "13C2-
PFTeDA", "95", "ng/L", "", "-99", "DL", "", "TRG", "108", "", "-99", "LOQ", "YES", "88.1", "", "283.7", "10", "88", ""
"TP-PFC-030-TPI", "EPA 537 (Mod)", "RES", "320-40153-1", "TALSAC", "STL02337", "13C3-
PFBS", "78", "ng/L", "", "-99", "DL", "", "TRG", "96", "", "-99", "LOQ", "YES", "82.0", "", "283.7", "10", "88", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "1763-23-
1", "Perfluorooctanesulfonic acid
(PFOS)", "2.5", "ng/L", "U", "0.92", "DL", "", "TRG", "", "", "3.3", "LOQ", "YES", "-99", "", "299.3", "10", "2.5", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "2058-94-8", "Perfluoroundecanoic
acid (PFUnA)", "1.3", "ng/L", "U", "0.60", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "1.3", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "2706-90-3", "Perfluoropentanoic
acid (PFPeA)", "240", "ng/L", "", "0.36", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "0.84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "307-24-4", "Perfluorohexanoic
acid (PFHxA)", "190", "ng/L", "", "0.39", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "0.84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "307-55-1", "Perfluorododecanoic
acid (PFDaA)", "1.3", "ng/L", "U", "0.43", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "1.3", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "335-67-1", "Perfluorooctanoic
acid (PFOA)", "46", "ng/L", "M", "0.45", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "1.3", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "335-76-2", "Perfluorodecanoic
acid (PFDA)", "0.84", "ng/L", "U", "0.40", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "0.84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "335-77-
3", "Perfluorodecanesulfonic acid
(PFDS)", "1.3", "ng/L", "U", "0.47", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "1.3", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "355-46-
4", "Perfluorohexanesulfonic acid
(PFHxS)", "3.2", "ng/L", "", "0.32", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "0.84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "375-22-4", "Perfluorobutanoic
acid (PFBA)", "110", "ng/L", "", "0.49", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "1.3", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "375-73-
5", "Perfluorobutanesulfonic acid
(PFBS)", "7.3", "ng/L", "", "0.38", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "0.84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "375-85-9", "Perfluoroheptanoic
acid (PFHpA)", "7.8", "ng/L", "", "0.51", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "1.3", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "375-92-
8", "Perfluoroheptanesulfonic Acid
(PFHpS)", "0.84", "ng/L", "U", "0.31", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "0.84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "375-95-1", "Perfluorononanoic
acid (PFNA)", "1.3", "ng/L", "U", "0.43", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "299.3", "10", "1.3", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "376-06-
7", "Perfluorotetradecanoic acid
(PFTeA)", "2.5", "ng/L", "U", "0.69", "DL", "", "TRG", "", "", "3.3", "LOQ", "YES", "-99", "", "299.3", "10", "2.5", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "72629-94-

8", "Perfluorotridecanoic Acid

(PFTriA)", "2.5", "ng/L", "U", "0.63", "DL", "", "TRG", "", "", "3.3", "LOQ", "YES", "-99", "", "299.3", "10", "2.5", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "754-91-6", "Perfluorooctane
Sulfonamide (FOSA)", "2.5", "ng/L", "U", "1.1", "DL", "", "TRG", "", "", "3.3", "LOQ", "YES", "-99", "", "299.3", "10", "2.5", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00990", "13C4
PFOA", "74", "ng/L", "", "-99", "DL", "", "TRG", "88", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00991", "13C4
PFOS", "62", "ng/L", "", "-99", "DL", "", "TRG", "77", "", "-99", "LOQ", "YES", "79.9", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00992", "13C4
PFBA", "76", "ng/L", "", "-99", "DL", "", "TRG", "91", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00993", "13C2
PFHxA", "72", "ng/L", "", "-99", "DL", "", "TRG", "86", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00994", "18O2
PFHxS", "63", "ng/L", "", "-99", "DL", "", "TRG", "80", "", "-99", "LOQ", "YES", "79.0", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00995", "13C5
PFNA", "72", "ng/L", "", "-99", "DL", "", "TRG", "86", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00996", "13C2
PFDA", "75", "ng/L", "", "-99", "DL", "", "TRG", "90", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00997", "13C2
PFUnA", "70", "ng/L", "", "-99", "DL", "", "TRG", "84", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL00998", "13C2
PFDaA", "62", "ng/L", "", "-99", "DL", "", "TRG", "74", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL01056", "13C8
FOSA", "66", "ng/L", "", "-99", "DL", "", "TRG", "79", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL01892", "13C4-
PFHpA", "79", "ng/L", "", "-99", "DL", "", "TRG", "94", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL01893", "13C5
PFPeA", "66", "ng/L", "", "-99", "DL", "", "TRG", "79", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL02116", "13C2-
PFTeDA", "67", "ng/L", "", "-99", "DL", "", "TRG", "80", "", "-99", "LOQ", "YES", "83.5", "", "299.3", "10", "84", ""
"TP-PFC-030-MIDCARBON", "EPA 537 (Mod)", "RES", "320-40153-2", "TALSAC", "STL02337", "13C3-
PFBS", "60", "ng/L", "", "-99", "DL", "", "TRG", "77", "", "-99", "LOQ", "YES", "77.7", "", "299.3", "10", "84", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)", "2.7", "ng/L", "U", "0.98", "DL", "", "TRG", "", "", "3.6", "LOQ", "YES", "-99", "", "280.6", "10", "2.7", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)", "1.3", "ng/L", "U", "0.64", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "1.3", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)", "200", "ng/L", "", "0.38", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "0.89", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)", "88", "ng/L", "", "0.42", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "0.89", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDaA)", "1.3", "ng/L", "U", "0.46", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "1.3", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "3.7", "ng/L", "M", "0.48", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "1.3", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)", "0.89", "ng/L", "U", "0.43", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "0.89", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)", "1.3", "ng/L", "U", "0.50", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "1.3", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)", "0.40", "ng/L", "J", "0.34", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "0.89", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)", "110", "ng/L", "", "0.53", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "1.3", ""
"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "1.8", "ng/L", "", "0.41", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "0.89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "1.7", "ng/L", "J", "0.54", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "1.3", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid (PFHpS)", "0.89", "ng/L", "U", "0.33", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "0.89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "1.3", "ng/L", "U", "0.46", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "280.6", "10", "1.3", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid (PFTeA)", "2.7", "ng/L", "U", "0.74", "DL", "", "TRG", "", "", "3.6", "LOQ", "YES", "-99", "", "280.6", "10", "2.7", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid (PFTriA)", "2.7", "ng/L", "U", "0.68", "DL", "", "TRG", "", "", "3.6", "LOQ", "YES", "-99", "", "280.6", "10", "2.7", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide (FOSA)", "2.7", "ng/L", "U", "1.2", "DL", "", "TRG", "", "", "3.6", "LOQ", "YES", "-99", "", "280.6", "10", "2.7", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00990", "13C4 PFOA", "84", "ng/L", "", "-99", "DL", "", "TRG", "95", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00991", "13C4 PFOS", "72", "ng/L", "", "-99", "DL", "", "TRG", "85", "", "-99", "LOQ", "YES", "85.2", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00992", "13C4 PFBA", "83", "ng/L", "", "-99", "DL", "", "TRG", "93", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00993", "13C2 PFHxA", "77", "ng/L", "", "-99", "DL", "", "TRG", "87", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00994", "18O2 PFHxS", "70", "ng/L", "", "-99", "DL", "", "TRG", "83", "", "-99", "LOQ", "YES", "84.3", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00995", "13C5 PFNA", "78", "ng/L", "", "-99", "DL", "", "TRG", "87", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00996", "13C2 PFDA", "80", "ng/L", "", "-99", "DL", "", "TRG", "90", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00997", "13C2 PFUnA", "76", "ng/L", "", "-99", "DL", "", "TRG", "86", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL00998", "13C2 PFDaA", "70", "ng/L", "", "-99", "DL", "", "TRG", "78", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL01056", "13C8 FOSA", "71", "ng/L", "", "-99", "DL", "", "TRG", "79", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL01892", "13C4-PFHpA", "84", "ng/L", "", "-99", "DL", "", "TRG", "94", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL01893", "13C5 PFPeA", "73", "ng/L", "", "-99", "DL", "", "TRG", "82", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL02116", "13C2-PFTeDA", "71", "ng/L", "", "-99", "DL", "", "TRG", "79", "", "-99", "LOQ", "YES", "89.1", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE", "EPA 537 (Mod)", "RES", "320-40153-3", "TALSAC", "STL02337", "13C3-PFBS", "69", "ng/L", "", "-99", "DL", "", "TRG", "83", "", "-99", "LOQ", "YES", "82.9", "", "280.6", "10", "89", ""

"TP-PFC-030-TPE-D", "EPA 537 (Mod)", "RES", "320-40153-4", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "2.7", "ng/L", "U", "0.99", "DL", "", "TRG", "", "", "3.6", "LOQ", "YES", "-99", "", "277.1", "10", "2.7", ""

"TP-PFC-030-TPE-D", "EPA 537 (Mod)", "RES", "320-40153-4", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid (PFUnA)", "1.4", "ng/L", "U", "0.65", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "277.1", "10", "1.4", ""

"TP-PFC-030-TPE-D", "EPA 537 (Mod)", "RES", "320-40153-4", "TALSAC", "2706-90-3", "Perfluoropentanoic acid (PFPeA)", "190", "ng/L", "", "0.39", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "277.1", "10", "0.90", ""

"TP-PFC-030-TPE-D", "EPA 537 (Mod)", "RES", "320-40153-4", "TALSAC", "307-24-4", "Perfluorohexanoic acid (PFHxA)", "90", "ng/L", "", "0.42", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "277.1", "10", "0.90", ""

"TP-PFC-030-TPE-D", "EPA 537 (Mod)", "RES", "320-40153-4", "TALSAC", "307-55-1", "Perfluorododecanoic acid (PFDaA)", "1.4", "ng/L", "U", "0.47", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "277.1", "10", "1.4", ""

"TP-PFC-030-TPE-D", "EPA 537 (Mod)", "RES", "320-40153-4", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "3.6", "ng/L", "M", "0.49", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "277.1", "10", "1.4", ""

"TP-PFC-030-TPE-D", "EPA 537 (Mod)", "RES", "320-40153-4", "TALSAC", "335-76-2", "Perfluorodecanoic acid (PFDA)", "0.90", "ng/L", "U", "0.43", "DL", "", "TRG", "", "", "1.8", "LOQ", "YES", "-99", "", "277.1", "10", "0.90", ""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.4","ng/L","U","0.51","DL","","TRG","","","1.8","LOQ","YES","-99","","277.1","10","1.4",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","0.37","ng/L","J","0.34","DL","","TRG","","","1.8","LOQ","YES","-99","","277.1","10","0.90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","110","ng/L","","0.53","DL","","TRG","","","1.8","LOQ","YES","-99","","277.1","10","1.4",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","1.8","ng/L","","0.42","DL","","TRG","","","1.8","LOQ","YES","-99","","277.1","10","0.90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.6","ng/L","J","0.55","DL","","TRG","","","1.8","LOQ","YES","-99","","277.1","10","1.4",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","0.90","ng/L","U","0.33","DL","","TRG","","","1.8","LOQ","YES","-99","","277.1","10","0.90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.4","ng/L","U M","0.47","DL","","TRG","","","1.8","LOQ","YES","-99","","277.1","10","1.4",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","2.7","ng/L","U","0.75","DL","","TRG","","","3.6","LOQ","YES","-99","","277.1","10","2.7",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.7","ng/L","U","0.69","DL","","TRG","","","3.6","LOQ","YES","-99","","277.1","10","2.7",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.7","ng/L","U","1.2","DL","","TRG","","","3.6","LOQ","YES","-99","","277.1","10","2.7",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00990","13C4 PFOA","82","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00991","13C4 PFOS","72","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","86.3","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00992","13C4 PFBA","82","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00993","13C2 PFHxA","75","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00994","18O2 PFHxS","71","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","85.3","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00995","13C5 PFNA","79","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00996","13C2 PFDA","79","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00997","13C2 PFUnA","77","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL00998","13C2 PFDaA","69","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL01056","13C8 FOSA","71","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL01892","13C4-PFHpA","83","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL01893","13C5 PFPeA","72","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL02116","13C2-PFTeDA","70","ng/L","","-99","DL","","TRG","77","","-99","LOQ","YES","90.2","","277.1","10","90",""

"TP-PFC-030-TPE-D","EPA 537 (Mod)","RES","320-40153-4","TALSAC","STL02337","13C3-PFBS","66","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","83.9","","277.1","10","90",""

"LCS 320-228913/2-A","EPA 537 (Mod)","RES","LCS 320-228913/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","34.3","ng/L","M","1.1","DL","","SPK","92","","4.0","LOQ","YES","37.1","","250","10","3.0",""

"LCS 320-228913/2-A","EPA 537 (Mod)","RES","LCS 320-228913/2-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","34.8","ng/L","","0.72","DL","","SPK","87","","2.0","LOQ","YES","40.0","","250","10","1.5",""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "2706-90-3", "Perfluoropentanoic acid (PFPeA)", "33.9", "ng/L", "", "0.43", "DL", "", "SPK", "85", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "307-24-4", "Perfluorohexanoic acid (PFHxA)", "35.7", "ng/L", "", "0.47", "DL", "", "SPK", "89", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "307-55-1", "Perfluorododecanoic acid (PFDoA)", "37.9", "ng/L", "", "0.52", "DL", "", "SPK", "95", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.5", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "33.6", "ng/L", "", "0.54", "DL", "", "SPK", "84", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.5", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "335-76-2", "Perfluorodecanoic acid (PFDA)", "37.2", "ng/L", "", "0.48", "DL", "", "SPK", "93", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid (PFDS)", "32.6", "ng/L", "", "0.56", "DL", "", "SPK", "85", "", "2.0", "LOQ", "YES", "38.6", "", "250", "10", "1.5", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "31.8", "ng/L", "", "0.38", "DL", "", "SPK", "87", "", "2.0", "LOQ", "YES", "36.4", "", "250", "10", "1.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "375-22-4", "Perfluorobutanoic acid (PFBA)", "36.1", "ng/L", "", "0.59", "DL", "", "SPK", "90", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.5", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "32.4", "ng/L", "", "0.46", "DL", "", "SPK", "92", "", "2.0", "LOQ", "YES", "35.4", "", "250", "10", "1.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "34.4", "ng/L", "", "0.61", "DL", "", "SPK", "86", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.5", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid (PFHpS)", "34.3", "ng/L", "", "0.37", "DL", "", "SPK", "90", "", "2.0", "LOQ", "YES", "38.1", "", "250", "10", "1.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "34.5", "ng/L", "", "0.52", "DL", "", "SPK", "86", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10", "1.5", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid (PFTeA)", "42.2", "ng/L", "", "0.83", "DL", "", "SPK", "105", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10", "3.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid (PFTriA)", "41.7", "ng/L", "", "0.76", "DL", "", "SPK", "104", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10", "3.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide (FOSA)", "36.1", "ng/L", "", "1.3", "DL", "", "SPK", "90", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10", "3.0", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00990", "13C4 PFOA", "89.6", "ng/L", "", "-99", "DL", "", "SPK", "90", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00991", "13C4 PFOS", "76.6", "ng/L", "", "-99", "DL", "", "SPK", "80", "", "-99", "LOQ", "YES", "95.6", "", "250", "10", "100", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00992", "13C4 PFBA", "89.9", "ng/L", "", "-99", "DL", "", "SPK", "90", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00993", "13C2 PFHxA", "83.9", "ng/L", "", "-99", "DL", "", "SPK", "84", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00994", "18O2 PFHxS", "74.2", "ng/L", "", "-99", "DL", "", "SPK", "78", "", "-99", "LOQ", "YES", "94.6", "", "250", "10", "100", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00995", "13C5 PFNA", "88.4", "ng/L", "", "-99", "DL", "", "SPK", "88", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00996", "13C2 PFDA", "87.5", "ng/L", "", "-99", "DL", "", "SPK", "88", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00997", "13C2 PFUnA", "86.0", "ng/L", "", "-99", "DL", "", "SPK", "86", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""

"LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL00998", "13C2

PFD0A", "73.1", "ng/L", "", "-99", "DL", "", "SPK", "73", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
 "LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL01056", "13C8
 FOSA", "78.3", "ng/L", "", "-99", "DL", "", "SPK", "78", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
 "LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL01892", "13C4-
 PFHpA", "90.6", "ng/L", "", "-99", "DL", "", "SPK", "91", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
 "LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL01893", "13C5
 PFPeA", "83.2", "ng/L", "", "-99", "DL", "", "SPK", "83", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
 "LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL02116", "13C2-
 PFTeDA", "69.2", "ng/L", "", "-99", "DL", "", "SPK", "69", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
 "LCS 320-228913/2-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/2-A", "TALSAC", "STL02337", "13C3-
 PFBS", "72.5", "ng/L", "", "-99", "DL", "", "SPK", "78", "", "-99", "LOQ", "YES", "93.0", "", "250", "10", "100", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "1763-23-
 1", "Perfluorooctanesulfonic acid
 (PFOS)", "34.2", "ng/L", "M", "1.1", "DL", "", "SPK", "92", "0", "4.0", "LOQ", "YES", "37.1", "LCS 320-228913/2-
 A", "250", "10", "3.0", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "2058-94-
 8", "Perfluoroundecanoic acid
 (PFUnA)", "36.9", "ng/L", "", "0.72", "DL", "", "SPK", "92", "6", "2.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-
 A", "250", "10", "1.5", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "2706-90-
 3", "Perfluoropentanoic acid
 (PFPeA)", "35.7", "ng/L", "", "0.43", "DL", "", "SPK", "89", "5", "2.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-
 A", "250", "10", "1.0", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "307-24-
 4", "Perfluorohexanoic acid
 (PFHxA)", "34.0", "ng/L", "", "0.47", "DL", "", "SPK", "85", "5", "2.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-
 A", "250", "10", "1.0", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "307-55-
 1", "Perfluorododecanoic acid
 (PFD0A)", "40.1", "ng/L", "", "0.52", "DL", "", "SPK", "100", "6", "2.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-
 A", "250", "10", "1.5", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "335-67-
 1", "Perfluorooctanoic acid (PFOA)", "36.4", "ng/L", "", "0.54", "DL", "", "SPK", "91", "8", "2.0", "LOQ", "YES", "40.0", "LCS
 320-228913/2-A", "250", "10", "1.5", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "335-76-
 2", "Perfluorodecanoic acid (PFDA)", "35.2", "ng/L", "", "0.48", "DL", "", "SPK", "88", "6", "2.0", "LOQ", "YES", "40.0", "LCS
 320-228913/2-A", "250", "10", "1.0", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "335-77-
 3", "Perfluorodecanesulfonic acid
 (PFDS)", "35.5", "ng/L", "", "0.56", "DL", "", "SPK", "92", "9", "2.0", "LOQ", "YES", "38.6", "LCS 320-228913/2-
 A", "250", "10", "1.5", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "355-46-
 4", "Perfluorohexanesulfonic acid
 (PFHxS)", "32.4", "ng/L", "", "0.38", "DL", "", "SPK", "89", "2", "2.0", "LOQ", "YES", "36.4", "LCS 320-228913/2-
 A", "250", "10", "1.0", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "375-22-
 4", "Perfluorobutanoic acid (PFBA)", "36.3", "ng/L", "", "0.59", "DL", "", "SPK", "91", "0", "2.0", "LOQ", "YES", "40.0", "LCS
 320-228913/2-A", "250", "10", "1.5", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "375-73-
 5", "Perfluorobutanesulfonic acid
 (PFBS)", "32.3", "ng/L", "", "0.46", "DL", "", "SPK", "91", "0", "2.0", "LOQ", "YES", "35.4", "LCS 320-228913/2-
 A", "250", "10", "1.0", ""
 "LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "375-85-
 9", "Perfluoroheptanoic acid

(PFHpA)", "33.8", "ng/L", "", "0.61", "DL", "", "SPK", "85", "2", "2.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-A", "250", "10", "1.5", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid

(PFHpS)", "36.4", "ng/L", "", "0.37", "DL", "", "SPK", "96", "6", "2.0", "LOQ", "YES", "38.1", "LCS 320-228913/2-A", "250", "10", "1.0", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "36.4", "ng/L", "", "0.52", "DL", "", "SPK", "91", "6", "2.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-A", "250", "10", "1.5", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid

