N60087_003870
BRUNSWICK_NAS
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-37938-1, NAS BRUNSWICK ME

04/26/2018

TESTAMERICA LABORATORIES INC

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ANALYTICAL REPORT

Job Number: 320-37938-1

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
4/26/2018 10:36 AM

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04/26/2018

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Qualifiers

LCMS

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

Glossary

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

Job Narrative
320-37938-1

Receipt
The samples were received on 4/6/2018 8:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.1° 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 matrix spike duplicate (MSD) recoveries for preparation batch 320-218592 and analytical batch 320-219174 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) EPA 537 (Mod): The concentration of one or more analytes associated with the following sample exceeded the instrument calibration range: TP-PFC-028-TPI (320-37938-1). These analytes have been qualified. The sample was also run at dilution to bring the analytes within the calibration range. Both sets of data are reported.

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

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

Detection Summary

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

TestAmerica Job ID: 320-37938-1

Client Sample ID: TP-PFC-028-TPI — Lab Sample ID: 320-37938-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	74		1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	200		1.7	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	360	E	1.7	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	81		1.7	0.53	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1400	E	1.7	0.47	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	2.7		1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.81	J M	1.7	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	50		1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	380	E	1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	7.3		1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	360	E	3.5	0.95	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	76	D	35	10	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	180	D	35	7.4	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	370	D	35	8.1	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	80	D	35	11	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1800	D	35	9.3	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	52	D	35	8.0	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	380	D	35	6.6	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	9.0	J D	35	6.4	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	370	D	69	19	ng/L	20		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-028-MID-CARB — Lab Sample ID: 320-37938-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	120		1.6	0.49	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	230		1.6	0.35	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	140		1.6	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.0		1.6	0.50	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	33	M	1.6	0.44	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	4.1		1.6	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.0		1.6	0.31	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-028-TPE — Lab Sample ID: 320-37938-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.7	0.50	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	190		1.7	0.36	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	65		1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3	J M	1.7	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.8	M	1.7	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.1	J	1.7	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.36	J	1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-028-TPE-D — Lab Sample ID: 320-37938-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.7	0.50	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-028-TPE-D (Continued)

Lab Sample ID: 320-37938-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	180		1.7	0.36	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	64		1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3	J	1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	2.8	M	1.7	0.46	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.1	J	1.7	0.39	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.47	J	1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-028-TPI

Lab Sample ID: 320-37938-1
Date Collected: 04/05/18 09:15
Matrix: Water
Date Received: 04/06/18 08:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**74**		1.7	0.51	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluoropentanoic acid (PFPeA)	**200**		1.7	0.37	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorohexanoic acid (PFHxA)	**360**	**E**	1.7	0.41	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluoroheptanoic acid (PFHpA)	**81**		1.7	0.53	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorooctanoic acid (PFOA)	**1400**	**E**	1.7	0.47	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorononanoic acid (PFNA)	**2.7**		1.7	0.45	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorodecanoic acid (PFDA)	**0.81**	**J M**	1.7	0.41	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	0.62	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.45	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	0.66	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	0.72	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorobutanesulfonic acid (PFBS)	**50**		1.7	0.40	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorohexanesulfonic acid (PFHxS)	**380**	**E**	1.7	0.33	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluoroheptanesulfonic Acid (PFHpS)	**7.3**		1.7	0.32	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorooctanesulfonic acid (PFOS)	**360**	**E**	3.5	0.95	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.48	ng/L		04/18/18 10:32	04/21/18 13:52	1
Perfluorooctane Sulfonamide (FOSA)	2.6	U M	3.5	1.1	ng/L		04/18/18 10:32	04/21/18 13:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*101*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C4 PFBA	*98*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C5 PFPeA	*106*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C2 PFHxA	*104*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C4-PFHpA	*105*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C4 PFOA	*94*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C5 PFNA	*106*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C2 PFDA	*110*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C2 PFUnA	*106*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C2 PFDoA	*101*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
18O2 PFHxS	*105*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C2-PFTeDA	*96*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C4 PFOS	*104*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*1*
13C3-PFBS	*108*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:52*	*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)	**76**	**D**	35	10	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluoropentanoic acid (PFPeA)	**180**	**D**	35	7.4	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorohexanoic acid (PFHxA)	**370**	**D**	35	8.1	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluoroheptanoic acid (PFHpA)	**80**	**D**	35	11	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorooctanoic acid (PFOA)	**1800**	**D**	35	9.3	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorononanoic acid (PFNA)	26	U	35	9.0	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorodecanoic acid (PFDA)	17	U	35	8.3	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluoroundecanoic acid (PFUnA)	26	U	35	12	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorododecanoic acid (PFDoA)	26	U	35	9.0	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorotridecanoic Acid (PFTriA)	52	U	69	13	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorotetradecanoic acid (PFTeA)	52	U	69	14	ng/L		04/18/18 10:32	04/21/18 13:13	20

Client Sample ID: TP-PFC-028-TPI — Lab Sample ID: 320-37938-1

Date Collected: 04/05/18 09:15 **Matrix: Water**
Date Received: 04/06/18 08:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**52**	**D**	35	8.0	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorohexanesulfonic acid (PFHxS)	**380**	**D**	35	6.6	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluoroheptanesulfonic Acid (PFHpS)	**9.0**	**J D**	35	6.4	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorooctanesulfonic acid (PFOS)	**370**	**D**	69	19	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorodecanesulfonic acid (PFDS)	26	U	35	9.7	ng/L		04/18/18 10:32	04/21/18 13:13	20
Perfluorooctane Sulfonamide (FOSA)	52	U	69	22	ng/L		04/18/18 10:32	04/21/18 13:13	20

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*84*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C4 PFBA	*92*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C5 PFPeA	*98*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C2 PFHxA	*92*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C4-PFHpA	*93*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C4 PFOA	*92*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C5 PFNA	*94*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C2 PFDA	*100*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C2 PFUnA	*85*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C2 PFDoA	*83*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
18O2 PFHxS	*90*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C2-PFTeDA	*80*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C4 PFOS	*86*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*
13C3-PFBS	*88*	*M*	*50 - 150*	*04/18/18 10:32*	*04/21/18 13:13*	*20*

Client Sample ID: TP-PFC-028-MID-CARB — Lab Sample ID: 320-37938-2

Date Collected: 04/05/18 09:20 **Matrix: Water**
Date Received: 04/06/18 08:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**120**		1.6	0.49	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluoropentanoic acid (PFPeA)	**230**		1.6	0.35	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorohexanoic acid (PFHxA)	**140**		1.6	0.39	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluoroheptanoic acid (PFHpA)	**6.0**		1.6	0.50	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorooctanoic acid (PFOA)	**33**	**M**	1.6	0.44	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorononanoic acid (PFNA)	1.2	U	1.6	0.43	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorodecanoic acid (PFDA)	0.82	U	1.6	0.39	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluoroundecanoic acid (PFUnA)	1.2	U	1.6	0.59	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	0.43	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	0.63	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	0.68	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorobutanesulfonic acid (PFBS)	**4.1**		1.6	0.38	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorohexanesulfonic acid (PFHxS)	**2.0**		1.6	0.31	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.82	U	1.6	0.30	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.3	0.90	ng/L		04/18/18 10:32	04/21/18 13:21	1
Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	0.46	ng/L		04/18/18 10:32	04/21/18 13:21	1

Client Sample ID: TP-PFC-028-MID-CARB — Lab Sample ID: 320-37938-2

Date Collected: 04/05/18 09:20 **Matrix: Water**
Date Received: 04/06/18 08:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	1.1	ng/L		04/18/18 10:32	04/21/18 13:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*76*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C4 PFBA	*86*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C5 PFPeA	*82*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C2 PFHxA	*84*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C4-PFHpA	*85*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C4 PFOA	*87*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C5 PFNA	*83*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C2 PFDA	*86*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C2 PFUnA	*80*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C2 PFDoA	*75*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
18O2 PFHxS	*86*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C2-PFTeDA	*73*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C4 PFOS	*81*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*
13C3-PFBS	*86*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:21*	*1*

Client Sample ID: TP-PFC-028-TPE — Lab Sample ID: 320-37938-3

Date Collected: 04/05/18 09:25 **Matrix: Water**
Date Received: 04/06/18 08:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**130**		1.7	0.50	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluoropentanoic acid (PFPeA)	**190**		1.7	0.36	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorohexanoic acid (PFHxA)	**65**		1.7	0.40	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluoroheptanoic acid (PFHpA)	**1.3**	**J M**	1.7	0.52	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorooctanoic acid (PFOA)	**2.8**	**M**	1.7	0.46	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.44	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.41	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	0.61	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.44	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	0.64	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.4	0.70	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorobutanesulfonic acid (PFBS)	**1.1**	**J**	1.7	0.39	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorohexanesulfonic acid (PFHxS)	**0.36**	**J**	1.7	0.32	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.31	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.4	0.93	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.47	ng/L		04/18/18 10:32	04/21/18 13:29	1
Perfluorooctane Sulfonamide (FOSA)	2.5	U M	3.4	1.1	ng/L		04/18/18 10:32	04/21/18 13:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*79*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C4 PFBA	*86*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C5 PFPeA	*82*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C2 PFHxA	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C4-PFHpA	*86*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C4 PFOA	*89*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*

Client Sample ID: TP-PFC-028-TPE — Lab Sample ID: 320-37938-3

Date Collected: 04/05/18 09:25 **Matrix: Water**
Date Received: 04/06/18 08:50

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

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFNA	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C2 PFDA	*87*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C2 PFUnA	*82*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C2 PFDoA	*81*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
18O2 PFHxS	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C2-PFTeDA	*76*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C4 PFOS	*87*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*
13C3-PFBS	*87*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:29*	*1*

Client Sample ID: TP-PFC-028-TPE-D — Lab Sample ID: 320-37938-4

Date Collected: 04/05/18 00:00 **Matrix: Water**
Date Received: 04/06/18 08:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**130**		1.7	0.50	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluoropentanoic acid (PFPeA)	**180**		1.7	0.36	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorohexanoic acid (PFHxA)	**64**		1.7	0.40	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluoroheptanoic acid (PFHpA)	**1.3**	**J**	1.7	0.51	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorooctanoic acid (PFOA)	**2.8**	**M**	1.7	0.46	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.44	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorodecanoic acid (PFDA)	0.84	U	1.7	0.41	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	0.61	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.44	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	0.64	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.4	0.70	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorobutanesulfonic acid (PFBS)	**1.1**	**J**	1.7	0.39	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorohexanesulfonic acid (PFHxS)	**0.47**	**J**	1.7	0.32	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.84	U	1.7	0.31	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.4	0.93	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.47	ng/L		04/18/18 10:32	04/21/18 13:44	1
Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.4	1.1	ng/L		04/18/18 10:32	04/21/18 13:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*80*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C4 PFBA	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C5 PFPeA	*86*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C2 PFHxA	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C4-PFHpA	*90*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C4 PFOA	*90*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C5 PFNA	*90*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C2 PFDA	*89*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C2 PFUnA	*84*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C2 PFDoA	*81*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
18O2 PFHxS	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C2-PFTeDA	*75*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C4 PFOS	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*
13C3-PFBS	*89*		*50 - 150*	*04/18/18 10:32*	*04/21/18 13:44*	*1*

Default Detection Limits

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

TestAmerica Job ID: 320-37938-1

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: 320-37938-1

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)
320-37938-1 - DL	TP-PFC-028-TPI	84	92	98	92	93	92	94	100
320-37938-1	TP-PFC-028-TPI	101	98	106	104	105	94	106	110
320-37938-2	TP-PFC-028-MID-CARB	76	86	82	84	85	87	83	86
320-37938-3	TP-PFC-028-TPE	79	86	82	88	86	89	88	87
320-37938-4	TP-PFC-028-TPE-D	80	88	86	88	90	90	90	89
LCS 320-218592/2-A	Lab Control Sample	81	89	88	90	98	91	91	90
MB 320-218592/1-A	Method Blank	78	88	93	90	90	89	91	90

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFUnA (50-150)	PFDoA (50-150)	PFHxS (50-150)	PFTDA (50-150)	PFOS (50-150)	3C3-PFBS (50-150)		
320-37938-1 - DL	TP-PFC-028-TPI	85	83	90	80	86	88 M		
320-37938-1	TP-PFC-028-TPI	106	101	105	96	104	108		
320-37938-2	TP-PFC-028-MID-CARB	80	75	86	73	81	86		
320-37938-3	TP-PFC-028-TPE	82	81	88	76	87	87		
320-37938-4	TP-PFC-028-TPE-D	84	81	88	75	88	89		
LCS 320-218592/2-A	Lab Control Sample	85	83	93	81	89	91		
MB 320-218592/1-A	Method Blank	90	85	91	80	93	88		

Surrogate Legend

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

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

Lab Sample ID: MB 320-218592/1-A
Matrix: Water
Analysis Batch: 219174

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 218592

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.5	U	2.0	0.59	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.43	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	0.47	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	0.61	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorooctanoic acid (PFOA)	1.5	U	2.0	0.54	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorononanoic acid (PFNA)	1.5	U	2.0	0.52	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.48	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluoroundecanoic acid (PFUnA)	1.5	U	2.0	0.72	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	0.52	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	0.76	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	0.83	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.46	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.38	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.37	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U M	4.0	1.1	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	0.56	ng/L		04/18/18 10:32	04/21/18 12:18	1
Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	1.3	ng/L		04/18/18 10:32	04/21/18 12:18	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*78*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C4 PFBA	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C5 PFPeA	*93*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C2 PFHxA	*90*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C4-PFHpA	*90*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C4 PFOA	*89*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C5 PFNA	*91*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C2 PFDA	*90*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C2 PFUnA	*90*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C2 PFDoA	*85*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
18O2 PFHxS	*91*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C2-PFTeDA	*80*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C4 PFOS	*93*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*
13C3-PFBS	*88*		*50 - 150*	*04/18/18 10:32*	*04/21/18 12:18*	*1*

Lab Sample ID: LCS 320-218592/2-A
Matrix: Water
Analysis Batch: 219174

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 218592

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	40.8		ng/L		102	83 - 118
Perfluoropentanoic acid (PFPeA)	40.0	39.0		ng/L		97	83 - 108
Perfluorohexanoic acid (PFHxA)	40.0	39.7		ng/L		99	83 - 109
Perfluoroheptanoic acid (PFHpA)	40.0	37.5		ng/L		94	80 - 113
Perfluorooctanoic acid (PFOA)	40.0	38.8		ng/L		97	80 - 107
Perfluorononanoic acid (PFNA)	40.0	37.5		ng/L		94	83 - 113
Perfluorodecanoic acid (PFDA)	40.0	38.3		ng/L		96	85 - 113
Perfluoroundecanoic acid (PFUnA)	40.0	35.4		ng/L		89	76 - 105

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

Lab Sample ID: LCS 320-218592/2-A
Matrix: Water
Analysis Batch: 219174

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 218592

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	40.0	38.4		ng/L		96	87 - 116
Perfluorotridecanoic Acid (PFTriA)	40.0	36.1		ng/L		90	75 - 129
Perfluorotetradecanoic acid (PFTeA)	40.0	37.4		ng/L		94	82 - 115
Perfluorobutanesulfonic acid (PFBS)	35.4	34.3		ng/L		97	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	36.4	32.8		ng/L		90	81 - 106
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.8		ng/L		99	80 - 117
Perfluorooctanesulfonic acid (PFOS)	37.1	40.0		ng/L		108	82 - 112
Perfluorodecanesulfonic acid (PFDS)	38.6	36.7		ng/L		95	81 - 114
Perfluorooctane Sulfonamide (FOSA)	40.0	37.2		ng/L		93	85 - 114

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*81*		*50 - 150*
13C4 PFBA	*89*		*50 - 150*
13C5 PFPeA	*88*		*50 - 150*
13C2 PFHxA	*90*		*50 - 150*
13C4-PFHpA	*98*		*50 - 150*
13C4 PFOA	*91*		*50 - 150*
13C5 PFNA	*91*		*50 - 150*
13C2 PFDA	*90*		*50 - 150*
13C2 PFUnA	*85*		*50 - 150*
13C2 PFDoA	*83*		*50 - 150*
18O2 PFHxS	*93*		*50 - 150*
13C2-PFTeDA	*81*		*50 - 150*
13C4 PFOS	*89*		*50 - 150*
13C3-PFBS	*91*		*50 - 150*

QC Association Summary

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

TestAmerica Job ID: 320-37938-1

LCMS

Prep Batch: 218592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-37938-1 - DL	TP-PFC-028-TPI	Total/NA	Water	3535	
320-37938-1	TP-PFC-028-TPI	Total/NA	Water	3535	
320-37938-2	TP-PFC-028-MID-CARB	Total/NA	Water	3535	
320-37938-3	TP-PFC-028-TPE	Total/NA	Water	3535	
320-37938-4	TP-PFC-028-TPE-D	Total/NA	Water	3535	
MB 320-218592/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-218592/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 219174

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-37938-1 - DL	TP-PFC-028-TPI	Total/NA	Water	EPA 537 (Mod)	218592
320-37938-1	TP-PFC-028-TPI	Total/NA	Water	EPA 537 (Mod)	218592
320-37938-2	TP-PFC-028-MID-CARB	Total/NA	Water	EPA 537 (Mod)	218592
320-37938-3	TP-PFC-028-TPE	Total/NA	Water	EPA 537 (Mod)	218592
320-37938-4	TP-PFC-028-TPE-D	Total/NA	Water	EPA 537 (Mod)	218592
MB 320-218592/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	218592
LCS 320-218592/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	218592

Lab Chronicle

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

TestAmerica Job ID: 320-37938-1

Client Sample ID: TP-PFC-028-TPI
Lab Sample ID: 320-37938-1
Date Collected: 04/05/18 09:15
Matrix: Water
Date Received: 04/06/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		218592	04/18/18 10:32	TWL	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	20	219174	04/21/18 13:13	JRB	TAL SAC
Total/NA	Prep	3535			218592	04/18/18 10:32	TWL	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	219174	04/21/18 13:52	JRB	TAL SAC

Client Sample ID: TP-PFC-028-MID-CARB
Lab Sample ID: 320-37938-2
Date Collected: 04/05/18 09:20
Matrix: Water
Date Received: 04/06/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			218592	04/18/18 10:32	TWL	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	219174	04/21/18 13:21	JRB	TAL SAC

Client Sample ID: TP-PFC-028-TPE
Lab Sample ID: 320-37938-3
Date Collected: 04/05/18 09:25
Matrix: Water
Date Received: 04/06/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			218592	04/18/18 10:32	TWL	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	219174	04/21/18 13:29	JRB	TAL SAC

Client Sample ID: TP-PFC-028-TPE-D
Lab Sample ID: 320-37938-4
Date Collected: 04/05/18 00:00
Matrix: Water
Date Received: 04/06/18 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			218592	04/18/18 10:32	TWL	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	219174	04/21/18 13:44	JRB	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-37938-1
Project/Site: TT: PFAS, Brunswick, Discharge

Laboratory: TestAmerica Sacramento

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

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

Method Summary

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

TestAmerica Job ID: 320-37938-1

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: 320-37938-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-37938-1	TP-PFC-028-TPI	Water	04/05/18 09:15	04/06/18 08:50
320-37938-2	TP-PFC-028-MID-CARB	Water	04/05/18 09:20	04/06/18 08:50
320-37938-3	TP-PFC-028-TPE	Water	04/05/18 09:25	04/06/18 08:50
320-37938-4	TP-PFC-028-TPE-D	Water	04/05/18 00:00	04/06/18 08:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 217360

Lab Sample ID: IC 320-217360/2 Client Sample ID:

Date Analyzed: 04/10/18 18:39 Lab File ID: 2018.04.10LLICAL_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	04/11/18 09:10
Perfluorooctanoic acid (PFOA)	2.68	Baseline	roycea	04/11/18 09:10
Perfluorooctanesulfonic acid (PFOS)	3.04	Assign Peak	roycea	04/11/18 09:10
8:2FTS	3.40	Baseline	roycea	04/11/18 09:11
Perfluorotridecanoic Acid (PFTriA)	4.28	Baseline	roycea	04/11/18 09:11

Lab Sample ID: IC 320-217360/3 Client Sample ID:

Date Analyzed: 04/10/18 18:47 Lab File ID: 2018.04.10LLICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.04	Baseline	roycea	04/11/18 09:13

Lab Sample ID: ICB 320-217360/9 Client Sample ID:

Date Analyzed: 04/10/18 19:34 Lab File ID: 2018.04.10LLICAL_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)		Invalid Compound ID	roycea	04/11/18 09:23

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 219174

Lab Sample ID: MB 320-218592/1-A Client Sample ID:

Date Analyzed: 04/21/18 12:18 Lab File ID: 2018.04.20LLCX_038.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.06	Baseline	barnettj	04/24/18 17:14

Lab Sample ID: 320-37938-1 DL Client Sample ID: TP-PFC-028-TPI DL

Date Analyzed: 04/21/18 13:13 Lab File ID: 2018.04.20LLCX_045.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
13C3-PFBS	1.74	Incomplete Integration	barnettj	04/24/18 17:20

Lab Sample ID: 320-37938-2 Client Sample ID: TP-PFC-028-MID-CARB

Date Analyzed: 04/21/18 13:21 Lab File ID: 2018.04.20LLCX_046.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.69	Isomers	barnettj	04/24/18 17:21

Lab Sample ID: 320-37938-3 Client Sample ID: TP-PFC-028-TPE

Date Analyzed: 04/21/18 13:29 Lab File ID: 2018.04.20LLCX_047.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.28	Baseline	barnettj	04/24/18 17:22
Perfluorooctanoic acid (PFOA)	2.60	Isomers	barnettj	04/24/18 17:22
Perfluorooctane Sulfonamide (FOSA)	3.40	Baseline	barnettj	04/24/18 17:23

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 219174

Lab Sample ID: 320-37938-4 Client Sample ID: TP-PFC-028-TPE-D

Date Analyzed: 04/21/18 13:44 Lab File ID: 2018.04.20LLCX_049.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.60	Isomers	barnettj	04/24/18 17:23

Lab Sample ID: 320-37938-1 Client Sample ID: TP-PFC-028-TPI

Date Analyzed: 04/21/18 13:52 Lab File ID: 2018.04.20LLCX_050.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonamide (FOSA)	3.39	Split Peak	barnettj	04/24/18 17:25
Perfluorodecanoic acid (PFDA)	3.42	Split Peak	barnettj	04/24/18 17:25

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00054	10/10/18	04/10/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00007	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00007	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00007	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00009	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00015	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00013	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00013	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00014	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00018	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00014	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00007	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00019	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00014	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00021	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00014	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00014	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00018	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00026	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00016	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA_00007	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA_00007	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00007	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00009	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00015	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00013	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00013	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00014	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA_00018	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00014	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00007	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00019	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00014	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00021	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00014	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00014	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00018	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00026	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00016	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-IS_00036	10/10/18	04/10/18	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_LL0_00006	08/20/18	02/22/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00041	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCPFC_LL0_00006	08/20/18	02/22/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL1_00005	08/20/18	02/22/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00136	50 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.02335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0237 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.02395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							Perfluorobutanoic acid (PFBA)	0.025 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.025 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid (PFDoA)	0.025 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0238 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.025 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorononanesulfonic acid	0.024 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.025 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.025 ng/mL
							Perfluoropentanesulfonic acid	0.02345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.025 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.025 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.025 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00136	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LCPFCSP_00132	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorononanesulfonic acid	0.096 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluoropentanesulfonic acid	0.0938 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL2_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00136	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0467 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0474 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0479 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutanoic acid (PFBA)	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.05 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0476 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorononanesulfonic acid	0.048 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.05 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluoropentanesulfonic acid	0.0469 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.05 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.05 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00136	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LCPFCSP_00132	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorononanesulfonic acid	0.096 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluoropentanesulfonic acid	0.0938 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL3_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00136	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.2335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.237 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.2395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							Perfluorobutanoic acid (PFBA)	0.25 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.25 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.25 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.238 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorononanesulfonic acid	0.24 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.25 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid (PFPeA)	0.25 ng/mL
							Perfluoropentanesulfonic acid	0.2345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.25 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.25 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.25 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00136	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LCPFCSP_00132	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorononanesulfonic acid	0.096 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluoropentanesulfonic acid	0.0938 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS0616		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS0816		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL4_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00132	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							Perfluorobutanoic acid (PFBA)	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid (PFDA)	1 ng/mL
							Perfluorododecanoic acid (PFDoA)	1 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorononanesulfonic acid	0.96 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluoropentanesulfonic acid	0.938 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL5_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00132	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	2.335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	2.37 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	2.395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.38 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorononanesulfonic acid	2.4 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL
							Perfluoropentanesulfonic acid	2.345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL6_00005	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00132	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	4.67 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	4.74 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	4.79 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							Perfluorobutanoic acid (PFBA)	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorononanesulfonic acid	4.8 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluoropentanesulfonic acid	4.69 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL7_00004	08/20/18	02/22/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFOA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00132	2 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	9.34 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	9.48 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	9.58 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutanoic acid (PFBA)	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid (PFDA)	10 ng/mL
							Perfluorododecanoic acid (PFDoA)	10 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	9.52 ng/mL
							Perfluorohexanoic acid (PFHxA)	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorononanesulfonic acid	9.6 ng/mL
							Perfluorooctanoic acid (PFOA)	10 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	10 ng/mL
							Perfluoropentanoic acid (PFPeA)	10 ng/mL
							Perfluoropentanesulfonic acid	9.38 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	10 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	10 ng/mL
							Perfluoroundecanoic acid (PFUnA)	10 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00132	08/20/18	02/20/18	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00003	200 uL	Perfluorononanesulfonic acid	0.96 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFPeS_00003	200 uL	Perfluoropentanesulfonic acid	0.938 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFCIC_FULL_00011	07/02/18	02/22/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC_ALL_SU_00041	10 mL	13C2-PFOA	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFCIC_FULL_00011	07/02/18	02/22/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC_ALL_SU_00041	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFAC-24PAR_00001	250 uL	Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.4125 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.375 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.28 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.31375 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ALL_SU_00041	08/20/18	02/20/18	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFAC-24PAR_00001	09/15/22	Wellington Laboratories, Lot PFAC24PAR0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	1.93 ug/mL
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid (PFDoA)	2 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	1.9 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.824 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.851 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid (PFPeA)	2 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
LCPFCSP_00138	09/20/18	03/20/18	Methanol, Lot 090285	250 mL	LC11CIPF3OUdS_00001	100 uL	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	0.01884 ug/mL
					LC4:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.01868 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC6:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.01896 ug/mL
					LC8:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.01916 ug/mL
					LC9CI-PF3ONS_00001	100 uL	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	0.01864 ug/mL
					LCDONA_00001	100 uL	Adona	0.02 ug/mL
					LCHFPO-DA_00001	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCN-EtFOSA-M_00005	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.02 ug/mL
					LCN-EtFOSAA_00004	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCN-MeFOSA-M_00004	100 uL	MeFOSA	0.02 ug/mL
					LCN-MeFOSAA_00004	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00007	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00008	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00007	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00007	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDSA_00002	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00008	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00007	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00008	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00004	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00009	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00008	100 uL	Perfluorooctanoic acid (PFOA)	0.02 ug/mL
					LCPFODA_00008	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00004	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00010	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00007	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00007	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFTrDA_00007	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00007	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.LC11CIPF3OUdS_00001	09/30/21	Wellington Labs, Lot 11CIPF3OUdS0916			(Purchased Reagent)		11-Chloroeicosafluoro-3-oxaundecane-1-sulfonate	47.1 ug/mL
.LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
.LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
.LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
.LC9CI-PF3ONS_00001	09/30/21	Wellington Labs, Lot 9CIPF3ONS0916			(Purchased Reagent)		9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate	46.6 ug/mL
.LCDONA_00001	04/10/22	WELLINGTON, Lot NADONA0417			(Purchased Reagent)		Adona	50 ug/mL
.LCHFPO-DA_00001	07/03/20	WELLINGTON, Lot HFPODA0717			(Purchased Reagent)		Perfluoro(2-propoxypropanoic) acid	50 ug/mL
.LCN-EtFOSA-M_00005	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
.LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCN-MeFOSA-M_00004	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
.LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
.LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA_00008	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
.LCPFOA_00008	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00008	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
.LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
.LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC11CIPF3OUdS_00001

r: 9/5/17 SQ

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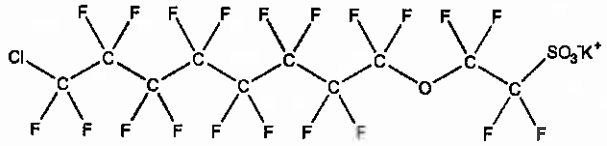
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

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



MOLECULAR FORMULA:	$C_{10}F_{20}ClSO_4K$	**MOLECULAR WEIGHT:**	670.69
CONCENTRATION:	50.0 ± 2.5 µg/ml (K Salt)	**SOLVENT(S):**	Methanol
	47.1 ± 2.4 µg/ml (11Cl-PF3OUdS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

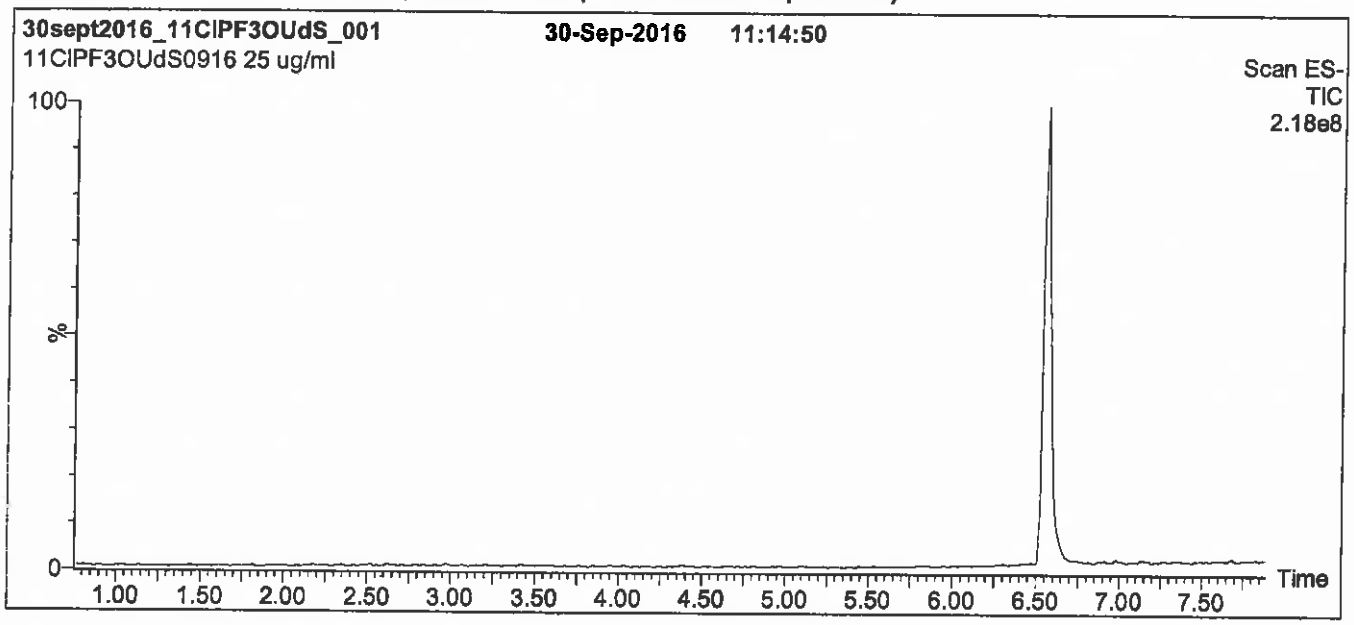
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

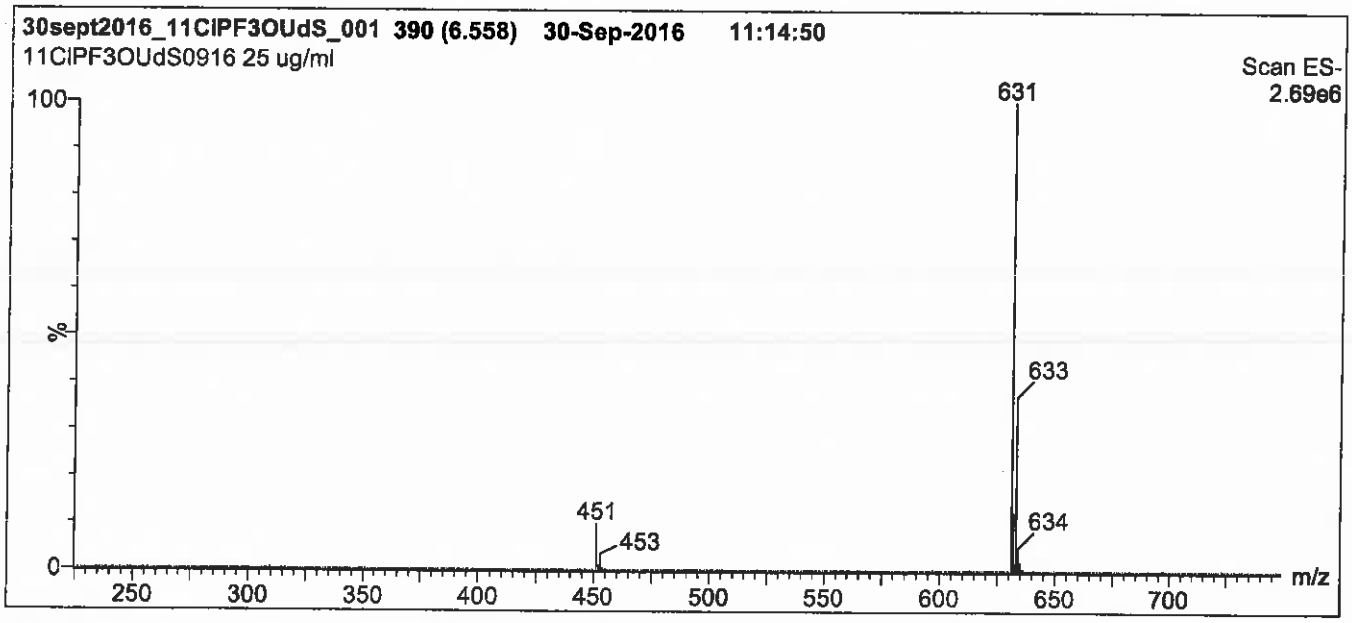
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

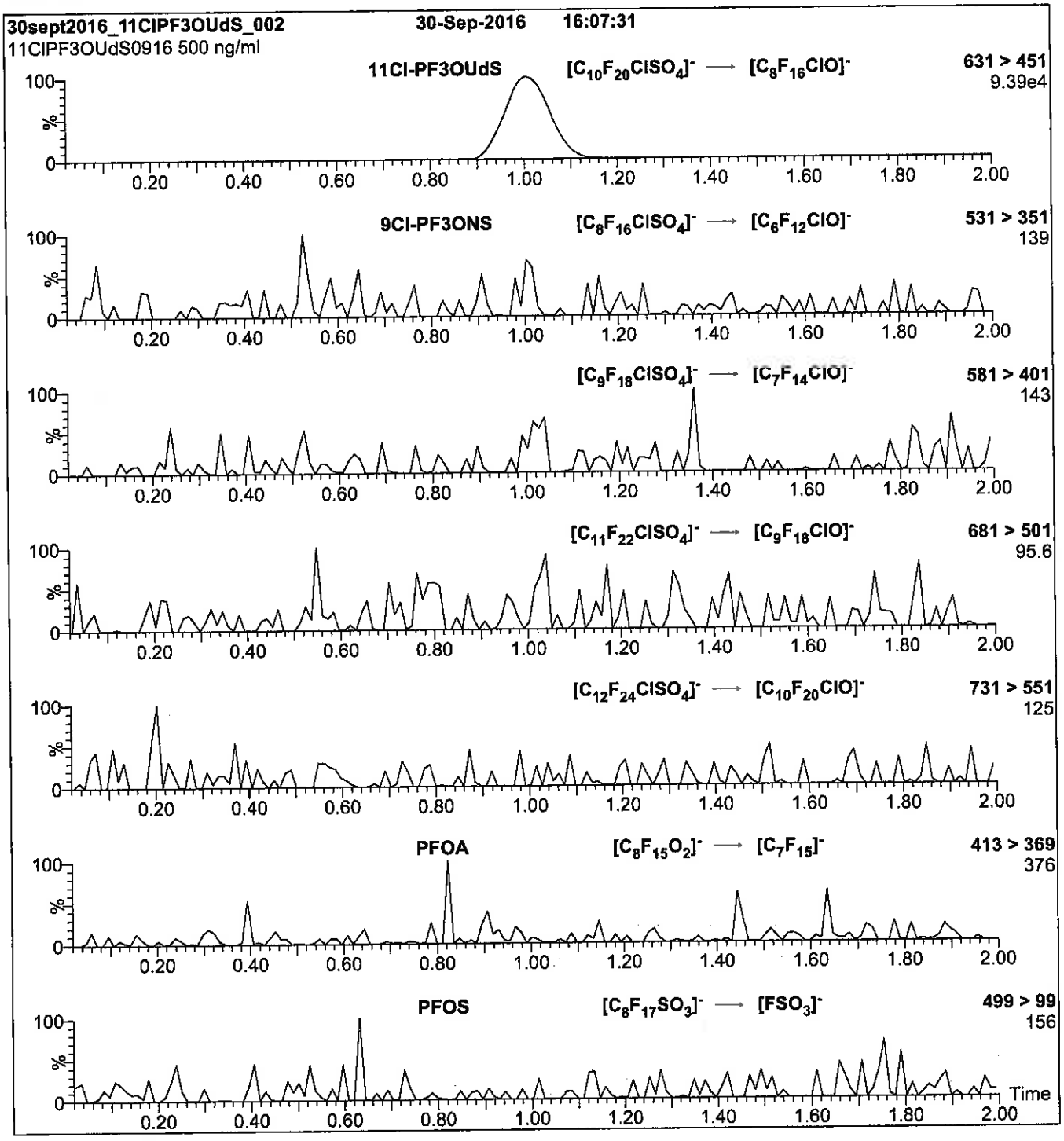
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LC4:2FTS_00003

n: 7/12/17 SK

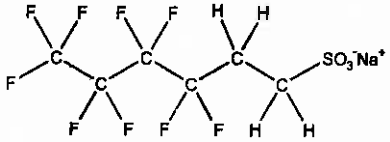
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_6H_4F_8SO_3Na$	**MOLECULAR WEIGHT:**	350.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	46.7 ± 2.3 µg/ml (4:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

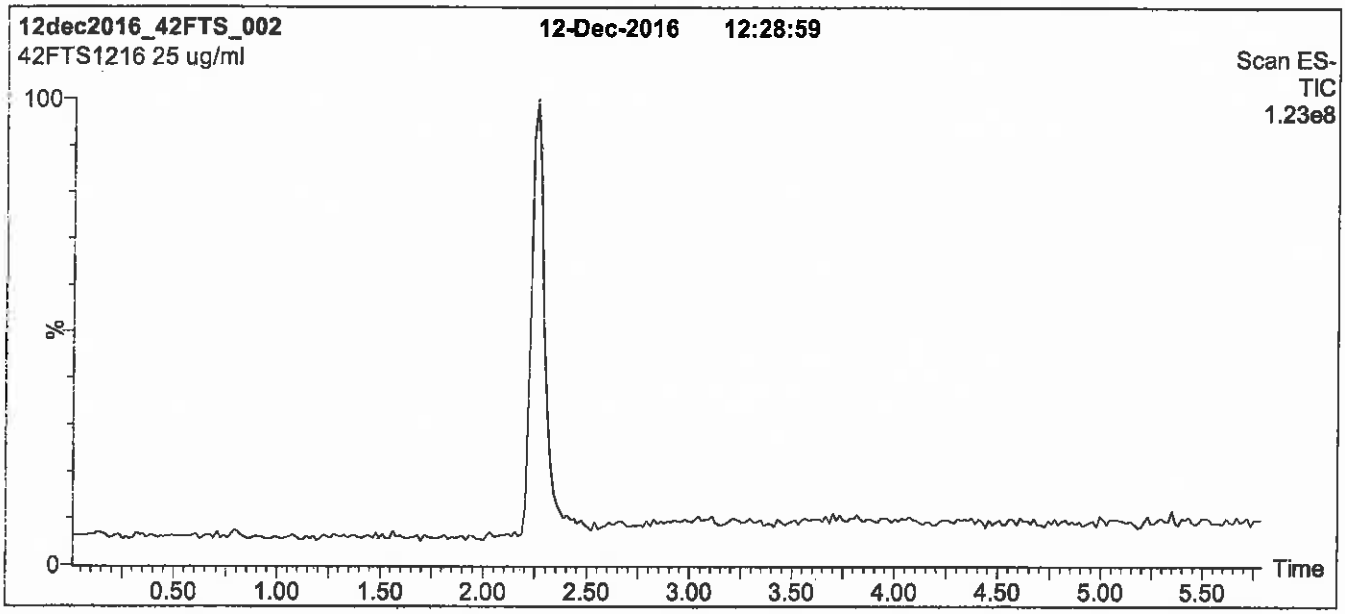
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

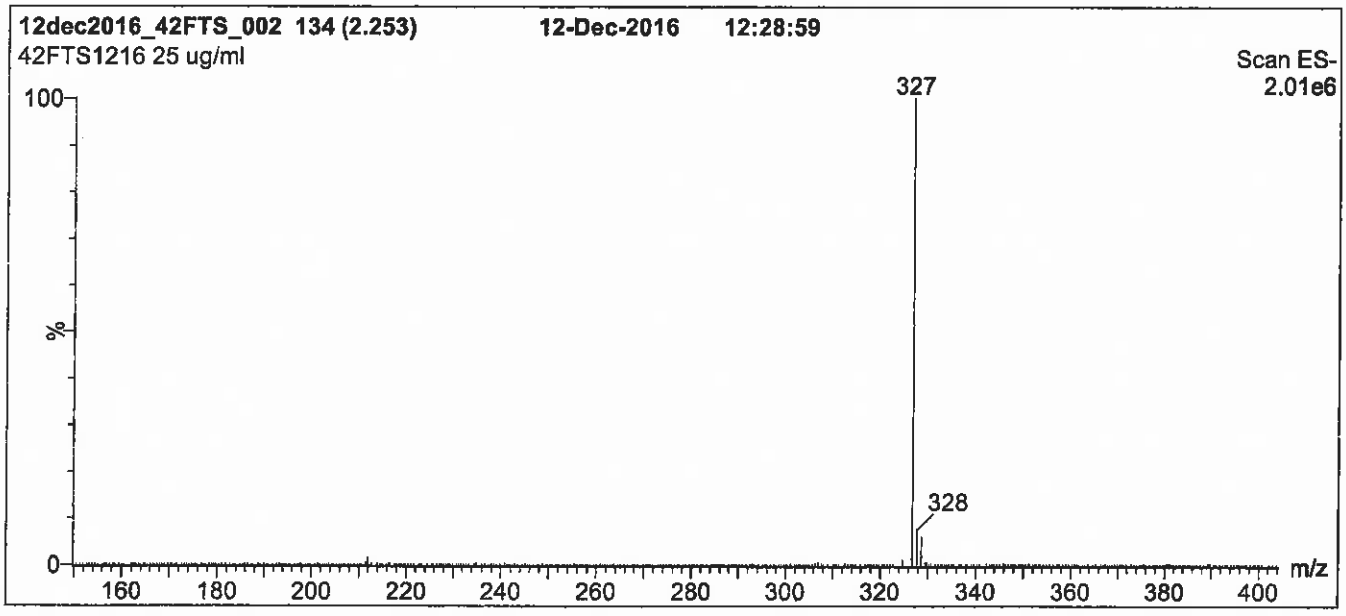
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

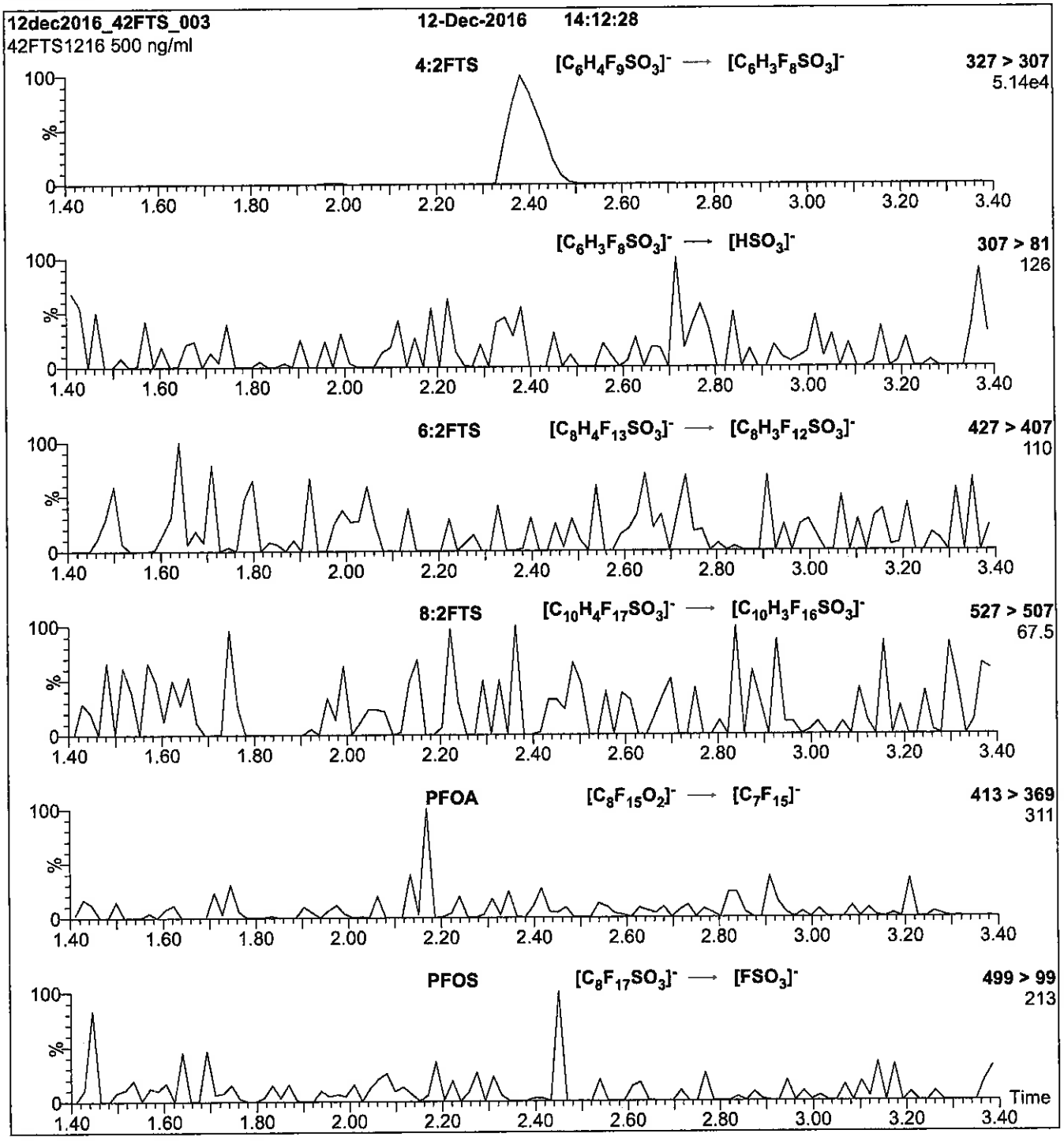
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml 4:2FTS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

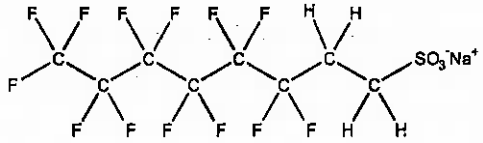
LC6:2FTS_00003

P: 12/29/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	6:2FTS	**LOT NUMBER:**	62FTS0616
COMPOUND:	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_8H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	450.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/ml (6:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/25/2016		
EXPIRY DATE: (mm/dd/yyyy)	06/25/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/29/2016 (mm/dd/yyyy)

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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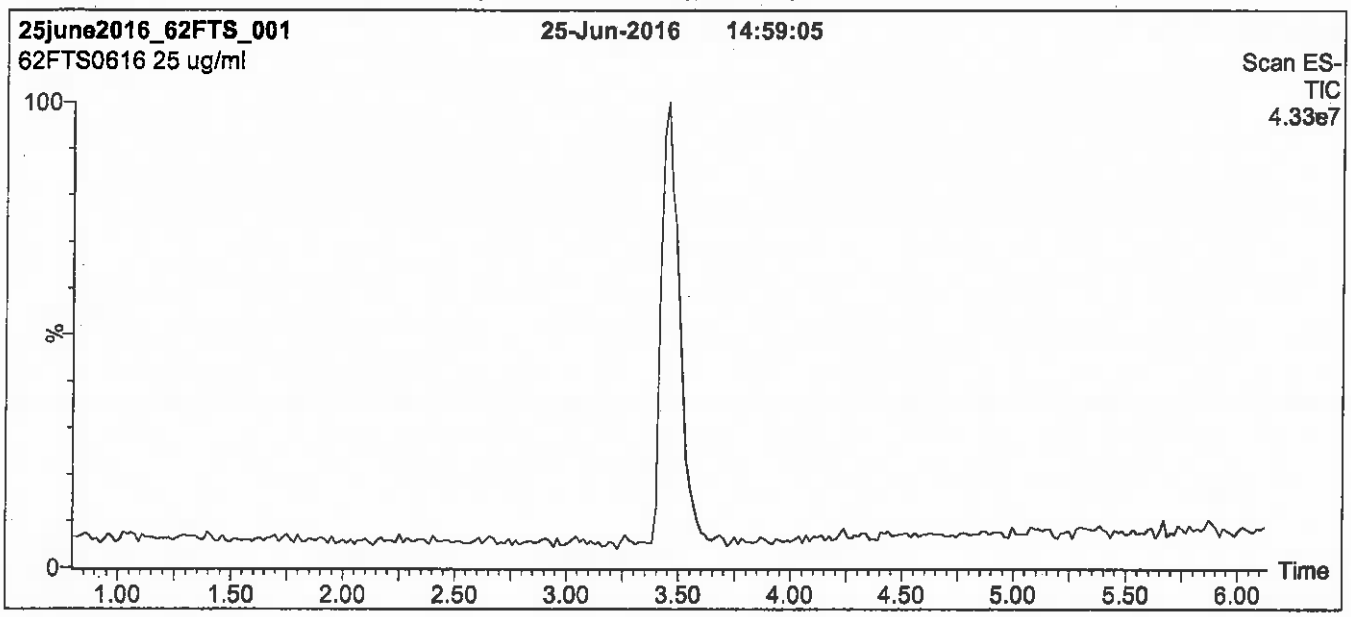
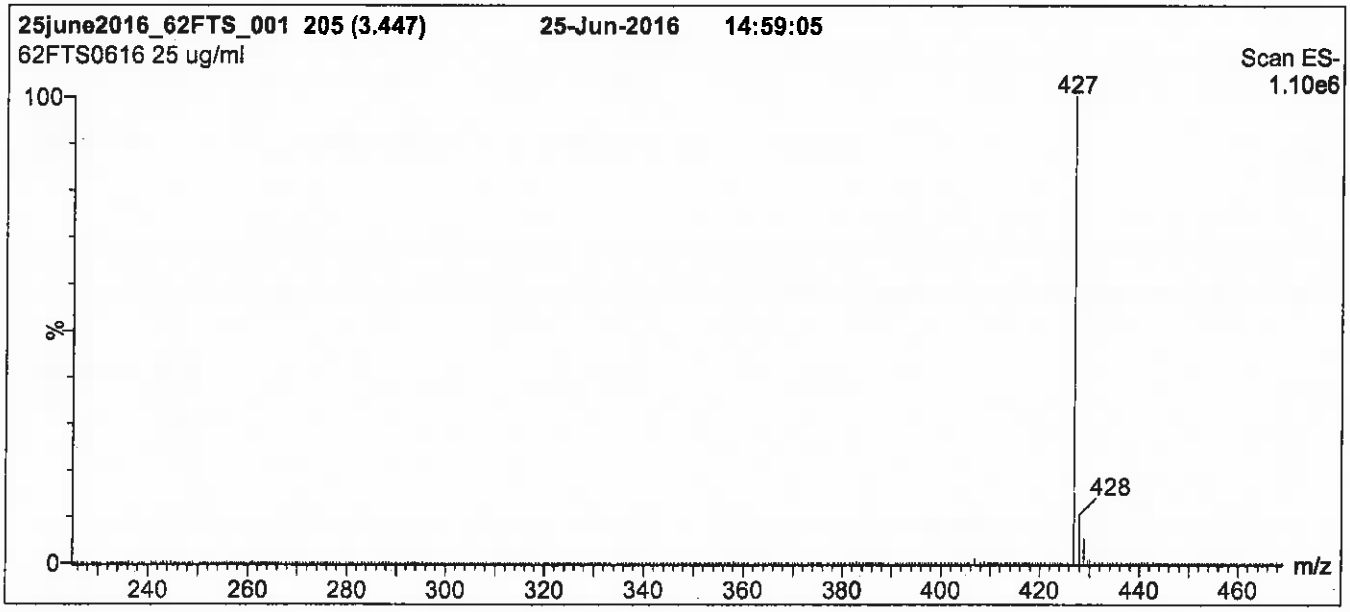
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

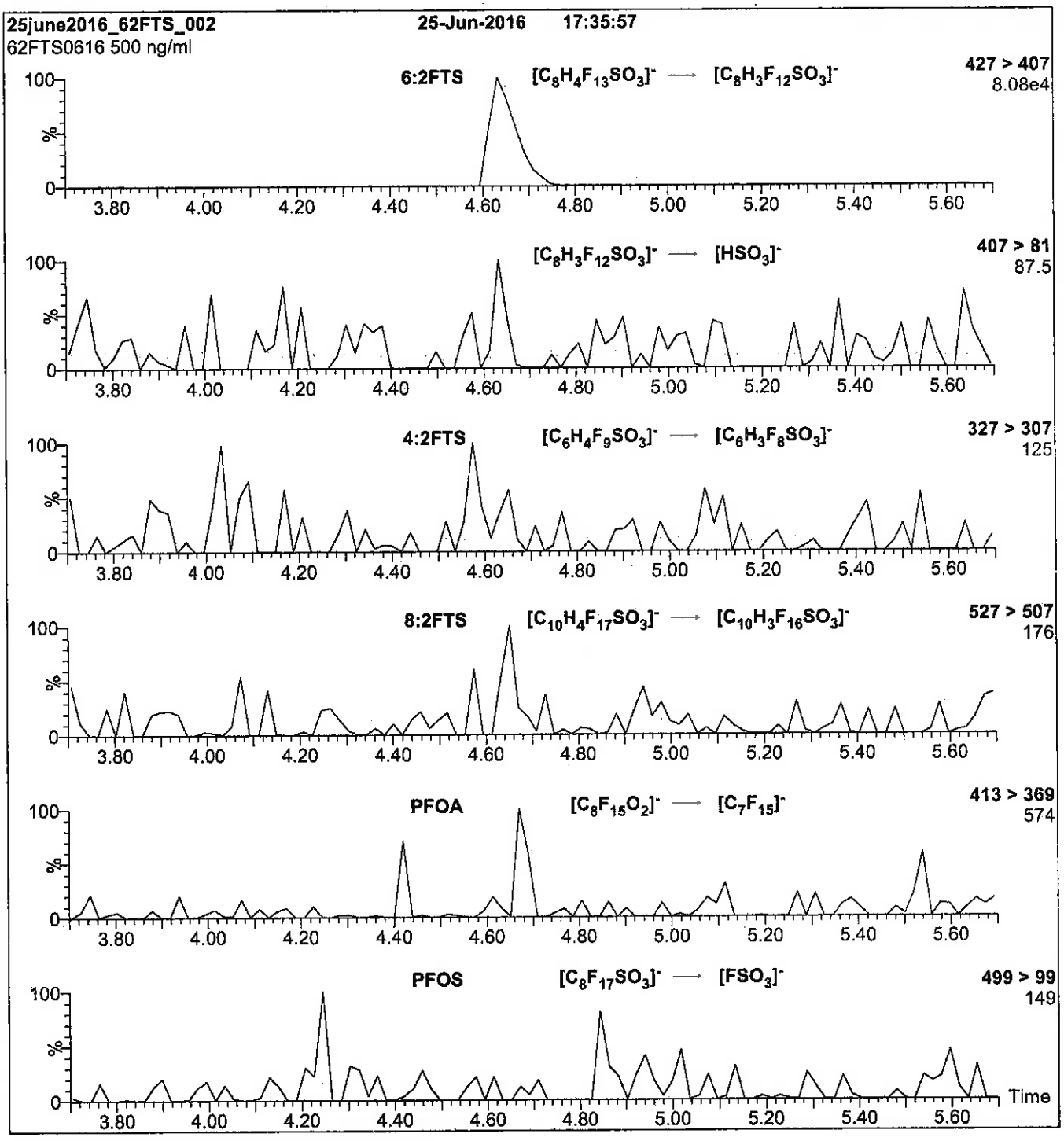
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 25

Reagent

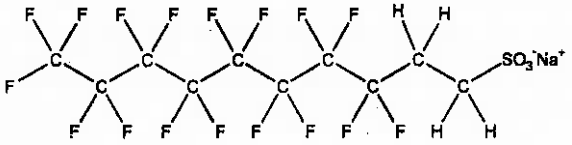
LC8:2FTS_00003

P: 12/29/16

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	8:2FTS	**LOT NUMBER:**	82FTS0816
COMPOUND:	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_{10}H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	550.16
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (8:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/22/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

ANAB ACCREDITED

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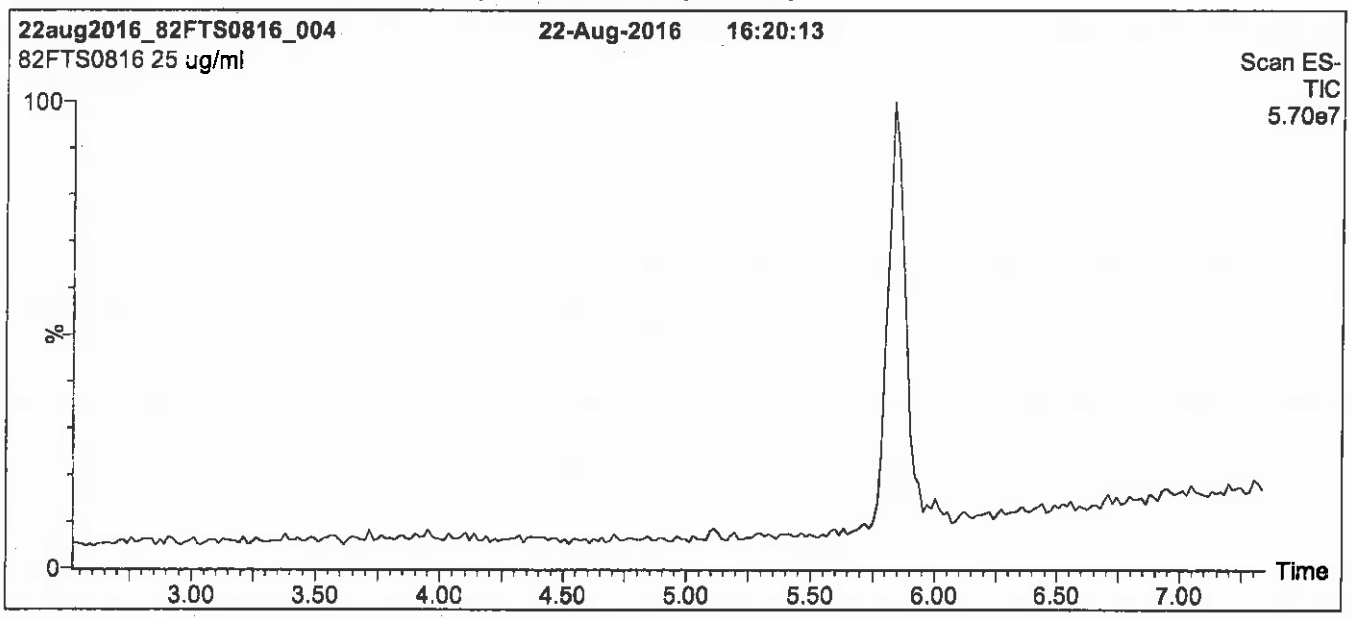
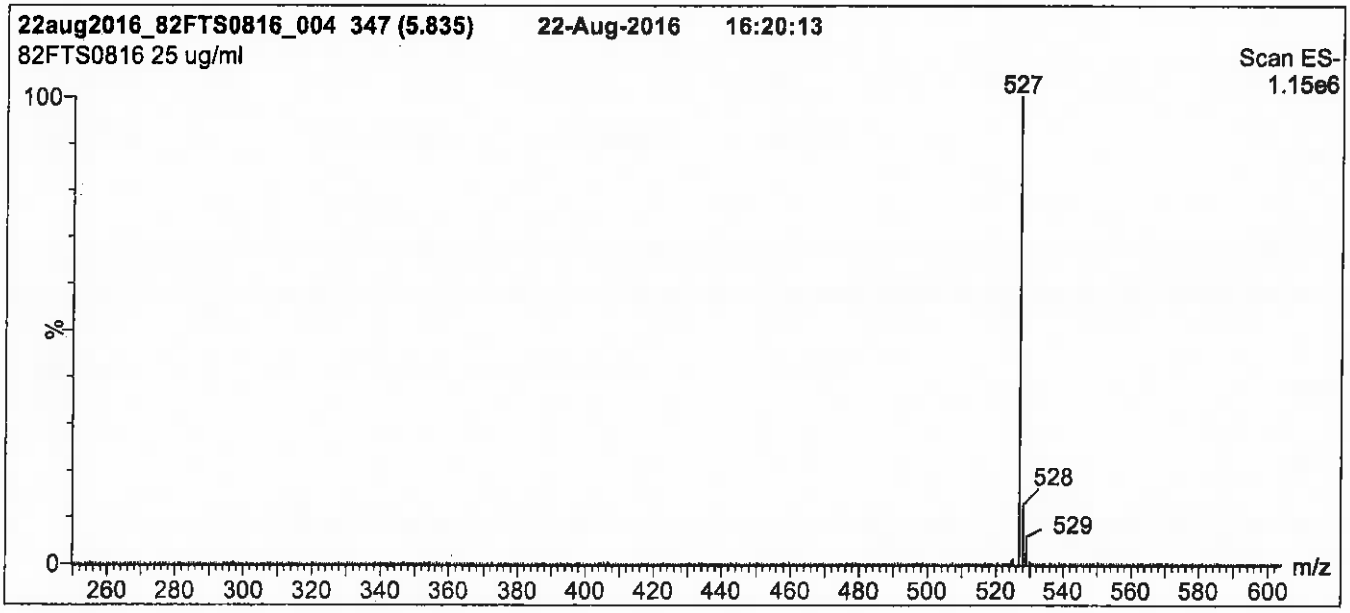
Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Agilent Zorbax Bonus-RP
1.8 µm, 2.1 x 100 mm

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

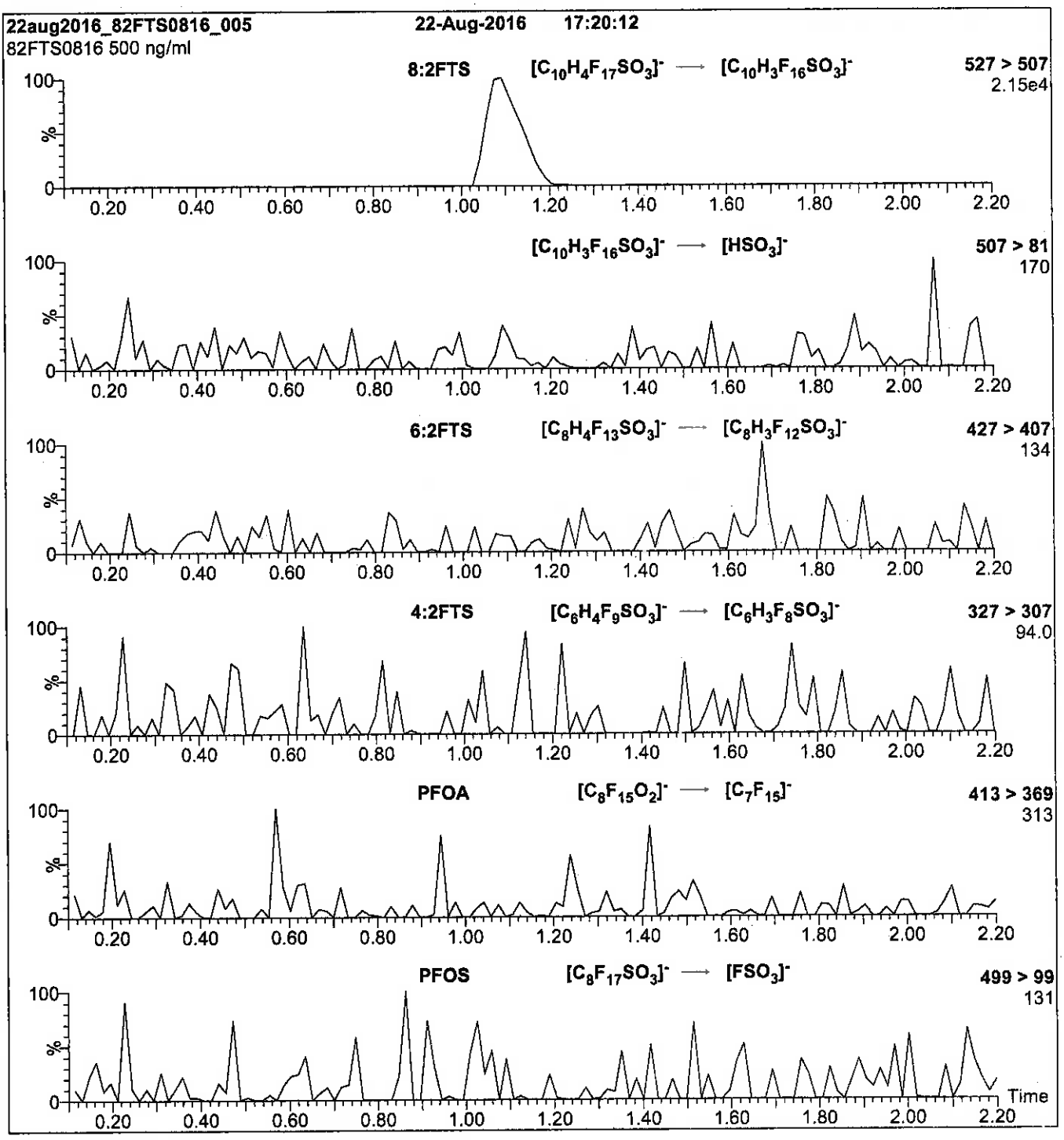
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250- 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 8:2FTS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 30

Reagent

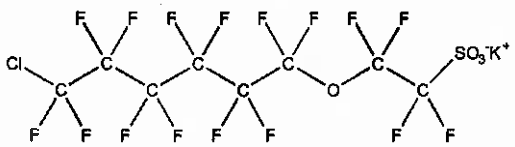
LC9CI-PF3ONS_00001

r: 9/5/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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



MOLECULAR FORMULA:	$C_8F_{16}ClSO_4K$	**MOLECULAR WEIGHT:**	570.67
CONCENTRATION:	50.0 ± 2.5 µg/ml (K Salt) 46.6 ± 2.3 µg/ml (9Cl-PF3ONS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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

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CALA

ANAB ACCREDITED

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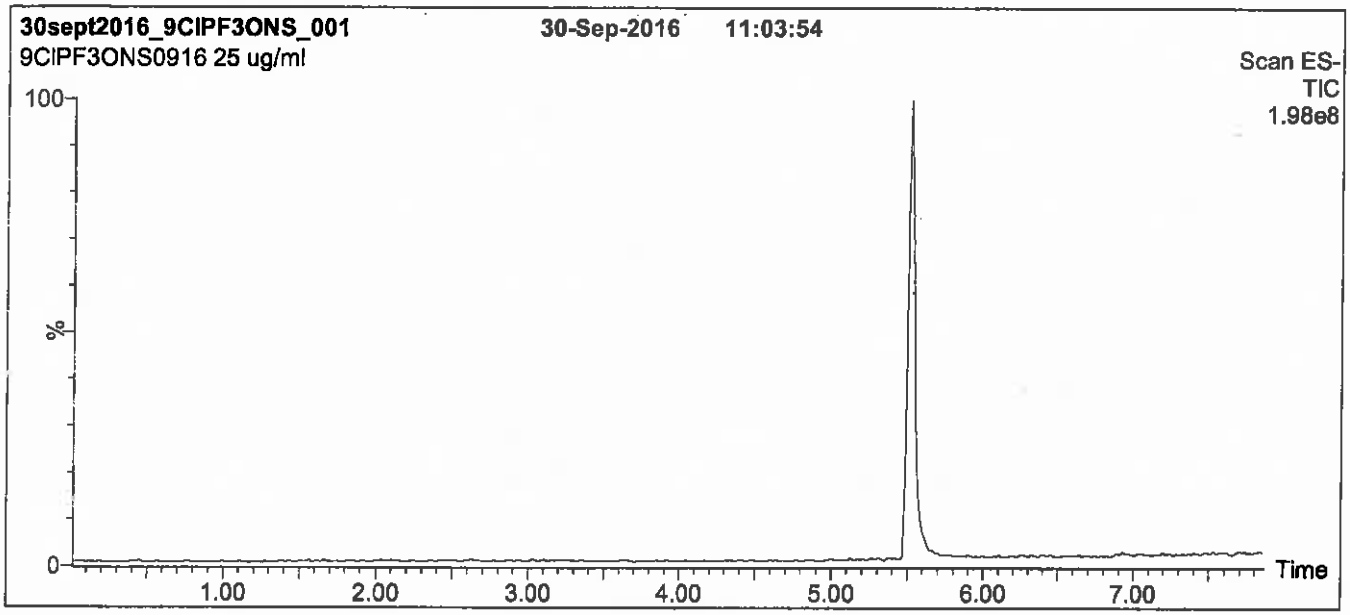
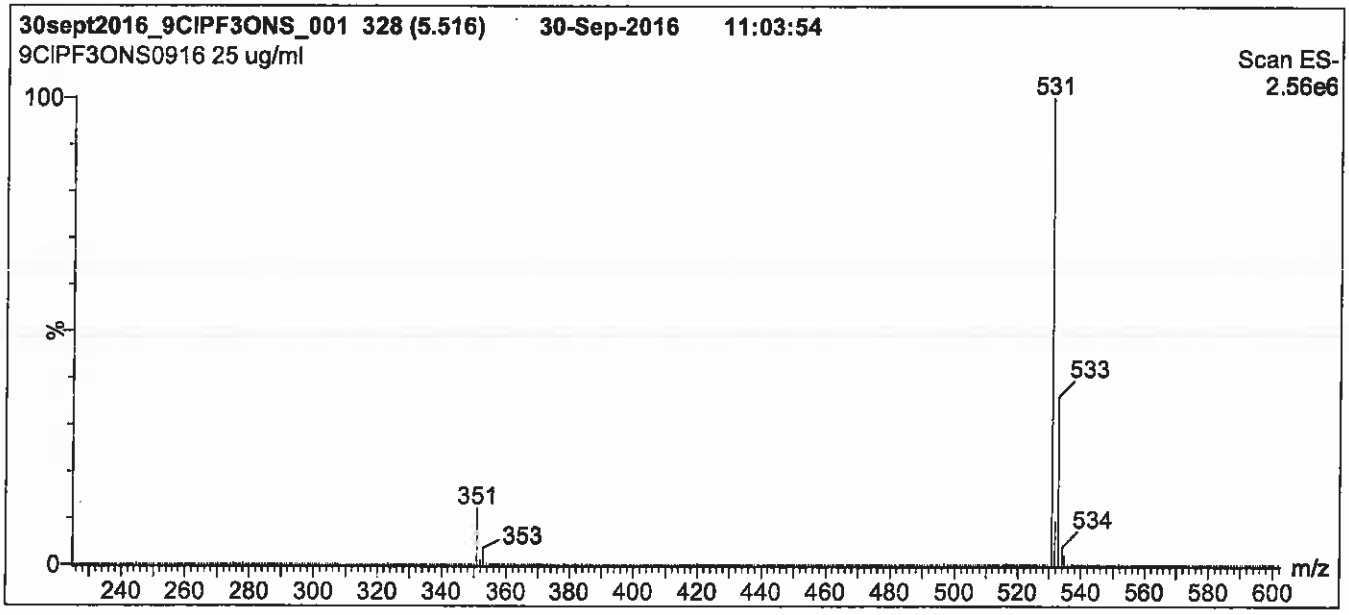
Figure 1: **9Cl-PF3ONS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

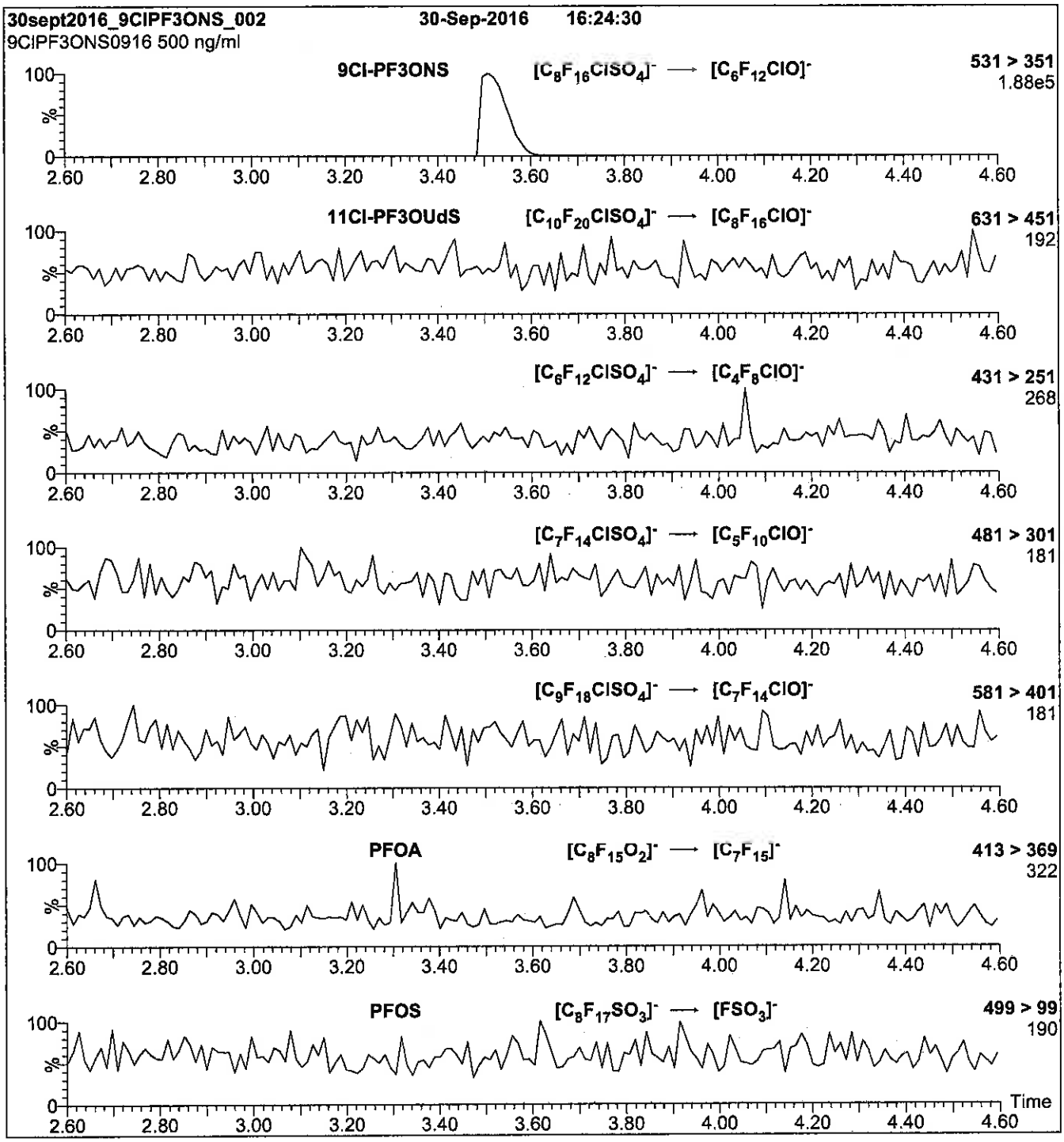
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00006

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

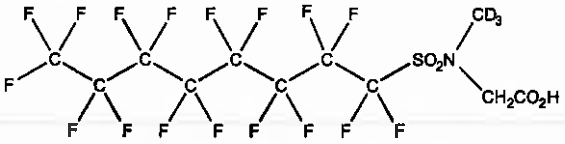
R: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

ANAB ACCREDITED CERTIFIED REFERENCE MATERIAL PRODUCER

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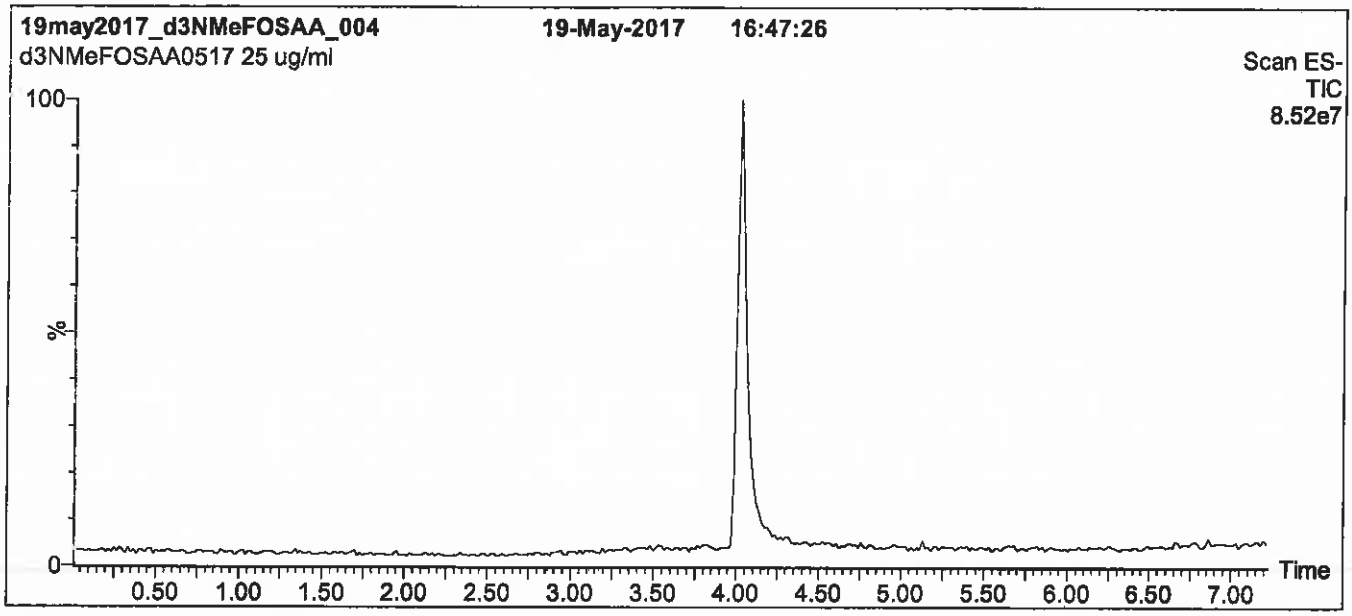
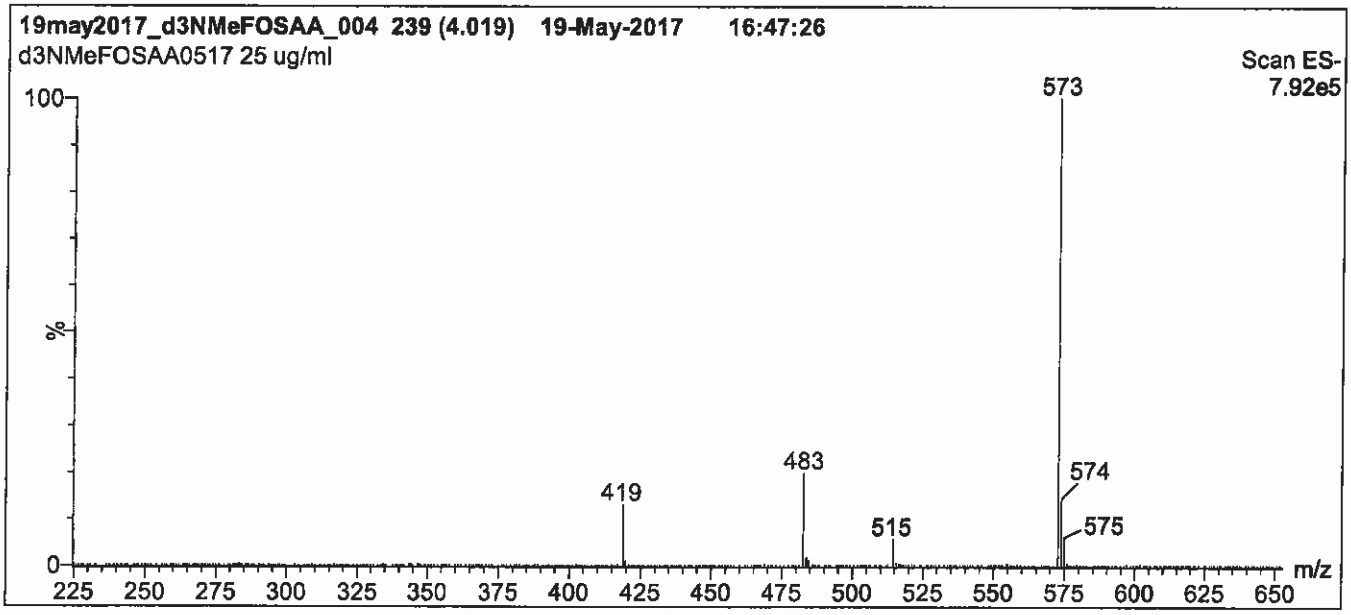
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

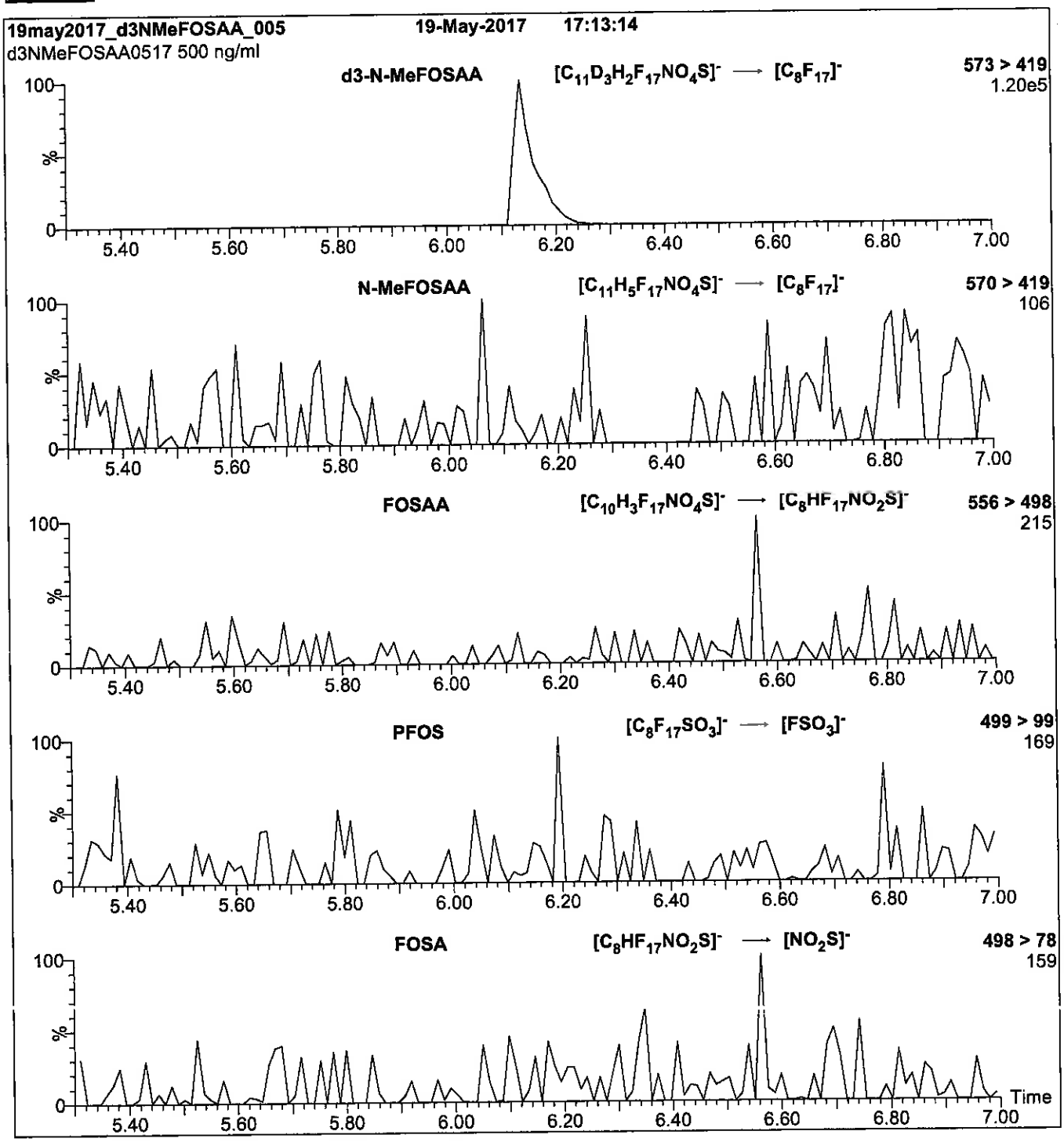
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00007

r: 1/26/18 SK

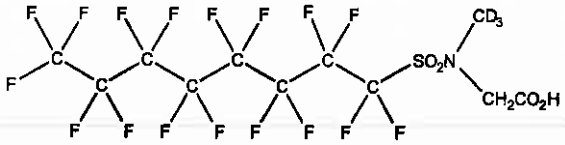
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA1117

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{11}D_3H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 574.23

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_3$

LAST TESTED: (mm/dd/yyyy) 11/08/2017

EXPIRY DATE: (mm/dd/yyyy) 11/08/2022

RECOMMENDED STORAGE: Refrigerate ampoule

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017
(mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED

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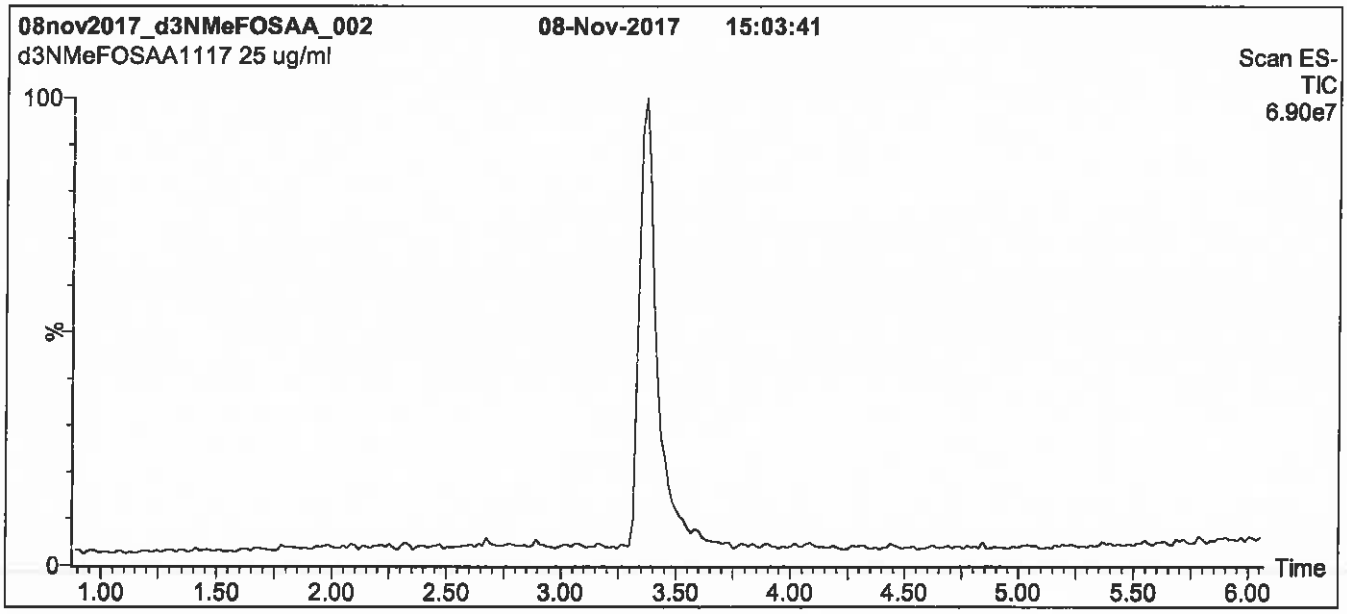

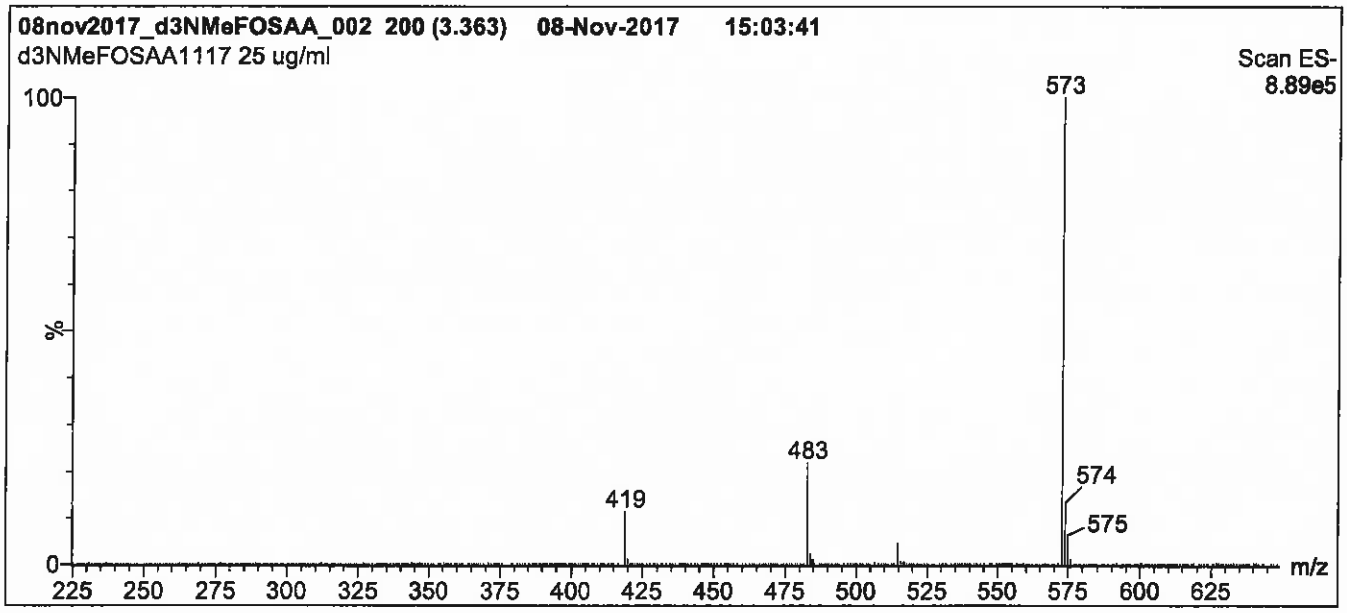

Conditions for Figure 1:

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

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

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

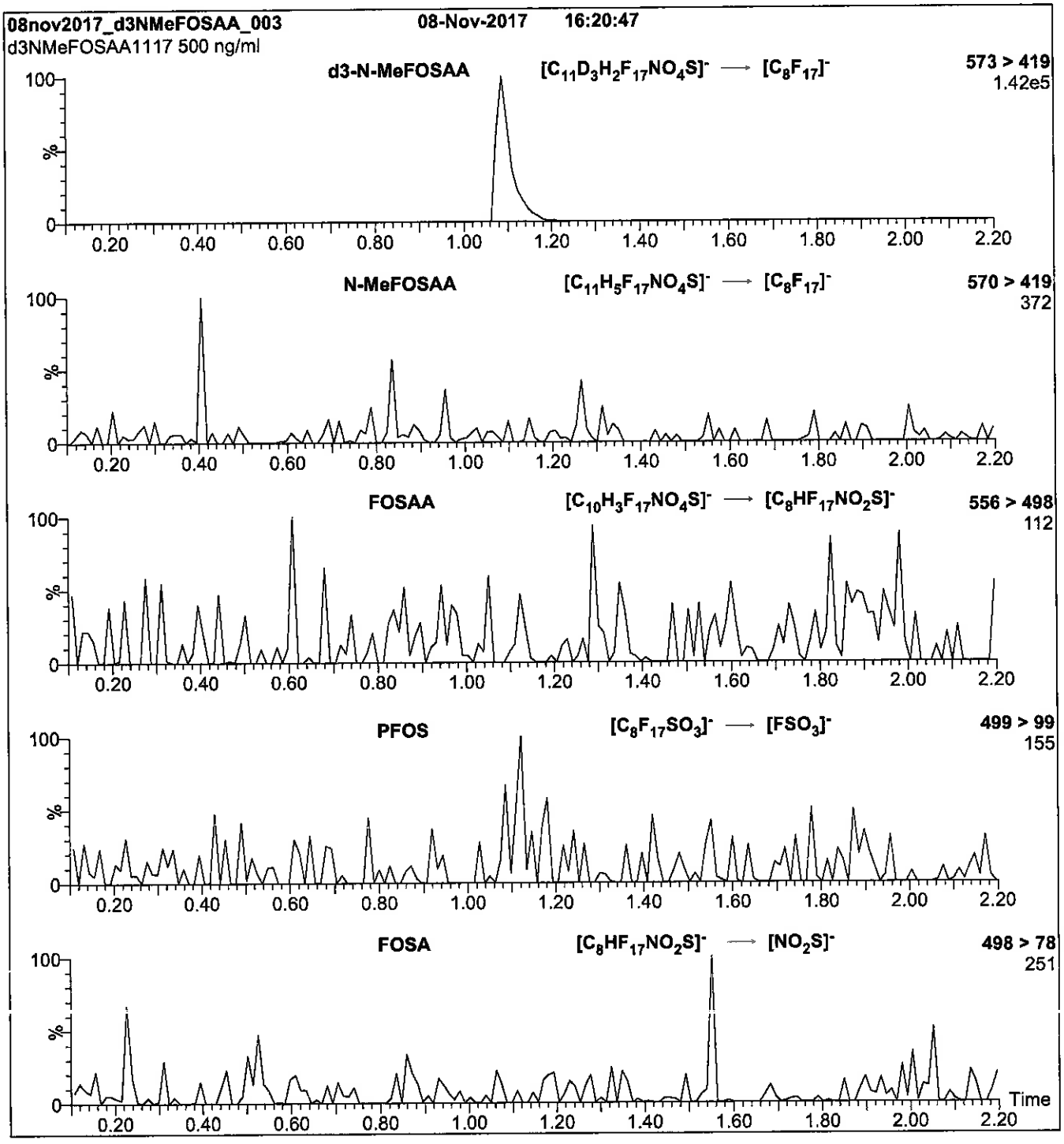
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCd5-NEtFOSAA_00006

R: 12/4/17 ccc

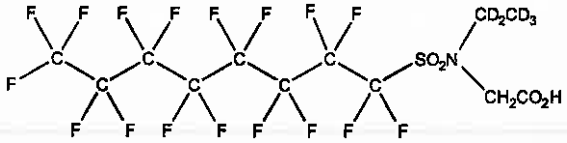
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{12}D_5H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	590.26
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED

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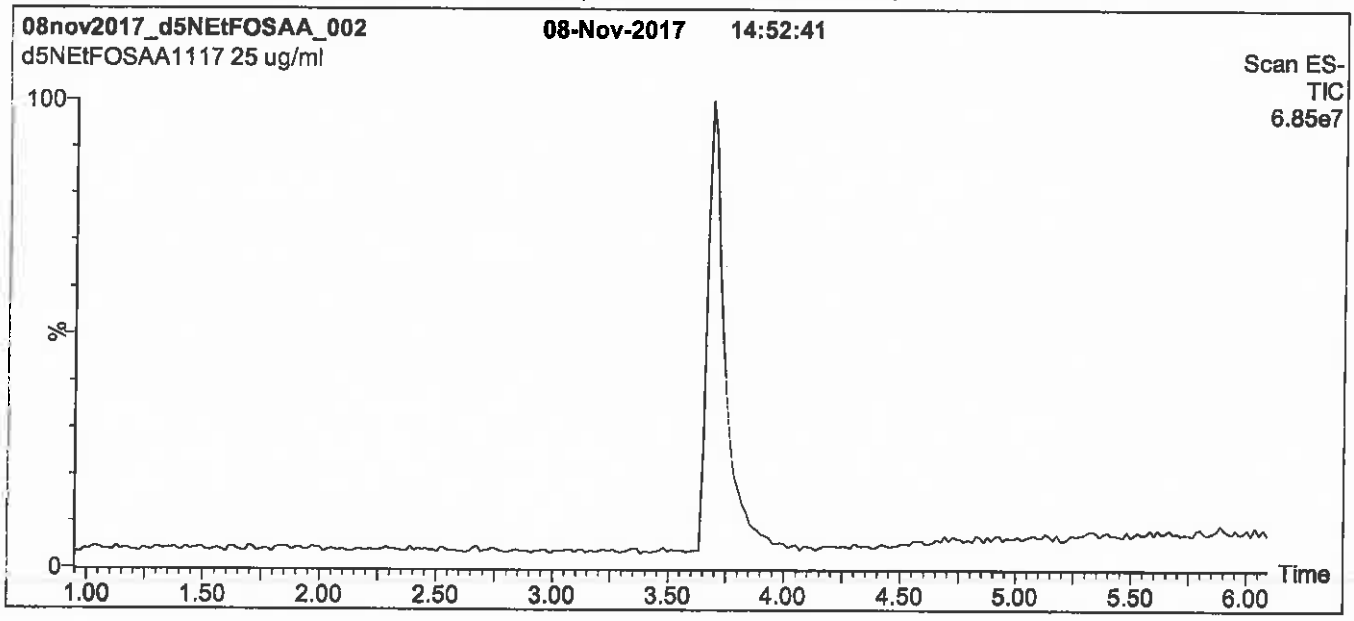
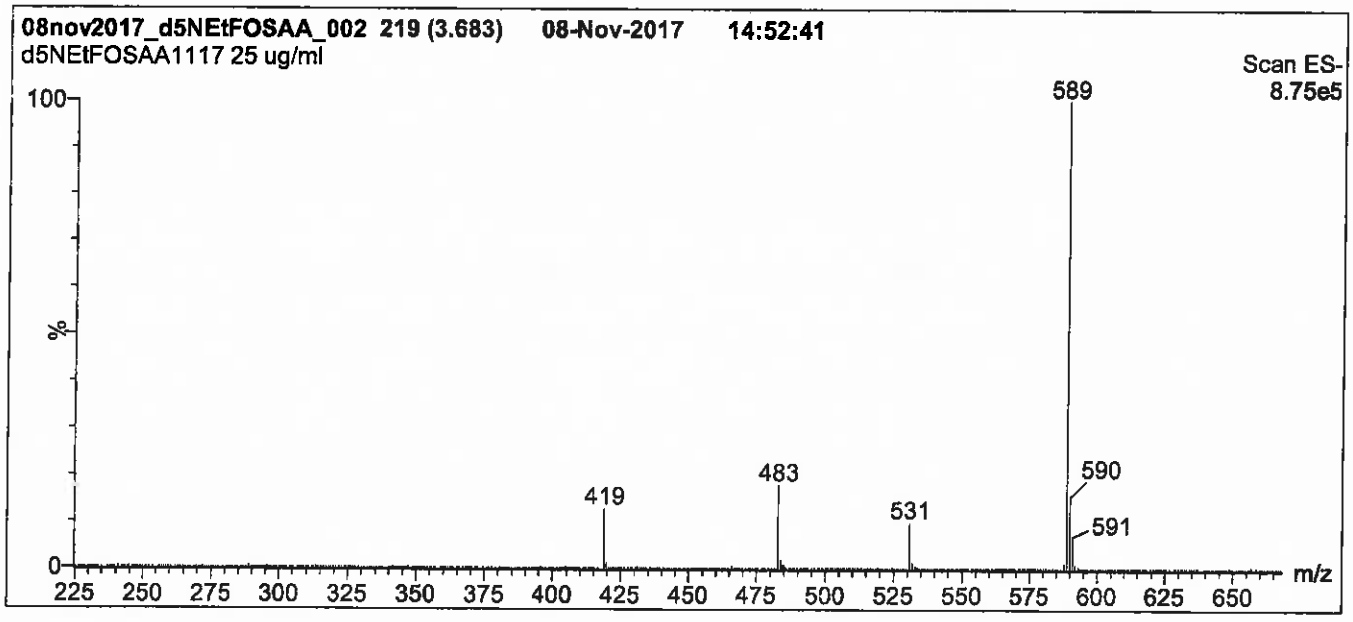
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

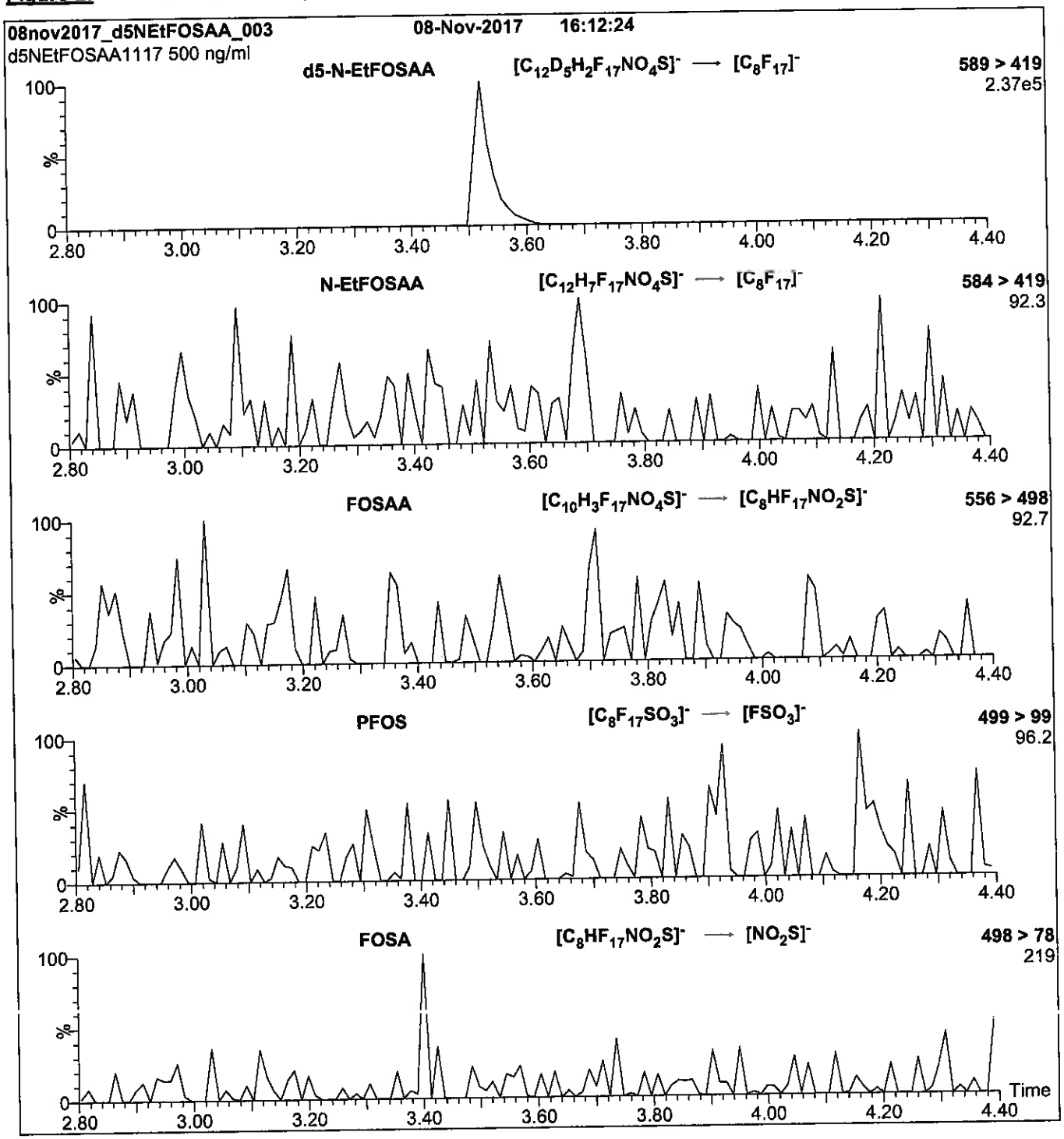
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d5-N-EtFOSAA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

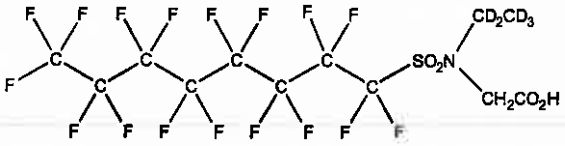
LCd5-NEtFOSAA_00007

R: 1/26/18 SEW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	d5-N-EtFOSAA	**LOT NUMBER:**	d5NEtFOSAA1117
COMPOUND:	N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_{12}D_5H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	590.26
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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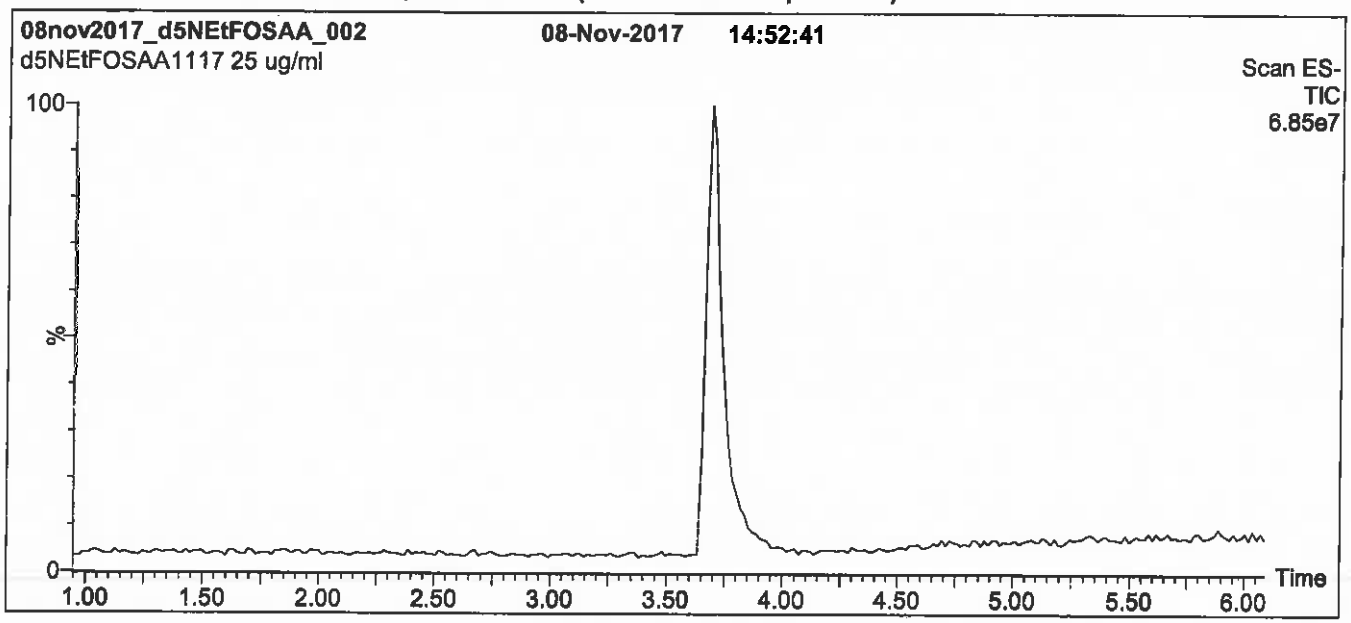
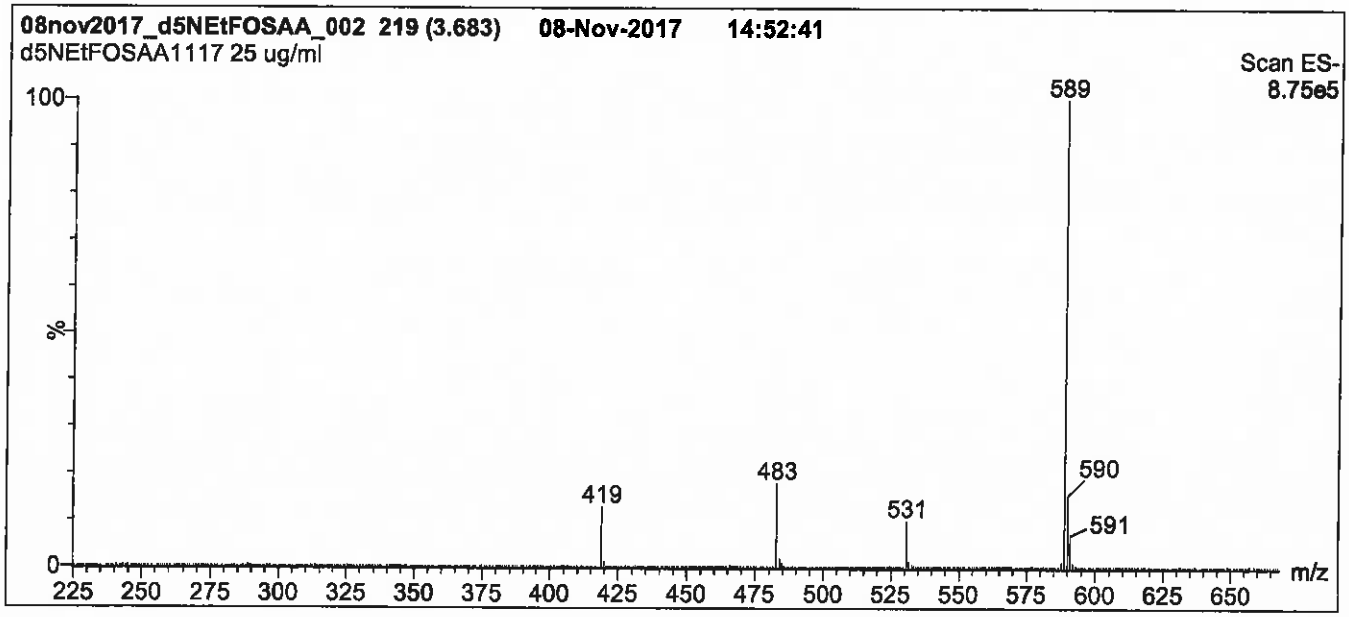
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

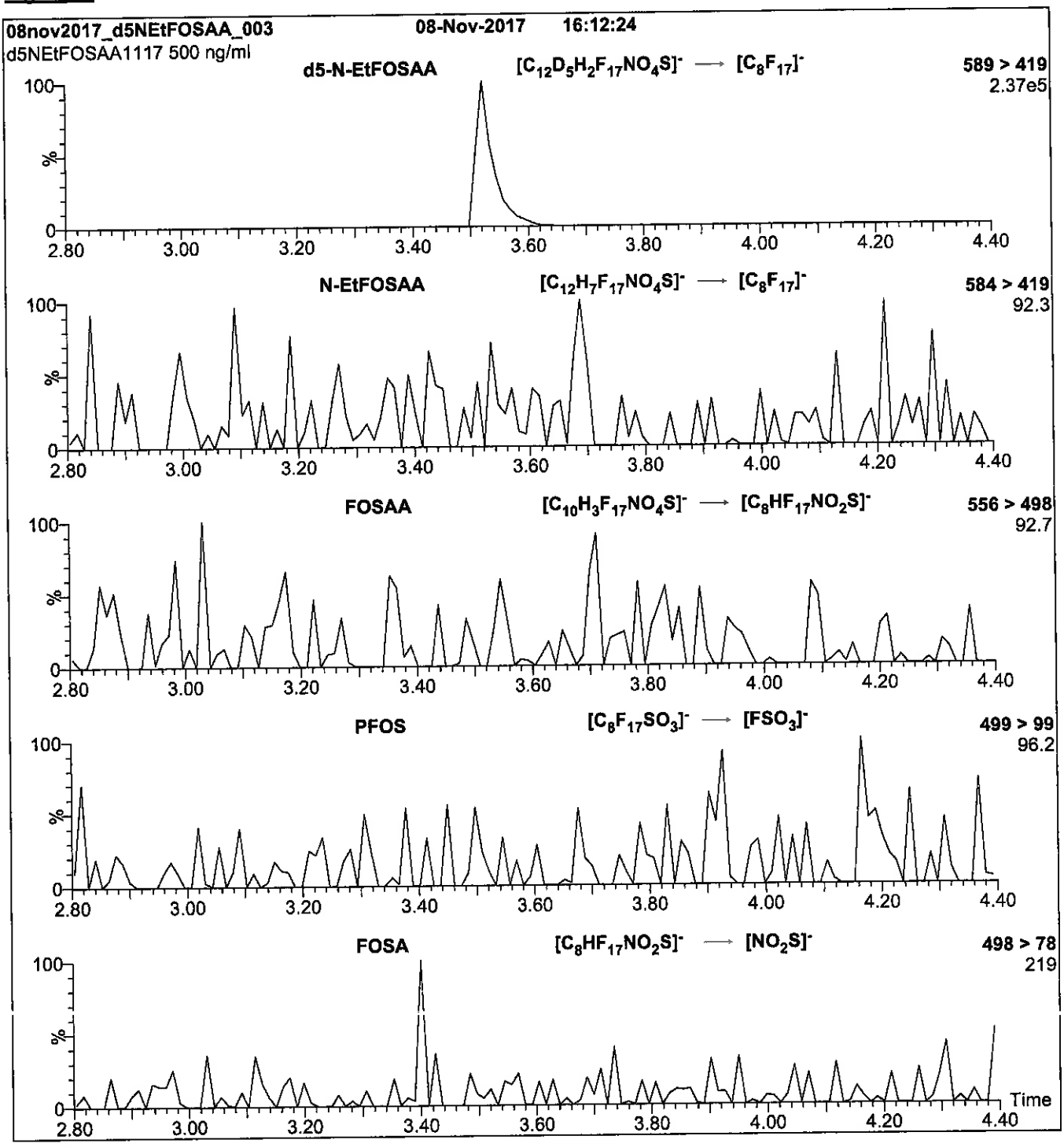
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d5-N-EtFOSAA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

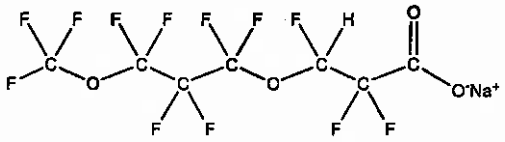
LCDONA_00001

R: 9/5/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$C_7HF_{12}O_4Na$	**MOLECULAR WEIGHT:**	400.05
CONCENTRATION:	50 ± 2.5 µg/ml (Na Salt)	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/10/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/10/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as ADONA.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/12/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED

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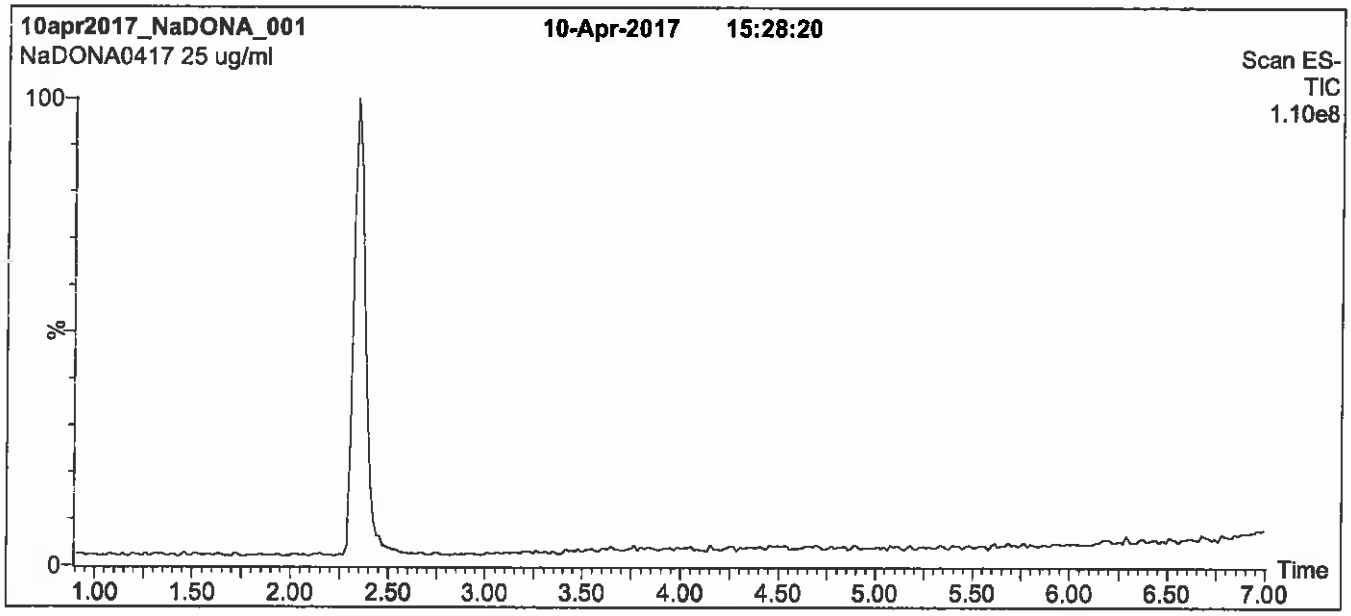
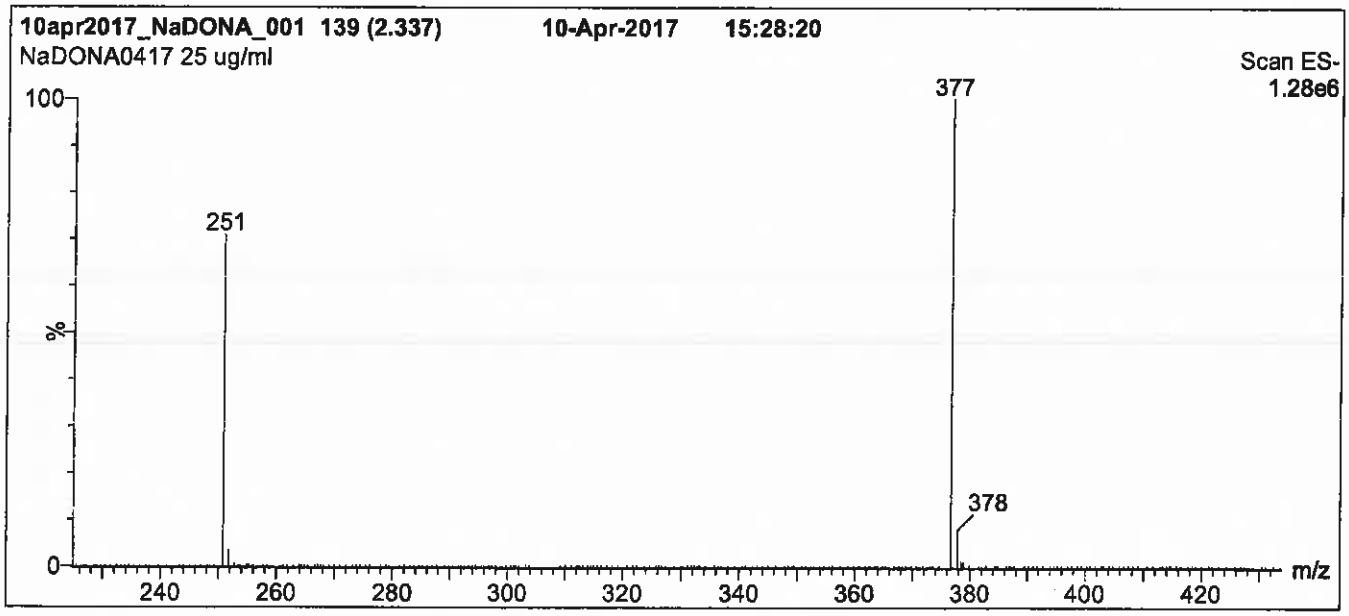
Figure 1: **NaDONA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
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Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

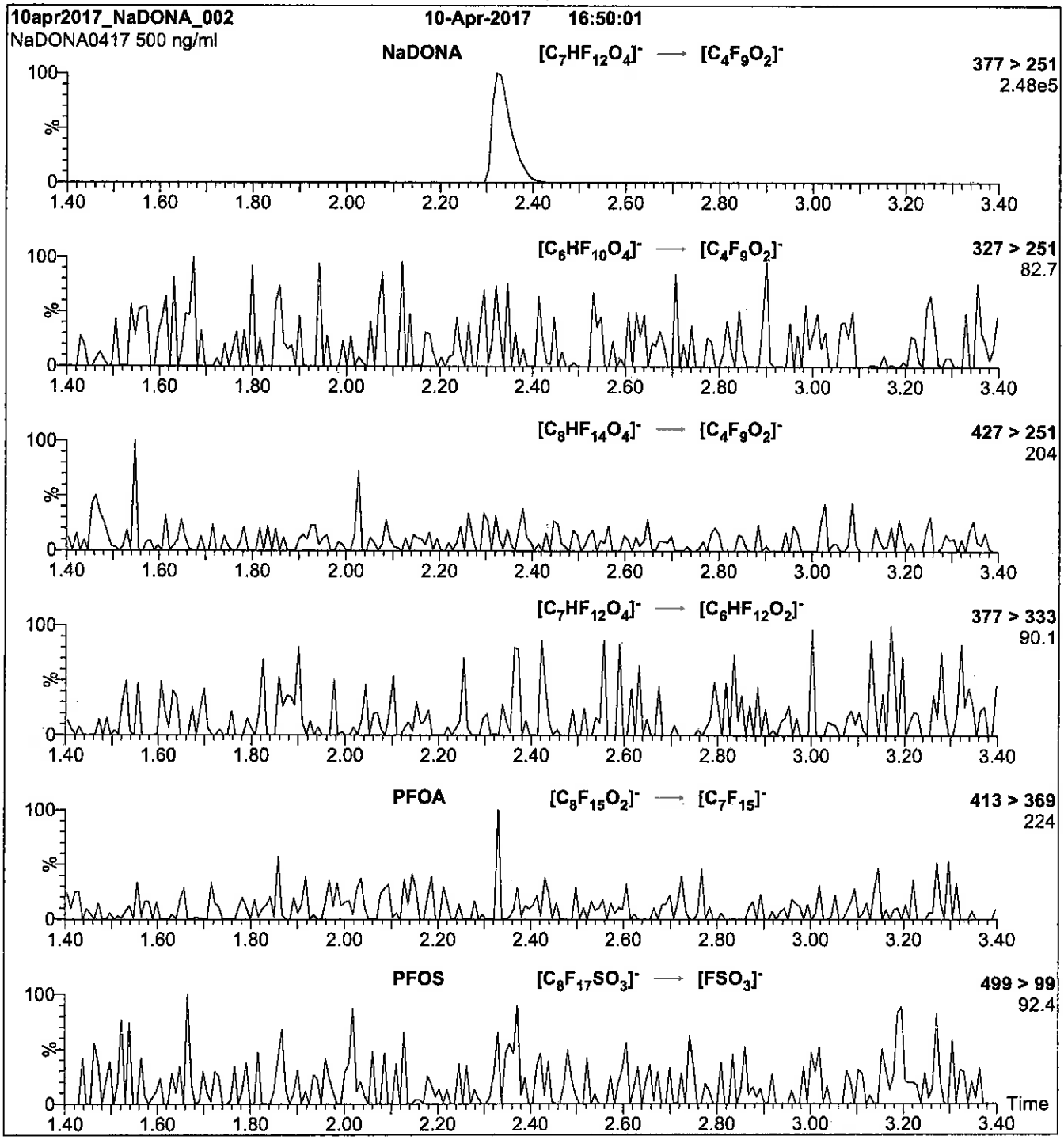
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCHFPO-DA_00001

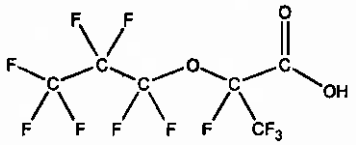
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

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



MOLECULAR FORMULA:	$C_6HF_{11}O_3$	**MOLECULAR WEIGHT:**	330.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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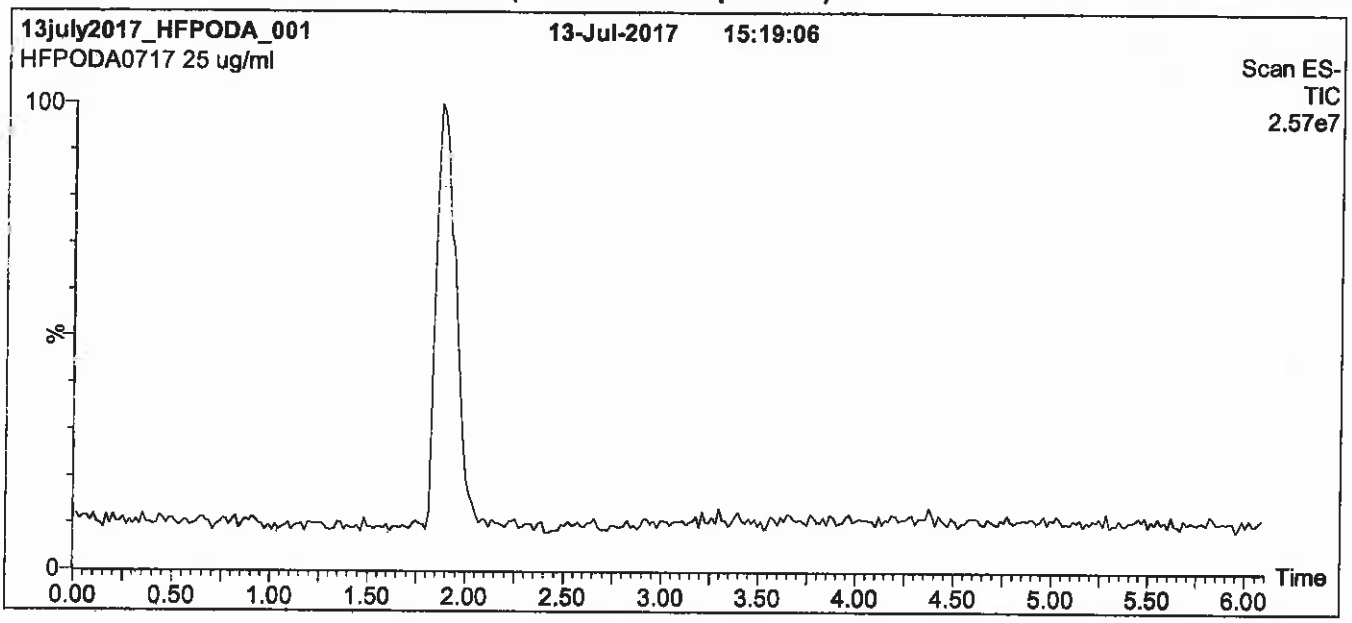
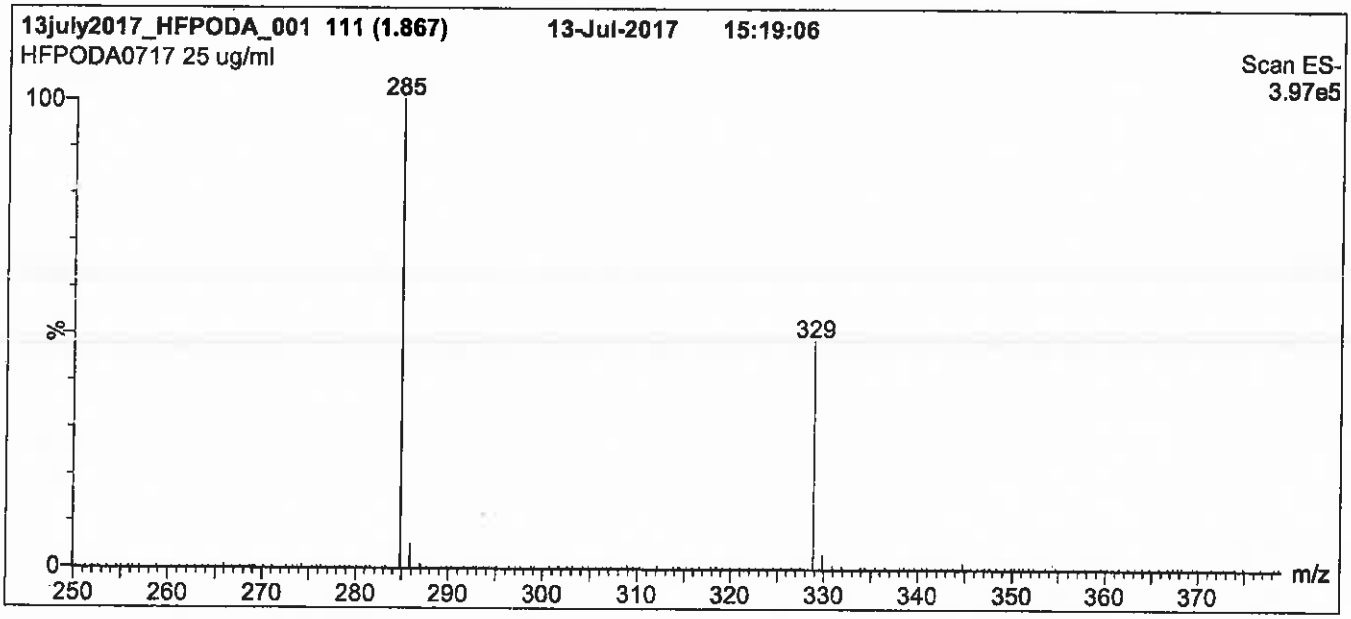
Figure 1: **HFPO-DA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

Time: 10 min

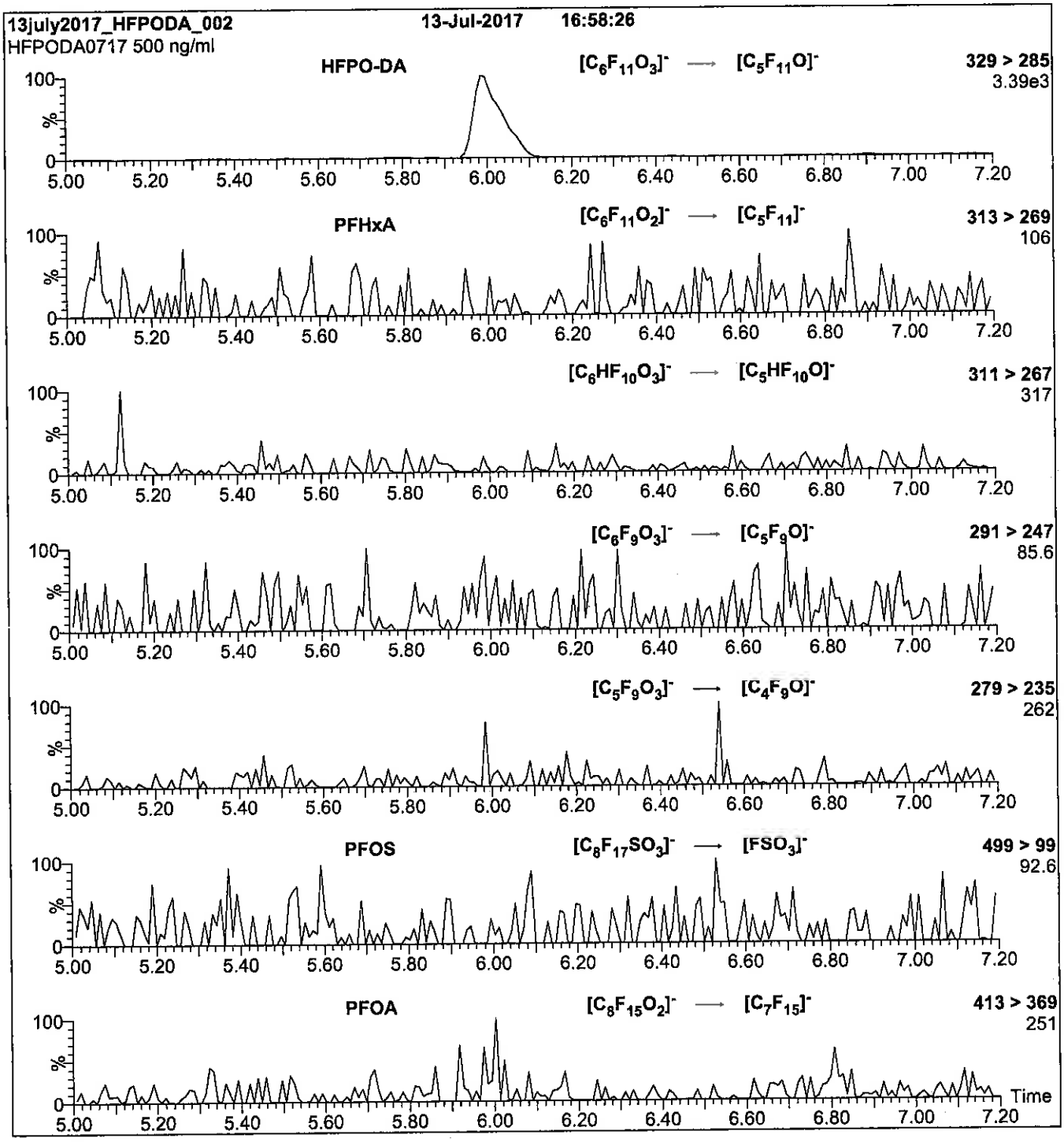
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-6:FTS_00006

1106100
ID: LCM2-6:FTS_00006
Exp: 02/17/22 Prpd: CCL
M2-6:2FTS

R: 12/4/17 CCL

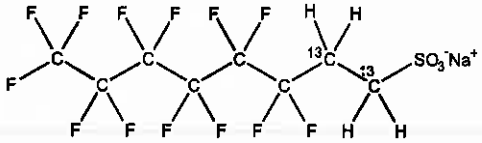
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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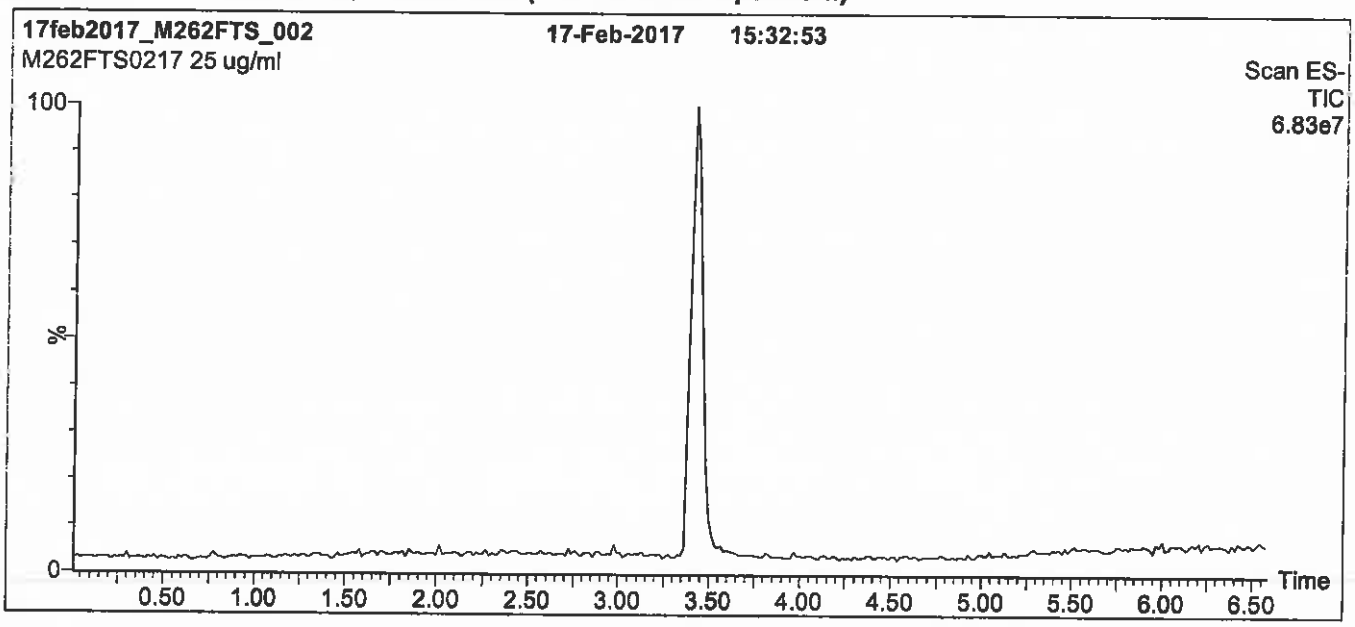
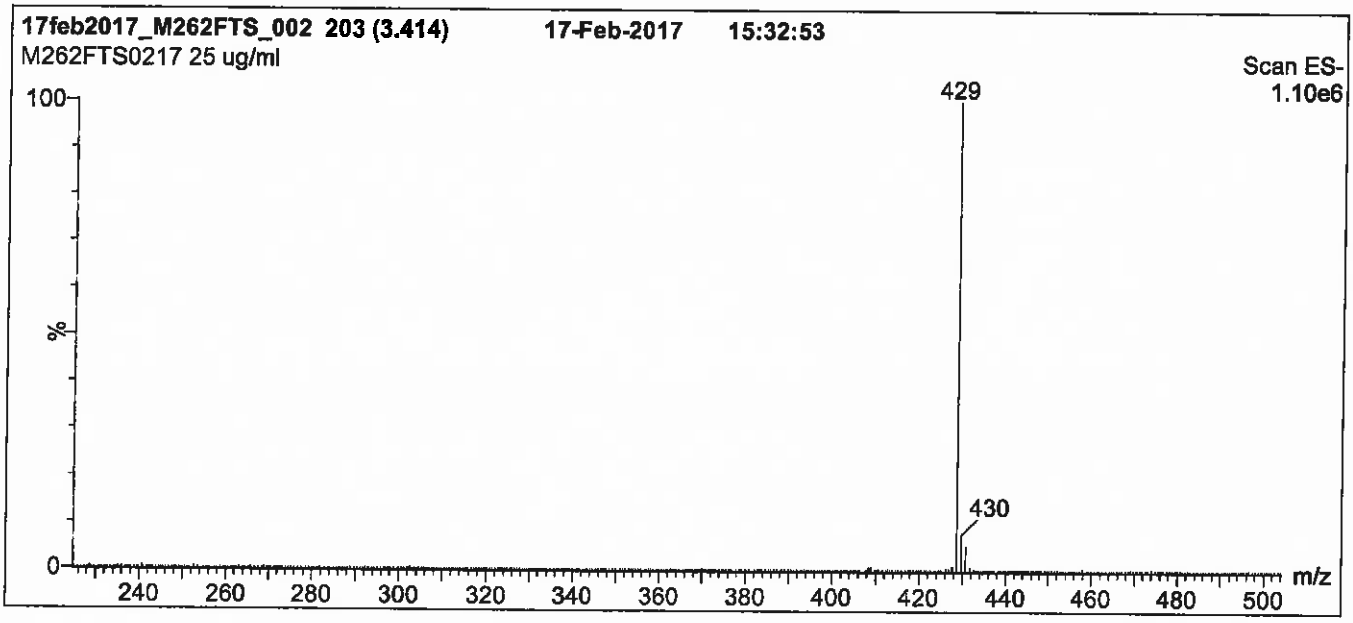




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

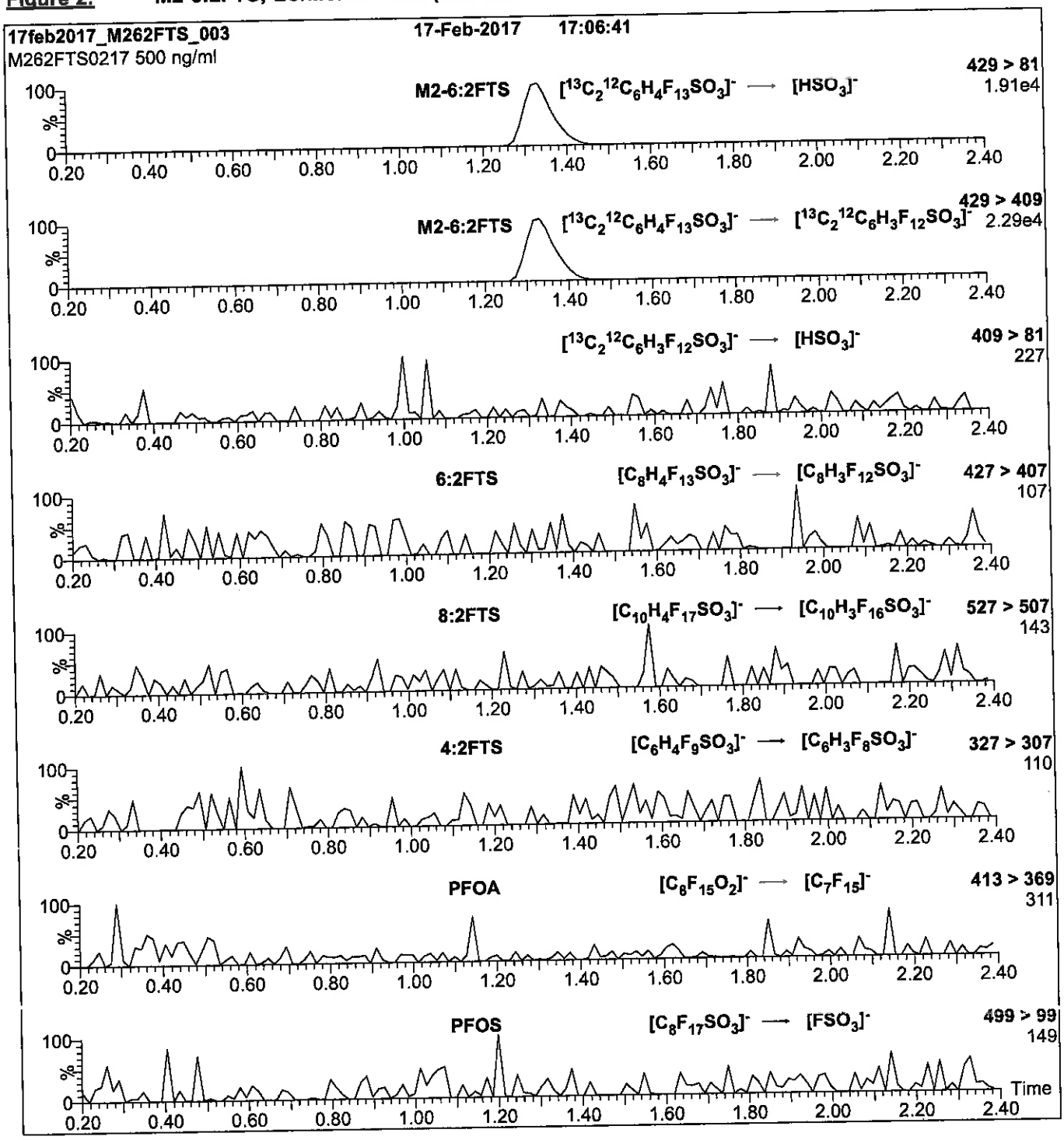
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-6:FTS_00007

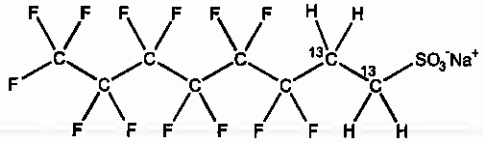
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

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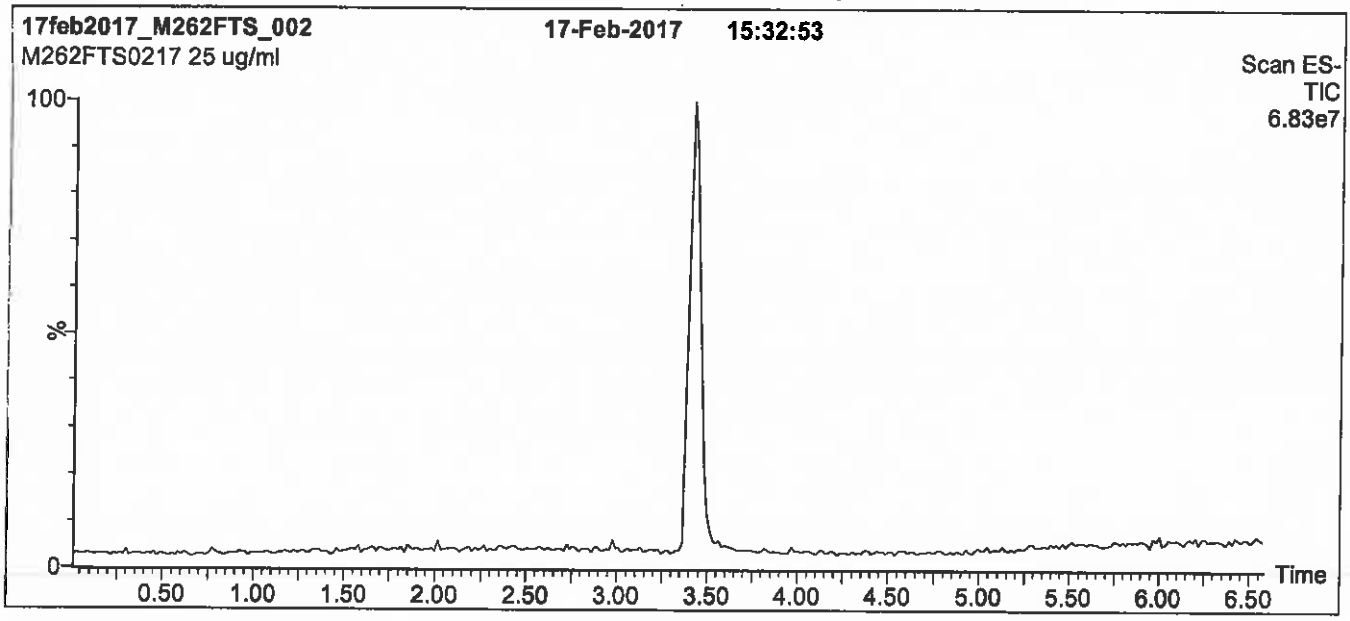
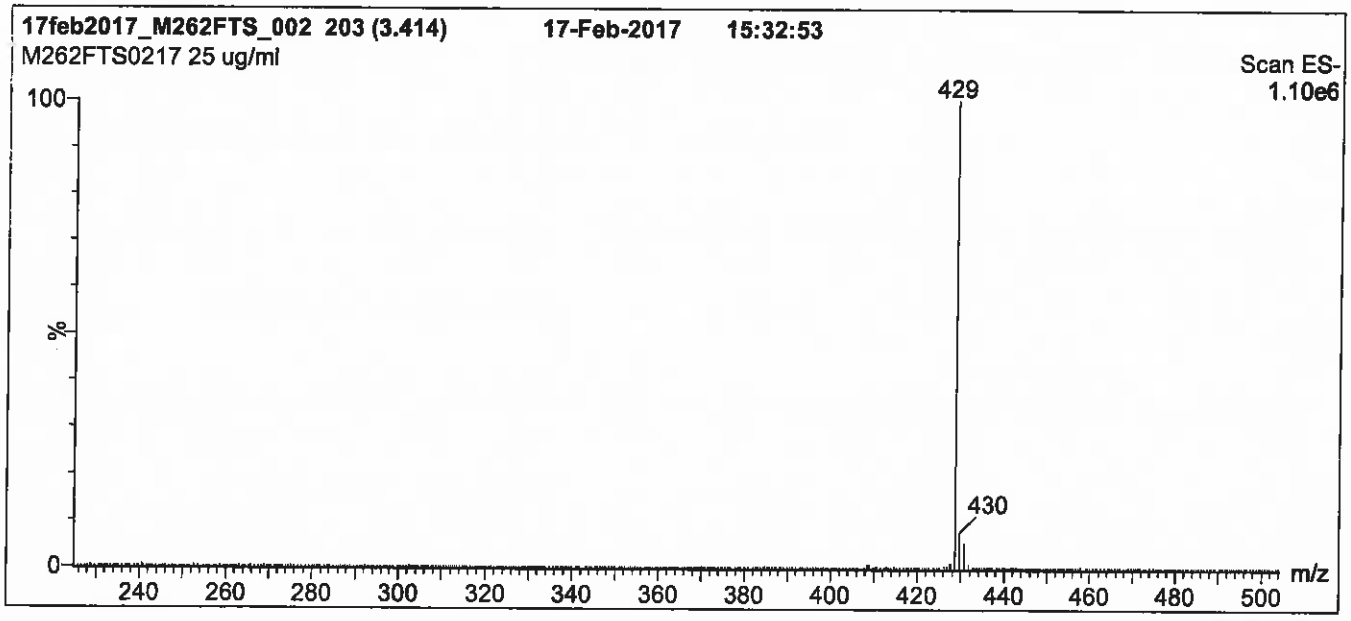
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

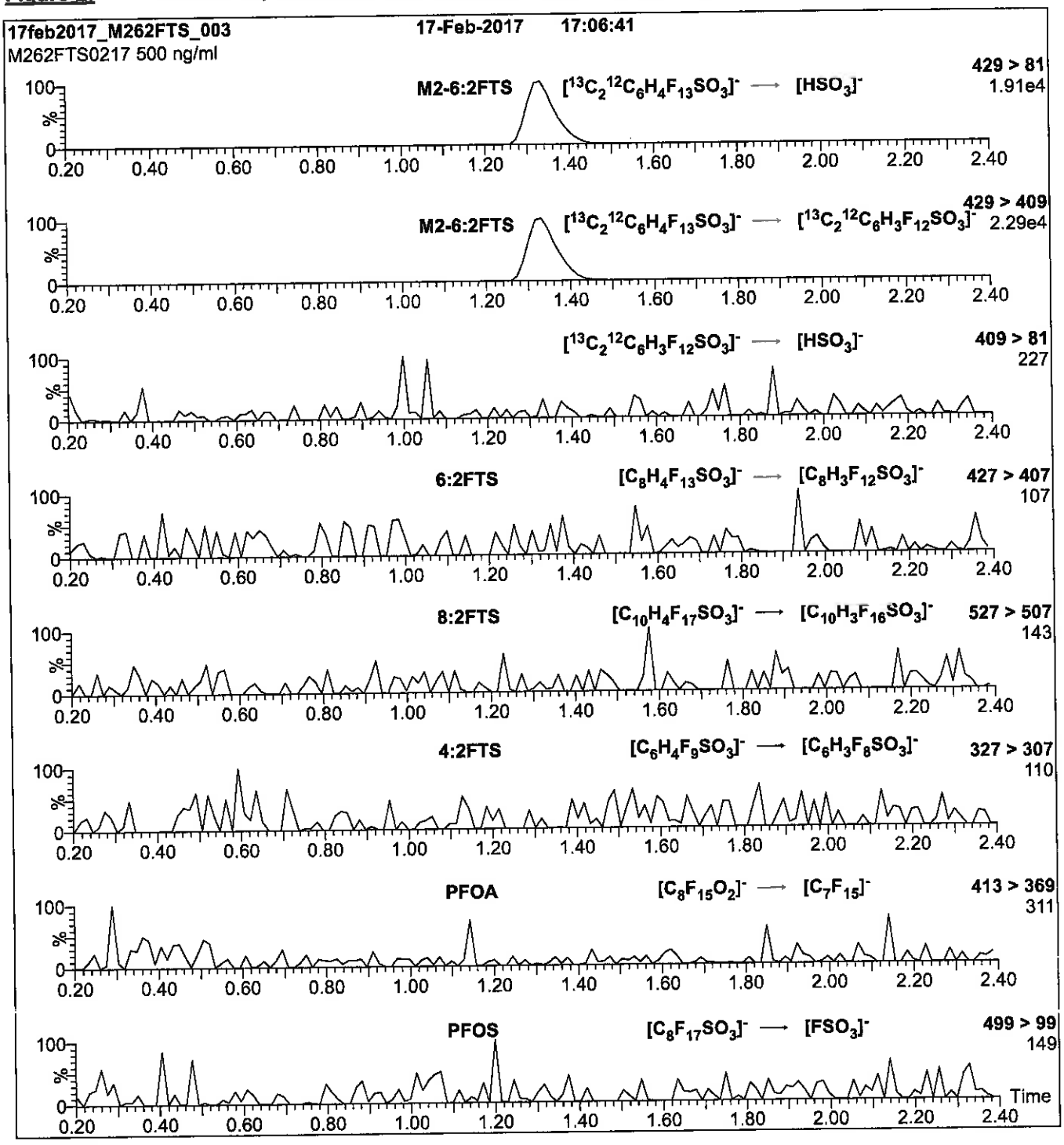
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-8:2FTS_00008

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

R: 12/4/17 CCL

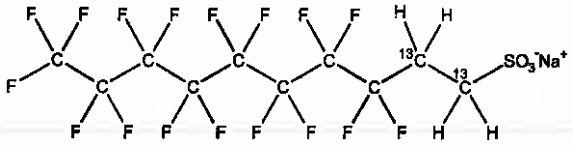
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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UNCERTAINTY:

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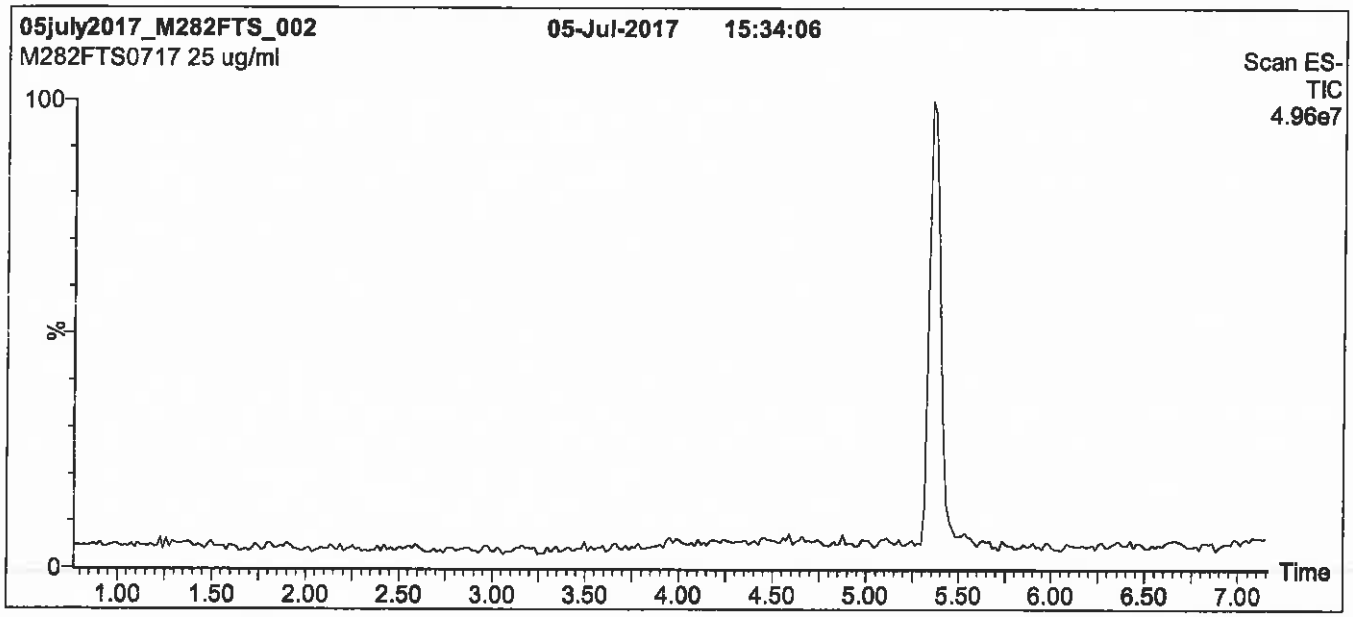
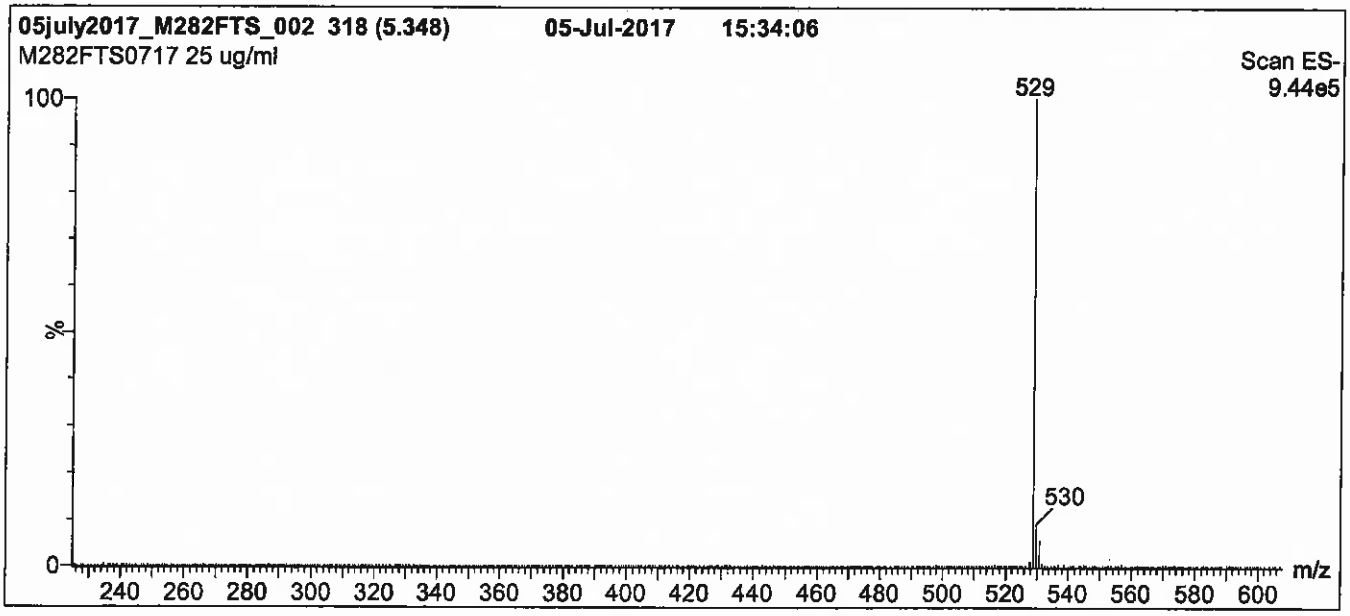
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

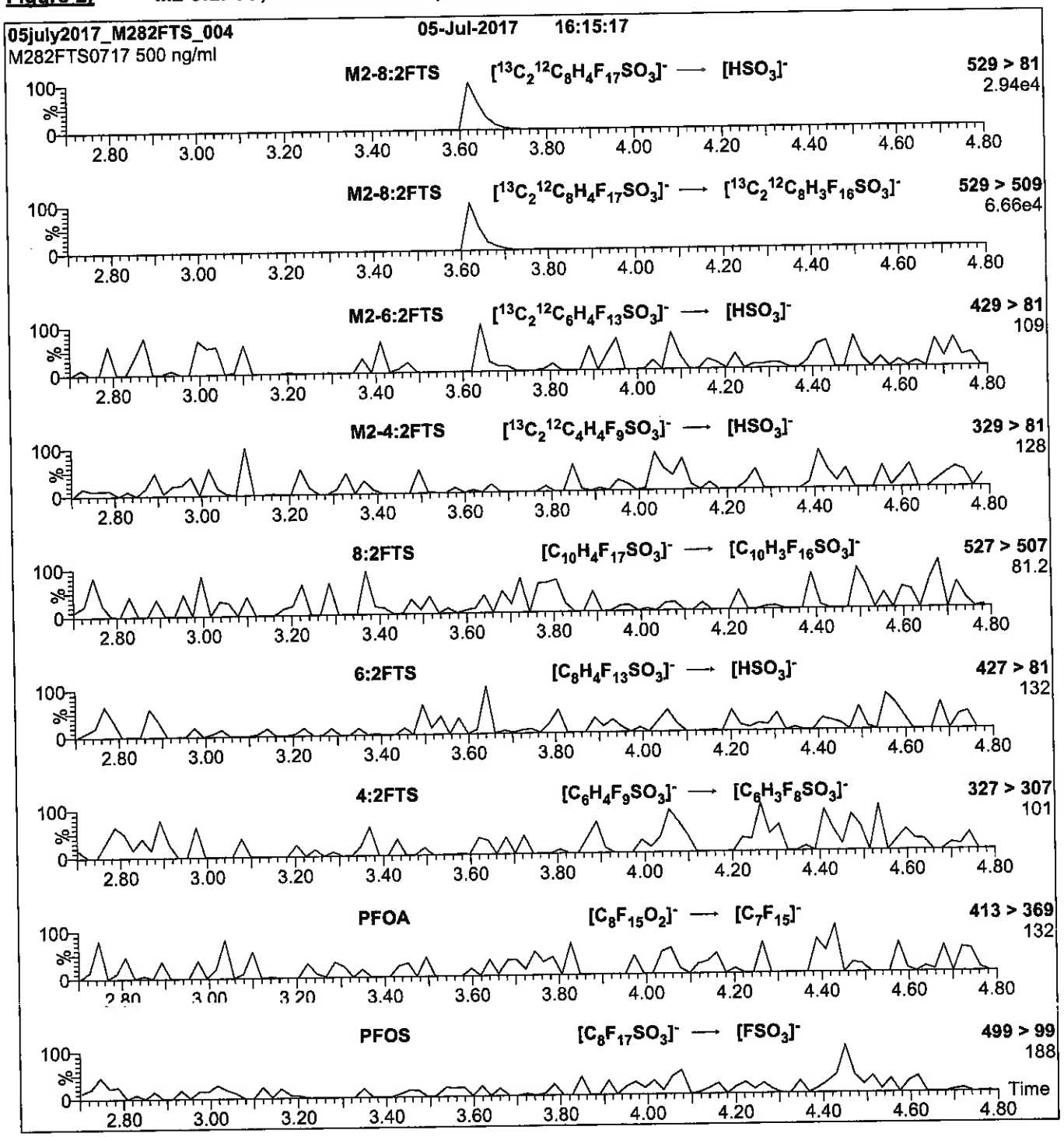
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-8:2FTS)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-8:2FTS_00009

r: 1/26/18 SKV

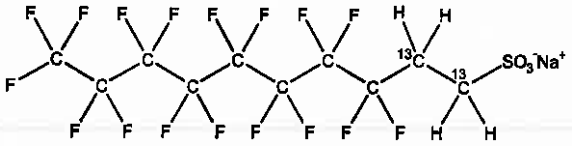
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/05/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/05/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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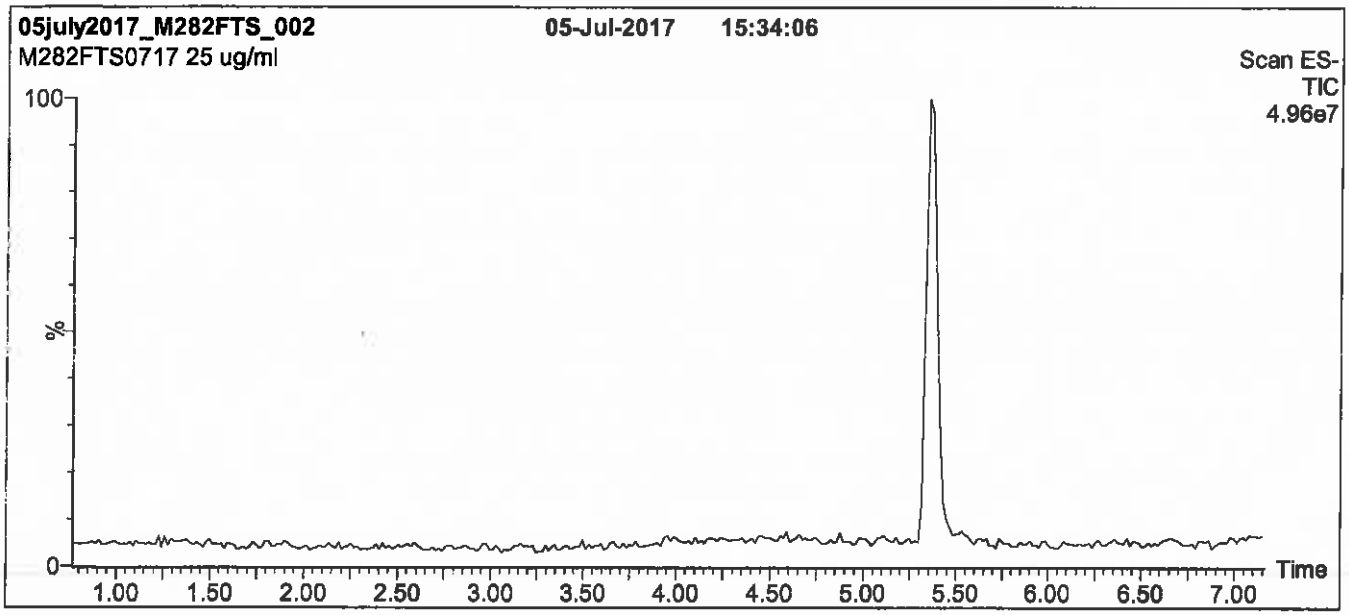
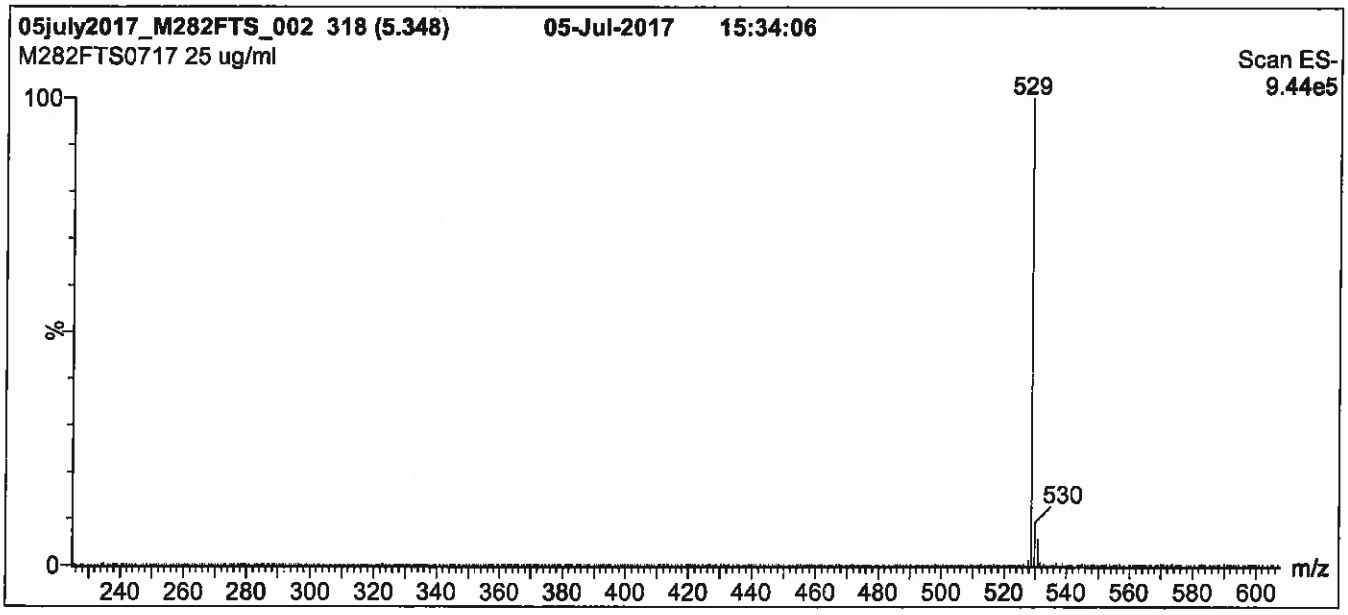




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

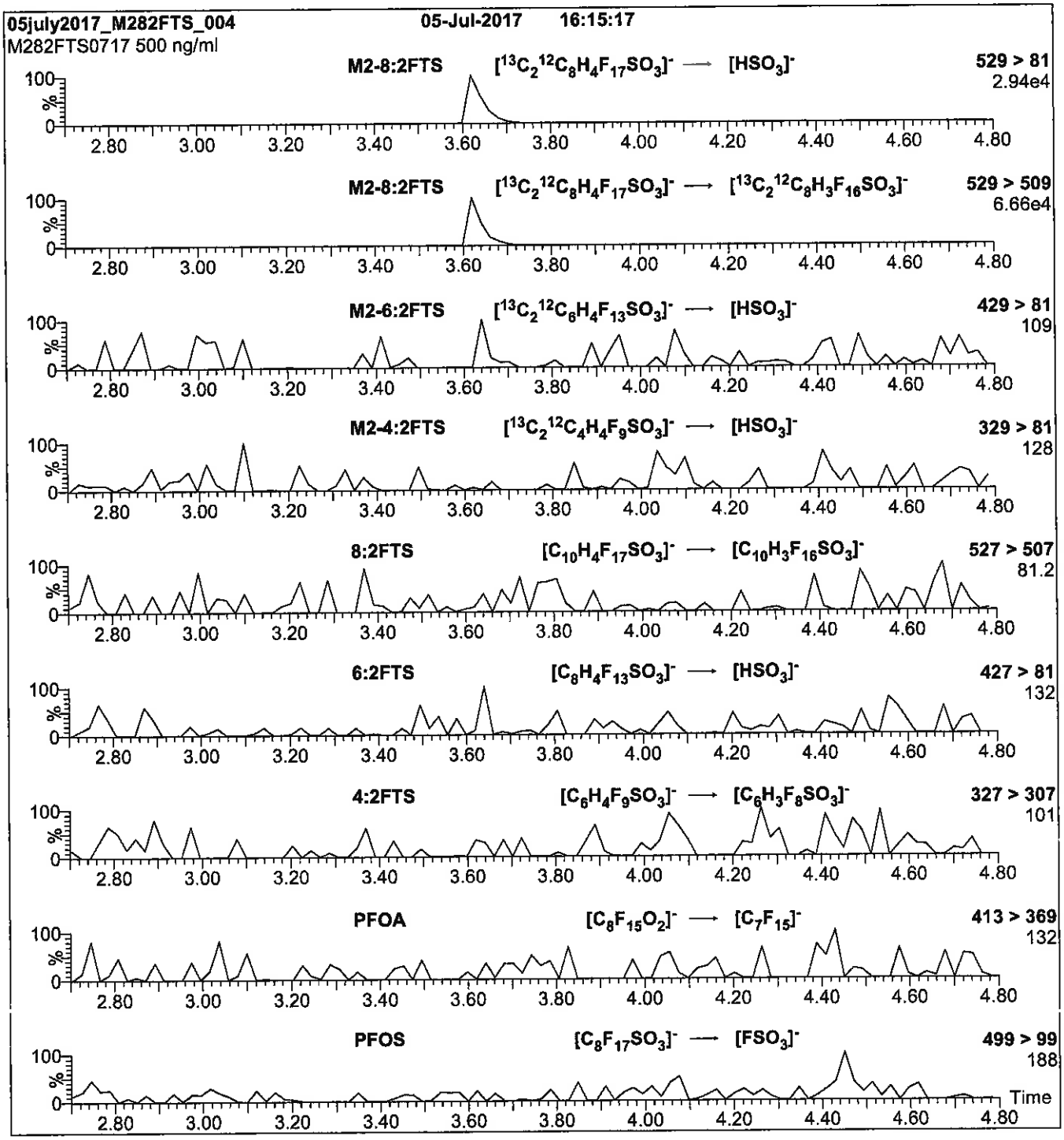
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-8:2FTS)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2PFHxDA_00013

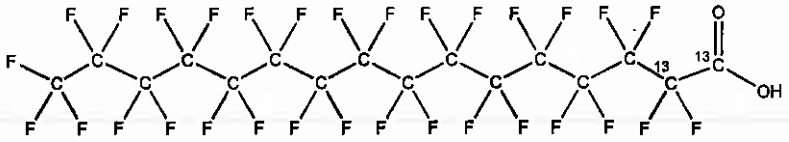
1106068
ID: LCM2PFHxDA_00013
Exp: 07/13/22 Prpd: CCL
13C2-PFHxDA at 50ug/mL

R: 12/4/17 ccz

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFHxDA	**LOT NUMBER:**	M2PFHxDA0717
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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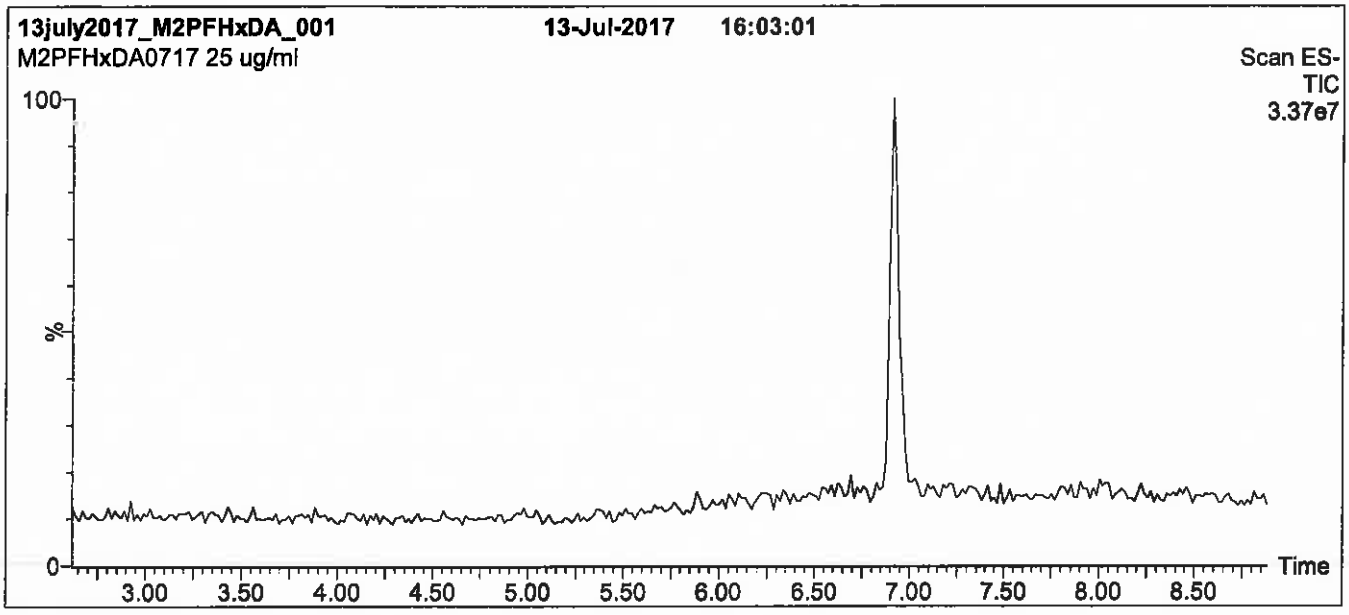
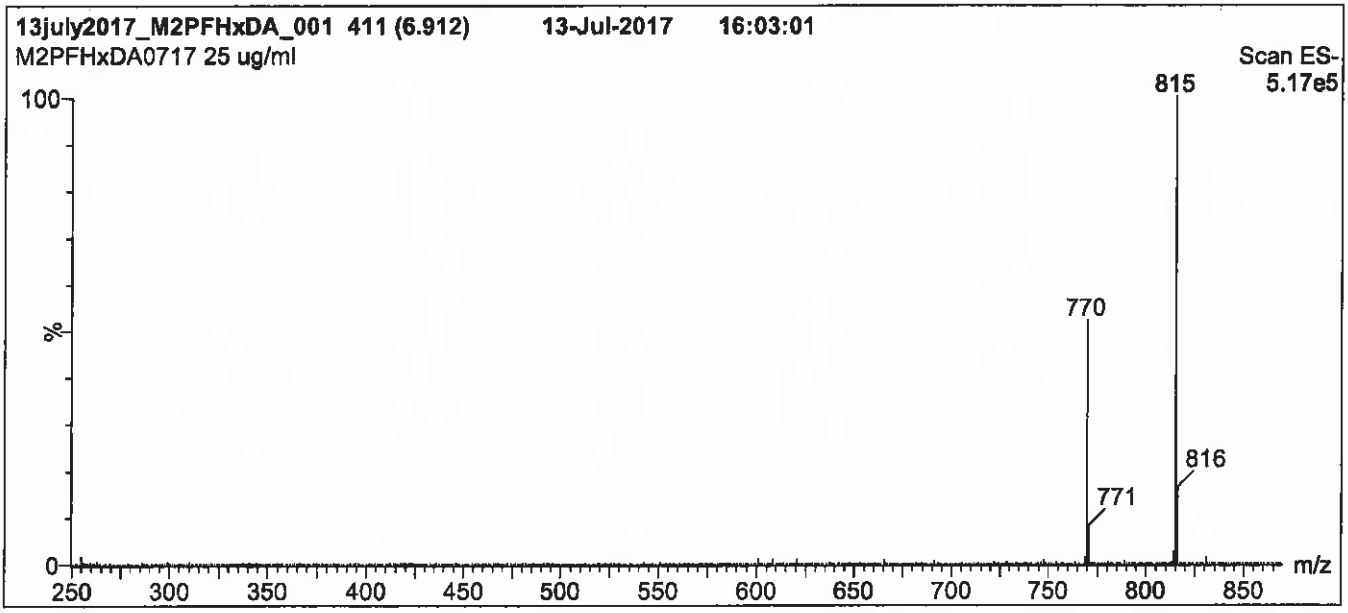
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

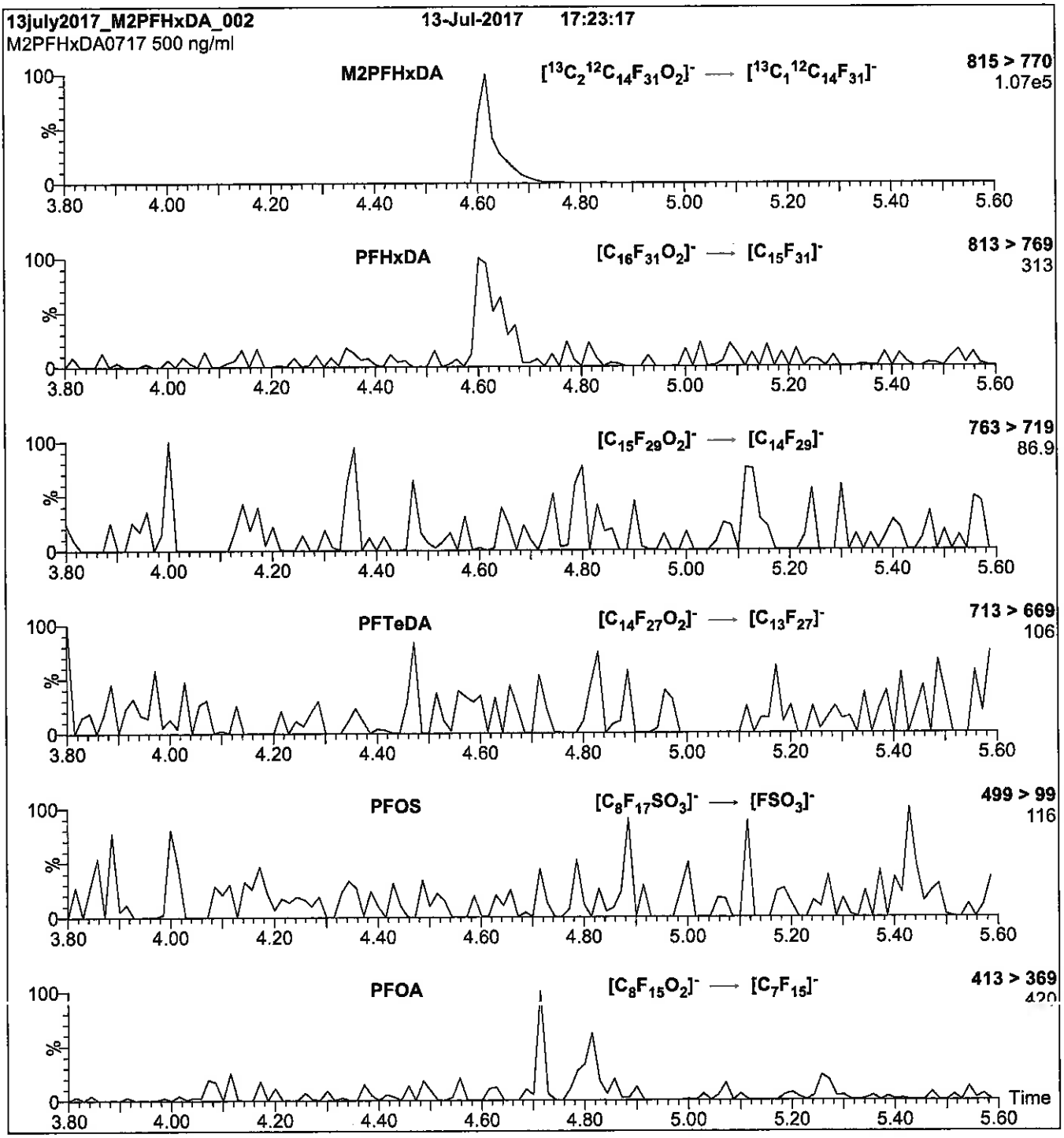
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFHxDA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

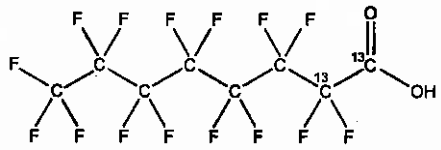
LCM2PFOA_00008

Y. 5/8/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/24/2016 (mm/dd/yyyy)

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

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CALA ANAB

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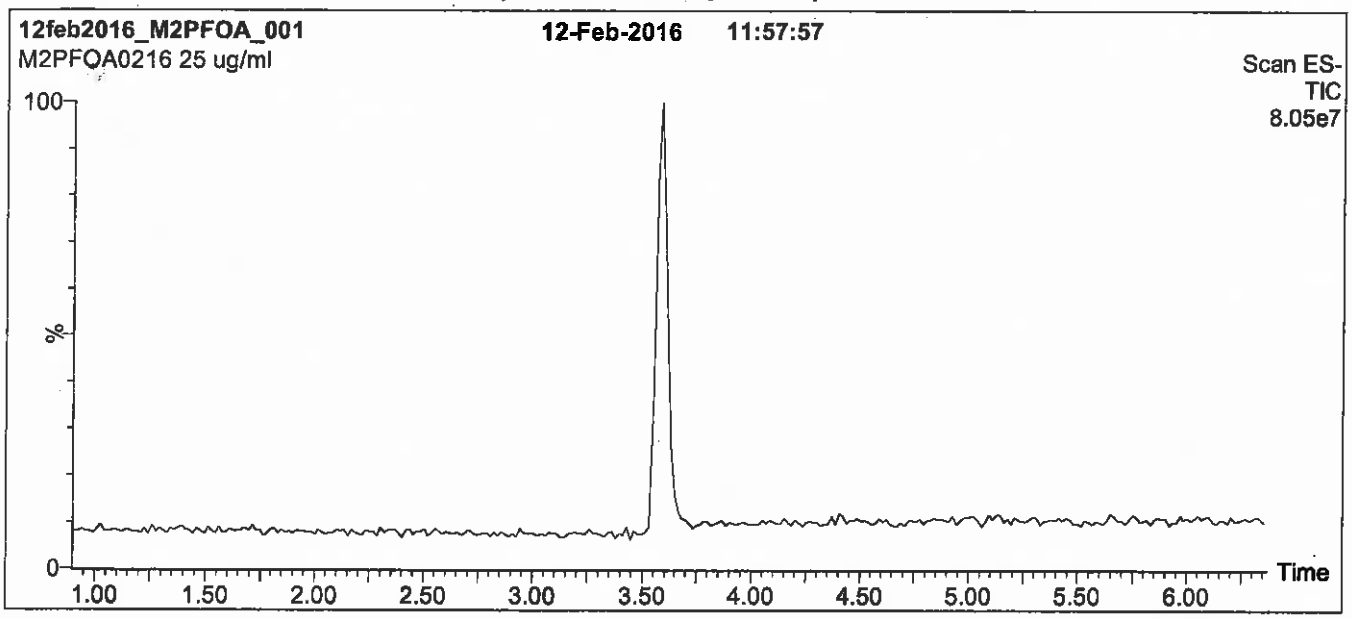
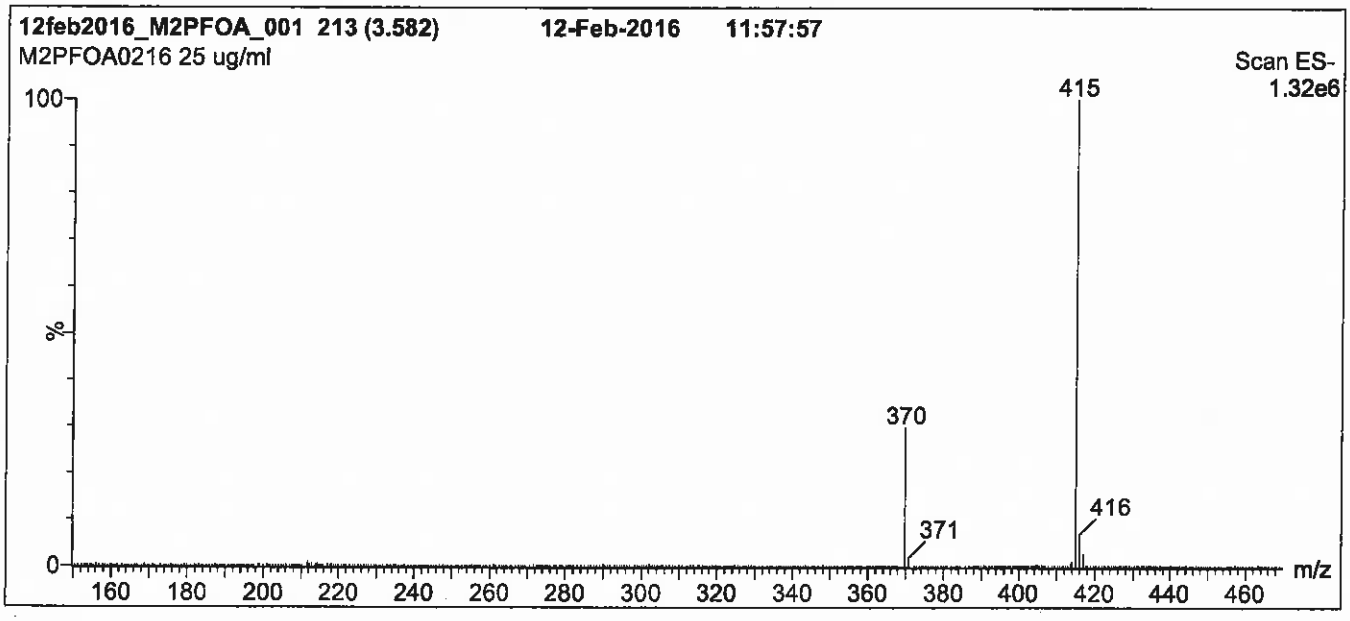
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

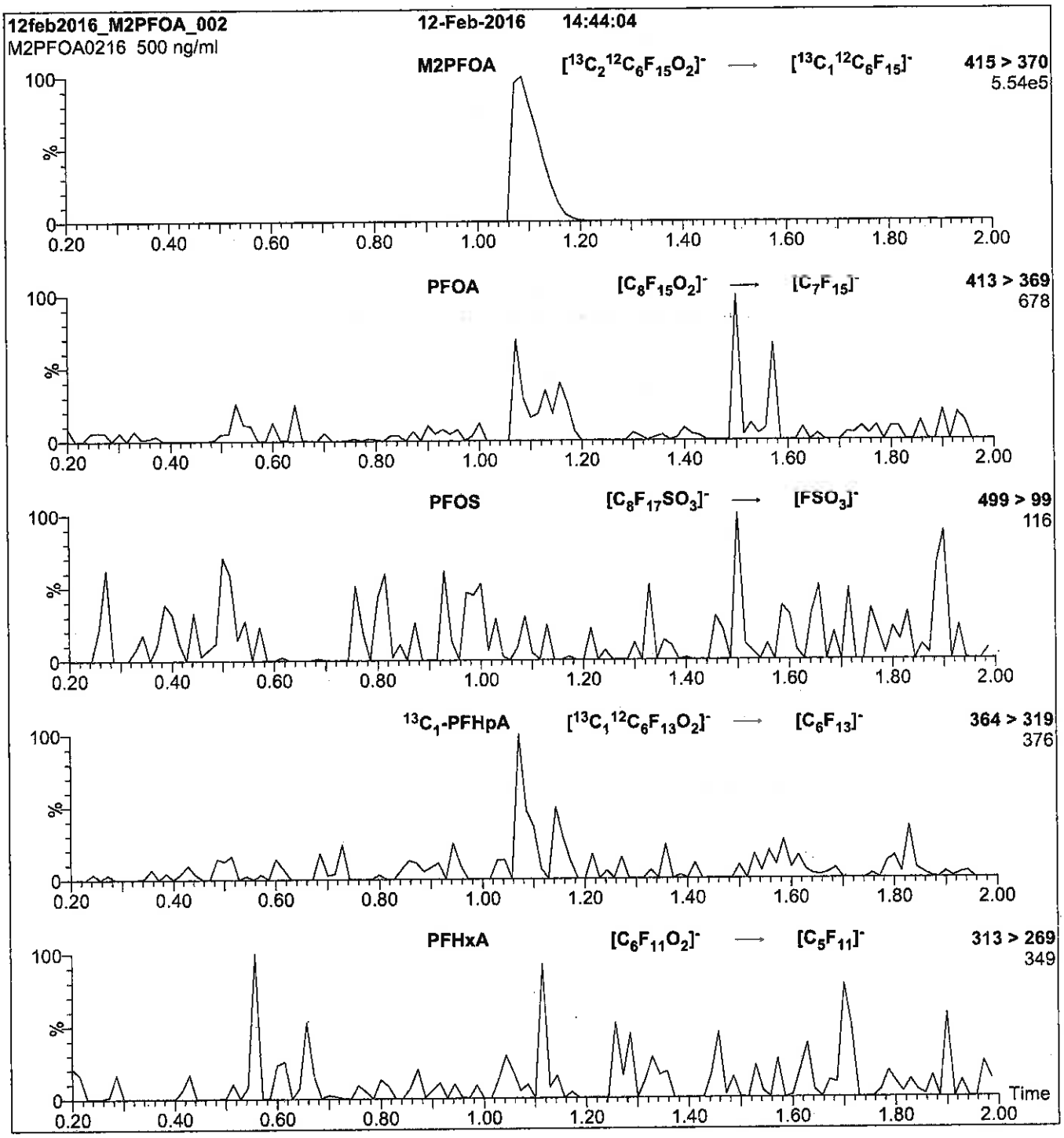
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2PFTeDA_00012

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

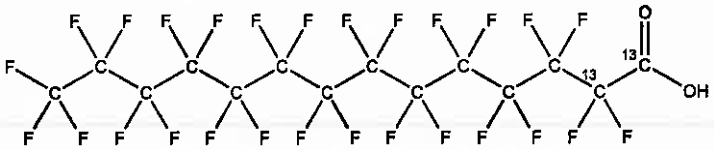
r: 12/4/17 ccl

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1117
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
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 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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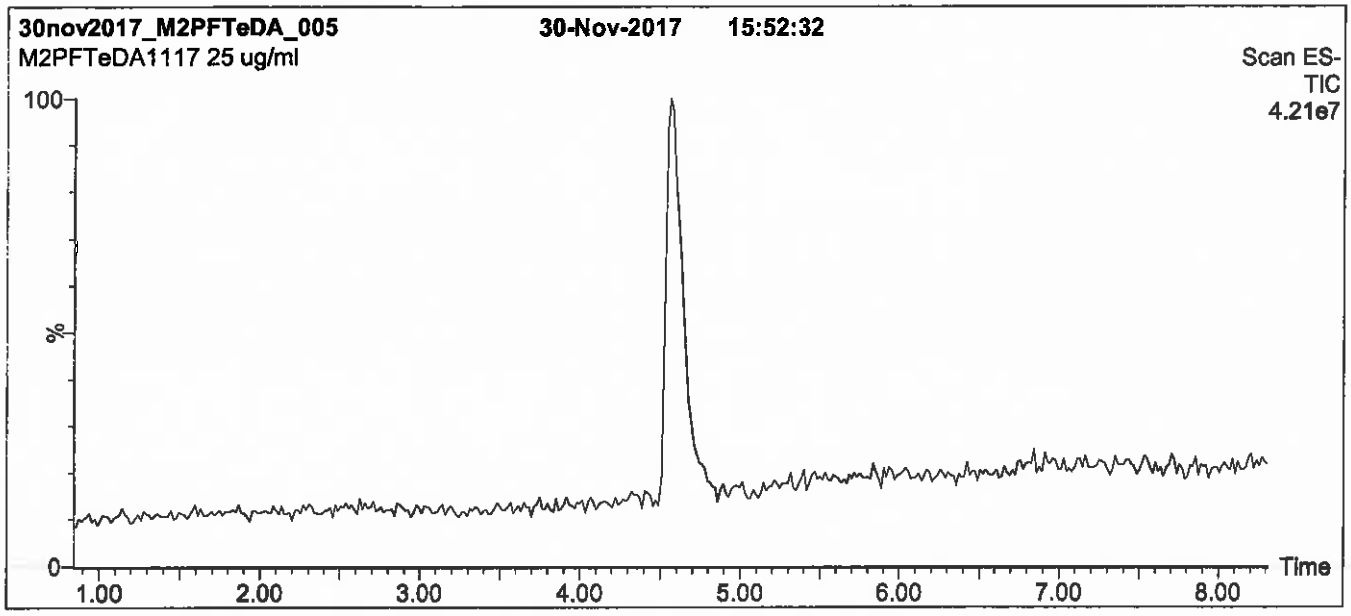
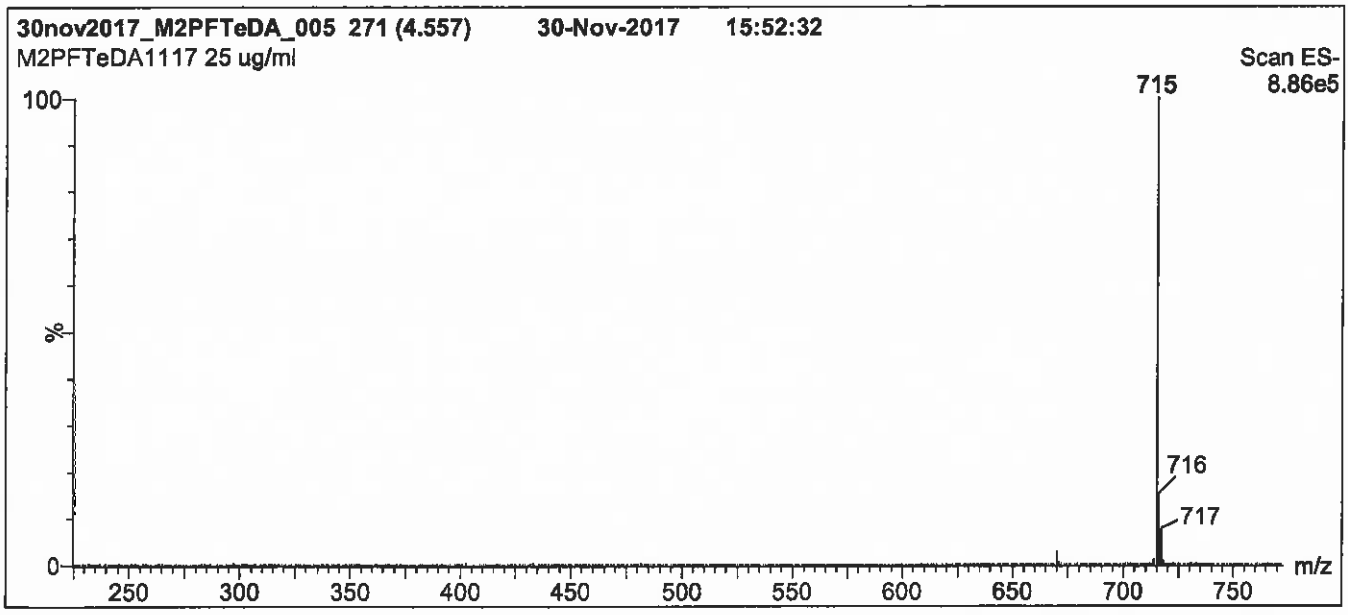
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