(PFTeA)", "36.7", "ng/L", "", "0.83", "DL", "", "SPK", "92", "14", "4.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-A", "250", "10", "3.0", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid

(PFTriA)", "39.5", "ng/L", "", "0.76", "DL", "", "SPK", "99", "5", "4.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-A", "250", "10", "3.0", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide (FOSA)", "37.3", "ng/L", "", "1.3", "DL", "", "SPK", "93", "3", "4.0", "LOQ", "YES", "40.0", "LCS 320-228913/2-A", "250", "10", "3.0", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00990", "13C4 PFOA", "88.5", "ng/L", "", "-99", "DL", "", "SPK", "89", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00991", "13C4 PFOS", "78.5", "ng/L", "", "-99", "DL", "", "SPK", "82", "", "-99", "LOQ", "YES", "95.6", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00992", "13C4 PFBA", "92.6", "ng/L", "", "-99", "DL", "", "SPK", "93", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00993", "13C2 PFHxA", "90.0", "ng/L", "", "-99", "DL", "", "SPK", "90", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00994", "18O2 PFHxS", "77.7", "ng/L", "", "-99", "DL", "", "SPK", "82", "", "-99", "LOQ", "YES", "94.6", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00995", "13C5 PFNA", "85.8", "ng/L", "", "-99", "DL", "", "SPK", "86", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00996", "13C2 PFDA", "91.7", "ng/L", "", "-99", "DL", "", "SPK", "92", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00997", "13C2 PFUnA", "79.6", "ng/L", "", "-99", "DL", "", "SPK", "80", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL00998", "13C2 PFDaA", "75.9", "ng/L", "", "-99", "DL", "", "SPK", "76", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL01056", "13C8 FOSA", "77.5", "ng/L", "", "-99", "DL", "", "SPK", "77", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL01892", "13C4-PFHpA", "90.1", "ng/L", "", "-99", "DL", "", "SPK", "90", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""

"LCS 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCS 320-228913/3-A", "TALSAC", "STL01893", "13C5

PFPeA", "82.4", "ng/L", "", "-99", "DL", "", "SPK", "82", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""
"LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "STL02116", "13C2-PFTeDA", "74.5", "ng/L", "", "-99", "DL", "", "SPK", "74", "", "-99", "LOQ", "YES", "100", "LCS 320-228913/2-A", "250", "10", "100", ""
"LCSD 320-228913/3-A", "EPA 537 (Mod)", "RES", "LCSD 320-228913/3-A", "TALSAC", "STL02337", "13C3-PFBS", "74.9", "ng/L", "", "-99", "DL", "", "SPK", "81", "", "-99", "LOQ", "YES", "93.0", "LCS 320-228913/2-A", "250", "10", "100", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "3.0", "ng/L", "U", "1.1", "DL", "", "TRG", "", "", "4.0", "LOQ", "YES", "-99", "", "250", "10", "3.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid (PFUnA)", "1.5", "ng/L", "U", "0.72", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.5", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "2706-90-3", "Perfluoropentanoic acid (PFPeA)", "1.0", "ng/L", "U", "0.43", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "307-24-4", "Perfluorohexanoic acid (PFHxA)", "1.0", "ng/L", "U", "0.47", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "307-55-1", "Perfluorododecanoic acid (PFDoA)", "1.5", "ng/L", "U", "0.52", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.5", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "1.5", "ng/L", "U", "0.54", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.5", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "335-76-2", "Perfluorodecanoic acid (PFDA)", "1.0", "ng/L", "U", "0.48", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid (PFDS)", "1.5", "ng/L", "U", "0.56", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.5", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "1.0", "ng/L", "U", "0.38", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "375-22-4", "Perfluorobutanoic acid (PFBA)", "1.5", "ng/L", "U", "0.59", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.5", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "1.0", "ng/L", "U", "0.46", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "1.5", "ng/L", "U", "0.61", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.5", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid (PFHpS)", "1.0", "ng/L", "U", "0.37", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "1.5", "ng/L", "U", "0.52", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "250", "10", "1.5", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid (PFTeA)", "3.0", "ng/L", "U", "0.83", "DL", "", "TRG", "", "", "4.0", "LOQ", "YES", "-99", "", "250", "10", "3.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid (PFTriA)", "3.0", "ng/L", "U", "0.76", "DL", "", "TRG", "", "", "4.0", "LOQ", "YES", "-99", "", "250", "10", "3.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide (FOSA)", "3.0", "ng/L", "U", "1.3", "DL", "", "TRG", "", "", "4.0", "LOQ", "YES", "-99", "", "250", "10", "3.0", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "STL00990", "13C4 PFOA", "94.9", "ng/L", "", "-99", "DL", "", "TRG", "95", "", "-99", "LOQ", "YES", "100", "", "250", "10", "100", ""
"MB 320-228913/1-A", "EPA 537 (Mod)", "RES", "MB 320-228913/1-A", "TALSAC", "STL00991", "13C4 PFOS", "80.9", "ng/L", "", "-99", "DL", "", "TRG", "85", "", "-99", "LOQ", "YES", "95.6", "", "250", "10", "100", ""

"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL00992","13C4
PFBA","92.7","ng/L","",-99,"DL","",,"TRG","93","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL00993","13C2
PFHxA","89.0","ng/L","",-99,"DL","",,"TRG","89","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL00994","18O2
PFHxS","76.9","ng/L","",-99,"DL","",,"TRG","81","",-99,"LOQ","YES","94.6","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL00995","13C5
PFNA","92.5","ng/L","",-99,"DL","",,"TRG","92","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL00996","13C2
PFDA","89.3","ng/L","",-99,"DL","",,"TRG","89","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL00997","13C2
PFUnA","90.0","ng/L","",-99,"DL","",,"TRG","90","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL00998","13C2
PFDaA","83.9","ng/L","",-99,"DL","",,"TRG","84","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL01056","13C8
FOSA","78.3","ng/L","",-99,"DL","",,"TRG","78","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL01892","13C4-
PFHpA","92.7","ng/L","",-99,"DL","",,"TRG","93","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL01893","13C5
PFPeA","87.6","ng/L","",-99,"DL","",,"TRG","88","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL02116","13C2-
PFTeDA","81.1","ng/L","",-99,"DL","",,"TRG","81","",-99,"LOQ","YES","100","",,"250","10","100",""
"MB 320-228913/1-A","EPA 537 (Mod)","RES","MB 320-228913/1-A","TALSAC","STL02337","13C3-
PFBS","76.7","ng/L","",-99,"DL","",,"TRG","82","",-99,"LOQ","YES","93.0","",,"250","10","100",""
"Unknown","Unknown","TP-PFC-030-TPI","06/07/2018 09:35","AQ","320-40153-1","NM","",,"5.60","EPA 537
(Mod)","3535","RES","06/13/2018 15:12","06/27/2018
05:40","TALSAC","COA","WET","NA","1","NA","NA","",,"100","320-228913","320-228913","NA","320-
231147","320-40153-1","06/08/2018 09:00","06/11/2018 17:16",""
"Unknown","Unknown","TP-PFC-030-TPI","06/07/2018 09:35","AQ","320-40153-1","NM","",,"5.60","EPA 537
(Mod)","3535","DL","06/13/2018 15:12","06/30/2018
01:08","TALSAC","COA","WET","NA","10","NA","NA","",,"100","320-228913","320-228913","NA","320-
231842","320-40153-1","06/08/2018 09:00","06/11/2018 17:16",""
"Unknown","Unknown","TP-PFC-030-MIDCARBON","06/07/2018 09:40","AQ","320-40153-
2","NM","",,"5.60","EPA 537 (Mod)","3535","RES","06/13/2018 15:12","06/27/2018
05:48","TALSAC","COA","WET","NA","1","NA","NA","",,"100","320-228913","320-228913","NA","320-
231147","320-40153-1","06/08/2018 09:00","06/11/2018 17:16",""
"Unknown","Unknown","TP-PFC-030-TPE","06/07/2018 09:45","AQ","320-40153-3","NM","",,"5.60","EPA 537
(Mod)","3535","RES","06/13/2018 15:12","06/27/2018
05:56","TALSAC","COA","WET","NA","1","NA","NA","",,"100","320-228913","320-228913","NA","320-
231147","320-40153-1","06/08/2018 09:00","06/11/2018 17:16",""
"Unknown","Unknown","TP-PFC-030-TPE-D","06/07/2018 00:00","AQ","320-40153-4","NM","",,"5.60","EPA 537
(Mod)","3535","RES","06/13/2018 15:12","06/27/2018
06:04","TALSAC","COA","WET","NA","1","NA","NA","",,"100","320-228913","320-228913","NA","320-
231147","320-40153-1","06/08/2018 09:00","06/11/2018 17:16",""
"Unknown","Unknown","LCS 320-228913/2-A","",,"AQ","LCS 320-228913/2-A","LCS","",-99,"EPA 537
(Mod)","3535","RES","06/13/2018 15:12","06/27/2018
05:25","TALSAC","COA","WET","NA","1","NA","NA","",,"100","320-228913","320-228913","NA","320-
231147","320-40153-1","06/13/2018 15:12","06/11/2018 17:16",""
"Unknown","Unknown","LCSD 320-228913/3-A","",,"AQ","LCSD 320-228913/3-A","LCSD","",-99,"EPA 537
(Mod)","3535","RES","06/13/2018 15:12","06/27/2018
05:32","TALSAC","COA","WET","NA","1","NA","NA","",,"100","320-228913","320-228913","NA","320-
231147","320-40153-1","06/13/2018 15:12","06/11/2018 17:16",""
"Unknown","Unknown","MB 320-228913/1-A","",,"AQ","MB 320-228913/1-A","MB","",-99,"EPA 537
(Mod)","3535","RES","06/13/2018 15:12","06/27/2018

05:17","TALSAC","COA","WET","NA","1","NA","NA","","100","320-228913","320-228913","NA","320-231147","320-40153-1","06/13/2018 15:12","06/11/2018 17:16",""

PFAS

The following compound was detected in the Initial/Continuing Calibration Blanks (ICB/CCBs) at the following maximum concentration affecting all samples:

<u>Analyte</u>	<u>Maximum Concentration (ng/ml)</u>	<u>Action Level Limit of Quantitation (LOQ) > or < < LOQ</u>
Perfluorohexanesulfonic acid (PFHxS)	0.0086	

The detected results reported for PFHxS reported below the Limit of Detection (LOD) was raised to LOD and qualified as non-detected, (U).

NOTES

The injected internal standard compound, 13C2-perfluorooctanoic acid (13C2-PFOA), had an area below the 50% quality control limit in the diluted analysis of sample TP-PFC-030-TPI. No action was taken because the sample was diluted ten times and the internal standard response varied as a result of the dilution.

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentrations of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)) and PFHxS exceeded the instrument calibration range in sample TP-PFC-030-TPI. The sample was reanalyzed at a 10X dilution. The results for these compounds from the dilution were used in the data validation.

Detected results reported below the LOQ but above the Detection Limit (DL) were qualified as estimated, (J). Non-detected results are reported to LOD.

EXECUTIVE SUMMARY

Laboratory Performance: A contaminant was detected in the ICB and CCBs. The injected internal standard area was low in the diluted sample.

Other Factors Affecting Data Quality: One sample was further diluted. Detected results below the LOQ were estimated.

TO: J. ORIENT
SDGs: 320-40153-1

PAGE 3

The data for these analyses were reviewed with reference to the EPA New England Environmental Data Review Supplement for Regional Data Review Elements Superfund Guidance/Procedures (April 2013), National Functional Guidelines for Organic Data Validation (January 2017), and the Department of Defense (DoD) document entitled, "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013). The text of this report has been formulated to address only those areas affecting data quality.



Tetra Tech, Inc.
Michelle L. Woeber
Environmental Chemist



Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

Appendix A - Qualified Analytical Results
Appendix B - Results as reported by the Laboratory
Appendix C - Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

APPENDIX A

QUALIFIED LABORATORY RESULTS

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors $>40\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCANOIC ACID (PFOA)	46			3.7			3.6					
PERFLUOROBUTANESULFONIC ACID (PFBS)	7.3			1.8			1.8			48		
PERFLUOROBUTANOIC ACID (PFBA)	110			110			110			64		
PERFLUORODECANESULFONIC ACID (PFDS)	1.3 U			1.3 U			1.4 U			1.3 U		
PERFLUORODECANOIC ACID (PFDA)	0.84 U			0.89 U			0.9 U			0.71 J		P
PERFLUORODODECANOIC ACID (PFDOA)	1.3 U			1.3 U			1.4 U			1.3 U		
PERFLUOROHEPTANESULFONIC ACID	0.84 U			0.89 U			0.9 U			7.1		
PERFLUOROHEPTANOIC ACID (PFHPA)	7.8			1.7 J		P	1.6 J		P	65		
PERFLUOROHEXANESULFONIC ACID (PFHXS)	3.2			0.89 U		A	0.9 U		A			
PERFLUOROHEXANOIC ACID (PFHXA)	190			88			90			330		
PERFLUORONONANOIC ACID (PFNA)	1.3 U			1.3 U			1.4 U			2.4		
PERFLUOROOCOTANE SULFONAMIDE (FOSA)	2.5 U			2.7 U			2.7 U			2.6 U		
PERFLUOROOCOTANESULFONIC ACID (PFOS)	2.5 U			2.7 U			2.7 U			310		
PERFLUOROPENTANOIC ACID (PFPEA)	240			200			190			180		
PERFLUOROTETRADECANOIC ACID (PFTEA)	2.5 U			2.7 U			2.7 U			2.6 U		
PERFLUOROTRIDECANOIC ACID (PFTRIA)	2.5 U			2.7 U			2.7 U			2.6 U		
PERFLUOROUNDECANOIC ACID (PFUNA)	1.3 U			1.3 U			1.4 U			1.3 U		

PROJ_NO: 08005-WE21 SDG: 320-40153-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	TP-PFC-030-TPI-DL		
	LAB_ID	320-40153-1		
	SAMP_DATE	6/7/2018		
	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER	RESULT	VQL	QLCD	
PENTADECAFLUOROOCANOIC ACID (PFOA)	1700			
PERFLUOROBUTANESULFONIC ACID (PFBS)				
PERFLUOROBUTANOIC ACID (PFBA)				
PERFLUORODECANESULFONIC ACID (PFDS)				
PERFLUORODECANOIC ACID (PFDA)				
PERFLUORODODECANOIC ACID (PFDOA)				
PERFLUOROHEPTANESULFONIC ACID				
PERFLUOROHEPTANOIC ACID (PFHPA)				
PERFLUOROHEXANESULFONIC ACID (PFHXS)	360			
PERFLUOROHEXANOIC ACID (PFHXA)				
PERFLUORONONANOIC ACID (PFNA)				
PERFLUOROOCTANE SULFONAMIDE (FOSA)				
PERFLUOROOCTANESULFONIC ACID (PFOS)				
PERFLUOROPENTANOIC ACID (PFPEA)				
PERFLUOROTETRADECANOIC ACID (PFTEA)				
PERFLUOROTRIDECANOIC ACID (PFTRIA)				
PERFLUOROUNDECANOIC ACID (PFUNA)				

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPI Lab Sample ID: 320-40153-1
 Matrix: Water Lab File ID: 2018.06.26LLC_050.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:35
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 283.7 (mL) Date Analyzed: 06/27/2018 05:40
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	64	M	1.8	1.3	0.52
2706-90-3	Perfluoropentanoic acid (PFPeA)	180		1.8	0.88	0.38
307-24-4	Perfluorohexanoic acid (PFHxA)	330		1.8	0.88	0.41
375-85-9	Perfluoroheptanoic acid (PFHpA)	65		1.8	1.3	0.54
335-67-1	Perfluorooctanoic acid (PFOA)	1300	M E	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	2.4		1.8	1.3	0.46
335-76-2	Perfluorodecanoic acid (PFDA)	0.71	J M	1.8	0.88	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	1.3	0.63
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	1.3	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	2.6	0.67
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	2.6	0.73
375-73-5	Perfluorobutanesulfonic acid (PFBS)	48		1.8	0.88	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	350	E	1.8	0.88	0.33
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.1		1.8	0.88	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	310		3.5	2.6	0.97
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	1.3	0.49
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-40153-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-030-TPI</u>	Lab Sample ID: <u>320-40153-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.06.26LLC_050.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>06/07/2018 09:35</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>06/13/2018 15:12</u>
Sample wt/vol: <u>283.7 (mL)</u>	Date Analyzed: <u>06/27/2018 05:40</u>
Con. Extract Vol.: <u>10 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>231147</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	97		50-150
STL00992	13C4 PFBA	110		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	99		50-150
STL01892	13C4-PFHpA	107		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	105		50-150
STL00996	13C2 PFDA	111		50-150
STL00997	13C2 PFUnA	109		50-150
STL00998	13C2 PFDoA	96		50-150
STL00994	18O2 PFHxS	95		50-150
STL02116	13C2-PFTeDA	108		50-150
STL00991	13C4 PFOS	103		50-150
STL02337	13C3-PFBS	96		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPI DL Lab Sample ID: 320-40153-1 DL
 Matrix: Water Lab File ID: 2018.06.29LLBBX_021.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:35
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 283.7 (mL) Date Analyzed: 06/30/2018 01:08
 Con. Extract Vol.: 10 (mL) Dilution Factor: 10
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231842 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	67	D M	18	13	5.2
2706-90-3	Perfluoropentanoic acid (PFPeA)	190	D	18	8.8	3.8
307-24-4	Perfluorohexanoic acid (PFHxA)	340	D	18	8.8	4.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	71	D	18	13	5.4
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D	18	13	4.8
375-95-1	Perfluorononanoic acid (PFNA)	13	U	18	13	4.6
335-76-2	Perfluorodecanoic acid (PFDA)	8.8	U	18	8.8	4.2
2058-94-8	Perfluoroundecanoic acid (PFUnA)	13	U	18	13	6.3
307-55-1	Perfluorododecanoic acid (PFDoA)	13	U	18	13	4.6
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	26	U	35	26	6.7
376-06-7	Perfluorotetradecanoic acid (PFTeA)	26	U	35	26	7.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	50	D	18	8.8	4.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	360	D	18	8.8	3.3
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.5	J D	18	8.8	3.3
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	300	D	35	26	9.7
335-77-3	Perfluorodecanesulfonic acid (PFDS)	13	U	18	13	4.9
754-91-6	Perfluorooctane Sulfonamide (FOSA)	26	U	35	26	11