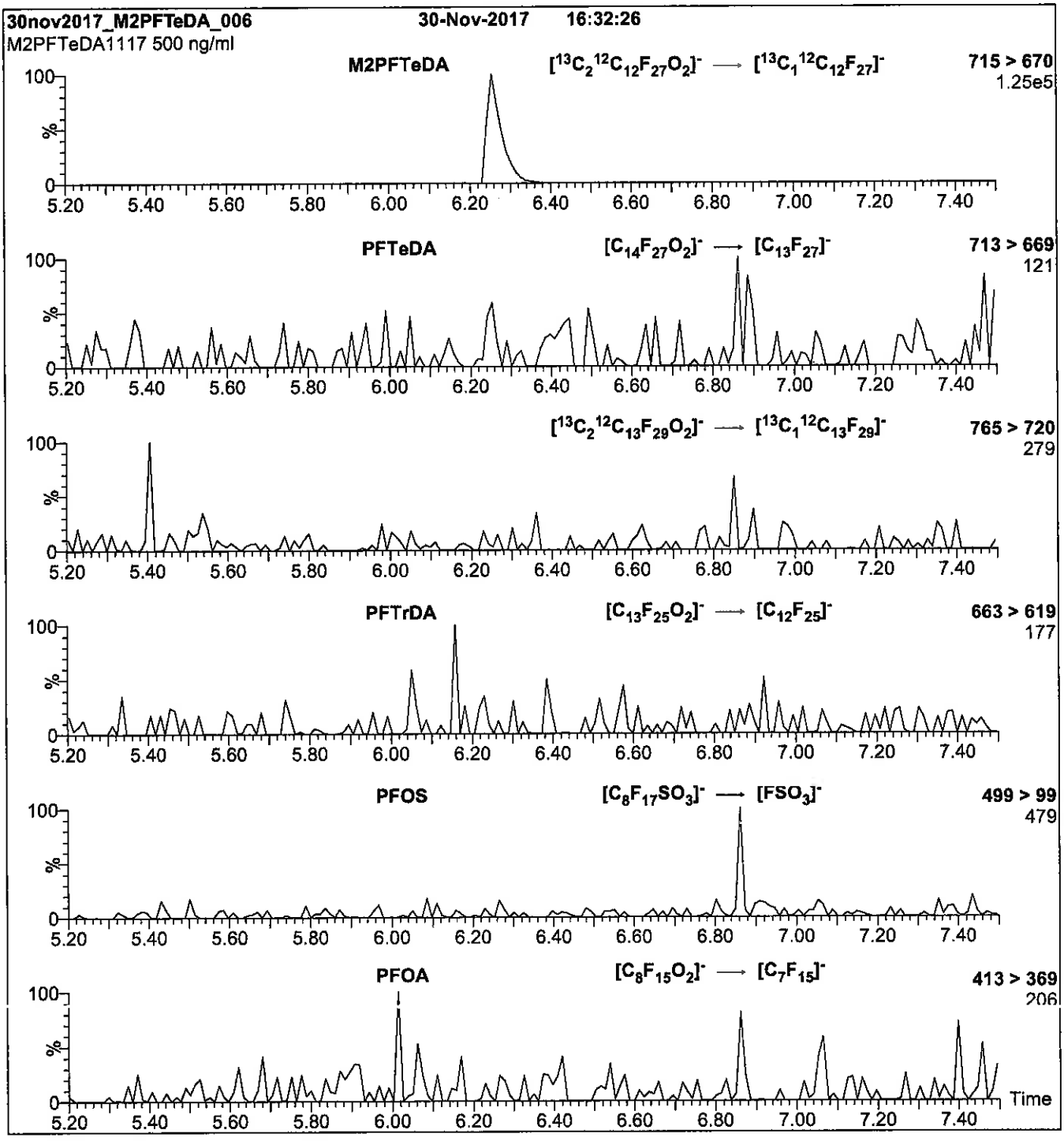
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFTeDA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 14

Reagent

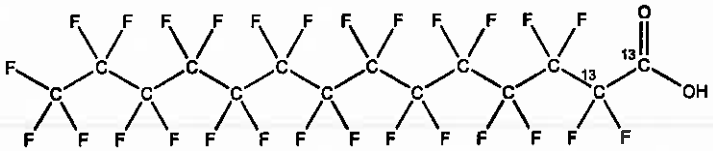
LCM2PFTeDA_00013

D: 1/26/18 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFTeDA	**LOT NUMBER:**	M2PFTeDA1117
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/30/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/30/2022		
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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

- See page 2 for further details.
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Certified By: _____ **Date:** 12/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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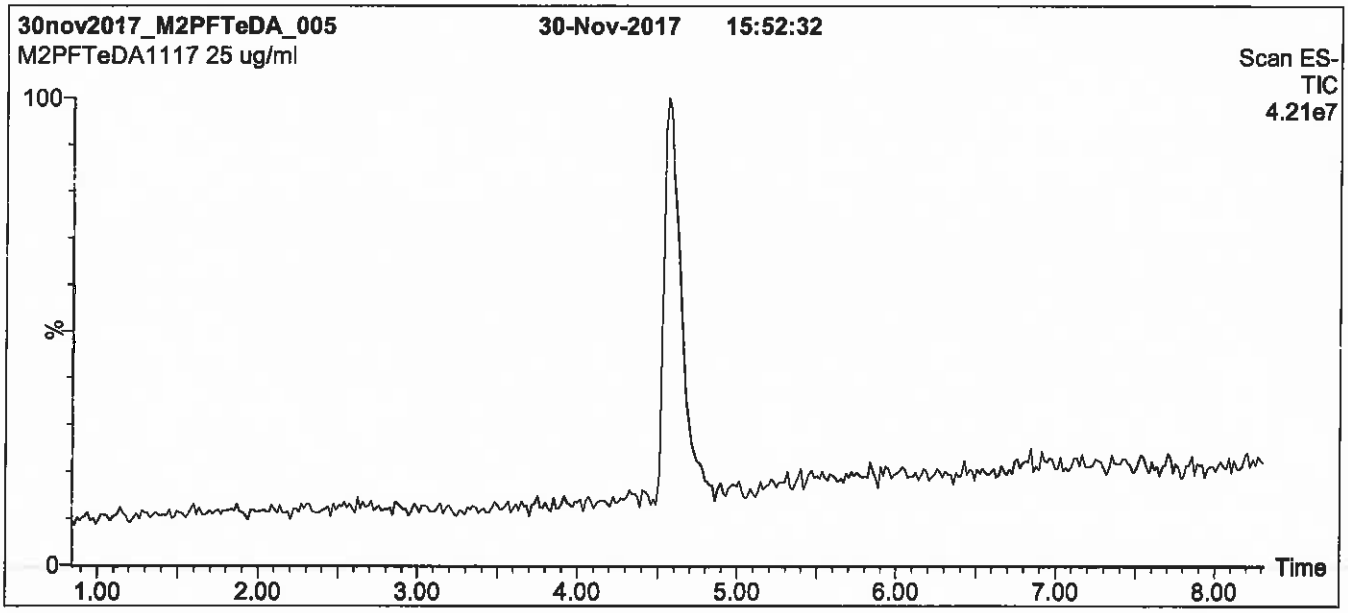

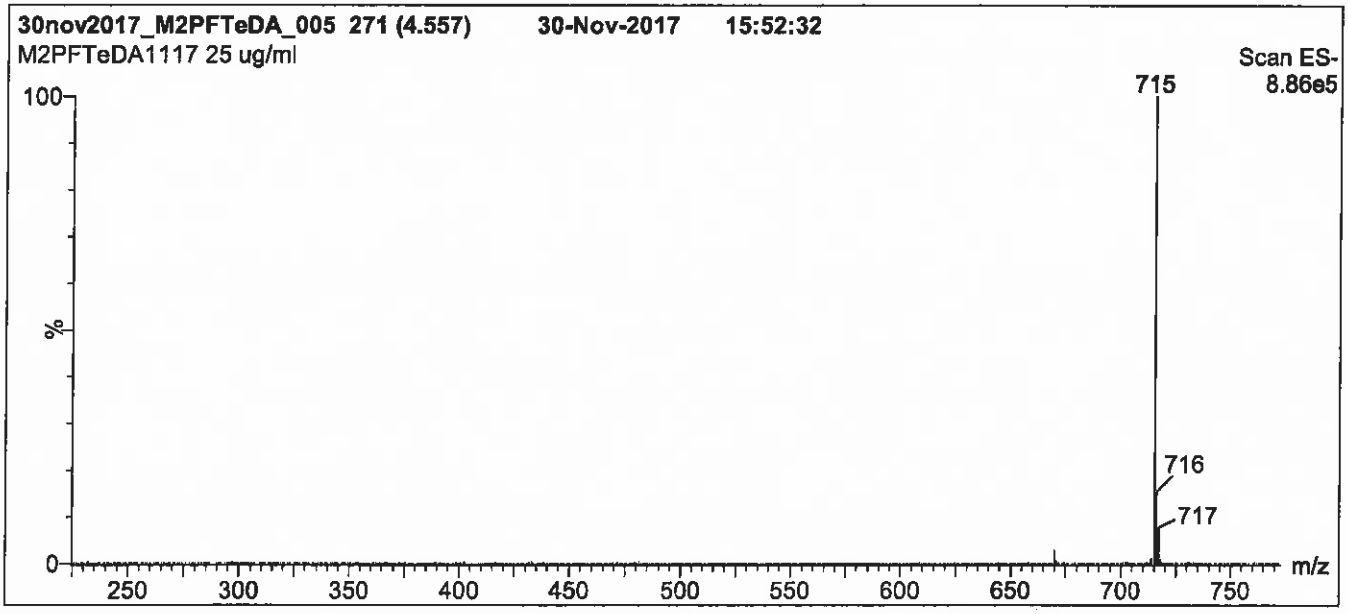

Conditions for Figure 1:

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MS: Micromass Quattro *micro* API MS

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

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

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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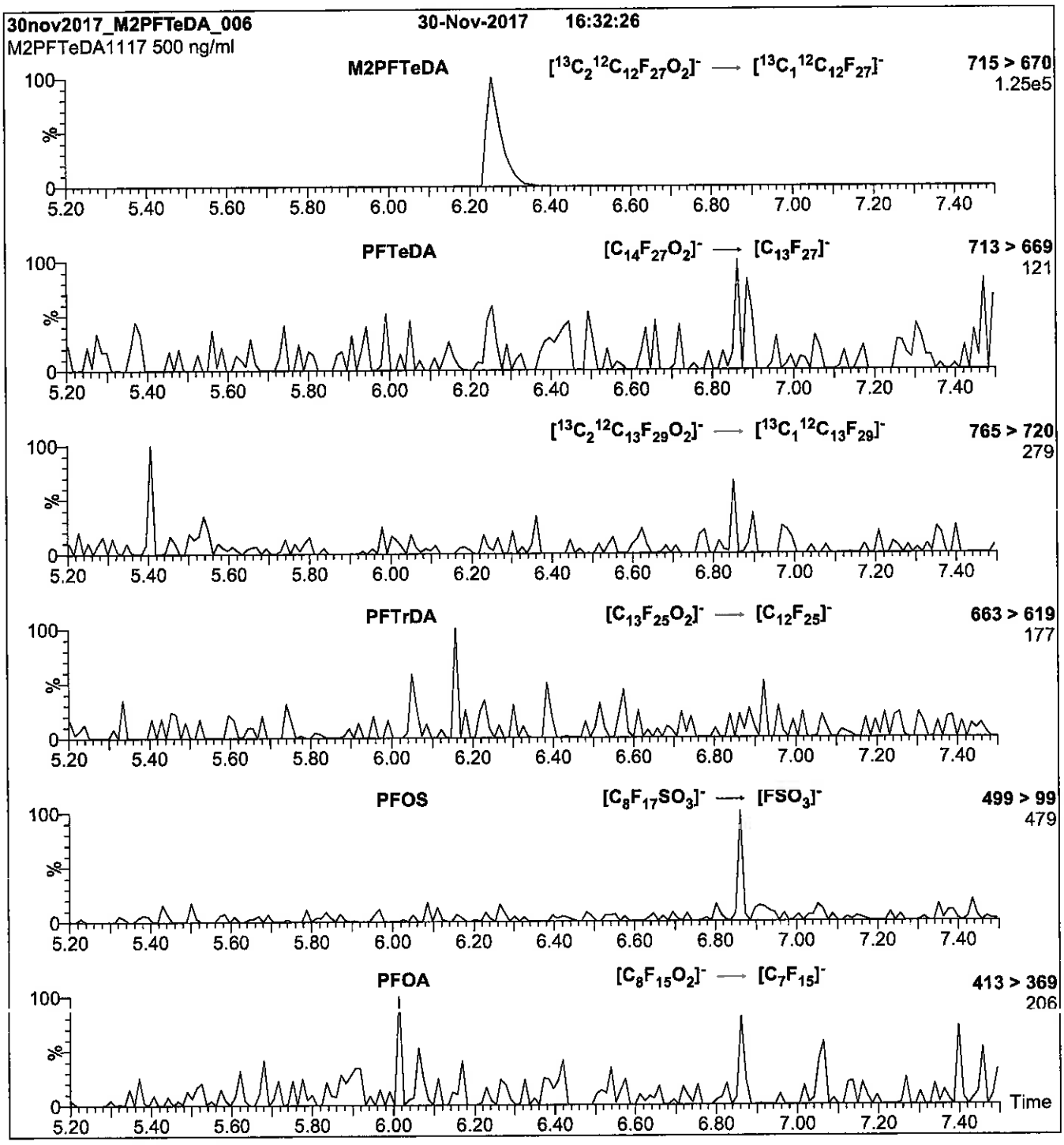
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFTeDA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00012

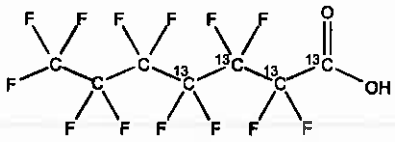
1106316
ID: LCM4PFHPA_00012
Exp: 05/03/22 Prpd: CCL
13C4-Perfluoroheptanoic a

v: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA0517
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_3HF_{13}O_2$	**MOLECULAR WEIGHT:**	368.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/03/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/03/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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

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CALA

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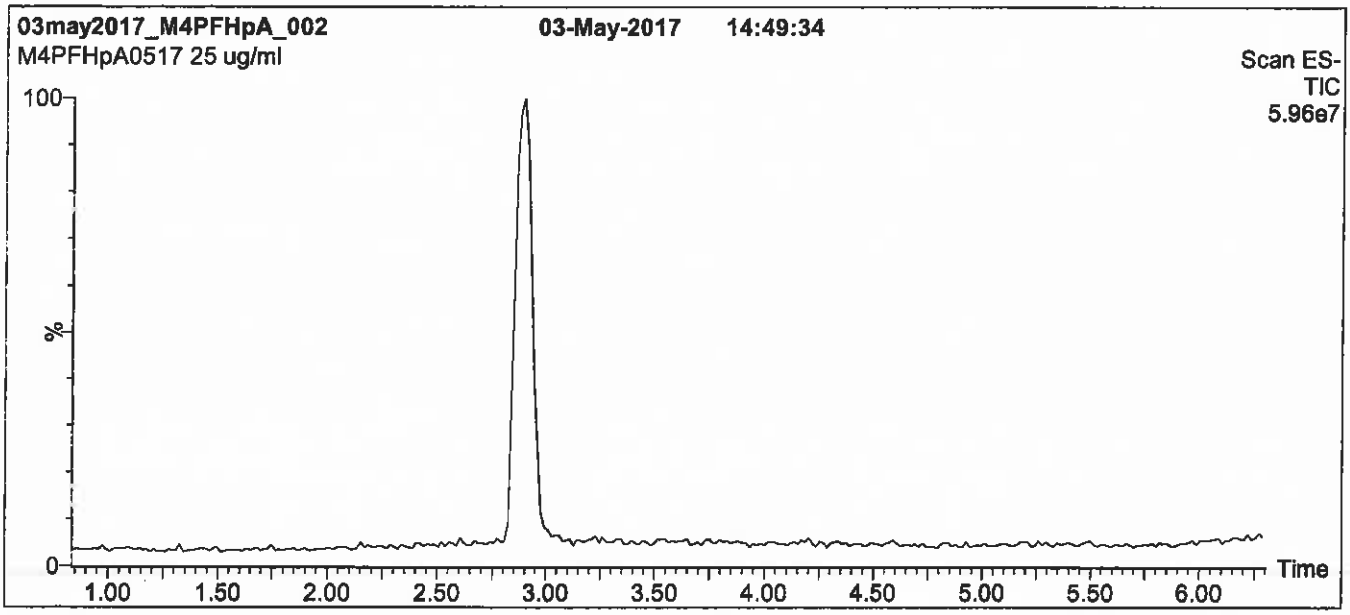
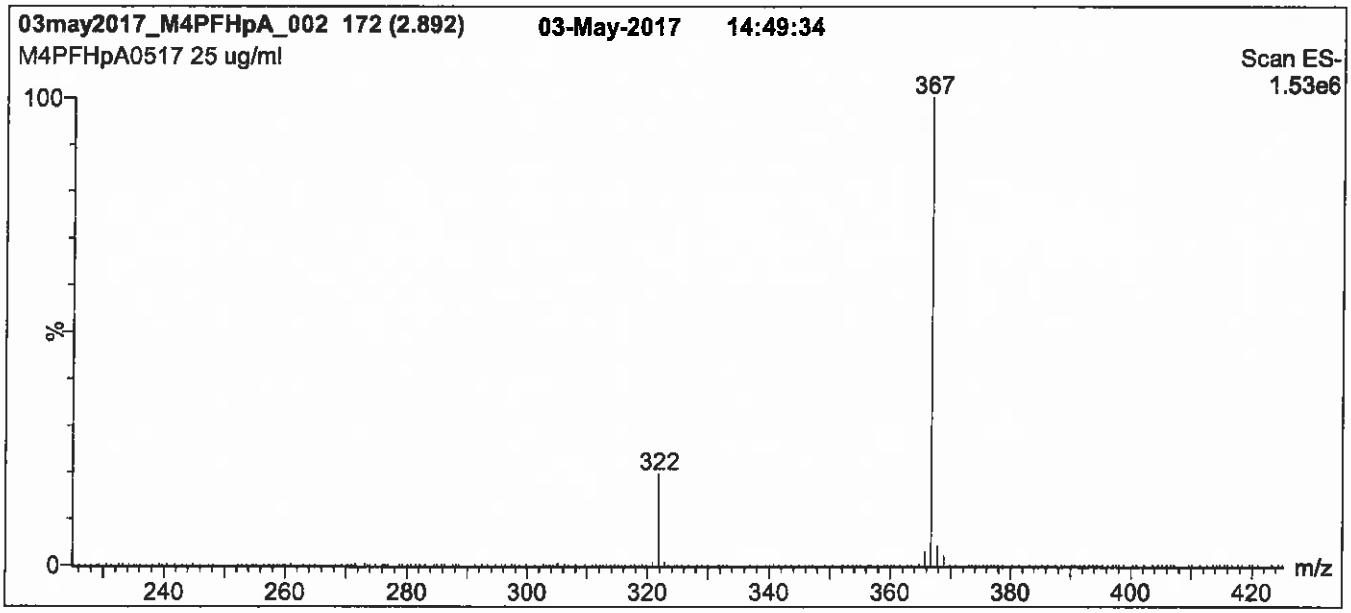
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

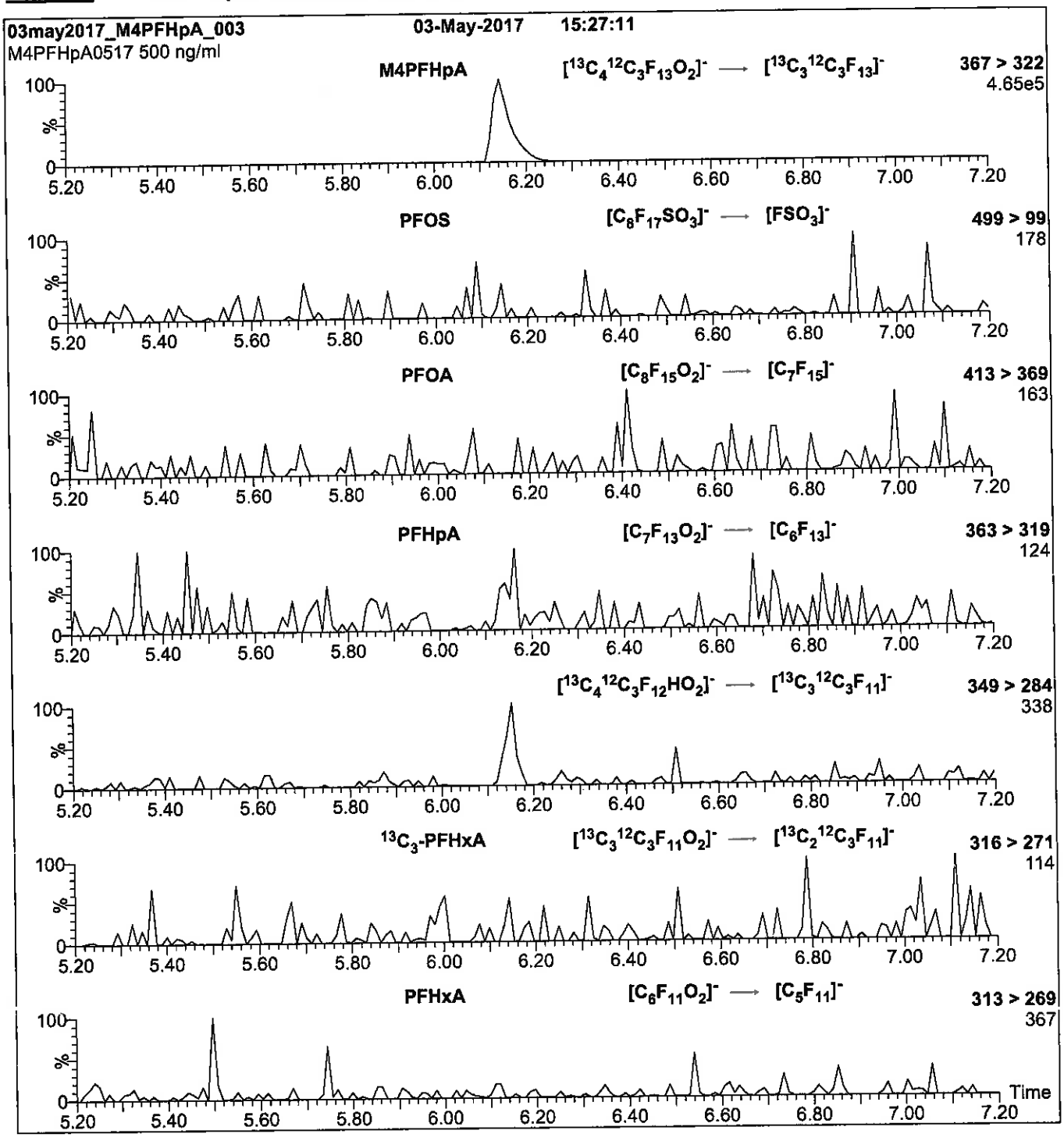
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCM4PFHPA_00013

r: 1/26/18 SKV

WELLINGTON LABORATORIES

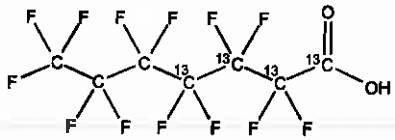
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

LOT NUMBER: M4PFHpA0517

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$
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
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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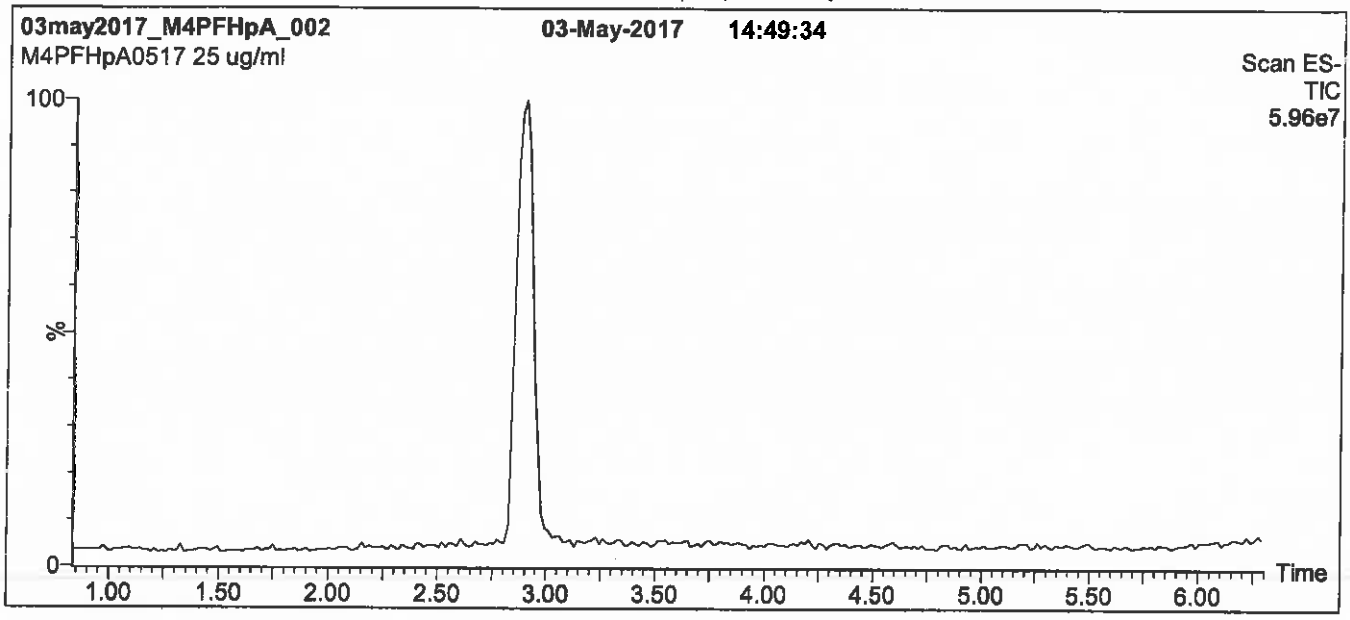
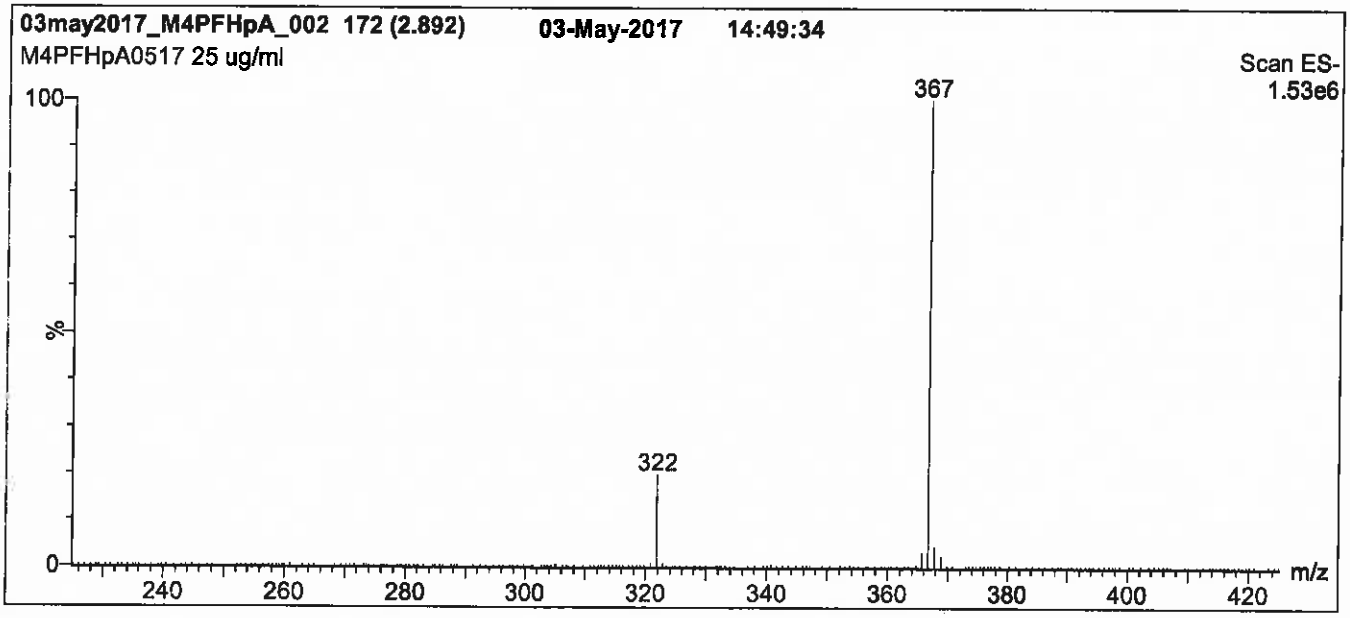
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

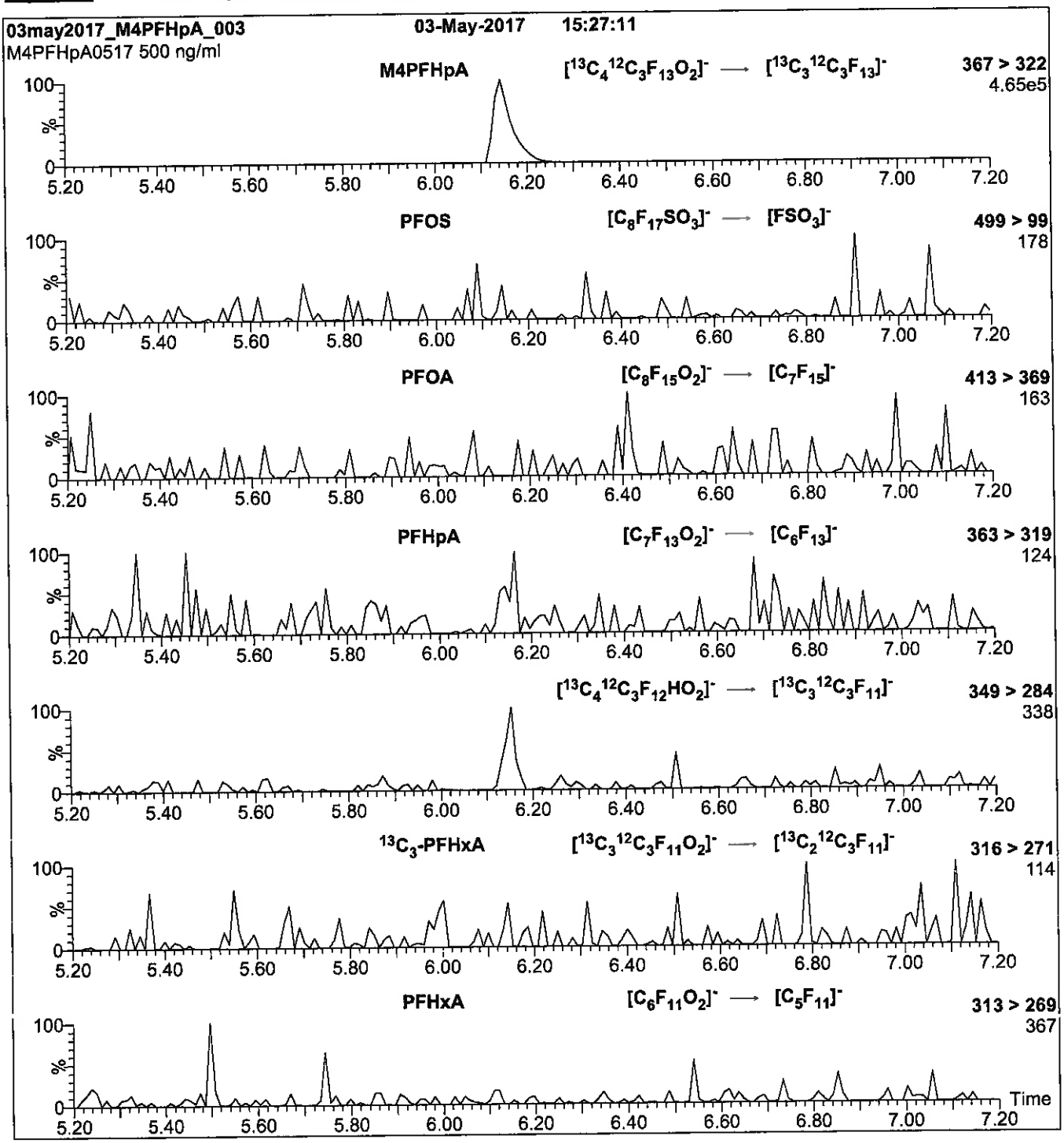
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M4PFHpA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM5PFPEA_00013

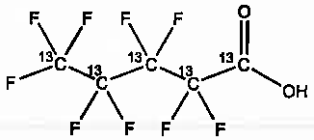
1106313
ID: LCM5PFPEA_00013
Exp: 07/20/22 Rpd: CCL
13C5-Perfluoropentanoic a

r: 12/4/17 ccc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0717
COMPOUND:	Perfluoro-n-[$^{13}C_5$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5HF_8O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	07/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/20/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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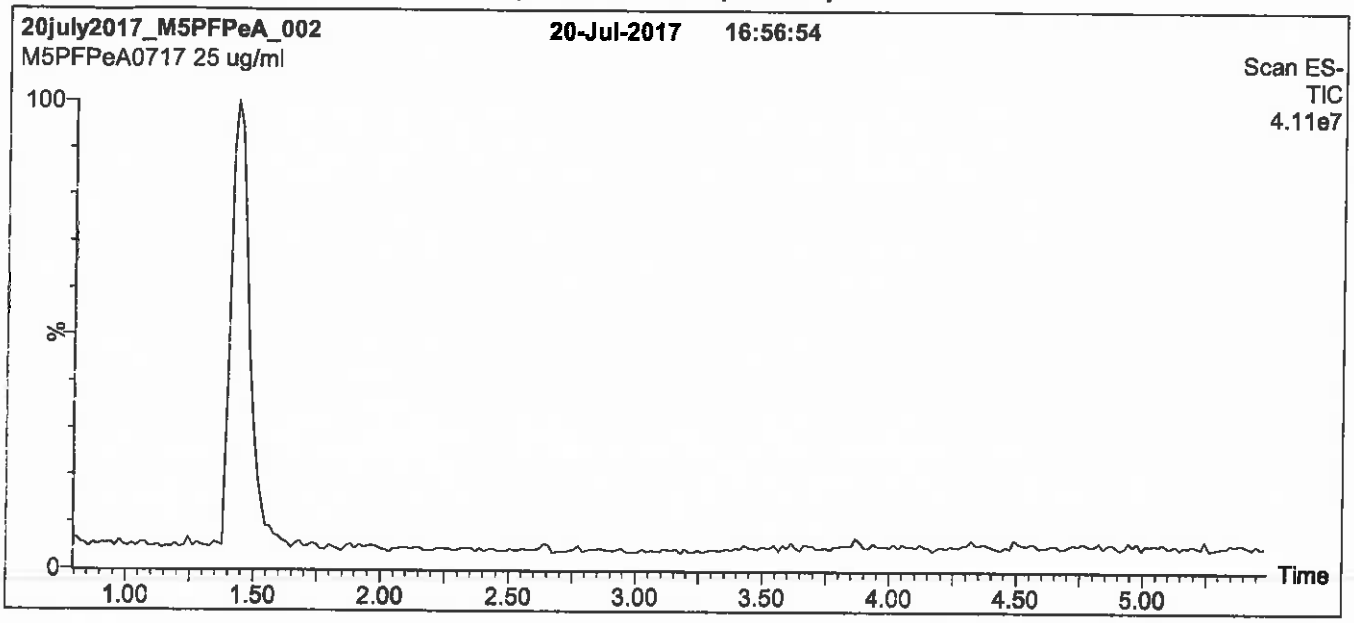
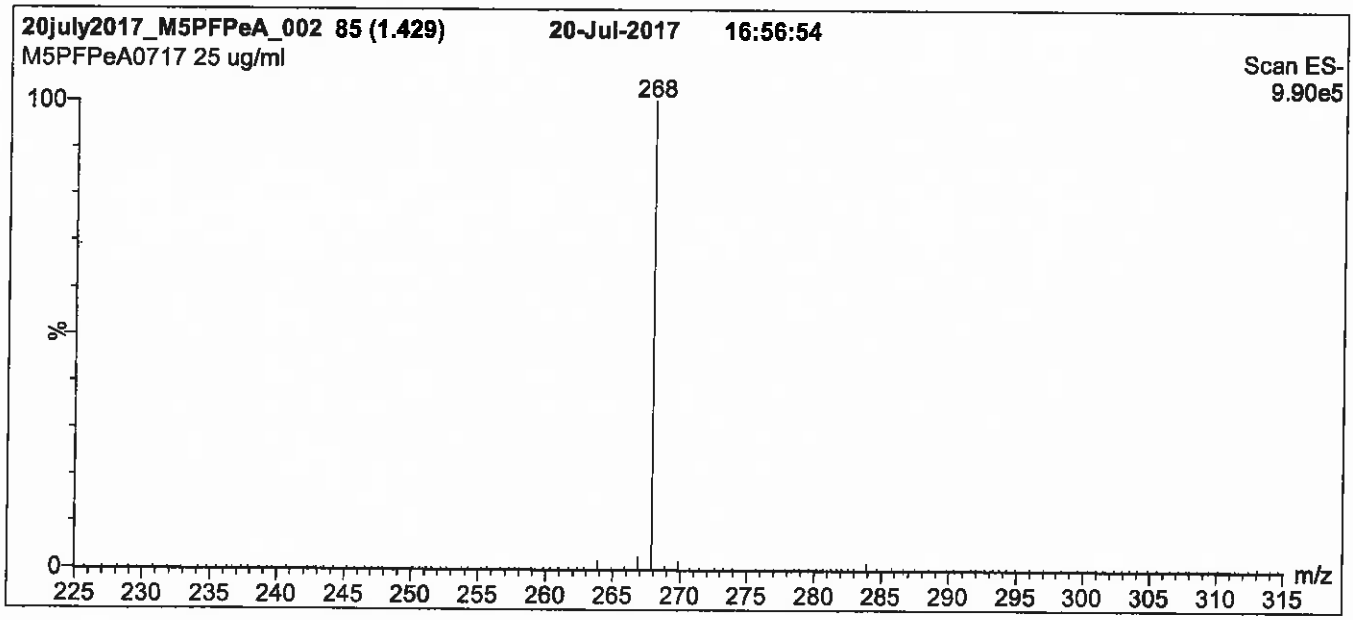
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

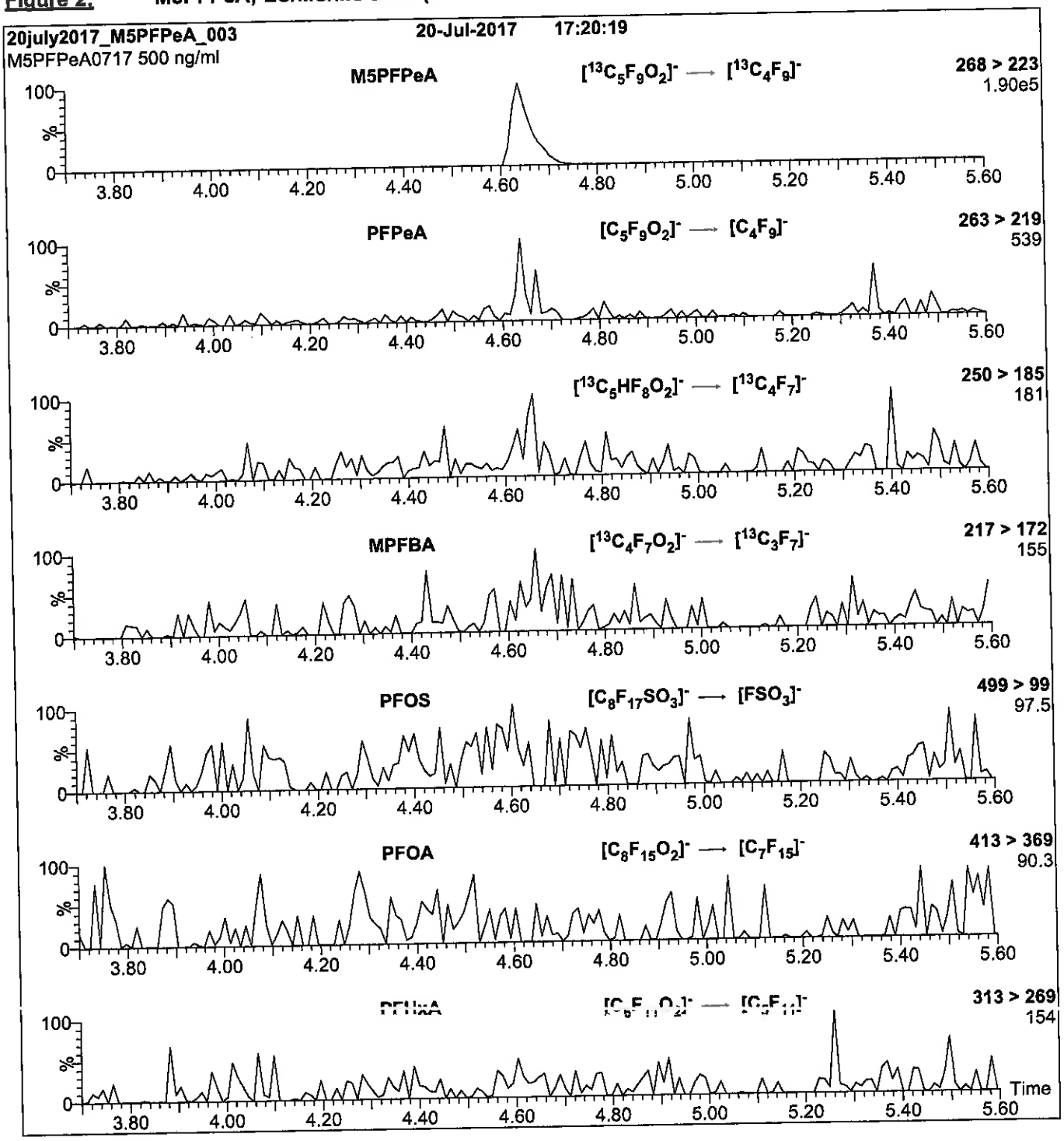
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M5PFPeA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

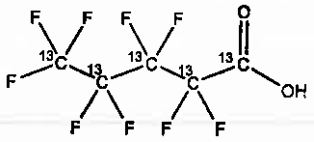
LCM5PFPEA_00014

n: 1/26/18 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0717
COMPOUND:	Perfluoro-n-[$^{13}C_5$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	07/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/20/2022		
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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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CALA

ANAB ACCREDITED

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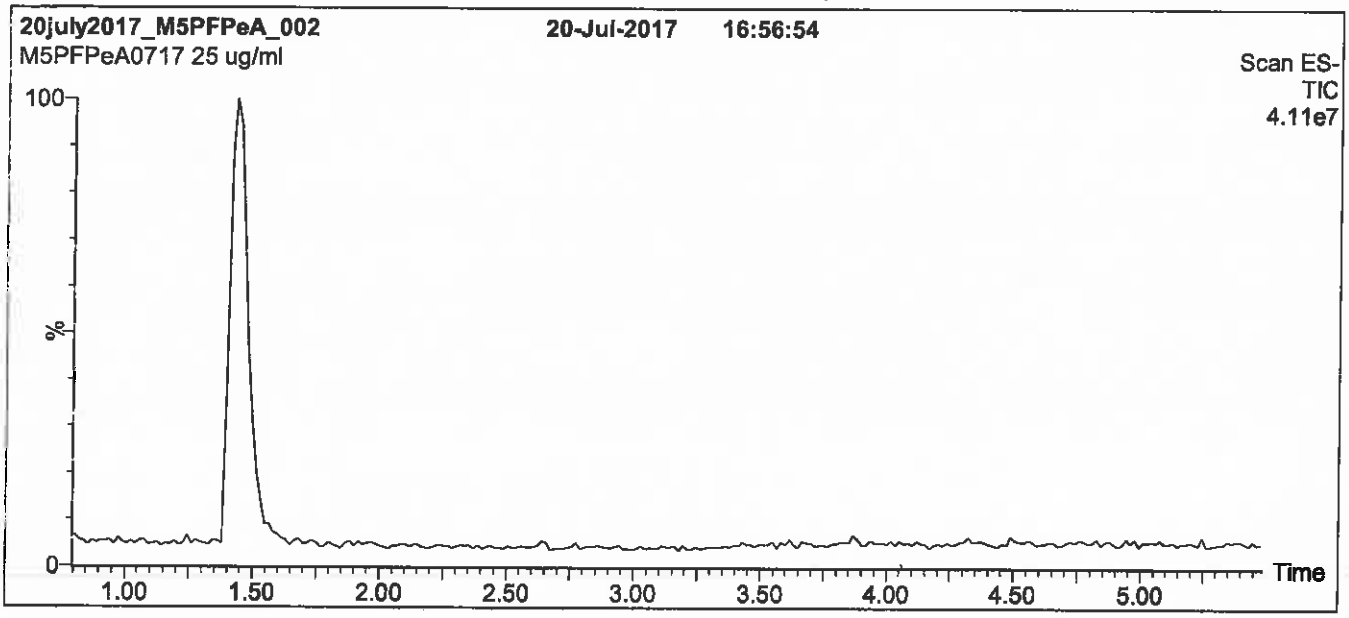

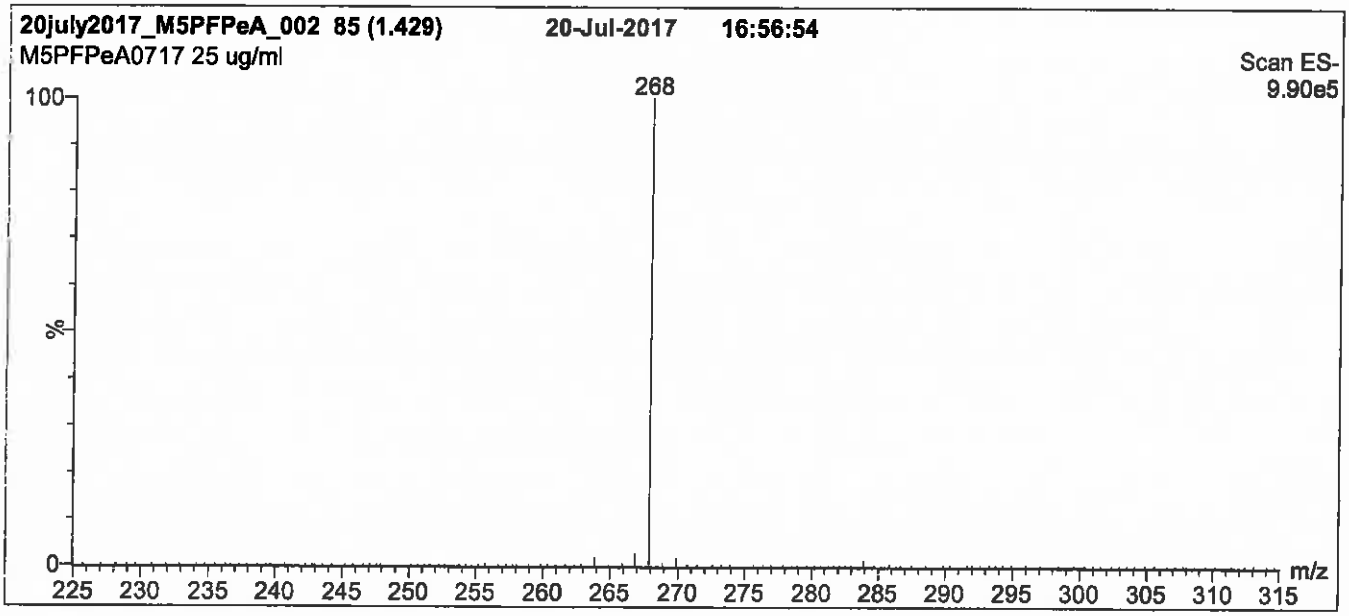

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MS: Micromass Quattro *micro* API MS

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Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
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Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
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Flow: 300 µl/min

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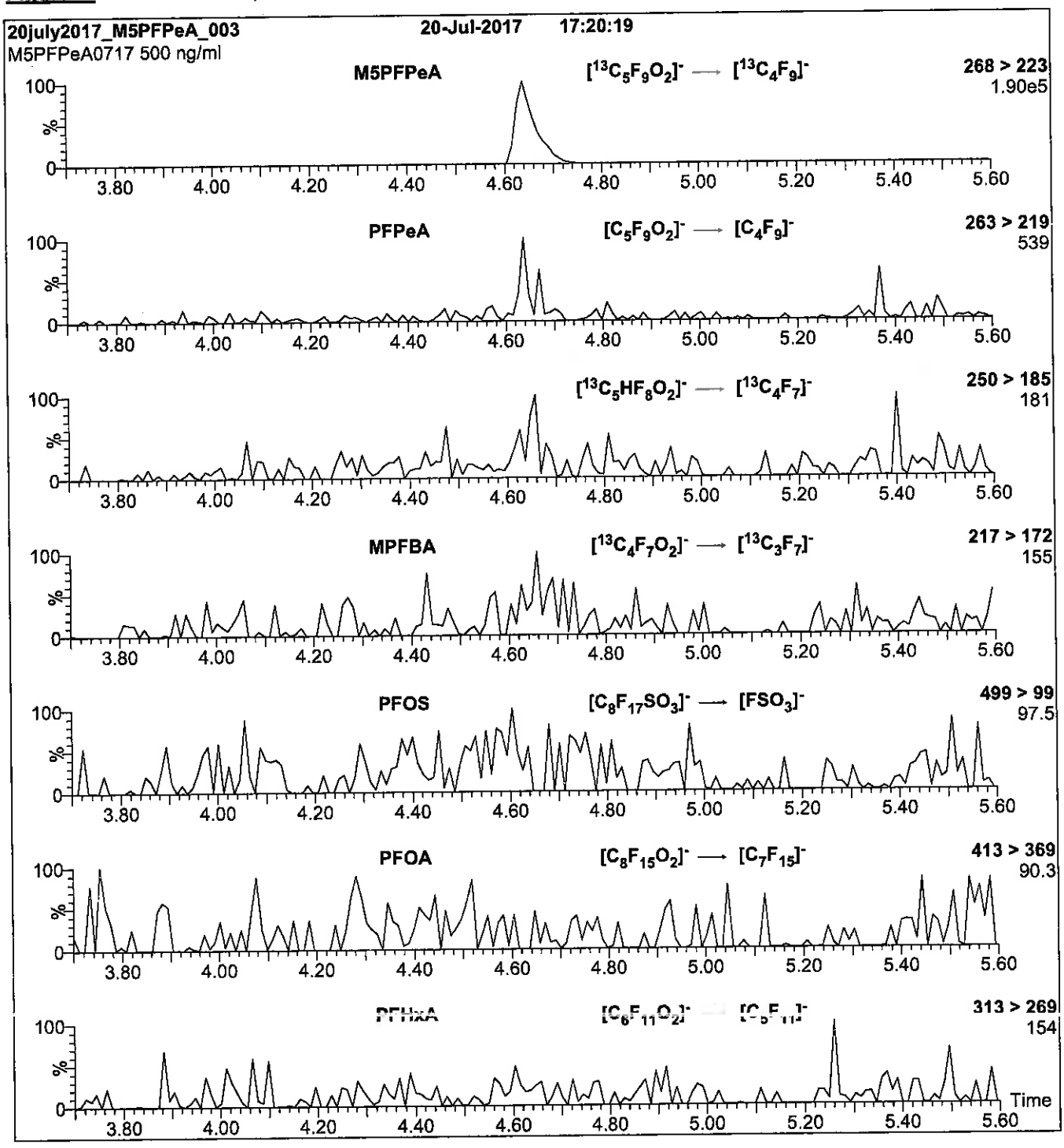
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M5PFPeA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

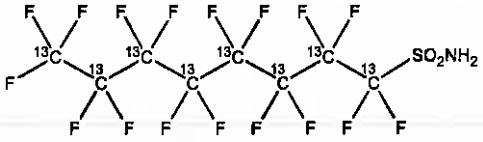
LCM8FOSA_00016

r: 12/4/17
CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA1017I
COMPOUND:	Perfluoro-1-[$^{13}C_8$]octanesulfonamide		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	10/11/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.01% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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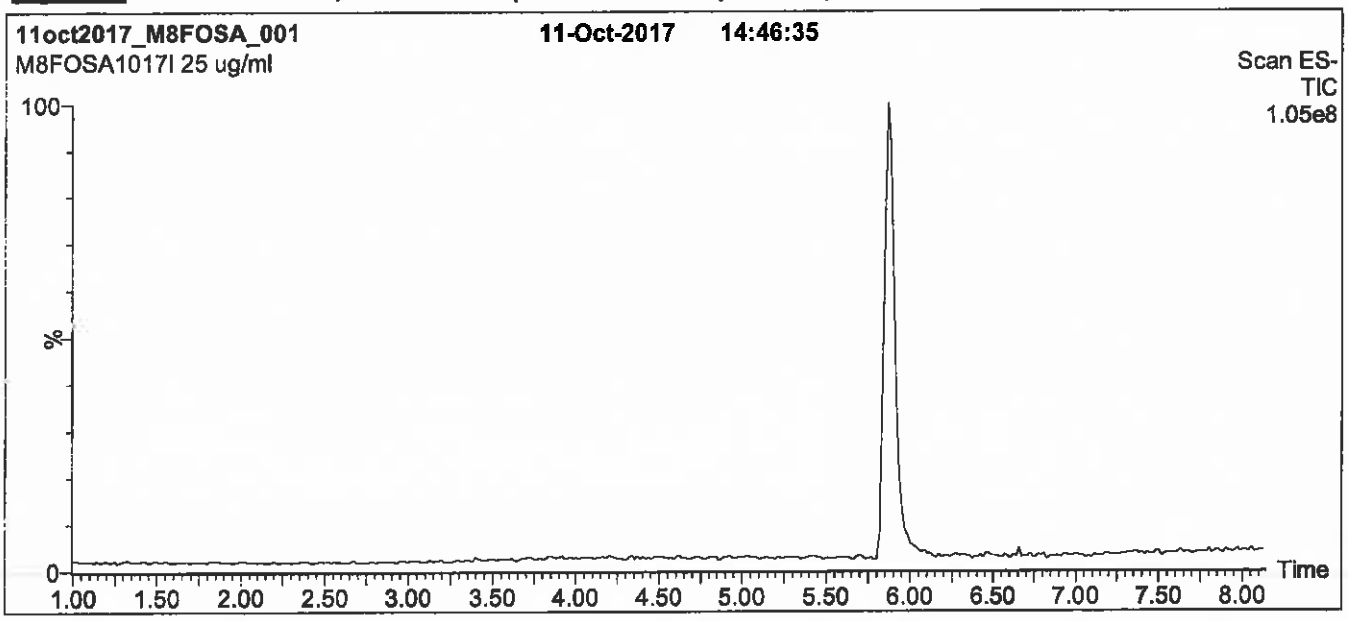
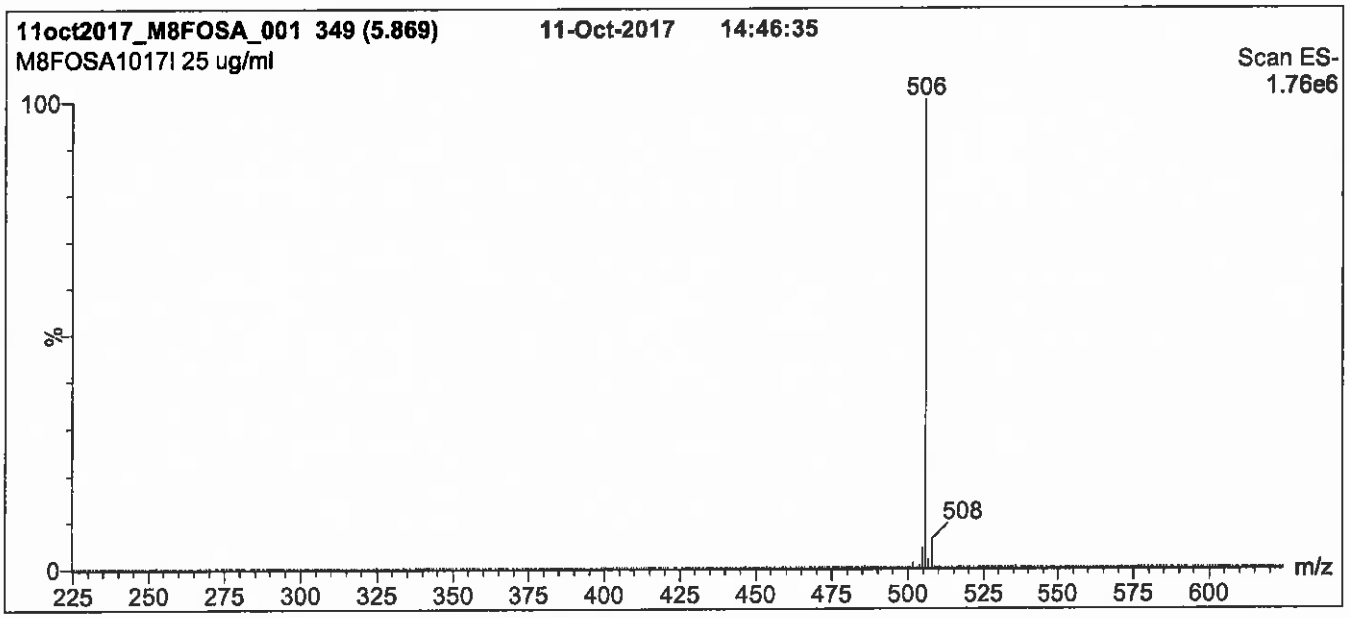
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

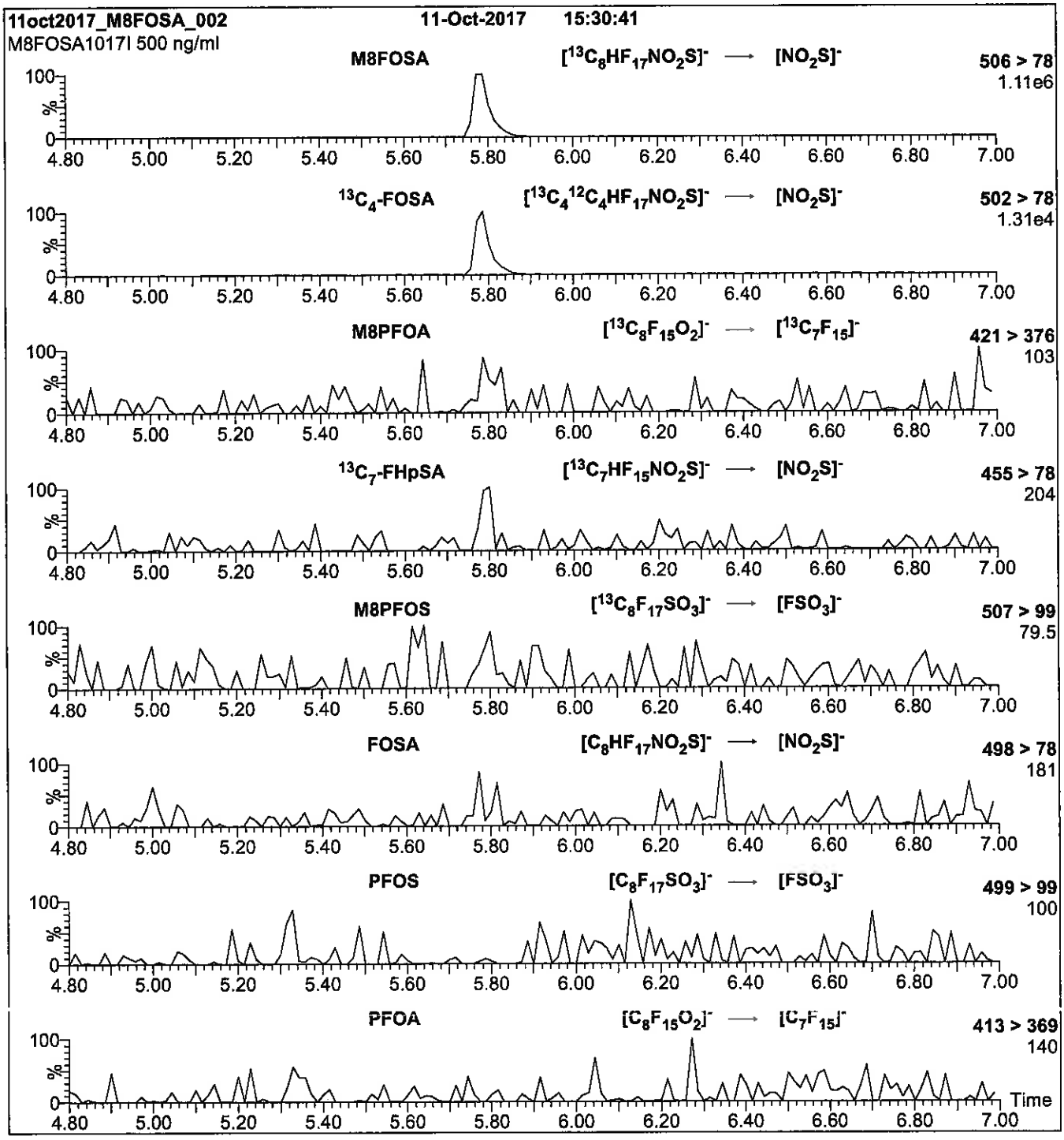
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFBA_00013

r: 12/4/17 ccc

WELLINGTON LABORATORIES

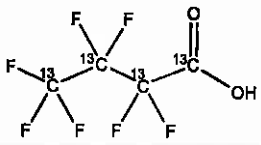
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFBA0417

STRUCTURE:

CAS #: Not available



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

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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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SYNTHESIS / CHARACTERIZATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

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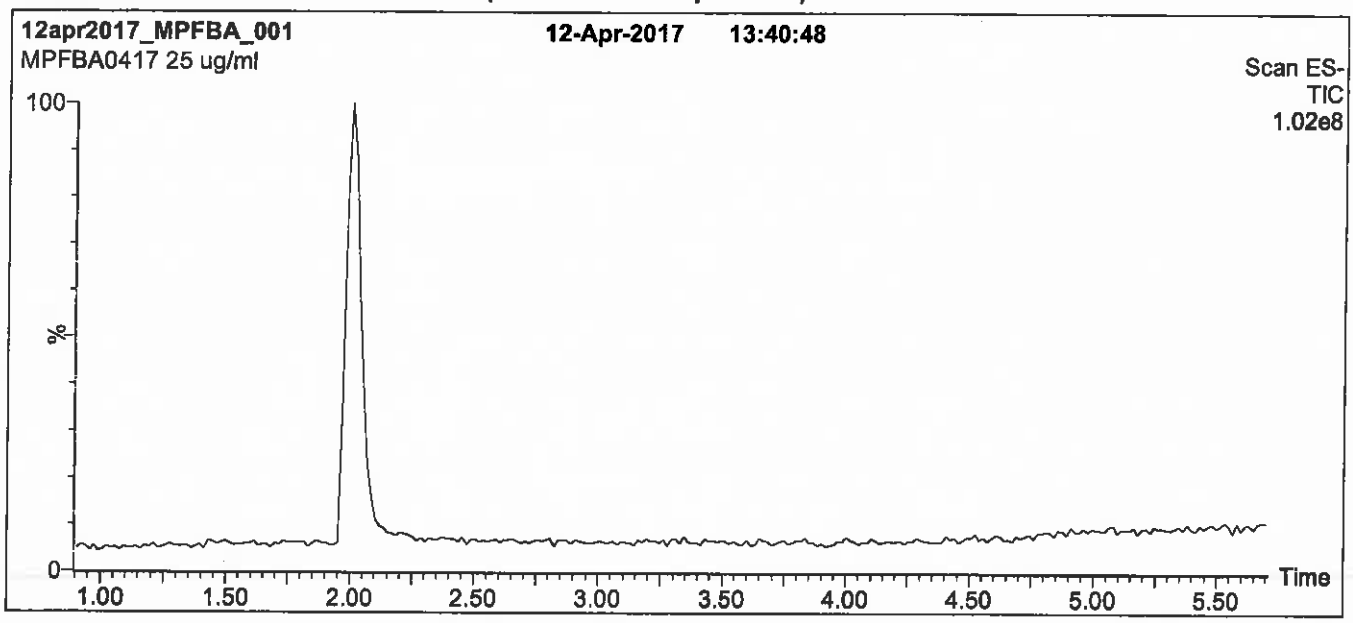
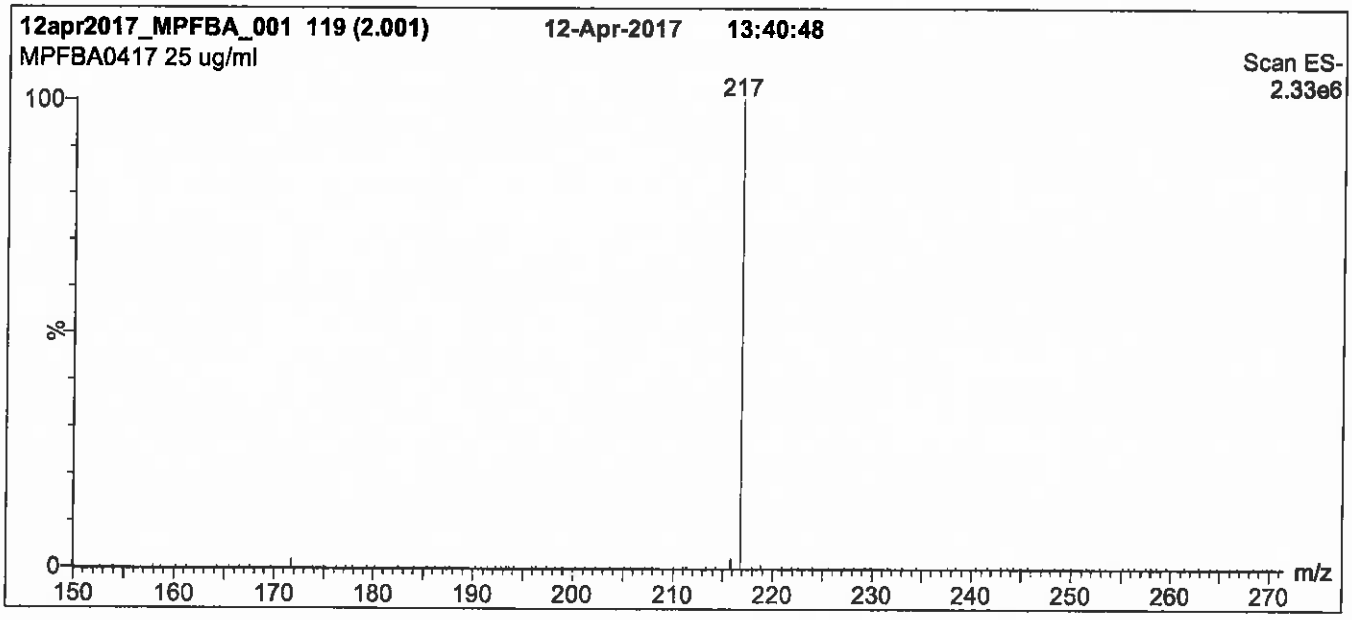
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

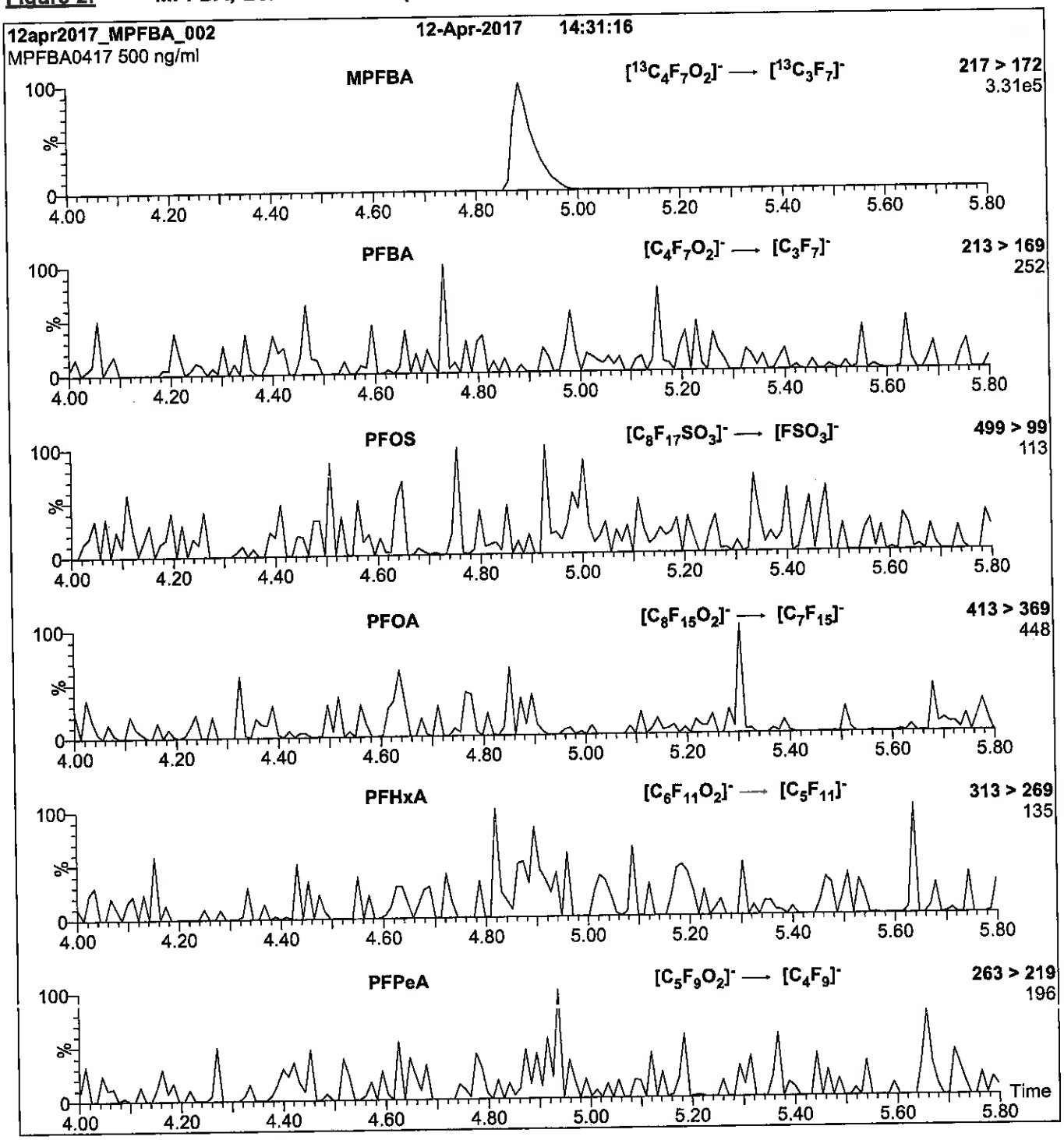
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFBA_00014

R: 1/24/18 SRJ

WELLINGTON LABORATORIES

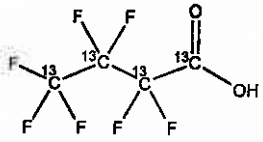
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFBA0417

STRUCTURE:

CAS #: Not available



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

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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED

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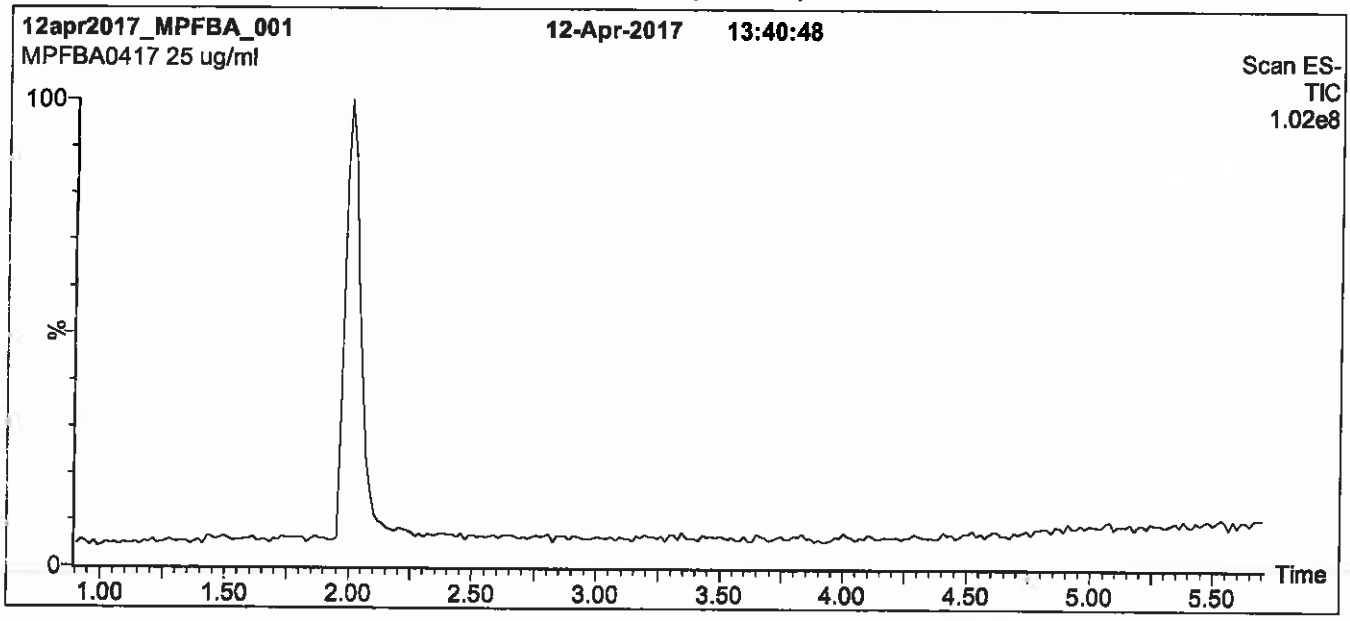
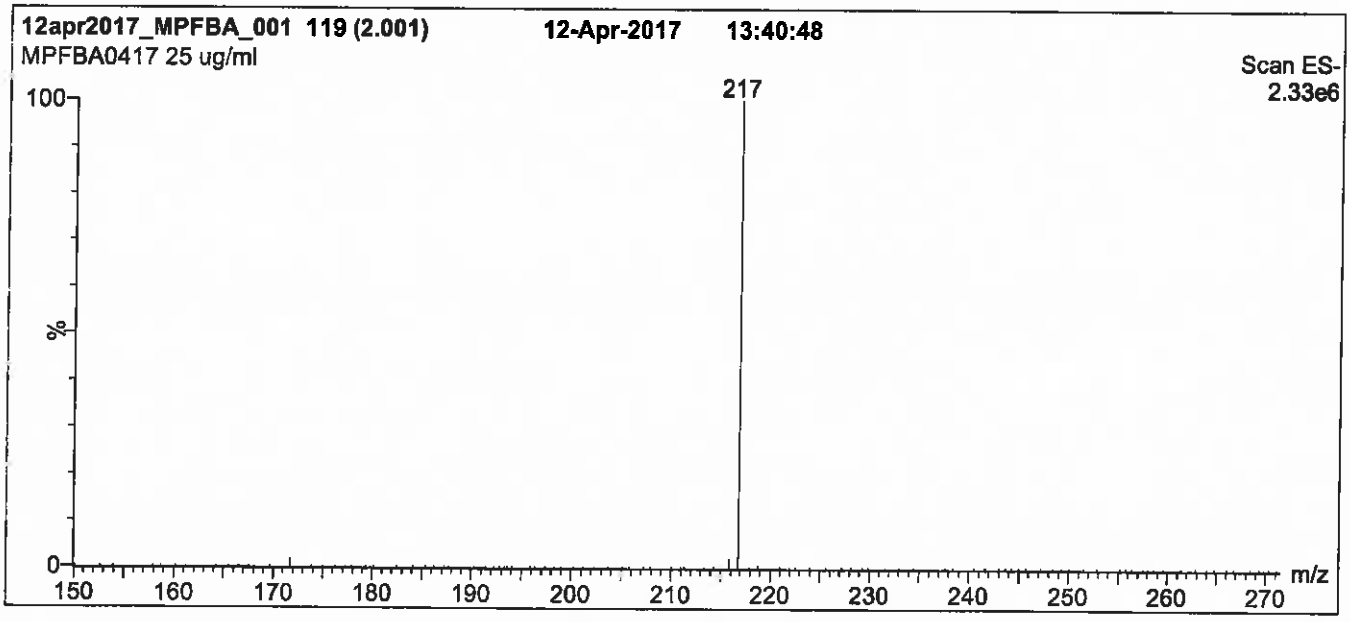




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

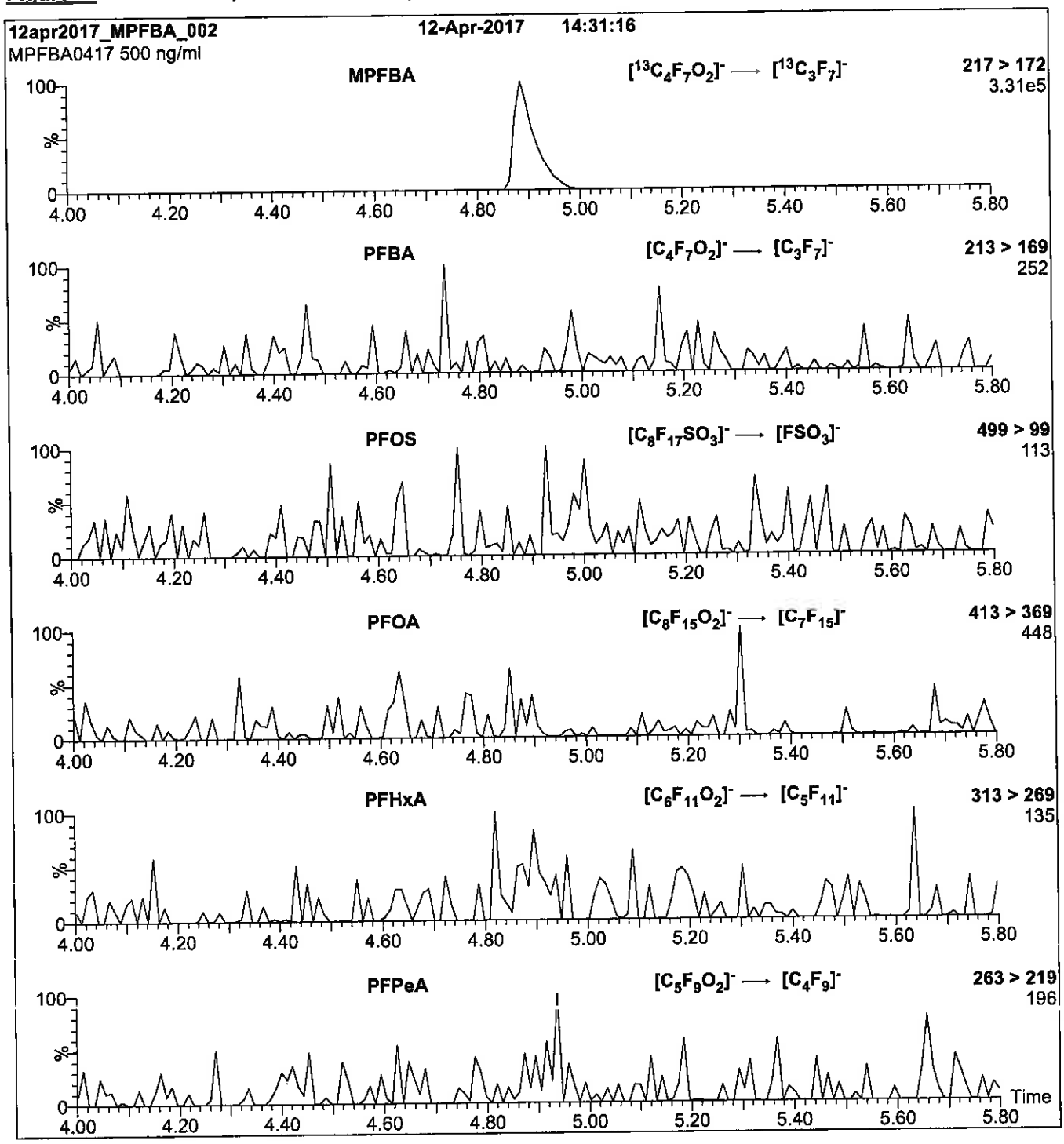
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFBS_00006

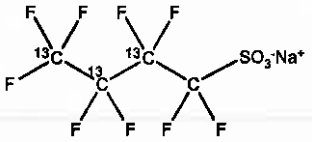
1106130
ID: LCMPFBS_00006
Exp: 05/24/22 Prpd: CCL
13C3-Perfluorobutanesulfo

r: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFBS	**LOT NUMBER:**	M3PFBS0815
COMPOUND:	Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_8SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.5 ± 2.3 µg/ml (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	05/24/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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HAZARDS:

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

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

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

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CALA

ANAB ACCREDITED

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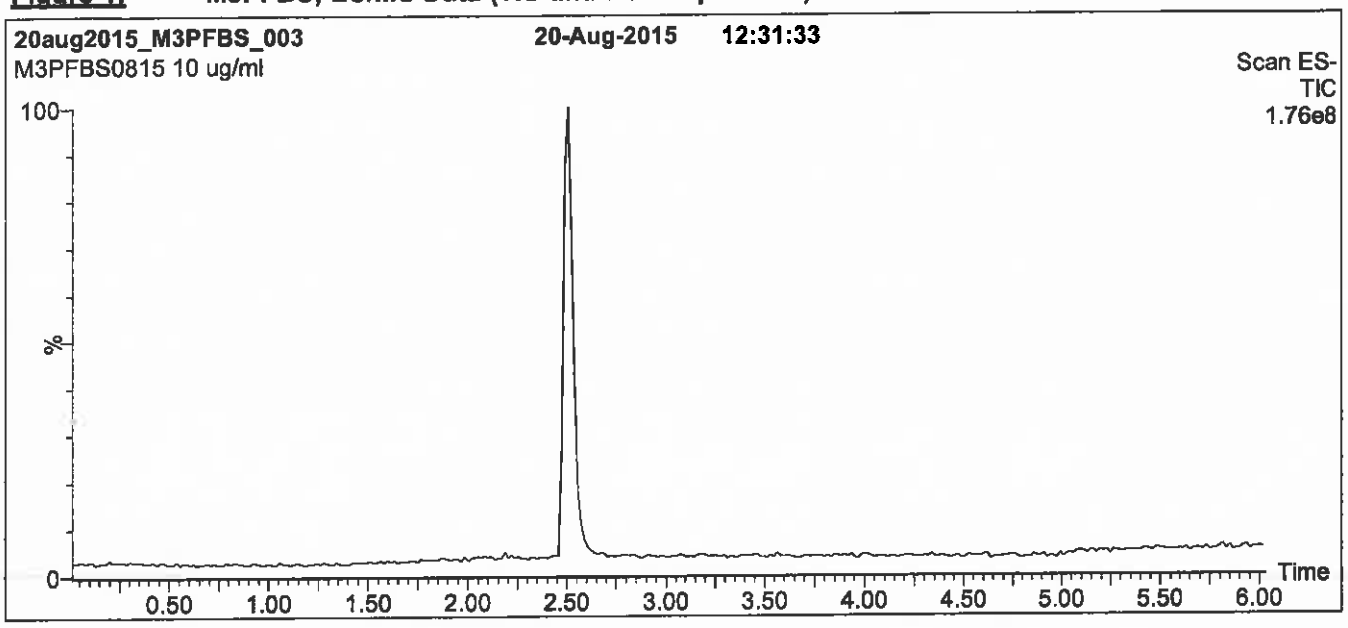
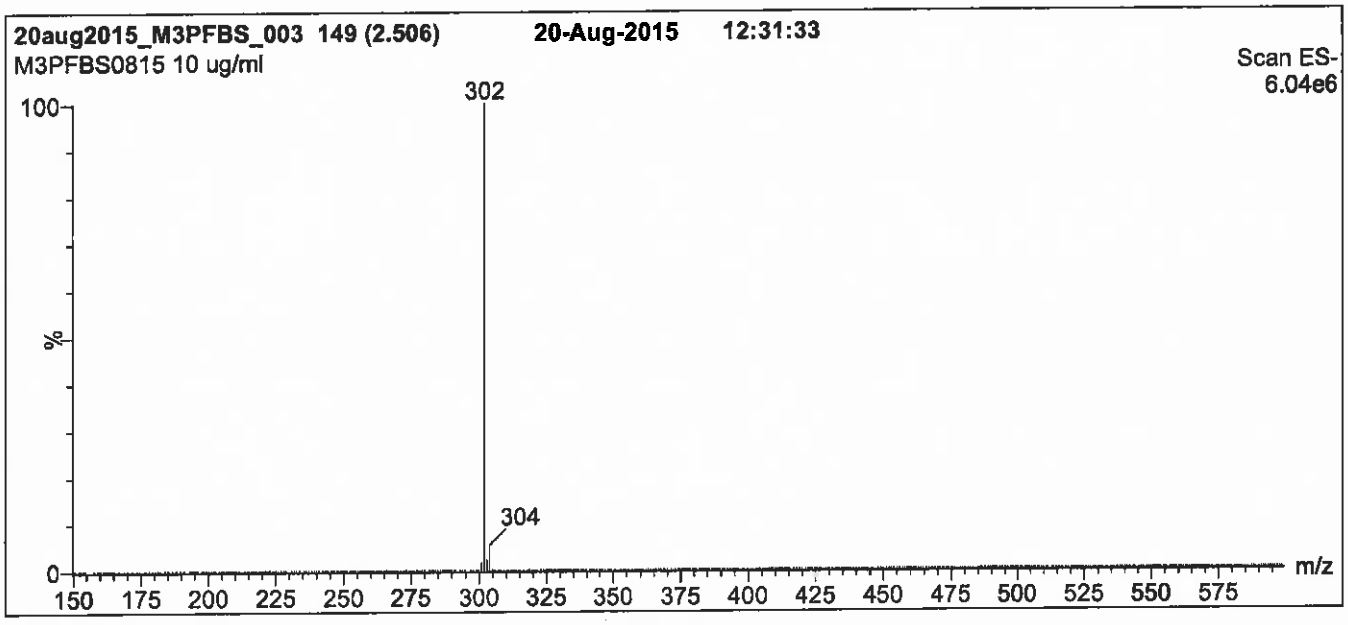
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

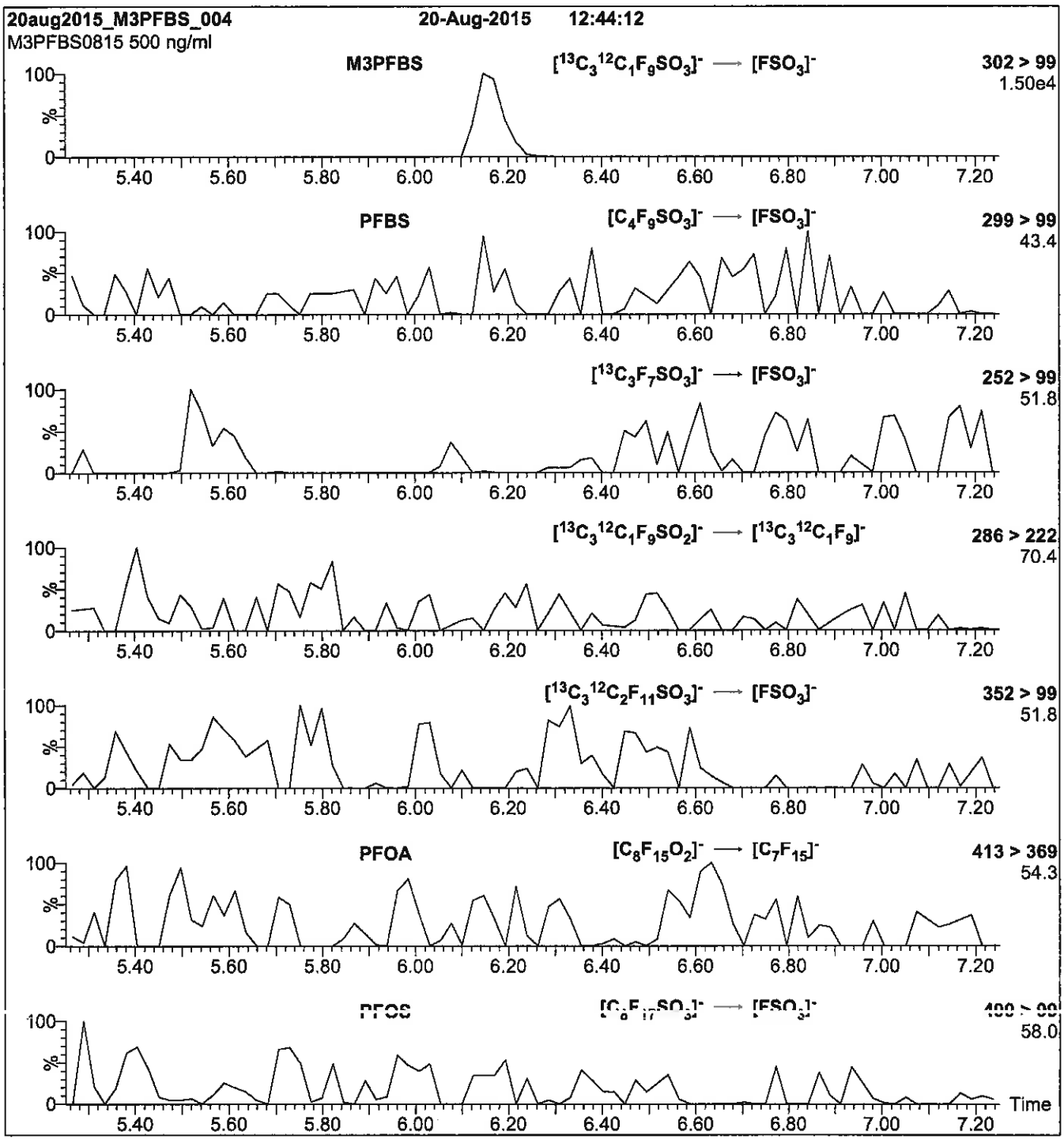
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

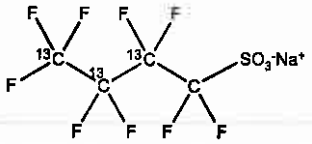
LCMPFBS_00007

r: 12/18 stv

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFBS	**LOT NUMBER:**	M3PFBS0815
COMPOUND:	Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_8SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.5 ± 2.3 µg/ml (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	05/24/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 05/25/2017 (mm/dd/yyyy)
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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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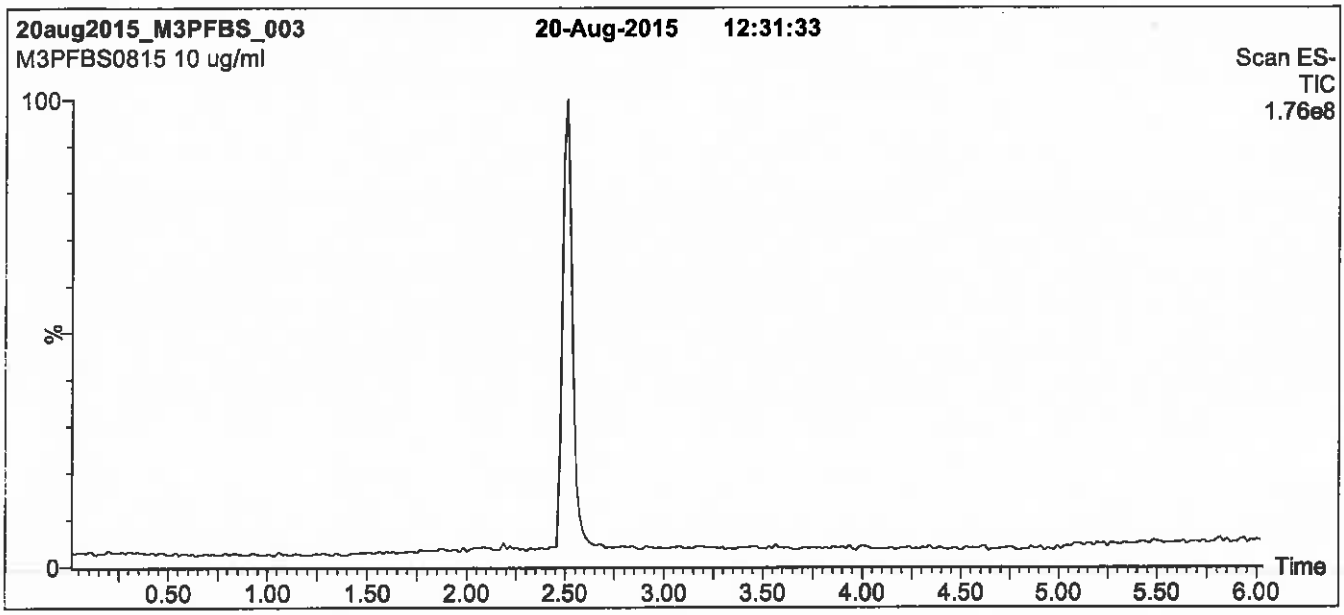
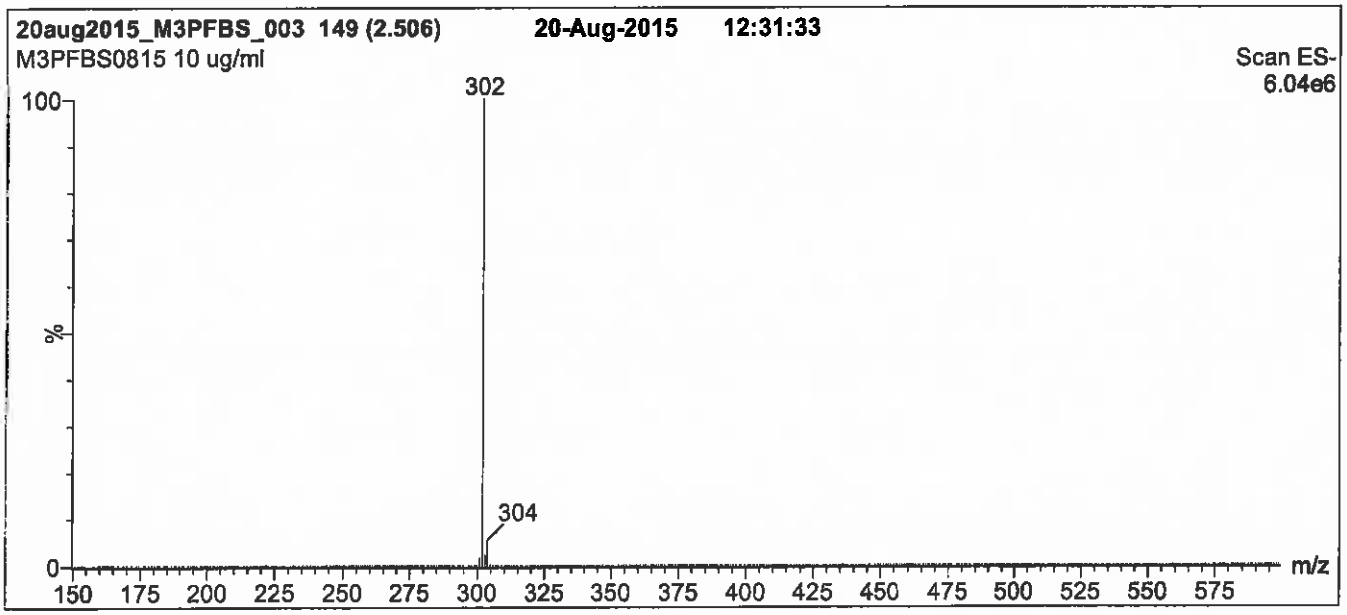




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

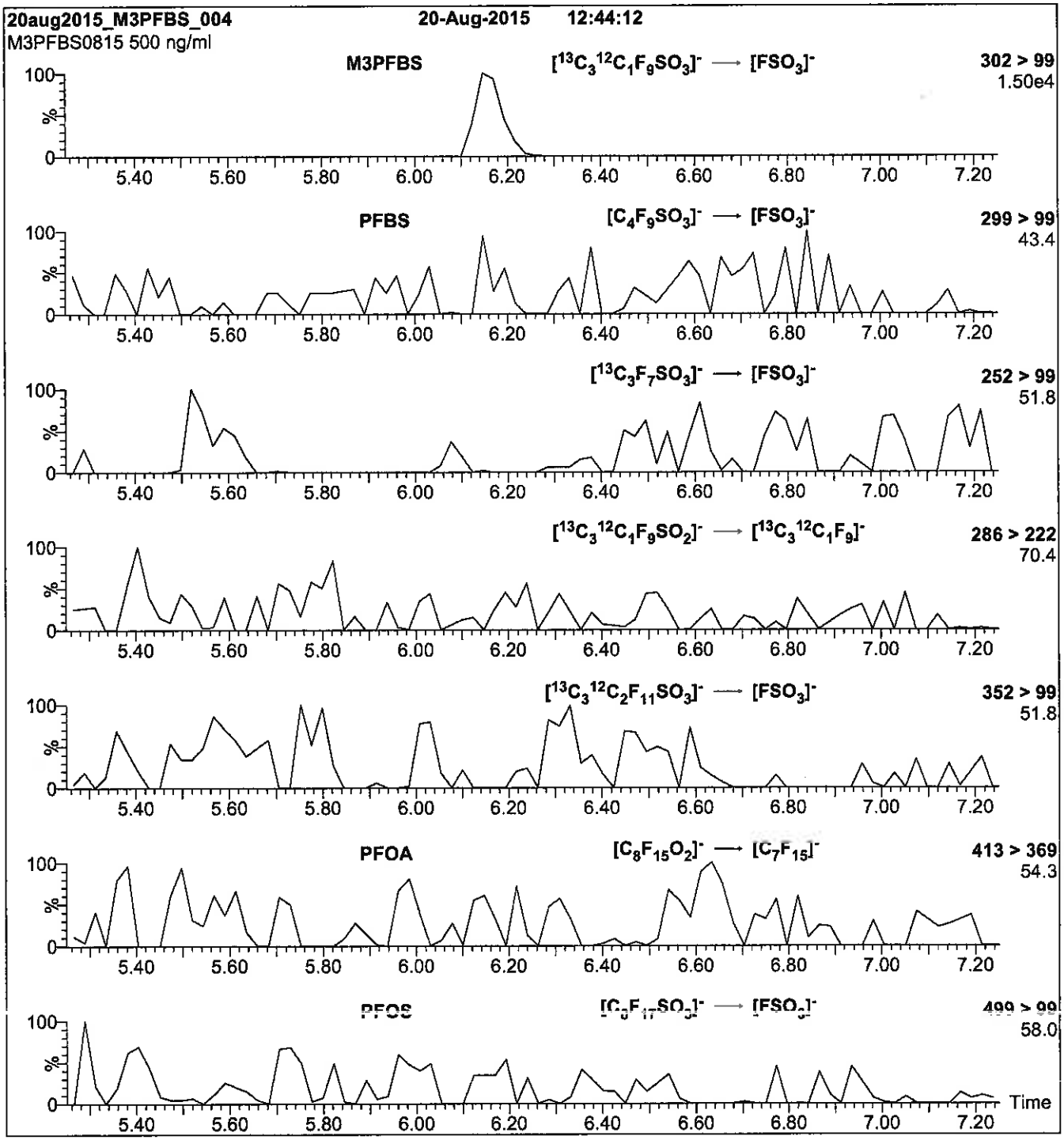
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFDA_00018

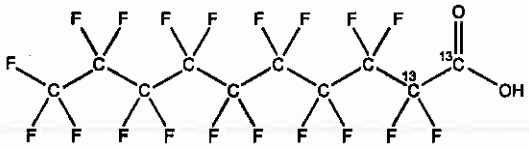
1106159
ID: LCMPFDA_00018
Exp: 07/13/22 Prpd: CCL
13C2-Perfluorodecanoic a

r: 12/4/17 cc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_4$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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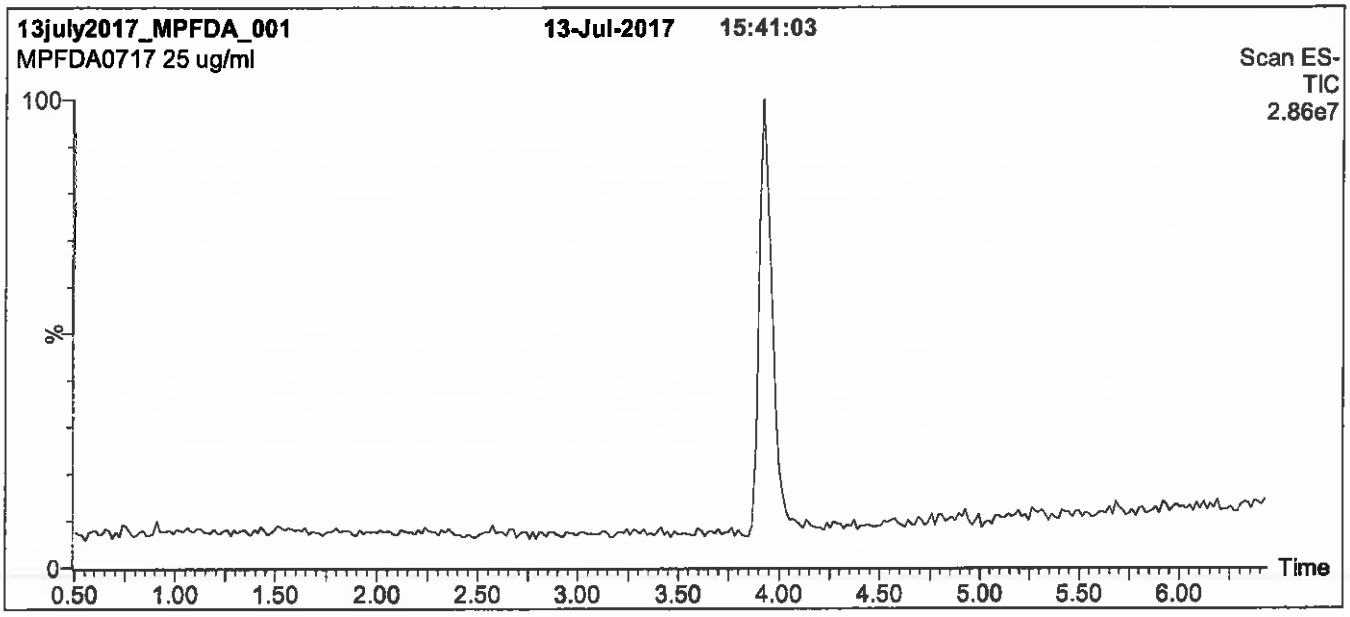

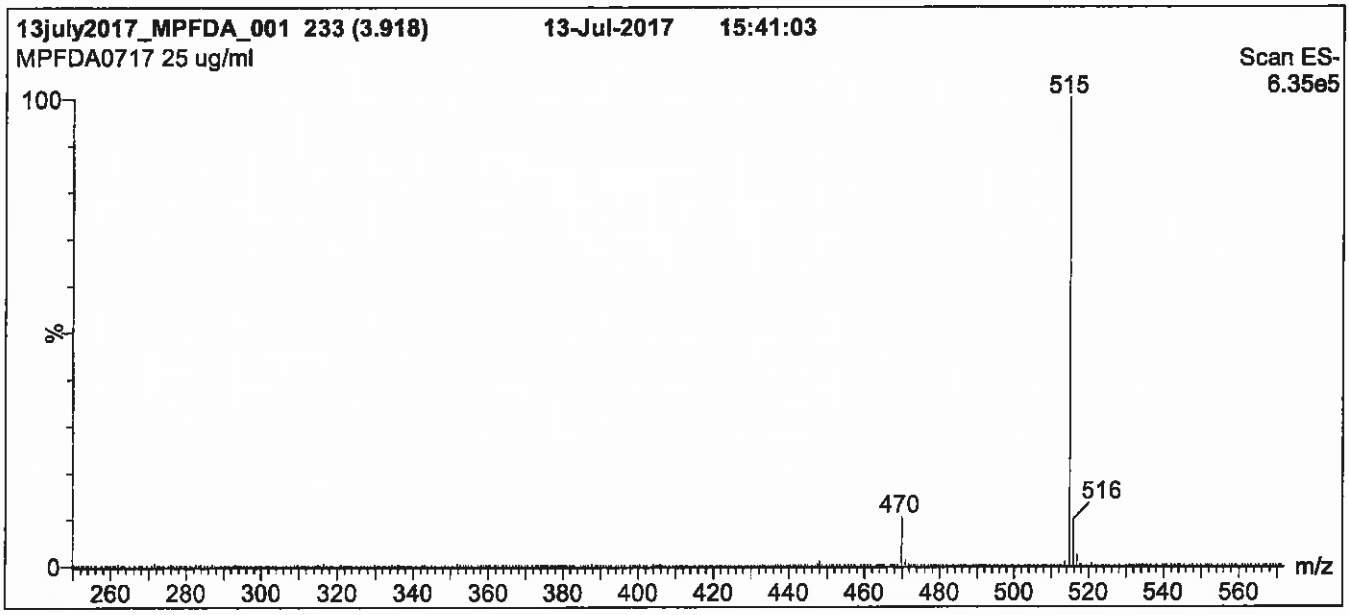

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MS: **Micromass Quattro *micro* API MS**

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

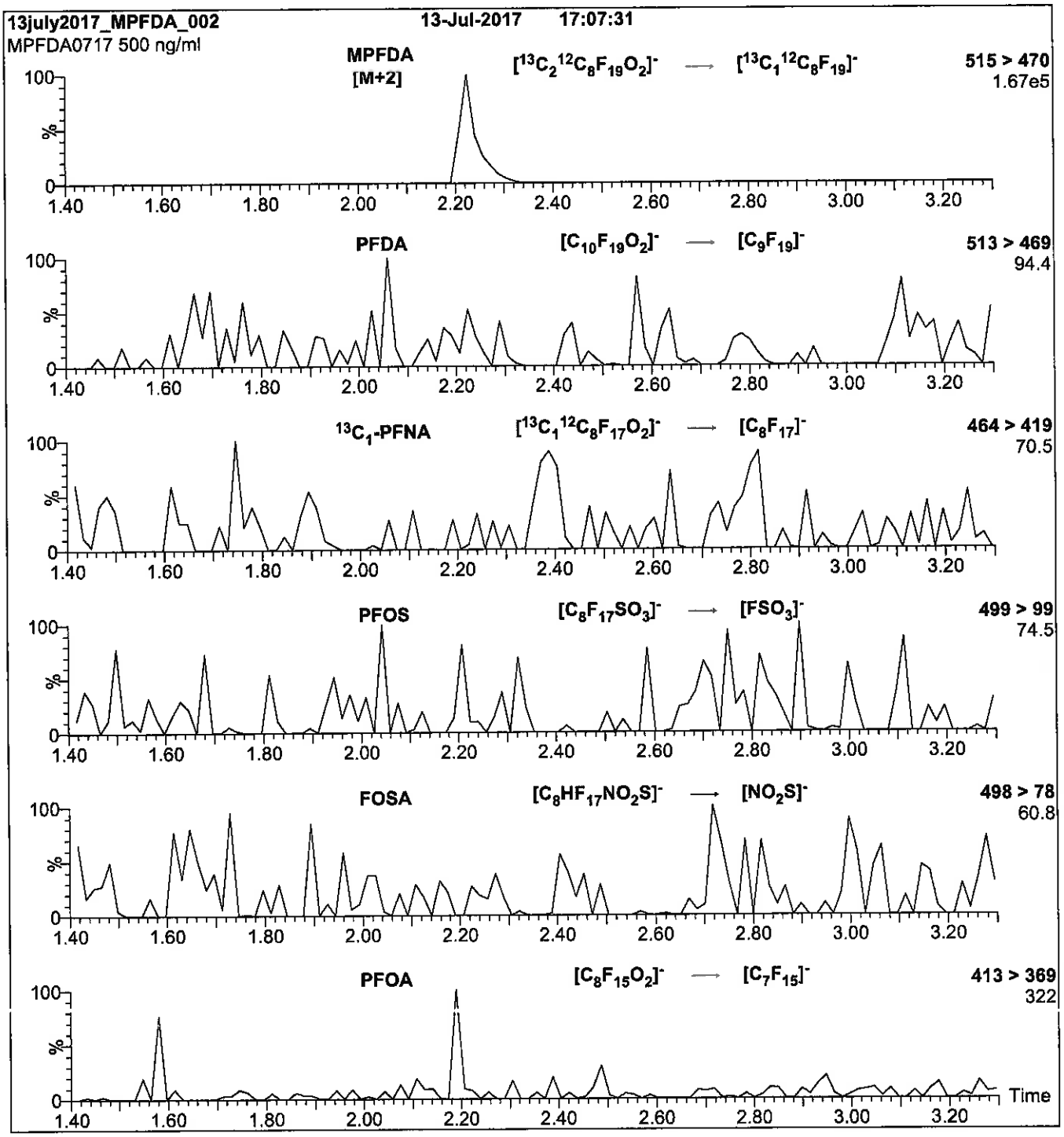
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 13

Reagent

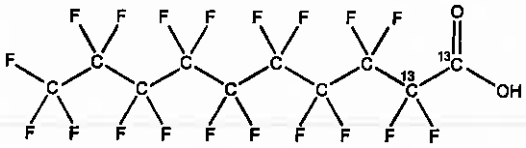
LCMPFDA_00019

R: 1/26/18 SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{18}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
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Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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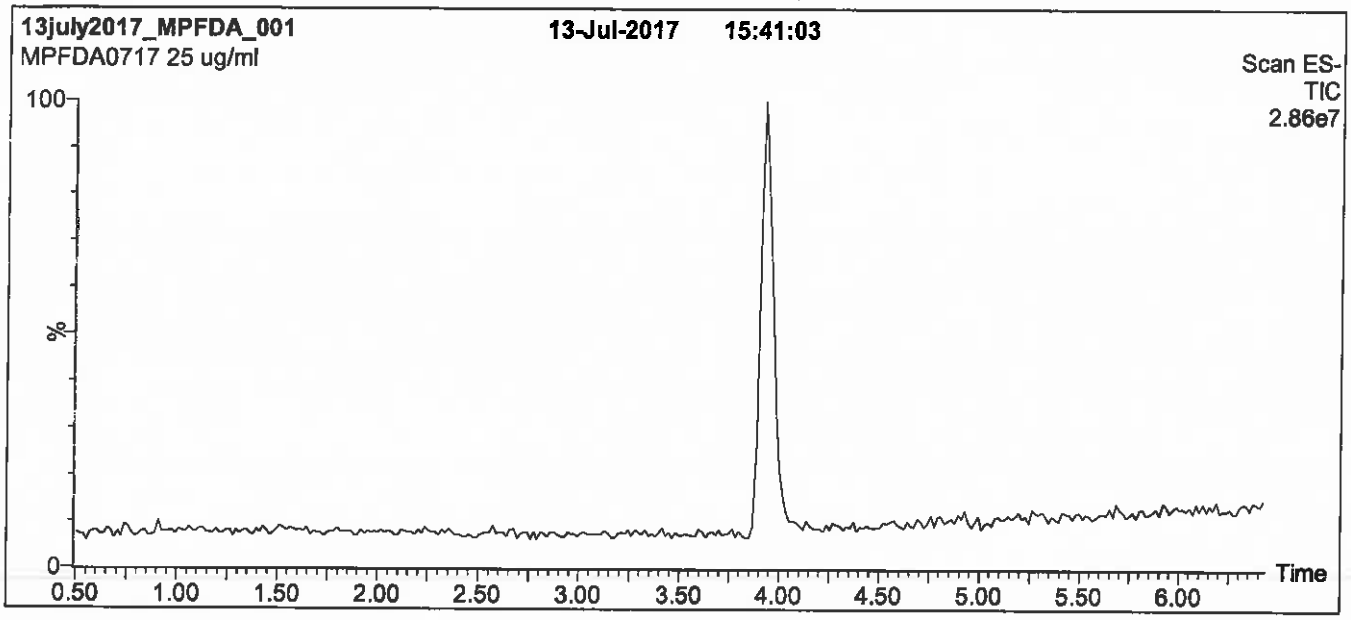
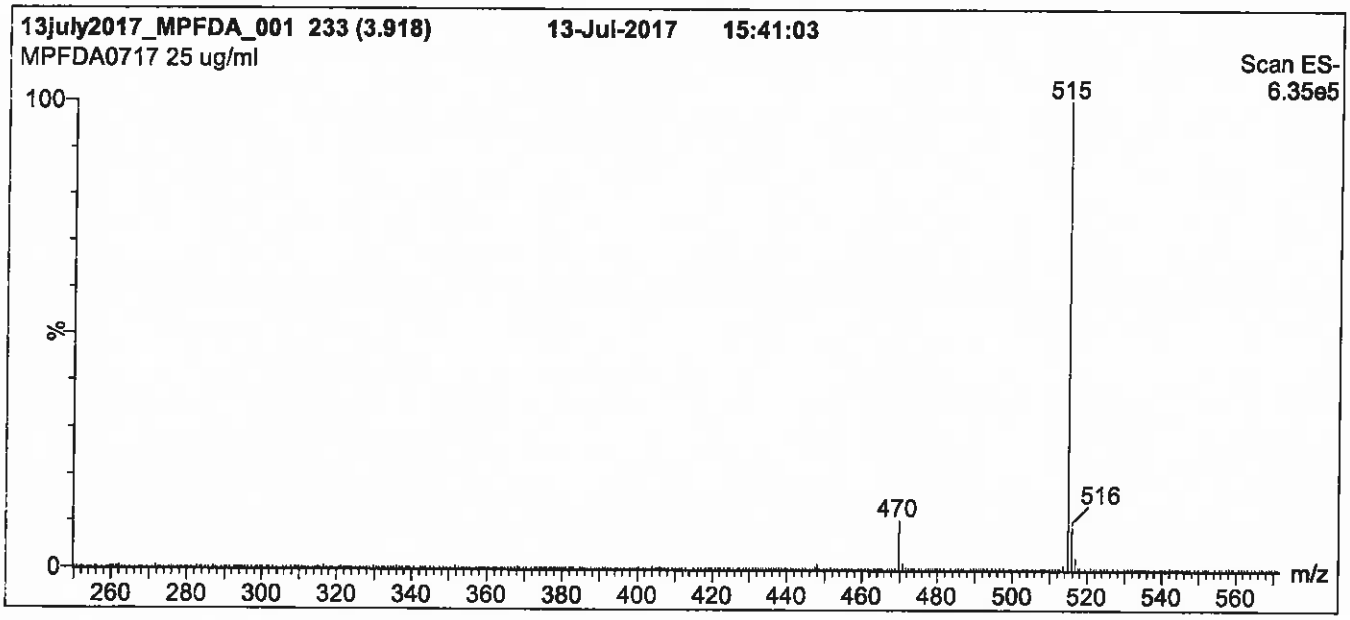
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

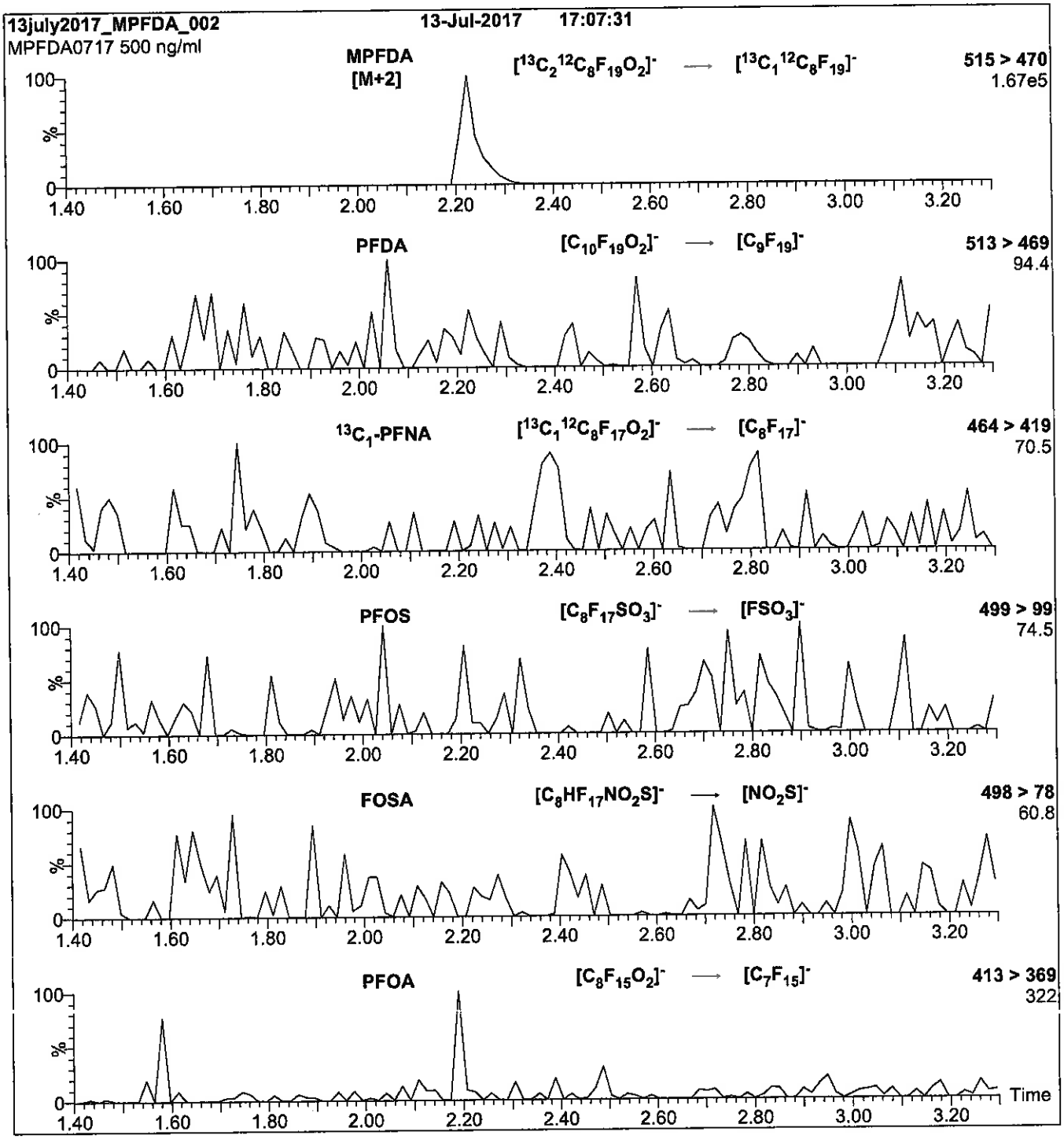
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00013

r: 12/4/17 cc

WELLINGTON LABORATORIES

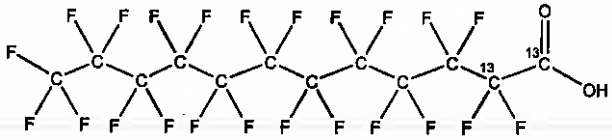
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFDoA0517

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	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 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

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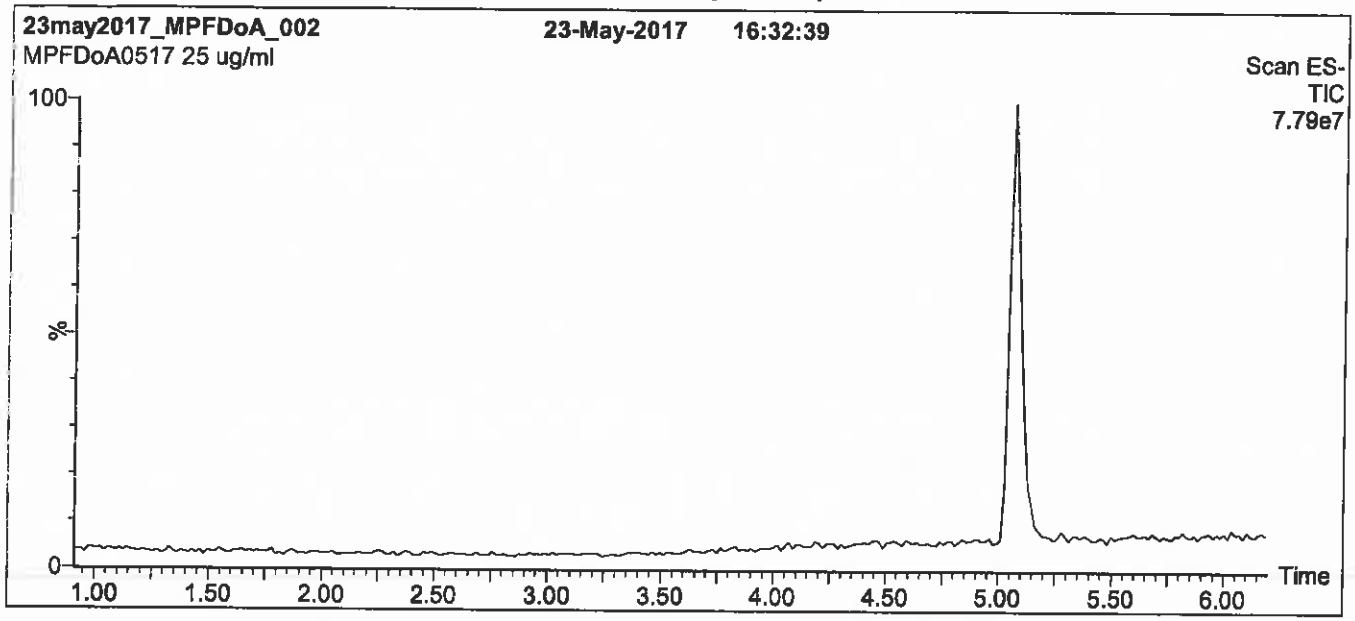
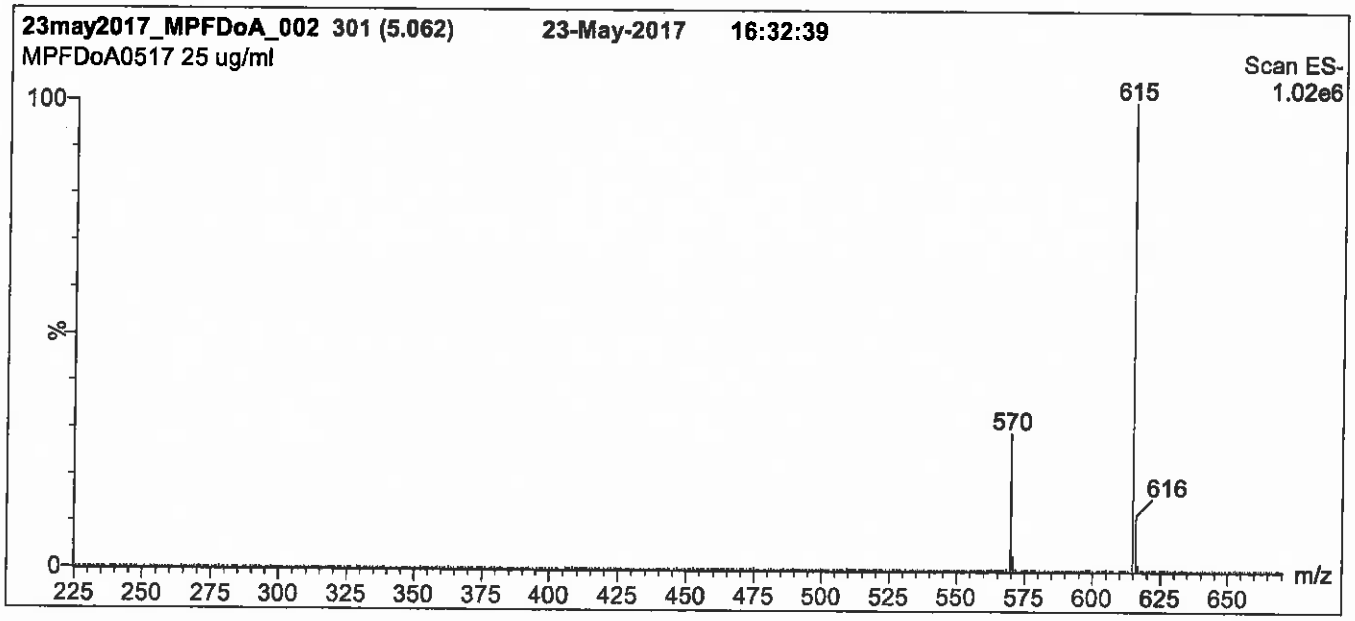




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

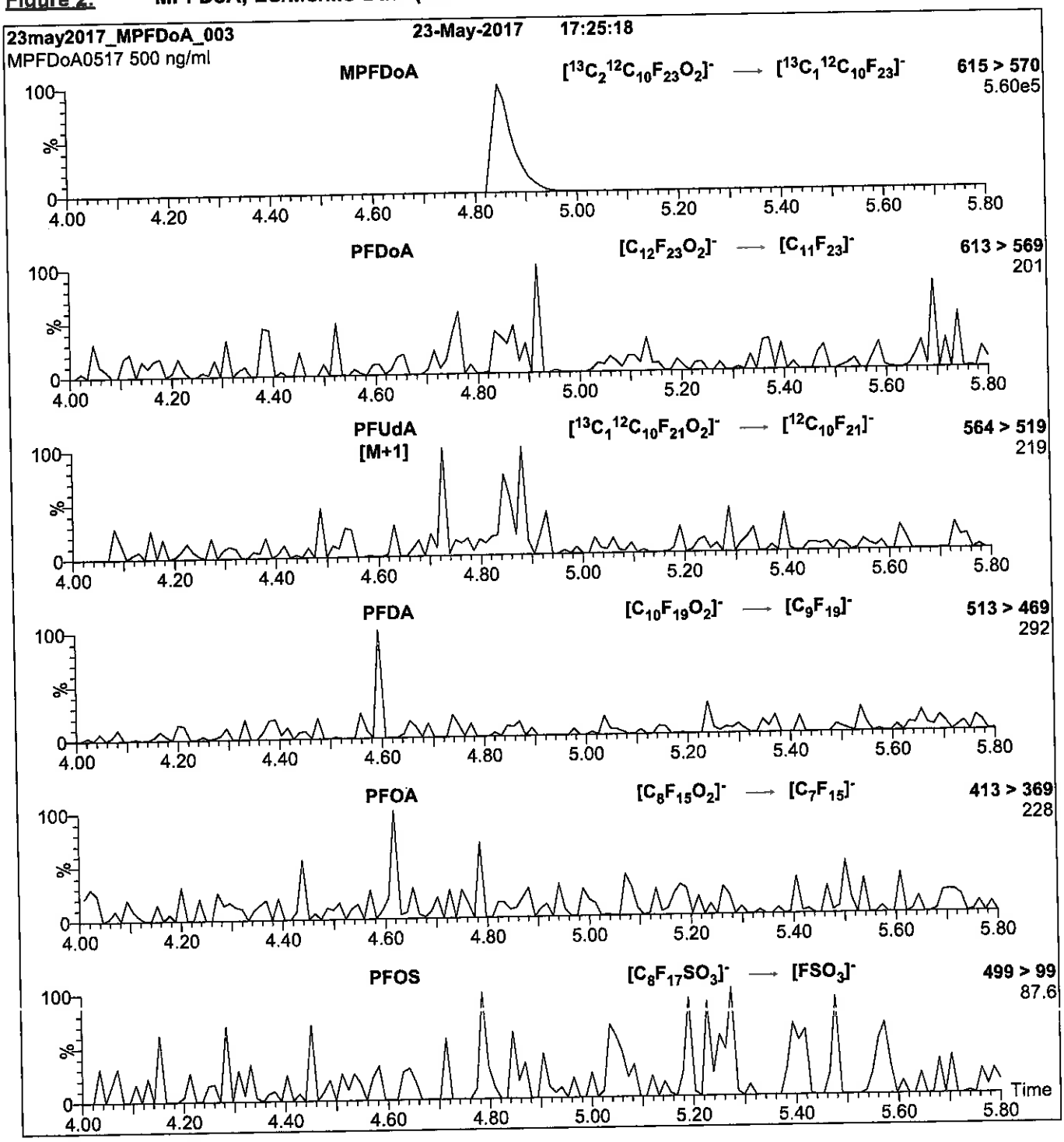
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

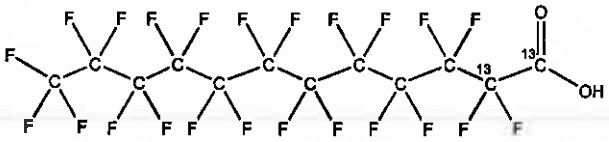
LCMPFDoA_00014

r: 1/26/18 SH

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDoA	**LOT NUMBER:**	MPFDoA0517
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
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.
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Certified By: _____ **Date:** 05/26/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED

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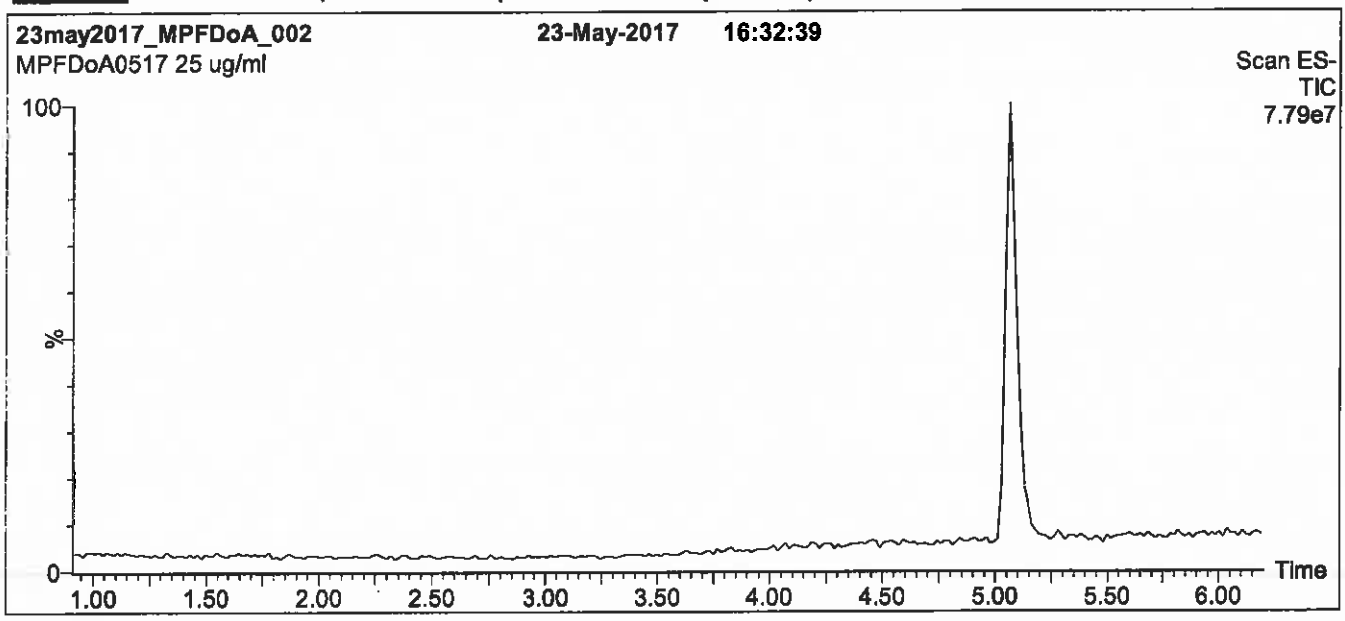
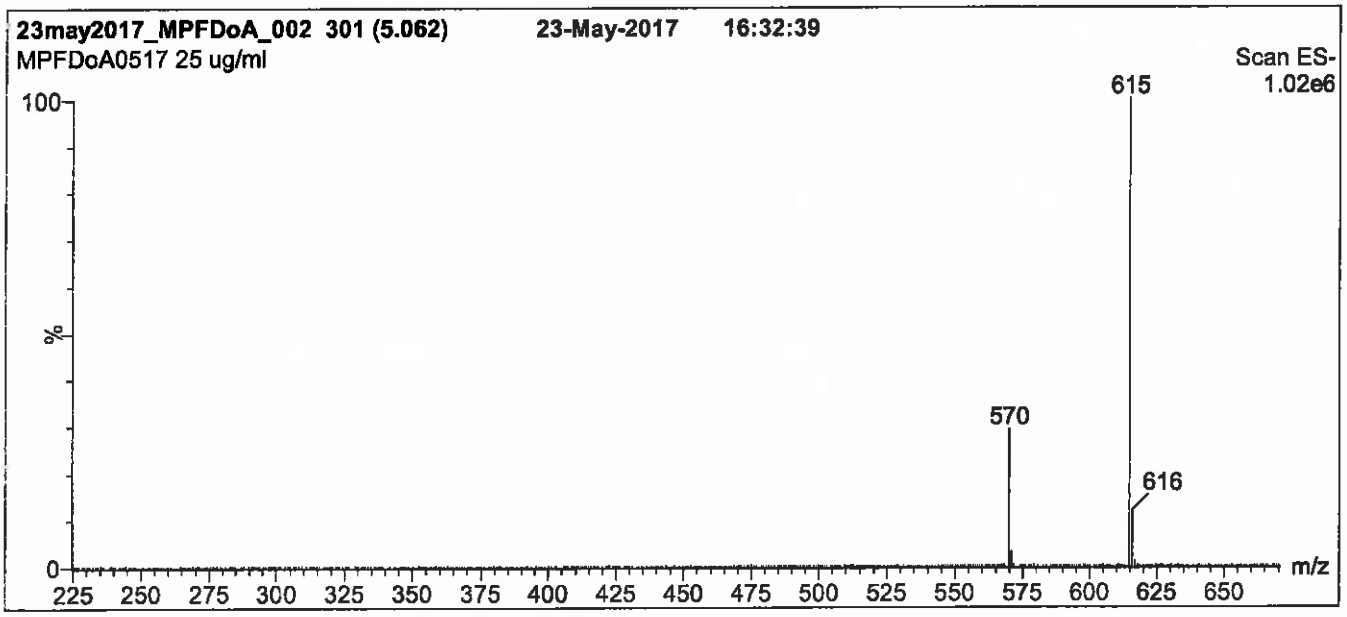




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

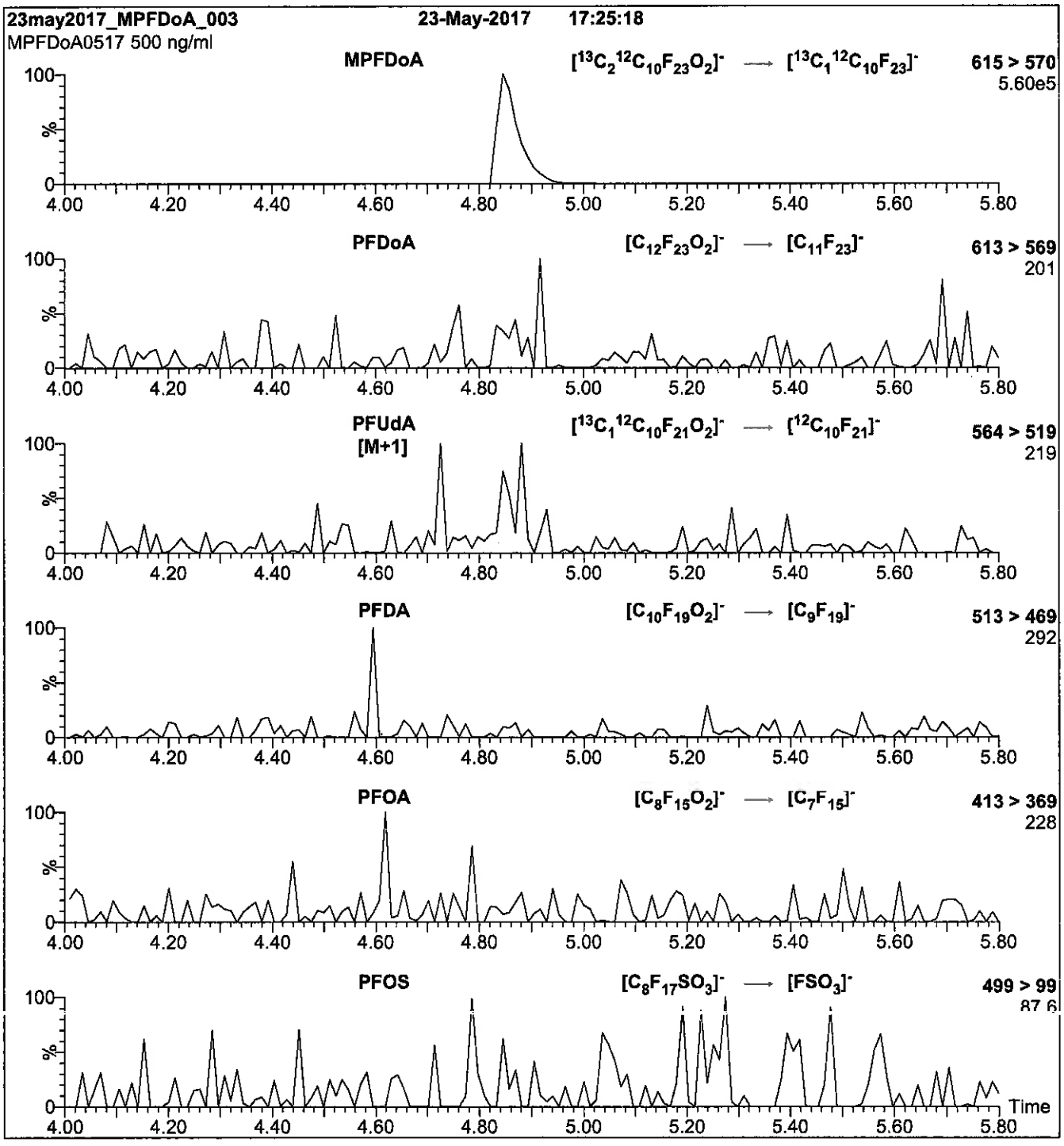
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCMPFHxA_00019

r: 12/14/17 ccc

WELLINGTON LABORATORIES

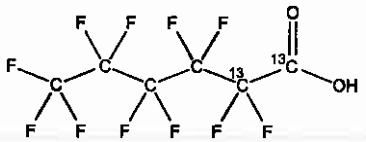
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFHxA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and < 0.3% of perfluoro-n-octanoic acid.

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Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
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UNCERTAINTY:

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

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

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

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CALA

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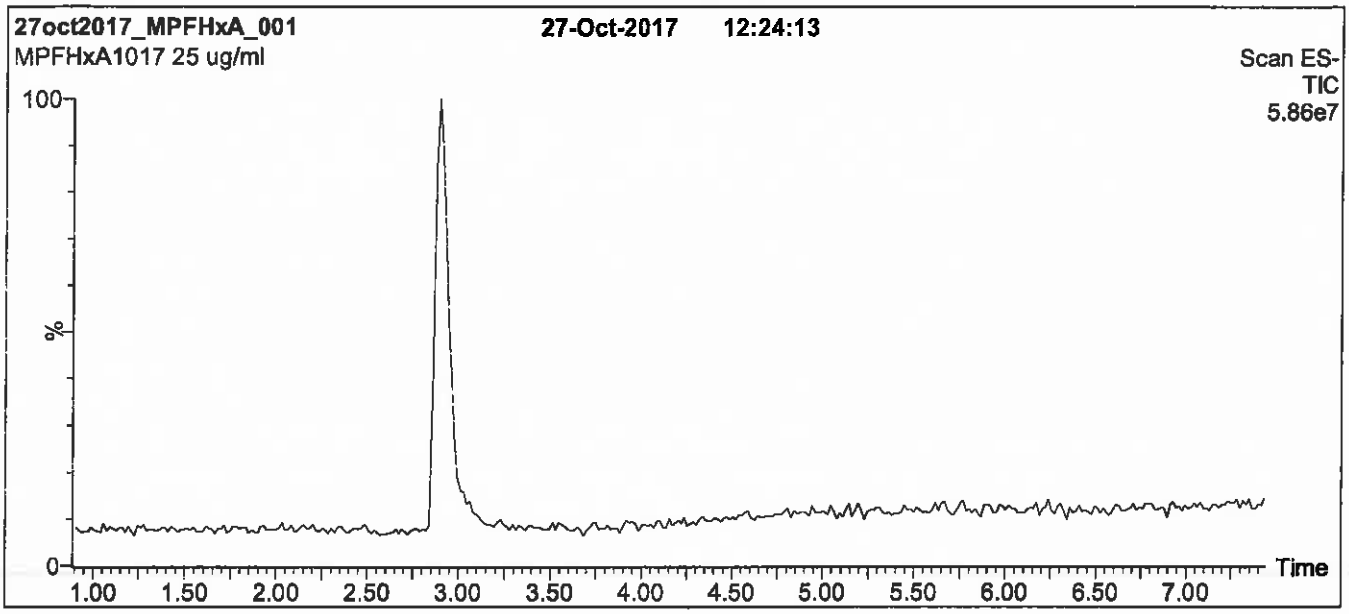
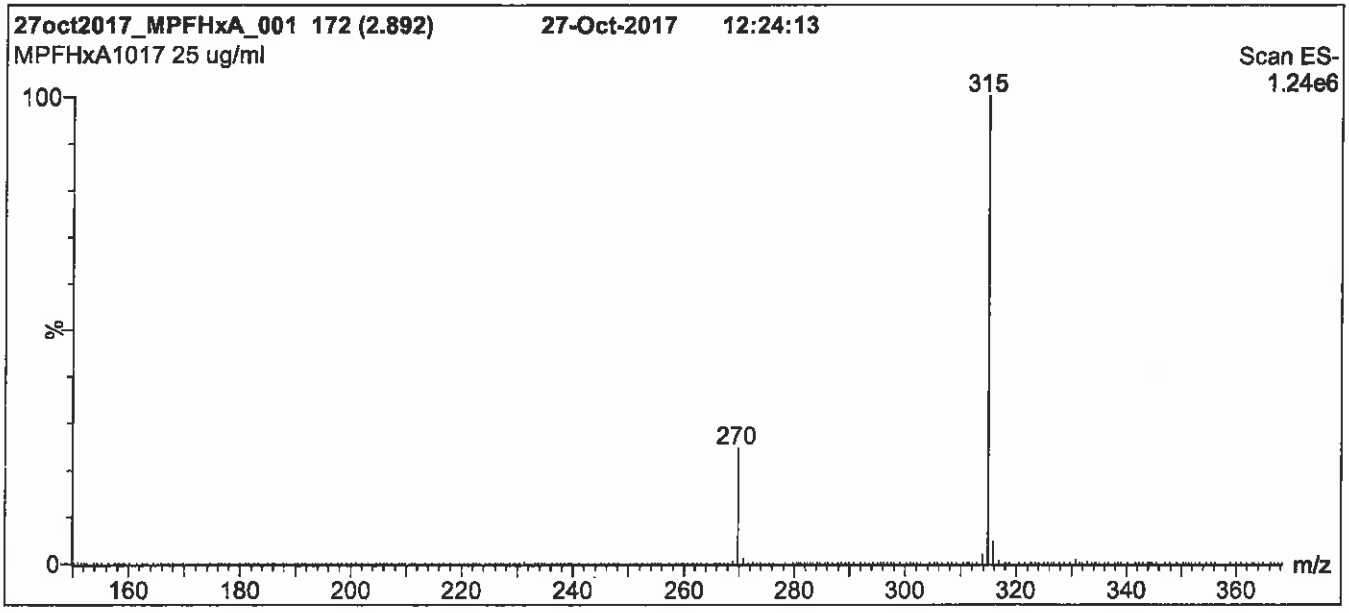
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

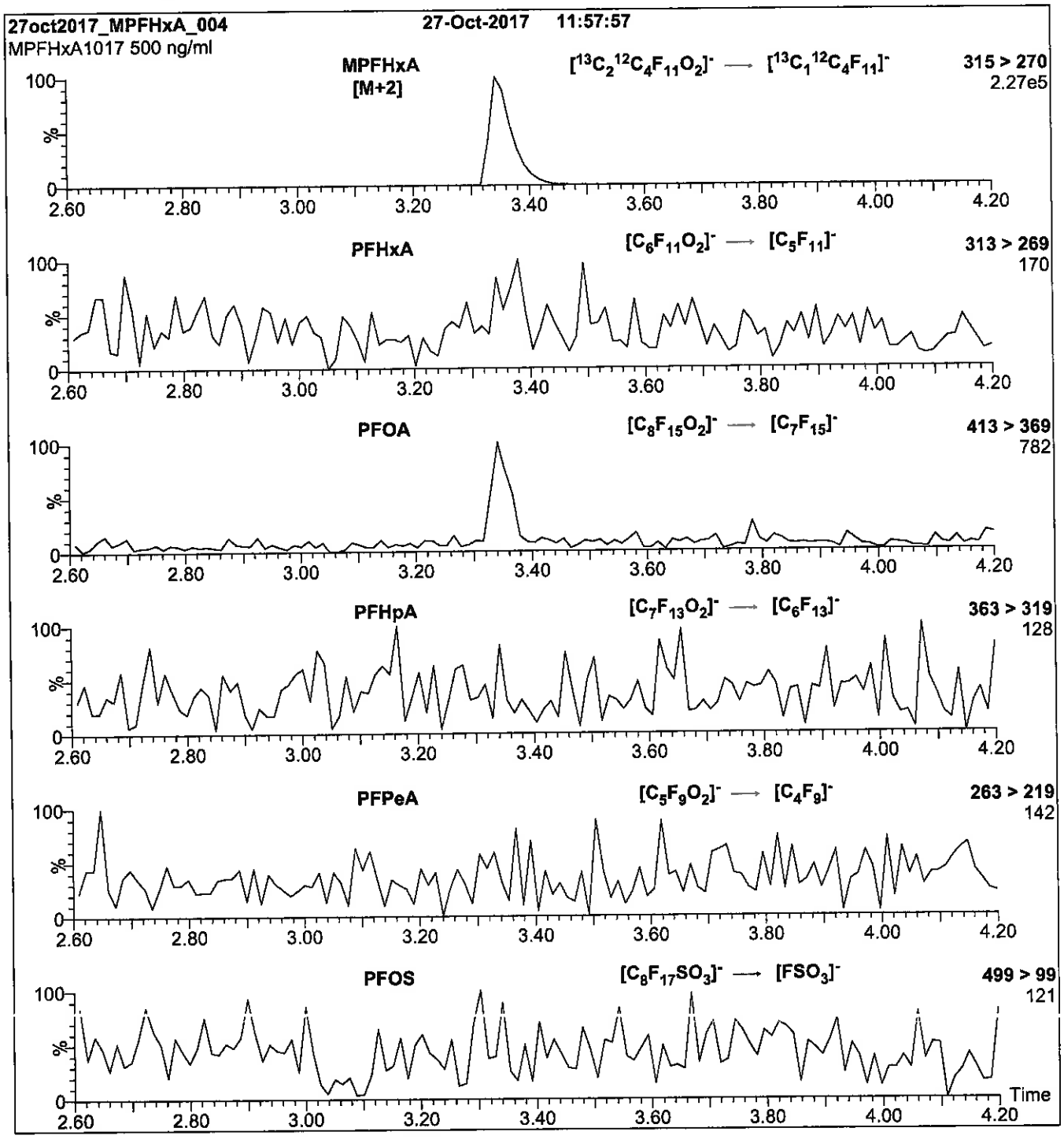
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxS_00013

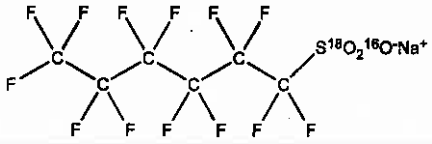
1106238
ID: LCMPFHxS_00013
Exp: 02/17/22 Prpd: CCL
18O2-Perfluorohexanesulfo

r: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

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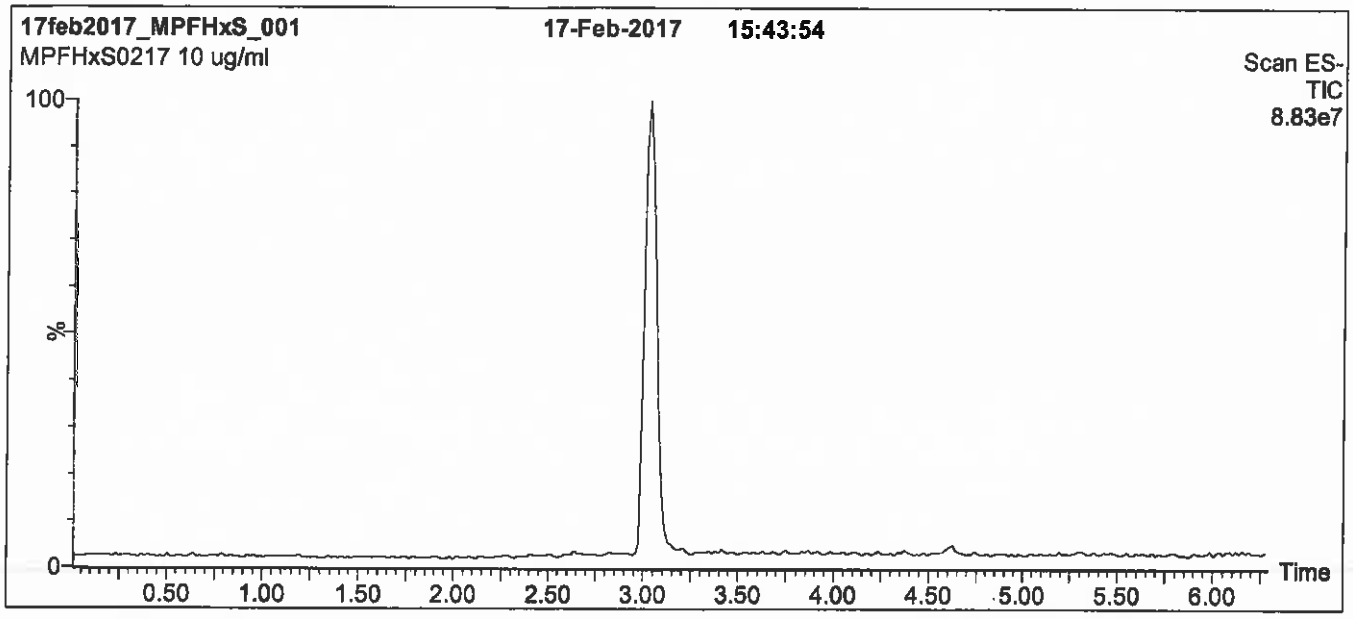
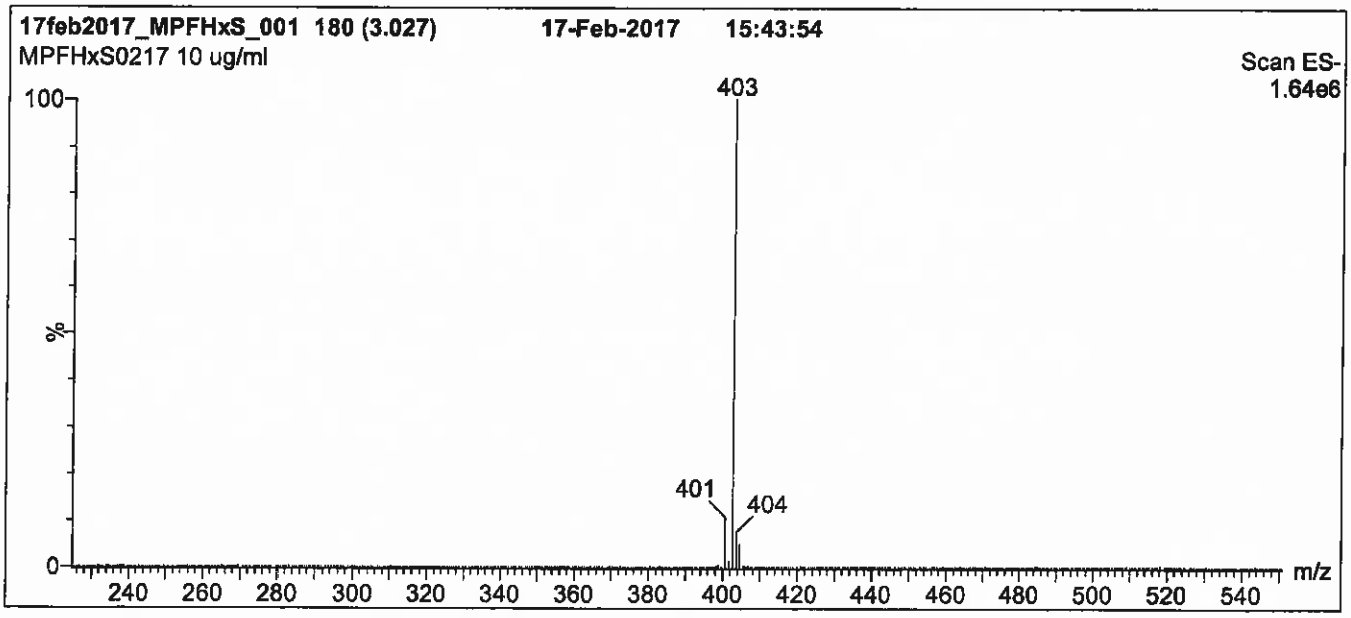




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

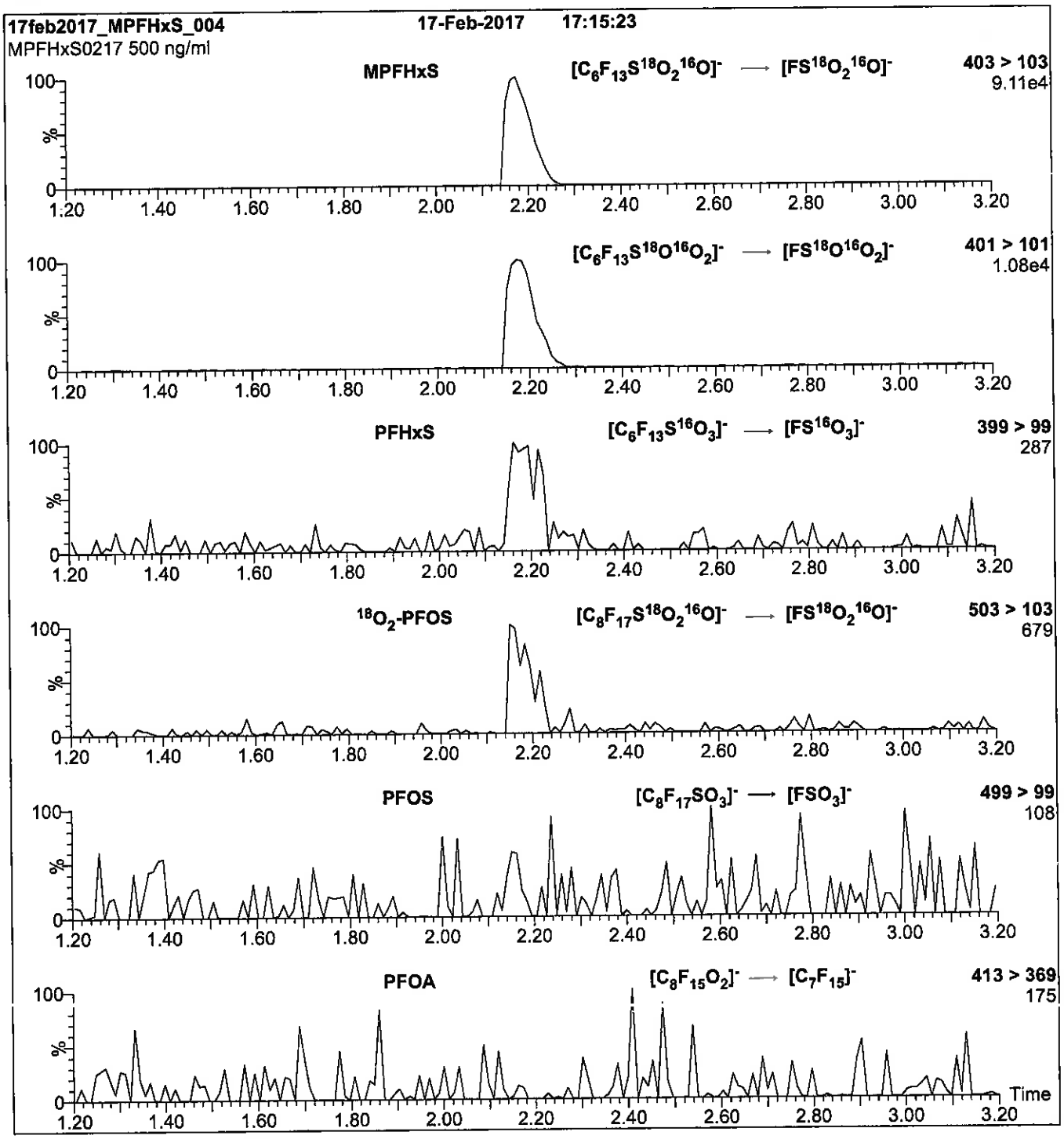
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

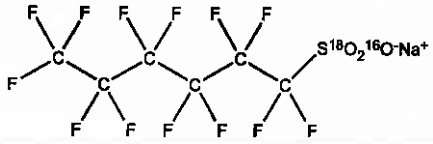
LCMPFHxS_00014

n: 1/26/18 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

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ADDITIONAL INFORMATION:

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

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CALA

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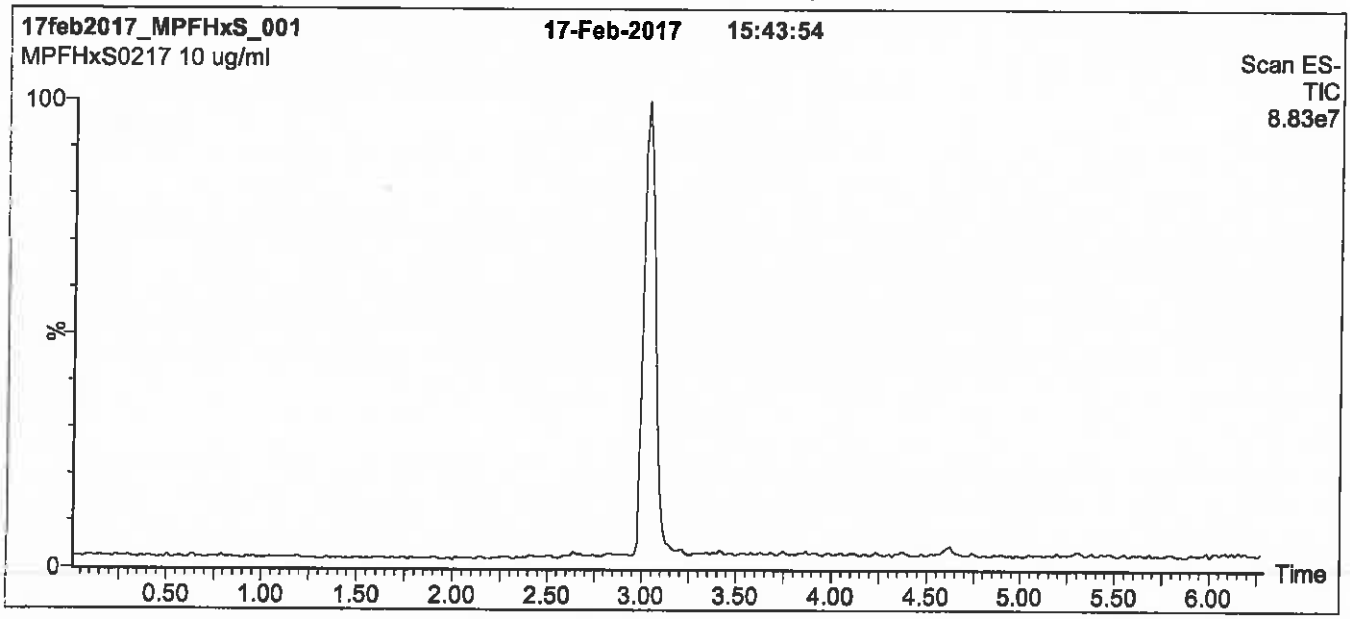
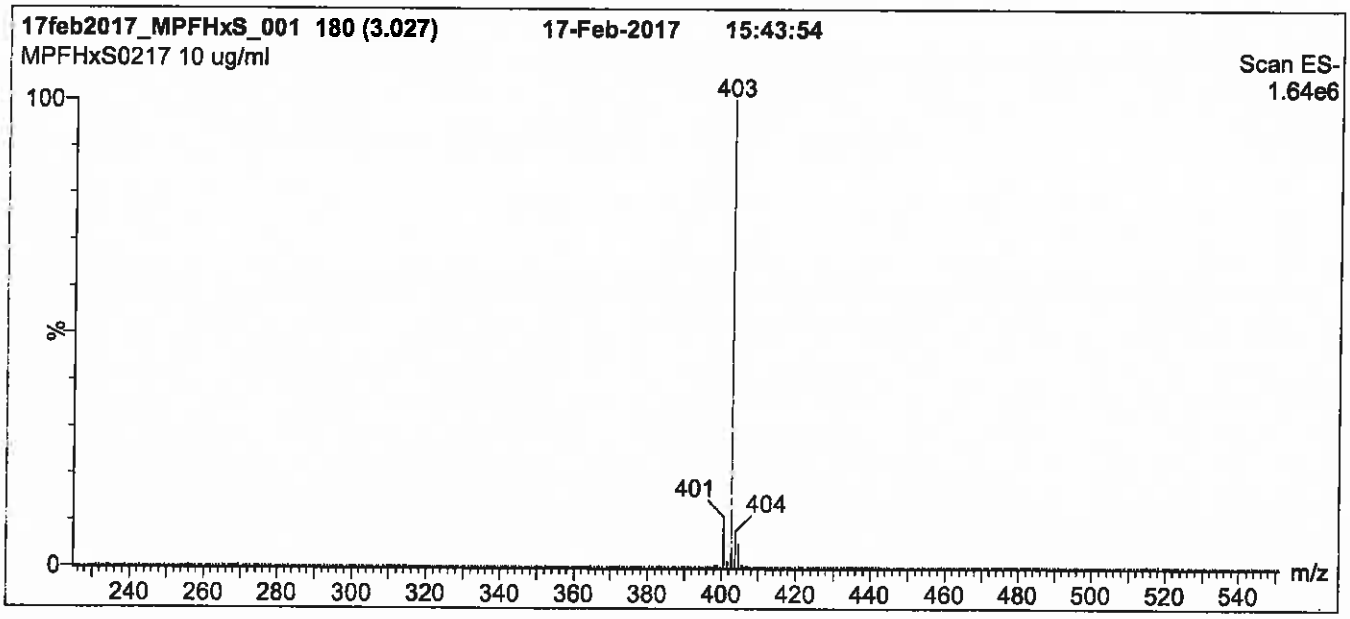




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

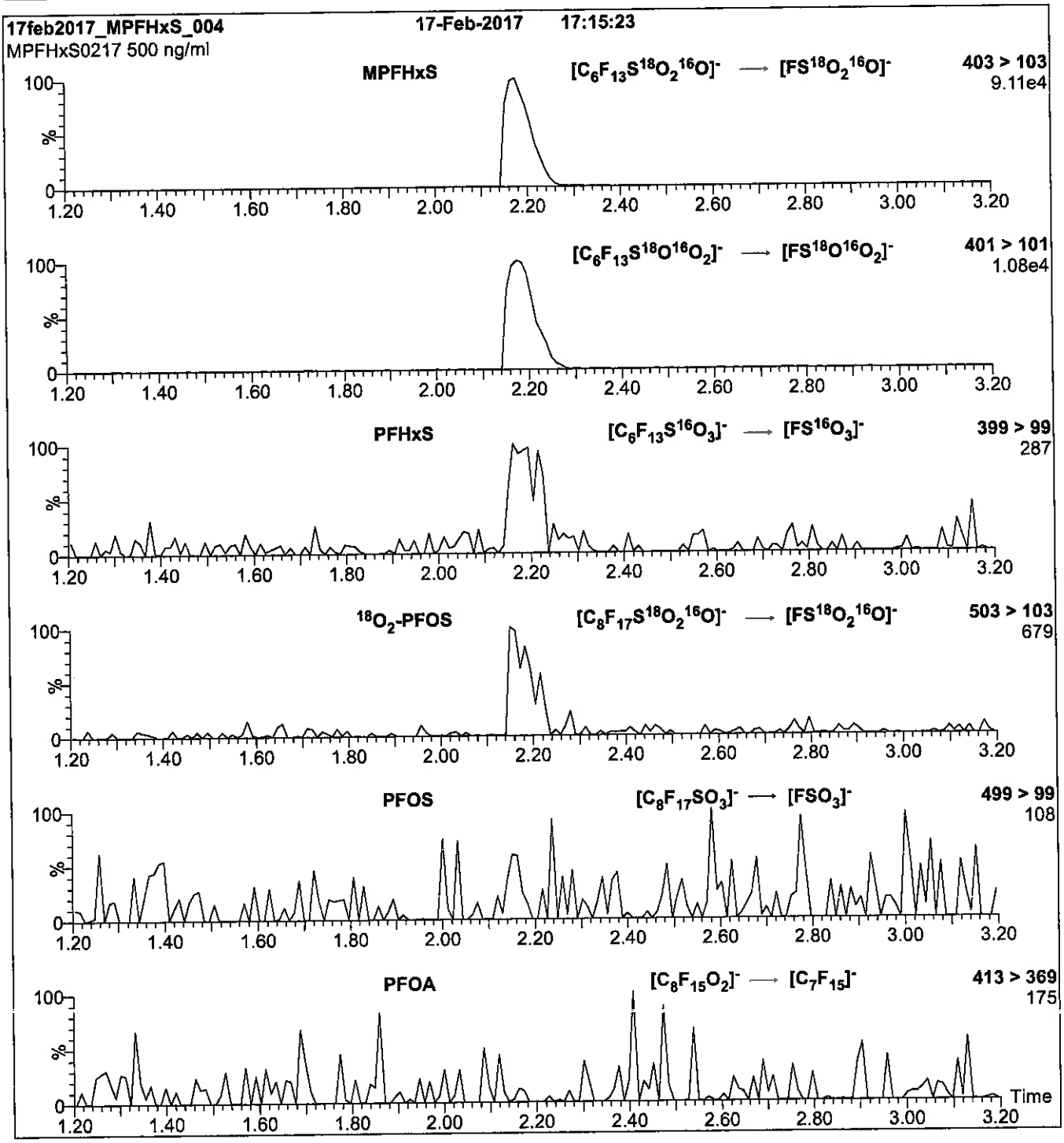
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFNA_00013

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

r: 12/4/17 ccc

WELLINGTON LABORATORIES

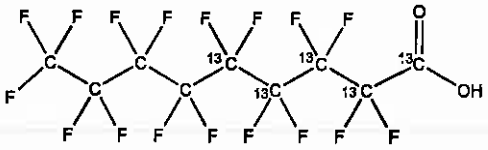
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFNA0916

STRUCTURE:

CAS #: Not available



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

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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 10/11/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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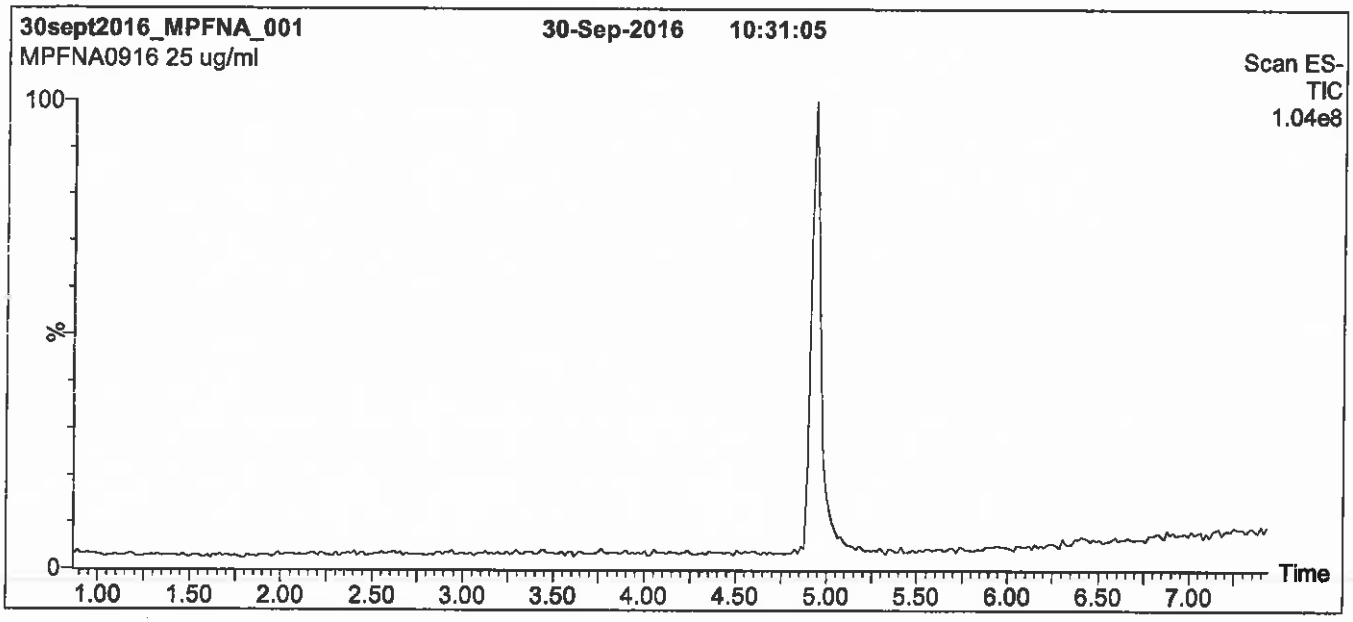
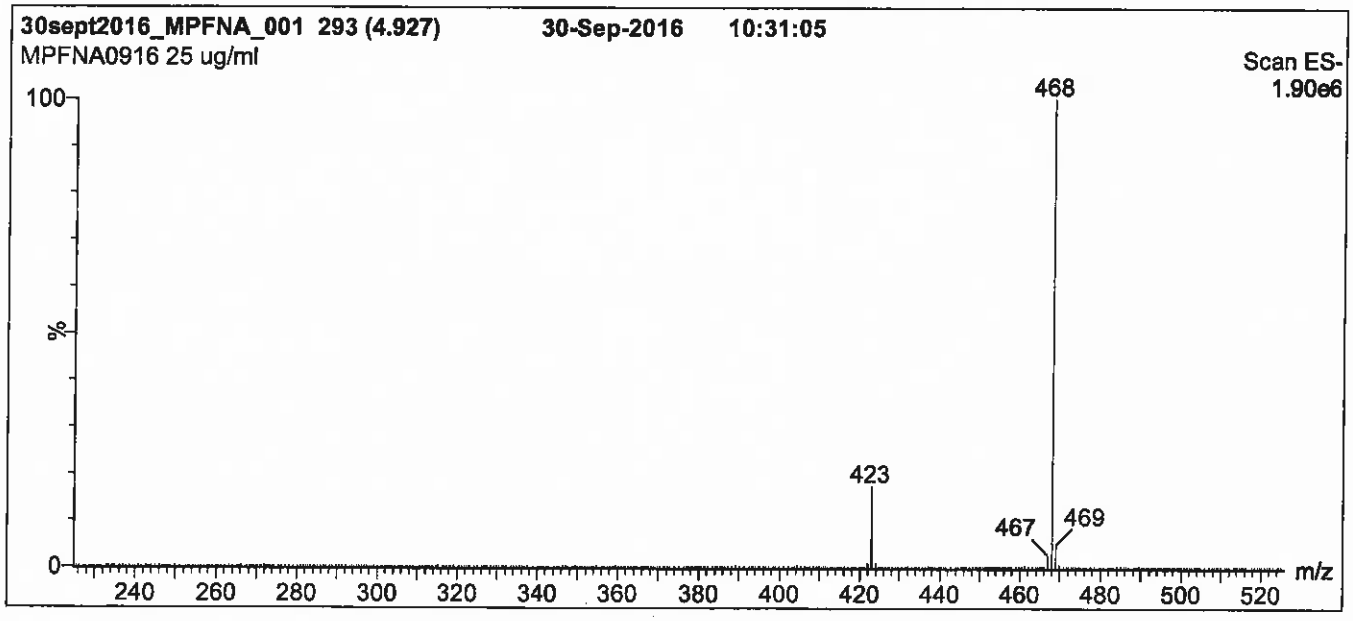
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

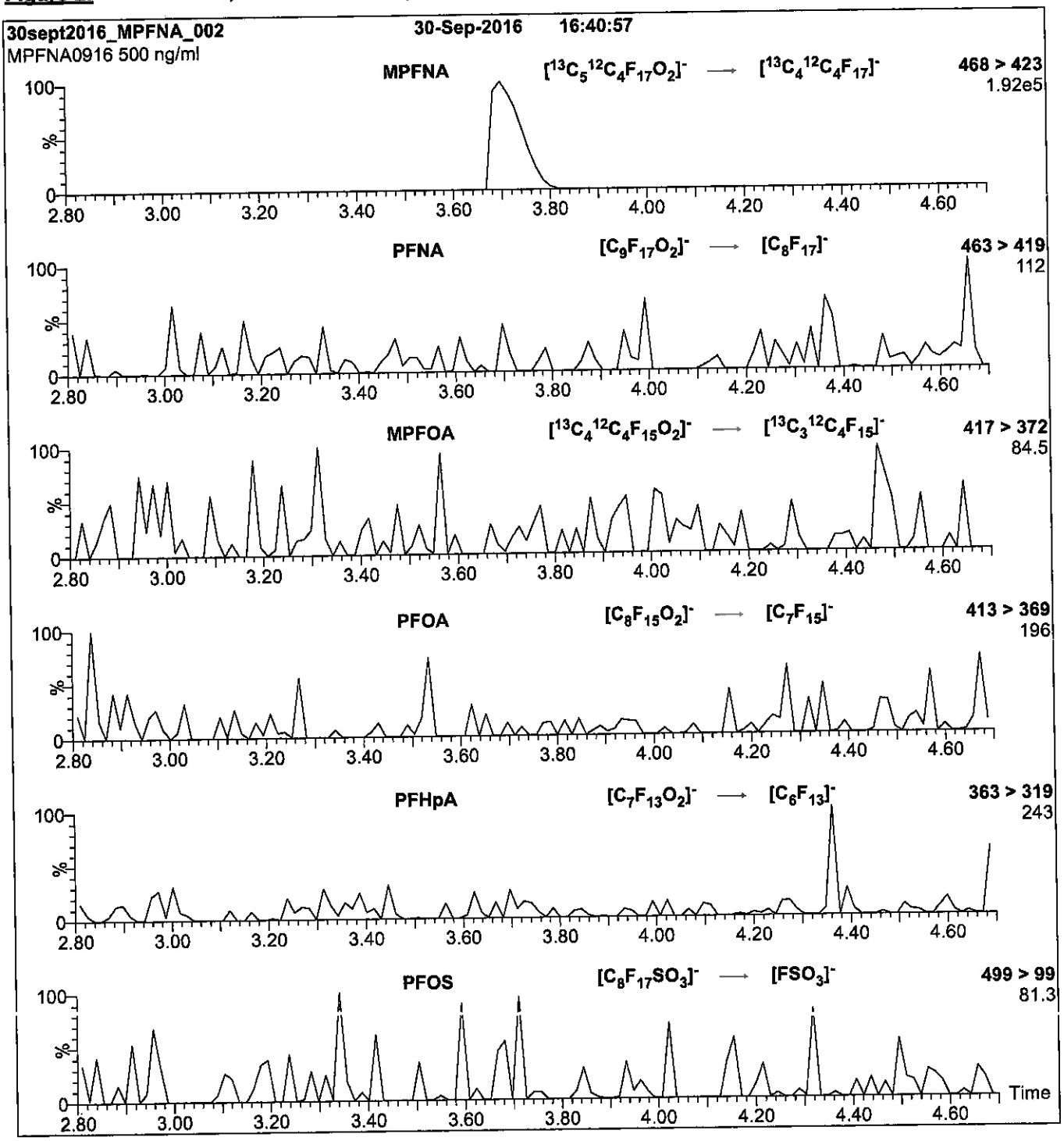
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

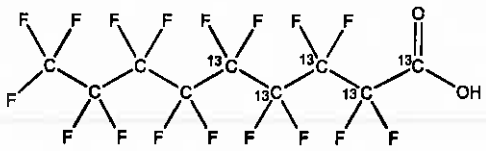
LCMPFNA_00014

R: 1/26/18 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA1217
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	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: _____ **Date:** 12/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED

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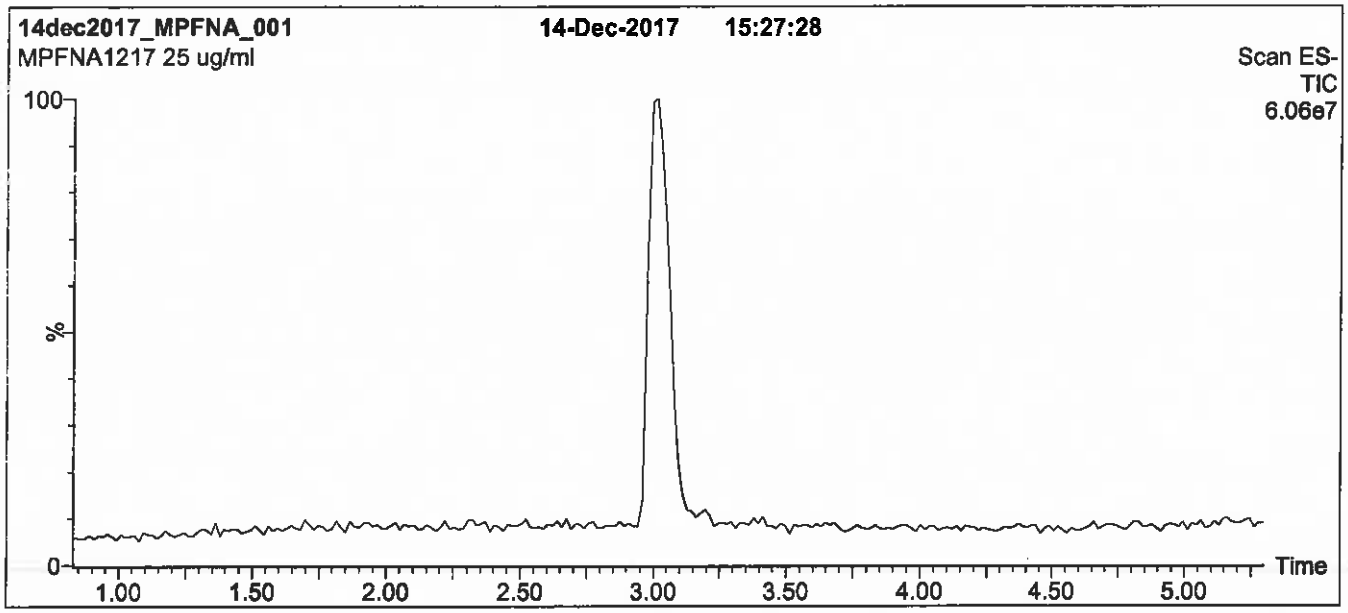
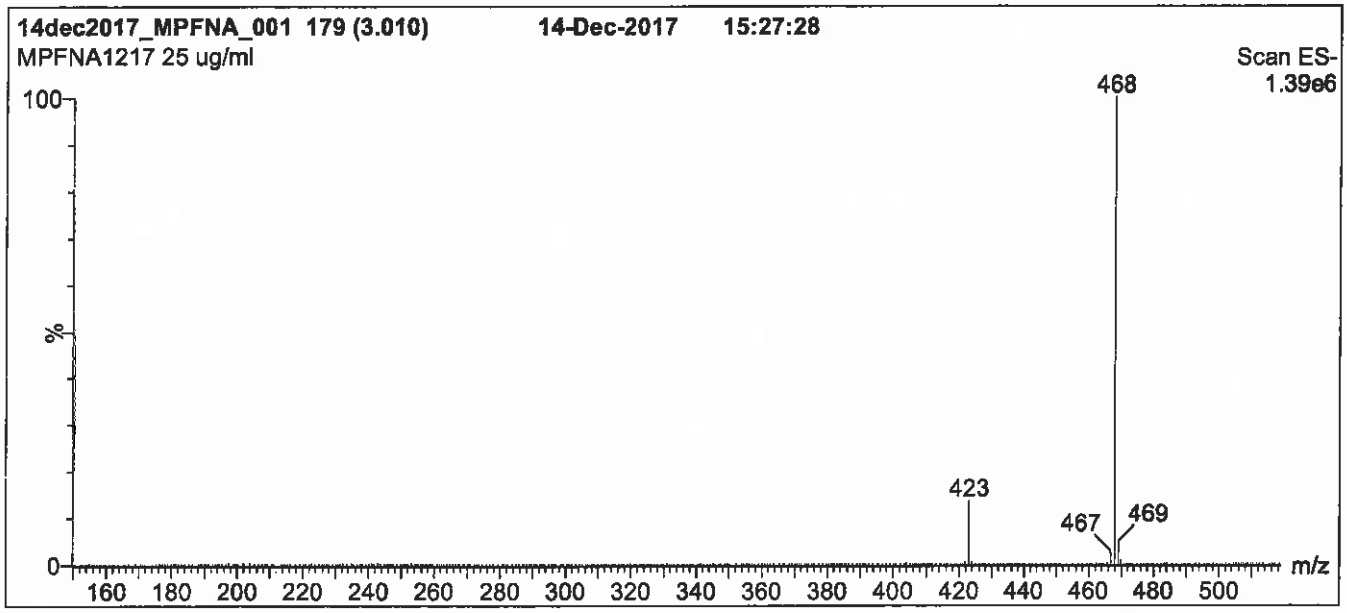




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

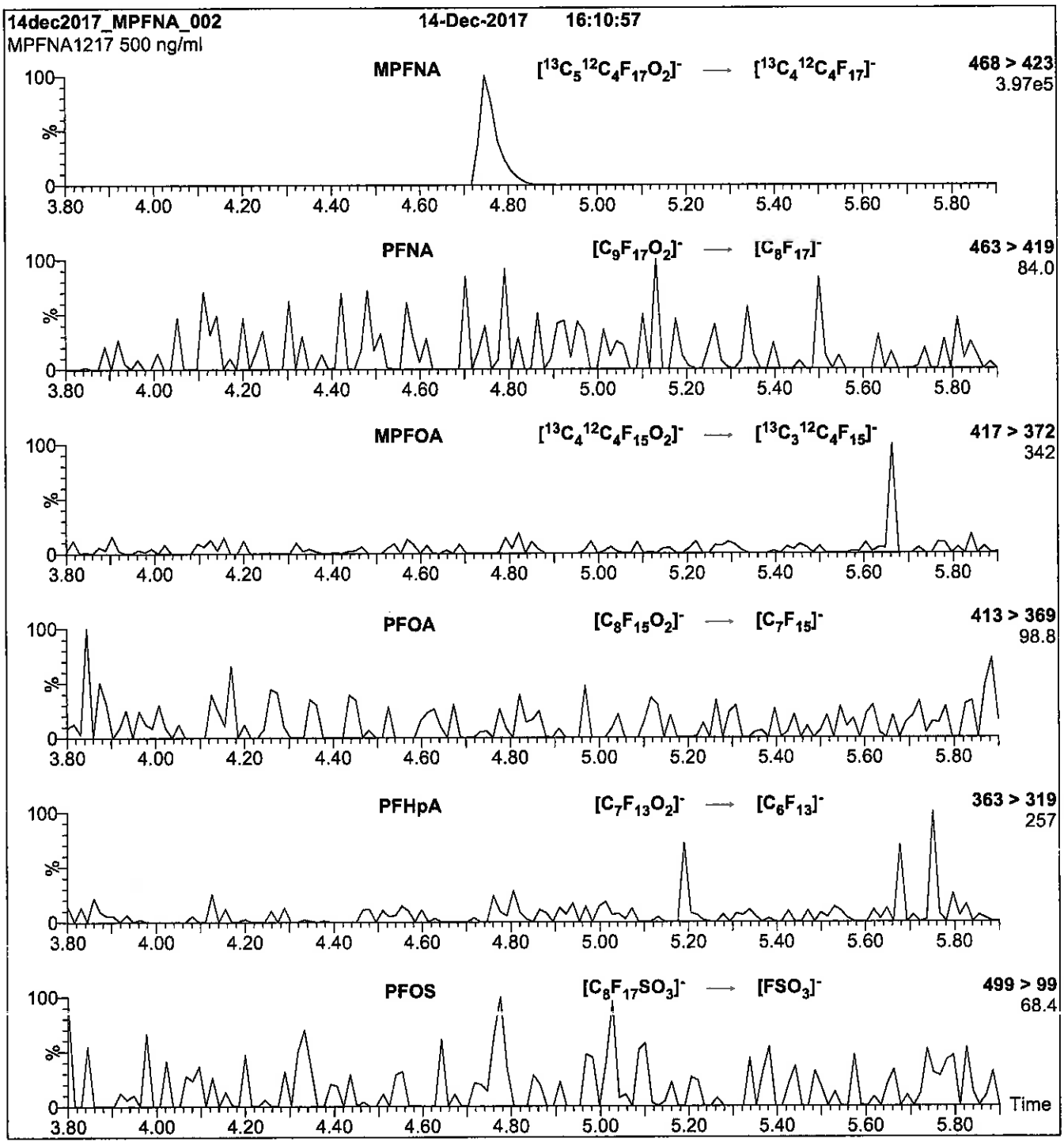
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

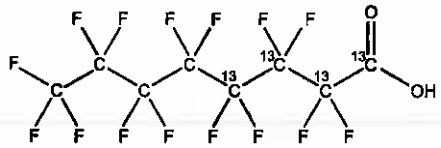
LCMPFOA_00017

R: 12/4/19 cc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{16}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
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ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

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Certified By: _____ **Date:** 10/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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CALA

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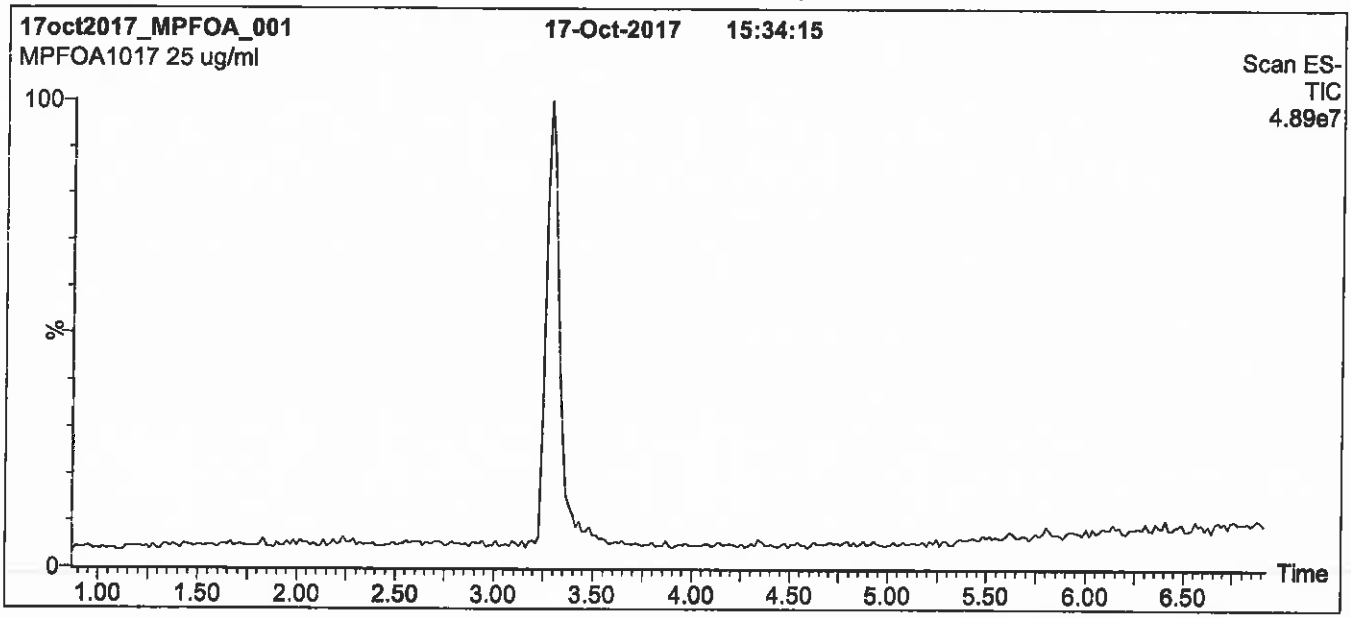

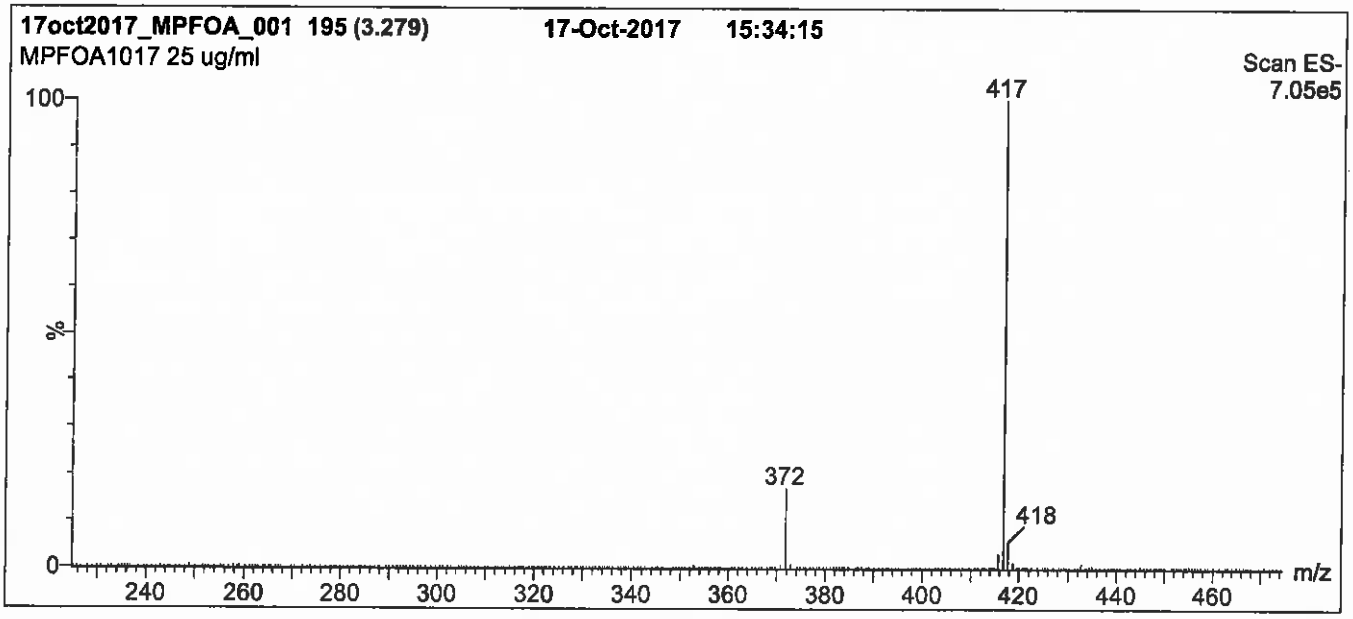

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MS: Micromass Quattro *micro* API MS

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1.7 µm, 2.1 x 100 mm

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

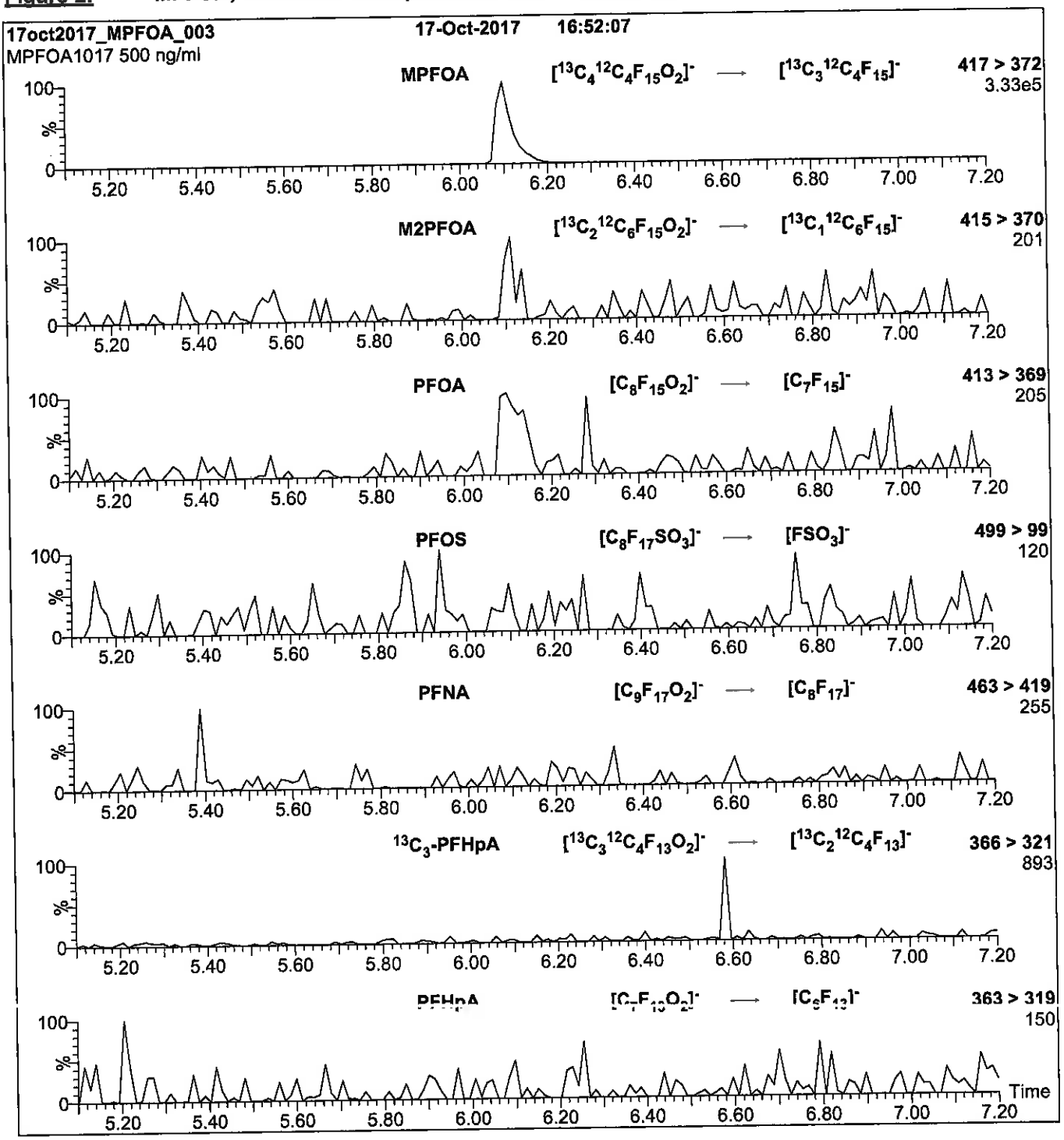
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

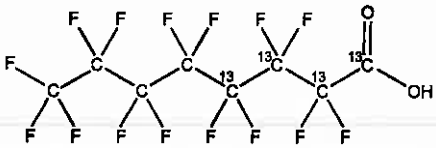
LCMPFOA_00018

V: 1/26/18 SR

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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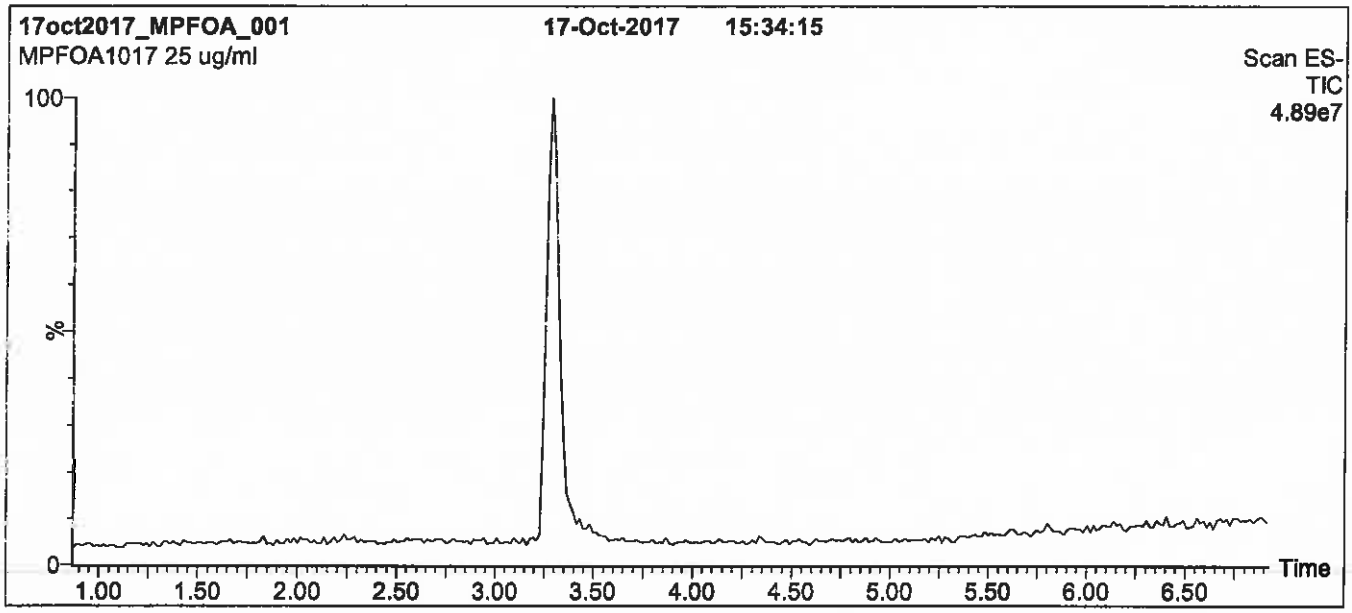
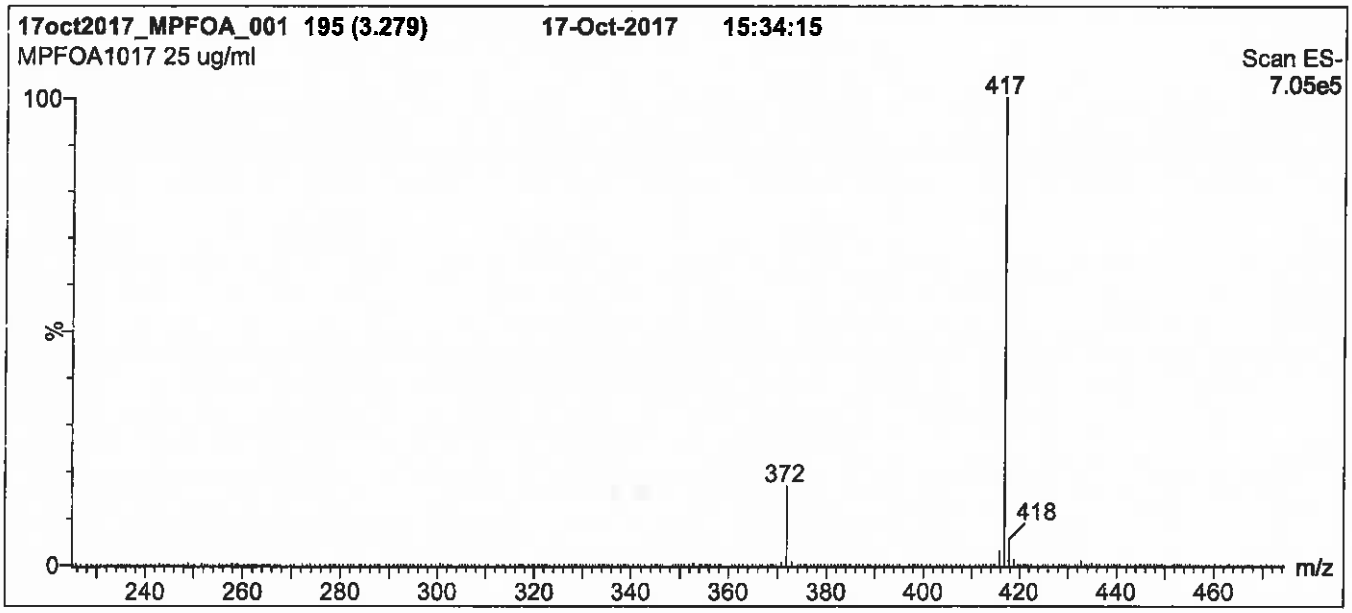
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

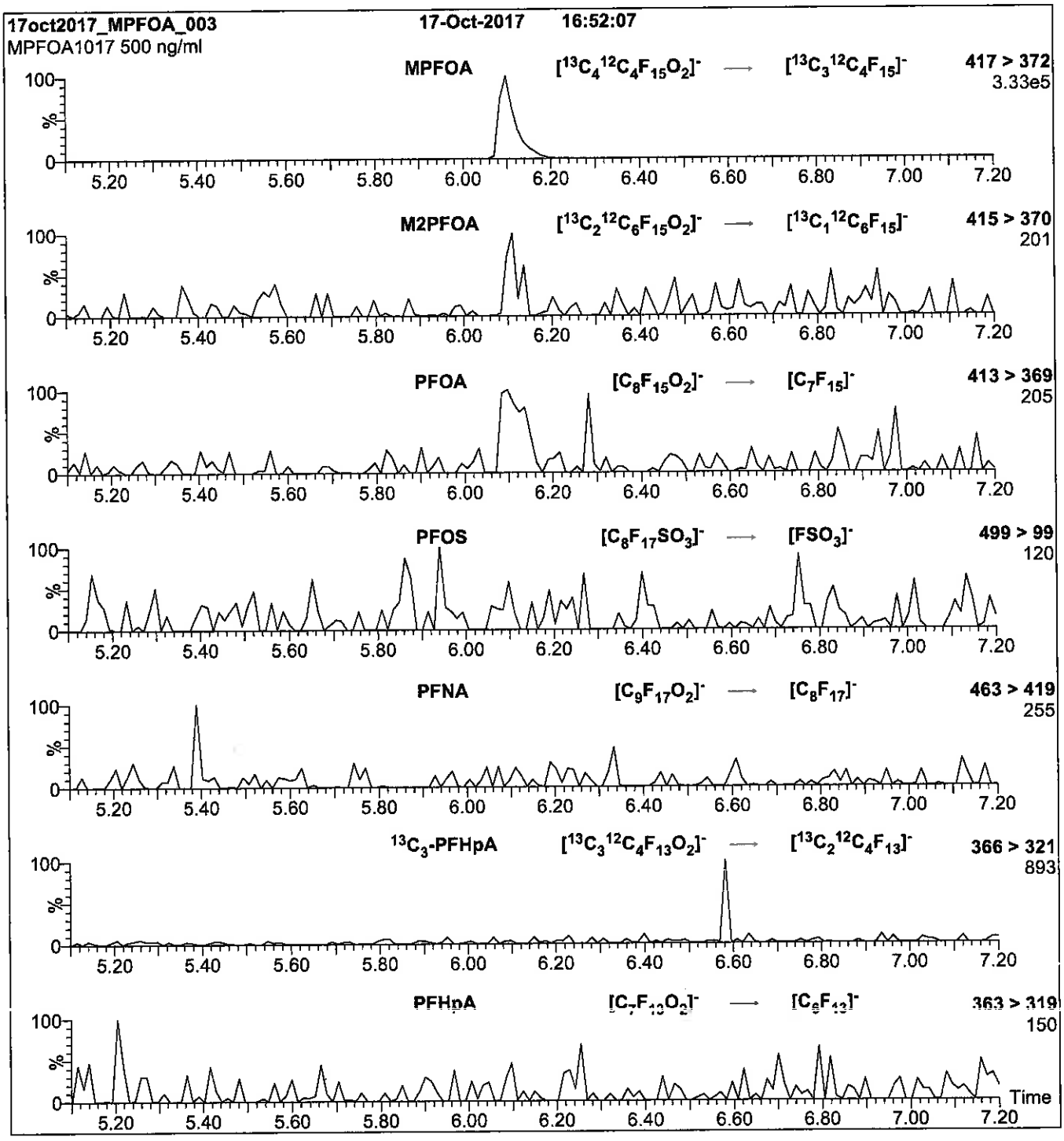
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOS_00025

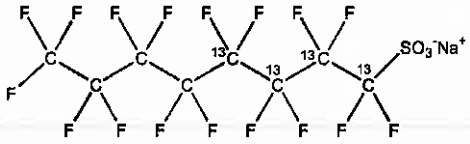
1106029
ID: LCMPFOS_00025
Exp: 10/17/22 Prpd: SKV
13C4-Perfluorooctanesulfo

P: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFOS	**LOT NUMBER:**	MPFOS1017
COMPOUND:	Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.4% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/18/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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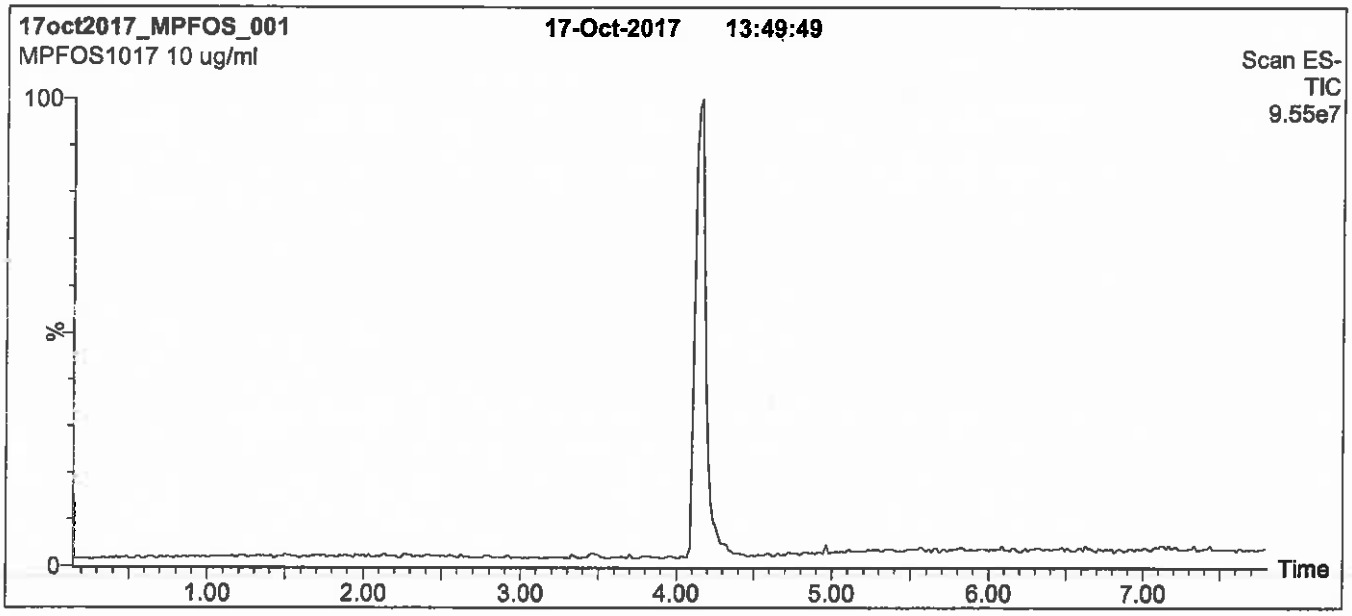
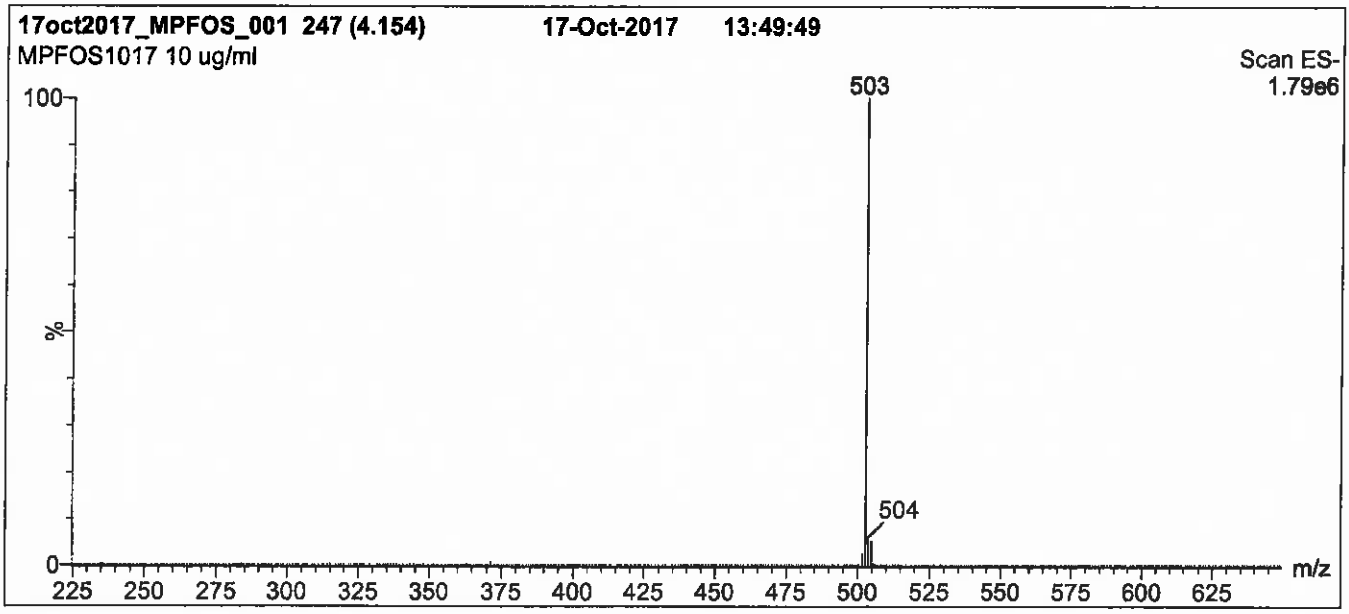




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

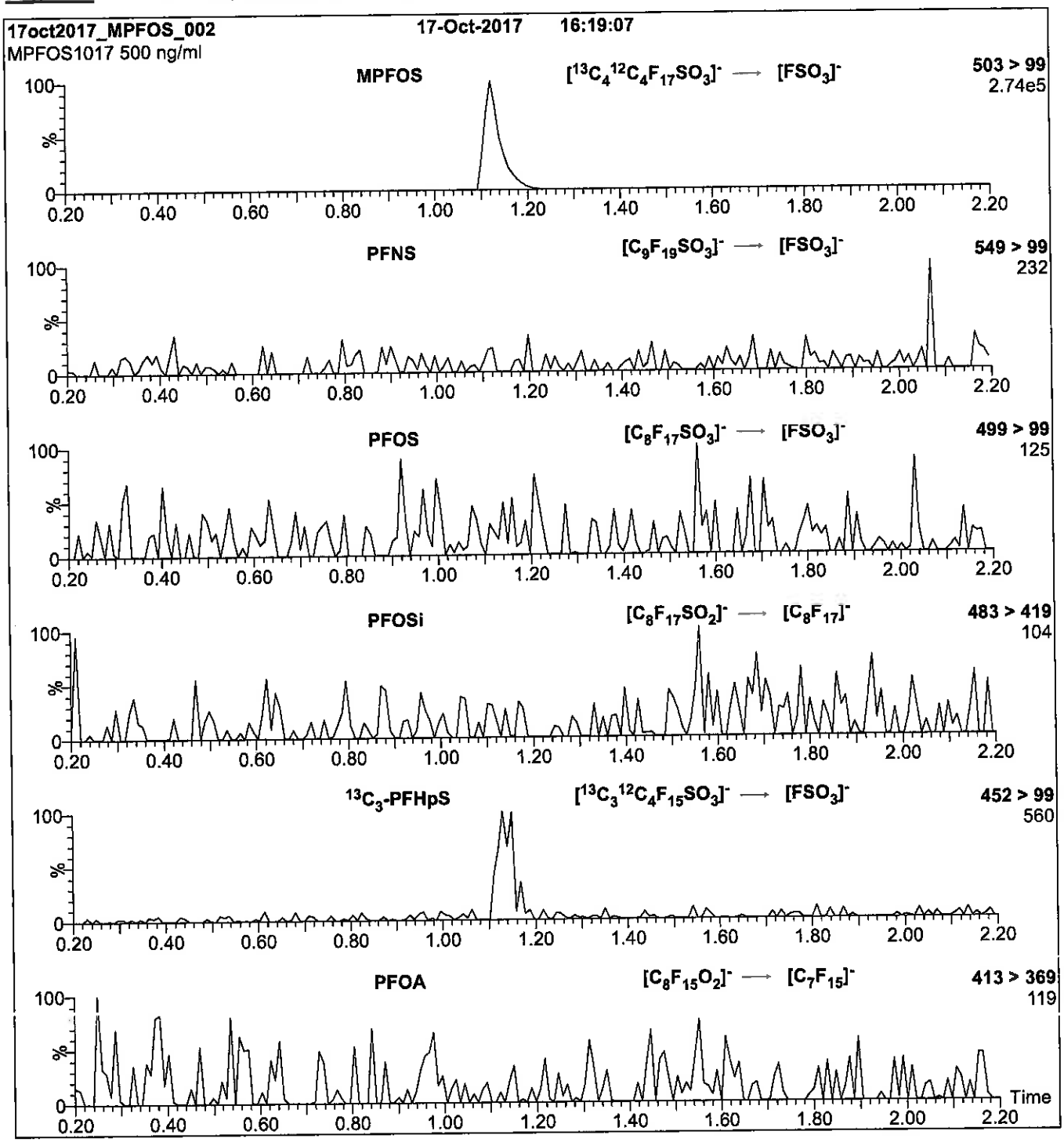
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00026

r: 1/26/18 SK

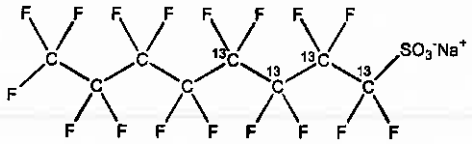
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
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ADDITIONAL INFORMATION:

- See page 2 for further details.
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B.G. Chittim, General Manager

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CALA

ANAB ACCREDITED

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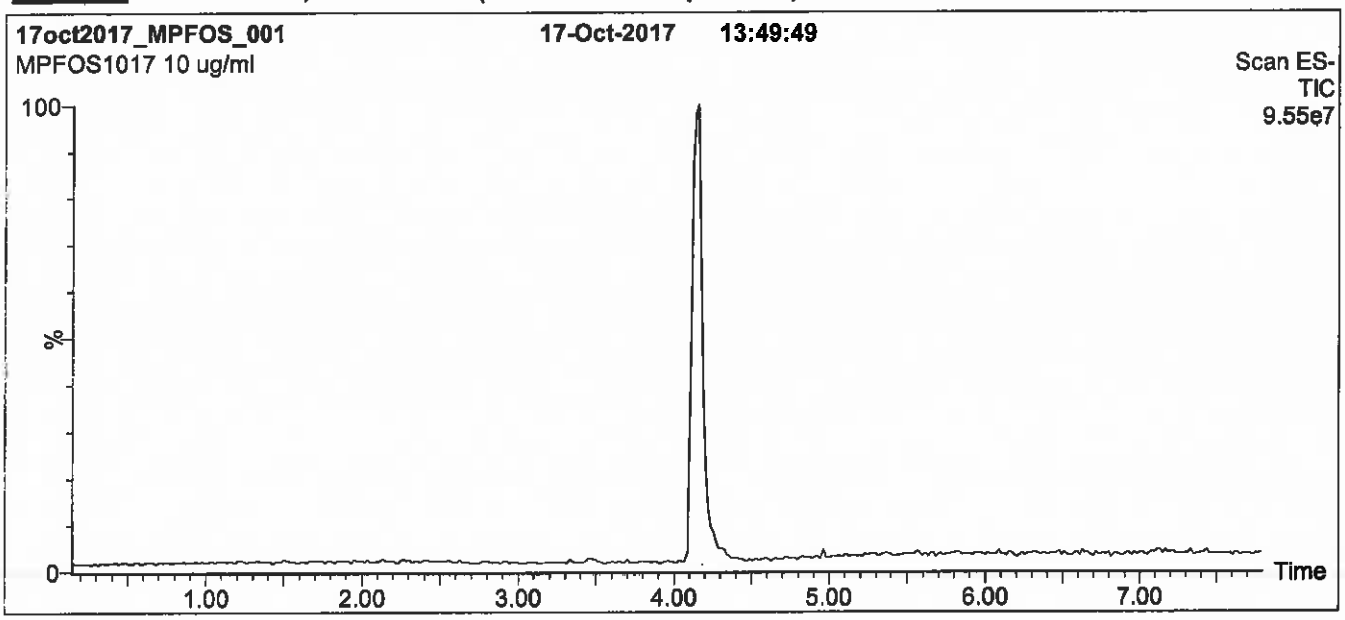

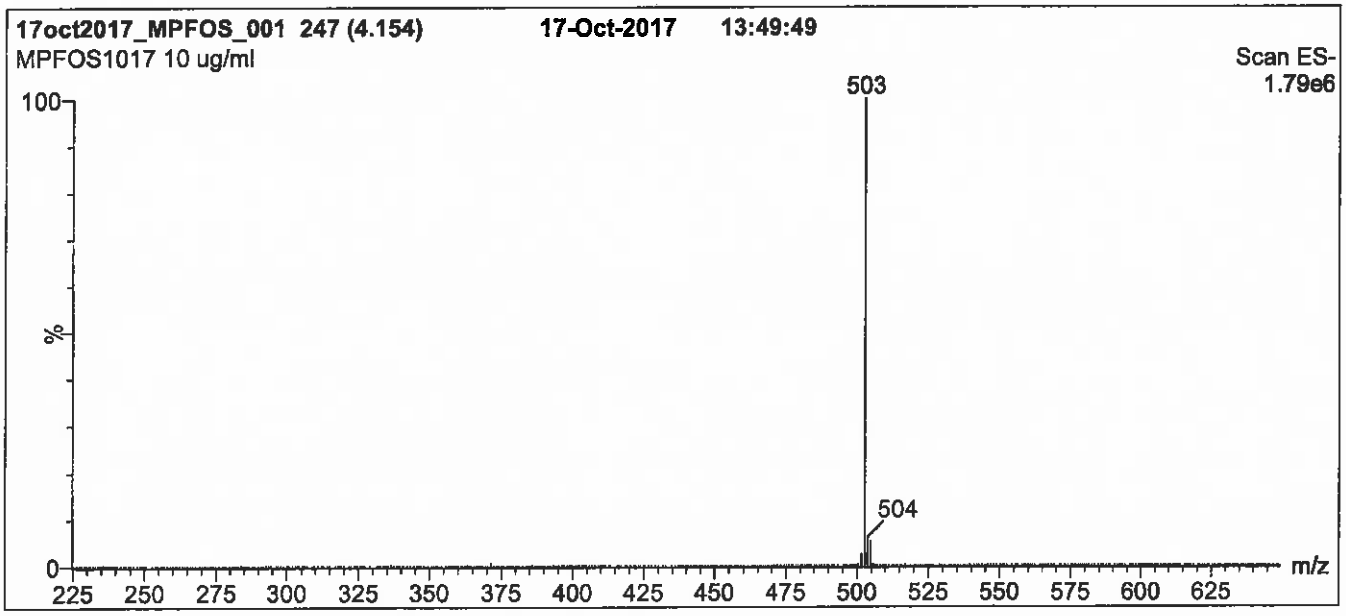

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MS: **Micromass Quattro *micro* API MS**

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

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

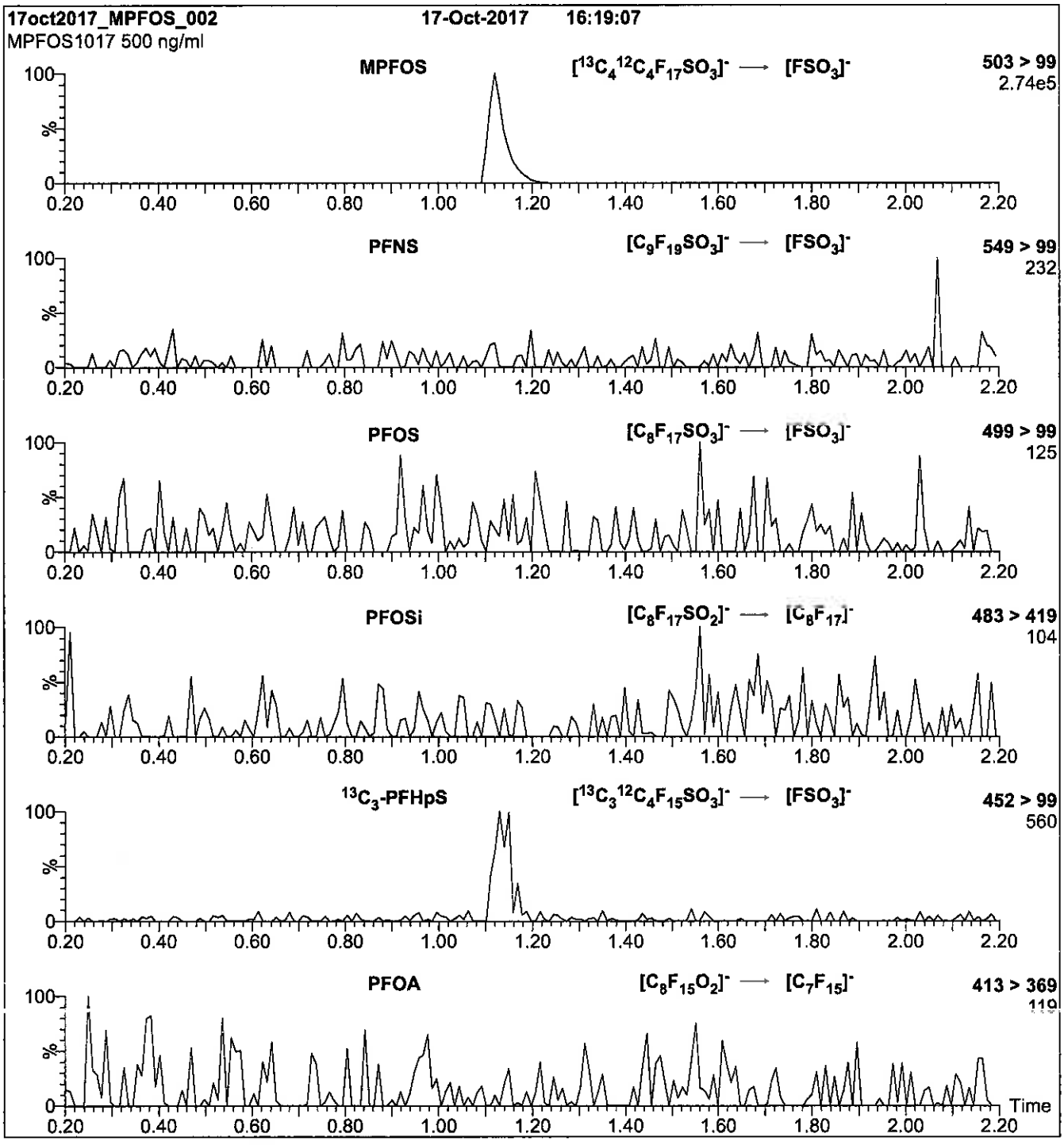
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00014

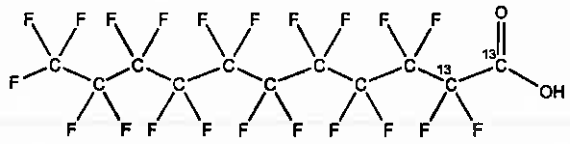
1106187
ID: LCMPFUdA_00014
Exp: 11/22/21 Prpd: CCL
13C2-Perfluoroundecanoic

R: 12/4/17 ccl

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFUdA	**LOT NUMBER:**	MPFUdA1116
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2021		
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DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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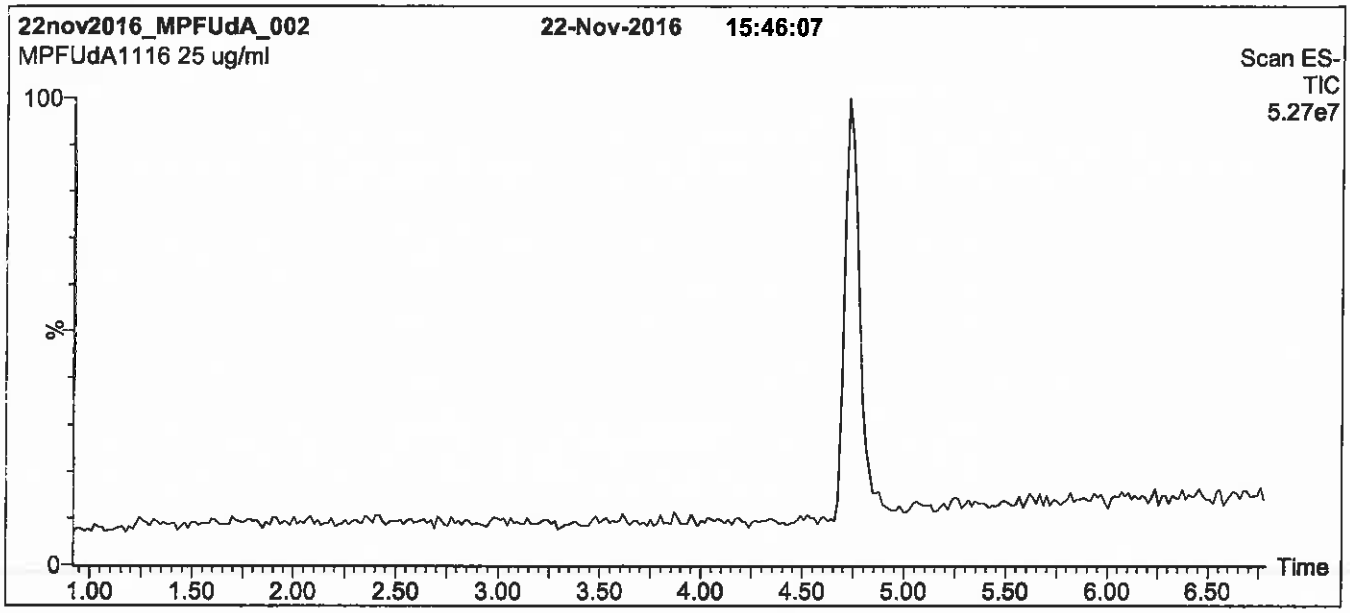
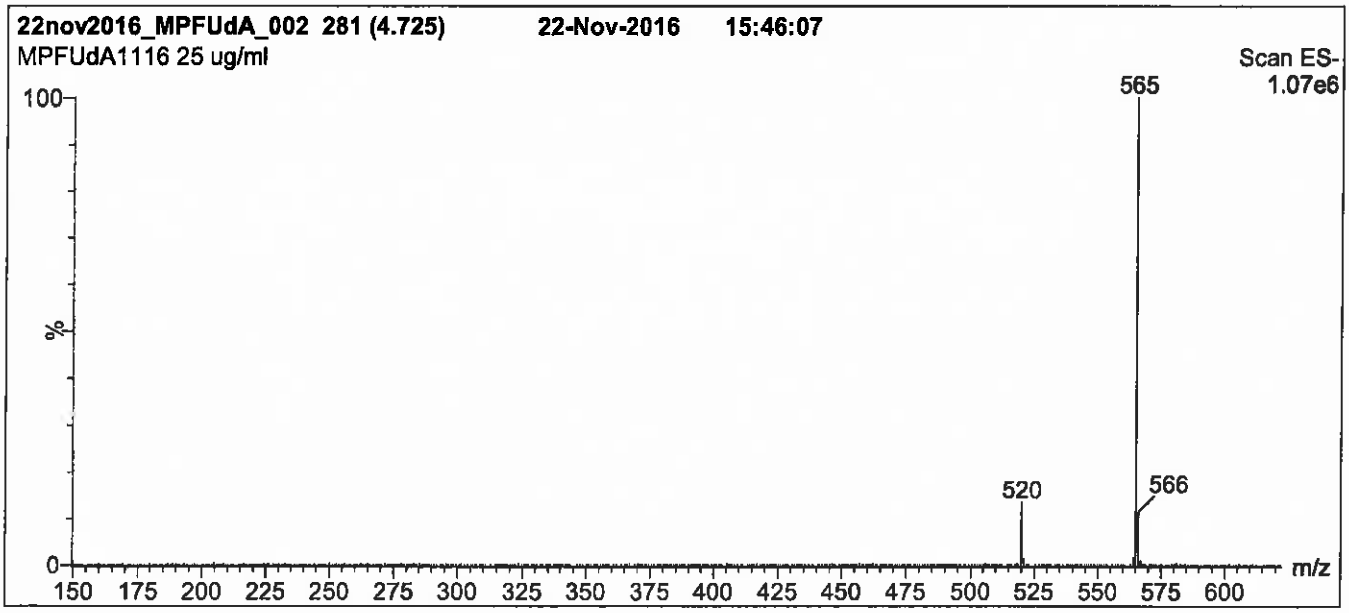
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

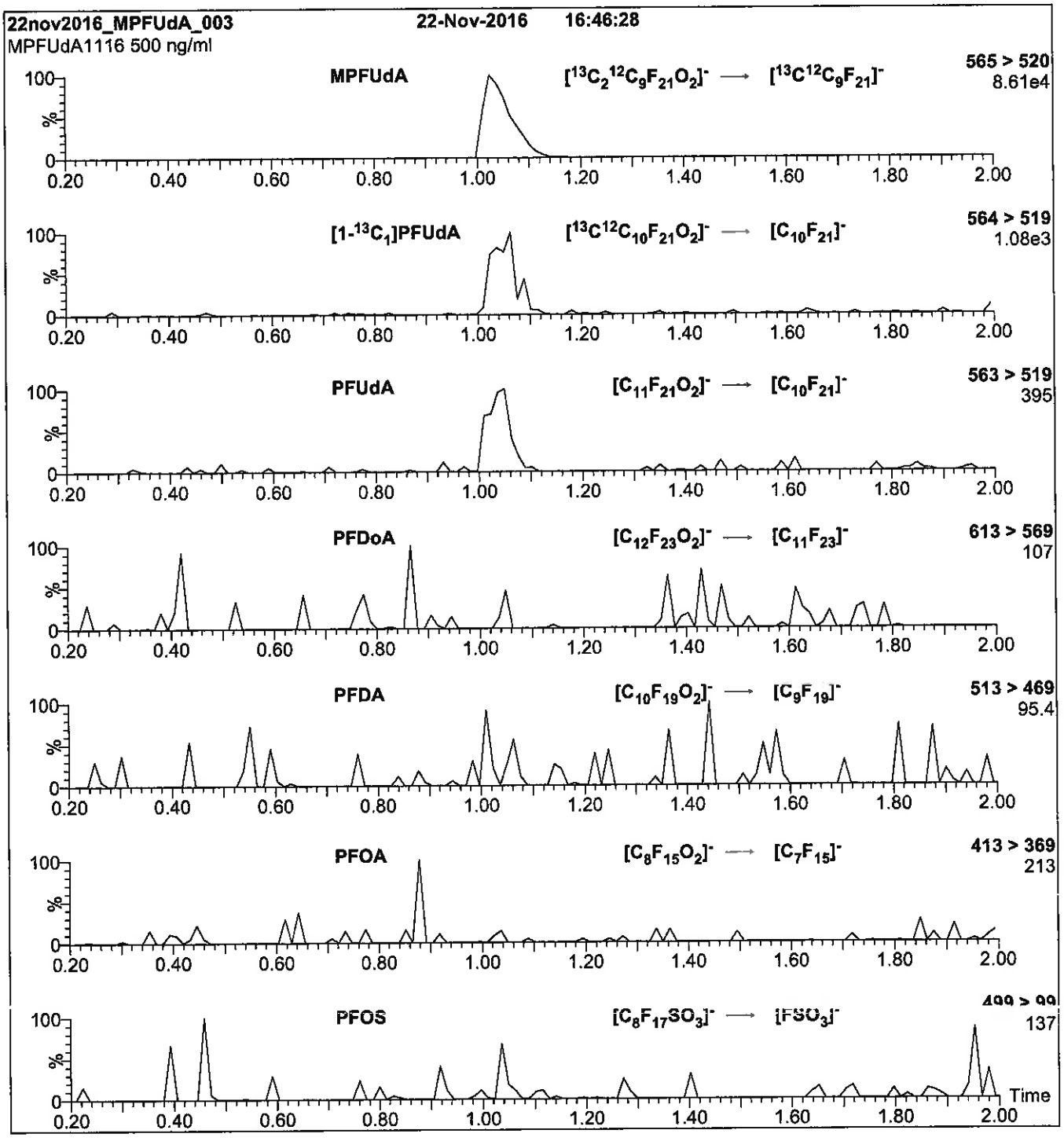
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

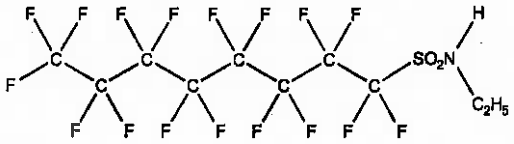
LCN-EtFOSA-M_00005

R: 12/20/16 SK✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSA-M	**LOT NUMBER:**	NEtFOSA0516M
COMPOUND:	N-ethylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	4151-50-2



MOLECULAR FORMULA:	$C_{10}H_5F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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UNCERTAINTY:

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

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

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

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

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

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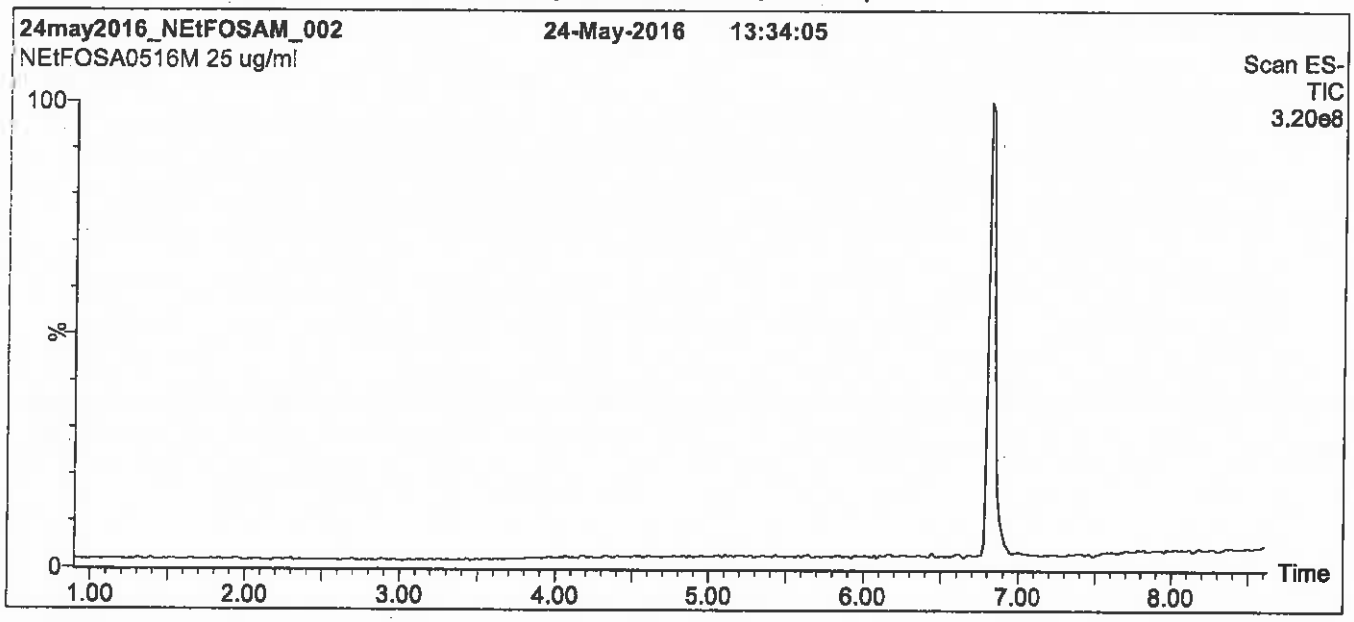
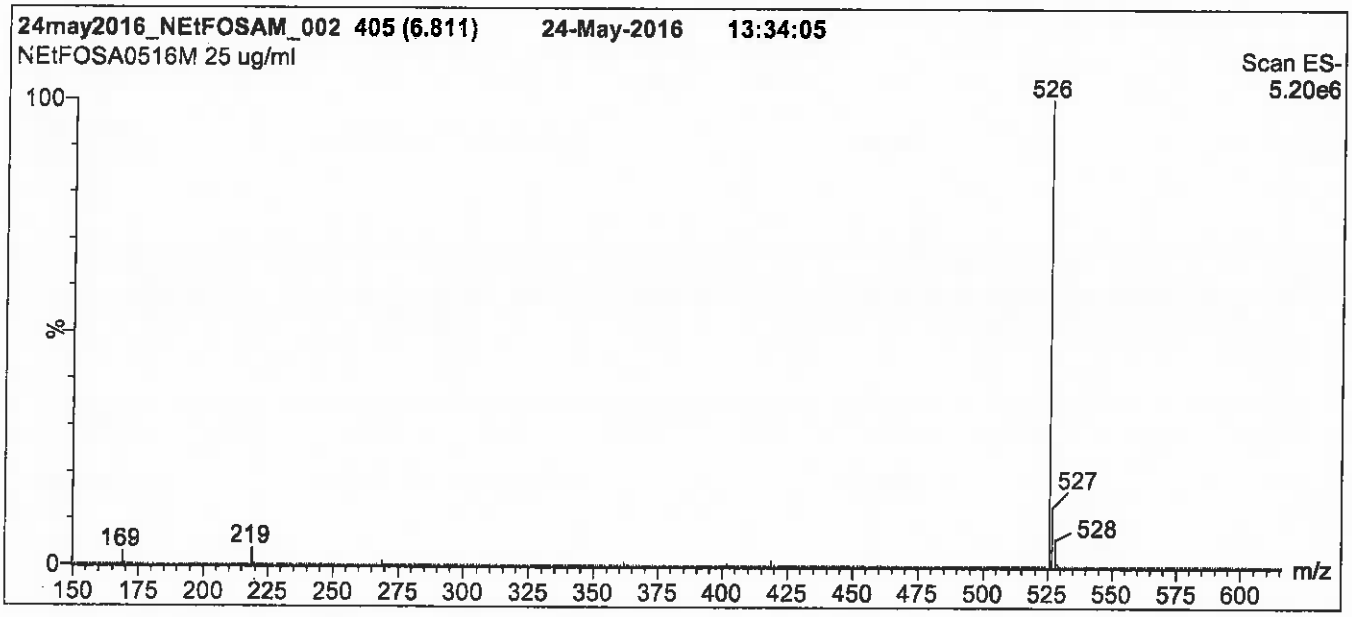
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

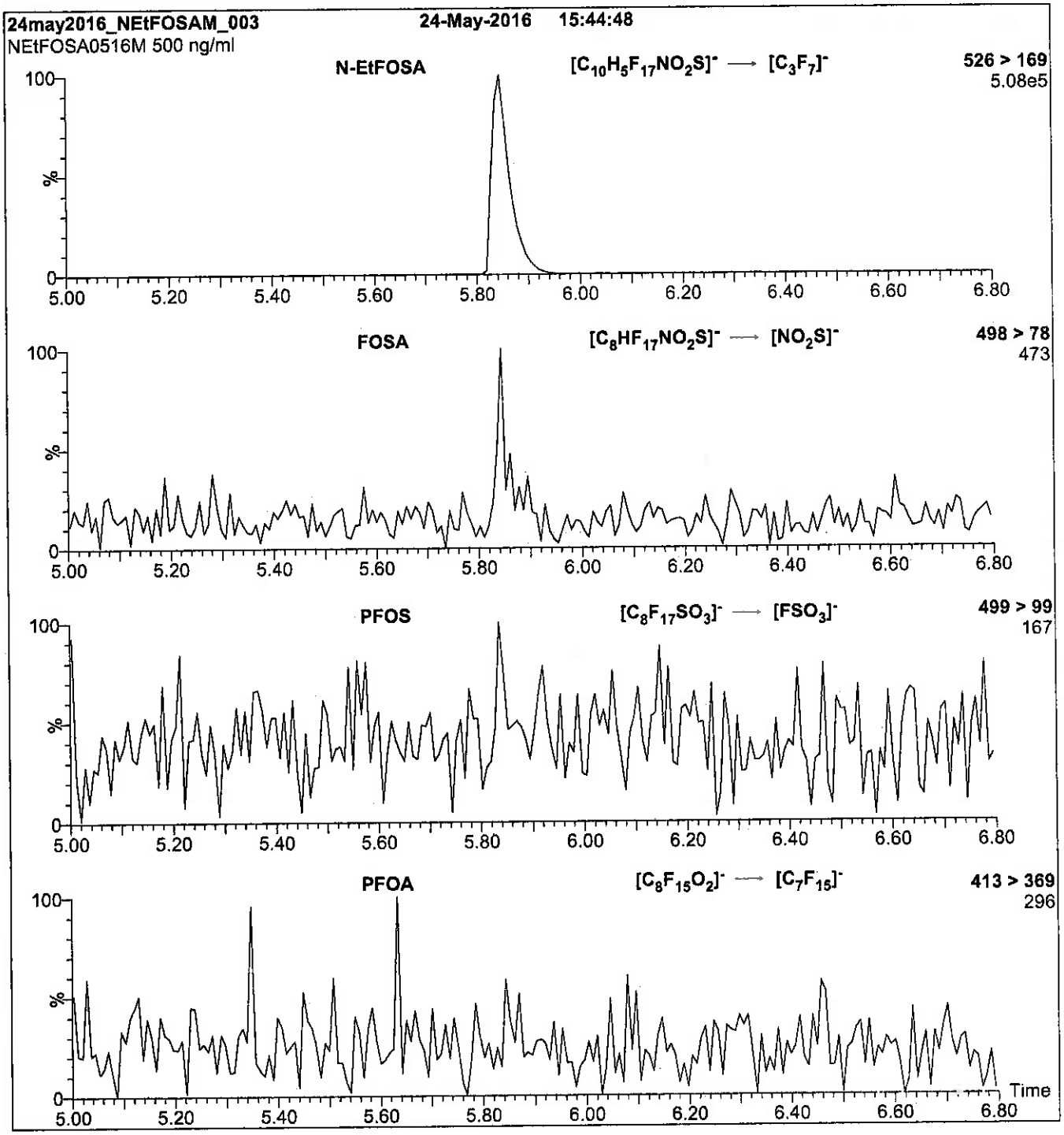
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

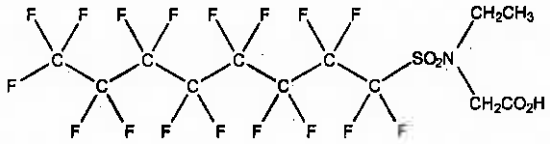
LCN-EtFOSAA_00004

P: 12/29/16 SFV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

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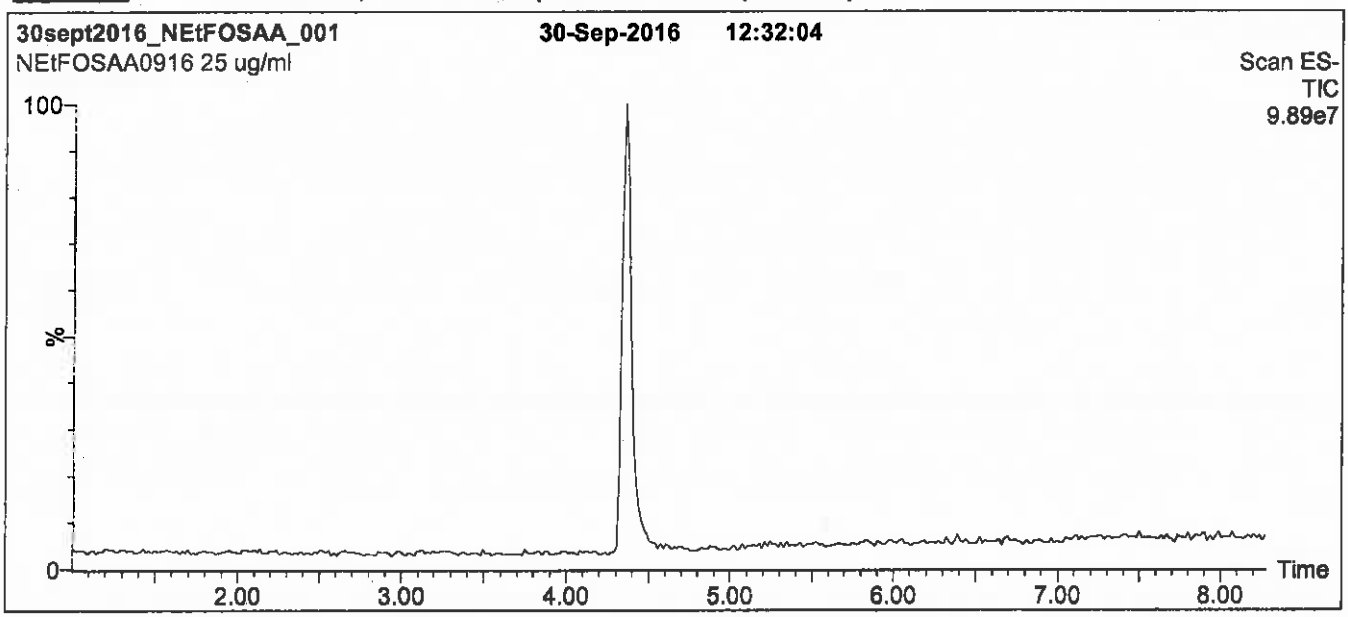
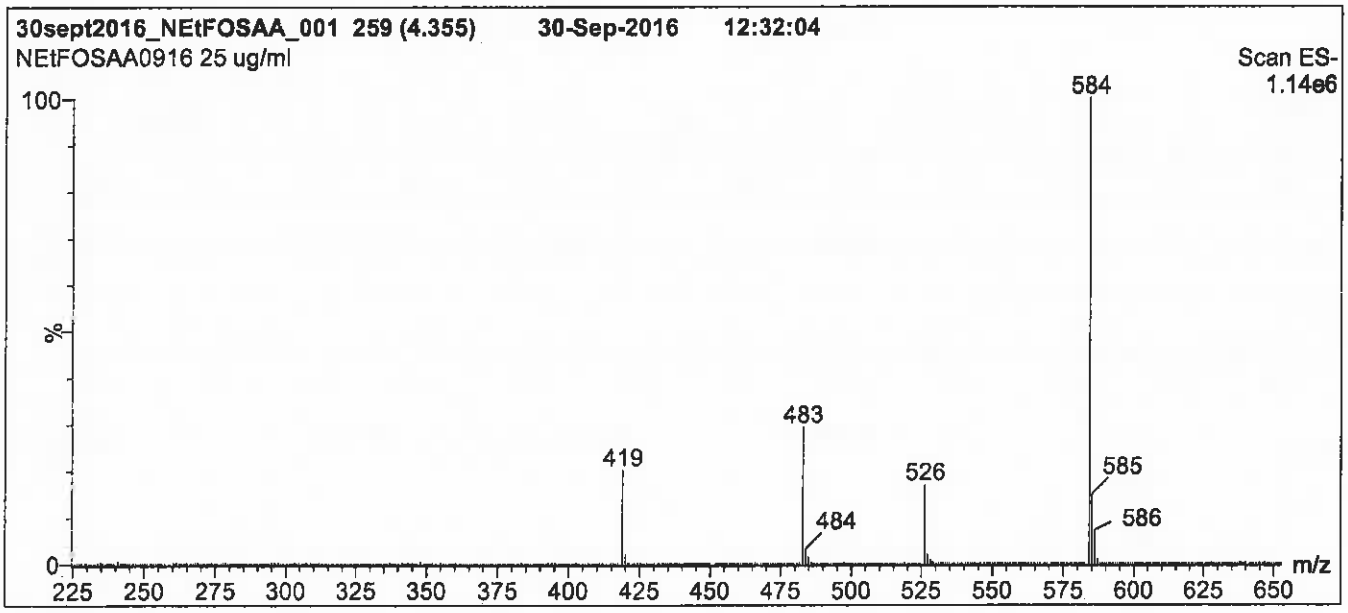
Figure 1: **N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

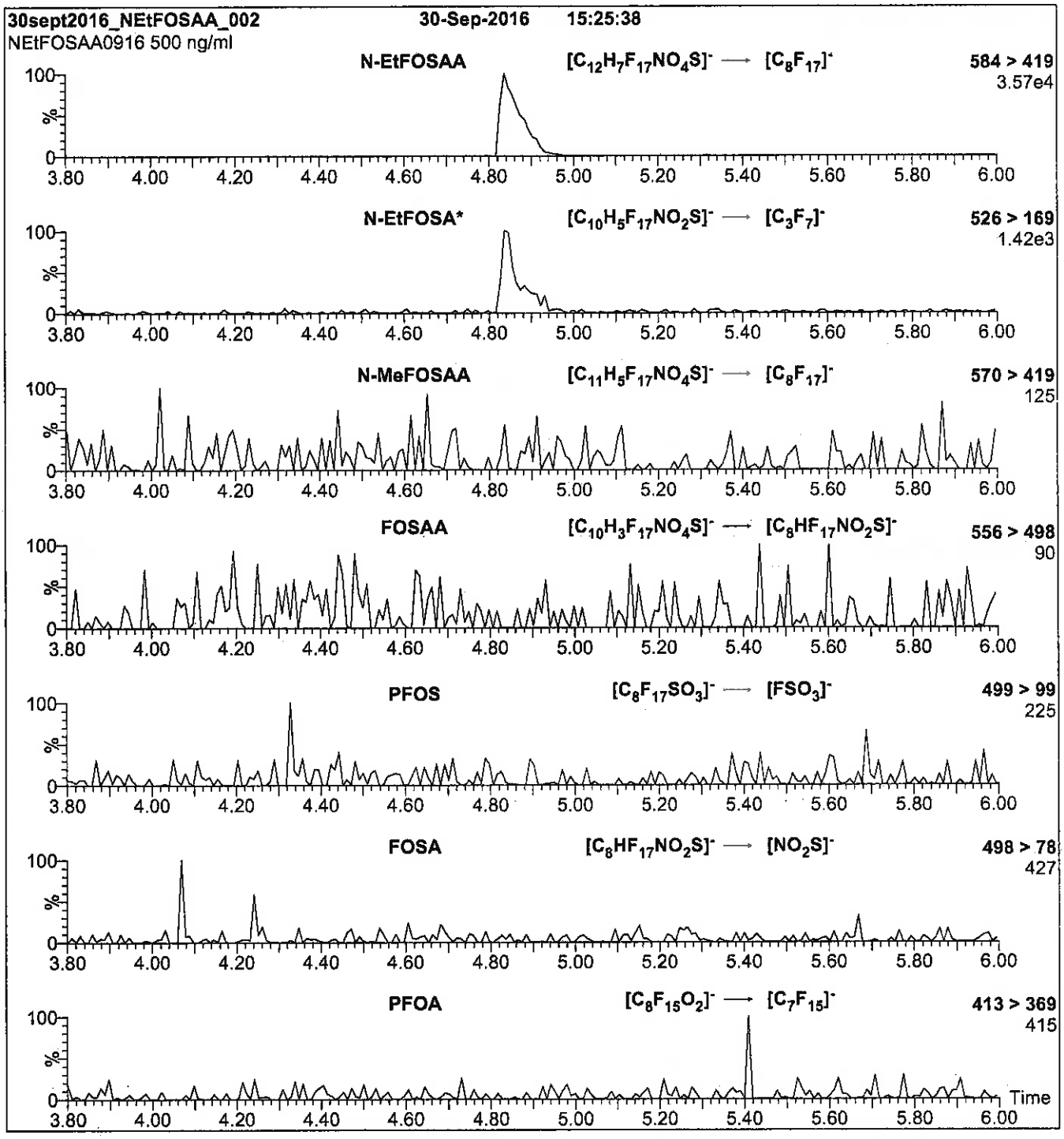
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



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

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

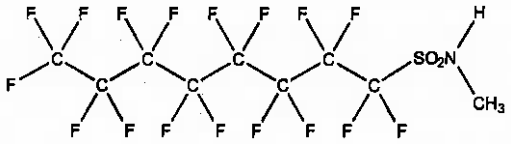
LCN-MeFOSA-M_00004

Pr 12/20/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	N-MeFOSA-M	**LOT NUMBER:**	NMeFOSA0516M
COMPOUND:	N-methylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	31506-32-8



MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 05/26/2016 (mm/dd/yyyy)

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ANAB ACCREDITED

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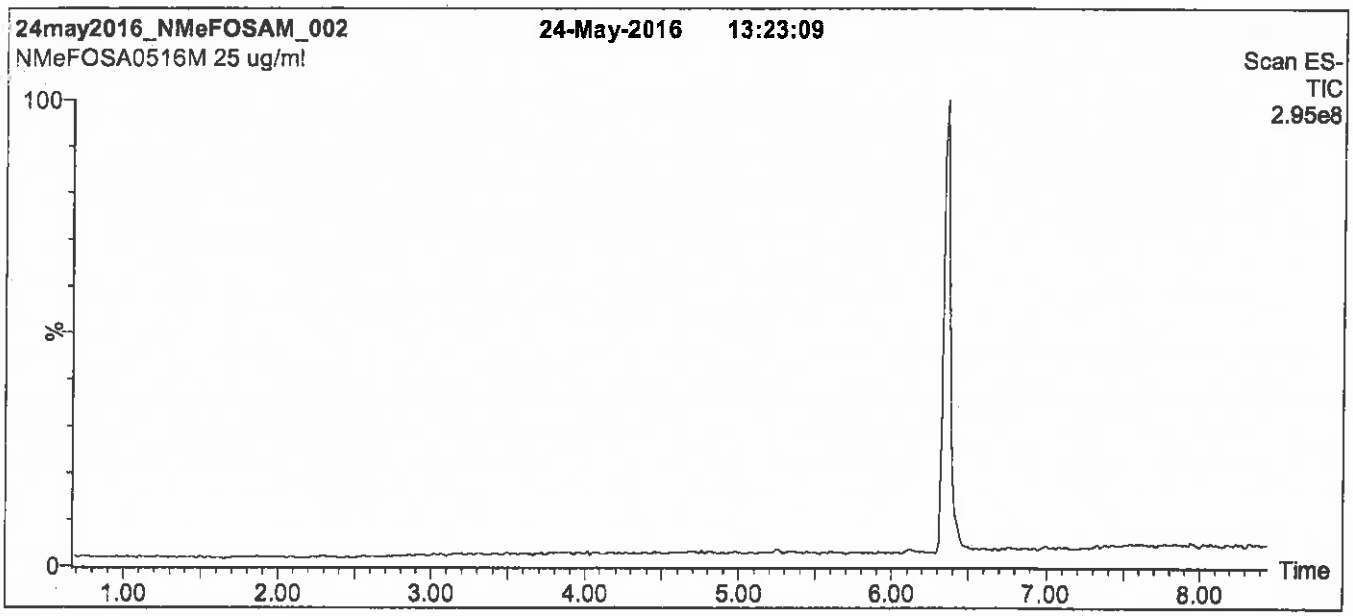
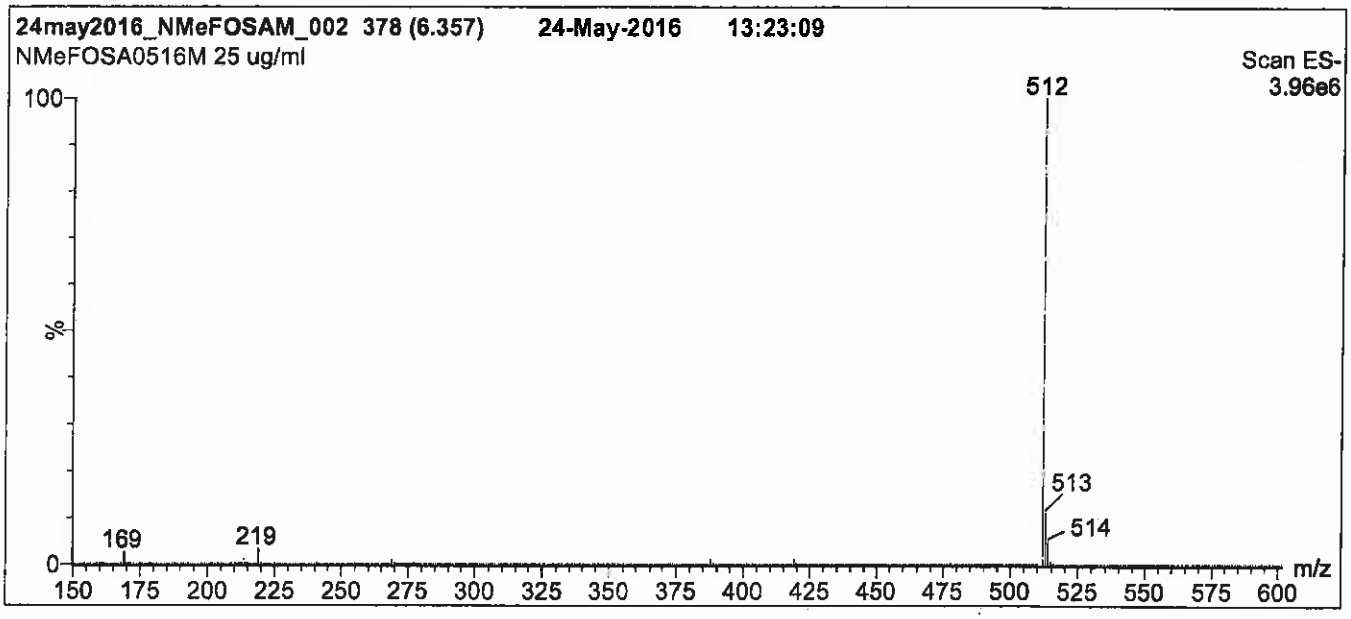
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

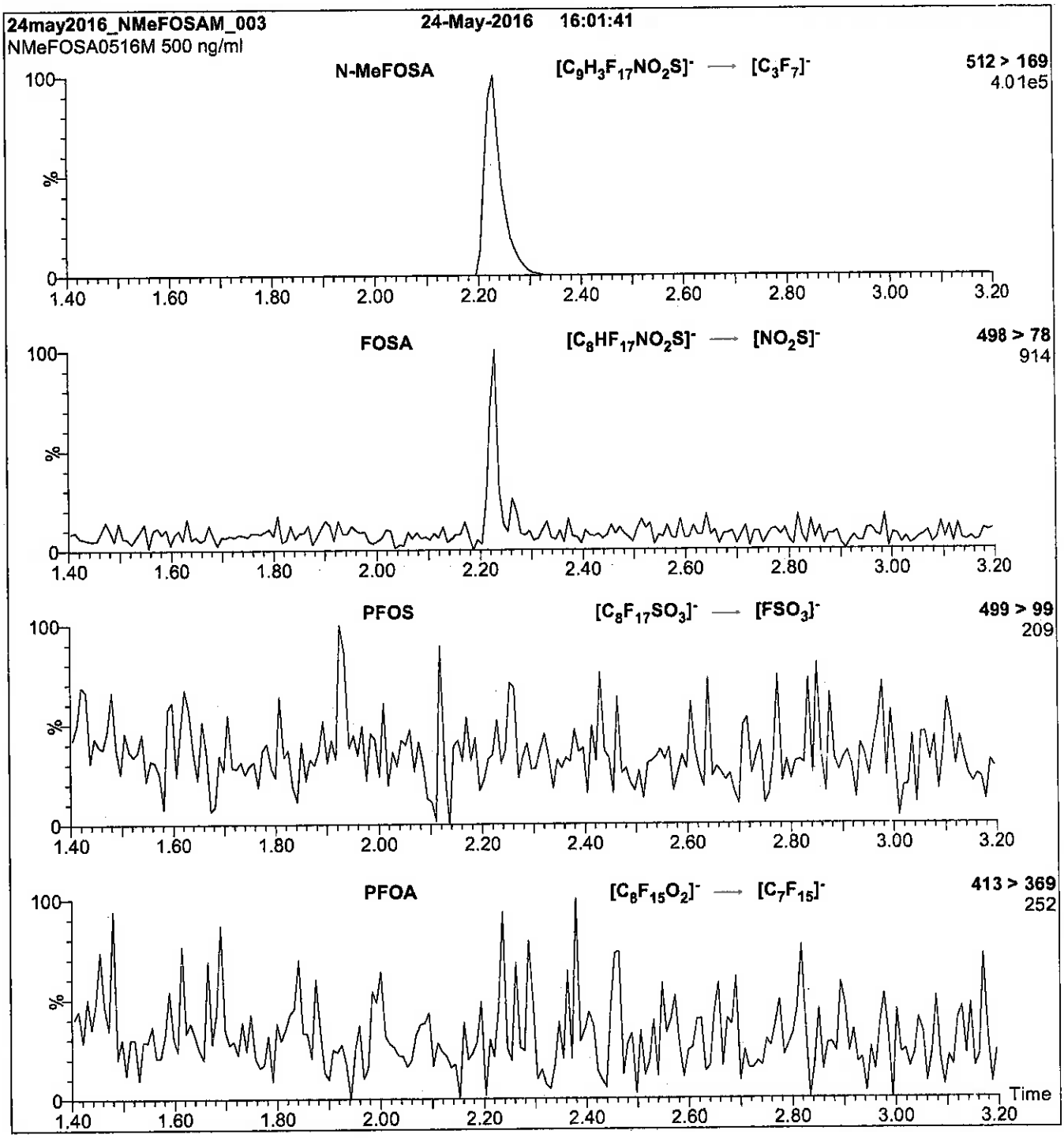
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00004

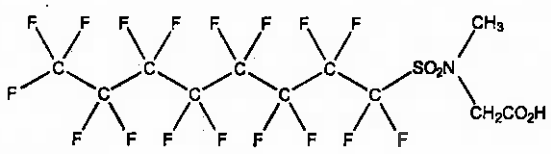
P: R/28/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

STRUCTURE: **CAS #:** 2355-31-9



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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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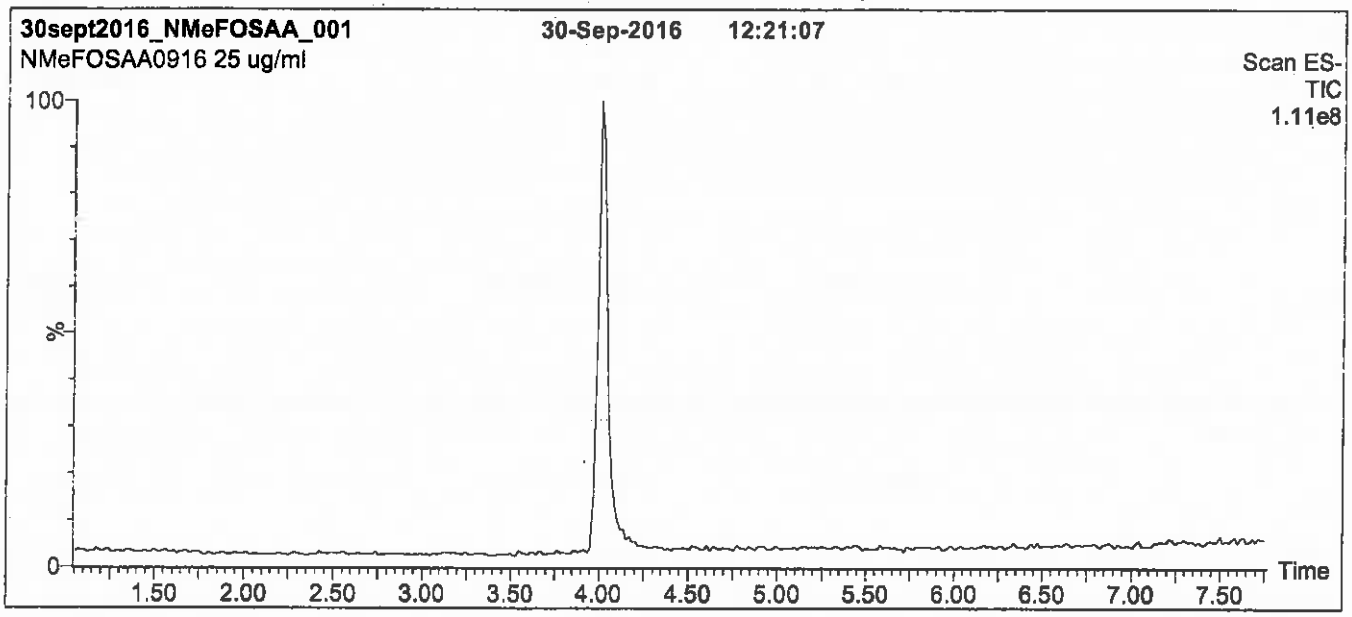
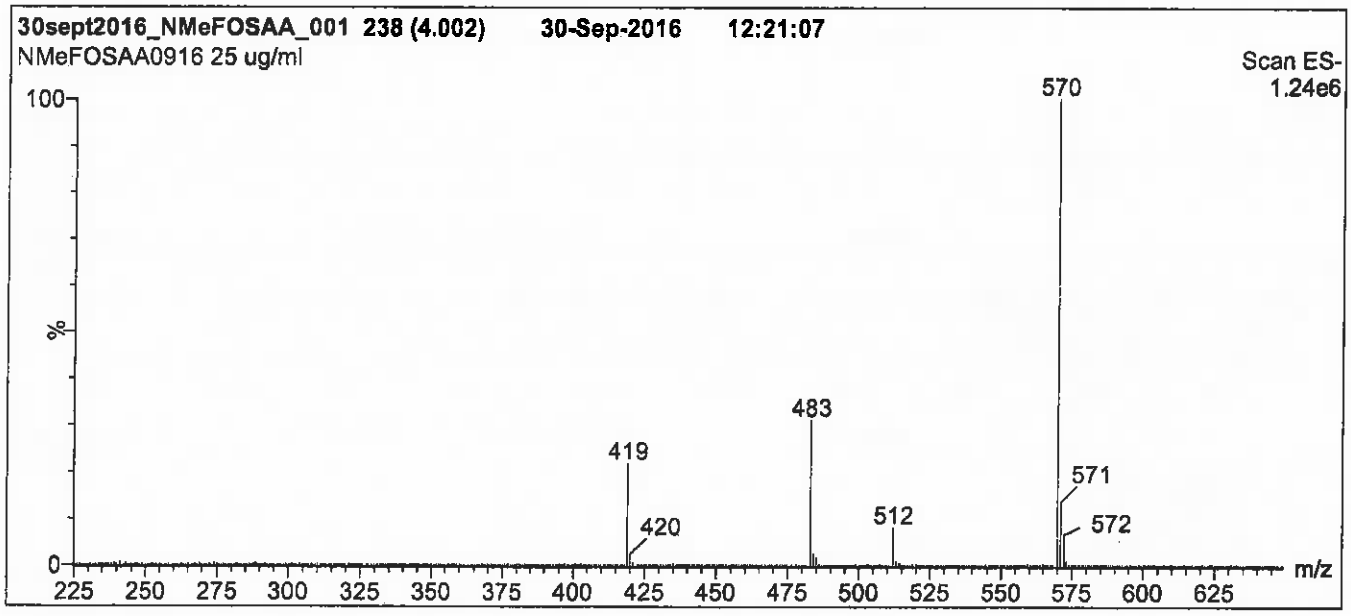
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

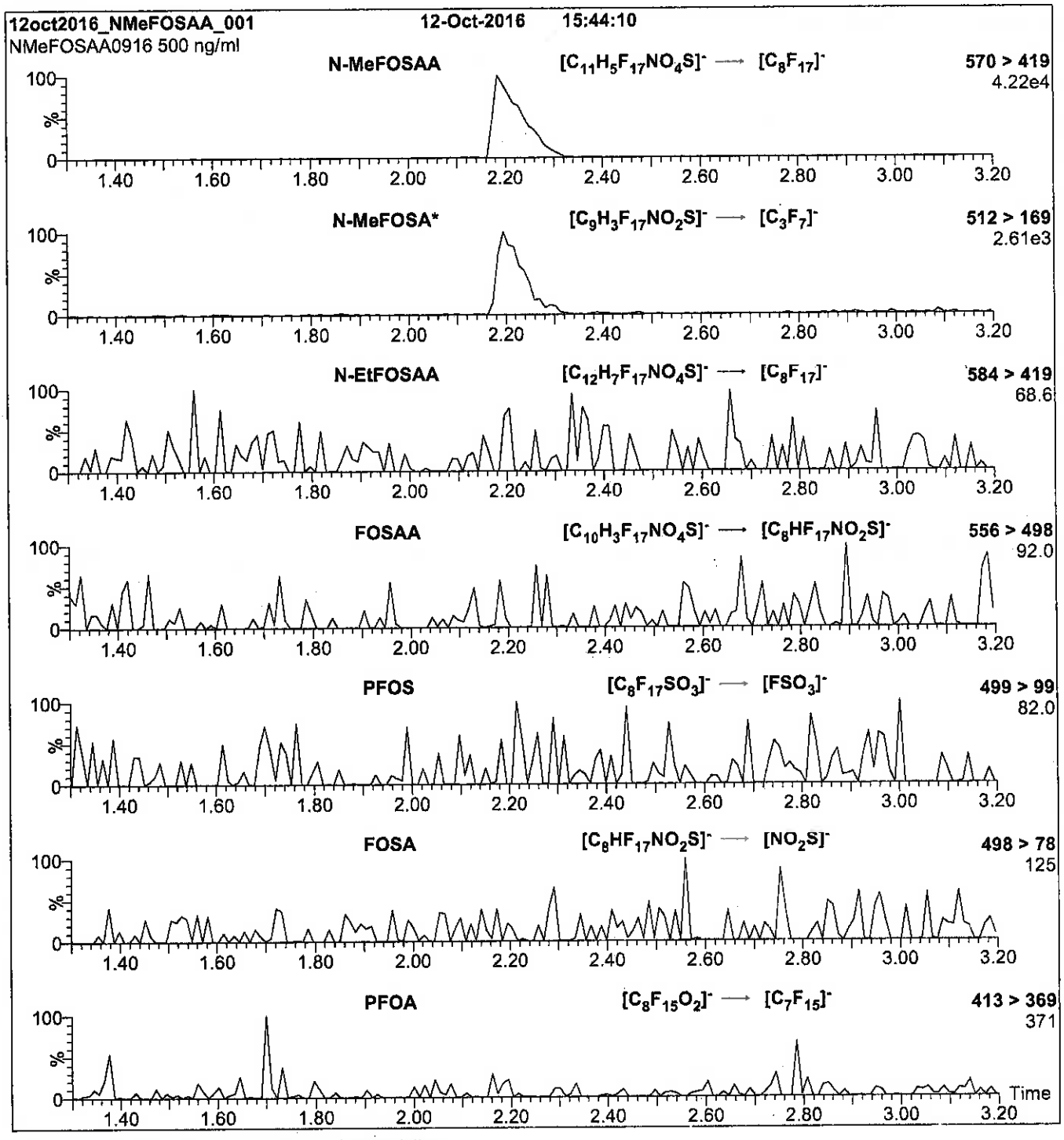
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



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

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 20

Reagent

LCN-MeFOSAA_00005

P: R/28/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

STRUCTURE:
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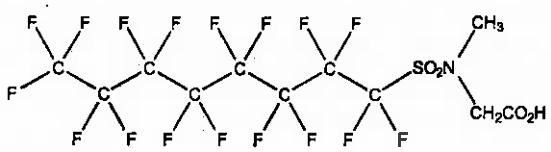

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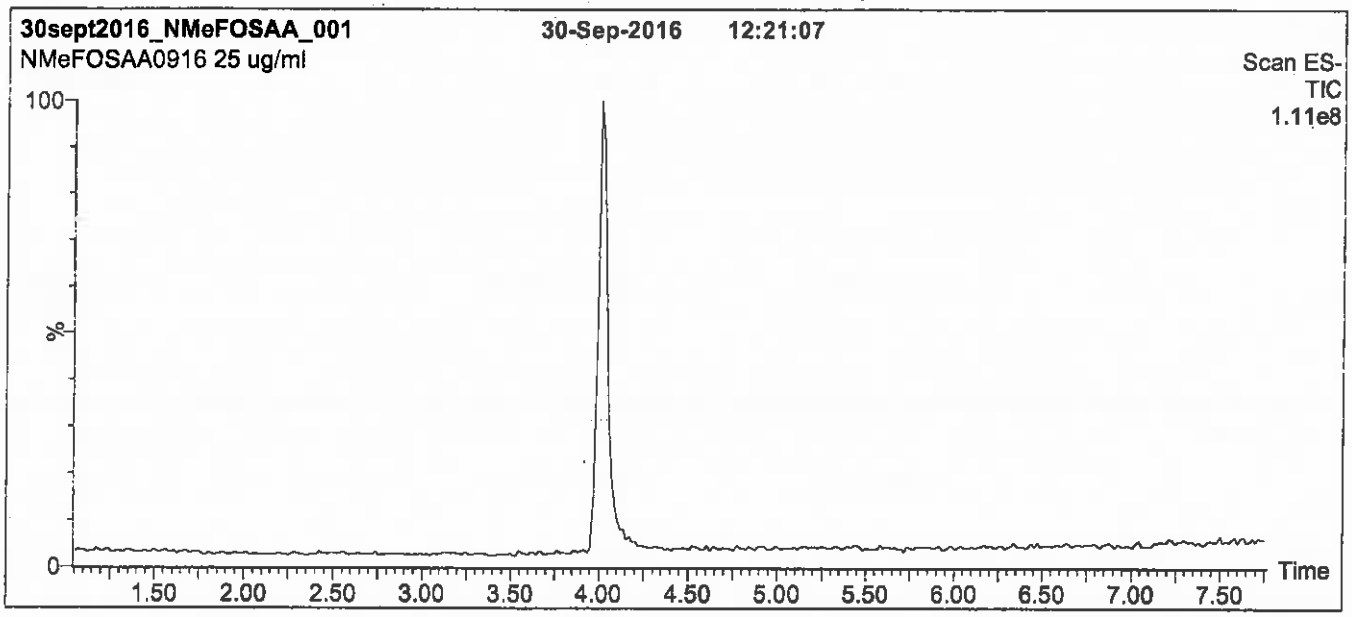

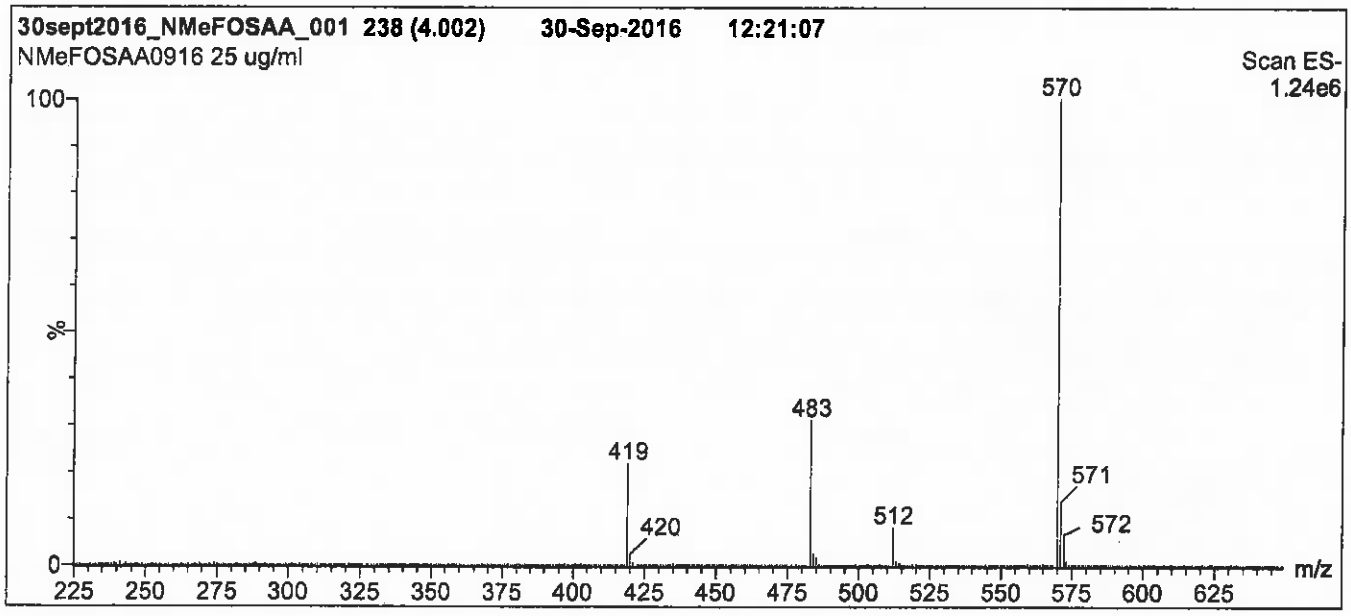

Conditions for Figure 1:

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

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

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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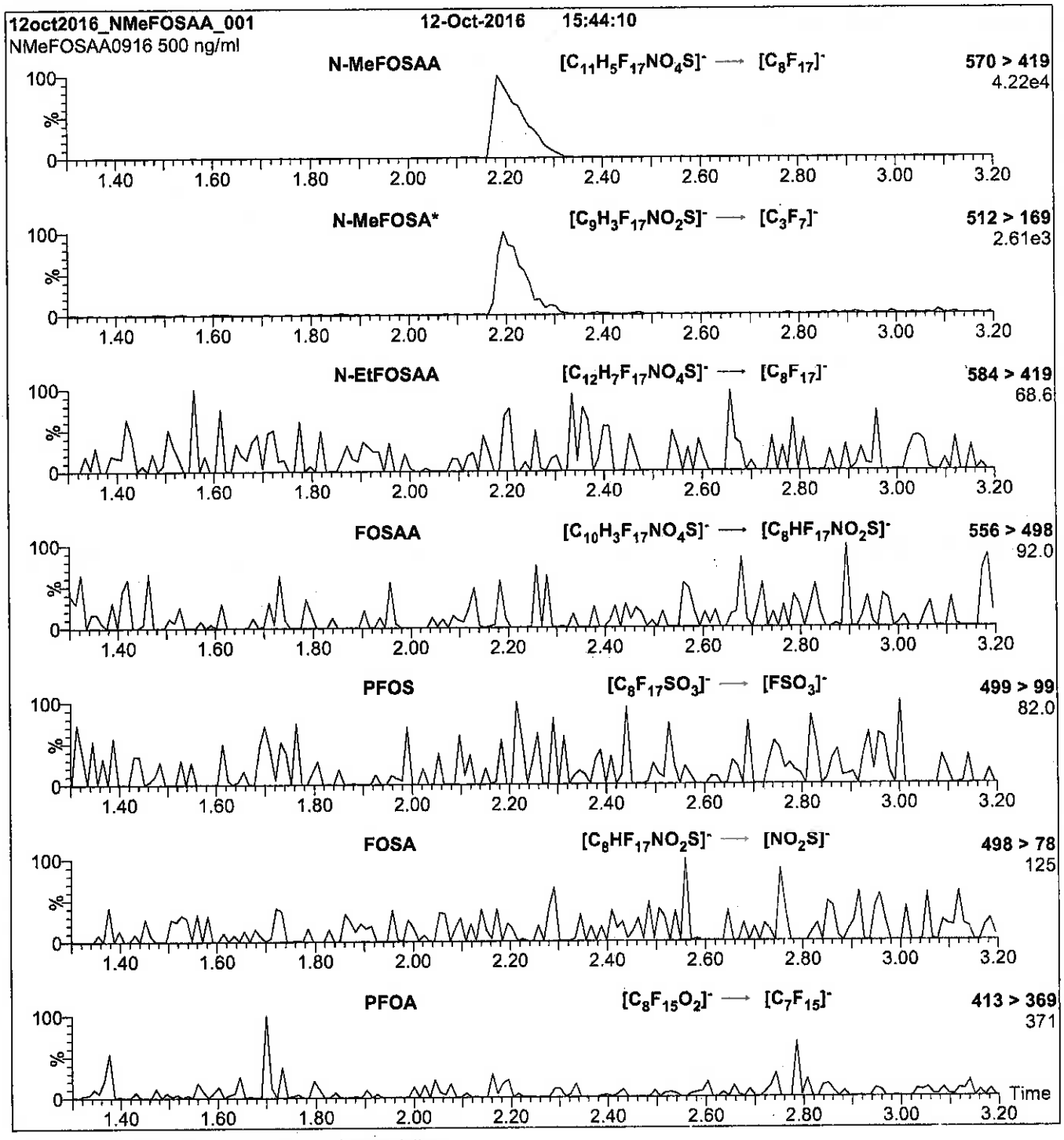
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



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

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 20

Reagent

LCPFAC-24PAR_00001

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-24PAR

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

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

DESCRIPTION:

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

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

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: Isomeric Components and Percent Composition of PFHxSK
Table C: Isomeric Components and Percent Composition of PFOSK
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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UNCERTAINTY:

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CALA

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

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

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

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

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

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR	
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9	18.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0	
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9	
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2	
7	Other Unidentified Isomers		0.5	

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

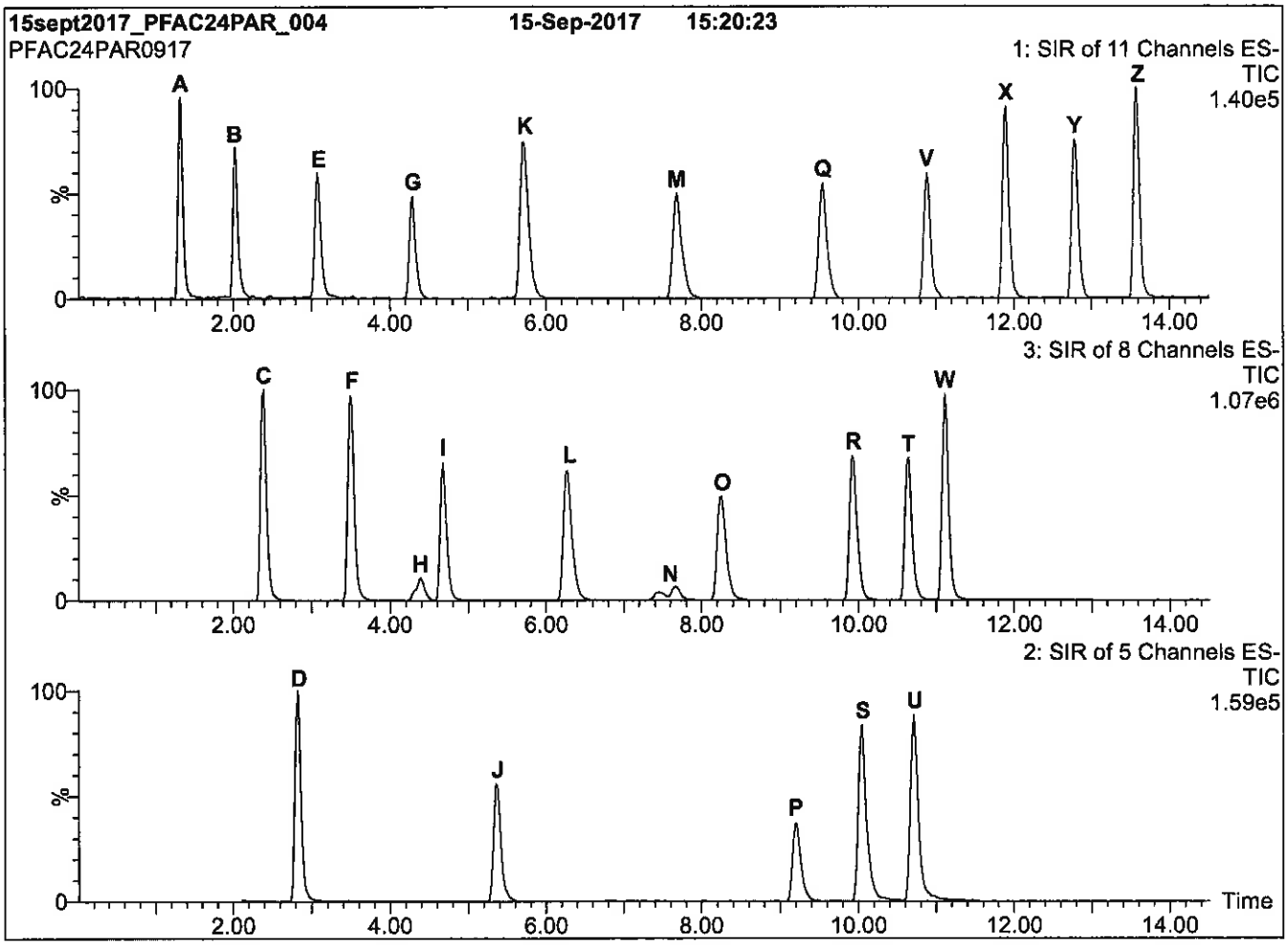
Table C: **PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR	
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2	21.1
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6	
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9	
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2	
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5	
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0	
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3C(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2	
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.03	
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.4	
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07	

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

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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

Flow: 300 µl/min

MS Parameters

Experiment: SIR

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

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

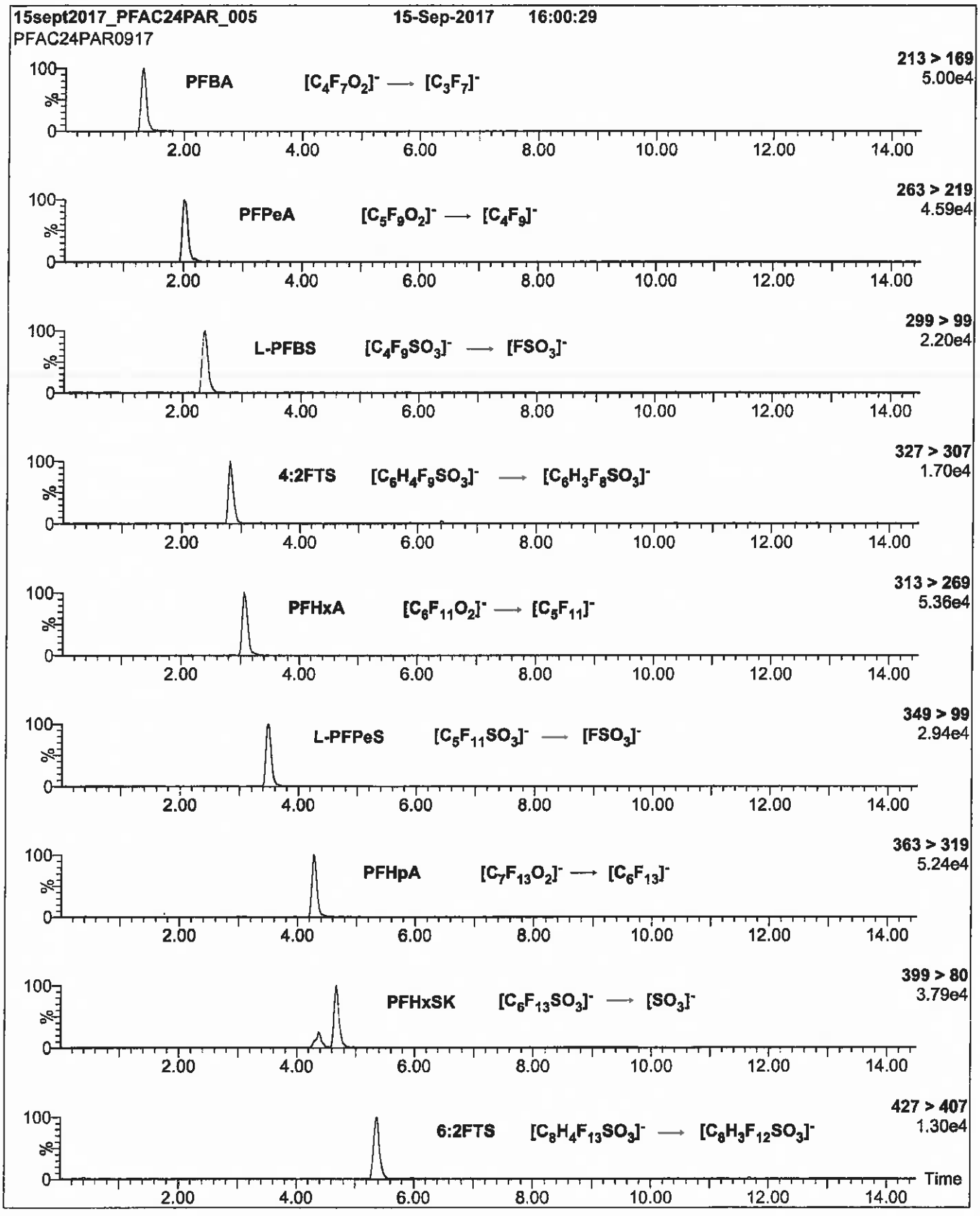


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**

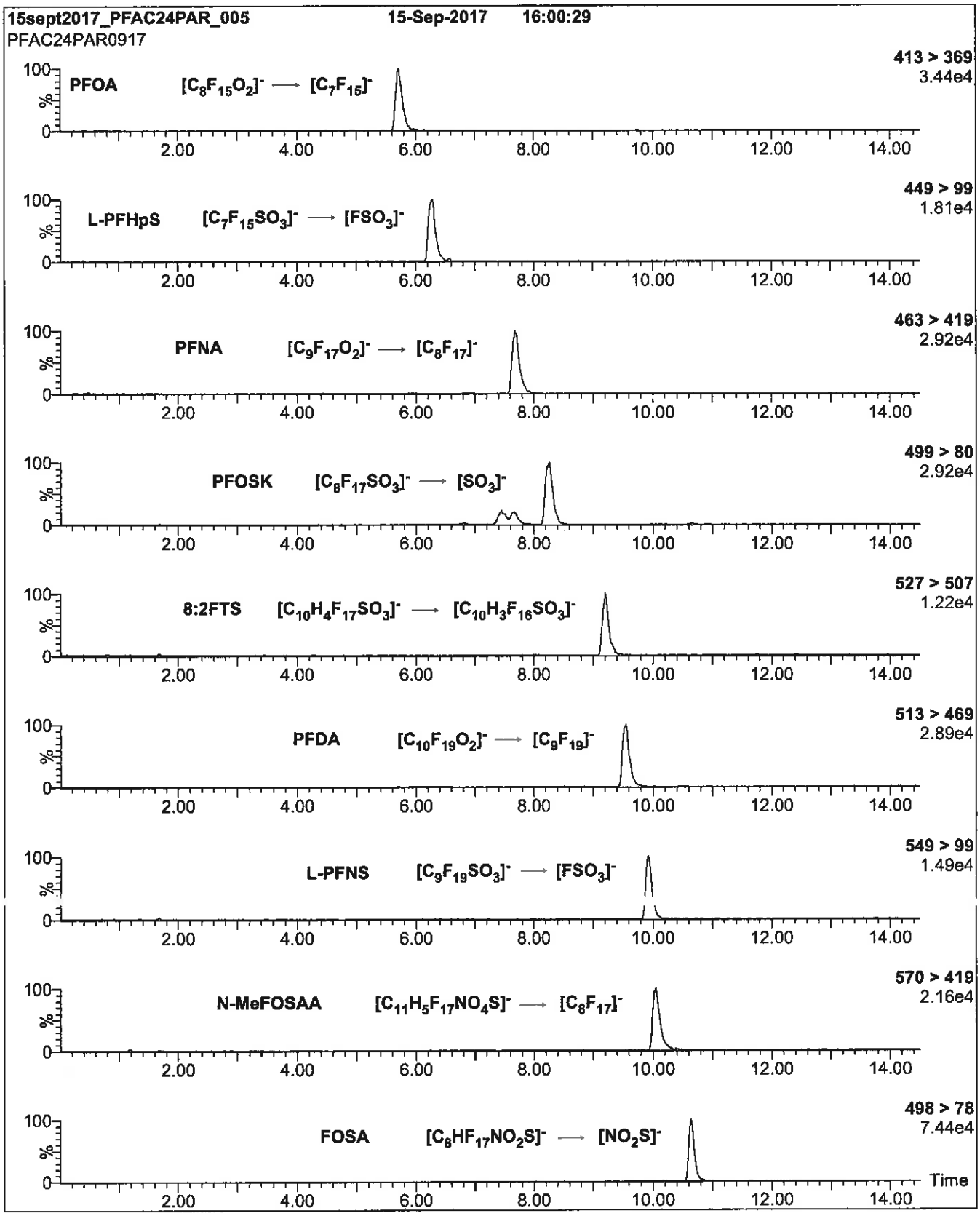
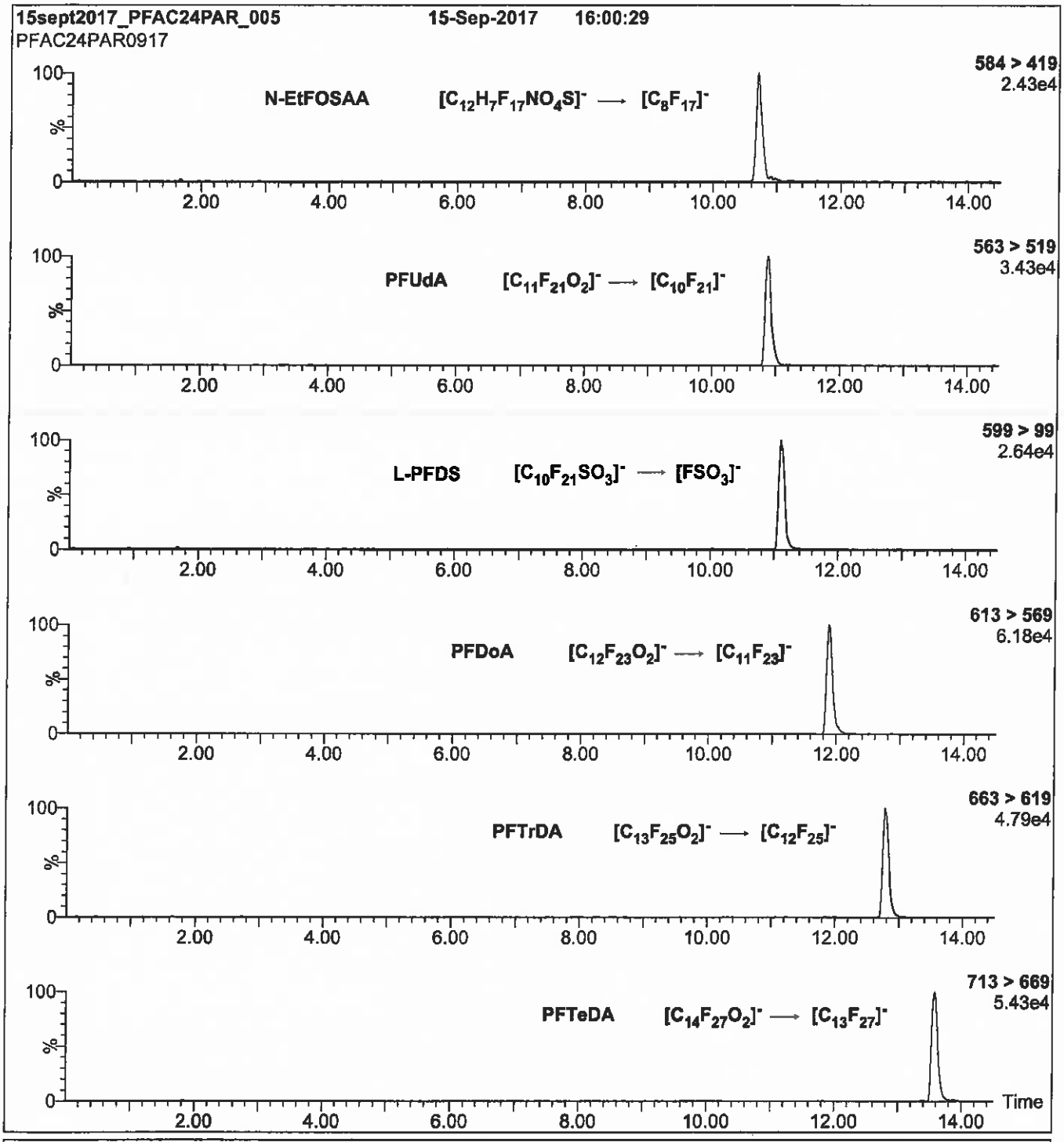


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFAC-24PAR)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3

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

Reagent

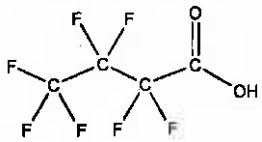
LCPFBA_00007

r: 12/20/16 SN
S

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/31/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

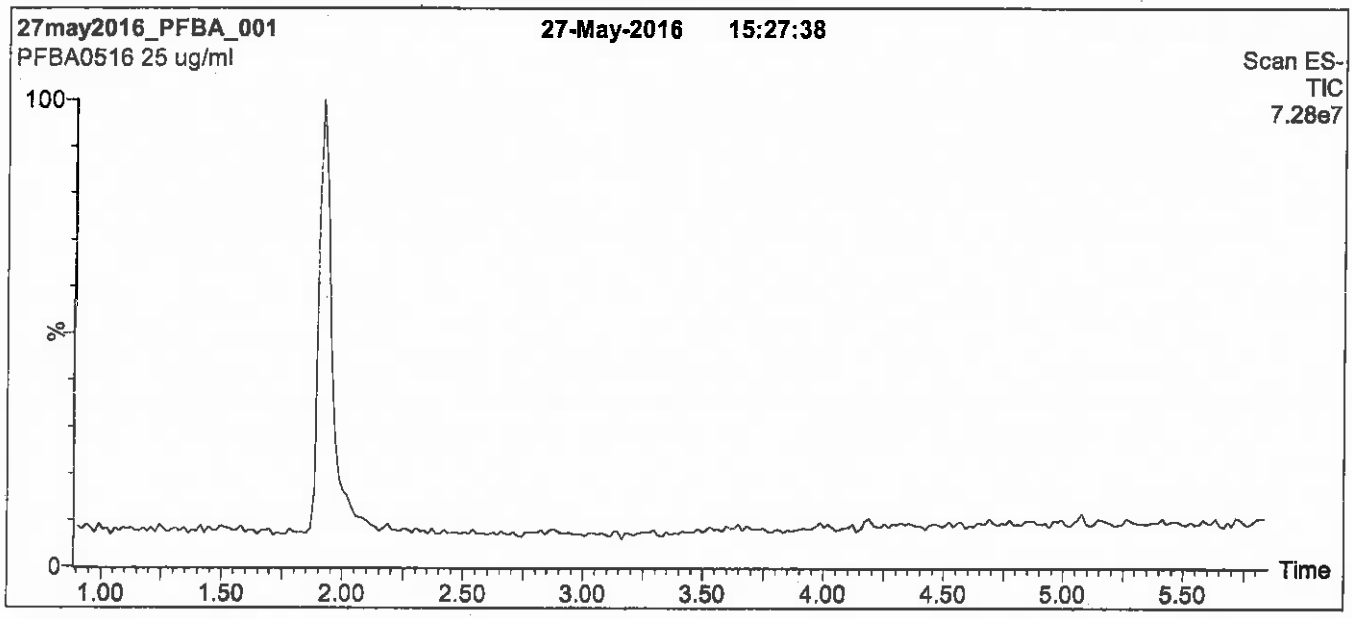
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

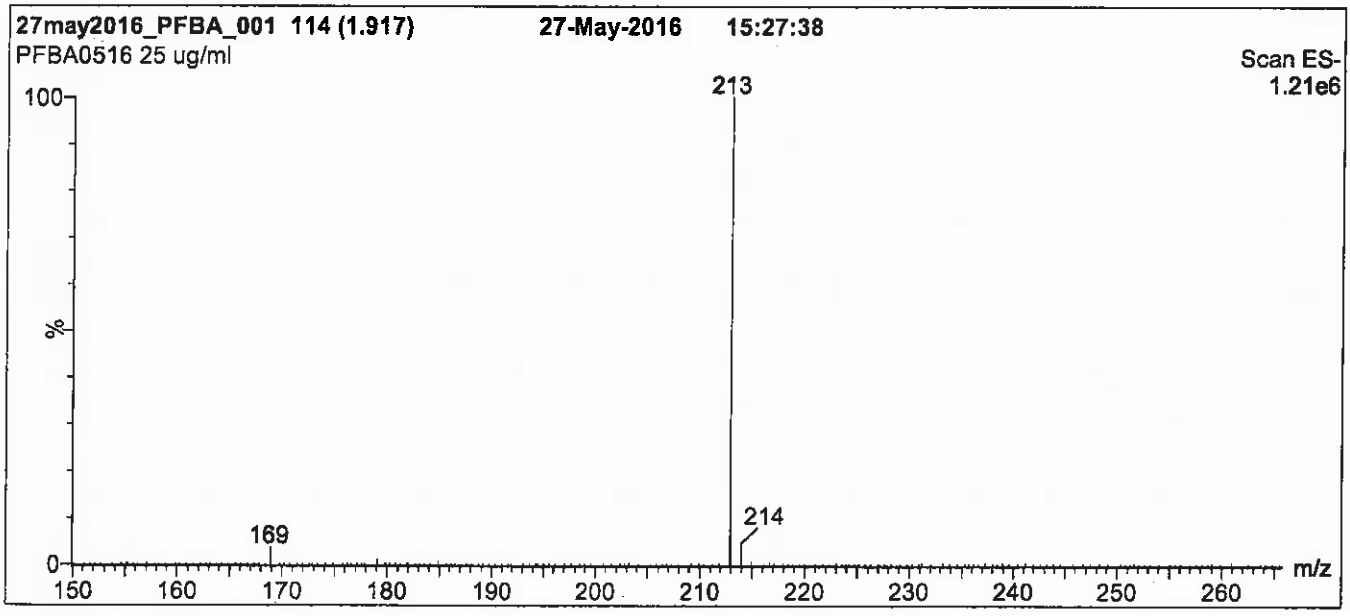
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

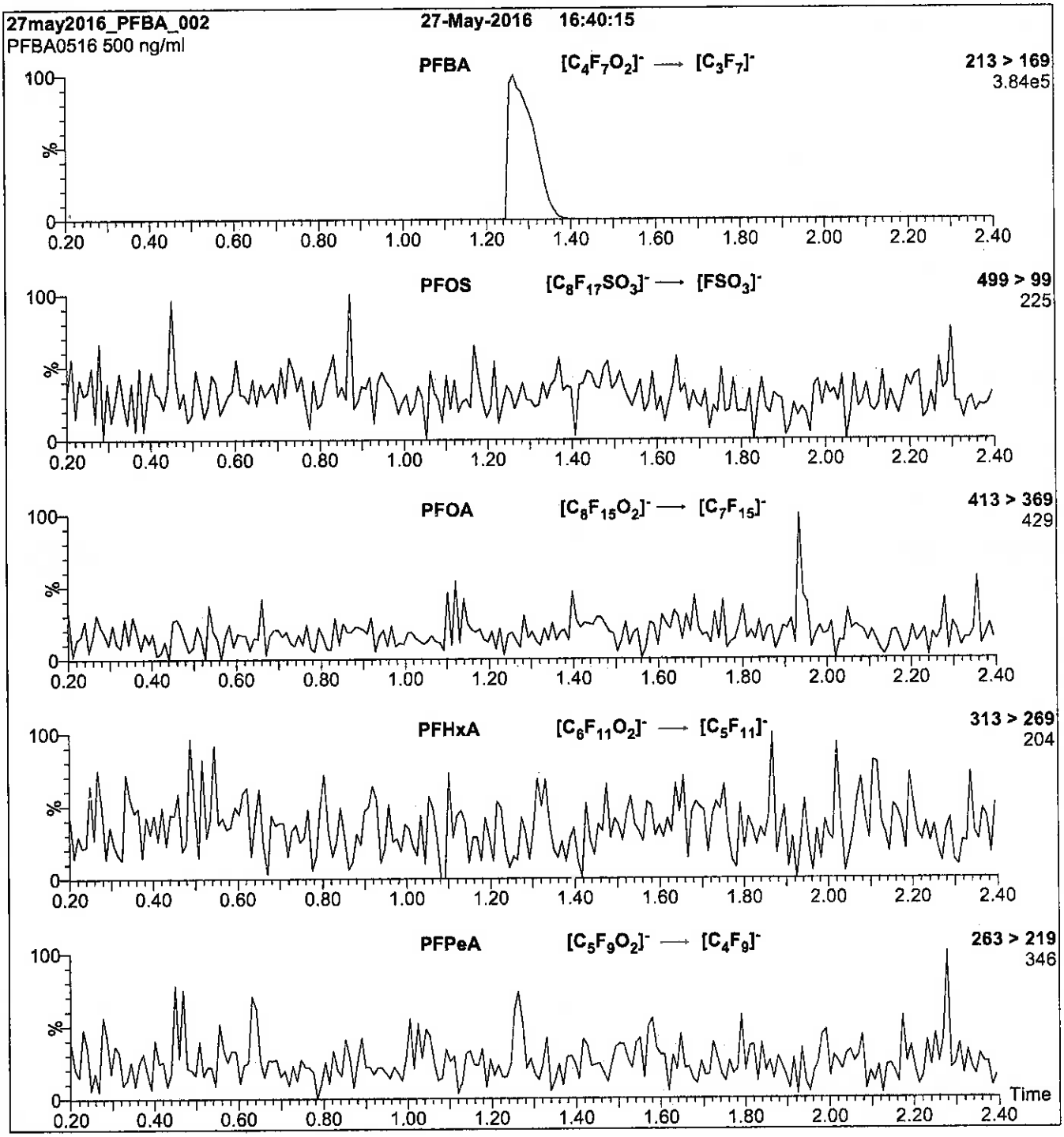
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00008

R: SBC 9/13/16

730724
ID: LCPFBS_00007
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

730725
ID: LCPFBS_00008
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

WELLINGTON LABORATORIES

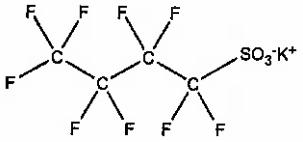
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: LPFBS0316

STRUCTURE:

CAS #: 29420-49-3



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**MOLECULAR WEIGHT:**	338.19
CONCENTRATION:	50.0 ± 2.5 µg/ml (K salt) 44.2 ± 2.2 µg/ml (PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	03/15/2016		
EXPIRY DATE: (mm/dd/yyyy)	03/15/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

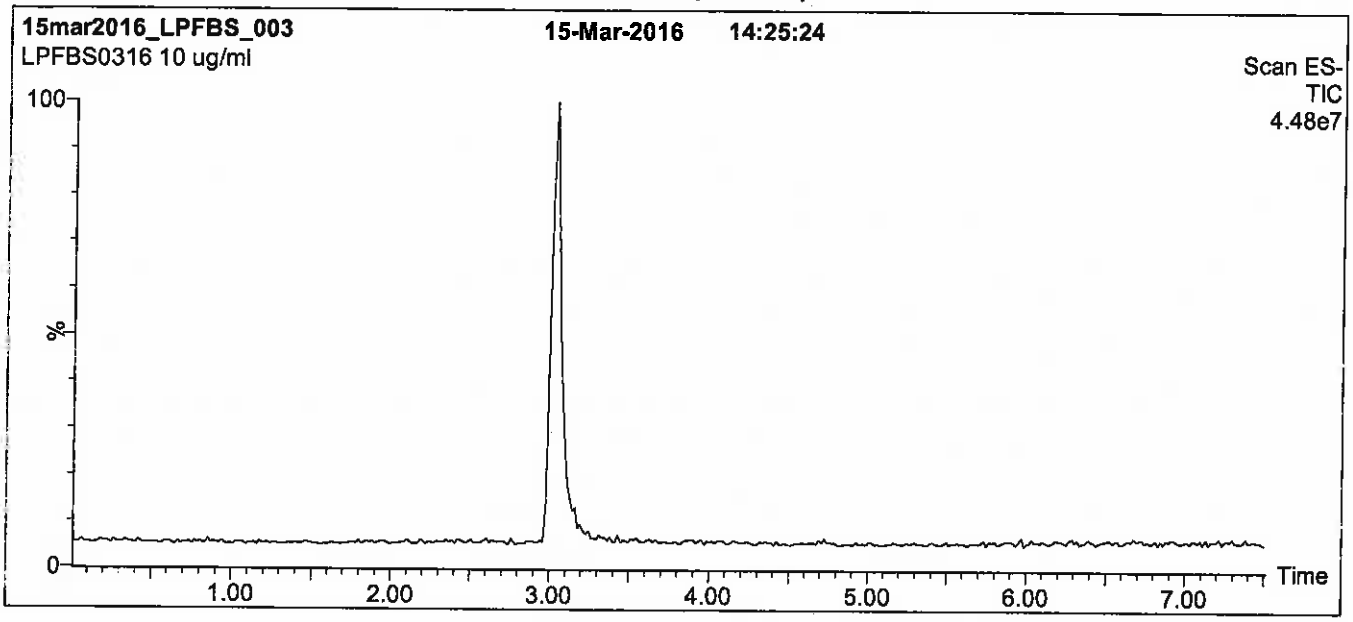
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

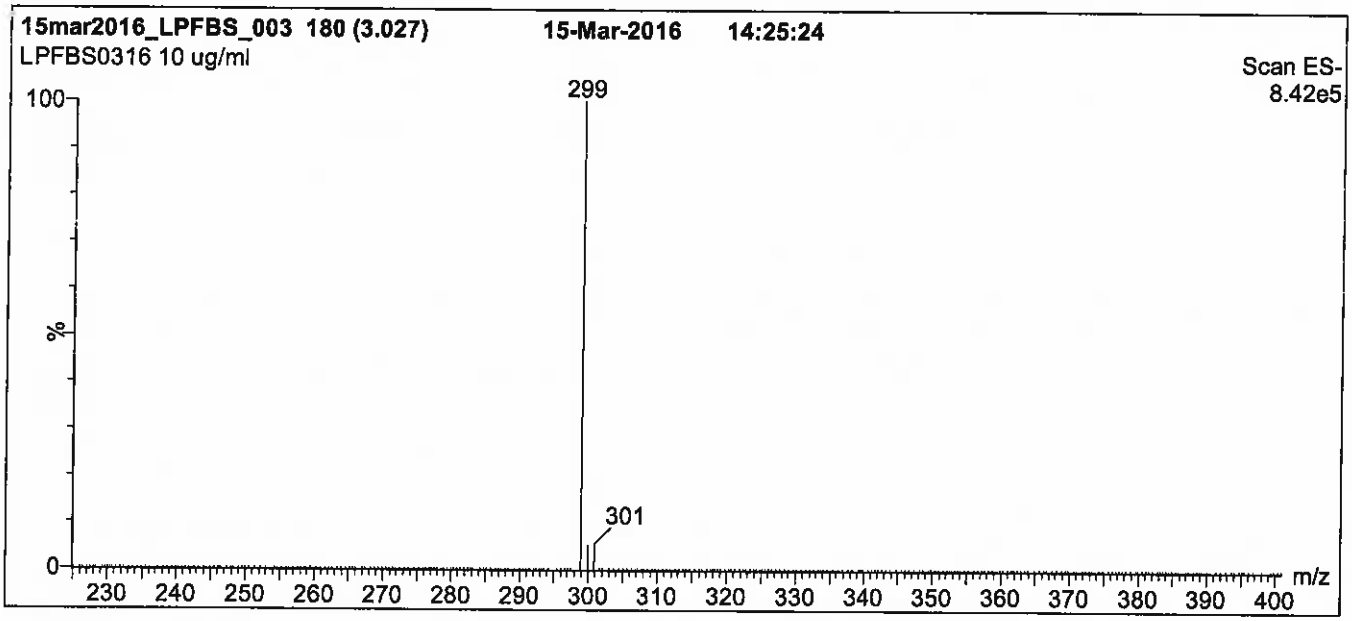
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

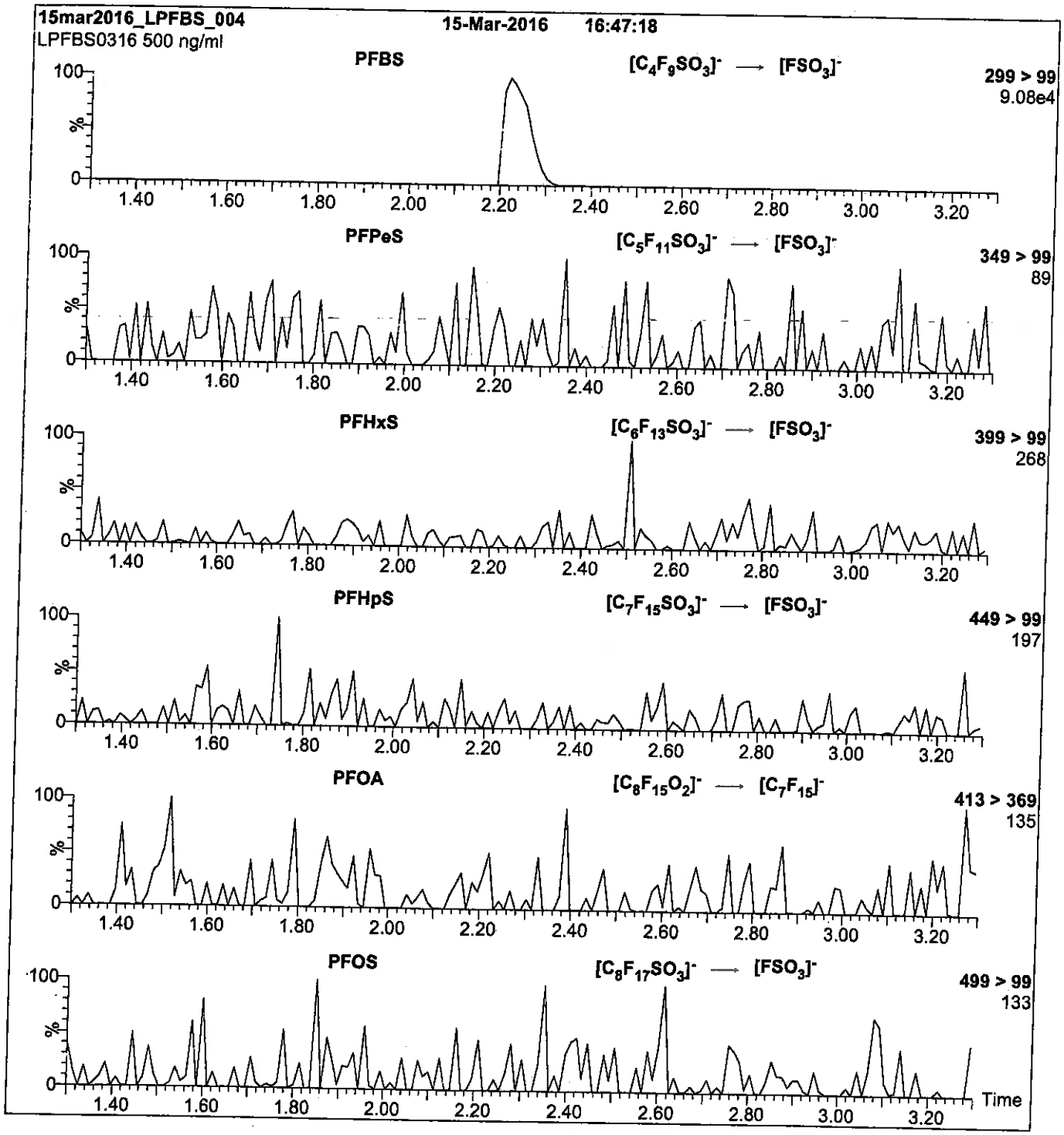
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFDA_00007

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

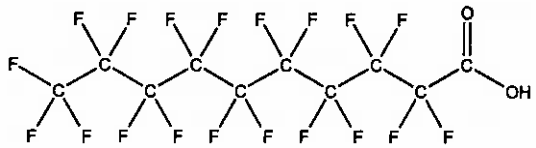
730620
ID: LCPFDA_00006
Exp: 05/31/21 Prpd: SBC
PF-n-decanoic acid

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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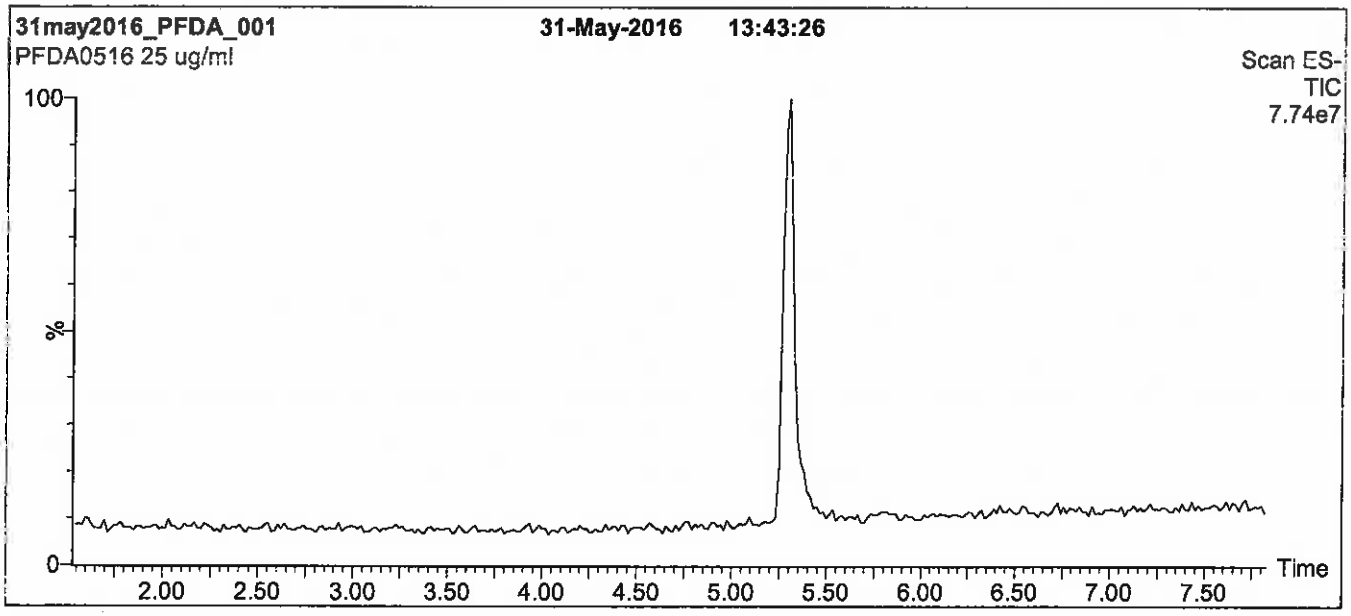
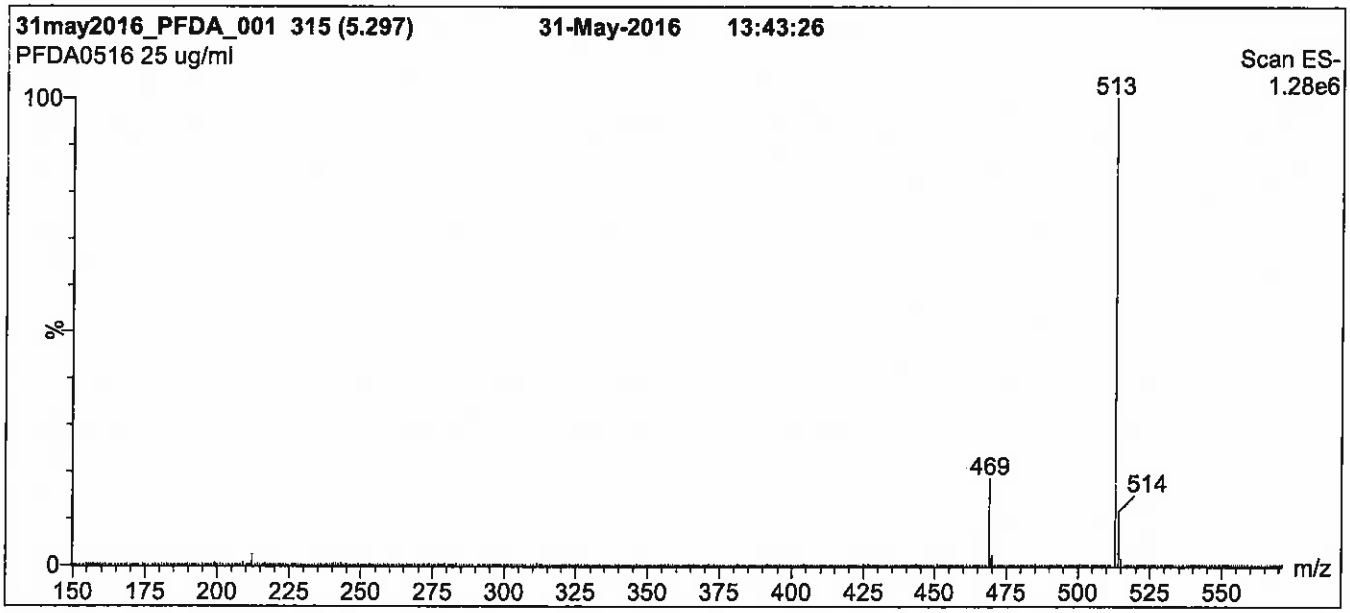
Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

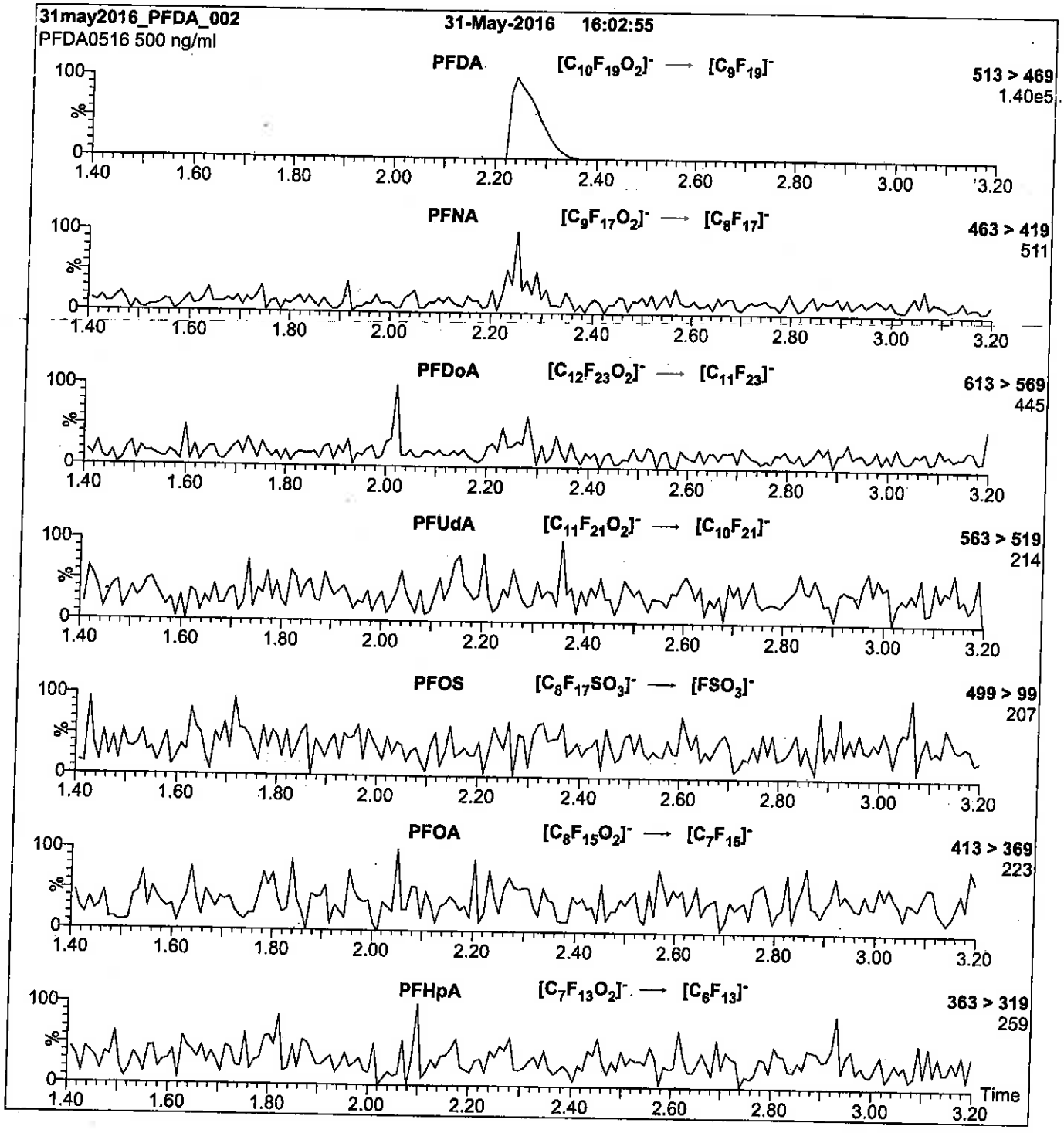
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFDA_00008

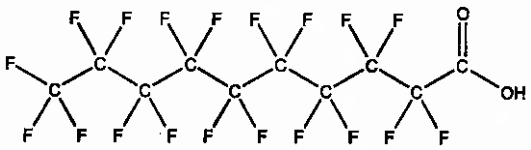
R: 9/21/17 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid
LOT NUMBER: PFDA0517

STRUCTURE:
CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
MOLECULAR WEIGHT: 514.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/29/2017
EXPIRY DATE: (mm/dd/yyyy) 05/29/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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HAZARDS:

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CALA

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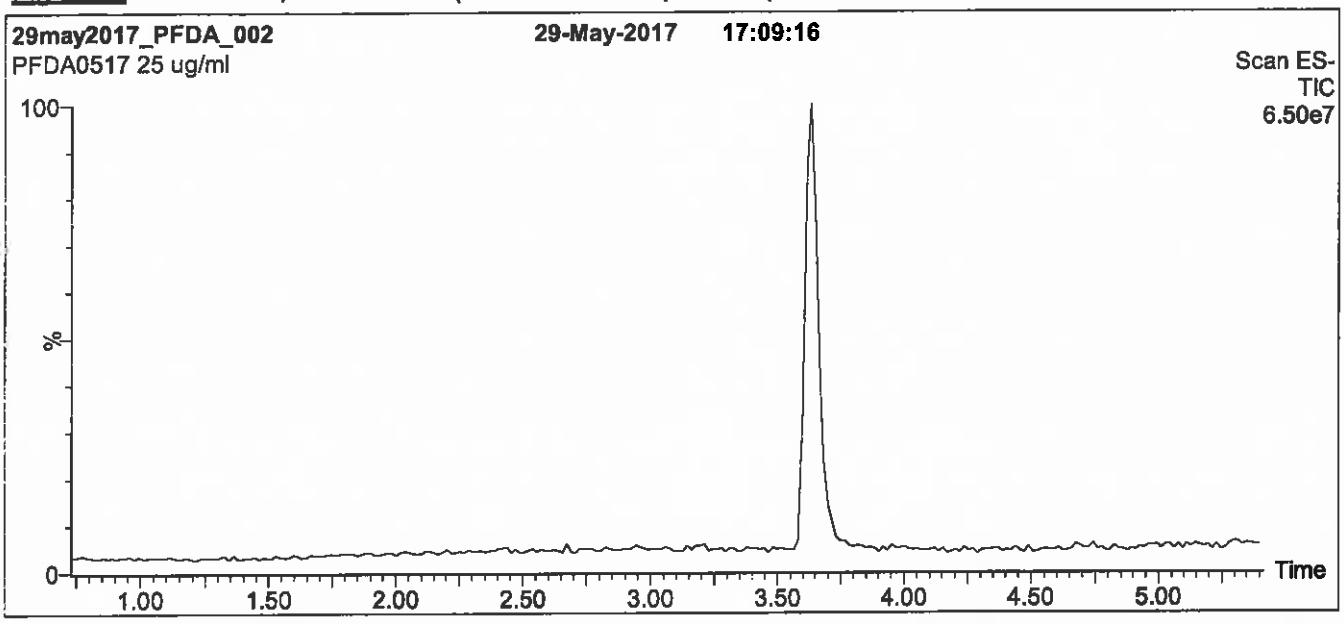
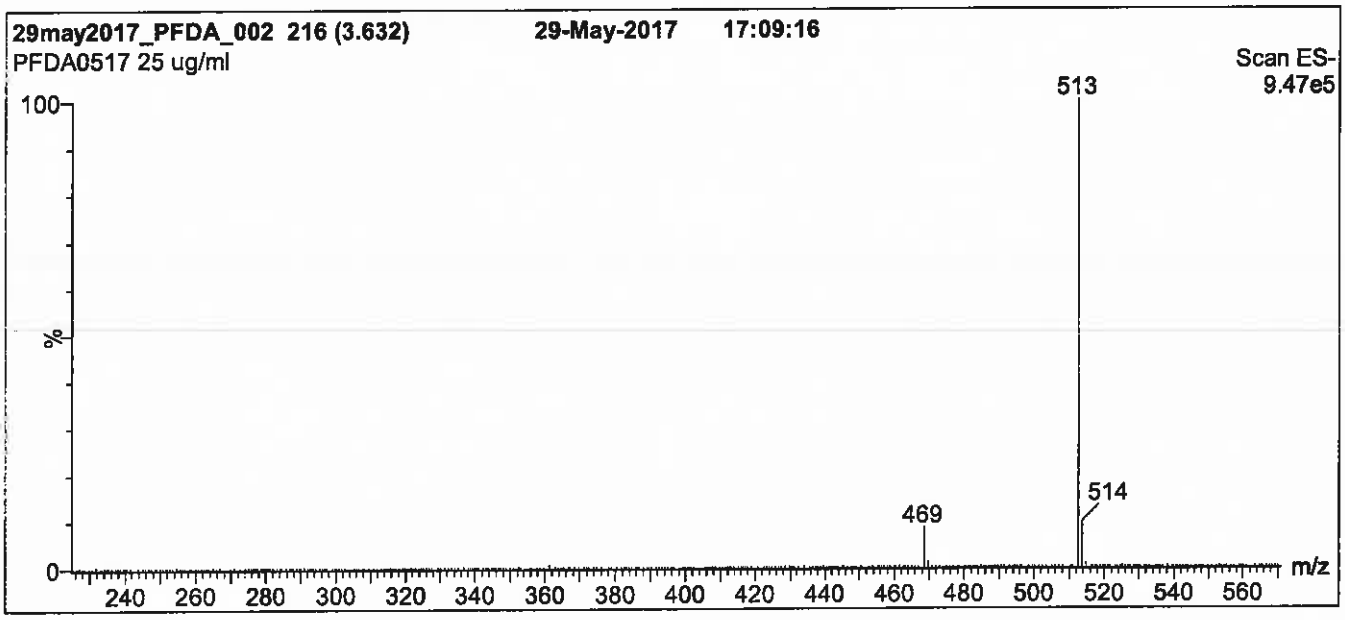




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

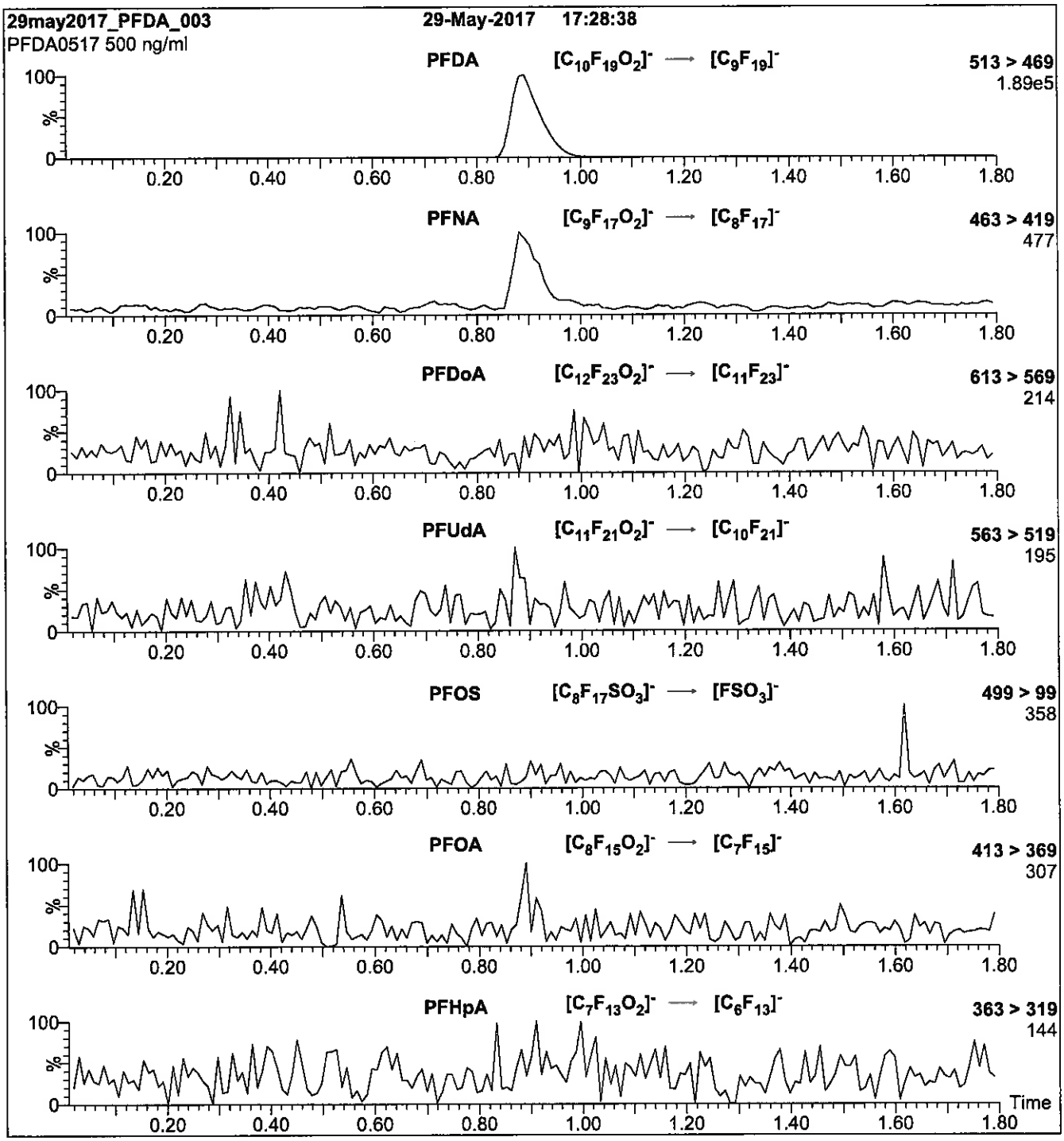
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 13

Reagent

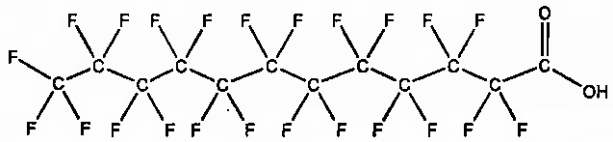
LCPFDoA_00007

r: 12/21/16 SPV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0516
COMPOUND:	Perfluoro-n-dodecanoic acid		
STRUCTURE:		**CAS #:**	307-55-1



MOLECULAR FORMULA:	$C_{12}HF_{23}O_2$	**MOLECULAR WEIGHT:**	614.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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CALA

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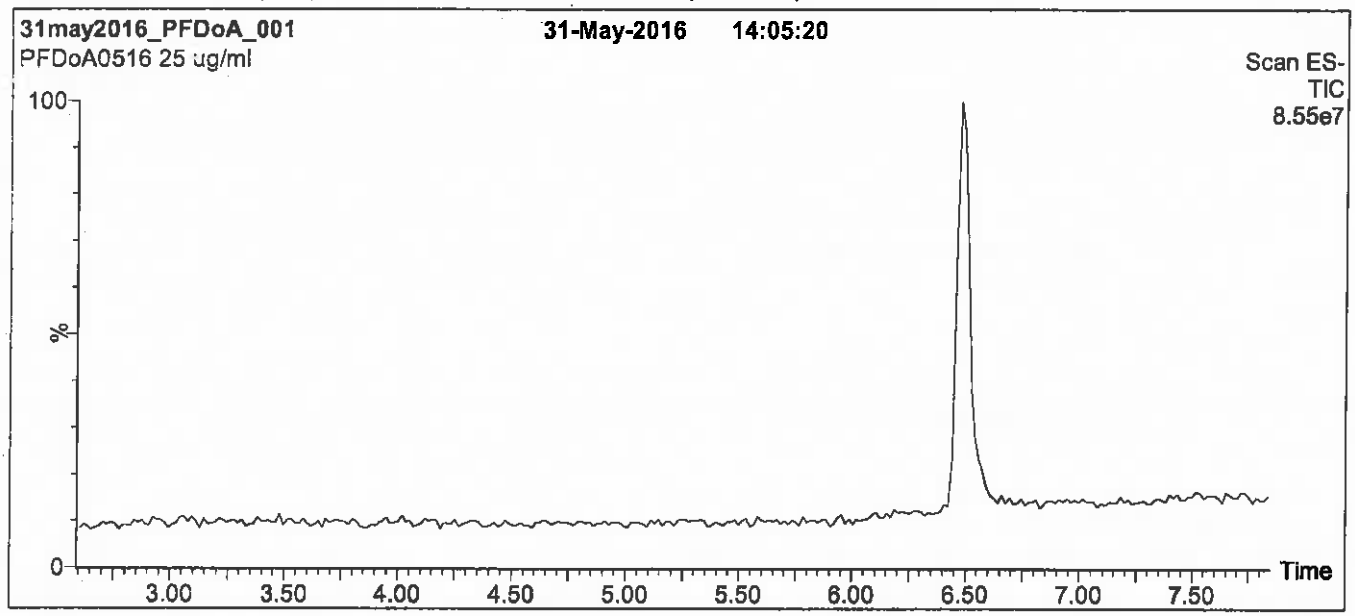
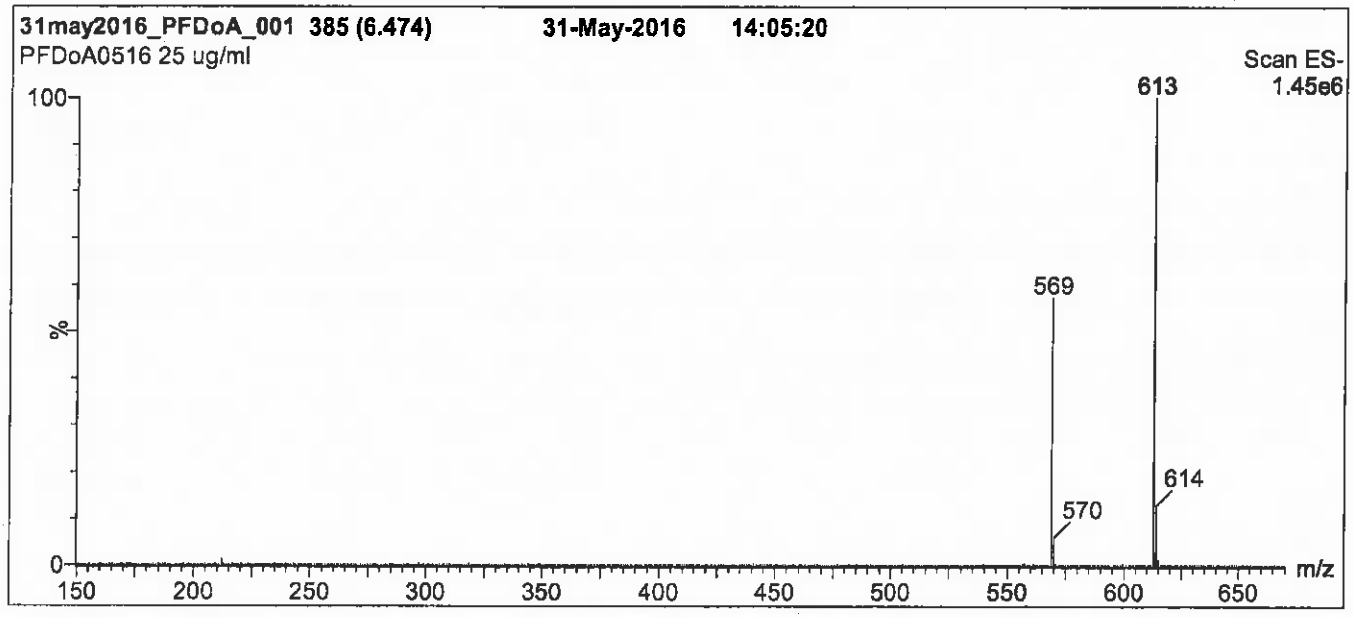
Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

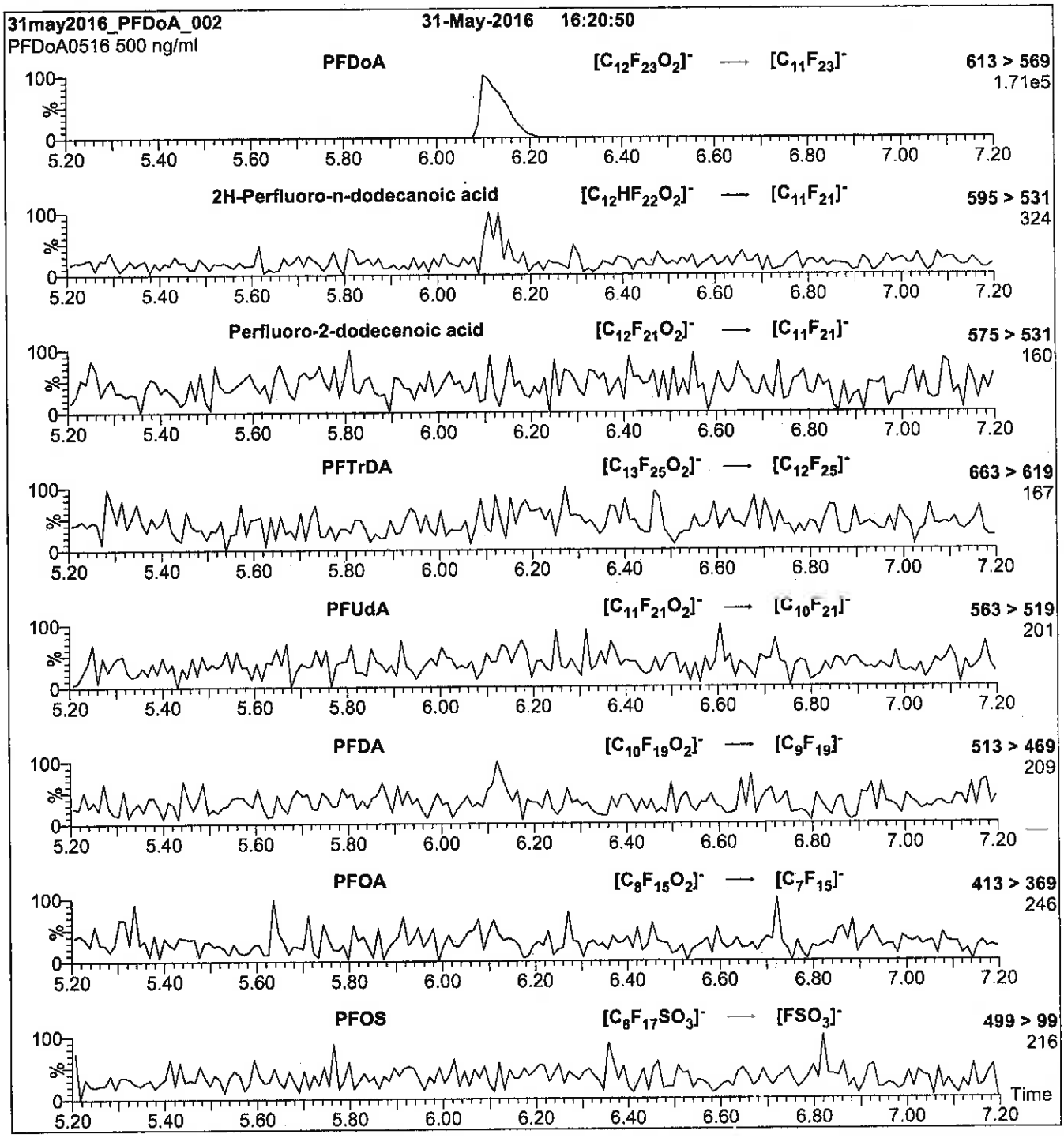
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

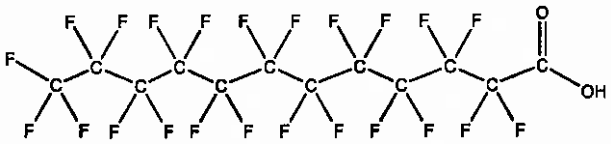
LCPFDoA_00008

P: 10/20/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0517
COMPOUND:	Perfluoro-n-dodecanoic acid		
STRUCTURE:		**CAS #:**	307-55-1



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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

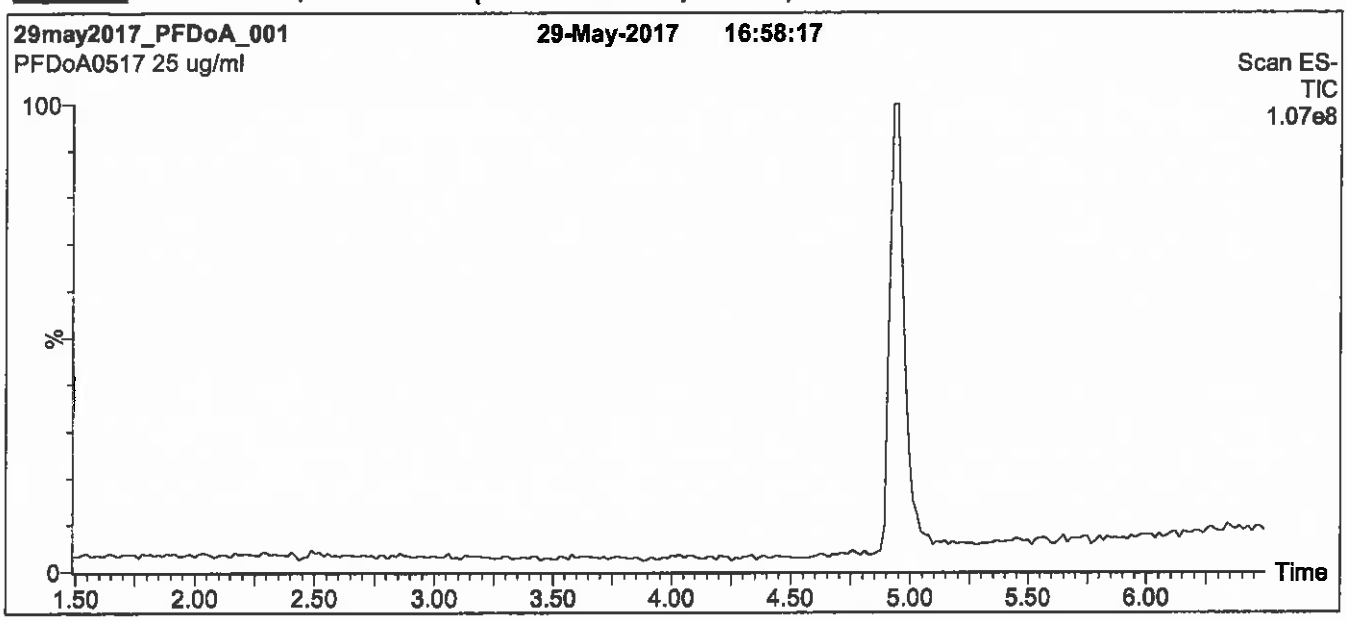
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

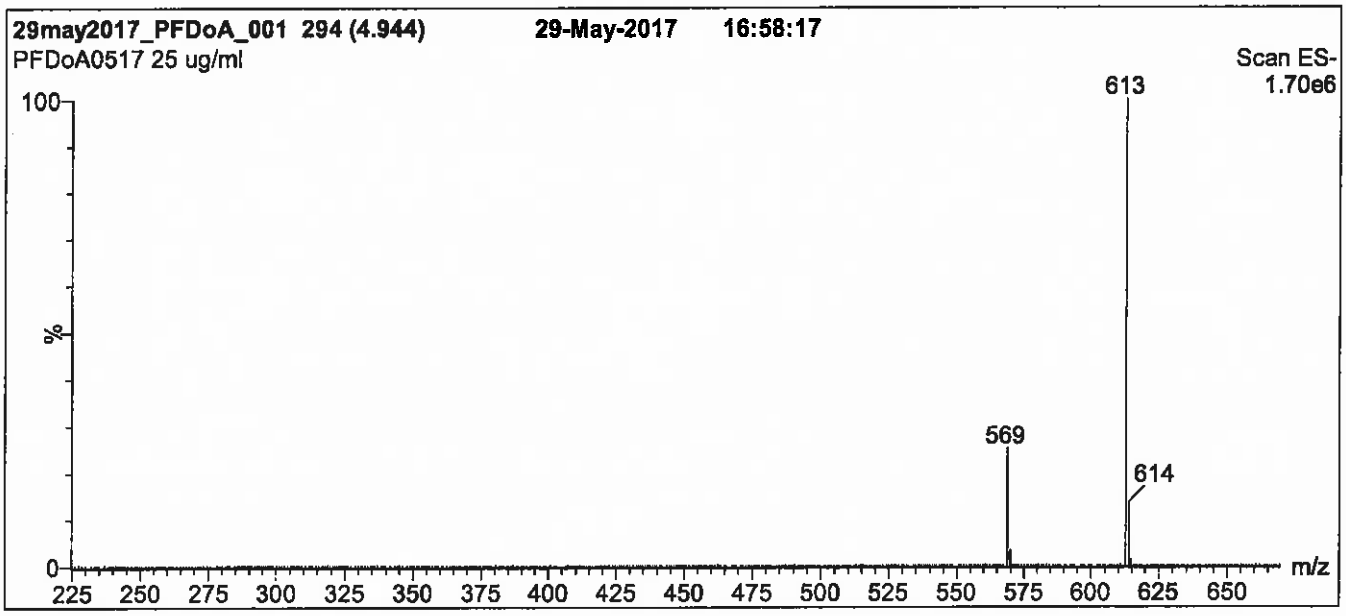
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

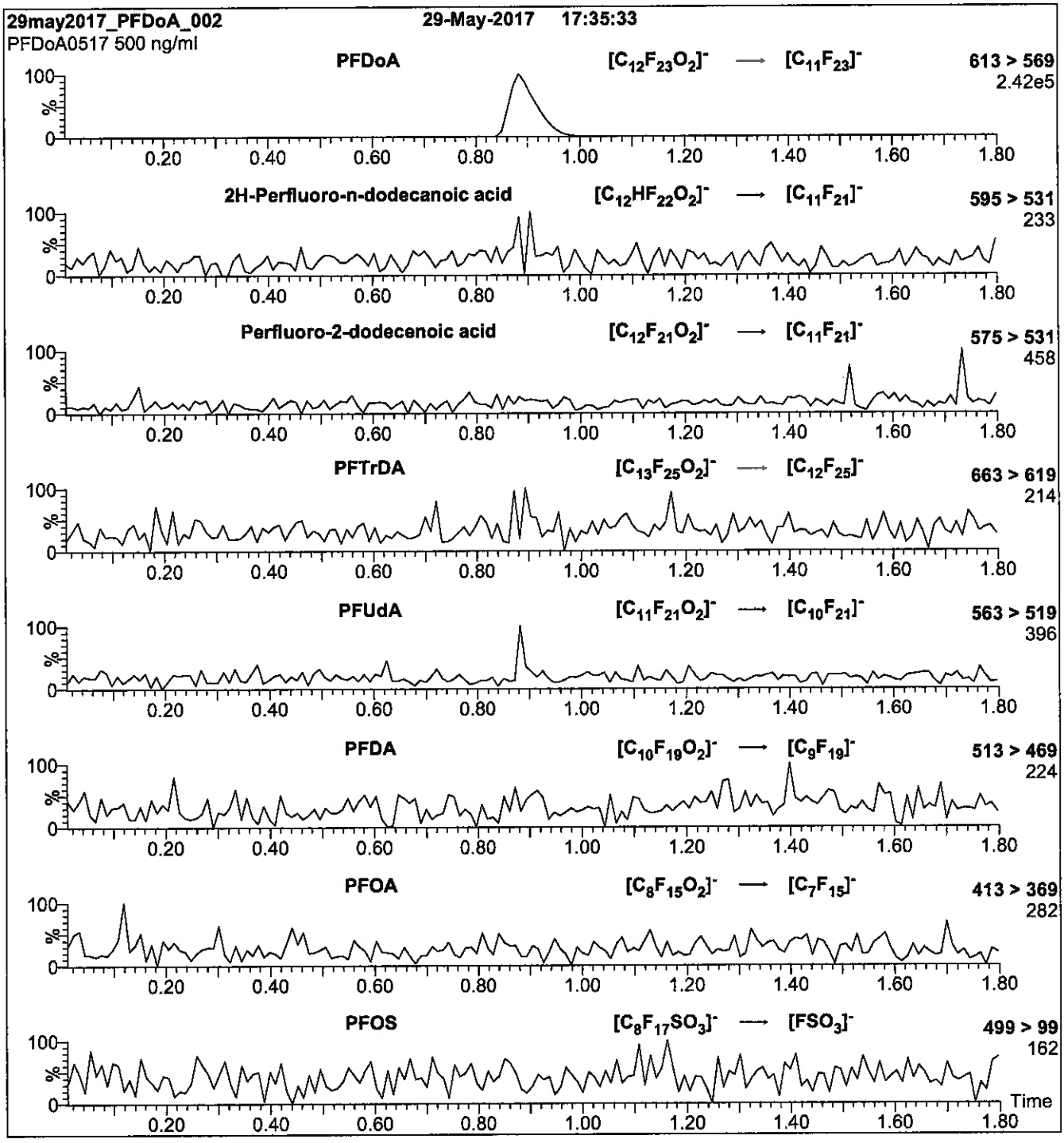
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

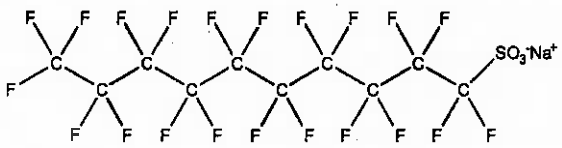
LCPFDSA_00002

R: 12/29/16 SK✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFDS	**LOT NUMBER:**	LPFDS0516
COMPOUND:	Sodium perfluoro-1-decanesulfonate		
STRUCTURE:		**CAS #:**	2806-15-7



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.2 ± 2.4 µg/ml (PFDS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/26/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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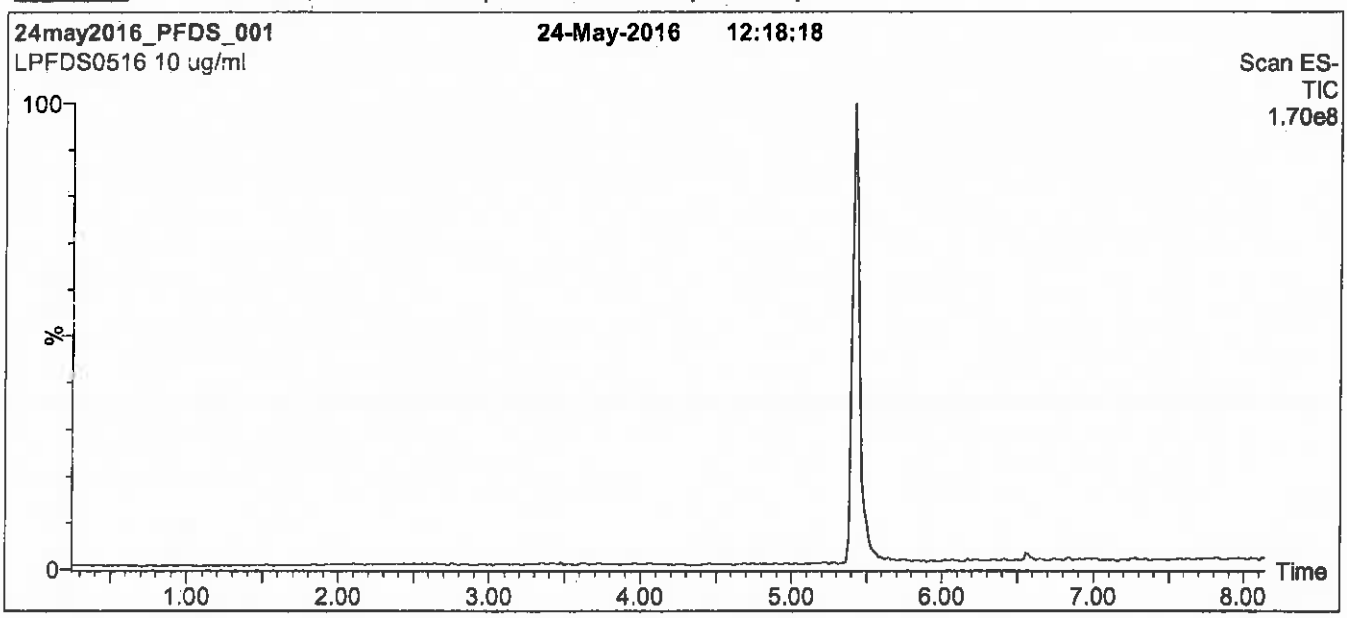
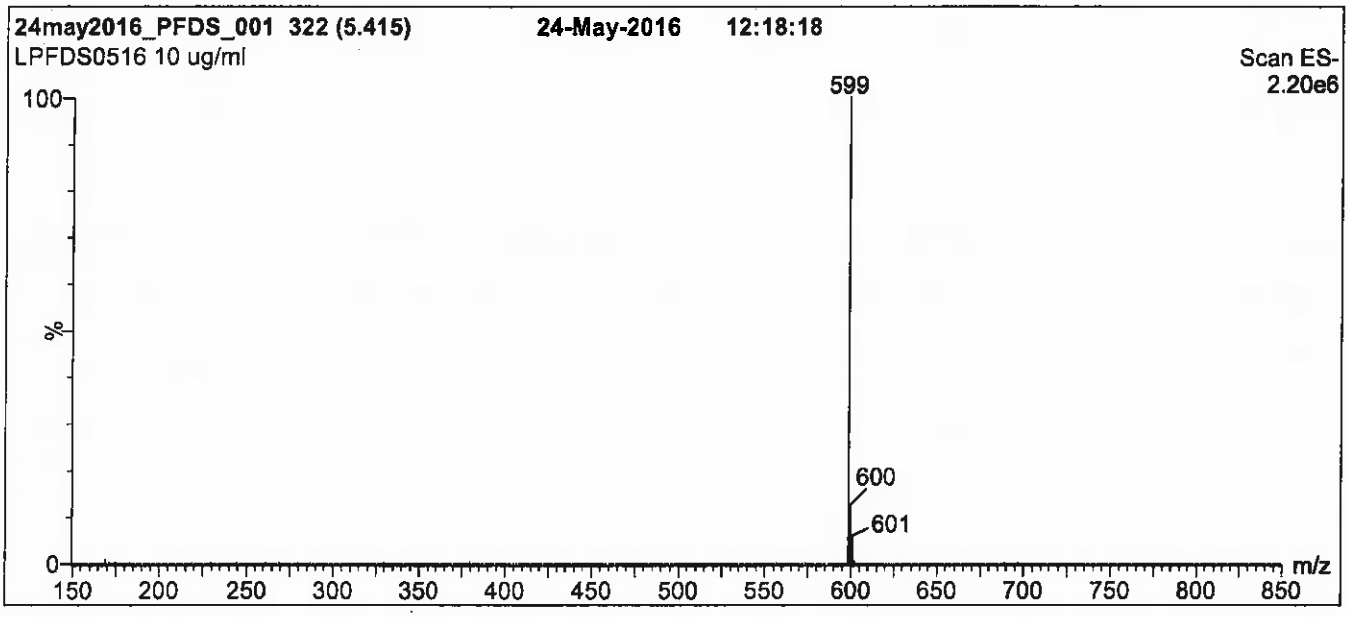
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

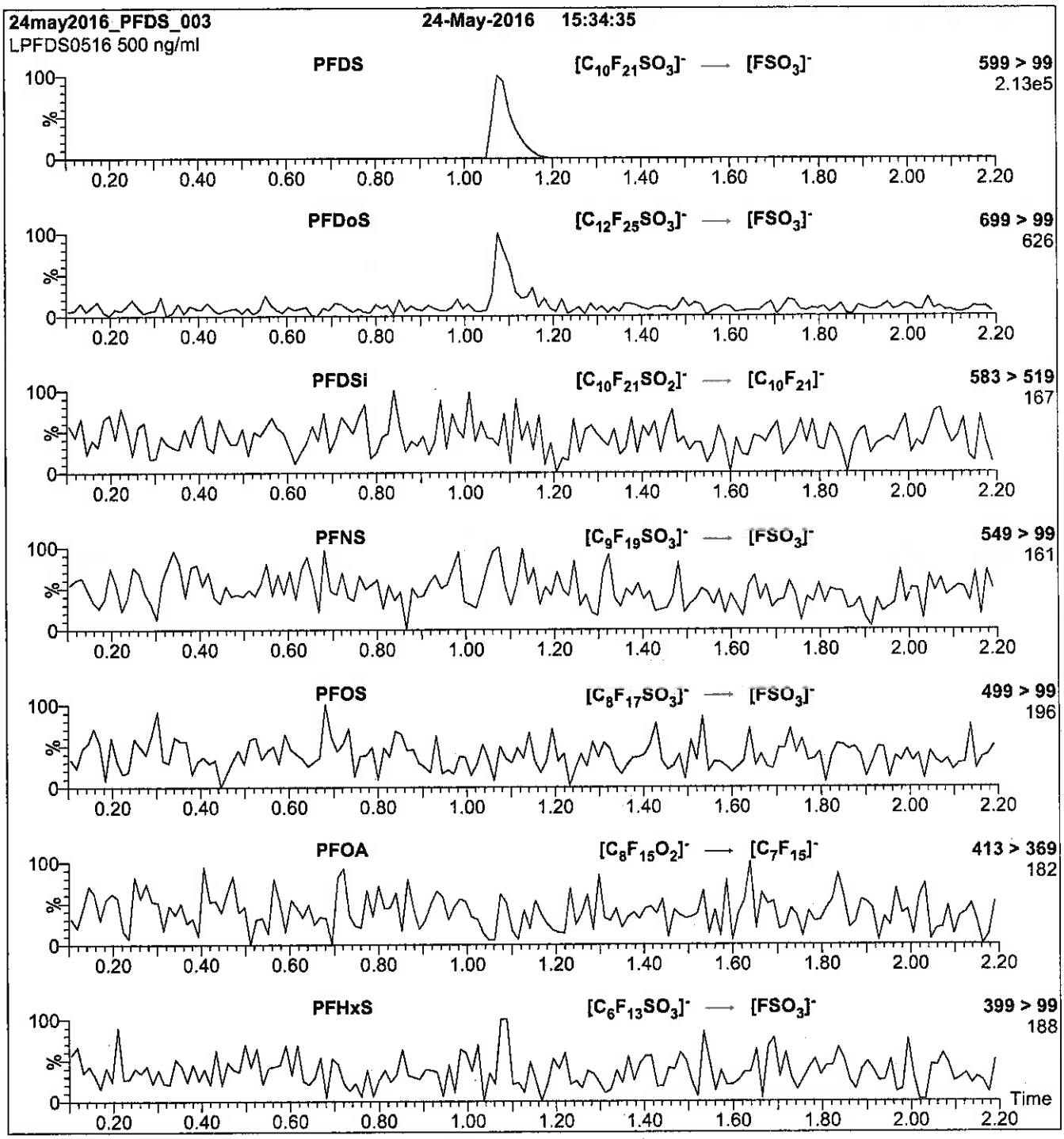
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 50

Reagent

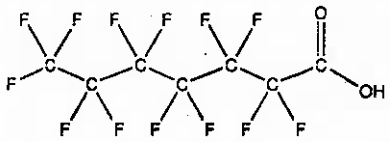
LCPFHpA_00008

P: 12/29/16 SKN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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HOMOGENEITY:

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

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ANAB ACCREDITED

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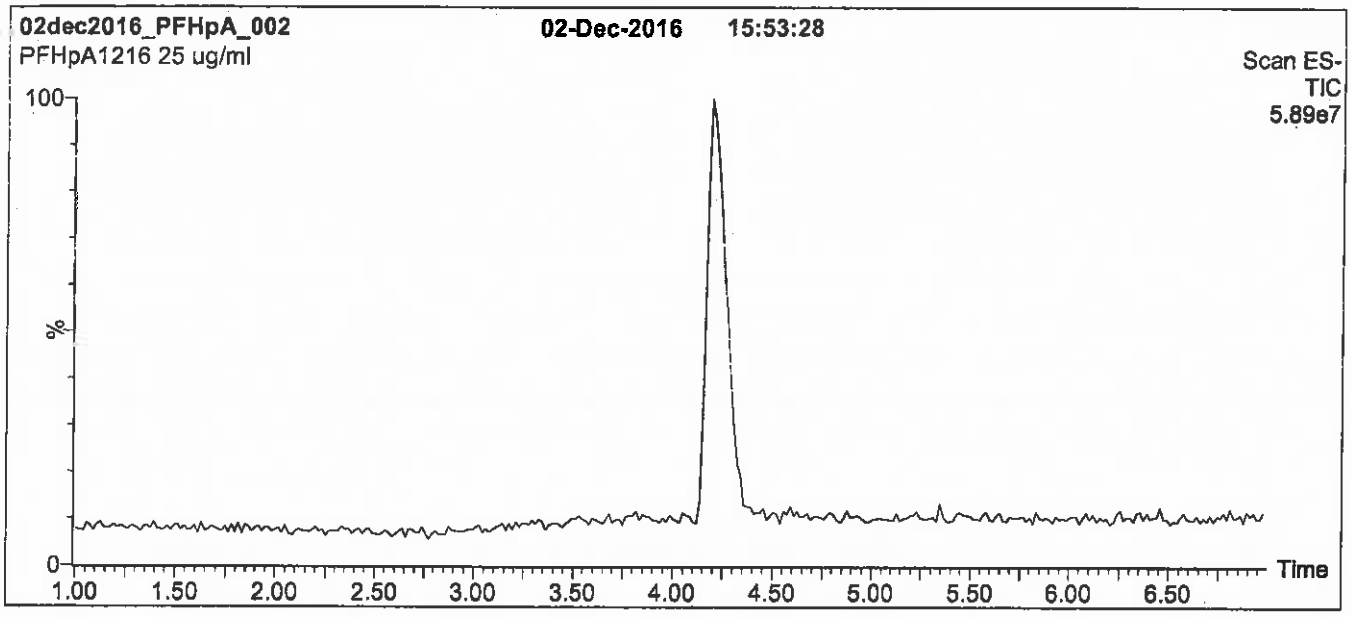
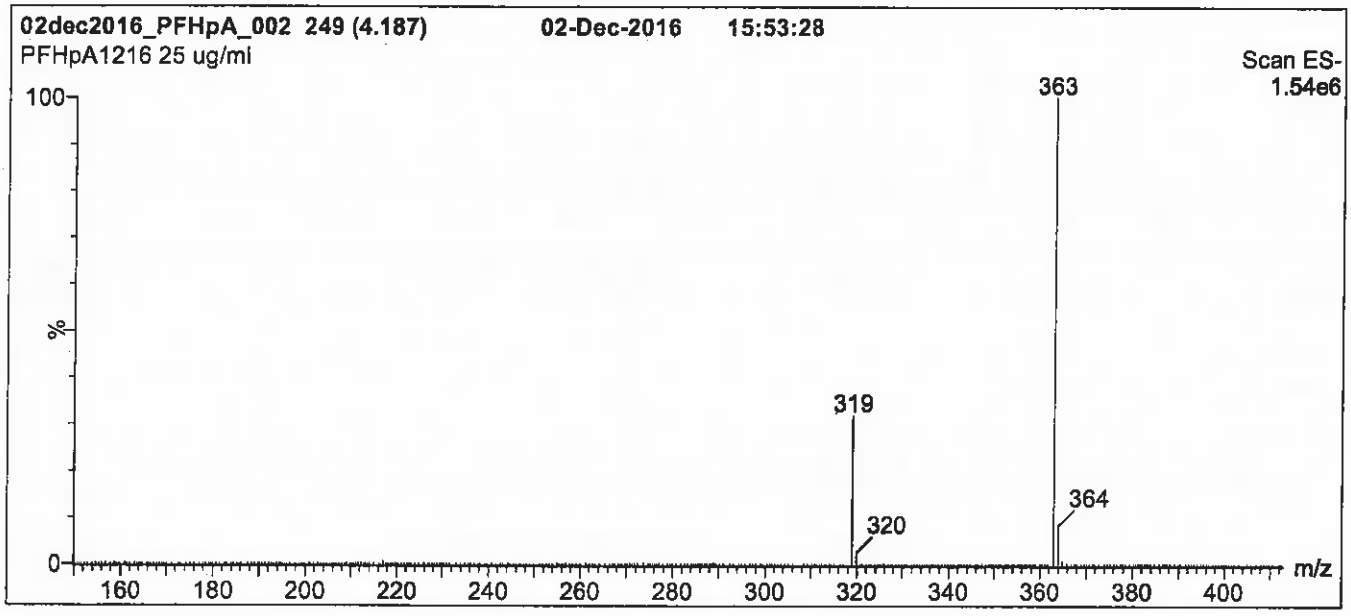
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

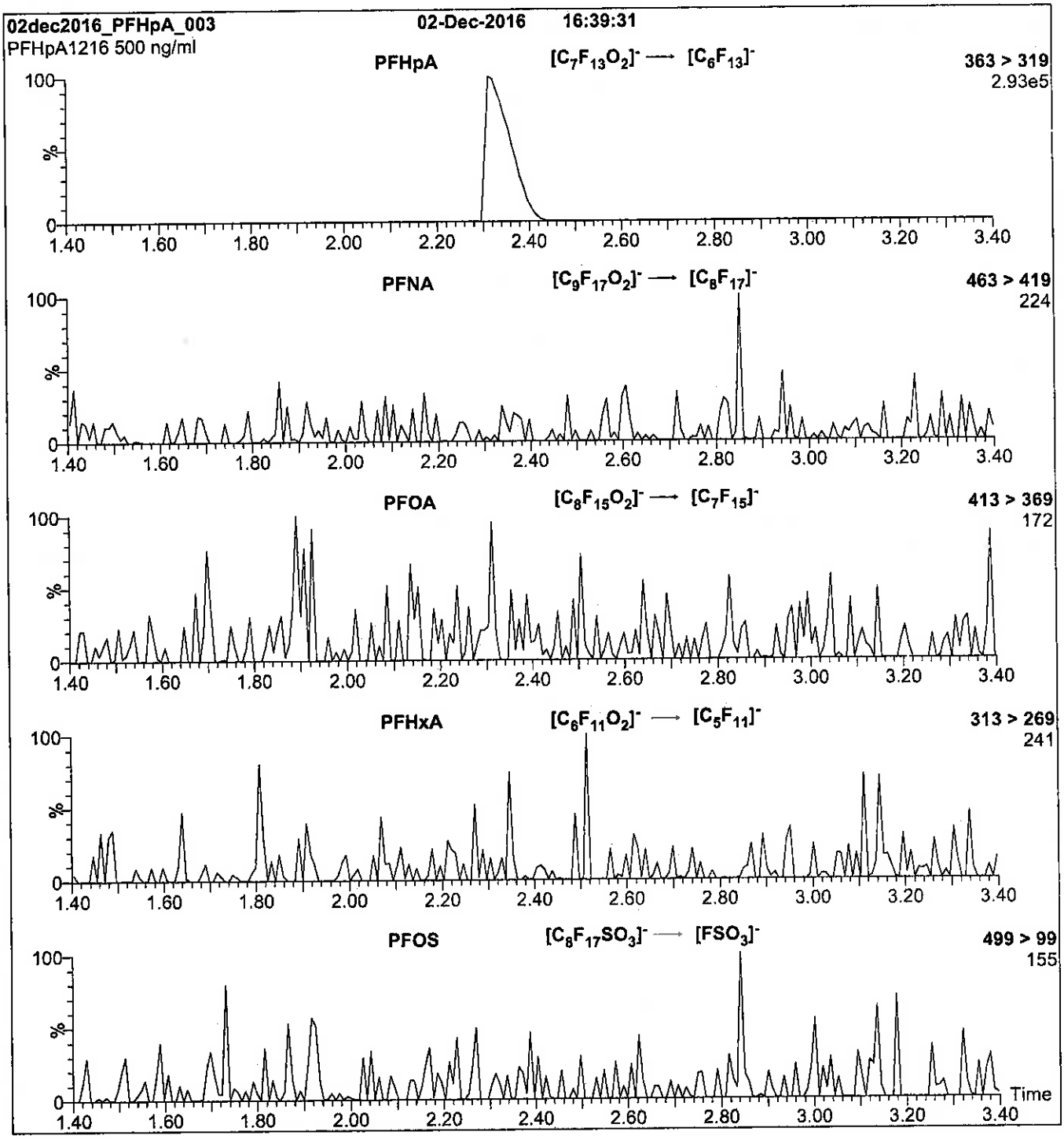
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

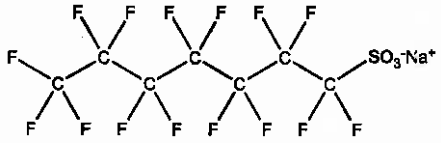
LCPFHpSA_00003

R: 9/21/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFHpS	**LOT NUMBER:**	LPFHpS0817
COMPOUND:	Sodium perfluoro-1-heptanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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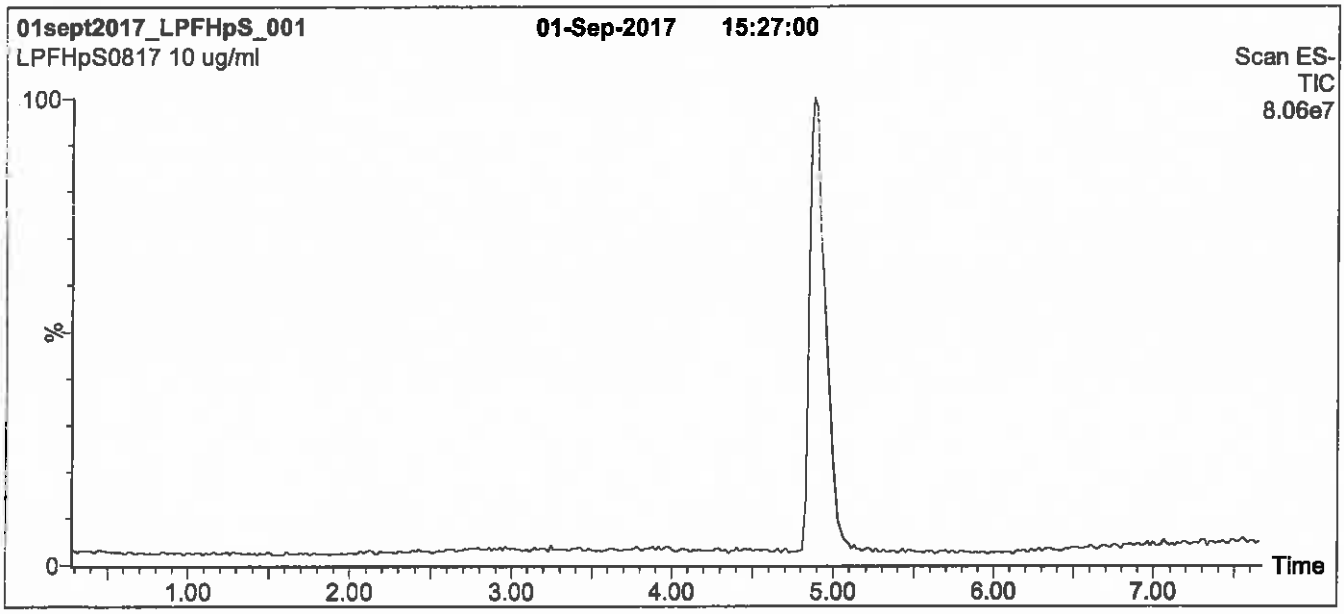
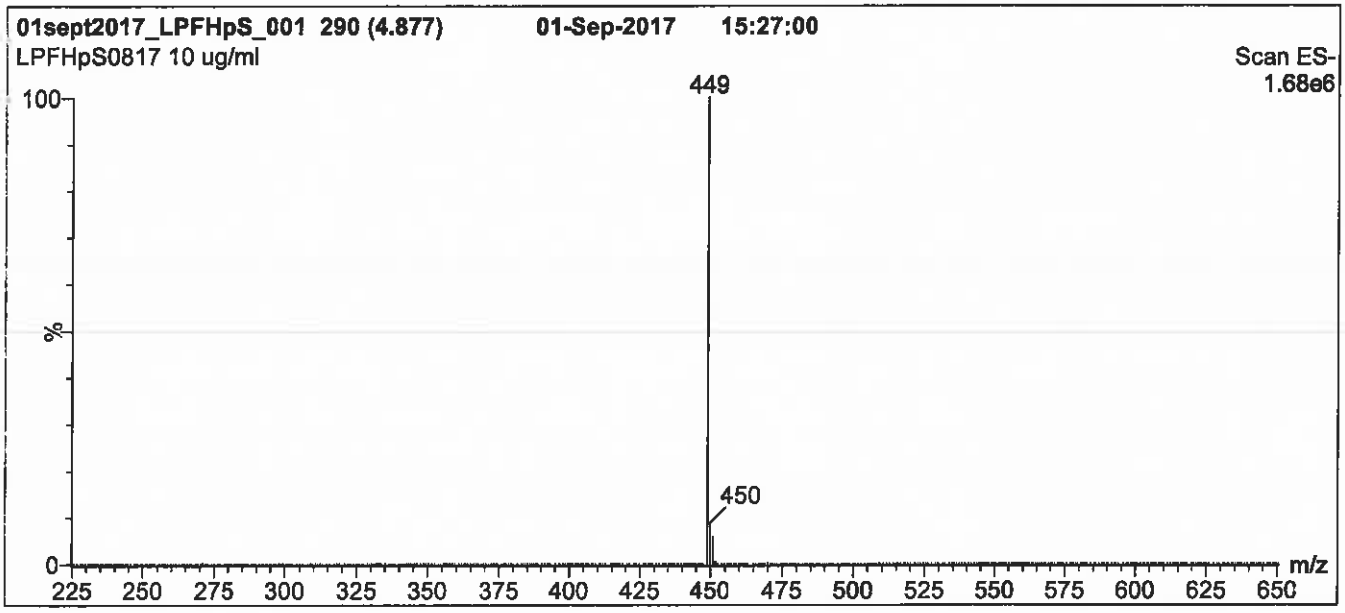
Figure 1: **L-PFHpS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

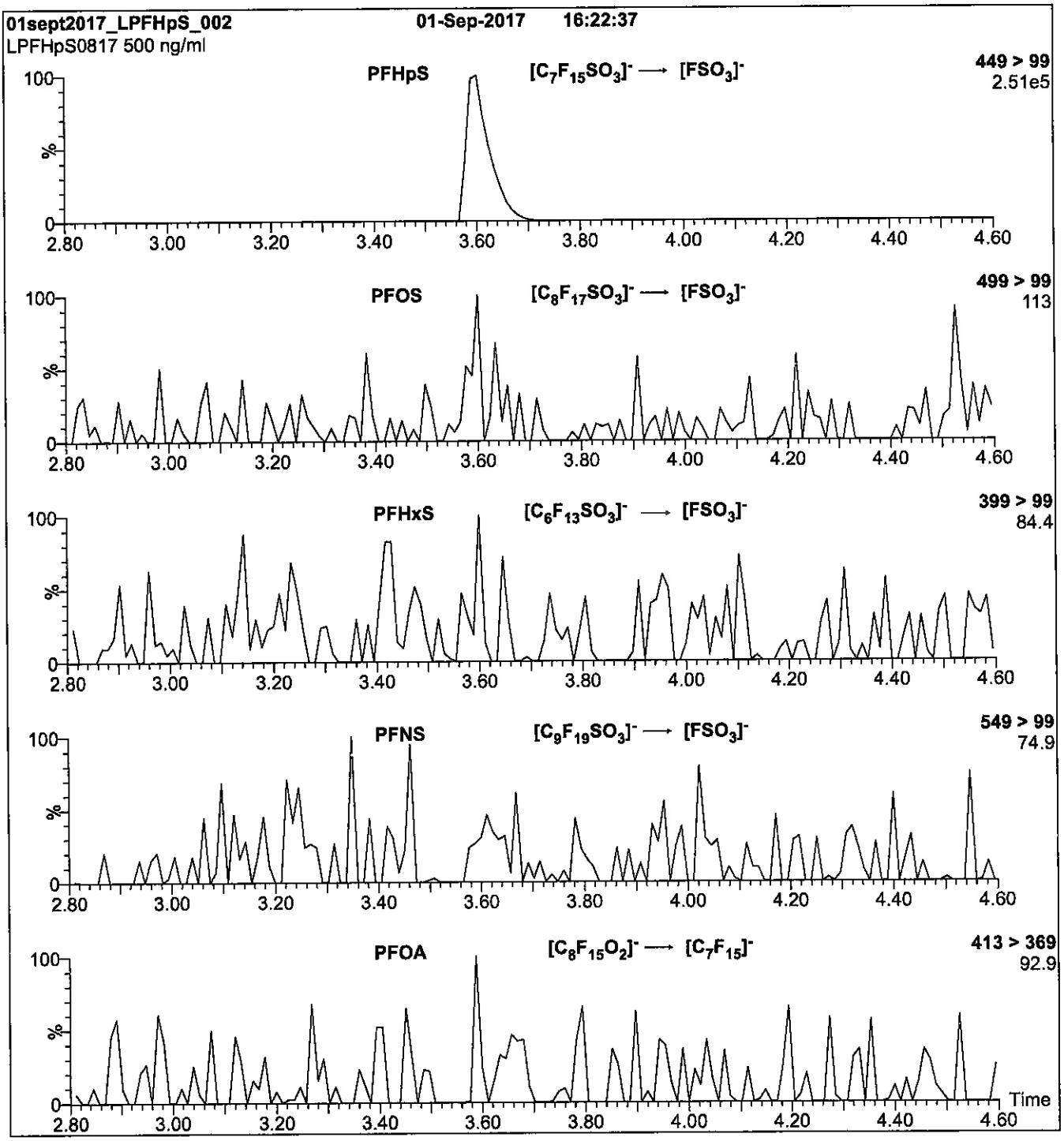
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFHpS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00007

R: 12/29/16 SAV

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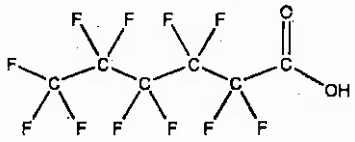
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxA	**LOT NUMBER:**	PFHxA1215
COMPOUND:	Perfluoro-n-hexanoic acid		
STRUCTURE:		**CAS #:**	307-24-4



MOLECULAR FORMULA:	$C_6HF_{11}O_2$	**MOLECULAR WEIGHT:**	314.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/23/2015 (mm/dd/yyyy)
B.G. Chittim

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, ...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

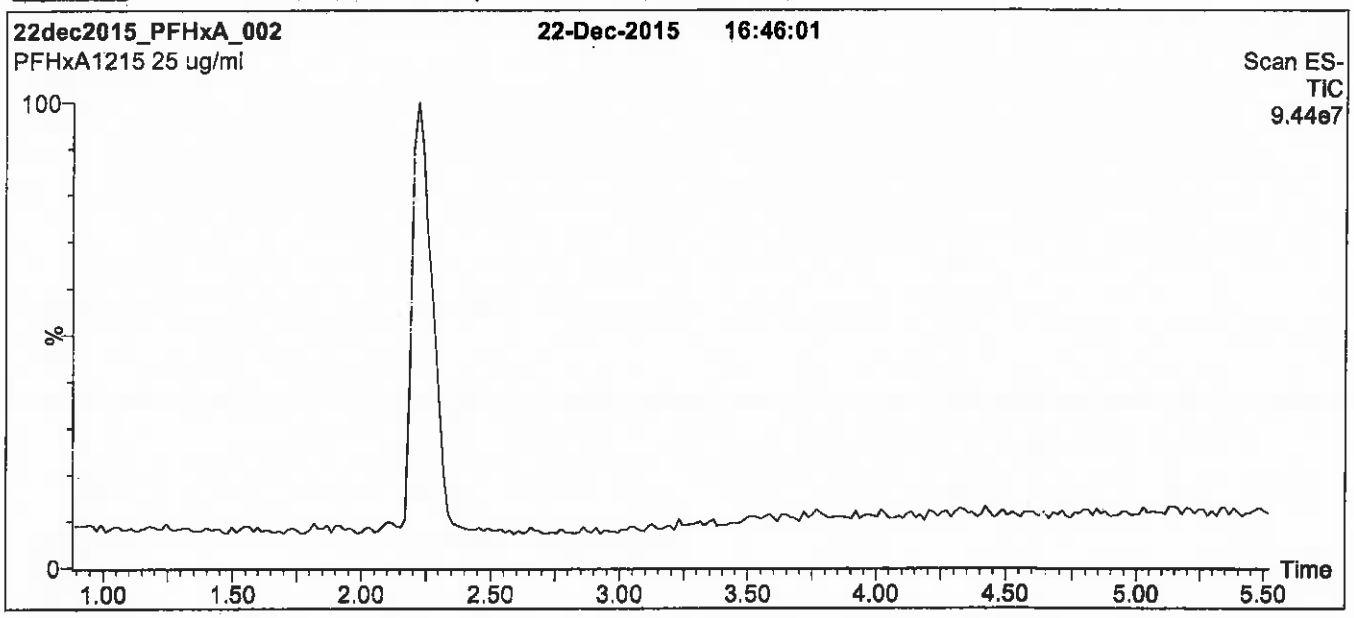
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

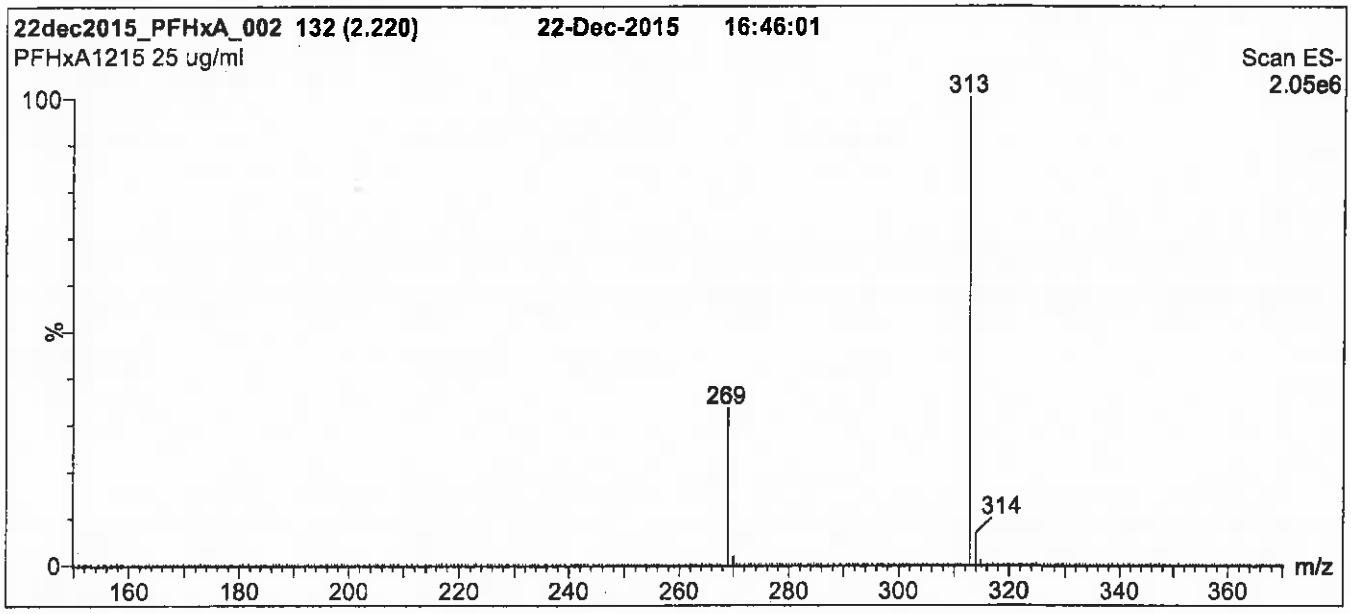
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

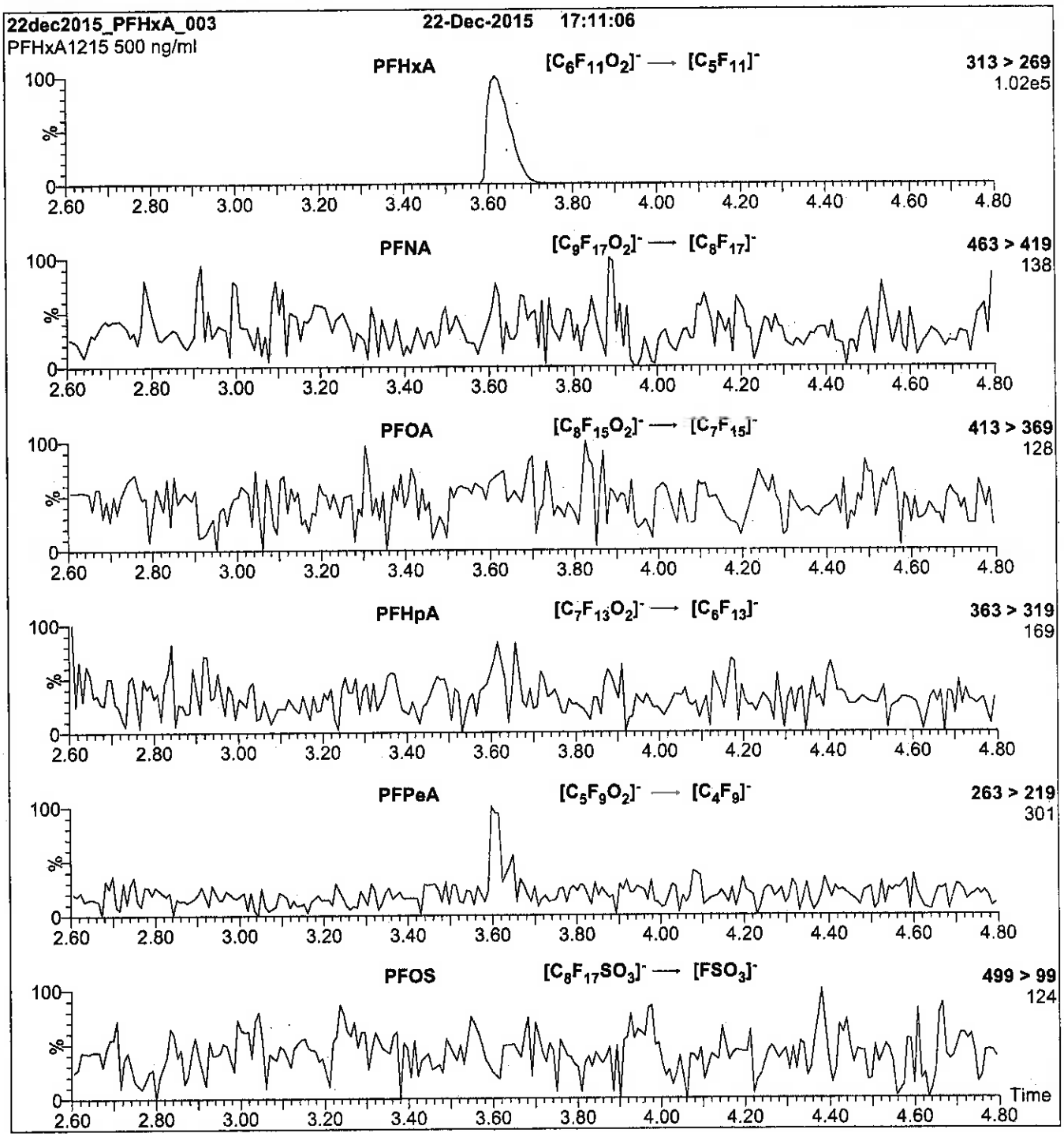
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