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPI DL Lab Sample ID: 320-40153-1 DL
 Matrix: Water Lab File ID: 2018.06.29LLBBX_021.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:35
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 283.7(mL) Date Analyzed: 06/30/2018 01:08
 Con. Extract Vol.: 10(mL) Dilution Factor: 10
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231842 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	86		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	91		50-150
STL00993	13C2 PFHxA	93		50-150
STL01892	13C4-PFHpA	89		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	95		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	91		50-150
STL00994	18O2 PFHxS	95		50-150
STL02116	13C2-PFTeDA	83		50-150
STL00991	13C4 PFOS	95		50-150
STL02337	13C3-PFBS	83		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-MIDCARBON Lab Sample ID: 320-40153-2
 Matrix: Water Lab File ID: 2018.06.26LLC_051.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:40
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 299.3 (mL) Date Analyzed: 06/27/2018 05:48
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.7	1.3	0.49
2706-90-3	Perfluoropentanoic acid (PFPeA)	240		1.7	0.84	0.36
307-24-4	Perfluorohexanoic acid (PFHxA)	190		1.7	0.84	0.39
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.8		1.7	1.3	0.51
335-67-1	Perfluorooctanoic acid (PFOA)	46	M	1.7	1.3	0.45
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	0.84	U	1.7	0.84	0.40
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.60
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	0.63
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.69
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.3		1.7	0.84	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.2		1.7	0.84	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.84	U	1.7	0.84	0.31
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.3	2.5	0.92
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.47
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-MIDCARBON Lab Sample ID: 320-40153-2
 Matrix: Water Lab File ID: 2018.06.26LLC_051.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:40
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 299.3 (mL) Date Analyzed: 06/27/2018 05:48
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	91		50-150
STL01893	13C5 PFPeA	79		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	86		50-150
STL00996	13C2 PFDA	90		50-150
STL00997	13C2 PFUnA	84		50-150
STL00998	13C2 PFDoA	74		50-150
STL00994	18O2 PFHxS	80		50-150
STL02116	13C2-PFTeDA	80		50-150
STL00991	13C4 PFOS	77		50-150
STL02337	13C3-PFBS	77		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPE Lab Sample ID: 320-40153-3
 Matrix: Water Lab File ID: 2018.06.26LLC_052.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 09:45
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 280.6(mL) Date Analyzed: 06/27/2018 05:56
 Con. Extract Vol.: 10(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.8	1.3	0.53
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		1.8	0.89	0.38
307-24-4	Perfluorohexanoic acid (PFHxA)	88		1.8	0.89	0.42
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	1.3	0.54
335-67-1	Perfluorooctanoic acid (PFOA)	3.7	M	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.8	1.3	0.46
335-76-2	Perfluorodecanoic acid (PFDA)	0.89	U	1.8	0.89	0.43
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	1.3	0.64
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	1.3	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	2.7	0.68
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	2.7	0.74
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8		1.8	0.89	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.40	J	1.8	0.89	0.34
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.89	U	1.8	0.89	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	0.98
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	1.3	0.50
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	2.7	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-40153-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-030-TPE</u>	Lab Sample ID: <u>320-40153-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.06.26LLC_052.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>06/07/2018 09:45</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>06/13/2018 15:12</u>
Sample wt/vol: <u>280.6(mL)</u>	Date Analyzed: <u>06/27/2018 05:56</u>
Con. Extract Vol.: <u>10(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>231147</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	82		50-150
STL00993	13C2 PFHxA	87		50-150
STL01892	13C4-PFHpA	94		50-150
STL00990	13C4 PFOA	95		50-150
STL00995	13C5 PFNA	87		50-150
STL00996	13C2 PFDA	90		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	78		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	79		50-150
STL00991	13C4 PFOS	85		50-150
STL02337	13C3-PFBS	83		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPE-D Lab Sample ID: 320-40153-4
 Matrix: Water Lab File ID: 2018.06.26LLC_053.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 00:00
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 277.1(mL) Date Analyzed: 06/27/2018 06:04
 Con. Extract Vol.: 10(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.8	1.4	0.53
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		1.8	0.90	0.39
307-24-4	Perfluorohexanoic acid (PFHxA)	90		1.8	0.90	0.42
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.6	J	1.8	1.4	0.55
335-67-1	Perfluorooctanoic acid (PFOA)	3.6	M	1.8	1.4	0.49
375-95-1	Perfluorononanoic acid (PFNA)	1.4	U M	1.8	1.4	0.47
335-76-2	Perfluorodecanoic acid (PFDA)	0.90	U	1.8	0.90	0.43
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.4	U	1.8	1.4	0.65
307-55-1	Perfluorododecanoic acid (PFDoA)	1.4	U	1.8	1.4	0.47
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	2.7	0.69
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	2.7	0.75
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8		1.8	0.90	0.42
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.37	J	1.8	0.90	0.34
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.90	U	1.8	0.90	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	0.99
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.4	U	1.8	1.4	0.51
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	2.7	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: TP-PFC-030-TPE-D Lab Sample ID: 320-40153-4
 Matrix: Water Lab File ID: 2018.06.26LLC_053.d
 Analysis Method: EPA 537 (Mod) Date Collected: 06/07/2018 00:00
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 277.1(mL) Date Analyzed: 06/27/2018 06:04
 Con. Extract Vol.: 10(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	78		50-150
STL00992	13C4 PFBA	91		50-150
STL01893	13C5 PFPeA	80		50-150
STL00993	13C2 PFHxA	83		50-150
STL01892	13C4-PFHpA	92		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	88		50-150
STL00996	13C2 PFDA	87		50-150
STL00997	13C2 PFUnA	86		50-150
STL00998	13C2 PFDoA	76		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	77		50-150
STL00991	13C4 PFOS	83		50-150
STL02337	13C3-PFBS	79		50-150

APPENDIX C

SUPPORT DOCUMENTATION

NAS BRUNSWICK
SDG 320-40153-1

SAMPLE IDENTIFICATION

TP-PFC-030-MIDCARBON

COMPOUND

PENTADECAFLUOROOCCTANOIC ACID (PFOA)

COMPOUND AREA	2619554
INTERNAL STANDARD AMOUNT (ng/ml)	2.5
DILUTION FACTOR	1
INTERNAL STANDARD AREA	3894346
AVERAGE RRF	1.2202
SAMPLE VOLUME (ml)	299.3
VOLUME EXTRACT (ml)	10
ml to L	1000
CONCENTRATION =	46.05 ng/L

$2619554 \times 2.5 \text{ ng/ml} \times 1000 \text{ ml} \times 10 \text{ ml} \times 1 / (3894346 \times 1.2202 \times 299.3 \text{ ml} \times 1 \text{ L})$

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_051.d
 Lims ID: 320-40153-B-2-A
 Client ID: TP-PFC-030-MIDCARBON
 Sample Type: Client
 Inject. Date: 27-Jun-2018 05:48:25 ALS Bottle#: 37 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-40153-b-2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 28-Jun-2018 09:04:41 Calib Date: 22-Jun-2018 10:05:18
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180622-60080.b\2018.06.022LLICALA_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK005

First Level Reviewer: mongkols Date: 28-Jun-2018 09:04:41

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	1.430	1.436	-0.006	1.004	7803919	3.27			4077	
D 1 13C4 PFBA										
217.00 > 172.00	1.425	1.441	-0.016	0.534	5932028	2.26		90.6	44209	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.703	1.703	0.0	1.000	13263686	7.33			6780	
D 3 13C5-PFPeA										
267.90 > 223.00	1.703	1.711	-0.008	0.638	3721129	1.97		78.7	57385	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.739	0.0	1.000	633139	0.2189			1231	
298.90 > 99.00	1.739	1.739	0.0	1.000	300679		2.11(1.25-3.74)		1148	
D 47 13C3-PFBS										
301.90 > 83.00	1.739	1.747	-0.008	0.652	85870	1.80		77.4	643	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.982	1.993	-0.011	1.000	10346908	5.54			19618	
313.00 > 119.00	1.982	1.993	-0.011	1.000	701150		14.76(5.03-15.10)		17019	
D 7 13C2 PFHxA										
315.00 > 270.00	1.982	2.003	-0.021	0.743	4450712	2.16		86.3	86837	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.308	2.308	0.0	1.000	474375	0.2326			453	
363.00 > 169.00	2.308	2.308	0.0	1.000	180470		2.63(1.13-3.40)		1583	
D 9 13C4-PFHpA										
367.00 > 322.00	2.308	2.319	-0.011	0.865	4400241	2.35		94.1	48317	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.308	2.321	-0.013	0.994	232300	0.0953			2001	
399.00 > 99.00	2.321	2.321	0.0	1.000	78351		2.96(1.50-4.49)		305	
D 11 18O2 PFHxS										
403.00 > 84.00	2.321	2.345	-0.024	0.870	5069487	1.90		80.2	52661	

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	2.669	2.675	-0.006		4600570	2.50		42889	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.669	2.675	-0.006	1.000	2619554	1.38		923	M	
413.00 > 169.00	2.669	2.675	-0.006	1.000	1704177		1.54(0.84-2.52)	7019		
D 14 13C4 PFOA	417.00 > 372.00	2.669	2.682	-0.013	1.000	3894346	2.20	88.2	41240	
D 19 13C5 PFNA	468.00 > 423.00	3.044	3.055	-0.011	1.141	2984789	2.14	85.8	48881	
D 18 13C4 PFOS	503.00 > 80.00	3.037	3.055	-0.018	1.138	3280672	1.85	77.2	35357	
D 21 13C8 FOSA	506.00 > 78.00	3.368	3.384	-0.016	1.262	4971216	1.97	78.8	41117	
D 23 13C2 PFDA	515.00 > 470.00	3.406	3.421	-0.015	1.276	2370440	2.25	89.9	33440	
D 30 13C2 PFUnA	565.00 > 520.00	3.739	3.754	-0.015	1.401	1699459	2.09	83.6	43946	
D 36 13C2 PFDoA	615.00 > 570.00	4.038	4.055	-0.017	1.513	1516591	1.85	73.9	10904	
D 43 13C2-PFTeDA	715.00 > 670.00	4.541	4.559	-0.018	1.702	1522676	2.01	80.5	6304	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_051.d

Injection Date: 27-Jun-2018 05:48:25

Instrument ID: A8_N

Lims ID: 320-40153-B-2-A

Lab Sample ID: 320-40153-2

Client ID: TP-PFC-030-MIDCARBON

Operator ID: SACINSTLCMS01

ALS Bottle#: 37

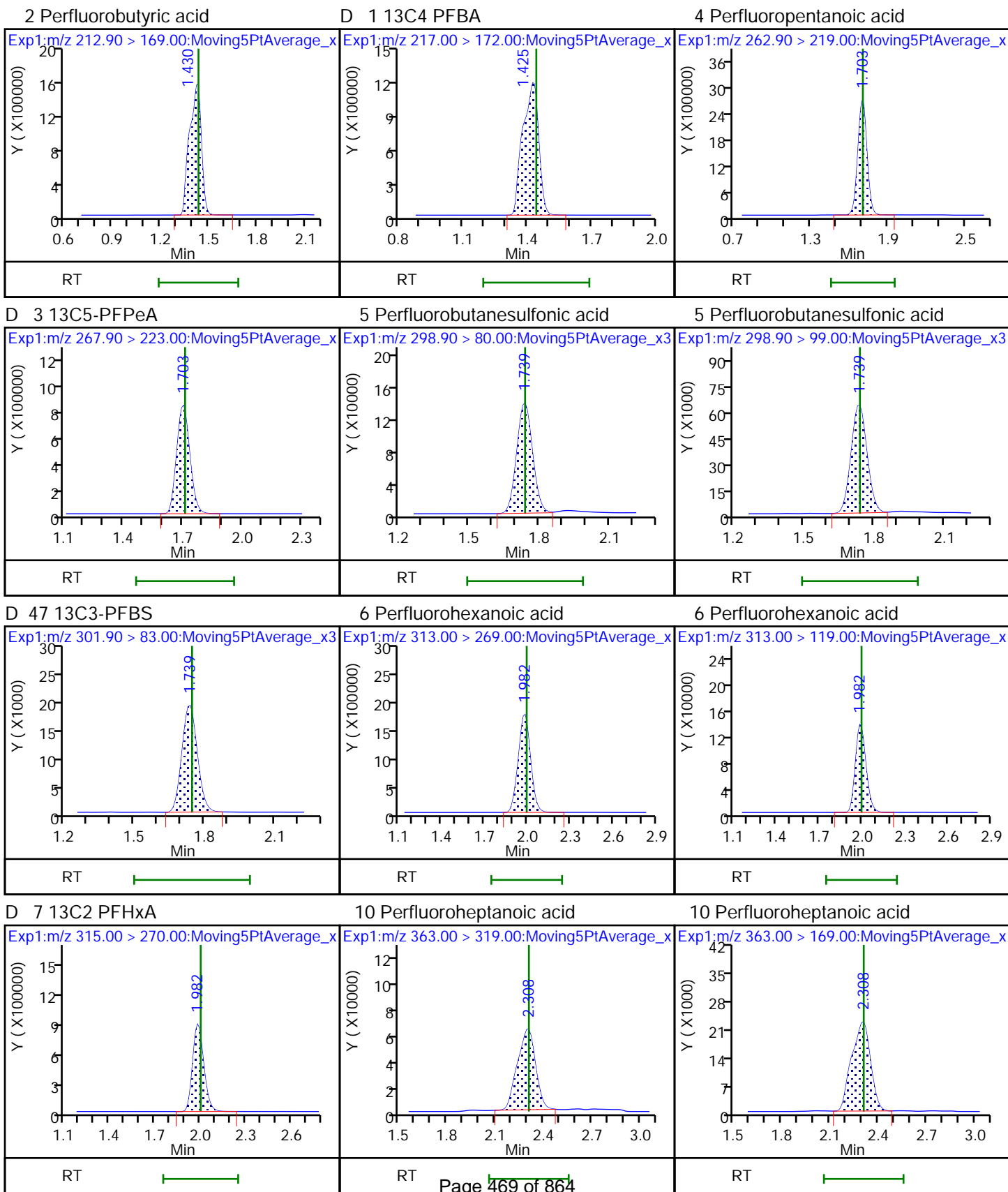
Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8_N

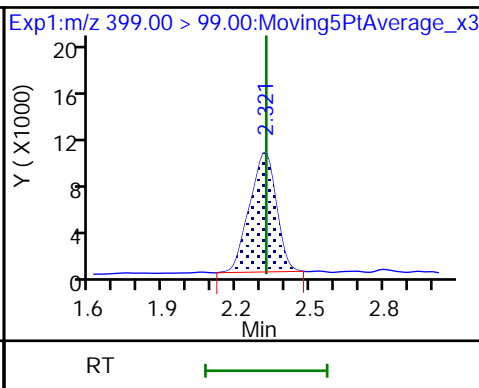
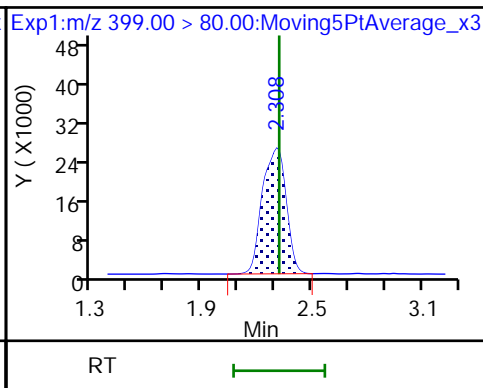
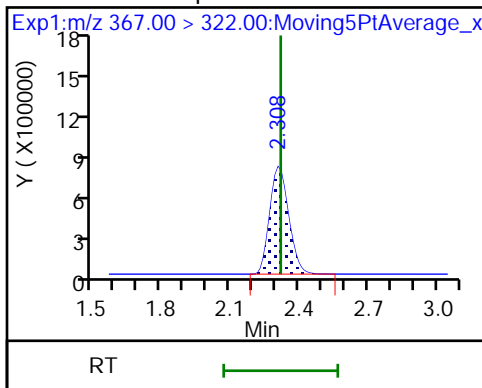
Limit Group: LC PFC_QSM5-1 ICAL



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid

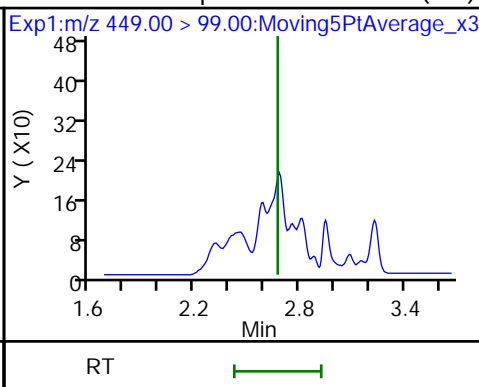
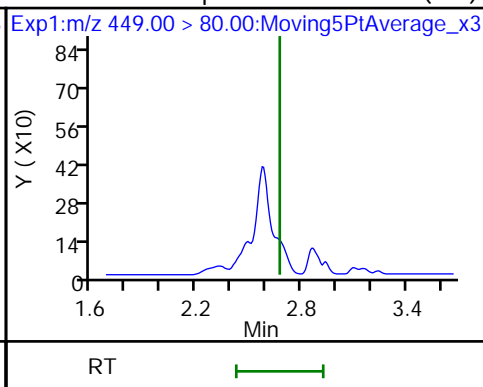
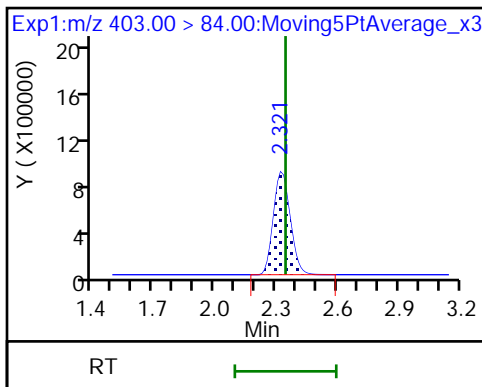
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

16 Perfluoroheptanesulfonic acid (ND)

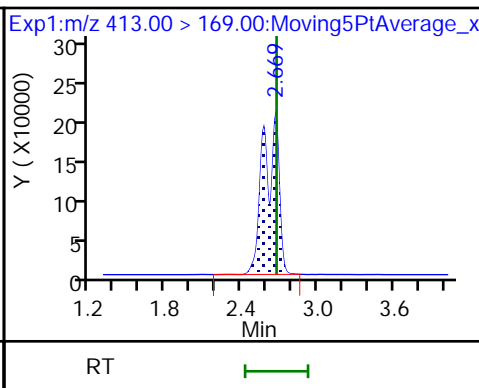
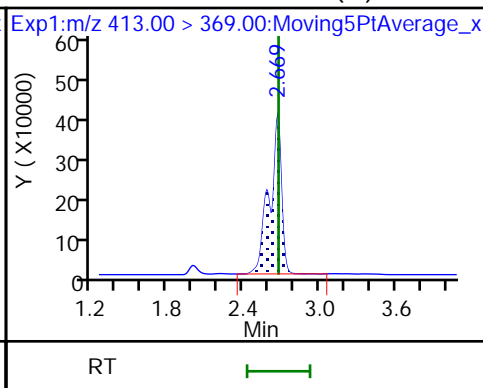
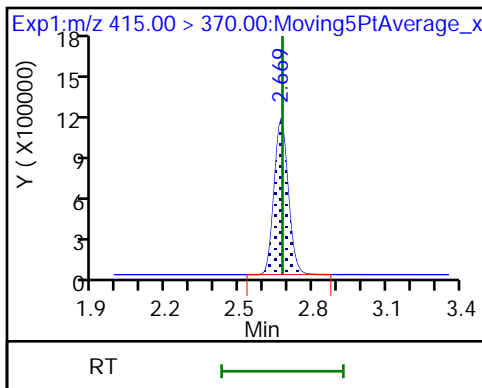
16 Perfluoroheptanesulfonic acid (ND)



* 62 13C2-PFOA

15 Perfluorooctanoic acid (M)

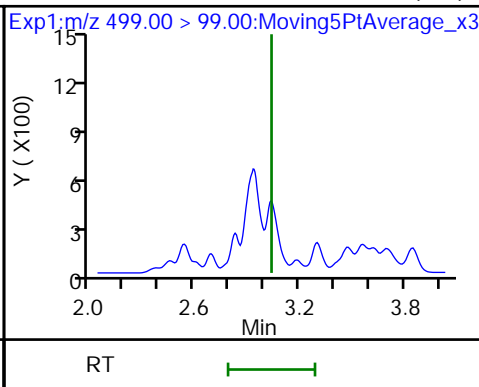
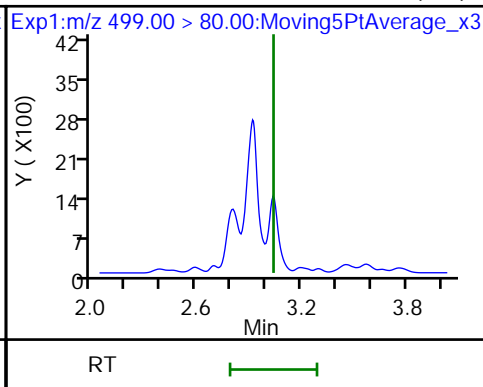
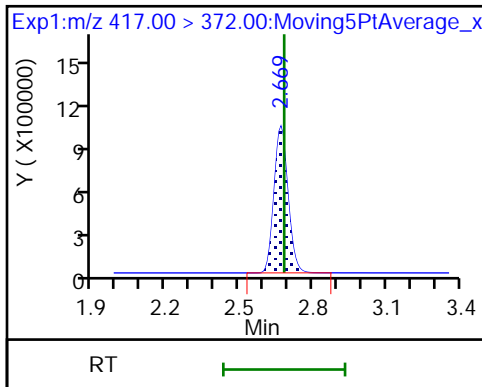
15 Perfluorooctanoic acid