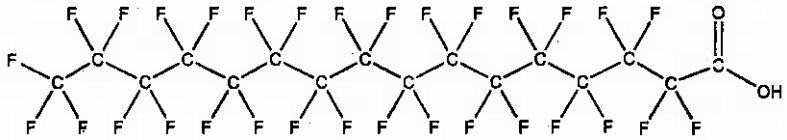
LCPFHxDA_00008

T: 12/29/16 SEV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxDA	**LOT NUMBER:**	PFHxDA0516
COMPOUND:	Perfluoro-n-hexadecanoic acid		
STRUCTURE:		**CAS #:**	67905-19-5



MOLECULAR FORMULA:	$C_{16}HF_{31}O_2$	**MOLECULAR WEIGHT:**	814.13
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/25/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/25/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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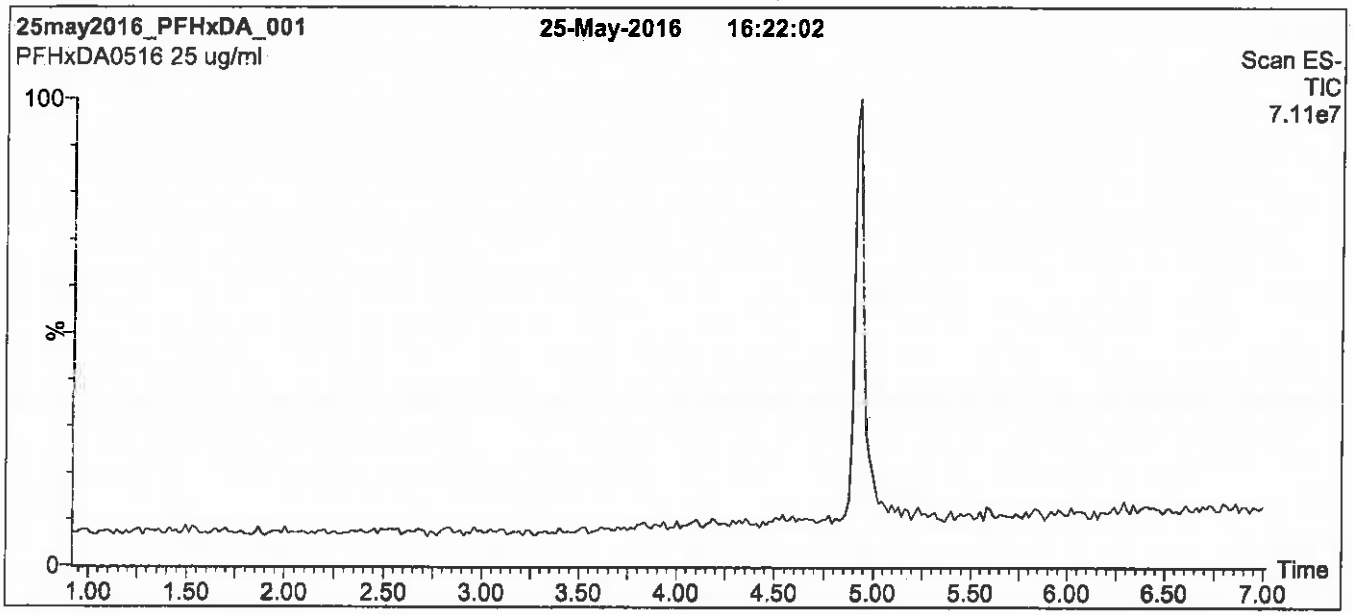
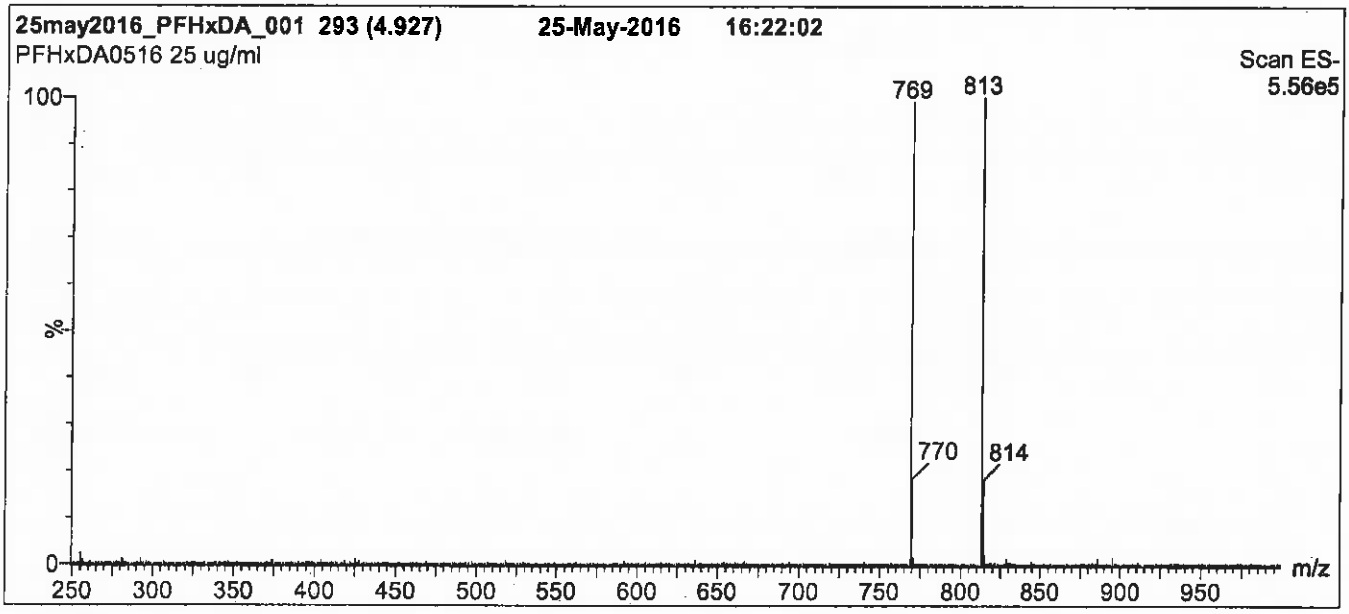
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 6 min and hold for 2.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

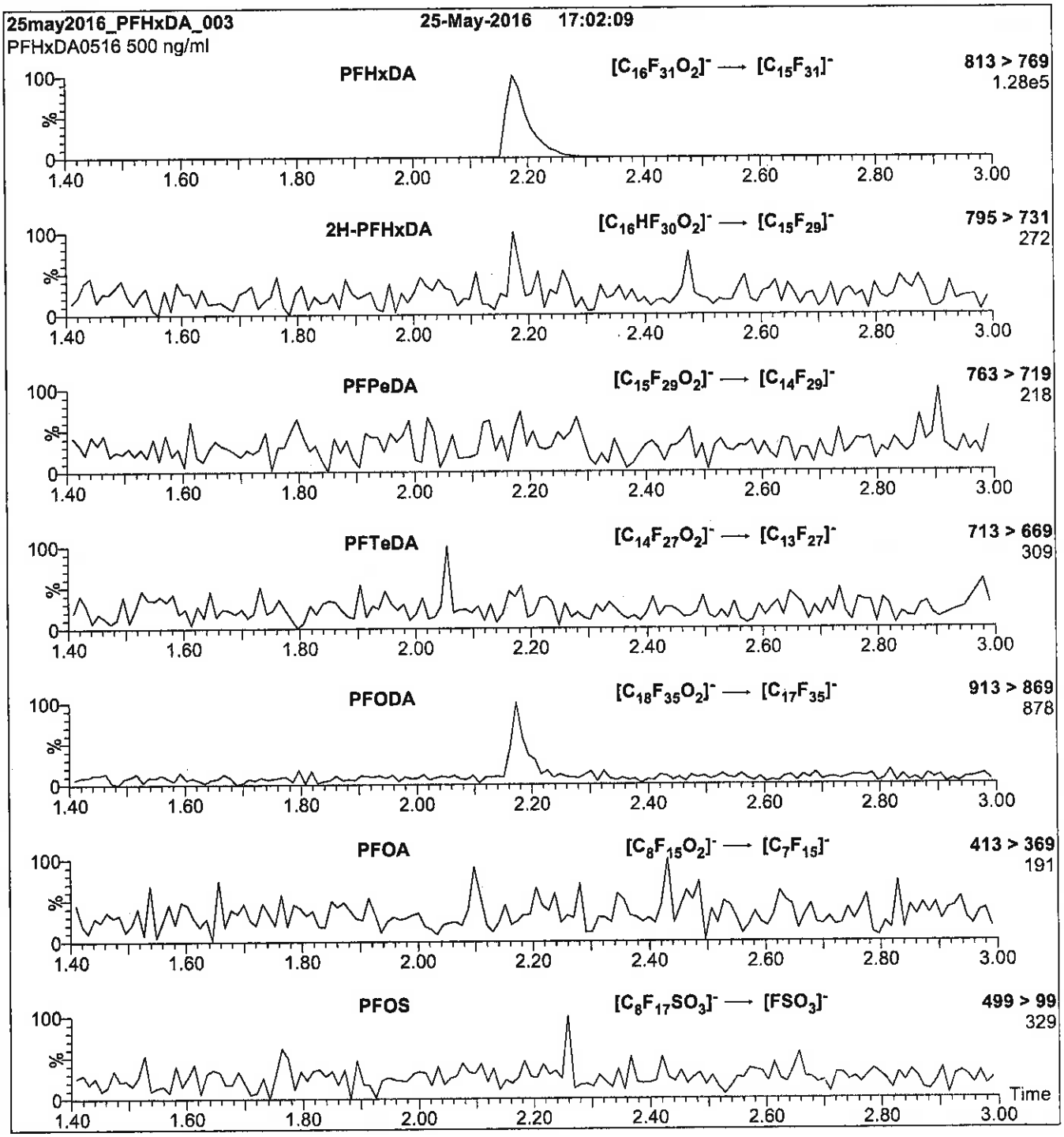
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0615
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	06/29/2015
LAST TESTED: (mm/dd/yyyy)	07/03/2015
EXPIRY DATE: (mm/dd/yyyy)	07/03/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

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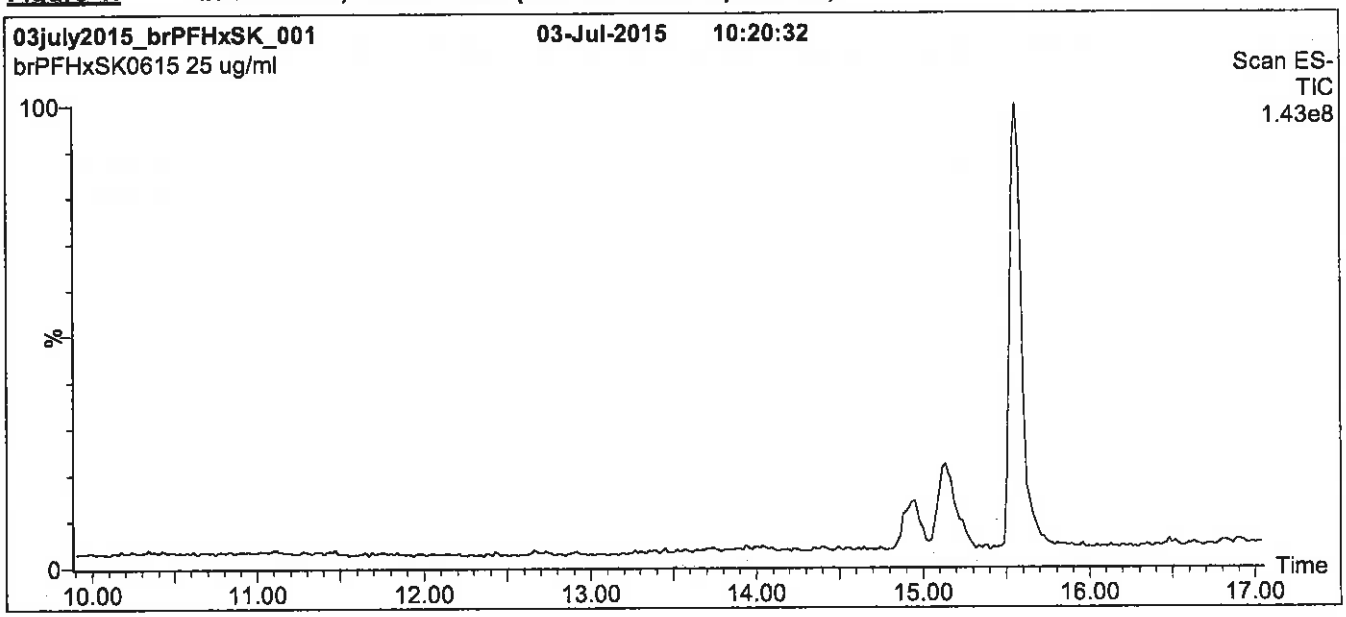
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

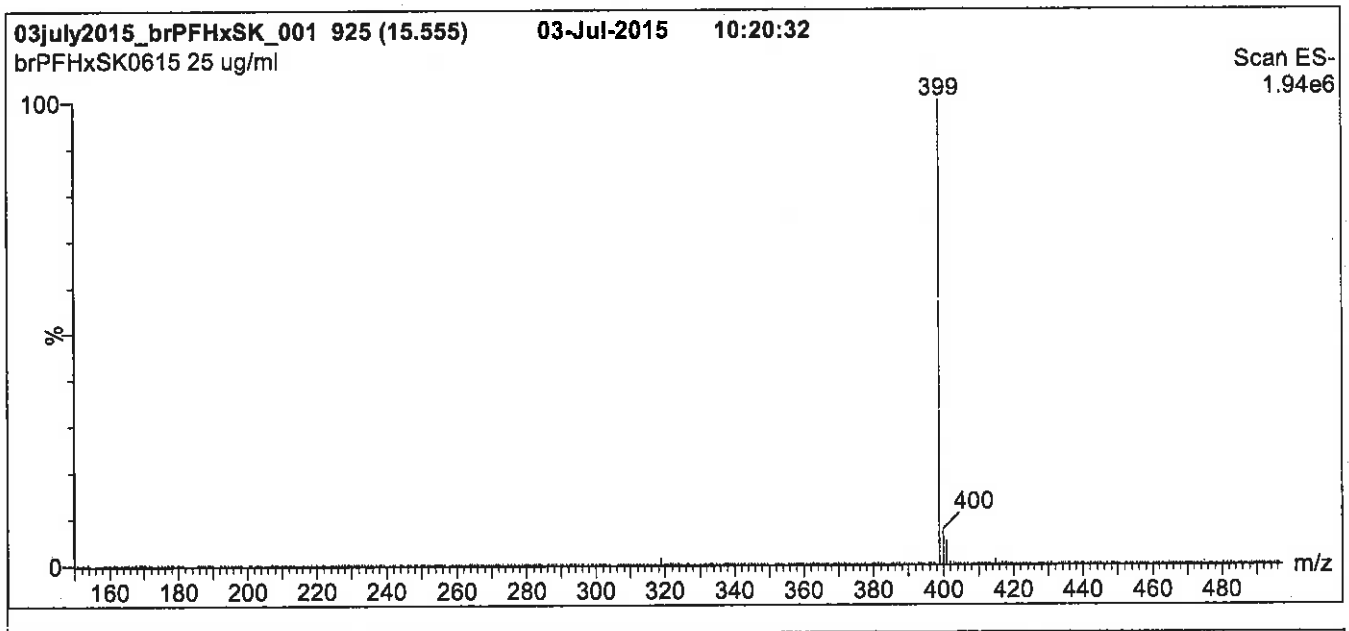
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: _____ **Date:** 09/27/2016
B.G. Chittim (mm/dd/yyyy)

Figure 1: **br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

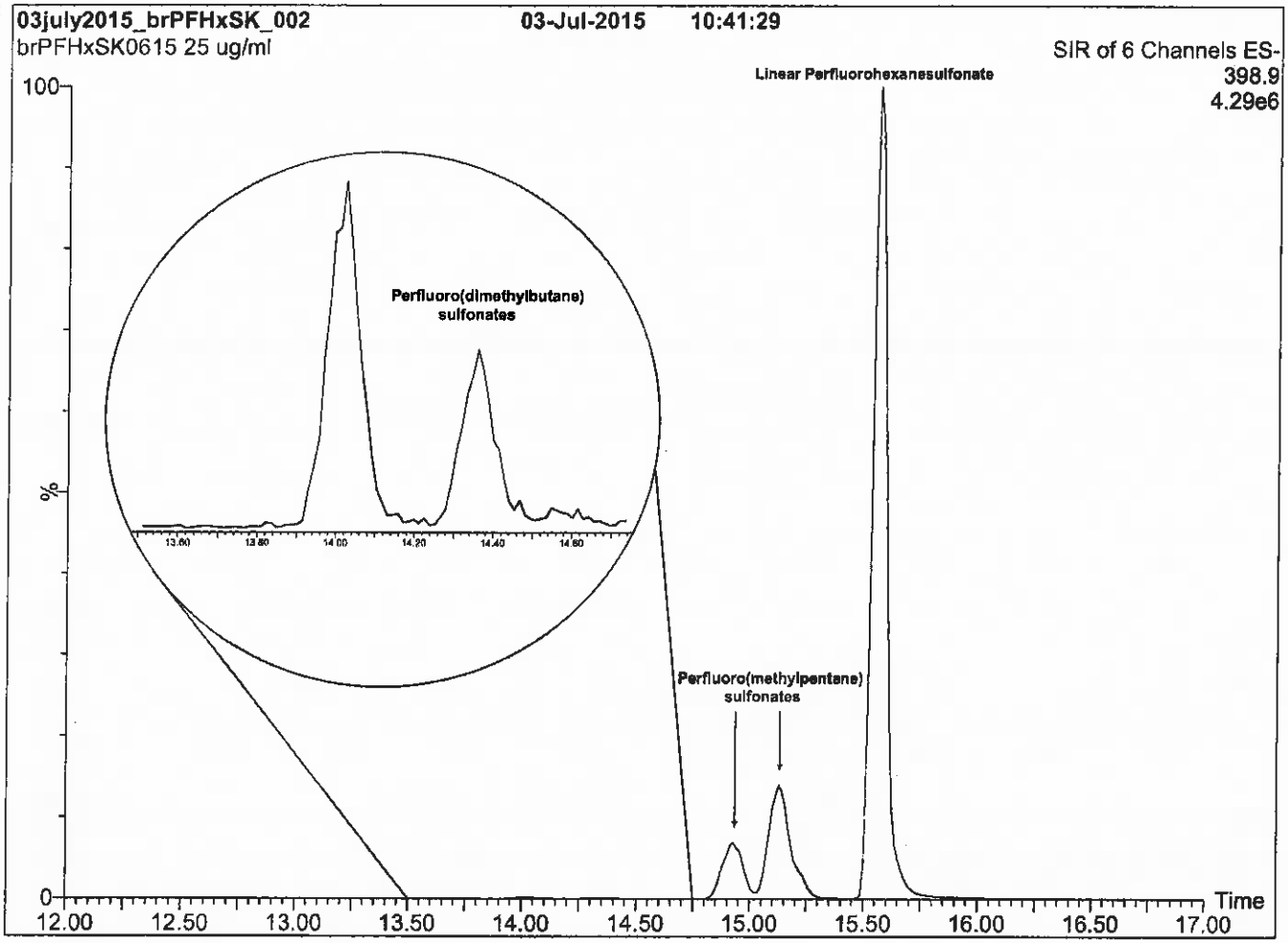
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFHxSK; LC/MS Data**



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

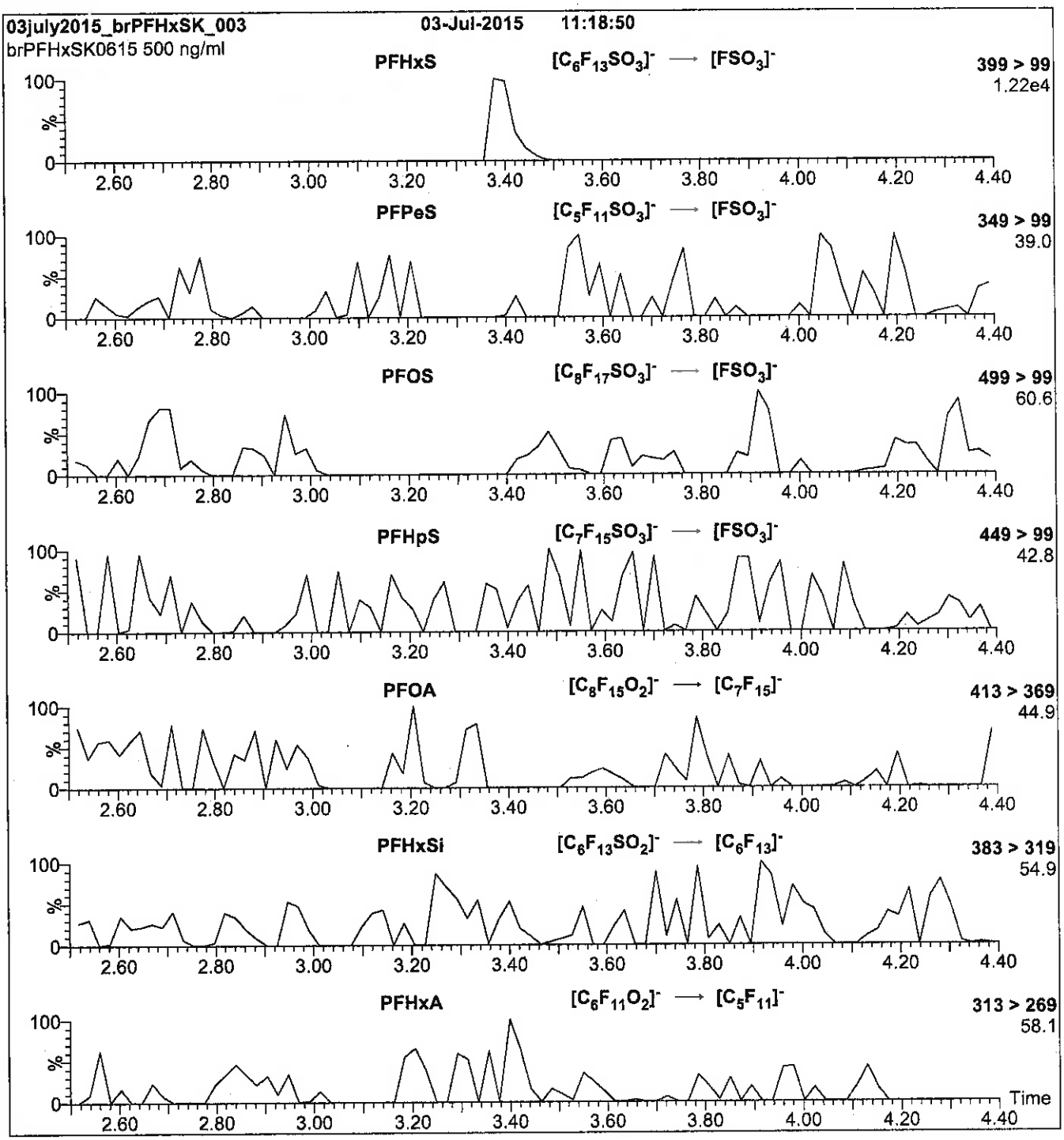
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

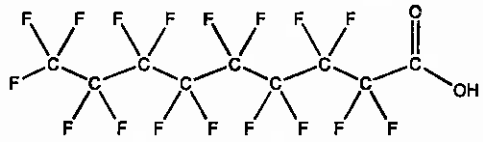
LCPFNA_00009

R: 9/21/17 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA0717
COMPOUND:	Perfluoro-n-nonanoic acid		
STRUCTURE:		**CAS #:**	375-95-1



MOLECULAR FORMULA:	$C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	464.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/20/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

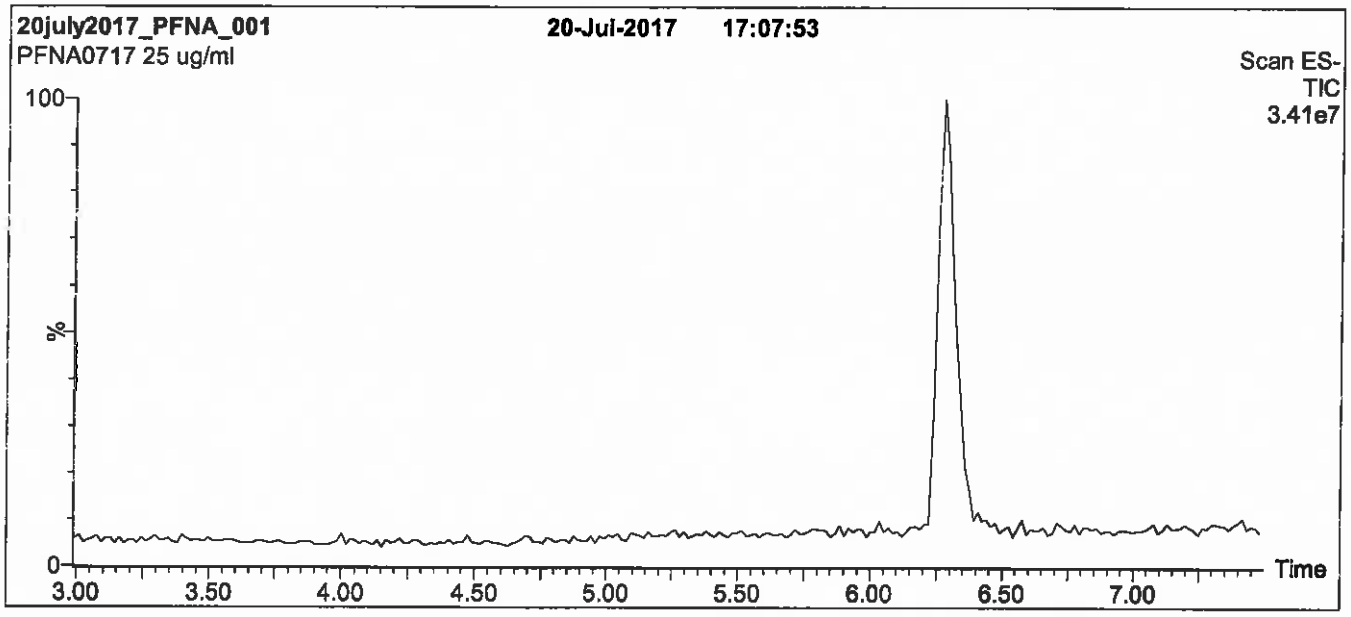
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

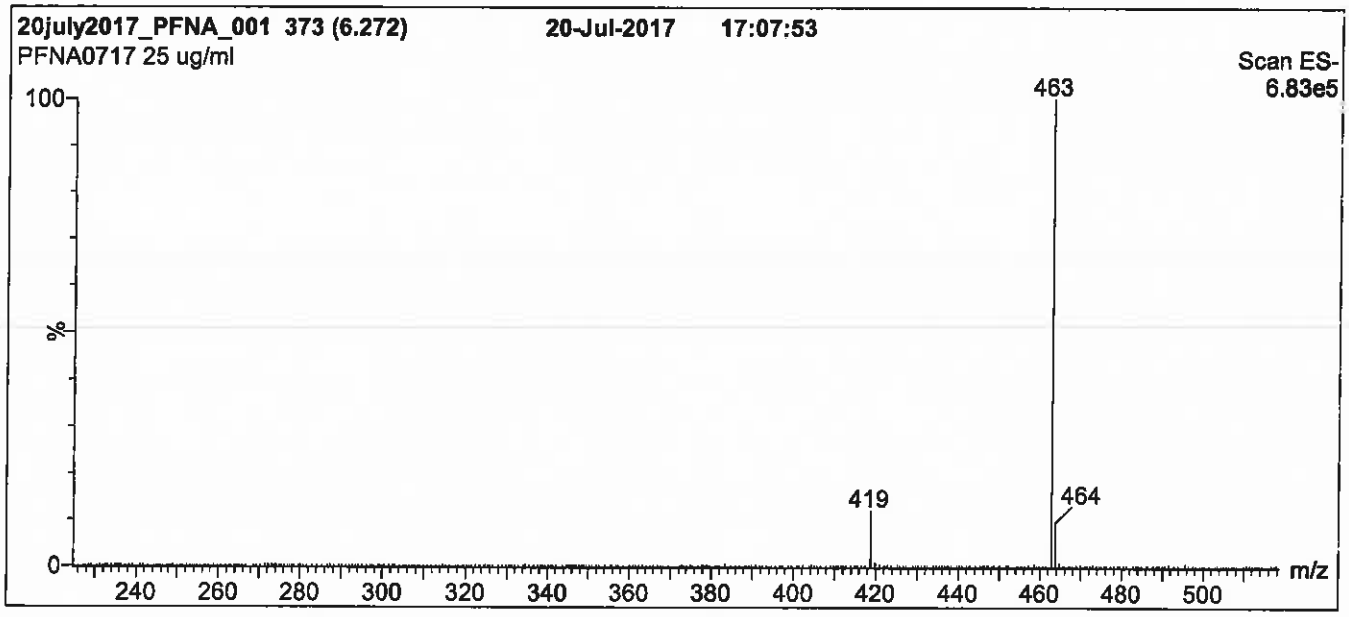
CALA

ANAB ACCREDITED

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

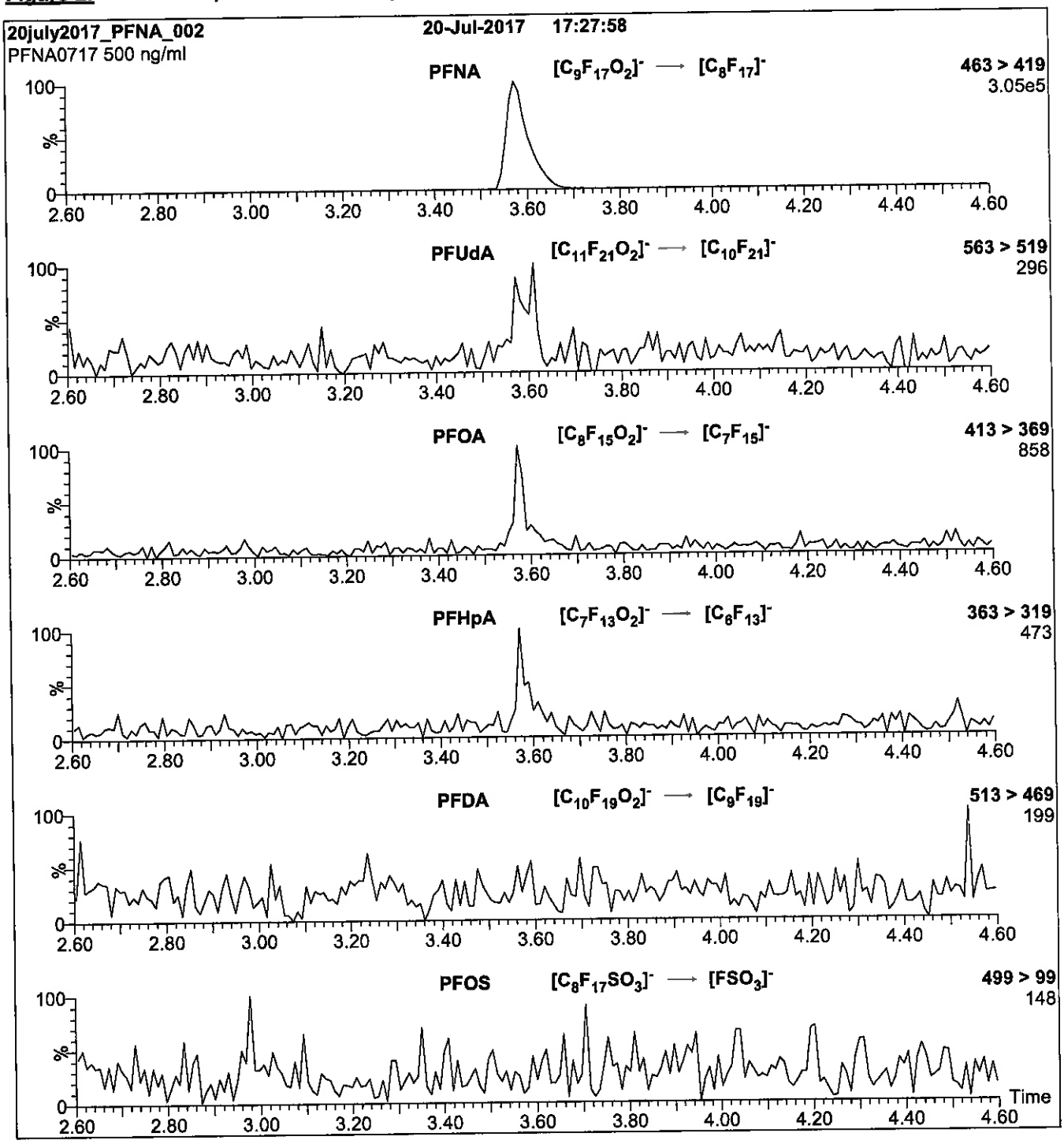
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFNS_00003

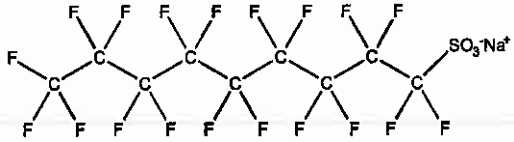
1106804
ID: LCPFNS_00003
Exp: 09/27/22 Prpd: SKV
L-PFNS at 48.0ug/mL

R: 12/4/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFNS	**LOT NUMBER:**	LPFNS0917
COMPOUND:	Sodium perfluoro-1-nonanesulfonate		
STRUCTURE:		**CAS #:**	98789-57-2



MOLECULAR FORMULA:	$C_9F_{19}SO_3Na$	**MOLECULAR WEIGHT:**	572.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.0 ± 2.4 µg/ml (PFNS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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SYNTHESIS / CHARACTERIZATION:

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Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

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QUALITY MANAGEMENT:

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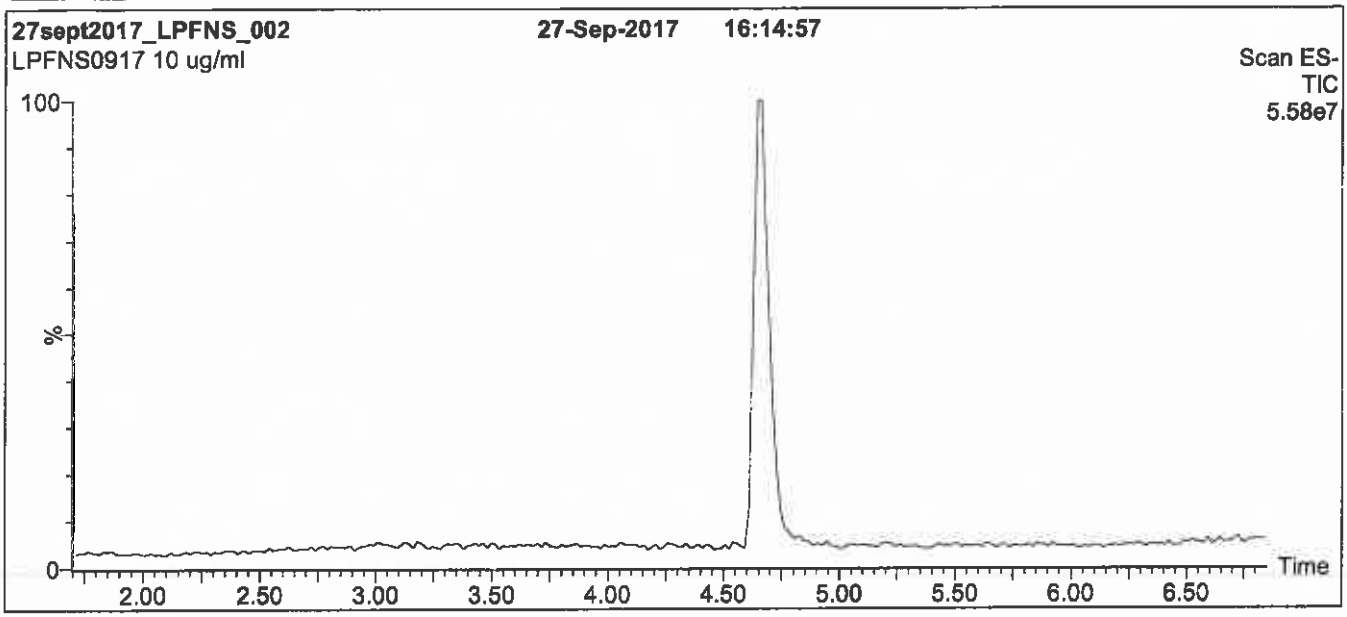
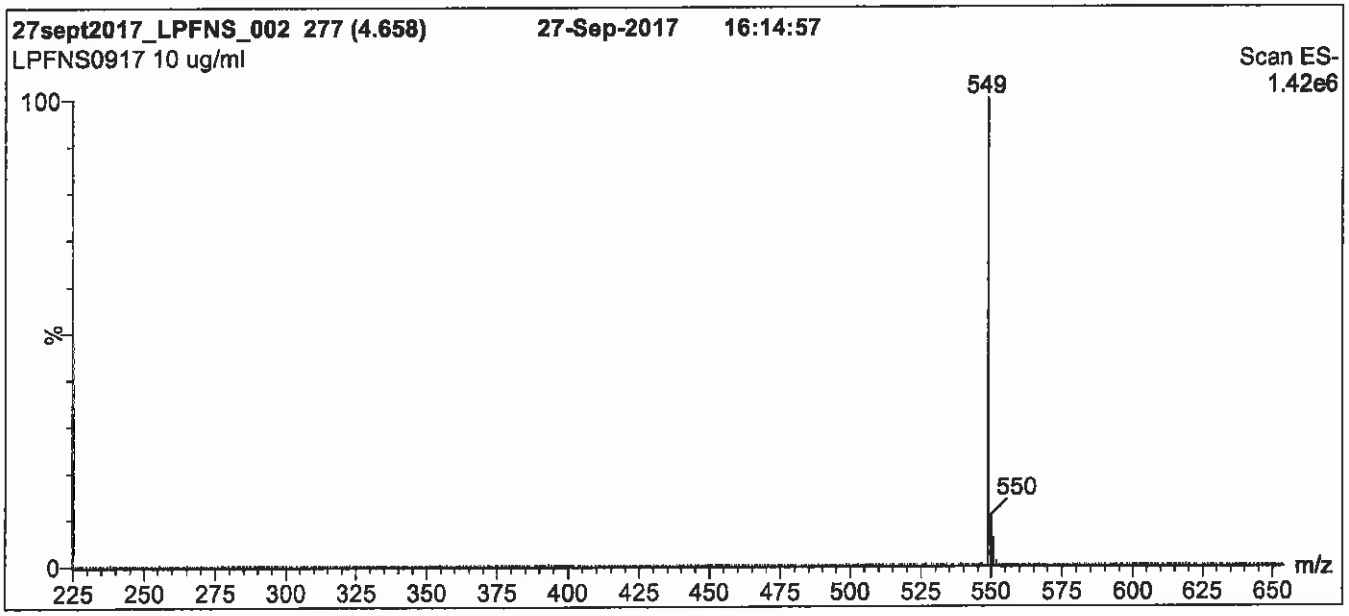
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

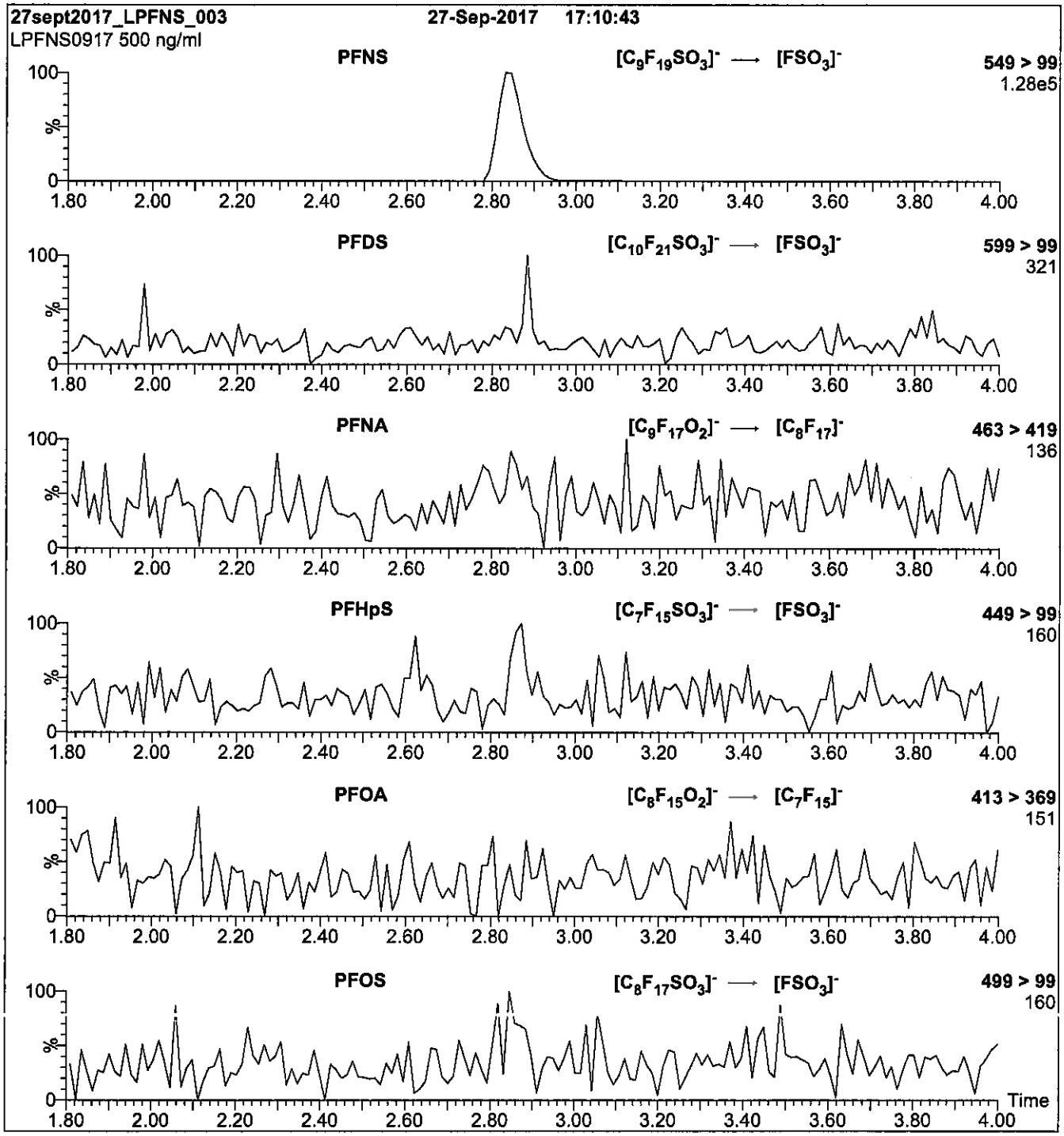
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFNS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFNS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 45

Reagent

LCPFOA_00008

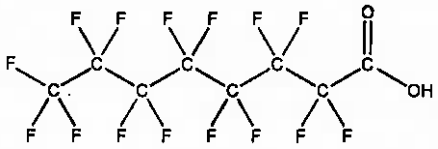
r: 12/21/16 SPV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid
LOT NUMBER: PFOA0716

STRUCTURE:
CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
MOLECULAR WEIGHT: 414.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/02/2016
EXPIRY DATE: (mm/dd/yyyy) 08/02/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/05/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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TRACEABILITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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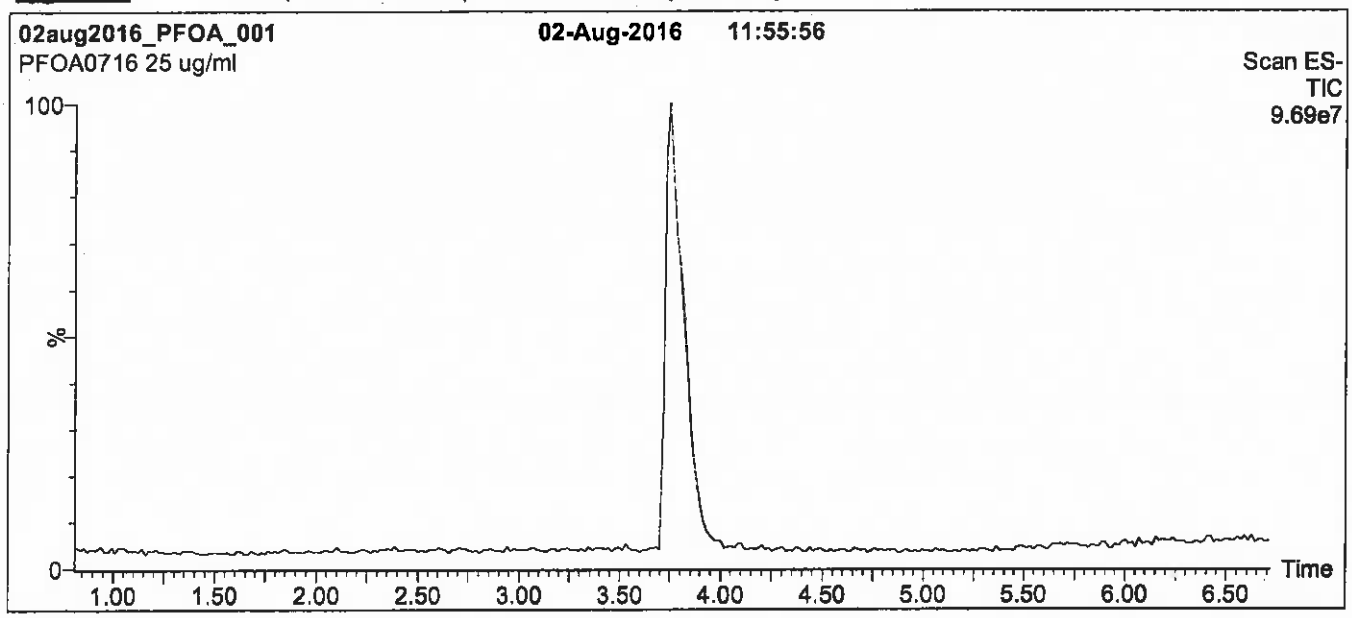
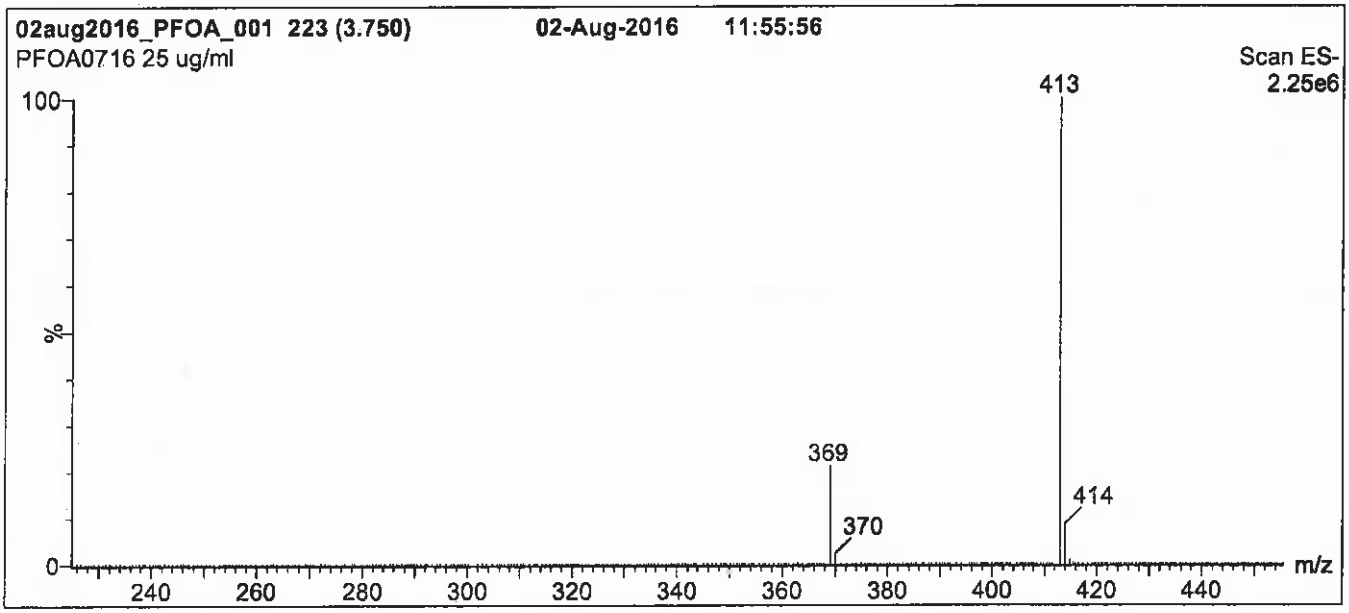
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

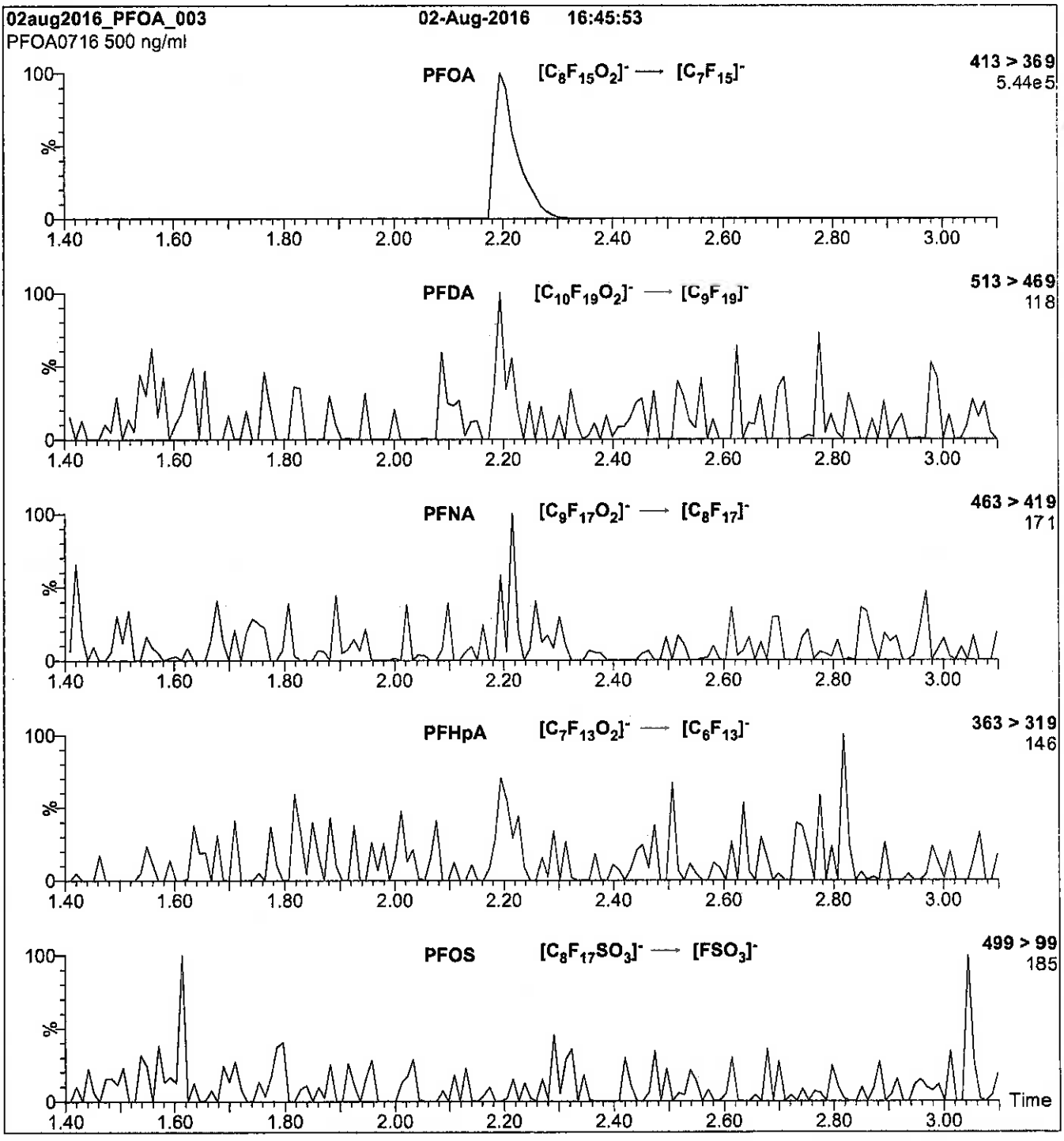
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFOA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

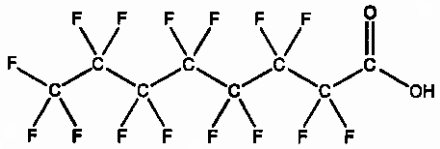
LCPFOA_00009

P: 10/2017 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFOA	**LOT NUMBER:**	PFOA0917
COMPOUND:	Perfluoro-n-octanoic acid		
STRUCTURE:		**CAS #:**	335-67-1



MOLECULAR FORMULA:	$C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	414.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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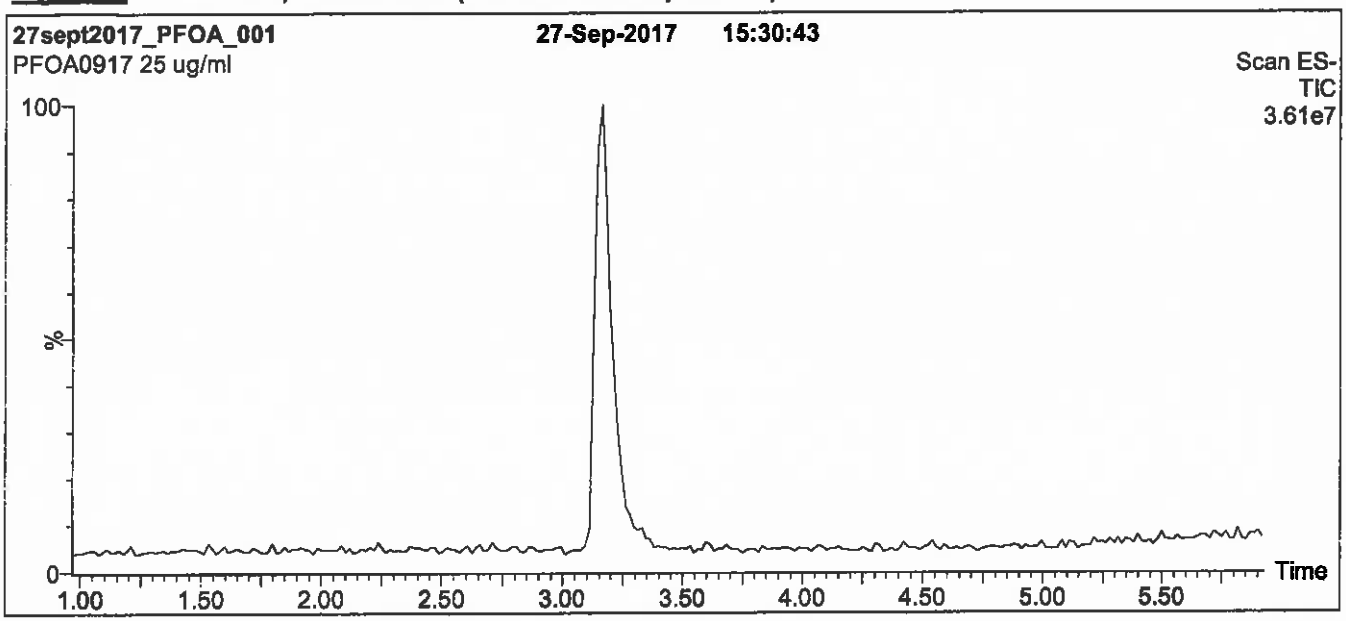
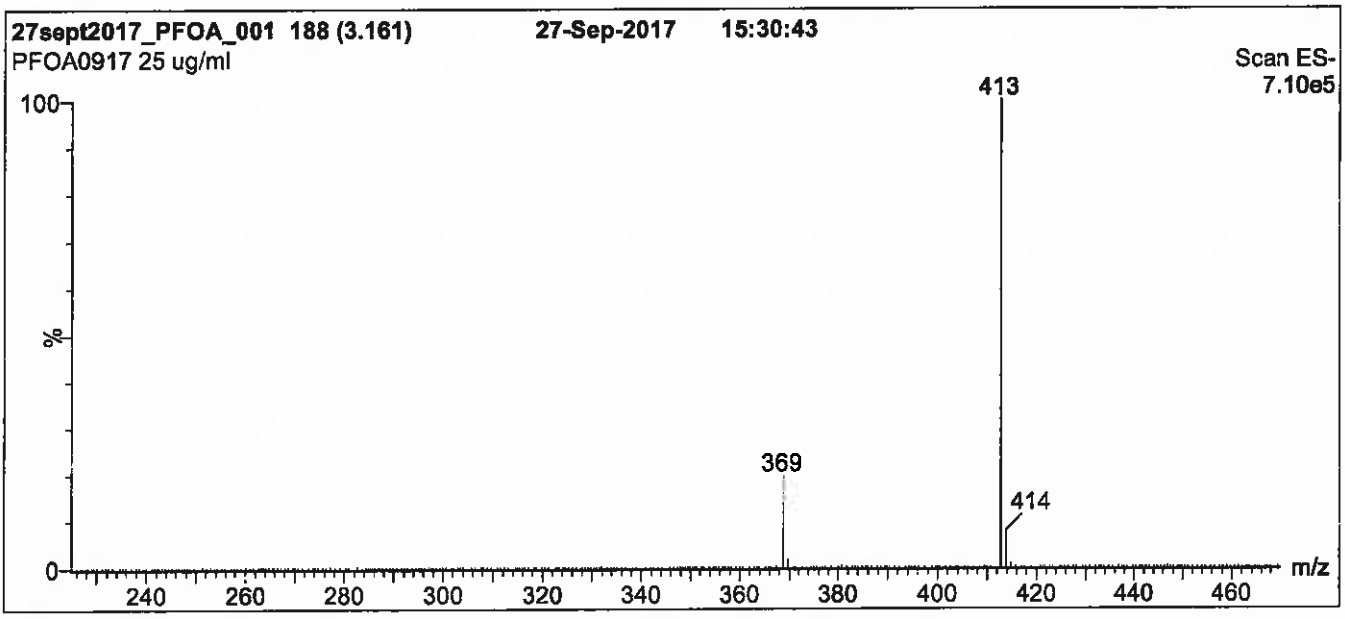
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

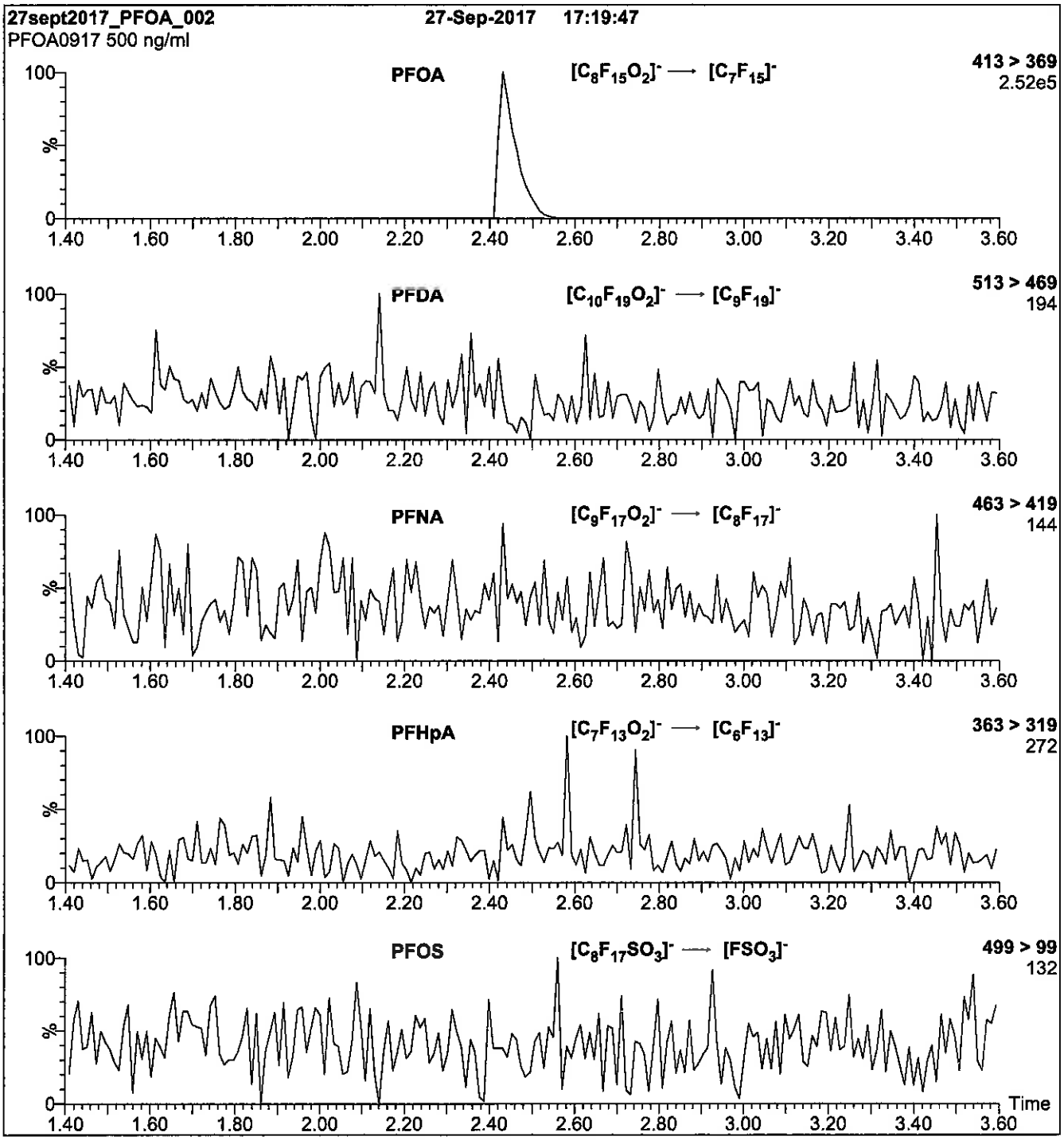
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

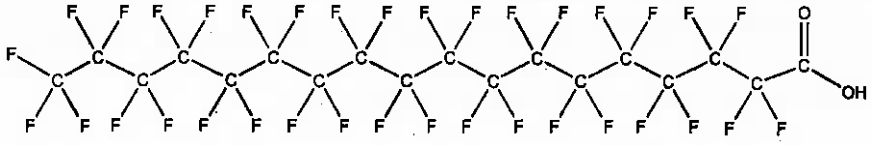
LCPFODA_00008

R: 12/20/16 SFN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFODA	**LOT NUMBER:**	PFODA0416
COMPOUND:	Perfluoro-n-octadecanoic acid		
STRUCTURE:		**CAS #:**	16517-11-6



MOLECULAR FORMULA:	$C_{18}HF_{35}O_2$	**MOLECULAR WEIGHT:**	914.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	04/29/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/29/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/20/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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EXPIRY DATE / PERIOD OF VALIDITY:

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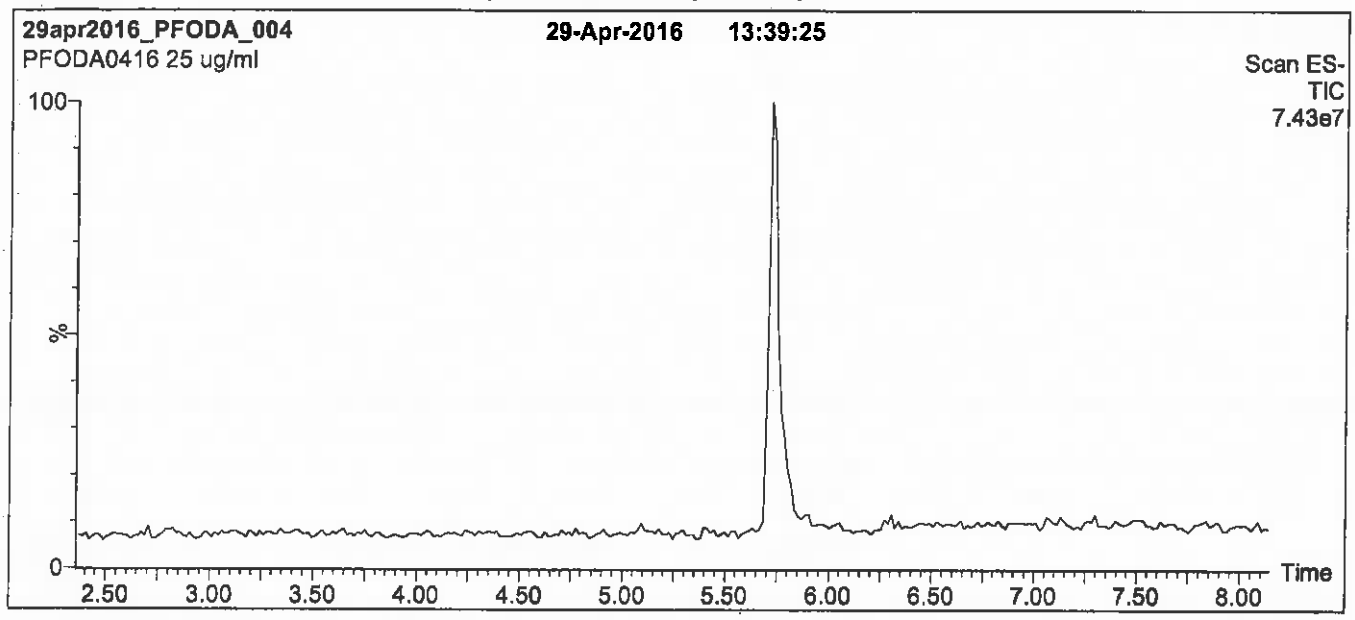
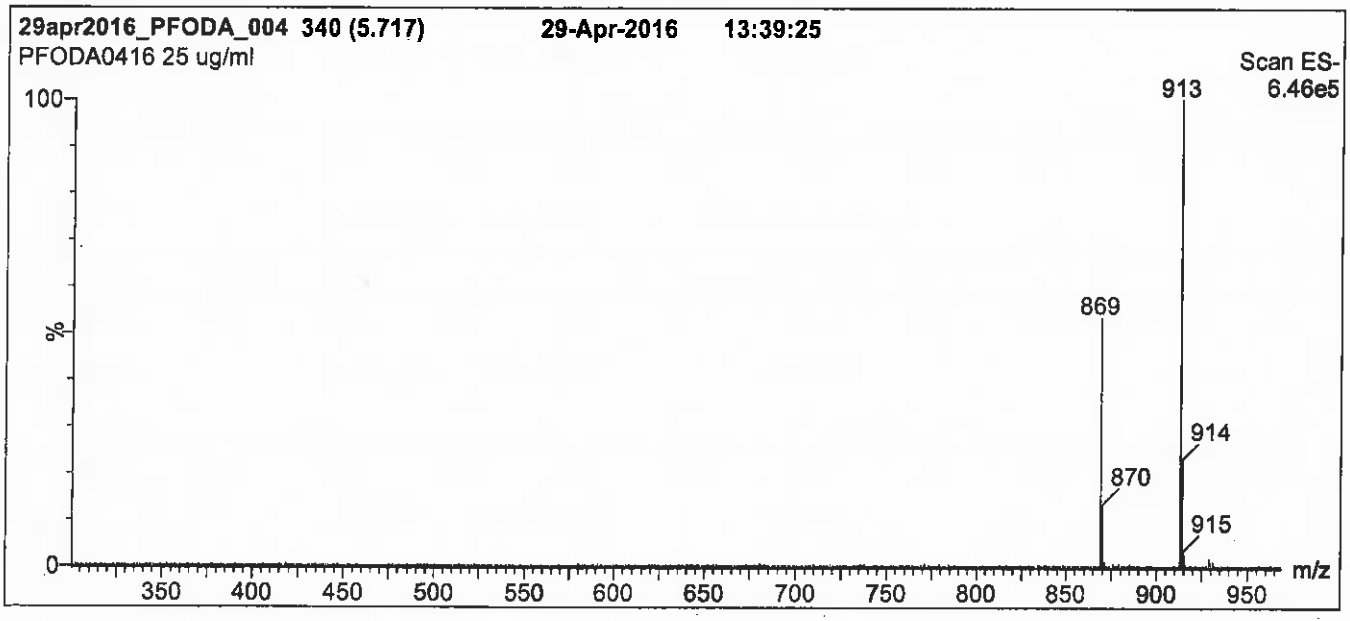
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 6 min and hold for
2.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

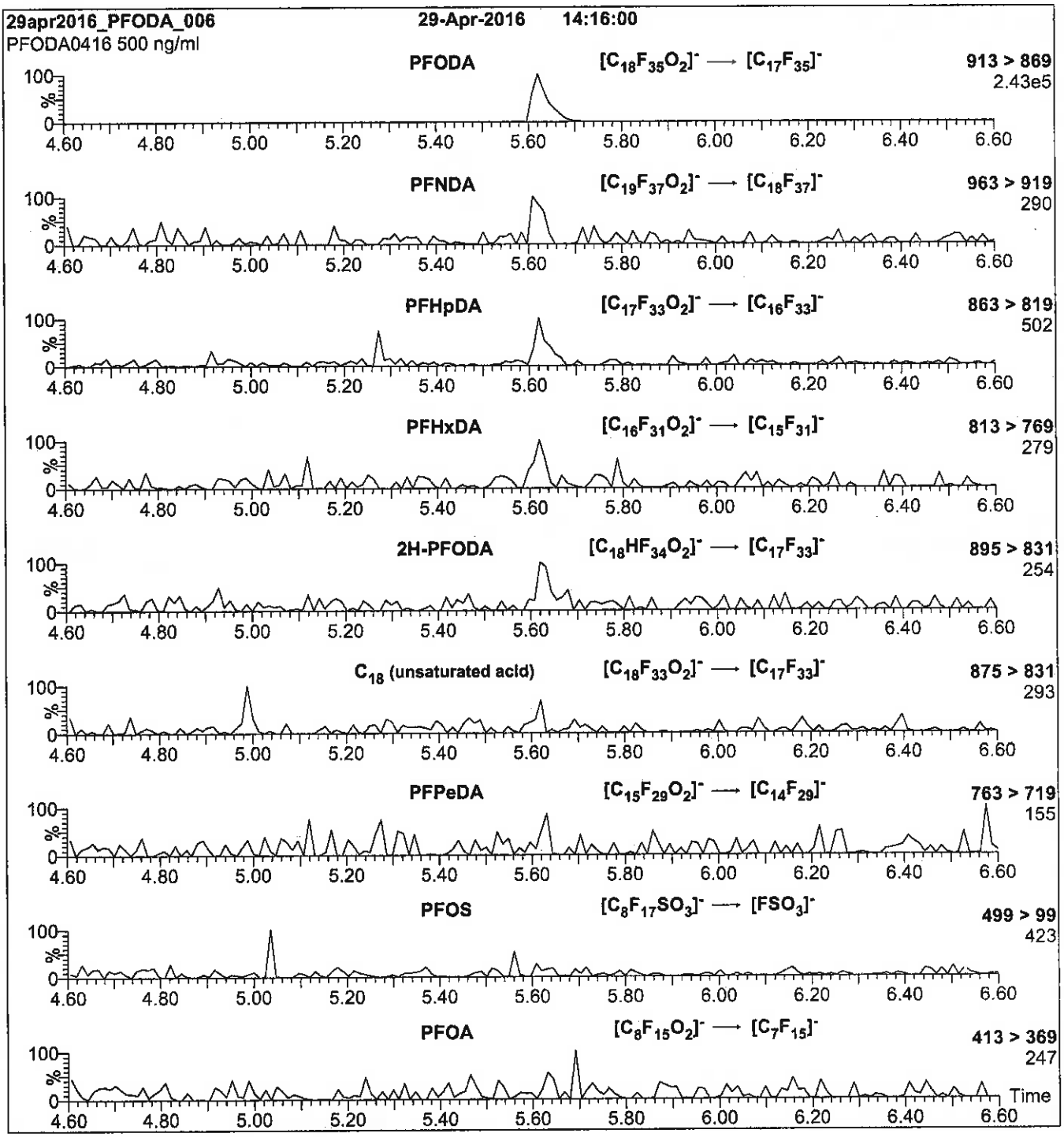
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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CALA

ANAB ACCREDITED

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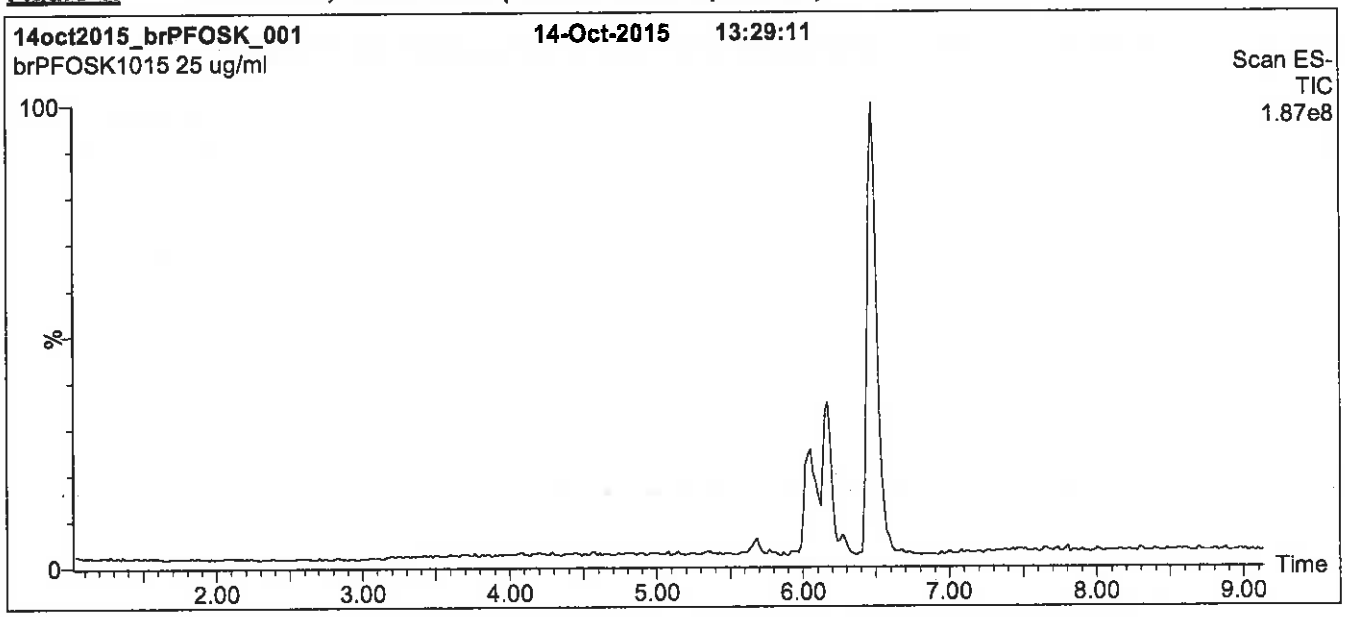
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

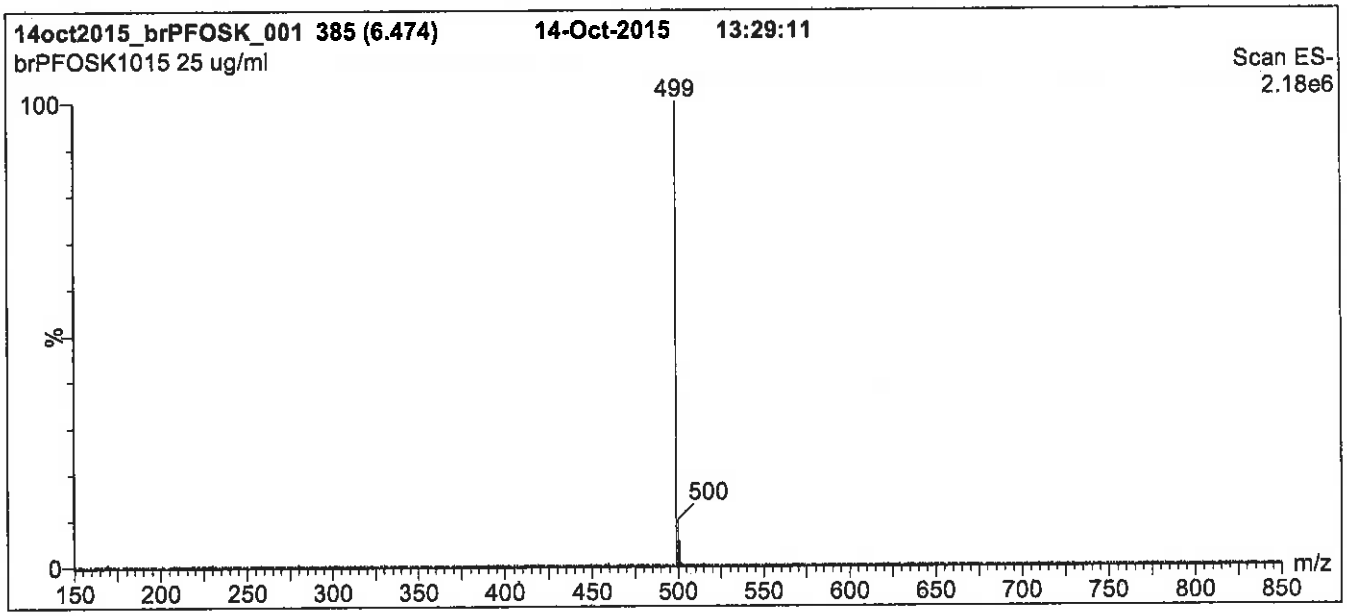
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 10/15/2015 (mm/dd/yyyy)

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

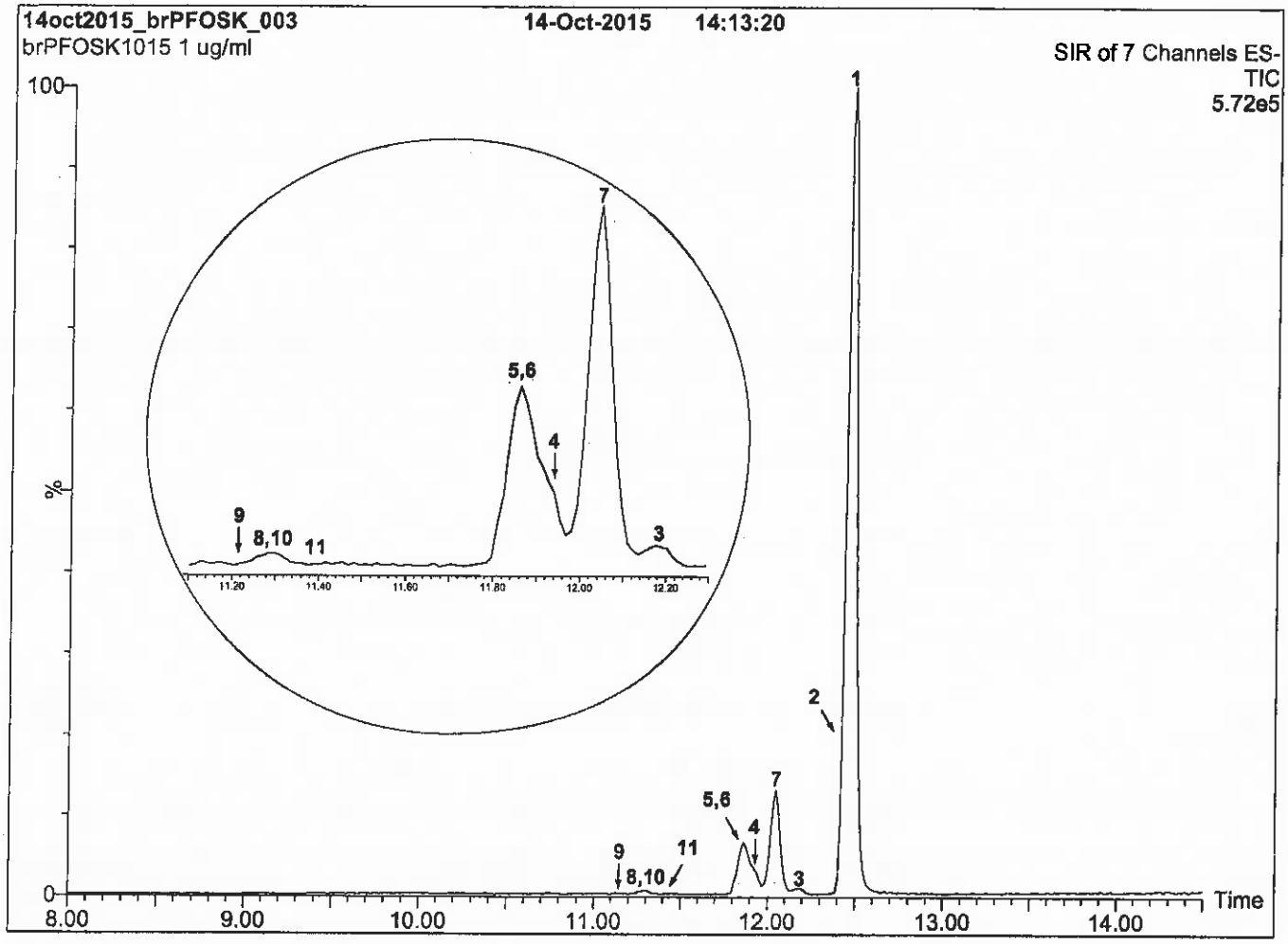
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

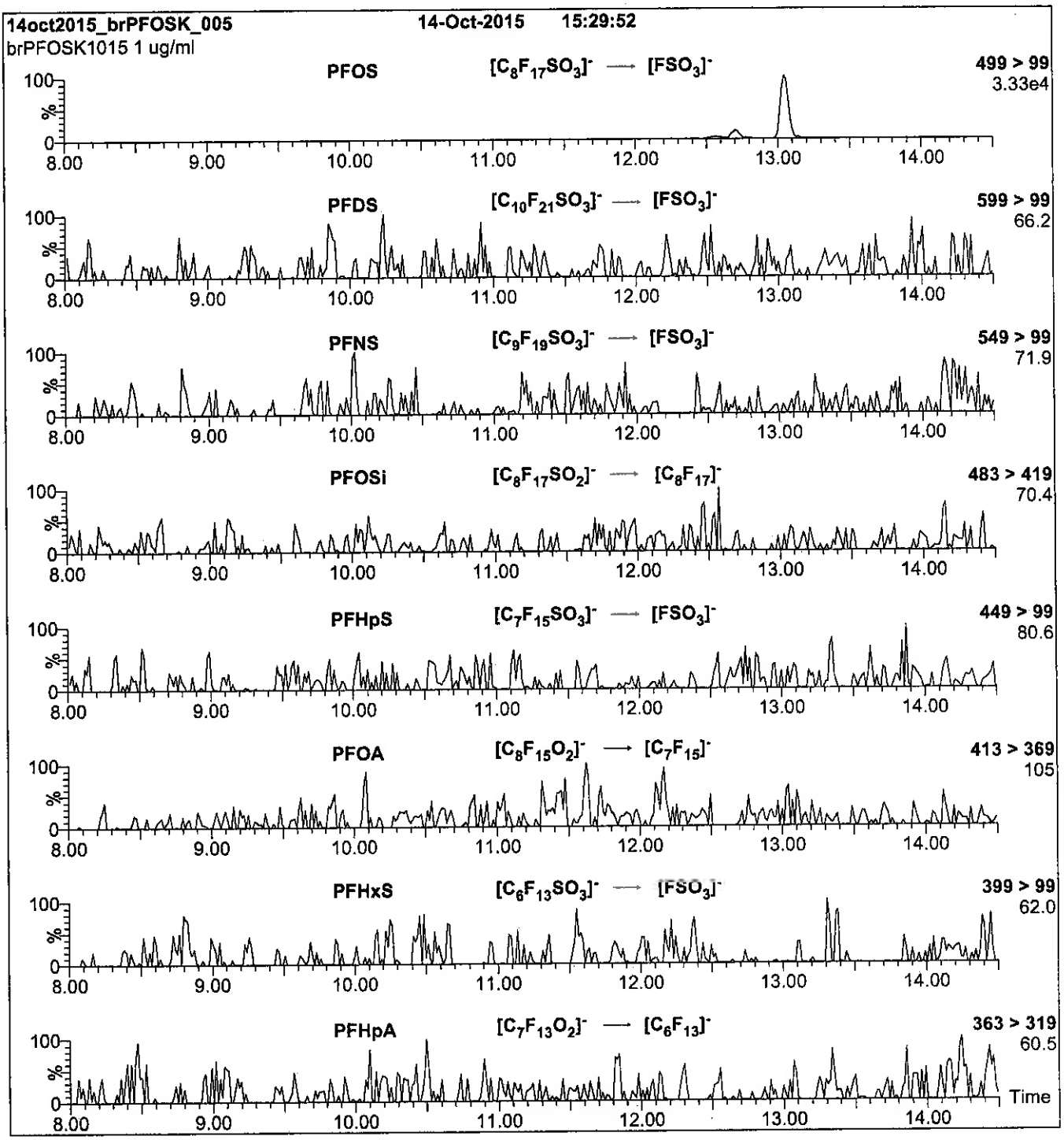
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

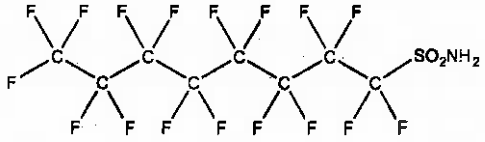
LCPFOSA_00010

12/20/16 SKI

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0916I
COMPOUND:	Perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/07/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB

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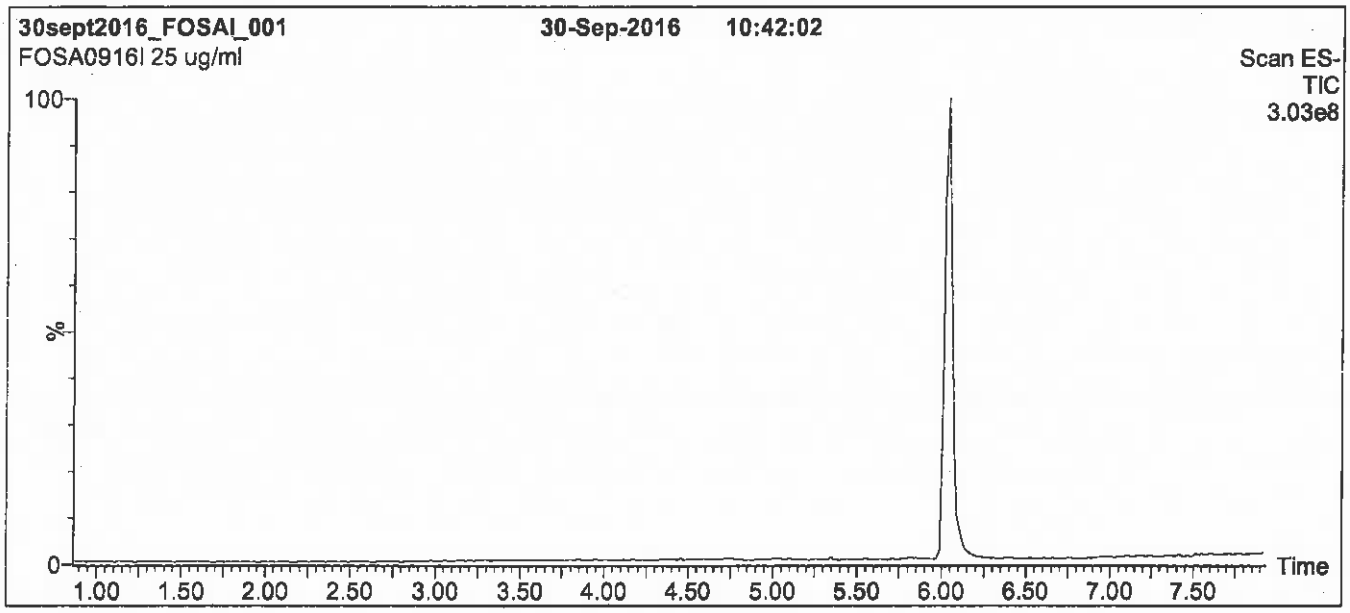
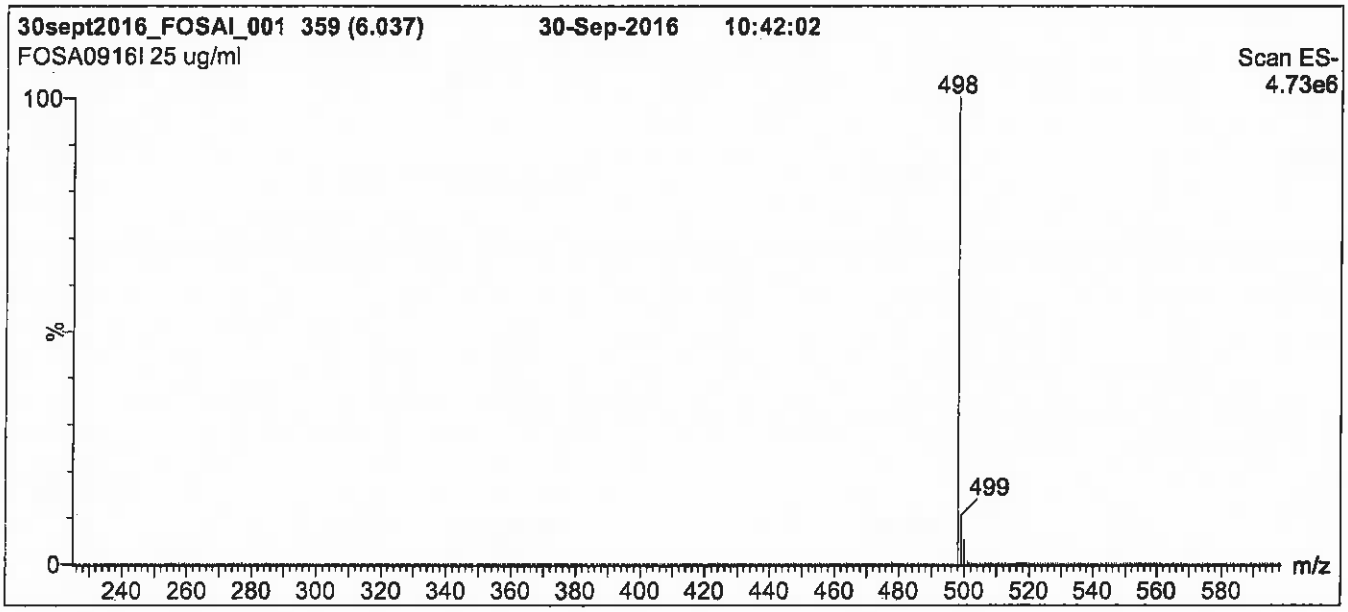
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

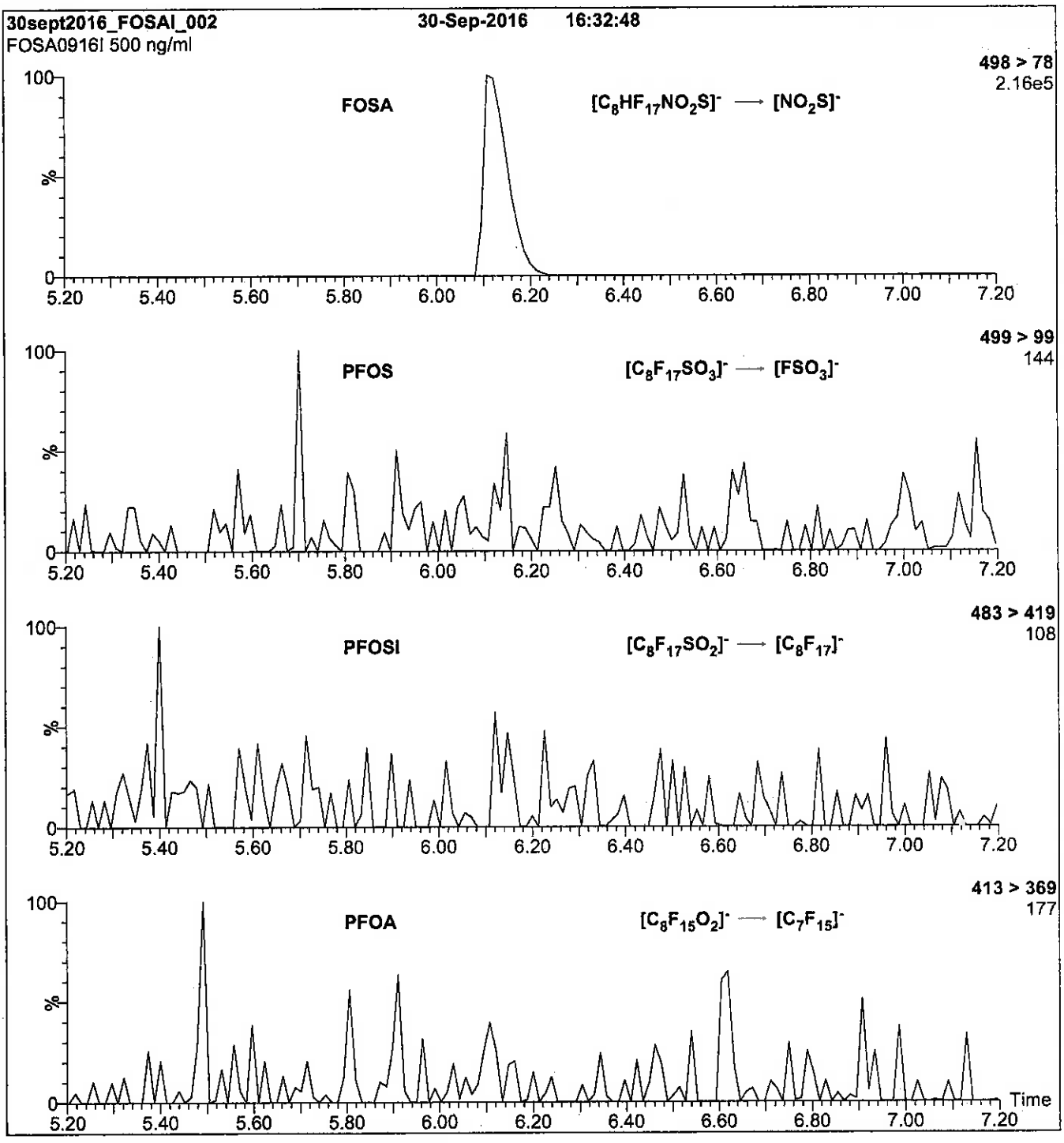
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

Reagent

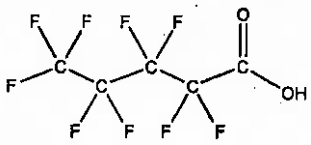
LCPFPeA_00007

r: 12/29/16 SH
s: 1/6/17 SH

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0516
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_8O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/02/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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SYNTHESIS / CHARACTERIZATION:

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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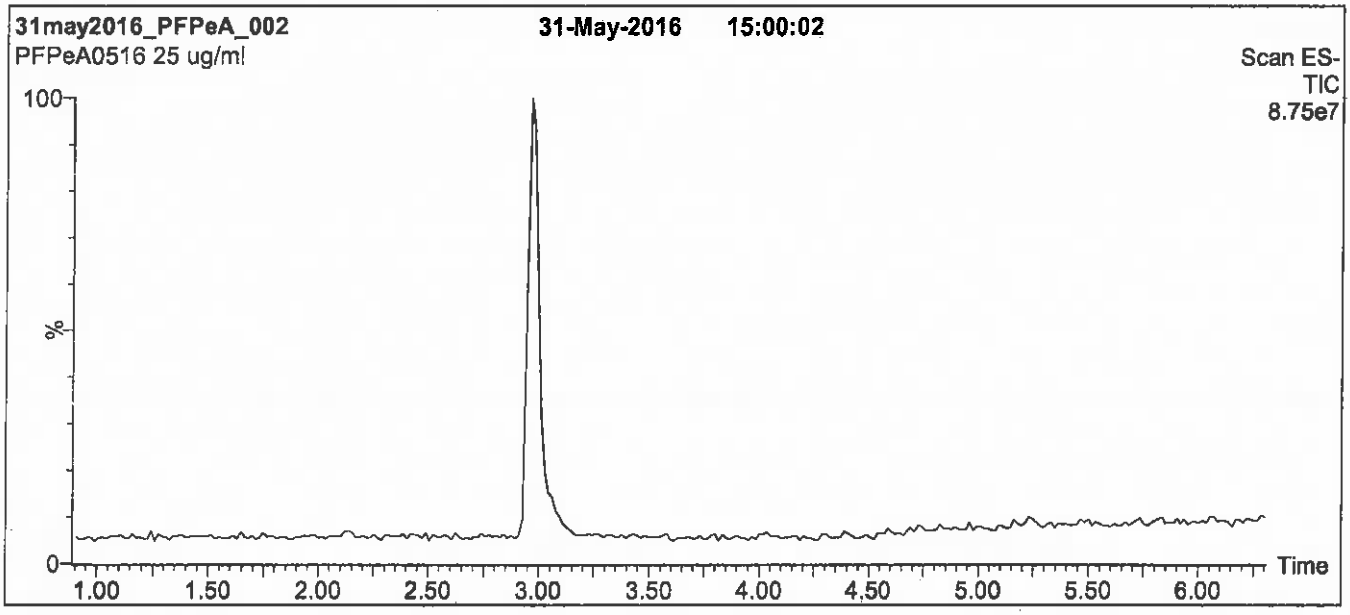
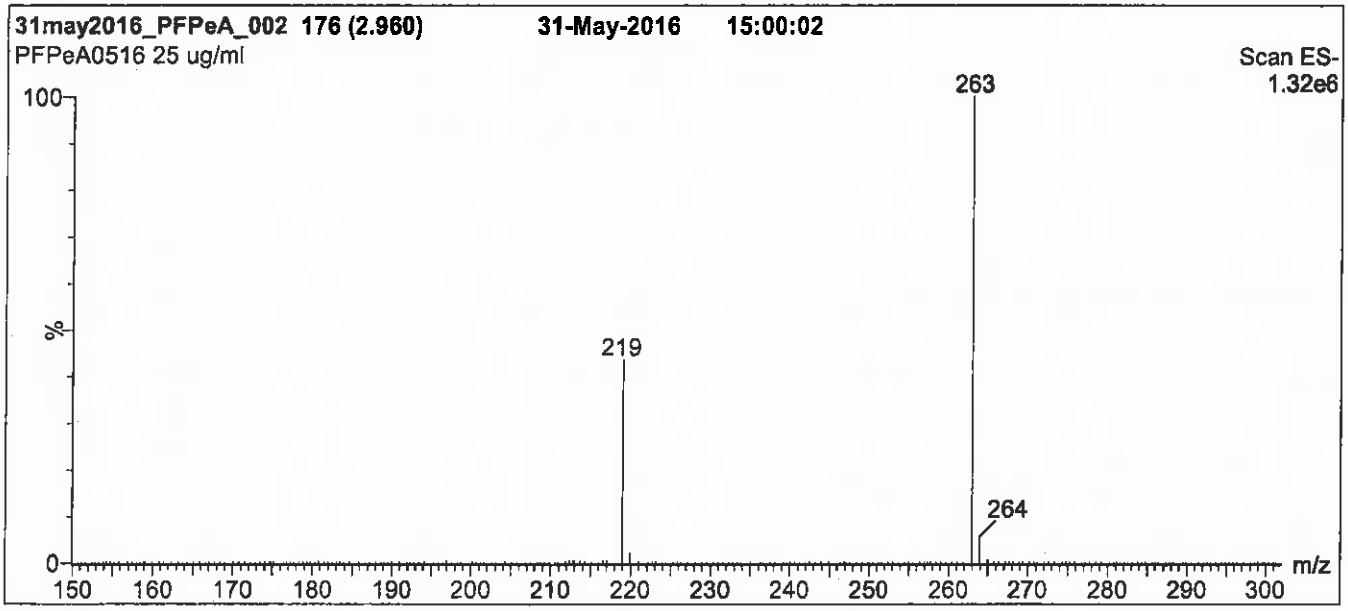
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

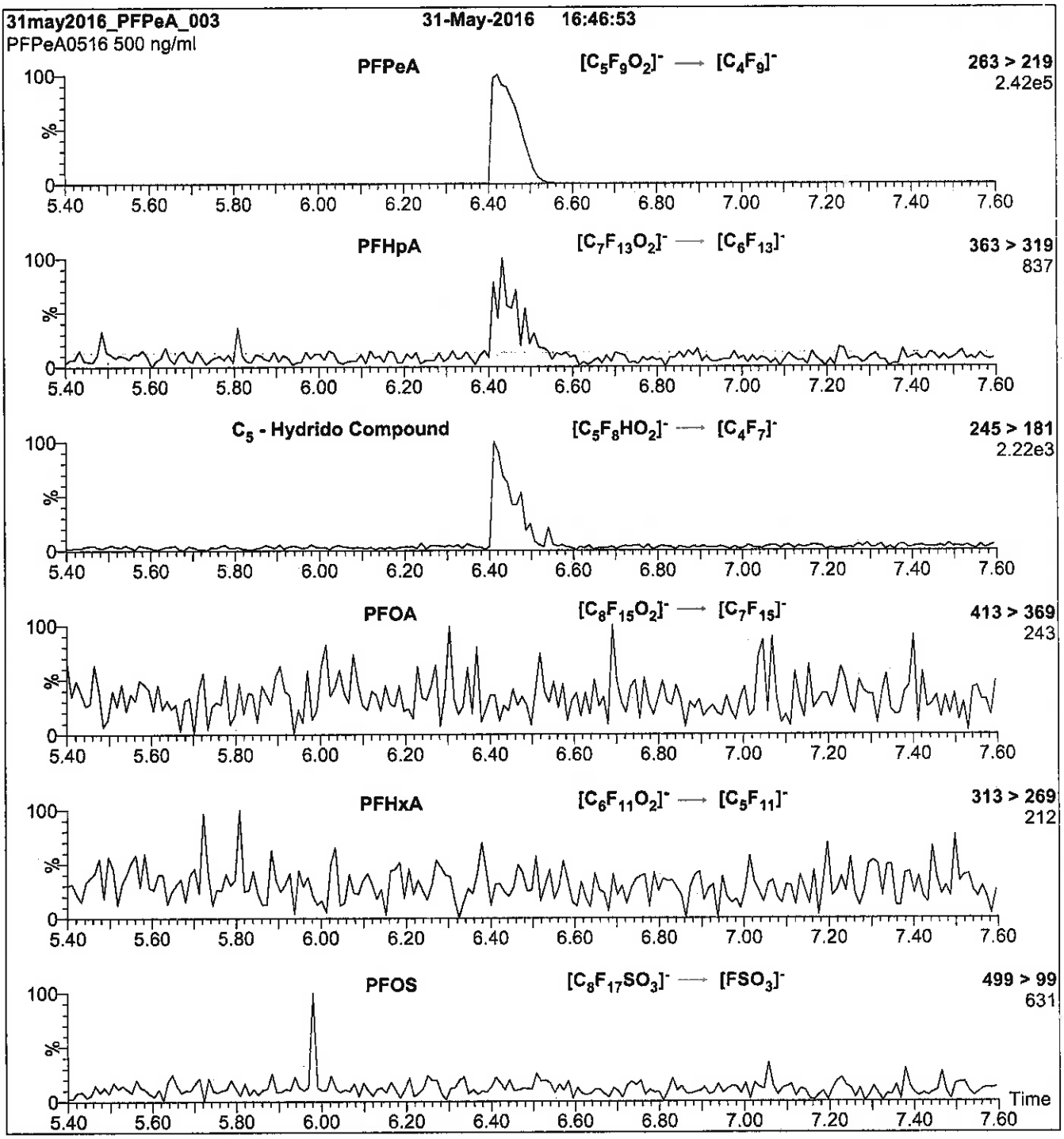
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 9

Reagent

LCPFPeS_00003

P: 12/4/17 SKV

WELLINGTON LABORATORIES

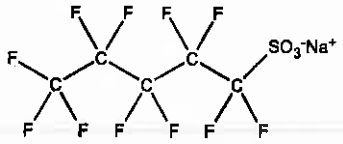
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate

LOT NUMBER: LPFPeS0117

STRUCTURE:

CAS #: 630402-22-1



MOLECULAR FORMULA: $C_5F_{11}SO_3Na$
MOLECULAR WEIGHT: 372.09
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
46.9 ± 2.3 µg/ml (PFPeS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/11/2017
EXPIRY DATE: (mm/dd/yyyy) 01/11/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/06/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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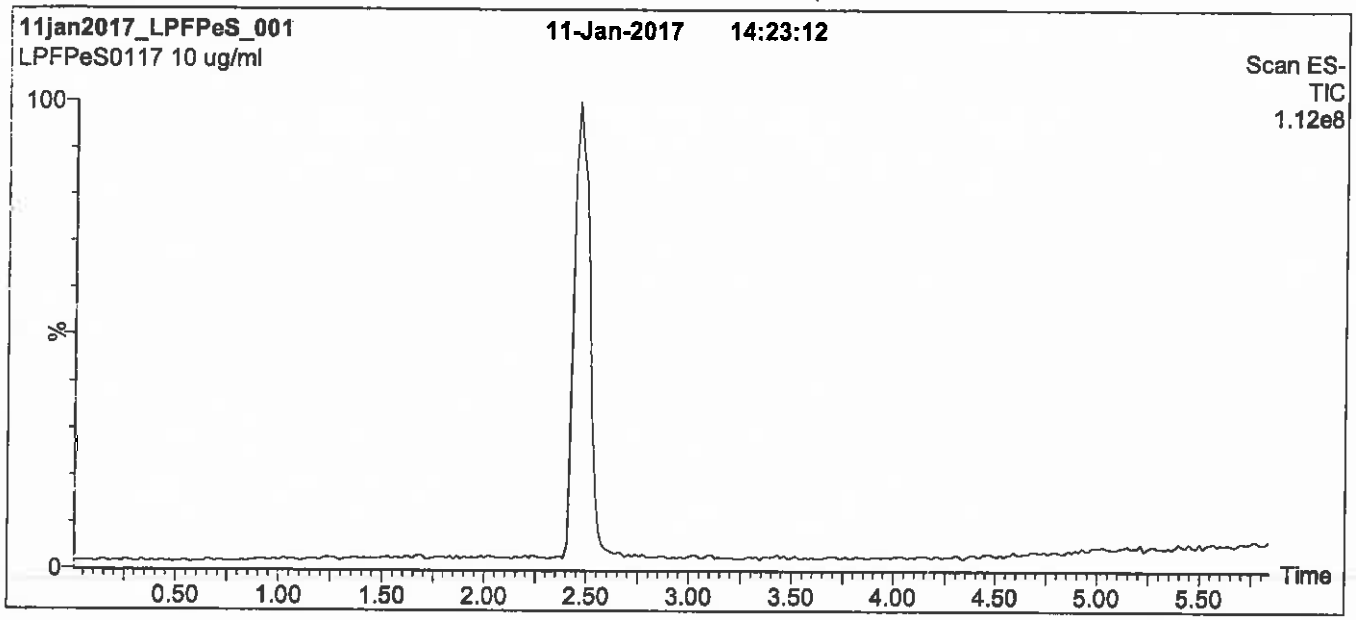
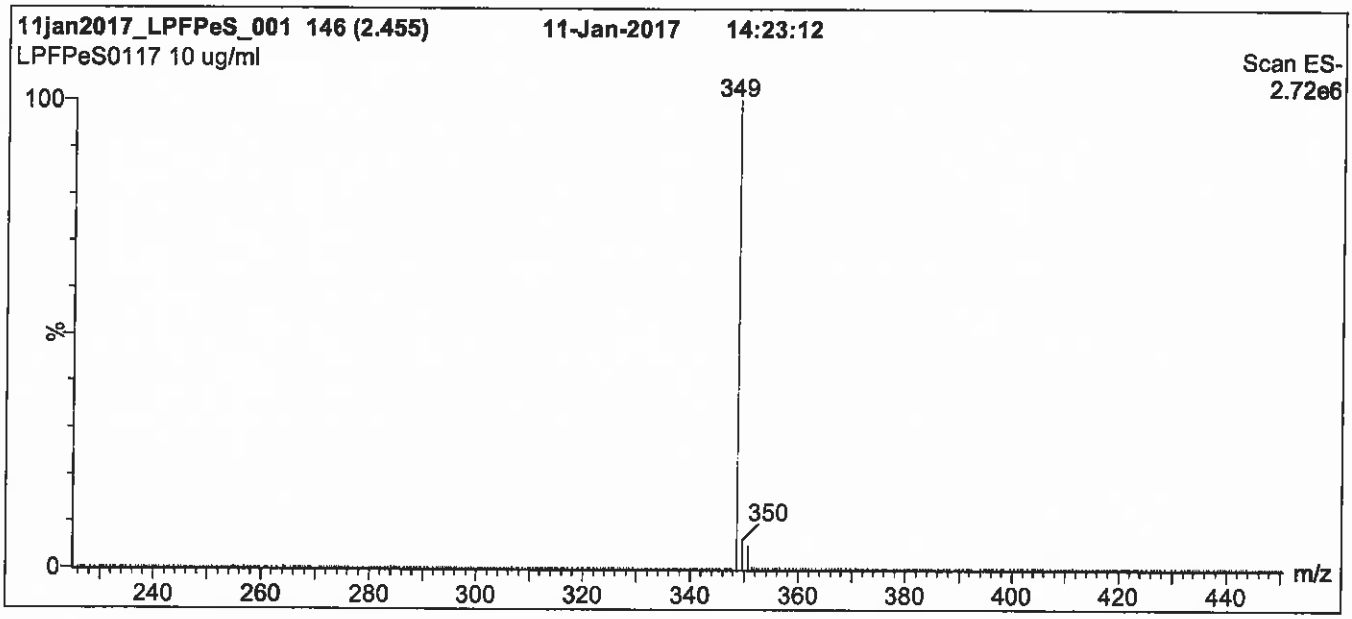
Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions over 0.5 min.
Time: 10 min

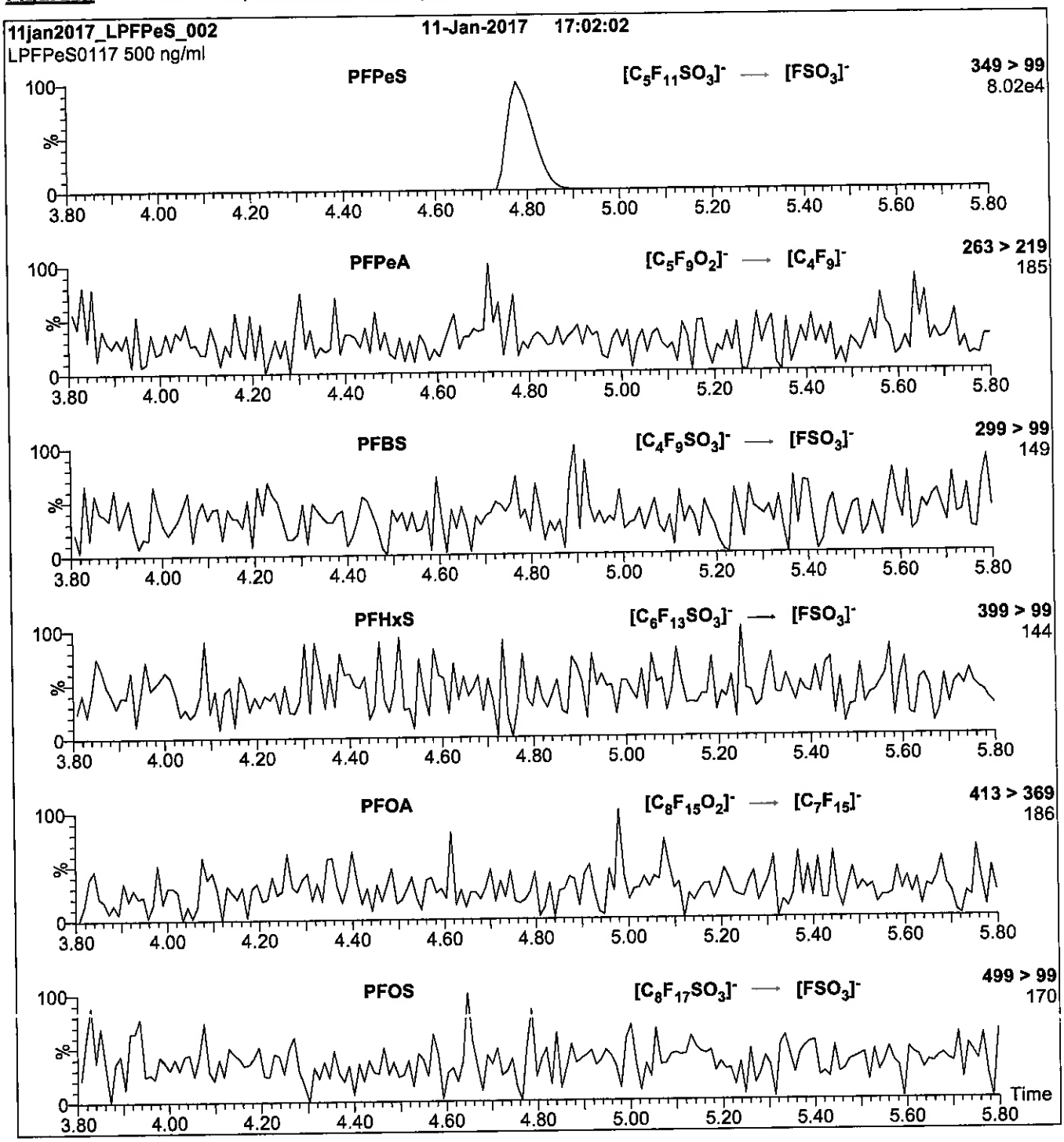
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFPeS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 30

Reagent

LCPFTeDA_00006

R: SBG 9/13/16

730645
ID: LCPFTeDA_00005
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

730659
ID: LCPFTeDA_00006
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

WELLINGTON LABORATORIES

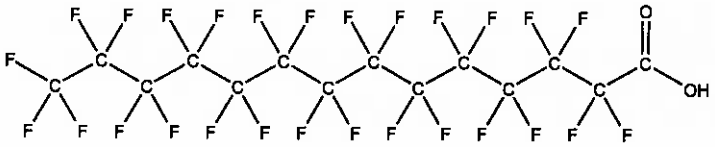
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid

LOT NUMBER: PFTeDA1215

STRUCTURE:

CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 714.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

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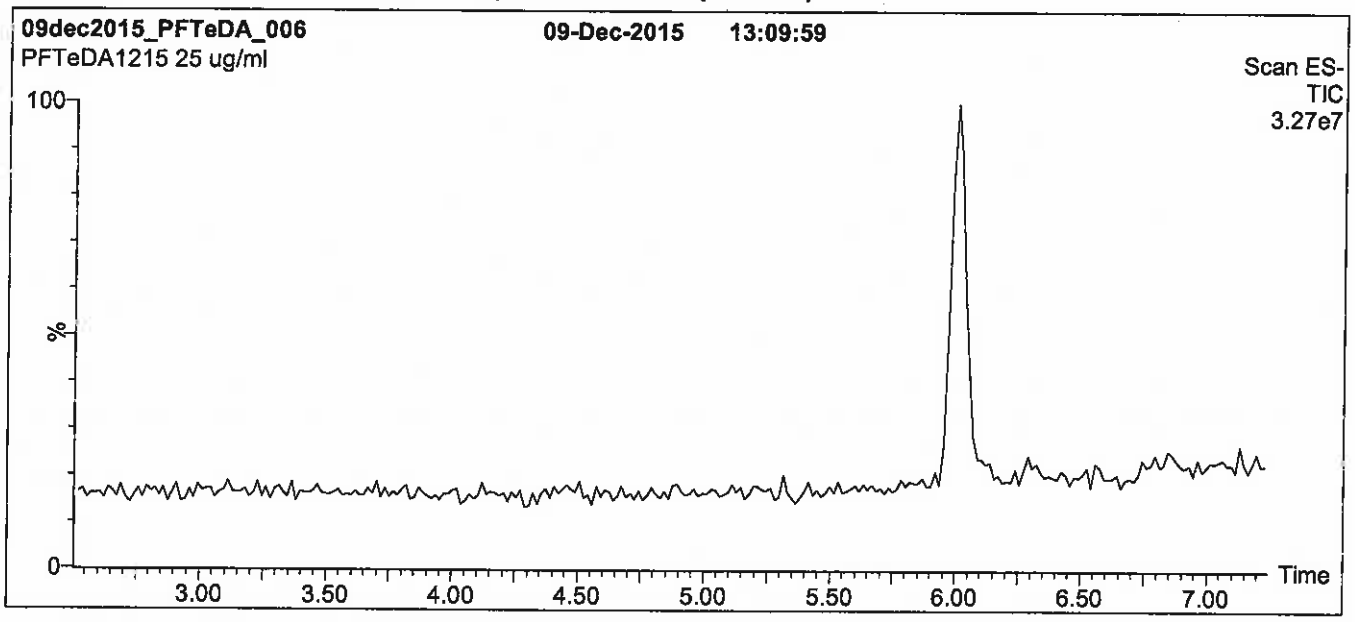
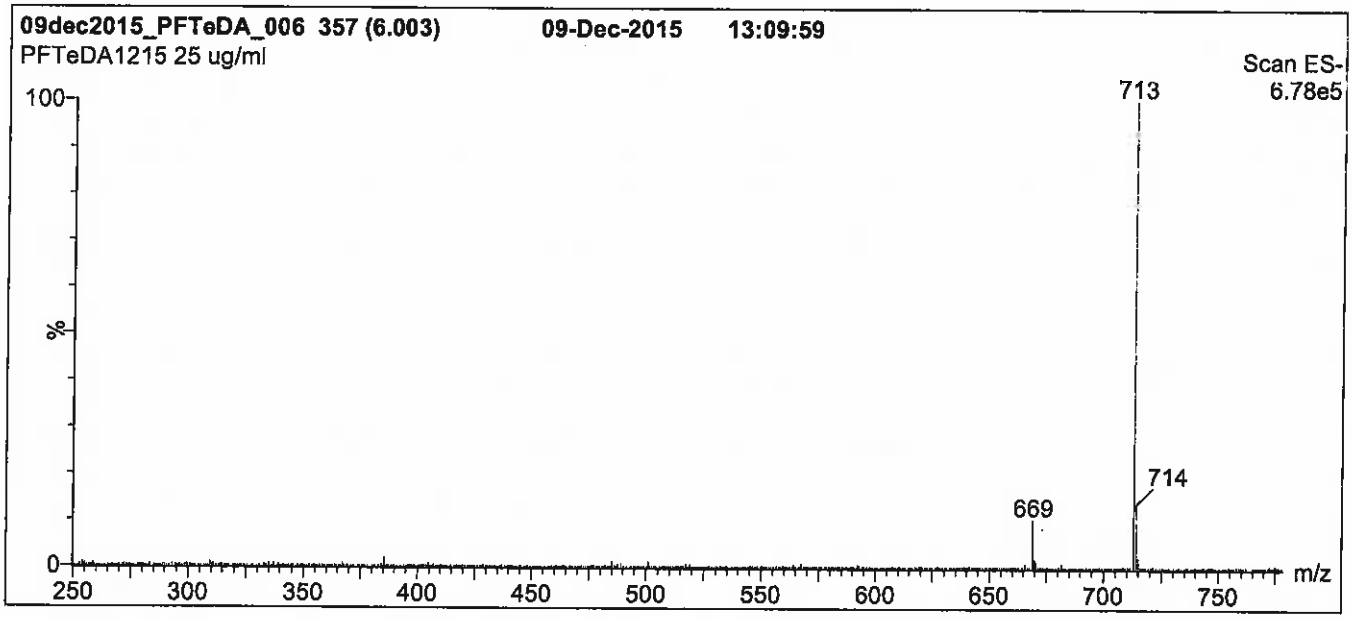
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

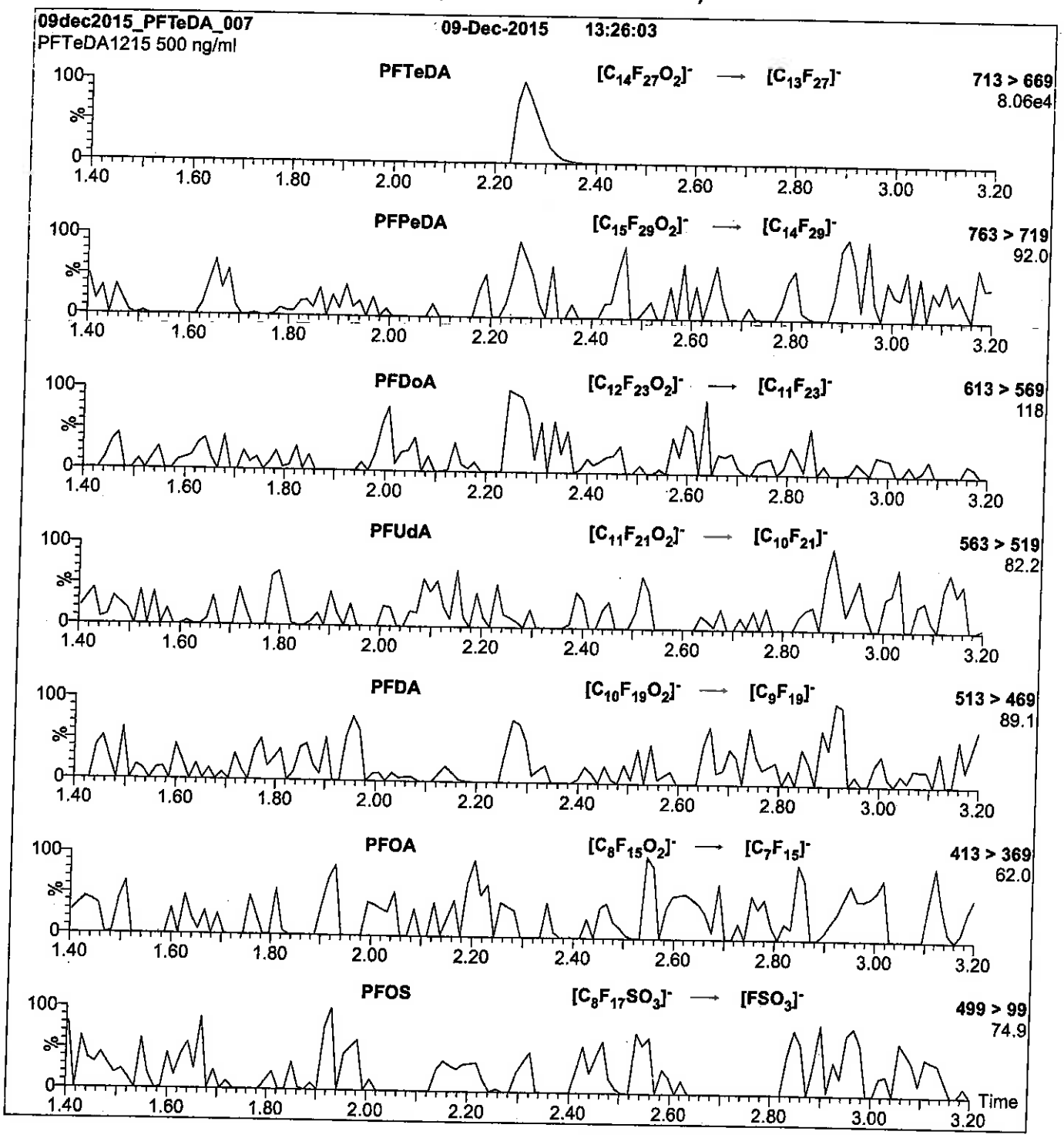
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

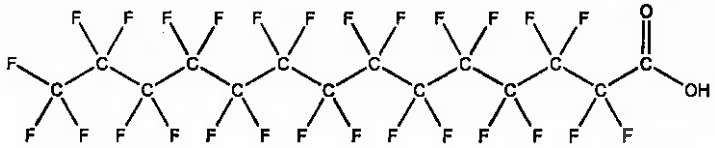
LCPFTeDA_00007

D: 12/20/16 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFTeDA	**LOT NUMBER:**	PFTeDA0916
COMPOUND:	Perfluoro-n-tetradecanoic acid		
STRUCTURE:		**CAS #:**	376-06-7



MOLECULAR FORMULA:	$C_{14}HF_{27}O_2$	**MOLECULAR WEIGHT:**	714.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/05/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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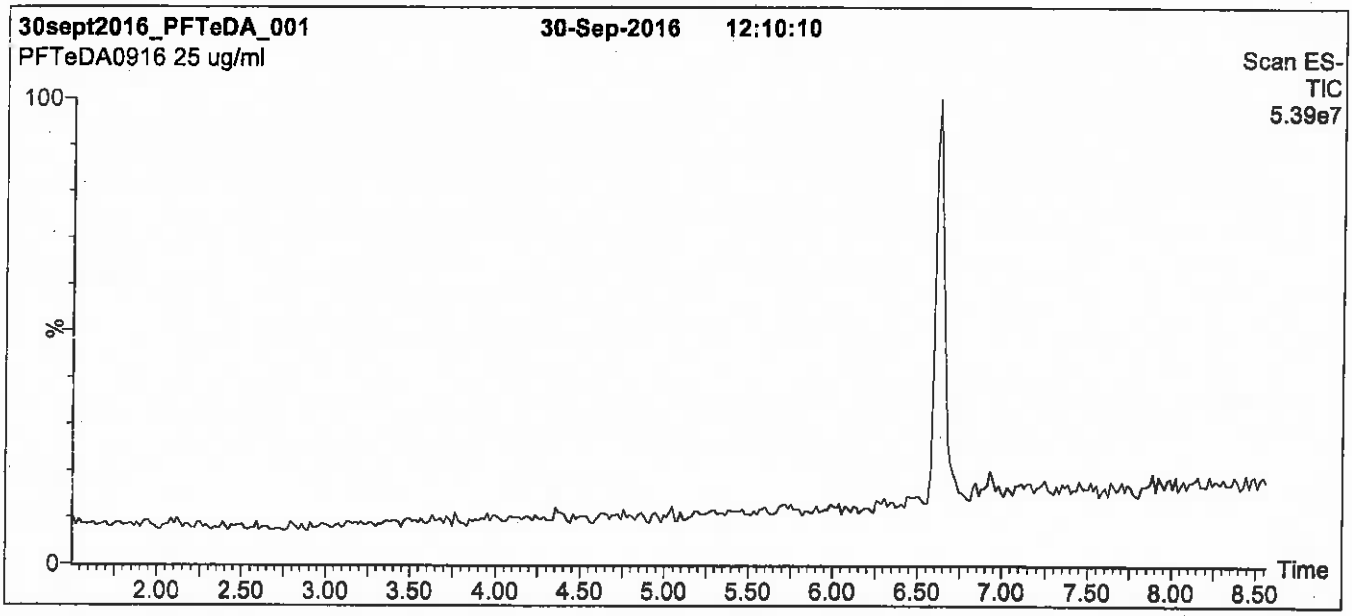
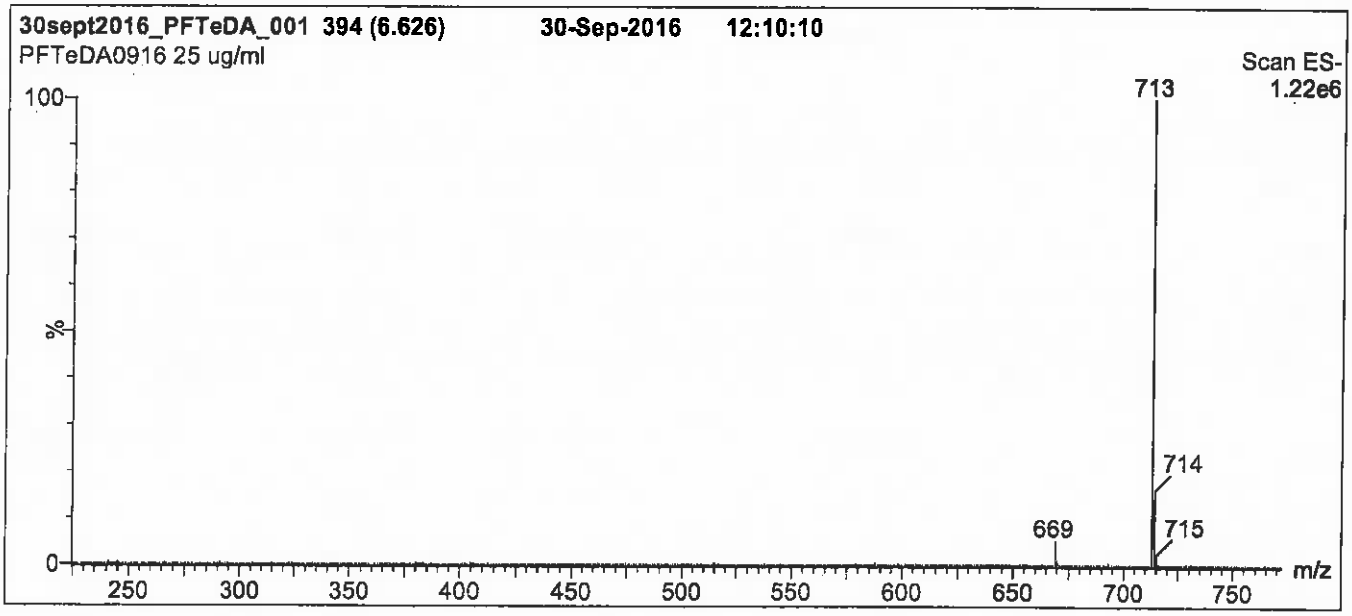
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

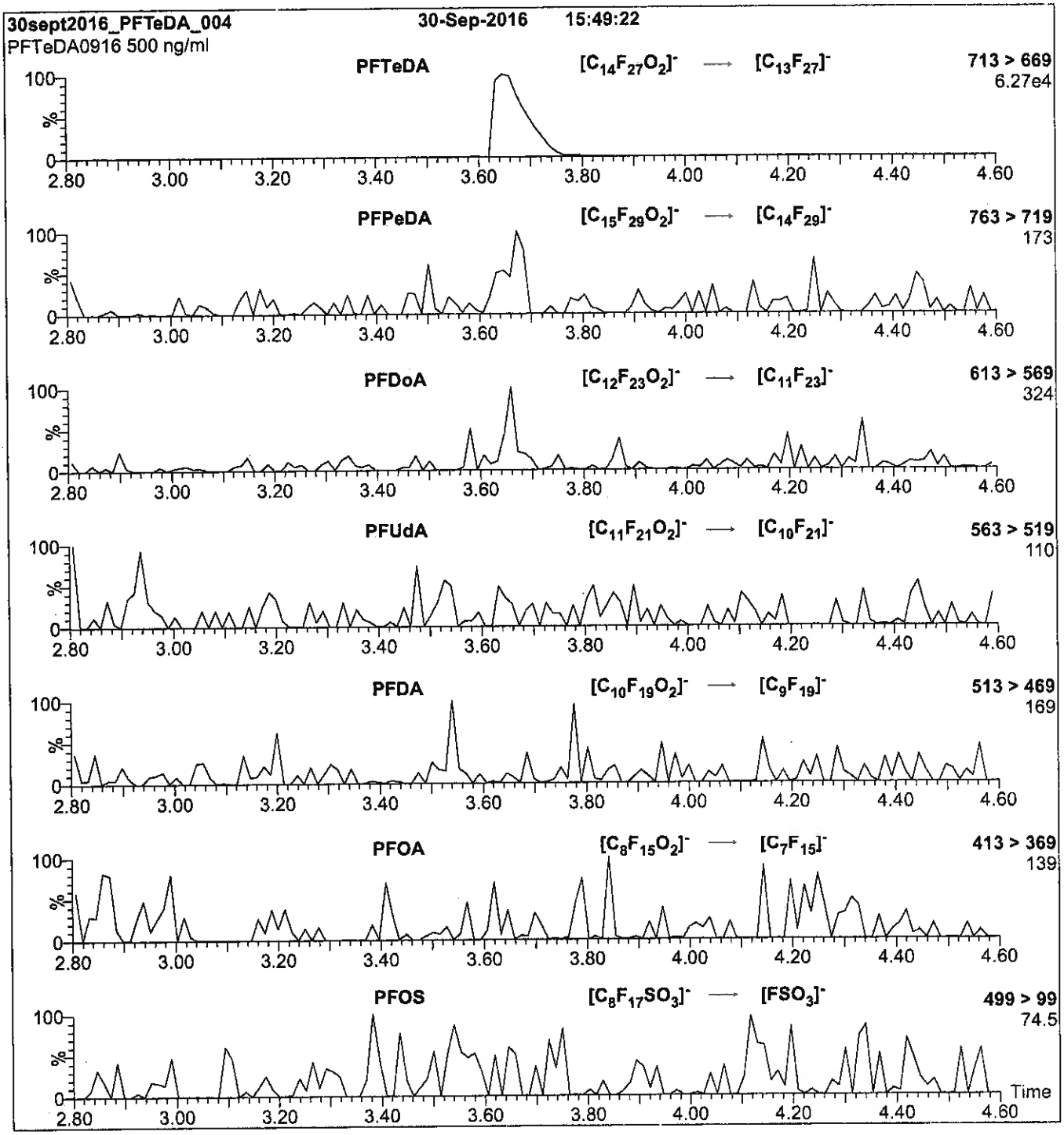
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00006

R: SBC 9/13/16

730665
ID: LCPFTrDA_00005
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

730666
ID: LCPFTrDA_00006
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

WELLINGTON LABORATORIES

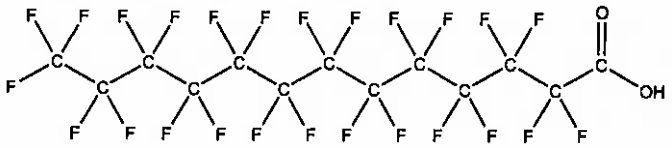
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid

LOT NUMBER: PFTrDA0216

STRUCTURE:

CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 664.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/16/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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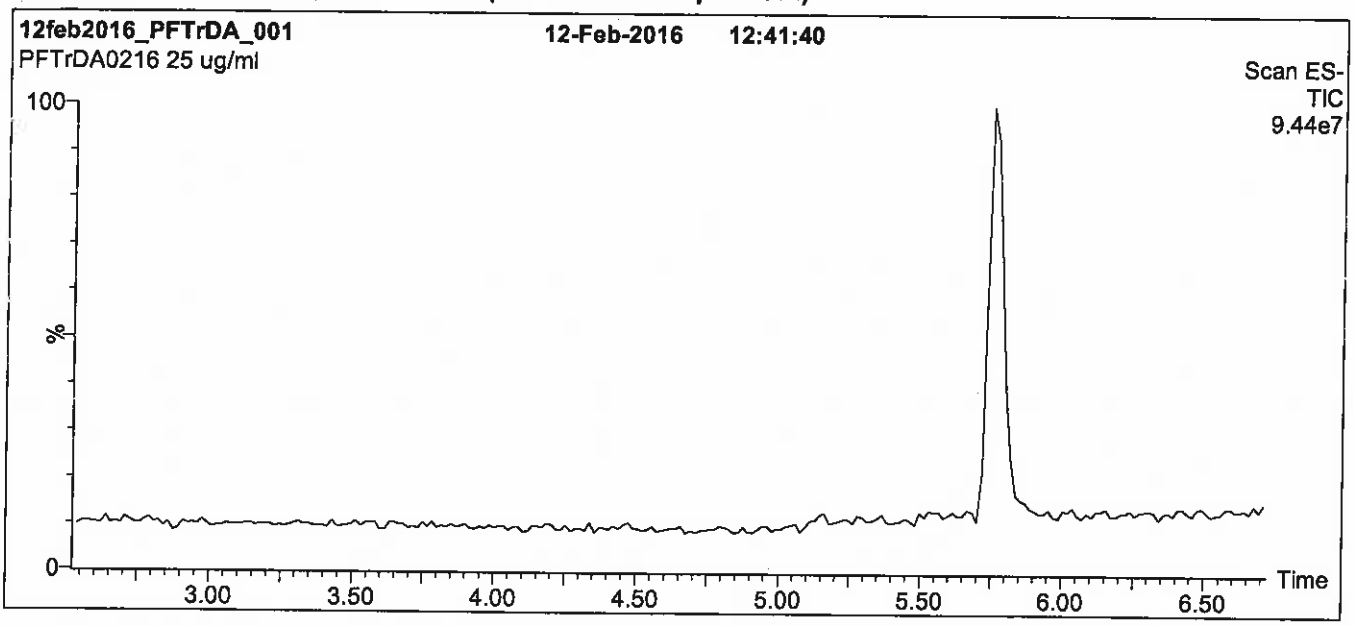
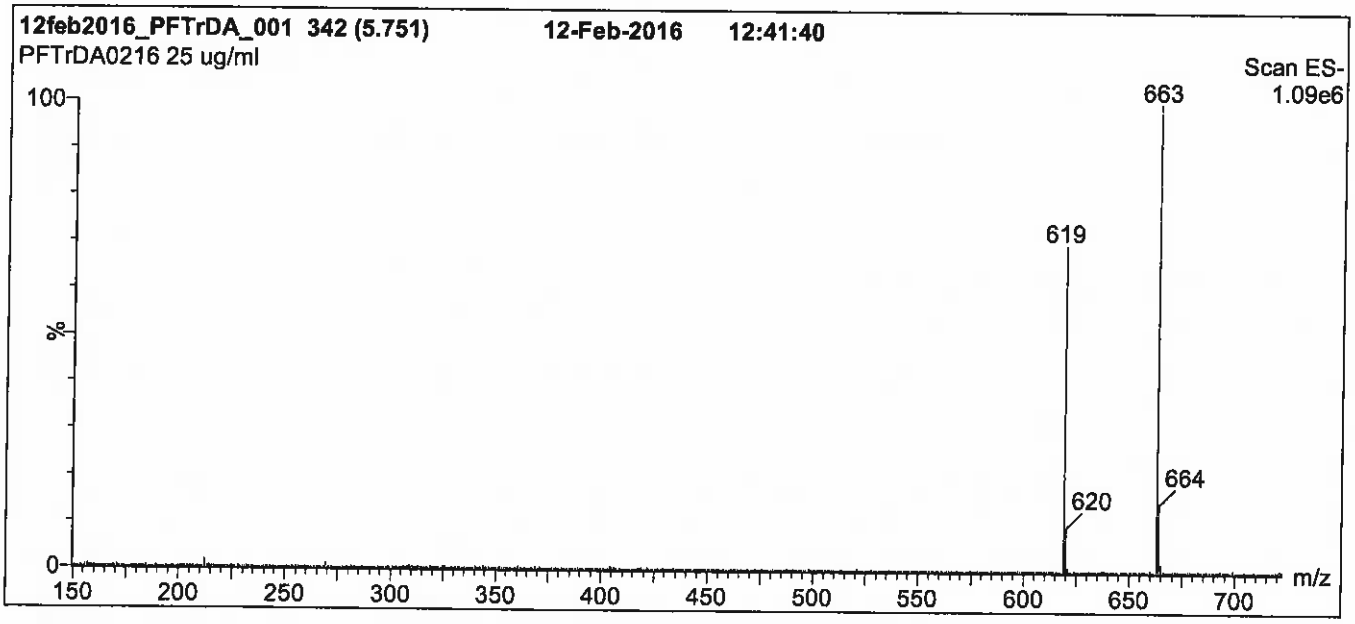
Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

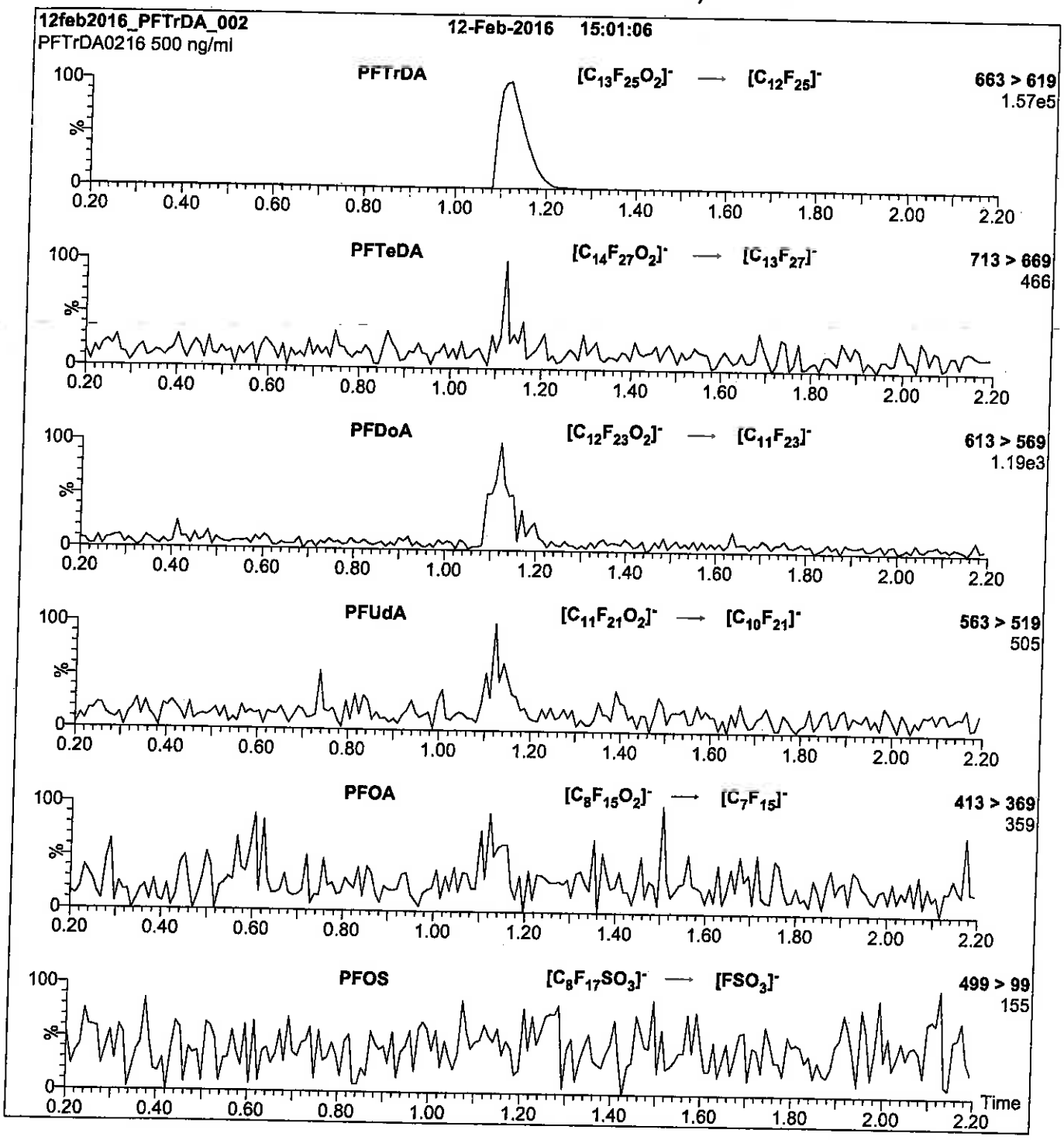
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 15

Reagent

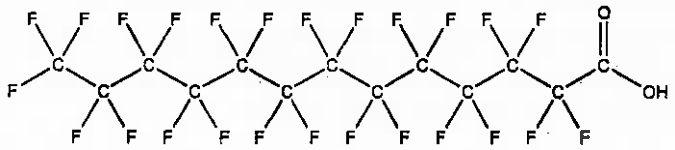
LCPFTrDA_00007

r: 12/29/16 SGJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFTrDA	**LOT NUMBER:**	PFTrDA0216
COMPOUND:	Perfluoro-n-tridecanoic acid		
STRUCTURE:		**CAS #:**	72629-94-8



MOLECULAR FORMULA:	$C_{13}HF_{25}O_2$	**MOLECULAR WEIGHT:**	664.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/16/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

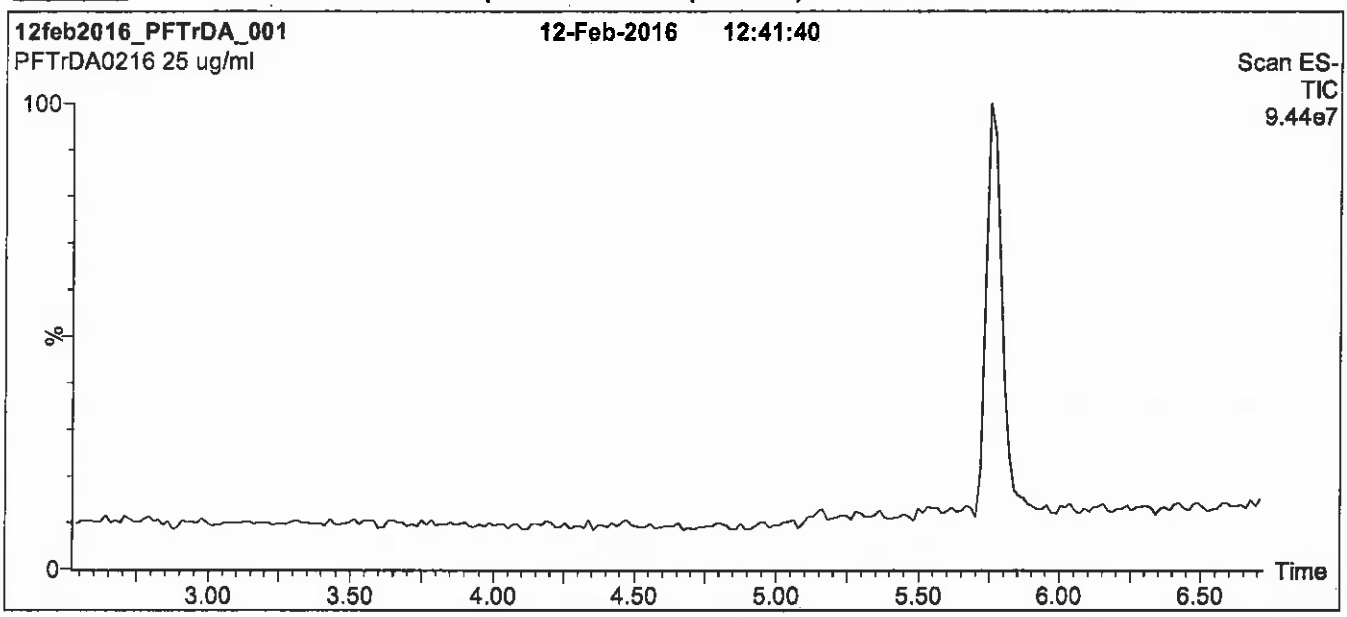
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

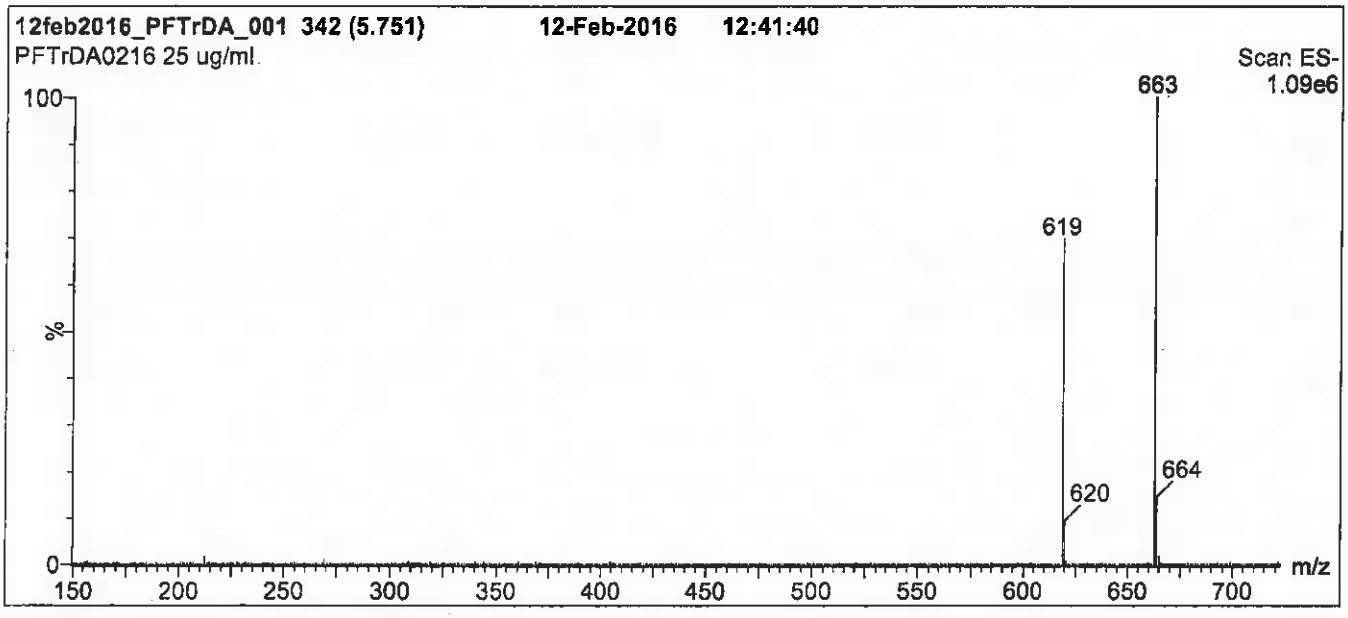
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

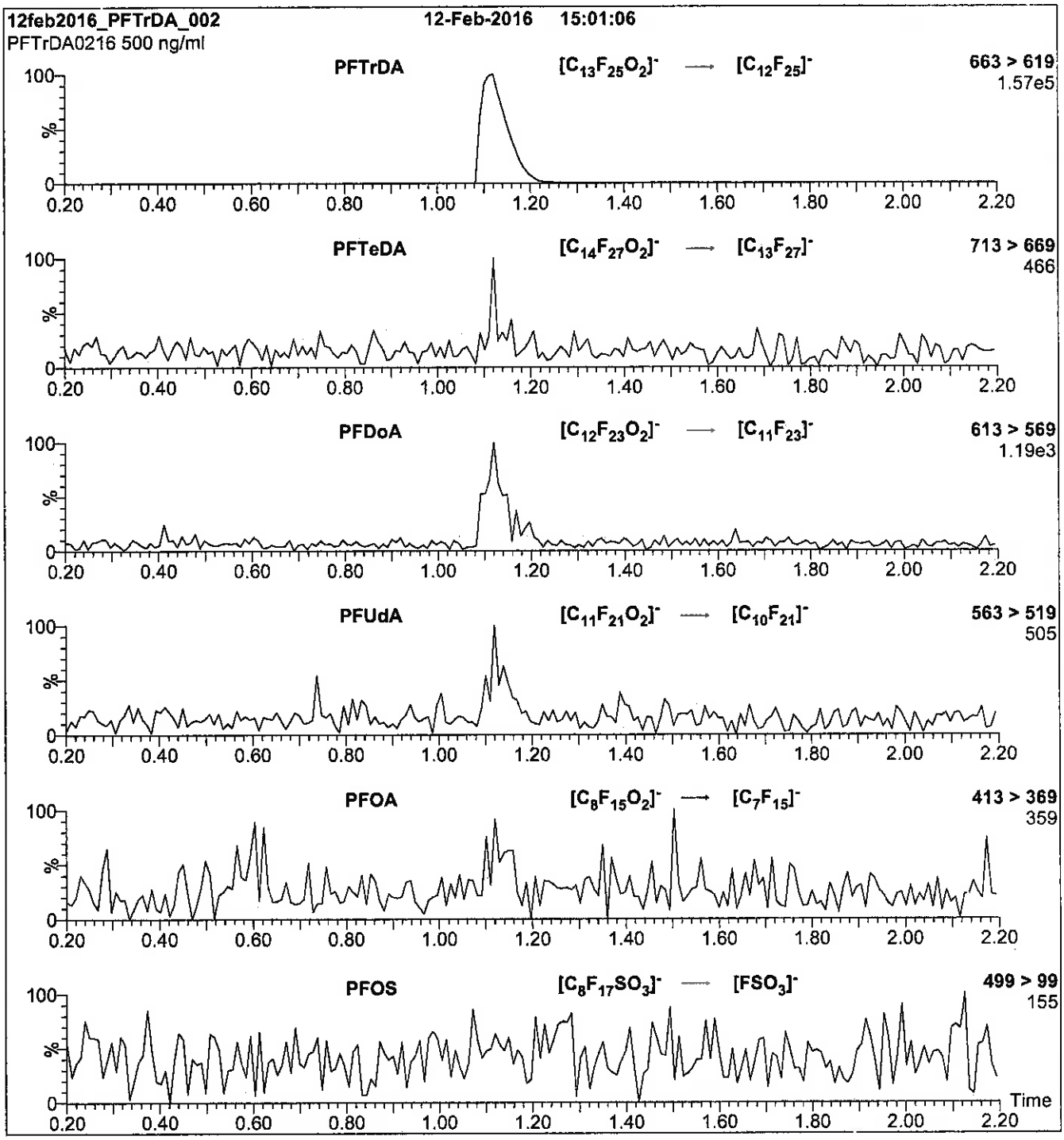
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 15

Reagent

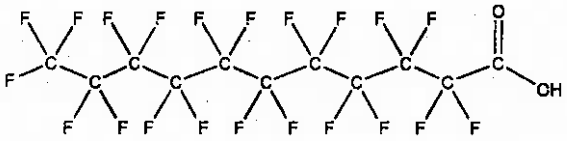
LCPFUdA_00007

r: 12/20/16 SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFUdA	**LOT NUMBER:**	PFUdA1016
COMPOUND:	Perfluoro-n-undecanoic acid		
STRUCTURE:		**CAS #:**	2058-94-8



MOLECULAR FORMULA:	$C_{11}HF_{21}O_2$	**MOLECULAR WEIGHT:**	564.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/18/2016		
EXPIRY DATE: (mm/dd/yyyy)	10/18/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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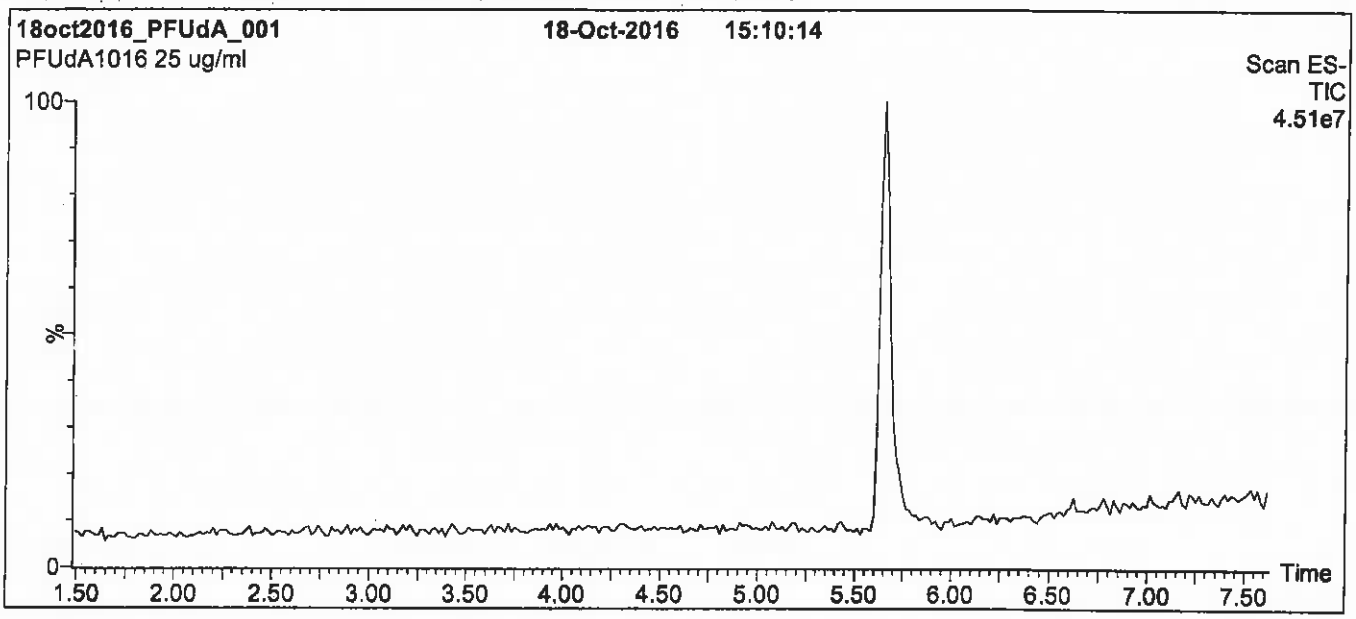
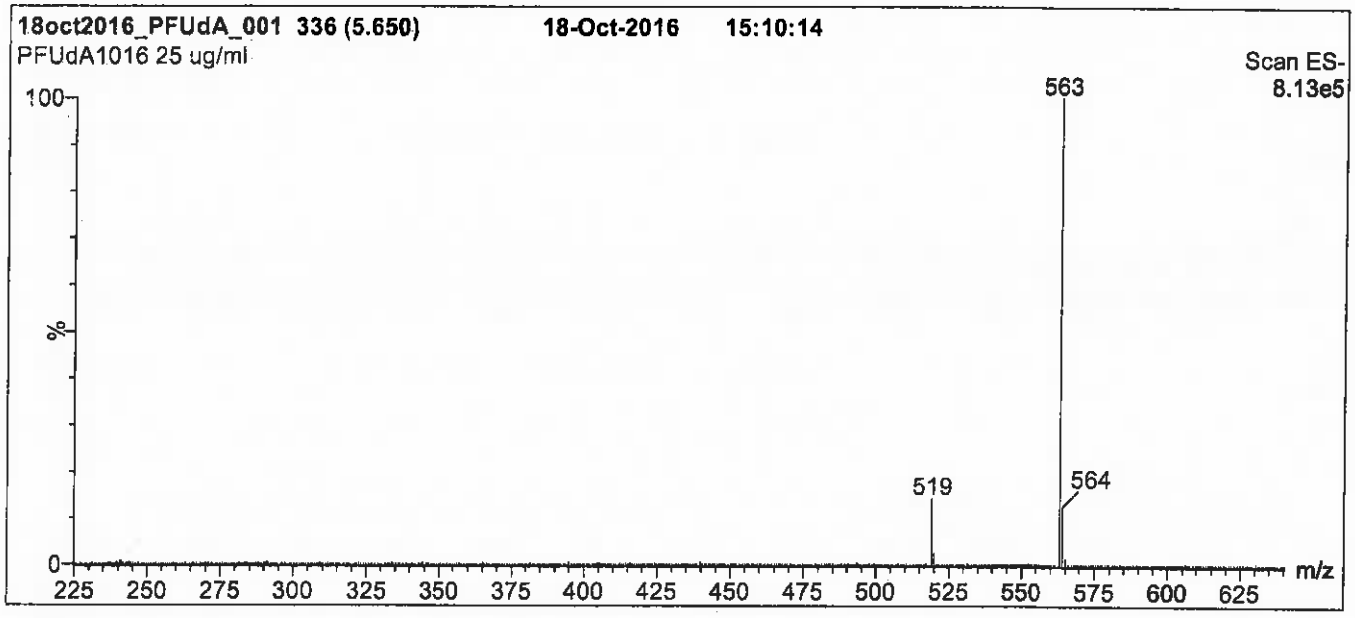
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

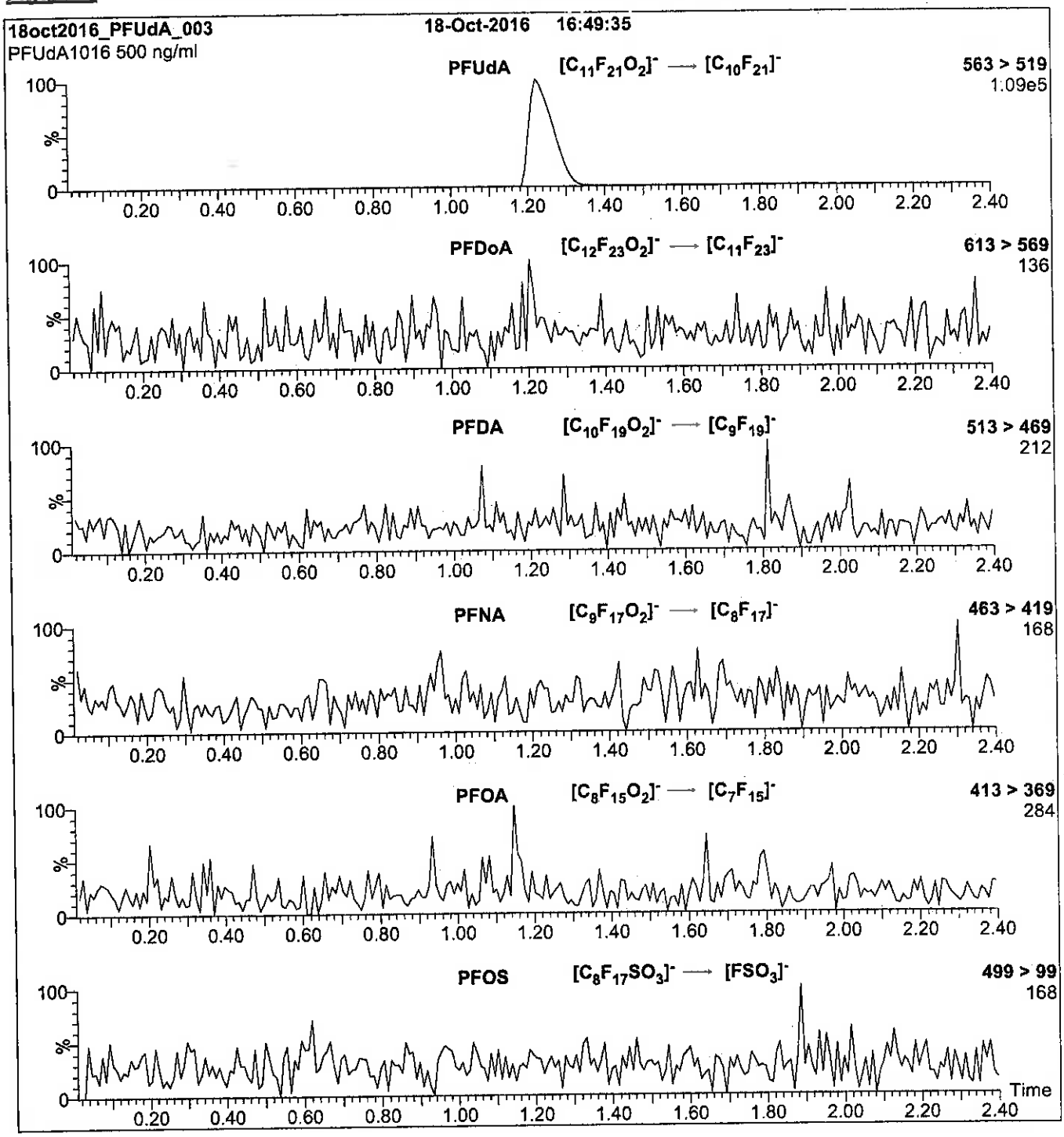
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 11

Method PFC DOD

Fluorinated Hydrocarbons (LC/MS) by Method PFAS_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

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 #	PFOS #
TP-PFC-028-TPI	320-37938-1	98	106	108	104	105	105	94	104
TP-PFC-028-TPI DL	320-37938-1 DL	92	98	88 M	92	93	90	92	86
TP-PFC-028-MID-CARB	320-37938-2	86	82	86	84	85	86	87	81
TP-PFC-028-TPE	320-37938-3	86	82	87	88	86	88	89	87
TP-PFC-028-TPE-D	320-37938-4	88	86	89	88	90	88	90	88
	MB 320-218592/1-A	88	93	88	90	90	91	89	93
	LCS 320-218592/2-A	89	88	91	90	98	93	91	89

	QC LIMITS
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFOS = 13C4 PFOS	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFNA #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-028-TPI	320-37938-1	106	101	110	106	101	96
TP-PFC-028-TPI DL	320-37938-1 DL	94	84	100	85	83	80
TP-PFC-028-MID-CAR B	320-37938-2	83	76	86	80	75	73
TP-PFC-028-TPE	320-37938-3	88	79	87	82	81	76
TP-PFC-028-TPE-D	320-37938-4	90	80	89	84	81	75
	MB 320-218592/1-A	91	78	90	90	85	80
	LCS 320-218592/2-A	91	81	90	85	83	81

	QC LIMITS
PFNA = 13C5 PFNA	50-150
PFOSA = 13C8 FOSA	50-150
PFDA = 13C2 PFDA	50-150
PFUnA = 13C2 PFUnA	50-150
PFDoA = 13C2 PFDoA	50-150
PFTDA = 13C2-PFTeDA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.04.20LLCX_039.d

Lab ID: LCS 320-218592/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	40.8	102	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	39.0	97	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	39.7	99	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	37.5	94	80-113	
Perfluorooctanoic acid (PFOA)	40.0	38.8	97	80-107	
Perfluorononanoic acid (PFNA)	40.0	37.5	94	83-113	
Perfluorodecanoic acid (PFDA)	40.0	38.3	96	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	35.4	89	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	38.4	96	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	36.1	90	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	37.4	94	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.3	97	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	32.8	90	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.8	99	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	40.0	108	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	36.7	95	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	37.2	93	85-114	
13C8 FOSA	100	80.7	81	50-150	
13C4 PFBA	100	89.1	89	50-150	
13C5 PFPeA	100	87.9	88	50-150	
13C2 PFHxA	100	89.6	90	50-150	
13C4-PFHpA	100	97.8	98	50-150	
13C4 PFOA	100	91.0	91	50-150	
13C5 PFNA	100	90.6	91	50-150	
13C2 PFDA	100	89.9	90	50-150	
13C2 PFUnA	100	85.5	85	50-150	
13C2 PFDoA	100	83.5	83	50-150	
18O2 PFHxS	94.6	87.8	93	50-150	
13C2-PFTeDA	100	80.7	81	50-150	
13C4 PFOS	95.6	85.1	89	50-150	
13C3-PFBS	93.0	84.2	91	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab File ID: 2018.04.20LLCX_038.d Lab Sample ID: MB 320-218592/1-A

Matrix: Water Date Extracted: 04/18/2018 10:32

Instrument ID: A8_N Date Analyzed: 04/21/2018 12:18

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-218592/2-A	2018.04.20LLCX_039.d	04/21/2018 12:26
TP-PFC-028-TPI DL	320-37938-1 DL	2018.04.20LLCX_045.d	04/21/2018 13:13
TP-PFC-028-MID-CARB	320-37938-2	2018.04.20LLCX_046.d	04/21/2018 13:21
TP-PFC-028-TPE	320-37938-3	2018.04.20LLCX_047.d	04/21/2018 13:29
TP-PFC-028-TPE-D	320-37938-4	2018.04.20LLCX_049.d	04/21/2018 13:44
TP-PFC-028-TPI	320-37938-1	2018.04.20LLCX_050.d	04/21/2018 13:52

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Sample No.: IC 320-217360/5 Date Analyzed: 04/10/2018 19:03

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.04.10LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 38528

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		4623888	2.67				
UPPER LIMIT		6935832	2.87				
LOWER LIMIT		2311944	2.47				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-217360/9		4390532	2.67				
ICV 320-217360/10		4377627	2.68				
CCV 320-219174/3 CCVIS		4509303	2.69				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Sample No.: CCV 320-219174/3 Date Analyzed: 04/21/2018 12:10

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.04.21LLA_006.d Heated Purge: (Y/N) N

Calibration ID: 38528

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		4509303	2.69				
UPPER LIMIT		6763955	2.89				
LOWER LIMIT		2254652	2.49				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-219174/1		4447416	2.69				
CCVL 320-219174/2		4804487	2.69				
MB 320-218592/1-A		4825971	2.68				
LCS 320-218592/2-A		4732969	2.69				
320-37938-1 DL	TP-PFC-028-TPI DL	236312Q	2.69				
320-37938-2	TP-PFC-028-MID-CARB	4939939	2.69				
320-37938-3	TP-PFC-028-TPE	5066384	2.68				
CCV 320-219174/14		4642897	2.68				
CCV 320-219174/19		4618295	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 EPA 537 (MOD)

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPI | Lab Sample ID: 320-37938-1

Matrix: Water | Lab File ID: 2018.04.20LLCX_050.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:15

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 289.3(mL) | Date Analyzed: 04/21/2018 13:52

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74		1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		1.7	0.86	0.37
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*360*	*E*	*1.7*	0.86	*0.41*
375-85-9	Perfluoroheptanoic acid (PFHpA)	81		1.7	1.3	0.53
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1400*	*E*	*1.7*	1.3	*0.47*
375-95-1	Perfluorononanoic acid (PFNA)	2.7		1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.81	J M	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	2.6	0.66
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	2.6	0.72
375-73-5	Perfluorobutanesulfonic acid (PFBS)	50		1.7	0.86	0.40
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*380*	*E*	*1.7*	0.86	*0.33*
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.3		1.7	0.86	0.32
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*360*	*E*	*3.5*	2.6	*0.95*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U M	3.5	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPI Lab Sample ID: 320-37938-1

Matrix: Water Lab File ID: 2018.04.20LLCX_050.d

Analysis Method: EPA 537 (Mod) Date Collected: 04/05/2018 09:15

Extraction Method: 3535 Date Extracted: 04/18/2018 10:32

Sample wt/vol: 289.3(mL) Date Analyzed: 04/21/2018 13:52

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		50-150
STL00992	13C4 PFBA	98		50-150
STL01893	13C5 PFPeA	106		50-150
STL00993	13C2 PFHxA	104		50-150
STL01892	13C4-PFHpA	105		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	106		50-150
STL00996	13C2 PFDA	110		50-150
STL00997	13C2 PFUnA	106		50-150
STL00998	13C2 PFDoA	101		50-150
STL00994	18O2 PFHxS	105		50-150
STL02116	13C2-PFTeDA	96		50-150
STL00991	13C4 PFOS	104		50-150
STL02337	13C3-PFBS	108		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_050.d
Lims ID: 320-37938-A-1-A
Client ID: TP-PFC-028-TPI
Sample Type: Client
Inject. Date: 21-Apr-2018 13:52:43 ALS Bottle#: 38 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-37938-a-1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:27:18 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:25:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.441	1.436	0.005	1.000	4218920	2.15			1650	
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.441	0.0	1.000	5278094	2.46		98.5	34993	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.703	-0.001	1.000	10038449	5.73			2936	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.703	-0.001	0.556	3675291	2.66		106	31431	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.738	1.739	-0.001	1.000	3856338	1.44			4369	
298.90 > 99.00	1.738	1.739	-0.001	1.000	1646625		2.34(1.25-3.74)		4701	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.739	-0.001	1.000	79556	2.51		108	354	
6 Perfluorohexanoic acid										E
313.00 > 269.00	1.991	1.982	0.009	1.000	16855500	10.5			12319	E
313.00 > 119.00	1.991	1.982	0.009	1.000	1367039		12.33(5.03-15.10)		13492	
D 7 13C2 PFHxA										
315.00 > 270.00	1.991	1.990	0.001	1.000	3960345	2.59		104	78127	
D 9 13C4-PFHpA										
367.00 > 322.00	2.319	2.318	0.001	1.000	3915404	2.63		105	70436	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.319	2.320	-0.001	1.000	3674135	2.34			3736	
363.00 > 169.00	2.319	2.320	-0.001	1.000	1417990		2.59(1.13-3.40)		7099	
D 11 18O2 PFHxS										
403.00 > 84.00	2.345	2.331	0.014	1.000	4545237	2.48		105	105382	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.332	2.333	-0.001	0.994	23823886	11.0			33655	E
399.00 > 99.00	2.332	2.333	-0.001	0.994	8084541		2.95(1.50-4.49)		26520	

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	2.689	2.676	0.013		3983654	2.50			76206	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.689	2.676	0.013	1.000	64818567	40.5			51936	E
413.00 > 169.00	2.689	2.676	0.013	1.000	43870137		1.48(0.84-2.52)		81089	
D 14 13C4 PFOA										
417.00 > 372.00	2.689	2.681	0.008	1.000	3465447	2.34		93.8	57310	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.697	2.683	0.014	1.000	376336	0.2121			140	
449.00 > 99.00	2.689	2.683	0.006	0.997	125364		3.00(1.94-5.82)		289	
20 Perfluorononanoic acid										
463.00 > 419.00	3.062	3.054	0.008	1.000	109825	0.0780			154	
463.00 > 169.00	3.062	3.054	0.008	1.000	27379		4.01(1.90-5.69)		90.3	
17 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.056	3.054	0.002	0.998	15119201	10.4			33905	E
499.00 > 99.00	3.056	3.054	0.002	0.998	3393005		4.46(2.31-6.93)		32045	
D 19 13C5 PFNA										
468.00 > 423.00	3.062	3.054	0.008	1.000	3373991	2.66		106	62865	
D 18 13C4 PFOS										
503.00 > 80.00	3.062	3.054	0.008	1.000	3194439	2.49		104	22032	
22 Perfluorooctane Sulfonamide										M
498.00 > 78.00	3.393	3.389	0.004	1.000	7150	0.004381			19.9	M
D 21 13C8 FOSA										
506.00 > 78.00	3.393	3.391	0.002	1.000	4033966	2.51		101	53840	
24 Perfluorodecanoic acid										M
513.00 > 469.00	3.421	3.417	0.004	0.997	28553	0.0235			74.6	
513.00 > 169.00	3.430	3.417	0.013	1.000	4245		6.73(2.36-7.09)		37.1	M
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.419	0.011	1.000	2939223	2.75		110	64940	
D 30 13C2 PFUnA										
565.00 > 520.00	3.754	3.753	0.001	1.000	2440144	2.65		106	41948	
D 36 13C2 PFDoA										
615.00 > 570.00	4.052	4.042	0.010	1.000	2519365	2.53		101	28436	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.553	4.547	0.006	1.000	3014441	2.39		95.6	22512	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 24-Apr-2018 17:27:23 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_050.d

Injection Date: 21-Apr-2018 13:52:43 Instrument ID: A8_N

Lims ID: 320-37938-A-1-A Lab Sample ID: 320-37938-1

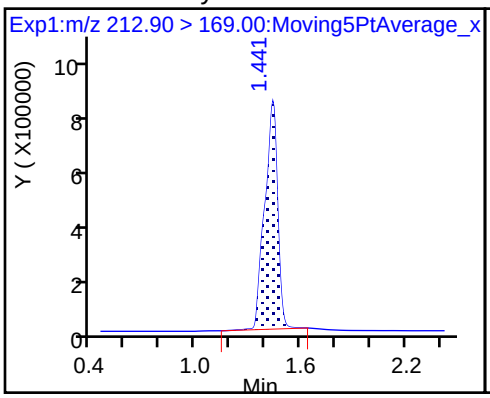
Client ID: TP-PFC-028-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 38 Worklist Smp#: 16

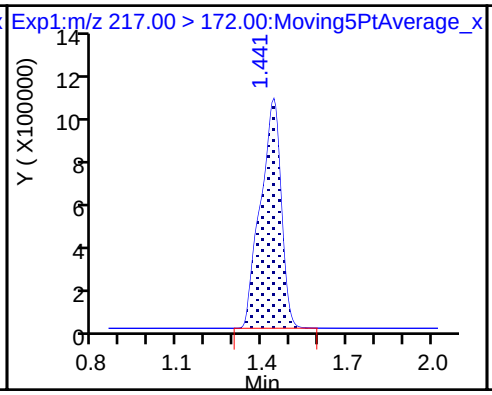
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

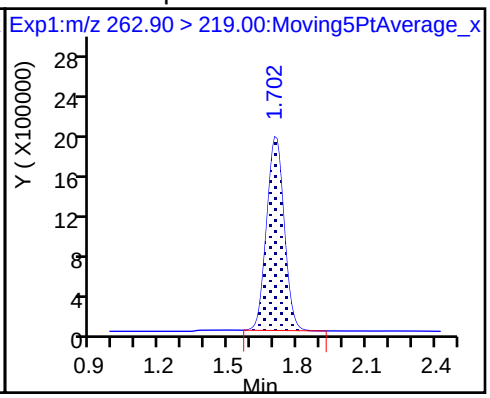
2 Perfluorobutyric acid



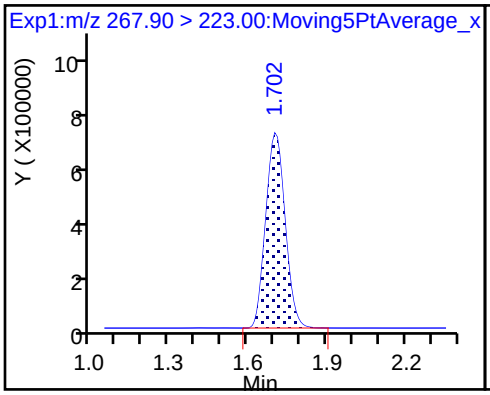
D 1 13C4 PFBA



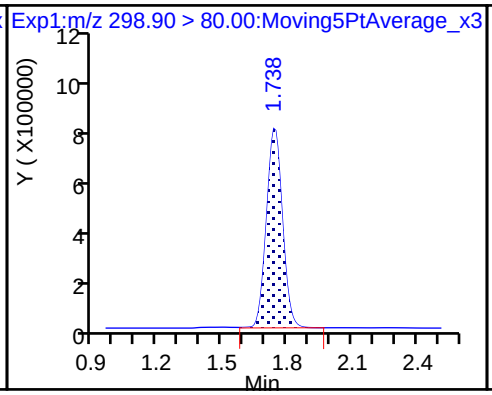
4 Perfluoropentanoic acid



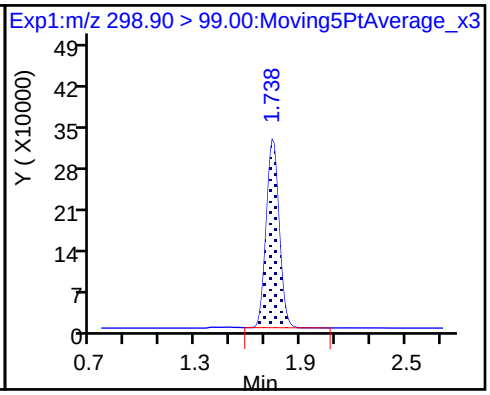
D 3 13C5-PFPeA



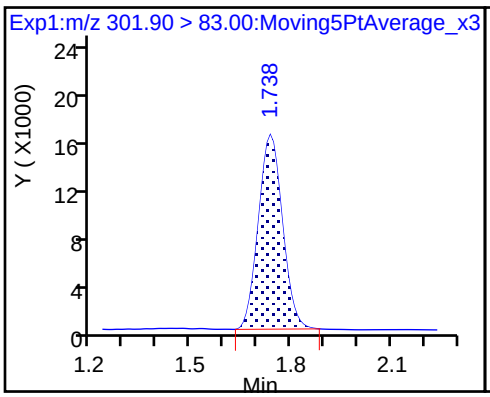
5 Perfluorobutanesulfonic acid



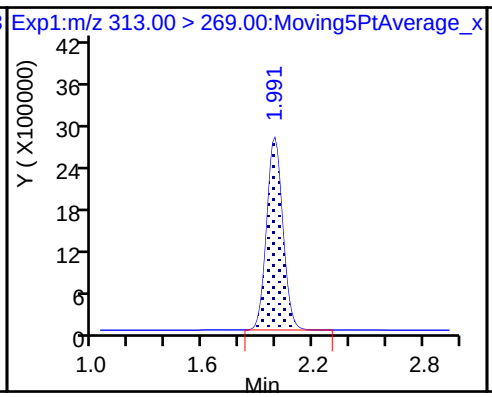
5 Perfluorobutanesulfonic acid



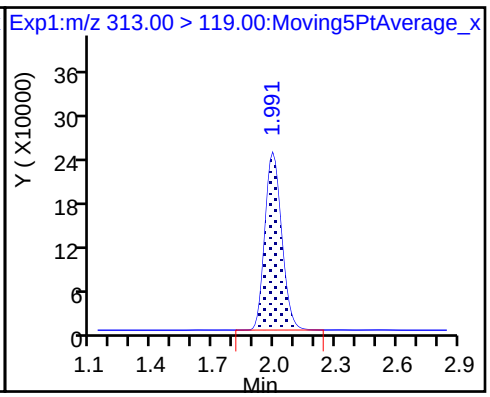
D 47 13C3-PFBS



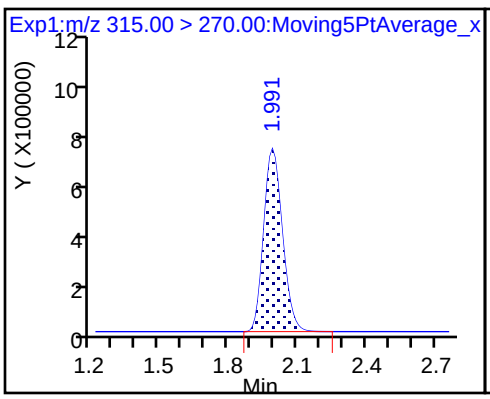
6 Perfluorohexanoic acid



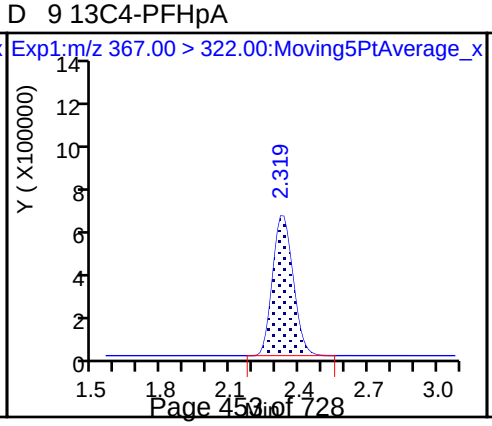
6 Perfluorohexanoic acid



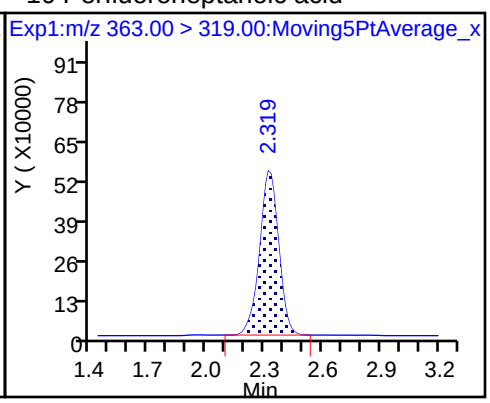
D 7 13C2 PFHxA



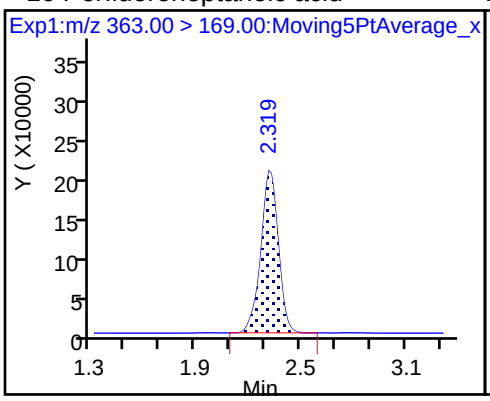
D 9 13C4-PFHpA



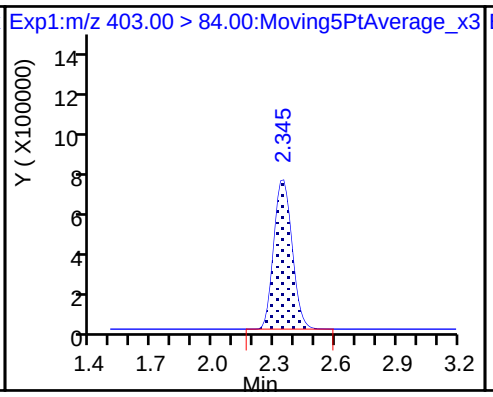
10 Perfluoroheptanoic acid



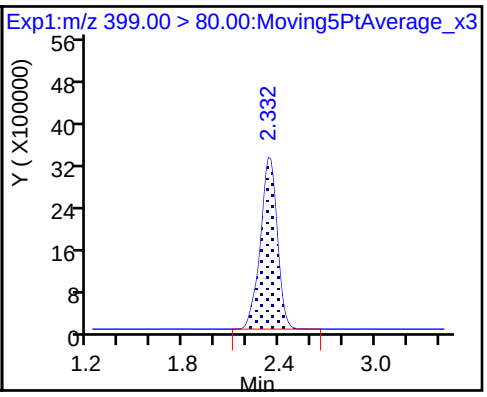
10 Perfluoroheptanoic acid



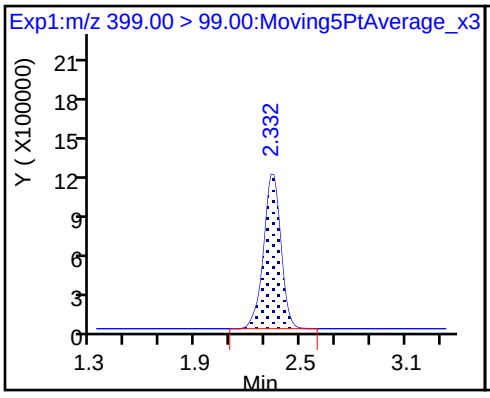
D 11 18O2 PFHxS



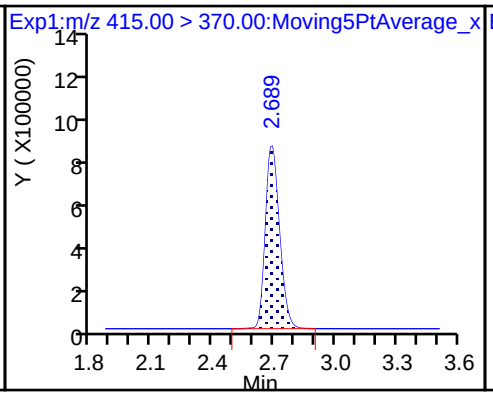
8 Perfluorohexanesulfonic acid



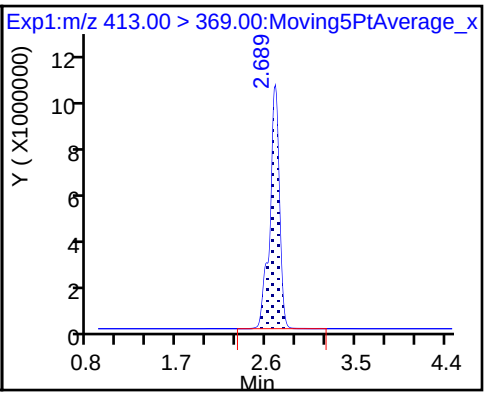
8 Perfluorohexanesulfonic acid



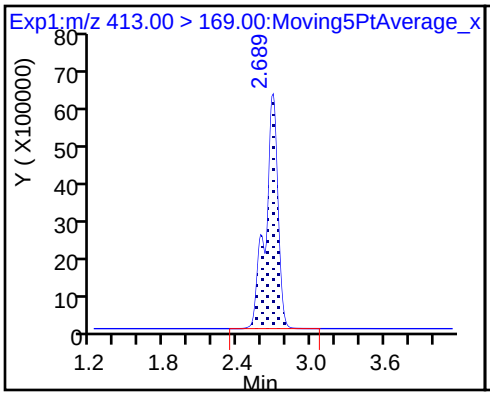
* 62 13C2-PFOA



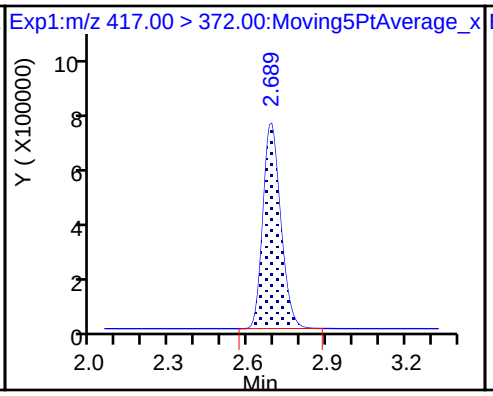
15 Perfluorooctanoic acid



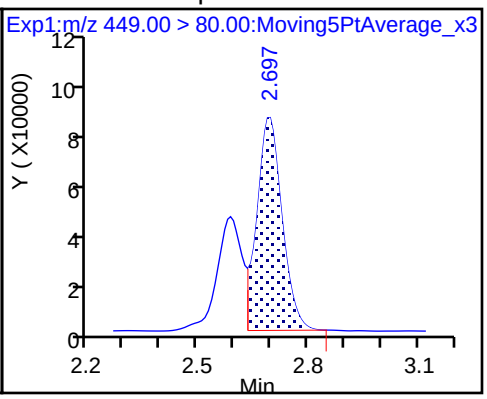
15 Perfluorooctanoic acid



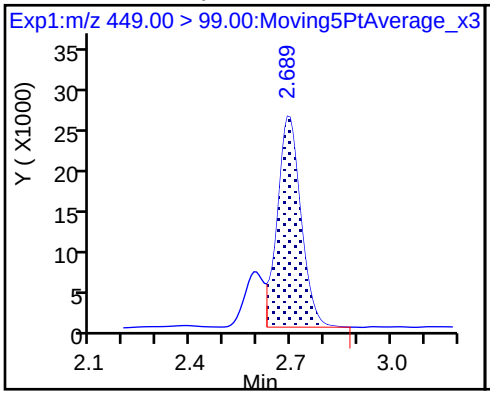
D 14 13C4 PFOA



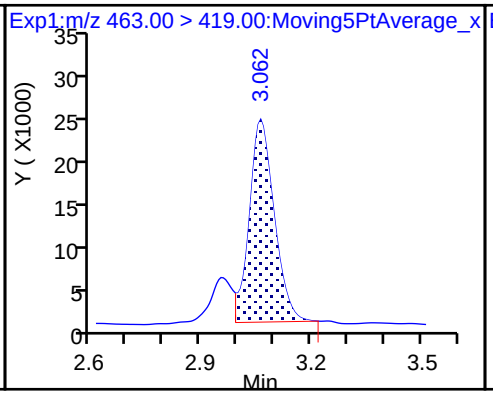
16 Perfluoroheptanesulfonic acid



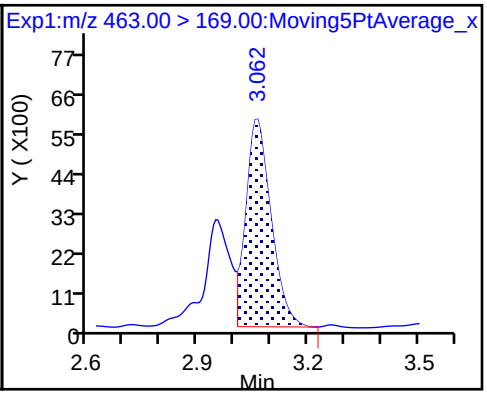
16 Perfluoroheptanesulfonic acid



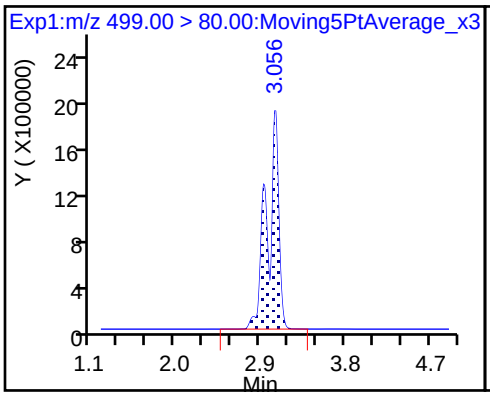
20 Perfluorononanoic acid



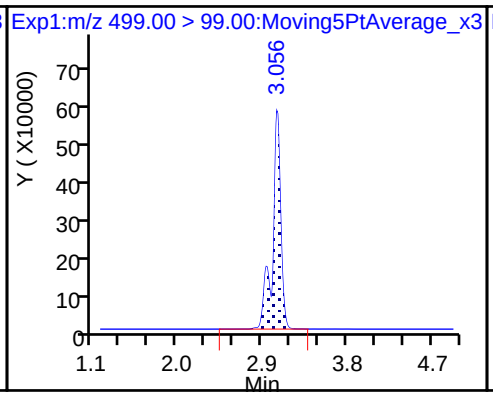
20 Perfluorononanoic acid



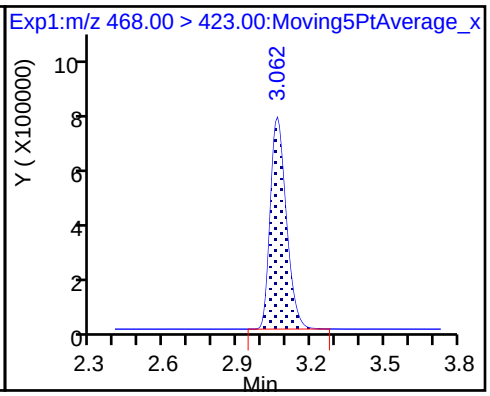
17 Perfluorooctane sulfonic acid



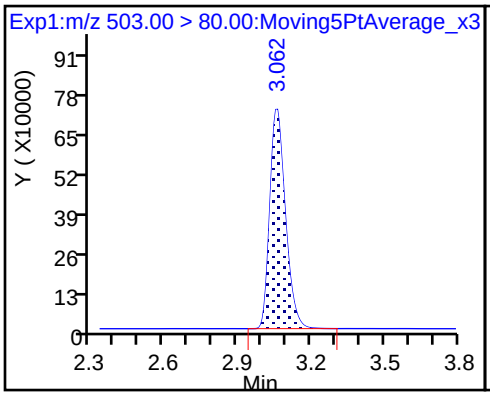
17 Perfluorooctane sulfonic acid



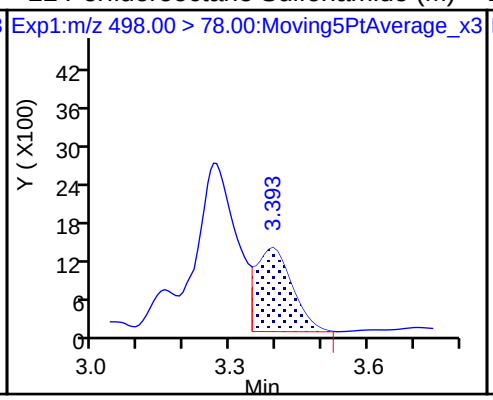
D 19 13C5 PFNA



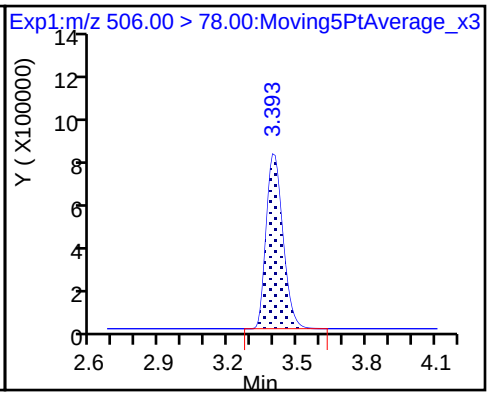
D 18 13C4 PFOS



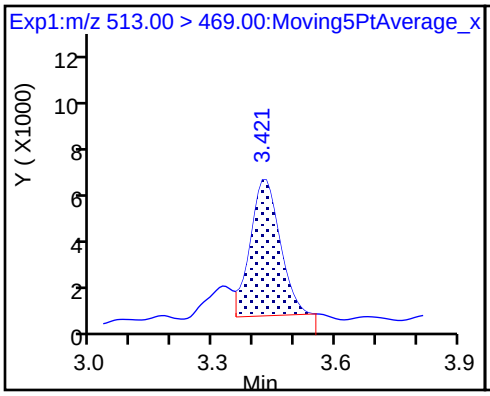
22 Perfluorooctane Sulfonamide (M)



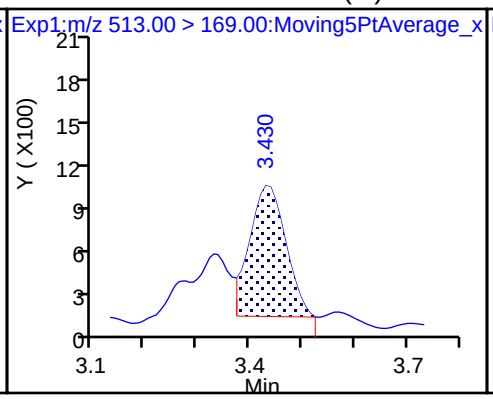
D 21 13C8 FOSA



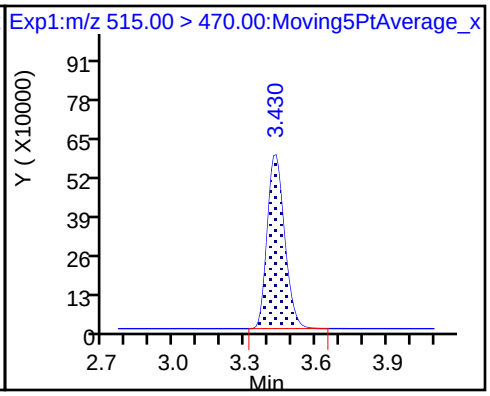
24 Perfluorodecanoic acid



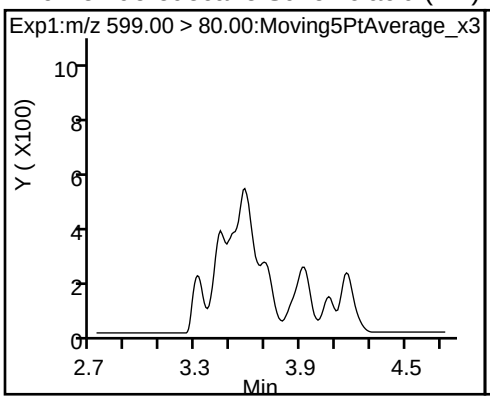
24 Perfluorodecanoic acid (M)



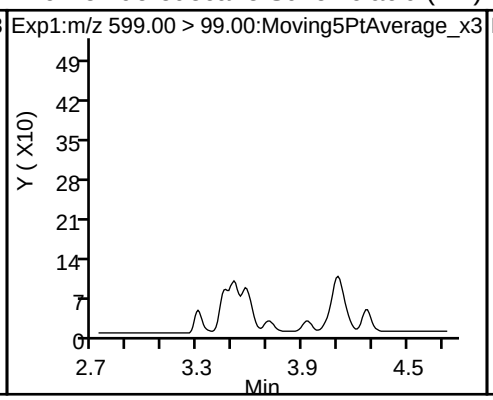
D 23 13C2 PFDA



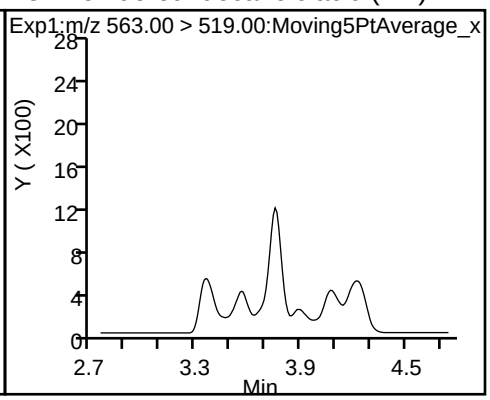
29 Perfluorodecane Sulfonic acid (ND)



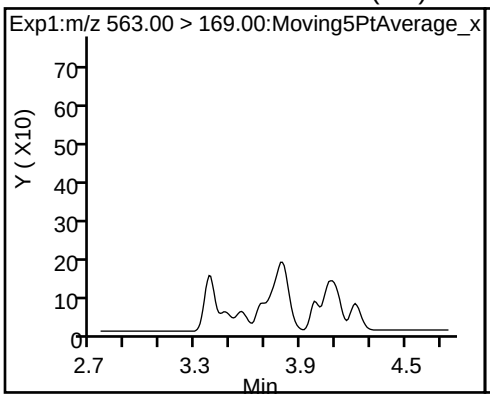
29 Perfluorodecane Sulfonic acid (ND)



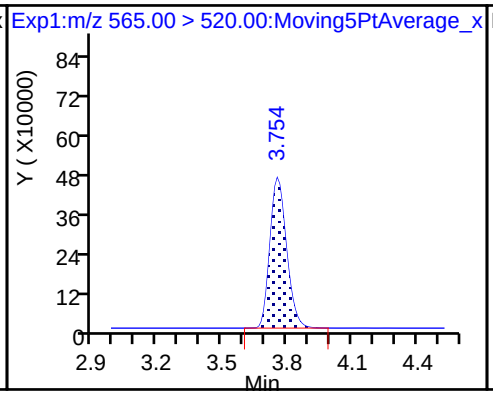
31 Perfluoroundecanoic acid (ND)



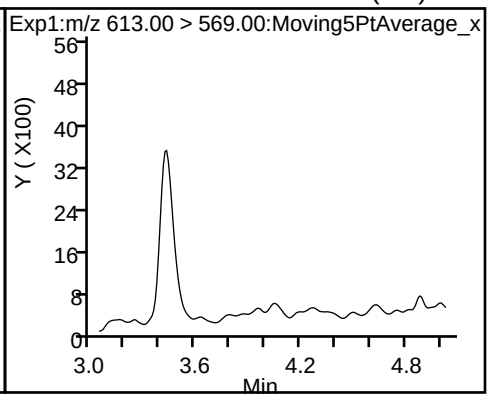
31 Perfluoroundecanoic acid (ND)



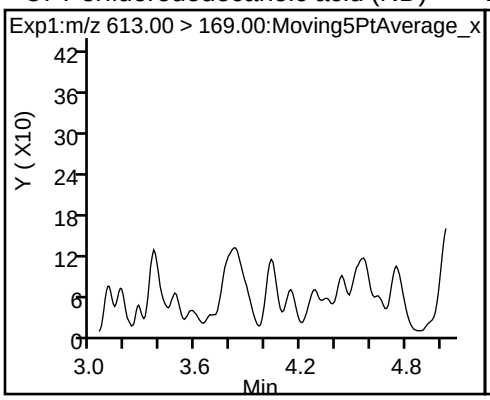
D 30 13C2 PFUnA



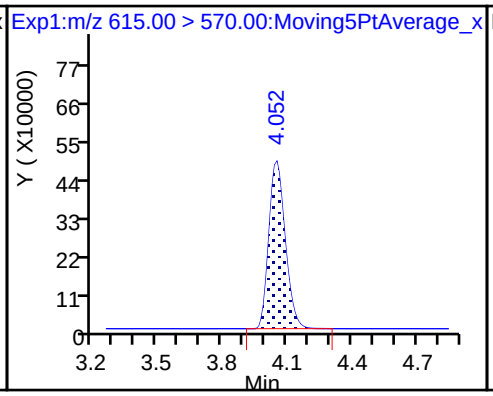
37 Perfluorododecanoic acid (ND)



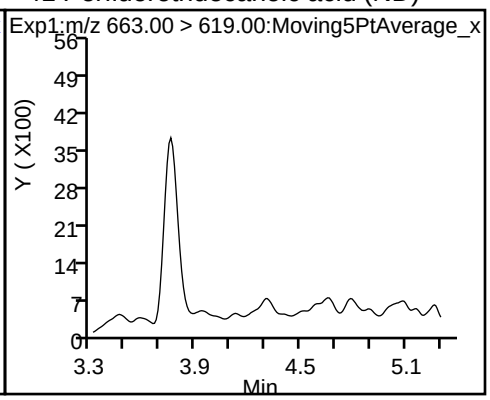
37 Perfluorododecanoic acid (ND)



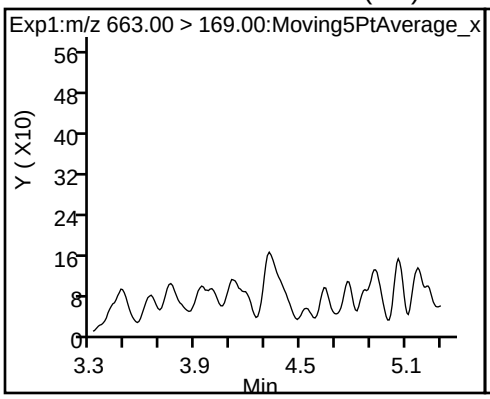
D 36 13C2 PFDoA



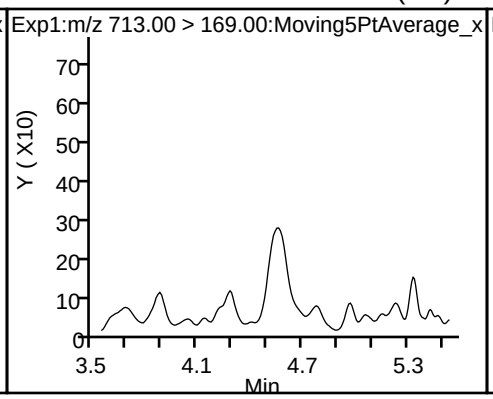
41 Perfluorotridecanoic acid (ND)



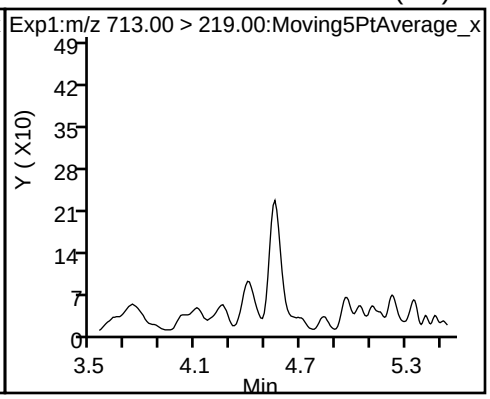
41 Perfluorotridecanoic acid (ND)



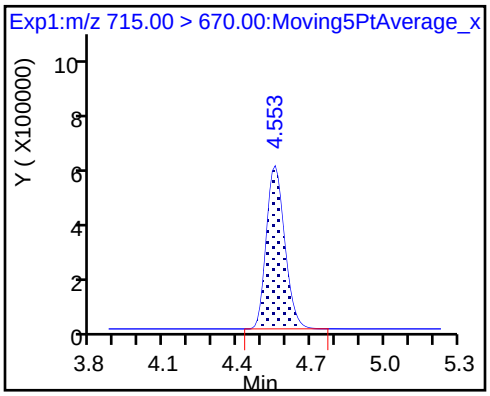
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

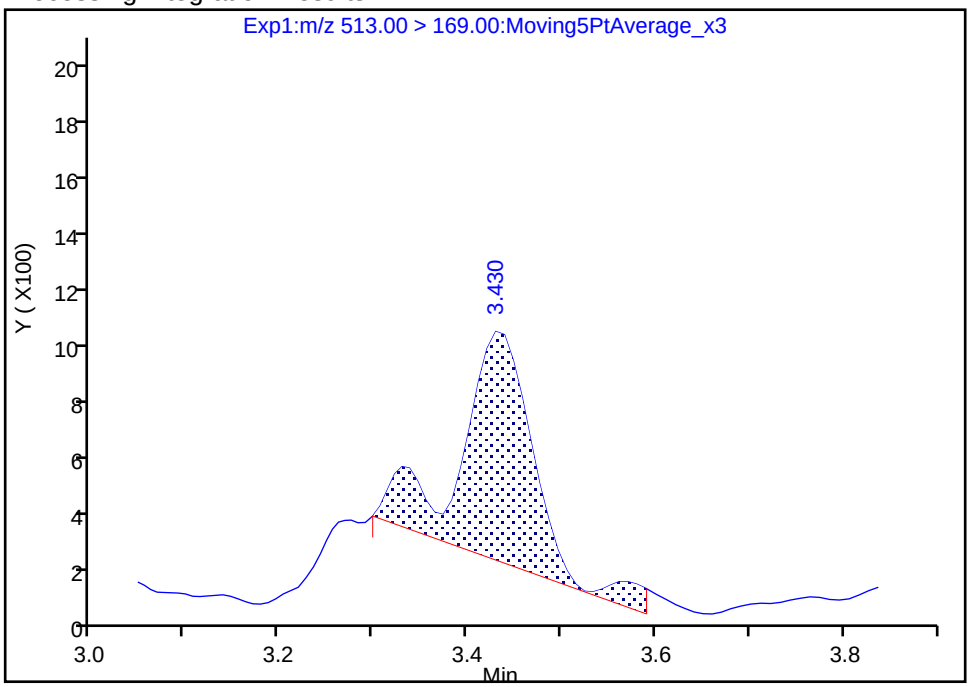
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_050.d				
Injection Date:	21-Apr-2018 13:52:43	Instrument ID:	A8_N		
Lims ID:	320-37938-A-1-A	Lab Sample ID:	320-37938-1		
Client ID:	TP-PFC-028-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	38	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 2

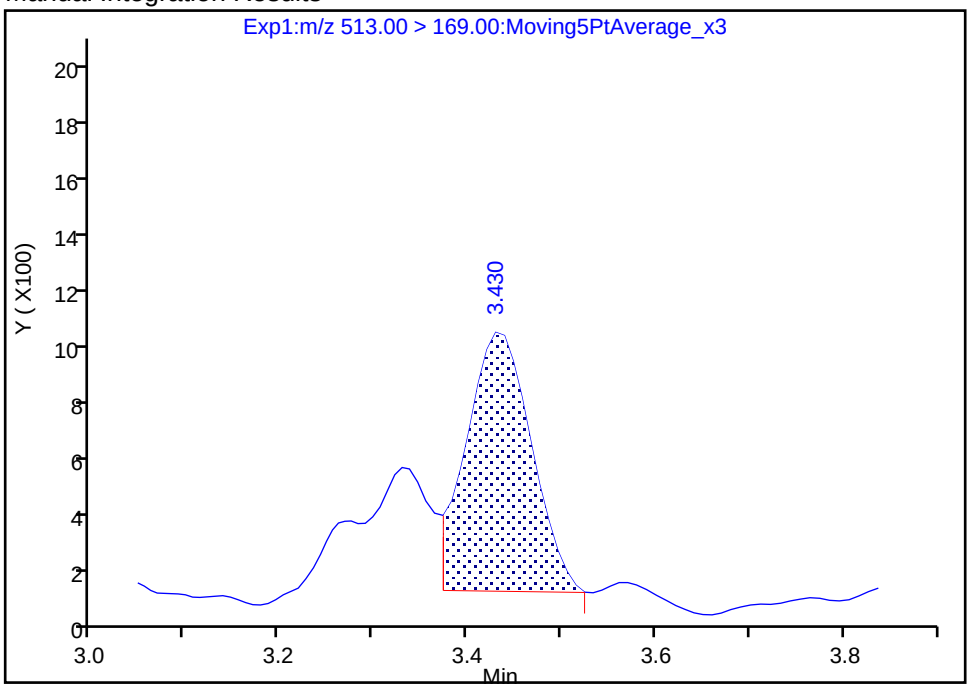
Processing Integration Results

RT: 3.43
Area: 4310
Amount: 0.023543
Amount Units: ng/ml



Manual Integration Results

RT: 3.43
Area: 4245
Amount: 0.023543
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:25:34

Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

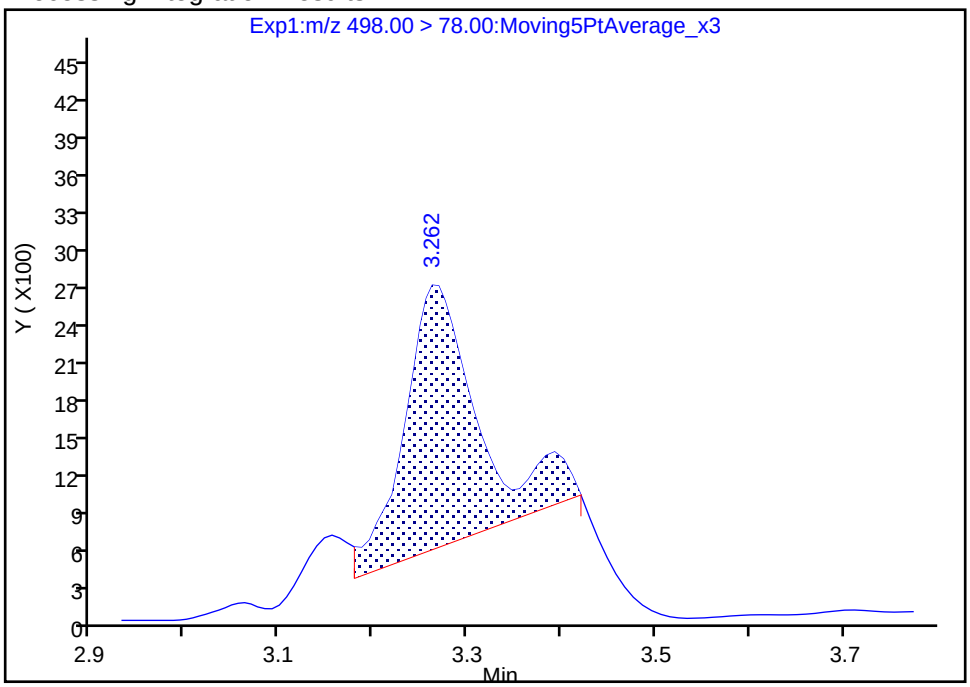
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_050.d				
Injection Date:	21-Apr-2018 13:52:43	Instrument ID:	A8_N		
Lims ID:	320-37938-A-1-A	Lab Sample ID:	320-37938-1		
Client ID:	TP-PFC-028-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	38	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

22 Perfluorooctane Sulfonamide, CAS: 754-91-6

Signal: 1

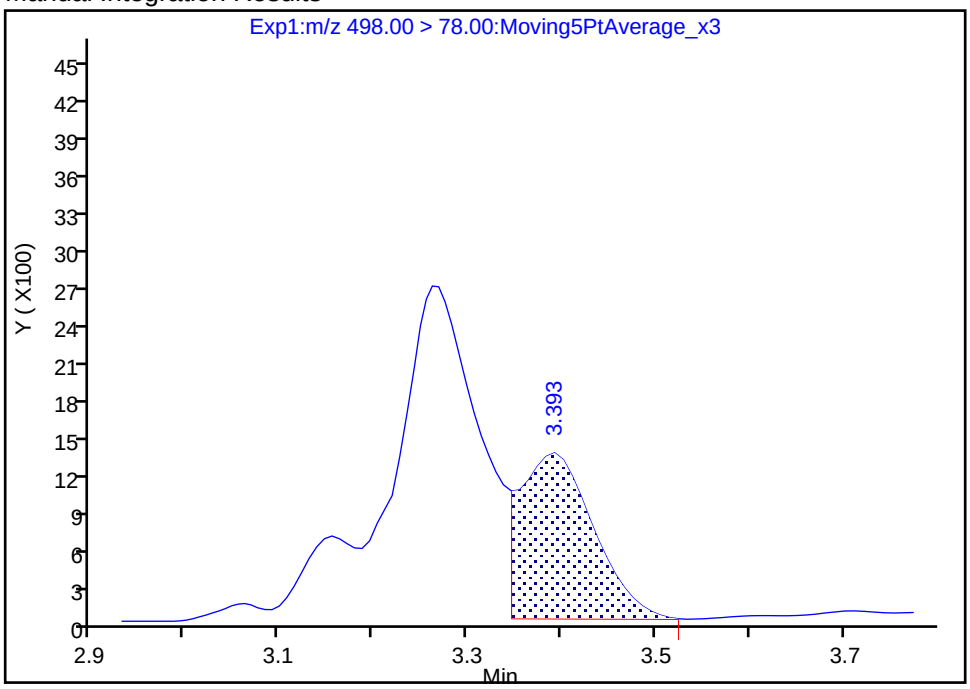
Processing Integration Results

RT: 3.26
Area: 11486
Amount: 0.007037
Amount Units: ng/ml



Manual Integration Results

RT: 3.39
Area: 7150
Amount: 0.004381
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:25:17

Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPI DL | Lab Sample ID: 320-37938-1 DL

Matrix: Water | Lab File ID: 2018.04.20LLCX_045.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:15

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 289.3(mL) | Date Analyzed: 04/21/2018 13:13

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*76*	*D*	*35*	26	*10*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*180*	*D*	*35*	17	*7.4*
307-24-4	Perfluorohexanoic acid (PFHxA)	370	D	35	17	8.1
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*80*	*D*	*35*	26	*11*
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D	35	26	9.3
375-95-1	*Perfluorononanoic acid (PFNA)*	*26*	*U*	*35*	26	*9.0*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*17*	*U*	*35*	17	*8.3*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*26*	*U*	*35*	26	*12*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*26*	*U*	*35*	26	*9.0*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*52*	*U*	*69*	52	*13*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*52*	*U*	*69*	52	*14*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*52*	*D*	*35*	17	*8.0*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	380	D	35	17	6.6
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*9.0*	*J D*	*35*	17	*6.4*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	370	D	69	52	19
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*26*	*U*	*35*	26	*9.7*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*52*	*U*	*69*	52	*22*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPI DL | Lab Sample ID: 320-37938-1 DL

Matrix: Water | Lab File ID: 2018.04.20LLCX_045.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:15

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 289.3(mL) | Date Analyzed: 04/21/2018 13:13

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	84		50-150
STL00992	13C4 PFBA	92		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	92		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	94		50-150
STL00996	13C2 PFDA	100		50-150
STL00997	13C2 PFUnA	85		50-150
STL00998	13C2 PFDoA	83		50-150
STL00994	18O2 PFHxS	90		50-150
STL02116	13C2-PFTeDA	80		50-150
STL00991	13C4 PFOS	86		50-150
STL02337	13C3-PFBS	88	M	50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_045.d
Lims ID: 320-37938-A-1-A
Client ID: TP-PFC-028-TPI
Sample Type: Client
Inject. Date: 21-Apr-2018 13:13:35 ALS Bottle#: 34 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Sample Info: 320-37938-a-1-a 20X
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:26:11 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:19:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.441	0.0	1.000	292254	0.1149		91.9	2597	
2 Perfluorobutyric acid										
212.90 > 169.00	1.446	1.446	0.0	1.004	237842	0.1096			105	
D 3 13C5-PFPeA										
267.90 > 223.00	1.711	1.703	0.008	0.559	200593	0.1224		97.9	3999	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.711	1.711	0.0	1.000	495739	0.2592			416	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.747	1.738	0.009	1.005	195158	0.0749			660	
298.90 > 99.00	1.747	1.738	0.009	1.005	85617		2.28(1.25-3.74)		700	
D 47 13C3-PFBS										M
301.90 > 83.00	1.738	1.739	-0.001	1.000	3870	0.1029		88.5	33.2	M
D 7 13C2 PFHxA										
315.00 > 270.00	1.991	1.990	0.001	1.000	208079	0.1148		91.8	5252	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.991	1.991	0.0	1.000	900952	0.5326			1080	
313.00 > 119.00	2.003	1.991	0.012	1.006	73016		12.34(5.03-15.10)		982	
D 9 13C4-PFHpA										
367.00 > 322.00	2.332	2.318	0.014	1.000	205545	0.1165		93.2	5550	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.332	2.319	0.013	1.000	189537	0.1152			212	
363.00 > 169.00	2.332	2.319	0.013	1.000	71439		2.65(1.13-3.40)		298	
D 11 18O2 PFHxS										
403.00 > 84.00	2.345	2.331	0.014	1.000	230565	0.1059		89.5	7568	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.345	2.332	0.013	1.000	1208765	0.5478			3302	
399.00 > 99.00	2.345	2.332	0.013	1.000	410048		2.95(1.50-4.49)		2457	

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	2.689	2.681	0.008	1.000	201676	0.1150		92.0	6386	
* 62 13C2-PFOA										
415.00 > 370.00	2.689	2.682	0.007		236312	0.1250			7444	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.689	2.682	0.007	1.000	4953381	2.66			4520	
413.00 > 169.00	2.689	2.682	0.007	1.000	2818524		1.76(0.84-2.52)		9596	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.697	2.689	0.008	1.000	22706	0.0131			82.7	
449.00 > 99.00	2.697	2.689	0.008	1.000	7017		3.24(1.94-5.82)		84.8	
D 18 13C4 PFOS										
503.00 > 80.00	3.062	3.054	0.008	1.000	156218	0.1024		85.7	1243	
D 19 13C5 PFNA										
468.00 > 423.00	3.062	3.054	0.008	1.000	177423	0.1177		94.2	8194	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.062	3.055	0.007	1.000	757008	0.5323			2229	
499.00 > 99.00	3.062	3.055	0.007	1.000	166859		4.54(2.31-6.93)		1774	
20 Perfluorononanoic acid										
463.00 > 419.00	3.069	3.055	0.014	1.002	5275	0.003564			14.6	
463.00 > 169.00	3.076	3.055	0.021	1.005	1858		2.84(1.90-5.69)		51.6	
D 21 13C8 FOSA										
506.00 > 78.00	3.402	3.391	0.011	1.000	199188	0.1046		83.7	2814	
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.419	0.011	1.000	159115	0.1256		100	4012	
D 30 13C2 PFUnA										
565.00 > 520.00	3.764	3.753	0.011	1.000	116543	0.1066		85.3	3585	
D 36 13C2 PFDoA										
615.00 > 570.00	4.051	4.042	0.009	1.000	122746	0.1040		83.2	2590	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.547	0.005	1.000	149786	0.1001		80.1	1683	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 24-Apr-2018 17:27:14 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_045.d

Injection Date: 21-Apr-2018 13:13:35 Instrument ID: A8_N

Lims ID: 320-37938-A-1-A Lab Sample ID: 320-37938-1

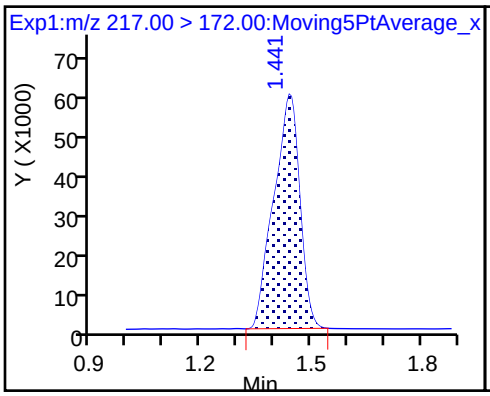
Client ID: TP-PFC-028-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 34 Worklist Smp#: 11

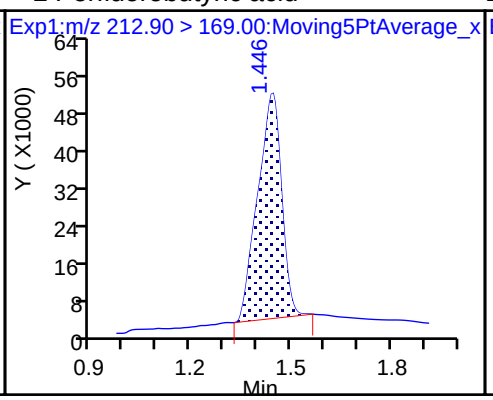
Injection Vol: 2.0 ul Dil. Factor: 20.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

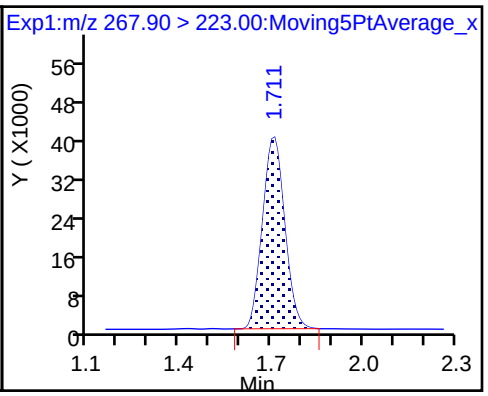
D 1 13C4 PFBA



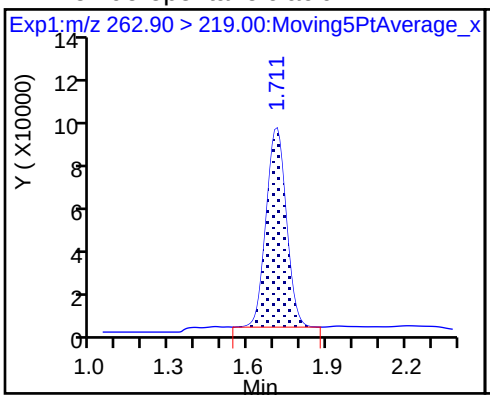
2 Perfluorobutyric acid



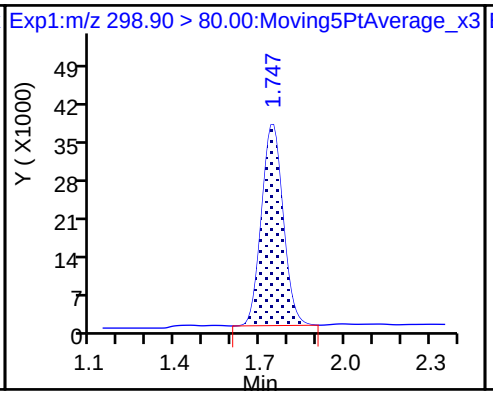
D 3 13C5-PFPeA



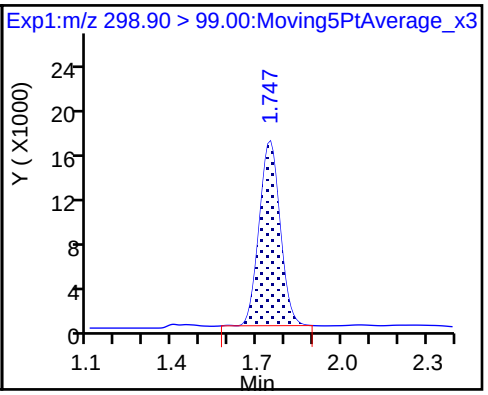
4 Perfluoropentanoic acid



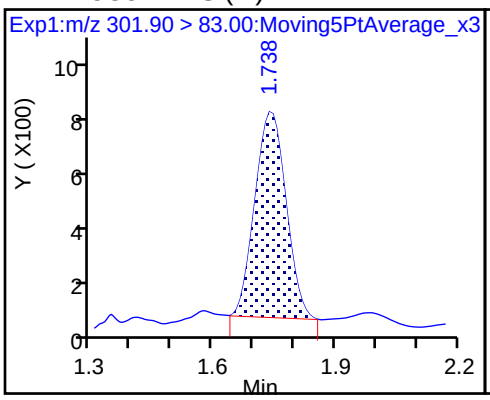
5 Perfluorobutanesulfonic acid



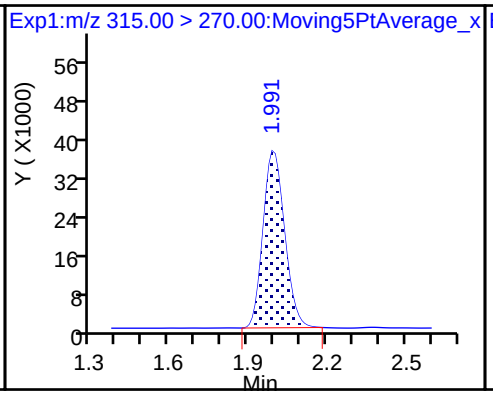
5 Perfluorobutanesulfonic acid



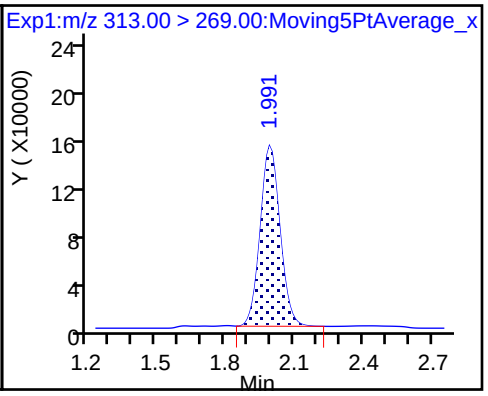
D 47 13C3-PFBS (M)



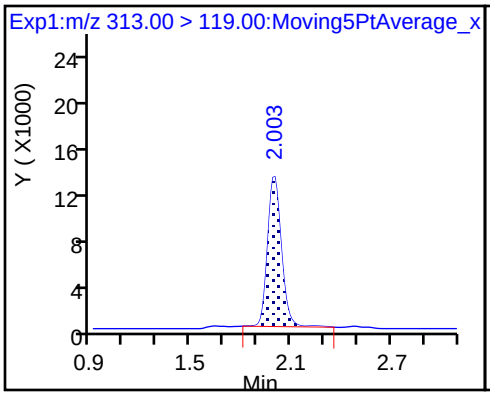
D 7 13C2 PFHxA



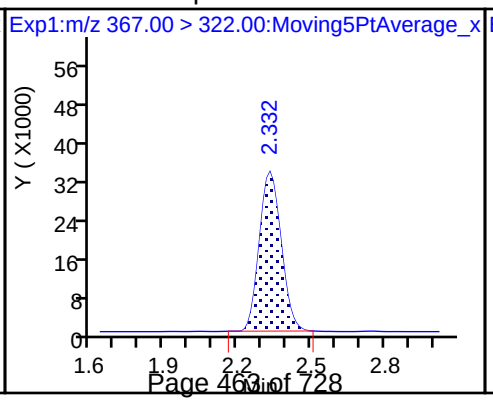
6 Perfluorohexanoic acid



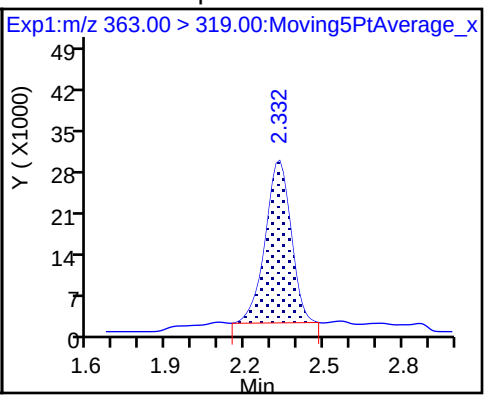
6 Perfluorohexanoic acid



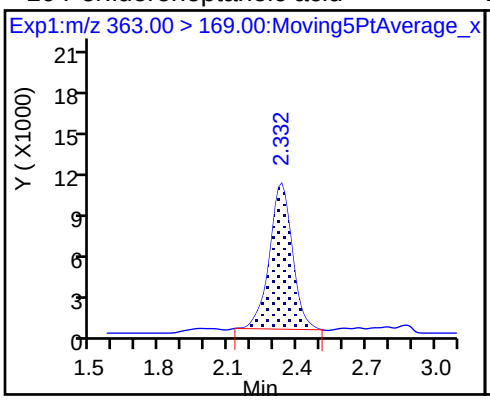
D 9 13C4-PFHpA



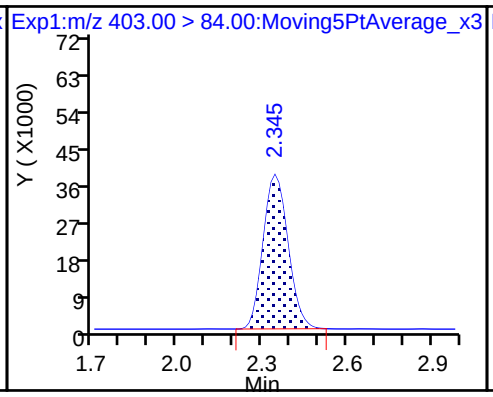
10 Perfluoroheptanoic acid



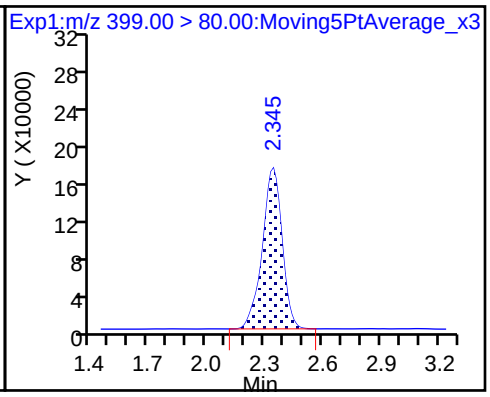
10 Perfluoroheptanoic acid



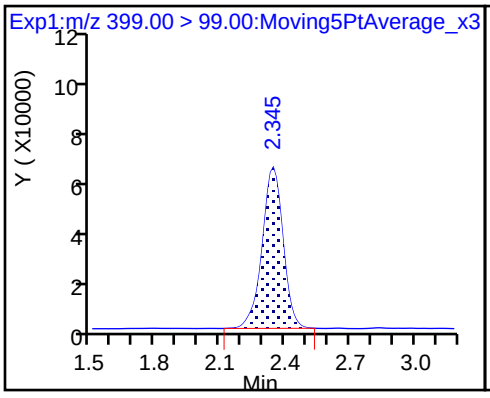
D 11 18O2 PFHxS



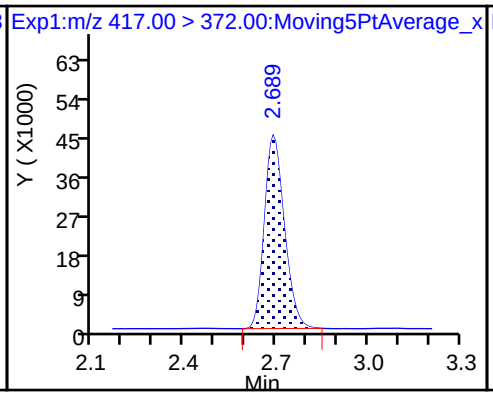
8 Perfluorohexanesulfonic acid



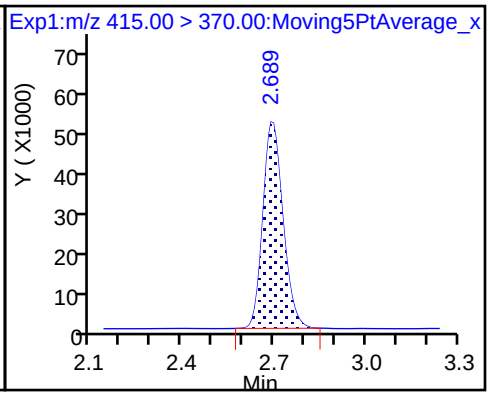
8 Perfluorohexanesulfonic acid



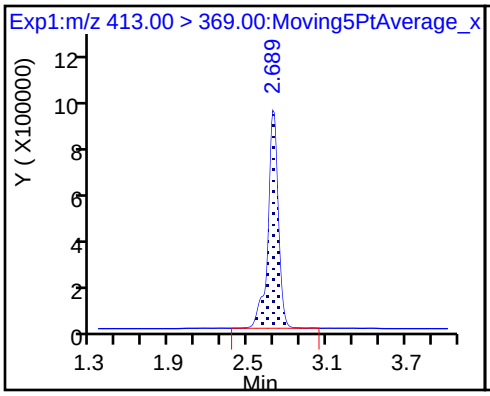
D 14 13C4 PFOA



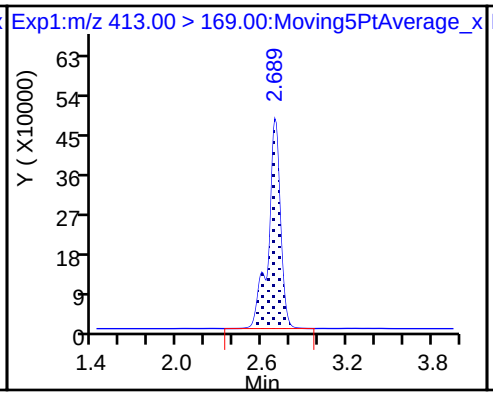
* 62 13C2-PFOA



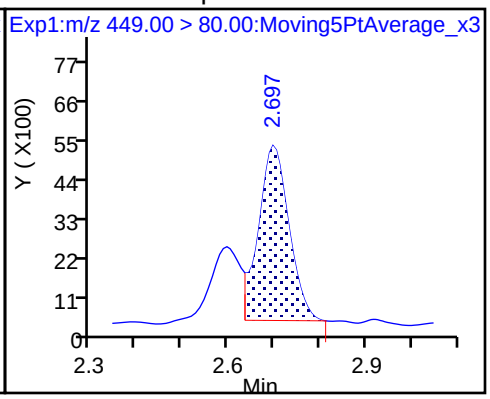
15 Perfluorooctanoic acid



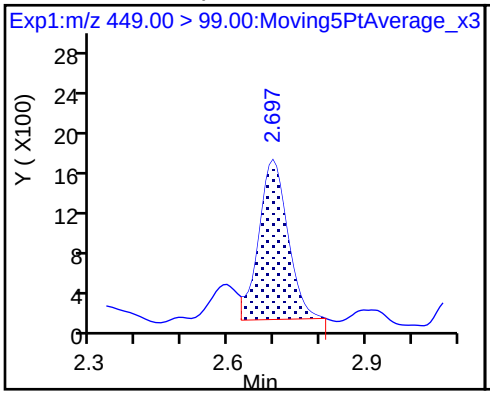
15 Perfluorooctanoic acid



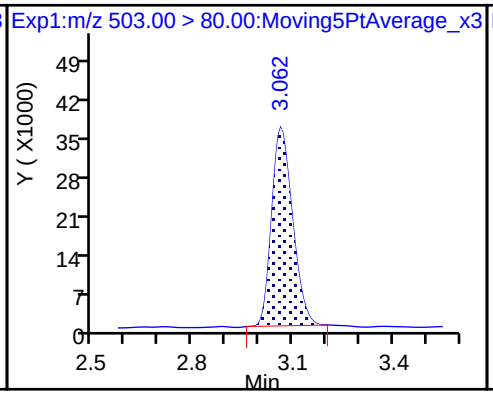
16 Perfluoroheptanesulfonic acid



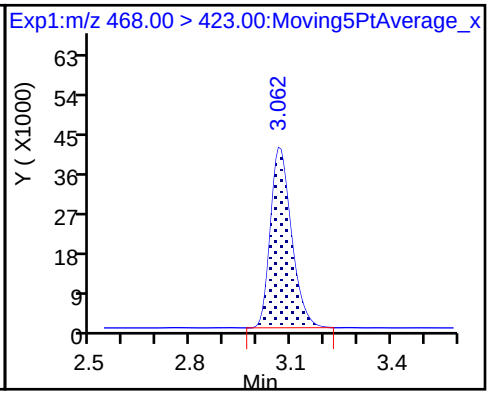
16 Perfluoroheptanesulfonic acid



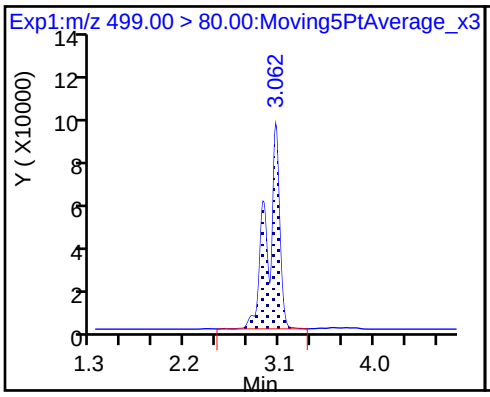
D 18 13C4 PFOS



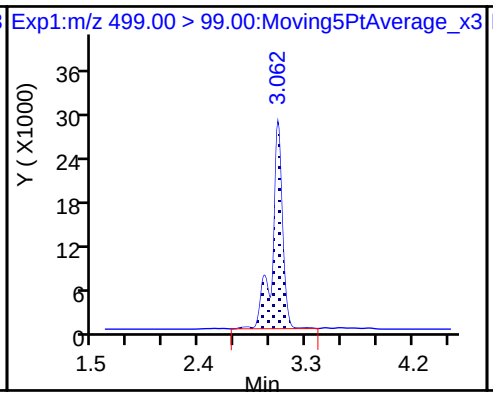
D 19 13C5 PFNA



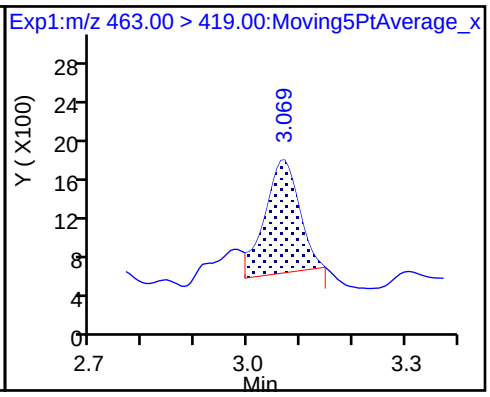
17 Perfluorooctane sulfonic acid



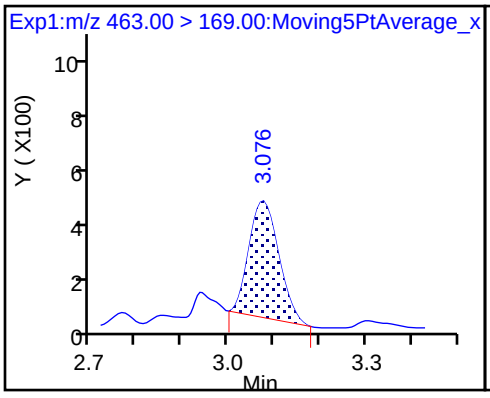
17 Perfluorooctane sulfonic acid



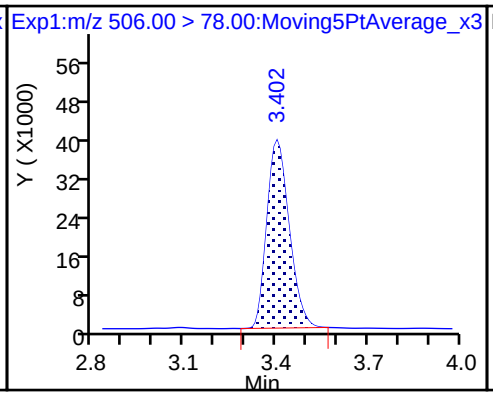
20 Perfluorononanoic acid



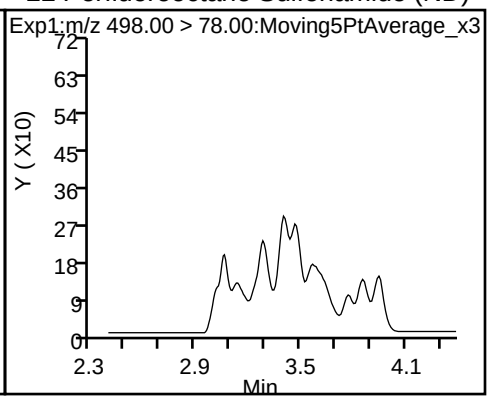
20 Perfluorononanoic acid



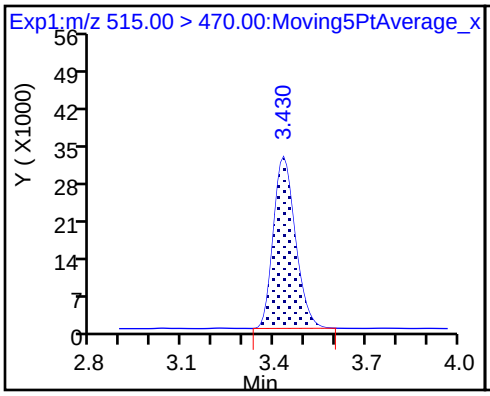
D 21 13C8 FOSA



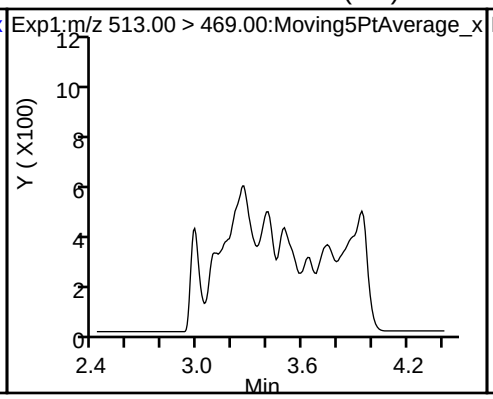
22 Perfluorooctane Sulfonamide (ND)



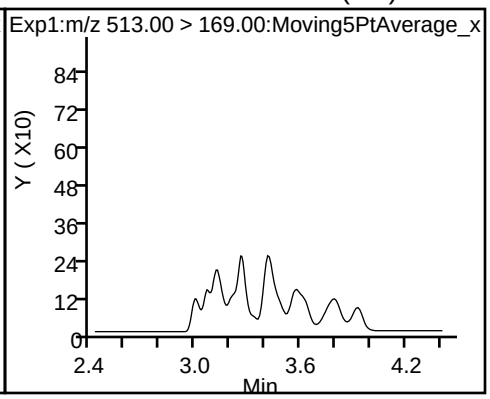
D 23 13C2 PFDA



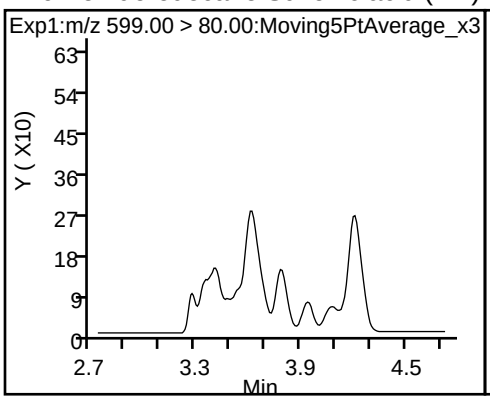
24 Perfluorodecanoic acid (ND)



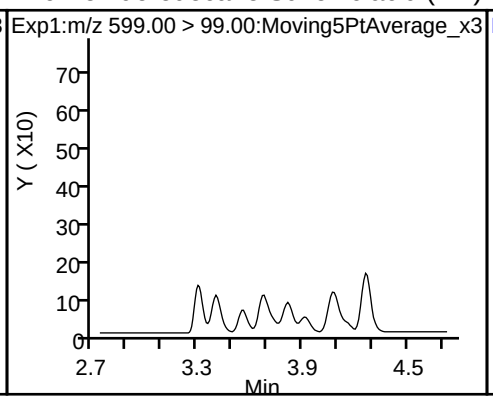
24 Perfluorodecanoic acid (ND)



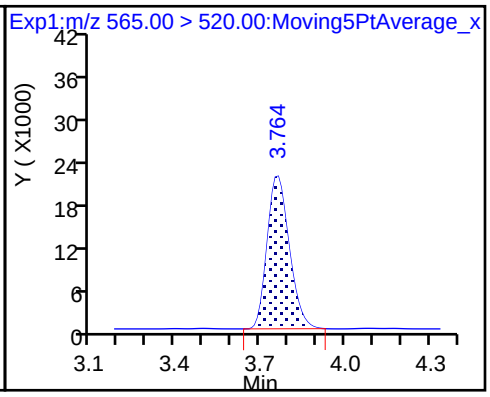
29 Perfluorodecane Sulfonic acid (ND)



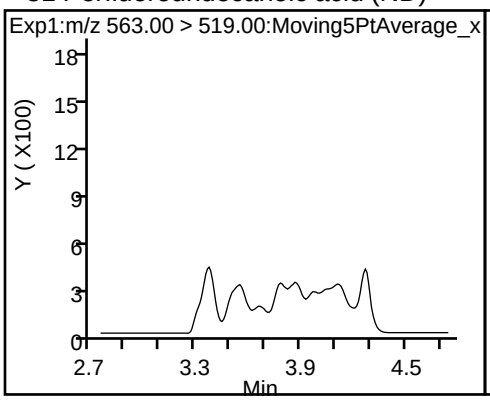
29 Perfluorodecane Sulfonic acid (ND)



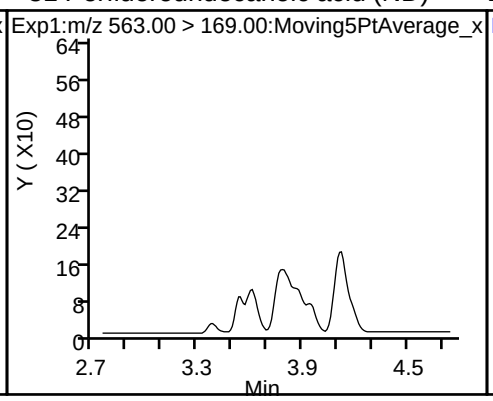
D 30 13C2 PFUnA



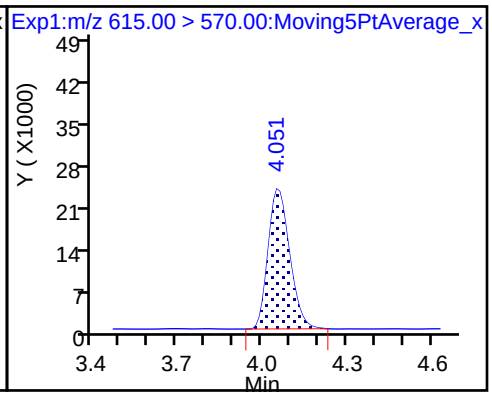
31 Perfluoroundecanoic acid (ND)



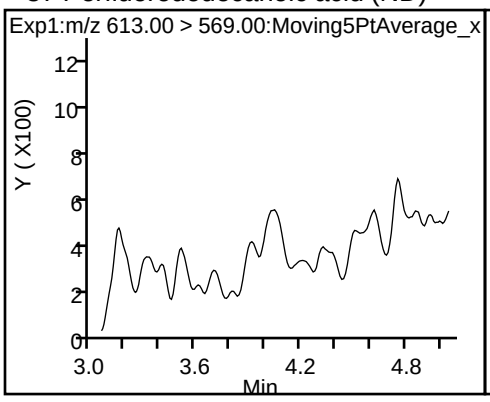
31 Perfluoroundecanoic acid (ND)



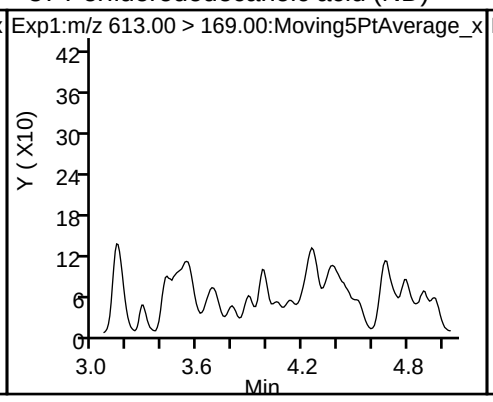
D 36 13C2 PFDoA



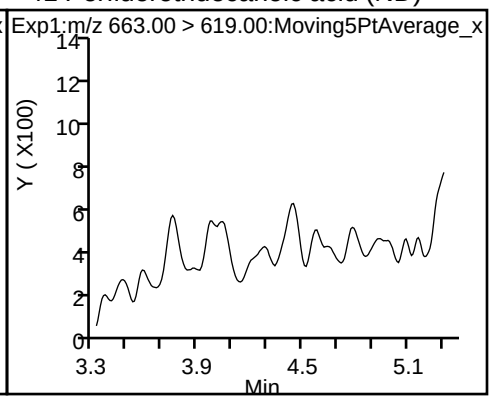
37 Perfluorododecanoic acid (ND)



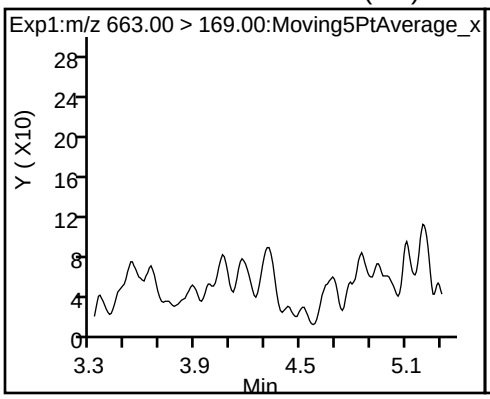
37 Perfluorododecanoic acid (ND)



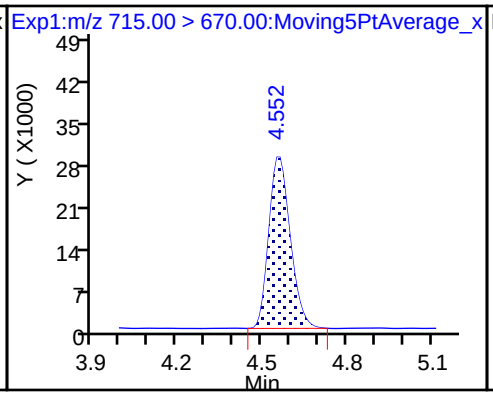
41 Perfluorotridecanoic acid (ND)



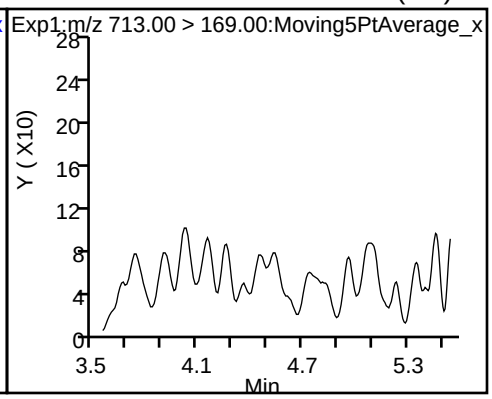
41 Perfluorotridecanoic acid (ND)



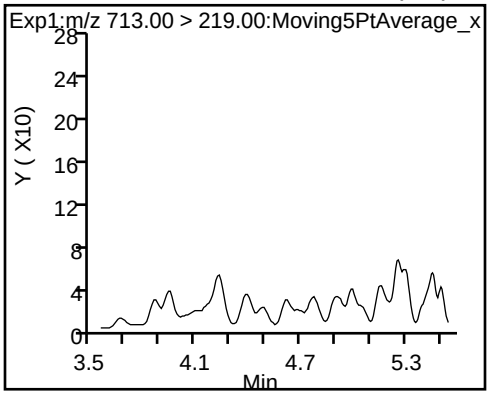
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

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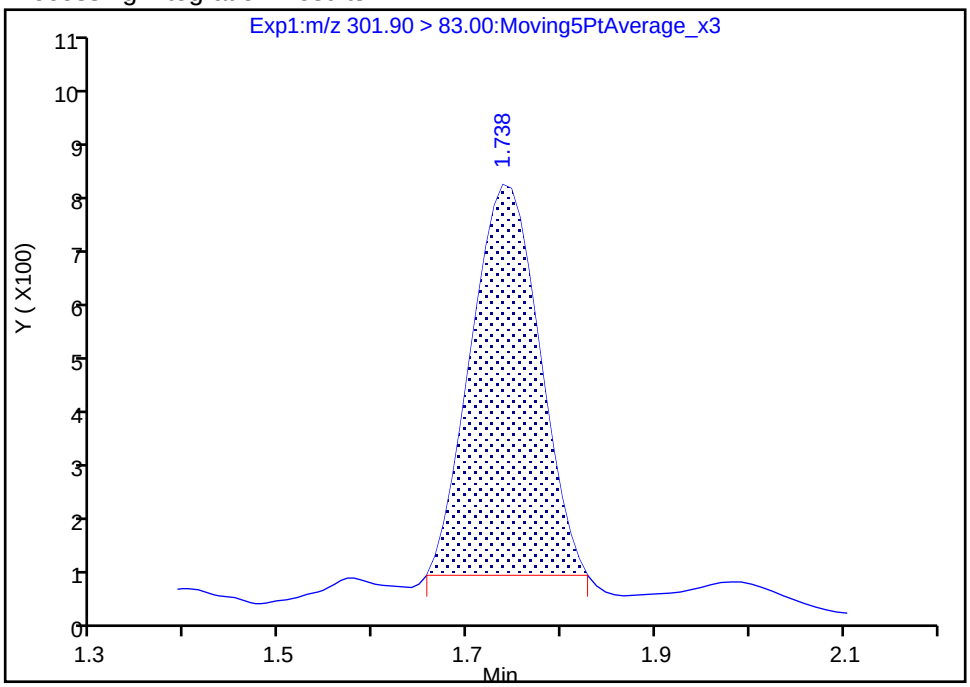
Injection Date:	21-Apr-2018 13:13:35	Instrument ID:	A8_N		
Lims ID:	320-37938-A-1-A	Lab Sample ID:	320-37938-1		
Client ID:	TP-PFC-028-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	34	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

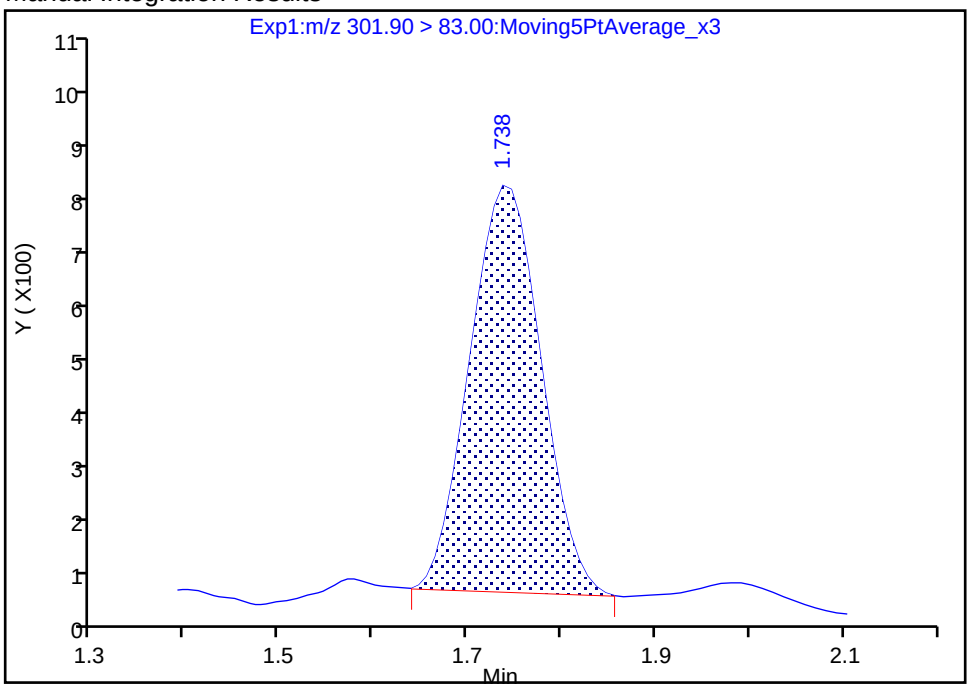
Processing Integration Results

RT: 1.74
Area: 3539
Amount: 0.094078
Amount Units: ng/ml



Manual Integration Results

RT: 1.74
Area: 3870
Amount: 0.102877
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:20:25

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-MID-CARB | Lab Sample ID: 320-37938-2

Matrix: Water | Lab File ID: 2018.04.20LLCX_046.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:20

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 304(mL) | Date Analyzed: 04/21/2018 13:21

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		1.6	1.2	0.49
2706-90-3	Perfluoropentanoic acid (PFPeA)	230		1.6	0.82	0.35
307-24-4	Perfluorohexanoic acid (PFHxA)	140		1.6	0.82	0.39
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0		1.6	1.2	0.50
335-67-1	Perfluorooctanoic acid (PFOA)	33	M	1.6	1.2	0.44
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U	1.6	1.2	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	0.82	U	1.6	0.82	0.39
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.2	U	1.6	1.2	0.59
307-55-1	Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	1.2	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	0.63
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.68
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.1		1.6	0.82	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0		1.6	0.82	0.31
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.82	U	1.6	0.82	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.3	2.5	0.90
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	1.2	0.46
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-MID-CARB | Lab Sample ID: 320-37938-2

Matrix: Water | Lab File ID: 2018.04.20LLCX_046.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:20

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 304(mL) | Date Analyzed: 04/21/2018 13:21

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	76		50-150
STL00992	13C4 PFBA	86		50-150
STL01893	13C5 PFPeA	82		50-150
STL00993	13C2 PFHxA	84		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	83		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	80		50-150
STL00998	13C2 PFDoA	75		50-150
STL00994	18O2 PFHxS	86		50-150
STL02116	13C2-PFTeDA	73		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	86		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_046.d
Lims ID: 320-37938-A-2-A
Client ID: TP-PFC-028-MID-CARB
Sample Type: Client
Inject. Date: 21-Apr-2018 13:21:27 ALS Bottle#: 35 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-37938-a-2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:26:11 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:19:37

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	1.439	1.441	-0.002	1.000	5706519	2.15		85.9	44834	
2 Perfluorobutyric acid										
212.90 > 169.00	1.439	1.446	-0.007	1.000	7937415	3.74			3714	
D 3 13C5-PFPeA										
267.90 > 223.00	1.708	1.703	0.005	0.557	3517262	2.05		82.1	56235	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.699	1.711	-0.012	0.995	11919457	7.11			12571	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.735	1.738	-0.003	1.000	329022	0.1240			1313	
298.90 > 99.00	1.735	1.738	-0.003	1.000	159562		2.06(1.25-3.74)		1145	
D 47 13C3-PFBS										
301.90 > 83.00	1.735	1.739	-0.004	1.000	78786	2.00		86.2	547	
D 7 13C2 PFHxA										
315.00 > 270.00	1.988	1.990	-0.002	1.000	3975024	2.10		83.9	99506	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.978	1.991	-0.013	0.995	7022565	4.35			12260	R
313.00 > 119.00	1.988	1.991	-0.003	1.000	437472		16.05(5.03-15.10)		5108	
D 9 13C4-PFHpA										
367.00 > 322.00	2.329	2.318	0.011	1.000	3899335	2.11		84.6	78956	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.316	2.319	-0.003	0.994	283676	0.1817			269	
363.00 > 169.00	2.316	2.319	-0.003	0.994	114696		2.47(1.13-3.40)		447	
D 11 18O2 PFHxS										
403.00 > 84.00	2.342	2.331	0.011	1.000	4650748	2.04		86.4	84417	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.329	2.332	-0.003	0.994	135771	0.0610			312	
399.00 > 99.00	2.329	2.332	-0.003	0.994	43951		3.09(1.50-4.49)		156	

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	2.688	2.681	0.007	1.000	4002437	2.18		87.3	73571	
* 62 13C2-PFOA										
415.00 > 370.00	2.688	2.682	0.006		4939939	2.50			76557	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.688	2.682	0.006	1.000	1836001	0.99			866	M
413.00 > 169.00	2.688	2.682	0.006	1.000	1212400		1.51(0.84-2.52)		2141	M
D 18 13C4 PFOS										
503.00 > 80.00	3.060	3.054	0.006	1.000	3102246	1.95		81.4	23523	
D 19 13C5 PFNA										
468.00 > 423.00	3.067	3.054	0.013	1.000	3259145	2.07		82.7	80524	
D 21 13C8 FOSA										
506.00 > 78.00	3.398	3.391	0.007	1.000	3797688	1.91		76.3	38520	
D 23 13C2 PFDA										
515.00 > 470.00	3.426	3.419	0.007	1.000	2848656	2.15		86.1	72179	
D 30 13C2 PFUnA										
565.00 > 520.00	3.761	3.753	0.008	1.000	2286246	2.00		80.1	47382	
D 36 13C2 PFDoA										
615.00 > 570.00	4.050	4.042	0.008	1.000	2314855	1.88		75.1	31273	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.547	0.005	1.000	2837675	1.81		72.6	28867	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 24-Apr-2018 17:27:16 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_046.d

Injection Date: 21-Apr-2018 13:21:27 Instrument ID: A8_N

Lims ID: 320-37938-A-2-A Lab Sample ID: 320-37938-2

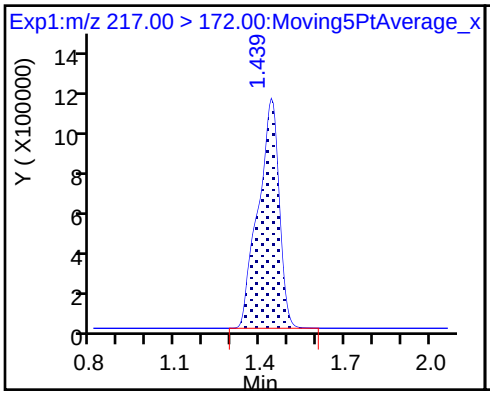
Client ID: TP-PFC-028-MID-CARB

Operator ID: SACINSTLCMS01 ALS Bottle#: 35 Worklist Smp#: 12

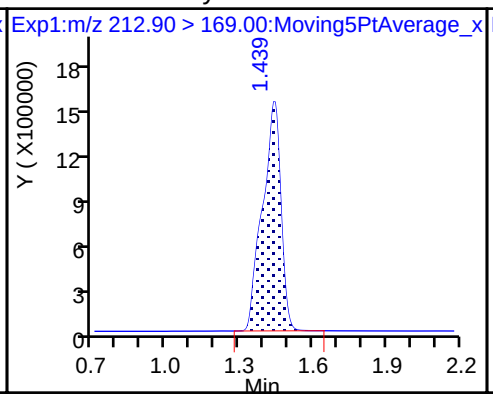
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

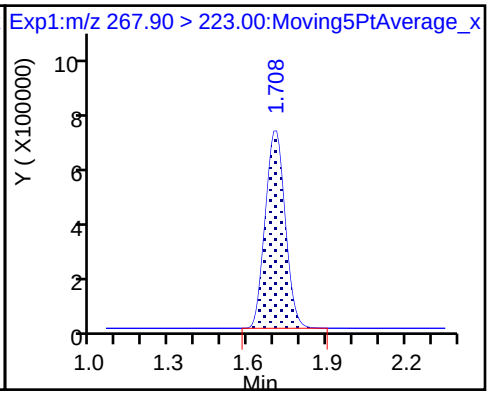
D 1 13C4 PFBA



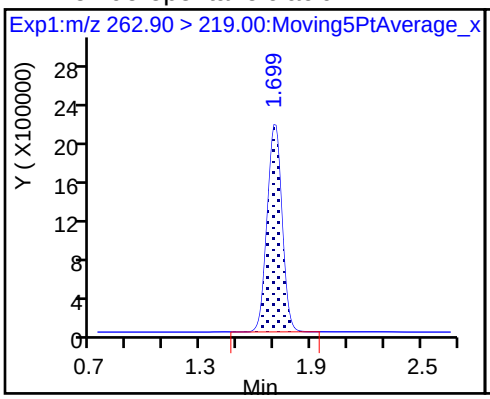
2 Perfluorobutyric acid



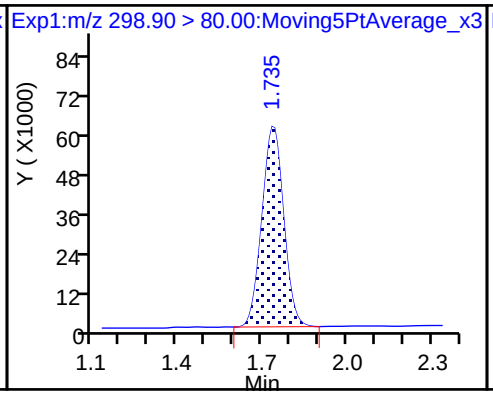
D 3 13C5-PFPeA



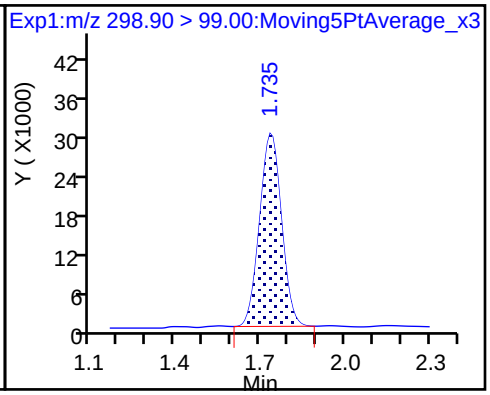
4 Perfluoropentanoic acid



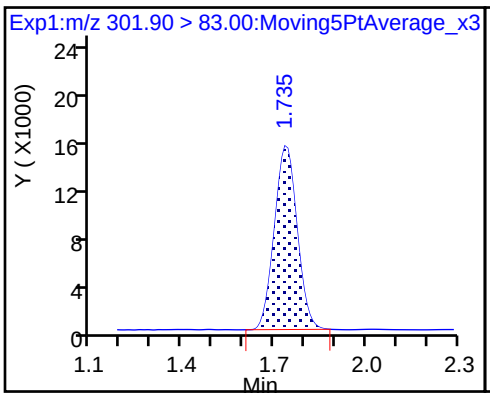
5 Perfluorobutanesulfonic acid



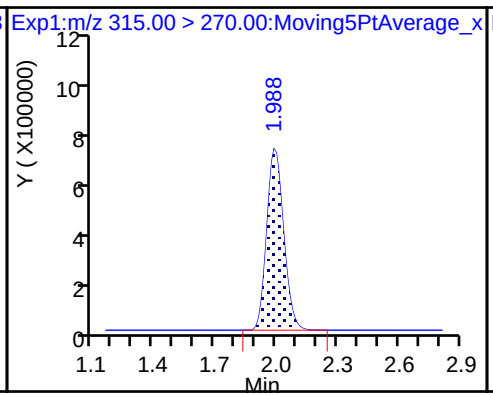
5 Perfluorobutanesulfonic acid



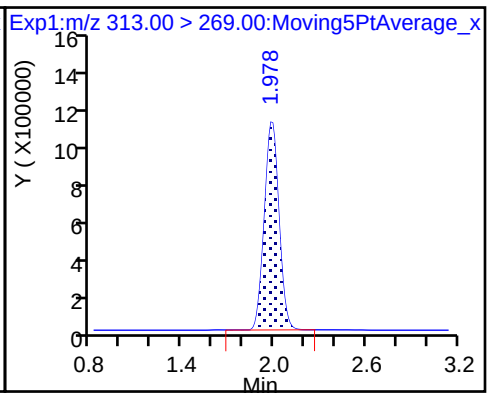
D 47 13C3-PFBS



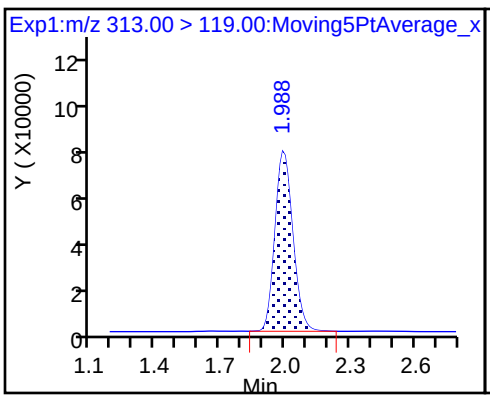
D 7 13C2 PFHxA



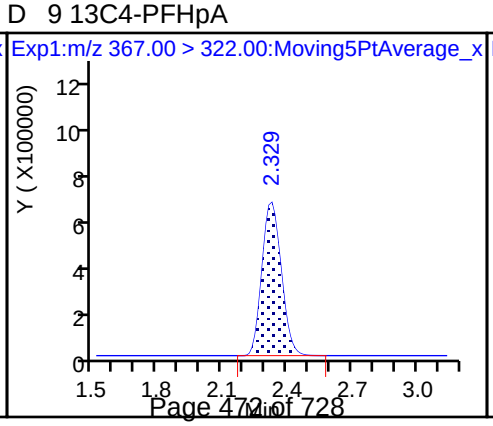
6 Perfluorohexanoic acid



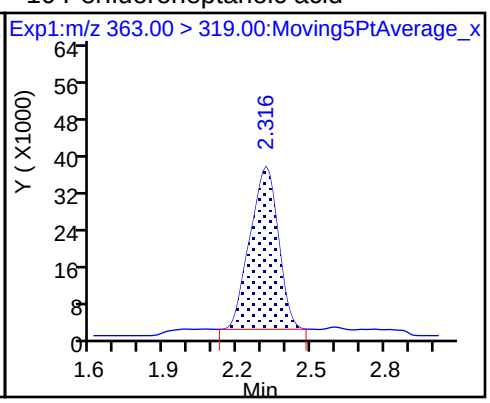
6 Perfluorohexanoic acid



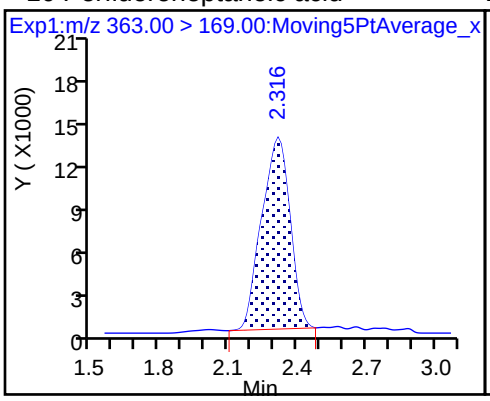
D 9 13C4-PFHpA



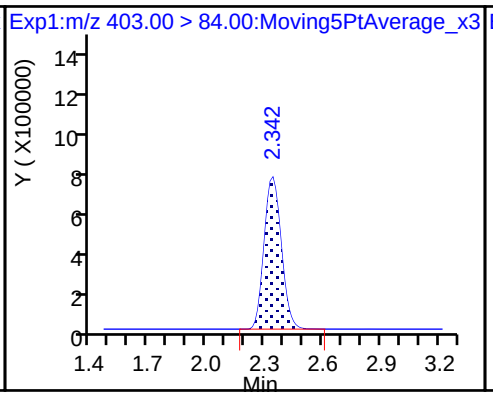
10 Perfluoroheptanoic acid



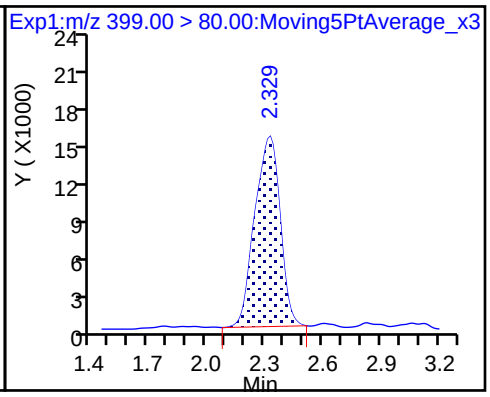
10 Perfluoroheptanoic acid



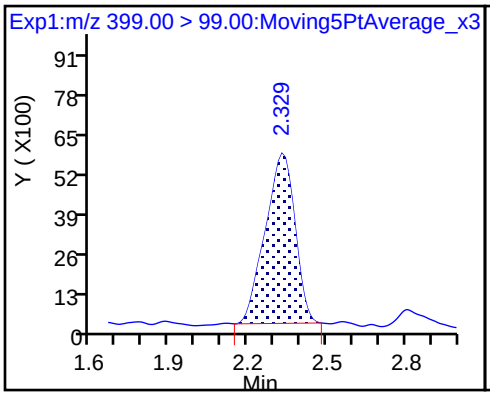
D 11 18O2 PFHxS



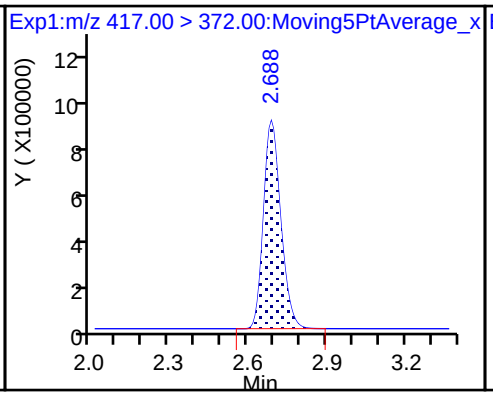
8 Perfluorohexanesulfonic acid



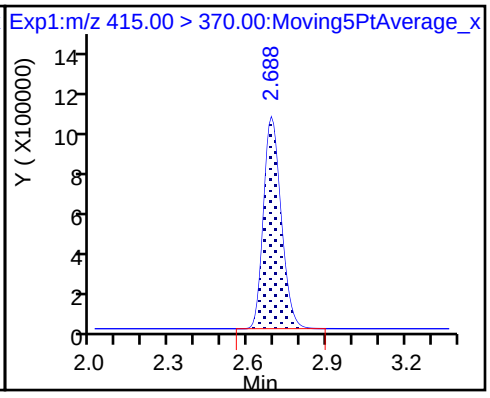
8 Perfluorohexanesulfonic acid



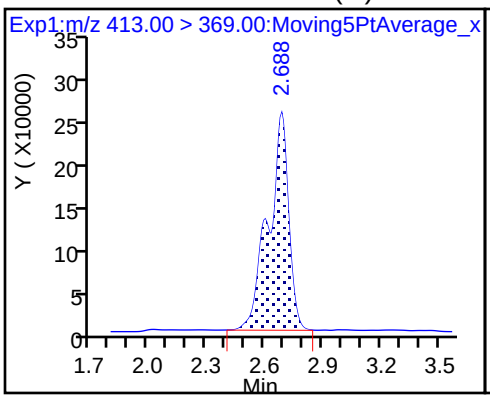
D 14 13C4 PFOA



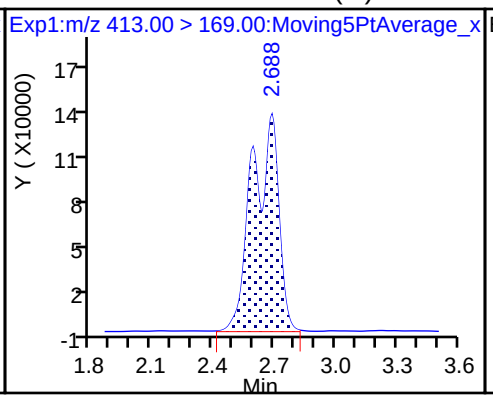
* 62 13C2-PFOA



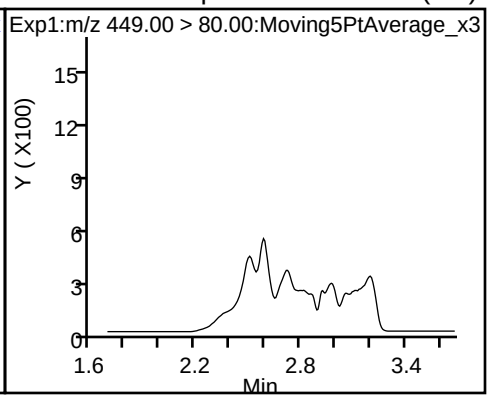
15 Perfluorooctanoic acid (M)



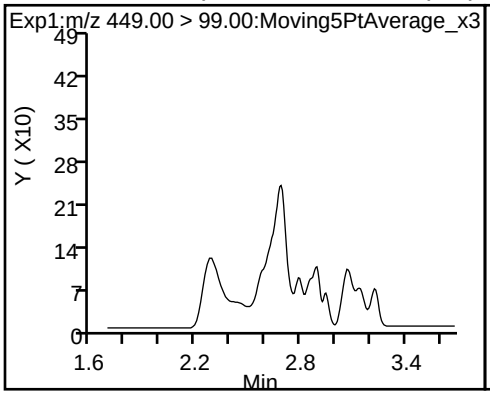
15 Perfluorooctanoic acid (M)



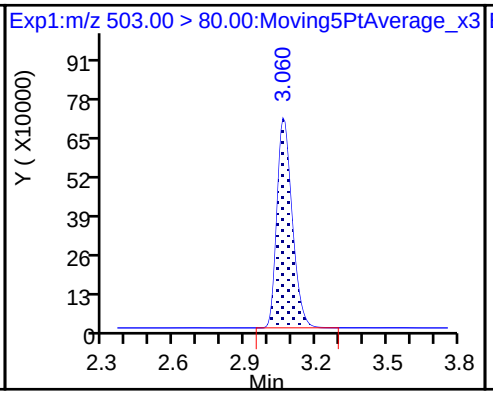
16 Perfluoroheptanesulfonic acid (ND)



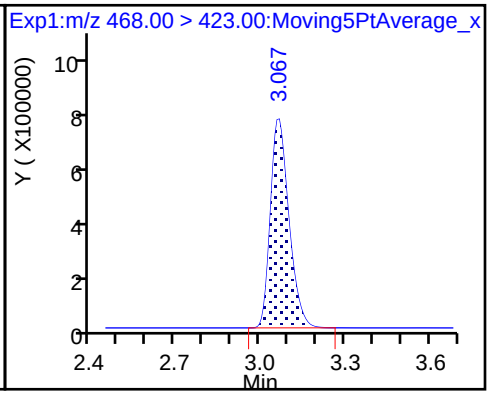
16 Perfluoroheptanesulfonic acid (ND)



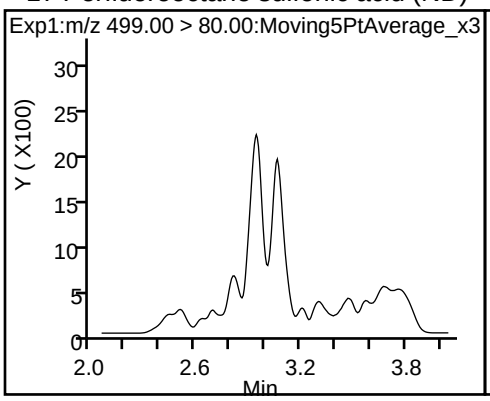
D 18 13C4 PFOS



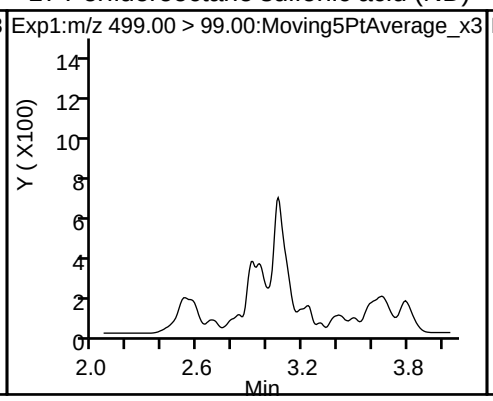
D 19 13C5 PFNA



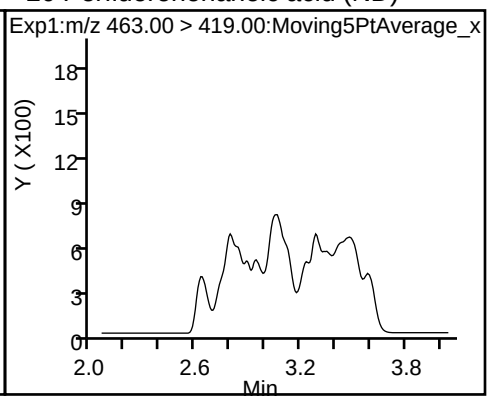
17 Perfluorooctane sulfonic acid (ND)



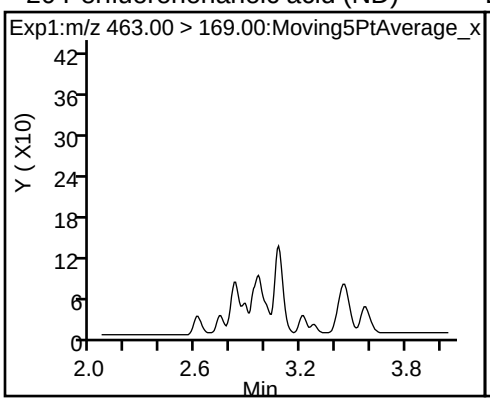
17 Perfluorooctane sulfonic acid (ND)



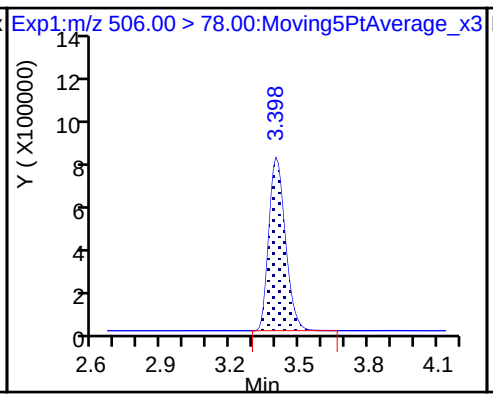
20 Perfluorononanoic acid (ND)



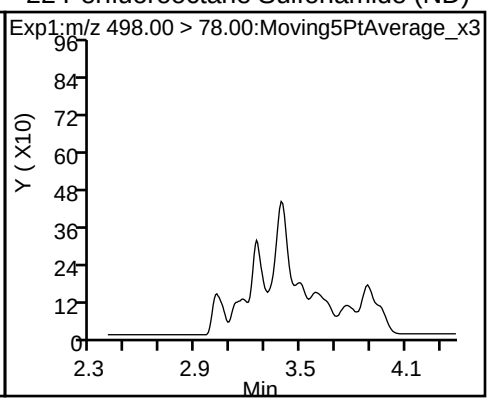
20 Perfluorononanoic acid (ND)



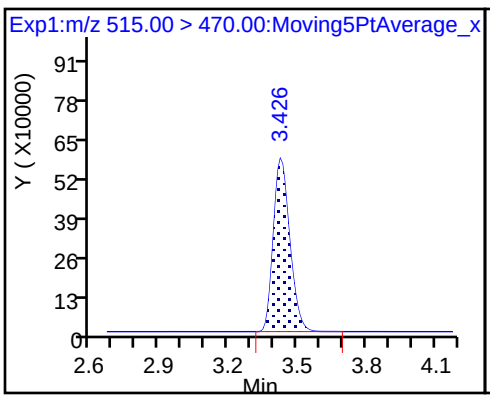
D 21 13C8 FOSA



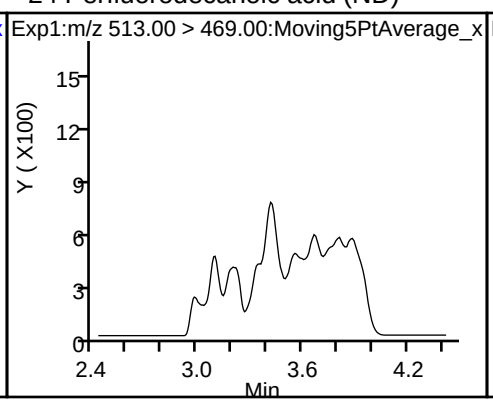
22 Perfluorooctane Sulfonamide (ND)



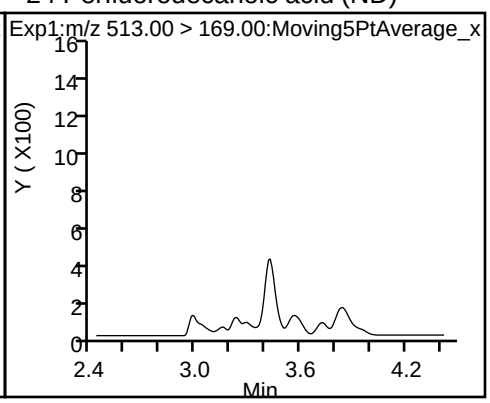
D 23 13C2 PFDA



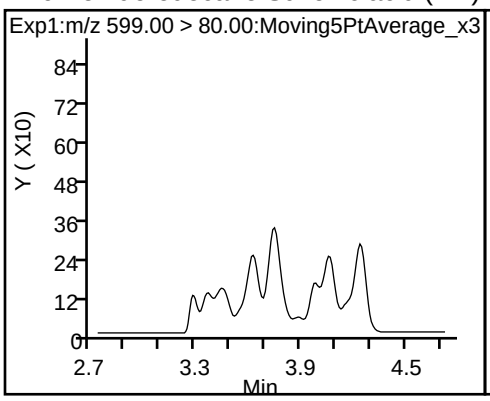
24 Perfluorodecanoic acid (ND)



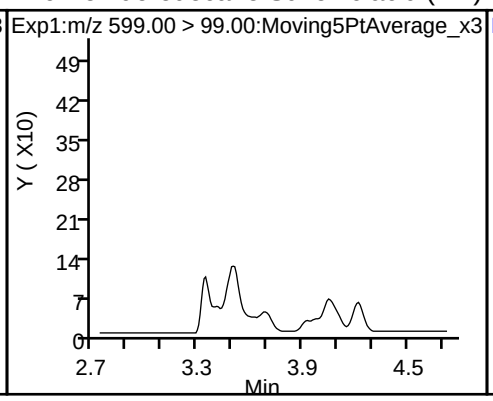
24 Perfluorodecanoic acid (ND)



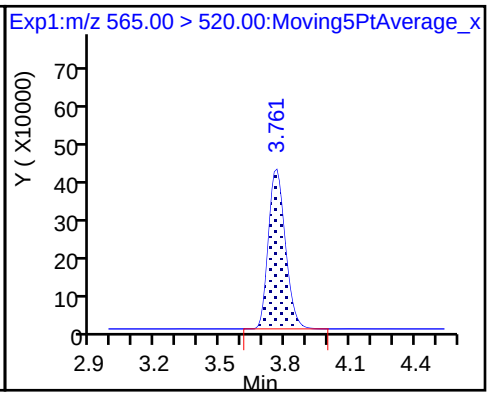
29 Perfluorodecane Sulfonic acid (ND)



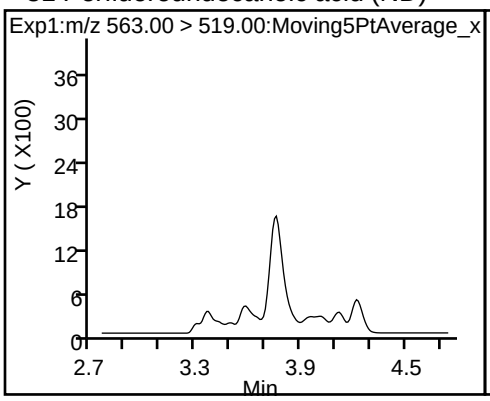
29 Perfluorodecane Sulfonic acid (ND)



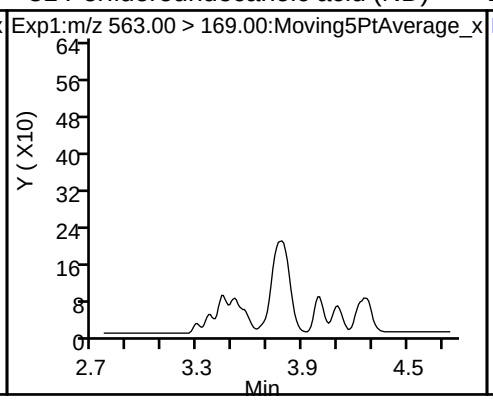
D 30 13C2 PFUnA



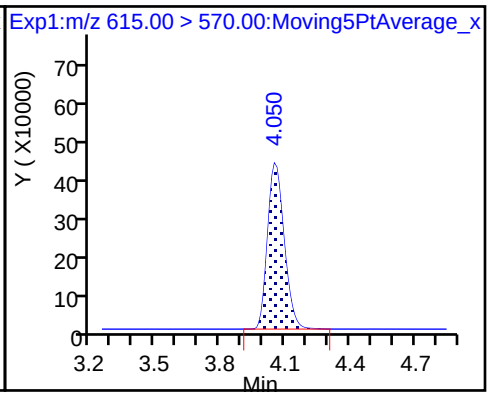
31 Perfluoroundecanoic acid (ND)



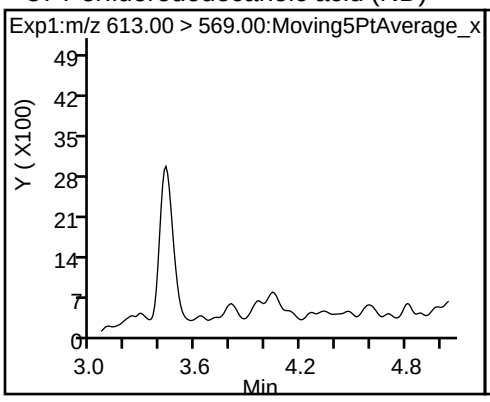
31 Perfluoroundecanoic acid (ND)



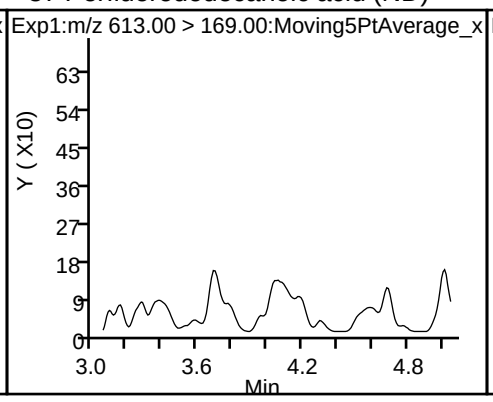
D 36 13C2 PFDoA



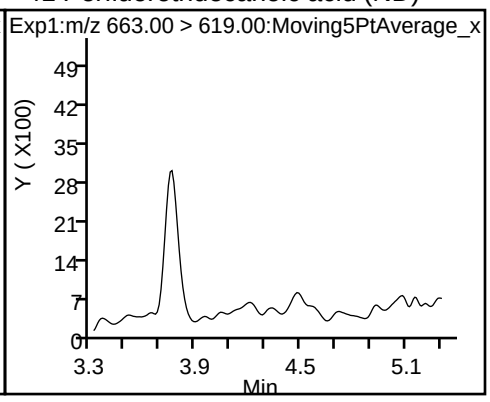
37 Perfluorododecanoic acid (ND)



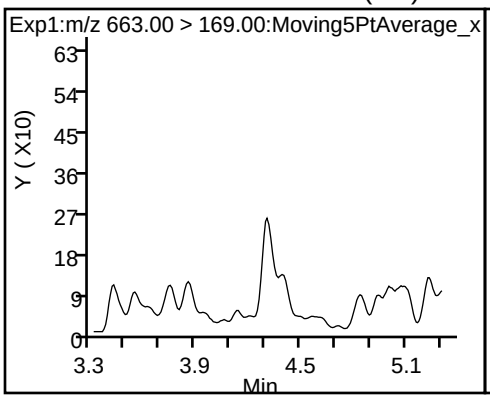
37 Perfluorododecanoic acid (ND)



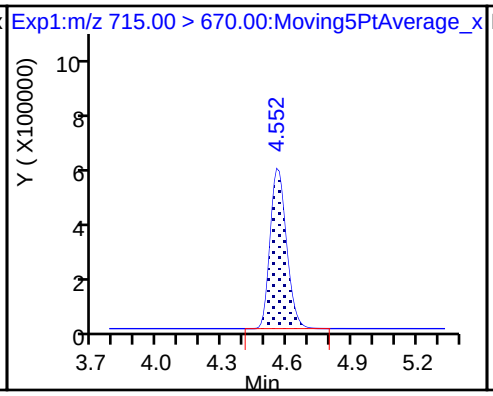
41 Perfluorotridecanoic acid (ND)



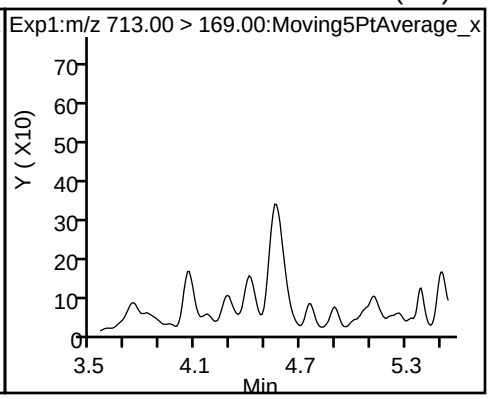
41 Perfluorotridecanoic acid (ND)



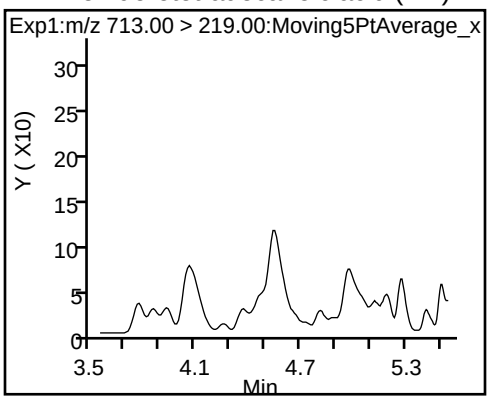
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

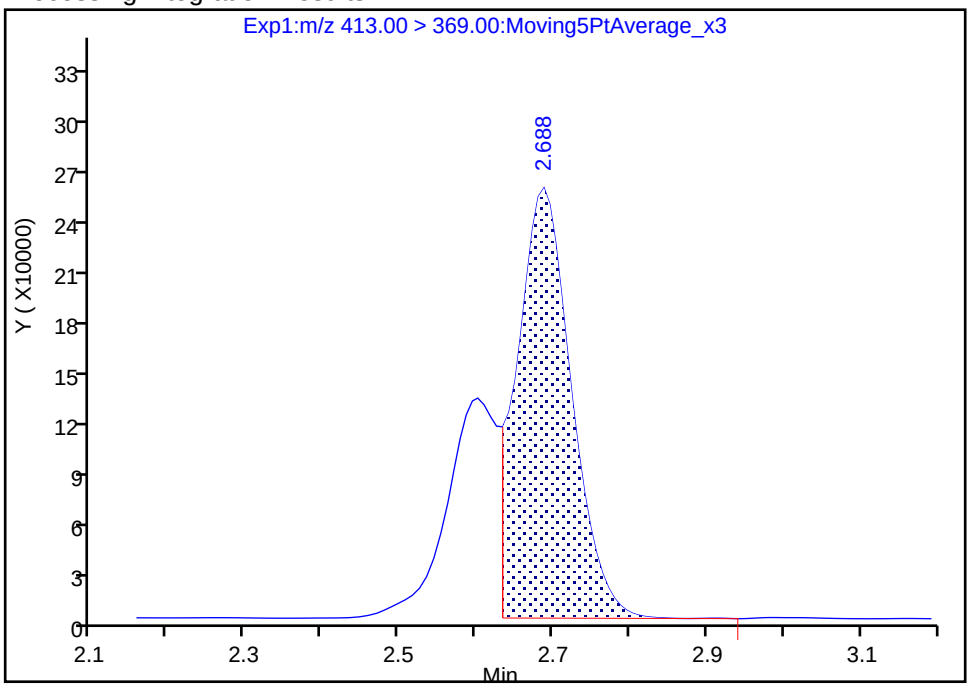
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_046.d				
Injection Date:	21-Apr-2018 13:21:27	Instrument ID:	A8_N		
Lims ID:	320-37938-A-2-A	Lab Sample ID:	320-37938-2		
Client ID:	TP-PFC-028-MID-CARB				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	35	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

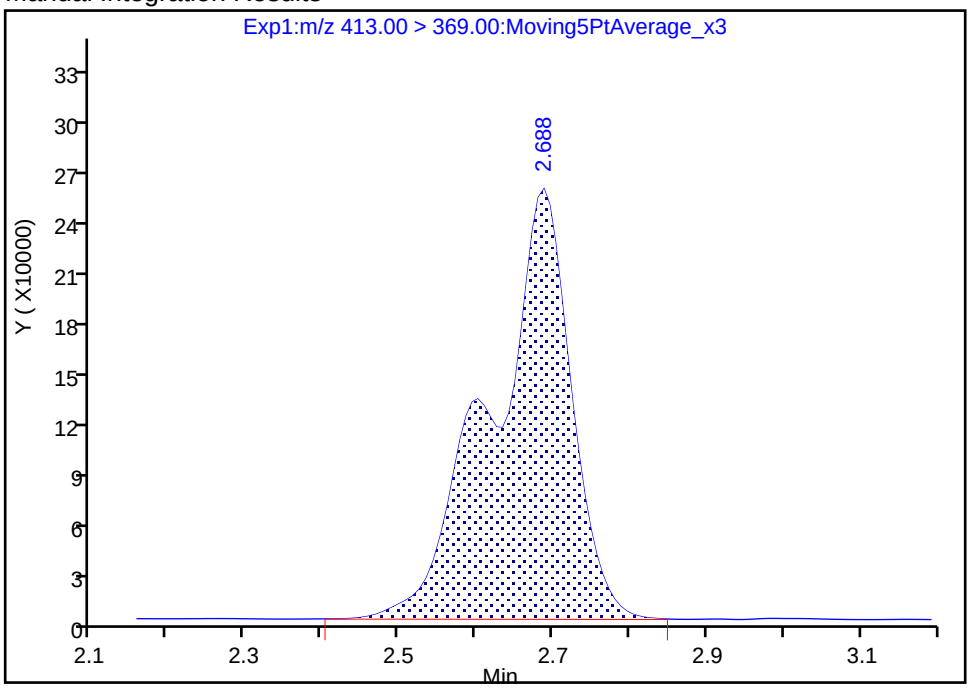
Processing Integration Results

RT: 2.69
Area: 1231411
Amount: 0.665707
Amount Units: ng/ml



Manual Integration Results

RT: 2.69
Area: 1836001
Amount: 0.992551
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:21:02

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

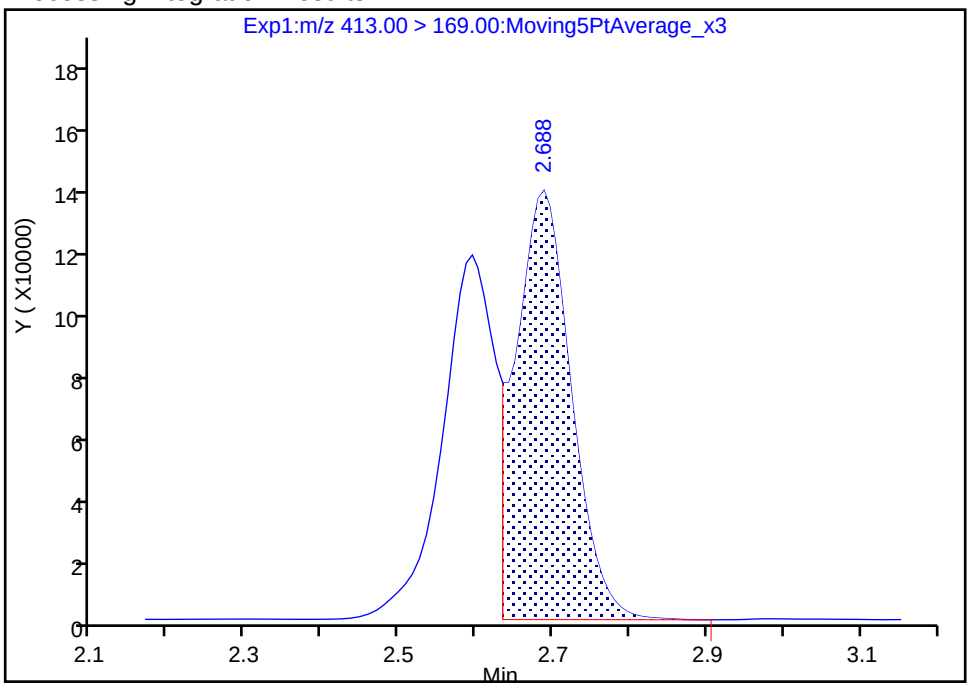
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_046.d				
Injection Date:	21-Apr-2018 13:21:27	Instrument ID:	A8_N		
Lims ID:	320-37938-A-2-A	Lab Sample ID:	320-37938-2		
Client ID:	TP-PFC-028-MID-CARB				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	35	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

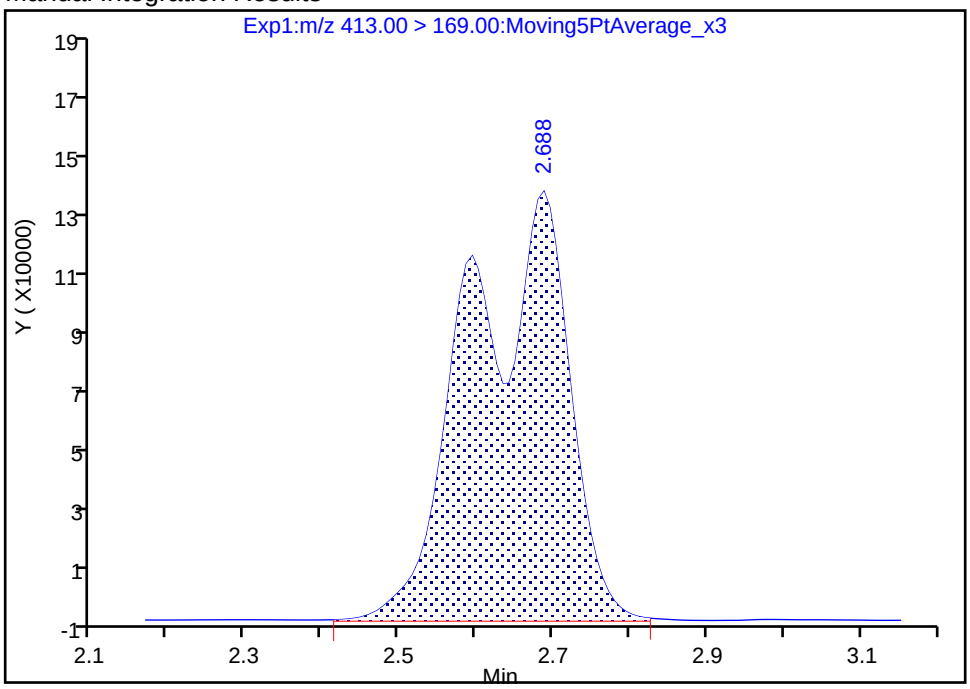
Processing Integration Results

RT: 2.69
Area: 667829
Amount: 0.665707
Amount Units: ng/ml



Manual Integration Results

RT: 2.69
Area: 1212400
Amount: 0.992551
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:21:12

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPE | Lab Sample ID: 320-37938-3

Matrix: Water | Lab File ID: 2018.04.20LLCX_047.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:25

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 295.8(mL) | Date Analyzed: 04/21/2018 13:29

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.7	1.3	0.50
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		1.7	0.85	0.36
307-24-4	Perfluorohexanoic acid (PFHxA)	65		1.7	0.85	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	J M	1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	2.8	M	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
335-76-2	Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.85	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.61
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.44
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	2.5	0.64
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.4	2.5	0.70
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.1	J	1.7	0.85	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.36	J	1.7	0.85	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.85	0.31
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.4	2.5	0.93
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.47
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U M	3.4	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPE Lab Sample ID: 320-37938-3

Matrix: Water Lab File ID: 2018.04.20LLCX_047.d

Analysis Method: EPA 537 (Mod) Date Collected: 04/05/2018 09:25

Extraction Method: 3535 Date Extracted: 04/18/2018 10:32

Sample wt/vol: 295.8(mL) Date Analyzed: 04/21/2018 13:29

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	86		50-150
STL01893	13C5 PFPeA	82		50-150
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	86		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	88		50-150
STL00996	13C2 PFDA	87		50-150
STL00997	13C2 PFUnA	82		50-150
STL00998	13C2 PFDoA	81		50-150
STL00994	18O2 PFHxS	88		50-150
STL02116	13C2-PFTeDA	76		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	87		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_047.d
Lims ID: 320-37938-A-3-A
Client ID: TP-PFC-028-TPE
Sample Type: Client
Inject. Date: 21-Apr-2018 13:29:16 ALS Bottle#: 36 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-37938-a-3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:26:11 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:23:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.435	1.441	-0.006	1.000	5888613	2.16		86.4	40106	
2 Perfluorobutyric acid										
212.90 > 169.00	1.435	1.446	-0.011	1.000	8474982	3.87			4212	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.703	-0.001	0.556	3624353	2.06		82.5	64775	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.711	-0.009	1.000	9656013	5.59			11318	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.738	1.738	0.0	1.000	90679	0.0331			355	
298.90 > 99.00	1.729	1.738	-0.009	0.995	48552		1.87(1.25-3.74)		378	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.739	-0.001	1.000	81285	2.02		86.7	720	
D 7 13C2 PFHxA										
315.00 > 270.00	1.992	1.990	0.002	1.000	4267284	2.20		87.8	83514	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.970	1.991	-0.021	0.989	3317508	1.91			4449	R
313.00 > 119.00	1.992	1.991	0.001	1.000	177118		18.73(5.03-15.10)		1953	
D 9 13C4-PFHpA										
367.00 > 322.00	2.320	2.318	0.002	1.000	4073512	2.15		86.2	66248	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.281	2.319	-0.038	0.983	63283	0.0388			53.5	M
363.00 > 169.00	2.268	2.319	-0.051	0.977	26683		2.37(1.13-3.40)		100	M
D 11 18O2 PFHxS										
403.00 > 84.00	2.333	2.331	0.002	1.000	4849629	2.08		87.8	79619	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.333	2.332	0.001	1.000	24497	0.0106			65.2	
399.00 > 99.00	2.333	2.332	0.001	1.000	8877		2.76(1.50-4.49)		49.2	

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	2.681	0.002	1.000	4166346	2.22		88.6	70188	
* 62 13C2-PFOA										
415.00 > 370.00	2.683	2.682	0.001		5066384	2.50			78769	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.597	2.682	-0.085	0.968	160987	0.0836			52.2	M
413.00 > 169.00	2.589	2.682	-0.093	0.965	119303		1.35(0.84-2.52)		262	
D 18 13C4 PFOS										
503.00 > 80.00	3.056	3.054	0.002	1.000	3380179	2.07		86.5	22335	
D 19 13C5 PFNA										
468.00 > 423.00	3.063	3.054	0.009	1.000	3563991	2.21		88.2	62349	
D 21 13C8 FOSA										
506.00 > 78.00	3.395	3.391	0.003	1.000	4050344	1.98		79.4	45535	
22 Perfluorooctane Sulfonamide										M
498.00 > 78.00	3.404	3.393	0.011	1.003	4624	0.002822			43.7	M
D 23 13C2 PFDA										
515.00 > 470.00	3.422	3.419	0.003	1.000	2943694	2.17		86.7	73776	
D 30 13C2 PFUnA										
565.00 > 520.00	3.758	3.753	0.005	1.000	2412390	2.06		82.4	44983	
D 36 13C2 PFDoA										
615.00 > 570.00	4.047	4.042	0.005	1.000	2563129	2.03		81.0	32688	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.550	4.547	0.003	1.000	3031826	1.89		75.6	21669	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 24-Apr-2018 17:27:17 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_047.d

Injection Date: 21-Apr-2018 13:29:16 Instrument ID: A8_N

Lims ID: 320-37938-A-3-A Lab Sample ID: 320-37938-3

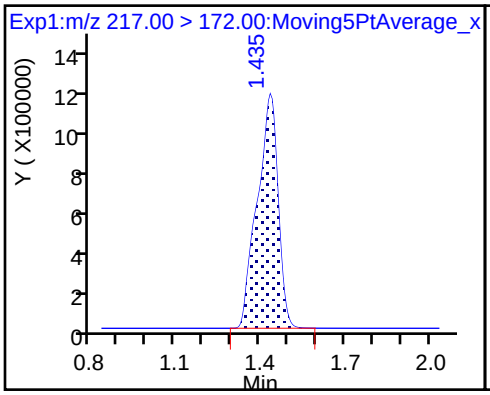
Client ID: TP-PFC-028-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 13

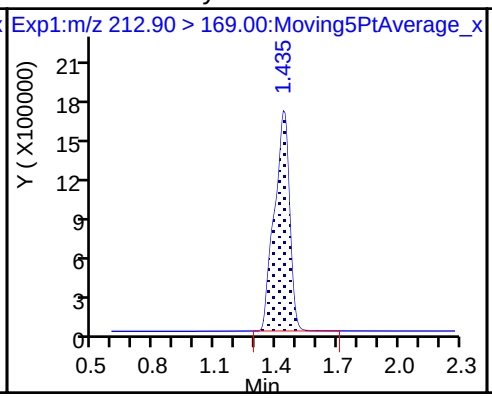
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

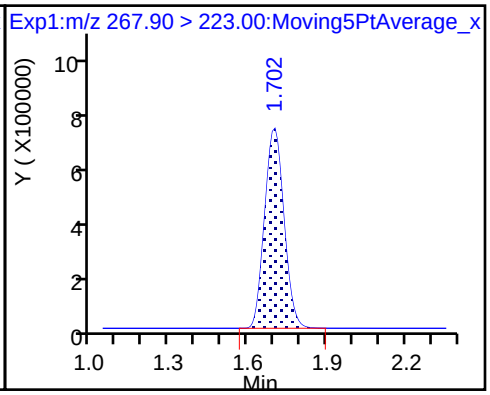
D 1 13C4 PFBA



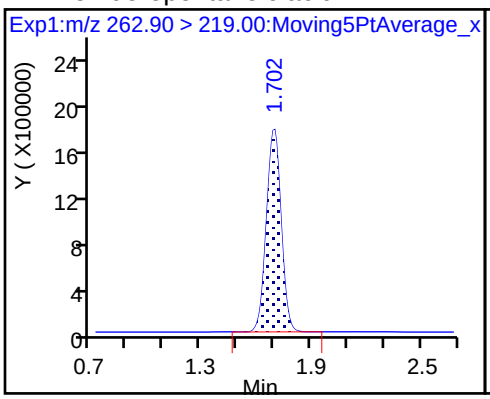
2 Perfluorobutyric acid



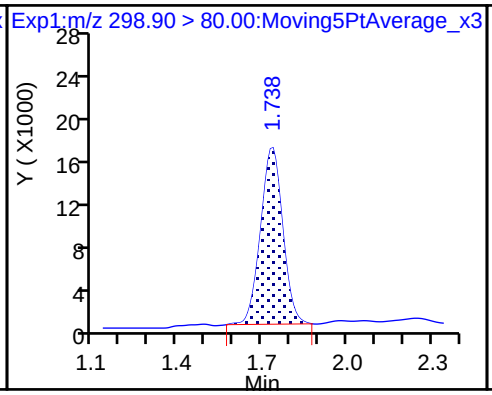
D 3 13C5-PFPeA



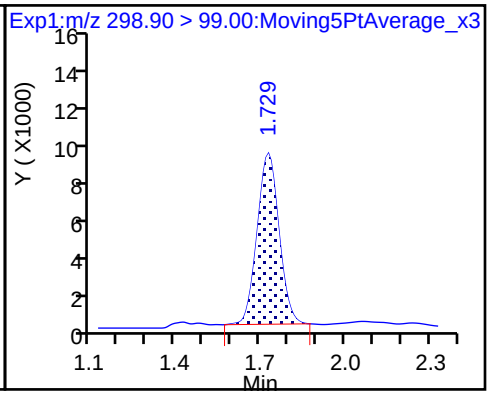
4 Perfluoropentanoic acid



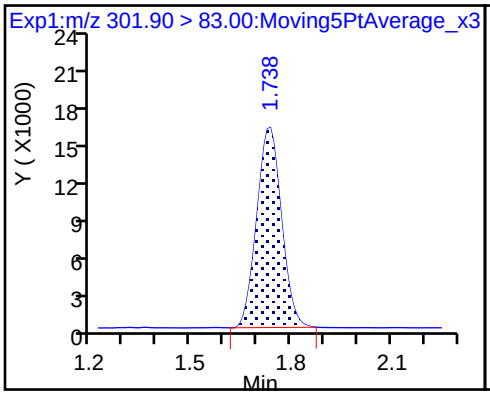
5 Perfluorobutanesulfonic acid



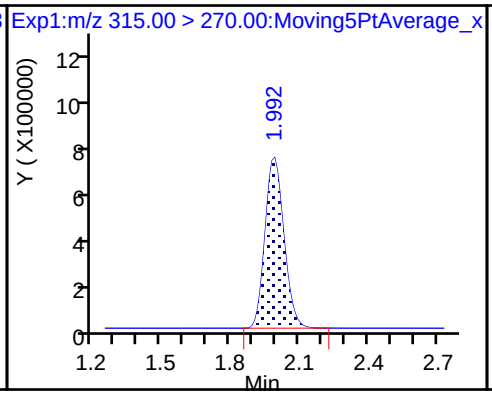
5 Perfluorobutanesulfonic acid



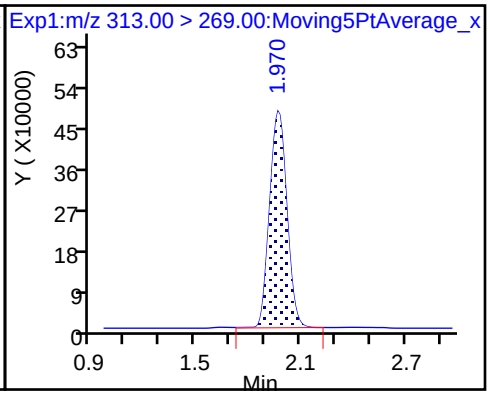
D 47 13C3-PFBS



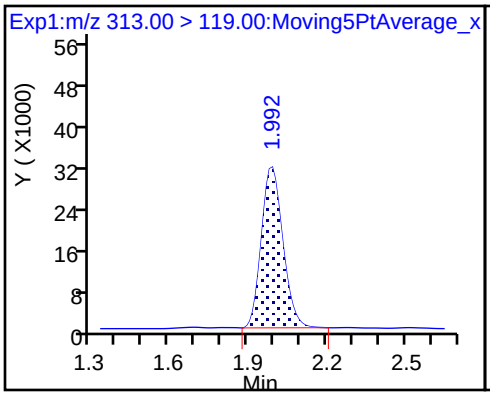
D 7 13C2 PFHxA



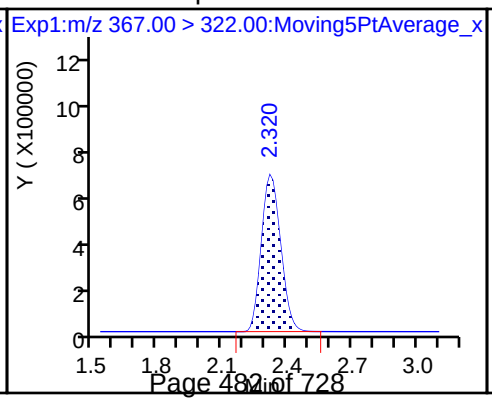
6 Perfluorohexanoic acid



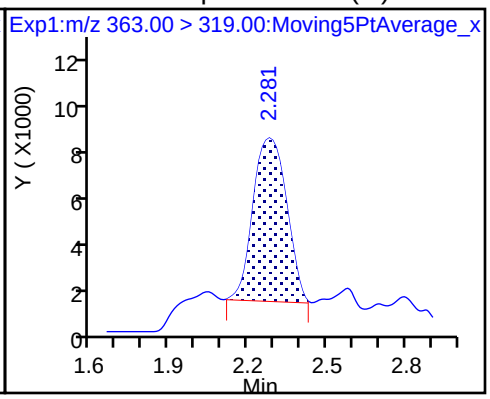
6 Perfluorohexanoic acid



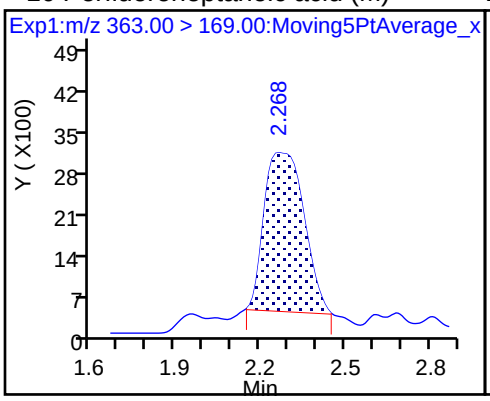
D 9 13C4-PFHpA



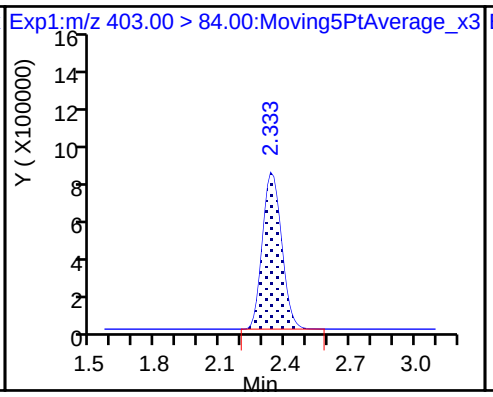
10 Perfluoroheptanoic acid (M)



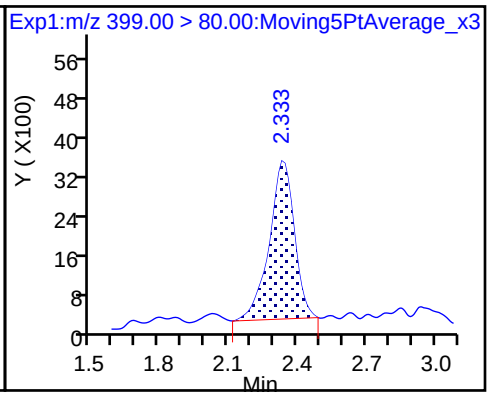
10 Perfluoroheptanoic acid (M)



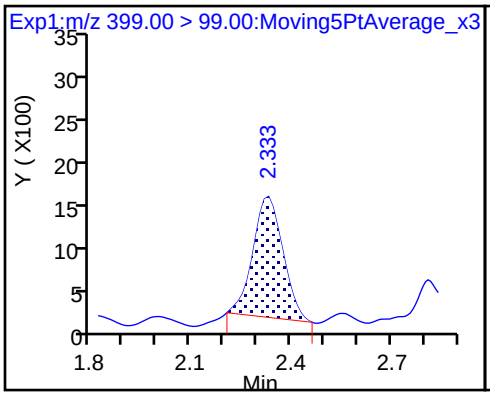
D 11 18O2 PFHxS



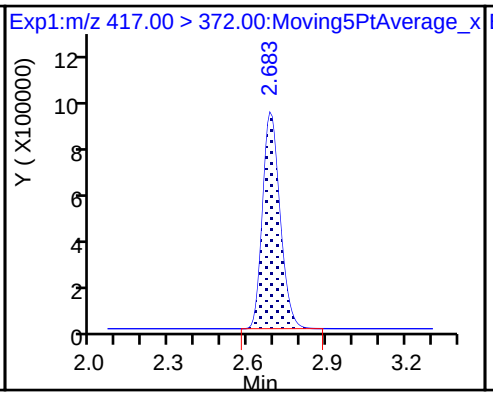
8 Perfluorohexanesulfonic acid



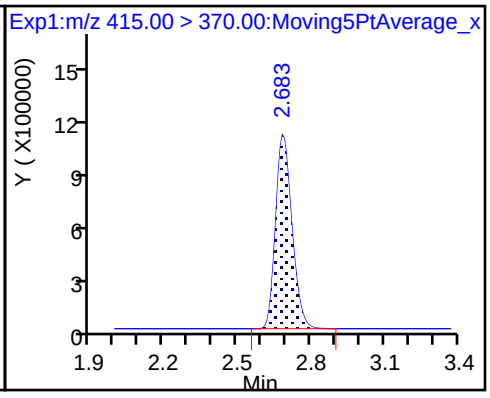
8 Perfluorohexanesulfonic acid



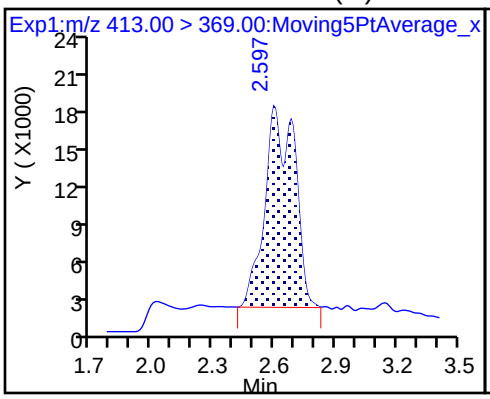
D 14 13C4 PFOA



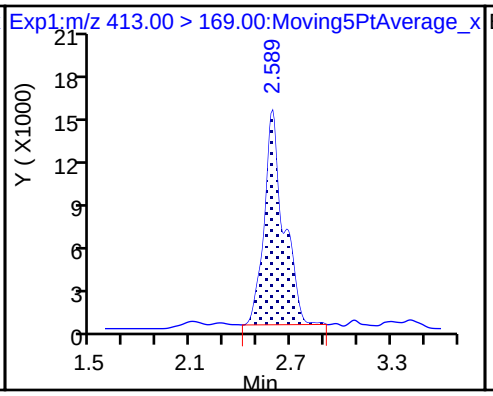
* 62 13C2-PFOA



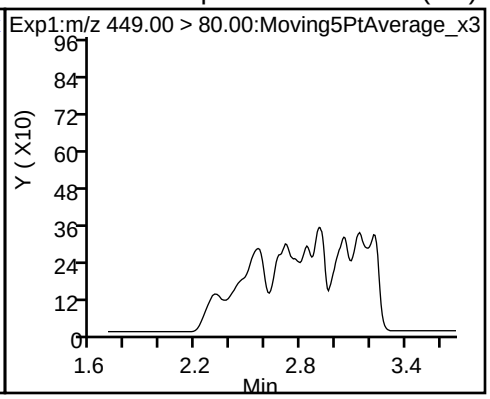
15 Perfluorooctanoic acid (M)



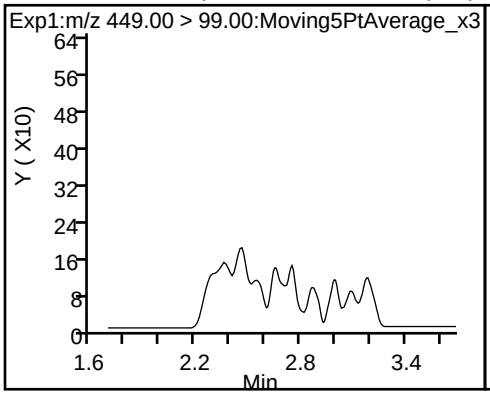
15 Perfluorooctanoic acid



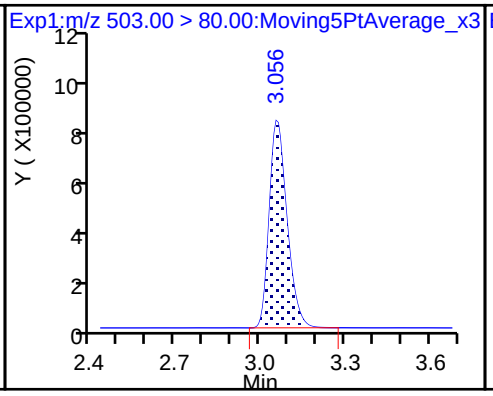
16 Perfluoroheptanesulfonic acid (ND)



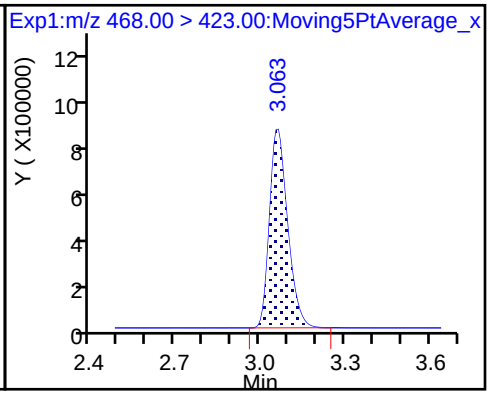
16 Perfluoroheptanesulfonic acid (ND)



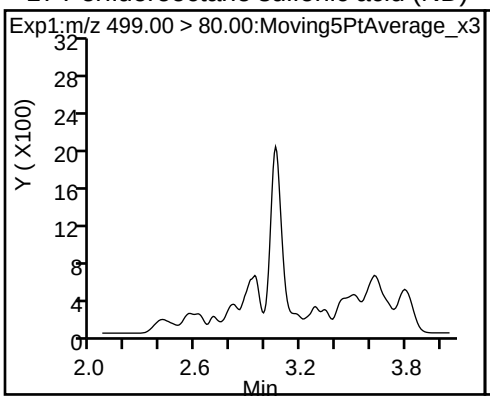
D 18 13C4 PFOS



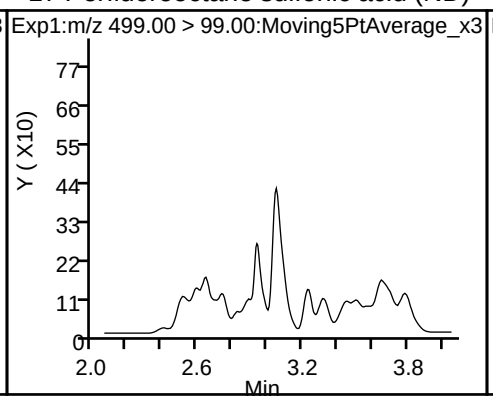
D 19 13C5 PFNA



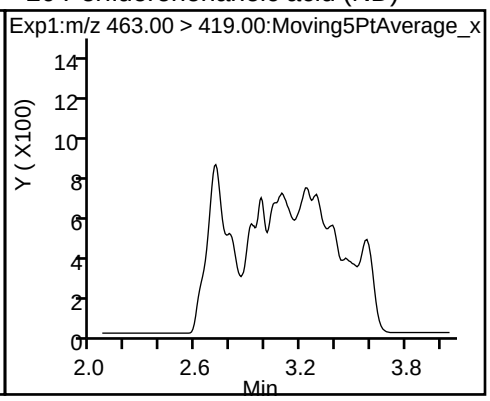
17 Perfluorooctane sulfonic acid (ND)



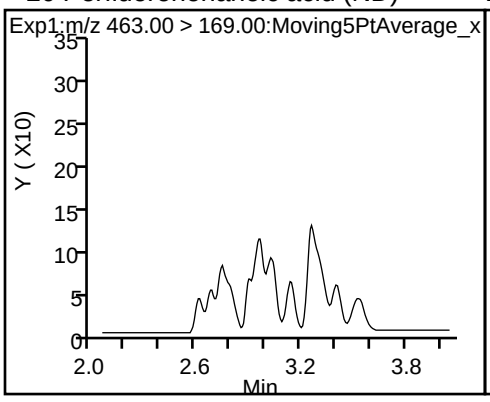
17 Perfluorooctane sulfonic acid (ND)



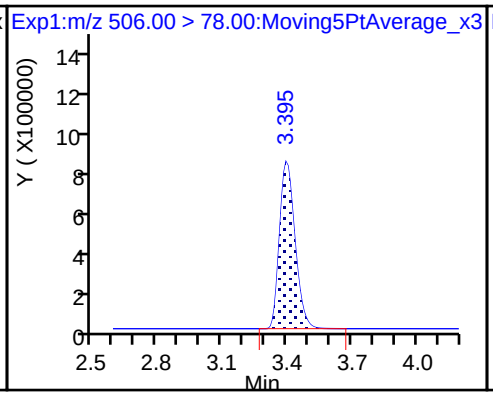
20 Perfluorononanoic acid (ND)



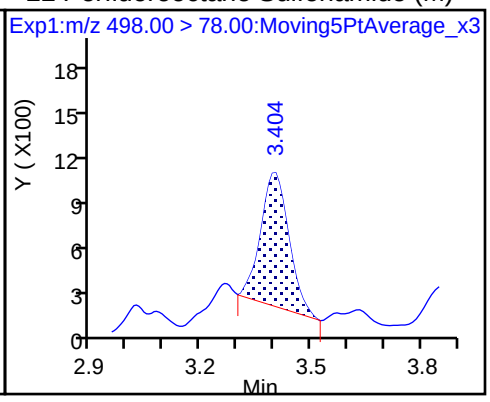
20 Perfluorononanoic acid (ND)



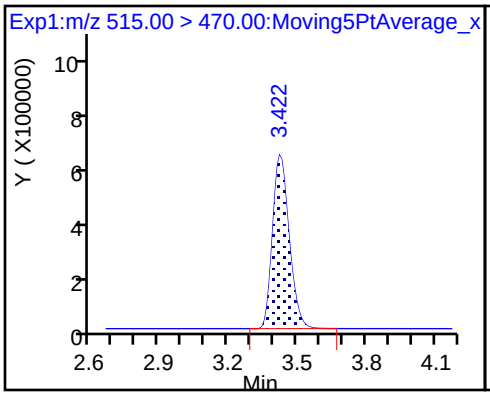
D 21 13C8 FOSA



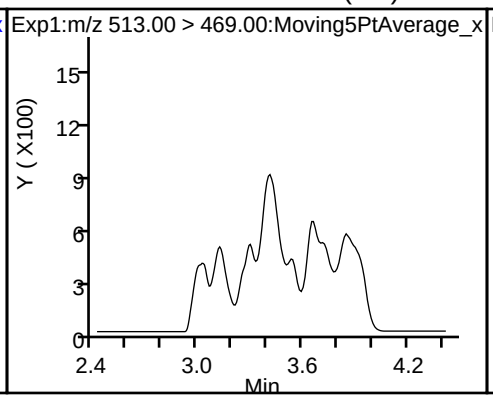
22 Perfluorooctane Sulfonamide (M)



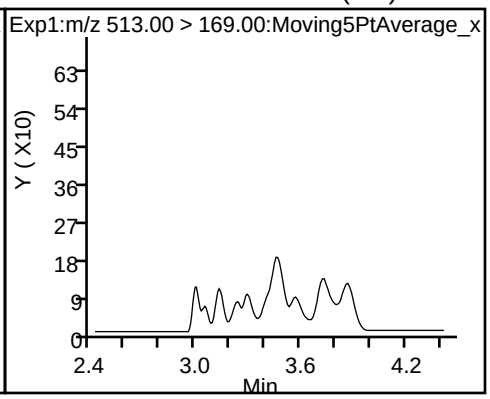
D 23 13C2 PFDA



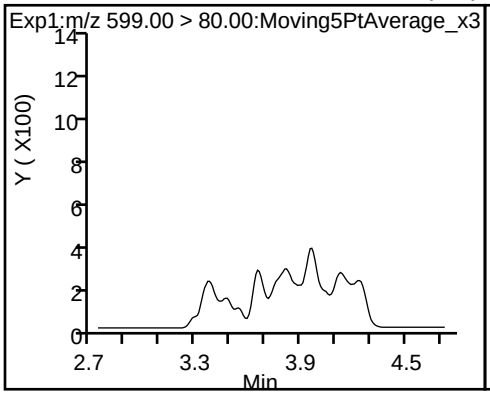
24 Perfluorodecanoic acid (ND)



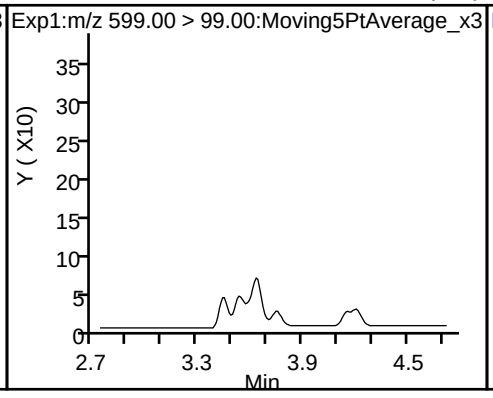
24 Perfluorodecanoic acid (ND)



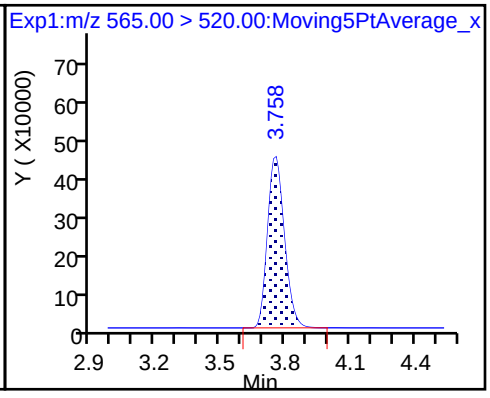
29 Perfluorodecane Sulfonic acid (ND)



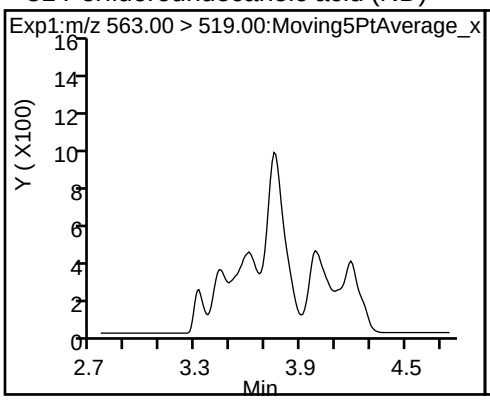
29 Perfluorodecane Sulfonic acid (ND)



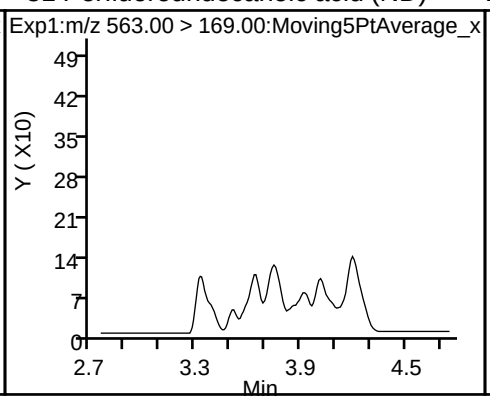
D 30 13C2 PFUnA



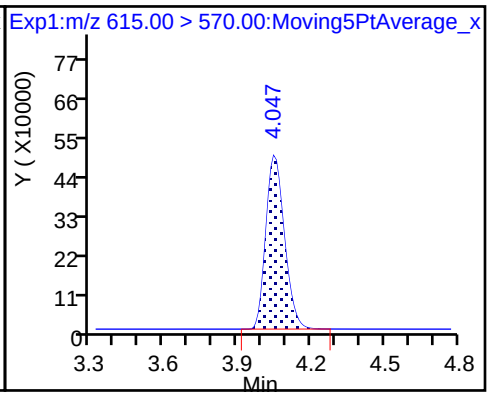
31 Perfluoroundecanoic acid (ND)



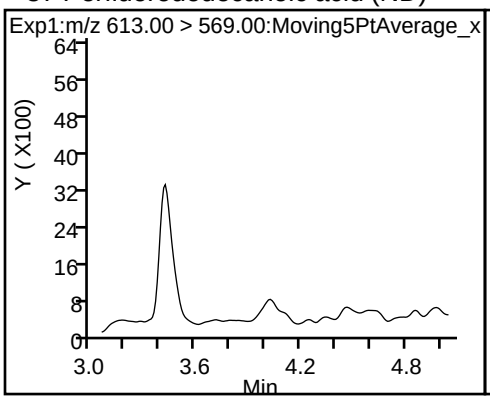
31 Perfluoroundecanoic acid (ND)



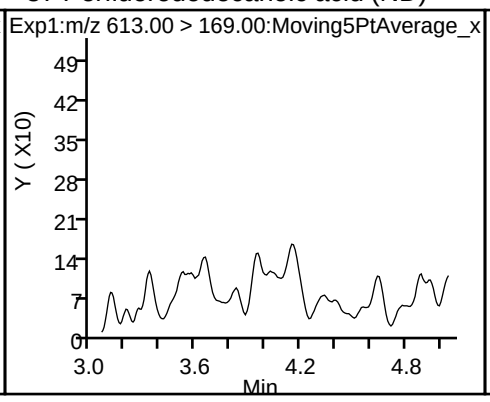
D 36 13C2 PFDoA



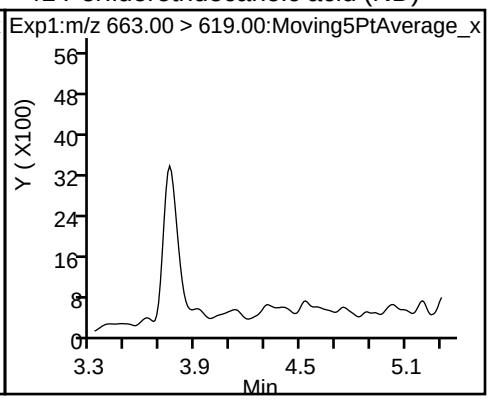
37 Perfluorododecanoic acid (ND)



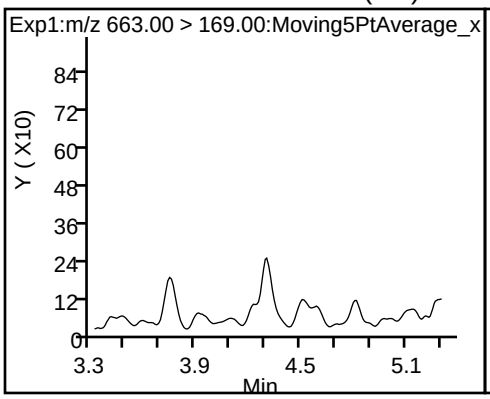
37 Perfluorododecanoic acid (ND)



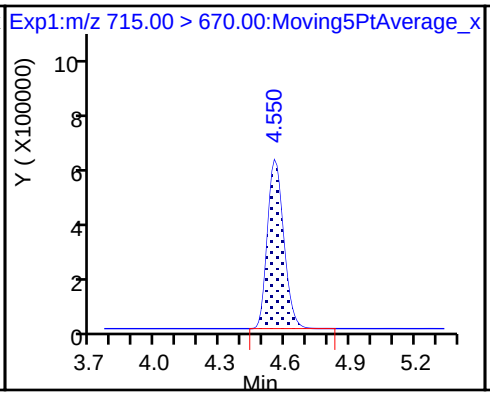
41 Perfluorotridecanoic acid (ND)



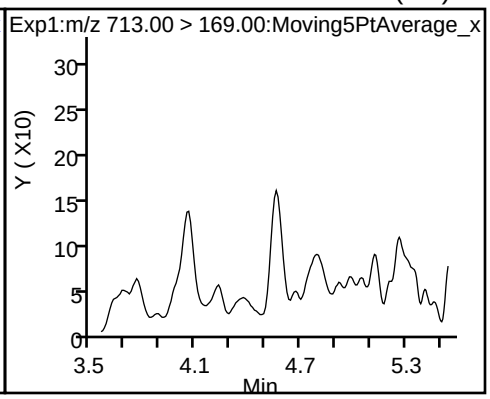
41 Perfluorotridecanoic acid (ND)



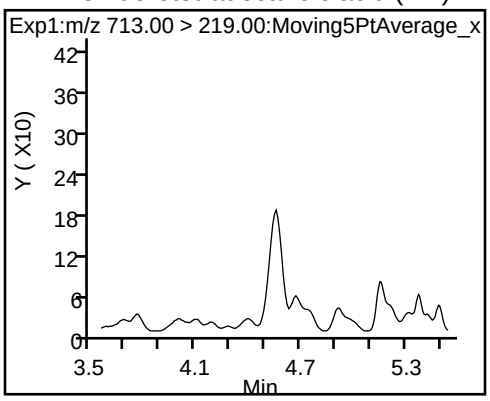
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

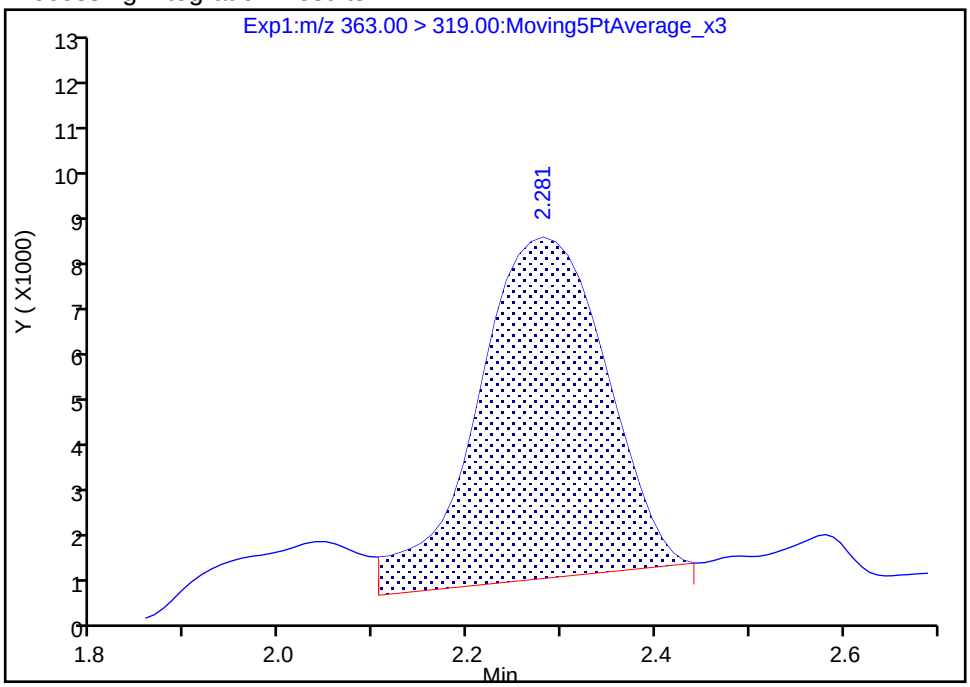
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_047.d				
Injection Date:	21-Apr-2018 13:29:16	Instrument ID:	A8_N		
Lims ID:	320-37938-A-3-A	Lab Sample ID:	320-37938-3		
Client ID:	TP-PFC-028-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	36	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

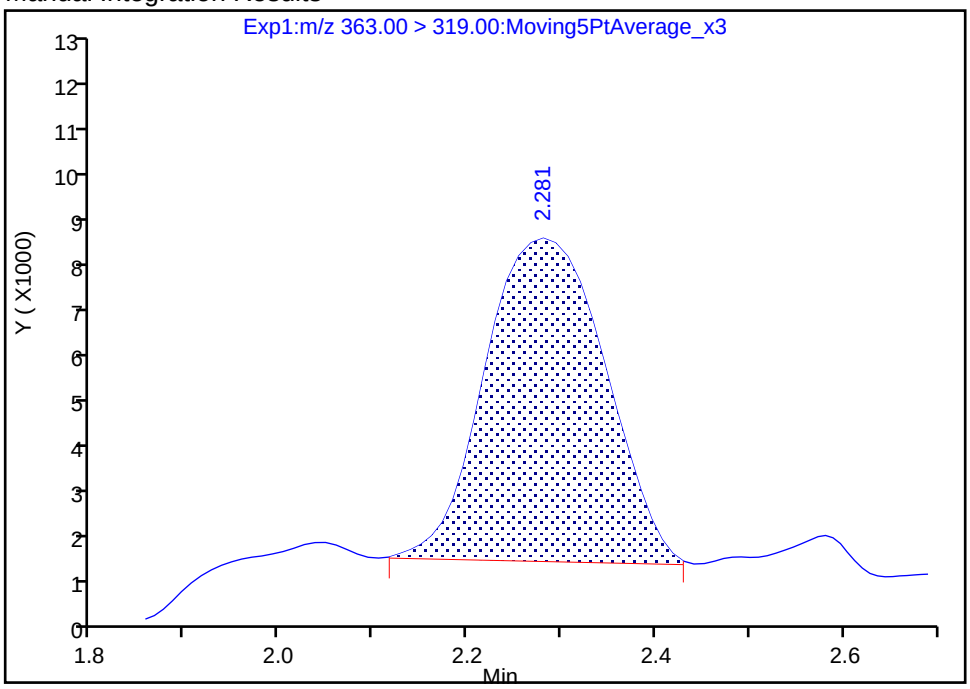
Processing Integration Results

RT: 2.28
Area: 71601
Amount: 0.043904
Amount Units: ng/ml



Manual Integration Results

RT: 2.28
Area: 63283
Amount: 0.038804
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:22:15

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

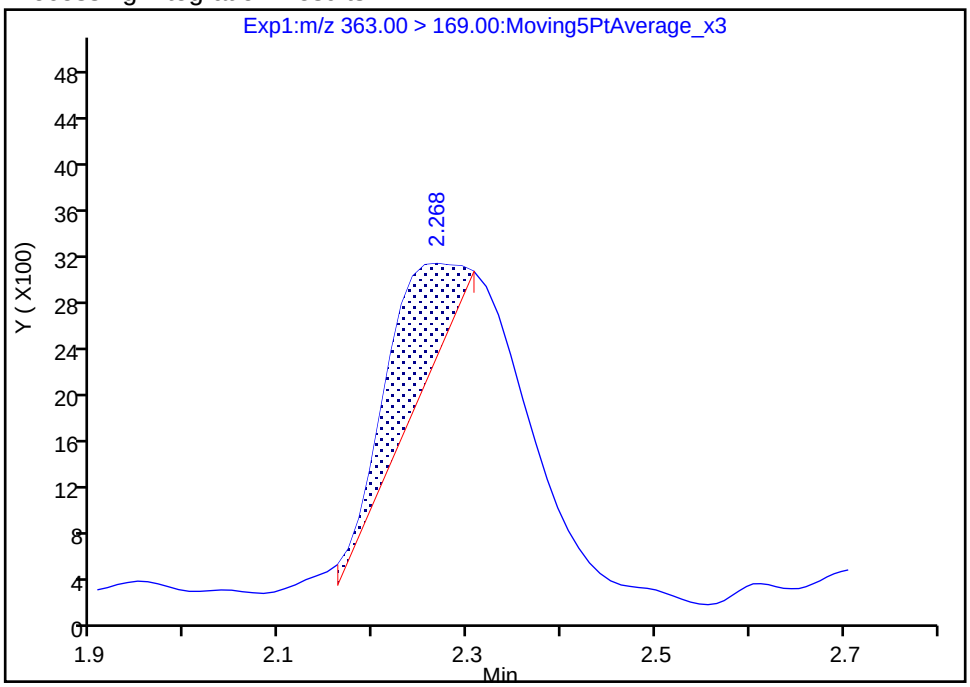
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_047.d				
Injection Date:	21-Apr-2018 13:29:16	Instrument ID:	A8_N		
Lims ID:	320-37938-A-3-A	Lab Sample ID:	320-37938-3		
Client ID:	TP-PFC-028-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	36	Worklist Smp#:	13
Injection 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: 2

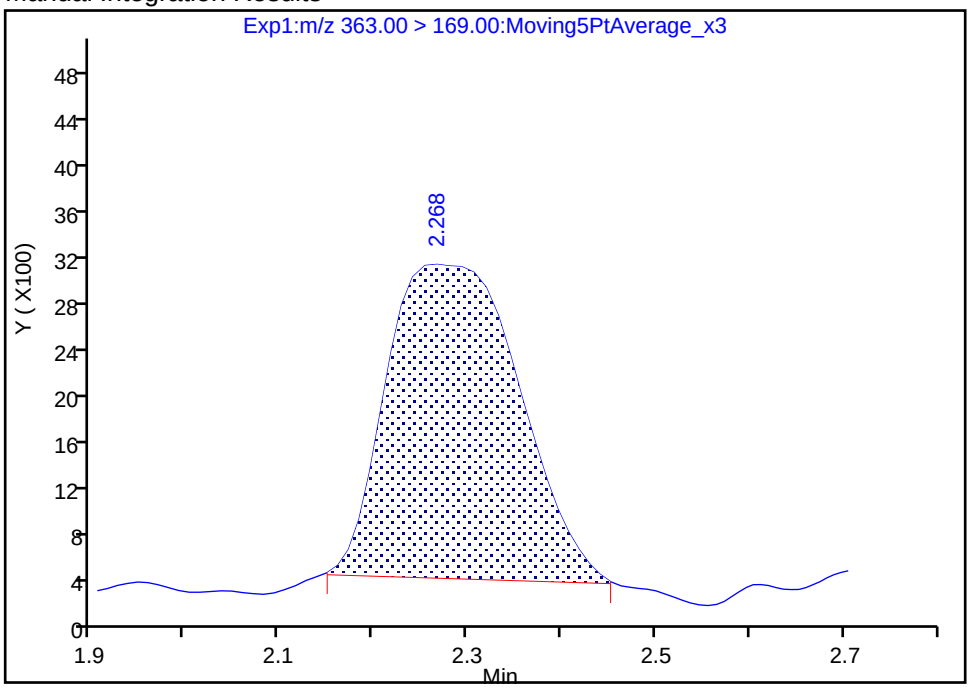
Processing Integration Results

RT: 2.27
Area: 5330
Amount: 0.043904
Amount Units: ng/ml



Manual Integration Results

RT: 2.27
Area: 26683
Amount: 0.038804
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:22:19
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

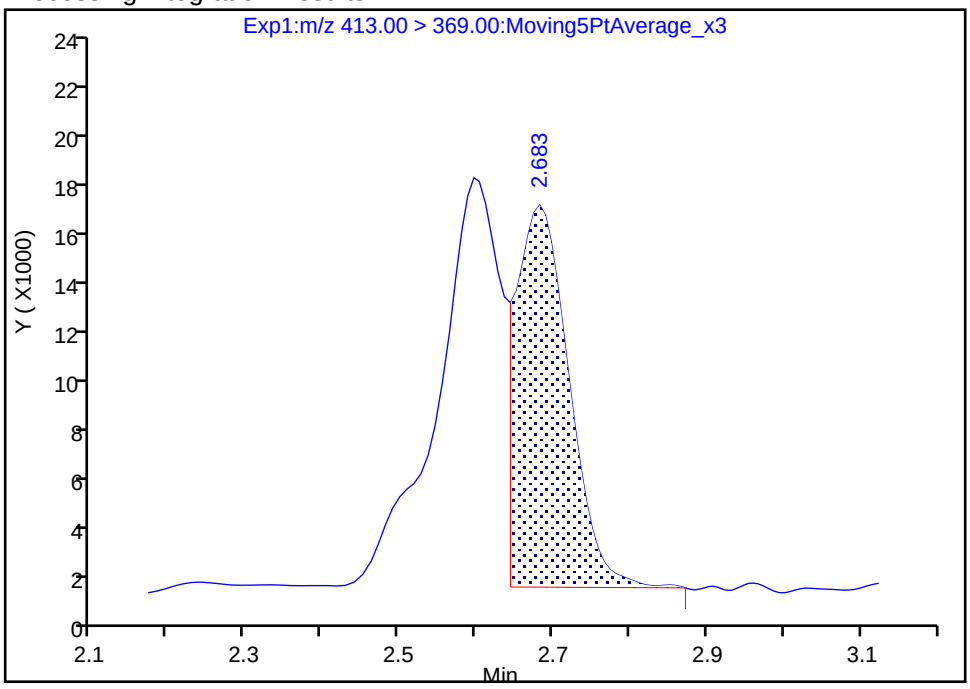
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_047.d				
Injection Date:	21-Apr-2018 13:29:16	Instrument ID:	A8_N		
Lims ID:	320-37938-A-3-A	Lab Sample ID:	320-37938-3		
Client ID:	TP-PFC-028-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	36	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

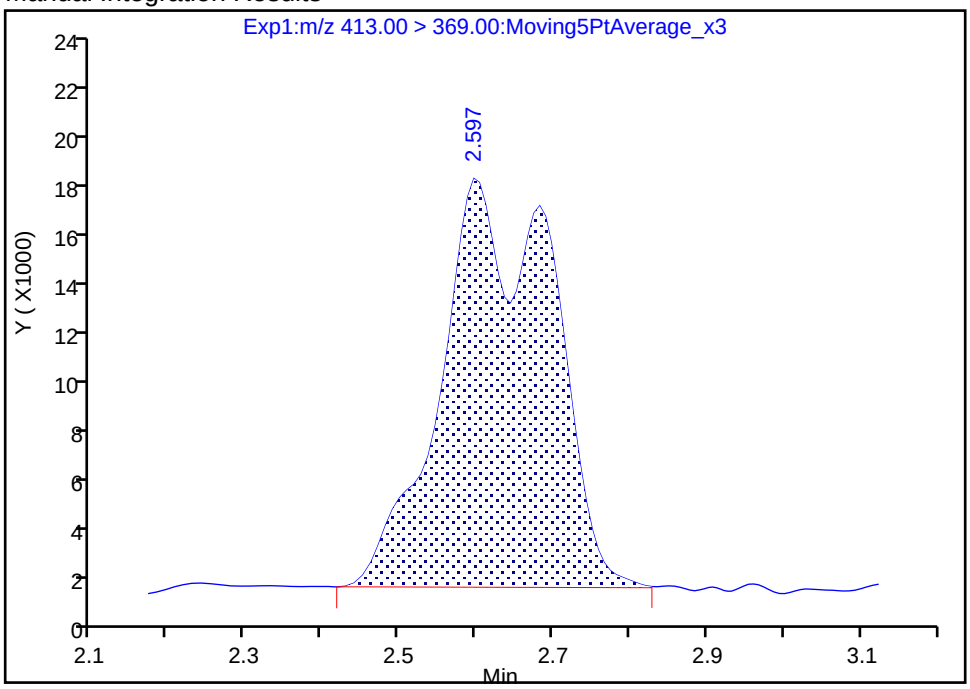
Processing Integration Results

RT: 2.68
Area: 70035
Amount: 0.036372
Amount Units: ng/ml



Manual Integration Results

RT: 2.60
Area: 160987
Amount: 0.083607
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:22:37

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

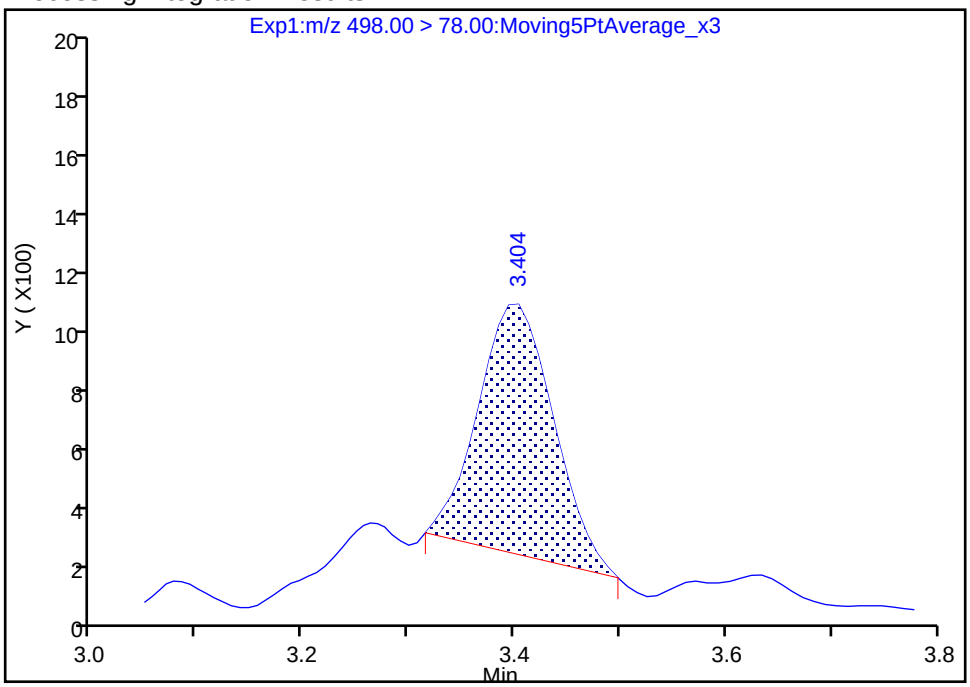
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_047.d				
Injection Date:	21-Apr-2018 13:29:16	Instrument ID:	A8_N		
Lims ID:	320-37938-A-3-A	Lab Sample ID:	320-37938-3		
Client ID:	TP-PFC-028-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	36	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

22 Perfluorooctane Sulfonamide, CAS: 754-91-6

Signal: 1

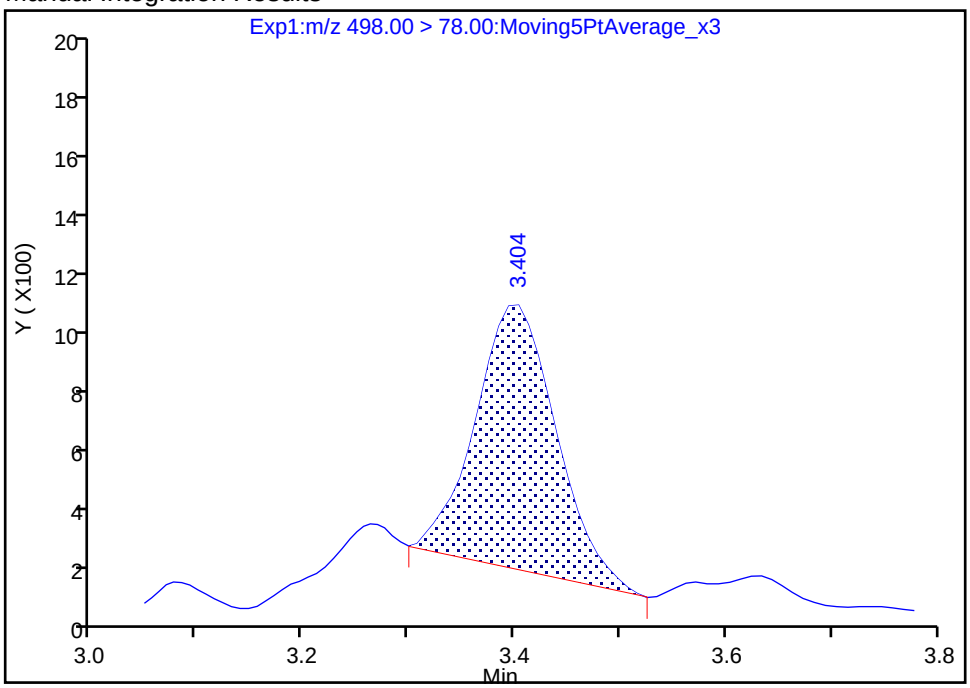
Processing Integration Results

RT: 3.40
Area: 4073
Amount: 0.002485
Amount Units: ng/ml



Manual Integration Results

RT: 3.40
Area: 4624
Amount: 0.002822
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:23:03

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPE-D | Lab Sample ID: 320-37938-4

Matrix: Water | Lab File ID: 2018.04.20LLCX_049.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 00:00

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 296.2(mL) | Date Analyzed: 04/21/2018 13:44

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.7	1.3	0.50
2706-90-3	Perfluoropentanoic acid (PFPeA)	180		1.7	0.84	0.36
307-24-4	Perfluorohexanoic acid (PFHxA)	64		1.7	0.84	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	J	1.7	1.3	0.51
335-67-1	Perfluorooctanoic acid (PFOA)	2.8	M	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
335-76-2	Perfluorodecanoic acid (PFDA)	0.84	U	1.7	0.84	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.61
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.44
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	2.5	0.64
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.4	2.5	0.70
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.1	J	1.7	0.84	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.47	J	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	3.4	2.5	0.93
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.47
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.4	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPE-D | Lab Sample ID: 320-37938-4

Matrix: Water | Lab File ID: 2018.04.20LLCX_049.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 00:00

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 296.2(mL) | Date Analyzed: 04/21/2018 13:44

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	80		50-150
STL00992	13C4 PFBA	88		50-150
STL01893	13C5 PFPeA	86		50-150
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	90		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	90		50-150
STL00996	13C2 PFDA	89		50-150
STL00997	13C2 PFUnA	84		50-150
STL00998	13C2 PFDoA	81		50-150
STL00994	18O2 PFHxS	88		50-150
STL02116	13C2-PFTeDA	75		50-150
STL00991	13C4 PFOS	88		50-150
STL02337	13C3-PFBS	89		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_049.d
Lims ID: 320-37938-A-4-A
Client ID: TP-PFC-028-TPE-D
Sample Type: Client
Inject. Date: 21-Apr-2018 13:44:53 ALS Bottle#: 37 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-37938-a-4-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:27:18 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:24:29

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	1.441	1.436	0.005	1.000	8455845	3.88			4378	
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.441	0.0	1.000	5872038	2.19		87.7	40879	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.703	-0.001	1.000	9575810	5.39			13562	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.703	-0.001	0.557	3729312	2.16		86.4	60408	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.738	1.739	-0.001	1.000	89412	0.0326			333	
298.90 > 99.00	1.729	1.739	-0.010	0.995	45749		1.95(1.25-3.74)		328	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.739	-0.001	1.000	81557	2.06		88.6	788	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.970	1.982	-0.012	0.989	3274345	1.91			3906	R
313.00 > 119.00	1.992	1.982	0.010	1.000	173345		18.89(5.03-15.10)		1891	
D 7 13C2 PFHxA										
315.00 > 270.00	1.992	1.990	0.002	1.000	4218500	2.21		88.4	93106	
D 9 13C4-PFHpA										
367.00 > 322.00	2.320	2.318	0.002	1.000	4171890	2.25		89.8	67769	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.281	2.320	-0.040	0.983	64124	0.0384			53.6	
363.00 > 169.00	2.267	2.320	-0.053	0.977	23298		2.75(1.13-3.40)		87.5	
D 11 18O2 PFHxS										
403.00 > 84.00	2.333	2.331	0.002	1.000	4793967	2.09		88.4	97945	
8 Perfluorohexanesulfonic acid										R
399.00 > 80.00	2.333	2.333	0.0	1.000	31978	0.0139			94.8	R
399.00 > 99.00	2.333	2.333	0.0	1.000	6075		5.26(1.50-4.49)		38.6	

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	2.676	0.007		4975840	2.50			78961	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.597	2.676	-0.079	0.968	160389	0.0837			54.4	M
413.00 > 169.00	2.589	2.676	-0.087	0.965	122486		1.31(0.84-2.52)		219	
D 14 13C4 PFOA										
417.00 > 372.00	2.683	2.681	0.002	1.000	4145914	2.25		89.8	64966	
D 19 13C5 PFNA										
468.00 > 423.00	3.057	3.054	0.003	1.000	3588193	2.26		90.4	63561	
D 18 13C4 PFOS										
503.00 > 80.00	3.057	3.054	0.003	1.000	3372379	2.10		87.9	22926	
D 21 13C8 FOSA										
506.00 > 78.00	3.395	3.391	0.004	1.000	4023547	2.01		80.3	40638	
D 23 13C2 PFDA										
515.00 > 470.00	3.423	3.419	0.004	1.000	2975557	2.23		89.2	66436	
D 30 13C2 PFUnA										
565.00 > 520.00	3.747	3.753	-0.006	1.000	2419372	2.10		84.1	56483	
D 36 13C2 PFDoA										
615.00 > 570.00	4.047	4.042	0.005	1.000	2516727	2.03		81.0	26850	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.550	4.547	0.003	1.000	2966455	1.88		75.3	24923	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 24-Apr-2018 17:27:21 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_049.d

Injection Date: 21-Apr-2018 13:44:53 Instrument ID: A8_N

Lims ID: 320-37938-A-4-A Lab Sample ID: 320-37938-4

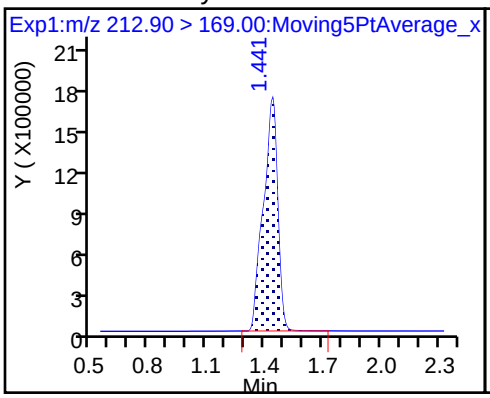
Client ID: TP-PFC-028-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 37 Worklist Smp#: 15

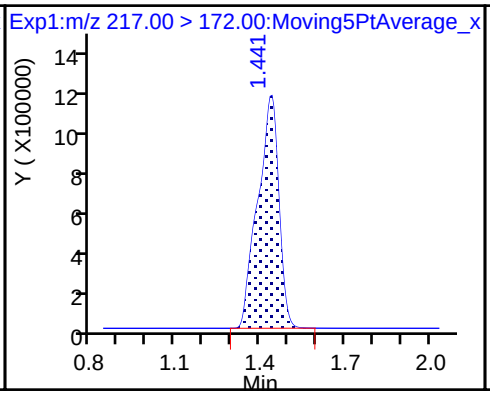
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

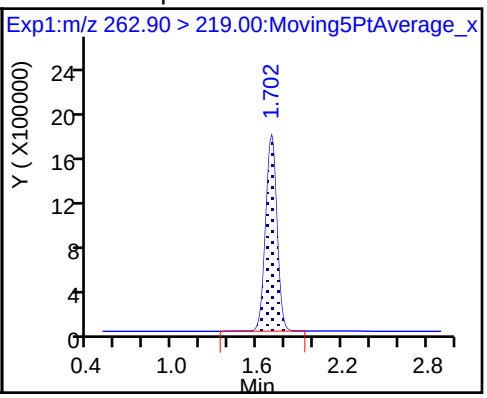
2 Perfluorobutyric acid



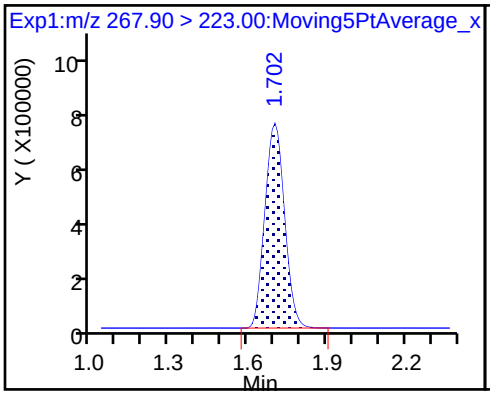
D 1 13C4 PFBA



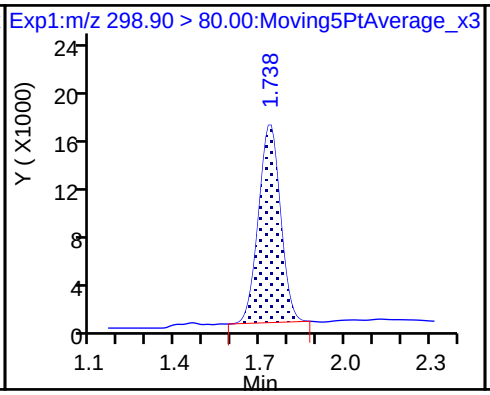
4 Perfluoropentanoic acid



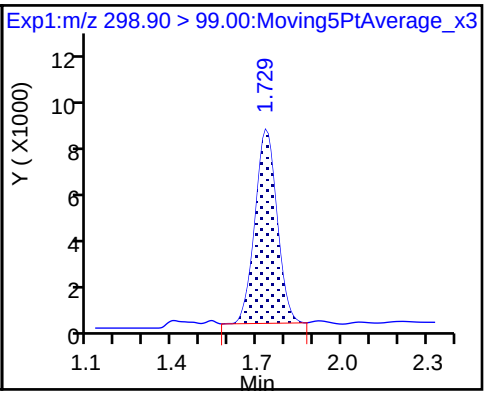
D 3 13C5-PFPeA



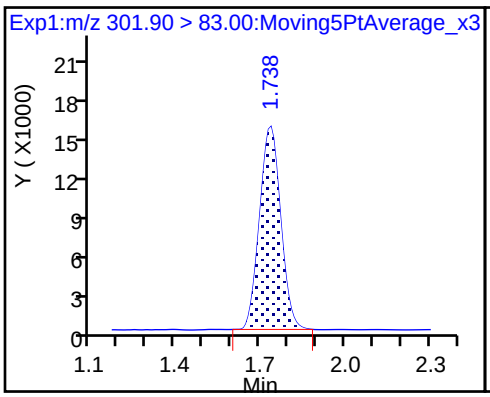
5 Perfluorobutanesulfonic acid



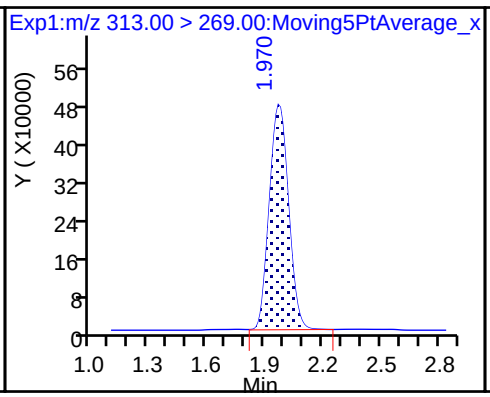
5 Perfluorobutanesulfonic acid



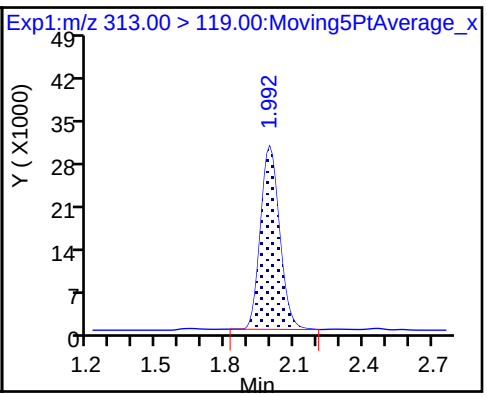
D 47 13C3-PFBS



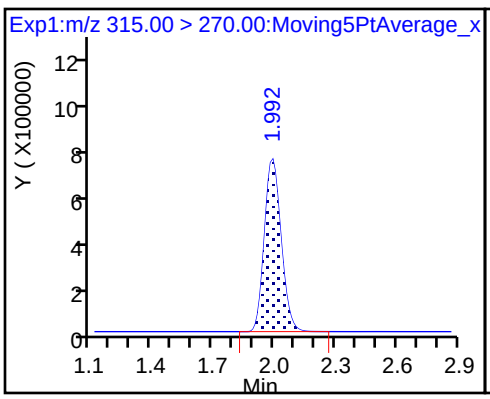
6 Perfluorohexanoic acid



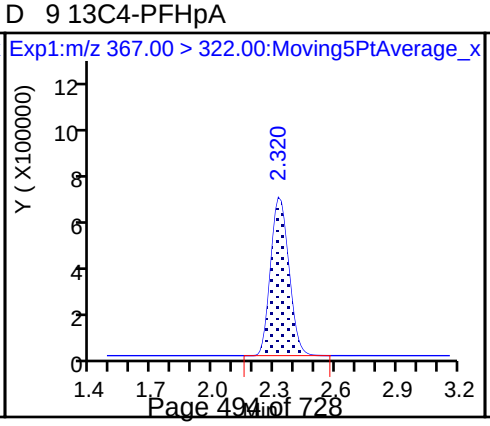
6 Perfluorohexanoic acid



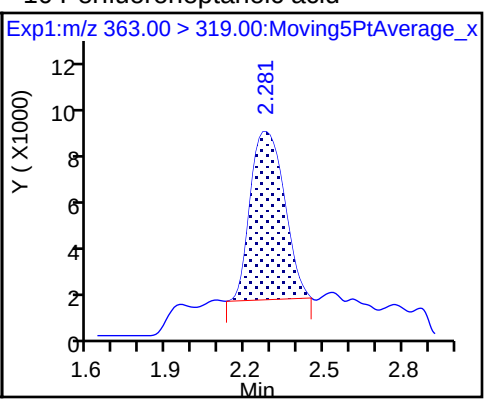
D 7 13C2 PFHxA



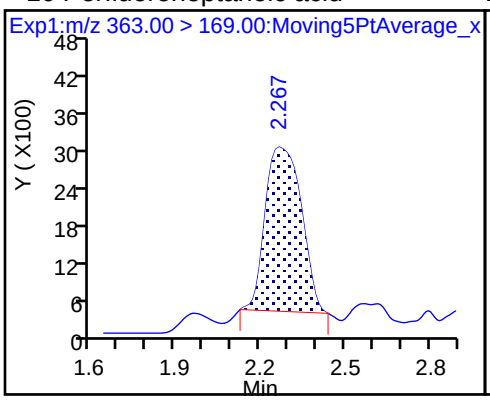
D 9 13C4-PFHpA



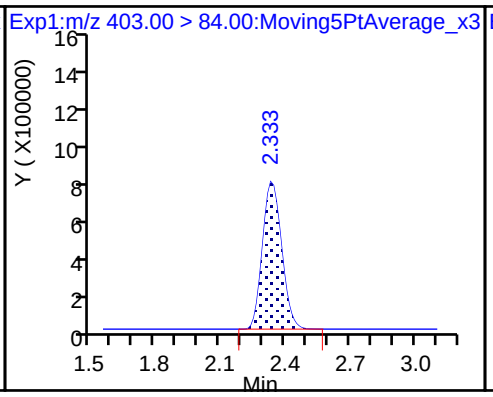
10 Perfluoroheptanoic acid



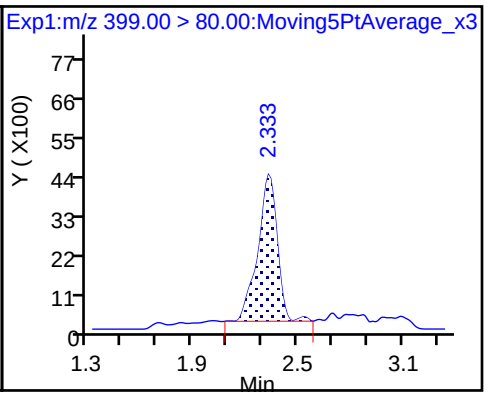
10 Perfluoroheptanoic acid



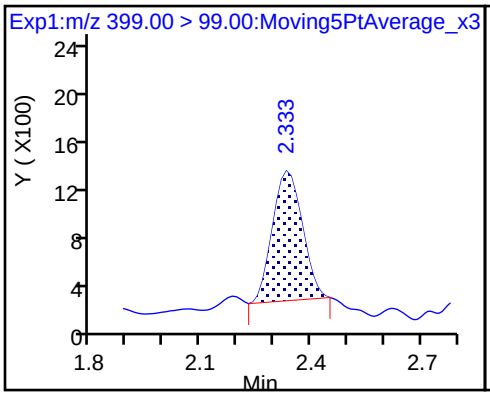
D 11 18O2 PFHxS



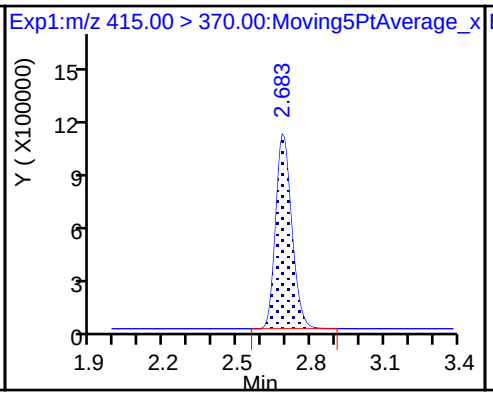
8 Perfluorohexanesulfonic acid



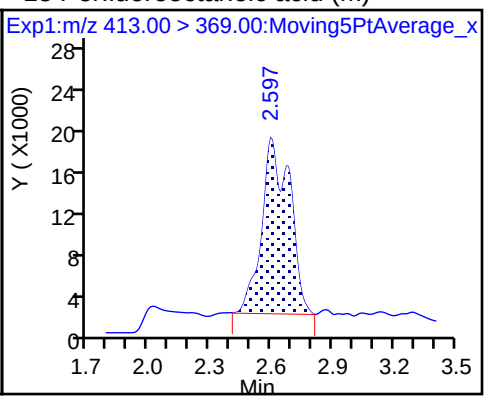
8 Perfluorohexanesulfonic acid



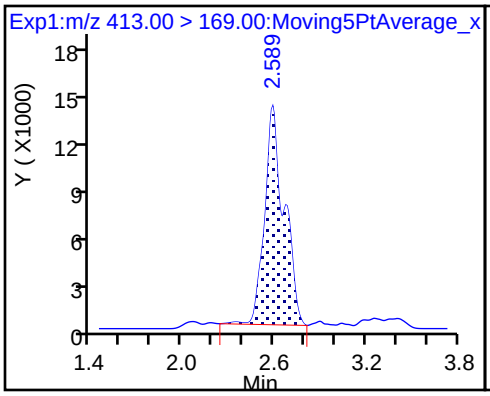
* 62 13C2-PFOA



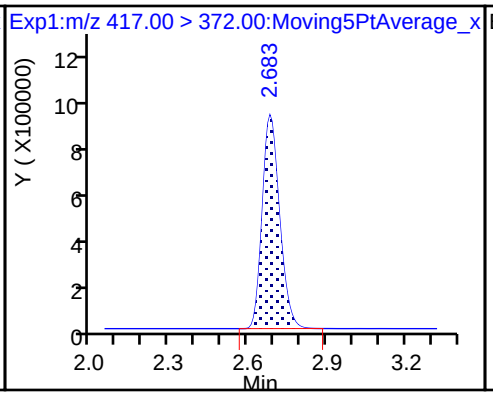
15 Perfluorooctanoic acid (M)



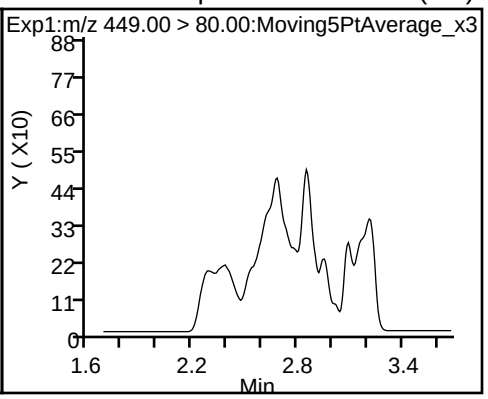
15 Perfluorooctanoic acid



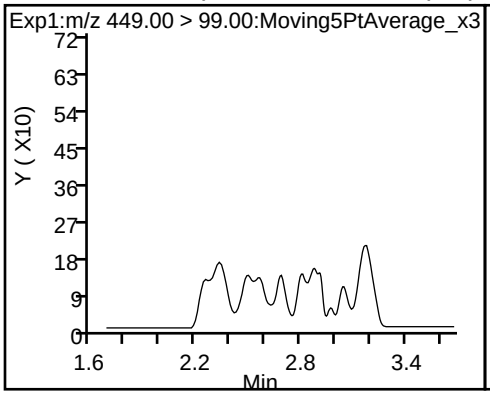
D 14 13C4 PFOA



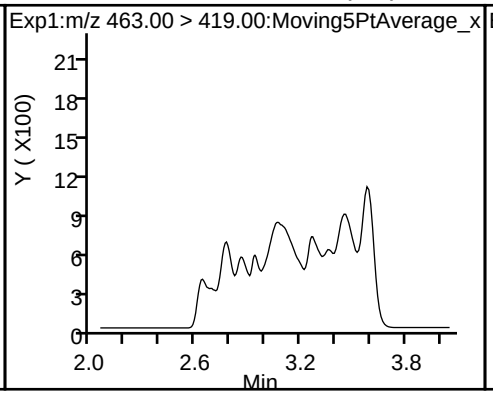
16 Perfluoroheptanesulfonic acid (ND)



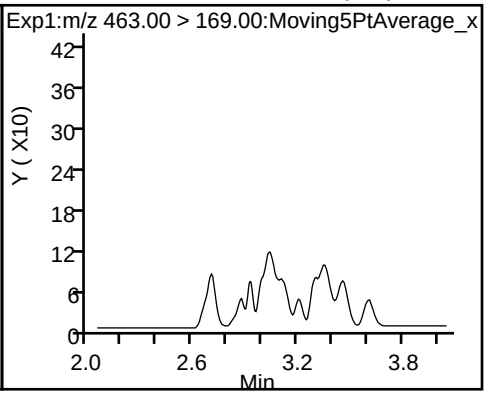
16 Perfluoroheptanesulfonic acid (ND)



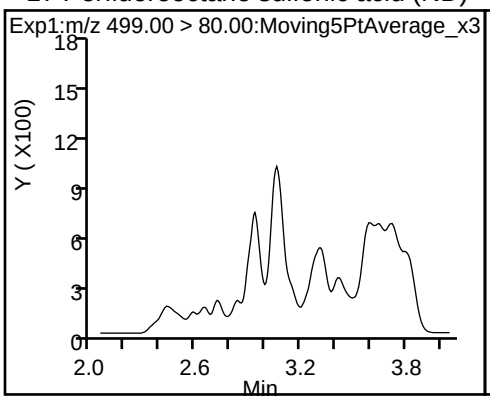
20 Perfluorononanoic acid (ND)



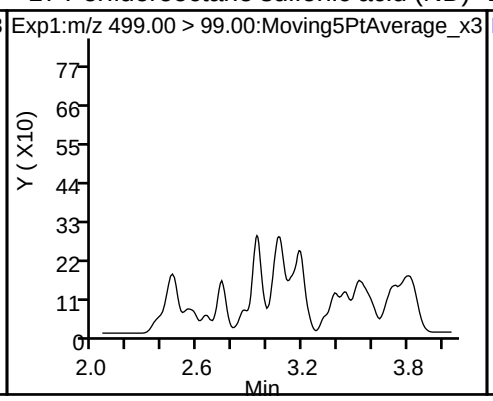
20 Perfluorononanoic acid (ND)



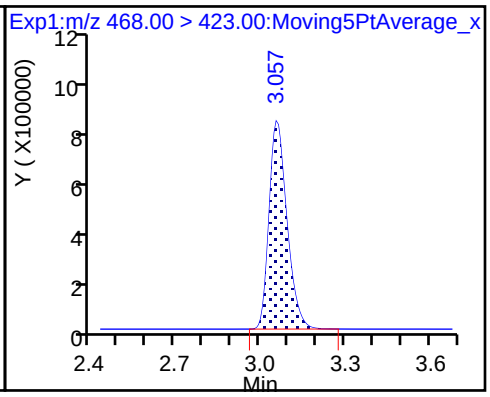
17 Perfluorooctane sulfonic acid (ND)



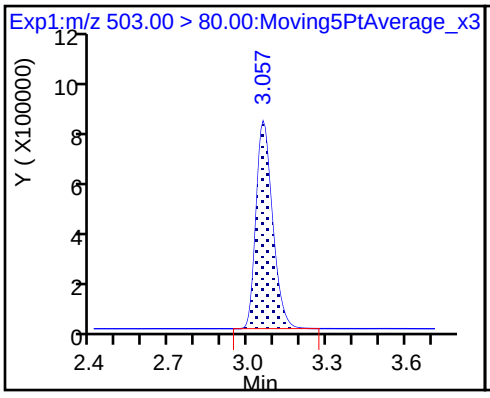
17 Perfluorooctane sulfonic acid (ND)



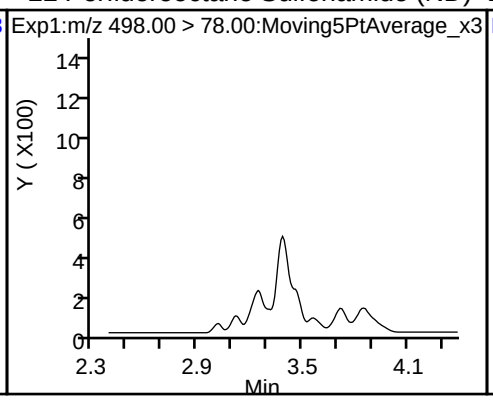
D 19 13C5 PFNA



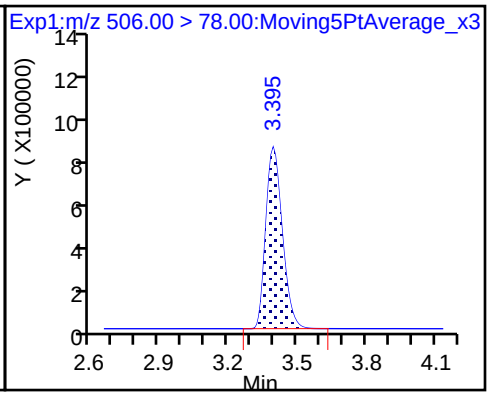
D 18 13C4 PFOS



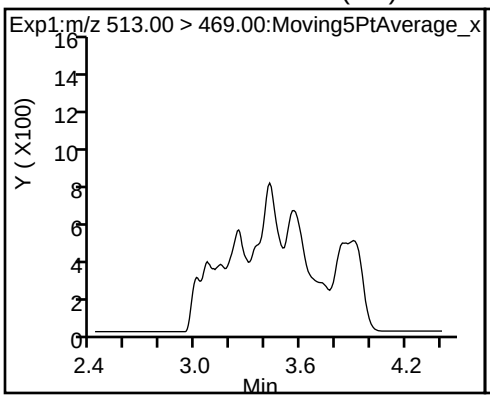
22 Perfluorooctane Sulfonamide (ND)



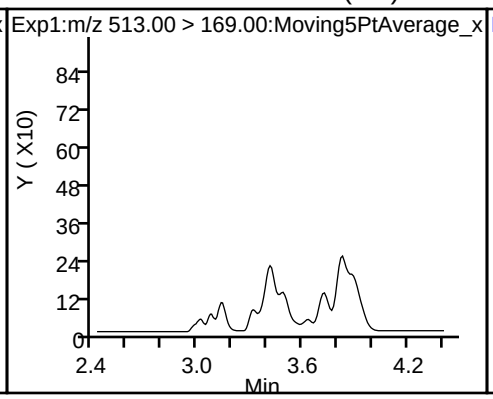
D 21 13C8 FOSA



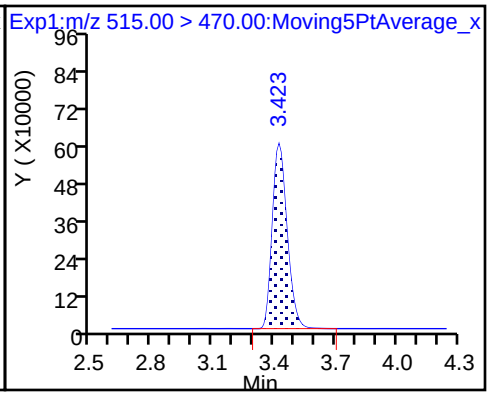
24 Perfluorodecanoic acid (ND)



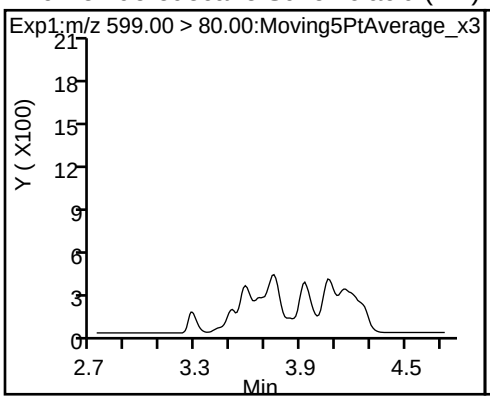
24 Perfluorodecanoic acid (ND)



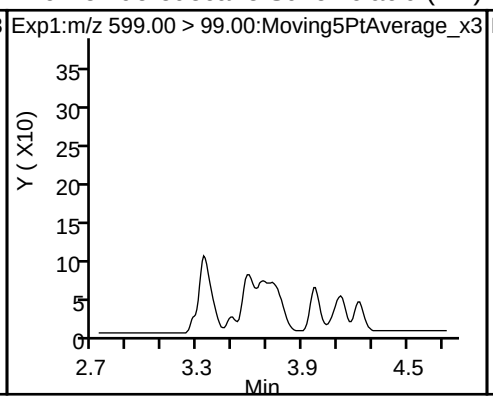
D 23 13C2 PFDA



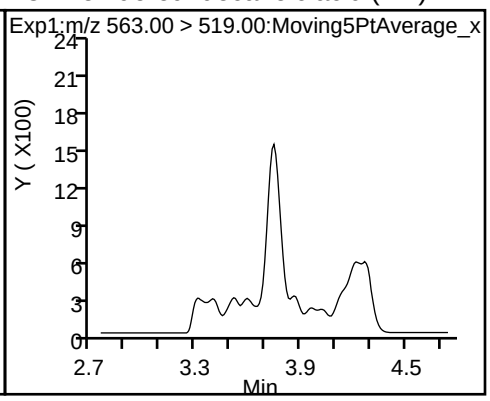
29 Perfluorodecane Sulfonic acid (ND)



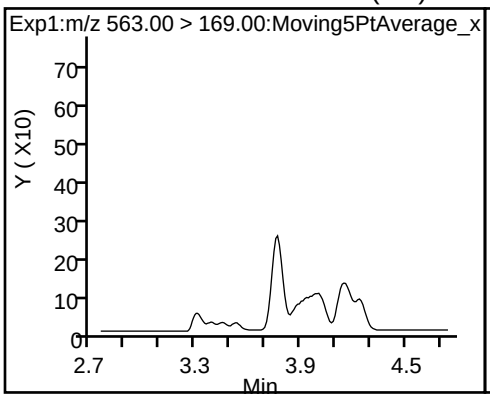
29 Perfluorodecane Sulfonic acid (ND)



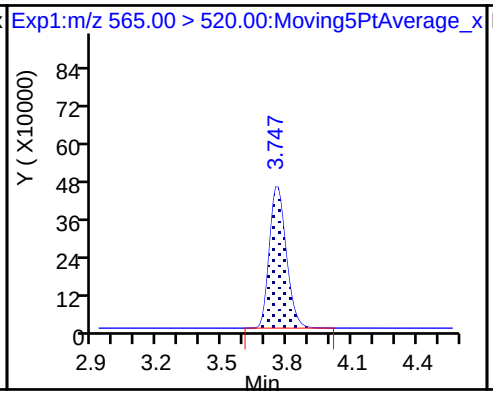
31 Perfluoroundecanoic acid (ND)



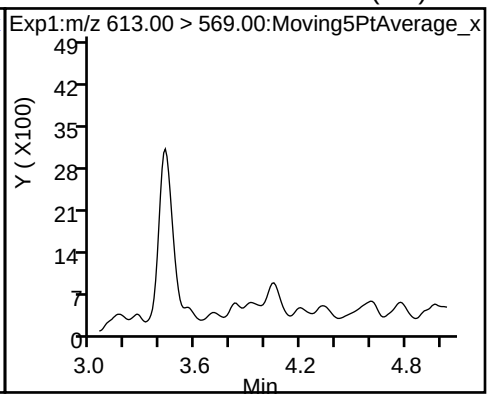
31 Perfluoroundecanoic acid (ND)