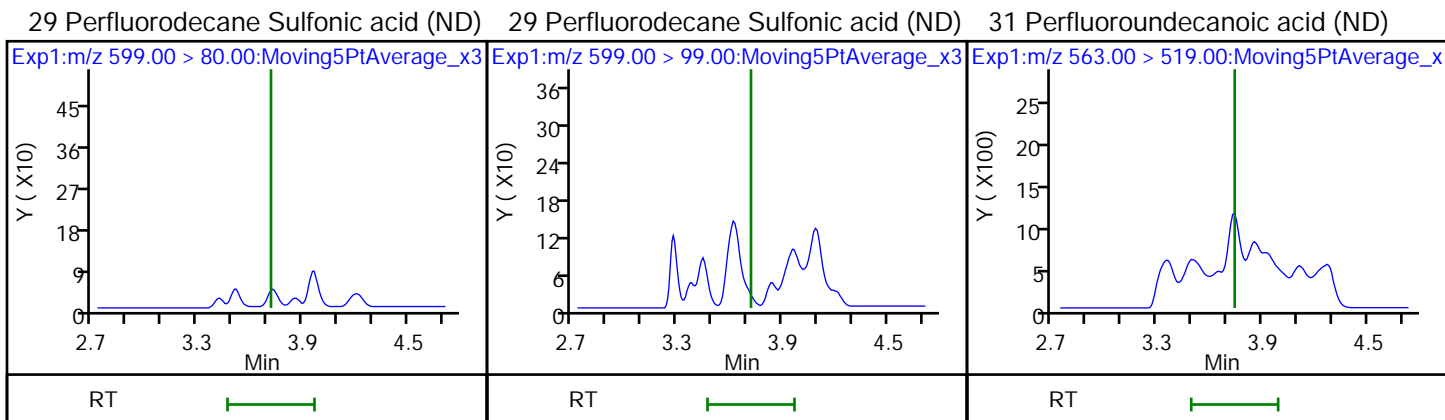
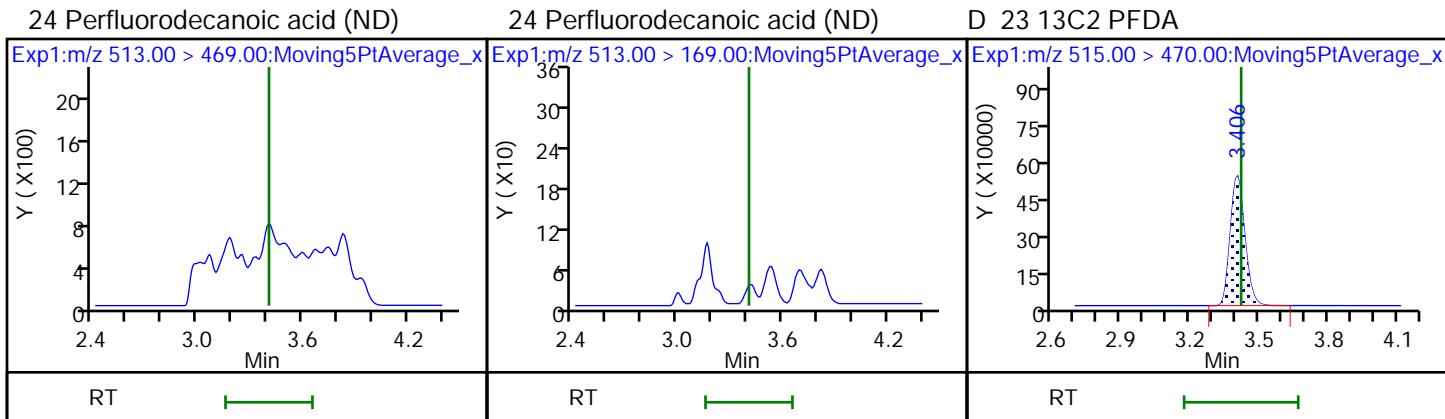
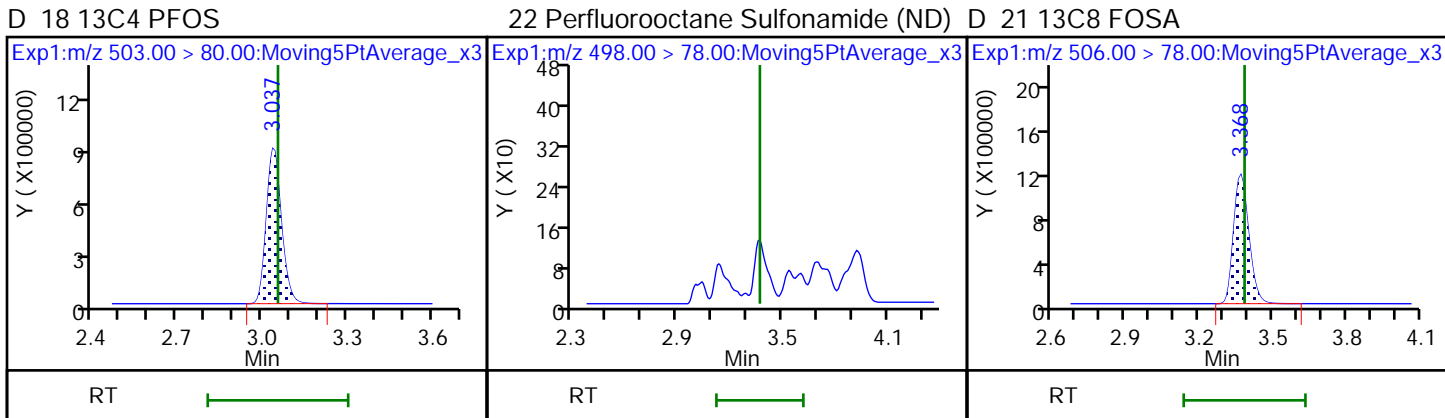
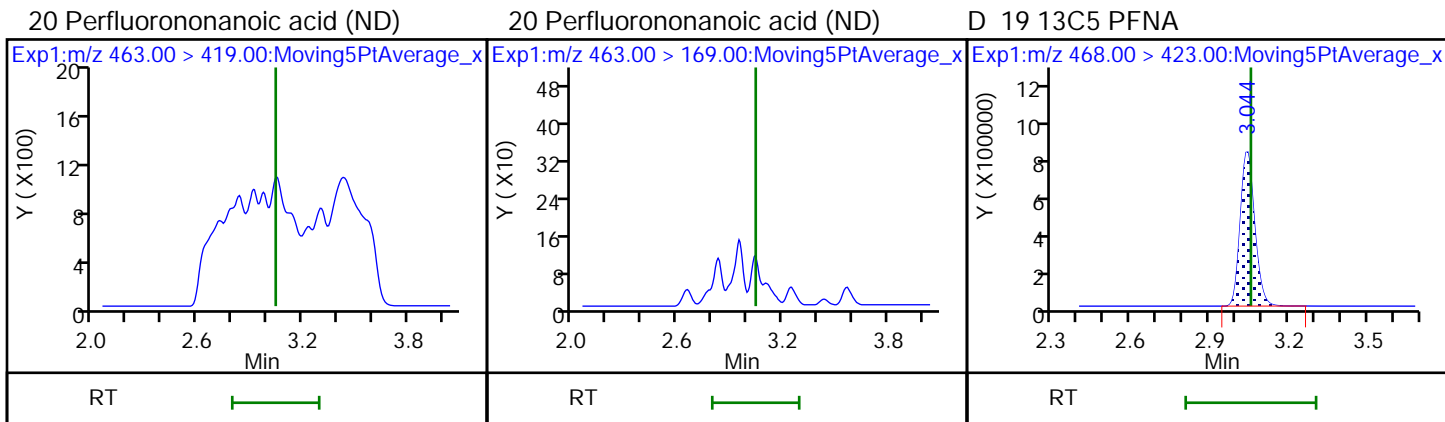


D 14 13C4 PFOA

17 Perfluorooctane sulfonic acid (ND)

17 Perfluorooctane sulfonic acid (ND)

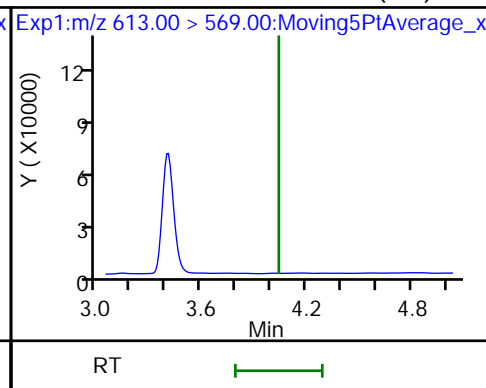
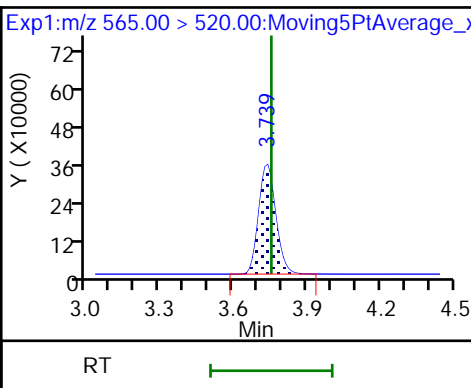
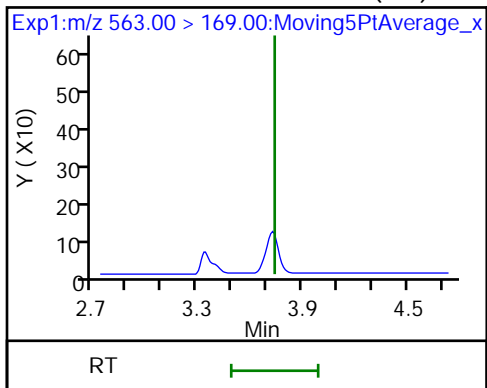




31 Perfluoroundecanoic acid (ND)

D 30 13C2 PFUnA

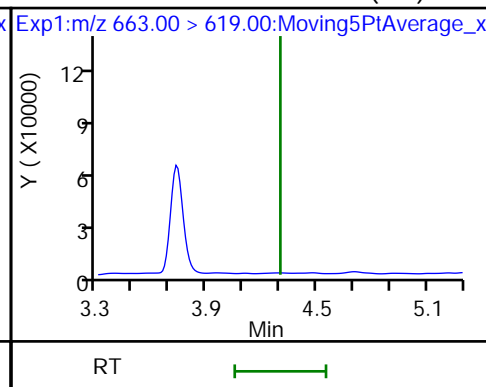
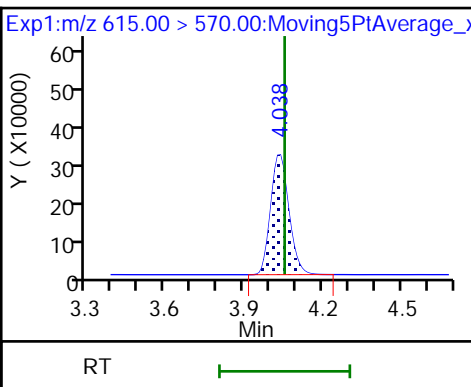
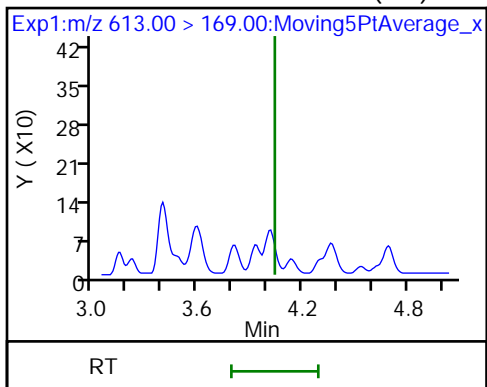
37 Perfluorododecanoic acid (ND)



37 Perfluorododecanoic acid (ND)

D 36 13C2 PFDaA

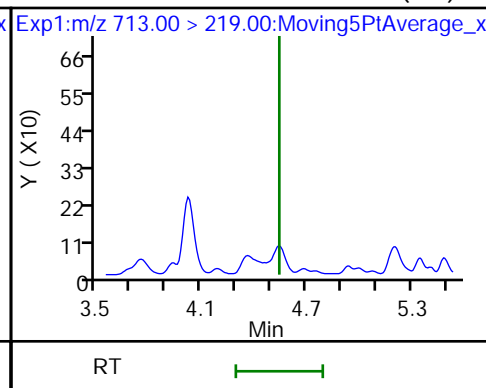
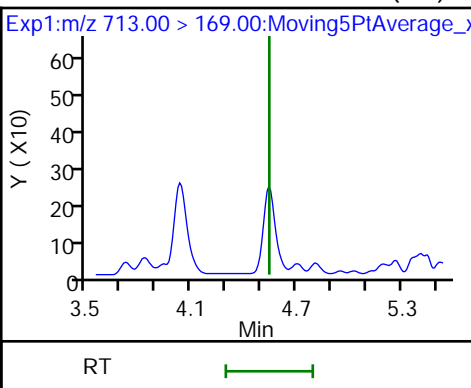
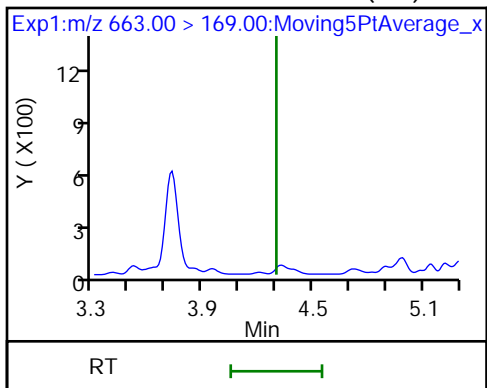
41 Perfluorotridecanoic acid (ND)



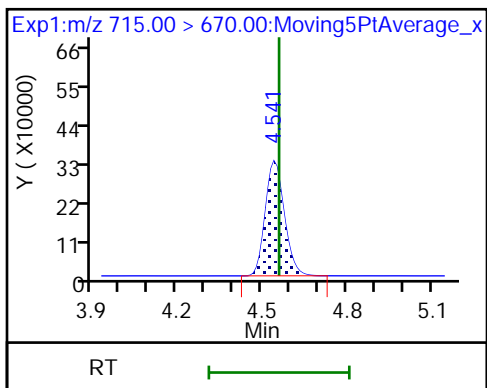
41 Perfluorotridecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



TestAmerica Sacramento

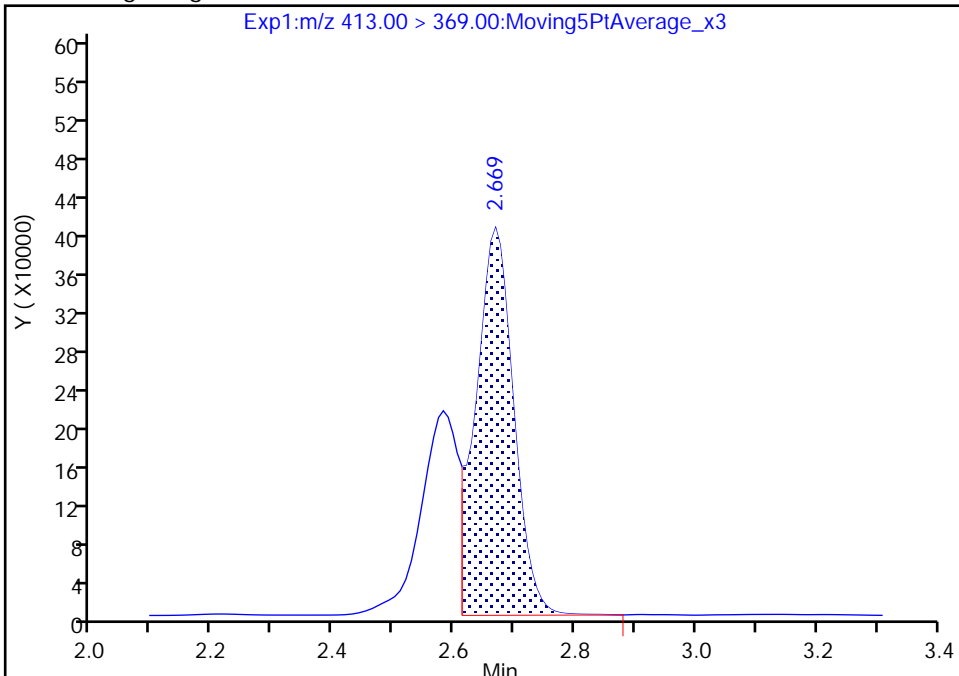
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180626-60284.b\2018.06.26LLC_051.d
Injection Date: 27-Jun-2018 05:48:25 Instrument ID: A8_N
Lims ID: 320-40153-B-2-A Lab Sample ID: 320-40153-2
Client ID: TP-PFC-030-MIDCARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 37 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

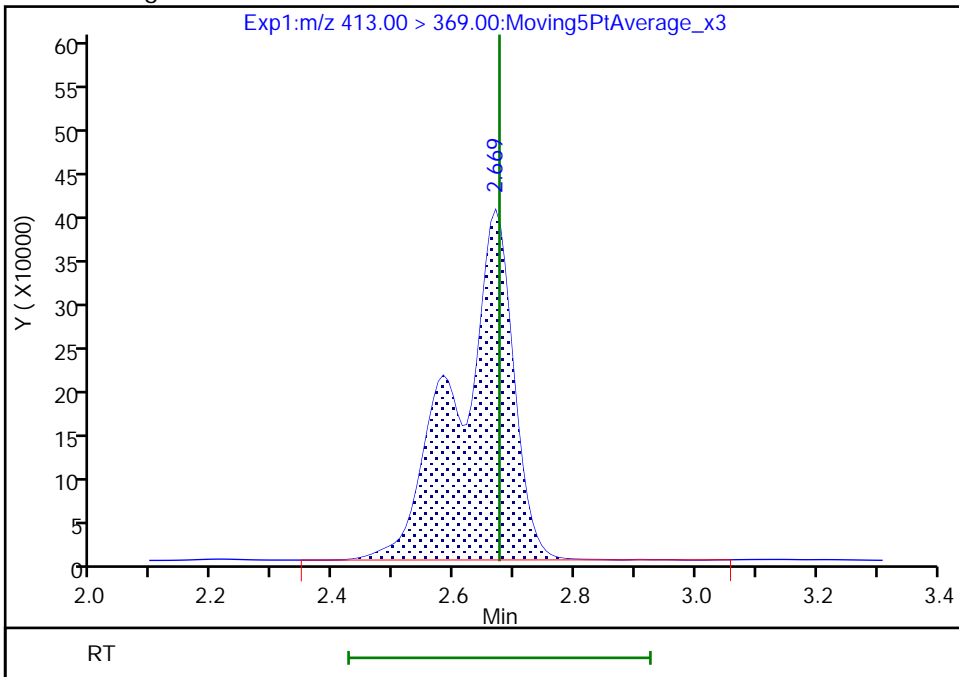
RT: 2.67
Area: 1727889
Amount: 0.909090
Amount Units: ng/ml

Processing Integration Results



RT: 2.67
Area: 2619554
Amount: 1.378219
Amount Units: ng/ml

Manual Integration Results



ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%
PENTADEC AFLUORO OCTANOIC ACID (PFOA)	3.7	3.6	1.8	2.74	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	1.8	1.8	1.8	0.00	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	110	110	1.8	0.00	FALSE
PERFLUOROHEPTANOIC ACID (PFHPA)	1.7	1.6	1.8	6.06	FALSE
PERFLUOROHEXANOIC ACID (PFHXA)	88	90	1.8	2.25	FALSE
PERFLUOROPENTANOIC ACID (PFPEA)	200	190	1.8	5.13	FALSE

ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2xRL
TRUE	FALSE	FALSE
FALSE	FALSE	FALSE
TRUE	TRUE	FALSE
FALSE	FALSE	FALSE
TRUE	TRUE	FALSE
TRUE	TRUE	TRUE

SDG 320-40153-1

TP-PFC-030-TPE/TP-PFC-030-TPE-D

West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: <u>Jeff Orient</u>		Site Contact: <u>Kevin Lamontagne</u>		Date: <u>6/7/2018</u>		COC No: <u>240497</u>																																																																																											
Company Name: <u>Tetra Tech</u>		Tel/Fax: <u>412-921-8650</u>		Lab Contact: <u>Rind Alltrick</u>		Carrier: <u>Fed Ex</u>		1 of 1 COCs																																																																																											
Address: <u>881 Anderson Dr Foster Plaza</u>		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Analysis Turnaround Time</th> </tr> <tr> <td><input checked="" type="checkbox"/> CALENDAR DAYS</td> <td><input type="checkbox"/> WORKING DAYS</td> </tr> <tr> <td colspan="2">TAT if different from Below _____</td> </tr> <tr> <td><input checked="" type="checkbox"/> 2 weeks</td> <td><input type="checkbox"/> 1 week</td> </tr> <tr> <td><input type="checkbox"/> 2 days</td> <td><input type="checkbox"/> 1 day</td> </tr> </table>								Analysis Turnaround Time		<input checked="" type="checkbox"/> CALENDAR DAYS	<input type="checkbox"/> WORKING DAYS	TAT if different from Below _____		<input checked="" type="checkbox"/> 2 weeks	<input type="checkbox"/> 1 week	<input type="checkbox"/> 2 days	<input type="checkbox"/> 1 day																																																																																
Analysis Turnaround Time																																																																																																			
<input checked="" type="checkbox"/> CALENDAR DAYS	<input type="checkbox"/> WORKING DAYS																																																																																																		
TAT if different from Below _____																																																																																																			
<input checked="" type="checkbox"/> 2 weeks	<input type="checkbox"/> 1 week																																																																																																		
<input type="checkbox"/> 2 days	<input type="checkbox"/> 1 day																																																																																																		
City/State/Zip: <u>Pittsburg, PA 015210</u>																																																																																																			
Phone: <u>412-921-8650</u>																																																																																																			
Fax:																																																																																																			
Project Name: <u>Brunswick GWETS</u>		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Sample Identification</th> <th>Sample Date</th> <th>Sample Time</th> <th>Sample Type (C=Comp, G=Grab)</th> <th>Matrix</th> <th># of Cont.</th> <th>Filtered Sample (Y/N)</th> <th>Perform MS / MSD (Y/N)</th> <th>Sample Specific Notes:</th> </tr> <tr> <td>TP-PFC-030-TPI</td> <td>6/7/18</td> <td>0935</td> <td>G</td> <td>W</td> <td>4</td> <td>N</td> <td>N</td> <td>KPL</td> </tr> <tr> <td>TP-PFC-030-MIDCARBON</td> <td> </td> <td>0940</td> <td> </td> <td> </td> <td> </td> <td>N</td> <td>N</td> <td>KPU</td> </tr> <tr> <td>TP-PFC-030-TPE</td> <td> </td> <td>0945</td> <td> </td> <td> </td> <td> </td> <td>N</td> <td>N</td> <td></td> </tr> <tr> <td>TP-PFC-030-TPE-D</td> <td> </td> <td>0000</td> <td> </td> <td> </td> <td> </td> <td>N</td> <td>N</td> <td></td> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>								Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes:	TP-PFC-030-TPI	6/7/18	0935	G	W	4	N	N	KPL	TP-PFC-030-MIDCARBON		0940				N	N	KPU	TP-PFC-030-TPE		0945				N	N		TP-PFC-030-TPE-D		0000				N	N																																														
Sample Identification	Sample Date									Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes:																																																																																			
TP-PFC-030-TPI	6/7/18									0935	G	W	4	N	N	KPL																																																																																			
TP-PFC-030-MIDCARBON										0940				N	N	KPU																																																																																			
TP-PFC-030-TPE										0945				N	N																																																																																				
TP-PFC-030-TPE-D										0000				N	N																																																																																				
Site: <u>Former NAS Brunswick</u>																																																																																																			
PO# <u>112608005-WE21</u>																																																																																																			
Job / SDG No.:																																																																																																			
Sample Specific Notes:																																																																																																			



320-40153 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client Disposal by Lab Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: Yes No

Custody Seal No.:

Cooler Temp. (°C): Obs'd: 5.0 Corr'd: _____ Therm ID No.: AK-6

Relinquished by: <u>[Signature]</u>	Company: <u>Tetra Tech</u>	Date/Time: <u>6/7/18 1430</u>	Received by: <u>[Signature]</u>	Company: <u>[Signature]</u>	Date/Time: <u>6-8-18 900</u>
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Page 863 of 864

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-40153-1

SDG Number:

Login Number: 40153

List Number: 1

Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative
320-40153-1

Receipt

The samples were received on 6/8/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.6° 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 Perfluorohexanesulfonic acid (PFHxS) and Perfluorooctanoic acid (PFOA) associated with the following sample exceeded the instrument calibration range: TP-PFC-030-TPI (320-40153-1). These analytes have been qualified; however, the peak did not saturate the instrument detector. The samples were diluted within calibration range, and both sets of data were reported.

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

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-228913.

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

Definitions/Glossary

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

TestAmerica Job ID: 320-40153-1

Qualifiers

LCMS

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

Glossary

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

Sample Summary

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

TestAmerica Job ID: 320-40153-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-40153-1	TP-PFC-030-TPI	Water	06/07/18 09:35	06/08/18 09:00
320-40153-2	TP-PFC-030-MIDCARBON	Water	06/07/18 09:40	06/08/18 09:00
320-40153-3	TP-PFC-030-TPE	Water	06/07/18 09:45	06/08/18 09:00
320-40153-4	TP-PFC-030-TPE-D	Water	06/07/18 00:00	06/08/18 09:00

Method Summary

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

TestAmerica Job ID: 320-40153-1

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

Protocol References:

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

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

Laboratory References:

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-030-TPI	320-40153-1	110	97	96	99	107	95	87	105
TP-PFC-030-TPI DL	320-40153-1 DL	93	91	83	93	89	95	92	92
TP-PFC-030-MIDCARB ON	320-40153-2	91	79	77	86	94	80	88	86
TP-PFC-030-TPE	320-40153-3	93	82	83	87	94	83	95	87
TP-PFC-030-TPE-D	320-40153-4	91	80	79	83	92	83	91	88
	MB 320-228913/1-A	93	88	82	89	93	81	95	92
	LCS 320-228913/2-A	90	83	78	84	91	78	90	88
	LCSD 320-228913/3-A	93	82	81	90	90	82	89	86

	<u>QC LIMITS</u>
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 1802 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-030-TPI	320-40153-1	103	97	111	109	96	108
TP-PFC-030-TPI DL	320-40153-1 DL	95	86	95	94	91	83
TP-PFC-030-MIDCARB ON	320-40153-2	77	79	90	84	74	80
TP-PFC-030-TPE	320-40153-3	85	79	90	86	78	79
TP-PFC-030-TPE-D	320-40153-4	83	78	87	86	76	77
	MB 320-228913/1-A	85	78	89	90	84	81
	LCS 320-228913/2-A	80	78	88	86	73	69
	LCSD 320-228913/3-A	82	77	92	80	76	74

PFOS = 13C4 PFOS
 PFOSA = 13C8 FOSA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDoA = 13C2 PFDoA
 PFTDA = 13C2-PFTeDA

QC LIMITS

50-150
 50-150
 50-150
 50-150
 50-150
 50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Sample No.: IC 320-230408/5 Date Analyzed: 06/22/2018 09:41
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.06.022LLICALA Heated Purge: (Y/N) N
 Calibration ID: 39780

	13PFOA					
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT	3755094	2.65				
UPPER LIMIT	5632641	2.85				
LOWER LIMIT	1877547	2.45				
LAB SAMPLE ID	CLIENT SAMPLE ID					
ICB 320-230408/9		3926269	2.65			
ICV 320-230408/10		3781334	2.65			
CCV 320-231134/3 CCVIS		3681597	2.68			

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Sample No.: CCV 320-231134/3 Date Analyzed: 06/26/2018 23:32
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.06.26LLC_003.d Heated Purge: (Y/N) N
 Calibration ID: 39780

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3681597	2.68				
UPPER LIMIT		5522396	2.88				
LOWER LIMIT		1840799	2.48				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-231134/1		3659241	2.68				
CCVL 320-231134/2		3323617	2.68				
CCV 320-231147/1		3773321	2.68				
MB 320-228913/1-A		4307793	2.68				
LCS 320-228913/2-A		4468673	2.68				
LCSD 320-228913/3-A		4426627	2.68				
320-40153-1	TP-PFC-030-TPI	3481814	2.68				
320-40153-2	TP-PFC-030-MIDCARBON	4600570	2.67				
320-40153-3	TP-PFC-030-TPE	4456919	2.68				
320-40153-4	TP-PFC-030-TPE-D	4509533	2.68				
CCV 320-231147/9		3884149	2.67				

13PFOA = 13C2-PFOA
 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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Sample No.: IC 320-231836/5 Date Analyzed: 06/29/2018 21:52
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.06.29LLICALA_0 Heated Purge: (Y/N) N
 Calibration ID: 39860

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		4168201	2.66				
UPPER LIMIT		6252302	2.86				
LOWER LIMIT		2084101	2.46				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-231836/9		4109243	2.65				
ICV 320-231836/10		4207014	2.65				
CCV 320-231842/1		4102960	2.65				
320-40153-1 DL	TP-PFC-030-TPI DL	4492150	2.65				
CCV 320-231842/10		4252257	2.64				

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 IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab File ID: 2018.06.26LLC_047.d Lab Sample ID: MB 320-228913/1-A
 Matrix: Water Date Extracted: 06/13/2018 15:12
 Instrument ID: A8_N Date Analyzed: 06/27/2018 05:17
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-228913/2-A	2018.06.26L LC 048.d	06/27/2018 05:25
	LCSD 320-228913/3-A	2018.06.26L LC 049.d	06/27/2018 05:32
TP-PFC-030-TPI	320-40153-1	2018.06.26L LC 050.d	06/27/2018 05:40
TP-PFC-030-MIDCARBON	320-40153-2	2018.06.26L LC 051.d	06/27/2018 05:48
TP-PFC-030-TPE	320-40153-3	2018.06.26L LC 052.d	06/27/2018 05:56
TP-PFC-030-TPE-D	320-40153-4	2018.06.26L LC 053.d	06/27/2018 06:04
TP-PFC-030-TPI DL	320-40153-1 DL	2018.06.29L LBBX 021.d	06/30/2018 01:08

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-228913/1-A
 Matrix: Water Lab File ID: 2018.06.26LLC_047.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 250 (mL) Date Analyzed: 06/27/2018 05:17
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.5	U	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.5	U	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-228913/1-A
 Matrix: Water Lab File ID: 2018.06.26LLC_047.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 06/13/2018 15:12
 Sample wt/vol: 250 (mL) Date Analyzed: 06/27/2018 05:17
 Con. Extract Vol.: 10 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231147 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	78		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	88		50-150
STL00993	13C2 PFHxA	89		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	95		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	89		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	84		50-150
STL00994	18O2 PFHxS	81		50-150
STL02116	13C2-PFTeDA	81		50-150
STL00991	13C4 PFOS	85		50-150
STL02337	13C3-PFBS	82		50-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Matrix: Water Level: Low

Lab File ID: 2018.06.26LLC_048.d

Lab ID: LCS 320-228913/2-A

Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	36.1	90	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	33.9	85	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	35.7	89	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	34.4	86	80-113	
Perfluorooctanoic acid (PFOA)	40.0	33.6	84	80-107	
Perfluorononanoic acid (PFNA)	40.0	34.5	86	83-113	
Perfluorodecanoic acid (PFDA)	40.0	37.2	93	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	34.8	87	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	37.9	95	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	41.7	104	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	42.2	105	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	32.4	92	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	31.8	87	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	34.3	90	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3	92	82-112	M
Perfluorodecanesulfonic acid (PFDS)	38.6	32.6	85	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	36.1	90	85-114	
13C8 FOSA	100	78.3	78	50-150	
13C4 PFBA	100	89.9	90	50-150	
13C5 PFPeA	100	83.2	83	50-150	
13C2 PFHxA	100	83.9	84	50-150	
13C4-PFHpA	100	90.6	91	50-150	
13C4 PFOA	100	89.6	90	50-150	
13C5 PFNA	100	88.4	88	50-150	
13C2 PFDA	100	87.5	88	50-150	
13C2 PFUnA	100	86.0	86	50-150	
13C2 PFDoA	100	73.1	73	50-150	
18O2 PFHxS	94.6	74.2	78	50-150	
13C2-PFTeDA	100	69.2	69	50-150	
13C4 PFOS	95.6	76.6	80	50-150	
13C3-PFBS	93.0	72.5	78	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

SDG No.: _____

Matrix: Water Level: Low

Lab File ID: 2018.06.26LLC_049.d

Lab ID: LCSD 320-228913/3-A

Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorobutanoic acid (PFBA)	40.0	36.3	91	0	30	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	35.7	89	5	30	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	34.0	85	5	30	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	33.8	85	2	30	80-113	
Perfluorooctanoic acid (PFOA)	40.0	36.4	91	8	30	80-107	
Perfluorononanoic acid (PFNA)	40.0	36.4	91	6	30	83-113	
Perfluorodecanoic acid (PFDA)	40.0	35.2	88	6	30	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	36.9	92	6	30	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	40.1	100	6	30	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	39.5	99	5	30	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	36.7	92	14	30	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	32.3	91	0	30	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	32.4	89	2	30	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	36.4	96	6	30	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.2	92	0	30	82-112	M
Perfluorodecanesulfonic acid (PFDS)	38.6	35.5	92	9	30	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	37.3	93	3	30	85-114	
13C8 FOSA	100	77.5	77			50-150	
13C4 PFBA	100	92.6	93			50-150	
13C5 PFPeA	100	82.4	82			50-150	
13C2 PFHxA	100	90.0	90			50-150	
13C4-PFHpA	100	90.1	90			50-150	
13C4 PFOA	100	88.5	89			50-150	
13C5 PFNA	100	85.8	86			50-150	
13C2 PFDA	100	91.7	92			50-150	
13C2 PFUnA	100	79.6	80			50-150	
13C2 PFDoA	100	75.9	76			50-150	
18O2 PFHxS	94.6	77.7	82			50-150	
13C2-PFTeDA	100	74.5	74			50-150	
13C4 PFOS	95.6	78.5	82			50-150	
13C3-PFBS	93.0	74.9	81			50-150	

Column to be used to flag recovery and RPD values

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/22/2018 09:18

Analysis Batch Number: 230408 End Date: 06/22/2018 10:28

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-230408/2		06/22/2018 09:18	1	2018.06.022LLIC ALA 002.d	GeminiC18 3x100 3(mm)
IC 320-230408/3		06/22/2018 09:26	1	2018.06.022LLIC ALA 003.d	GeminiC18 3x100 3(mm)
IC 320-230408/4		06/22/2018 09:33	1	2018.06.022LLIC ALA 004.d	GeminiC18 3x100 3(mm)
IC 320-230408/5 ICIS		06/22/2018 09:41	1	2018.06.022LLIC ALA 005.d	GeminiC18 3x100 3(mm)
IC 320-230408/6		06/22/2018 09:49	1	2018.06.022LLIC ALA 006.d	GeminiC18 3x100 3(mm)
IC 320-230408/7		06/22/2018 09:57	1	2018.06.022LLIC ALA 007.d	GeminiC18 3x100 3(mm)
IC 320-230408/8		06/22/2018 10:05	1	2018.06.022LLIC ALA 008.d	GeminiC18 3x100 3(mm)
ICB 320-230408/9		06/22/2018 10:13	1	2018.06.022LLIC ALA 009.d	GeminiC18 3x100 3(mm)
ICV 320-230408/10		06/22/2018 10:20	1	2018.06.022LLIC ALA 010.d	GeminiC18 3x100 3(mm)
CCB 320-230408/11		06/22/2018 10:28	1		GeminiC18 3x100 3(mm)

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

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-230408/2	2018.06.022LLICALA_002.d
Level 2	IC 320-230408/3	2018.06.022LLICALA_003.d
Level 3	IC 320-230408/4	2018.06.022LLICALA_004.d
Level 4	IC 320-230408/5	2018.06.022LLICALA_005.d
Level 5	IC 320-230408/6	2018.06.022LLICALA_006.d
Level 6	IC 320-230408/7	2018.06.022LLICALA_007.d
Level 7	IC 320-230408/8	2018.06.022LLICALA_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorobutanoic acid (PFBA)	1.0353 1.0170	1.0030 1.0158	0.9823	0.9824	1.0026	AveID		1.0055			1.9		20.0				
Perfluoropentanoic acid (PFPeA)	1.3465 1.1574	1.2972 1.1961	1.1504	1.1539	1.2112	AveID		1.2161			6.3		20.0				
Perfluorobutanesulfonic acid (PFBS)	79.040 77.111	78.583 78.972	76.530	77.150	80.692	AveID		78.297			1.9		20.0				
4:2 FTS	18.329 15.425	16.211 15.353	17.030	16.787	16.971	AveID		16.586			6.2		20.0				
Perfluorohexanoic acid (PFHxA)	1.2603 1.0684	0.9632 1.0186	0.9811	1.0097	1.0450	AveID		1.0495			9.5		20.0				
Perfluoropentanesulfonic acid	72.268 70.822	71.435 70.326	68.453	70.485	75.312	AveID		71.300			3.0		20.0				
Perfluoroheptanoic acid (PFHpA)	1.3654 1.1287	1.1117 1.1412	1.0785	1.1177	1.1682	AveID		1.1587			8.2		20.0				
Perfluorohexanesulfonic acid (PFHxS)	1.2604 1.0842	1.1790 1.0762	1.0621	1.1581	1.1376	AveID		1.1368			6.2		20.0				
6:2 FTS	++++ 1.7070	1.6435 1.6793	1.6959	1.6340	1.6154	AveID		1.6625			2.2		20.0				
Perfluorooctanoic acid (PFOA)	++++ 1.1359	1.5081 1.1369	1.2697	1.1017	1.1686	AveID		1.2202			12.5		20.0				
Perfluoroheptanesulfonic Acid (PFHpS)	1.2752 1.4526	1.3381 1.3781	1.3924	1.4350	1.4275	AveID		1.3856			4.5		20.0				
Perfluorooctanesulfonic acid (PFOS)	1.0565 1.1794	1.1753 1.1621	1.1014	1.1569	1.1307	AveID		1.1375			3.9		20.0				
Perfluorononanoic acid (PFNA)	1.1560 1.0962	1.0441 1.0488	1.0909	1.0770	1.0896	AveID		1.0861			3.4		20.0				
Perfluorononanesulfonic acid	0.7006 0.7928	0.8091 0.7687	0.7555	0.7855	0.7595	AveID		0.7674			4.6		20.0				

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

Analy Batch No.: 230408

SDG No.: _____

Instrument ID: A8_N

GC Column: GeminiC18 3 ID: 3(mm)

Heated Purge: (Y/N) N

Calibration Start Date: 06/22/2018 09:18

Calibration End Date: 06/22/2018 10:05

Calibration ID: 39780

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
8:2 FTS	1.4762 1.3646	1.1544 1.3857	1.2614	1.3184	1.3601	AveID		1.3316			7.6		20.0				
Perfluorooctane Sulfonamide (FOSA)	0.8985 1.0593	0.9977 1.0209	0.9919	1.0049	1.0709	AveID		1.0063			5.6		20.0				
Perfluorodecanoic acid (PFDA)	0.9387 1.0423	1.0394 1.0117	1.0415	0.9720	1.0528	AveID		1.0141			4.2		20.0				
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.8325 1.0151	1.0314 1.0130	0.9277	1.0833	1.0196	AveID		0.9889			8.4		20.0				
Perfluorodecanesulfonic acid (PFDS)	0.6929 0.6790	0.5746 0.6487	0.6429	0.6272	0.6573	AveID		0.6461			6.0		20.0				
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.0582 0.9439	0.9951 0.8884	0.8924	0.8611	0.8593	AveID		0.9284			8.1		20.0				
Perfluoroundecanoic acid (PFUnA)	1.0449 0.7840	0.6477 0.8056	0.7091	0.7793	0.8616	AveID		0.8046			15.7		20.0				
Perfluorododecanoic acid (PFDoA)	1.0519 1.0749	1.1127 1.0585	1.0346	1.0205	1.0526	AveID		1.0579			2.8		20.0				
Perfluorotridecanoic Acid (PFTriA)	0.7927 0.9699	0.9730 1.0049	0.9614	0.9299	0.8857	AveID		0.9311			7.7		20.0				
Perfluorotetradecanoic acid (PFTeA)	0.2603 0.2523	0.2898 0.2509	0.2624	0.2412	0.2392	AveID		0.2566			6.6		20.0				
13C4 PFBA	1.4298 1.4358	1.4078 1.5218	1.3840	1.3480	1.4358	Ave		1.4233			3.8		20.0				
13C5 PFPeA	1.0414 1.0280	1.0376 1.0540	1.0199	0.9901	1.0273	Ave		1.0283			2.0		20.0				
13C3-PFBS	0.0260 0.0266	0.0257 0.0269	0.0256	0.0246	0.0260	Ave		0.0259			2.9		20.0				
13C2 PFHxA	1.1117 1.0902	1.1433 1.1425	1.1559	1.0899	1.1132	Ave		1.1210			2.4		20.0				
13C4-PFHpA	1.0352 0.9834	1.0268 1.0049	1.0501	1.0055	1.0090	Ave		1.0164			2.2		20.0				
18O2 PFHxS	1.4335 1.4827	1.4294 1.5348	1.4865	1.3474	1.4492	Ave		1.4519			4.1		20.0				
M2-6:2FTS	0.2693 0.2581	0.2683 0.2530	0.2643	0.2515	0.2753	Ave		0.2628			3.4		20.0				
13C4 PFOA	0.9578 0.9631	0.9738 0.9510	0.9573	0.9567	0.9608	Ave		0.9601			0.7		20.0				
13C4 PFOS	0.9737 0.9542	0.9681 1.0314	0.9478	0.9121	0.9740	Ave		0.9659			3.7		20.0				
13C5 PFNA	0.7802 0.7391	0.7646 0.7655	0.7526	0.7289	0.7636	Ave		0.7564			2.3		20.0				