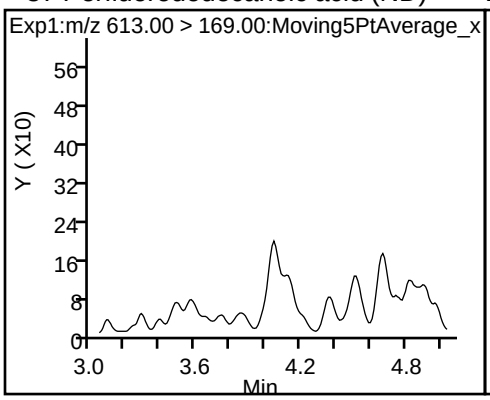
D 30 13C2 PFUnA



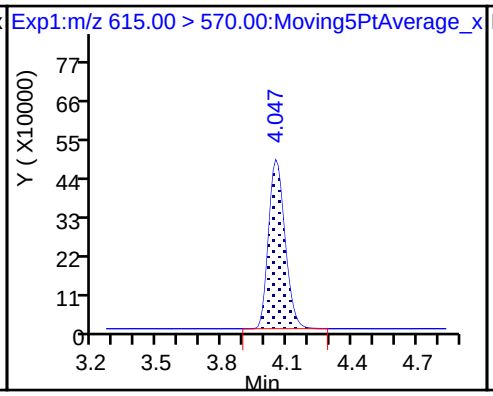
37 Perfluorododecanoic acid (ND)



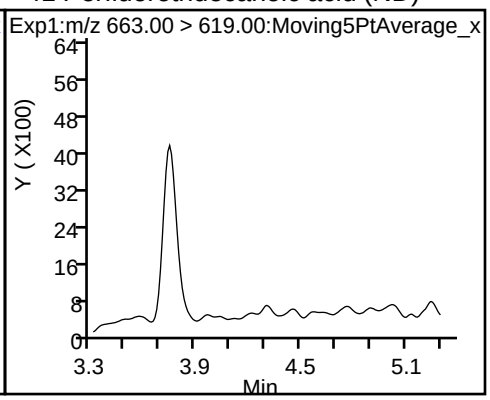
37 Perfluorododecanoic acid (ND)



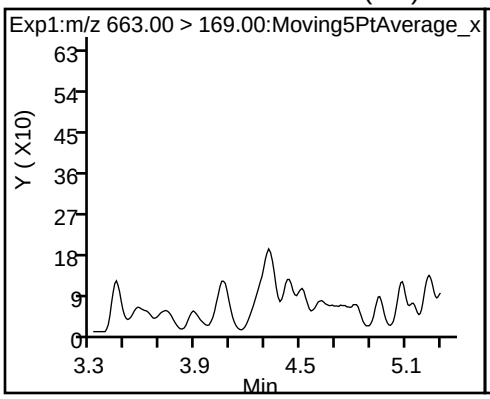
D 36 13C2 PFDoA



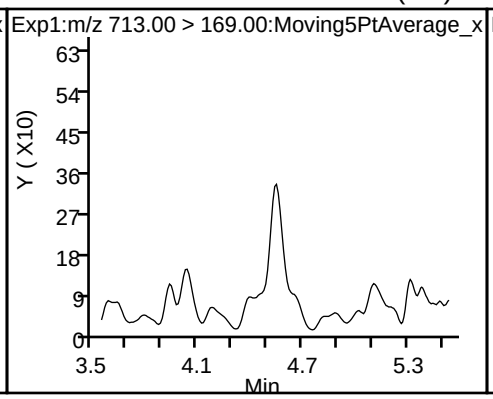
41 Perfluorotridecanoic acid (ND)



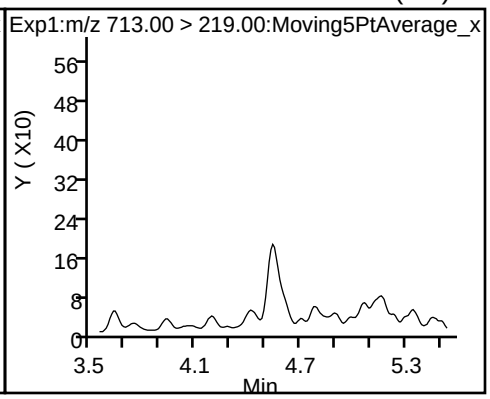
41 Perfluorotridecanoic acid (ND)



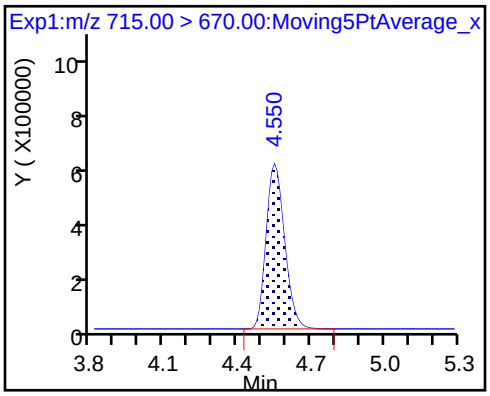
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

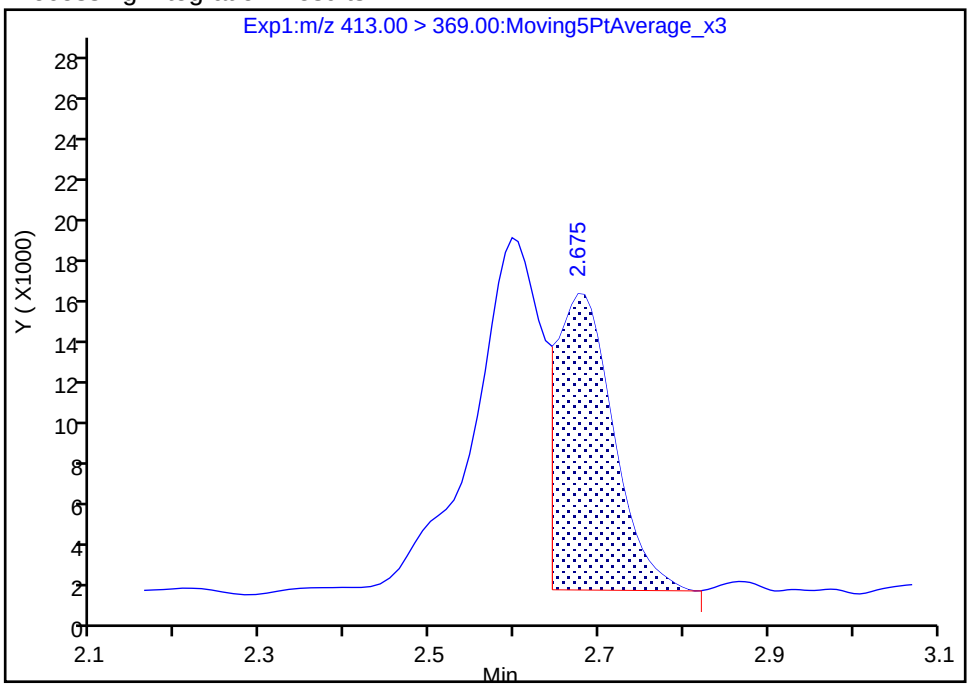
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_049.d				
Injection Date:	21-Apr-2018 13:44:53	Instrument ID:	A8_N		
Lims ID:	320-37938-A-4-A	Lab Sample ID:	320-37938-4		
Client ID:	TP-PFC-028-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	37	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

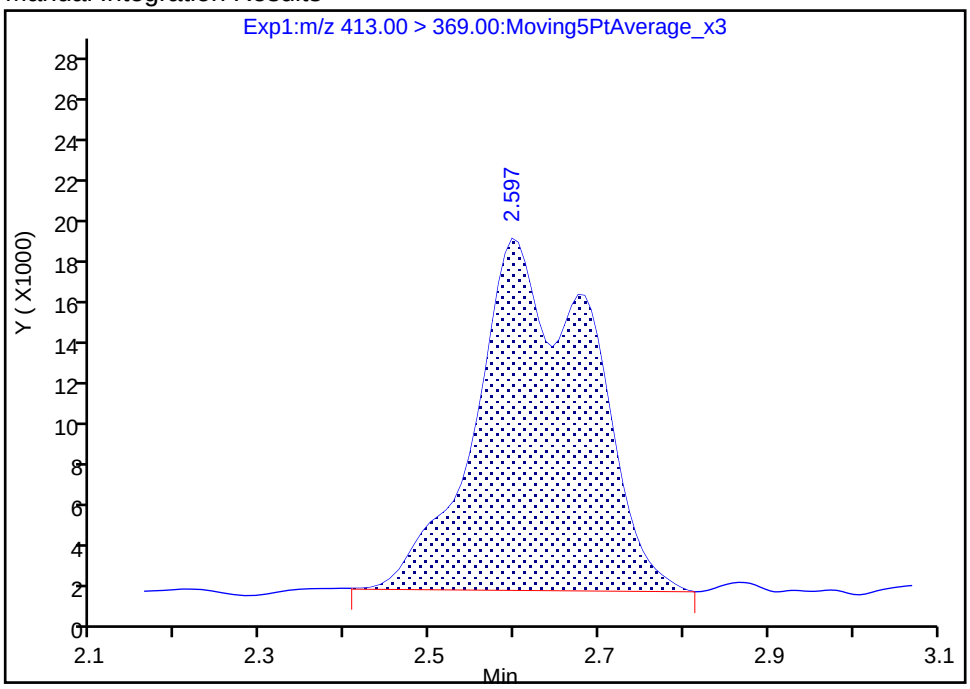
Processing Integration Results

RT: 2.68
Area: 65039
Amount: 0.033944
Amount Units: ng/ml



Manual Integration Results

RT: 2.60
Area: 160389
Amount: 0.083706
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:23:47

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217360/2	2018.04.10LLICAL_002.d
Level 2	IC 320-217360/3	2018.04.10LLICAL_003.d
Level 3	IC 320-217360/4	2018.04.10LLICAL_004.d
Level 4	IC 320-217360/5	2018.04.10LLICAL_005.d
Level 5	IC 320-217360/6	2018.04.10LLICAL_006.d
Level 6	IC 320-217360/7	2018.04.10LLICAL_007.d
Level 7	IC 320-217360/8	2018.04.10LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.9087 0.9558	0.9215 0.9254	0.9250	0.9115	0.9520	AveID		0.9286				2.0		20.0			
Perfluoropentanoic acid (PFPeA)	1.2578 1.1682	1.2108 1.1732	1.1604	1.1461	1.2257	AveID		1.1918				3.4		20.0			
Perfluorobutanesulfonic acid (PFBS)	76.893 81.717	82.786 71.544	78.801	75.066	81.197	AveID		78.286				5.2		20.0			
4:2 FTS	14.379 16.335	17.388 16.450	16.158	15.381	16.133	AveID		16.032				5.9		20.0			
Perfluorohexanoic acid (PFHxA)	0.9165 1.0971	1.0419 0.9805	0.9871	1.0324	1.0575	AveID		1.0161				5.9		20.0			
Perfluoropentanesulfonic acid	72.651 73.152	73.718 66.574	72.295	69.587	72.578	AveID		71.508				3.6		20.0			
Perfluoroheptanoic acid (PFHpA)	0.8886 1.0632	0.8961 1.0895	1.0153	1.0044	1.0491	AveID		1.0009				7.9		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3313 1.0960	1.2076 1.0563	1.0824	1.0501	1.0988	AveID		1.1318				9.0		20.0			
6:2FTS	1.5421 1.7475	1.9455 1.7701	1.5586	1.6684	1.6013	AveID		1.6905				8.5		20.0			
Perfluorooctanoic acid (PFOA)	1.2196 1.1748	1.2108 1.1155	1.1409	1.0810	1.1452	AveID		1.1554				4.3		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2050 1.3855	1.3067 1.3134	1.3594	1.3058	1.4180	AveID		1.3277				5.2		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.0579 1.1424	1.0586 1.1443	1.0560	1.0546	1.1010	AveID		1.0878				3.8		20.0			
Perfluorononanoic acid (PFNA)	0.9233 1.1269	1.1068 1.0188	1.0452	1.0400	1.0380	AveID		1.0427				6.3		20.0			
Perfluorononanesulfonic acid	0.8421 0.8194	0.8119 0.7979	0.7759	0.7194	0.8292	AveID		0.7994				5.2		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
8:2FTS	1.4631 1.3212	1.2394 1.2657	1.1167	1.2298	1.2217	AveID		1.2654				8.4		20.0			
Perfluorooctane Sulfonamide (FOSA)	0.9307 1.0709	1.0441 0.9800	1.0023	1.0041	1.0484	AveID		1.0115				4.7		20.0			
Perfluorodecanoic acid (PFDA)	1.0885 0.9859	1.1057 1.0134	0.9627	1.0005	1.0643	AveID		1.0316				5.3		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9083 1.1043	0.8872 1.0603	1.0109	0.9545	1.0557	AveID		0.9973				8.3		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.5294 0.7137	0.6184 0.7022	0.6496	0.6477	0.6837	AveID		0.6492				9.6		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.7913 0.9588	0.9928 0.9829	0.9228	0.9274	0.9655	AveID		0.9345				7.3		20.0			
Perfluoroundecanoic acid (PFUnA)	0.9440 0.8695	0.9150 0.8330	0.7542	0.7914	0.8086	AveID		0.8451				8.1		20.0			
Perfluorododecanoic acid (PFDoA)	1.0500 1.0844	0.9584 1.0838	1.0669	0.9590	1.0976	AveID		1.0429				5.7		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.2989 1.2824	1.2093 1.2168	1.1646	1.1001	1.2353	AveID		1.2153				5.6		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.2445 0.2592	0.2707 0.2509	0.2469	0.2461	0.2397	AveID		0.2511				4.2		20.0			
13C4 PFBA	1.2940 1.4238	1.3269 1.4303	1.2929	1.3278	1.3223	Ave		1.3454				4.3		20.0			
13C5 PFPeA	0.8504 0.9141	0.8510 0.9065	0.8296	0.8639	0.8548	Ave		0.8672				3.6		20.0			
13C3-PFBS	0.0195 0.0202	0.0192 0.0216	0.0190	0.0203	0.0195	Ave		0.0199				4.6		20.0			
13C2 PFHxA	0.9705 0.9727	0.9235 1.0286	0.9450	0.9498	0.9228	Ave		0.9590				3.8		20.0			
13C4-PFHpA	0.9512 0.9245	0.9580 0.9305	0.9001	0.9261	0.9425	Ave		0.9333				2.1		20.0			
18O2 PFHxS	1.1389 1.1679	1.1640 1.1715	1.1515	1.1448	1.1247	Ave		1.1519				1.5		20.0			
M2-6:2FTS	0.2013 0.2035	0.1892 0.1970	0.2051	0.2032	0.2005	Ave		0.2000				2.7		20.0			
13C4 PFOA	0.9343 0.9540	0.9073 0.9397	0.9043	0.9264	0.9275	Ave		0.9276				1.9		20.0			
13C4 PFOS	0.7935 0.8268	0.8168 0.8235	0.7958	0.8102	0.7798	Ave		0.8066				2.2		20.0			
13C5 PFNA	0.8203 0.7821	0.8002 0.8169	0.7761	0.7954	0.7901	Ave		0.7973				2.1		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
M2-8:2FTS	0.2407 0.2360	0.2491 0.2358	0.2375	0.2469	0.2400	Ave		0.2409				2.2		20.0			
13C8 FOSA	1.0076 1.0108	1.0097 1.0199	0.9999	1.0220	0.9804	Ave		1.0072				1.4		20.0			
13C2 PFDA	0.6589 0.7306	0.6313 0.6919	0.6468	0.6894	0.6418	Ave		0.6701				5.3		20.0			
d3-NMeFOSAA	0.3521 0.3880	0.3703 0.4138	0.3721	0.3933	0.3693	Ave		0.3798				5.3		20.0			
d5-NEtFOSAA	0.3917 0.3803	0.3750 0.3593	0.3725	0.3713	0.3740	Ave		0.3749				2.6		20.0			
13C2 PFUnA	0.5883 0.5911	0.5771 0.5697	0.5957	0.5619	0.5626	Ave		0.5781				2.4		20.0			
13C2 PFDoA	0.5964 0.6225	0.6348 0.6364	0.6241	0.6615	0.5939	Ave		0.6242				3.8		20.0			
13C2-PFTeDA	0.7749 0.7948	0.7757 0.8130	0.7679	0.8272	0.7873	Ave		0.7915				2.8		20.0			
13C2-PFHxDA	1.2936 1.3188	1.2730 1.3422	1.2549	1.2935	1.2397	Ave		1.2879				2.8		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.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217360/2	2018.04.10LLICAL_002.d
Level 2	IC 320-217360/3	2018.04.10LLICAL_003.d
Level 3	IC 320-217360/4	2018.04.10LLICAL_004.d
Level 4	IC 320-217360/5	2018.04.10LLICAL_005.d
Level 5	IC 320-217360/6	2018.04.10LLICAL_006.d
Level 6	IC 320-217360/7	2018.04.10LLICAL_007.d
Level 7	IC 320-217360/8	2018.04.10LLICAL_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	56172 13377174	112834 21784128	580880	2238331	5819896	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	51097 10497161	95082 17503102	467549	1831380	4844578	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	63156 14347107	129549 22532715	642890	2489261	6477140	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	12478 3030208	28749 5473778	139275	538908	1359770	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	42489 10489823	88785 16596765	453023	1813678	4512177	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	63317 13627914	122406 22248169	625836	2448518	6143254	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	40376 9662627	79218 16683281	443829	1720489	4571563	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	65909 11450464	118037 18531754	550837	2023389	5199428	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2FTS		AveID	14055 3314359	32205 5439954	147222	594490	1407564	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	54434 11016957	101372 17251700	501075	1852208	4910933	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	43482 10719572	93755 16945821	500192	1862796	4867309	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorooctanesulfonic acid (PFOS)		AveID	37213 8615775	74043 14391699	378769	1466540	3684174	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanoic acid (PFNA)		AveID	36180 8663453	81721 13696835	394004	1529838	3792206	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorononanesulfonic acid		AveID	30641 6392773	58744 10381596	287902	1034931	2870093	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
8:2FTS		AveID	16119 2936296	27294 4704229	123407	537990	1298898	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.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

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	44800 10640158	97271 16450280	486733	1898032	4752476	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanoic acid (PFDA)		AveID	34262 7080425	64415 11538792	302427	1275776	3158094	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	15277 4211279	30316 7221428	182686	694281	1802851	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	19344 5591516	44930 9173589	242056	935700	2376399	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	14805 3584245	34358 5812610	166943	636880	1669717	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroundecanoic acid (PFUnA)		AveID	26530 5051597	48726 7810732	218231	822546	2103252	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	29913 6635970	56140 11350274	323392	1173427	3013785	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	37004 7847307	70835 12743041	353030	1346073	3391923	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	9052 2025257	19373 3357209	92073	376531	872520	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	6181350 6997865	6122262 5884851	6279614	6139471	6113537	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	4062250 4492903	3926283 3729652	4029236	3994638	3952401	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	86409 92353	82315 82834	85829	87216	83922	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4636047 4780636	4260718 4231897	4589544	4391788	4266668	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4543661 4543925	4420246 3828332	4371595	4282212	4357585	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5146760 5430236	5080567 4559710	5290521	5007633	4919272	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	913336 950305	829435 769923	946554	892700	880882	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	4463374 4688766	4186198 3866213	4391971	4283435	4288230	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3623690 3884830	3602676 3239063	3695054	3581436	3447017	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3918358 3844023	3691890 3361051	3769499	3677661	3653281	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1101720 1111203	1101099 929210	1105113	1093693	1063168	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C8 FOSA	13PF OA	Ave	4813462 4967723	4658336 4196317	4856180	4725832	4533137	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.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

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	3147491 3590754	2912736 2846573	3141564	3187733	2967373	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1681961 1906740	1708589 1702670	1807153	1818526	1707705	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1870983 1869135	1730407 1478400	1809132	1716798	1729345	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2810450 2905024	2662627 2344065	2893419	2598322	2601195	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2848895 3059706	2928766 2618174	3031255	3058842	2745849	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3701548 3906384	3578927 3344927	3729686	3824690	3639964	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6179539 6481798	5873165 5522067	6094708	5981114	5731595	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.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217360/2	2018.04.10LLICAL_002.d
Level 2	IC 320-217360/3	2018.04.10LLICAL_003.d
Level 3	IC 320-217360/4	2018.04.10LLICAL_004.d
Level 4	IC 320-217360/5	2018.04.10LLICAL_005.d
Level 5	IC 320-217360/6	2018.04.10LLICAL_006.d
Level 6	IC 320-217360/7	2018.04.10LLICAL_007.d
Level 7	IC 320-217360/8	2018.04.10LLICAL_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)	-2.1 -0.3	-0.8	-0.4	-1.8	2.5	2.9	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	5.5 -1.6	1.6	-2.6	-3.8	2.8	-2.0	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	-1.8 -8.6	5.7	0.7	-4.1	3.7	4.4	30 30	30	30	30	30	30
4:2 FTS	-10.3 2.6	8.5	0.8	-4.1	0.6	1.9	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	-9.8 -3.5	2.5	-2.9	1.6	4.1	8.0	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	1.6 -6.9	3.1	1.1	-2.7	1.5	2.3	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	-11.2 8.8	-10.5	1.4	0.4	4.8	6.2	30 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	17.6 -6.7	6.7	-4.4	-7.2	-2.9	-3.2	30 30	30	30	30	30	30
6:2FTS	-8.8 4.7	15.1	-7.8	-1.3	-5.3	3.4	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	5.6 -3.5	4.8	-1.3	-6.4	-0.9	1.7	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	-9.2 -1.1	-1.6	2.4	-1.6	6.8	4.4	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-2.7 5.2	-2.7	-2.9	-3.1	1.2	5.0	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-11.4 -2.3	6.1	0.2	-0.3	-0.4	8.1	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	5.3 -0.2	1.6	-2.9	-10.0	3.7	2.5	30 30	30	30	30	30	30
8:2FTS	15.6 0.0	-2.1	-11.7	-2.8	-3.4	4.4	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.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

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)	-8.0 -3.1	3.2	-0.9	-0.7	3.6	5.9	30 30	30	30	30	30	30
Perfluorodecanoic acid (PFDA)	5.5 -1.8	7.2	-6.7	-3.0	3.2	-4.4	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-8.9 6.3	-11.0	1.4	-4.3	5.9	10.7	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-18.5 8.2	-4.8	0.1	-0.2	5.3	9.9	30 30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	-15.3 5.2	6.2	-1.3	-0.8	3.3	2.6	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	11.7 -1.4	8.3	-10.8	-6.4	-4.3	2.9	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	0.7 3.9	-8.1	2.3	-8.0	5.2	4.0	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	6.9 0.1	-0.5	-4.2	-9.5	1.6	5.5	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	-2.6 -0.1	7.8	-1.7	-2.0	-4.6	3.2	30 30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 10-Apr-2018 18:39:37 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:50:57 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:12:29

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	1.432	1.431	0.001	1.000	6181350	2.40		96.2	51986	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.432	1.432	0.0	1.000	56172	0.0245		97.9	31.7	M
4 Perfluoropentanoic acid										
262.90 > 219.00	1.706	1.699	0.007	1.000	51097	0.0264		106	41.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.706	1.699	0.007	0.560	4062250	2.45		98.1	95308	
D 47 13C3-PFBS										
301.90 > 83.00	1.742	1.735	0.007	1.000	86409	2.27		97.7	767	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.742	1.736	0.006	1.000	63156	0.0217		98.2	279	
298.90 > 99.00	1.742	1.736	0.006	1.000	27507		2.30(1.25-3.74)	98.2	389	
D 60 M2-4:2FTS										
329.00 > 81.00	1.953	1.950	0.003	1.000	627830	NC			7913	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.953	1.950	0.003	1.000	12478	0.0209		89.7	710	
D 7 13C2 PFHxA										
315.00 > 270.00	1.986	1.985	0.001	1.000	4636047	2.53		101	101202	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.986	1.985	0.001	1.000	42489	0.0225		90.2	86.3	
313.00 > 119.00	1.986	1.985	0.001	1.000	5567		7.63(5.03-15.10)	90.2	74.7	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.008	2.008	0.0	1.000	63317	0.0238		102	545	
349.00 > 99.00	2.008	2.008	0.0	1.000	22154		2.86(1.36-4.07)	102	547	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.087	2.084	0.003	1.000	290038	NC			7460	

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	2.087	2.087	0.0	1.000	7766	NC			49.1	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.313	2.314	-0.001	1.000	40376	0.0222		88.8	47.6	
363.00 > 169.00	2.313	2.314	-0.001	1.000	16255		2.48(1.13-3.40)	88.8	62.1	
D 9 13C4-PFHpA										
367.00 > 322.00	2.313	2.314	-0.001	1.000	4543661	2.55		102	82661	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.326	2.323	0.003	1.000	65909	0.0268		118	260	
399.00 > 99.00	2.326	2.323	0.003	1.000	23111		2.85(1.50-4.49)	118	253	
D 11 18O2 PFHxS										
403.00 > 84.00	2.326	2.327	-0.001	1.000	5146760	2.34		98.9	93287	
65 Adona										
377.00 > 251.00	2.366	2.360	0.006	1.000	131051	NC			1983	
377.00 > 85.00	2.352	2.360	-0.008	0.994	76139		1.72(0.84-2.53)		2103	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.648	2.649	-0.001	1.000	14055	0.0216		91.2	251	
D 12 M2-6:2FTS										
429.00 > 81.00	2.648	2.649	-0.001	1.000	913336	2.39		101	13873	
D 14 13C4 PFOA										
417.00 > 372.00	2.679	2.673	0.006	1.000	4463374	2.52		101	72271	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.679	2.674	0.005	1.000	54434	0.0264		106	31.2	
413.00 > 169.00	2.679	2.674	0.005	1.000	29641		1.84(0.84-2.52)	106	116	M
* 62 13C2-PFOA										
415.00 > 370.00	2.679	2.674	0.005		4776998	2.50			72796	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.679	2.680	-0.001	1.000	43482	0.0216		90.8	413	
449.00 > 99.00	2.686	2.680	0.006	1.003	12993		3.35(1.94-5.82)	90.8	376	
D 18 13C4 PFOS										
503.00 > 80.00	3.039	3.041	-0.002	1.000	3623690	2.35		98.4	29511	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.039	3.042	-0.003	1.000	37213	0.0226		97.3	125	
499.00 > 99.00	3.039	3.042	-0.003	1.000	9288		4.01(2.31-6.93)	97.3	122	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.046	3.043	0.003	1.000	36180	0.0221		88.6	86.3	
463.00 > 169.00	3.046	3.043	0.003	1.000	9677		3.74(1.90-5.69)	88.6	183	
D 19 13C5 PFNA										
468.00 > 423.00	3.046	3.045	0.001	1.000	3918358	2.57		103	96245	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.253	3.253	0.0	1.000	57962	NC			1598	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.389	3.388	0.001	1.000	30641	0.0253		105	390	
549.00 > 99.00	3.389	3.388	0.001	1.000	9777		3.13(1.33-3.97)	105	297	
D 26 M2-8:2FTS										
529.00 > 81.00	3.389	3.390	-0.001	1.000	1101720	2.39		99.9	9765	
25 Sodium 1H,1H,2H,2H-perfluorodecane										M
527.00 > 507.00	3.398	3.393	0.005	1.003	16119	0.0277		116	867	M

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	3.398	3.397	0.001	1.000	4813462	2.50		100	67909	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.407	3.401	0.006	1.003	44800	0.0230		92.0	1056	
D 23 13C2 PFDA										
515.00 > 470.00	3.398	3.401	-0.003	1.000	3147491	2.46		98.3	66677	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.407	3.402	0.005	1.003	34262	0.0264		106	145	
513.00 > 169.00	3.407	3.402	0.005	1.003	5026		6.82(2.36-7.09)	106	79.2	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.557	3.553	0.004	1.000	1681961	2.32		92.7	20302	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.557	3.558	-0.001	1.000	15277	0.0228		91.1	111	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.719	3.715	0.004	1.000	19344	0.0197		81.5	163	
599.00 > 99.00	3.708	3.715	-0.007	0.997	6967		2.78(1.39-4.16)	81.5	357	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.719	3.722	-0.003	1.000	1870983	2.61		104	18488	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.730	3.727	0.003	1.003	14805	0.0212		84.7	220	
D 30 13C2 PFUnA										
565.00 > 520.00	3.730	3.727	0.003	1.000	2810450	2.54		102	70104	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.730	3.727	0.003	1.000	26530	0.0279		112	97.5	
563.00 > 169.00	3.730	3.727	0.003	1.000	6718		3.95(2.12-6.36)	112	163	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.886	3.883	0.003	1.000	97600	NC			2230	
D 36 13C2 PFDoA										
615.00 > 570.00	4.019	4.017	0.002	1.000	2848895	2.39		95.5	25147	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.019	4.020	-0.001	1.000	29913	0.0252		101	33.4	
613.00 > 169.00	4.019	4.020	-0.001	1.000	6518		4.59(2.13-6.40)	101	83.8	
41 Perfluorotridecanoic acid										M
663.00 > 619.00	4.281	4.278	0.003	1.000	37004	0.0267		107	34.1	
663.00 > 169.00	4.281	4.278	0.003	1.000	11098		3.33(1.25-3.76)	107	130	M
D 43 13C2-PFTeDA										
715.00 > 670.00	4.511	4.513	-0.002	1.000	3701548	2.45		97.9	26989	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.521	4.513	0.008	1.002	9052	0.0243		97.4	86.8	
713.00 > 219.00	4.511	4.513	-0.002	1.000	5901		1.53(0.71-2.13)	97.4	99.4	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.913	4.918	-0.005	1.000	6179539	2.51		100	17318	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.922	4.920	0.002	1.002	111692	NC			37.2	
813.00 > 169.00	4.913	4.920	-0.007	1.000	18001		6.20(2.86-8.58)		160	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.262	5.268	-0.006	1.000	63194	NC			18.7	
913.00 > 169.00	5.262	5.268	-0.006	1.000	7131		8.86(3.83-11.48)		64.8	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00005 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:50:59 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_002.d

Injection Date: 10-Apr-2018 18:39:37 Instrument ID: A8_N

Lims ID: IC L1 Full

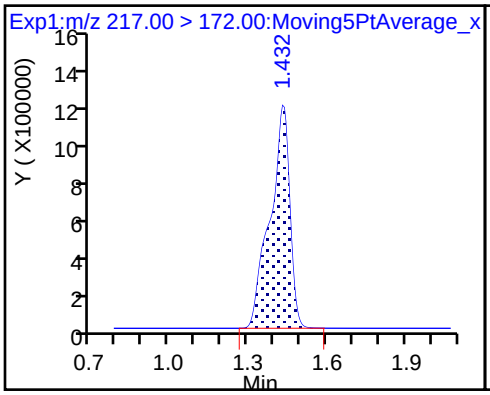
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

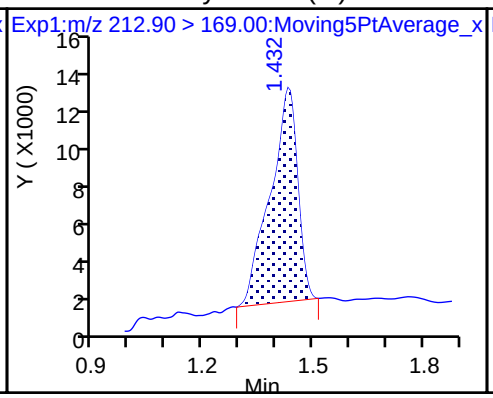
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

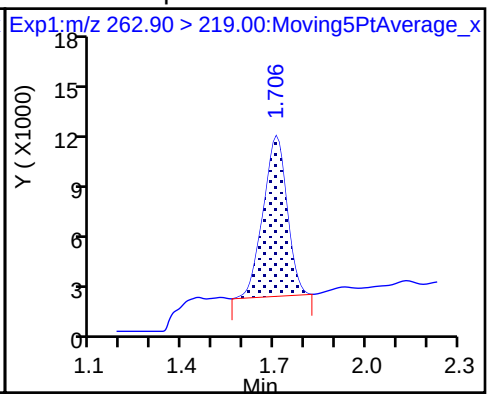
D 1 13C4 PFBA



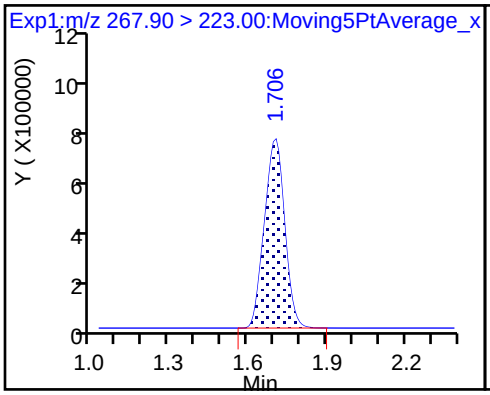
2 Perfluorobutyric acid (M)



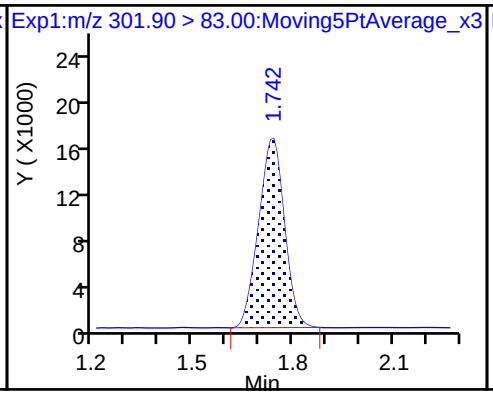
4 Perfluoropentanoic acid



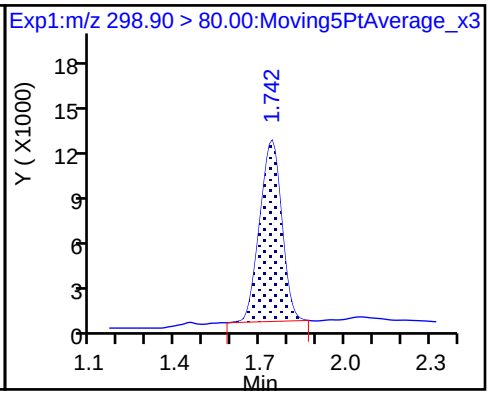
D 3 13C5-PFPeA



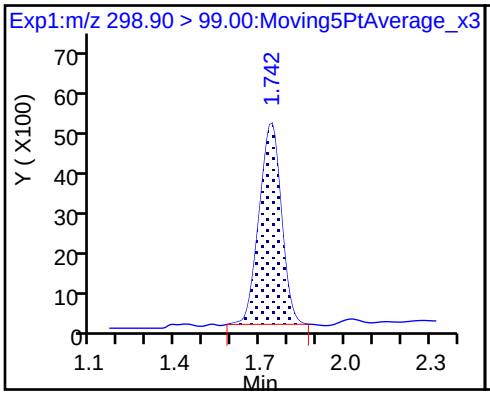
D 47 13C3-PFBS



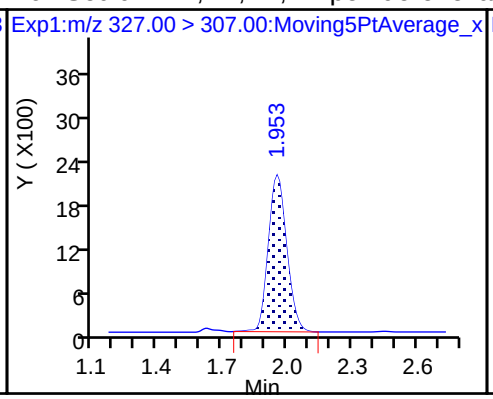
5 Perfluorobutanesulfonic acid



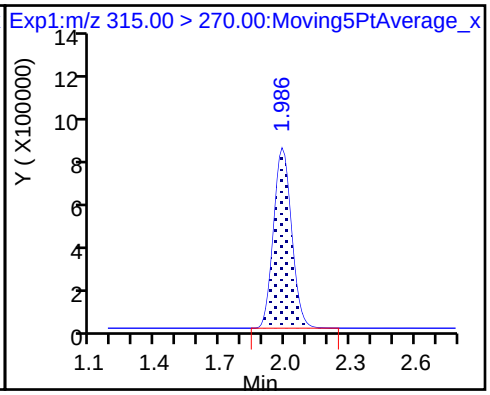
5 Perfluorobutanesulfonic acid



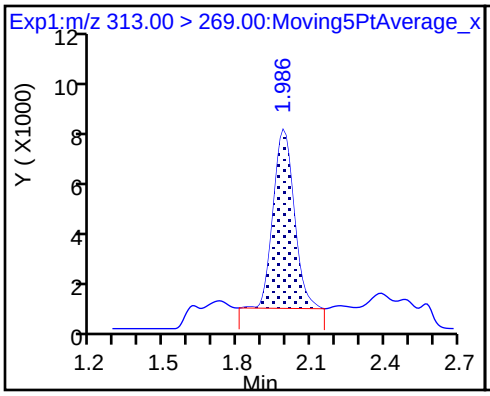
61 Sodium 1H,1H,2H,2H-perfluorohexa



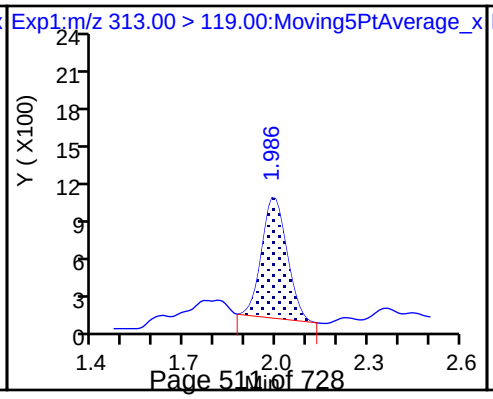
D 7 13C2 PFHxA



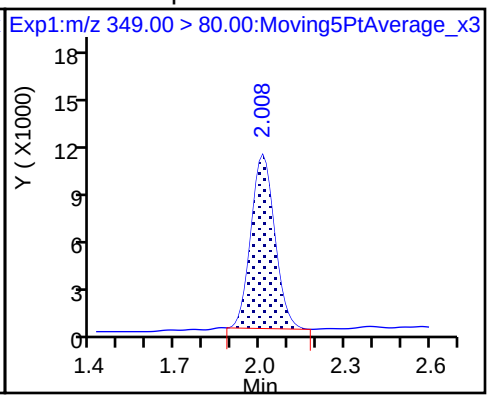
6 Perfluorohexanoic acid



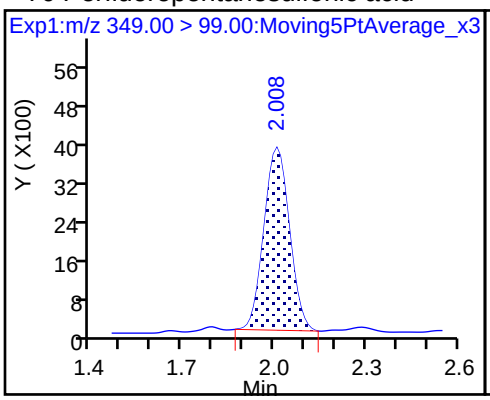
6 Perfluorohexanoic acid



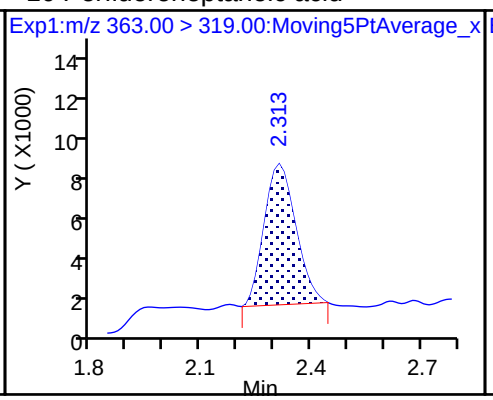
70 Perfluoropentanesulfonic acid



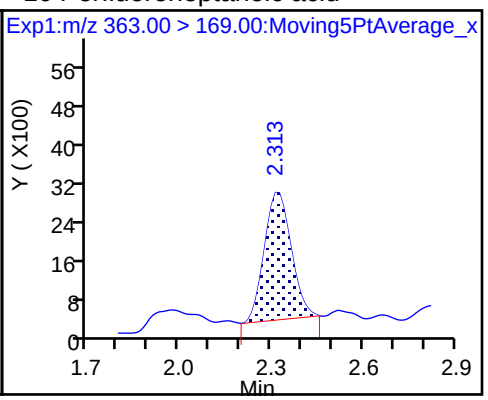
70 Perfluoropentanesulfonic acid



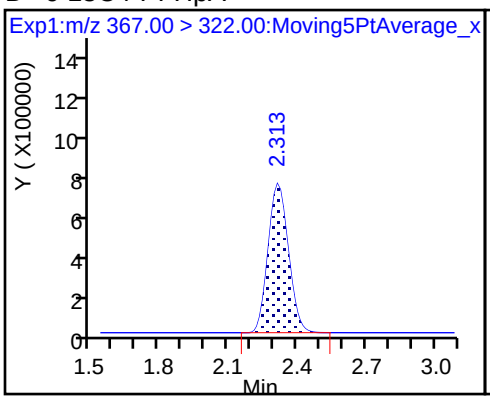
10 Perfluoroheptanoic acid



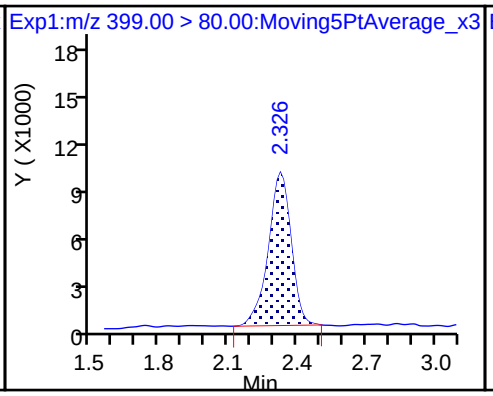
10 Perfluoroheptanoic acid



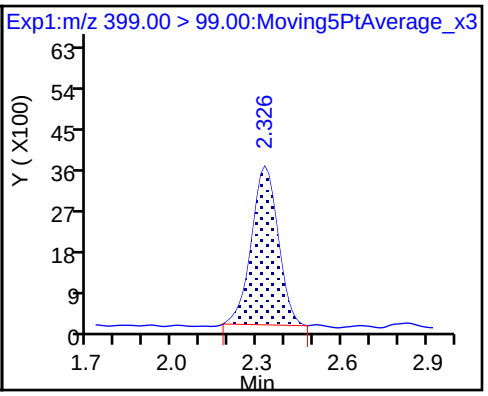
D 9 13C4-PFHpA



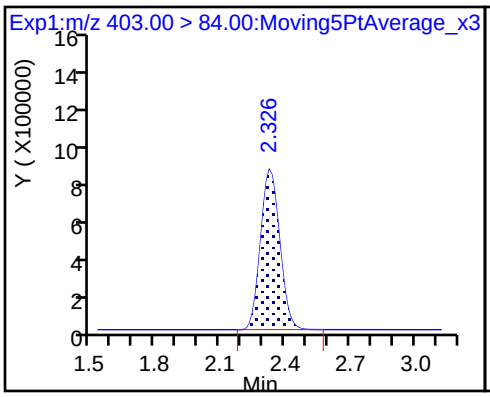
8 Perfluorohexanesulfonic acid



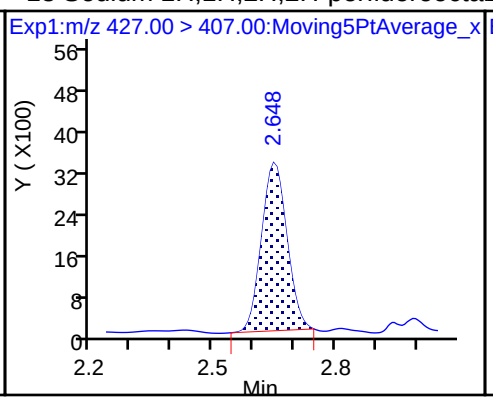
8 Perfluorohexanesulfonic acid



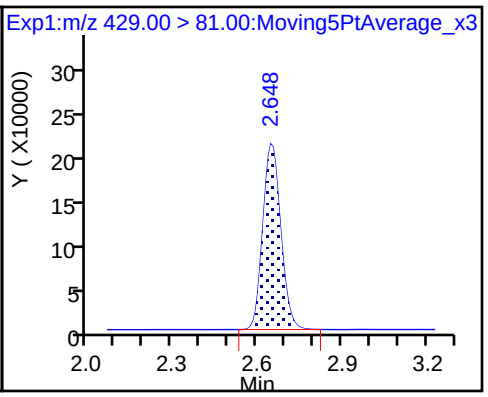
D 11 18O2 PFHxS



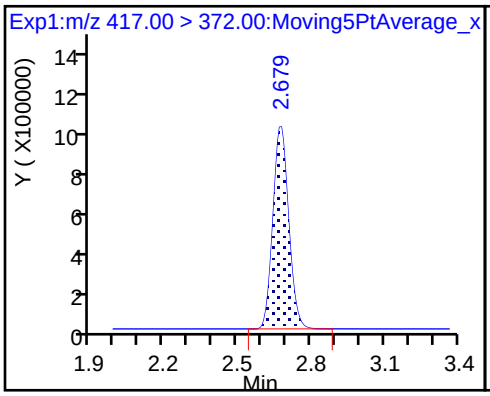
13 Sodium 1H,1H,2H,2H-perfluorooctane



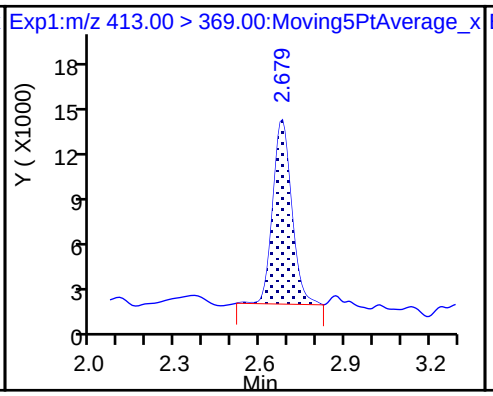
D 12 M2-6:2FTS



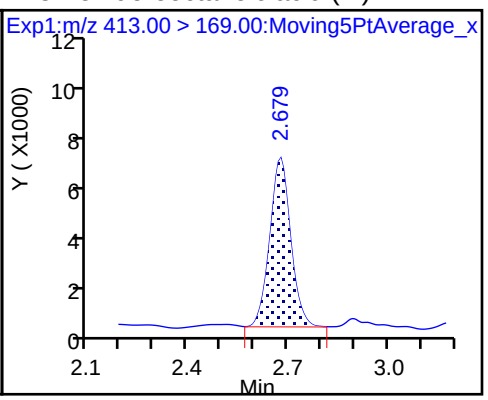
D 14 13C4 PFOA



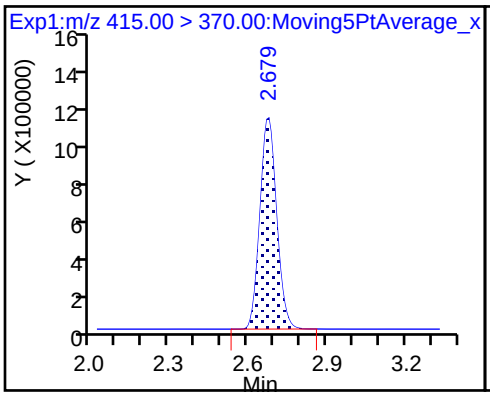
15 Perfluorooctanoic acid



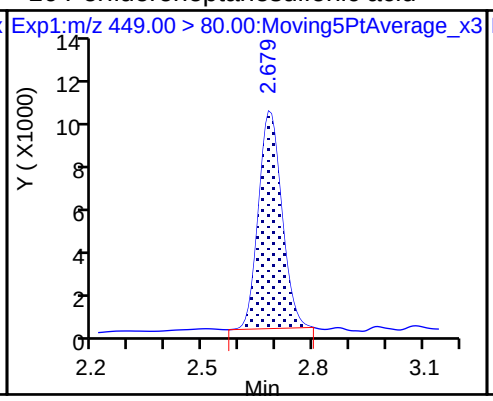
15 Perfluorooctanoic acid (M)



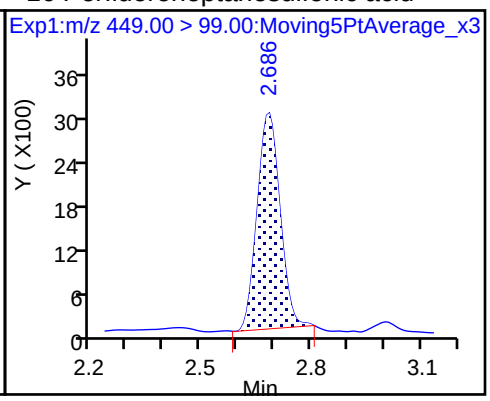
* 62 13C2-PFOA



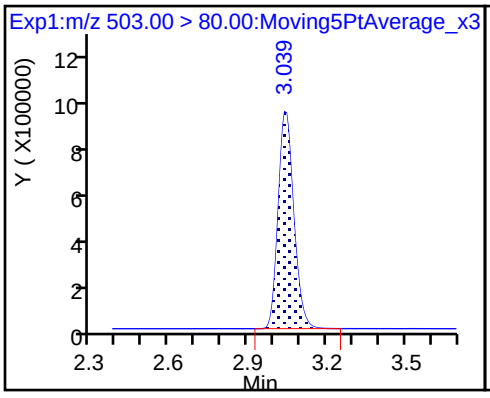
16 Perfluoroheptanesulfonic acid



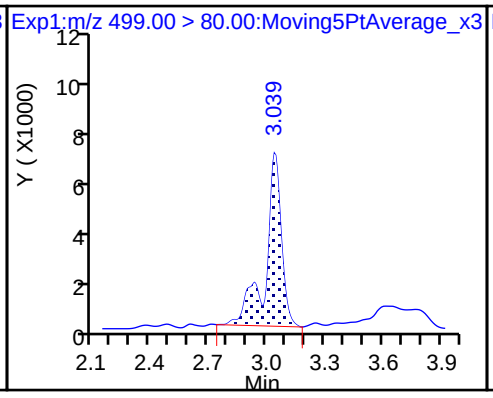
16 Perfluoroheptanesulfonic acid



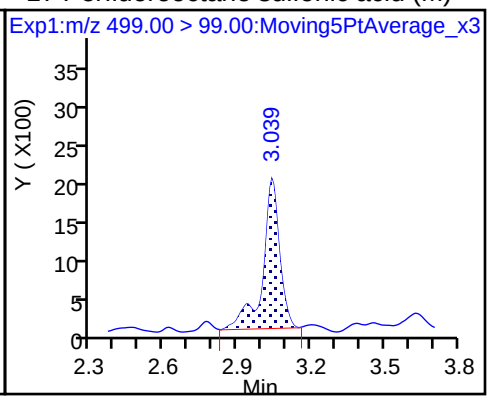
D 18 13C4 PFOS



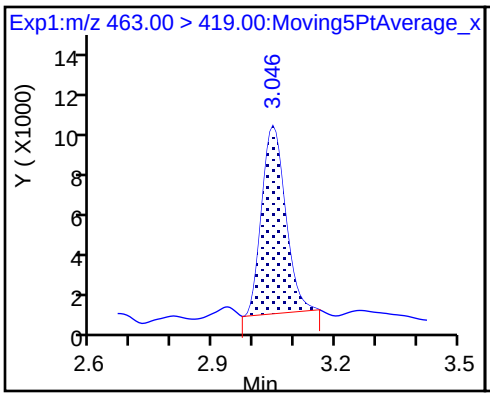
17 Perfluorooctane sulfonic acid



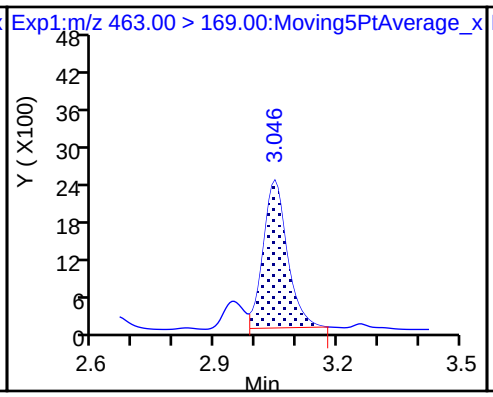
17 Perfluorooctane sulfonic acid (M)



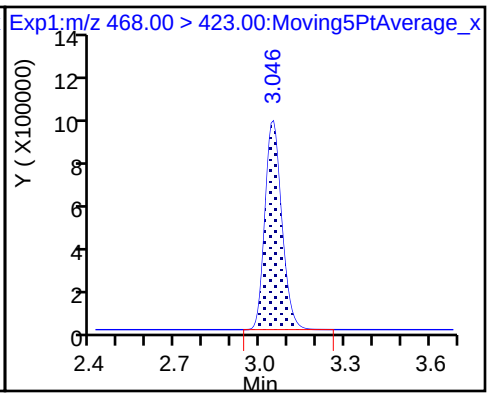
20 Perfluorononanoic acid



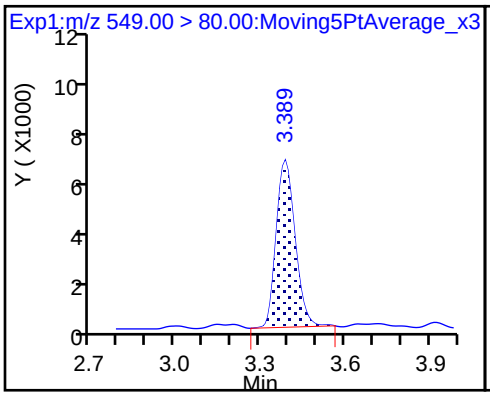
20 Perfluorononanoic acid



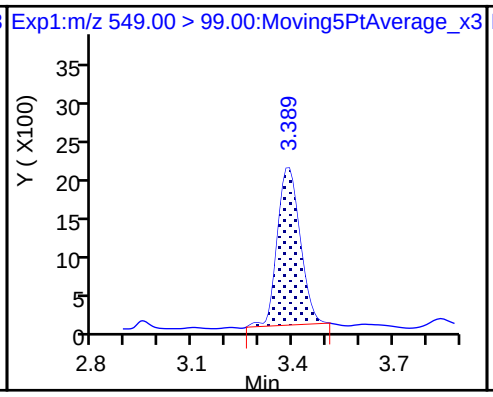
D 19 13C5 PFNA



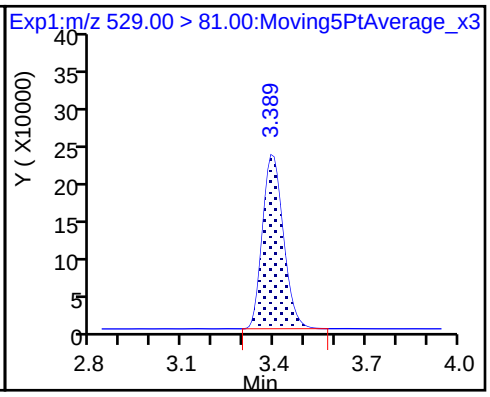
68 Perfluorononanesulfonic acid



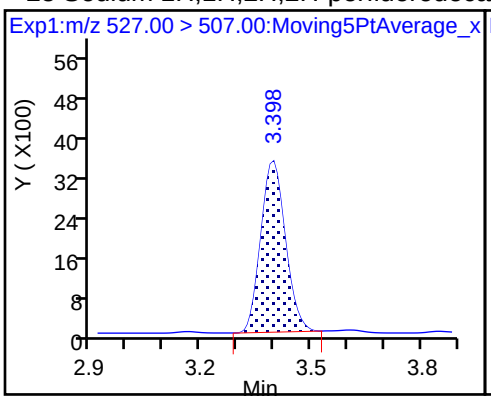
68 Perfluorononanesulfonic acid



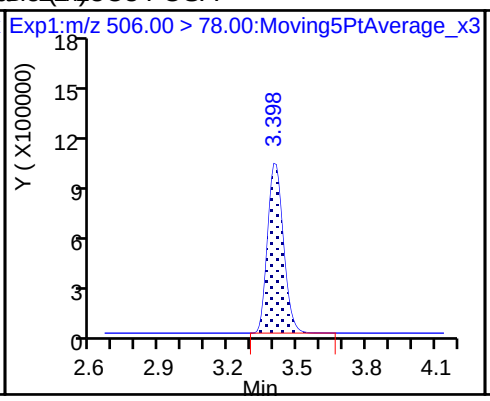
D 26 M2-8:2FTS



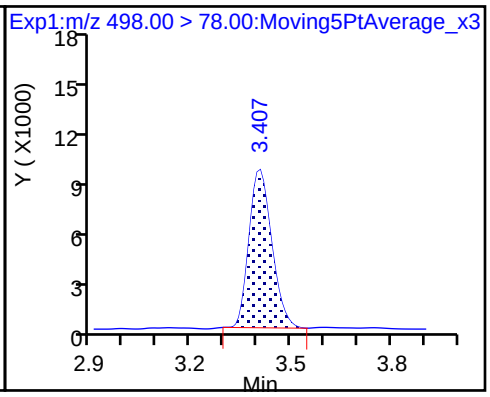
25 Sodium 1H,1H,2H,2H-perfluorodecane2(M)



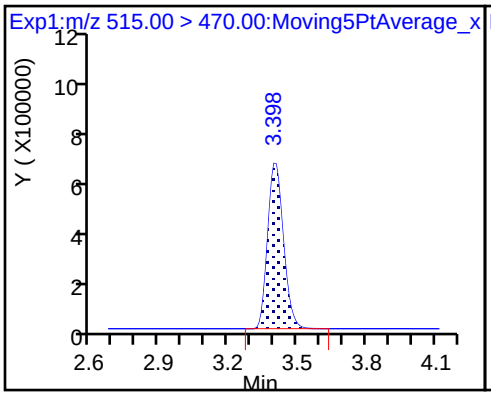
D 21 13C8 FOSA



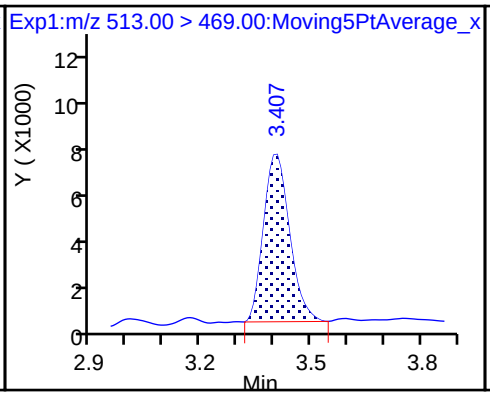
22 Perfluorooctane Sulfonamide



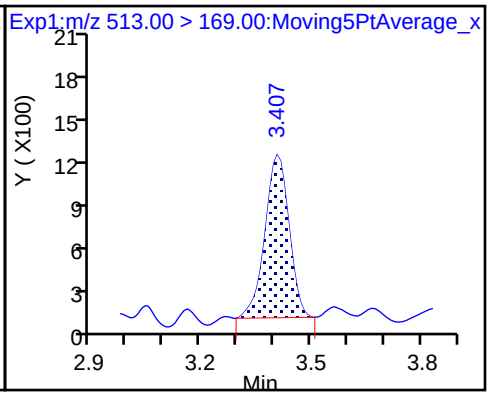
D 23 13C2 PFDA



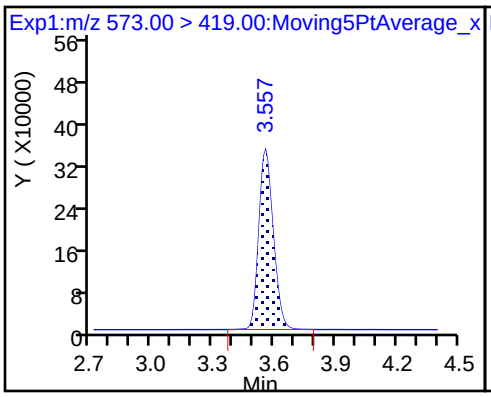
24 Perfluorodecanoic acid



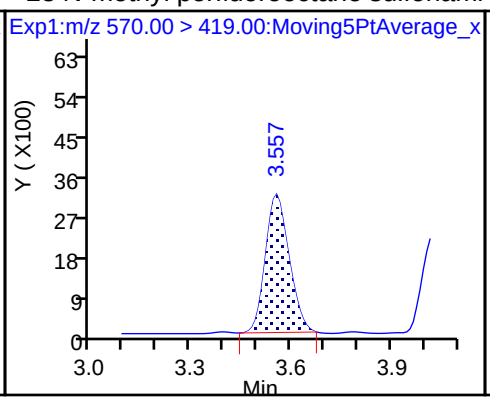
24 Perfluorodecanoic acid



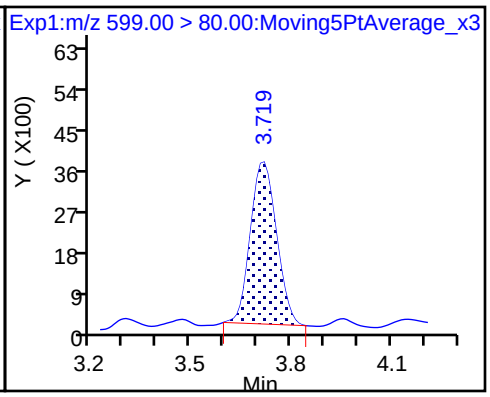
D 27 d3-NMeFOSAA



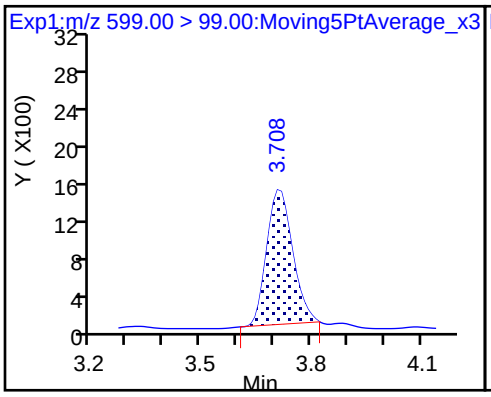
28 N-methyl perfluorooctane sulfonami



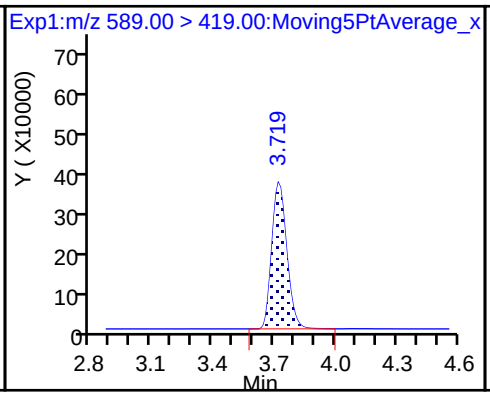
29 Perfluorodecane Sulfonic acid



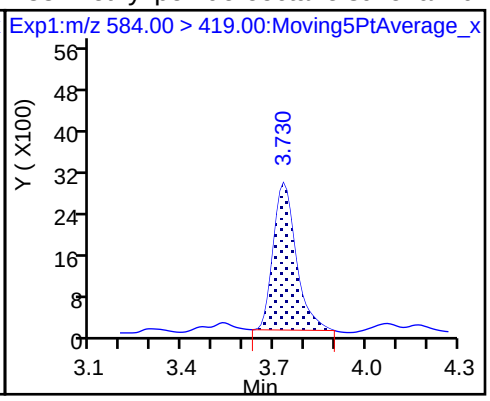
29 Perfluorodecane Sulfonic acid



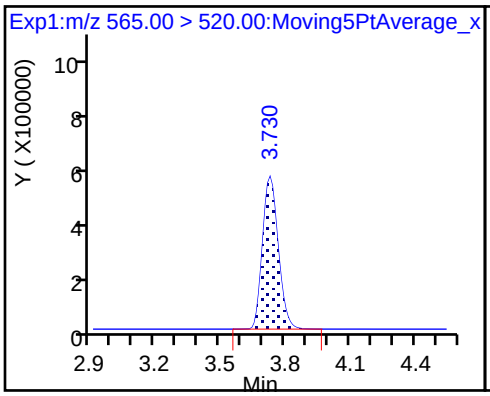
D 32 d5-NEtFOSAA



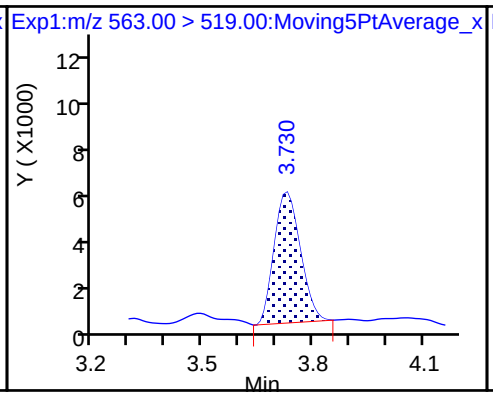
33 N-ethyl perfluorooctane sulfonamid



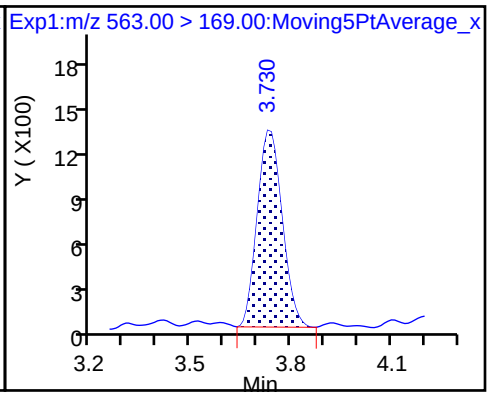
D 30 13C2 PFUnA



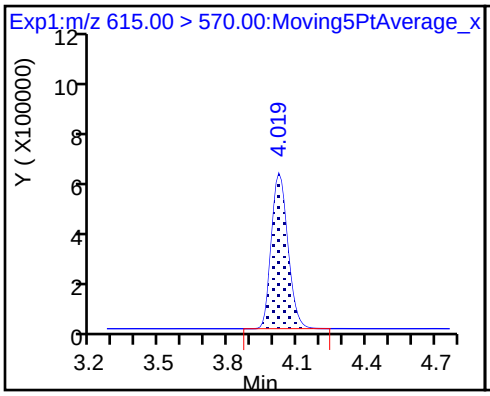
31 Perfluoroundecanoic acid



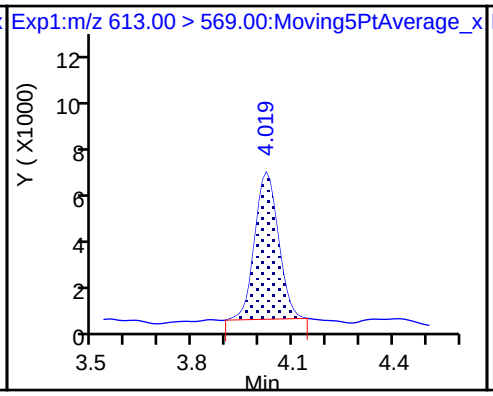
31 Perfluoroundecanoic acid



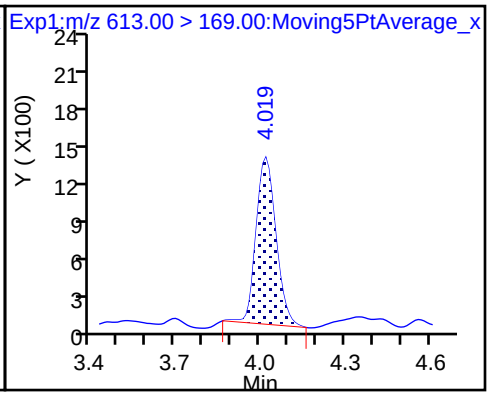
D 36 13C2 PFDoA



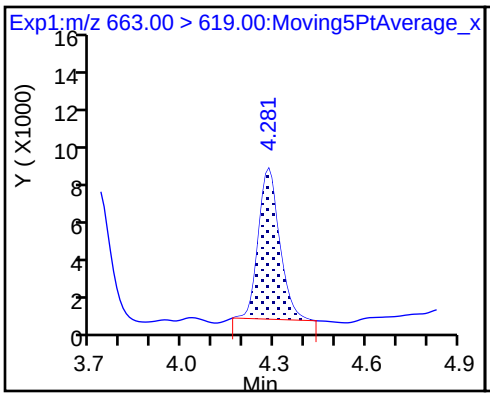
37 Perfluorododecanoic acid



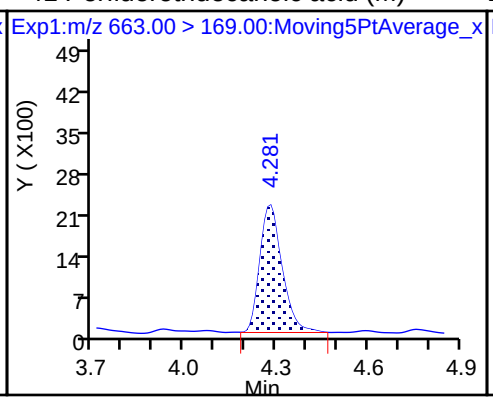
37 Perfluorododecanoic acid



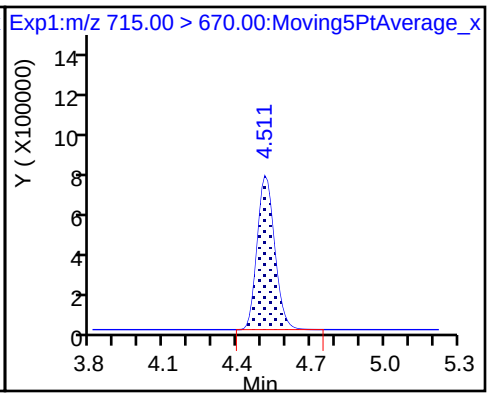
41 Perfluorotridecanoic acid



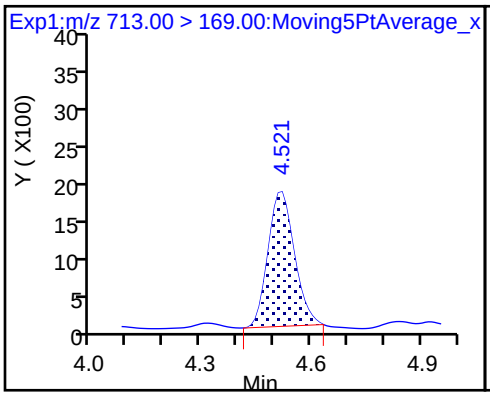
41 Perfluorotridecanoic acid (M)



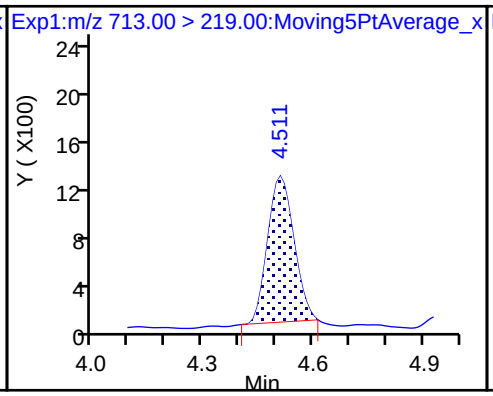
D 43 13C2-PFTeDA



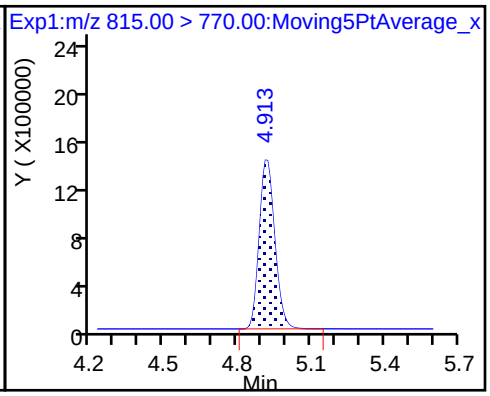
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

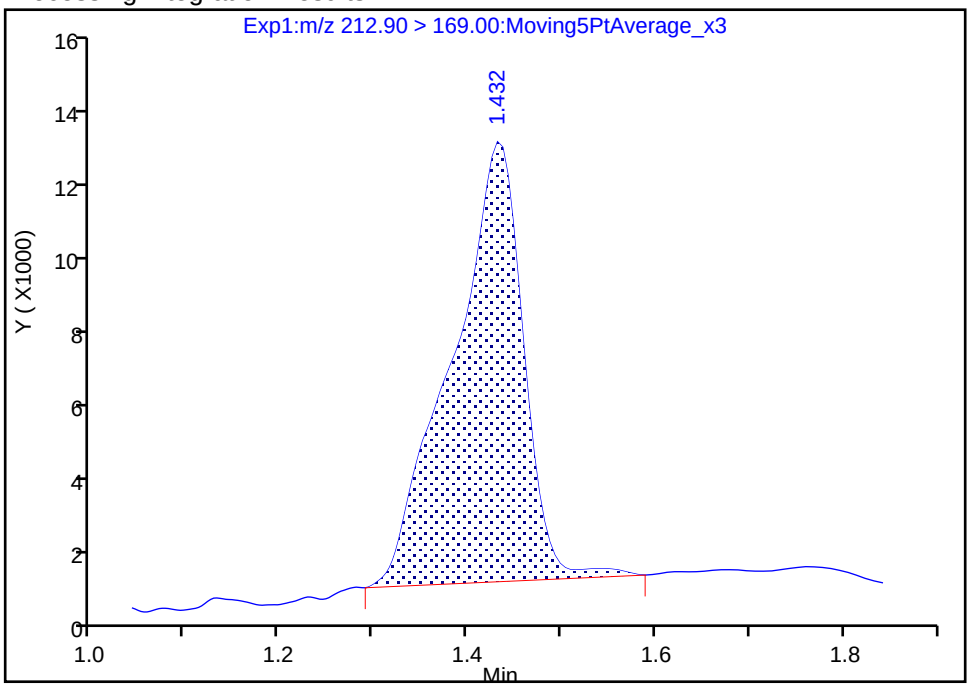
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_002.d
Injection Date: 10-Apr-2018 18:39:37 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

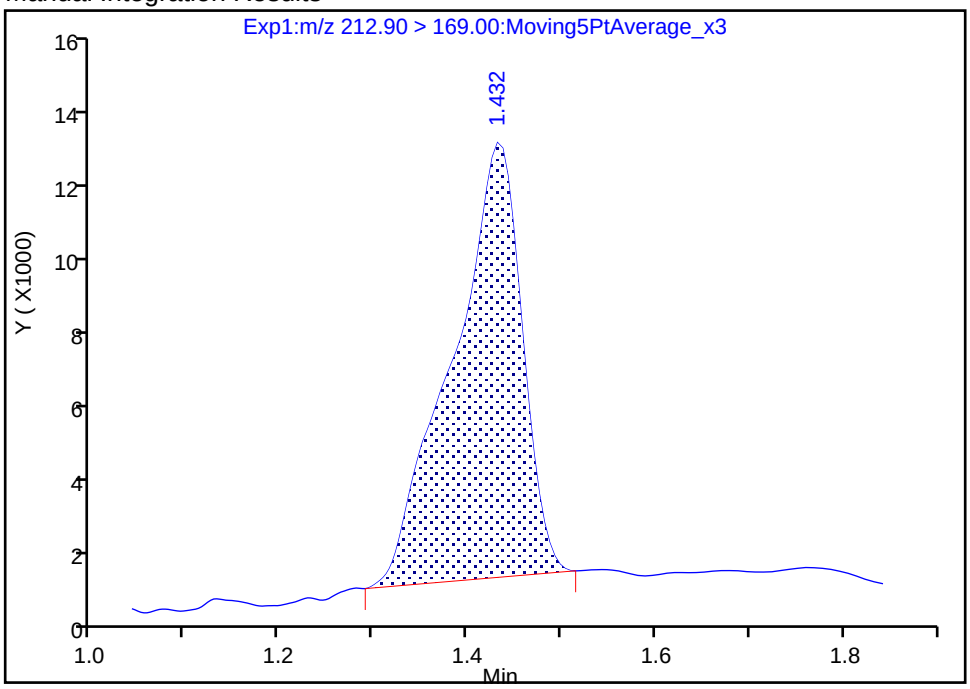
Processing Integration Results

RT: 1.43
Area: 58250
Amount: 0.025241
Amount Units: ng/ml



Manual Integration Results

RT: 1.43
Area: 56172
Amount: 0.024466
Amount Units: ng/ml



Reviewer: roycea, 11-Apr-2018 09:10:46
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

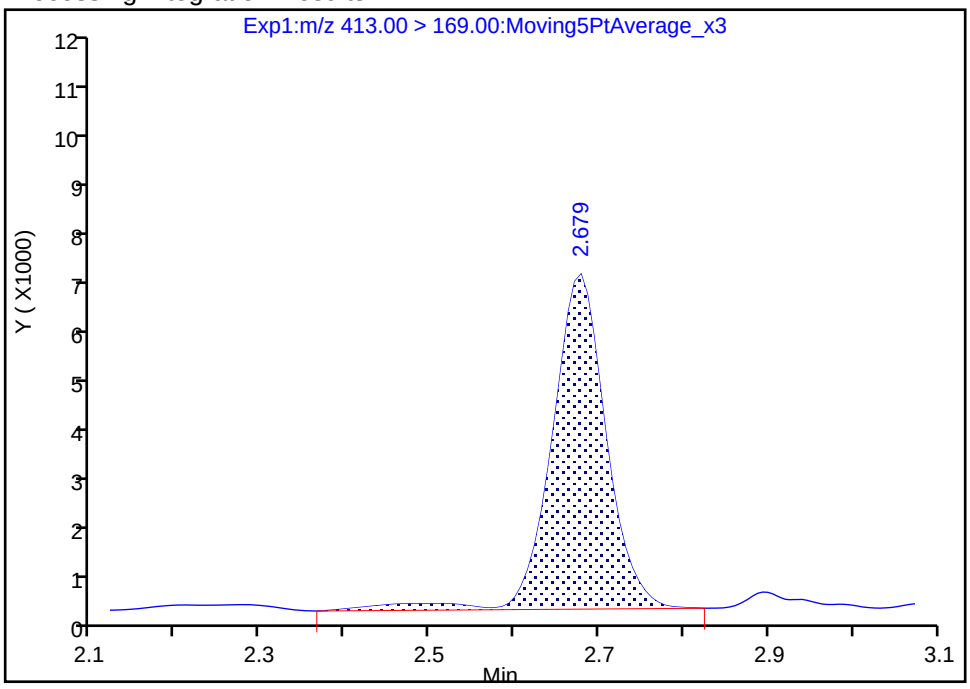
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_002.d
Injection Date: 10-Apr-2018 18:39:37 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

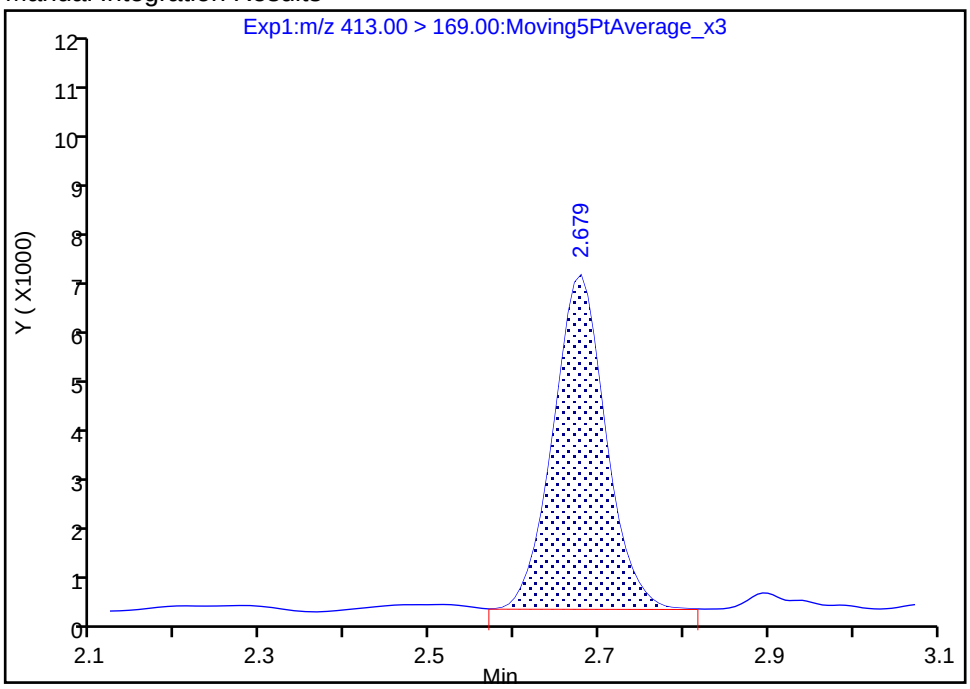
Processing Integration Results

RT: 2.68
Area: 30899
Amount: 0.026388
Amount Units: ng/ml



Manual Integration Results

RT: 2.68
Area: 29641
Amount: 0.026388
Amount Units: ng/ml



Reviewer: roycea, 11-Apr-2018 09:10:16
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

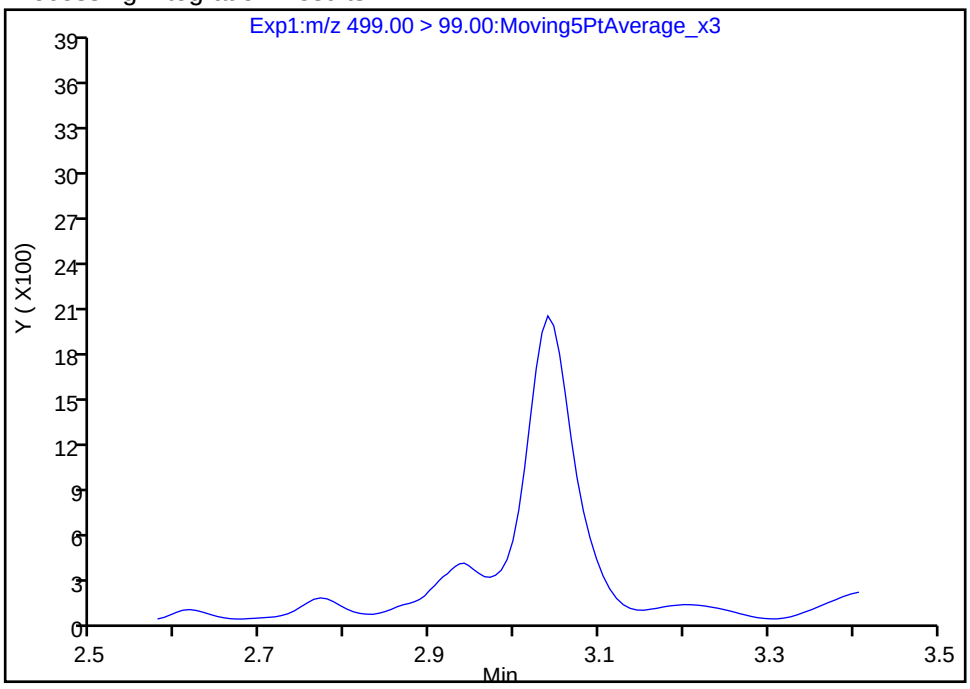
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_002.d
Injection Date: 10-Apr-2018 18:39:37 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

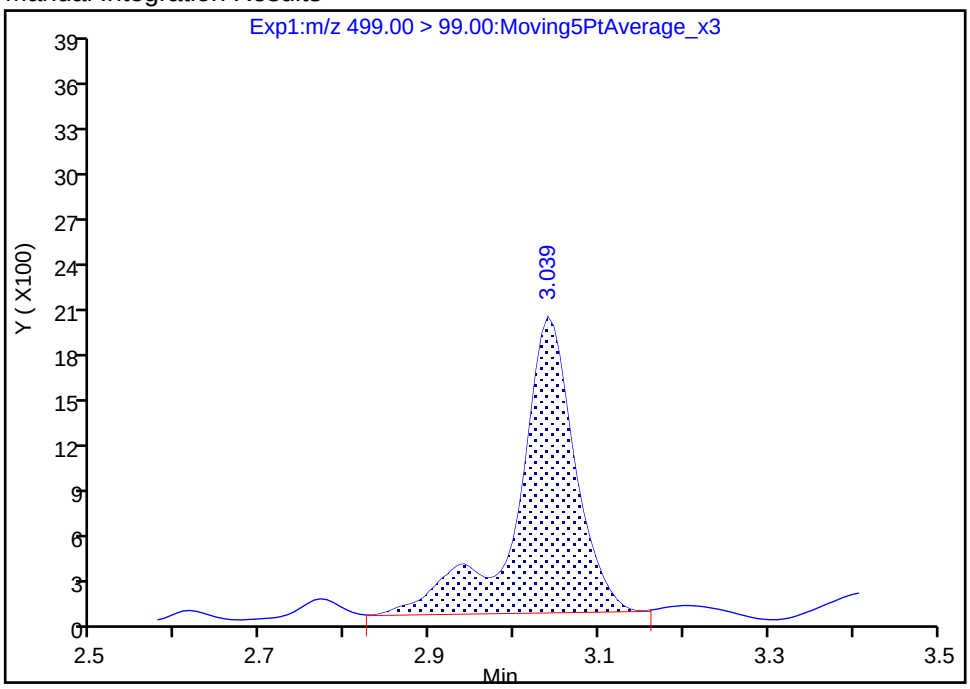
Processing Integration Results

RT: 3.04
Area: 0
Amount: 0.022562
Amount Units: ng/ml



Manual Integration Results

RT: 3.04
Area: 9288
Amount: 0.022562
Amount Units: ng/ml



Reviewer: roycea, 11-Apr-2018 09:10:29
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

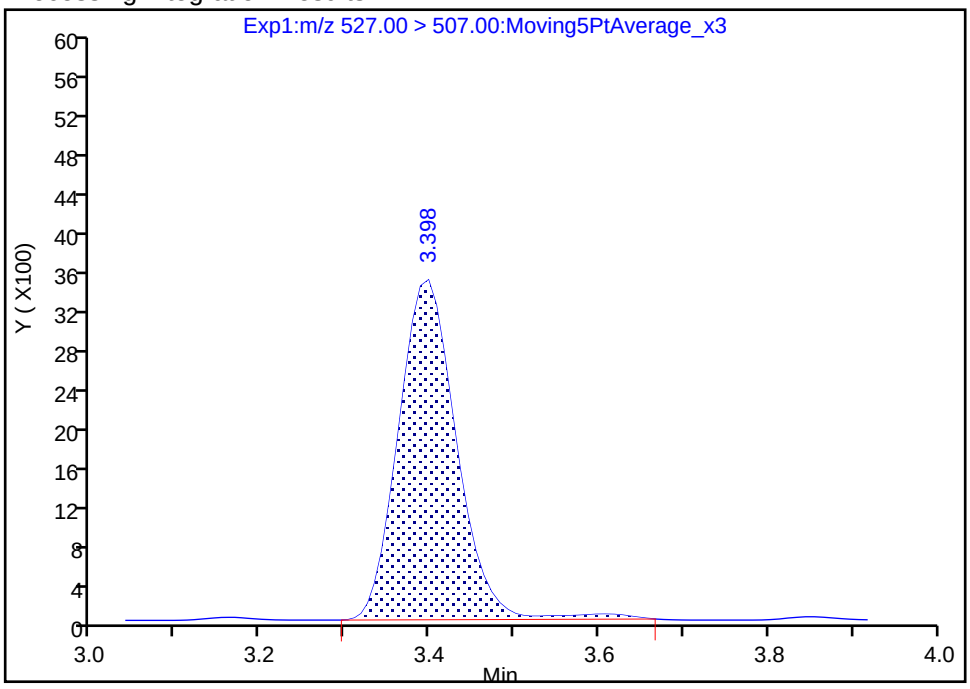
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_002.d
Injection Date: 10-Apr-2018 18:39:37 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

25 Sodium 1H,1H,2H,2H-perfluorodecane sulfonate, CAS: 39108-34-4

Signal: 1

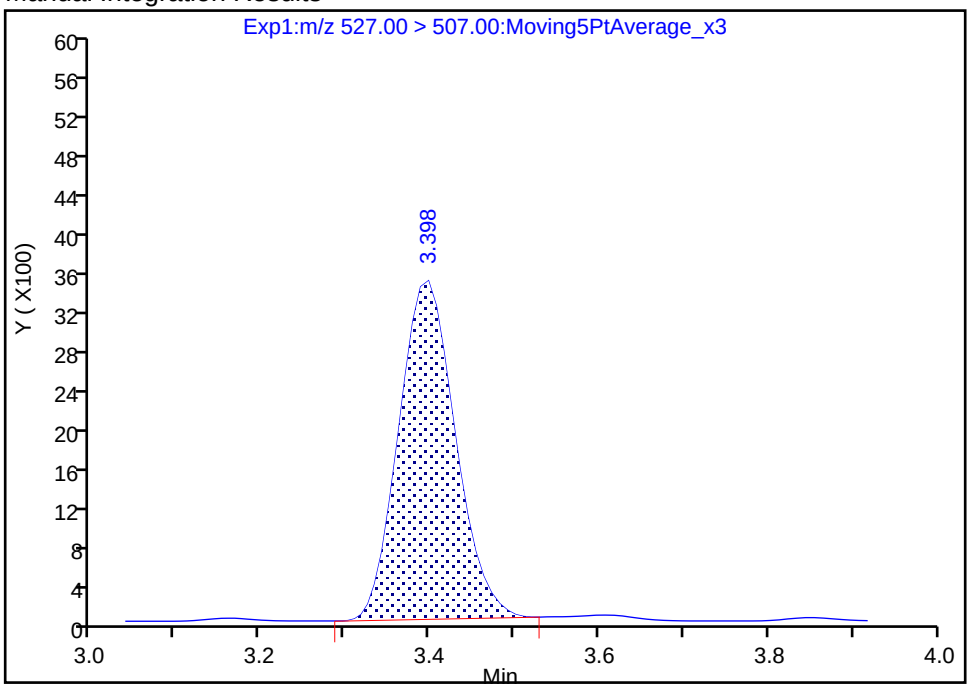
Processing Integration Results

RT: 3.40
Area: 16622
Amount: 0.028410
Amount Units: ng/ml



Manual Integration Results

RT: 3.40
Area: 16119
Amount: 0.027692
Amount Units: ng/ml



Reviewer: roycea, 11-Apr-2018 09:11:26
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

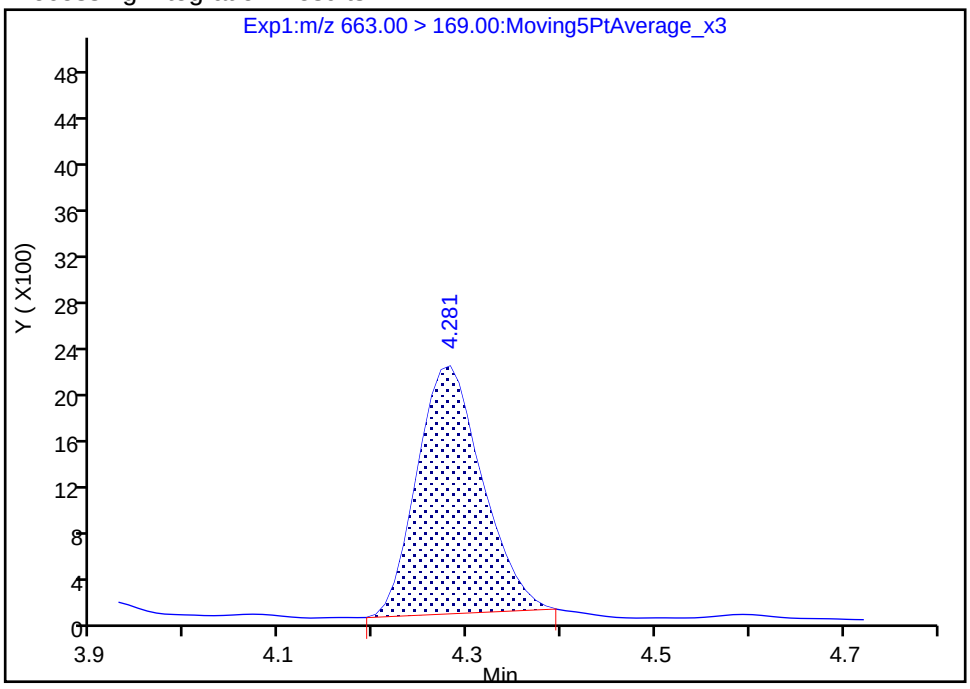
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_002.d
Injection Date: 10-Apr-2018 18:39:37 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

41 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 2

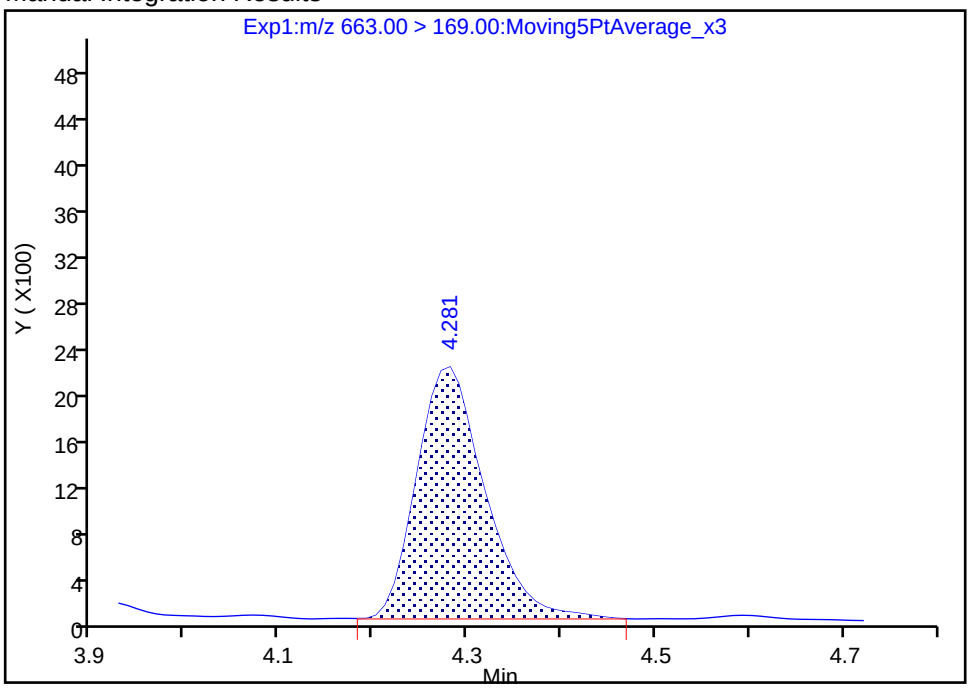
Processing Integration Results

RT: 4.28
Area: 10435
Amount: 0.026719
Amount Units: ng/ml



Manual Integration Results

RT: 4.28
Area: 11098
Amount: 0.026719
Amount Units: ng/ml



Reviewer: roycea, 11-Apr-2018 09:11:49
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 10-Apr-2018 18:47:28 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:51:01 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:13:40

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	1.436	1.431	0.005	1.000	6122262	2.47		98.6	45490	
2 Perfluorobutyric acid										
212.90 > 169.00	1.436	1.432	0.004	1.000	112834	0.0496		99.2	64.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.703	1.699	0.004	0.558	3926283	2.45		98.1	81057	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.703	1.699	0.004	1.000	95082	0.0508		102	82.0	
D 47 13C3-PFBS										
301.90 > 83.00	1.739	1.735	0.004	1.000	82315	2.24		96.4	726	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.736	0.003	1.000	129549	0.0467		106	581	
298.90 > 99.00	1.739	1.736	0.003	1.000	54808		2.36(1.25-3.74)	106	750	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.950	1.950	0.0	1.000	28749	0.0506		108	1649	
D 60 M2-4:2FTS										
329.00 > 81.00	1.950	1.950	0.0	1.000	603123	NC			6638	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.993	1.985	0.008	1.000	88785	0.0513		103	187	
313.00 > 119.00	1.993	1.985	0.008	1.000	8724		10.18(5.03-15.10)	103	121	
D 7 13C2 PFHxA										
315.00 > 270.00	1.993	1.985	0.008	1.000	4260718	2.41		96.3	104826	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.016	2.008	0.008	1.000	122406	0.0483		103	896	
349.00 > 99.00	2.004	2.008	-0.004	0.994	46264		2.65(1.36-4.07)	103	913	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.084	2.084	0.0	1.000	297607	NC			6443	

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	2.095	2.087	0.008	1.005	13126	NC			93.1	
D 9 13C4-PFHpA										
367.00 > 322.00	2.321	2.314	0.007	1.000	4420246	2.57		103	71318	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.321	2.314	0.007	1.000	79218	0.0448		89.5	85.7	
363.00 > 169.00	2.321	2.314	0.007	1.000	35808		2.21(1.13-3.40)	89.5	164	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.321	2.323	-0.002	0.994	118037	0.0485		107	408	
399.00 > 99.00	2.334	2.323	0.011	1.000	37872		3.12(1.50-4.49)	107	437	
D 11 18O2 PFHxS										
403.00 > 84.00	2.334	2.327	0.007	1.000	5080567	2.39		101	118670	
65 Adona										
377.00 > 251.00	2.360	2.360	0.0	1.000	264804	NC			3382	
377.00 > 85.00	2.360	2.360	0.0	1.000	154875		1.71(0.84-2.53)		3689	
D 12 M2-6:2FTS										
429.00 > 81.00	2.653	2.649	0.004	1.000	829435	2.25		94.6	10696	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.653	2.649	0.004	1.000	32205	0.0545		115	547	
D 14 13C4 PFOA										
417.00 > 372.00	2.675	2.673	0.002	1.000	4186198	2.45		97.8	105368	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.674	0.001		4613805	2.50			88596	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.674	0.001	1.000	101372	0.0524		105	60.7	
413.00 > 169.00	2.675	2.674	0.001	1.000	56802		1.78(0.84-2.52)	105	205	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.683	2.680	0.003	1.000	93755	0.0468		98.4	815	
449.00 > 99.00	2.683	2.680	0.003	1.000	23808		3.94(1.94-5.82)	98.4	554	
D 18 13C4 PFOS										
503.00 > 80.00	3.043	3.041	0.002	1.000	3602676	2.42		101	24509	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.043	3.042	0.001	1.000	74043	0.0452		97.3	267	
499.00 > 99.00	3.050	3.042	0.008	1.002	15924		4.65(2.31-6.93)	97.3	249	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.050	3.043	0.007	1.000	81721	0.0531		106	203	
463.00 > 169.00	3.050	3.043	0.007	1.000	20435		4.00(1.90-5.69)	106	366	
D 19 13C5 PFNA										
468.00 > 423.00	3.050	3.045	0.005	1.000	3691890	2.51		100	88911	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.257	3.253	0.004	1.000	130088	NC			3608	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.395	3.388	0.007	1.000	58744	0.0488		102	794	
549.00 > 99.00	3.395	3.388	0.007	1.000	21166		2.78(1.33-3.97)	102	527	
D 26 M2-8:2FTS										
529.00 > 81.00	3.395	3.390	0.005	1.000	1101099	2.48		103	10682	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.395	3.393	0.002	1.000	27294	0.0469		97.9	1136	

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	3.404	3.397	0.007	1.000	4658336	2.51		100	52005	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.404	3.401	0.003	1.000	97271	0.0516		103	2312	
D 23 13C2 PFDA										
515.00 > 470.00	3.404	3.401	0.003	1.000	2912736	2.36		94.2	67644	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.404	3.402	0.002	1.000	64415	0.0536		107	275	
513.00 > 169.00	3.404	3.402	0.002	1.000	11191		5.76(2.36-7.09)	107	302	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.553	3.553	0.0	1.000	1708589	2.44		97.5	20700	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.563	3.558	0.005	1.003	30316	0.0445		89.0	308	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.716	3.715	0.001	1.000	44930	0.0459		95.2	493	
599.00 > 99.00	3.716	3.715	0.001	1.000	14514		3.10(1.39-4.16)	95.2	960	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.727	3.722	0.005	1.000	1730407	2.50		100	16886	
D 30 13C2 PFUnA										
565.00 > 520.00	3.727	3.727	0.0	1.000	2662627	2.50		99.8	58782	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.727	3.727	0.0	1.000	34358	0.0531		106	684	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.737	3.727	0.010	1.003	48726	0.0541		108	200	
563.00 > 169.00	3.727	3.727	0.0	1.000	13759		3.54(2.12-6.36)	108	342	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.883	3.883	0.0	1.000	214741	NC			3908	
D 36 13C2 PFDoA										
615.00 > 570.00	4.027	4.017	0.010	1.000	2928766	2.54		102	34702	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.027	4.020	0.007	1.000	56140	0.0460		91.9	63.9	
613.00 > 169.00	4.027	4.020	0.007	1.000	16582		3.39(2.13-6.40)	91.9	256	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.279	4.278	0.001	1.000	70835	0.0498		99.5	65.7	
663.00 > 169.00	4.279	4.278	0.001	1.000	22777		3.11(1.25-3.76)	99.5	277	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.520	4.513	0.007	1.000	3578927	2.45		98.0	23308	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.510	4.513	-0.003	0.998	19373	0.0539		108	235	
713.00 > 219.00	4.510	4.513	-0.003	0.998	13443		1.44(0.71-2.13)	108	289	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.921	4.918	0.003	1.000	5873165	2.47		98.8	20125	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.921	4.920	0.001	1.000	156018	NC			51.2	
813.00 > 169.00	4.921	4.920	0.001	1.000	25268		6.17(2.86-8.58)		222	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.269	5.268	0.001	1.000	116814	NC			34.4	
913.00 > 169.00	5.269	5.268	0.001	1.000	14479		8.07(3.83-11.48)		141	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00004 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:51:03 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_003.d

Injection Date: 10-Apr-2018 18:47:28 Instrument ID: A8_N

Lims ID: IC L2 Full

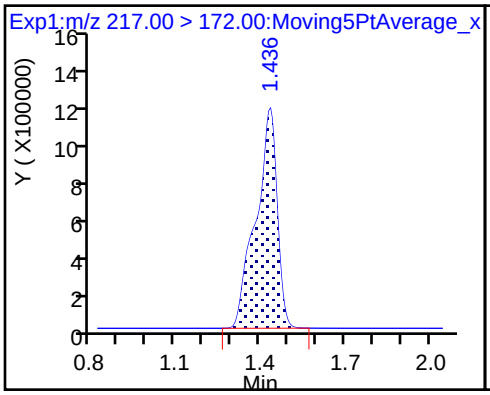
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

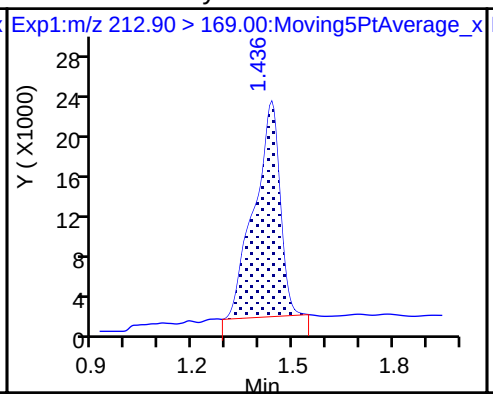
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

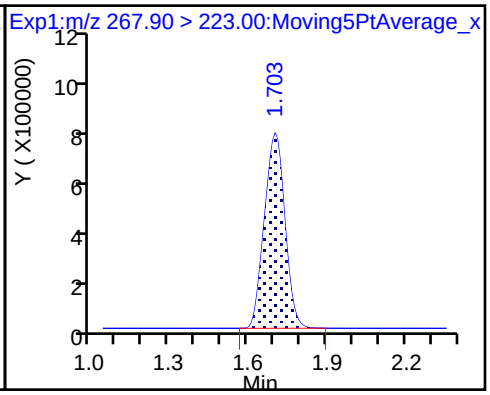
D 1 13C4 PFBA



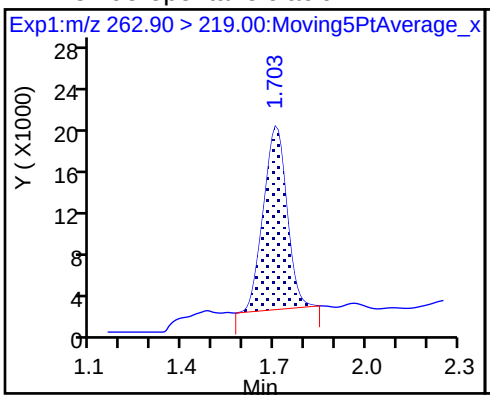
2 Perfluorobutyric acid



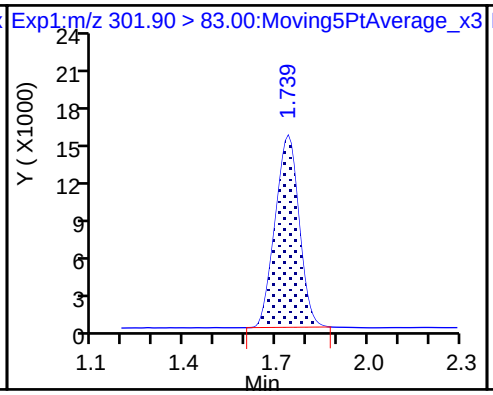
D 3 13C5-PFPeA



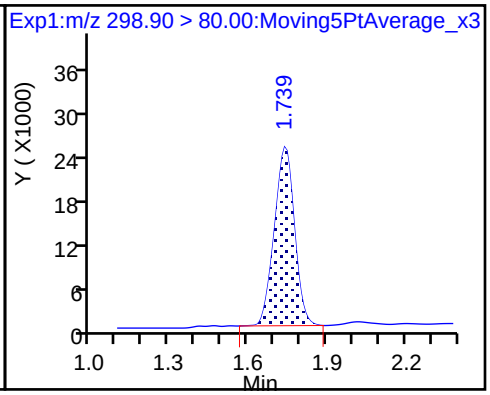
4 Perfluoropentanoic acid



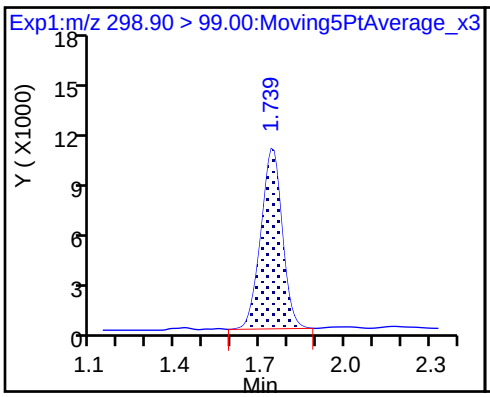
D 47 13C3-PFBS



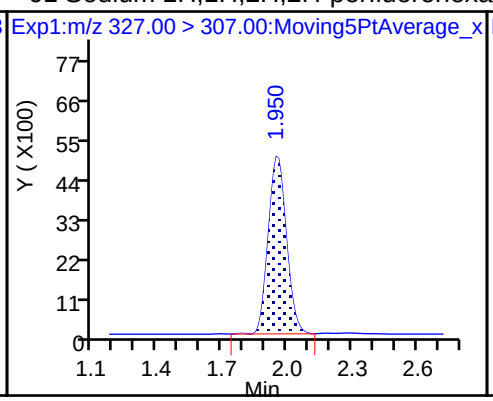
5 Perfluorobutanesulfonic acid



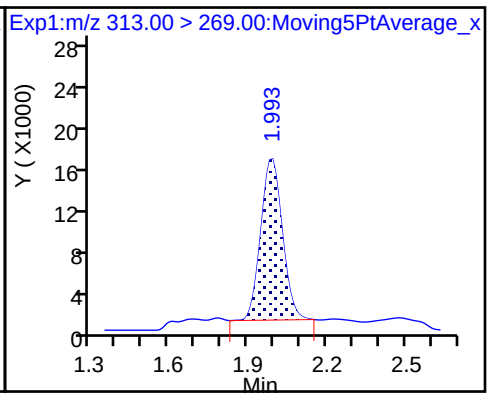
5 Perfluorobutanesulfonic acid



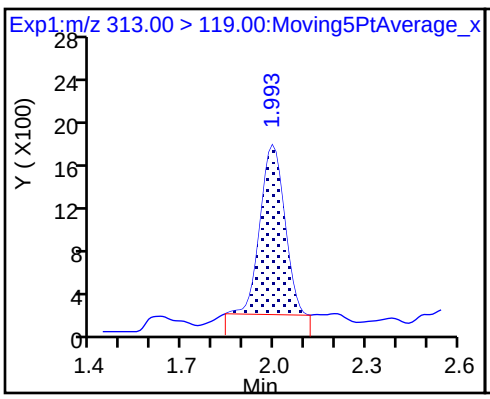
61 Sodium 1H,1H,2H,2H-perfluorohexane



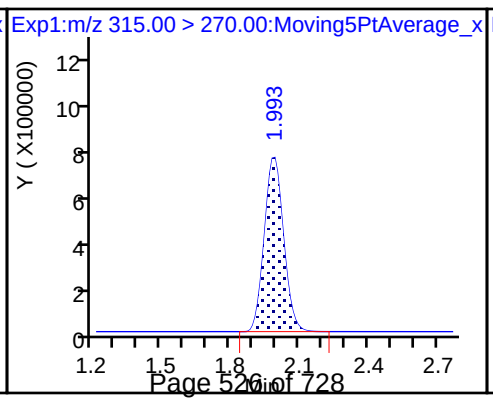
6 Perfluorohexanoic acid



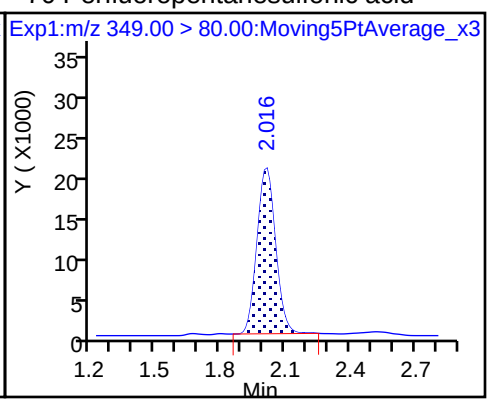
6 Perfluorohexanoic acid



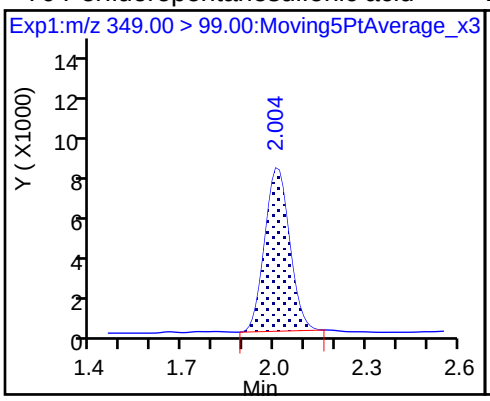
D 7 13C2 PFHxA



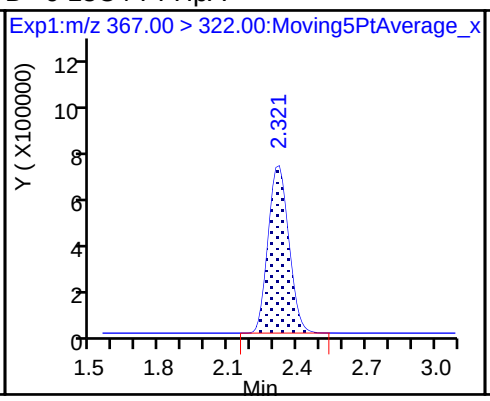
70 Perfluoropentanesulfonic acid



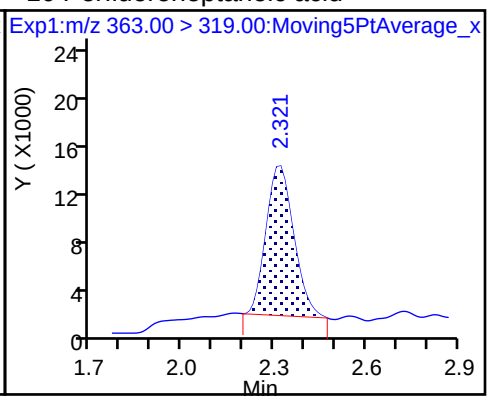
70 Perfluoropentanesulfonic acid



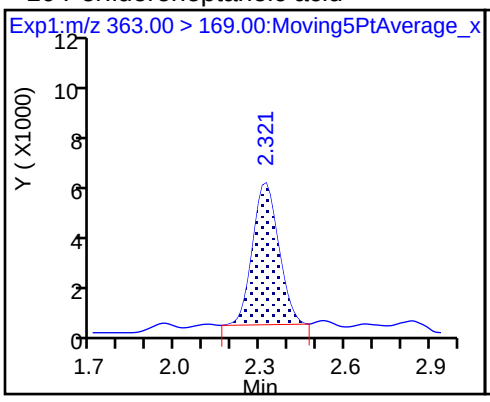
D 9 13C4-PFHpA



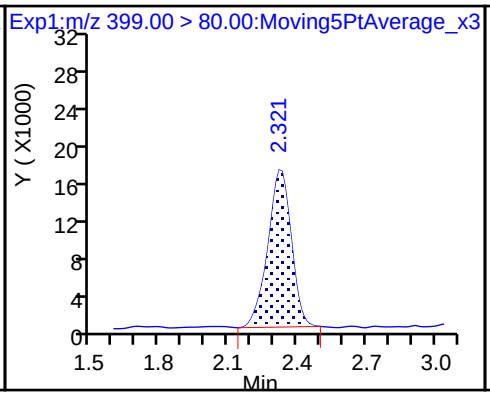
10 Perfluoroheptanoic acid



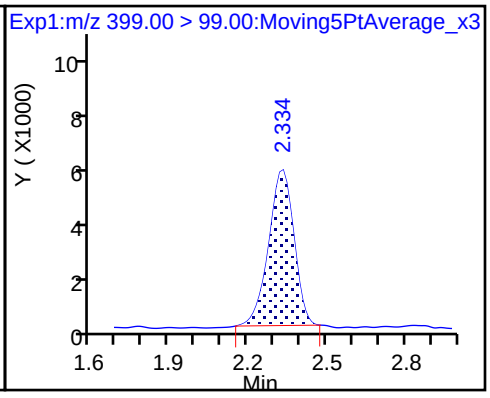
10 Perfluoroheptanoic acid



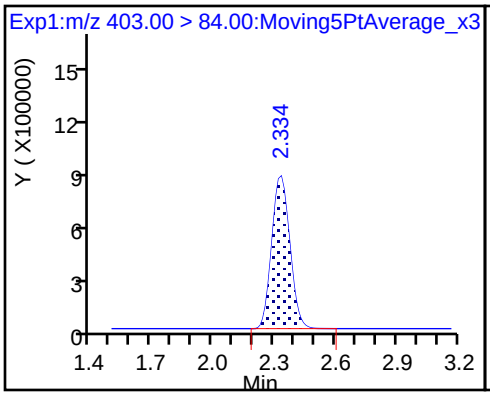
8 Perfluorohexanesulfonic acid



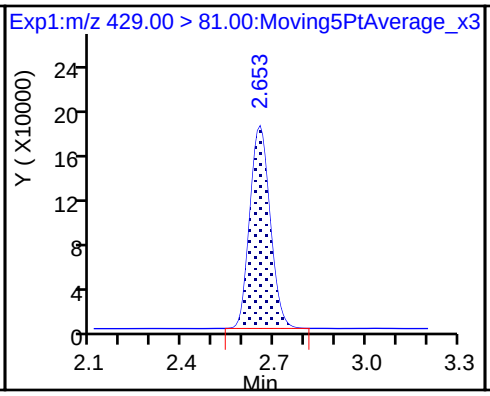
8 Perfluorohexanesulfonic acid



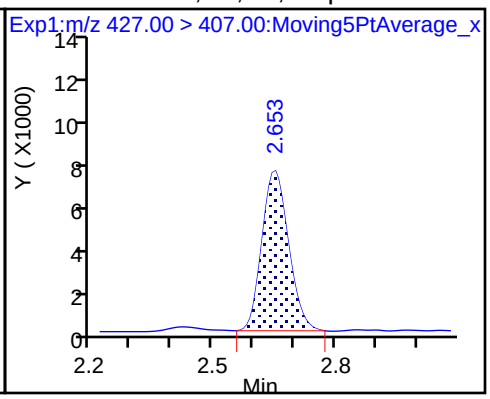
D 11 18O2 PFHxS



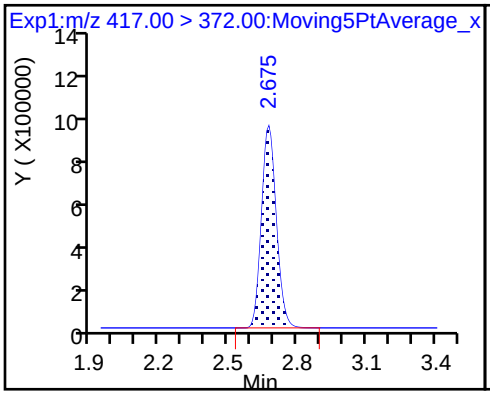
D 12 M2-6:2FTS



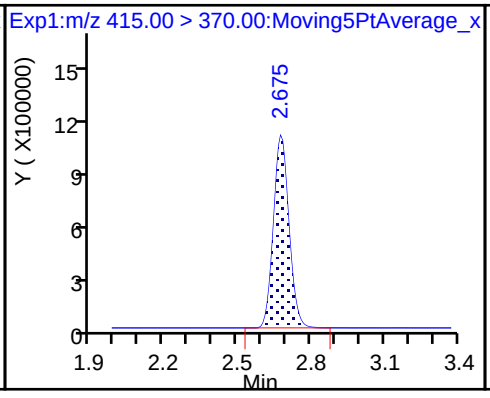
13 Sodium 1H,1H,2H,2H-perfluorooctane



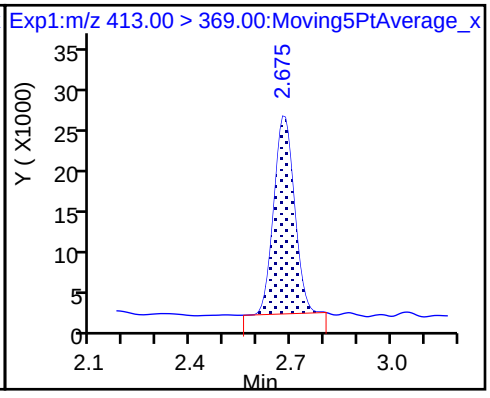
D 14 13C4 PFOA



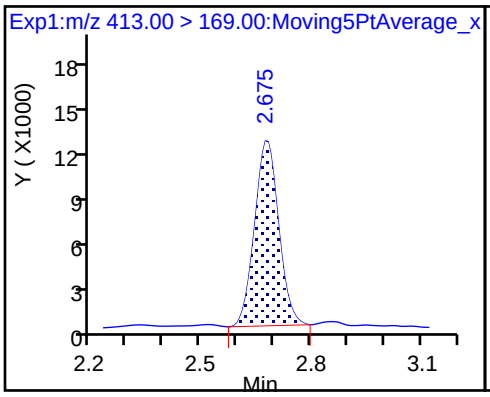
* 62 13C2-PFOA



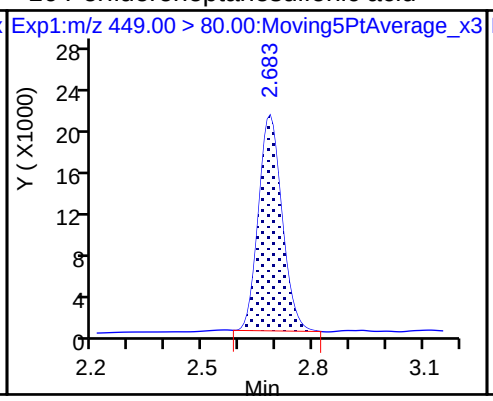
15 Perfluorooctanoic acid



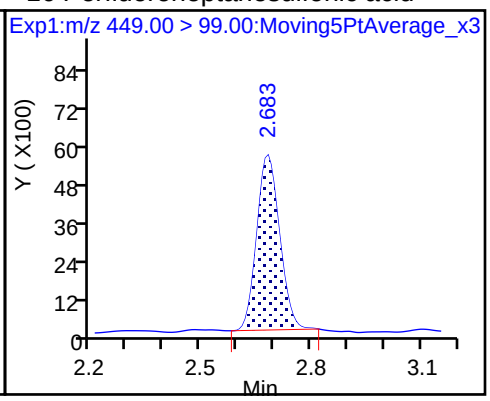
15 Perfluorooctanoic acid



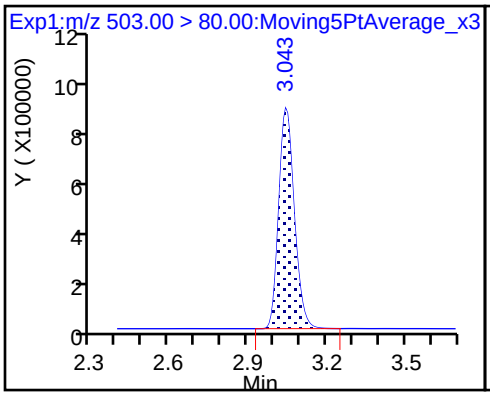
16 Perfluoroheptanesulfonic acid



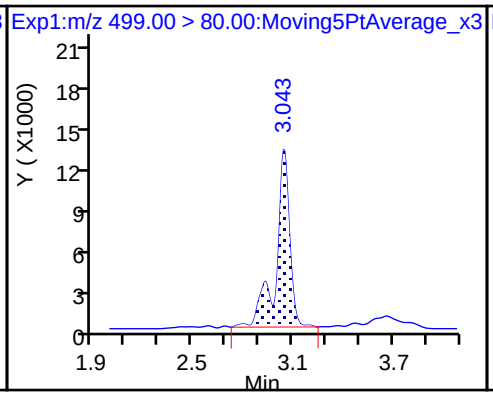
16 Perfluoroheptanesulfonic acid



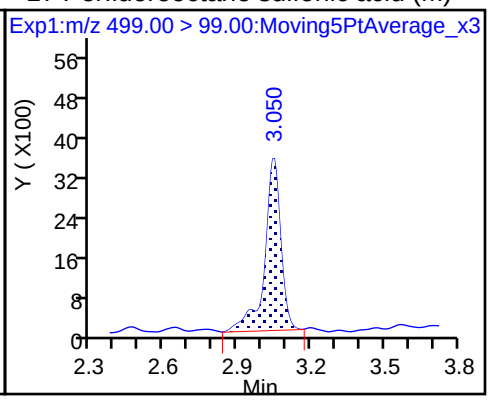
D 18 13C4 PFOS



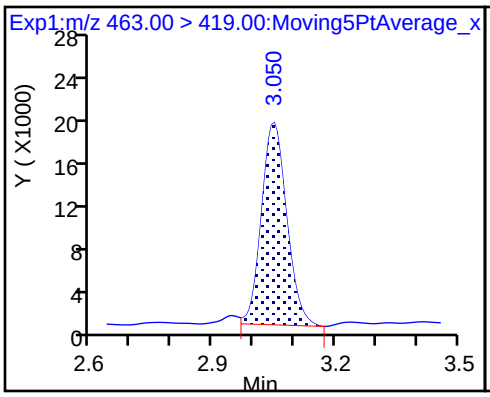
17 Perfluorooctane sulfonic acid



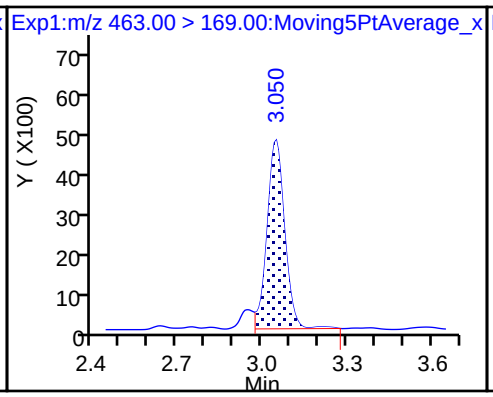
17 Perfluorooctane sulfonic acid (M)



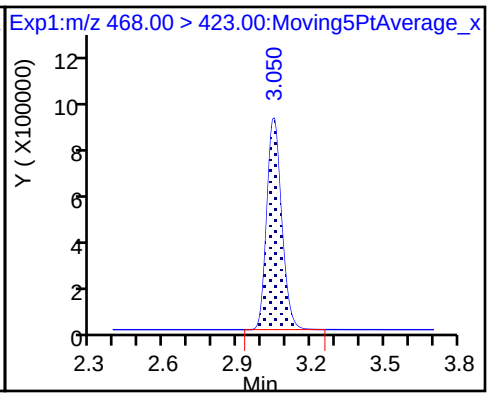
20 Perfluorononanoic acid



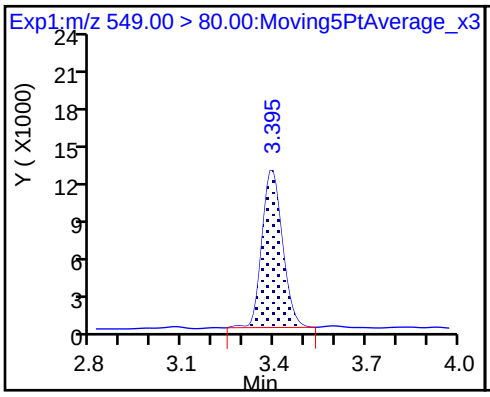
20 Perfluorononanoic acid



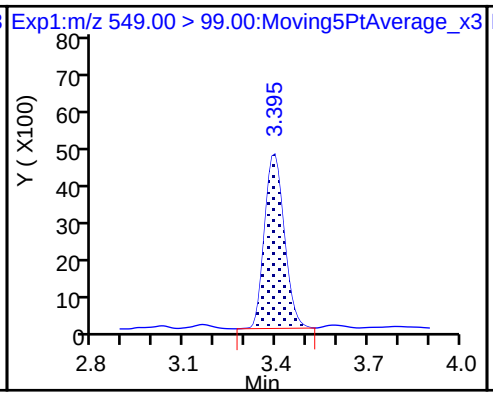
D 19 13C5 PFNA



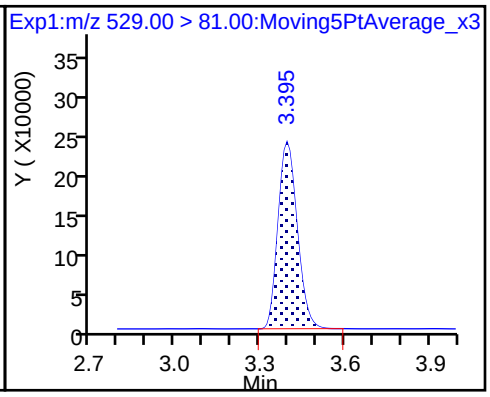
68 Perfluorononanesulfonic acid



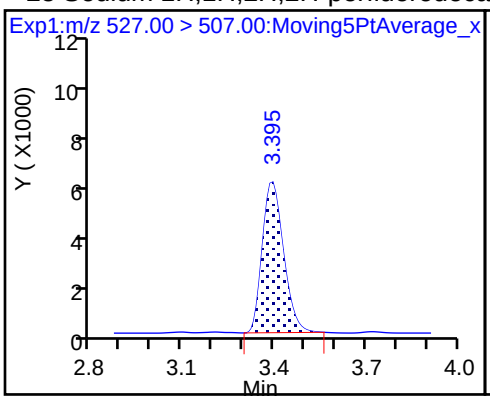
68 Perfluorononanesulfonic acid



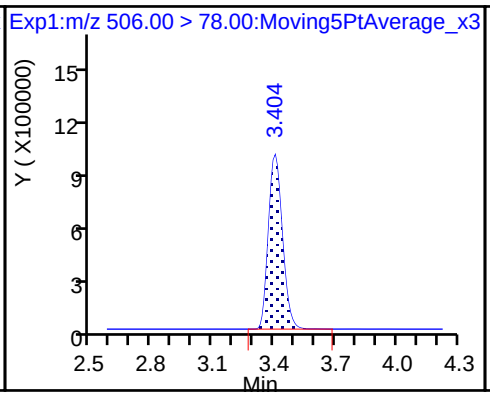
D 26 M2-8:2FTS



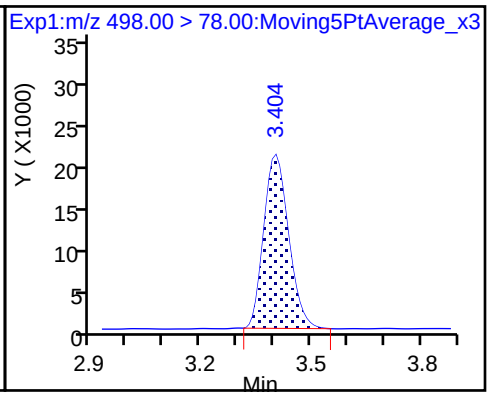
25 Sodium 1H,1H,2H,2H-perfluorodecane



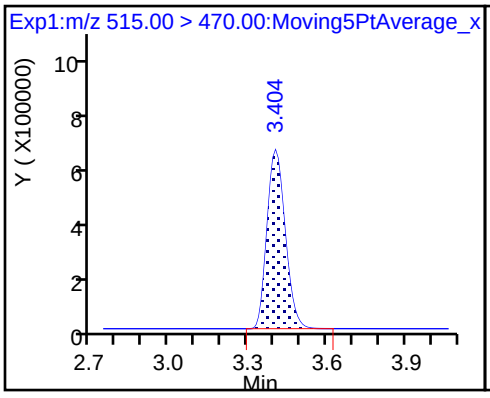
D 21 13C8 FOSA



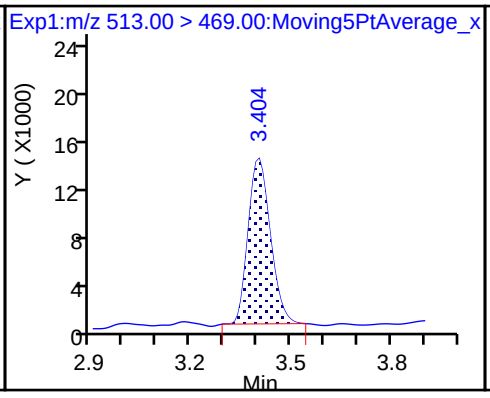
22 Perfluorooctane Sulfonamide



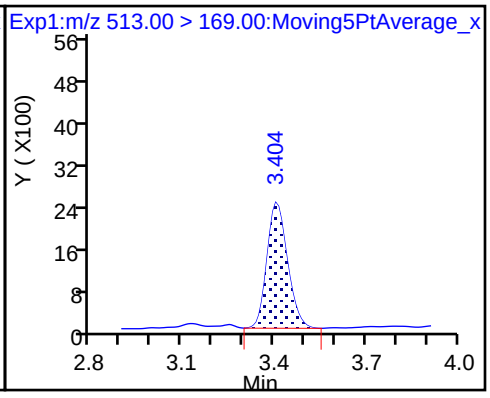
D 23 13C2 PFDA



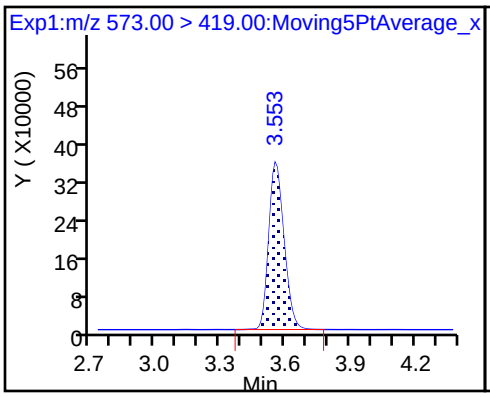
24 Perfluorodecanoic acid



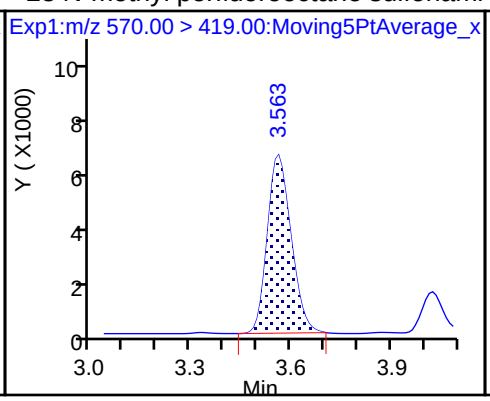
24 Perfluorodecanoic acid



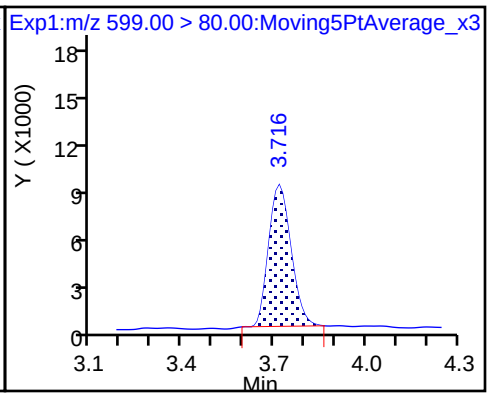
D 27 d3-NMeFOSAA



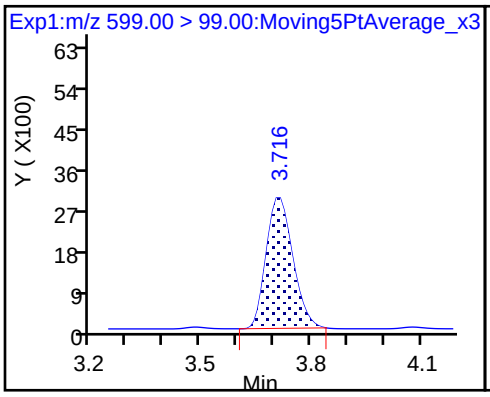
28 N-methyl perfluorooctane sulfonami



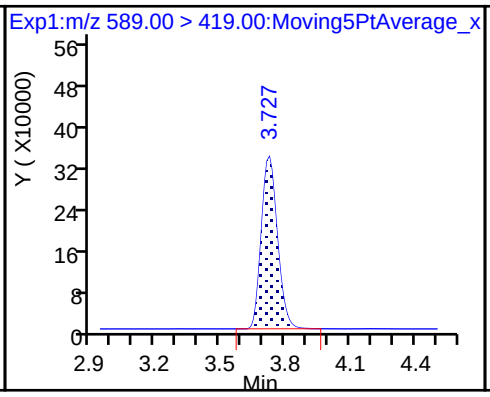
29 Perfluorodecane Sulfonic acid



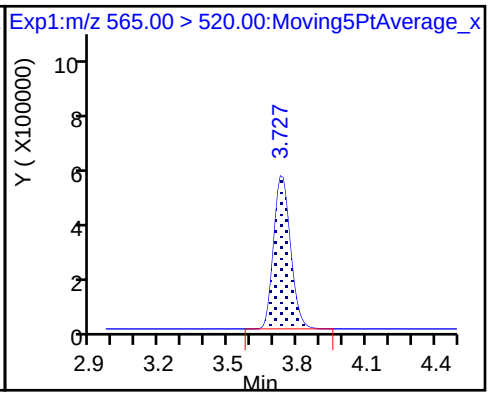
29 Perfluorodecane Sulfonic acid



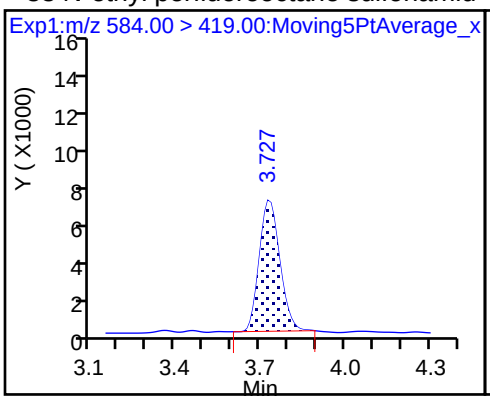
D 32 d5-NEtFOSAA



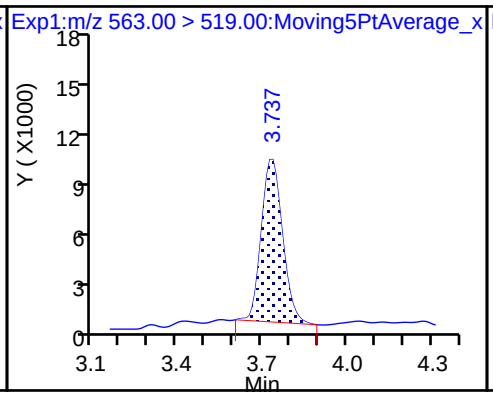
D 30 13C2 PFUnA



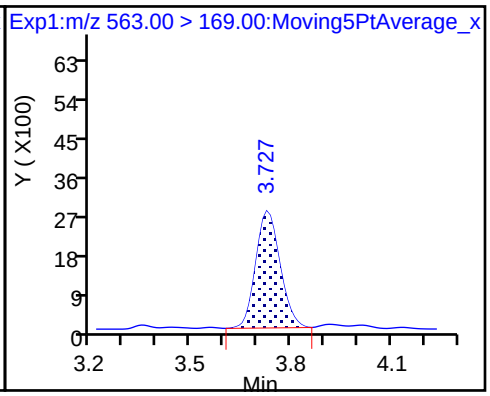
33 N-ethyl perfluorooctane sulfonamid



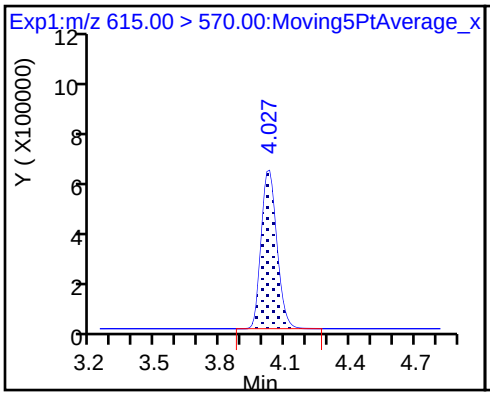
31 Perfluoroundecanoic acid



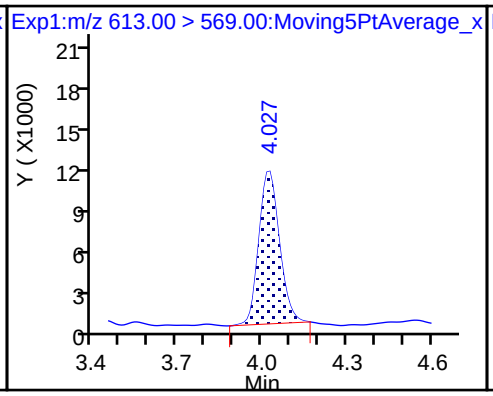
31 Perfluoroundecanoic acid



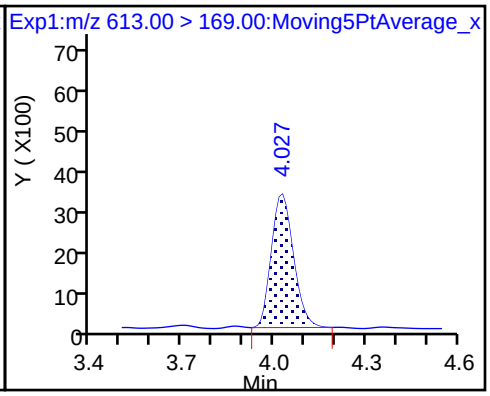
D 36 13C2 PFDoA



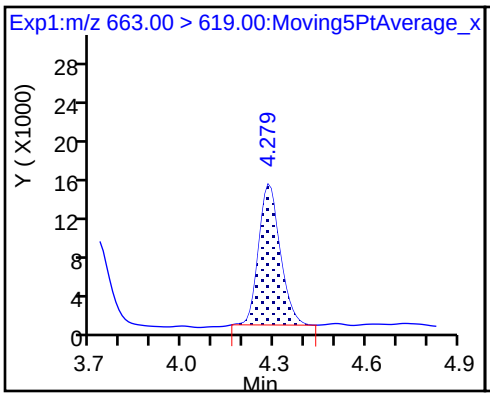
37 Perfluorododecanoic acid



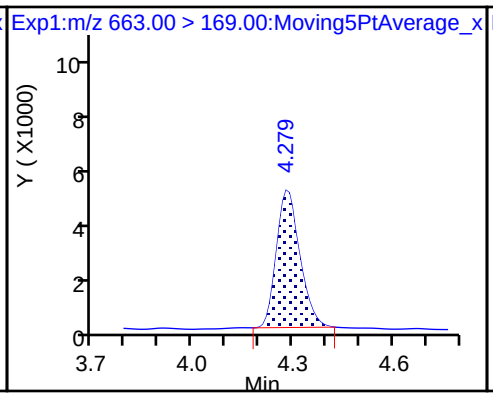
37 Perfluorododecanoic acid



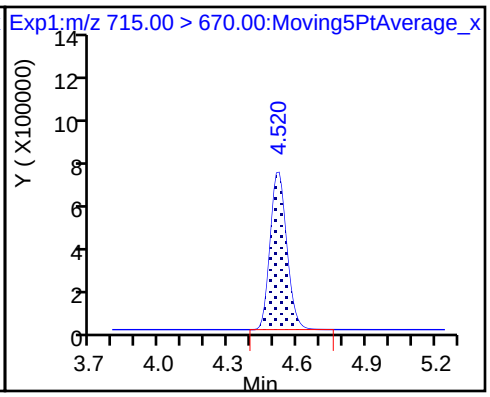
41 Perfluorotridecanoic acid



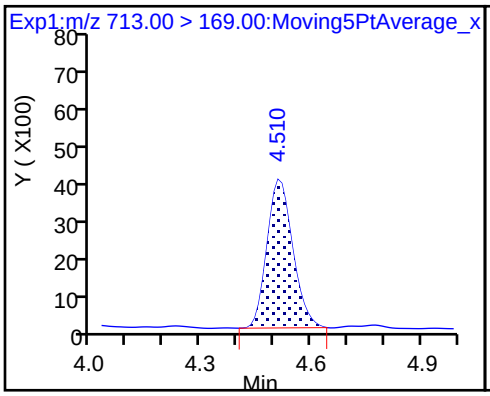
41 Perfluorotridecanoic acid



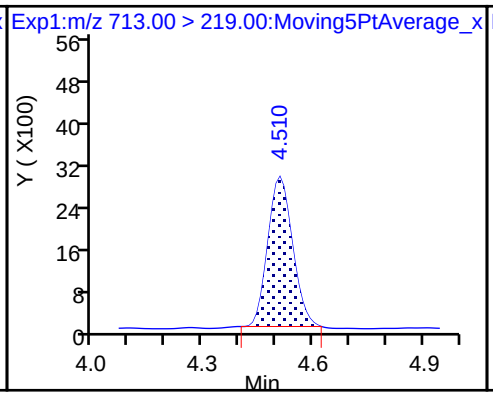
D 43 13C2-PFTeDA



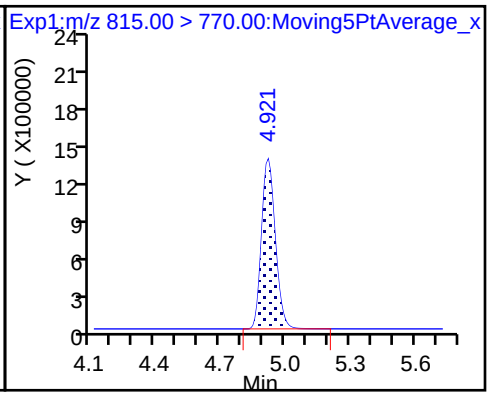
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

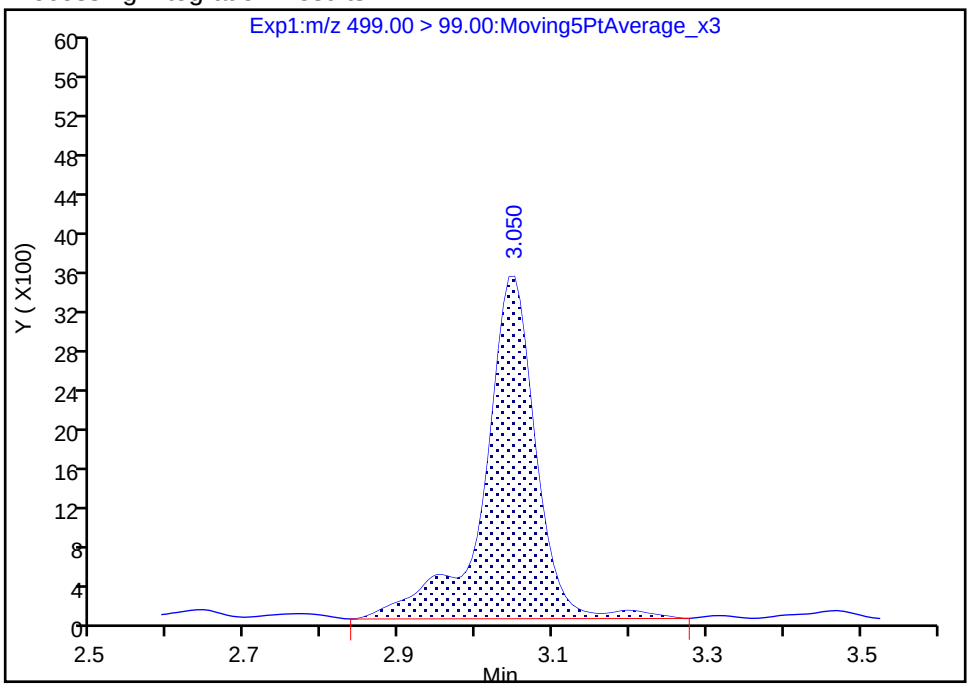
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_003.d
Injection Date: 10-Apr-2018 18:47:28 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

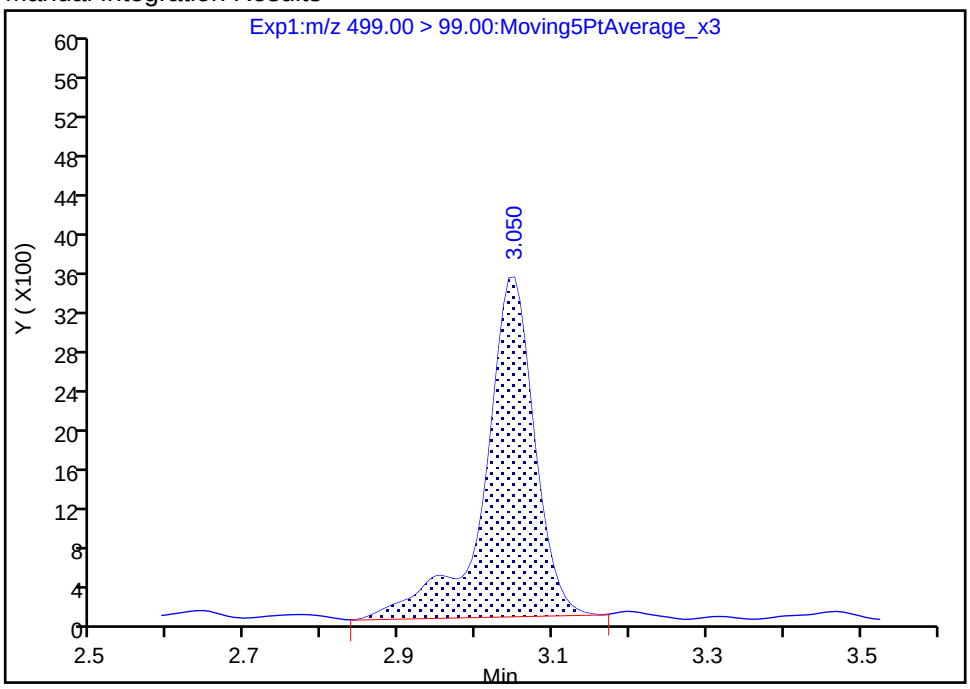
Processing Integration Results

RT: 3.05
Area: 16662
Amount: 0.045154
Amount Units: ng/ml



Manual Integration Results

RT: 3.05
Area: 15924
Amount: 0.045154
Amount Units: ng/ml



Reviewer: roycea, 11-Apr-2018 09:13:05
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 10-Apr-2018 18:55:18 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:51:05 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:15:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.435	1.431	0.004	1.000	6279614	2.40		96.1	48122	
2 Perfluorobutyric acid										
212.90 > 169.00	1.435	1.432	0.003	1.000	580880	0.2490		99.6	342	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.699	0.003	1.000	467549	0.2434		97.4	427	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.699	0.003	0.558	4029236	2.39		95.7	84337	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.735	0.003	1.000	85829	2.22		95.5	892	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.738	1.736	0.002	1.000	642890	0.2225		101	3140	
298.90 > 99.00	1.738	1.736	0.002	1.000	274212		2.34(1.25-3.74)	101	4317	
D 60 M2-4:2FTS										
329.00 > 81.00	1.948	1.950	-0.002	1.000	625222	NC			5849	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.948	1.950	-0.002	1.000	139275	0.2353		101	8215	
D 7 13C2 PFHxA										
315.00 > 270.00	1.992	1.985	0.007	1.000	4589544	2.46		98.5	114865	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.992	1.985	0.007	1.000	453023	0.2428		97.1	1126	
313.00 > 119.00	1.992	1.985	0.007	1.000	45129		10.04(5.03-15.10)	97.1	510	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.015	2.008	0.007	1.000	625836	0.2371		101	5727	
349.00 > 99.00	2.003	2.008	-0.005	0.994	236948		2.64(1.36-4.07)	101	6870	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.082	2.084	-0.002	1.000	260156	NC			6351	

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	2.094	2.087	0.007	1.005	76650	NC			612	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.320	2.314	0.006	1.000	443829	0.2536		101	594	
363.00 > 169.00	2.320	2.314	0.006	1.000	183548		2.42(1.13-3.40)	101	819	
D 9 13C4-PFHpA										
367.00 > 322.00	2.320	2.314	0.006	1.000	4371595	2.41		96.4	64932	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.333	2.323	0.010	1.000	550837	0.2176		95.6	1709	
399.00 > 99.00	2.333	2.323	0.010	1.000	175057		3.15(1.50-4.49)	95.6	1638	
D 11 18O2 PFHxS										
403.00 > 84.00	2.333	2.327	0.006	1.000	5290521	2.36		100.0	79356	
65 Adona										
377.00 > 251.00	2.359	2.360	-0.001	1.000	1339859	NC			20372	
377.00 > 85.00	2.359	2.360	-0.001	1.000	772157		1.74(0.84-2.53)		16304	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.653	2.649	0.004	1.000	147222	0.2185		92.2	3008	
D 12 M2-6:2FTS										
429.00 > 81.00	2.653	2.649	0.004	1.000	946554	2.44		103	15607	
D 14 13C4 PFOA										
417.00 > 372.00	2.675	2.673	0.002	1.000	4391971	2.44		97.5	89680	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.674	0.001	1.000	501075	0.2469		98.7	266	
413.00 > 169.00	2.675	2.674	0.001	1.000	260669		1.92(0.84-2.52)	98.7	1136	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.674	0.001		4856867	2.50			62253	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.683	2.680	0.003	1.000	500192	0.2437		102	4655	
449.00 > 99.00	2.683	2.680	0.003	1.000	131175		3.81(1.94-5.82)	102	3786	
D 18 13C4 PFOS										
503.00 > 80.00	3.043	3.041	0.002	1.000	3695054	2.36		98.7	32380	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.050	3.042	0.008	1.002	378769	0.2252		97.1	1651	
499.00 > 99.00	3.043	3.042	0.001	1.000	94059		4.03(2.31-6.93)	97.1	1374	
20 Perfluorononanoic acid										
463.00 > 419.00	3.043	3.043	0.0	0.998	394004	0.2506		100	1139	
463.00 > 169.00	3.050	3.043	0.007	1.000	89167		4.42(1.90-5.69)	100	1764	
D 19 13C5 PFNA										
468.00 > 423.00	3.050	3.045	0.005	1.000	3769499	2.43		97.3	82628	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.257	3.253	0.004	1.000	659333	NC			17883	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.385	3.388	-0.003	1.000	287902	0.2330		97.1	4091	
549.00 > 99.00	3.395	3.388	0.007	1.003	106966		2.69(1.33-3.97)	97.1	2580	
D 26 M2-8:2FTS										
529.00 > 81.00	3.395	3.390	0.005	1.000	1105113	2.36		98.6	11270	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.395	3.393	0.002	1.000	123407	0.2114		88.3	6419	

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	3.404	3.397	0.007	1.000	4856180	2.48		99.3	57058	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.404	3.401	0.003	1.000	486733	0.2477		99.1	17148	
D 23 13C2 PFDA										
515.00 > 470.00	3.404	3.401	0.003	1.000	3141564	2.41		96.5	74258	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.404	3.402	0.002	1.000	302427	0.2333		93.3	1146	
513.00 > 169.00	3.404	3.402	0.002	1.000	51441		5.88(2.36-7.09)	93.3	1188	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.553	3.553	0.0	1.000	1807153	2.45		98.0	18609	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.562	3.558	0.004	1.003	182686	0.2534		101	1647	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.716	3.715	0.001	1.000	242056	0.2411		100	3016	
599.00 > 99.00	3.716	3.715	0.001	1.000	77912		3.11(1.39-4.16)	100	1891	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.726	3.722	0.004	1.000	1809132	2.48		99.4	15271	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.726	3.727	-0.001	1.000	166943	0.2469		98.7	2050	
D 30 13C2 PFUnA										
565.00 > 520.00	3.726	3.727	-0.001	1.000	2893419	2.58		103	82331	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.726	3.727	-0.001	1.000	218231	0.2231		89.2	981	
563.00 > 169.00	3.726	3.727	-0.001	1.000	53370		4.09(2.12-6.36)	89.2	1795	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.883	3.883	0.0	1.000	1099095	NC			17279	
D 36 13C2 PFDoA										
615.00 > 570.00	4.016	4.017	-0.001	1.000	3031255	2.50		100.0	32020	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.026	4.020	0.006	1.003	323392	0.2558		102	356	
613.00 > 169.00	4.026	4.020	0.006	1.003	76615		4.22(2.13-6.40)	102	964	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.279	4.278	0.001	1.000	353030	0.2396		95.8	325	
663.00 > 169.00	4.279	4.278	0.001	1.000	109952		3.21(1.25-3.76)	95.8	1133	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.510	4.513	-0.003	1.000	3729686	2.43		97.0	27846	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.510	4.513	-0.003	1.000	92073	0.2457		98.3	961	
713.00 > 219.00	4.510	4.513	-0.003	1.000	66153		1.39(0.71-2.13)	98.3	1347	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.921	4.918	0.003	1.000	6094708	2.44		97.4	18710	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.921	4.920	0.001	1.000	648936	NC			210	
813.00 > 169.00	4.921	4.920	0.001	1.000	100021		6.49(2.86-8.58)		777	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.269	5.268	0.001	1.000	616691	NC			178	
913.00 > 169.00	5.269	5.268	0.001	1.000	75406		8.18(3.83-11.48)		660	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00004 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:51:06 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_004.d

Injection Date: 10-Apr-2018 18:55:18 Instrument ID: A8_N

Lims ID: IC L3 Full

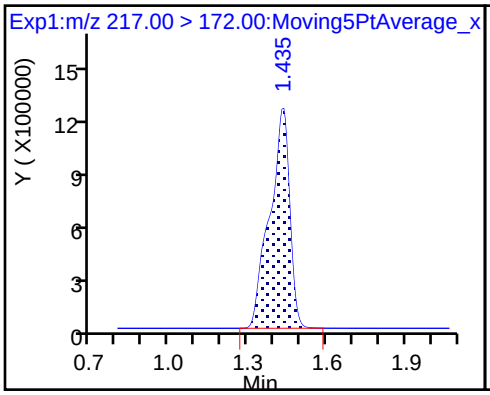
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4

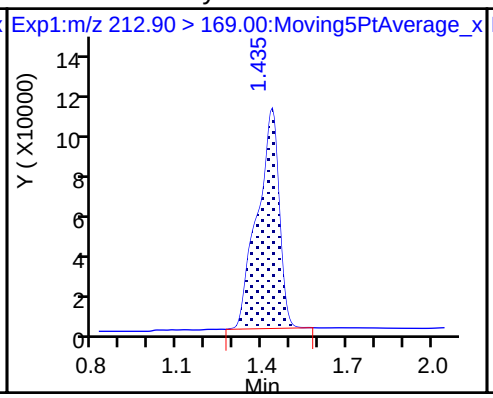
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

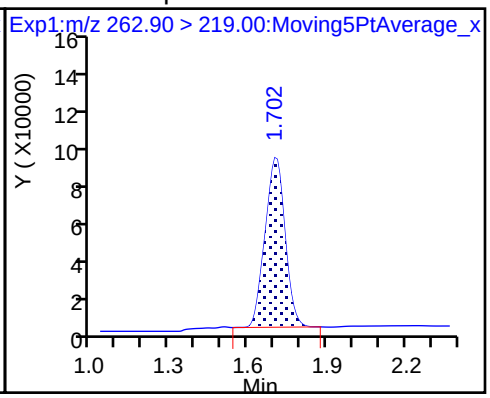
D 1 13C4 PFBA



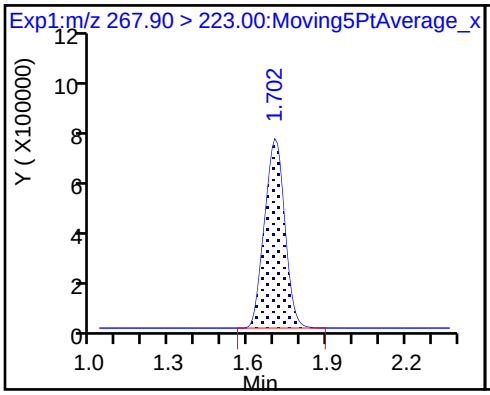
2 Perfluorobutyric acid



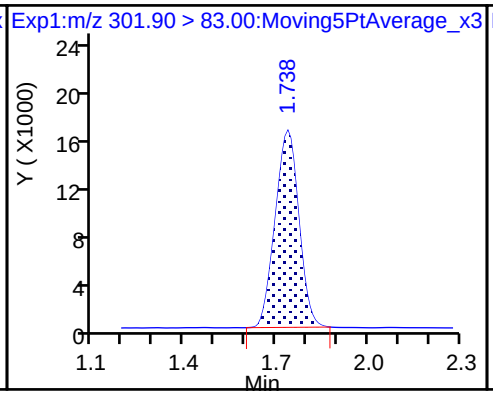
4 Perfluoropentanoic acid



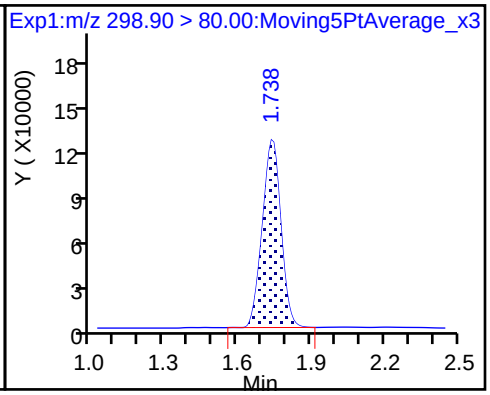
D 3 13C5-PFPeA



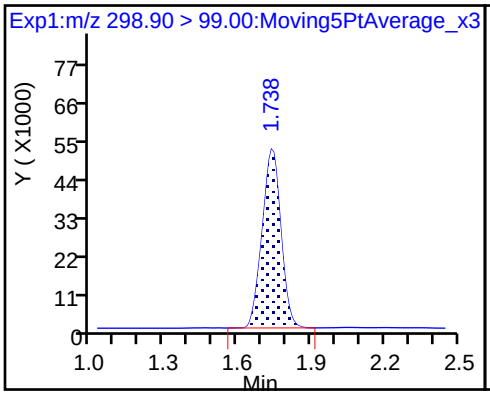
D 47 13C3-PFBS



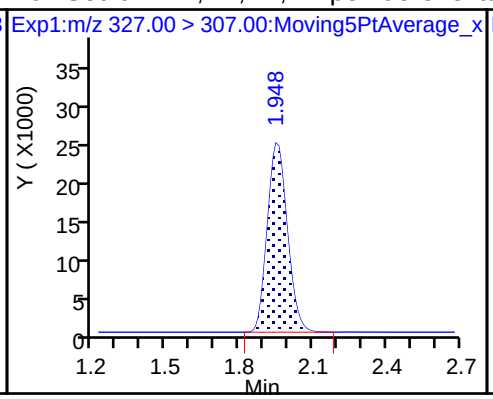
5 Perfluorobutanesulfonic acid



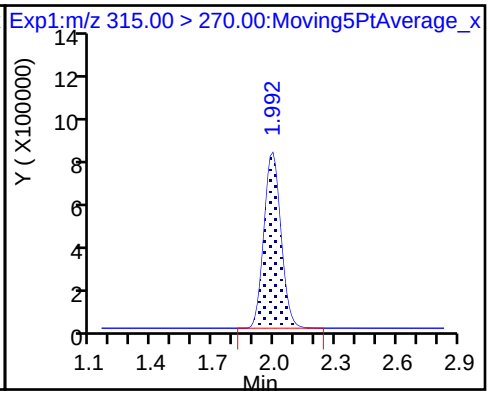
5 Perfluorobutanesulfonic acid



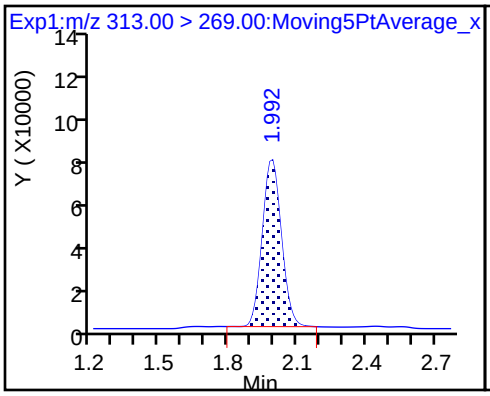
61 Sodium 1H,1H,2H,2H-perfluorohexa



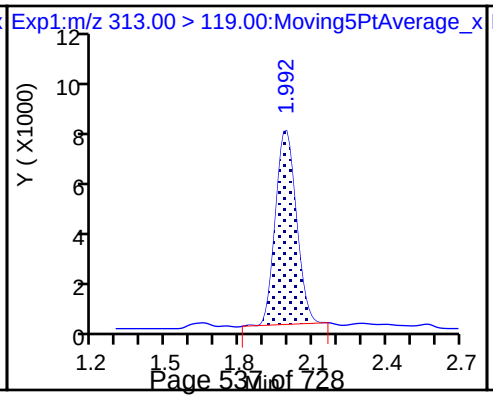
D 7 13C2 PFHxA



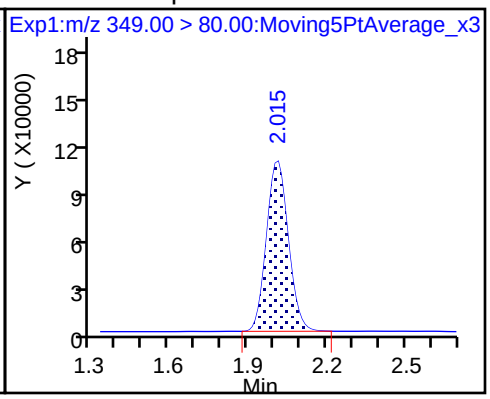
6 Perfluorohexanoic acid



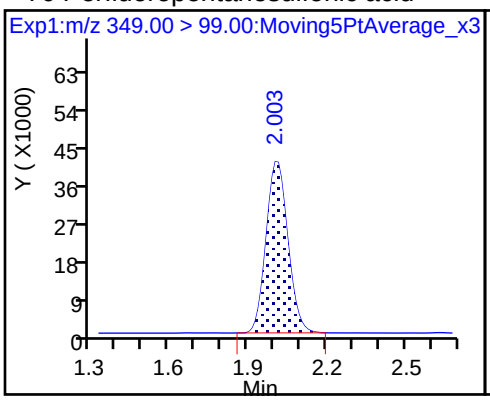
6 Perfluorohexanoic acid



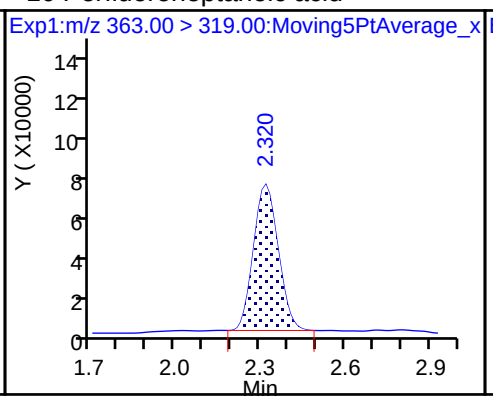
70 Perfluoropentanesulfonic acid



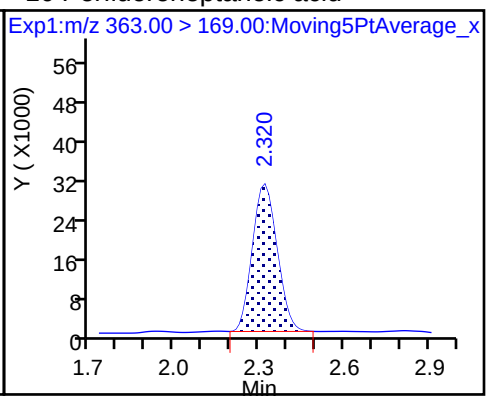
70 Perfluoropentanesulfonic acid



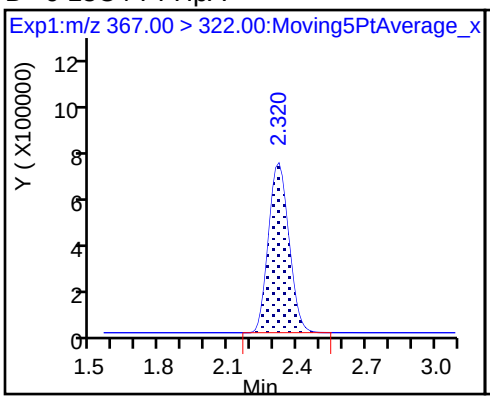
10 Perfluoroheptanoic acid



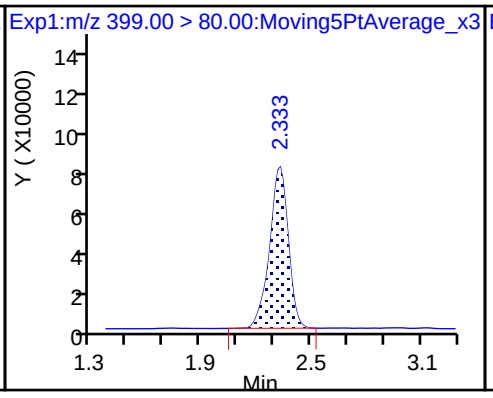
10 Perfluoroheptanoic acid



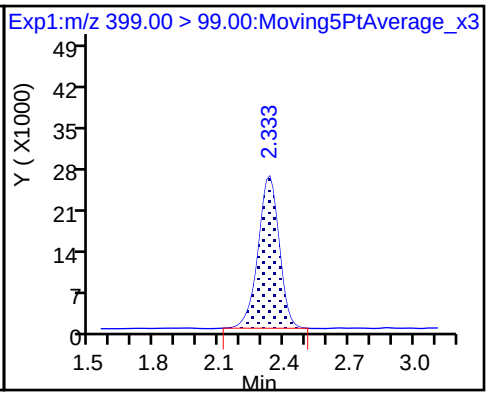
D 9 13C4-PFHpA



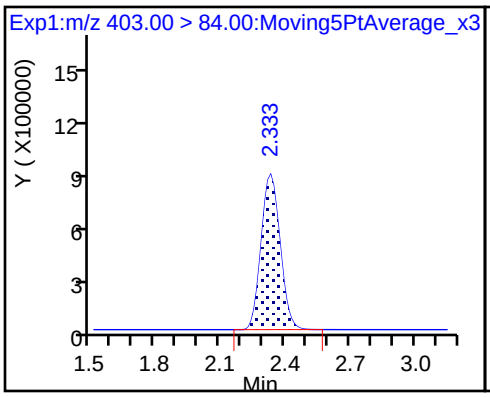
8 Perfluorohexanesulfonic acid



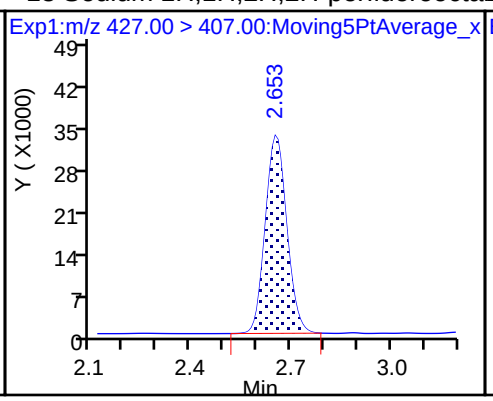
8 Perfluorohexanesulfonic acid



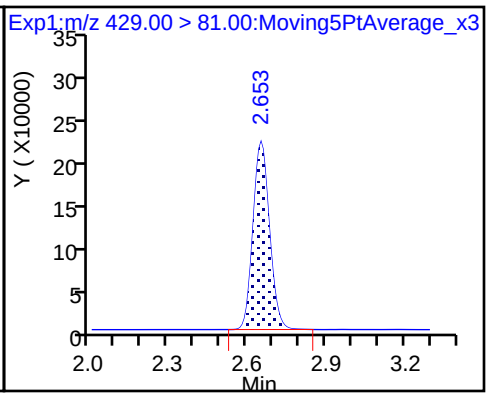
D 11 18O2 PFHxS



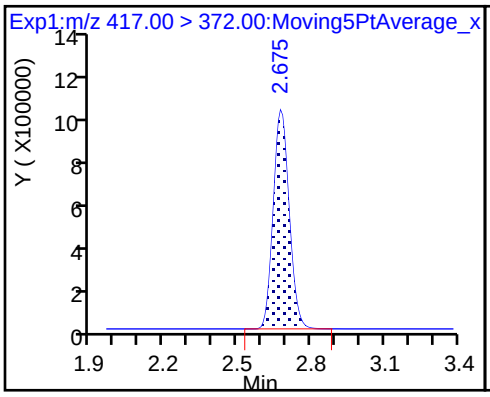
13 Sodium 1H,1H,2H,2H-perfluorooctane



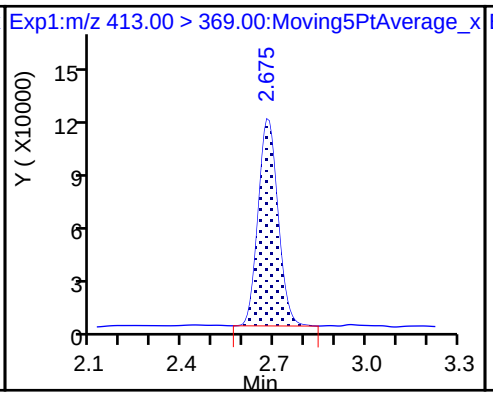
D 12 M2-6:2FTS



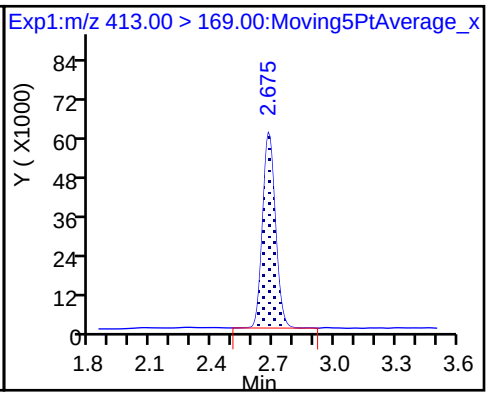
D 14 13C4 PFOA



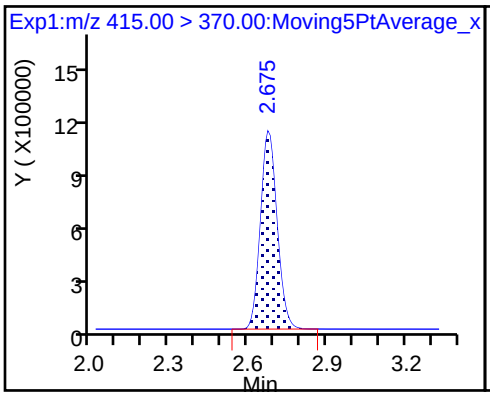
15 Perfluorooctanoic acid



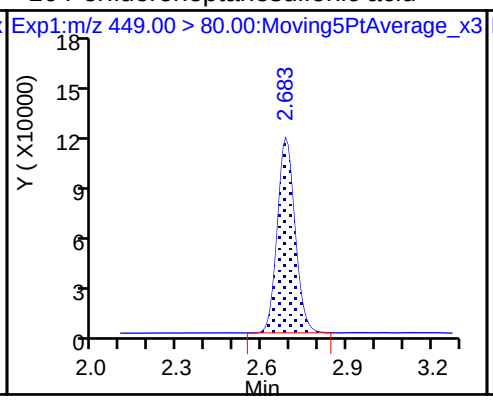
15 Perfluorooctanoic acid



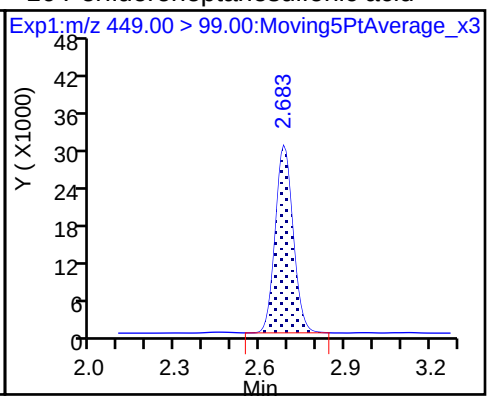
* 62 13C2-PFOA



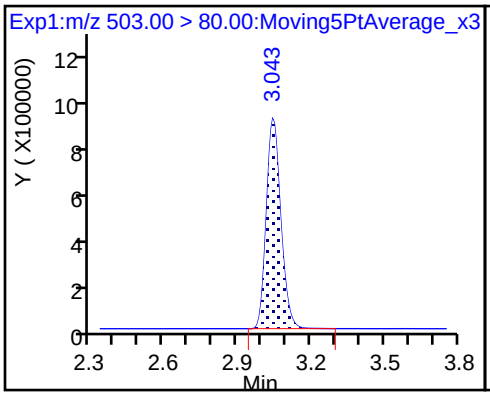
16 Perfluoroheptanesulfonic acid



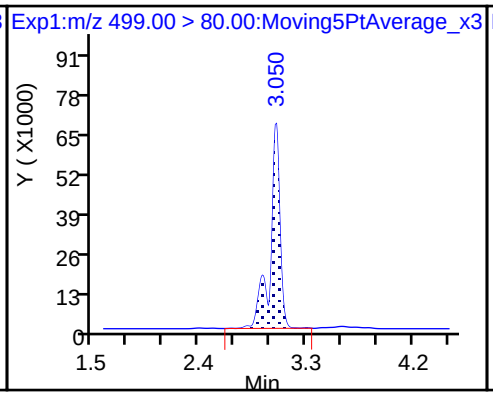
16 Perfluoroheptanesulfonic acid



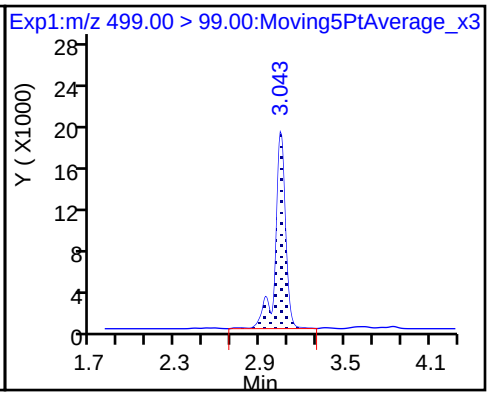
D 18 13C4 PFOS



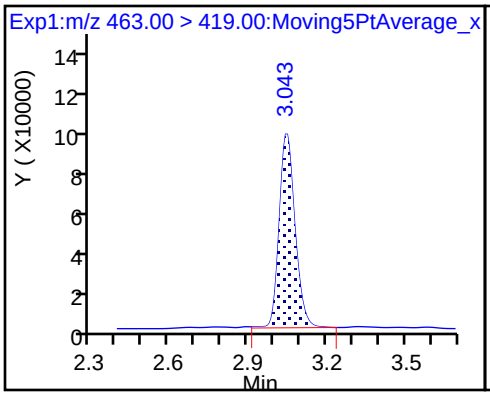
17 Perfluorooctane sulfonic acid



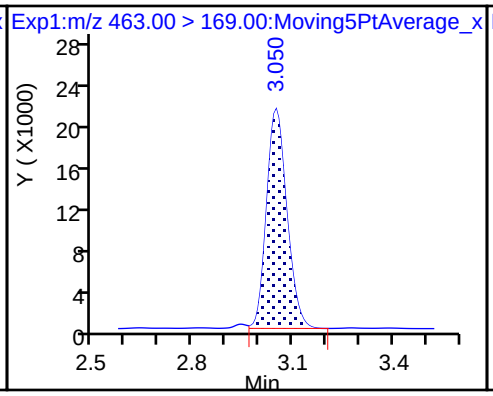
17 Perfluorooctane sulfonic acid



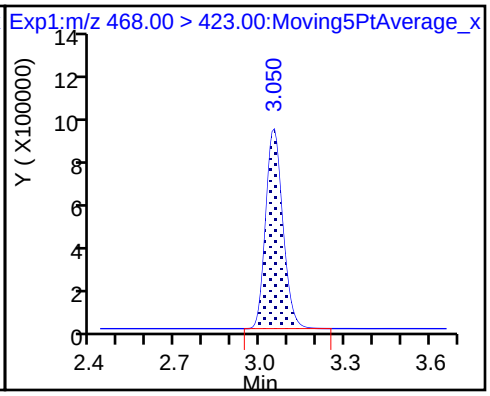
20 Perfluorononanoic acid



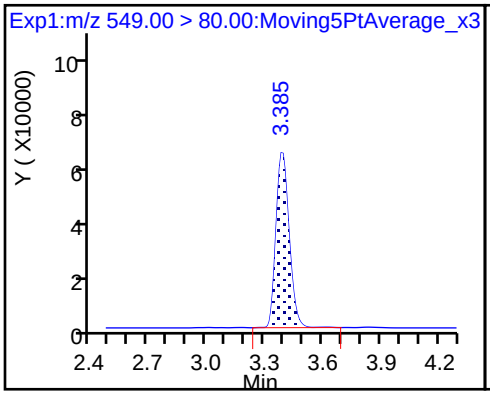
20 Perfluorononanoic acid



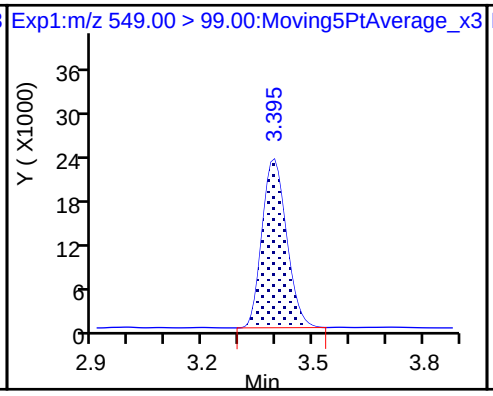
D 19 13C5 PFNA



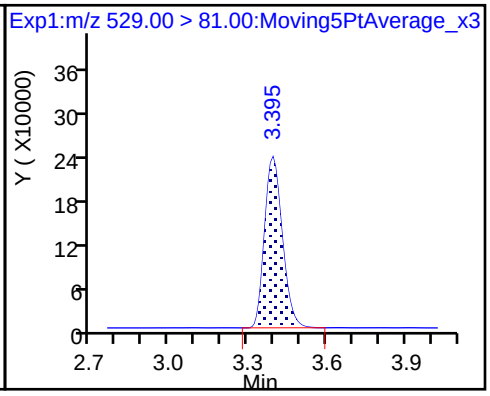
68 Perfluorononanesulfonic acid



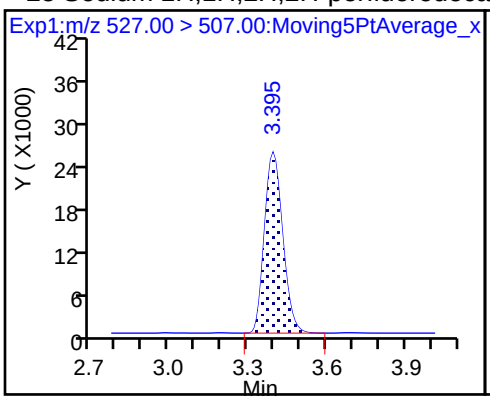
68 Perfluorononanesulfonic acid



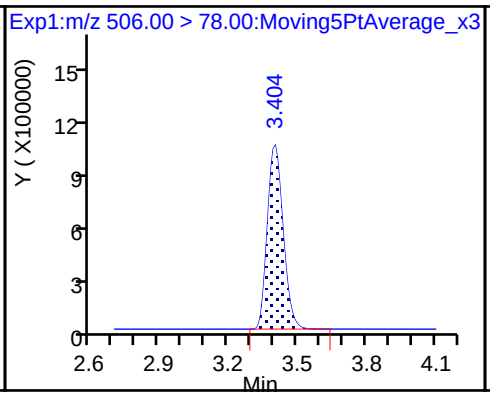
D 26 M2-8:2FTS



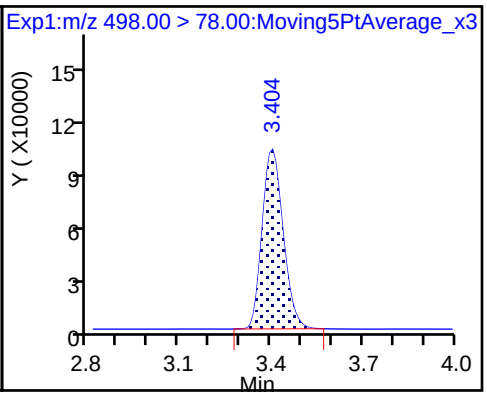
25 Sodium 1H,1H,2H,2H-perfluorodecane



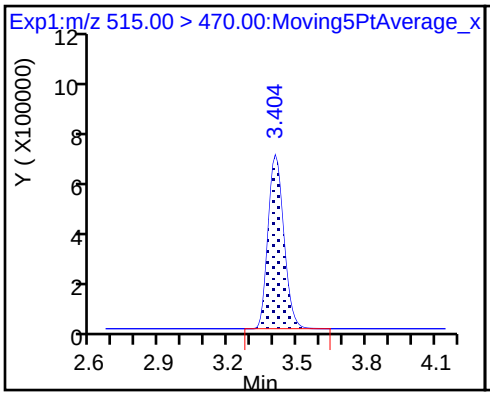
D 21 13C8 FOSA



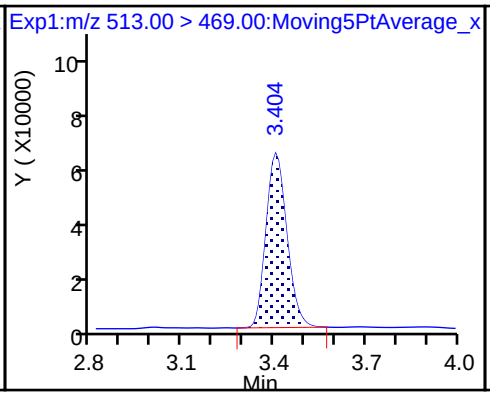
22 Perfluorooctane Sulfonamide



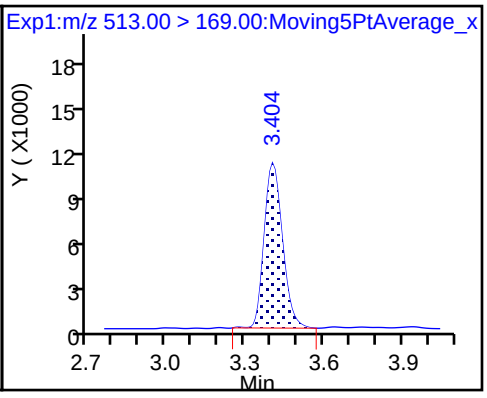
D 23 13C2 PFDA



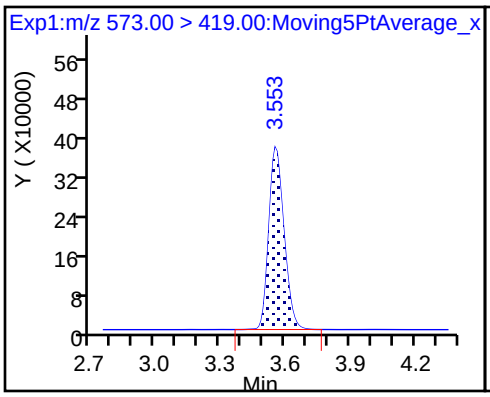
24 Perfluorodecanoic acid



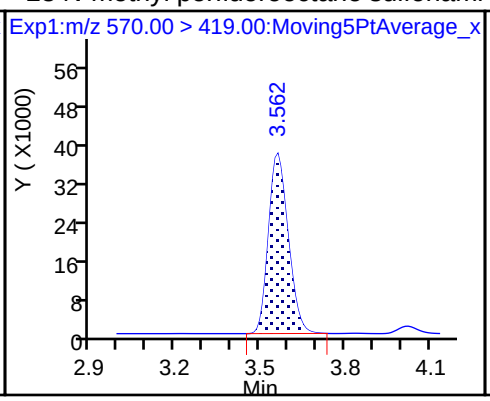
24 Perfluorodecanoic acid



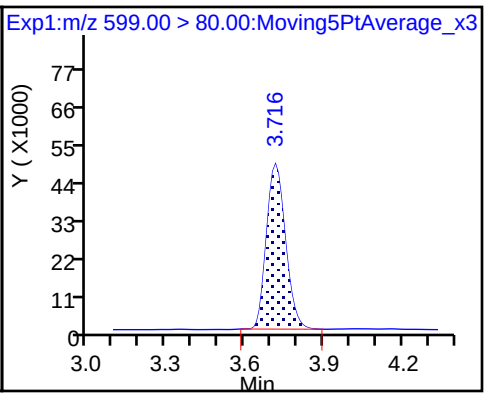
D 27 d3-NMeFOSAA



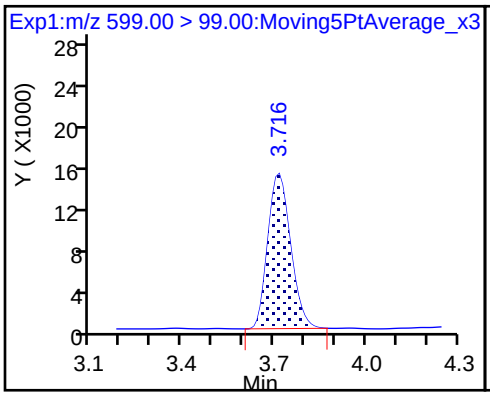
28 N-methyl perfluorooctane sulfonami



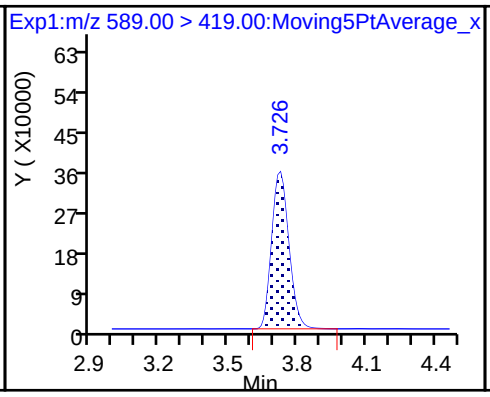
29 Perfluorodecane Sulfonic acid



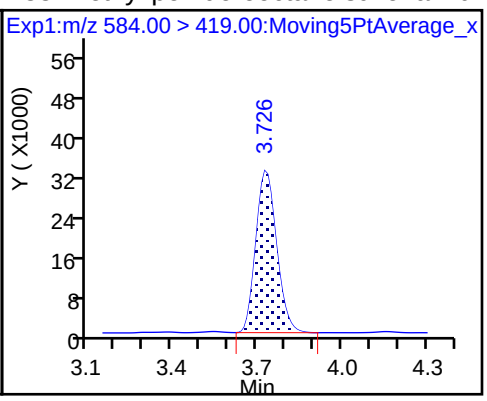
29 Perfluorodecane Sulfonic acid



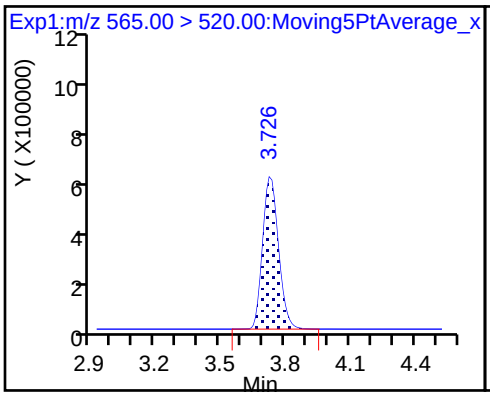
D 32 d5-NEtFOSAA



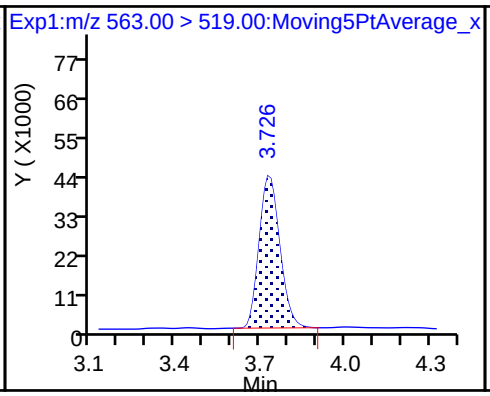
33 N-ethyl perfluorooctane sulfonamid



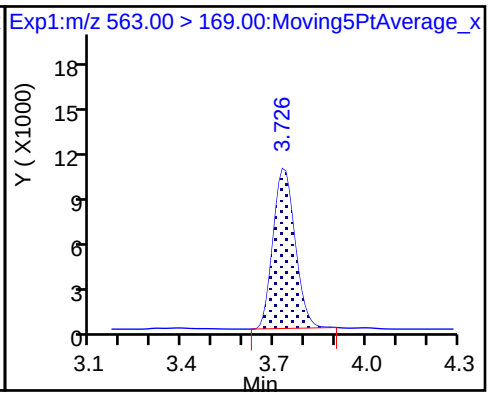
D 30 13C2 PFUnA



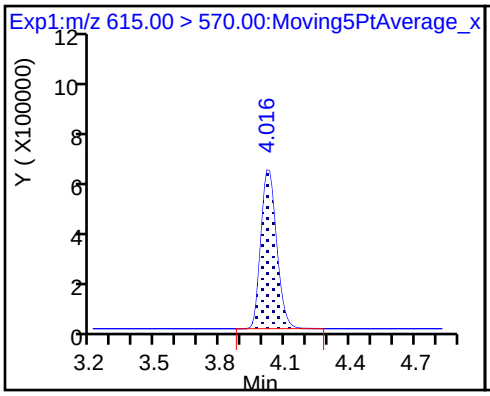
31 Perfluoroundecanoic acid



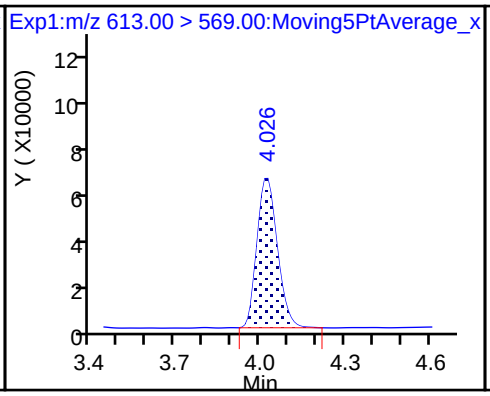
31 Perfluoroundecanoic acid



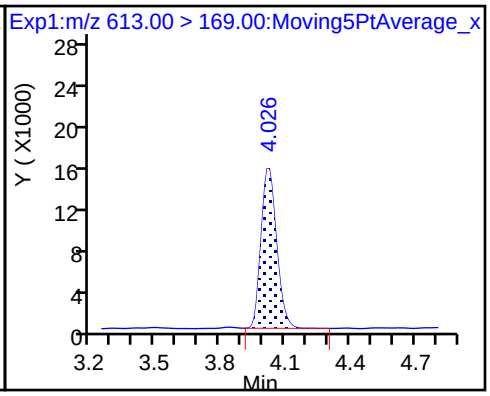
D 36 13C2 PFDoA



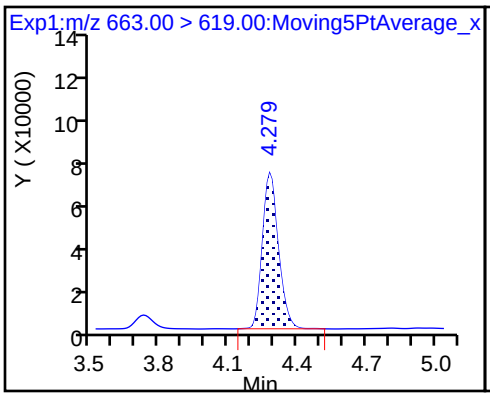
37 Perfluorododecanoic acid



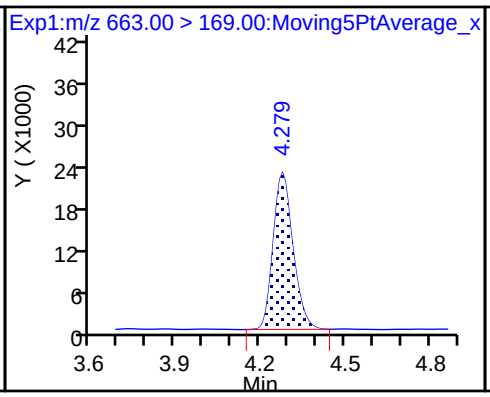
37 Perfluorododecanoic acid



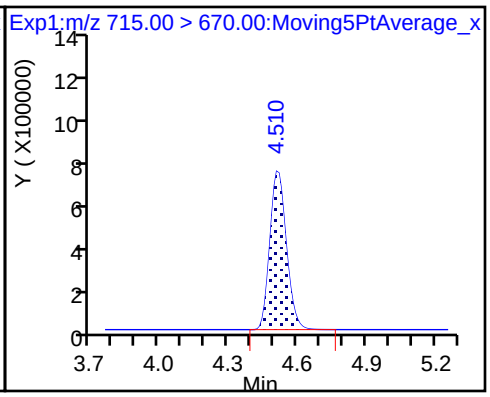
41 Perfluorotridecanoic acid



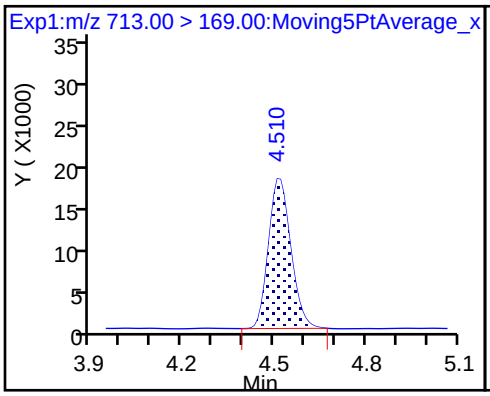
41 Perfluorotridecanoic acid



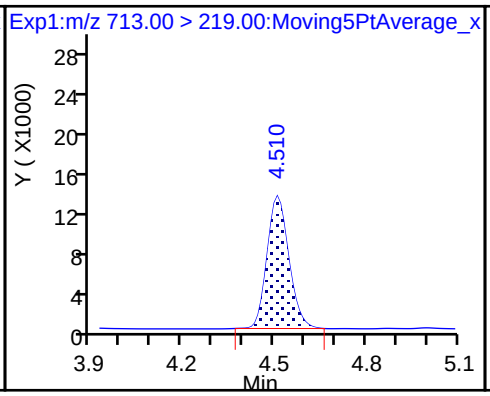
D 43 13C2-PFTeDA



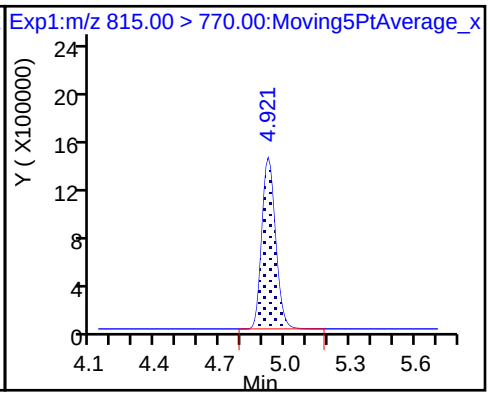
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