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1 Analy Batch No.: 230408
 SDG No.: _____
 Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
 Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
M2-8:2FTS	0.2544 0.2326	0.2467 0.2190	0.2479	0.2301	0.2414	Ave		0.2389			5.1		20.0				
13C8 FOSA	1.4126 1.3407	1.4075 1.3193	1.4048	1.3611	1.3525	Ave		1.3712			2.7		20.0				
13C2 PFDA	0.5737 0.5495	0.5806 0.5651	0.6007	0.5678	0.5755	Ave		0.5733			2.7		20.0				
d3-NMeFOSAA	0.1662 0.1801	0.1674 0.2046	0.1779	0.1639	0.1710	Ave		0.1759			8.0		20.0				
d5-NEtFOSAA	0.1774 0.1807	0.1784 0.1912	0.1809	0.1833	0.1790	Ave		0.1816			2.6		20.0				
13C2 PUnA	0.4438 0.4362	0.4427 0.4545	0.4666	0.4259	0.4249	Ave		0.4421			3.4		20.0				
13C2 PFDoA	0.4498 0.4514	0.4207 0.4618	0.4353	0.4330	0.4685	Ave		0.4458			3.8		20.0				
13C2-PFTeDA	0.4083 0.4127	0.4049 0.4417	0.4038	0.3890	0.4184	Ave		0.4113			3.9		20.0				
13C2-PFHxDA	0.8032 0.6575	0.6895 0.7031	0.6987	0.6519	0.6649	Ave		0.6956			7.4		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.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-230408/2	2018.06.022LLICALA_002.d
Level 2	IC 320-230408/3	2018.06.022LLICALA_003.d
Level 3	IC 320-230408/4	2018.06.022LLICALA_004.d
Level 4	IC 320-230408/5	2018.06.022LLICALA_005.d
Level 5	IC 320-230408/6	2018.06.022LLICALA_006.d
Level 6	IC 320-230408/7	2018.06.022LLICALA_007.d
Level 7	IC 320-230408/8	2018.06.022LLICALA_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorobutanoic acid (PFBA)		AveID	53032 10038407	101417 19649046	494056	1988994	5082569	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	50238 8179819	96672 16023894	426389	1716017	4393072	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	65039 12478112	128130 23901442	628678	2522554	6551841	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	15935 2637247	27927 4909543	147810	579912	1455891	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	50192 8007957	79094 14793082	412137	1652916	4107362	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	63099 12160402	123589 22585045	596678	2445390	6488596	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	50637 7630621	81982 14577124	411542	1687983	4161707	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	58905 10057619	110145 19106190	522113	2132865	5297055	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	++++ 2871537	30024 5120478	154417	585176	1488769	++++ 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	++++ 7528593	105585 13757900	442141	1584645	3968232	++++ 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	42344 9071722	88572 17200801	456597	1871532	4673461	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorooctanesulfonic acid (PFOS)		AveID	34198 7180006	75835 14138725	352073	1470850	3608394	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanoic acid (PFNA)		AveID	32312 5570182	57337 10205563	298376	1179075	2937722	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorononanesulfonic acid		AveID	23459 4992926	54007 9674320	249818	1033122	2507520	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
8:2 FTS		AveID	12889 2089995	19597 3695792	108875	436473	1110703	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

Analy Batch No.: 230408

SDG No.: _____

Instrument ID: A8_N

GC Column: GeminiC18 3 ID: 3(mm)

Heated Purge: (Y/N) N

Calibration Start Date: 06/22/2018 09:18

Calibration End Date: 06/22/2018 10:05

Calibration ID: 39780

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
Perfluorooctane Sulfonamide (FOSA)		AveID	45469 9763674	100861 17119032	506378	2054520	5113705	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanoic acid (PFDA)		AveID	19293 3937614	43347 7267465	227358	829041	2139115	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	4957 1256655	12404 2634345	59968	266738	615583	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	23300 4293805	38516 8199124	213465	828269	2179207	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	6725 1172882	12753 2158862	58676	237035	542960	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	16614 2350950	20596 4654341	120245	498561	1292539	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	16949 3336019	33622 6212547	163681	663667	1741222	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	12773 3010254	29402 5898236	152090	604768	1465014	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	3808 715874	8429 1408363	38505	140908	353319	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5122345 4935509	5055585 4836014	5029706	5061708	5069506	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	3730951 3533618	3726101 3349234	3706517	3717905	3626987	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	86568 85120	85767 79602	86423	85995	85421	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	3982548 3747484	4105876 3630593	4200709	4092652	3930538	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	3708572 3380419	3687398 3193349	3816037	3775621	3562614	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	4858266 4821638	4856023 4613755	5110525	4786363	4840412	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	916363 842860	915348 763908	912462	897174	923567	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3431350 3310624	3497172 3022175	3478825	3592336	3392211	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3334607 3135647	3323626 3133382	3292910	3274276	3287685	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	2795037 2540754	2745740 2432568	2735161	2736975	2696141	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	873098 765818	848789 666781	863118	827630	816606	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C8 FOSA	13PF OA	Ave	5060678 4608610	5054657 4192257	5105100	5111177	4775273	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
 LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
 RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
13C2 PFDA	13PF OA	Ave	2055243 1888841	2085206 1795814	2182998	2132271	2031902	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	595413 618999	601308 650146	646446	615584	603767	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	635511 621285	640803 607510	657494	688173	631827	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFOA	13PF OA	Ave	1590058 1499395	1589901 1444430	1695763	1599453	1500246	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	1611289 1551827	1510879 1467364	1581996	1625890	1654135	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	1462791 1418685	1454197 1403478	1467413	1460585	1477284	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	2877327 2260290	2476240 2234373	2539173	2447790	2347684	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.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-230408/2	2018.06.022LLICALA_002.d
Level 2	IC 320-230408/3	2018.06.022LLICALA_003.d
Level 3	IC 320-230408/4	2018.06.022LLICALA_004.d
Level 4	IC 320-230408/5	2018.06.022LLICALA_005.d
Level 5	IC 320-230408/6	2018.06.022LLICALA_006.d
Level 6	IC 320-230408/7	2018.06.022LLICALA_007.d
Level 7	IC 320-230408/8	2018.06.022LLICALA_008.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)	3.0 1.0	-0.2	-2.3	-2.3	-0.3	1.1	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	10.7 -1.6	6.7	-5.4	-5.1	-0.4	-4.8	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	0.9 0.9	0.4	-2.3	-1.5	3.1	-1.5	30 30	30	30	30	30	30
4:2 FTS	10.5 -7.4	-2.3	2.7	1.2	2.3	-7.0	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	20.1 -2.9	-8.2	-6.5	-3.8	-0.4	1.8	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	1.4 -1.4	0.2	-4.0	-1.1	5.6	-0.7	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	17.8 -1.5	-4.1	-6.9	-3.5	0.8	-2.6	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	10.9 -5.3	3.7	-6.6	1.9	0.1	-4.6	30 30	30	30	30	30	30
6:2 FTS	++++ 1.0	-1.1	2.0	-1.7	-2.8	2.7	30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	++++ -6.8	23.6	4.1	-9.7	-4.2	-6.9	30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-8.0 -0.5	-3.4	0.5	3.6	3.0	4.8	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-7.1 2.2	3.3	-3.2	1.7	-0.6	3.7	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	6.4 -3.4	-3.9	0.4	-0.8	0.3	0.9	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-8.7 0.2	5.4	-1.5	2.4	-1.0	3.3	30 30	30	30	30	30	30
8:2 FTS	10.9 4.1	-13.3	-5.3	-1.0	2.1	2.5	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.: 320-40153-1 Analy Batch No.: 230408

SDG No.: _____

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

Calibration Start Date: 06/22/2018 09:18 Calibration End Date: 06/22/2018 10:05 Calibration ID: 39780

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
Perfluorooctane Sulfonamide (FOSA)	-10.7 1.4	-0.9	-1.4	-0.1	6.4	5.3	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	-7.4 -0.2	2.5	2.7	-4.1	3.8	2.8	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-15.8 2.4	4.3	-6.2	9.5	3.1	2.6	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	7.2 0.4	-11.1	-0.5	-2.9	1.7	5.1	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	14.0 -4.3	7.2	-3.9	-7.2	-7.4	1.7	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	29.9 0.1	-19.5	-11.9	-3.1	7.1	-2.6	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	-0.6 0.0	5.2	-2.2	-3.5	-0.5	1.6	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	-14.9 7.9	4.5	3.3	-0.1	-4.9	4.2	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	1.5 -2.2	13.0	2.3	-6.0	-6.8	-1.7	30 30	30	30	30	30	30

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: ICV 320-230408/10 Calibration Date: 06/22/2018 10:20
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.022LLICALA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	0.9819		2.44	2.50	-2.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.164		2.39	2.50	-4.3	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	81.70		2.31	2.21	4.3	30.0
4:2 FTS	AveID	16.59	16.59		2.34	2.34	0.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	1.003		2.39	2.50	-4.5	30.0
Perfluoropentanesulfonic acid	AveID	71.30	73.54		2.42	2.35	3.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.089		2.35	2.50	-6.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.065		2.14	2.28	-6.3	30.0
6:2 FTS	AveID	1.663	1.644		2.35	2.38	-1.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.137		2.33	2.50	-6.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.341		2.30	2.38	-3.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.044		2.40	2.50	-3.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.079		2.20	2.31	-5.1	30.0
8:2 FTS	AveID	1.332	1.295		2.33	2.40	-2.7	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.7482		2.34	2.40	-2.5	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	1.065		2.65	2.50	5.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	0.9647		2.38	2.50	-4.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	1.020		2.58	2.50	3.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6444		2.41	2.41	-0.3	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.9650		2.60	2.50	3.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.7480		2.32	2.50	-7.0	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.080		2.55	2.50	2.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	0.9467		2.54	2.50	1.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2368		2.31	2.50	-7.7	30.0
13C4 PFBA	Ave	1.423	1.349		2.37	2.50	-5.2	30.0
13C5 PFPeA	Ave	1.028	0.9649		2.35	2.50	-6.2	30.0
13C3-PFBS	Ave	0.0259	0.0234		2.10	2.33	-9.7	30.0
13C2 PFHxA	Ave	1.121	1.106		2.47	2.50	-1.4	30.0
13C4-PFHpA	Ave	1.016	0.9912		2.44	2.50	-2.5	30.0
18O2 PFHxS	Ave	1.452	1.375		2.24	2.37	-5.3	30.0
M2-6:2FTS	Ave	0.2628	0.2439		2.20	2.38	-7.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: ICV 320-230408/10 Calibration Date: 06/22/2018 10:20
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.022LLICALA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9334		2.43	2.50	-2.8	30.0
13C4 PFOS	Ave	0.9659	0.9264		2.29	2.39	-4.1	30.0
13C5 PFNA	Ave	0.7564	0.7111		2.35	2.50	-6.0	30.0
M2-8:2FTS	Ave	0.2389	0.2358		2.36	2.40	-1.3	30.0
13C8 FOSA	Ave	1.371	1.268		2.31	2.50	-7.5	30.0
13C2 PFDA	Ave	0.5733	0.5571		2.43	2.50	-2.8	30.0
d3-NMeFOSAA	Ave	0.1759	0.1840		2.62	2.50	4.6	30.0
13C2 PFUnA	Ave	0.4421	0.4299		2.43	2.50	-2.8	30.0
d5-NEtFOSAA	Ave	0.1816	0.1773		2.44	2.50	-2.4	30.0
13C2 PFDoA	Ave	0.4458	0.4223		2.37	2.50	-5.3	30.0
13C2-PFTeDA	Ave	0.4113	0.4131		2.51	2.50	0.4	30.0
13C2-PFHxDA	Ave	0.6956	0.6292		2.26	2.50	-9.5	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/26/2018 23:17

Analysis Batch Number: 231134 End Date: 06/26/2018 23:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-231134/1		06/26/2018 23:17	1	2018.06.26LLC_001.d	GeminiC18 3x100 3(mm)
CCVL 320-231134/2		06/26/2018 23:24	1	2018.06.26LLC_002.d	GeminiC18 3x100 3(mm)
CCV 320-231134/3 CCVIS		06/26/2018 23:32	1	2018.06.26LLC_003.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/26/2018 23:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/26/2018 23:48	10		GeminiC18 3x100 3(mm)
CCV 320-231134/6		06/26/2018 23:56	1		GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-231134/2 Calibration Date: 06/26/2018 23:24
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	0.996		0.0495	0.0500	-1.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.271		0.0523	0.0500	4.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	74.78		0.0422	0.0442	-4.5	30.0
4:2 FTS	AveID	16.59	18.25		0.400	0.0467	10.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	1.102		0.0525	0.0500	5.0	30.0
Perfluoropentanesulfonic acid	AveID	71.30	71.31		0.0469	0.0469	0.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.123		0.0485	0.0500	-3.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.247		0.0499	0.0455	9.7	30.0
6:2 FTS	AveID	1.663	1.826		0.0520	0.0474	9.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.235		0.0507	0.0501	1.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.454		0.0500	0.0476	4.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.172		0.0539	0.0500	7.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.230		0.0502	0.0464	8.1	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	0.9636		0.0479	0.0500	-4.2	30.0
8:2 FTS	AveID	1.332	1.402		0.0504	0.0479	5.3	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.7606		0.0476	0.0480	-0.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	0.9942		0.0490	0.0500	-2.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	1.135		0.400	0.0500	14.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6778		0.0506	0.0482	4.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.9667		0.0521	0.0500	4.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.8648		0.0537	0.0500	7.5	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.181		0.0558	0.0500	11.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	1.137		0.0610	0.0500	22.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2996		0.0584	0.0500	16.8	30.0
13C4 PFBA	Ave	1.423	1.395		2.45	2.50	-2.0	30.0
13C5 PFPeA	Ave	1.028	1.033		2.51	2.50	0.5	30.0
13C3-PFBS	Ave	0.0259	0.0256		2.29	2.33	-1.4	30.0
13C2 PFHxA	Ave	1.121	1.130		2.52	2.50	0.8	30.0
13C4-PFHpA	Ave	1.016	1.051		2.59	2.50	3.4	30.0
18O2 PFHxS	Ave	1.452	1.418		2.31	2.37	-2.3	30.0
M2-6:2FTS	Ave	0.2628	0.2597		2.35	2.38	-1.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-231134/2 Calibration Date: 06/26/2018 23:24
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9736		2.54	2.50	1.4	30.0
13C4 PFOS	Ave	0.9659	0.9495		2.35	2.39	-1.7	30.0
13C5 PFNA	Ave	0.7564	0.7541		2.49	2.50	-0.3	30.0
13C8 FOSA	Ave	1.371	1.380		2.52	2.50	0.6	30.0
M2-8:2FTS	Ave	0.2389	0.2689		2.70	2.40	12.6	30.0
13C2 PFDA	Ave	0.5733	0.5907		2.58	2.50	3.0	30.0
d3-NMeFOSAA	Ave	0.1759	0.1919		2.73	2.50	9.1	30.0
13C2 PFUnA	Ave	0.4421	0.4468		2.53	2.50	1.1	30.0
d5-NEtFOSAA	Ave	0.1816	0.2111		2.91	2.50	16.2	30.0
13C2 PFDoA	Ave	0.4458	0.4110		2.30	2.50	-7.8	30.0
13C2-PFTeDA	Ave	0.4113	0.3900		2.37	2.50	-5.2	30.0
13C2-PFHxDA	Ave	0.6956	0.6557		2.36	2.50	-5.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231134/3 Calibration Date: 06/26/2018 23:32
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	0.9751		0.970	1.00	-3.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.131		0.930	1.00	-7.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	76.87		0.868	0.884	-1.8	30.0
4:2 FTS	AveID	16.59	17.33		0.976	0.934	4.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	1.021		0.973	1.00	-2.7	30.0
Perfluoropentanesulfonic acid	AveID	71.30	68.07		0.896	0.938	-4.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.132		0.977	1.00	-2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.095		0.877	0.910	-3.7	30.0
6:2 FTS	AveID	1.663	1.623		0.926	0.948	-2.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.229		1.01	1.00	0.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.375		0.945	0.952	-0.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.143		0.933	0.928	0.5	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.060		0.976	1.00	-2.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	0.9897		0.984	1.00	-1.6	30.0
8:2 FTS	AveID	1.332	1.348		0.970	0.958	1.2	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.7692		0.962	0.960	0.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	1.053		1.04	1.00	3.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	0.9509		0.961	1.00	-3.9	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6540		0.976	0.964	1.2	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.8788		0.947	1.00	-5.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.7502		0.932	1.00	-6.8	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.064		1.01	1.00	0.6	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	0.9903		1.06	1.00	6.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2519		0.982	1.00	-1.8	30.0
13C4 PFBA	Ave	1.423	1.399		2.46	2.50	-1.7	30.0
13C5 PFPeA	Ave	1.028	1.048		2.55	2.50	1.9	30.0
13C3-PFBS	Ave	0.0259	0.0261		2.34	2.33	0.6	30.0
13C2 PFHxA	Ave	1.121	1.161		2.59	2.50	3.6	30.0
13C4-PFHpA	Ave	1.016	1.033		2.54	2.50	1.7	30.0
18O2 PFHxS	Ave	1.452	1.413		2.30	2.37	-2.7	30.0
M2-6:2FTS	Ave	0.2628	0.2723		2.46	2.38	3.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231134/3 Calibration Date: 06/26/2018 23:32
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9412		2.45	2.50	-2.0	30.0
13C4 PFOS	Ave	0.9659	0.9760		2.41	2.39	1.0	30.0
13C5 PFNA	Ave	0.7564	0.7411		2.45	2.50	-2.0	30.0
13C8 FOSA	Ave	1.371	1.397		2.55	2.50	1.9	30.0
M2-8:2FTS	Ave	0.2389	0.2464		2.47	2.40	3.1	30.0
13C2 PFDA	Ave	0.5733	0.5452		2.38	2.50	-4.9	30.0
d3-NMeFOSAA	Ave	0.1759	0.1962		2.79	2.50	11.5	30.0
d5-NEtFOSAA	Ave	0.1816	0.2087		2.87	2.50	15.0	30.0
13C2 PFUnA	Ave	0.4421	0.4201		2.38	2.50	-5.0	30.0
13C2 PFDoA	Ave	0.4458	0.4102		2.30	2.50	-8.0	30.0
13C2-PFTeDA	Ave	0.4113	0.3887		2.36	2.50	-5.5	30.0
13C2-PFHxDA	Ave	0.6956	0.6640		2.39	2.50	-4.5	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/27/2018 05:09

Analysis Batch Number: 231147 End Date: 06/27/2018 06:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-231147/1		06/27/2018 05:09	1	2018.06.26LLC_0 46.d	GeminiC18 3x100 3(mm)
MB 320-228913/1-A		06/27/2018 05:17	1	2018.06.26LLC_0 47.d	GeminiC18 3x100 3(mm)
LCS 320-228913/2-A		06/27/2018 05:25	1	2018.06.26LLC_0 48.d	GeminiC18 3x100 3(mm)
LCSD 320-228913/3-A		06/27/2018 05:32	1	2018.06.26LLC_0 49.d	GeminiC18 3x100 3(mm)
320-40153-1		06/27/2018 05:40	1	2018.06.26LLC_0 50.d	GeminiC18 3x100 3(mm)
320-40153-2		06/27/2018 05:48	1	2018.06.26LLC_0 51.d	GeminiC18 3x100 3(mm)
320-40153-3		06/27/2018 05:56	1	2018.06.26LLC_0 52.d	GeminiC18 3x100 3(mm)
320-40153-4		06/27/2018 06:04	1	2018.06.26LLC_0 53.d	GeminiC18 3x100 3(mm)
CCV 320-231147/9		06/27/2018 06:11	1	2018.06.26LLC_0 54.d	GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231147/1 Calibration Date: 06/27/2018 05:09
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	1.005		2.50	2.50	-0.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.186		2.44	2.50	-2.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	77.74		2.19	2.21	-0.7	30.0
4:2 FTS	AveID	16.59	19.42		2.73	2.34	17.1	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	1.010		2.40	2.50	-3.8	30.0
Perfluoropentanesulfonic acid	AveID	71.30	71.90		2.36	2.35	0.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.199		2.59	2.50	3.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.158		2.32	2.28	1.9	30.0
6:2 FTS	AveID	1.663	1.693		2.41	2.37	1.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.419		2.44	2.38	2.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.161		2.38	2.50	-4.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.171		2.39	2.32	3.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.109		2.55	2.50	2.1	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	1.046		2.60	2.50	3.9	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.8317		2.60	2.40	8.4	30.0
8:2 FTS	AveID	1.332	1.380		2.48	2.40	3.6	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	1.043		2.57	2.50	2.9	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	1.012		2.56	2.50	2.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6720		2.51	2.41	4.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.9089		2.45	2.50	-2.1	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.7539		2.34	2.50	-6.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.034		2.44	2.50	-2.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	1.081		2.90	2.50	16.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2692		2.62	2.50	4.9	30.0
13C4 PFBA	Ave	1.423	1.378		2.42	2.50	-3.2	30.0
13C5 PFPeA	Ave	1.028	0.9784		2.38	2.50	-4.9	30.0
13C3-PFBS	Ave	0.0259	0.0251		2.25	2.33	-3.1	30.0
13C2 PFHxA	Ave	1.121	1.128		2.52	2.50	0.6	30.0
13C4-PFHpA	Ave	1.016	1.017		2.50	2.50	0.0	30.0
1802 PFHxS	Ave	1.452	1.322		2.15	2.37	-9.0	30.0
M2-6:2FTS	Ave	0.2628	0.2952		2.67	2.38	12.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231147/1 Calibration Date: 06/27/2018 05:09
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9612		2.50	2.50	0.1	30.0
13C4 PFOS	Ave	0.9659	0.9361		2.32	2.39	-3.1	30.0
13C5 PFNA	Ave	0.7564	0.7475		2.47	2.50	-1.2	30.0
13C8 FOSA	Ave	1.371	1.334		2.43	2.50	-2.7	30.0
M2-8:2FTS	Ave	0.2389	0.2634		2.64	2.40	10.3	30.0
13C2 PFDA	Ave	0.5733	0.5535		2.41	2.50	-3.4	30.0
d3-NMeFOSAA	Ave	0.1759	0.2015		2.86	2.50	14.6	30.0
d5-NEtFOSAA	Ave	0.1816	0.2098		2.89	2.50	15.6	30.0
13C2 PFUnA	Ave	0.4421	0.4393		2.48	2.50	-0.6	30.0
13C2 PFDoA	Ave	0.4458	0.4244		2.38	2.50	-4.8	30.0
13C2-PFTeDA	Ave	0.4113	0.4396		2.67	2.50	6.9	30.0
13C2-PFHxDA	Ave	0.6956	0.9910		3.56	2.50	42.5*	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231147/9 Calibration Date: 06/27/2018 06:11
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.005	0.9763		0.971	1.00	-2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.216	1.148		0.944	1.00	-5.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.30	80.62		0.910	0.884	3.0	30.0
4:2 FTS	AveID	16.59	18.58		1.05	0.934	12.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.049	0.9484		0.904	1.00	-9.6	30.0
Perfluoropentanesulfonic acid	AveID	71.30	69.57		0.915	0.938	-2.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.159	1.140		0.984	1.00	-1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.137	1.093		0.875	0.910	-3.9	30.0
6:2 FTS	AveID	1.663	1.676		0.955	0.948	0.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.386	1.370		0.941	0.952	-1.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.220	1.212		0.994	1.00	-0.7	30.0
Perfluorononanoic acid (PFNA)	AveID	1.086	1.053		0.970	1.00	-3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.137	1.138		0.928	0.928	0.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.006	1.034		1.03	1.00	2.8	30.0
8:2 FTS	AveID	1.332	1.367		0.984	0.958	2.7	30.0
Perfluorononanesulfonic acid	AveID	0.7674	0.7790		0.974	0.960	1.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.014	1.060		1.04	1.00	4.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9889	0.9632		0.974	1.00	-2.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6461	0.6634		0.990	0.964	2.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9284	0.9043		0.974	1.00	-2.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8046	0.7394		0.919	1.00	-8.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.058	1.130		1.07	1.00	6.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9311	1.102		1.18	1.00	18.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2566	0.2542		0.991	1.00	-0.9	30.0
13C4 PFBA	Ave	1.423	1.358		2.39	2.50	-4.6	30.0
13C5 PFPeA	Ave	1.028	0.9774		2.38	2.50	-5.0	30.0
13C3-PFBS	Ave	0.0259	0.0246		2.20	2.33	-5.3	30.0
13C2 PFHxA	Ave	1.121	1.173		2.62	2.50	4.7	30.0
13C4-PFHpA	Ave	1.016	1.036		2.55	2.50	2.0	30.0
1802 PFHxS	Ave	1.452	1.367		2.23	2.37	-5.9	30.0
M2-6:2FTS	Ave	0.2628	0.3032		2.74	2.38	15.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231147/9 Calibration Date: 06/27/2018 06:11
 Instrument ID: A8_N Calib Start Date: 06/22/2018 09:18
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/22/2018 10:05
 Lab File ID: 2018.06.26LLC_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9601	0.9309		2.42	2.50	-3.0	30.0
13C4 PFOS	Ave	0.9659	0.9222		2.28	2.39	-4.5	30.0
13C5 PFNA	Ave	0.7564	0.7428		2.46	2.50	-1.8	30.0
13C8 FOSA	Ave	1.371	1.342		2.45	2.50	-2.1	30.0
M2-8:2FTS	Ave	0.2389	0.2691		2.70	2.40	12.6	30.0
13C2 PFDA	Ave	0.5733	0.5796		2.53	2.50	1.1	30.0
d3-NMeFOSAA	Ave	0.1759	0.2065		2.94	2.50	17.4	30.0
13C2 PFUnA	Ave	0.4421	0.4454		2.52	2.50	0.7	30.0
d5-NEtFOSAA	Ave	0.1816	0.2078		2.86	2.50	14.5	30.0
13C2 PFDoA	Ave	0.4458	0.4041		2.27	2.50	-9.3	30.0
13C2-PFTeDA	Ave	0.4113	0.4094		2.49	2.50	-0.4	30.0
13C2-PFHxDA	Ave	0.6956	0.8385		3.01	2.50	20.6	30.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-230408/9
 Matrix: Water Lab File ID: 2018.06.022LLICALA_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/22/2018 10:13
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 230408 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	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 M	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U M	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)	0.00804	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-230408/9
 Matrix: Water Lab File ID: 2018.06.022LLICALA_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/22/2018 10:13
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 230408 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	97		50-150
STL00992	13C4 PFBA	96		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	101		50-150
STL01892	13C4-PFHpA	100		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	103		50-150
STL00996	13C2 PFDA	100		50-150
STL00997	13C2 PFUnA	98		50-150
STL00998	13C2 PFDoA	95		50-150
STL00994	18O2 PFHxS	95		50-150
STL02116	13C2-PFTeDA	89		50-150
STL00991	13C4 PFOS	97		50-150
STL02337	13C3-PFBS	94		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 320-231134/1
 Matrix: Water Lab File ID: 2018.06.26LLC_001.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/26/2018 23:17
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231134 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	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 M	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00860	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 320-231134/1
 Matrix: Water Lab File ID: 2018.06.26LLC_001.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/26/2018 23:17
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231134 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		50-150
STL00992	13C4 PFBA	97		50-150
STL01893	13C5 PFPeA	103		50-150
STL00993	13C2 PFHxA	99		50-150
STL01892	13C4-PFHpA	100		50-150
STL00990	13C4 PFOA	100		50-150
STL00995	13C5 PFNA	97		50-150
STL00996	13C2 PFDA	101		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	89		50-150
STL00994	18O2 PFHxS	96		50-150
STL02116	13C2-PFTeDA	100		50-150
STL00991	13C4 PFOS	98		50-150
STL02337	13C3-PFBS	98		50-150

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/29/2018 21:29

Analysis Batch Number: 231836 End Date: 06/29/2018 22:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-231836/2		06/29/2018 21:29	1	2018.06.29LLICA LA 002.d	GeminiC18 3x100 3(mm)
IC 320-231836/3		06/29/2018 21:36	1	2018.06.29LLICA LA 003.d	GeminiC18 3x100 3(mm)
IC 320-231836/4		06/29/2018 21:44	1	2018.06.29LLICA LA 004.d	GeminiC18 3x100 3(mm)
IC 320-231836/5 ICIS		06/29/2018 21:52	1	2018.06.29LLICA LA 005.d	GeminiC18 3x100 3(mm)
IC 320-231836/6		06/29/2018 22:00	1	2018.06.29LLICA LA 006.d	GeminiC18 3x100 3(mm)
IC 320-231836/7		06/29/2018 22:08	1	2018.06.29LLICA LA 007.d	GeminiC18 3x100 3(mm)
IC 320-231836/8		06/29/2018 22:16	1	2018.06.29LLICA LA 008.d	GeminiC18 3x100 3(mm)
ICB 320-231836/9		06/29/2018 22:23	1	2018.06.29LLICA LA 009.d	GeminiC18 3x100 3(mm)
ICV 320-231836/10		06/29/2018 22:31	1	2018.06.29LLICA LA 010.d	GeminiC18 3x100 3(mm)
CCB 320-231836/11		06/29/2018 22:39	1		GeminiC18 3x100 3(mm)

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

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-231836/2	2018.06.29LLICALA_002.d
Level 2	IC 320-231836/3	2018.06.29LLICALA_003.d
Level 3	IC 320-231836/4	2018.06.29LLICALA_004.d
Level 4	IC 320-231836/5	2018.06.29LLICALA_005.d
Level 5	IC 320-231836/6	2018.06.29LLICALA_006.d
Level 6	IC 320-231836/7	2018.06.29LLICALA_007.d
Level 7	IC 320-231836/8	2018.06.29LLICALA_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorobutanoic acid (PFBA)	1.1172 1.0147	1.0378 0.9924	0.9746	0.9742	1.0109	AveID		1.0174			4.9		20.0				
Perfluoropentanoic acid (PFPeA)	1.1831 1.1764	1.2809 1.1416	1.1626	1.1873	1.1798	AveID		1.1874			3.7		20.0				
Perfluorobutanesulfonic acid (PFBS)	79.069 78.301	77.680 74.556	75.181	76.908	78.450	AveID		77.163			2.2		20.0				
4:2 FTS	22.926 18.821	20.439 18.373	19.234	18.646	19.569	AveID		19.715			8.0		20.0				
Perfluorohexanoic acid (PFHxA)	0.9740 1.0307	1.1170 1.0482	0.9998	1.0381	1.0327	AveID		1.0344			4.3		20.0				
Perfluoropentanesulfonic acid	71.573 70.160	67.484 65.414	69.342	69.002	71.219	AveID		69.171			3.1		20.0				
Perfluoroheptanoic acid (PFHpA)	1.2725 1.1312	1.0179 1.0825	1.0536	1.1126	1.0932	AveID		1.1091			7.3		20.0				
Perfluorohexanesulfonic acid (PFHxS)	1.3541 1.1133	1.2539 1.1879	1.0335	1.0628	1.1052	AveID		1.1587			9.8		20.0				
6:2 FTS	1.5015 1.6305	1.5781 1.6740	1.6010	1.5976	1.6672	AveID		1.6071			3.7		20.0				
Perfluorooctanoic acid (PFOA)	1.2981 1.1451	1.1933 1.0999	1.1186	1.1664	1.2071	AveID		1.1755			5.6		20.0				
Perfluoroheptanesulfonic Acid (PFHpS)	1.2603 1.4385	1.3364 1.3173	1.3690	1.3812	1.4110	AveID		1.3591			4.4		20.0				
Perfluorononanoic acid (PFNA)	1.3006 1.1390	1.1247 1.1055	1.0619	1.0454	1.0020	AveID		1.1113			8.7		20.0				
Perfluorooctanesulfonic acid (PFOS)	1.1744 1.1875	1.2182 1.1558	1.1195	1.1233	1.1612	AveID		1.1628			3.0		20.0				
Perfluorononanesulfonic acid	0.7933 0.8189	0.8645 0.7890	0.7846	0.7919	0.7943	AveID		0.8052			3.5		20.0				

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

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

Lab Name: TestAmerica Sacramento

Job No.: 320-40153-1

Analy Batch No.: 231836

SDG No.: _____

Instrument ID: A8_N

GC Column: GeminiC18 3 ID: 3(mm)

Heated Purge: (Y/N) N

Calibration Start Date: 06/29/2018 21:29

Calibration End Date: 06/29/2018 22:16

Calibration ID: 39860

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorooctane Sulfonamide (FOSA)	0.9209 0.9897	1.0093 1.0018	1.0079	1.0226	1.0660	AveID		1.0026			4.3		20.0				
8:2 FTS	1.3651 1.3034	1.3378 1.3200	1.3111	1.4039	1.3853	AveID		1.3467			2.9		20.0				
Perfluorodecanoic acid (PFDA)	1.1434 1.0626	1.0656 1.0181	1.0651	0.9934	1.0803	AveID		1.0612			4.5		20.0				
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9972 1.0074	0.8393 0.9793	0.9400	0.9204	1.0028	AveID		0.9552			6.4		20.0				
Perfluorodecanesulfonic acid (PFDS)	0.6679 0.7024	0.6462 0.7045	0.6843	0.6936	0.7190	AveID		0.6883			3.6		20.0				
Perfluoroundecanoic acid (PFUnA)	1.0160 0.8771	0.9333 0.8713	0.8908	0.7937	0.9325	AveID		0.9021			7.6		20.0				
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.8603 0.8826	0.9246 0.9634	0.8969	0.8354	0.8931	AveID		0.8938			4.7		20.0				
Perfluorododecanoic acid (PFDoA)	0.8803 1.0723	1.1610 1.1170	1.1090	1.0943	1.1434	AveID		1.0825			8.7		20.0				
Perfluorotridecanoic Acid (PFTriA)	1.3189 1.1473	1.1343 1.2037	1.0878	1.1059	1.2011	AveID		1.1713			6.7		20.0				
Perfluorotetradecanoic acid (PFTeA)	0.2983 0.2475	0.2357 0.2391	0.2446	0.2456	0.2400	AveID		0.2501			8.7		20.0				
13C4 PFBA	1.3863 1.3876	1.3300 1.5102	1.3550	1.3868	1.4226	Ave		1.3969			4.1		20.0				
13C5 PFPeA	0.9682 0.9686	0.9284 1.0521	0.9535	0.9748	1.0208	Ave		0.9809			4.3		20.0				
13C3-PFBS	0.0213 0.0212	0.0204 0.0227	0.0212	0.0219	0.0227	Ave		0.0216			4.0		20.0				
13C2 PFHxA	1.0894 1.0693	1.0509 1.0792	1.0299	1.0727	1.1271	Ave		1.0741			2.8		20.0				
13C4-PFHpA	1.0103 0.9285	0.9649 1.0337	0.9845	0.9750	1.0680	Ave		0.9950			4.7		20.0				
18O2 PFHxS	1.2140 1.1143	1.1146 1.1204	1.1828	1.1747	1.2103	Ave		1.1616			3.8		20.0				
M2-6:2FTS	0.2505 0.2341	0.2364 0.2377	0.2370	0.2423	0.2494	Ave		0.2411			2.7		20.0				
13C4 PFOA	0.9586 0.9614	0.9358 0.9784	0.9307	0.9510	0.9678	Ave		0.9548			1.8		20.0				
13C4 PFOS	0.7870 0.7450	0.7462 0.7838	0.7760	0.7919	0.8213	Ave		0.7787			3.4		20.0				
13C5 PFNA	0.8244 0.7339	0.7794 0.7798	0.7715	0.7963	0.8488	Ave		0.7906			4.7		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.: 320-40153-1 Analy Batch No.: 231836
 SDG No.: _____
 Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
 Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
13C8 FOSA	1.0769 1.0021	1.0237 0.9933	0.9893	1.0141	1.0645	Ave		1.0234			3.4		20.0				
M2-8:2FTS	0.2813 0.2414	0.2639 0.2541	0.2719	0.2480	0.2737	Ave		0.2621			5.6		20.0				
13C2 PFDA	0.6633 0.6205	0.6194 0.6454	0.6360	0.6697	0.6628	Ave		0.6453			3.2		20.0				
d3-NMeFOSAA	0.3813 0.3793	0.3579 0.4140	0.3827	0.3964	0.3969	Ave		0.3869			4.6		20.0				
d5-NEtFOSAA	0.4059 0.3505	0.3871 0.3625	0.3843	0.3988	0.3880	Ave		0.3825			5.1		20.0				
13C2 PFunA	0.5402 0.5121	0.5421 0.5155	0.5064	0.5590	0.5360	Ave		0.5302			3.6		20.0				
13C2 PFDoA	0.6148 0.5967	0.5817 0.6172	0.6203	0.6250	0.6480	Ave		0.6148			3.4		20.0				
13C2-PFTeDA	0.7905 0.7344	0.7538 0.7760	0.7400	0.7743	0.7969	Ave		0.7666			3.2		20.0				
13C2-PFHxDA	1.4812 1.4223	1.4101 1.3815	1.3890	1.4499	1.5161	Ave		1.4357			3.4		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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-231836/2	2018.06.29LLICALA_002.d
Level 2	IC 320-231836/3	2018.06.29LLICALA_003.d
Level 3	IC 320-231836/4	2018.06.29LLICALA_004.d
Level 4	IC 320-231836/5	2018.06.29LLICALA_005.d
Level 5	IC 320-231836/6	2018.06.29LLICALA_006.d
Level 6	IC 320-231836/7	2018.06.29LLICALA_007.d
Level 7	IC 320-231836/8	2018.06.29LLICALA_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorobutanoic acid (PFBA)		AveID	63343 11741171	126354 23128489	610361	2252577	5508925	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	46852 9501364	108868 18536324	512335	1929658	4613629	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	60783 12236181	128257 23050057	650349	2478950	6043590	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	18621 3107472	35656 6001471	175795	635002	1592786	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	43400 9190933	107466 17458801	475916	1856655	4458485	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	58382 11633698	118229 21459182	636482	2359989	5821695	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	52584 8757903	89912 17268732	479453	1808556	4472196	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	61184 9413780	116431 18691081	514149	1894329	4662604	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	14584 3017922	32377 5820534	166253	611856	1509731	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	50947 9189211	102335 16625027	481654	1851409	4479330	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	38620 8507357	86914 15169426	467426	1735998	4226190	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	43852 6970772	80249 13304232	378656	1387831	3257852	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	35082 6845858	77229 12974045	372592	1376214	3390238	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanesulfonic acid		AveID	24516 4883680	56695 9162545	270116	1003682	2399114	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
Perfluorooctane Sulfonamide (FOSA)		AveID	40561 8270576	94580 15357897	460857	1729076	4346618	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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