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Client ID:
Sample Type: ICIS Calib Level: 4
Inject. Date: 10-Apr-2018 19:03:10 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:51:08 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:18:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.430	1.431	-0.001	1.000	6139471	2.47		98.7	48680	
2 Perfluorobutyric acid										
212.90 > 169.00	1.430	1.432	-0.002	1.000	2238331	0.9816		98.2	1326	
D 3 13C5-PFPeA										
267.90 > 223.00	1.694	1.699	-0.005	0.557	3994638	2.49		99.6	84241	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.694	1.699	-0.005	1.000	1831380	0.9617		96.2	1761	
D 47 13C3-PFBS										
301.90 > 83.00	1.730	1.735	-0.005	1.000	87216	2.37		102	926	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.736	0.003	1.005	2489261	0.8476		95.9	14542	
298.90 > 99.00	1.730	1.736	-0.006	1.000	1026363		2.43(1.25-3.74)	95.9	13875	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.950	1.950	0.0	1.000	538908	0.8961		95.9	32256	
D 60 M2-4:2FTS										
329.00 > 81.00	1.950	1.950	0.0	1.000	623892	NC			7451	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.982	1.985	-0.003	1.000	1813678	1.02		102	3998	
313.00 > 119.00	1.982	1.985	-0.003	1.000	170514		10.64(5.03-15.10)	102	2276	
D 7 13C2 PFHxA										
315.00 > 270.00	1.982	1.985	-0.003	1.000	4391788	2.48		99.0	110601	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.005	2.008	-0.003	1.000	2448518	0.9128		97.3	20312	
349.00 > 99.00	2.005	2.008	-0.003	1.000	889950		2.75(1.36-4.07)	97.3	22028	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.084	2.084	0.0	1.000	279991	NC			7988	

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	2.087	-0.003	1.000	295687	NC			2375	
D 9 13C4-PFHpA										
367.00 > 322.00	2.308	2.314	-0.006	1.000	4282212	2.48		99.2	70470	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.308	2.314	-0.006	1.000	1720489	1.00		100	2264	
363.00 > 169.00	2.308	2.314	-0.006	1.000	645805		2.66(1.13-3.40)	100	2862	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.321	2.323	-0.002	1.000	2023389	0.8443		92.8	6640	
399.00 > 99.00	2.321	2.323	-0.002	1.000	680836		2.97(1.50-4.49)	92.8	7311	
D 11 18O2 PFHxS										
403.00 > 84.00	2.321	2.327	-0.006	1.000	5007633	2.35		99.4	102844	
65 Adona										
377.00 > 251.00	2.360	2.360	0.0	1.000	5740779	NC			74377	
377.00 > 85.00	2.360	2.360	0.0	1.000	3274137		1.75(0.84-2.53)		78247	
D 12 M2-6:2FTS										
429.00 > 81.00	2.644	2.649	-0.005	1.000	892700	2.41		102	13338	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.644	2.649	-0.005	1.000	594490	0.9356		98.7	14992	
D 14 13C4 PFOA										
417.00 > 372.00	2.667	2.673	-0.006	1.000	4283435	2.50		99.9	79564	
* 62 13C2-PFOA										
415.00 > 370.00	2.667	2.674	-0.007		4623888	2.50			81419	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.667	2.674	-0.007	1.000	1852208	0.9356		93.6	1057	
413.00 > 169.00	2.667	2.674	-0.007	1.000	965583		1.92(0.84-2.52)	93.6	3850	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.675	2.680	-0.005	1.000	1862796	0.9363		98.4	15147	
449.00 > 99.00	2.675	2.680	-0.005	1.000	507863		3.67(1.94-5.82)	98.4	12696	
D 18 13C4 PFOS										
503.00 > 80.00	3.039	3.041	-0.002	1.000	3581436	2.40		100	25084	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.039	3.042	-0.003	1.000	1466540	0.8996		96.9	6157	
499.00 > 99.00	3.039	3.042	-0.003	1.000	330120		4.44(2.31-6.93)	96.9	8806	
20 Perfluorononanoic acid										
463.00 > 419.00	3.039	3.043	-0.004	1.000	1529838	1.00		99.7	3704	
463.00 > 169.00	3.039	3.043	-0.004	1.000	361461		4.23(1.90-5.69)	99.7	8802	
D 19 13C5 PFNA										
468.00 > 423.00	3.039	3.045	-0.006	1.000	3677661	2.49		99.8	74488	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.247	3.253	-0.006	1.000	2661617	NC			59184	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.380	3.388	-0.008	1.000	1034931	0.8640		90.0	11093	
549.00 > 99.00	3.380	3.388	-0.008	1.000	415423		2.49(1.33-3.97)	90.0	9871	
D 26 M2-8:2FTS										
529.00 > 81.00	3.389	3.390	-0.001	1.000	1093693	2.46		103	11489	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.389	3.393	-0.004	1.000	537990	0.9310		97.2	28178	

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	3.389	3.397	-0.008	1.000	4725832	2.54		101	62563	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.399	3.401	-0.002	1.003	1898032	0.99		99.3	33374	
D 23 13C2 PFDA										
515.00 > 470.00	3.399	3.401	-0.002	1.000	3187733	2.57		103	83926	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.399	3.402	-0.003	1.000	1275776	0.9699		97.0	5989	
513.00 > 169.00	3.399	3.402	-0.003	1.000	223055		5.72(2.36-7.09)	97.0	4231	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.548	3.553	-0.005	1.000	1818526	2.59		104	25217	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.557	3.558	-0.001	1.003	694281	0.9570		95.7	4614	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.709	3.715	-0.006	1.000	935700	0.9618		99.8	9931	
599.00 > 99.00	3.709	3.715	-0.006	1.000	313308		2.99(1.39-4.16)	99.8	9034	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.720	3.722	-0.002	1.000	1716798	2.48		99.0	15143	
D 30 13C2 PFUnA										
565.00 > 520.00	3.720	3.727	-0.007	1.000	2598322	2.43		97.2	73211	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.720	3.727	-0.007	1.000	636880	0.99		99.2	12406	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.720	3.727	-0.007	1.000	822546	0.9365		93.6	3940	
563.00 > 169.00	3.720	3.727	-0.007	1.000	193601		4.25(2.12-6.36)	93.6	4746	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.876	3.883	-0.007	1.000	4412145	NC			64014	
D 36 13C2 PFDoA										
615.00 > 570.00	4.009	4.017	-0.008	1.000	3058842	2.65		106	28121	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.020	4.020	0.0	1.003	1173427	0.9196		92.0	1328	
613.00 > 169.00	4.009	4.020	-0.011	1.000	277484		4.23(2.13-6.40)	92.0	3949	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.272	4.278	-0.006	1.000	1346073	0.9052		90.5	1176	
663.00 > 169.00	4.272	4.278	-0.006	1.000	415749		3.24(1.25-3.76)	90.5	4126	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.512	4.513	-0.001	1.000	3824690	2.61		105	24410	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.512	4.513	-0.001	1.000	376531	0.9800		98.0	4038	
713.00 > 219.00	4.502	4.513	-0.011	0.998	255558		1.47(0.71-2.13)	98.0	4003	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.914	4.918	-0.004	1.000	5981114	2.51		100	18136	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.914	4.920	-0.006	1.000	2337041	NC			753	
813.00 > 169.00	4.914	4.920	-0.006	1.000	365367		6.40(2.86-8.58)		2438	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.263	5.268	-0.005	1.000	2359770	NC			640	
913.00 > 169.00	5.263	5.268	-0.005	1.000	281134		8.39(3.83-11.48)		1988	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:51:09 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_005.d

Injection Date: 10-Apr-2018 19:03:10 Instrument ID: A8_N

Lims ID: IC L4 Full

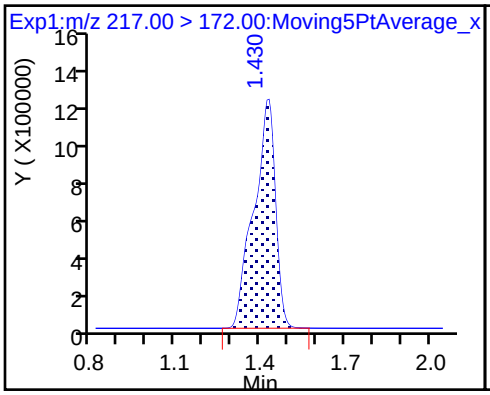
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 5

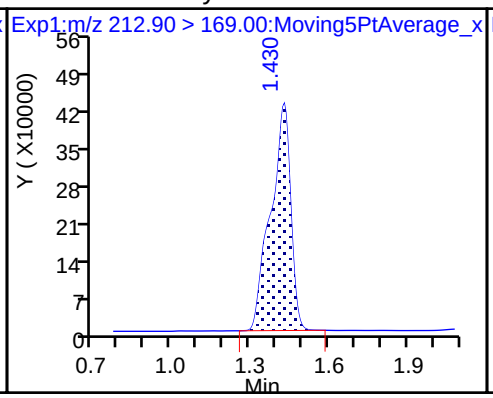
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

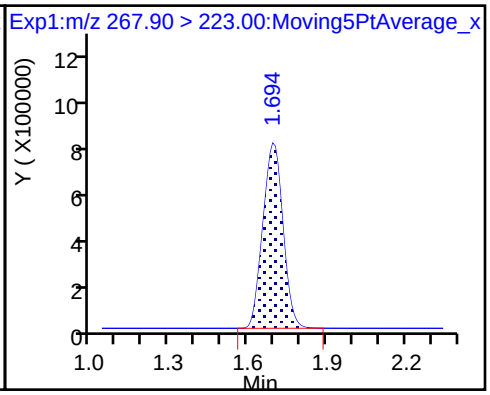
D 1 13C4 PFBA



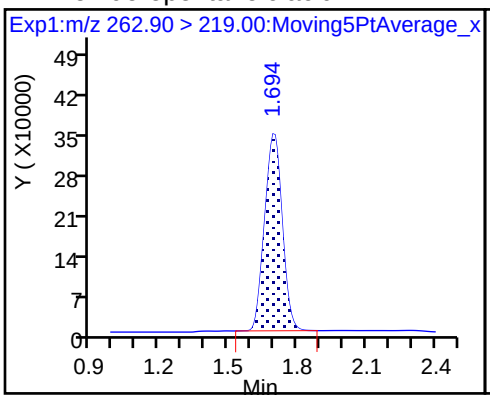
2 Perfluorobutyric acid



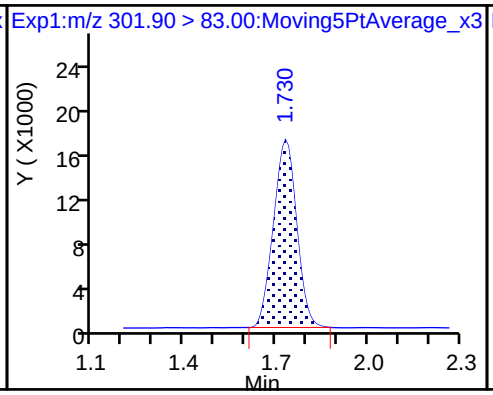
D 3 13C5-PFPeA



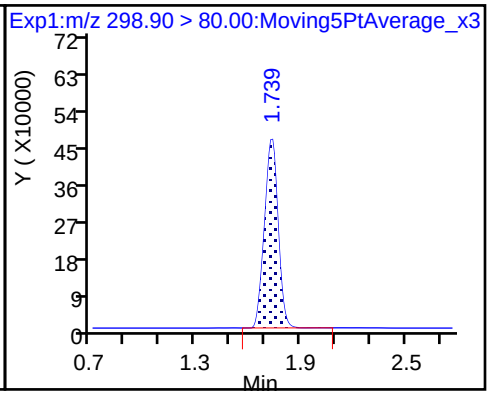
4 Perfluoropentanoic acid



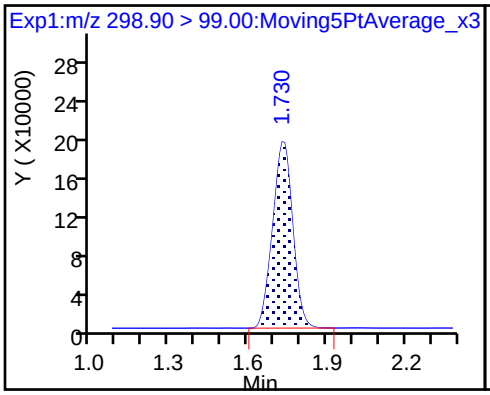
D 47 13C3-PFBS



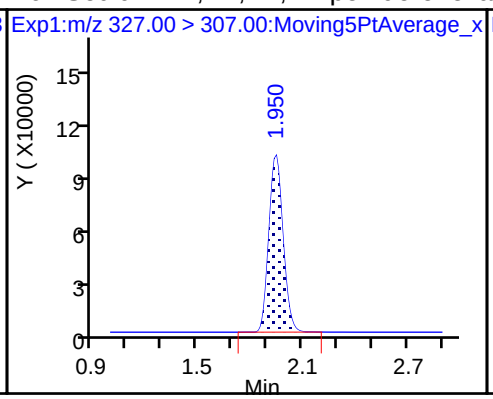
5 Perfluorobutanesulfonic acid



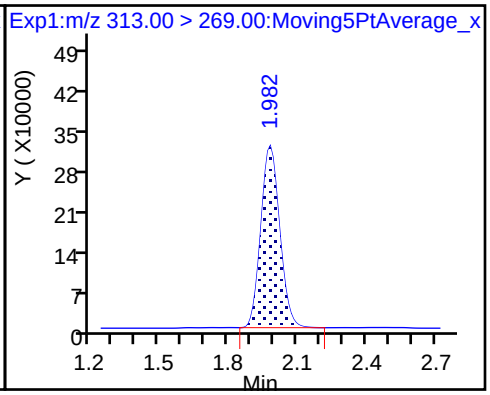
5 Perfluorobutanesulfonic acid



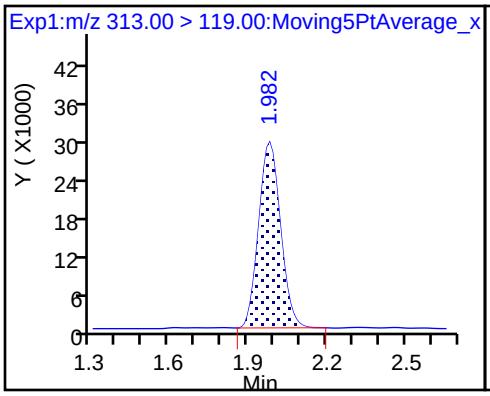
61 Sodium 1H,1H,2H,2H-perfluorohexane



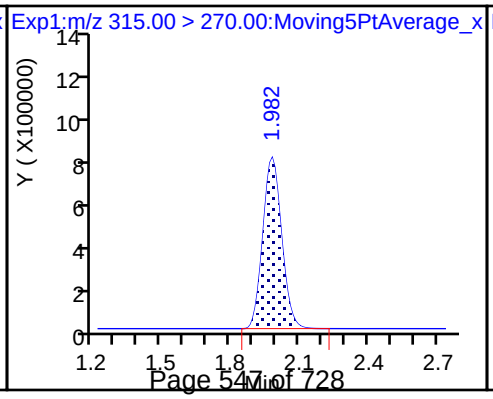
6 Perfluorohexanoic acid



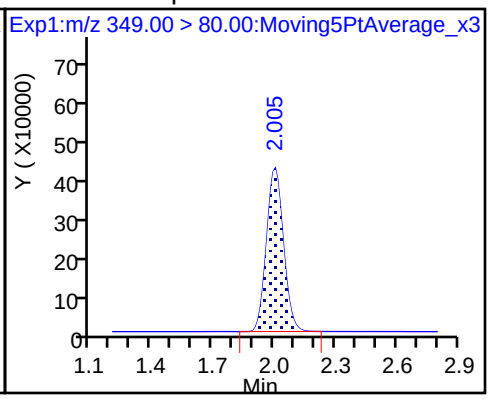
6 Perfluorohexanoic acid



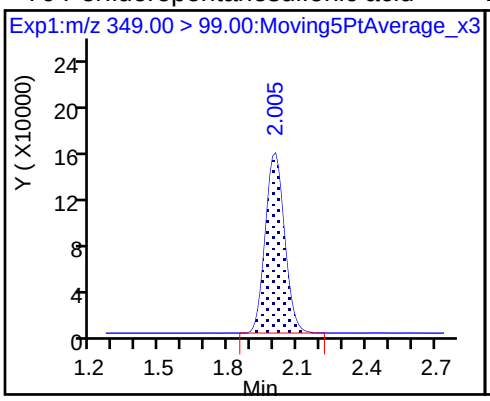
D 7 13C2 PFHxA



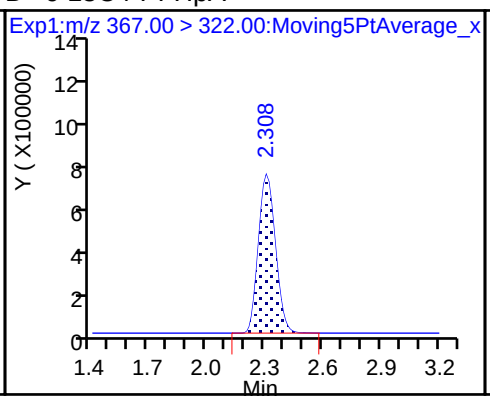
70 Perfluoropentanesulfonic acid



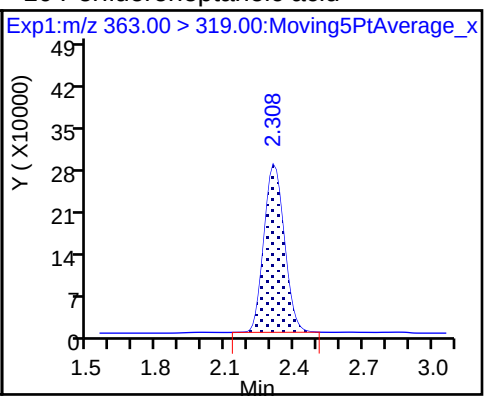
70 Perfluoropentanesulfonic acid



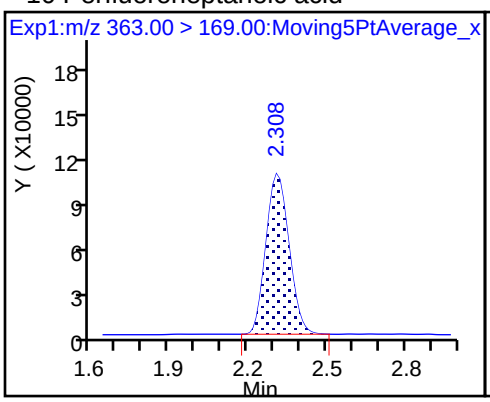
D 9 13C4-PFHpA



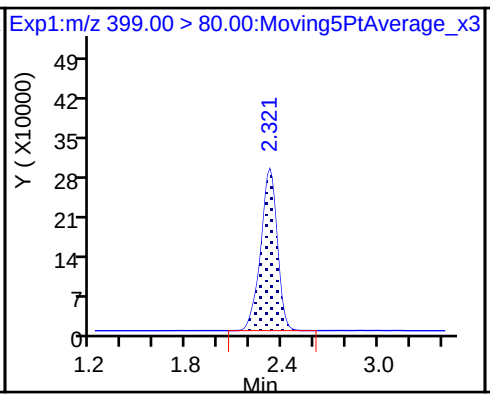
10 Perfluoroheptanoic acid



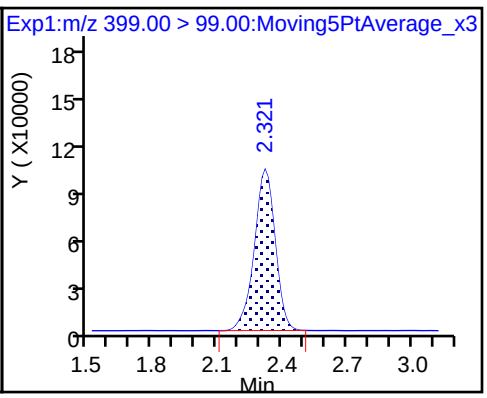
10 Perfluoroheptanoic acid



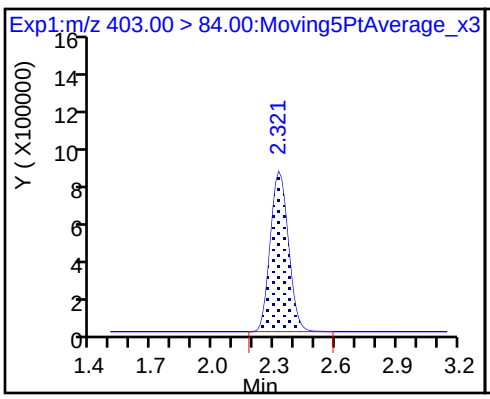
8 Perfluorohexanesulfonic acid



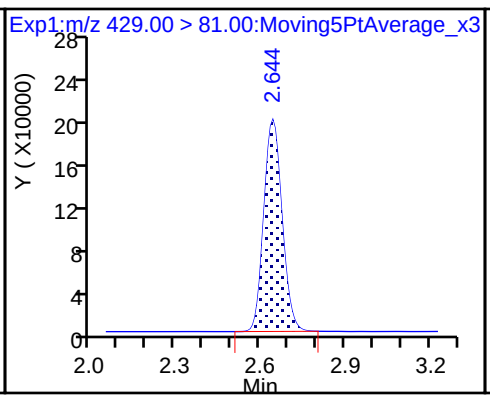
8 Perfluorohexanesulfonic acid



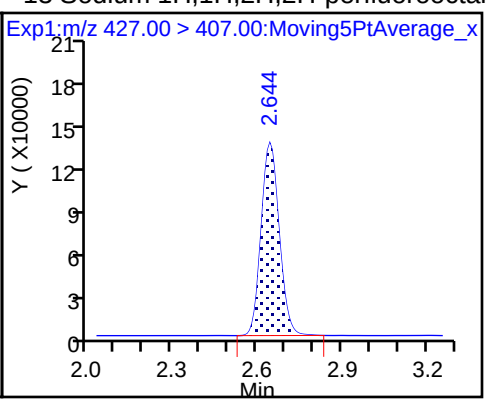
D 11 18O2 PFHxS



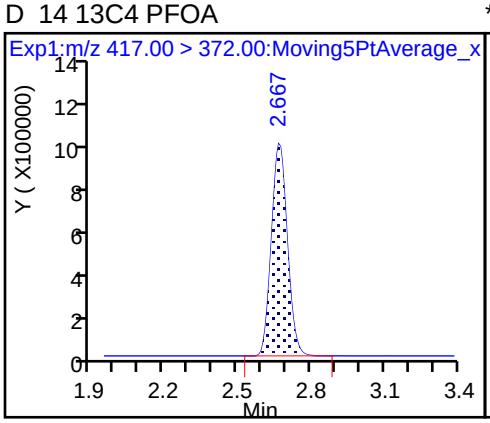
D 12 M2-6:2FTS



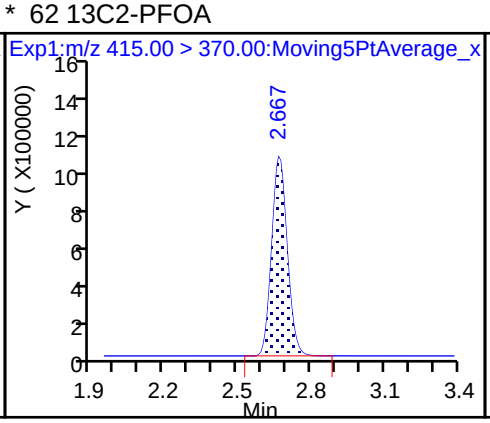
13 Sodium 1H,1H,2H,2H-perfluorooctane



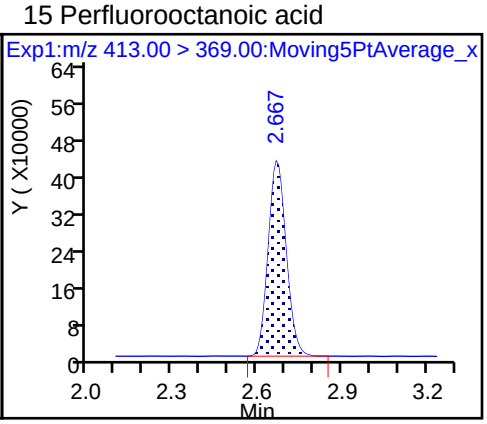
D 14 13C4 PFOA



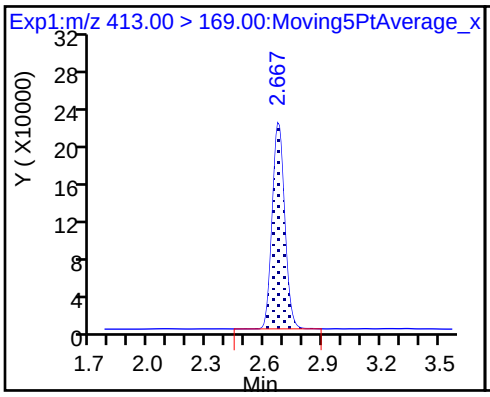
* 62 13C2-PFOA



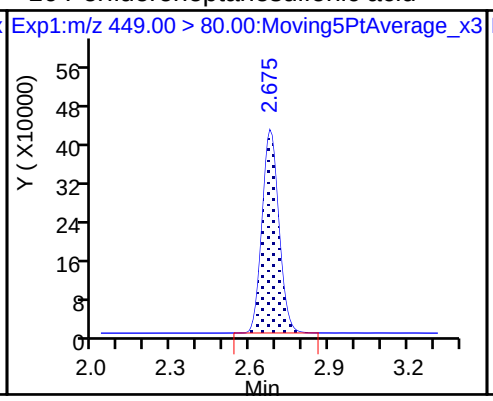
15 Perfluorooctanoic acid



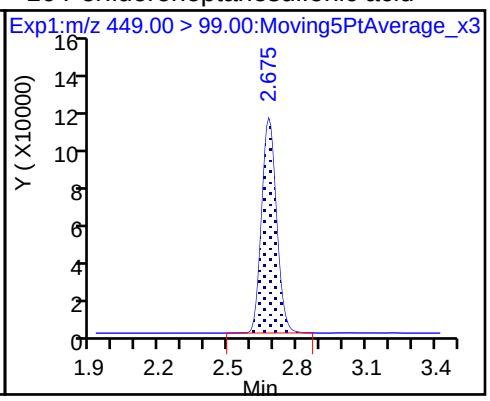
15 Perfluorooctanoic acid



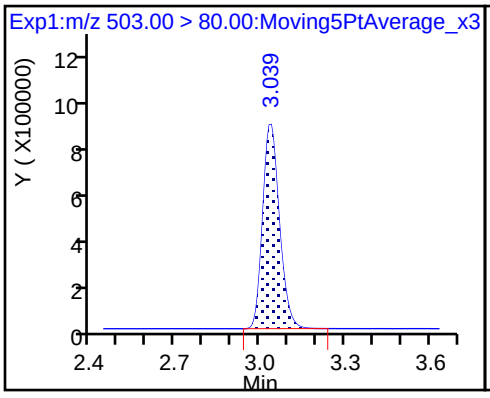
16 Perfluoroheptanesulfonic acid



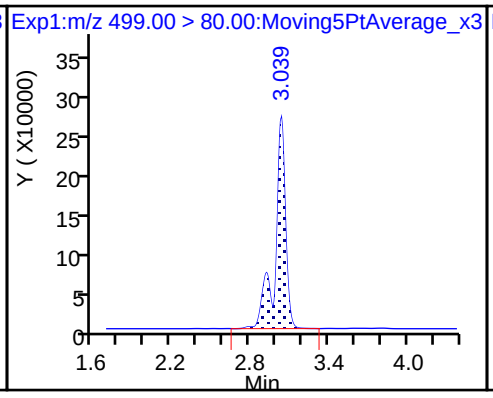
16 Perfluoroheptanesulfonic acid



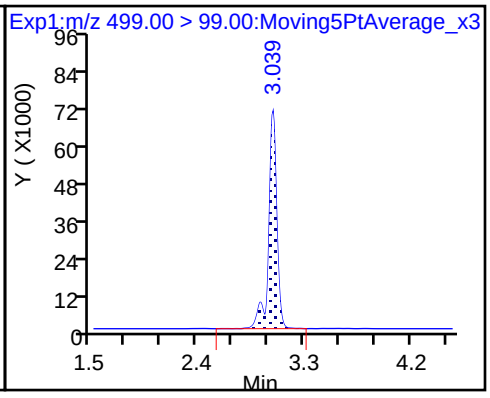
D 18 13C4 PFOS



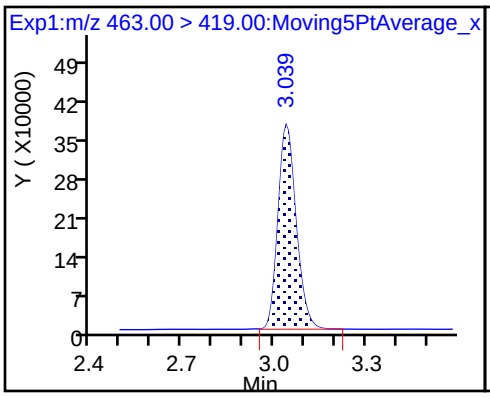
17 Perfluorooctane sulfonic acid



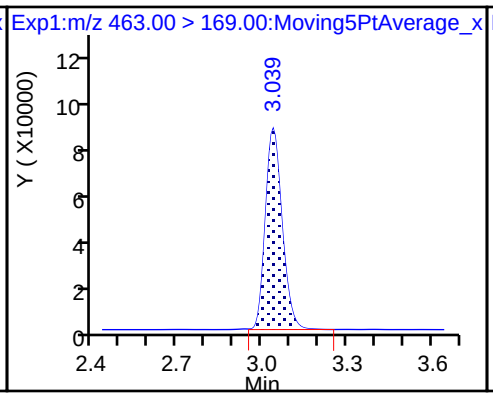
17 Perfluorooctane sulfonic acid



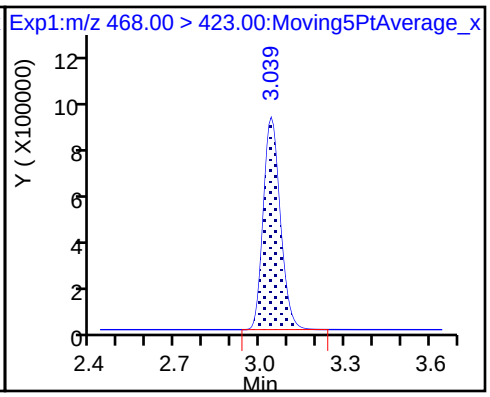
20 Perfluorononanoic acid



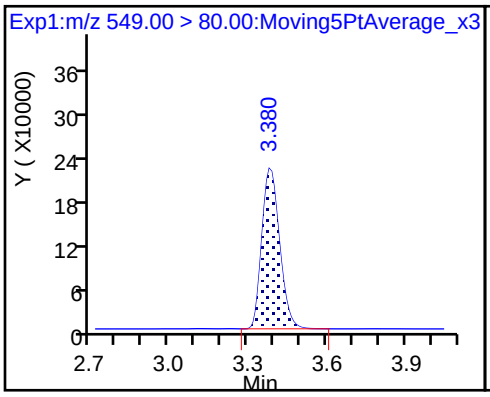
20 Perfluorononanoic acid



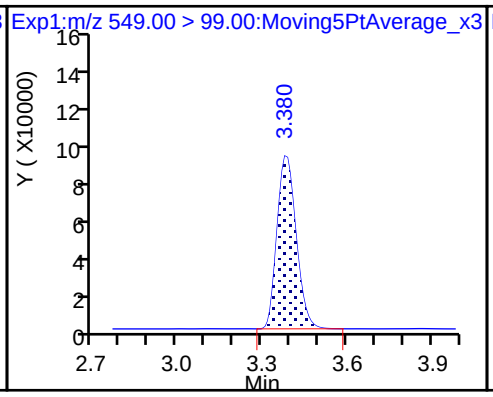
D 19 13C5 PFNA



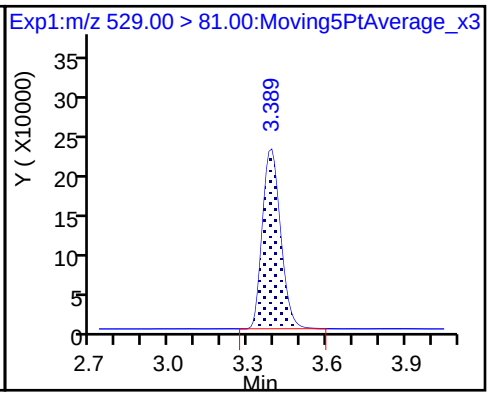
68 Perfluorononanesulfonic acid



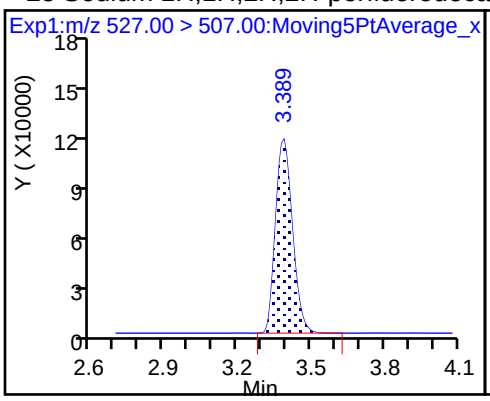
68 Perfluorononanesulfonic acid



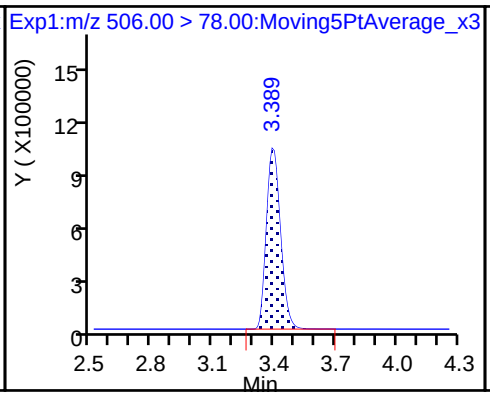
D 26 M2-8:2FTS



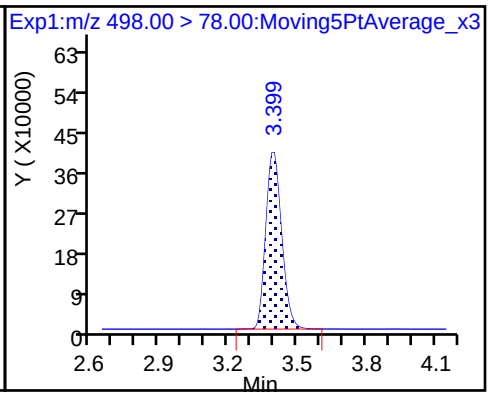
25 Sodium 1H,1H,2H,2H-perfluorodecane



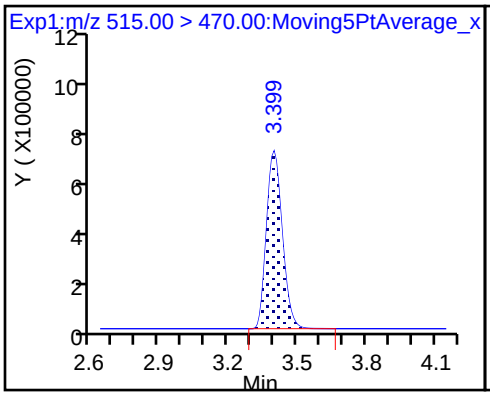
D 21 13C8 FOSA



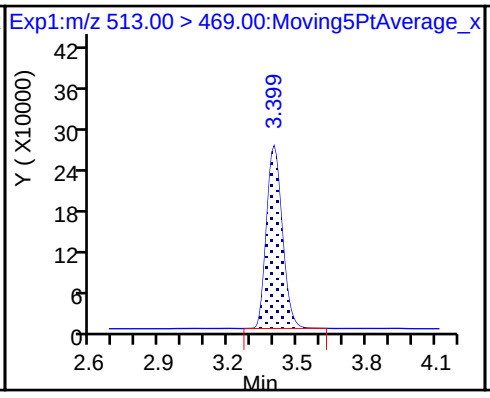
22 Perfluorooctane Sulfonamide



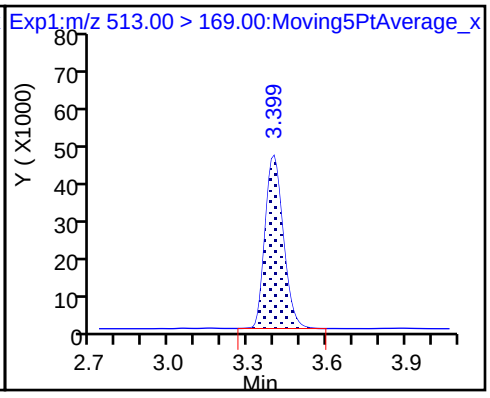
D 23 13C2 PFDA



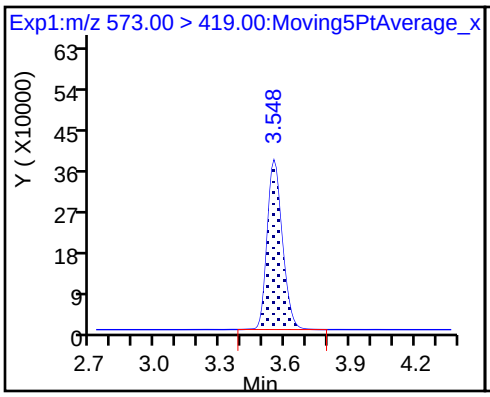
24 Perfluorodecanoic acid



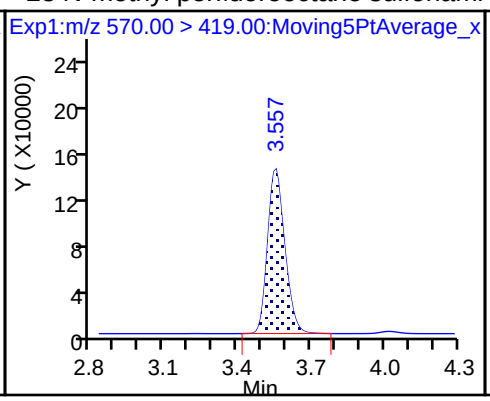
24 Perfluorodecanoic acid



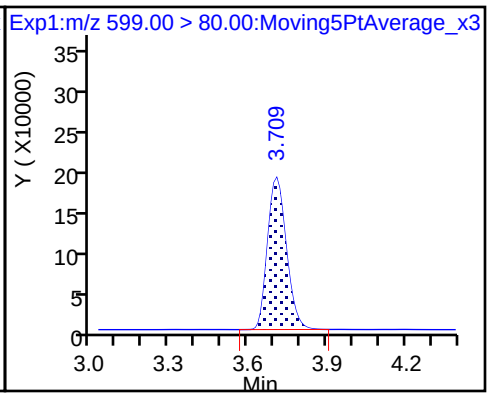
D 27 d3-NMeFOSAA



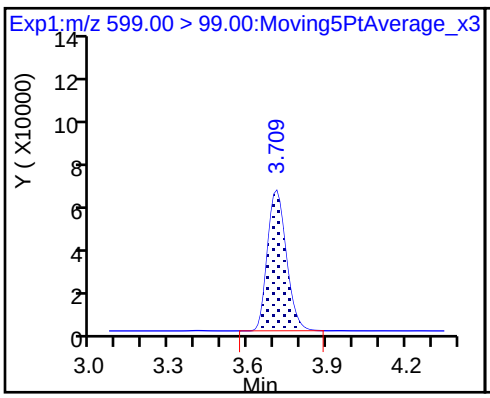
28 N-methyl perfluorooctane sulfonami



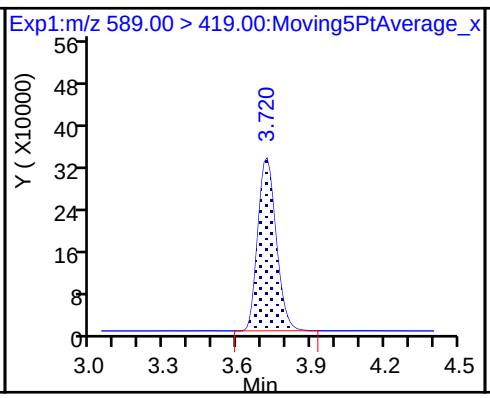
29 Perfluorodecane Sulfonic acid



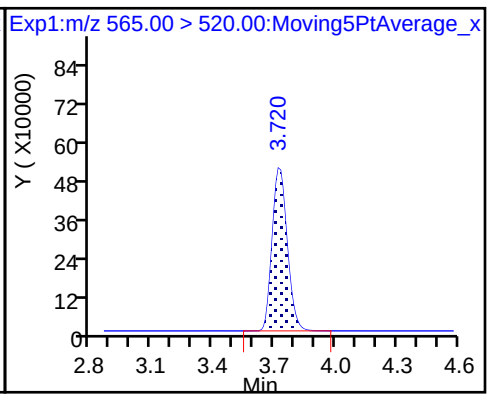
29 Perfluorodecane Sulfonic acid



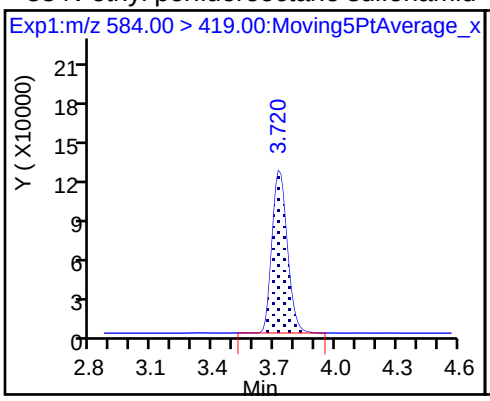
D 32 d5-NEtFOSAA



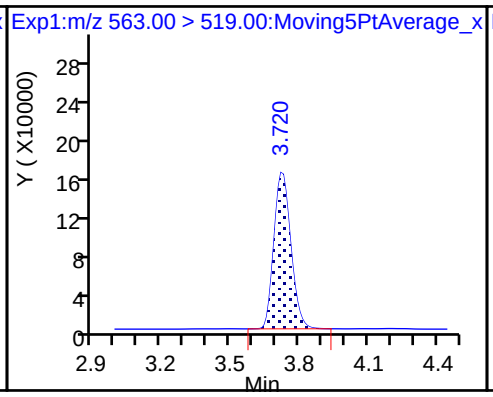
D 30 13C2 PFUnA



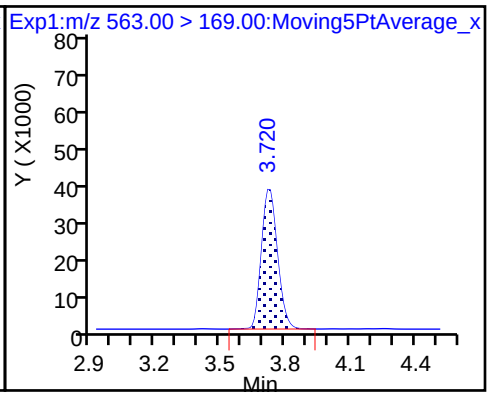
33 N-ethyl perfluorooctane sulfonamid



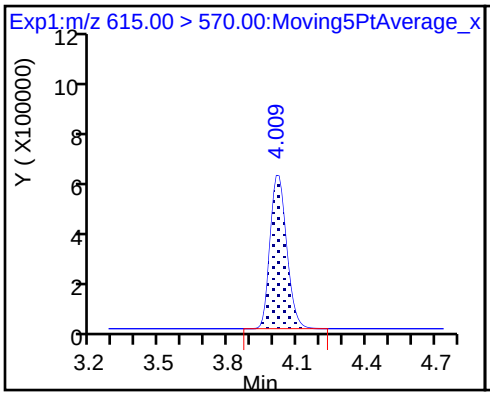
31 Perfluoroundecanoic acid



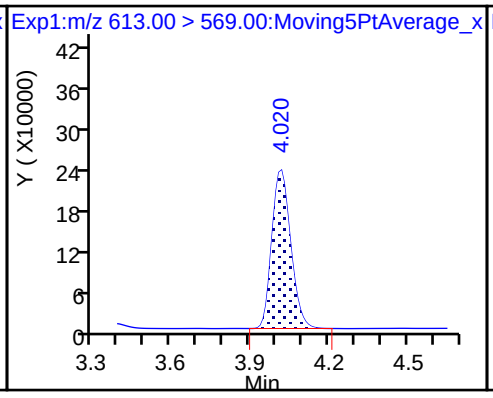
31 Perfluoroundecanoic acid



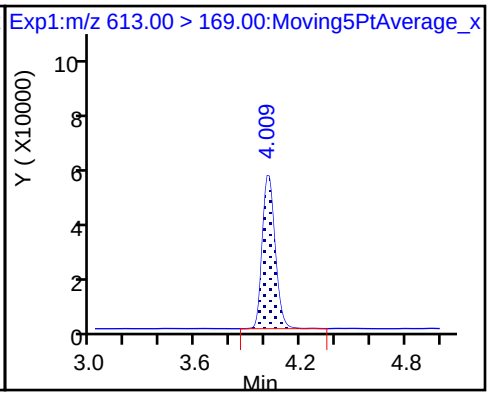
D 36 13C2 PFDoA



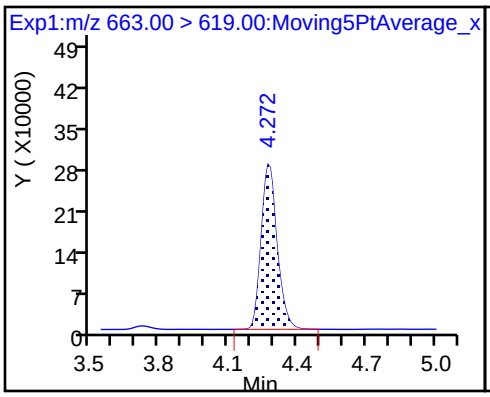
37 Perfluorododecanoic acid



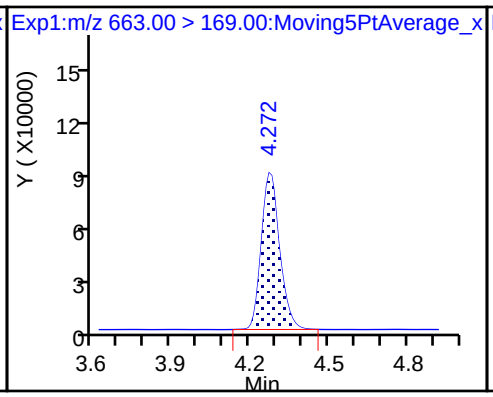
37 Perfluorododecanoic acid



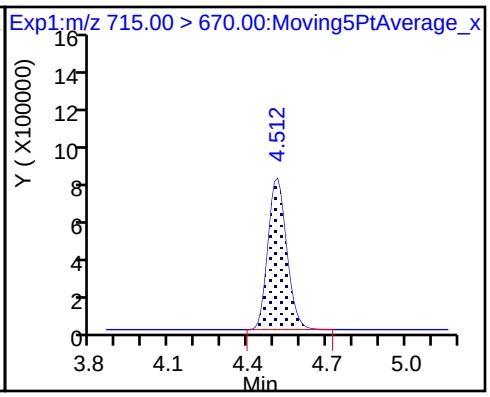
41 Perfluorotridecanoic acid



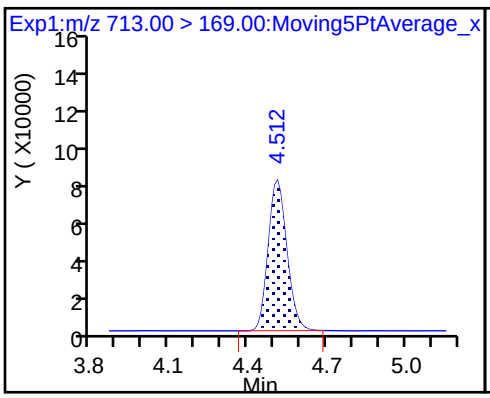
41 Perfluorotridecanoic acid



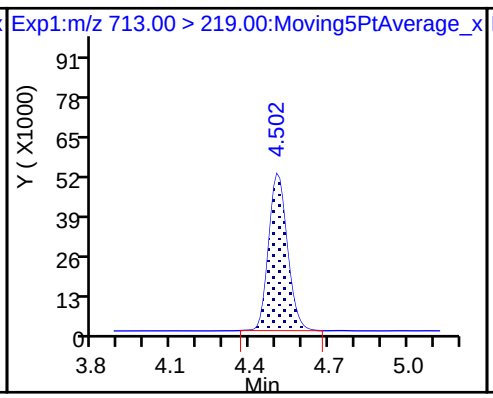
D 43 13C2-PFTeDA



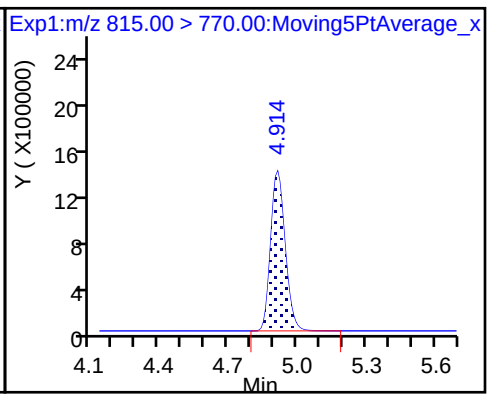
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 10-Apr-2018 19:10:58 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:51:11 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:19:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.430	1.431	-0.001	1.000	6113537	2.46		98.3	50691	
2 Perfluorobutyric acid										
212.90 > 169.00	1.430	1.432	-0.002	1.000	5819896	2.56		103	2506	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.693	1.699	-0.006	1.000	4844578	2.57		103	4840	
D 3 13C5-PFPeA										
267.90 > 223.00	1.693	1.699	-0.006	0.558	3952401	2.46		98.6	74416	
D 47 13C3-PFBS										
301.90 > 83.00	1.729	1.735	-0.006	1.000	83922	2.28		98.1	740	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.729	1.736	-0.007	1.000	6477140	2.29		104	28669	
298.90 > 99.00	1.729	1.736	-0.007	1.000	2643044		2.45(1.25-3.74)	104	34961	
D 60 M2-4:2FTS										
329.00 > 81.00	1.948	1.950	-0.002	1.000	615130	NC			6761	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.948	1.950	-0.002	1.000	1359770	2.35		101	79419	
D 7 13C2 PFHxA										
315.00 > 270.00	1.981	1.985	-0.004	1.000	4266668	2.41		96.2	93064	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.981	1.985	-0.004	1.000	4512177	2.60		104	11165	
313.00 > 119.00	1.981	1.985	-0.004	1.000	415818		10.85(5.03-15.10)	104	4827	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.003	2.008	-0.005	1.000	6143254	2.38		101	39164	
349.00 > 99.00	2.003	2.008	-0.005	1.000	2304917		2.67(1.36-4.07)	101	57041	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.082	2.084	-0.002	1.000	282614	NC			8102	

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	2.087	-0.005	1.000	771939	NC			6105	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.306	2.314	-0.008	1.000	4571563	2.62		105	6057	
363.00 > 169.00	2.306	2.314	-0.008	1.000	1750162		2.61(1.13-3.40)	105	10592	
D 9 13C4-PFHpA										
367.00 > 322.00	2.306	2.314	-0.008	1.000	4357585	2.52		101	88768	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.319	2.323	-0.004	1.000	5199428	2.21		97.1	17064	
399.00 > 99.00	2.319	2.323	-0.004	1.000	1684954		3.09(1.50-4.49)	97.1	15461	
D 11 18O2 PFHxS										
403.00 > 84.00	2.319	2.327	-0.008	1.000	4919272	2.31		97.6	100471	
65 Adona										
377.00 > 251.00	2.358	2.360	-0.002	1.000	13509817	NC			130340	
377.00 > 85.00	2.345	2.360	-0.015	0.994	7737038		1.75(0.84-2.53)		141597	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.644	2.649	-0.005	1.000	1407564	2.24		94.7	22058	
D 12 M2-6:2FTS										
429.00 > 81.00	2.644	2.649	-0.005	1.000	880882	2.38		100	13167	
D 14 13C4 PFOA										
417.00 > 372.00	2.667	2.673	-0.006	1.000	4288230	2.50		100.0	57314	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.667	2.674	-0.007	1.000	4910933	2.48		99.1	2984	
413.00 > 169.00	2.667	2.674	-0.007	1.000	2476515		1.98(0.84-2.52)	99.1	13949	
* 62 13C2-PFOA										
415.00 > 370.00	2.667	2.674	-0.007		4623543	2.50			75604	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.675	2.680	-0.005	1.000	4867309	2.54		107	34655	
449.00 > 99.00	2.675	2.680	-0.005	1.000	1250756		3.89(1.94-5.82)	107	35350	
D 18 13C4 PFOS										
503.00 > 80.00	3.035	3.041	-0.006	1.000	3447017	2.31		96.7	25534	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.035	3.042	-0.007	1.000	3684174	2.35		101	15653	
499.00 > 99.00	3.035	3.042	-0.007	1.000	824846		4.47(2.31-6.93)	101	12600	
20 Perfluorononanoic acid										
463.00 > 419.00	3.035	3.043	-0.008	1.000	3792206	2.49		99.6	9277	
463.00 > 169.00	3.042	3.043	-0.001	1.002	865580		4.38(1.90-5.69)	99.6	18899	
D 19 13C5 PFNA										
468.00 > 423.00	3.035	3.045	-0.010	1.000	3653281	2.48		99.1	80277	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.250	3.253	-0.003	1.000	6954333	NC			142943	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.384	3.388	-0.004	1.000	2870093	2.49		104	29938	
549.00 > 99.00	3.384	3.388	-0.004	1.000	1016002		2.82(1.33-3.97)	104	24257	
D 26 M2-8:2FTS										
529.00 > 81.00	3.384	3.390	-0.006	1.000	1063168	2.39		99.7	11071	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.384	3.393	-0.009	1.000	1298898	2.31		96.6	67638	

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	3.393	3.397	-0.004	1.000	4533137	2.43		97.3	60119	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.393	3.401	-0.008	1.000	4752476	2.59		104	78074	
D 23 13C2 PFDA										
515.00 > 470.00	3.393	3.401	-0.008	1.000	2967373	2.39		95.8	61893	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.393	3.402	-0.009	1.000	3158094	2.58		103	14590	
513.00 > 169.00	3.393	3.402	-0.009	1.000	519040		6.08(2.36-7.09)	103	12013	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.551	3.553	-0.002	1.000	1707705	2.43		97.2	23521	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.551	3.558	-0.007	1.000	1802851	2.65		106	12762	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.711	3.715	-0.004	1.000	2376399	2.54		105	29437	
599.00 > 99.00	3.711	3.715	-0.004	1.000	777508		3.06(1.39-4.16)	105	25627	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.722	3.722	0.0	1.000	1729345	2.49		99.8	19661	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.722	3.727	-0.005	1.000	1669717	2.58		103	29608	
D 30 13C2 PFUnA										
565.00 > 520.00	3.722	3.727	-0.005	1.000	2601195	2.43		97.3	36634	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.722	3.727	-0.005	1.000	2103252	2.39		95.7	10698	
563.00 > 169.00	3.722	3.727	-0.005	1.000	525073		4.01(2.12-6.36)	95.7	20485	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.880	3.883	-0.003	1.000	10487942	NC			87880	
D 36 13C2 PFDoA										
615.00 > 570.00	4.013	4.017	-0.004	1.000	2745849	2.38		95.1	29081	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.013	4.020	-0.007	1.000	3013785	2.63		105	3414	
613.00 > 169.00	4.013	4.020	-0.007	1.000	730770		4.12(2.13-6.40)	105	9810	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.276	4.278	-0.002	1.000	3391923	2.54		102	3159	
663.00 > 169.00	4.276	4.278	-0.002	1.000	1004489		3.38(1.25-3.76)	102	9947	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.508	4.513	-0.005	1.000	3639964	2.49		99.5	25555	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.508	4.513	-0.005	1.000	872520	2.39		95.4	8442	
713.00 > 219.00	4.508	4.513	-0.005	1.000	674330		1.29(0.71-2.13)	95.4	11267	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.910	4.918	-0.008	1.000	5731595	2.41		96.3	16637	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.919	4.920	-0.001	1.002	5739538	NC			1768	
813.00 > 169.00	4.919	4.920	-0.001	1.002	919527		6.24(2.86-8.58)		5404	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.267	5.268	-0.001	1.000	5927518	NC			1545	
913.00 > 169.00	5.260	5.268	-0.008	0.999	709210		8.36(3.83-11.48)		3575	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00004 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:51:13 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_006.d

Injection Date: 10-Apr-2018 19:10:58 Instrument ID: A8_N

Lims ID: IC L5 Full

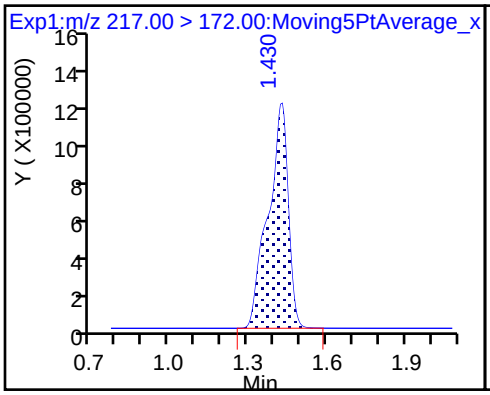
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 6

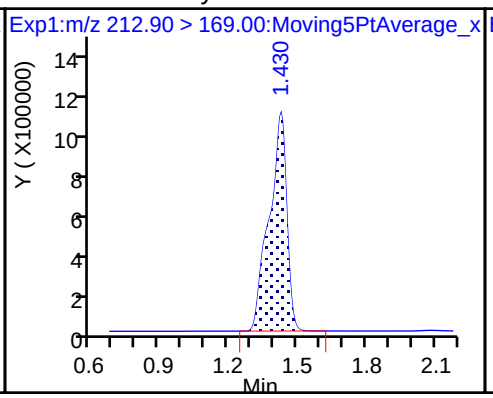
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

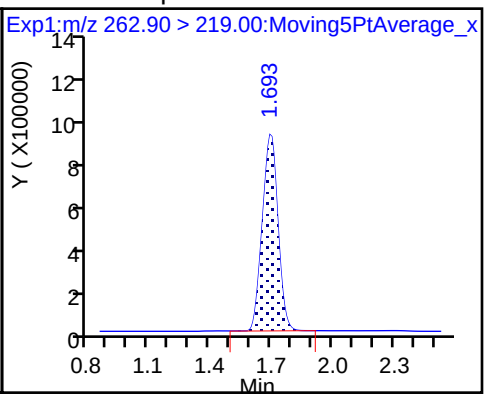
D 1 13C4 PFBA



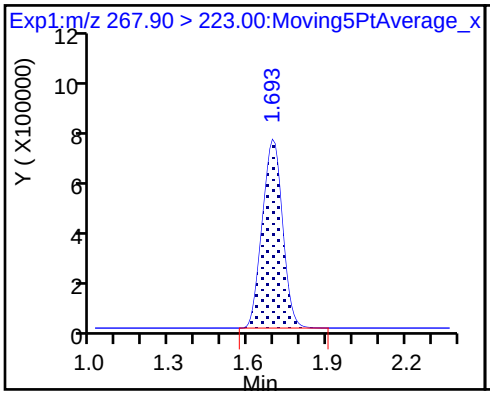
2 Perfluorobutyric acid



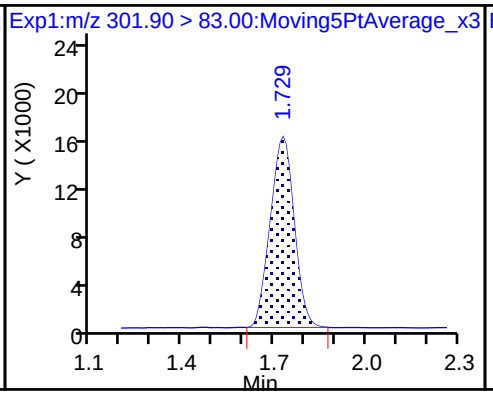
4 Perfluoropentanoic acid



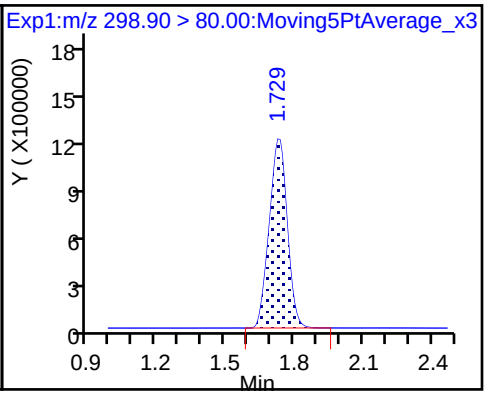
D 3 13C5-PFPeA



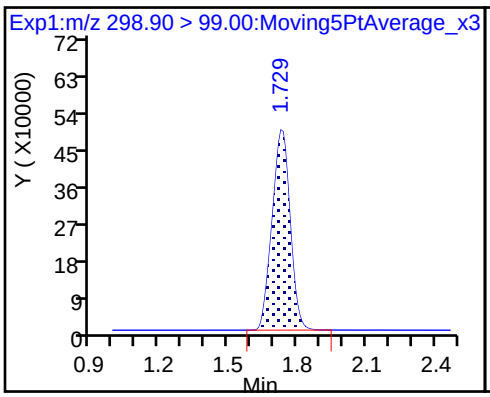
D 47 13C3-PFBS



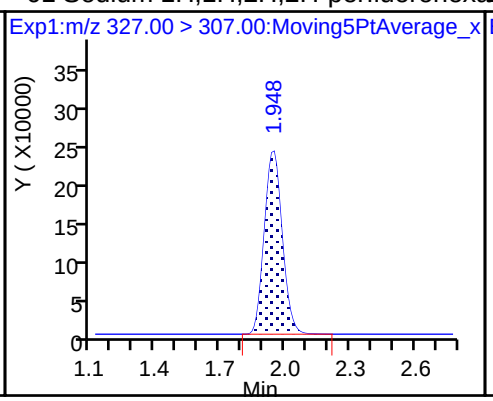
5 Perfluorobutanesulfonic acid



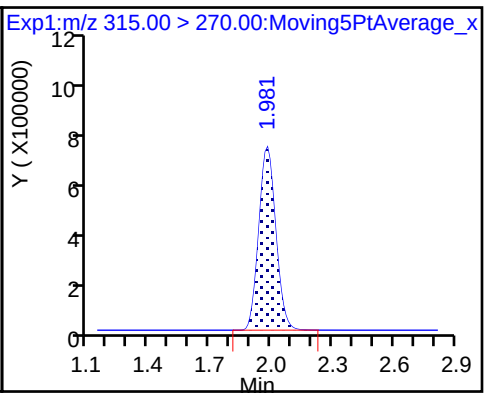
5 Perfluorobutanesulfonic acid



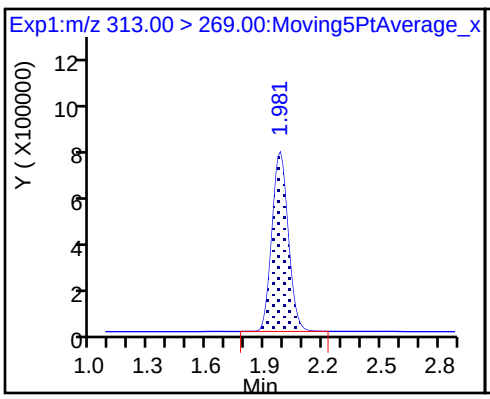
61 Sodium 1H,1H,2H,2H-perfluorohexa



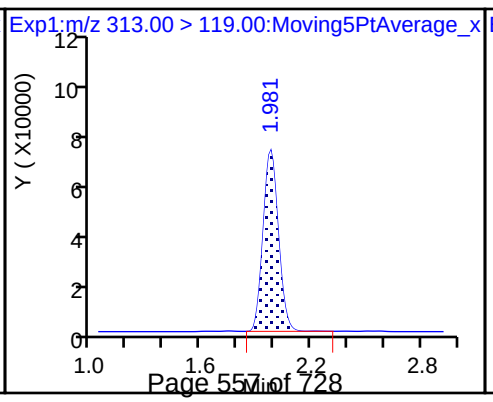
De 7 13C2 PFHxA



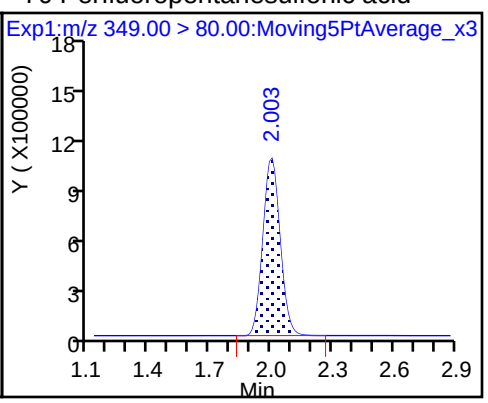
6 Perfluorohexanoic acid



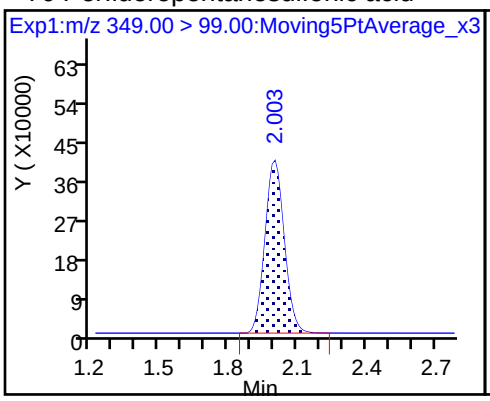
6 Perfluorohexanoic acid



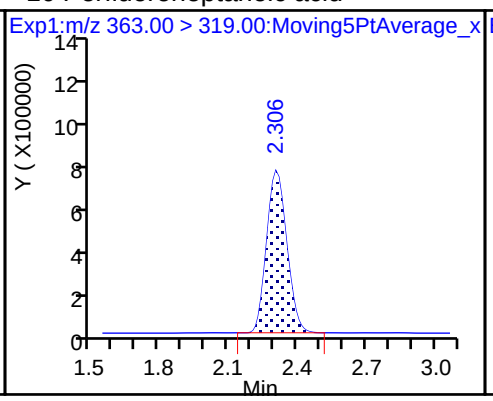
70 Perfluoropentanesulfonic acid



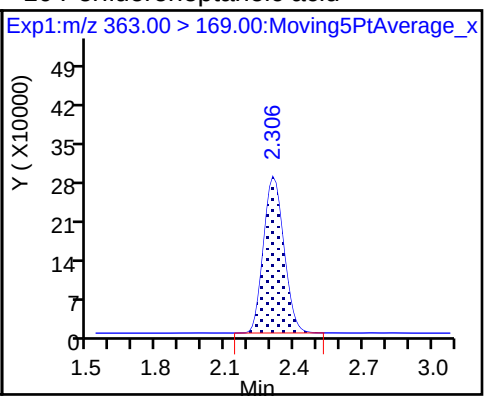
70 Perfluoropentanesulfonic acid



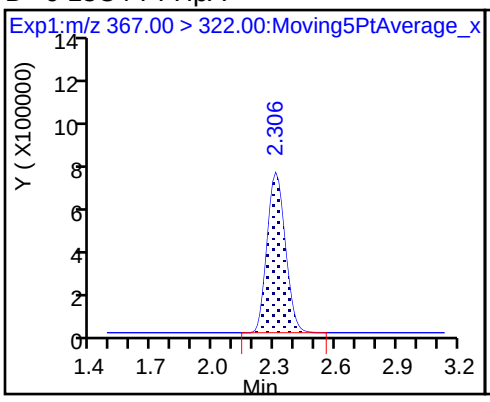
10 Perfluoroheptanoic acid



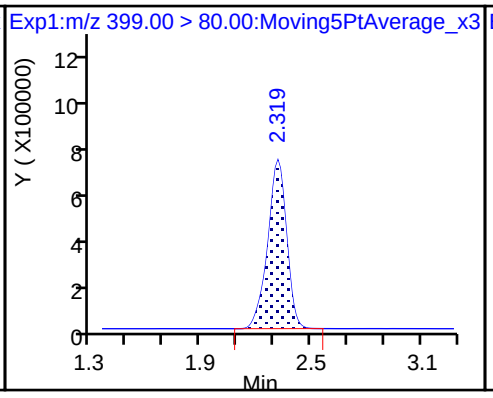
10 Perfluoroheptanoic acid



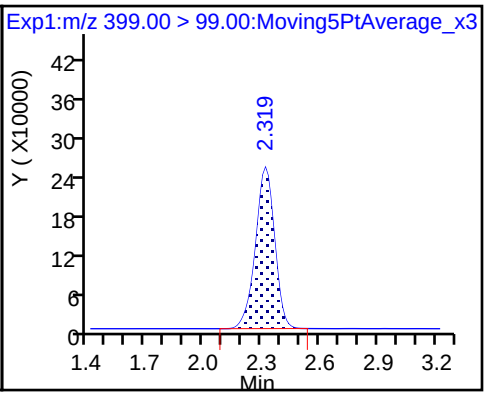
D 9 13C4-PFHpA



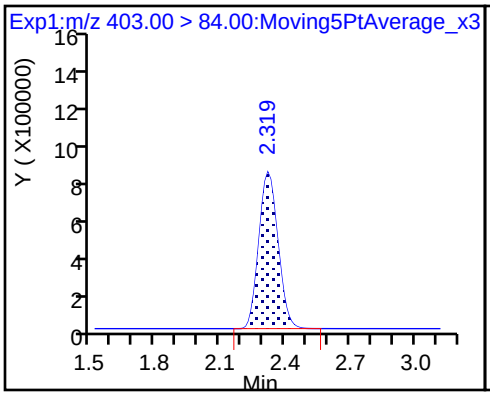
8 Perfluorohexanesulfonic acid



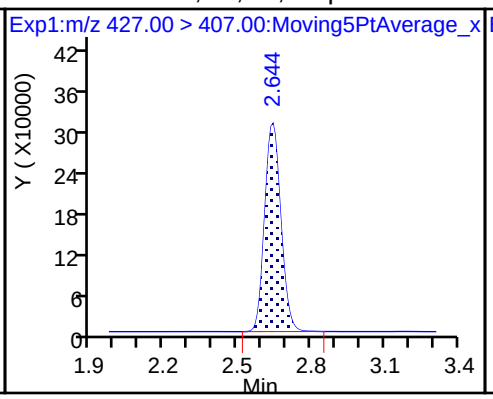
8 Perfluorohexanesulfonic acid



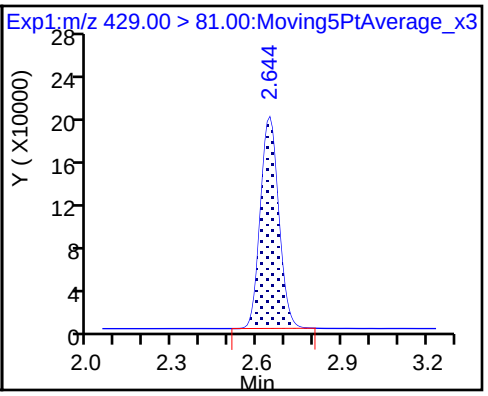
D 11 18O2 PFHxS



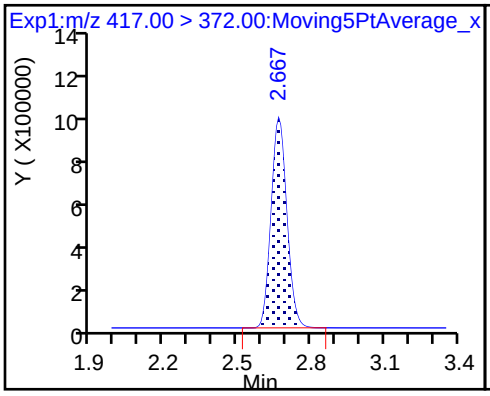
13 Sodium 1H,1H,2H,2H-perfluorooctane



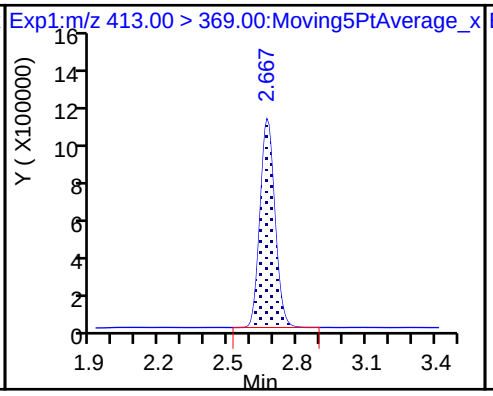
D 12 M2-6:2FTS



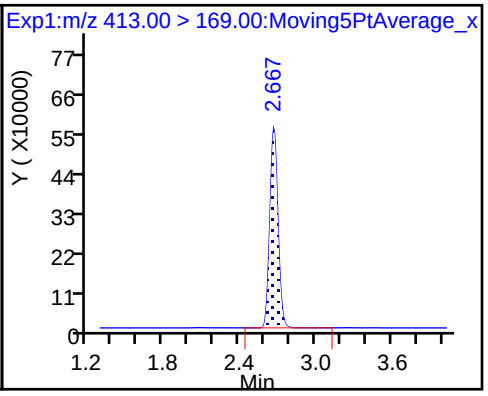
D 14 13C4 PFOA



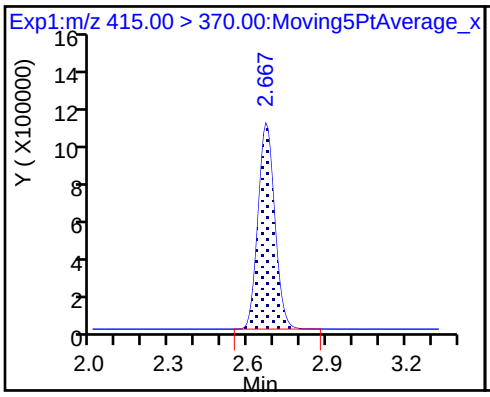
15 Perfluorooctanoic acid



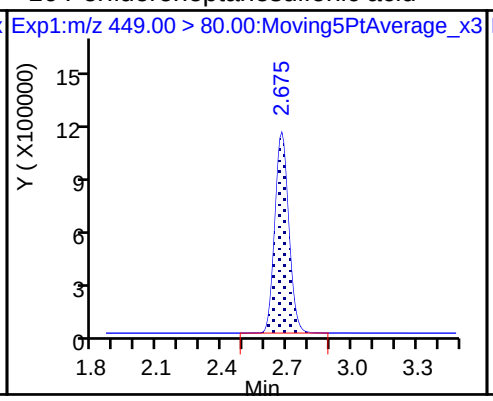
15 Perfluorooctanoic acid



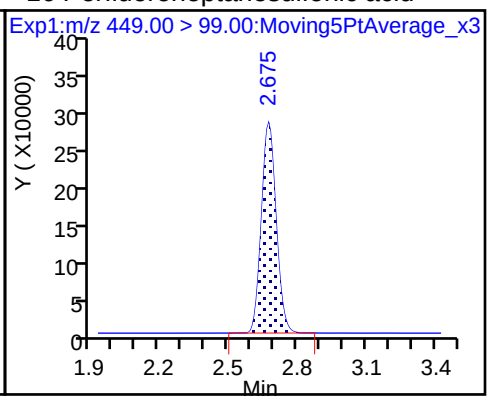
* 62 13C2-PFOA



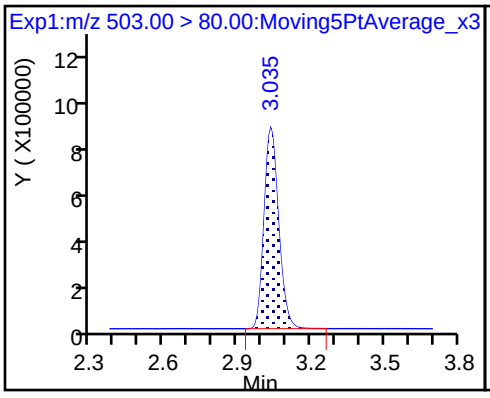
16 Perfluoroheptanesulfonic acid



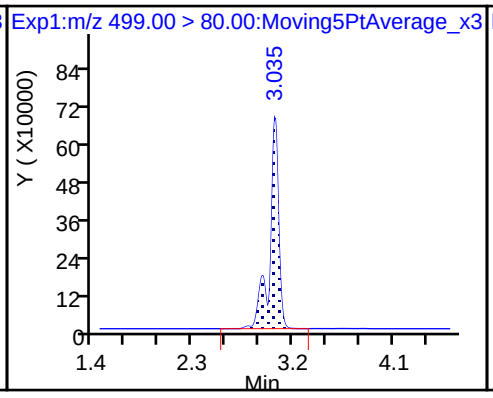
16 Perfluoroheptanesulfonic acid



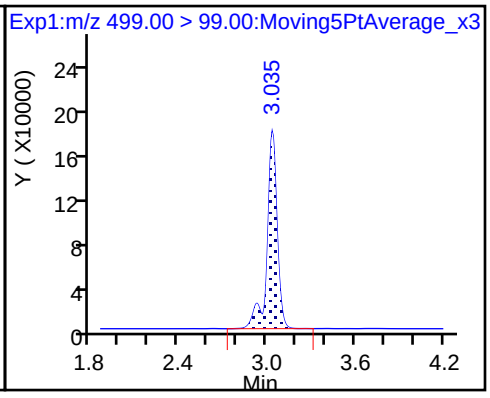
D 18 13C4 PFOS



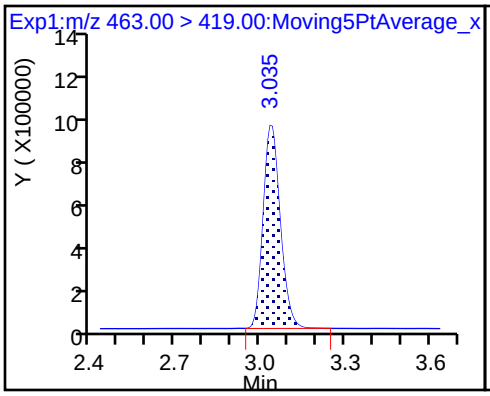
17 Perfluorooctane sulfonic acid



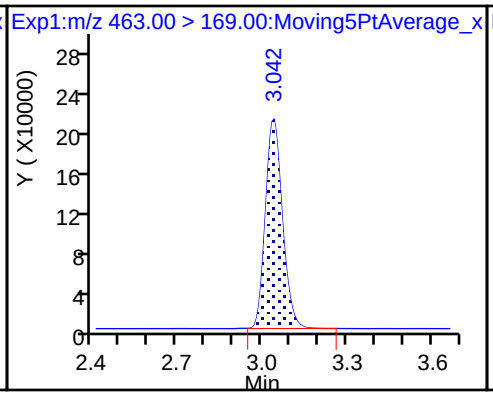
17 Perfluorooctane sulfonic acid



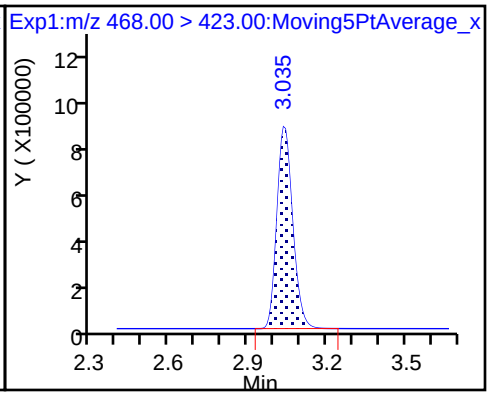
20 Perfluorononanoic acid



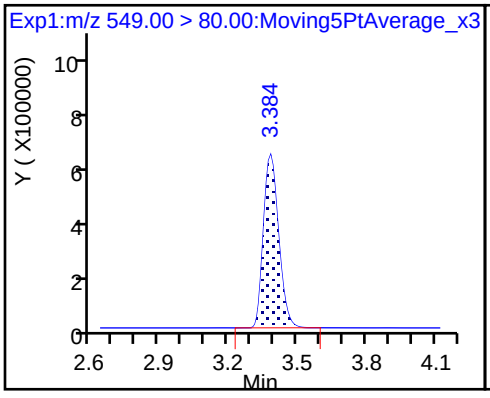
20 Perfluorononanoic acid



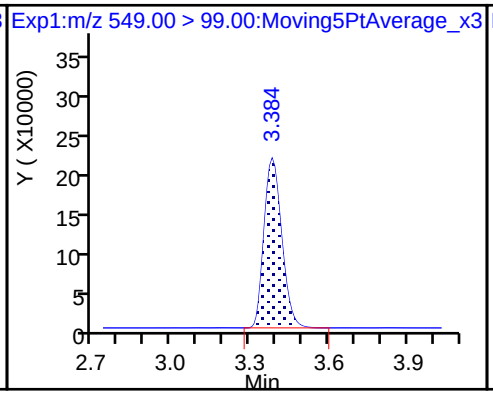
D 19 13C5 PFNA



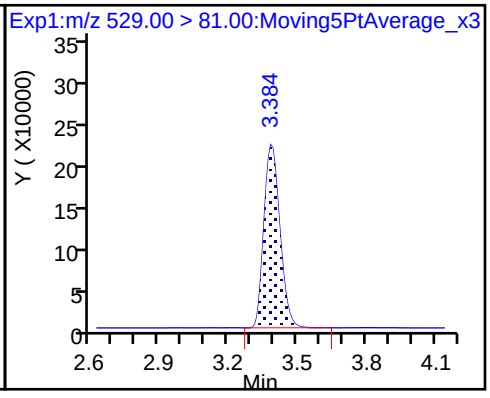
68 Perfluorononanesulfonic acid



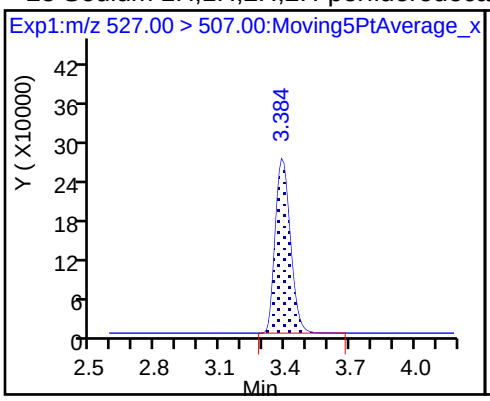
68 Perfluorononanesulfonic acid



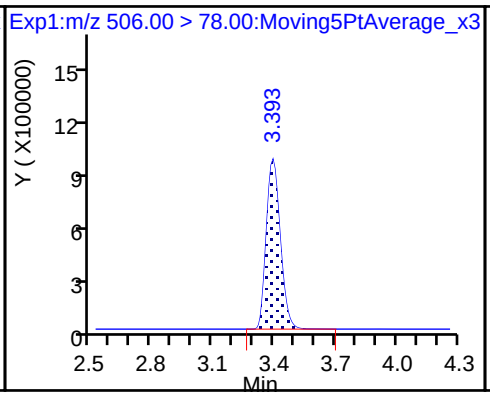
D 26 M2-8:2FTS



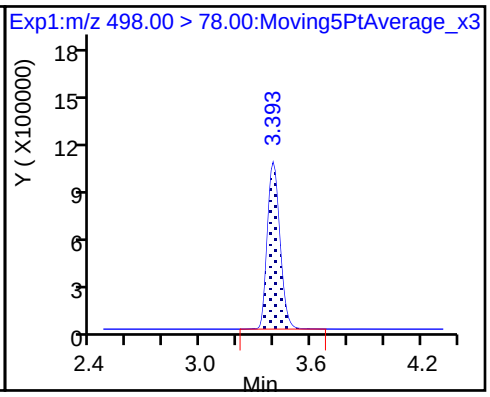
25 Sodium 1H,1H,2H,2H-perfluorodecane



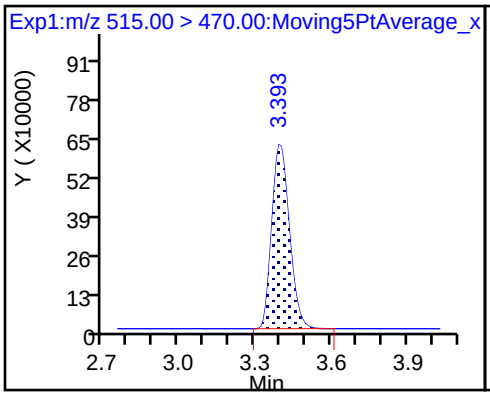
D 21 13C8 FOSA



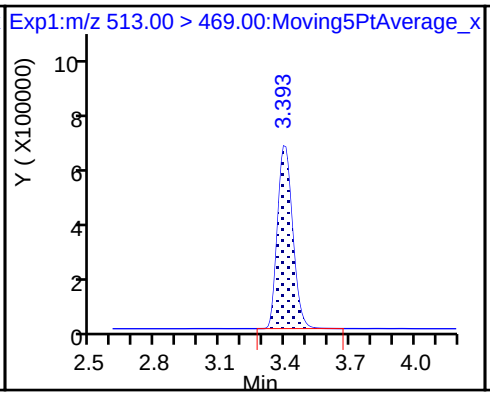
22 Perfluorooctane Sulfonamide



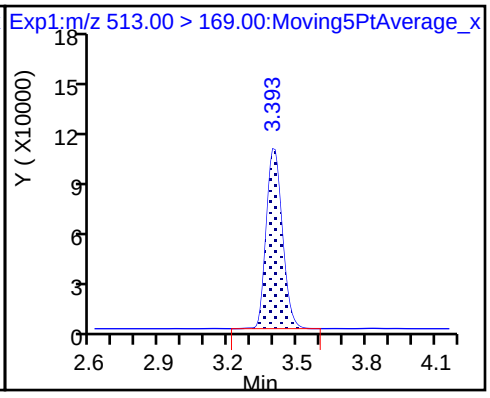
D 23 13C2 PFDA



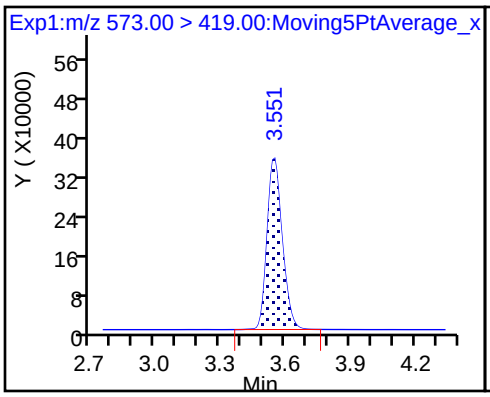
24 Perfluorodecanoic acid



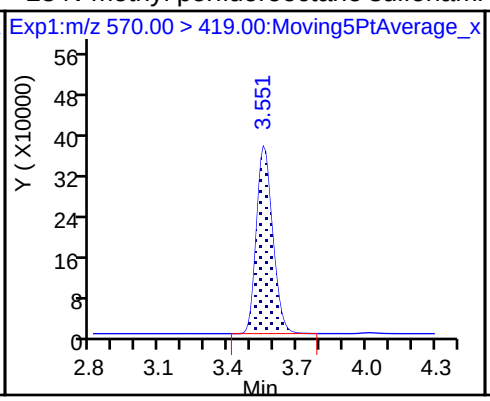
24 Perfluorodecanoic acid



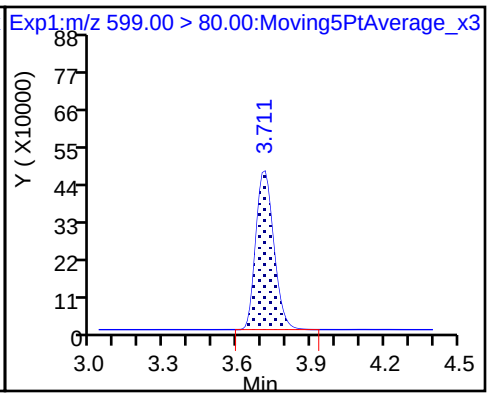
D 27 d3-NMeFOSAA



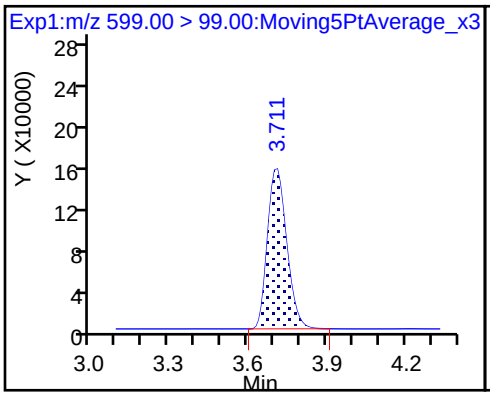
28 N-methyl perfluorooctane sulfonami



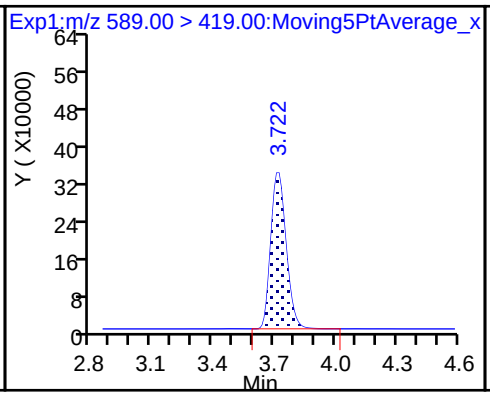
29 Perfluorodecane Sulfonic acid



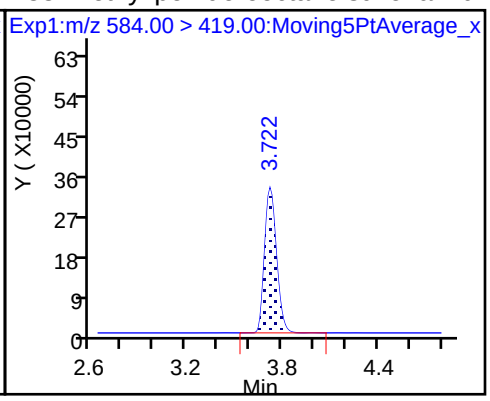
29 Perfluorodecane Sulfonic acid



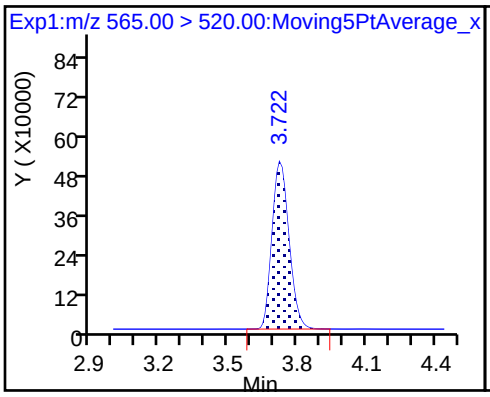
D 32 d5-NEtFOSAA



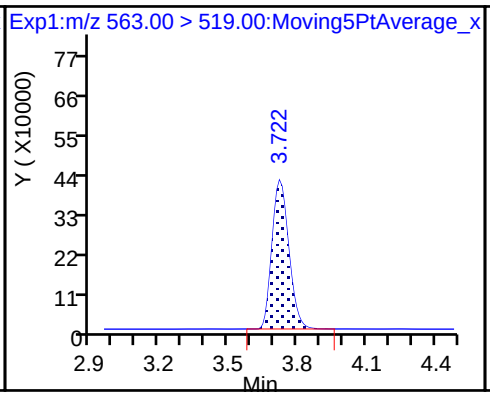
33 N-ethyl perfluorooctane sulfonamid



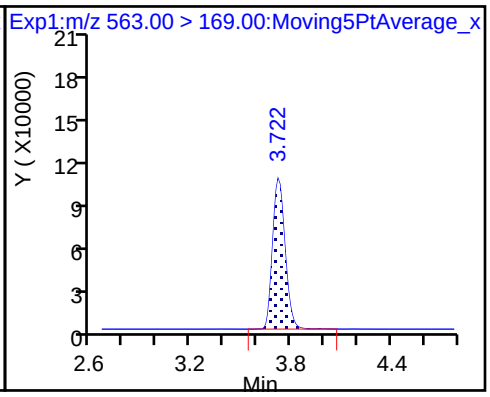
D 30 13C2 PFUnA



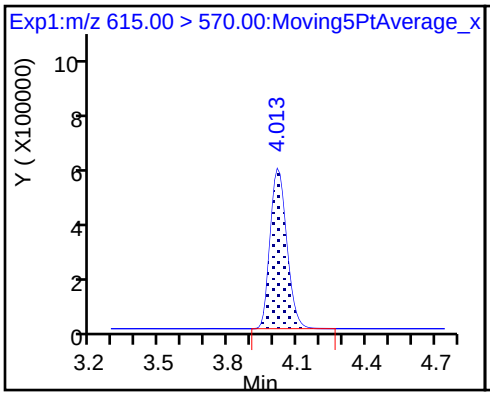
31 Perfluoroundecanoic acid



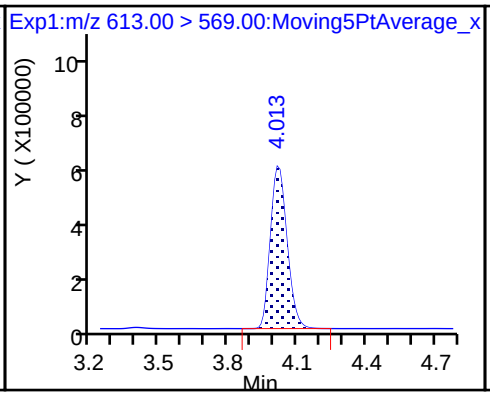
31 Perfluoroundecanoic acid



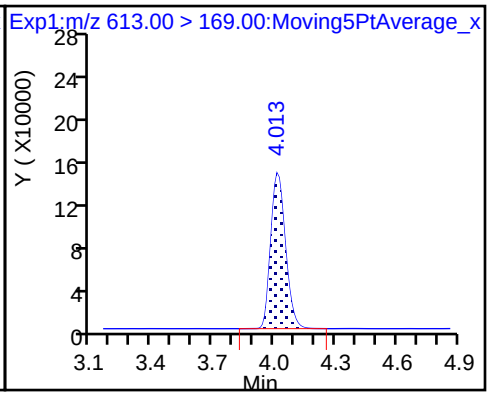
D 36 13C2 PFDoA



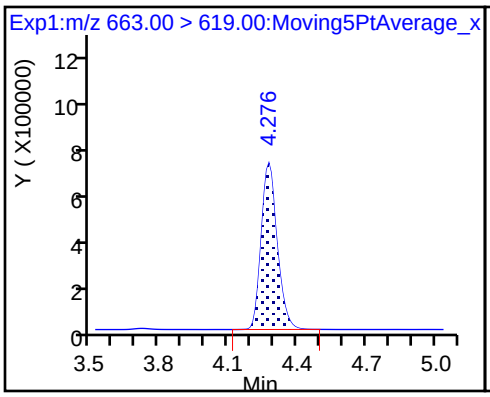
37 Perfluorododecanoic acid



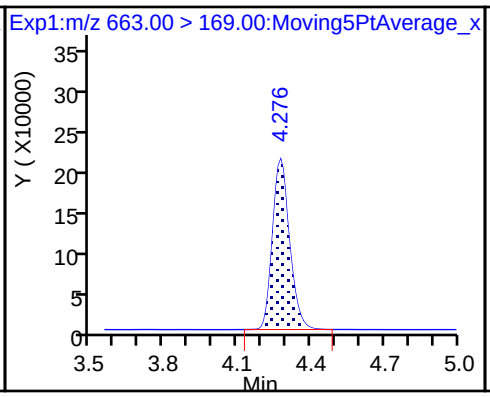
37 Perfluorododecanoic acid



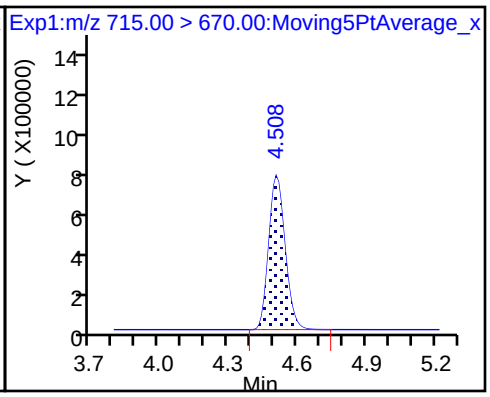
41 Perfluorotridecanoic acid



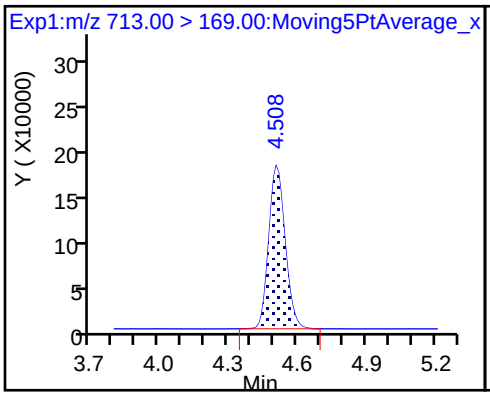
41 Perfluorotridecanoic acid



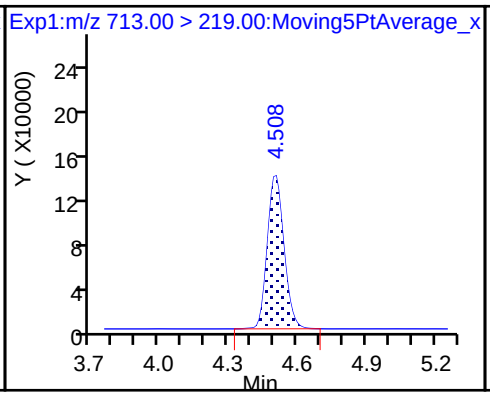
D 43 13C2-PFTeDA



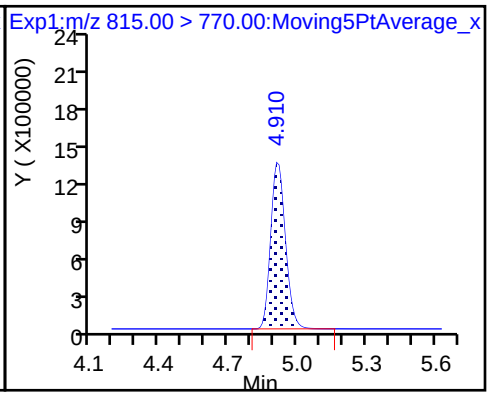
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 10-Apr-2018 19:18:46 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:51:14 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:20:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.425	1.431	-0.006	1.000	6997865	2.65		106	49847	
2 Perfluorobutyric acid										
212.90 > 169.00	1.431	1.432	-0.001	1.004	13377174	5.15		103	7717	
D 3 13C5-PFPeA										
267.90 > 223.00	1.694	1.699	-0.005	0.557	4492903	2.64		105	81359	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.694	1.699	-0.005	1.000	10497161	4.90		98.0	10563	
D 47 13C3-PFBS										
301.90 > 83.00	1.730	1.735	-0.005	1.000	92353	2.36		102	1083	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.730	1.736	-0.006	1.000	14347107	4.61		104	64269	
298.90 > 99.00	1.730	1.736	-0.006	1.000	6127625		2.34(1.25-3.74)	104	70987	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.950	1.950	0.0	1.000	3030208	4.76		102	141069	
D 60 M2-4:2FTS										
329.00 > 81.00	1.950	1.950	0.0	1.000	668373	NC			7685	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.982	1.985	-0.003	1.000	10489823	5.40		108	24333	
313.00 > 119.00	1.982	1.985	-0.003	1.000	894344		11.73(5.03-15.10)	108	11532	
D 7 13C2 PFHxA										
315.00 > 270.00	1.982	1.985	-0.003	1.000	4780636	2.54		101	96741	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.005	2.008	-0.003	1.000	13627914	4.80		102	98334	
349.00 > 99.00	2.005	2.008	-0.003	1.000	5231254		2.61(1.36-4.07)	102	95005	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.084	2.084	0.0	1.000	274179	NC			8284	

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	2.087	-0.003	1.000	1870994	NC			12525	
D 9 13C4-PFHpA										
367.00 > 322.00	2.310	2.314	-0.004	1.000	4543925	2.48		99.1	68671	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.310	2.314	-0.004	1.000	9662627	5.31		106	14097	
363.00 > 169.00	2.310	2.314	-0.004	1.000	4011641		2.41(1.13-3.40)	106	22953	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.323	2.323	0.0	1.000	11450464	4.41		96.8	31512	
399.00 > 99.00	2.323	2.323	0.0	1.000	3849777		2.97(1.50-4.49)	96.8	34232	
D 11 18O2 PFHxS										
403.00 > 84.00	2.323	2.327	-0.004	1.000	5430236	2.40		101	91039	
65 Adona										
377.00 > 251.00	2.362	2.360	0.002	1.000	26999565	NC			217494	
377.00 > 85.00	2.362	2.360	0.002	1.000	16841301		1.60(0.84-2.53)		159720	
D 12 M2-6:2FTS										
429.00 > 81.00	2.645	2.649	-0.004	1.000	950305	2.42		102	15598	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.645	2.649	-0.004	1.000	3314359	4.90		103	51474	
D 14 13C4 PFOA										
417.00 > 372.00	2.668	2.673	-0.005	1.000	4688766	2.57		103	76247	
* 62 13C2-PFOA										
415.00 > 370.00	2.676	2.674	0.002		4914871	2.50			59774	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.676	2.674	0.002	1.003	11016957	5.08		102	7204	
413.00 > 169.00	2.676	2.674	0.002	1.003	5404594		2.04(0.84-2.52)	102	21416	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.683	2.680	0.003	1.000	10719572	4.97		104	63342	
449.00 > 99.00	2.676	2.680	-0.004	0.997	2882422		3.72(1.94-5.82)	104	51468	
D 18 13C4 PFOS										
503.00 > 80.00	3.043	3.041	0.002	1.000	3884830	2.45		103	25175	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.043	3.042	0.001	1.000	8615775	4.87		105	37504	
499.00 > 99.00	3.043	3.042	0.001	1.000	1907418		4.52(2.31-6.93)	105	40242	
20 Perfluorononanoic acid										
463.00 > 419.00	3.043	3.043	0.0	1.000	8663453	5.40		108	21881	
463.00 > 169.00	3.043	3.043	0.0	1.000	1977379		4.38(1.90-5.69)	108	42954	
D 19 13C5 PFNA										
468.00 > 423.00	3.043	3.045	-0.002	1.000	3844023	2.45		98.1	71022	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.252	3.253	-0.001	1.000	15327887	NC			237615	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.387	3.388	-0.001	1.000	6392773	4.92		102	46125	
549.00 > 99.00	3.387	3.388	-0.001	1.000	2379569		2.69(1.33-3.97)	102	42811	
D 26 M2-8:2FTS										
529.00 > 81.00	3.387	3.390	-0.003	1.000	1111203	2.35		98.0	12960	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.396	3.393	0.003	1.003	2936296	5.00		104	87146	

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	3.396	3.397	-0.001	1.000	4967723	2.51		100	59122	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.396	3.401	-0.005	1.000	10640158	5.29		106	83571	
D 23 13C2 PFDA										
515.00 > 470.00	3.405	3.401	0.004	1.000	3590754	2.73		109	63551	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.405	3.402	0.003	1.000	7080425	4.78		95.6	42943	
513.00 > 169.00	3.405	3.402	0.003	1.000	1224285		5.78(2.36-7.09)	95.6	19818	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.555	3.553	0.002	1.000	1906740	2.55		102	32484	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.555	3.558	-0.003	1.000	4211279	5.54		111	24793	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.717	3.715	0.002	1.000	5591516	5.30		110	68704	
599.00 > 99.00	3.717	3.715	0.002	1.000	1873892		2.98(1.39-4.16)	110	41042	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.717	3.722	-0.005	1.000	1869135	2.54		101	18949	
D 30 13C2 PFUnA										
565.00 > 520.00	3.728	3.727	0.001	1.000	2905024	2.56		102	63455	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.728	3.727	0.001	1.003	3584245	5.13		103	43487	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.728	3.727	0.001	1.000	5051597	5.14		103	23183	
563.00 > 169.00	3.728	3.727	0.001	1.000	1197755		4.22(2.12-6.36)	103	29187	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.886	3.883	0.003	1.000	21858692	NC			132441	
D 36 13C2 PFDoA										
615.00 > 570.00	4.019	4.017	0.002	1.000	3059706	2.49		99.7	34585	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.019	4.020	-0.001	1.000	6635970	5.20		104	7407	
613.00 > 169.00	4.019	4.020	-0.001	1.000	1580285		4.20(2.13-6.40)	104	18694	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.281	4.278	0.003	1.000	7847307	5.28		106	6944	
663.00 > 169.00	4.281	4.278	0.003	1.000	2374861		3.30(1.25-3.76)	106	19843	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.512	4.513	-0.001	1.000	3906384	2.51		100	23277	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.512	4.513	-0.001	1.000	2025257	5.16		103	14592	
713.00 > 219.00	4.512	4.513	-0.001	1.000	1435695		1.41(0.71-2.13)	103	15337	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.923	4.918	0.005	1.000	6481798	2.56		102	19589	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.923	4.920	0.003	1.000	11955765	NC			3378	
813.00 > 169.00	4.923	4.920	0.003	1.000	2040197		5.86(2.86-8.58)		10211	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.270	5.268	0.002	1.000	12855038	NC			2871	
913.00 > 169.00	5.270	5.268	0.002	1.000	1566786		8.20(3.83-11.48)		6806	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00005 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:51:16 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_007.d

Injection Date: 10-Apr-2018 19:18:46 Instrument ID: A8_N

Lims ID: IC L6 Full

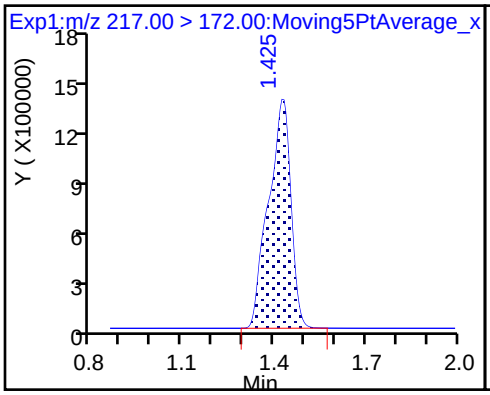
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 15 Worklist Smp#: 7

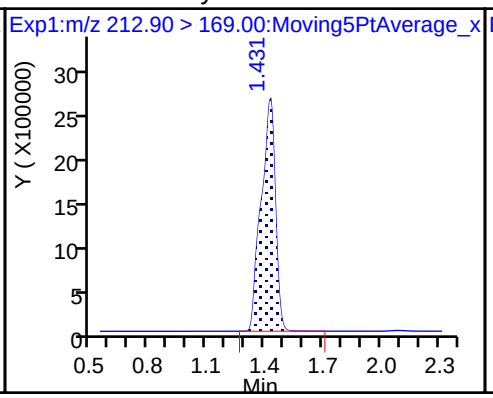
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

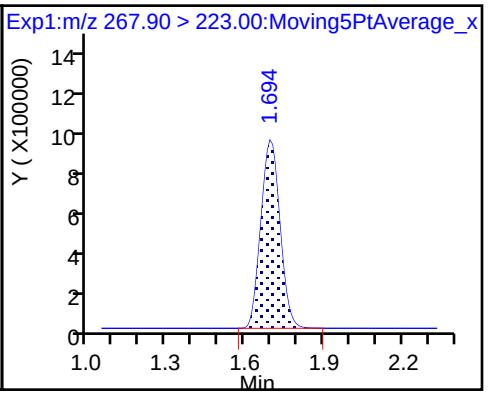
D 1 13C4 PFBA



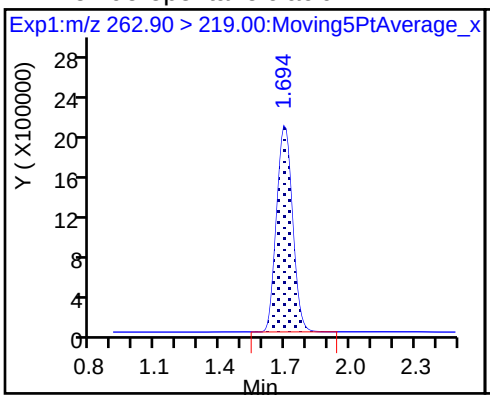
2 Perfluorobutyric acid



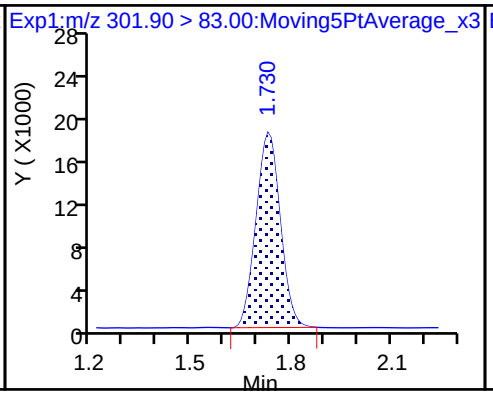
D 3 13C5-PFPeA



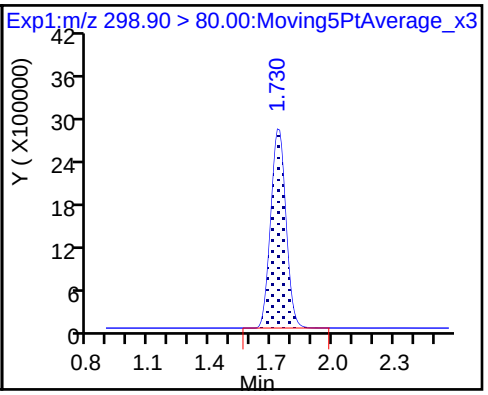
4 Perfluoropentanoic acid



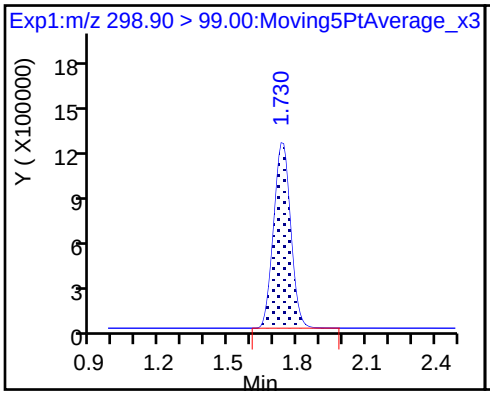
D 47 13C3-PFBS



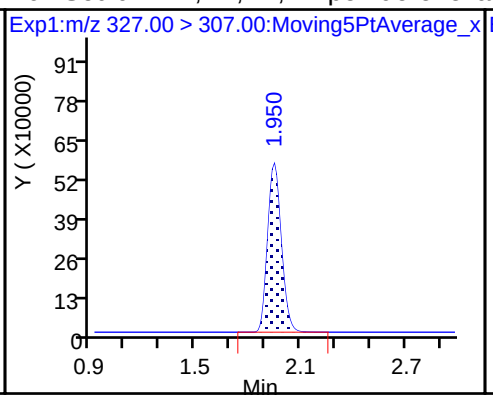
5 Perfluorobutanesulfonic acid



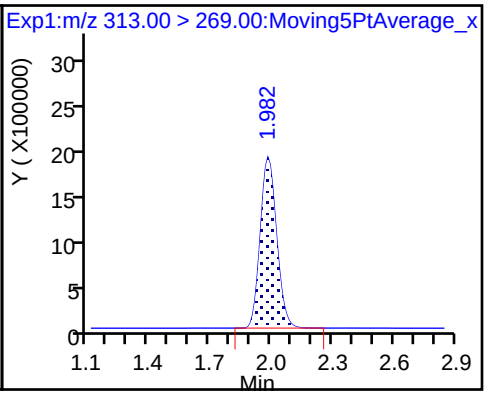
5 Perfluorobutanesulfonic acid



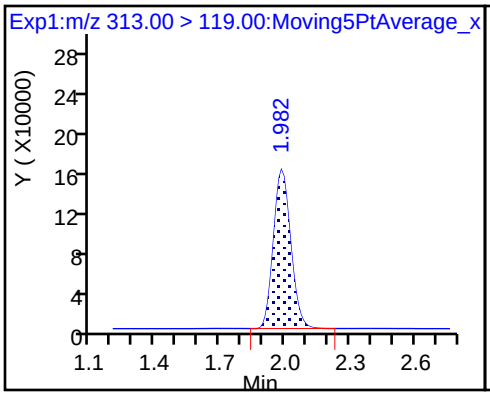
61 Sodium 1H,1H,2H,2H-perfluorohexane



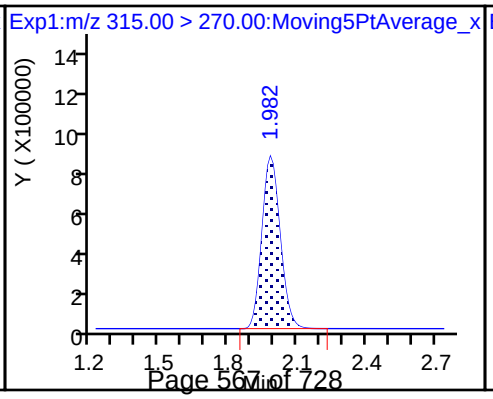
6 Perfluorohexanoic acid



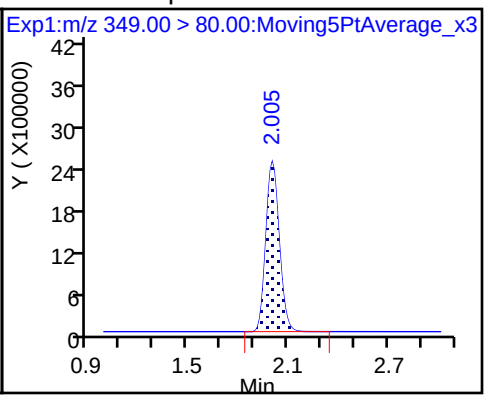
6 Perfluorohexanoic acid



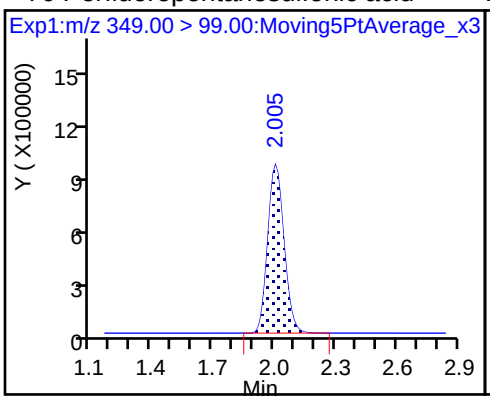
D 7 13C2 PFHxA



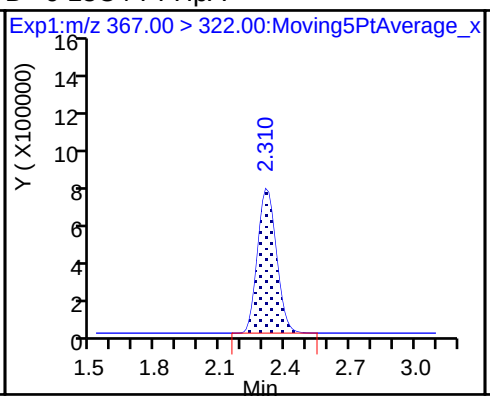
70 Perfluoropentanesulfonic acid



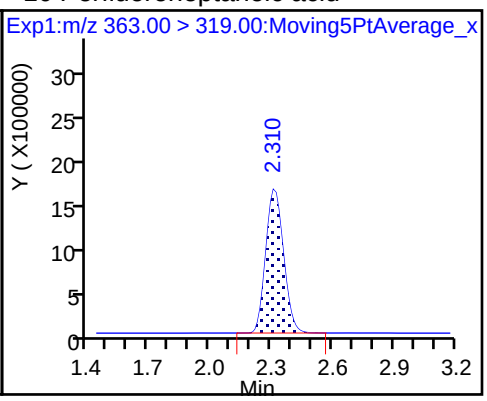
70 Perfluoropentanesulfonic acid



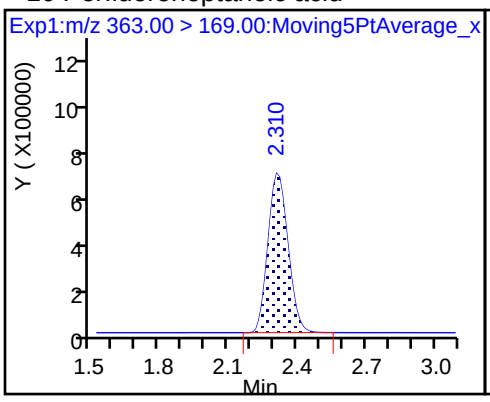
D 9 13C4-PFHpA



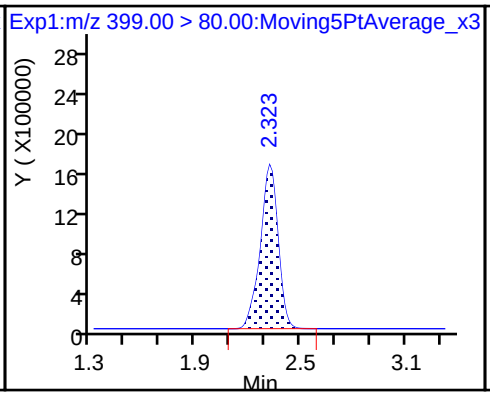
10 Perfluoroheptanoic acid



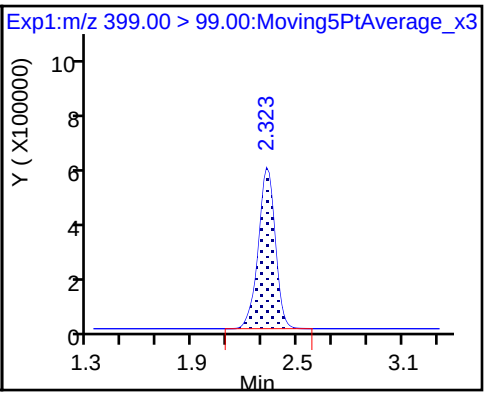
10 Perfluoroheptanoic acid



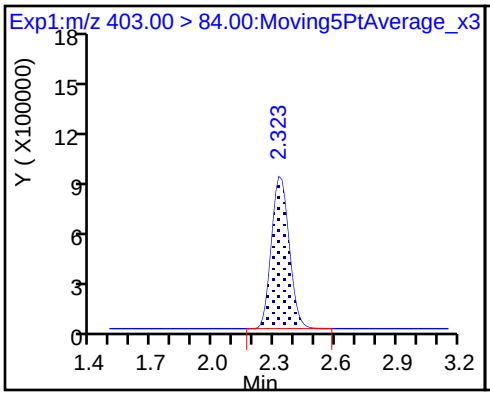
8 Perfluorohexanesulfonic acid



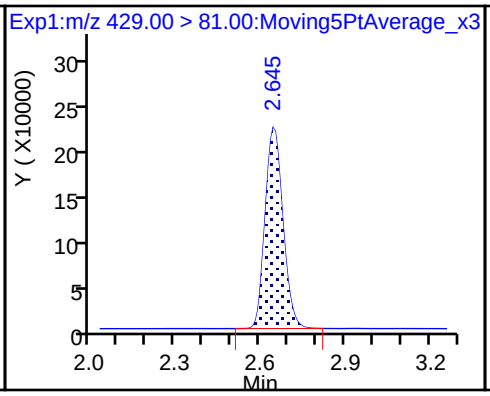
8 Perfluorohexanesulfonic acid



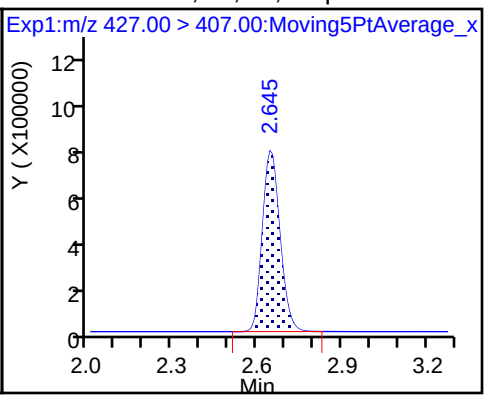
D 11 18O2 PFHxS



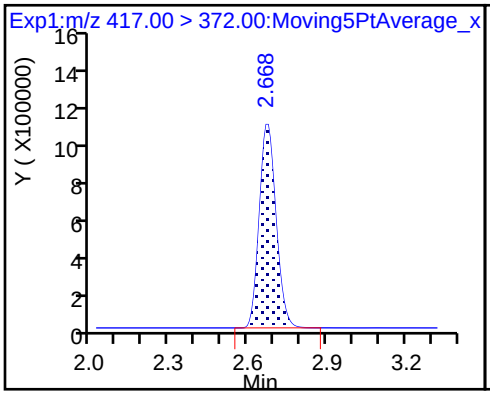
D 12 M2-6:2FTS



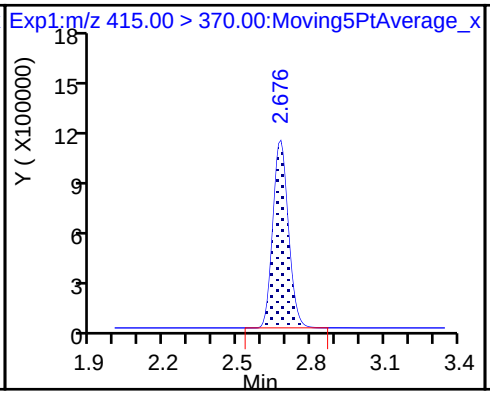
13 Sodium 1H,1H,2H,2H-perfluorooctane



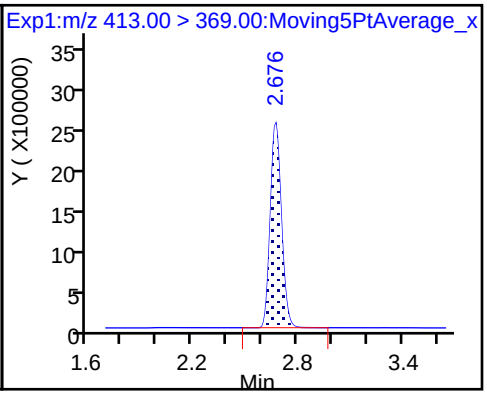
D 14 13C4 PFOA



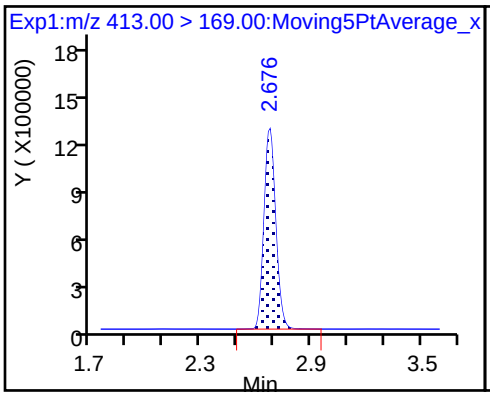
* 62 13C2-PFOA



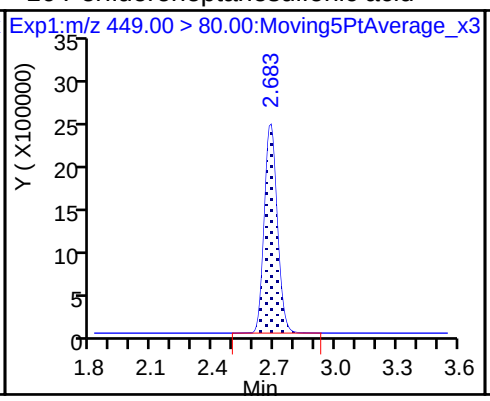
15 Perfluorooctanoic acid



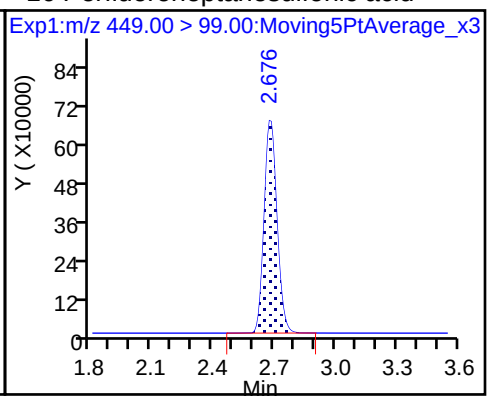
15 Perfluorooctanoic acid



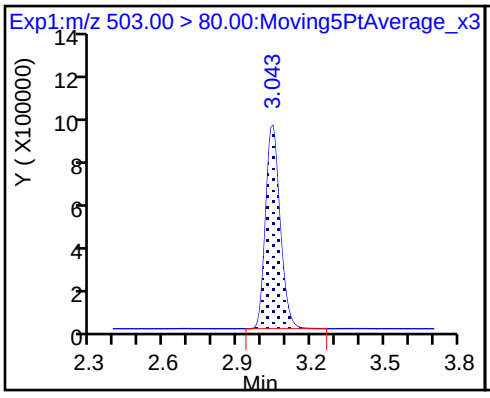
16 Perfluoroheptanesulfonic acid



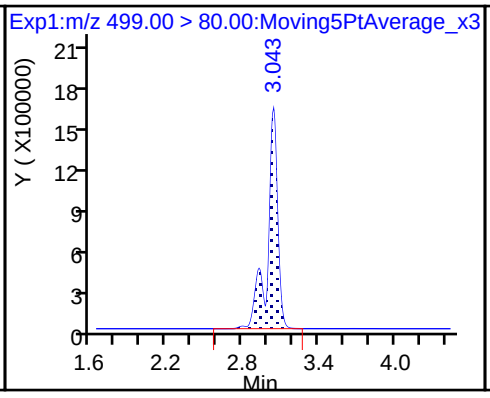
16 Perfluoroheptanesulfonic acid



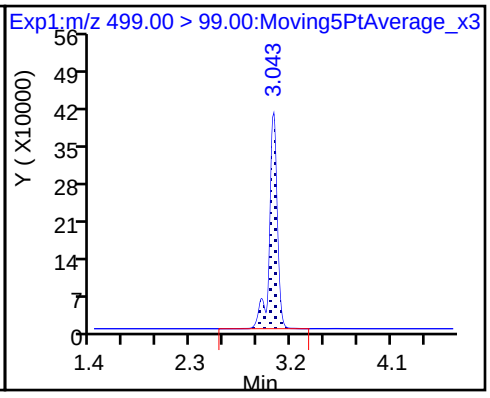
D 18 13C4 PFOS



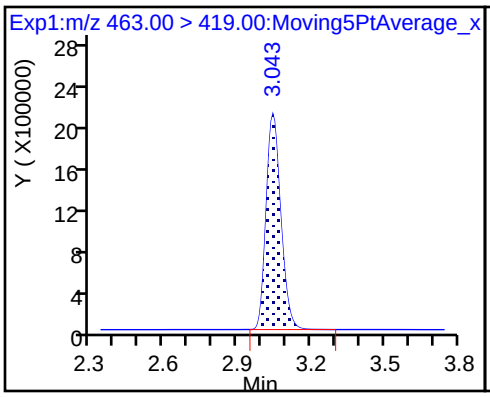
17 Perfluorooctane sulfonic acid



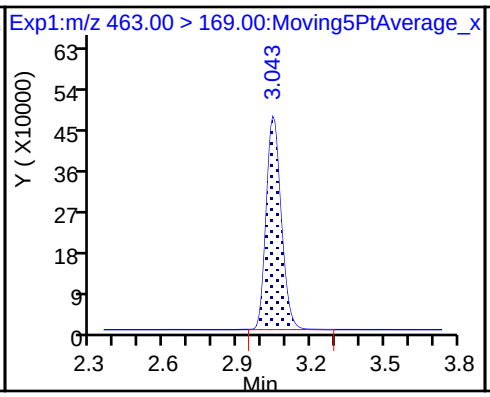
17 Perfluorooctane sulfonic acid



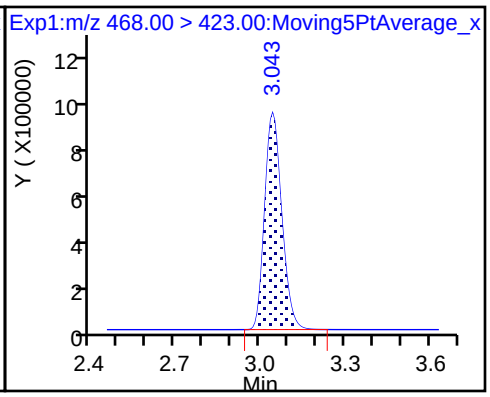
20 Perfluorononanoic acid



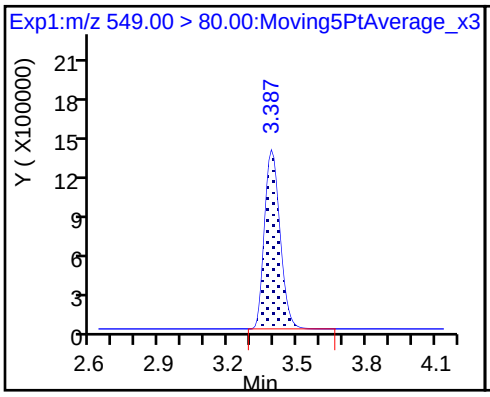
20 Perfluorononanoic acid



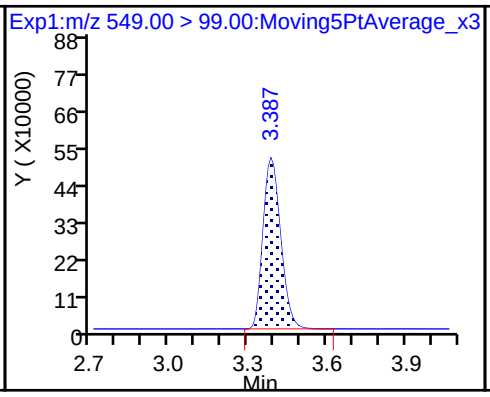
D 19 13C5 PFNA



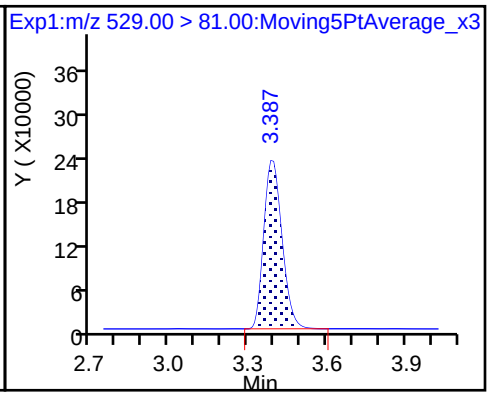
68 Perfluorononanesulfonic acid



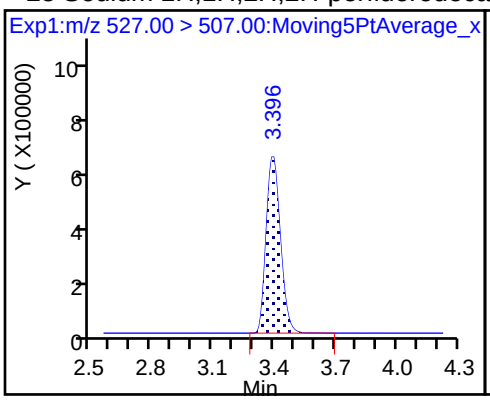
68 Perfluorononanesulfonic acid



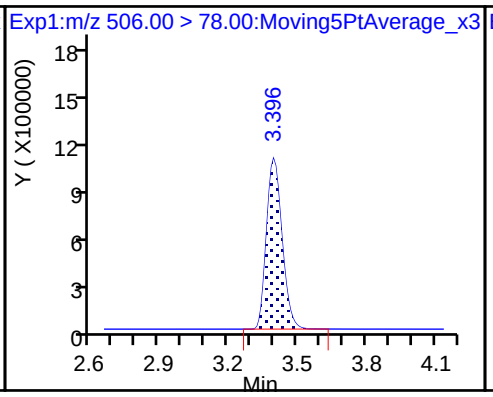
D 26 M2-8:2FTS



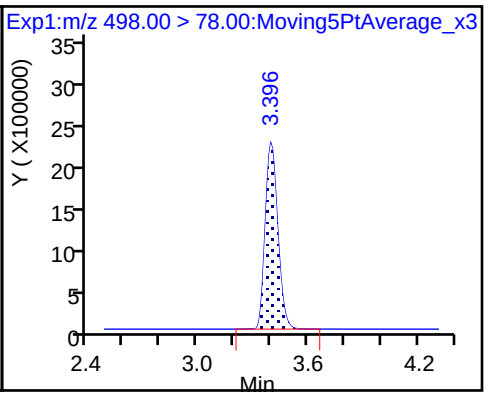
25 Sodium 1H,1H,2H,2H-perfluorodecane



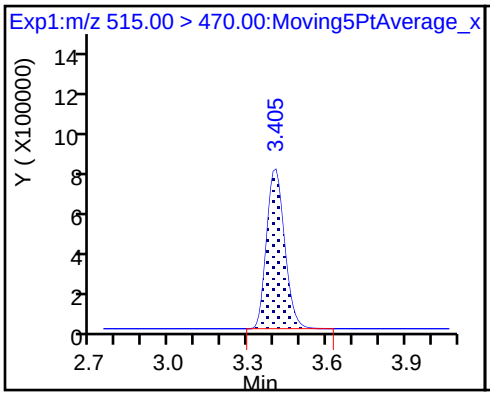
D 21 13C8 FOSA



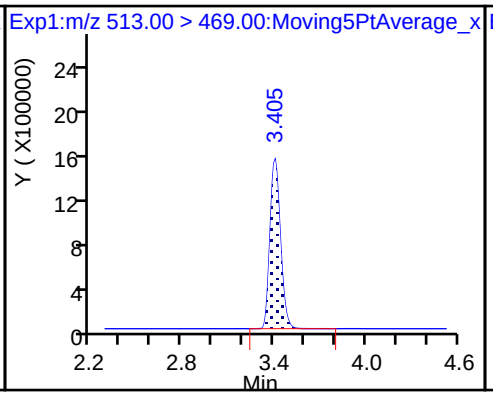
22 Perfluorooctane Sulfonamide



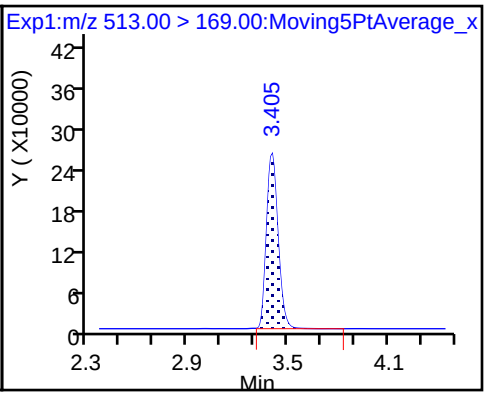
D 23 13C2 PFDA



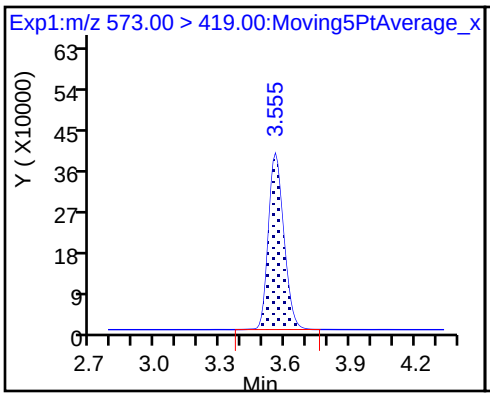
24 Perfluorodecanoic acid



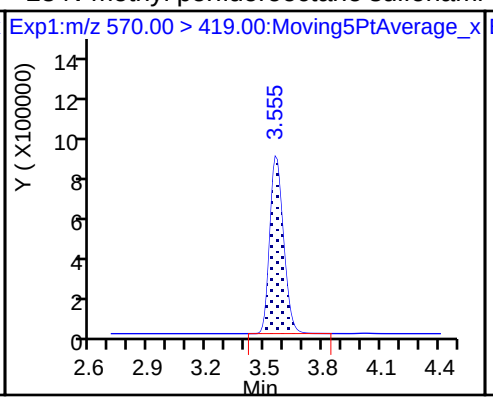
24 Perfluorodecanoic acid



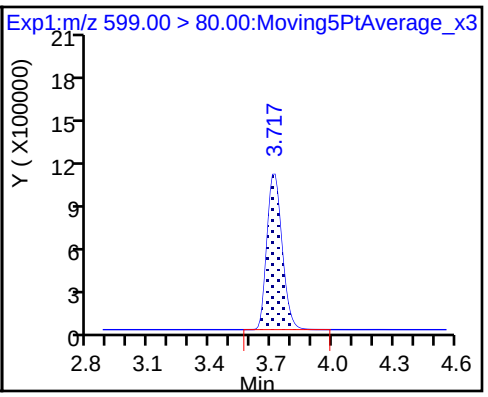
D 27 d3-NMeFOSAA



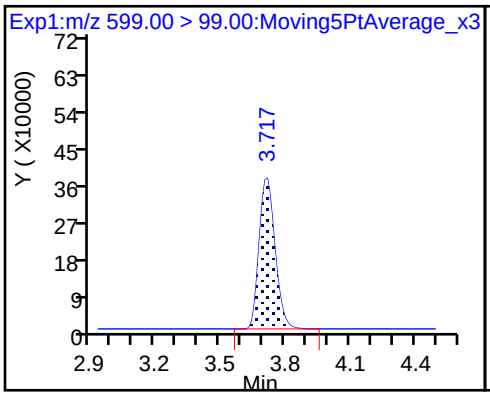
28 N-methyl perfluorooctane sulfonami



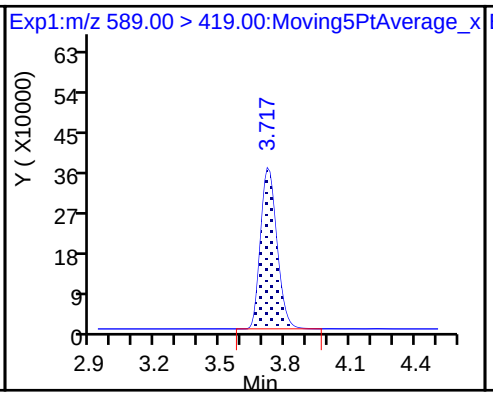
29 Perfluorodecane Sulfonic acid



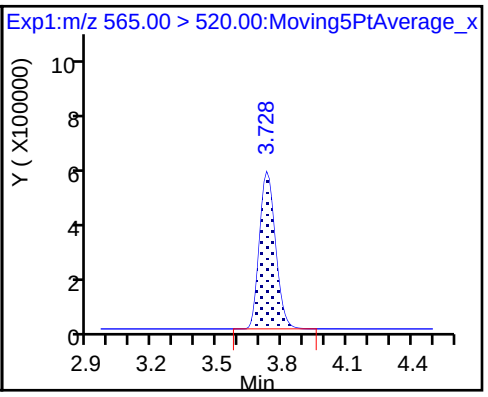
29 Perfluorodecane Sulfonic acid



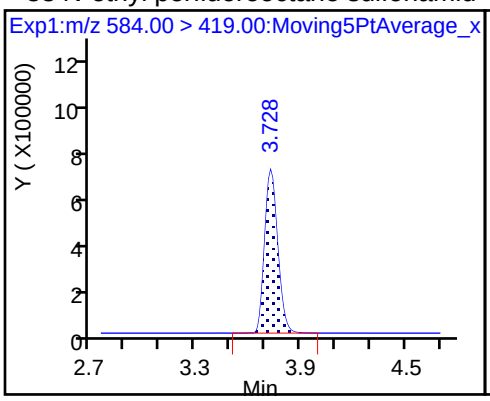
D 32 d5-NEtFOSAA



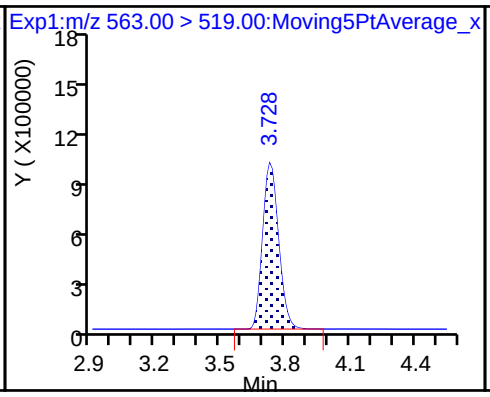
D 30 13C2 PFUnA



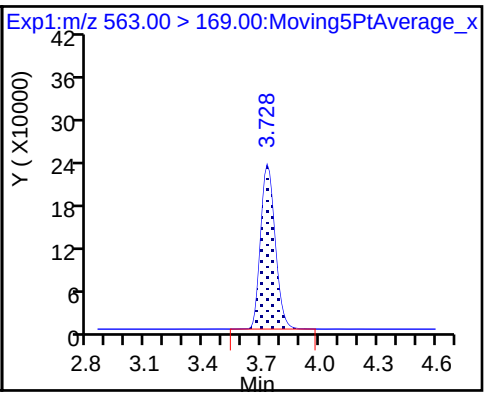
33 N-ethyl perfluorooctane sulfonamid



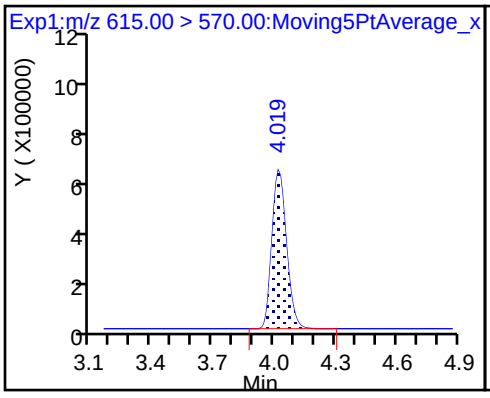
31 Perfluoroundecanoic acid



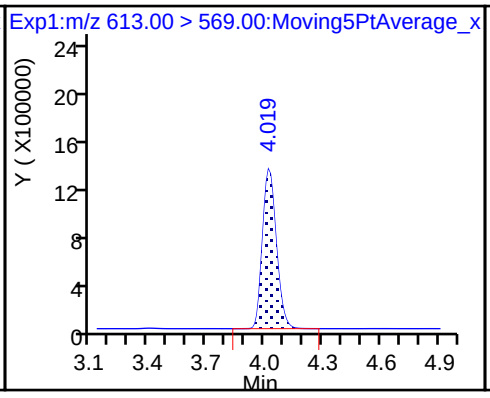
31 Perfluoroundecanoic acid



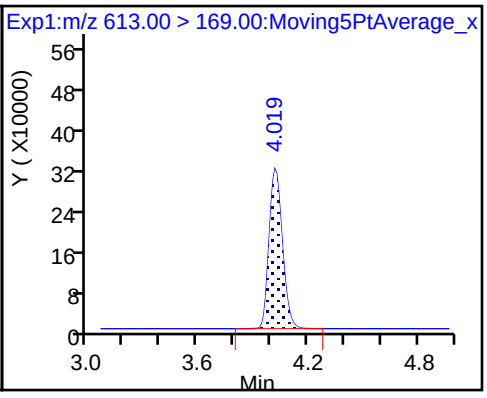
D 36 13C2 PFDoA



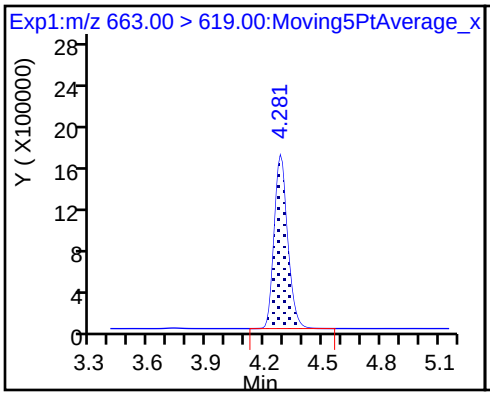
37 Perfluorododecanoic acid



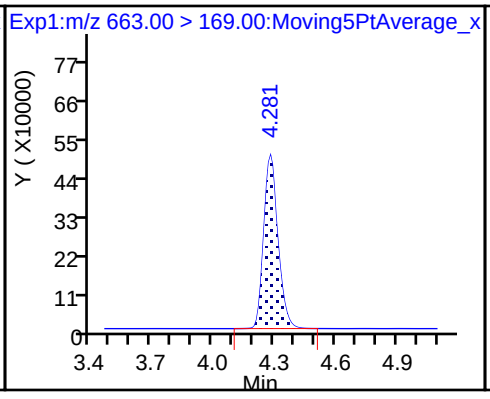
37 Perfluorododecanoic acid



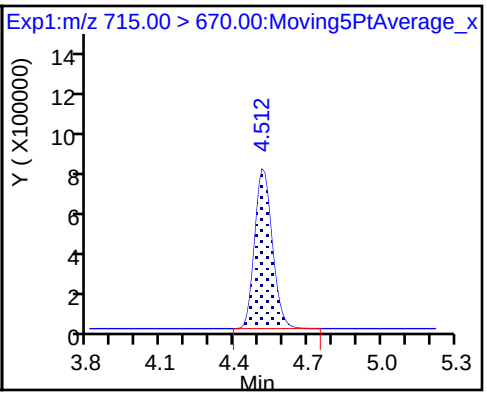
41 Perfluorotridecanoic acid



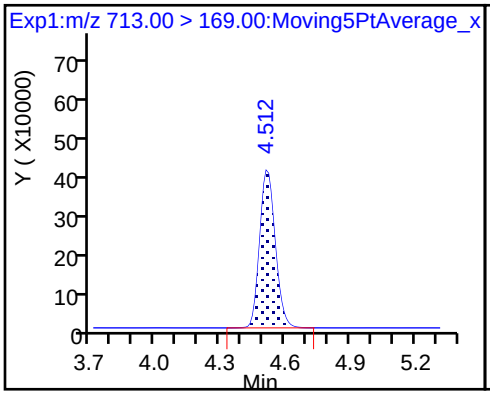
41 Perfluorotridecanoic acid



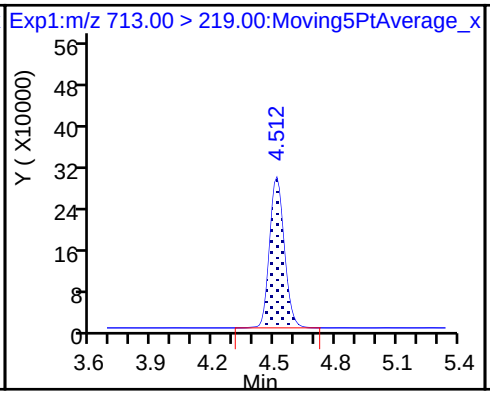
D 43 13C2-PFTeDA



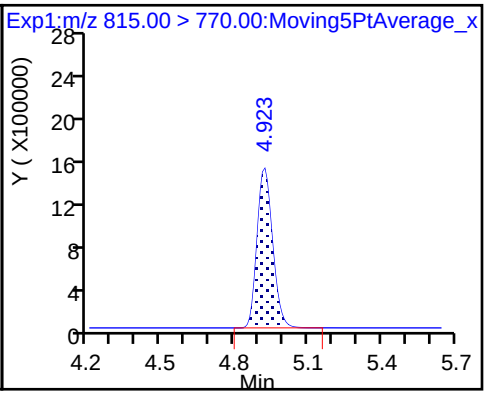
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 10-Apr-2018 19:26:34 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:51:18 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:20:58

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	1.430	1.431	-0.001	1.000	5884851	2.66		106	46581	
2 Perfluorobutyric acid										
212.90 > 169.00	1.430	1.432	-0.002	1.000	21784128	9.97		99.7	11333	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.699	0.003	1.000	17503102	9.84		98.4	16746	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.699	0.003	0.558	3729652	2.61		105	78108	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.735	0.003	1.000	82834	2.53		109	829	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.738	1.736	0.002	1.000	22532715	8.08		91.4	76780	
298.90 > 99.00	1.738	1.736	0.002	1.000	10095018		2.23(1.25-3.74)	91.4	146676	
D 60 M2-4:2FTS										
329.00 > 81.00	1.949	1.950	-0.001	1.000	563434	NC			6225	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.949	1.950	-0.001	1.000	5473778	9.58		103	195589	
D 7 13C2 PFHxA										
315.00 > 270.00	1.981	1.985	-0.004	1.000	4231897	2.68		107	122911	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.981	1.985	-0.004	1.000	16596765	9.65		96.5	37407	
313.00 > 119.00	1.981	1.985	-0.004	1.000	1629067		10.19(5.03-15.10)	96.5	18942	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.003	2.008	-0.005	1.000	22248169	8.73		93.1	165195	
349.00 > 99.00	2.003	2.008	-0.005	1.000	8727242		2.55(1.36-4.07)	93.1	125798	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.083	2.084	-0.001	1.000	242908	NC			8616	

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	2.087	-0.004	1.000	2803143	NC			17925	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.320	2.314	0.006	1.000	16683281	10.9		109	20962	
363.00 > 169.00	2.320	2.314	0.006	1.000	6590526		2.53(1.13-3.40)	109	34535	
D 9 13C4-PFHpA										
367.00 > 322.00	2.320	2.314	0.006	1.000	3828332	2.49		99.7	77251	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.320	2.323	-0.003	0.994	18531754	8.49		93.3	42607	
399.00 > 99.00	2.320	2.323	-0.003	0.994	6460937		2.87(1.50-4.49)	93.3	47012	
D 11 18O2 PFHxS										
403.00 > 84.00	2.333	2.327	0.006	1.000	4559710	2.41		102	82801	
65 Adona										
377.00 > 251.00	2.359	2.360	-0.001	1.000	39451342	NC			277885	
377.00 > 85.00	2.359	2.360	-0.001	1.000	26259771		1.50(0.84-2.53)		255143	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.653	2.649	0.004	1.000	5439954	9.93		105	66881	
D 12 M2-6:2FTS										
429.00 > 81.00	2.653	2.649	0.004	1.000	769923	2.34		98.5	9054	
D 14 13C4 PFOA										
417.00 > 372.00	2.675	2.673	0.002	1.000	3866213	2.53		101	50638	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.675	2.674	0.001	1.000	17251700	9.65		96.5	9651	
413.00 > 169.00	2.675	2.674	0.001	1.000	9097235		1.90(0.84-2.52)	96.5	29224	
* 62 13C2-PFOA										
415.00 > 370.00	2.675	2.674	0.001		4114287	2.50			76246	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.683	2.680	0.003	1.000	16945821	9.42		98.9	66065	
449.00 > 99.00	2.683	2.680	0.003	1.000	4841116		3.50(1.94-5.82)	98.9	91269	
D 18 13C4 PFOS										
503.00 > 80.00	3.043	3.041	0.002	1.000	3239063	2.44		102	17414	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.043	3.042	0.001	1.000	14391699	9.76		105	52846	
499.00 > 99.00	3.043	3.042	0.001	1.000	3174442		4.53(2.31-6.93)	105	34754	
20 Perfluorononanoic acid										
463.00 > 419.00	3.043	3.043	0.0	0.998	13696835	9.77		97.7	34474	
463.00 > 169.00	3.043	3.043	0.0	0.998	3462437		3.96(1.90-5.69)	97.7	45718	
D 19 13C5 PFNA										
468.00 > 423.00	3.050	3.045	0.005	1.000	3361051	2.56		102	67264	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.257	3.253	0.004	1.000	23669204	NC			298503	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.395	3.388	0.007	1.000	10381596	9.58		99.8	64461	
549.00 > 99.00	3.395	3.388	0.007	1.000	3993295		2.60(1.33-3.97)	99.8	65048	
D 26 M2-8:2FTS										
529.00 > 81.00	3.395	3.390	0.005	1.000	929210	2.34		97.9	9349	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.395	3.393	0.002	1.000	4704229	9.58		100	196732	

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	3.395	3.397	-0.002	1.000	4196317	2.53		101	46250	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.404	3.401	0.003	1.003	16450280	9.69		96.9	74333	
D 23 13C2 PFDA										
515.00 > 470.00	3.404	3.401	0.003	1.000	2846573	2.58		103	67167	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.404	3.402	0.002	1.000	11538792	9.82		98.2	37953	
513.00 > 169.00	3.404	3.402	0.002	1.000	2042111		5.65(2.36-7.09)	98.2	47982	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.553	3.553	0.0	1.000	1702670	2.72		109	20225	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.563	3.558	0.005	1.003	7221428	10.6		106	41843	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.716	3.715	0.001	1.000	9173589	10.4		108	56586	
599.00 > 99.00	3.716	3.715	0.001	1.000	3114281		2.95(1.39-4.16)	108	76561	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.727	3.722	0.005	1.000	1478400	2.40		95.9	16640	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.737	3.727	0.010	1.003	5812610	10.5		105	50290	
D 30 13C2 PFUnA										
565.00 > 520.00	3.737	3.727	0.010	1.000	2344065	2.46		98.6	49963	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.727	3.727	0.0	0.997	7810732	9.86		98.6	36756	
563.00 > 169.00	3.727	3.727	0.0	0.997	1900318		4.11(2.12-6.36)	98.6	52722	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.885	3.883	0.002	1.000	32450794	NC			180198	
D 36 13C2 PFDoA										
615.00 > 570.00	4.018	4.017	0.001	1.000	2618174	2.55		102	22873	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.018	4.020	-0.002	1.000	11350274	10.4		104	14082	
613.00 > 169.00	4.028	4.020	0.008	1.003	2800305		4.05(2.13-6.40)	104	29481	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.280	4.278	0.002	1.000	12743041	10.0		100	11764	
663.00 > 169.00	4.280	4.278	0.002	1.000	3998604		3.19(1.25-3.76)	100	28384	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.522	4.513	0.009	1.000	3344927	2.57		103	23122	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.522	4.513	0.009	1.000	3357209	10.0		99.9	21100	
713.00 > 219.00	4.512	4.513	-0.001	0.998	2463893		1.36(0.71-2.13)	99.9	21721	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.922	4.918	0.004	1.000	5522067	2.61		104	17481	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.922	4.920	0.002	1.000	20182542	NC			5657	
813.00 > 169.00	4.922	4.920	0.002	1.000	3386021		5.96(2.86-8.58)		12815	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.277	5.268	0.009	1.000	21808387	NC			4861	
913.00 > 169.00	5.277	5.268	0.009	1.000	2810004		7.76(3.83-11.48)		7858	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00004 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:51:19 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Injection Date: 10-Apr-2018 19:26:34 Instrument ID: A8_N

Lims ID: IC L7 Full

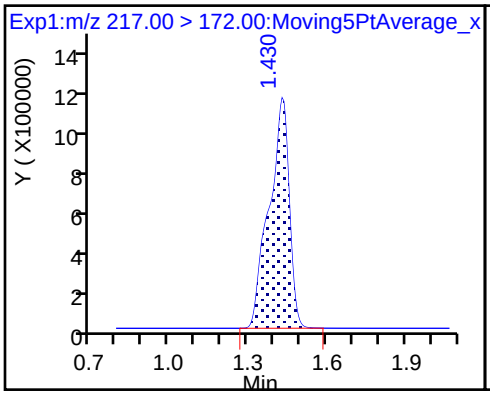
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 8

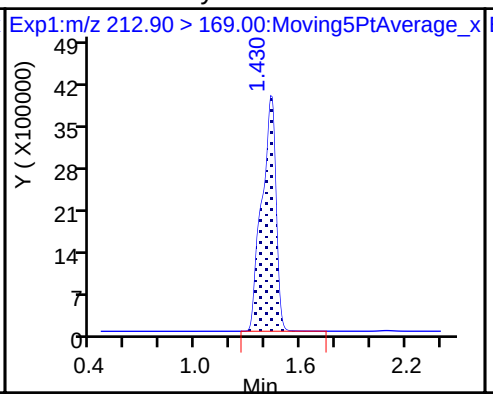
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

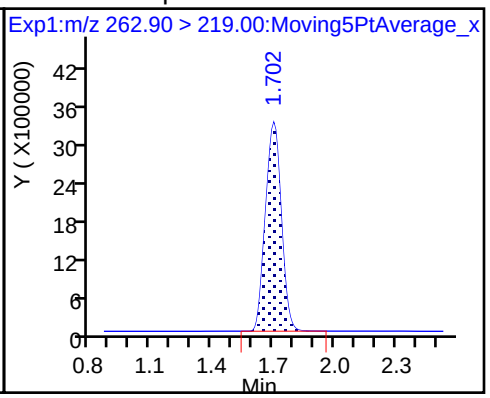
D 1 13C4 PFBA



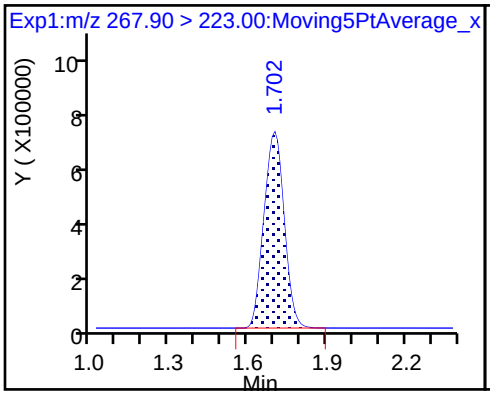
2 Perfluorobutyric acid



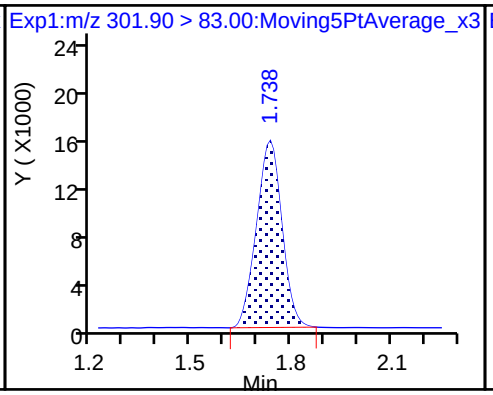
4 Perfluoropentanoic acid



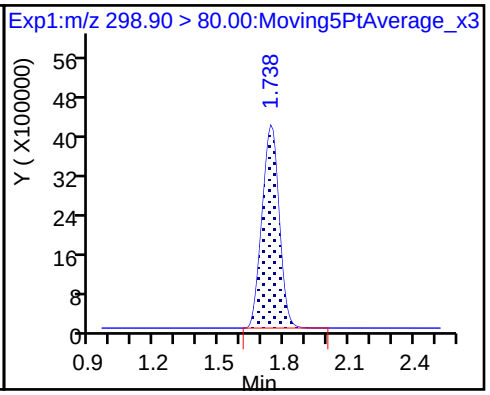
D 3 13C5-PFPeA



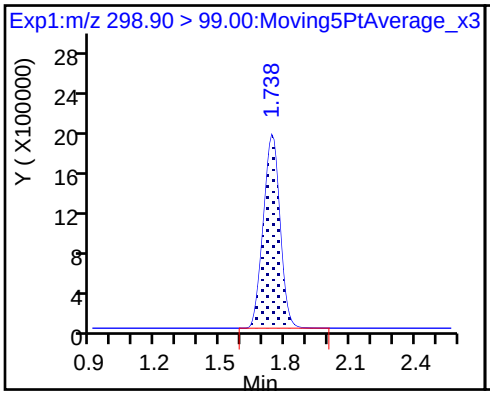
D 47 13C3-PFBS



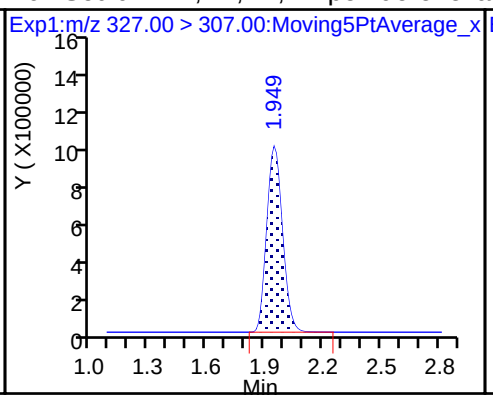
5 Perfluorobutanesulfonic acid



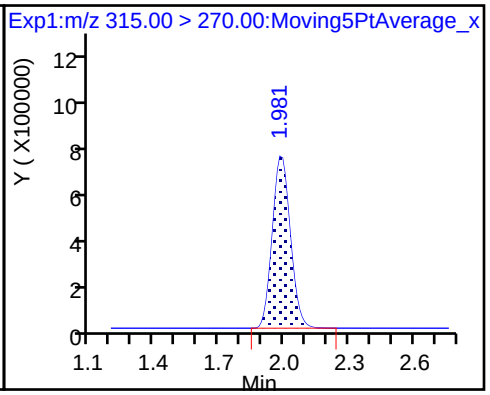
5 Perfluorobutanesulfonic acid



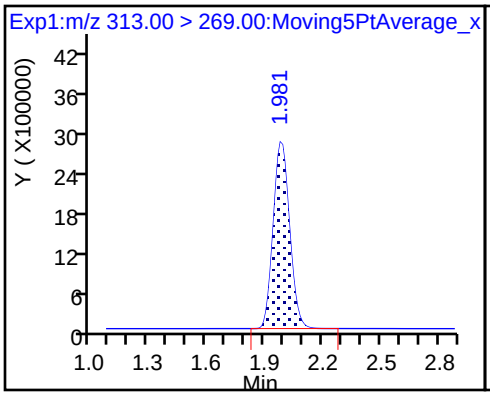
61 Sodium 1H,1H,2H,2H-perfluorohexa



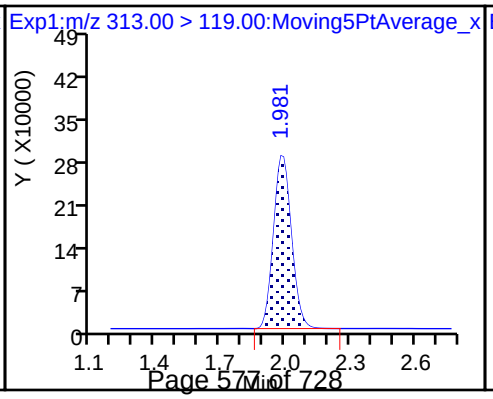
De 7 13C2 PFHxA



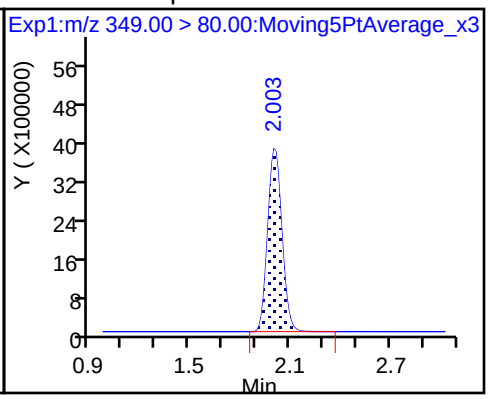
6 Perfluorohexanoic acid



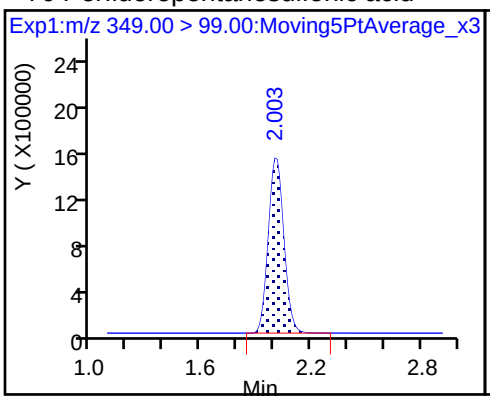
6 Perfluorohexanoic acid



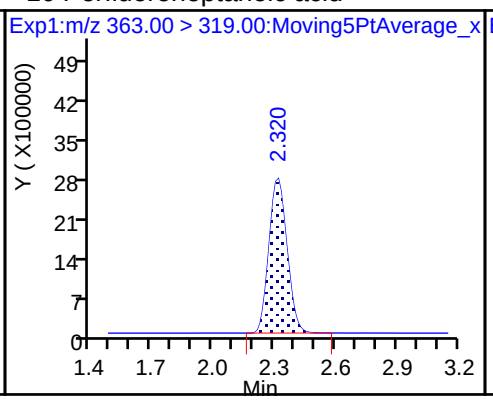
70 Perfluoropentanesulfonic acid



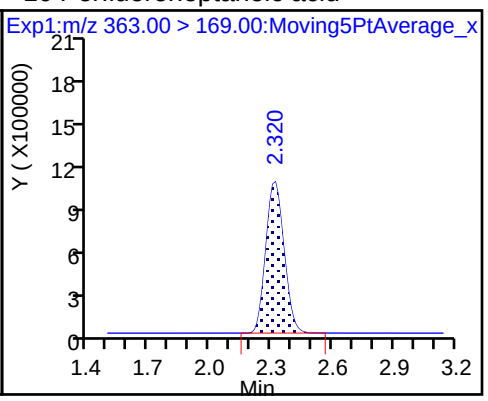
70 Perfluoropentanesulfonic acid



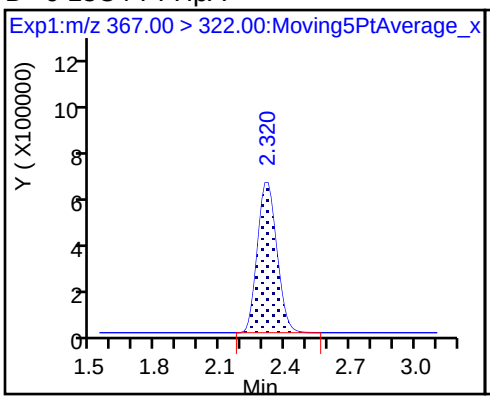
10 Perfluoroheptanoic acid



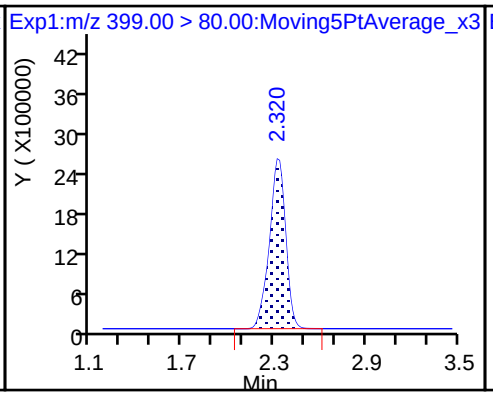
10 Perfluoroheptanoic acid



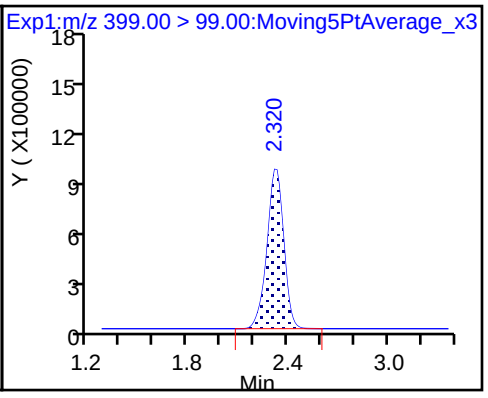
D 9 13C4-PFHpA



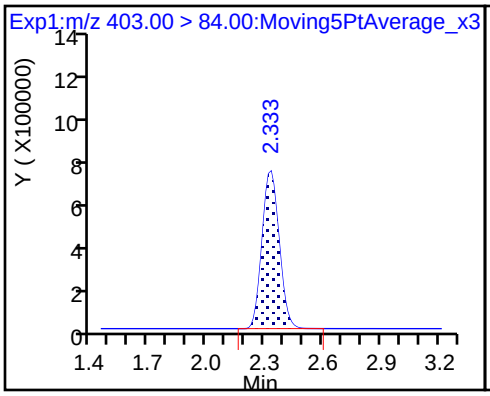
8 Perfluorohexanesulfonic acid



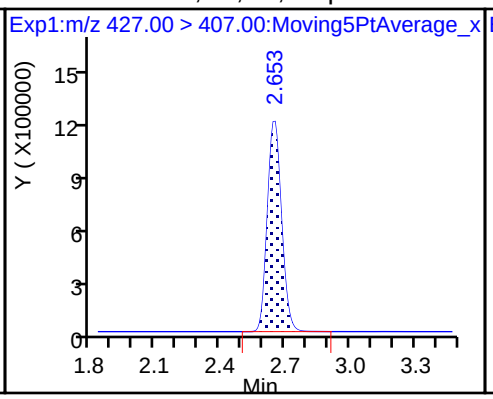
8 Perfluorohexanesulfonic acid



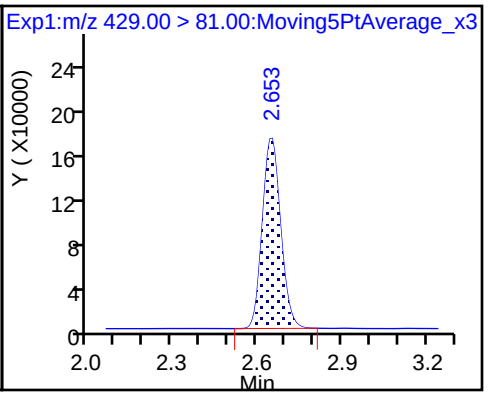
D 11 18O2 PFHxS



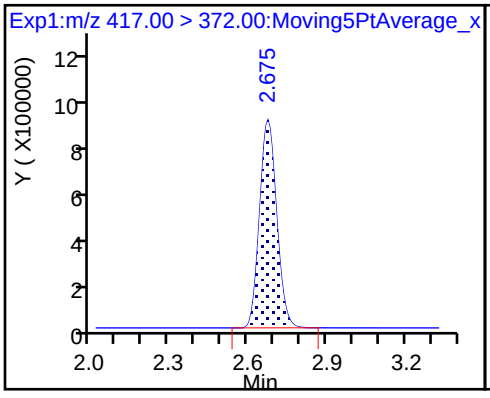
13 Sodium 1H,1H,2H,2H-perfluorooctane



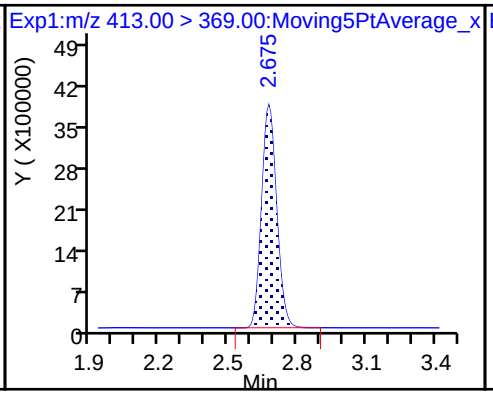
D 12 M2-6:2FTS



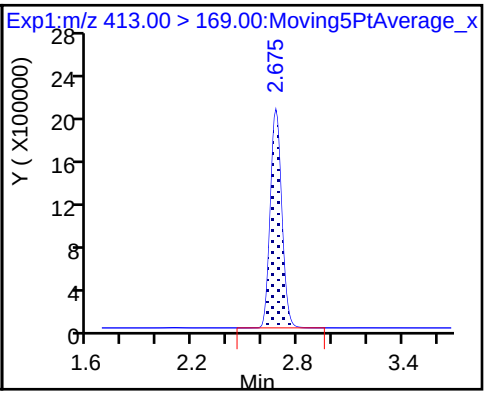
D 14 13C4 PFOA



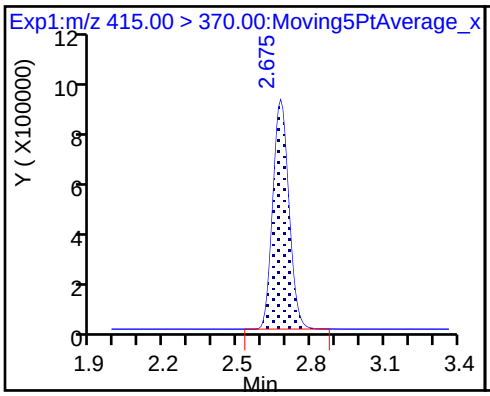
15 Perfluorooctanoic acid



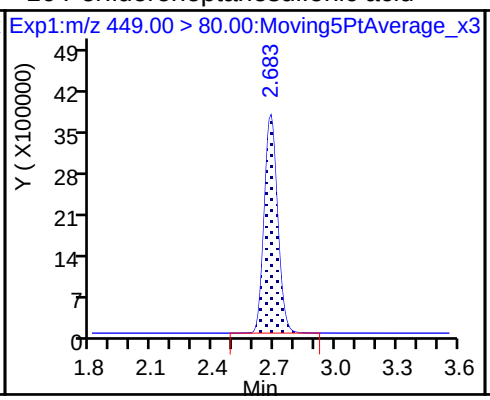
15 Perfluorooctanoic acid



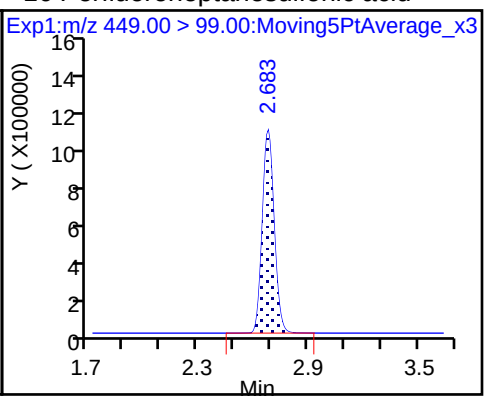
* 62 13C2-PFOA



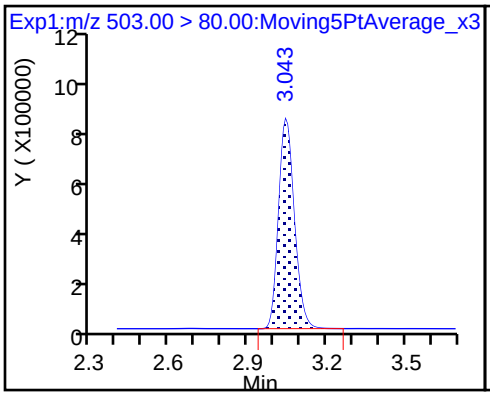
16 Perfluoroheptanesulfonic acid



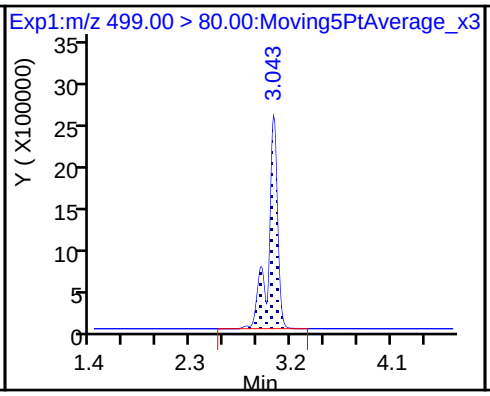
16 Perfluoroheptanesulfonic acid



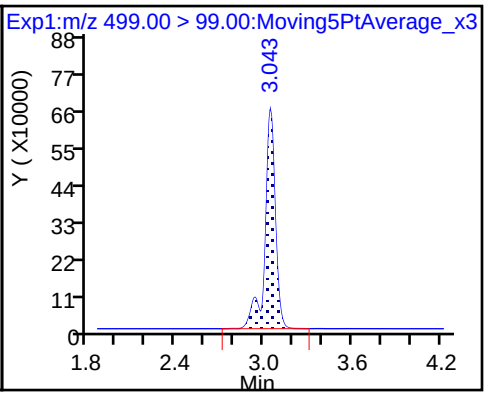
D 18 13C4 PFOS



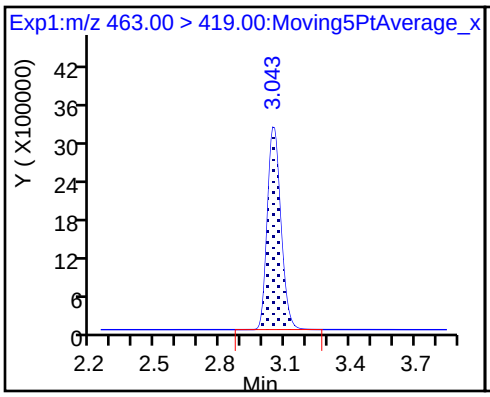
17 Perfluorooctane sulfonic acid



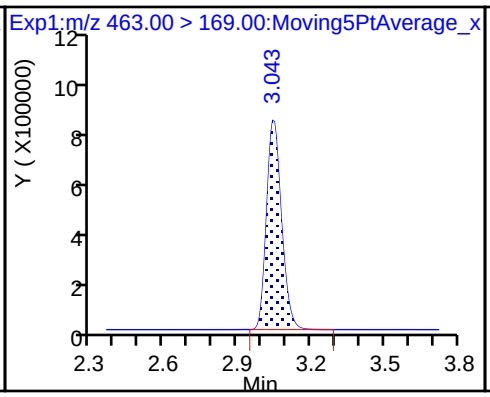
17 Perfluorooctane sulfonic acid



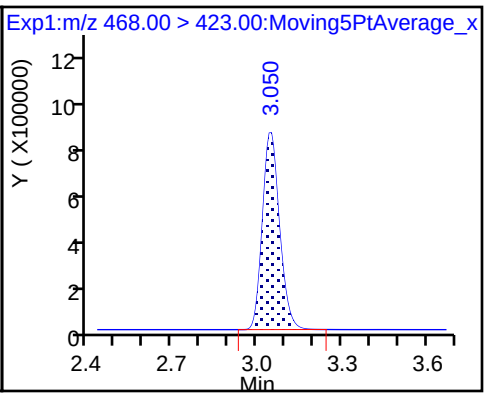
20 Perfluorononanoic acid



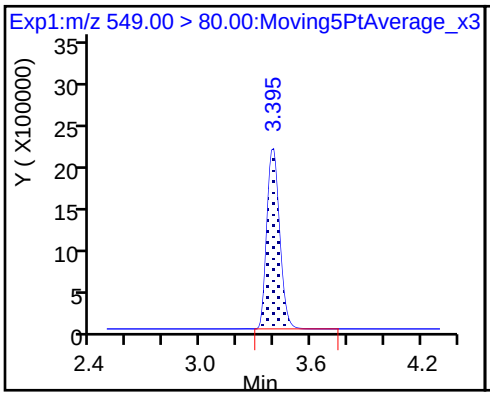
20 Perfluorononanoic acid



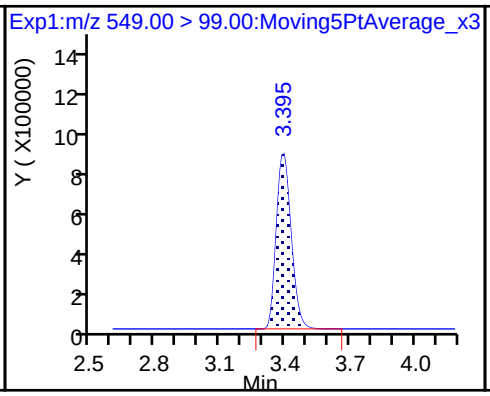
D 19 13C5 PFNA



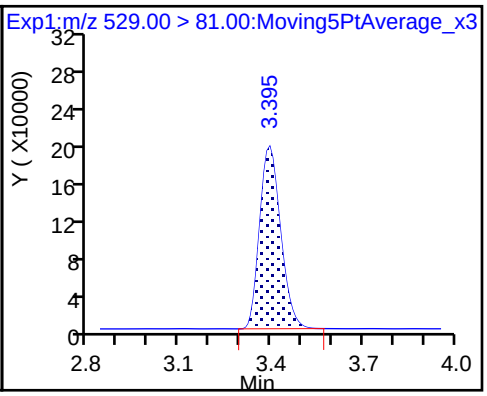
68 Perfluorononanesulfonic acid



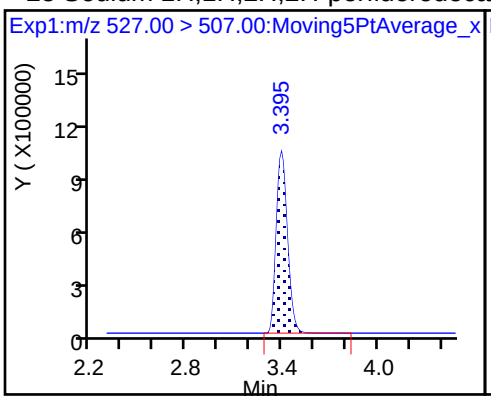
68 Perfluorononanesulfonic acid



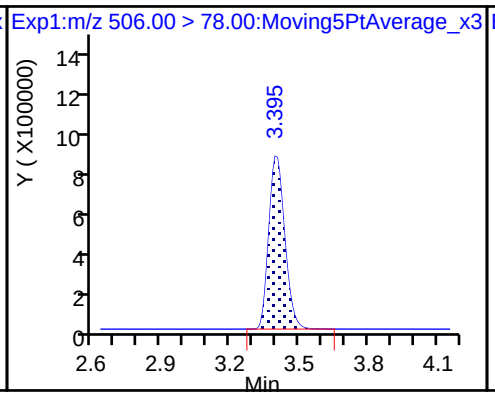
D 26 M2-8:2FTS



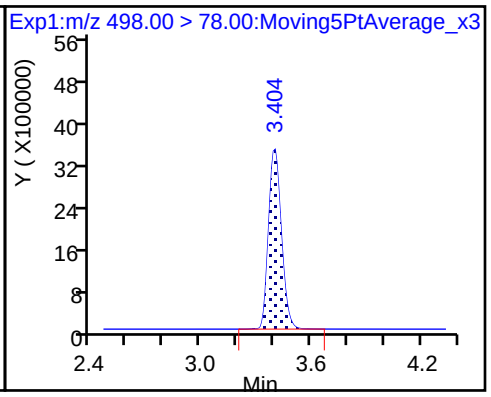
25 Sodium 1H,1H,2H,2H-perfluorodecane



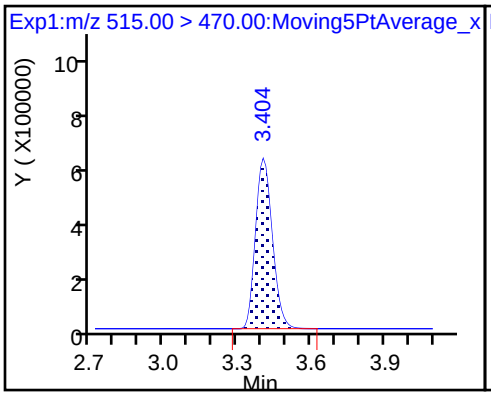
D 21 13C8 FOSA



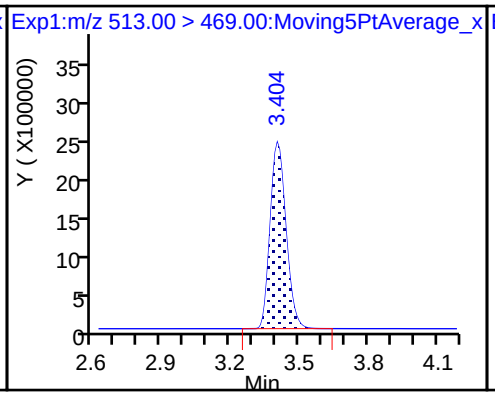
22 Perfluorooctane Sulfonamide



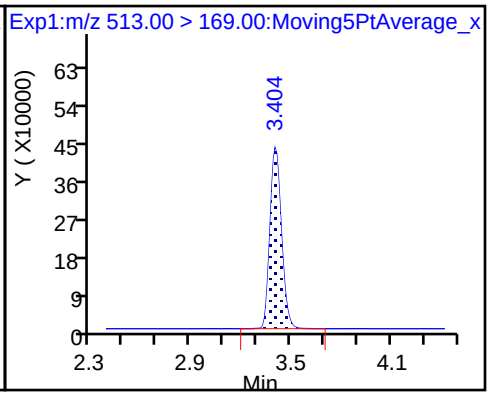
D 23 13C2 PFDA



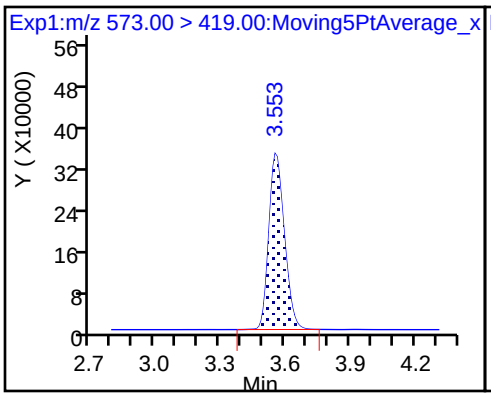
24 Perfluorodecanoic acid



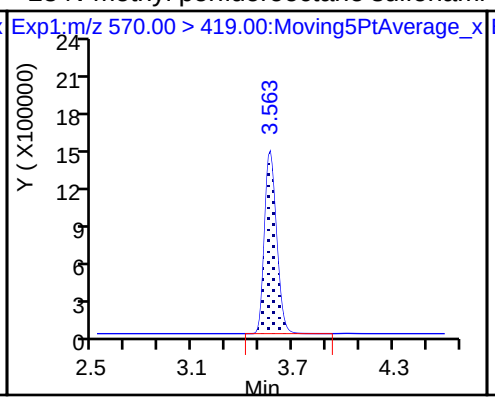
24 Perfluorodecanoic acid



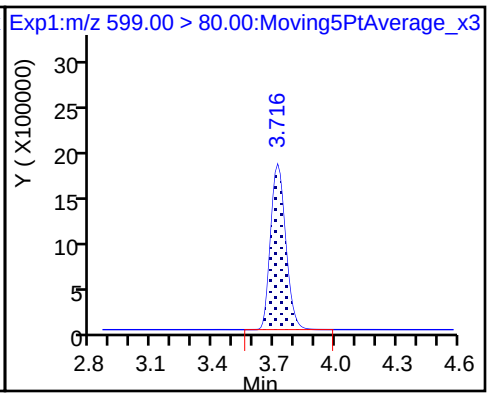
D 27 d3-NMeFOSAA



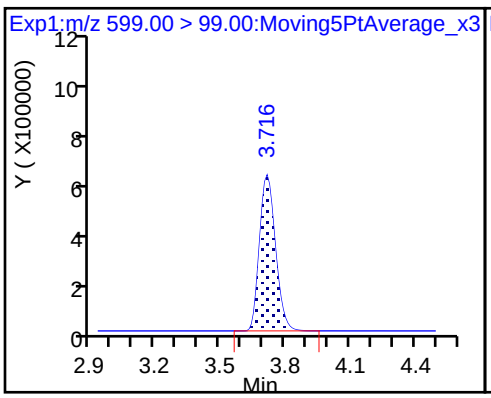
28 N-methyl perfluorooctane sulfonami



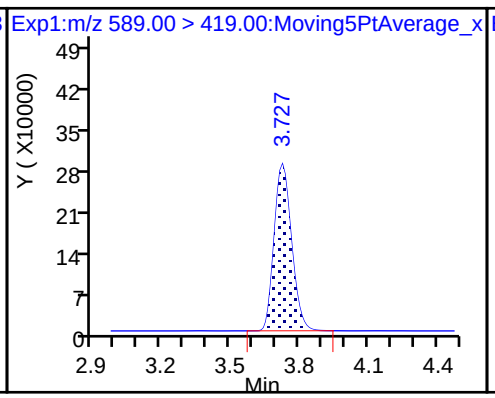
29 Perfluorodecane Sulfonic acid



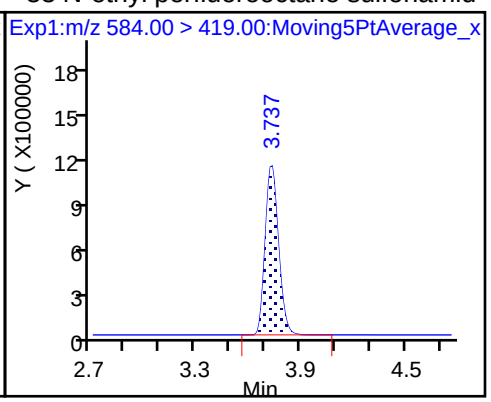
29 Perfluorodecane Sulfonic acid



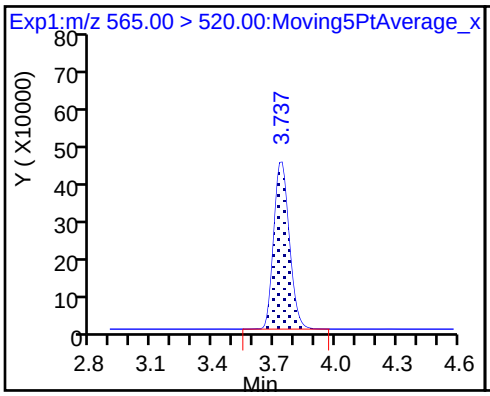
D 32 d5-NEtFOSAA



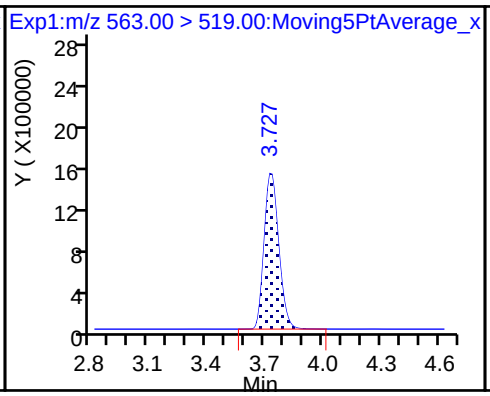
33 N-ethyl perfluorooctane sulfonamid



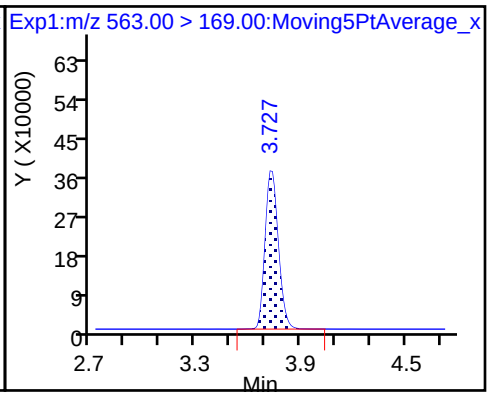
D 30 13C2 PFUnA



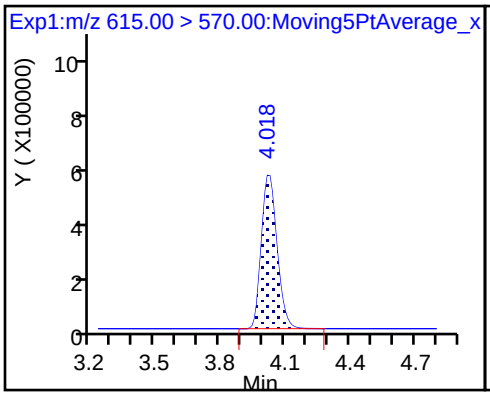
31 Perfluoroundecanoic acid



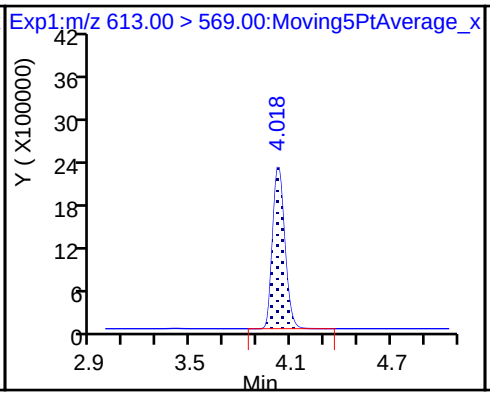
31 Perfluoroundecanoic acid



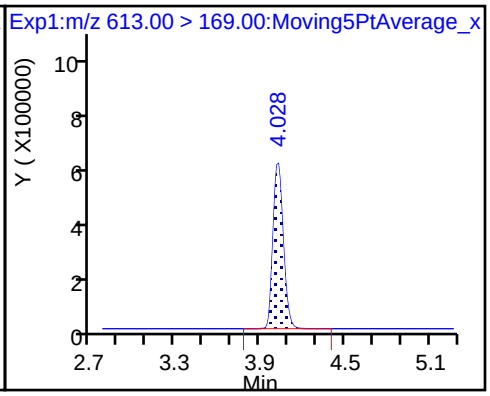
D 36 13C2 PFDoA



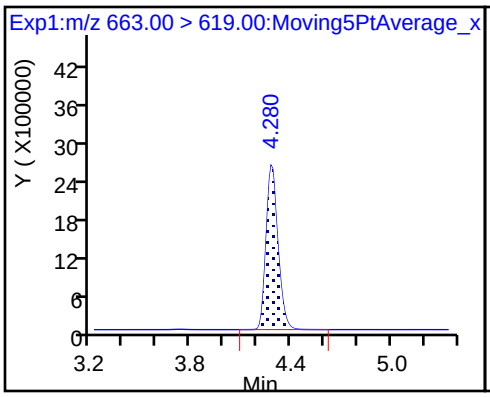
37 Perfluorododecanoic acid



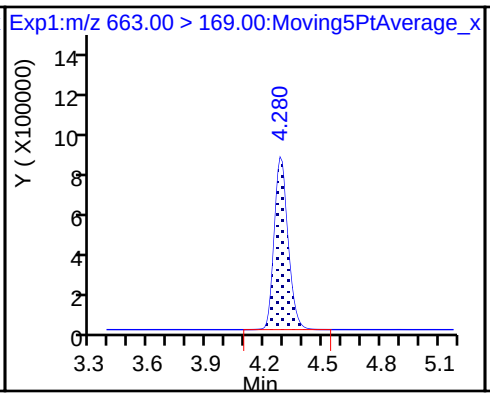
37 Perfluorododecanoic acid



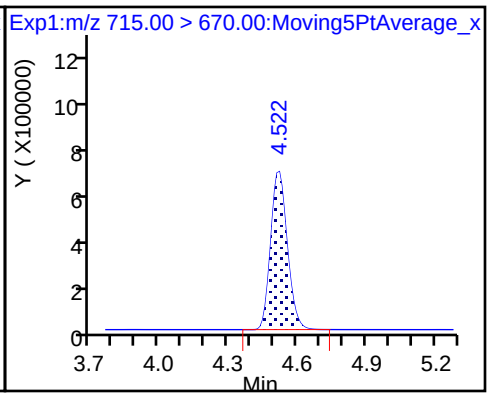
41 Perfluorotridecanoic acid



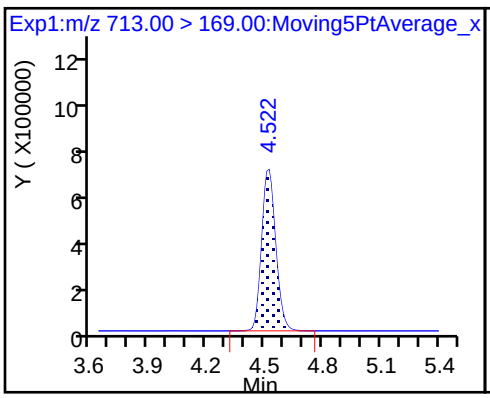
41 Perfluorotridecanoic acid



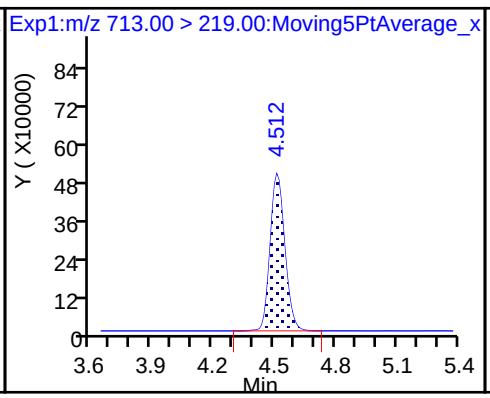
D 43 13C2-PFTeDA



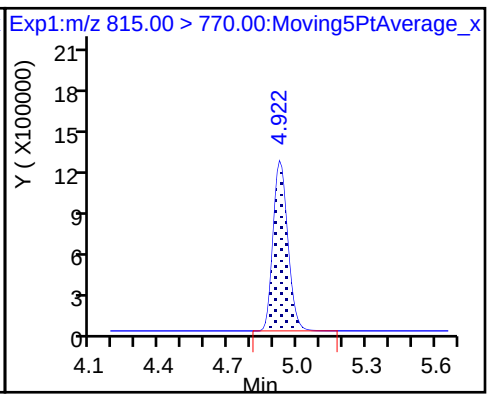
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