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	15048 2513469	30968 4958739	157827	556151	1391409	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	31018 5498196	60419 10140917	313067	1109123	2743088	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	15552 3186253	27497 6257140	166284	608345	1524413	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	20726 4206492	42559 8214689	236582	882815	2180555	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	22447 3744964	46322 6931775	208512	739739	1914730	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	14281 2579637	32768 5390142	159315	555505	1327250	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	22136 5334947	61822 10640247	317910	1140263	2838470	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	33165 5708249	60399 11465935	311842	1152386	2981566	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	9644 1515366	16269 2863050	83650	317057	732758	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5669907 5785463	6087691 5826550	6262374	5780456	5449346	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	3960055 4038335	4249734 4059427	4406926	4063195	3910355	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	80874 82201	86851 81313	91006	84775	81046	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4455638 4458382	4810563 4163964	4760163	4471278	4317490	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4132240 3871069	4416706 3988277	4550423	4063826	4090923	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	4697015 4395037	4826276 4089199	5171616	4632149	4385789	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	973359 927417	1028014 871081	1040599	959459	907459	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3920686 4008387	4283590 3774933	4301713	3964131	3707106	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3077341 2969473	3265540 2891085	3428587	3155396	3007709	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3371665 3059923	3567496 3008741	3565828	3318974	3251248	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	4404580 4178174	4685651 3832562	4572335	4227113	4077656	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1102336 964231	1157380 939188	1203743	990382	1004377	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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

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	2712679 2587120	2835108 2490269	2939262	2791311	2539116	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1559520 1581489	1638012 1597284	1768886	1652411	1520200	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1659993 1461344	1771980 1398706	1776279	1662467	1486190	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2209251 2134943	2481505 1989027	2340674	2329895	2053362	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2514542 2487635	2662501 2381403	2866693	2605043	2482377	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3232976 3061795	3450533 2994139	3420305	3227344	3052797	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6058178 5930151	6454693 5329991	6419892	6043418	5807526	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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-231836/2	2018.06.29LLICALA_002.d
Level 2	IC 320-231836/3	2018.06.29LLICALA_003.d
Level 3	IC 320-231836/4	2018.06.29LLICALA_004.d
Level 4	IC 320-231836/5	2018.06.29LLICALA_005.d
Level 5	IC 320-231836/6	2018.06.29LLICALA_006.d
Level 6	IC 320-231836/7	2018.06.29LLICALA_007.d
Level 7	IC 320-231836/8	2018.06.29LLICALA_008.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)	9.8 -2.5	2.0	-4.2	-4.2	-0.6	-0.3	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	-0.4 -3.9	7.9	-2.1	0.0	-0.6	-0.9	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	2.5 -3.4	0.7	-2.6	-0.3	1.7	1.5	30 30	30	30	30	30	30
4:2 FTS	16.3 -6.8	3.7	-2.4	-5.4	-0.7	-4.5	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-5.8 1.3	8.0	-3.3	0.4	-0.2	-0.3	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	3.5 -5.4	-2.4	0.2	-0.2	3.0	1.4	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	14.7 -2.4	-8.2	-5.0	0.3	-1.4	2.0	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	16.9 2.5	8.2	-10.8	-8.3	-4.6	-3.9	30 30	30	30	30	30	30
6:2 FTS	-6.6 4.2	-1.8	-0.4	-0.6	3.7	1.5	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	10.4 -6.4	1.5	-4.8	-0.8	2.7	-2.6	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-7.3 -3.1	-1.7	0.7	1.6	3.8	5.8	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	17.0 -0.5	1.2	-4.4	-5.9	-9.8	2.5	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	1.0 -0.6	4.8	-3.7	-3.4	-0.1	2.1	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-1.5 -2.0	7.4	-2.6	-1.7	-1.4	1.7	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-8.2 -0.1	0.7	0.5	2.0	6.3	-1.3	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.: 320-40153-1 Analy Batch No.: 231836

SDG No.: _____

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

Calibration Start Date: 06/29/2018 21:29 Calibration End Date: 06/29/2018 22:16 Calibration ID: 39860

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	1.4 -2.0	-0.7	-2.6	4.2	2.9	-3.2	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	7.7 -4.1	0.4	0.4	-6.4	1.8	0.1	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	4.4 2.5	-12.1	-1.6	-3.6	5.0	5.5	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-3.0 2.4	-6.1	-0.6	0.8	4.5	2.1	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	12.6 -3.4	3.5	-1.3	-12.0	3.4	-2.8	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	-3.7 7.8	3.5	0.4	-6.5	-0.1	-1.2	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	-18.7 3.2	7.3	2.4	1.1	5.6	-0.9	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	12.6 2.8	-3.2	-7.1	-5.6	2.5	-2.0	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	19.3 -4.4	-5.7	-2.2	-1.8	-4.0	-1.1	30 30	30	30	30	30	30

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: ICV 320-231836/10 Calibration Date: 06/29/2018 22:31
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLICALA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.017	0.9762		2.40	2.50	-4.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.187	1.133		2.38	2.50	-4.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.16	79.50		2.28	2.21	3.0	30.0
4:2 FTS	AveID	19.72	18.05		2.14	2.34	-8.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.034	0.996		2.41	2.50	-3.7	30.0
Perfluoropentanesulfonic acid	AveID	69.17	70.12		2.38	2.35	1.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.109	1.053		2.37	2.50	-5.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.159	1.051		2.07	2.28	-9.3	30.0
6:2 FTS	AveID	1.607	1.632		2.41	2.38	1.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.176	1.105		2.35	2.50	-6.0	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.359	1.358		2.37	2.38	-0.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.111	1.016		2.29	2.50	-8.6	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.163	1.127		2.24	2.31	-3.1	30.0
Perfluorononanesulfonic acid	AveID	0.8052	0.8228		2.45	2.40	2.2	30.0
8:2 FTS	AveID	1.347	1.304		2.32	2.40	-3.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.003	1.042		2.60	2.50	3.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.061	1.072		2.53	2.50	1.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9552	1.063		2.78	2.50	11.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6883	0.6713		2.35	2.41	-2.5	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8938	1.054		2.95	2.50	17.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9021	0.8398		2.33	2.50	-6.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.044		2.41	2.50	-3.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.171	1.103		2.35	2.50	-5.8	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2501	0.2474		2.47	2.50	-1.1	30.0
13C4 PFBA	Ave	1.397	1.399		2.50	2.50	0.2	30.0
13C5 PFPeA	Ave	0.9809	0.9778		2.49	2.50	-0.3	30.0
13C3-PFBS	Ave	0.0216	0.0215		2.31	2.33	-0.4	30.0
13C2 PFHxA	Ave	1.074	1.091		2.54	2.50	1.5	30.0
13C4-PFHpA	Ave	0.9950	1.020		2.56	2.50	2.5	30.0
18O2 PFHxS	Ave	1.162	1.164		2.37	2.37	0.2	30.0
M2-6:2FTS	Ave	0.2411	0.2325		2.29	2.38	-3.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: ICV 320-231836/10 Calibration Date: 06/29/2018 22:31
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLICALA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9548	0.9644		2.53	2.50	1.0	30.0
13C4 PFOS	Ave	0.7787	0.7730		2.37	2.39	-0.7	30.0
13C5 PFNA	Ave	0.7906	0.7773		2.46	2.50	-1.7	30.0
M2-8:2FTS	Ave	0.2621	0.2612		2.39	2.40	-0.3	30.0
13C8 FOSA	Ave	1.023	1.009		2.47	2.50	-1.4	30.0
13C2 PFDA	Ave	0.6453	0.6490		2.51	2.50	0.6	30.0
d3-NMeFOSAA	Ave	0.3869	0.3878		2.51	2.50	0.2	30.0
d5-NEtFOSAA	Ave	0.3825	0.3475		2.27	2.50	-9.1	30.0
13C2 PFUnA	Ave	0.5302	0.5307		2.50	2.50	0.0	30.0
13C2 PFDoA	Ave	0.6148	0.6200		2.52	2.50	0.8	30.0
13C2-PFTeDA	Ave	0.7666	0.7512		2.45	2.50	-2.0	30.0
13C2-PFHxDA	Ave	1.436	1.434		2.50	2.50	-0.1	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Instrument ID: A8_N Start Date: 06/30/2018 00:13

Analysis Batch Number: 231842 End Date: 06/30/2018 01:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-231842/1		06/30/2018 00:13	1	2018.06.29LLBBX 014.d	GeminiC18 3x100 3(mm)
320-40153-1 DL		06/30/2018 01:08	10	2018.06.29LLBBX 021.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/30/2018 01:16	1		GeminiC18 3x100 3(mm)
CCV 320-231842/10		06/30/2018 01:24	1	2018.06.29LLBBX 023.d	GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231842/1 Calibration Date: 06/30/2018 00:13
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLBBX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.017	0.9875		0.971	1.00	-2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.187	1.146		0.965	1.00	-3.5	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.16	75.88		0.869	0.884	-1.7	30.0
4:2 FTS	AveID	19.72	18.72		0.887	0.934	-5.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.034	1.045		1.01	1.00	1.0	30.0
Perfluoropentanesulfonic acid	AveID	69.17	68.80		0.933	0.938	-0.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.109	1.095		0.987	1.00	-1.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.159	1.063		0.835	0.910	-8.3	30.0
6:2 FTS	AveID	1.607	1.763		1.04	0.948	9.7	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.176	1.111		0.946	1.00	-5.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.359	1.390		0.974	0.952	2.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.111	1.065		0.959	1.00	-4.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.163	1.123		0.896	0.928	-3.4	30.0
8:2 FTS	AveID	1.347	1.431		1.02	0.958	6.3	30.0
Perfluorononanesulfonic acid	AveID	0.8052	0.7879		0.939	0.960	-2.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.061	1.112		1.05	1.00	4.8	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.003	1.041		1.04	1.00	3.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9552	0.995		1.04	1.00	4.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6883	0.7158		1.00	0.964	4.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8938	0.8530		0.954	1.00	-4.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9021	0.9863		1.09	1.00	9.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.056		0.975	1.00	-2.5	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.171	1.061		0.906	1.00	-9.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2501	0.2489		0.995	1.00	-0.5	30.0
13C4 PFBA	Ave	1.397	1.393		2.49	2.50	-0.3	30.0
13C5 PFPeA	Ave	0.9809	1.010		2.57	2.50	3.0	30.0
13C3-PFBS	Ave	0.0216	0.0222		2.38	2.33	2.5	30.0
13C2 PFHxA	Ave	1.074	1.090		2.54	2.50	1.5	30.0
13C4-PFHpA	Ave	0.9950	1.010		2.54	2.50	1.5	30.0
18O2 PFHxS	Ave	1.162	1.214		2.47	2.37	4.5	30.0
M2-6:2FTS	Ave	0.2411	0.2432		2.40	2.38	0.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231842/1 Calibration Date: 06/30/2018 00:13
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLBBX_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9548	0.995		2.61	2.50	4.2	30.0
13C4 PFOS	Ave	0.7787	0.7961		2.44	2.39	2.2	30.0
13C5 PFNA	Ave	0.7906	0.7875		2.49	2.50	-0.4	30.0
13C8 FOSA	Ave	1.023	1.044		2.55	2.50	2.0	30.0
M2-8:2FTS	Ave	0.2621	0.2573		2.35	2.40	-1.8	30.0
13C2 PFDA	Ave	0.6453	0.6280		2.43	2.50	-2.7	30.0
d3-NMeFOSAA	Ave	0.3869	0.3746		2.42	2.50	-3.2	30.0
13C2 PFUnA	Ave	0.5302	0.4973		2.35	2.50	-6.2	30.0
d5-NEtFOSAA	Ave	0.3825	0.3993		2.61	2.50	4.4	30.0
13C2 PFDoA	Ave	0.6148	0.6396		2.60	2.50	4.0	30.0
13C2-PFTeDA	Ave	0.7666	0.7527		2.45	2.50	-1.8	30.0
13C2-PFHxDA	Ave	1.436	1.437		2.50	2.50	0.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231842/10 Calibration Date: 06/30/2018 01:24
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLBBX_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.017	1.021		2.51	2.50	0.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.187	1.155		2.43	2.50	-2.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.16	78.34		2.24	2.21	1.5	30.0
4:2 FTS	AveID	19.72	19.21		2.27	2.34	-2.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.034	1.000		2.42	2.50	-3.4	30.0
Perfluoropentanesulfonic acid	AveID	69.17	71.08		2.41	2.35	2.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.109	1.128		2.54	2.50	1.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.159	1.122		2.20	2.28	-3.1	30.0
6:2 FTS	AveID	1.607	1.637		2.41	2.37	1.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.176	1.161		2.47	2.50	-1.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.359	1.459		2.55	2.38	7.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.111	1.081		2.43	2.50	-2.7	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.163	1.172		2.34	2.32	0.7	30.0
8:2 FTS	AveID	1.347	1.375		2.45	2.40	2.1	30.0
Perfluorononanesulfonic acid	AveID	0.8052	0.8211		2.45	2.40	2.0	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.003	1.041		2.60	2.50	3.9	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.061	1.069		2.52	2.50	0.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9552	1.047		2.74	2.50	9.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6883	0.7080		2.48	2.41	2.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9021	0.8535		2.37	2.50	-5.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8938	0.8809		2.46	2.50	-1.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.082	1.134		2.62	2.50	4.8	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.171	1.111		2.37	2.50	-5.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2501	0.2505		2.50	2.50	0.2	30.0
13C4 PFBA	Ave	1.397	1.373		2.46	2.50	-1.7	30.0
13C5 PFPeA	Ave	0.9809	0.9762		2.49	2.50	-0.5	30.0
13C3-PFBS	Ave	0.0216	0.0213		2.29	2.33	-1.6	30.0
13C2 PFHxA	Ave	1.074	1.069		2.49	2.50	-0.5	30.0
13C4-PFHpA	Ave	0.9950	0.9760		2.45	2.50	-1.9	30.0
18O2 PFHxS	Ave	1.162	1.150		2.34	2.37	-1.0	30.0
M2-6:2FTS	Ave	0.2411	0.2411		2.38	2.38	0.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Lab Sample ID: CCV 320-231842/10 Calibration Date: 06/30/2018 01:24
 Instrument ID: A8_N Calib Start Date: 06/29/2018 21:29
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/29/2018 22:16
 Lab File ID: 2018.06.29LLBBX_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9548	0.9399		2.46	2.50	-1.6	30.0
13C4 PFOS	Ave	0.7787	0.7609		2.34	2.39	-2.3	30.0
13C5 PFNA	Ave	0.7906	0.7470		2.36	2.50	-5.5	30.0
13C8 FOSA	Ave	1.023	1.002		2.45	2.50	-2.1	30.0
M2-8:2FTS	Ave	0.2621	0.2593		2.37	2.40	-1.1	30.0
13C2 PFDA	Ave	0.6453	0.6222		2.41	2.50	-3.6	30.0
d3-NMeFOSAA	Ave	0.3869	0.3687		2.38	2.50	-4.7	30.0
d5-NEtFOSAA	Ave	0.3825	0.3901		2.55	2.50	2.0	30.0
13C2 PFUnA	Ave	0.5302	0.5238		2.47	2.50	-1.2	30.0
13C2 PFDoA	Ave	0.6148	0.5890		2.40	2.50	-4.2	30.0
13C2-PFTeDA	Ave	0.7666	0.7207		2.35	2.50	-6.0	30.0
13C2-PFHxDA	Ave	1.436	1.387		2.41	2.50	-3.4	30.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-231836/9
 Matrix: Water Lab File ID: 2018.06.29LLICALA_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/29/2018 22:23
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231836 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U M	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	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 M	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00962	J	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)	0.00870	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

No Action, sample result greater than RL

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-231836/9
 Matrix: Water Lab File ID: 2018.06.29LLICALA_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 06/29/2018 22:23
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 231836 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	104		50-150
STL00992	13C4 PFBA	99		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	98		50-150
STL01892	13C4-PFHpA	101		50-150
STL00990	13C4 PFOA	98		50-150
STL00995	13C5 PFNA	99		50-150
STL00996	13C2 PFDA	109		50-150
STL00997	13C2 PFUnA	103		50-150
STL00998	13C2 PFDoA	103		50-150
STL00994	18O2 PFHxS	103		50-150
STL02116	13C2-PFTeDA	97		50-150
STL00991	13C4 PFOS	104		50-150
STL02337	13C3-PFBS	98		50-150

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Batch Number: 228913 Batch Start Date: 06/13/18 15:12 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 06/13/18 21:50

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00073	LCPFC-IS 00056
MB 320-228913/1		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
LCS 320-228913/2		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
LCSD 320-228913/3		3535, EPA 537 (Mod)				250 mL	10 mL	500 uL	500 uL
320-40153-A-1	TP-PFC-030-TPI	3535, EPA 537 (Mod)	T	312.32 g	28.65 g	283.7 mL	10 mL	500 uL	500 uL
320-40153-B-2	TP-PFC-030-MIDCA RBON	3535, EPA 537 (Mod)	T	328.18 g	28.92 g	299.3 mL	10 mL	500 uL	500 uL
320-40153-D-3	TP-PFC-030-TPE	3535, EPA 537 (Mod)	T	308.50 g	27.87 g	280.6 mL	10 mL	500 uL	500 uL
320-40153-C-4	TP-PFC-030-TPE-D	3535, EPA 537 (Mod)	T	304.85 g	27.75 g	277.1 mL	10 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00150					
MB 320-228913/1		3535, EPA 537 (Mod)							
LCS 320-228913/2		3535, EPA 537 (Mod)		500 uL					
LCSD 320-228913/3		3535, EPA 537 (Mod)		500 uL					
320-40153-A-1	TP-PFC-030-TPI	3535, EPA 537 (Mod)	T						
320-40153-B-2	TP-PFC-030-MIDCA RBON	3535, EPA 537 (Mod)	T						
320-40153-D-3	TP-PFC-030-TPE	3535, EPA 537 (Mod)	T						
320-40153-C-4	TP-PFC-030-TPE-D	3535, EPA 537 (Mod)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-40153-1

SDG No.: _____

Batch Number: 228913 Batch Start Date: 06/13/18 15:12 Batch Analyst: Epstein, Anya M

Batch Method: 3535 Batch End Date: 06/13/18 21:50

Batch Notes	
Analyst ID - Aliquot Step	AME
Balance ID	QA-070
Batch Comment	Client labels match lab labels: AME, Envicarb Lot # 99684
Analyst ID - Final Volume Step	AME
H2O ID	6/12/18
Hexane ID	1270832
Internal Standard ID#	1265443
Manifold ID	10
Methanol ID	1270809
Sodium Hydroxide ID	1265514
Pipette ID	I46345G
Analyst ID - Reagent Drop	JER
Analyst ID - IS Reagent Drop	JER
Analyst ID - IS Reagent Drop Witness	AME
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	AME
Solvent Lot #	1271770
Solvent Name	0.3% NH3OH/ MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	Wax 500 mg
Solid Phase Extraction Disk ID	003637254A

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.

Method ID PFL

Analyst (Print Name) Lan / Alyssa

Reagent ID LC-80:20-0007

Date 6/28/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
82 40455	1	10,000	15	300	20
40444	13	10,000	60	300	5
190-16512	1	10,000	60	300	20
↓	2	10,000	60	300	20
39942	6 6	10,000	60	300	20 5 ^{HW} 6/28/18
↓	22	10,000	150	300	2
190-16450	1	10,000	30	300	10
↓	2	↓	↓	↓	↓
↓	3	↓	↓	↓	↓
↓	4	↓	↓	↓	↓
↓	5	↓	↓	↓	↓
↓	6	↓	↓	↓	↓
30-40153	1	10,000	30	300	10
LW 6/28/18					

Comments:

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	BRUNSWICK_NAS	320-38875-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-029-TPE	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-38875-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-029-TPE-D	Ground water	Field duplicate	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-38875-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-029-TPI	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-38875-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-029-MIDCARBON	Ground water	Normal (Regular)	3-May-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-40153-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-030-MIDCARBON	Ground water	Normal (Regular)	7-Jun-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-40153-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-030-TPE	Ground water	Normal (Regular)	7-Jun-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-40153-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-030-TPE-D	Ground water	Field duplicate	7-Jun-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-40153-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-030-TPI	Ground water	Normal (Regular)	7-Jun-18	537	Perfluoroalkyl Compounds