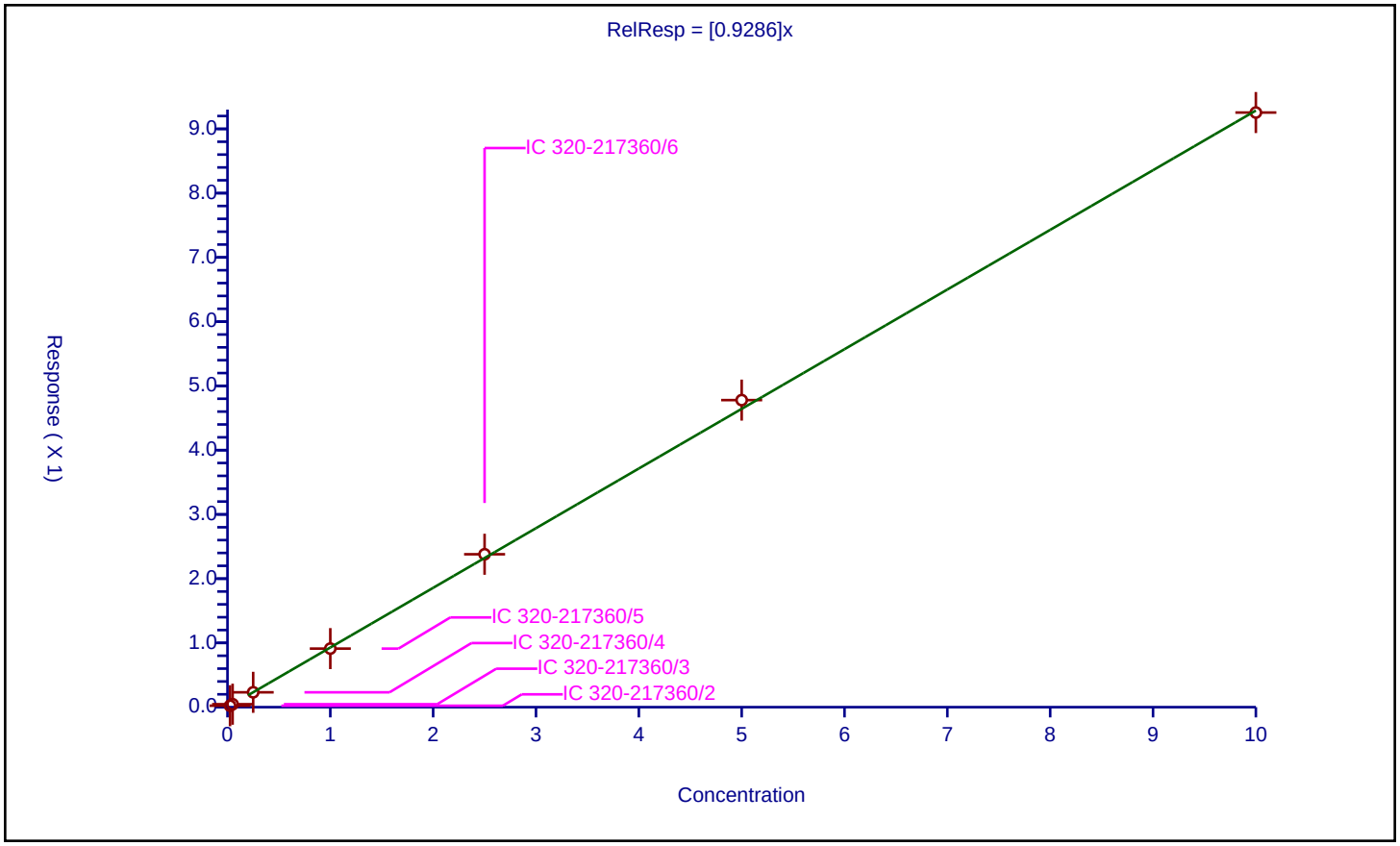
Curve Coefficients

Intercept:	0
Slope:	0.9286

Error Coefficients

Standard Error:	10700000
Relative Standard Error:	2.0
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.022718	2.5	6181350.0	0.908734	Y
2	IC 320-217360/3	0.05	0.046075	2.5	6122262.0	0.921506	Y
3	IC 320-217360/4	0.25	0.231256	2.5	6279614.0	0.925025	Y
4	IC 320-217360/5	1.0	0.911451	2.5	6139471.0	0.911451	Y
5	IC 320-217360/6	2.5	2.379922	2.5	6113537.0	0.951969	Y
6	IC 320-217360/7	5.0	4.77902	2.5	6997865.0	0.955804	Y
7	IC 320-217360/8	10.0	9.254324	2.5	5884851.0	0.925432	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

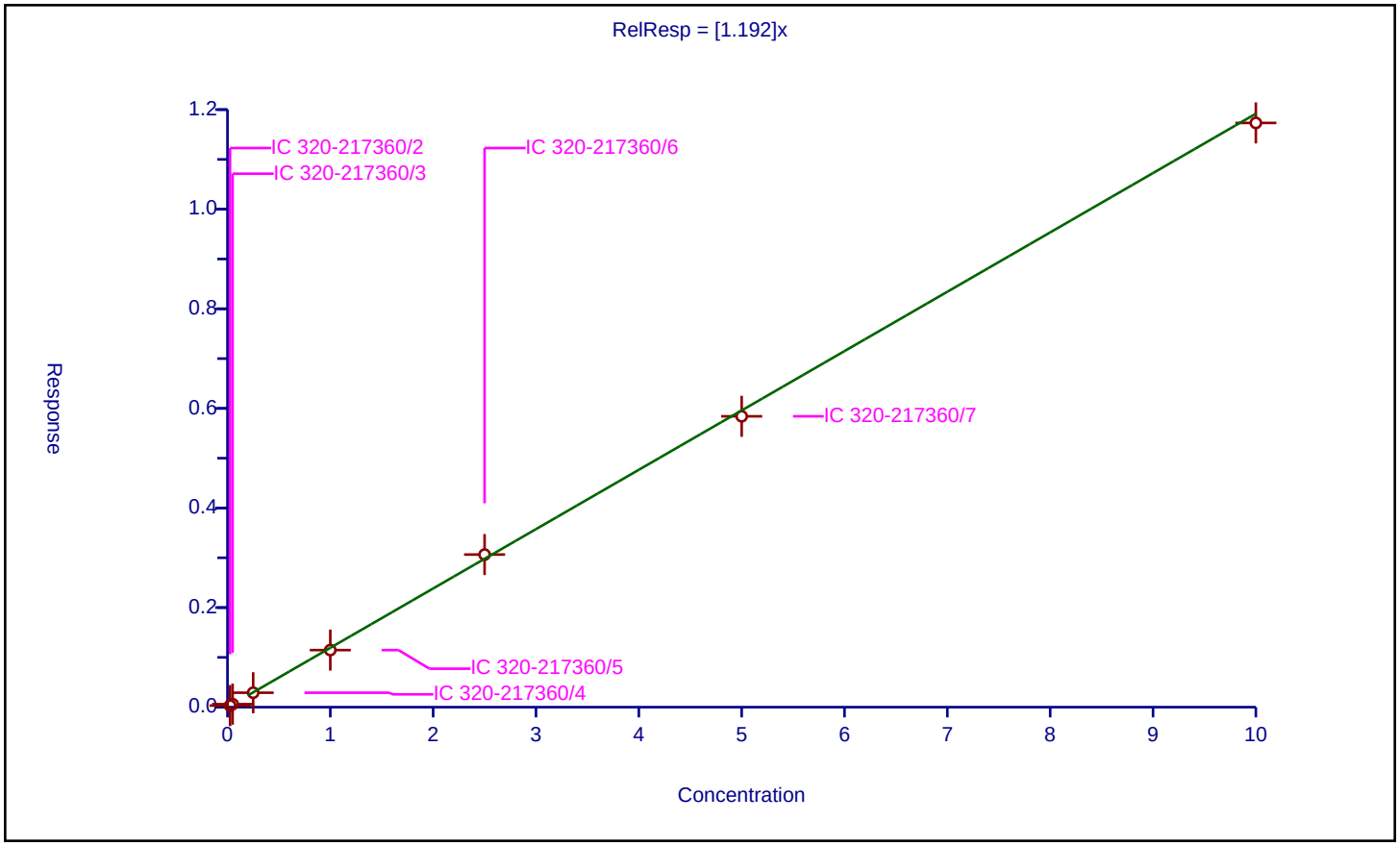
Curve Coefficients

Intercept:	0
Slope:	1.192

Error Coefficients

Standard Error:	8600000
Relative Standard Error:	3.4
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.031446	2.5	4062250.0	1.25785	Y
2	IC 320-217360/3	0.05	0.060542	2.5	3926283.0	1.21084	Y
3	IC 320-217360/4	0.25	0.290098	2.5	4029236.0	1.160391	Y
4	IC 320-217360/5	1.0	1.146149	2.5	3994638.0	1.146149	Y
5	IC 320-217360/6	2.5	3.064326	2.5	3952401.0	1.22573	Y
6	IC 320-217360/7	5.0	5.840968	2.5	4492903.0	1.168194	Y
7	IC 320-217360/8	10.0	11.732396	2.5	3729652.0	1.17324	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

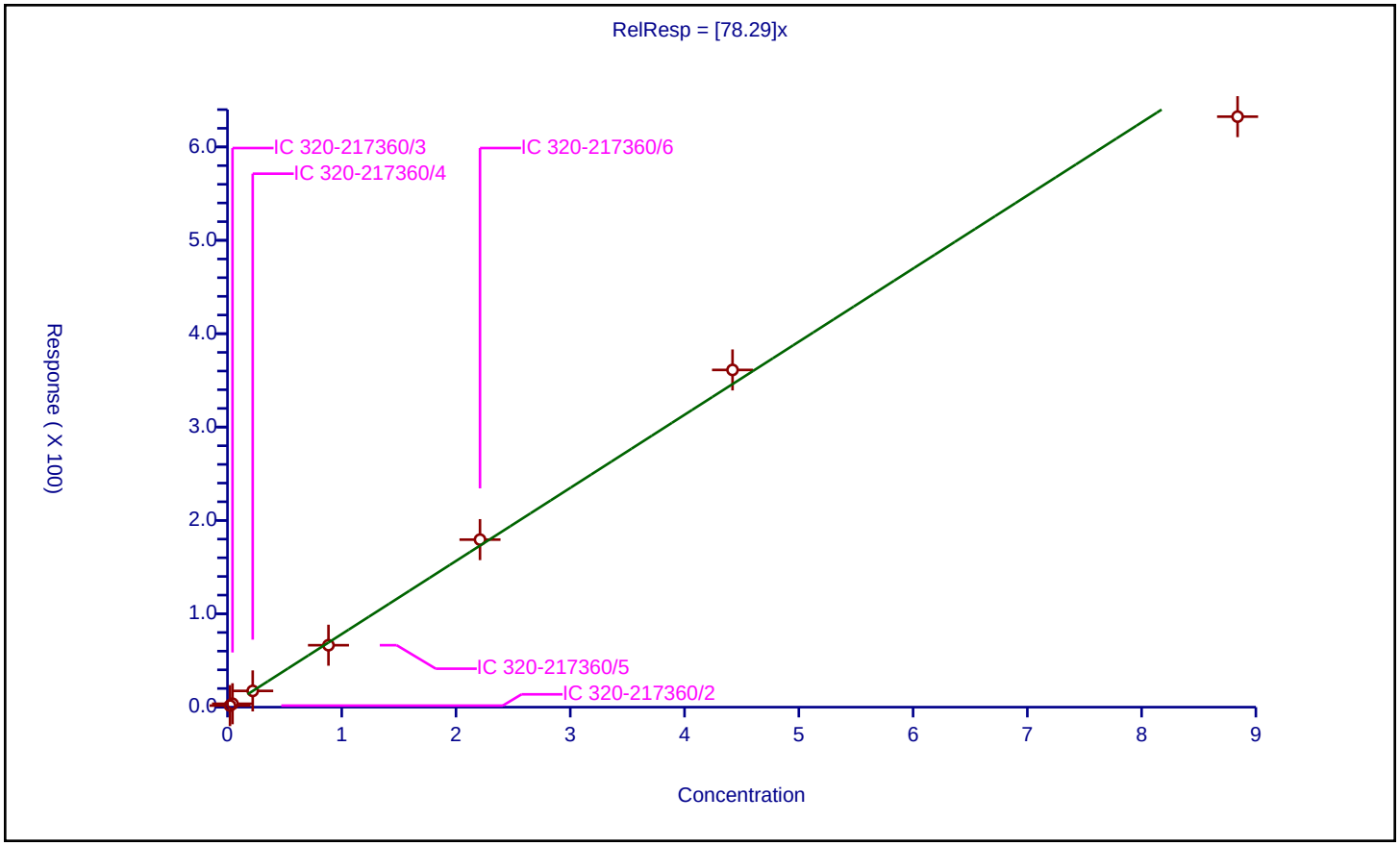
Curve Coefficients

Intercept:	0
Slope:	78.29

Error Coefficients

Standard Error:	11300000
Relative Standard Error:	5.2
Correlation Coefficient:	0.984
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0221	1.699333	2.325	86409.0	76.892914	Y
2	IC 320-217360/3	0.0442	3.659132	2.325	82315.0	82.785785	Y
3	IC 320-217360/4	0.221	17.415084	2.325	85829.0	78.801285	Y
4	IC 320-217360/5	0.884	66.358602	2.325	87216.0	75.066292	Y
5	IC 320-217360/6	2.21	179.444609	2.325	83922.0	81.196656	Y
6	IC 320-217360/7	4.42	361.190473	2.325	92353.0	81.717302	Y
7	IC 320-217360/8	8.84	632.452403	2.325	82834.0	71.54439	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

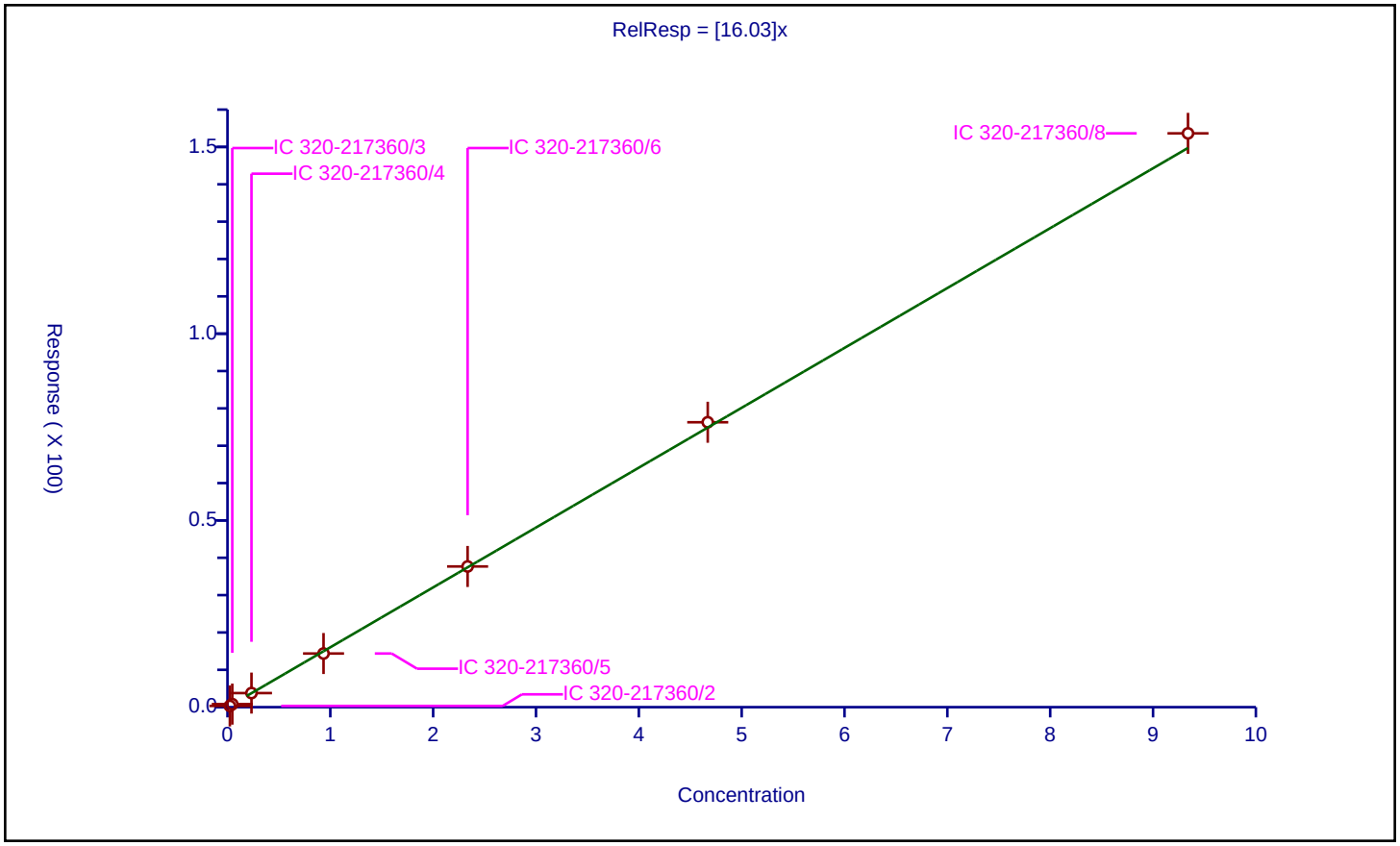
Curve Coefficients

Intercept:	0
Slope:	16.03

Error Coefficients

Standard Error:	2620000
Relative Standard Error:	5.9
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.02335	0.335745	2.325	86409.0	14.378781	Y
2	IC 320-217360/3	0.0467	0.81202	2.325	82315.0	17.388008	Y
3	IC 320-217360/4	0.2335	3.772785	2.325	85829.0	16.157538	Y
4	IC 320-217360/5	0.934	14.366184	2.325	87216.0	15.381353	Y
5	IC 320-217360/6	2.335	37.671472	2.325	83922.0	16.133393	Y
6	IC 320-217360/7	4.67	76.28592	2.325	92353.0	16.335315	Y
7	IC 320-217360/8	9.34	153.639011	2.325	82834.0	16.449573	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

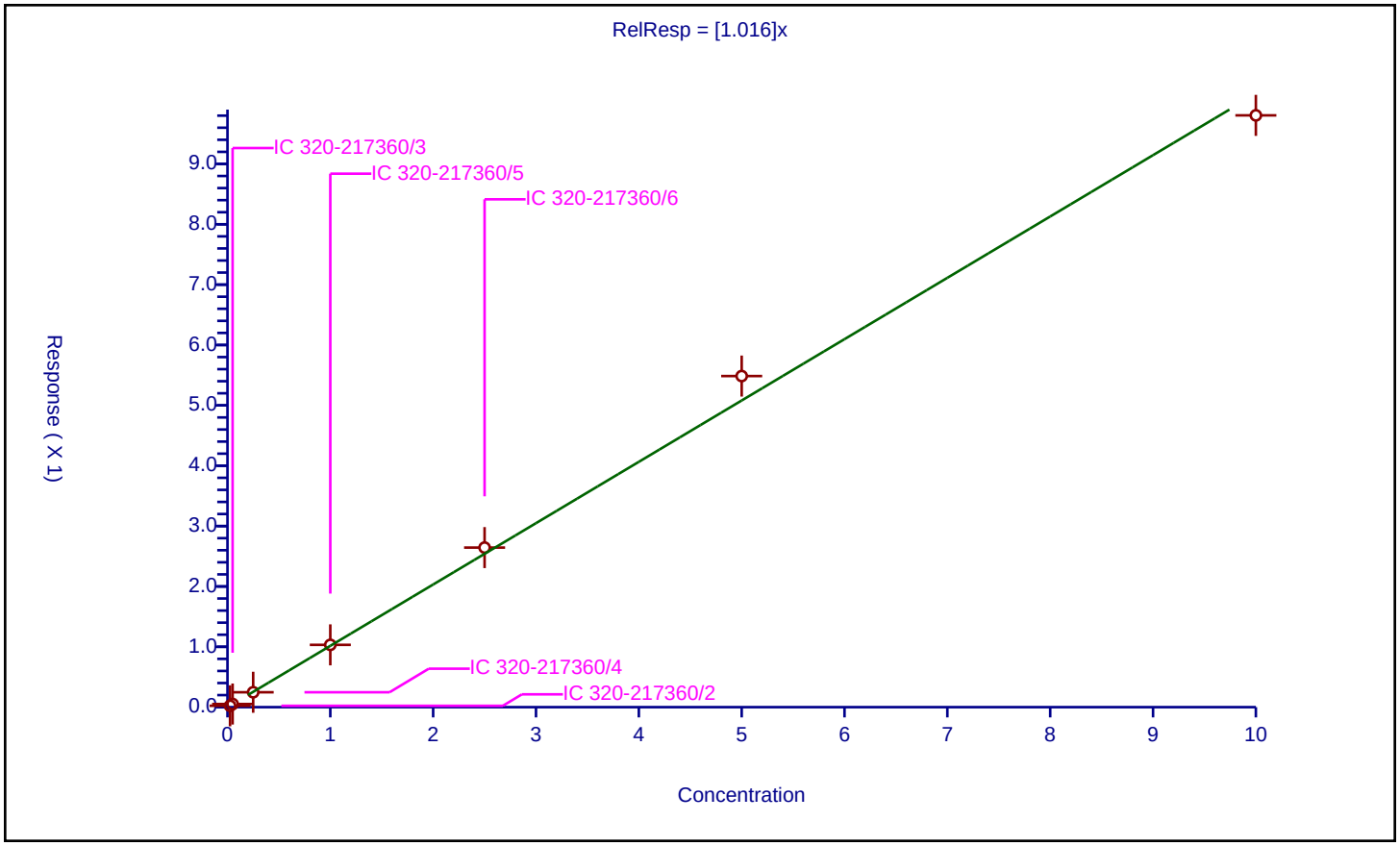
Curve Coefficients

Intercept:	0
Slope:	1.016

Error Coefficients

Standard Error:	8260000
Relative Standard Error:	5.9
Correlation Coefficient:	0.985
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.022912	2.5	4636047.0	0.916492	Y
2	IC 320-217360/3	0.05	0.052095	2.5	4260718.0	1.041902	Y
3	IC 320-217360/4	0.25	0.246769	2.5	4589544.0	0.987076	Y
4	IC 320-217360/5	1.0	1.032426	2.5	4391788.0	1.032426	Y
5	IC 320-217360/6	2.5	2.643853	2.5	4266668.0	1.057541	Y
6	IC 320-217360/7	5.0	5.485579	2.5	4780636.0	1.097116	Y
7	IC 320-217360/8	10.0	9.804566	2.5	4231897.0	0.980457	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

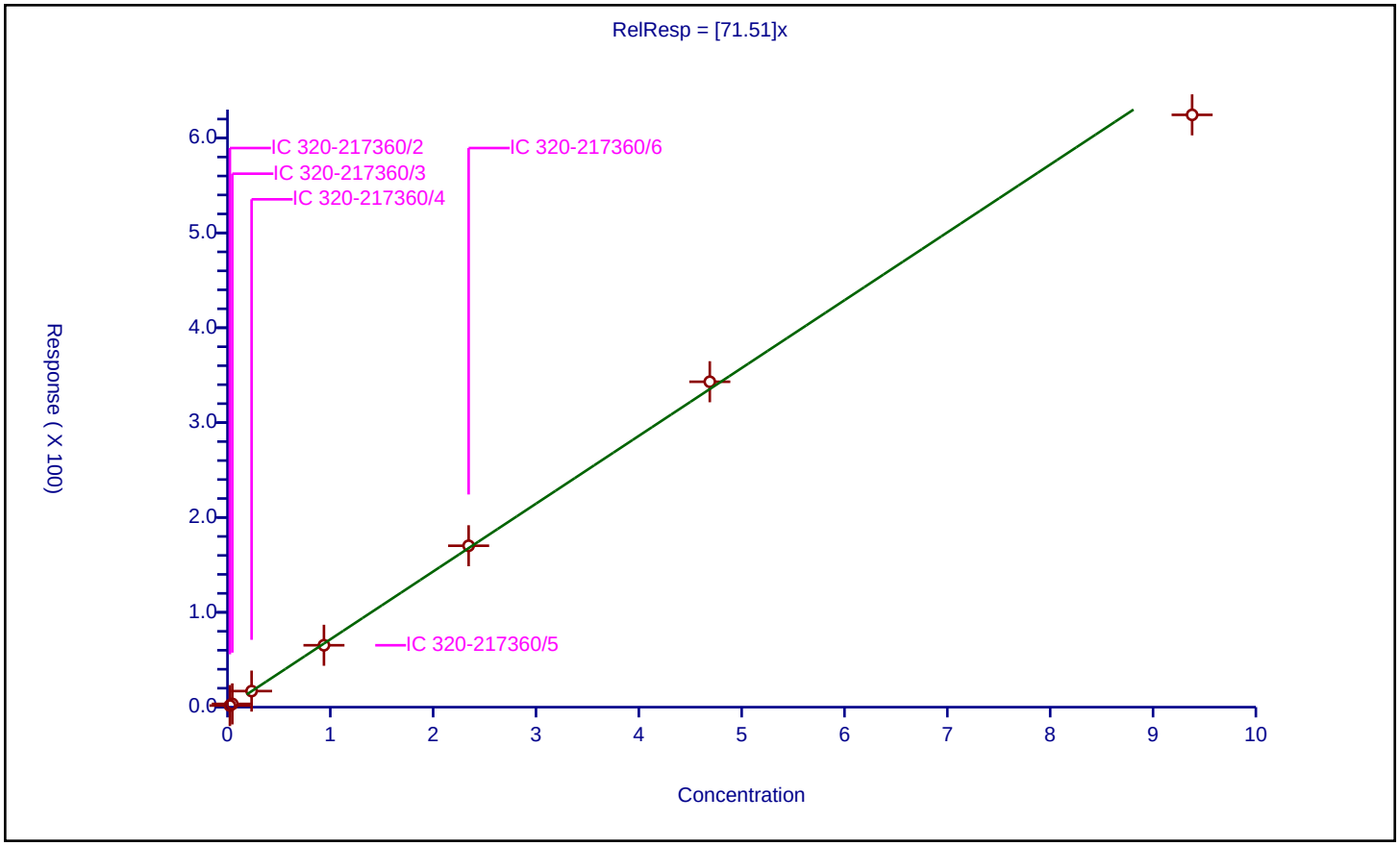
Curve Coefficients

Intercept:	0
Slope:	71.51

Error Coefficients

Standard Error:	11000000
Relative Standard Error:	3.6
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.02345	1.703665	2.325	86409.0	72.650977	Y
2	IC 320-217360/3	0.0469	3.457377	2.325	82315.0	73.71805	Y
3	IC 320-217360/4	0.2345	16.953113	2.325	85829.0	72.294723	Y
4	IC 320-217360/5	0.938	65.272477	2.325	87216.0	69.586862	Y
5	IC 320-217360/6	2.345	170.194532	2.325	83922.0	72.577626	Y
6	IC 320-217360/7	4.69	343.084686	2.325	92353.0	73.152385	Y
7	IC 320-217360/8	9.38	624.465714	2.325	82834.0	66.57417	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

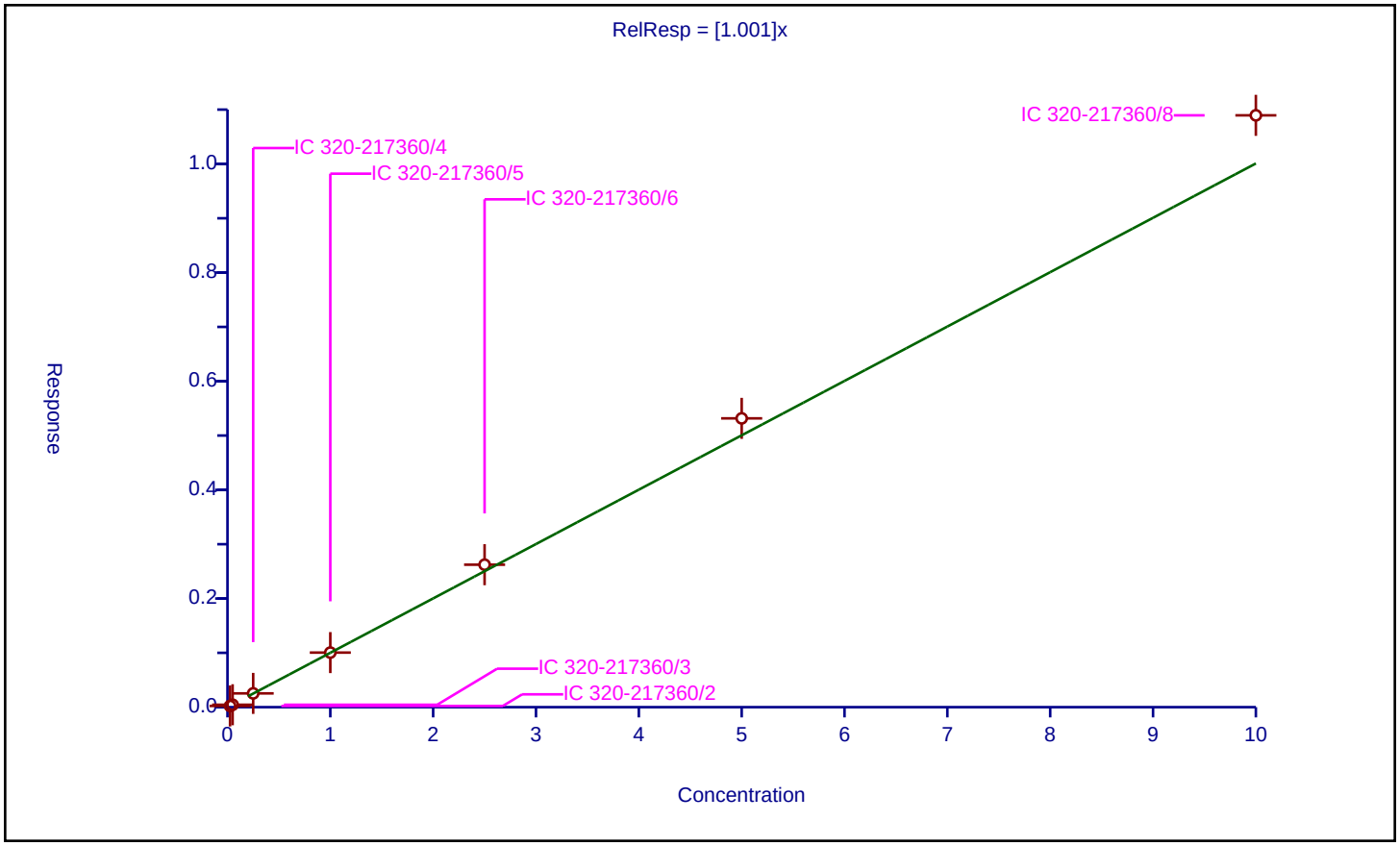
Curve Coefficients

Intercept:	0
Slope:	1.001

Error Coefficients

Standard Error:	8120000
Relative Standard Error:	7.9
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.022216	2.5	4543661.0	0.888623	Y
2	IC 320-217360/3	0.05	0.044804	2.5	4420246.0	0.896081	Y
3	IC 320-217360/4	0.25	0.253814	2.5	4371595.0	1.015256	Y
4	IC 320-217360/5	1.0	1.004439	2.5	4282212.0	1.004439	Y
5	IC 320-217360/6	2.5	2.622762	2.5	4357585.0	1.049105	Y
6	IC 320-217360/7	5.0	5.316234	2.5	4543925.0	1.063247	Y
7	IC 320-217360/8	10.0	10.894615	2.5	3828332.0	1.089461	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

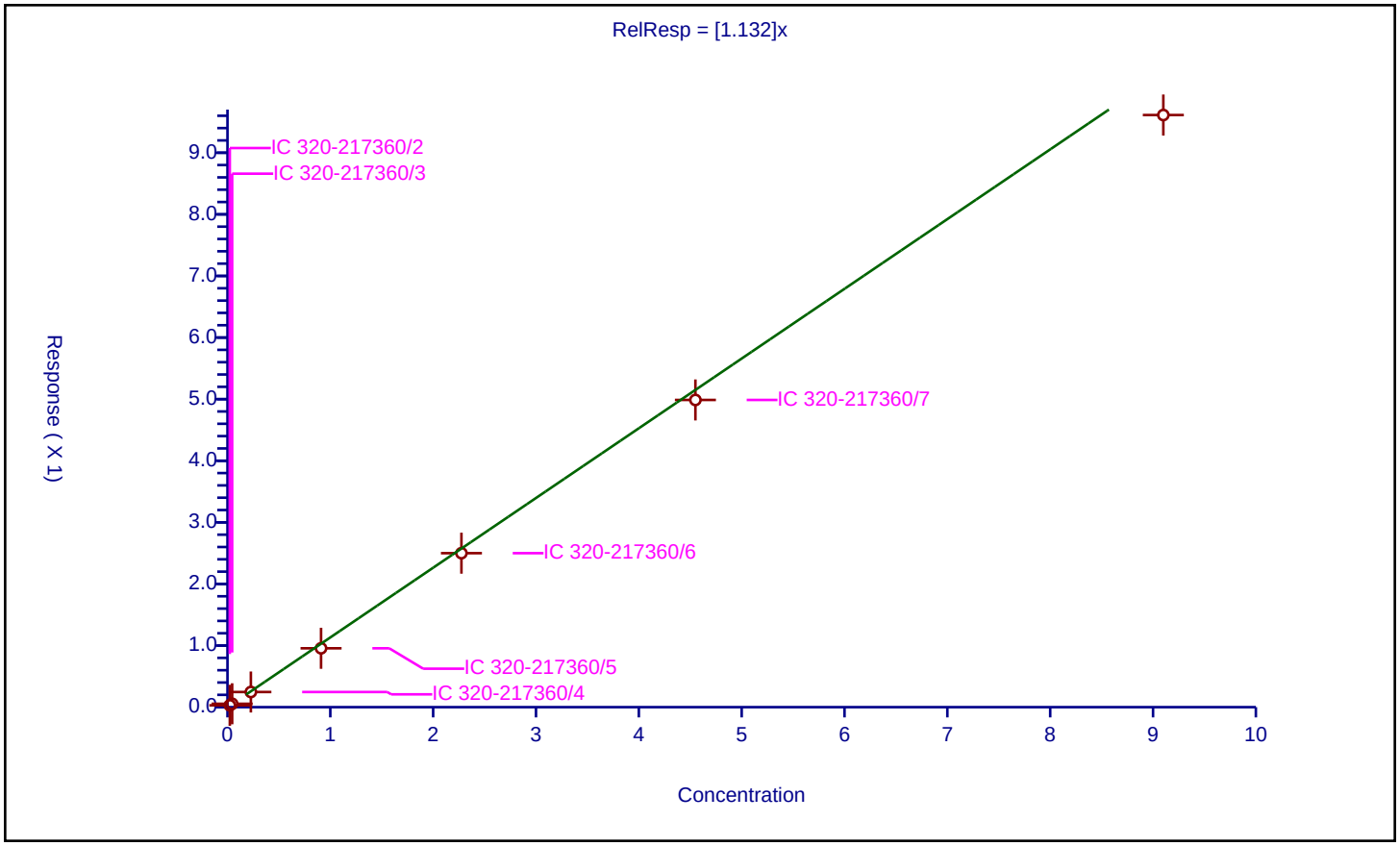
Curve Coefficients

Intercept:	0
Slope:	1.132

Error Coefficients

Standard Error:	9180000
Relative Standard Error:	9.0
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.989

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.02275	0.030286	2.365	5146760.0	1.331253	Y
2	IC 320-217360/3	0.0455	0.054946	2.365	5080567.0	1.207607	Y
3	IC 320-217360/4	0.2275	0.246238	2.365	5290521.0	1.082367	Y
4	IC 320-217360/5	0.91	0.955604	2.365	5007633.0	1.050114	Y
5	IC 320-217360/6	2.275	2.499688	2.365	4919272.0	1.098764	Y
6	IC 320-217360/7	4.55	4.986956	2.365	5430236.0	1.096034	Y
7	IC 320-217360/8	9.1	9.611927	2.365	4559710.0	1.056256	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

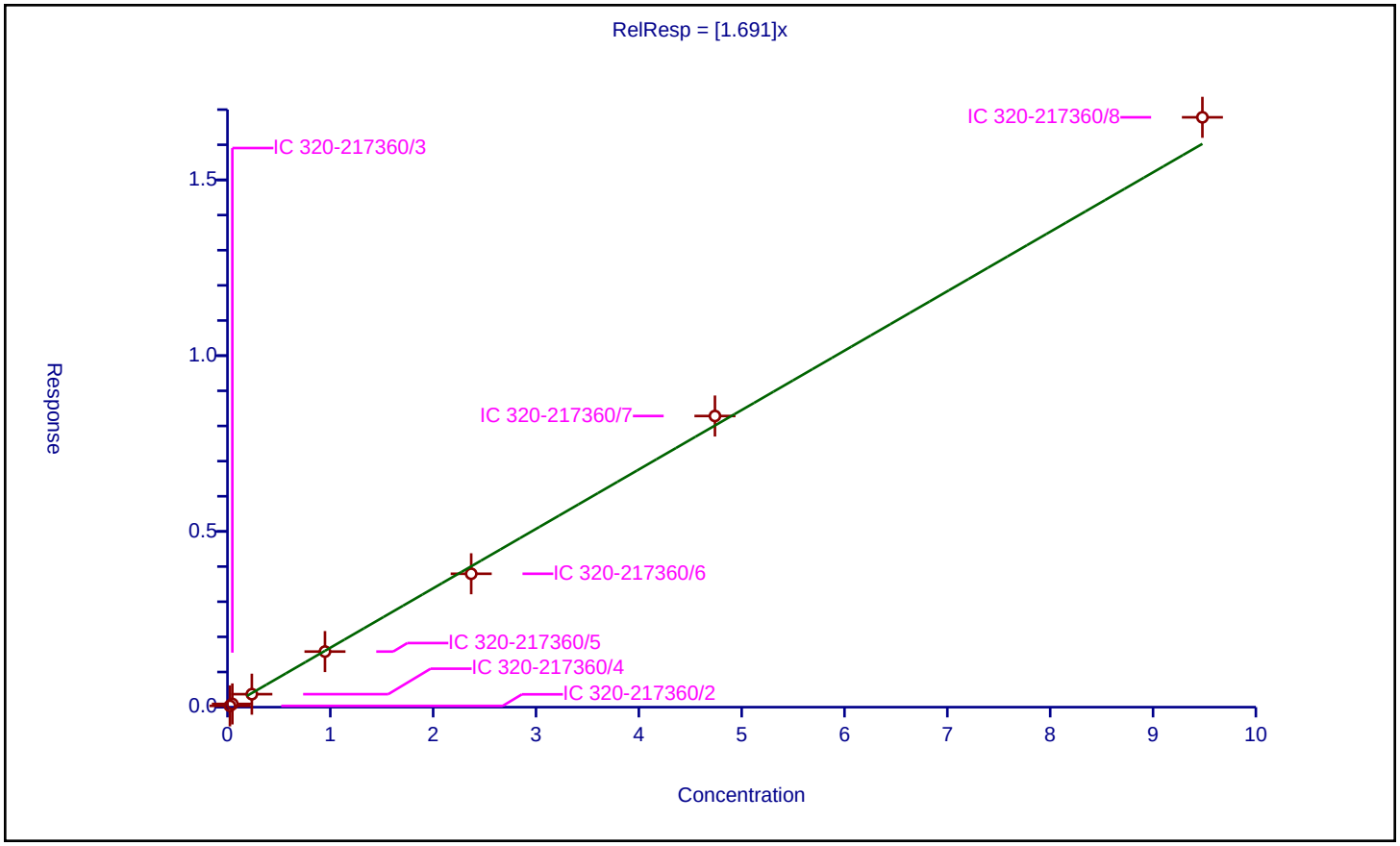
Curve Coefficients

Intercept:	0
Slope:	1.691

Error Coefficients

Standard Error:	2680000
Relative Standard Error:	8.5
Correlation Coefficient:	0.990
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0237	0.036548	2.375	913336.0	1.542111	Y
2	IC 320-217360/3	0.0474	0.092216	2.375	829435.0	1.945478	Y
3	IC 320-217360/4	0.237	0.369395	2.375	946554.0	1.558628	Y
4	IC 320-217360/5	0.948	1.581622	2.375	892700.0	1.668377	Y
5	IC 320-217360/6	2.37	3.79502	2.375	880882.0	1.601274	Y
6	IC 320-217360/7	4.74	8.283238	2.375	950305.0	1.747519	Y
7	IC 320-217360/8	9.48	16.780757	2.375	769923.0	1.770122	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

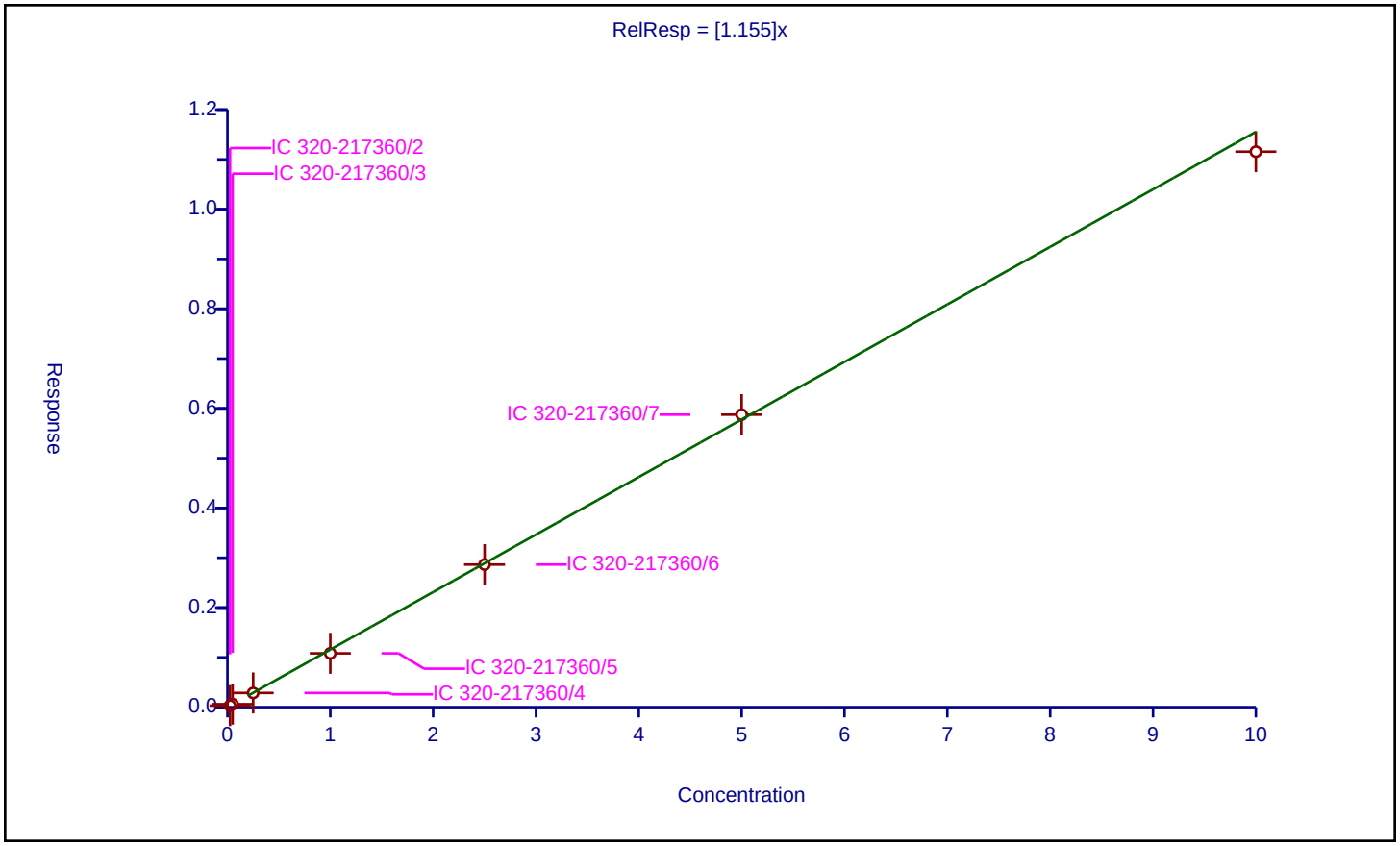
Curve Coefficients

Intercept:	0
Slope:	1.155

Error Coefficients

Standard Error:	8630000
Relative Standard Error:	4.3
Correlation Coefficient:	0.984
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.030489	2.5	4463374.0	1.219571	Y
2	IC 320-217360/3	0.05	0.060539	2.5	4186198.0	1.210788	Y
3	IC 320-217360/4	0.25	0.285222	2.5	4391971.0	1.140889	Y
4	IC 320-217360/5	1.0	1.08103	2.5	4283435.0	1.08103	Y
5	IC 320-217360/6	2.5	2.86303	2.5	4288230.0	1.145212	Y
6	IC 320-217360/7	5.0	5.874124	2.5	4688766.0	1.174825	Y
7	IC 320-217360/8	10.0	11.155425	2.5	3866213.0	1.115543	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

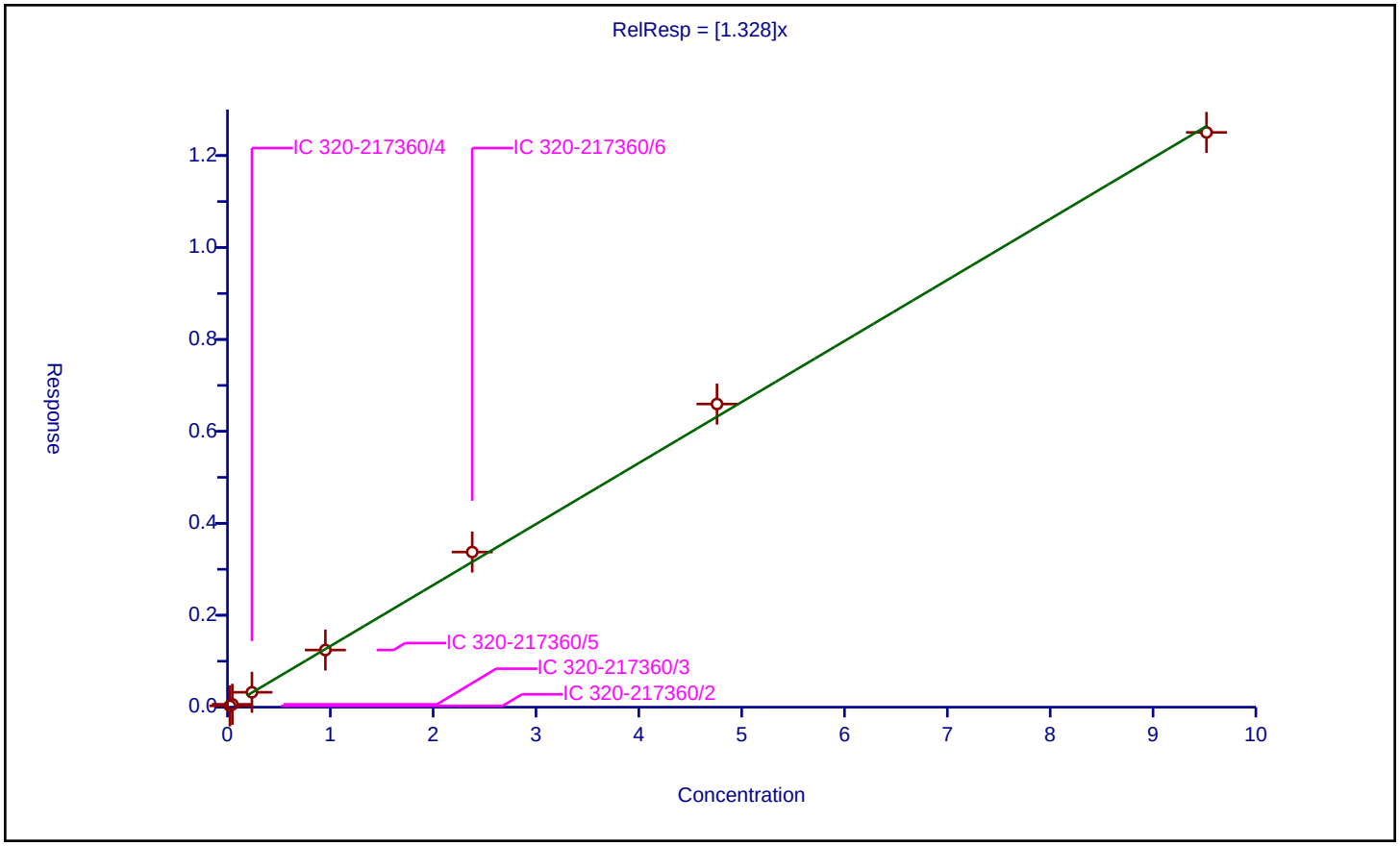
Curve Coefficients

Intercept:	0
Slope:	1.328

Error Coefficients

Standard Error:	8460000
Relative Standard Error:	5.2
Correlation Coefficient:	0.985
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0238	0.028678	2.39	3623690.0	1.204979	Y
2	IC 320-217360/3	0.0476	0.062197	2.39	3602676.0	1.306653	Y
3	IC 320-217360/4	0.238	0.323529	2.39	3695054.0	1.359368	Y
4	IC 320-217360/5	0.952	1.2431	2.39	3581436.0	1.305777	Y
5	IC 320-217360/6	2.38	3.374764	2.39	3447017.0	1.417968	Y
6	IC 320-217360/7	4.76	6.594826	2.39	3884830.0	1.385468	Y
7	IC 320-217360/8	9.52	12.503774	2.39	3239063.0	1.313422	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

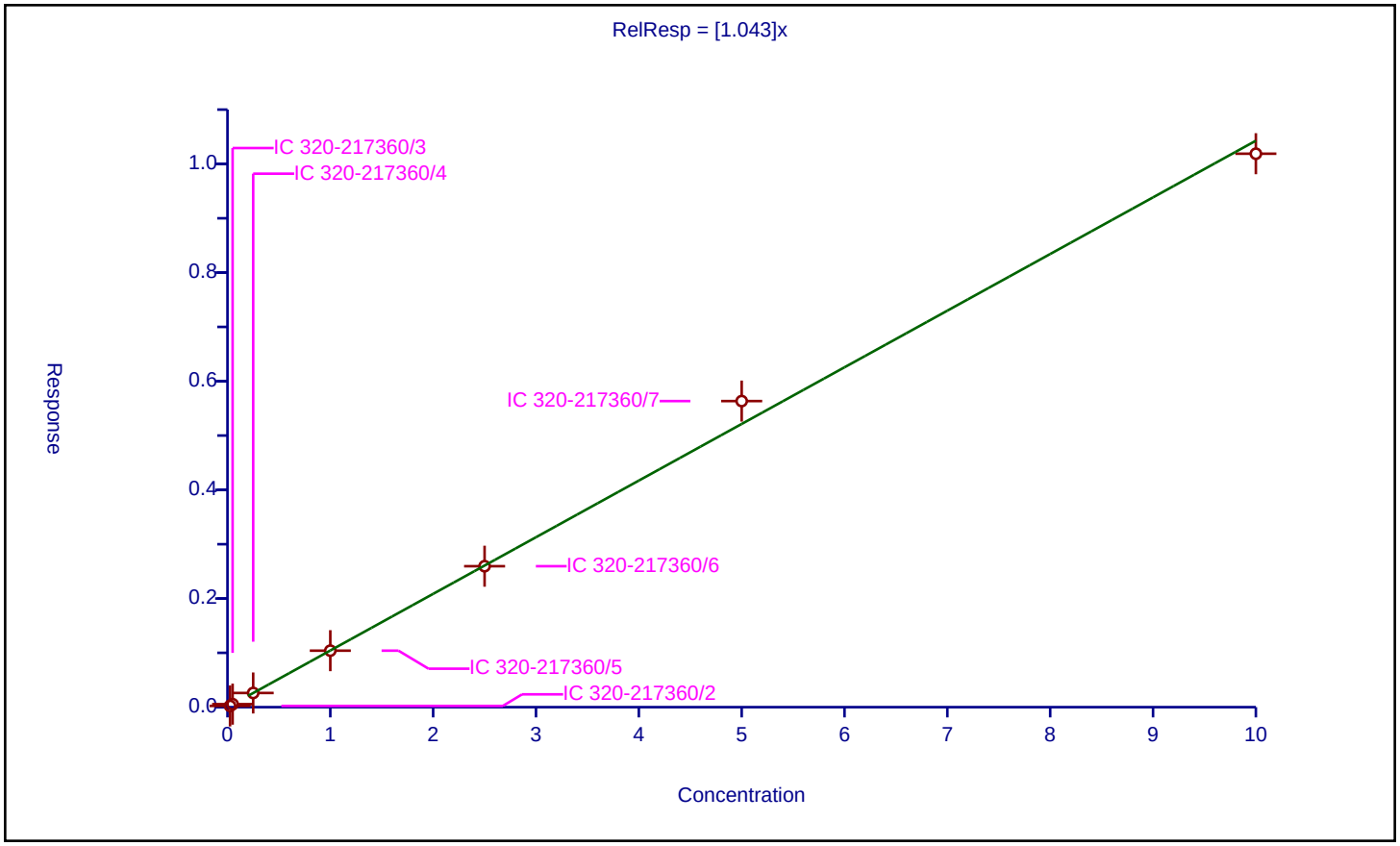
Curve Coefficients

Intercept:	0
Slope:	1.043

Error Coefficients

Standard Error:	6830000
Relative Standard Error:	6.3
Correlation Coefficient:	0.985
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.023084	2.5	3918358.0	0.923346	Y
2	IC 320-217360/3	0.05	0.055338	2.5	3691890.0	1.106764	Y
3	IC 320-217360/4	0.25	0.261311	2.5	3769499.0	1.045242	Y
4	IC 320-217360/5	1.0	1.039953	2.5	3677661.0	1.039953	Y
5	IC 320-217360/6	2.5	2.595069	2.5	3653281.0	1.038027	Y
6	IC 320-217360/7	5.0	5.634366	2.5	3844023.0	1.126873	Y
7	IC 320-217360/8	10.0	10.187911	2.5	3361051.0	1.018791	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

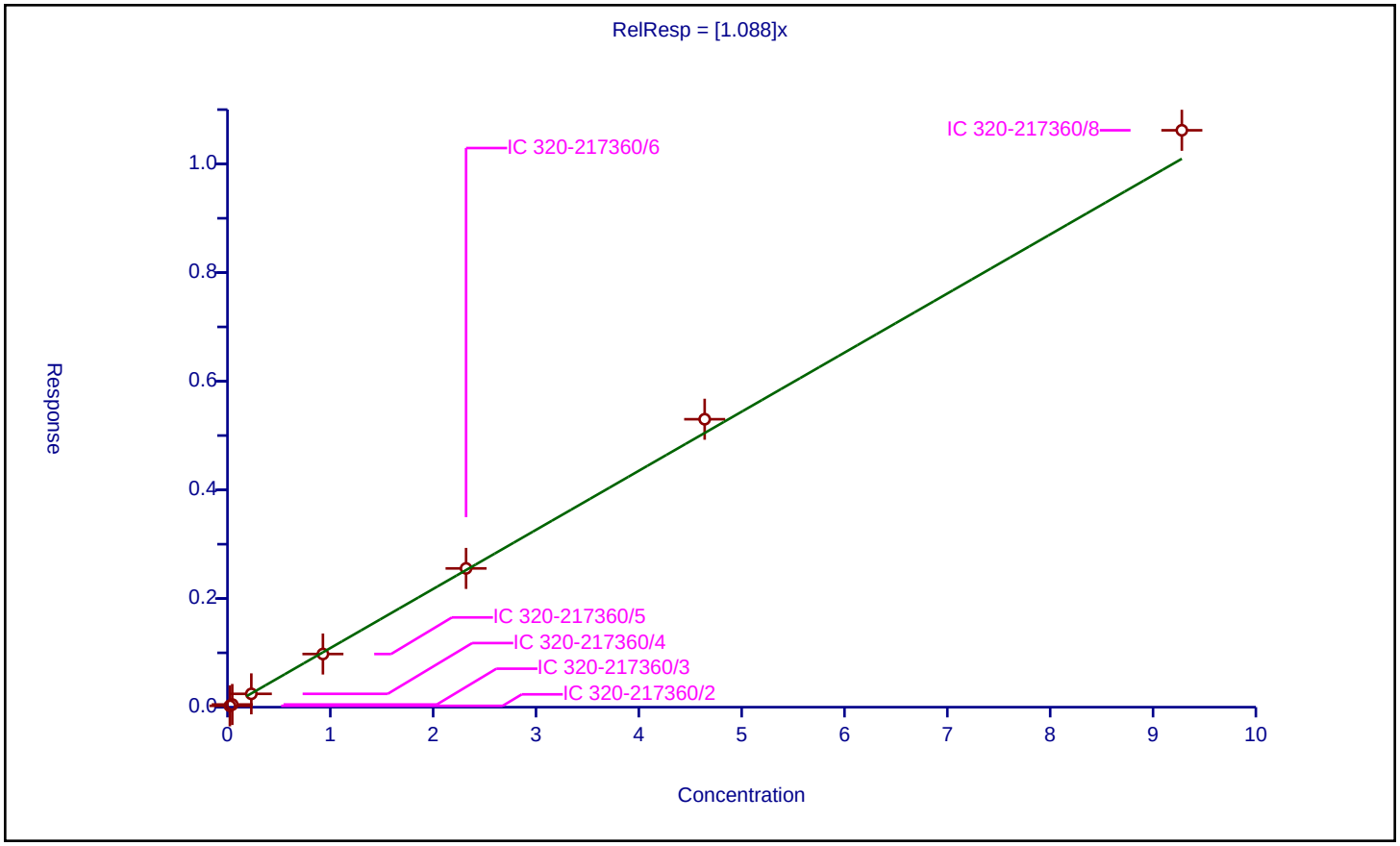
Curve Coefficients

Intercept:	0
Slope:	1.088

Error Coefficients

Standard Error:	7040000
Relative Standard Error:	3.8
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0232	0.024544	2.39	3623690.0	1.057922	Y
2	IC 320-217360/3	0.0464	0.04912	2.39	3602676.0	1.058617	Y
3	IC 320-217360/4	0.232	0.244992	2.39	3695054.0	1.055999	Y
4	IC 320-217360/5	0.928	0.978666	2.39	3581436.0	1.054597	Y
5	IC 320-217360/6	2.32	2.554434	2.39	3447017.0	1.101049	Y
6	IC 320-217360/7	4.64	5.300541	2.39	3884830.0	1.142358	Y
7	IC 320-217360/8	9.28	10.61917	2.39	3239063.0	1.144307	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

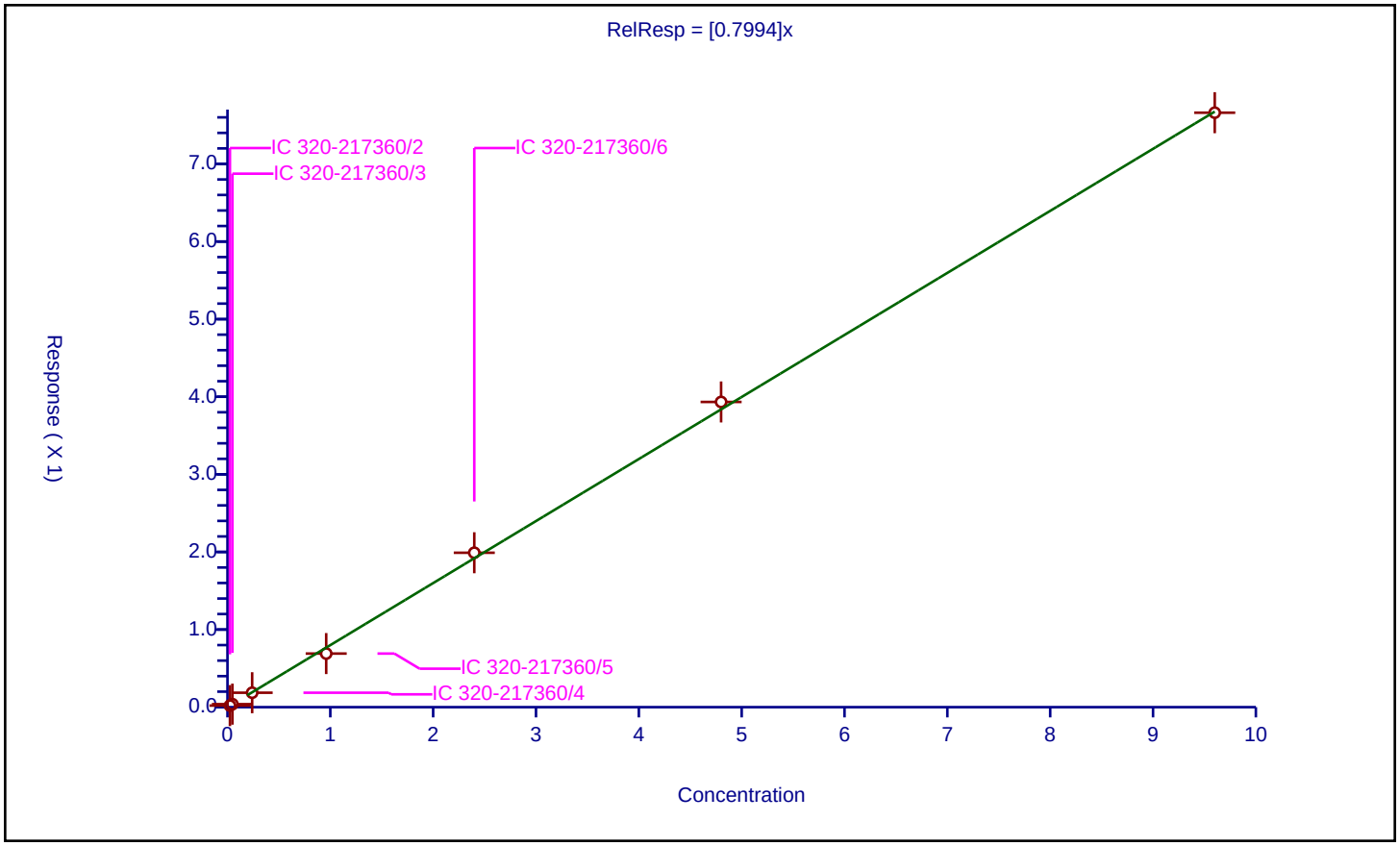
Curve Coefficients

Intercept:	0
Slope:	0.7994

Error Coefficients

Standard Error:	5130000
Relative Standard Error:	5.2
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.024	0.020209	2.39	3623690.0	0.842051	Y
2	IC 320-217360/3	0.048	0.038971	2.39	3602676.0	0.811886	Y
3	IC 320-217360/4	0.24	0.186218	2.39	3695054.0	0.775909	Y
4	IC 320-217360/5	0.96	0.690641	2.39	3581436.0	0.719417	Y
5	IC 320-217360/6	2.4	1.989988	2.39	3447017.0	0.829162	Y
6	IC 320-217360/7	4.8	3.93292	2.39	3884830.0	0.819358	Y
7	IC 320-217360/8	9.6	7.660244	2.39	3239063.0	0.797942	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

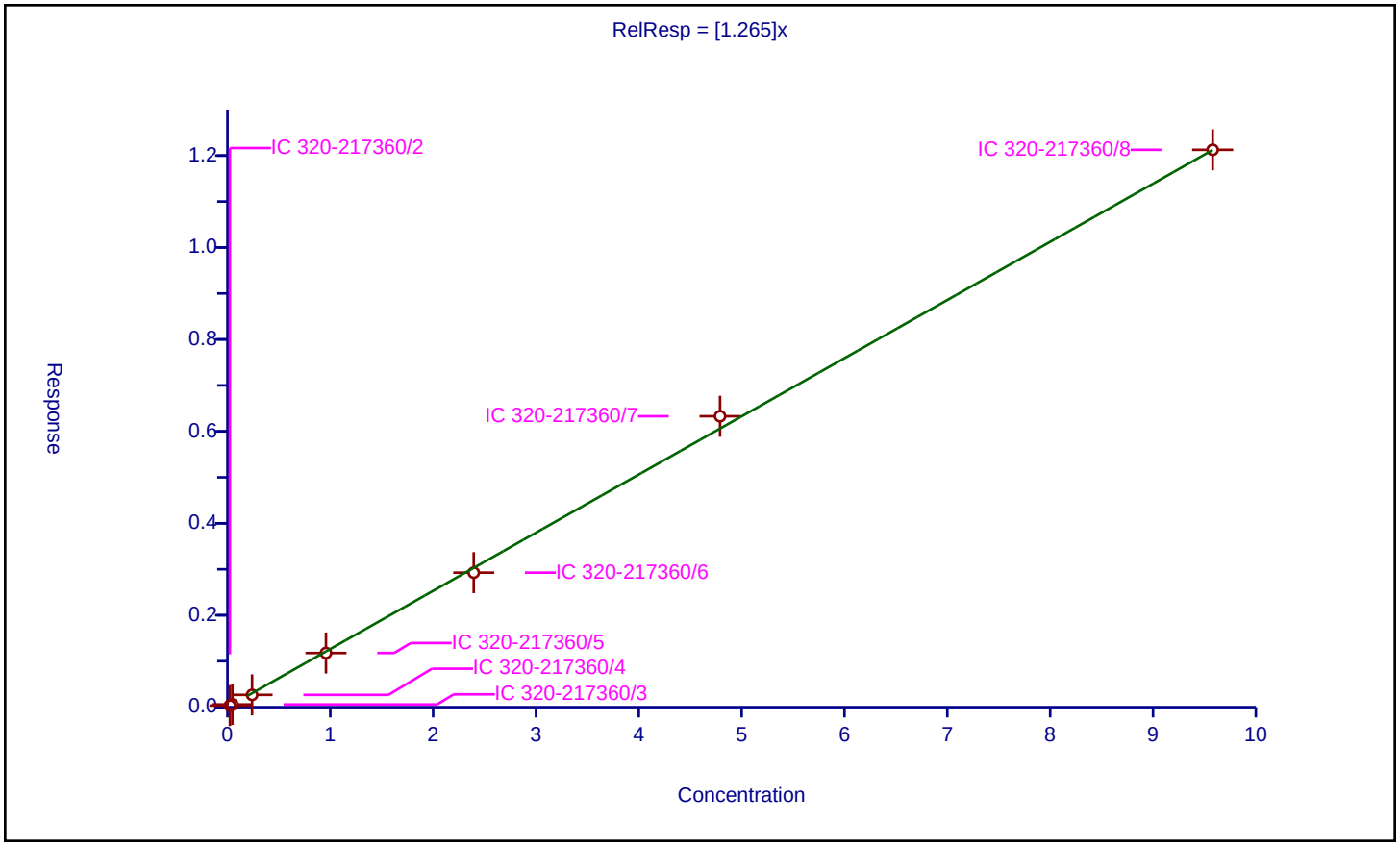
Curve Coefficients

Intercept:	0
Slope:	1.265

Error Coefficients

Standard Error:	2340000
Relative Standard Error:	8.4
Correlation Coefficient:	0.987
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.02395	0.035041	2.395	1101720.0	1.463076	Y
2	IC 320-217360/3	0.0479	0.059367	2.395	1101099.0	1.239398	Y
3	IC 320-217360/4	0.2395	0.267448	2.395	1105113.0	1.116691	Y
4	IC 320-217360/5	0.958	1.178106	2.395	1093693.0	1.229756	Y
5	IC 320-217360/6	2.395	2.926029	2.395	1063168.0	1.221724	Y
6	IC 320-217360/7	4.79	6.328663	2.395	1111203.0	1.321224	Y
7	IC 320-217360/8	9.58	12.124954	2.395	929210.0	1.265653	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

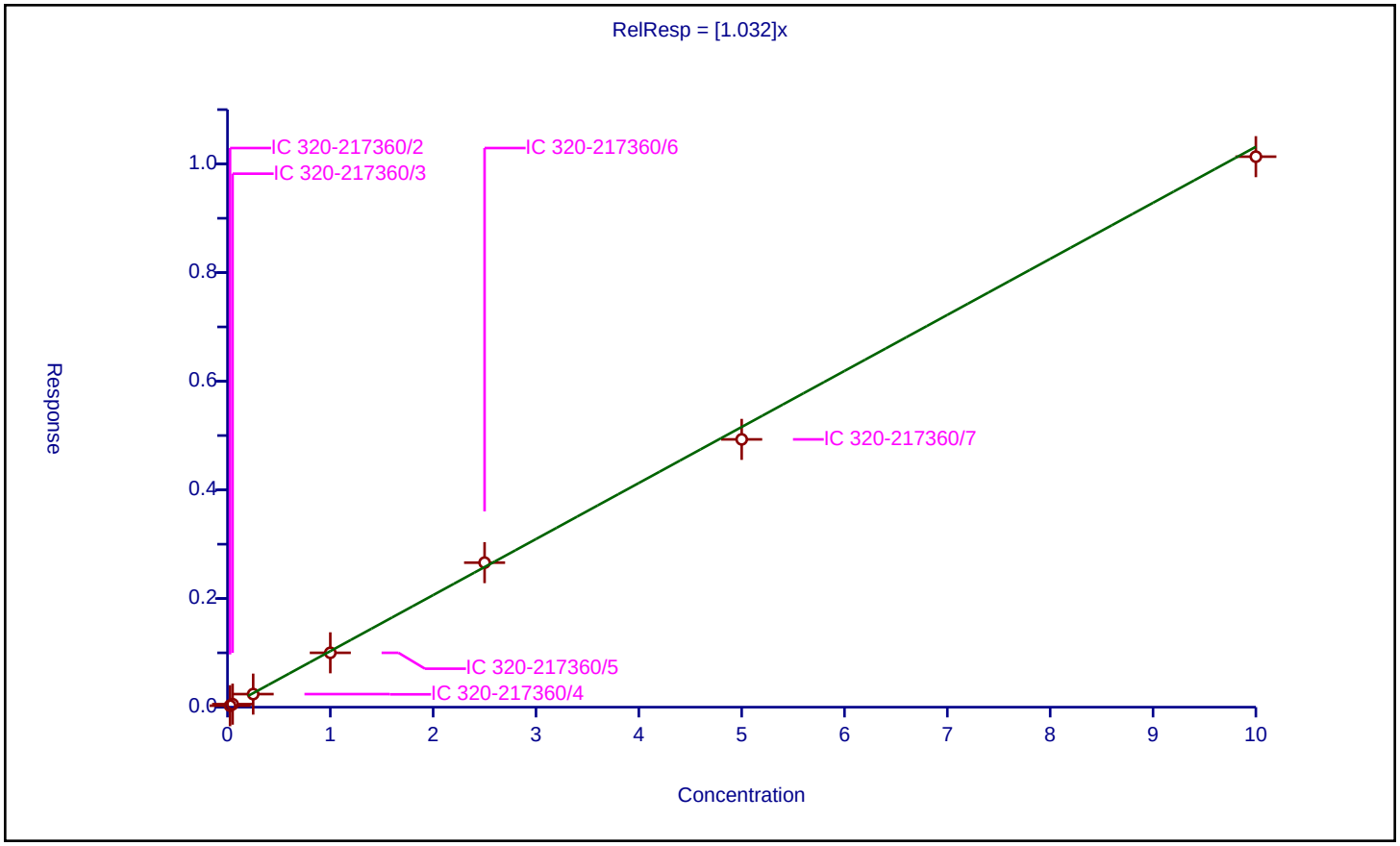
Curve Coefficients

Intercept:	0
Slope:	1.032

Error Coefficients

Standard Error:	5700000
Relative Standard Error:	5.3
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.027214	2.5	3147491.0	1.08855	Y
2	IC 320-217360/3	0.05	0.055287	2.5	2912736.0	1.105747	Y
3	IC 320-217360/4	0.25	0.240666	2.5	3141564.0	0.962664	Y
4	IC 320-217360/5	1.0	1.000535	2.5	3187733.0	1.000535	Y
5	IC 320-217360/6	2.5	2.660682	2.5	2967373.0	1.064273	Y
6	IC 320-217360/7	5.0	4.929623	2.5	3590754.0	0.985925	Y
7	IC 320-217360/8	10.0	10.133933	2.5	2846573.0	1.013393	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

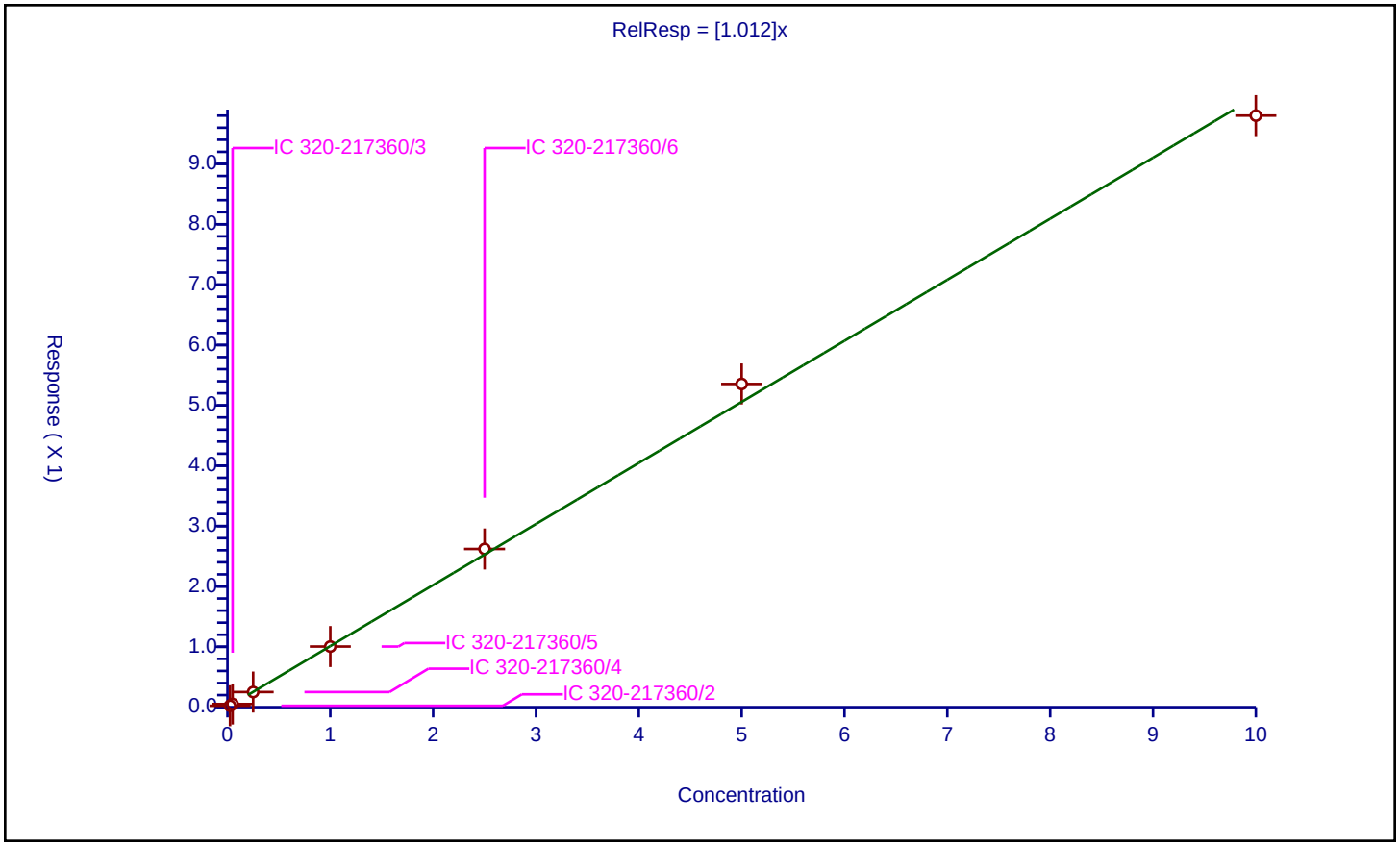
Curve Coefficients

Intercept:	0
Slope:	1.012

Error Coefficients

Standard Error:	8270000
Relative Standard Error:	4.7
Correlation Coefficient:	0.982
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.023268	2.5	4813462.0	0.930723	Y
2	IC 320-217360/3	0.05	0.052203	2.5	4658336.0	1.044053	Y
3	IC 320-217360/4	0.25	0.250574	2.5	4856180.0	1.002296	Y
4	IC 320-217360/5	1.0	1.004073	2.5	4725832.0	1.004073	Y
5	IC 320-217360/6	2.5	2.620964	2.5	4533137.0	1.048386	Y
6	IC 320-217360/7	5.0	5.354645	2.5	4967723.0	1.070929	Y
7	IC 320-217360/8	10.0	9.800427	2.5	4196317.0	0.980043	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

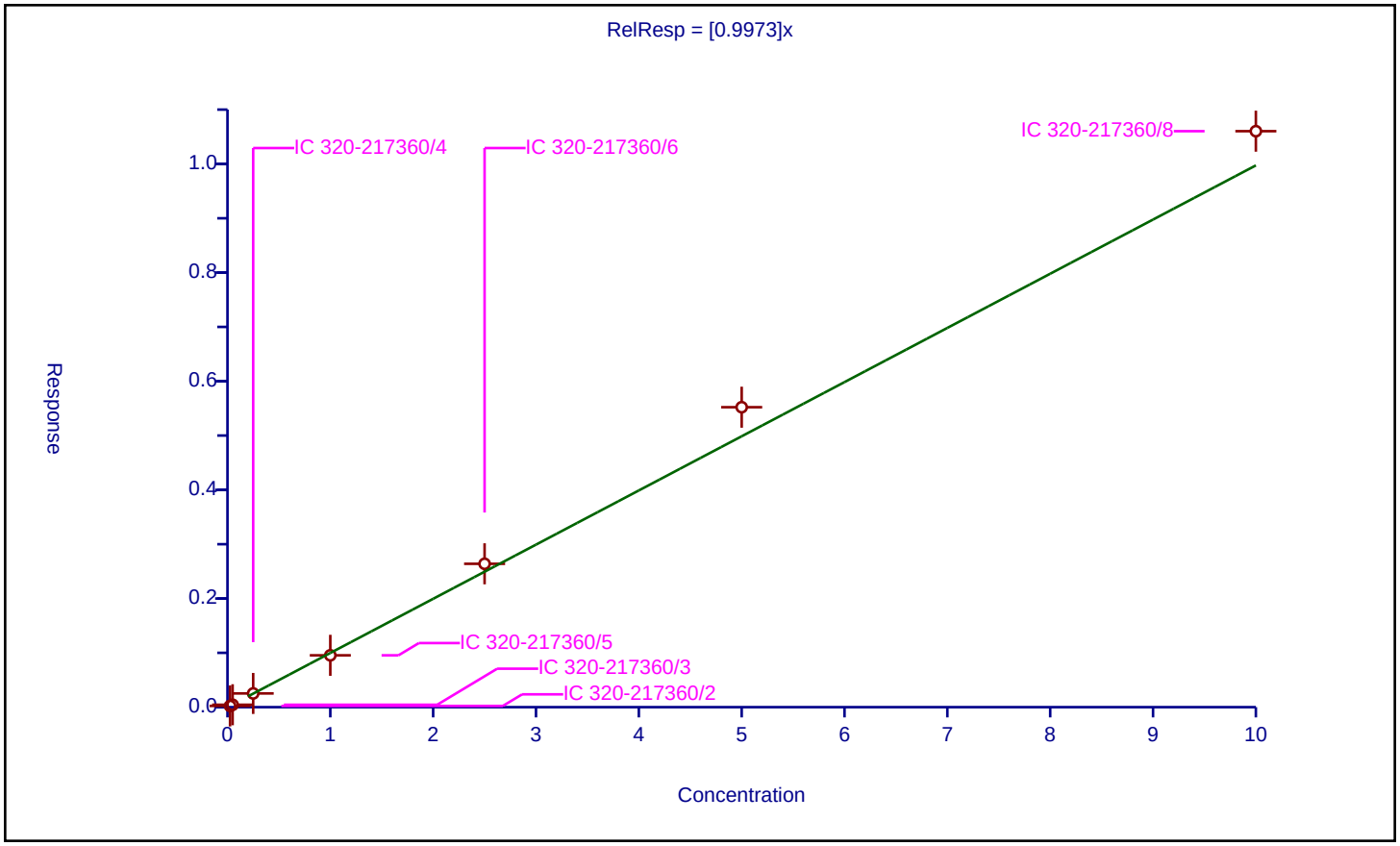
Curve Coefficients

Intercept:	0
Slope:	0.9973

Error Coefficients

Standard Error:	3500000
Relative Standard Error:	8.3
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.022707	2.5	1681961.0	0.908285	Y
2	IC 320-217360/3	0.05	0.044358	2.5	1708589.0	0.887165	Y
3	IC 320-217360/4	0.25	0.252726	2.5	1807153.0	1.010905	Y
4	IC 320-217360/5	1.0	0.954456	2.5	1818526.0	0.954456	Y
5	IC 320-217360/6	2.5	2.639289	2.5	1707705.0	1.055716	Y
6	IC 320-217360/7	5.0	5.52157	2.5	1906740.0	1.104314	Y
7	IC 320-217360/8	10.0	10.603094	2.5	1702670.0	1.060309	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

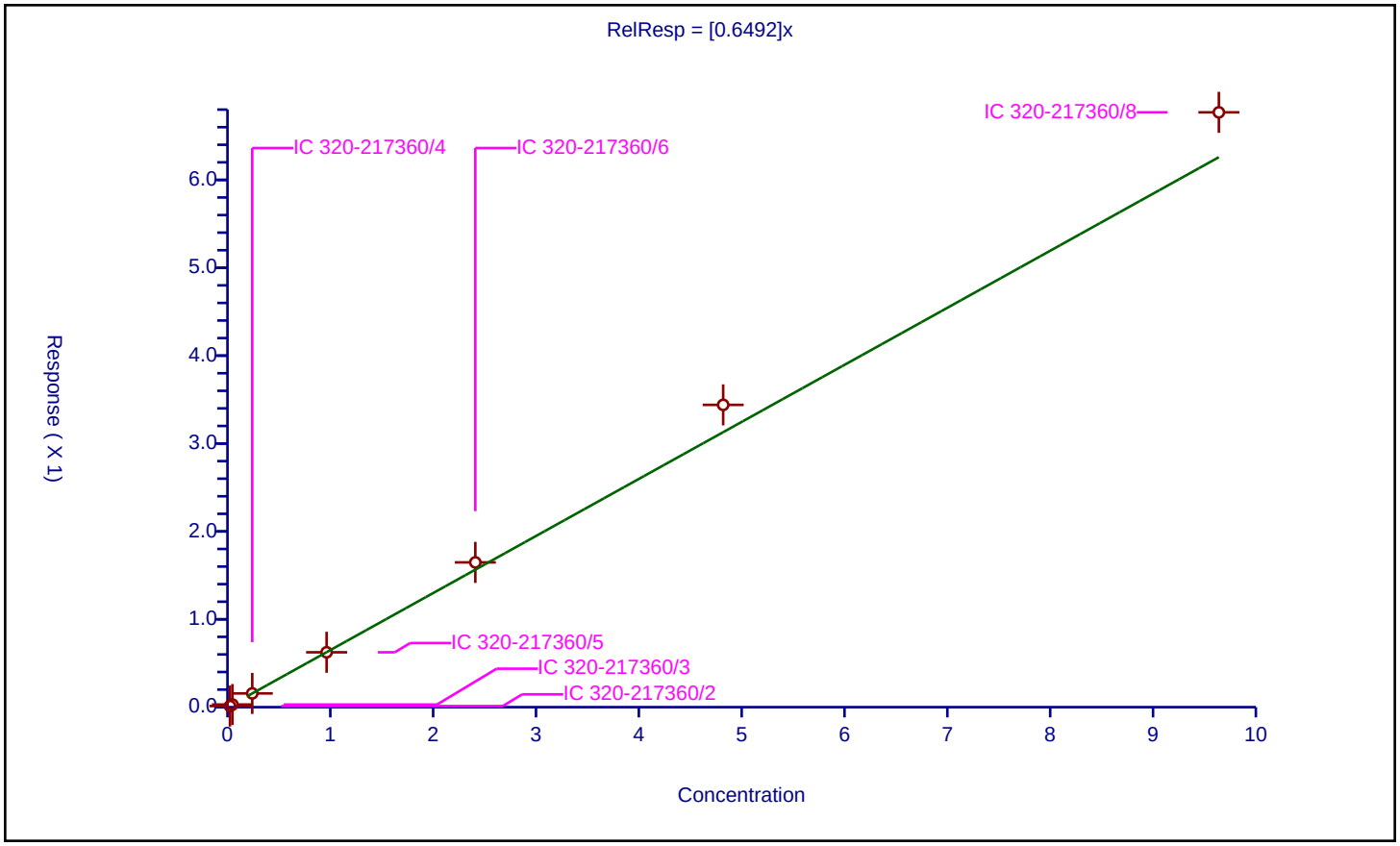
Curve Coefficients

Intercept:	0
Slope:	0.6492

Error Coefficients

Standard Error:	4510000
Relative Standard Error:	9.6
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0241	0.012758	2.39	3623690.0	0.52939	Y
2	IC 320-217360/3	0.0482	0.029806	2.39	3602676.0	0.618389	Y
3	IC 320-217360/4	0.241	0.156564	2.39	3695054.0	0.649645	Y
4	IC 320-217360/5	0.964	0.624421	2.39	3581436.0	0.647739	Y
5	IC 320-217360/6	2.41	1.647684	2.39	3447017.0	0.683686	Y
6	IC 320-217360/7	4.82	3.439976	2.39	3884830.0	0.713688	Y
7	IC 320-217360/8	9.64	6.768895	2.39	3239063.0	0.702168	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

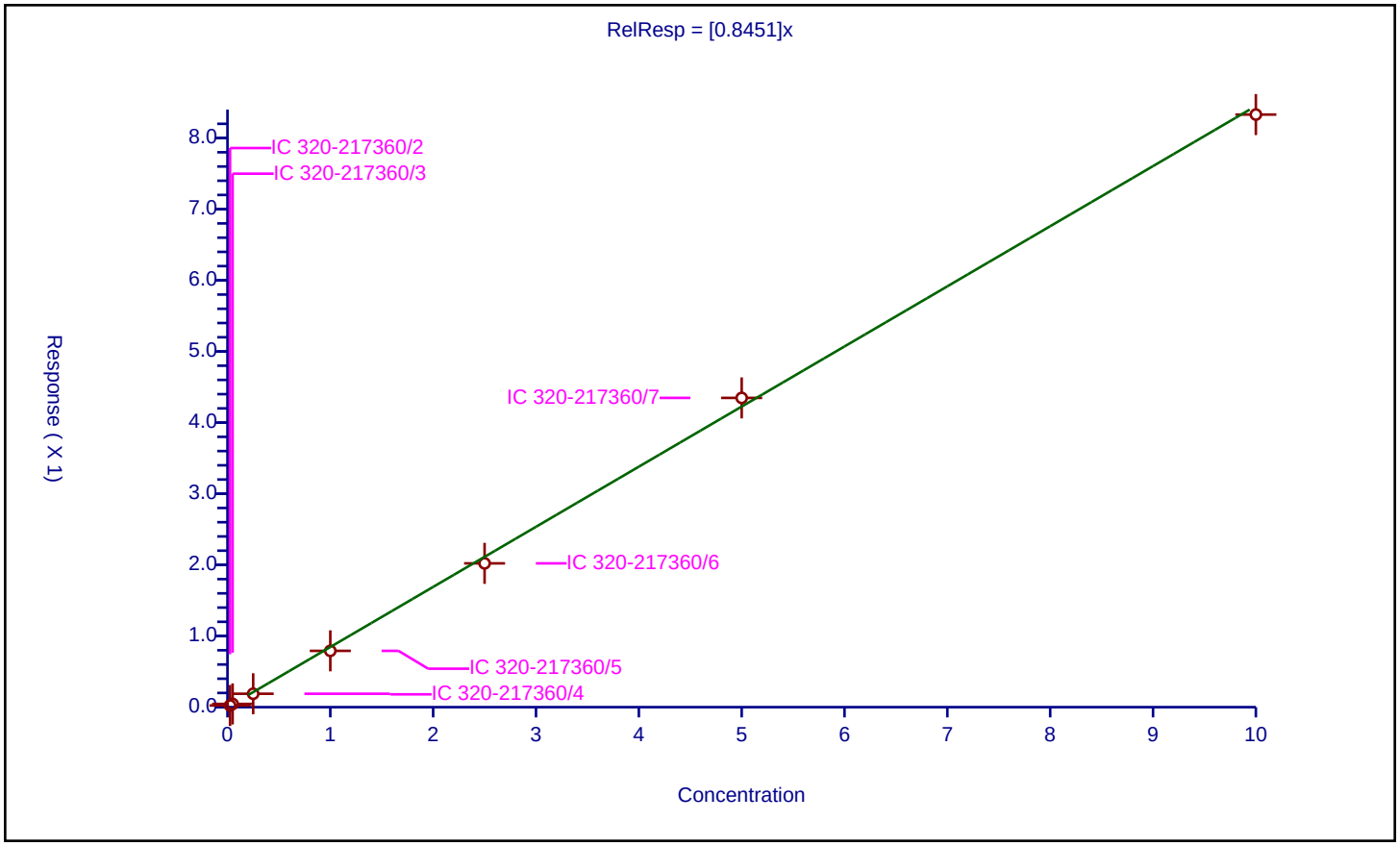
Curve Coefficients

Intercept:	0
Slope:	0.8451

Error Coefficients

Standard Error:	3910000
Relative Standard Error:	8.1
Correlation Coefficient:	0.982
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.023599	2.5	2810450.0	0.943977	Y
2	IC 320-217360/3	0.05	0.04575	2.5	2662627.0	0.914999	Y
3	IC 320-217360/4	0.25	0.188558	2.5	2893419.0	0.754232	Y
4	IC 320-217360/5	1.0	0.79142	2.5	2598322.0	0.79142	Y
5	IC 320-217360/6	2.5	2.021429	2.5	2601195.0	0.808571	Y
6	IC 320-217360/7	5.0	4.347294	2.5	2905024.0	0.869459	Y
7	IC 320-217360/8	10.0	8.330328	2.5	2344065.0	0.833033	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

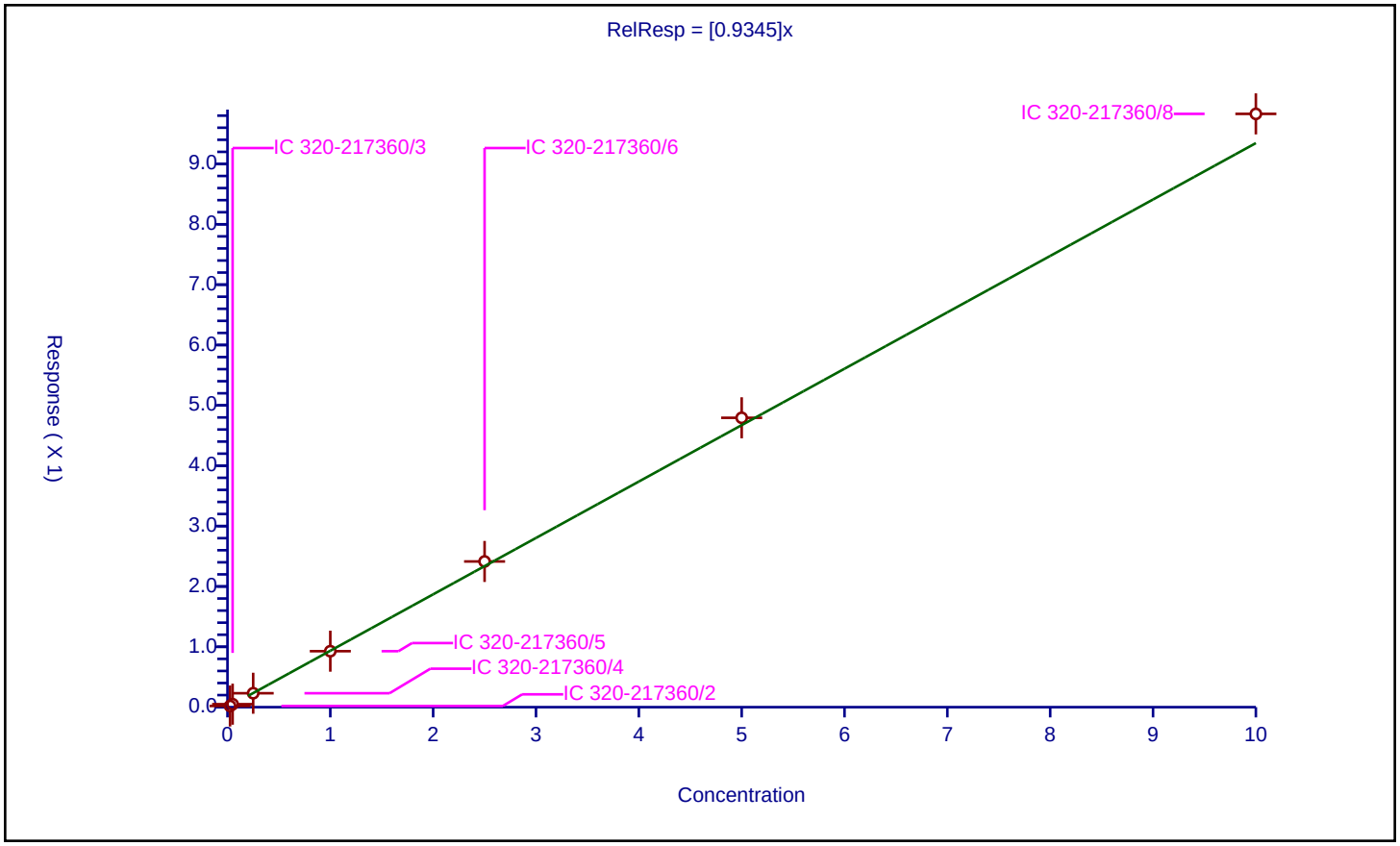
Curve Coefficients

Intercept:	0
Slope:	0.9345

Error Coefficients

Standard Error:	2880000
Relative Standard Error:	7.3
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.019782	2.5	1870983.0	0.791295	Y
2	IC 320-217360/3	0.05	0.049639	2.5	1730407.0	0.992772	Y
3	IC 320-217360/4	0.25	0.230695	2.5	1809132.0	0.92278	Y
4	IC 320-217360/5	1.0	0.927424	2.5	1716798.0	0.927424	Y
5	IC 320-217360/6	2.5	2.4138	2.5	1729345.0	0.96552	Y
6	IC 320-217360/7	5.0	4.793989	2.5	1869135.0	0.958798	Y
7	IC 320-217360/8	10.0	9.829224	2.5	1478400.0	0.982922	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

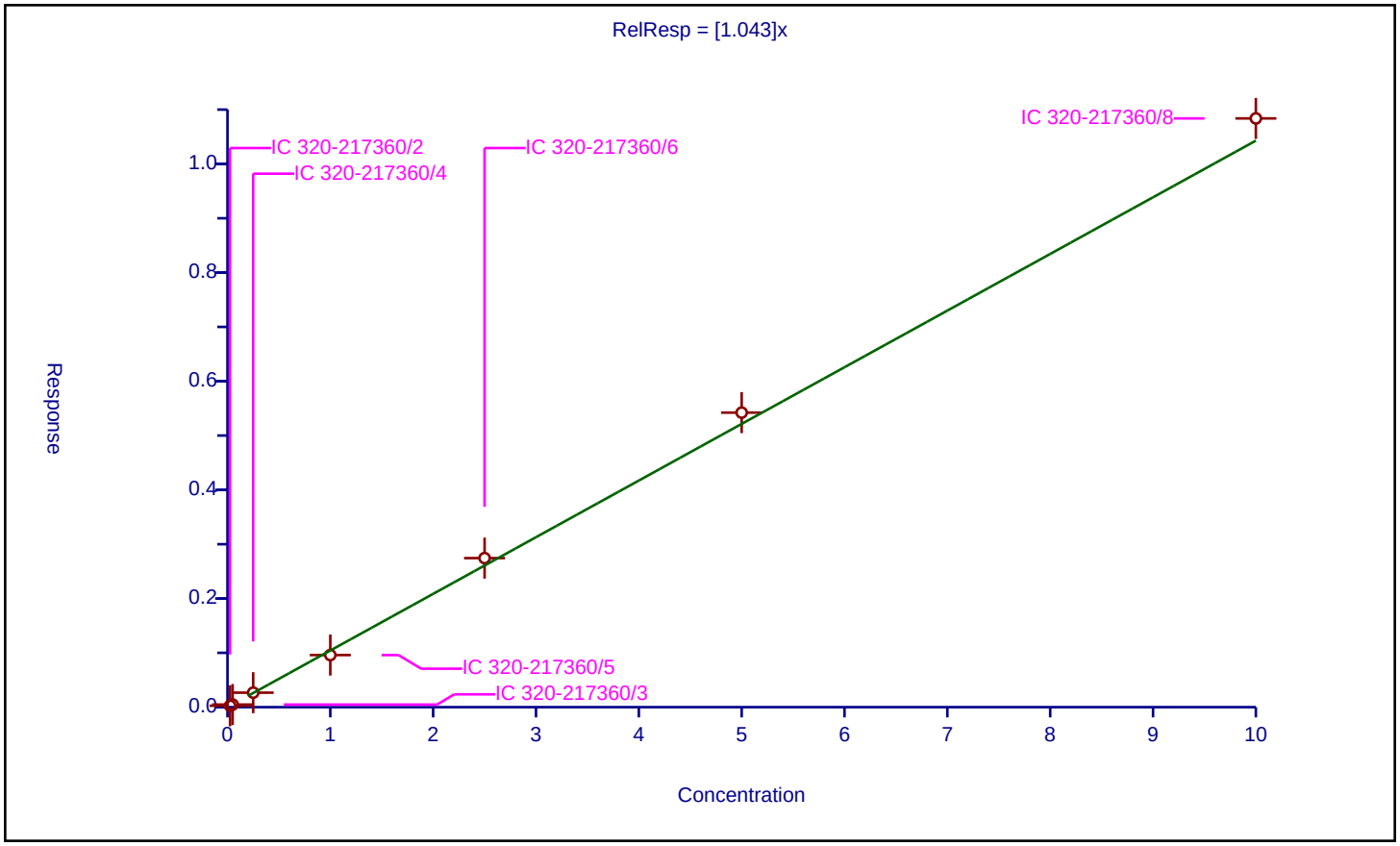
Curve Coefficients

Intercept:	0
Slope:	1.043

Error Coefficients

Standard Error:	5530000
Relative Standard Error:	5.7
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.02625	2.5	2848895.0	1.049986	Y
2	IC 320-217360/3	0.05	0.047921	2.5	2928766.0	0.958424	Y
3	IC 320-217360/4	0.25	0.266715	2.5	3031255.0	1.066858	Y
4	IC 320-217360/5	1.0	0.959045	2.5	3058842.0	0.959045	Y
5	IC 320-217360/6	2.5	2.743946	2.5	2745849.0	1.097579	Y
6	IC 320-217360/7	5.0	5.422065	2.5	3059706.0	1.084413	Y
7	IC 320-217360/8	10.0	10.837968	2.5	2618174.0	1.083797	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

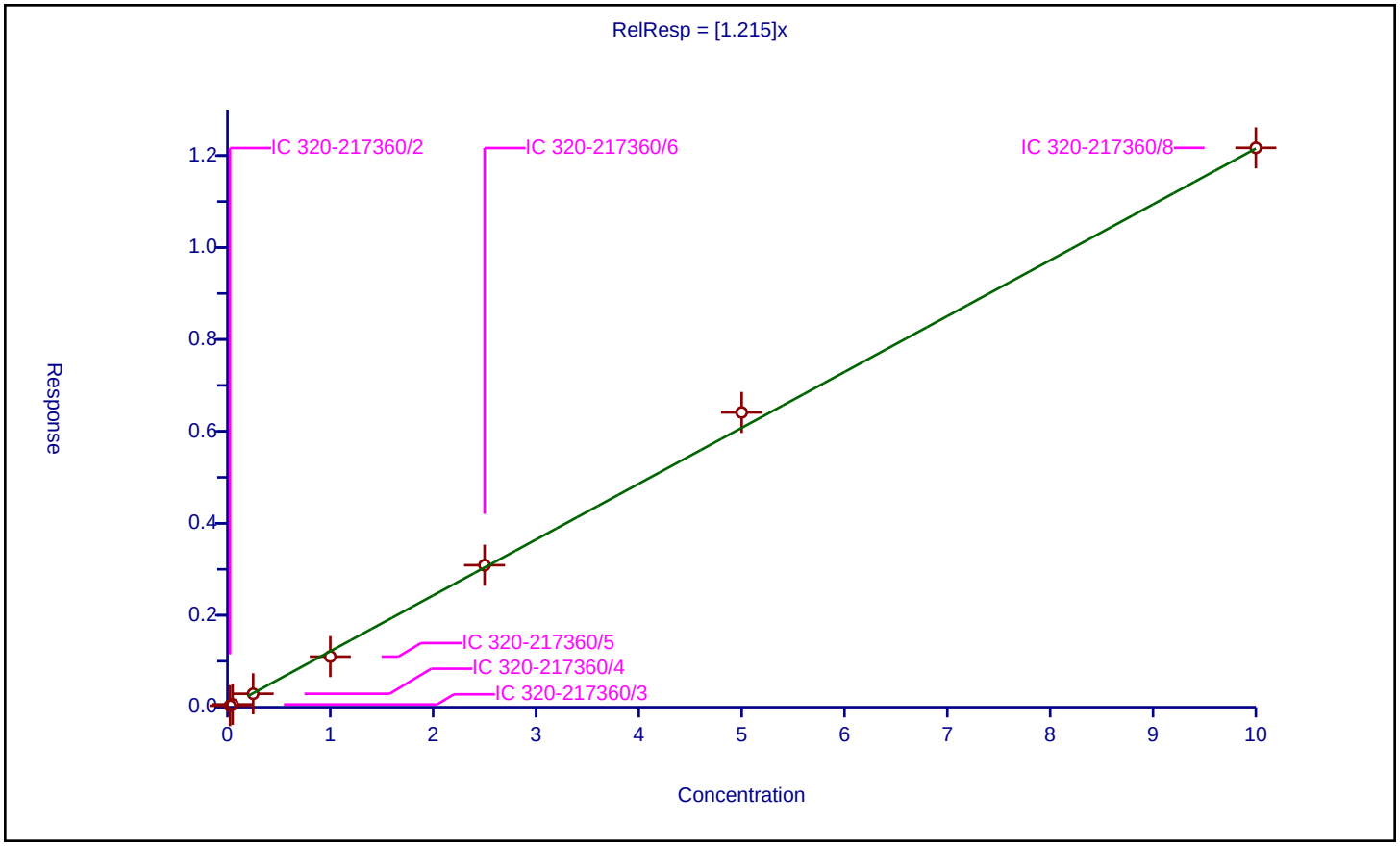
Curve Coefficients

Intercept:	0
Slope:	1.215

Error Coefficients

Standard Error:	6290000
Relative Standard Error:	5.6
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.032472	2.5	2848895.0	1.29889	Y
2	IC 320-217360/3	0.05	0.060465	2.5	2928766.0	1.209298	Y
3	IC 320-217360/4	0.25	0.291158	2.5	3031255.0	1.164633	Y
4	IC 320-217360/5	1.0	1.100149	2.5	3058842.0	1.100149	Y
5	IC 320-217360/6	2.5	3.088228	2.5	2745849.0	1.235291	Y
6	IC 320-217360/7	5.0	6.411815	2.5	3059706.0	1.282363	Y
7	IC 320-217360/8	10.0	12.167871	2.5	2618174.0	1.216787	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

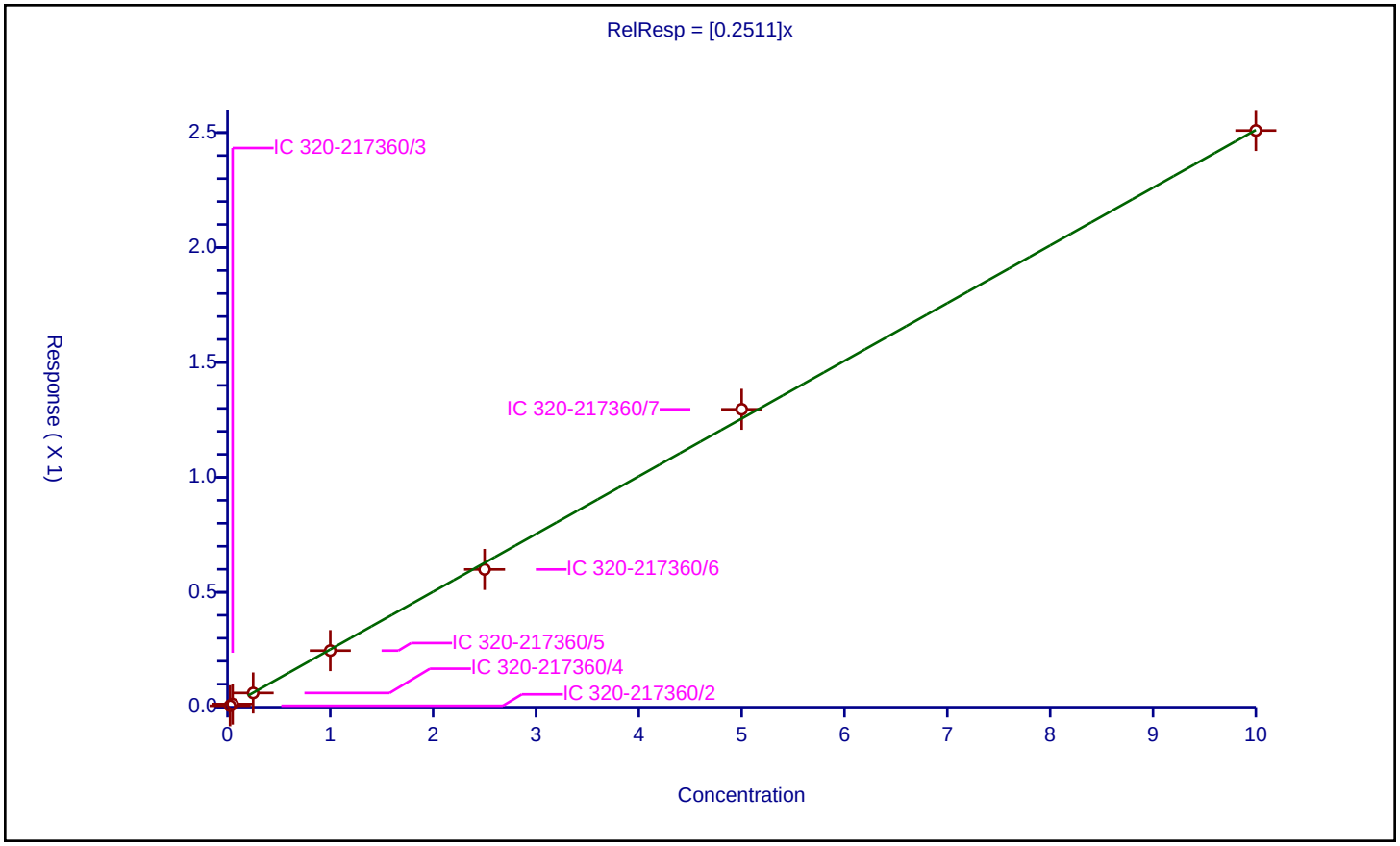
Curve Coefficients

Intercept:	0
Slope:	0.2511

Error Coefficients

Standard Error:	1650000
Relative Standard Error:	4.2
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.006114	2.5	3701548.0	0.244546	Y
2	IC 320-217360/3	0.05	0.013533	2.5	3578927.0	0.270654	Y
3	IC 320-217360/4	0.25	0.061716	2.5	3729686.0	0.246865	Y
4	IC 320-217360/5	1.0	0.246119	2.5	3824690.0	0.246119	Y
5	IC 320-217360/6	2.5	0.599264	2.5	3639964.0	0.239706	Y
6	IC 320-217360/7	5.0	1.29612	2.5	3906384.0	0.259224	Y
7	IC 320-217360/8	10.0	2.50918	2.5	3344927.0	0.250918	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: ICV 320-217360/10 Calibration Date: 04/10/2018 19:42

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.10LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.9456		2.55	2.50	1.8	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.133		2.38	2.50	-5.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	82.79		2.34	2.21	5.8	30.0
4:2 FTS	AveID	16.03	17.79		2.59	2.34	11.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	1.124		2.77	2.50	10.6	30.0
Perfluoropentanesulfonic acid	AveID	71.51	72.96		2.40	2.35	2.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.015		2.54	2.50	1.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.112		2.24	2.28	-1.7	30.0
6:2FTS	AveID	1.691	1.750		2.46	2.38	3.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.174		2.54	2.50	1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.287		2.30	2.38	-3.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.033		2.48	2.50	-0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.066		2.27	2.31	-2.0	30.0
8:2FTS	AveID	1.265	1.321		2.51	2.40	4.4	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7710		2.31	2.40	-3.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	1.008		2.44	2.50	-2.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	1.087		2.69	2.50	7.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.055		2.65	2.50	5.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6537		2.43	2.41	0.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.9922		2.65	2.50	6.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.8169		2.42	2.50	-3.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	1.064		2.55	2.50	2.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.212		2.49	2.50	-0.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2481		2.47	2.50	-1.2	30.0
13C4 PFBA	Ave	1.345	1.348		2.51	2.50	0.2	30.0
13C5 PFPeA	Ave	0.8672	0.8855		2.55	2.50	2.1	30.0
13C3-PFBS	Ave	0.0199	0.0197		2.31	2.33	-0.8	30.0
13C2 PFHxA	Ave	0.9590	0.9273		2.42	2.50	-3.3	30.0
13C4-PFHpA	Ave	0.9333	0.9503		2.55	2.50	1.8	30.0
18O2 PFHxS	Ave	1.152	1.130		2.32	2.37	-1.9	30.0
M2-6:2FTS	Ave	0.2000	0.1936		2.30	2.38	-3.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: ICV 320-217360/10 Calibration Date: 04/10/2018 19:42

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.10LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9247		2.49	2.50	-0.3	30.0
13C4 PFOS	Ave	0.8066	0.8532		2.53	2.39	5.8	30.0
13C5 PFNA	Ave	0.7973	0.8279		2.60	2.50	3.8	30.0
M2-8:2FTS	Ave	0.2409	0.2384		2.37	2.40	-1.0	30.0
13C2 PFDA	Ave	0.6701	0.6944		2.59	2.50	3.6	30.0
13C8 FOSA	Ave	1.007	1.012		2.51	2.50	0.5	30.0
d3-NMeFOSAA	Ave	0.3798	0.3981		2.62	2.50	4.8	30.0
d5-NEtFOSAA	Ave	0.3749	0.3684		2.46	2.50	-1.7	30.0
13C2 PFUnA	Ave	0.5781	0.5516		2.39	2.50	-4.6	30.0
13C2 PFDoA	Ave	0.6242	0.6257		2.51	2.50	0.2	30.0
13C2-PFTeDA	Ave	0.7915	0.8266		2.61	2.50	4.4	30.0
13C2-PFHxDA	Ave	1.288	1.382		2.68	2.50	7.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 10-Apr-2018 19:42:10 ALS Bottle#: 18 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:51:23 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:23:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.435	1.431	0.004	1.000	5903140	2.51		100	42897	
2 Perfluorobutyric acid										
212.90 > 169.00	1.435	1.432	0.003	1.000	5582092	2.55			3157	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.699	0.003	0.558	3876443	2.55		102	71438	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.699	0.003	1.000	4390263	2.38			3574	
D 47 13C3-PFBS										
301.90 > 83.00	1.739	1.735	0.003	1.000	80328	2.31		99.2	737	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.736	0.002	1.000	6328944	2.34			26552	
298.90 > 99.00	1.739	1.736	0.002	1.000	2603286		2.43(1.25-3.74)		34374	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.949	1.950	-0.001	1.000	1436925	2.59			63389	
D 60 M2-4:2FTS										
329.00 > 81.00	1.949	1.950	-0.001	1.000	612715	NC			5966	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.993	1.985	0.008	1.006	4562329	2.77			12399	
313.00 > 119.00	1.981	1.985	-0.004	1.000	384388		11.87(5.03-15.10)		6555	
D 7 13C2 PFHxA										
315.00 > 270.00	1.981	1.985	-0.004	1.000	4059281	2.42		96.7	114705	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.004	2.008	-0.004	1.000	5923371	2.40			37471	
349.00 > 99.00	2.004	2.008	-0.004	1.000	2141440		2.77(1.36-4.07)		32919	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.083	2.084	-0.001	1.000	267167	NC			7732	

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	2.087	-0.004	1.000	680925	NC			4640	
D 9 13C4-PFHpA										
367.00 > 322.00	2.320	2.314	0.006	1.000	4159917	2.55		102	83647	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.320	2.314	0.006	1.000	4222004	2.54			5555	
363.00 > 169.00	2.320	2.314	0.006	1.000	1656229		2.55(1.13-3.40)		8075	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.333	2.323	0.010	1.000	5017849	2.24			13906	
399.00 > 99.00	2.333	2.323	0.010	1.000	1647913		3.04(1.50-4.49)		14109	
D 11 18O2 PFHxS										
403.00 > 84.00	2.333	2.327	0.006	1.000	4679824	2.32		98.1	94921	
65 Adona										
377.00 > 251.00	2.359	2.360	-0.001	1.000	12510918	NC			98964	
377.00 > 85.00	2.359	2.360	-0.001	1.000	7623155		1.64(0.84-2.53)		115527	
D 12 M2-6:2FTS										
429.00 > 81.00	2.653	2.649	0.004	1.000	805312	2.30		96.8	15934	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.653	2.649	0.004	1.000	1408901	2.46			22533	
D 14 13C4 PFOA										
417.00 > 372.00	2.676	2.673	0.003	1.000	4047870	2.49		99.7	60383	
* 62 13C2-PFOA										
415.00 > 370.00	2.676	2.674	0.002		4377627	2.50			57743	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.676	2.674	0.002	1.000	4752903	2.54			3234	
413.00 > 169.00	2.676	2.674	0.002	1.000	2366488		2.01(0.84-2.52)		10676	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.683	2.680	0.003	1.000	4566459	2.30			32288	
449.00 > 99.00	2.683	2.680	0.003	1.000	1249476		3.65(1.94-5.82)		23451	
D 18 13C4 PFOS										
503.00 > 80.00	3.049	3.041	0.008	1.000	3570537	2.53		106	24066	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.049	3.042	0.007	1.000	3685601	2.27			15600	
499.00 > 99.00	3.049	3.042	0.007	1.000	812986		4.53(2.31-6.93)		15657	
20 Perfluorononanoic acid										
463.00 > 419.00	3.049	3.043	0.006	1.000	3743693	2.48			9400	
463.00 > 169.00	3.049	3.043	0.006	1.000	898645		4.17(1.90-5.69)		36471	
D 19 13C5 PFNA										
468.00 > 423.00	3.049	3.045	0.004	1.000	3624090	2.60		104	67532	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.257	3.253	0.004	1.000	6286262	NC			103380	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.394	3.388	0.006	1.000	2764509	2.31			32991	
549.00 > 99.00	3.394	3.388	0.006	1.000	1003388		2.76(1.33-3.97)		19714	
D 26 M2-8:2FTS										
529.00 > 81.00	3.394	3.390	0.004	1.000	999777	2.37		99.0	10613	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.394	3.393	0.001	1.000	1323882	2.51			55023	

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	3.404	3.397	0.007	1.000	4432045	2.51		101	58050	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.404	3.401	0.003	1.000	4817944	2.69			67785	
D 23 13C2 PFDA										
515.00 > 470.00	3.404	3.401	0.003	1.000	3039987	2.59		104	79981	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.404	3.402	0.002	1.000	3064833	2.44			12447	
513.00 > 169.00	3.404	3.402	0.002	1.000	528428		5.80(2.36-7.09)		18431	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.562	3.553	0.009	1.000	1742858	2.62		105	25420	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.562	3.558	0.004	1.000	1839262	2.65			12104	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.715	3.715	0.0	1.000	2356067	2.43			29098	
599.00 > 99.00	3.715	3.715	0.0	1.000	795988		2.96(1.39-4.16)		22459	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.726	3.722	0.004	1.000	1612562	2.46		98.3	9989	
D 30 13C2 PFUnA										
565.00 > 520.00	3.737	3.727	0.010	1.000	2414889	2.39		95.4	67805	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.737	3.727	0.010	1.003	1599970	2.65			18023	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.737	3.727	0.010	1.000	1972744	2.42			8361	
563.00 > 169.00	3.737	3.727	0.010	1.000	467144		4.22(2.12-6.36)		11394	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.894	3.883	0.011	1.000	9854892	NC			104542	
D 36 13C2 PFDoA										
615.00 > 570.00	4.027	4.017	0.010	1.000	2739185	2.51		100	21240	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.027	4.020	0.007	1.000	2914311	2.55			3322	
613.00 > 169.00	4.027	4.020	0.007	1.000	731402		3.98(2.13-6.40)		7033	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.289	4.278	0.011	1.000	3318610	2.49			3147	
663.00 > 169.00	4.289	4.278	0.011	1.000	1033553		3.21(1.25-3.76)		10706	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.521	4.513	0.008	1.000	3618492	2.61		104	23098	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.521	4.513	0.008	1.000	897606	2.47			8678	
713.00 > 219.00	4.511	4.513	-0.002	0.998	658771		1.36(0.71-2.13)		10322	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.930	4.918	0.012	1.000	6051317	2.68		107	16293	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.930	4.920	0.010	1.000	5691508	NC			1760	
813.00 > 169.00	4.930	4.920	0.010	1.000	909536		6.26(2.86-8.58)		5961	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.277	5.268	0.009	1.000	6120324	NC			1552	
913.00 > 169.00	5.277	5.268	0.009	1.000	734463		8.33(3.83-11.48)		3317	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00011 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:51:25 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_010.d

Injection Date: 10-Apr-2018 19:42:10 Instrument ID: A8_N

Lims ID: ICV Full

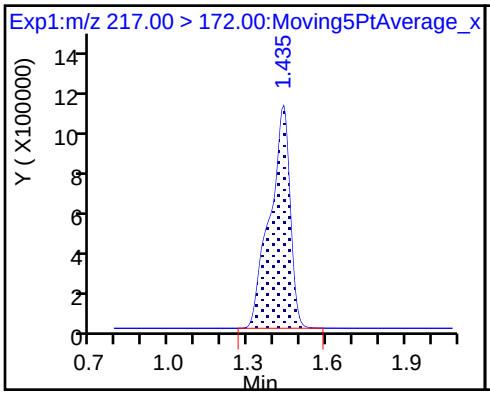
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 10

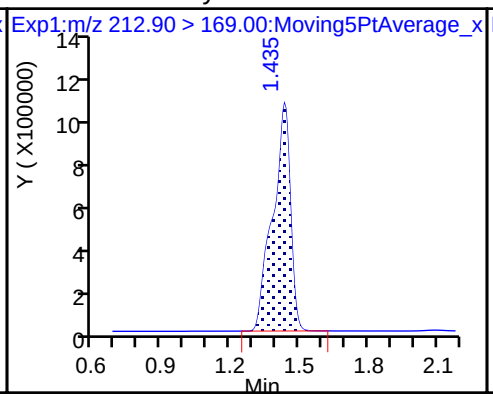
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

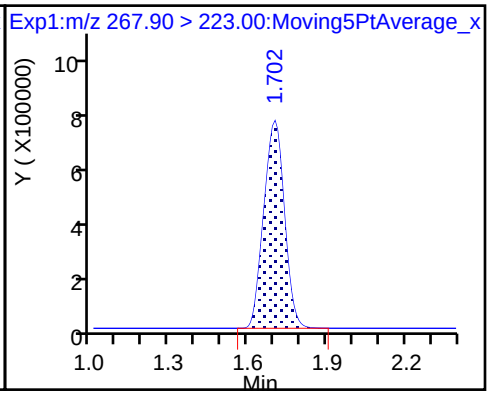
D 1 13C4 PFBA



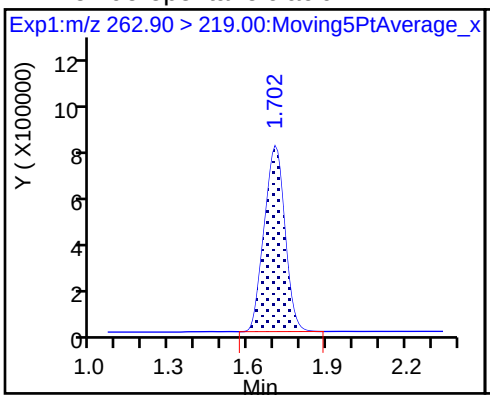
2 Perfluorobutyric acid



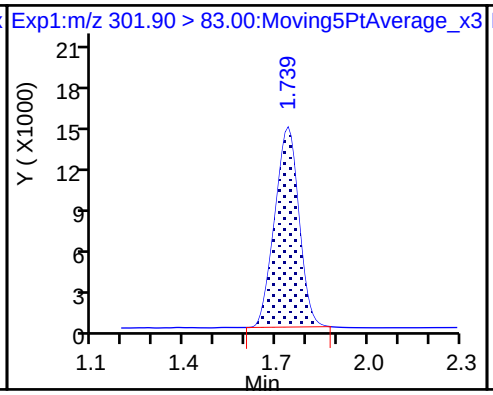
D 3 13C5-PFPeA



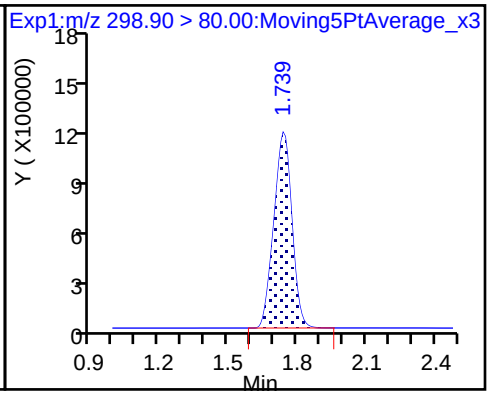
4 Perfluoropentanoic acid



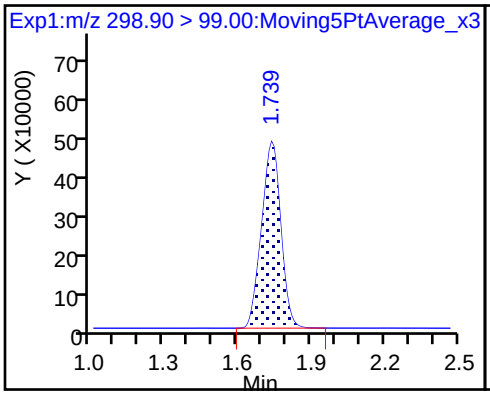
D 47 13C3-PFBS



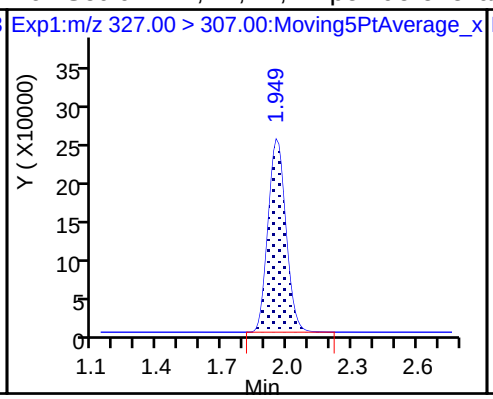
5 Perfluorobutanesulfonic acid



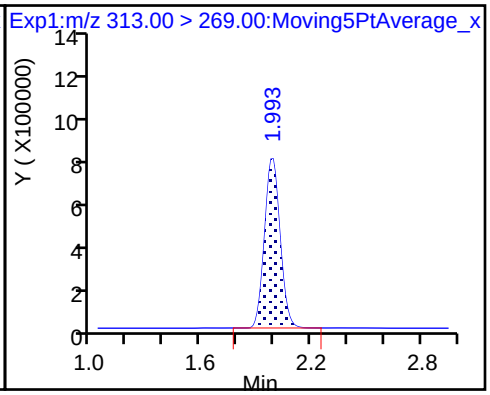
5 Perfluorobutanesulfonic acid



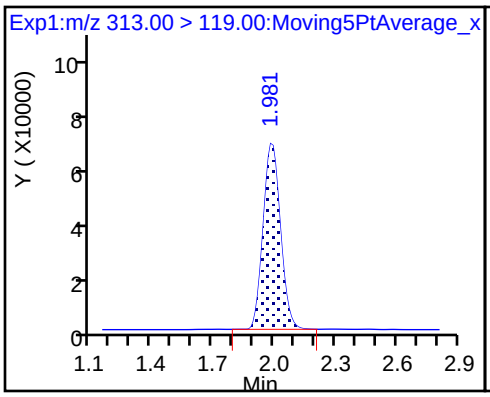
61 Sodium 1H,1H,2H,2H-perfluorohexane



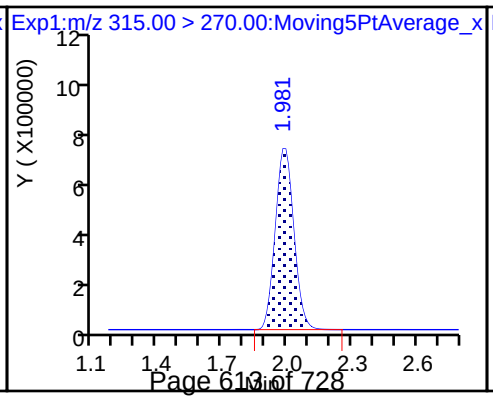
6 Perfluorohexanoic acid



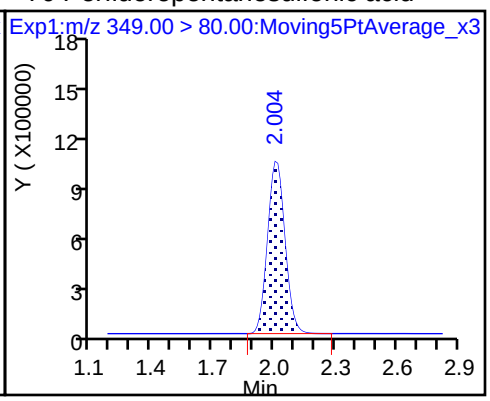
6 Perfluorohexanoic acid



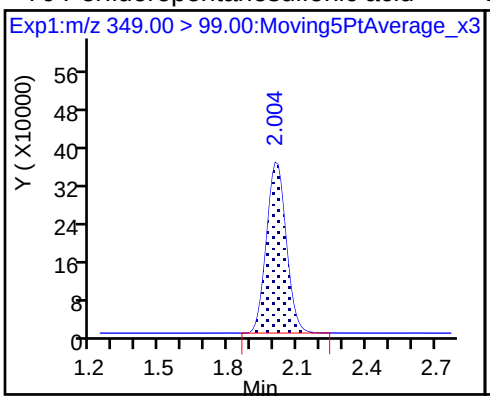
D 7 13C2 PFHxA



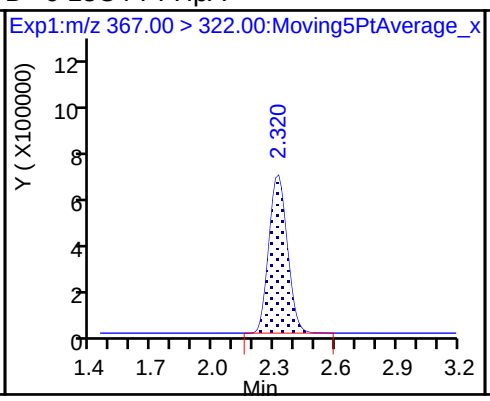
70 Perfluoropentanesulfonic acid



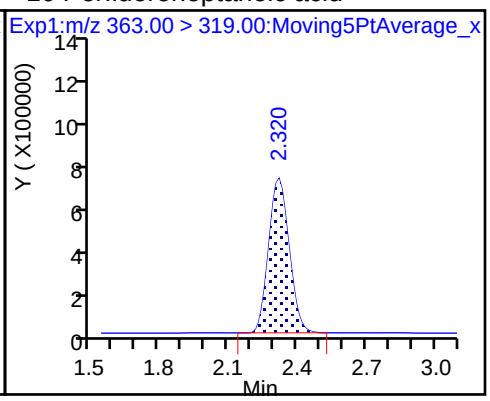
70 Perfluoropentanesulfonic acid



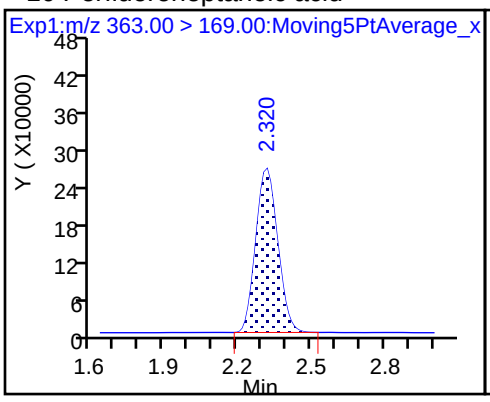
D 9 13C4-PFHpA



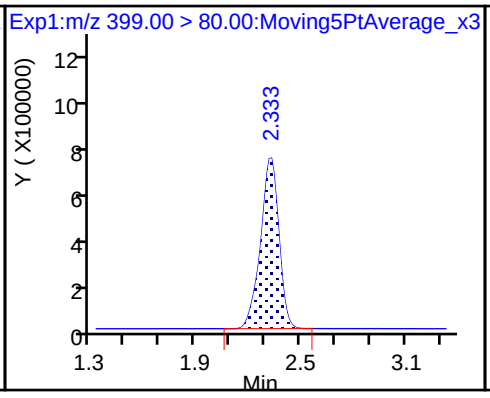
10 Perfluoroheptanoic acid



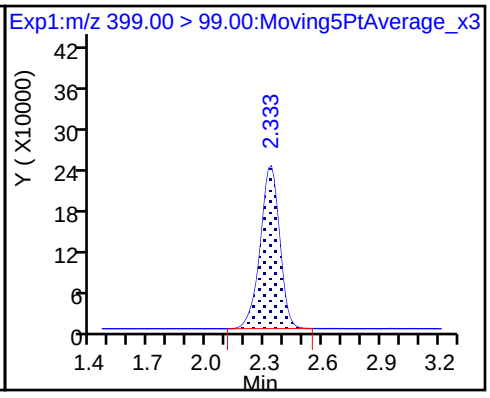
10 Perfluoroheptanoic acid



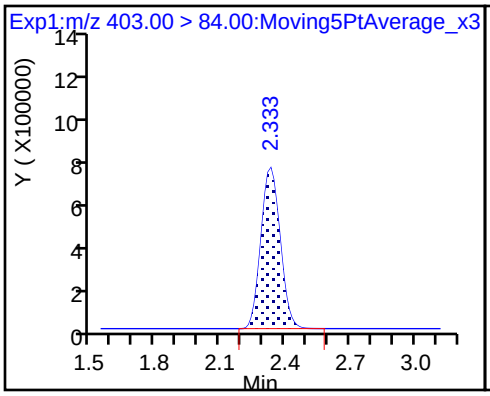
8 Perfluorohexanesulfonic acid



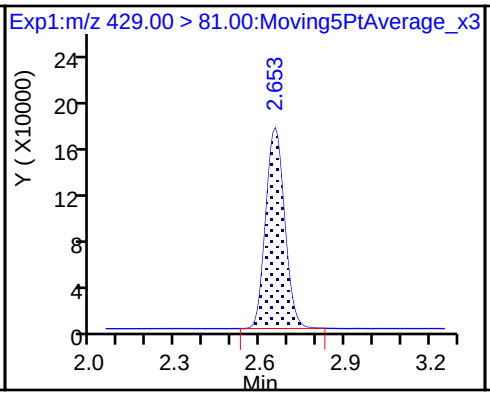
8 Perfluorohexanesulfonic acid



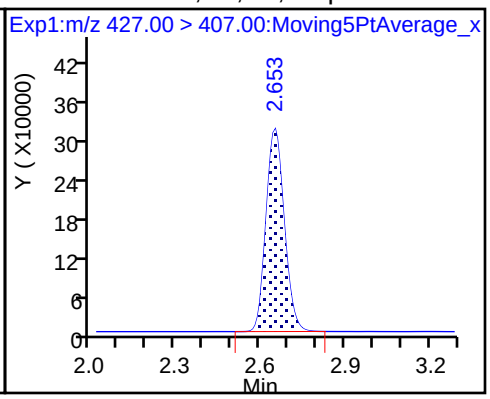
D 11 18O2 PFHxS



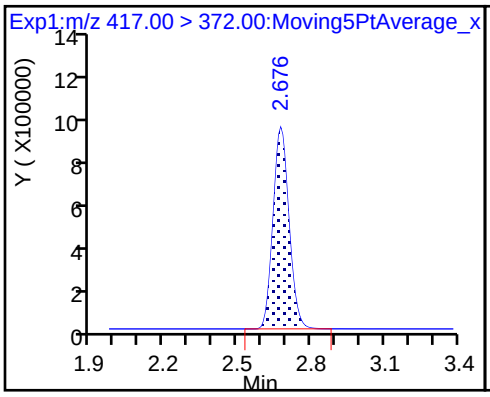
D 12 M2-6:2FTS



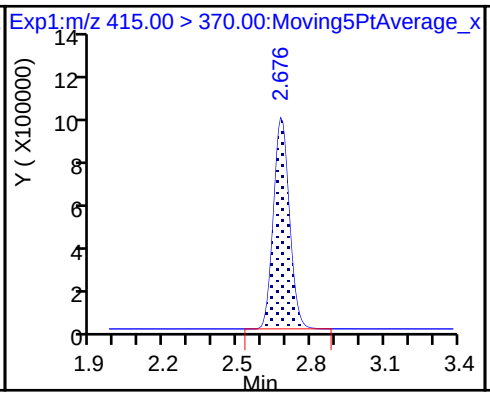
13 Sodium 1H,1H,2H,2H-perfluorooctane



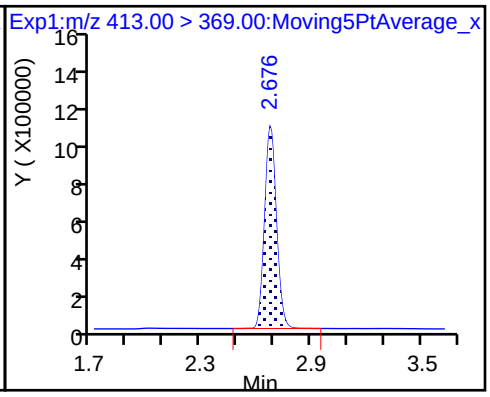
D 14 13C4 PFOA



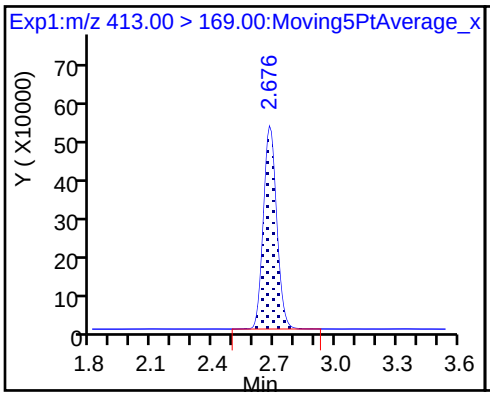
* 62 13C2-PFOA



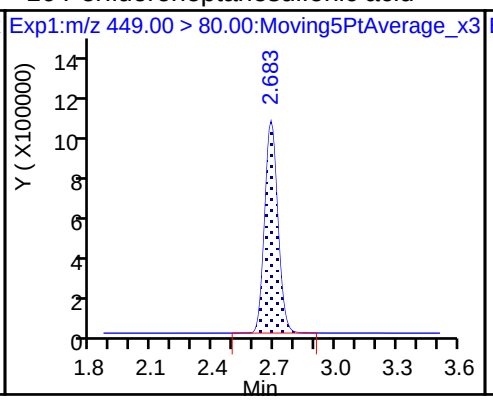
15 Perfluorooctanoic acid



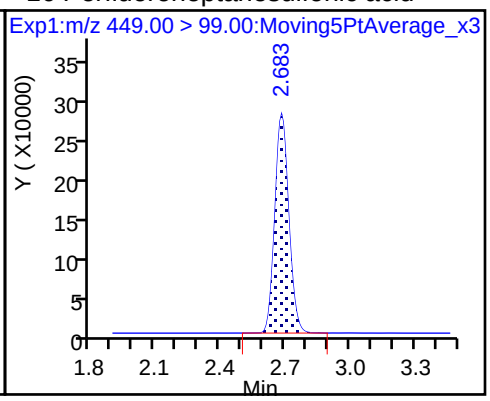
15 Perfluorooctanoic acid



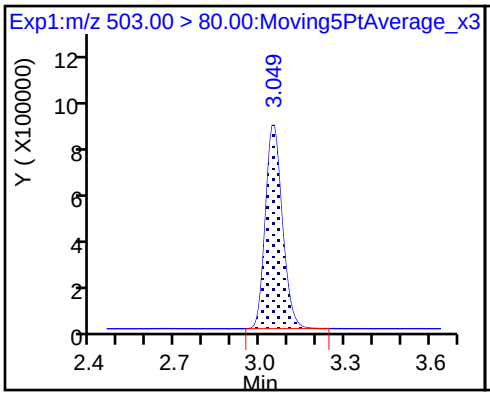
16 Perfluoroheptanesulfonic acid



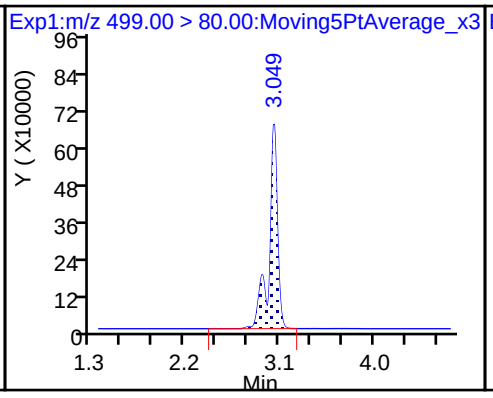
16 Perfluoroheptanesulfonic acid



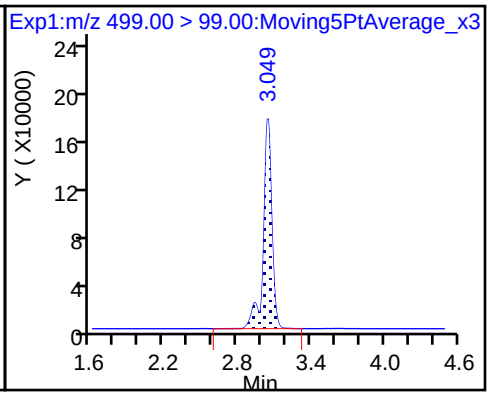
D 18 13C4 PFOS



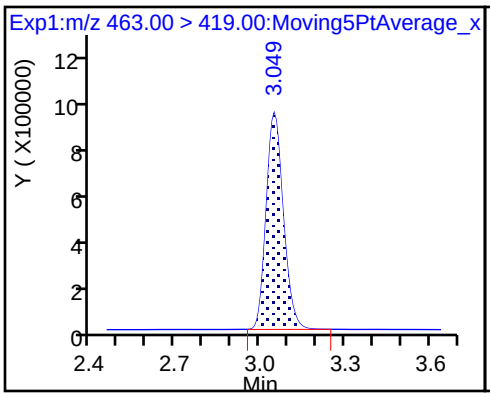
17 Perfluorooctane sulfonic acid



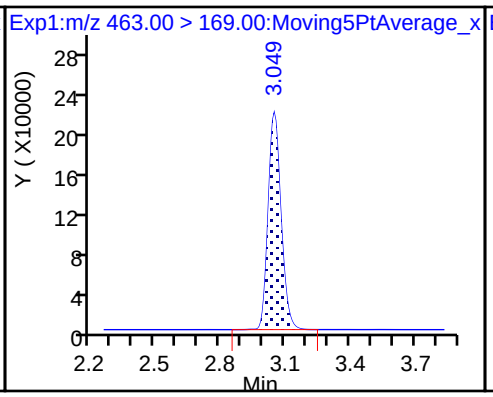
17 Perfluorooctane sulfonic acid



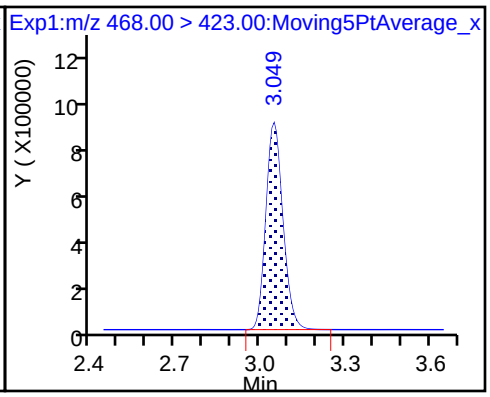
20 Perfluorononanoic acid



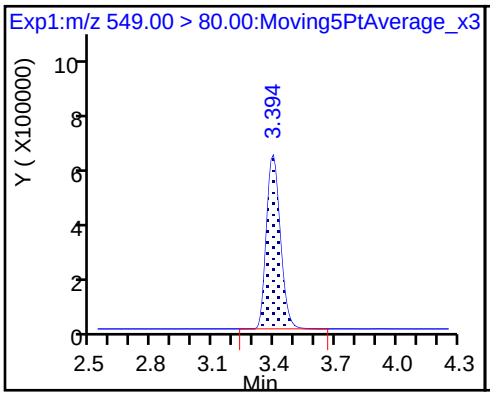
20 Perfluorononanoic acid



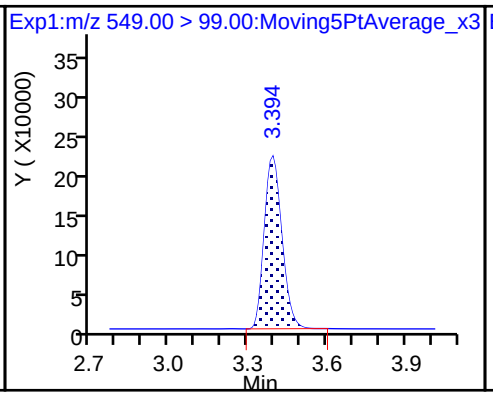
D 19 13C5 PFNA



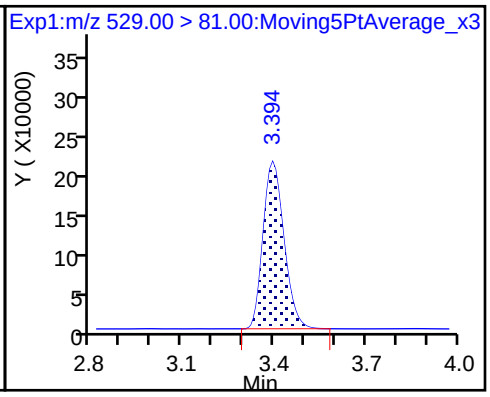
68 Perfluorononanesulfonic acid



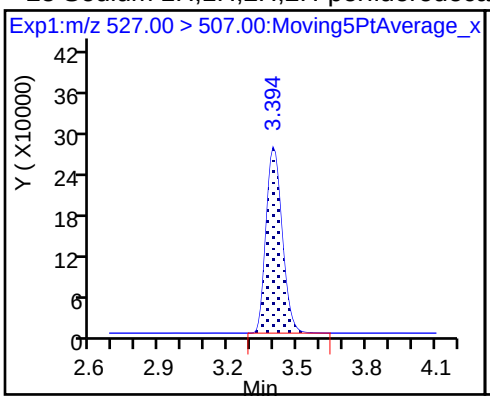
68 Perfluorononanesulfonic acid



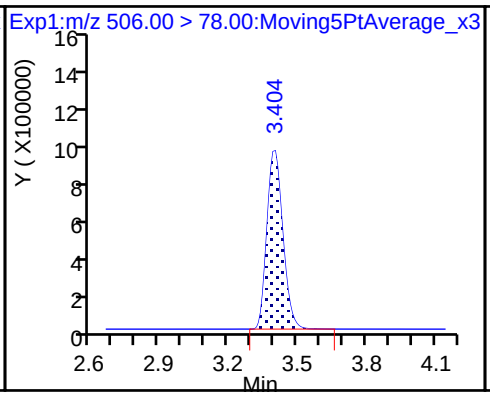
D 26 M2-8:2FTS



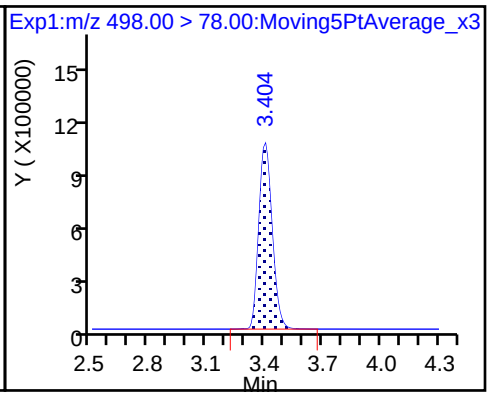
25 Sodium 1H,1H,2H,2H-perfluorodecane



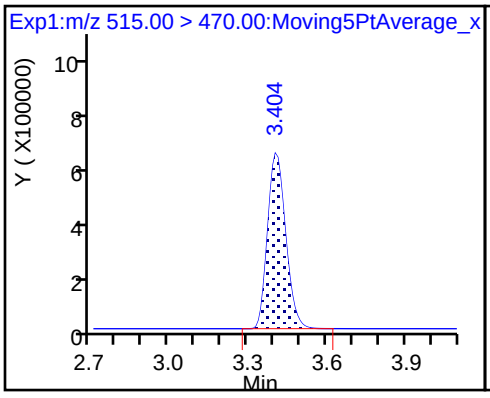
D 21 13C8 FOSA



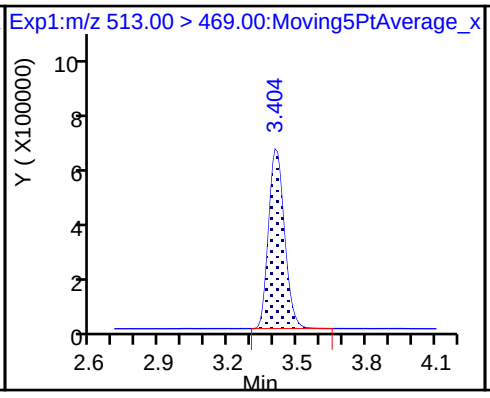
22 Perfluorooctane Sulfonamide



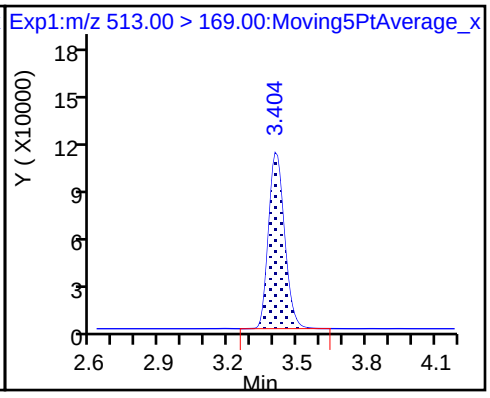
D 23 13C2 PFDA



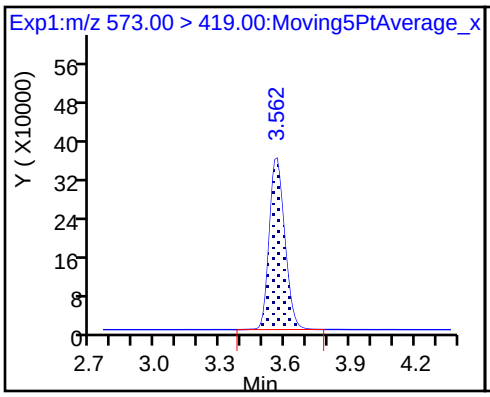
24 Perfluorodecanoic acid



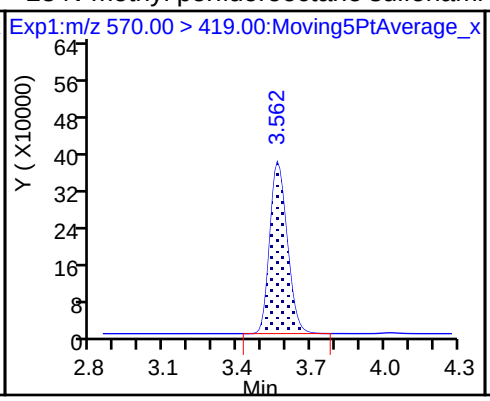
24 Perfluorodecanoic acid



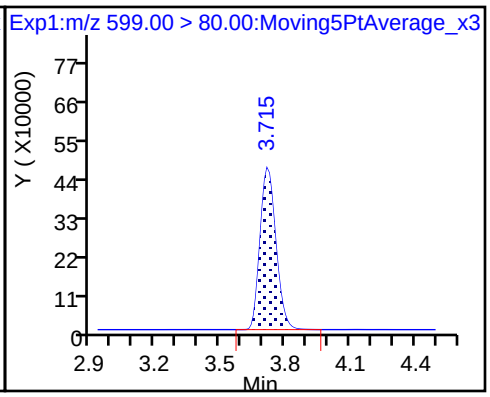
D 27 d3-NMeFOSAA



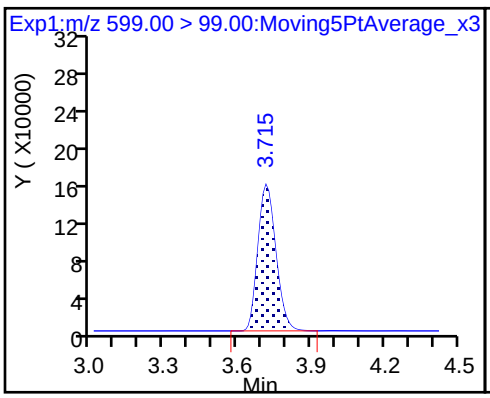
28 N-methyl perfluorooctane sulfonami



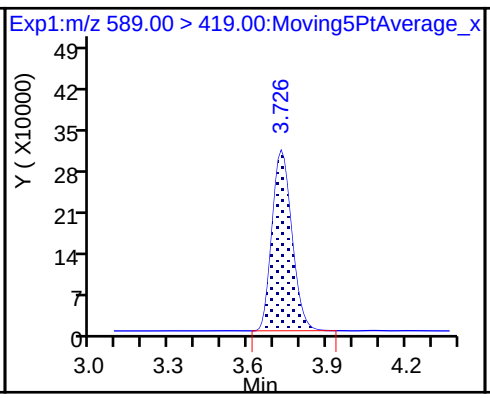
29 Perfluorodecane Sulfonic acid



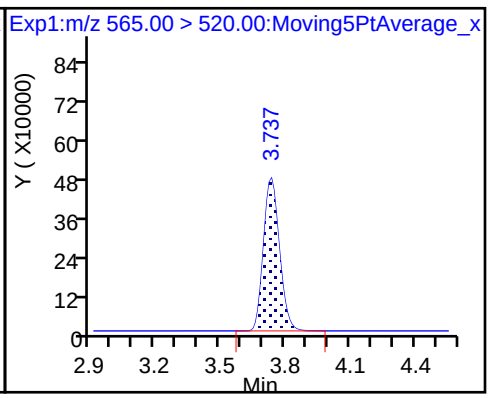
29 Perfluorodecane Sulfonic acid



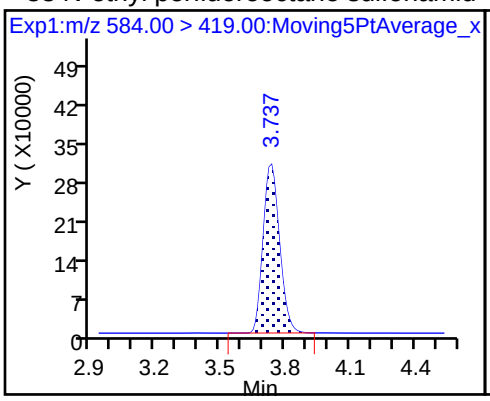
D 32 d5-NEtFOSAA



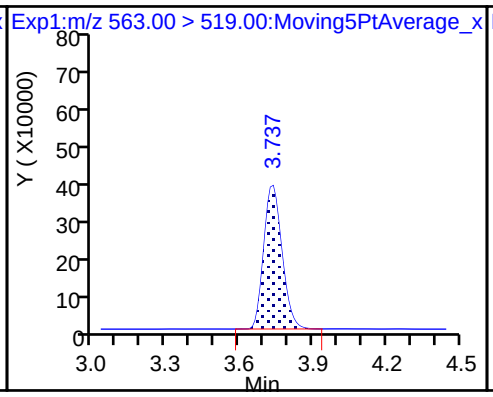
D 30 13C2 PFUnA



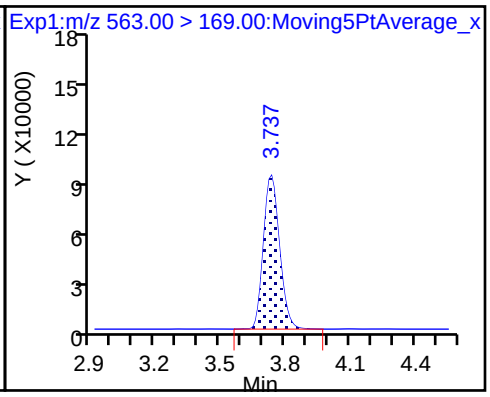
33 N-ethyl perfluorooctane sulfonamid



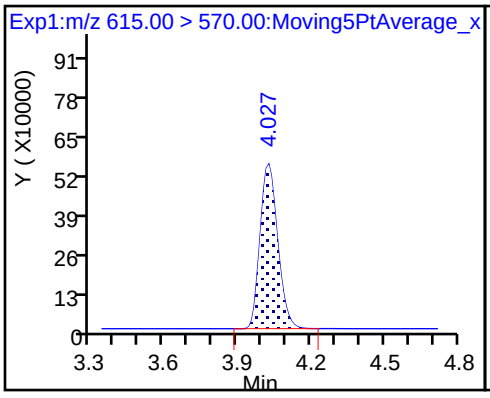
31 Perfluoroundecanoic acid



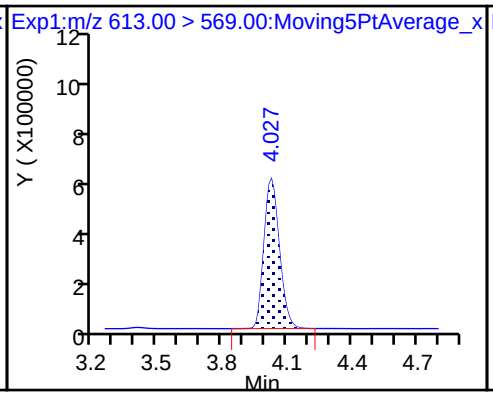
31 Perfluoroundecanoic acid



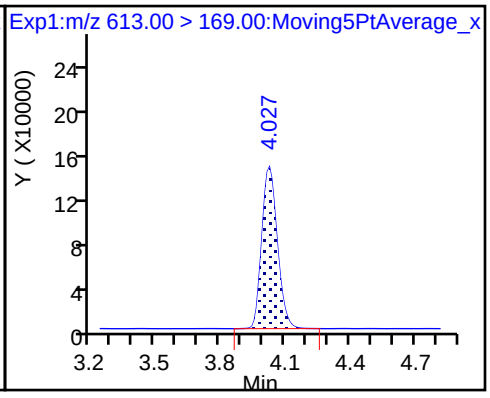
D 36 13C2 PFDoA



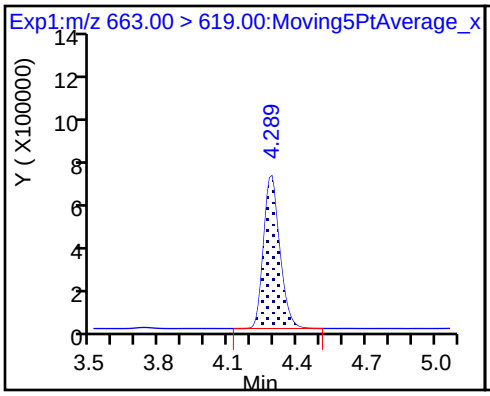
37 Perfluorododecanoic acid



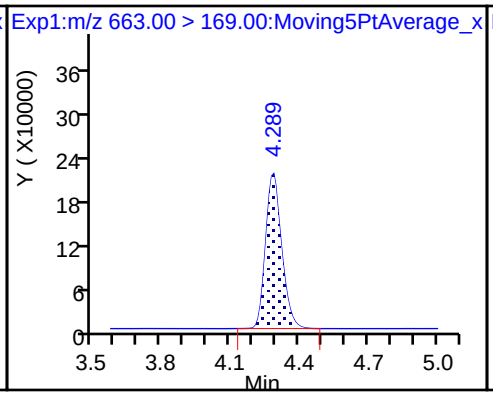
37 Perfluorododecanoic acid



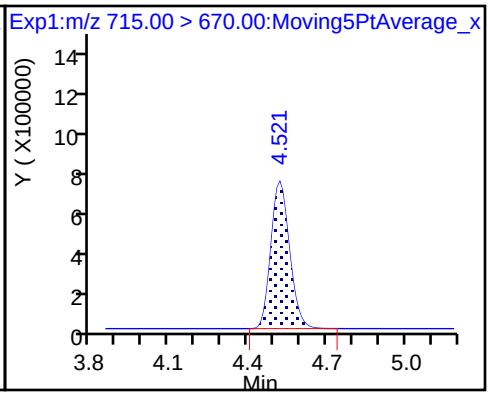
41 Perfluorotridecanoic acid



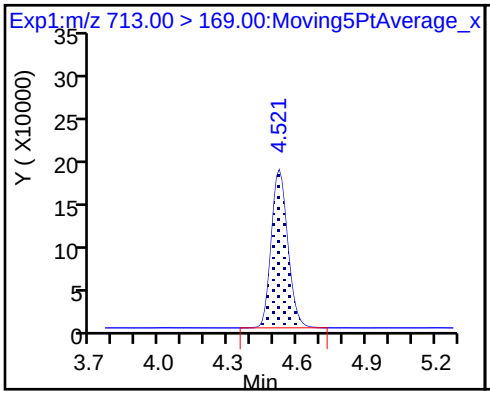
41 Perfluorotridecanoic acid



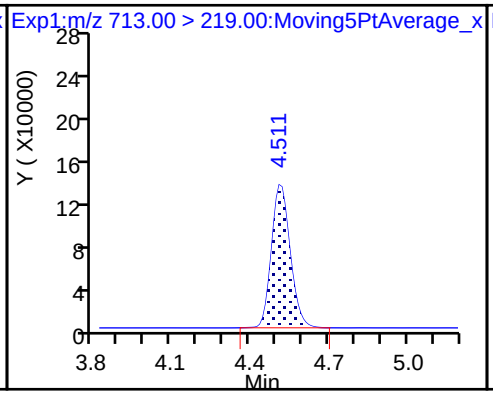
D 43 13C2-PFTeDA



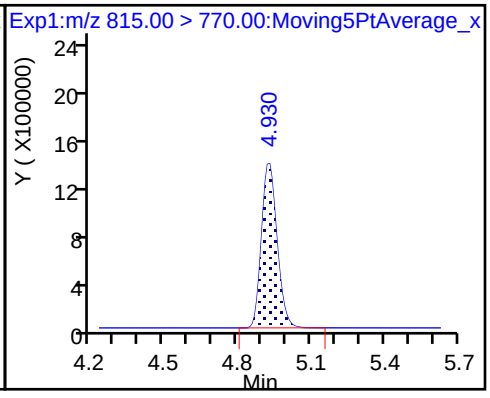
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCVL 320-219174/2 Calibration Date: 04/21/2018 12:03

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.21LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.8687		0.0468	0.0500	-6.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.201		0.0504	0.0500	0.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	80.19		0.0453	0.0442	2.4	30.0
4:2 FTS	AveID	16.03	16.26		0.400	0.0467	1.4	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	1.136		0.0559	0.0500	11.8	30.0
Perfluoropentanesulfonic acid	AveID	71.51	66.02		0.0433	0.0469	-7.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.270		0.0634	0.0500	26.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.133		0.0455	0.0455	0.1	30.0
6:2FTS	AveID	1.691	1.701		0.400	0.0474	0.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.222		0.0529	0.0500	5.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.289		0.0462	0.0476	-2.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.086		0.0521	0.0500	4.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.045		0.0446	0.0464	-3.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	1.088		0.0538	0.0500	7.6	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7080		0.0425	0.0480	-11.4	30.0
8:2FTS	AveID	1.265	1.404		0.0531	0.0479	11.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	0.9619		0.0466	0.0500	-6.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.119		0.400	0.0500	12.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6151		0.0457	0.0482	-5.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.9181		0.0543	0.0500	8.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.9466		0.0506	0.0500	1.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	0.9877		0.0474	0.0500	-5.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.283		0.0528	0.0500	5.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2714		0.0540	0.0500	8.1	30.0
13C4 PFBA	Ave	1.345	1.351		2.51	2.50	0.4	30.0
13C5 PFPeA	Ave	0.8672	0.8660		2.50	2.50	-0.1	30.0
13C3-PFBS	Ave	0.0199	0.0199		2.32	2.33	-0.3	30.0
13C2 PFHxA	Ave	0.9590	0.9588		2.50	2.50	-0.0	30.0
13C4-PFHpA	Ave	0.9333	0.9047		2.42	2.50	-3.1	30.0
18O2 PFHxS	Ave	1.152	1.182		2.43	2.37	2.6	30.0
M2-6:2FTS	Ave	0.2000	0.2302		2.73	2.38	15.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCVL 320-219174/2 Calibration Date: 04/21/2018 12:03

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.21LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9648		2.60	2.50	4.0	30.0
13C4 PFOS	Ave	0.8066	0.8203		2.43	2.39	1.7	30.0
13C5 PFNA	Ave	0.7973	0.7862		2.47	2.50	-1.4	30.0
13C8 FOSA	Ave	1.007	0.9479		2.35	2.50	-5.9	30.0
M2-8:2FTS	Ave	0.2409	0.2604		2.59	2.40	8.1	30.0
13C2 PFDA	Ave	0.6701	0.6483		2.42	2.50	-3.3	30.0
d3-NMeFOSAA	Ave	0.3798	0.3729		2.45	2.50	-1.8	30.0
13C2 PFUnA	Ave	0.5781	0.5505		2.38	2.50	-4.8	30.0
d5-NEtFOSAA	Ave	0.3749	0.4222		2.82	2.50	12.6	30.0
13C2 PFDoA	Ave	0.6242	0.5548		2.22	2.50	-11.1	30.0
13C2-PFTeDA	Ave	0.7915	0.7376		2.33	2.50	-6.8	30.0
13C2-PFHxDA	Ave	1.288	1.173		2.28	2.50	-9.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.21LLA_005.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 21-Apr-2018 12:03:07 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\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Apr-2018 11:41:15 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 23-Apr-2018 11:41:15

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	1.442	1.436	0.006	1.000	112760	0.0468		93.5	36.7	
D 1 13C4 PFBA										
217.00 > 172.00	1.442	1.441	0.001	1.000	6490534	2.51		100	45147	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.703	1.703	0.0	1.000	99969	0.0504		101	82.2	
D 3 13C5-PFPeA										
267.90 > 223.00	1.703	1.703	0.0	0.556	4160604	2.50		99.9	70882	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.739	0.0	1.000	135175	0.0453		102	478	
298.90 > 99.00	1.739	1.739	0.0	1.000	56527		2.39(1.25-3.74)		468	
D 47 13C3-PFBS										
301.90 > 83.00	1.739	1.739	0.0	1.000	88671	2.32		99.7	747	
D 60 M2-4:2FTS										
329.00 > 81.00	1.950	1.947	0.003	1.000	712591	NC			5356	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.960	1.949	0.011	1.000	28951	0.0473		101	1643	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.993	1.982	0.011	1.000	104662	0.0559		112	126	
313.00 > 119.00	1.993	1.982	0.011	1.000	11148		9.39(5.03-15.10)		109	
D 7 13C2 PFHxA										
315.00 > 270.00	1.993	1.990	0.003	1.000	4606716	2.50		100.0	77891	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.016	2.004	0.012	1.000	118080	0.0433		92.3	765	
349.00 > 99.00	2.016	2.004	0.012	1.000	44385		2.66(1.36-4.07)		538	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.095	2.083	0.012	1.000	16861	NC			99.0	

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	2.092	0.003	1.000	253081	NC			7388	
D 9 13C4-PFHpA										
367.00 > 322.00	2.321	2.318	0.003	1.000	4346492	2.42		96.9	52791	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.334	2.320	0.014	1.006	110411	0.0634		127	134	
363.00 > 169.00	2.321	2.320	0.001	1.000	45817		2.41(1.13-3.40)		216	
D 11 18O2 PFHxS										
403.00 > 84.00	2.334	2.331	0.003	1.000	5372466	2.43		103	70606	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.334	2.333	0.001	1.000	117094	0.0455		100	304	
399.00 > 99.00	2.334	2.333	0.001	1.000	41433		2.83(1.50-4.49)		216	
65 Adona										
377.00 > 251.00	2.372	2.360	0.012	1.000	278881	NC			5112	
377.00 > 85.00	2.372	2.360	0.012	1.000	171483		1.63(0.84-2.53)		2844	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.668	2.653	0.015	1.003	35676	0.0477		101	440	
D 12 M2-6:2FTS										
429.00 > 81.00	2.660	2.658	0.002	1.000	1050849	2.73		115	15706	
* 62 13C2-PFOA										
415.00 > 370.00	2.690	2.676	0.014		4804487	2.50			60374	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.690	2.676	0.014	1.000	113292	0.0529		106	70.5	
413.00 > 169.00	2.690	2.676	0.014	1.000	61394		1.85(0.84-2.52)		229	
D 14 13C4 PFOA										
417.00 > 372.00	2.690	2.681	0.009	1.000	4635496	2.60		104	70291	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.698	2.683	0.015	1.000	96735	0.0462		97.1	711	
449.00 > 99.00	2.698	2.683	0.015	1.000	24844		3.89(1.94-5.82)		470	
20 Perfluorononanoic acid										
463.00 > 419.00	3.063	3.054	0.009	1.000	82048	0.0521		104	240	
463.00 > 169.00	3.070	3.054	0.016	1.002	19642		4.18(1.90-5.69)		439	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.063	3.054	0.009	1.000	76448	0.0446		96.1	269	
499.00 > 99.00	3.063	3.054	0.009	1.000	17747		4.31(2.31-6.93)		175	
D 19 13C5 PFNA										
468.00 > 423.00	3.063	3.054	0.009	1.000	3777219	2.47		98.6	83124	
D 18 13C4 PFOS										
503.00 > 80.00	3.063	3.054	0.009	1.000	3767711	2.43		102	21888	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.277	3.266	0.011	1.000	125376	NC			2162	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.404	3.389	0.015	1.000	99141	0.0538		108	849	
D 21 13C8 FOSA										
506.00 > 78.00	3.404	3.391	0.013	1.000	4554358	2.35		94.1	43131	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.413	3.399	0.014	1.000	53575	0.0425		88.6	440	
549.00 > 99.00	3.413	3.399	0.014	1.000	20291		2.64(1.33-3.97)		618	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.422	3.408	0.014	1.000	33657	0.0531		111	1619	
D 26 M2-8:2FTS										
529.00 > 81.00	3.422	3.410	0.012	1.000	1198643	2.59		108	12987	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.432	3.417	0.015	1.000	59922	0.0466		93.2	263	
513.00 > 169.00	3.432	3.417	0.015	1.000	13075		4.58(2.36-7.09)		288	
D 23 13C2 PFDA										
515.00 > 470.00	3.432	3.419	0.013	1.000	3114703	2.42		96.7	51582	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.582	3.568	0.014	1.000	1791392	2.45		98.2	23498	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.593	3.576	0.017	1.003	40087	0.0561		112	389	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.747	3.730	0.017	1.000	46736	0.0457		94.7	428	
599.00 > 99.00	3.747	3.730	0.017	1.000	13508		3.46(1.39-4.16)		291	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.757	3.743	0.014	1.000	2028654	2.82		113	31128	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.768	3.751	0.017	1.003	38408	0.0506		101	645	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.757	3.751	0.006	1.000	48567	0.0543		109	226	
563.00 > 169.00	3.768	3.751	0.017	1.003	12417		3.91(2.12-6.36)		232	
D 30 13C2 PFUnA										
565.00 > 520.00	3.757	3.753	0.004	1.000	2645016	2.38		95.2	40949	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.924	3.908	0.016	1.000	207733	NC			3987	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.057	4.040	0.017	1.000	52655	0.0474		94.7	73.1	
613.00 > 169.00	4.057	4.040	0.017	1.000	15280		3.45(2.13-6.40)		224	
D 36 13C2 PFDoA										
615.00 > 570.00	4.057	4.042	0.015	1.000	2665675	2.22		88.9	36347	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.327	4.308	0.019	1.000	68397	0.0528		106	85.0	
663.00 > 169.00	4.327	4.308	0.019	1.000	22635		3.02(1.25-3.76)		270	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.560	4.543	0.017	1.000	19235	0.0540		108	210	
713.00 > 219.00	4.550	4.543	0.007	0.998	12863		1.50(0.71-2.13)		249	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.560	4.547	0.013	1.000	3543788	2.33		93.2	23834	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.973	4.961	0.012	1.000	5633693	2.28		91.0	17148	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.973	4.967	0.006	1.000	166016	NC			83.7	
813.00 > 169.00	4.973	4.967	0.006	1.000	26713		6.21(2.86-8.58)		210	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.341	5.329	0.012	1.000	111226	NC			44.6	
913.00 > 169.00	5.341	5.329	0.012	1.000	13207		8.42(3.83-11.48)		123	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL2_00004 Amount Added: 1.00 Units: mL

Report Date: 23-Apr-2018 11:41:17 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.21LLA_005.d

Injection Date: 21-Apr-2018 12:03:07 Instrument ID: A8_N

Lims ID: CCVL

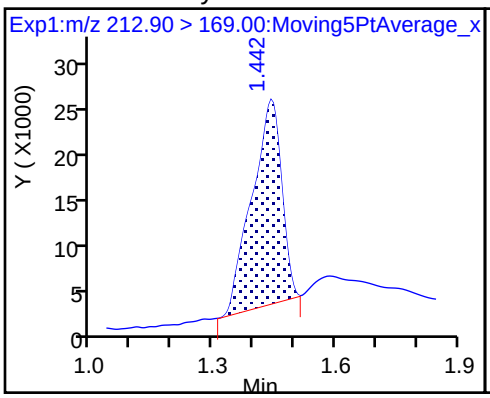
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 2

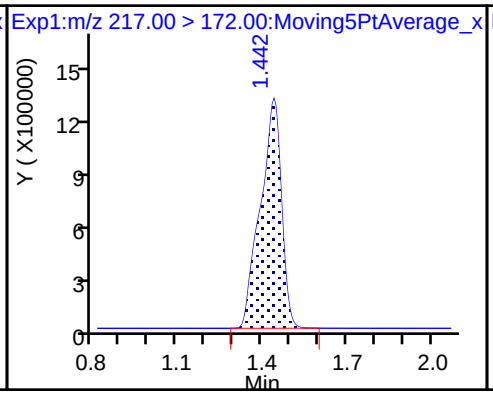
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

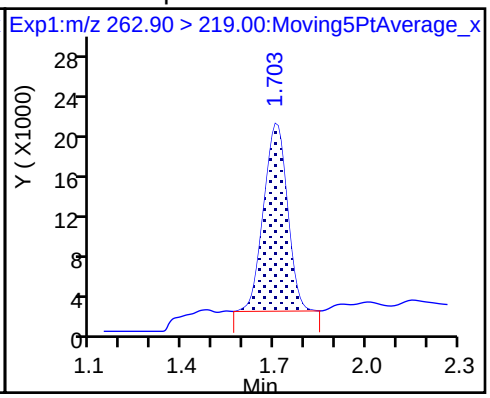
2 Perfluorobutyric acid



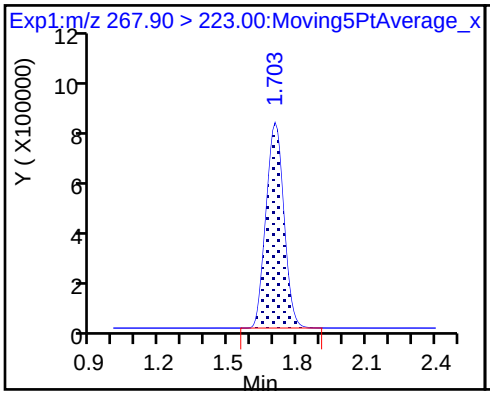
D 1 13C4 PFBA



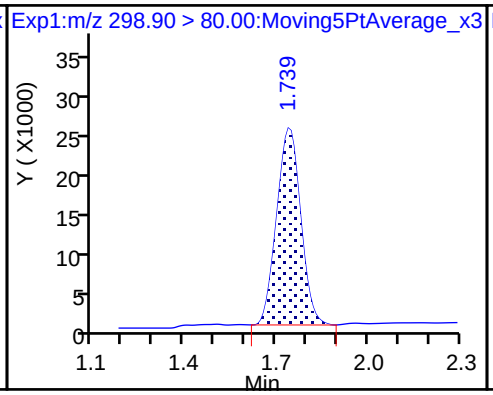
4 Perfluoropentanoic acid



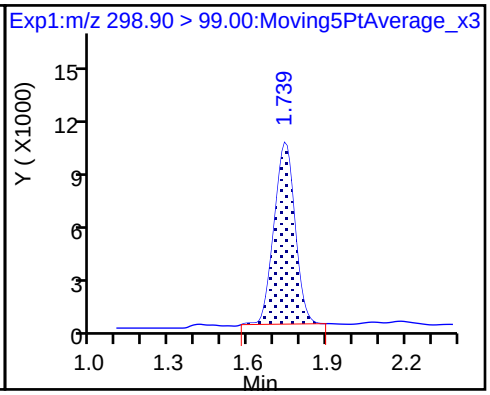
D 3 13C5-PFPeA



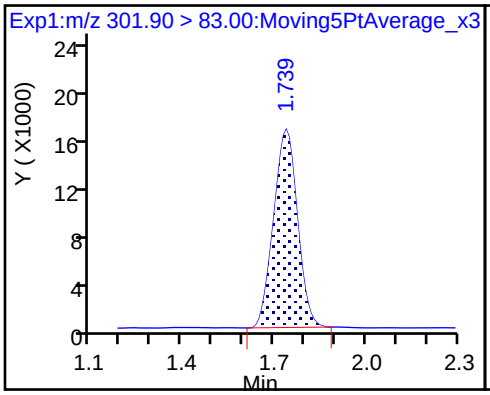
5 Perfluorobutanesulfonic acid



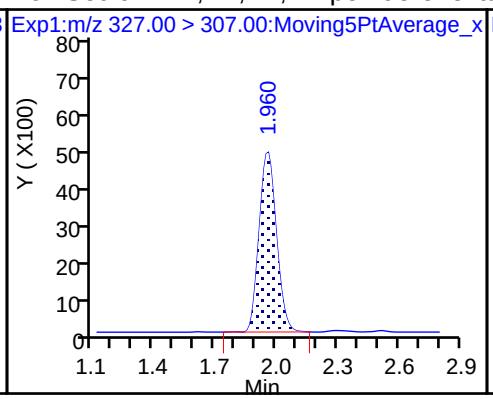
5 Perfluorobutanesulfonic acid



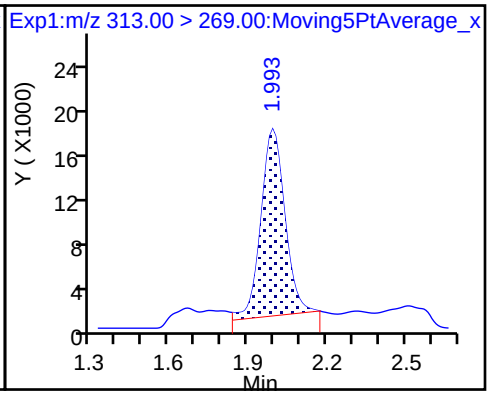
D 47 13C3-PFBS



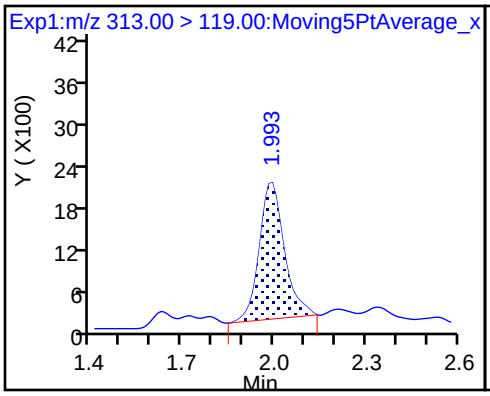
61 Sodium 1H,1H,2H,2H-perfluorohexane



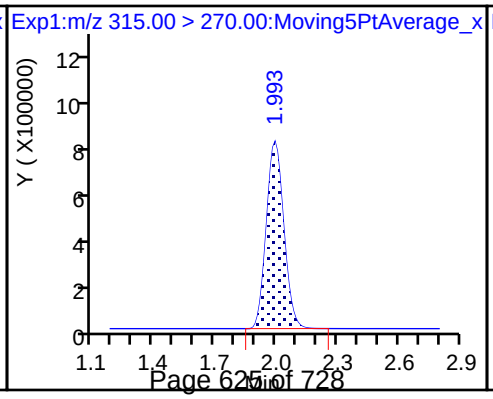
6 Perfluorohexanoic acid



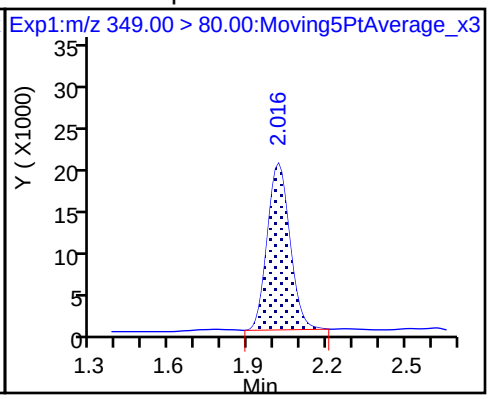
6 Perfluorohexanoic acid



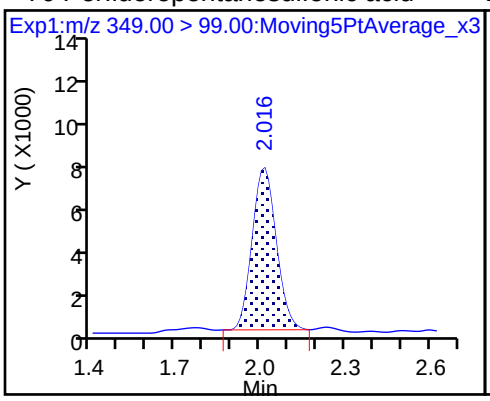
D 7 13C2 PFHxA



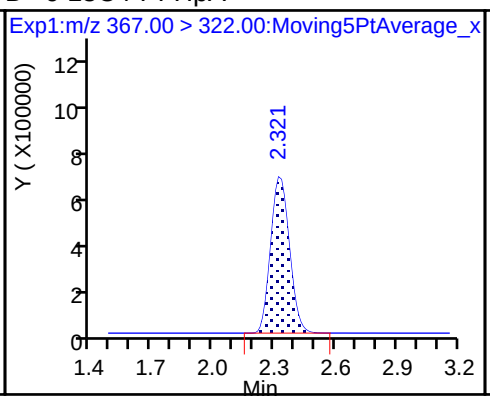
70 Perfluoropentanesulfonic acid



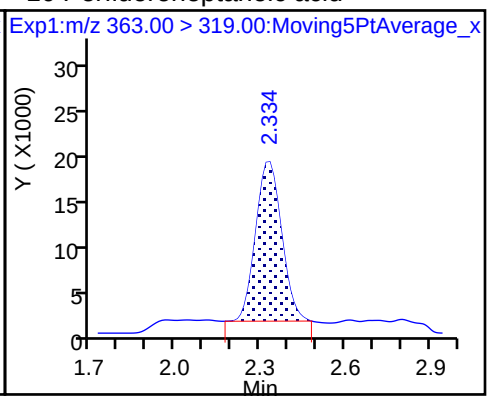
70 Perfluoropentanesulfonic acid



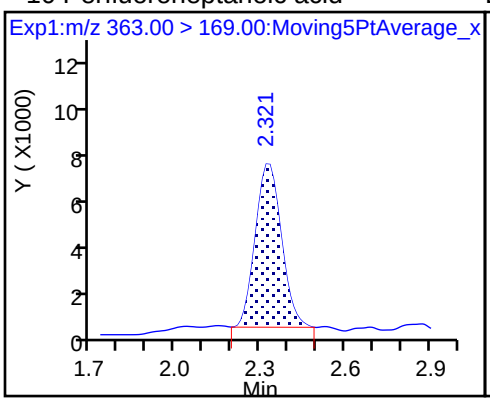
D 9 13C4-PFHpA



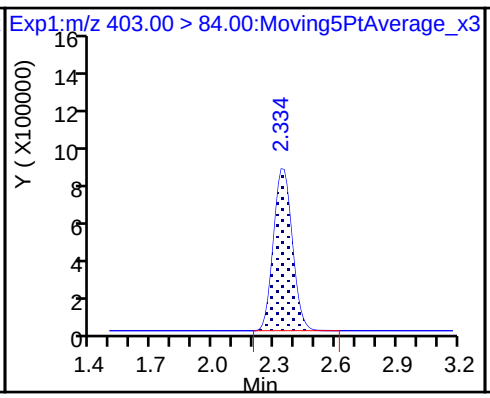
10 Perfluoroheptanoic acid



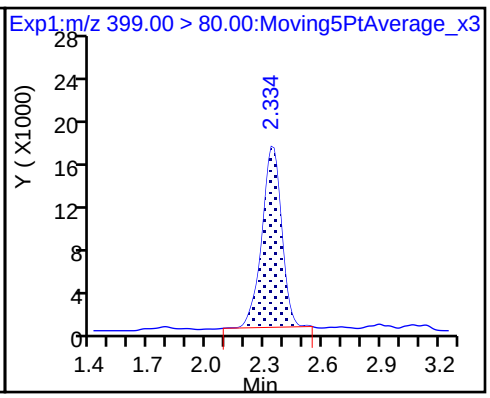
10 Perfluoroheptanoic acid



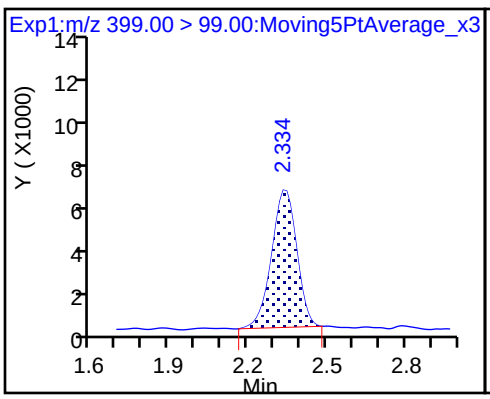
D 11 18O2 PFHxS



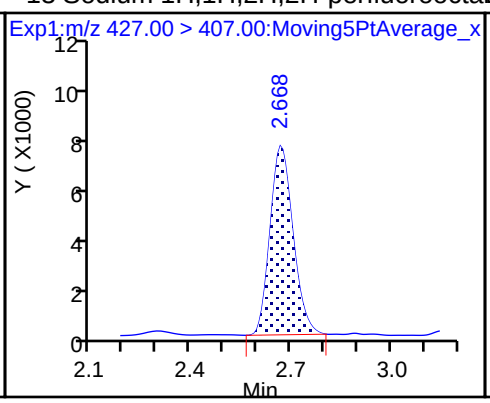
8 Perfluorohexanesulfonic acid



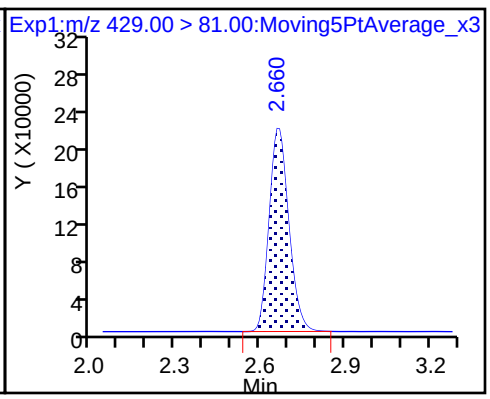
8 Perfluorohexanesulfonic acid



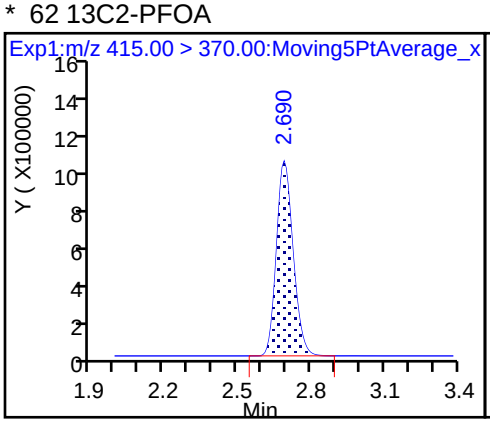
13 Sodium 1H,1H,2H,2H-perfluorooctane



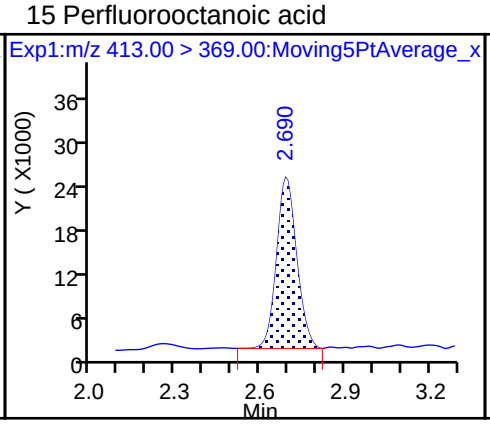
D 12 M2-6:2FTS



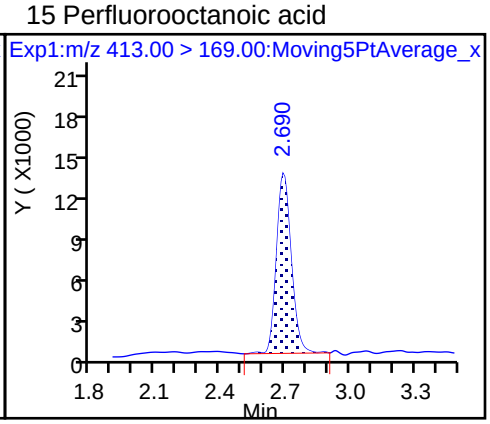
* 62 13C2-PFOA



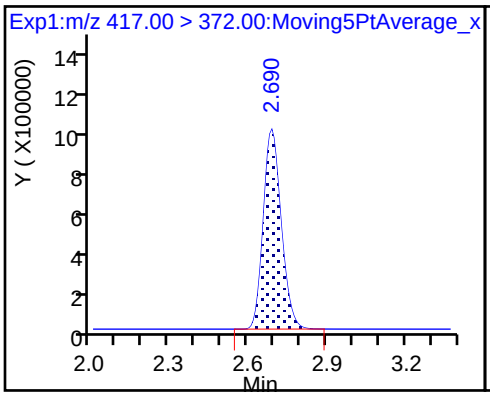
15 Perfluorooctanoic acid



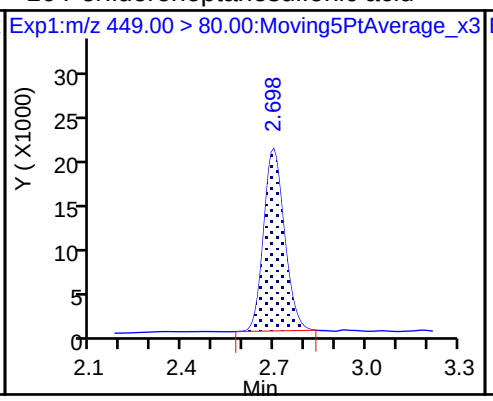
15 Perfluorooctanoic acid



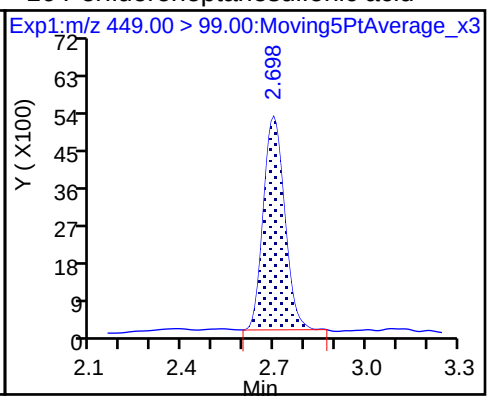
D 14 13C4 PFOA



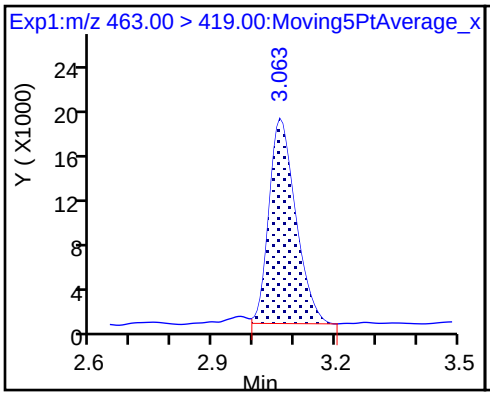
16 Perfluoroheptanesulfonic acid



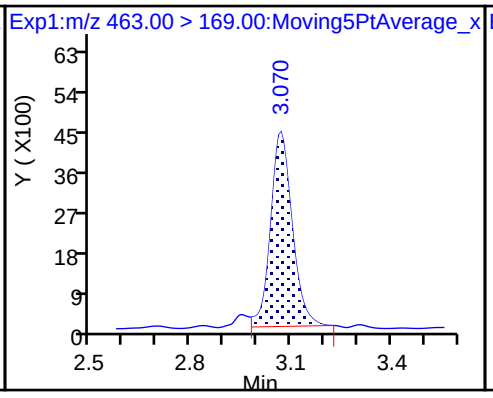
16 Perfluoroheptanesulfonic acid



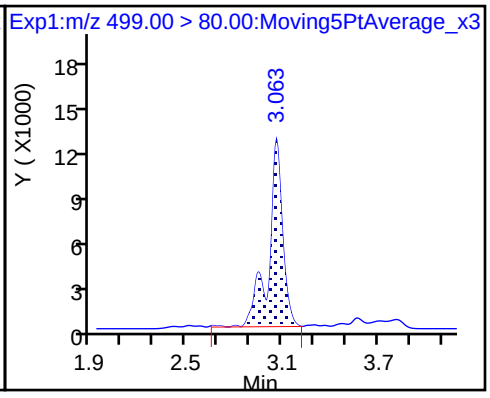
20 Perfluorononanoic acid



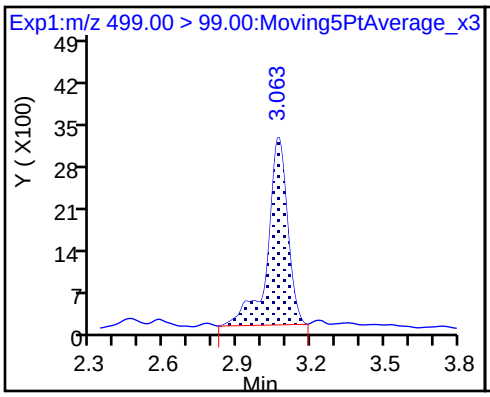
20 Perfluorononanoic acid



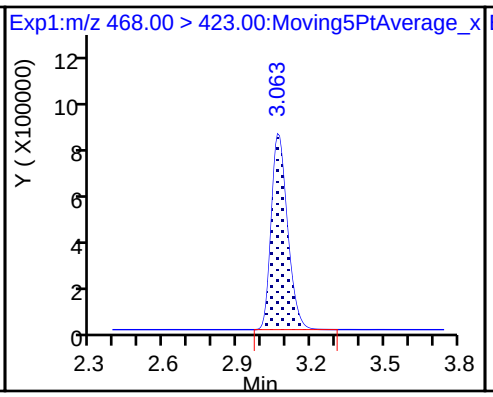
17 Perfluorooctane sulfonic acid



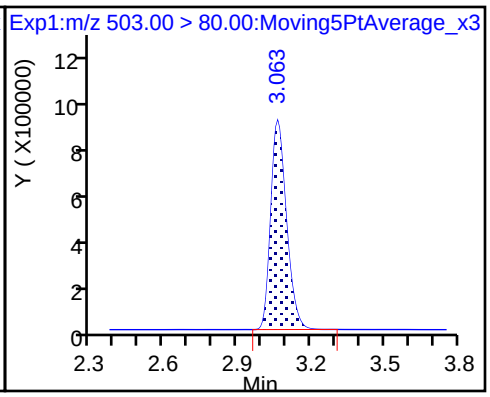
17 Perfluorooctane sulfonic acid



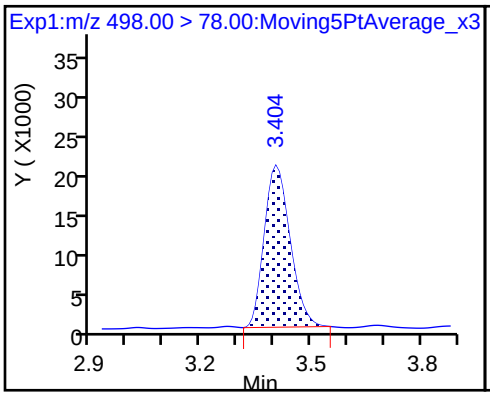
D 19 13C5 PFNA



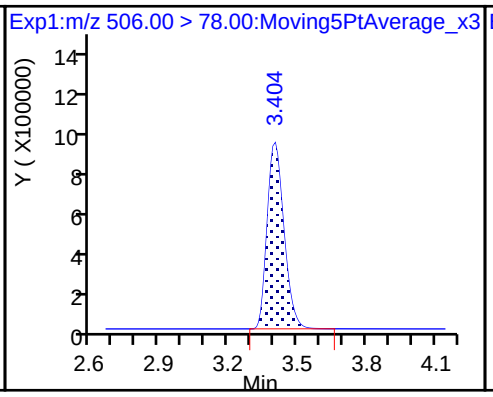
D 18 13C4 PFOS



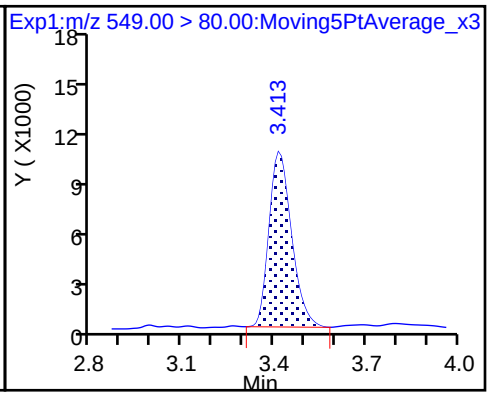
22 Perfluorooctane Sulfonamide



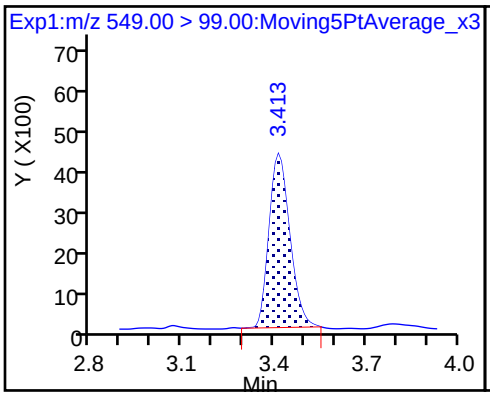
D 21 13C8 FOSA



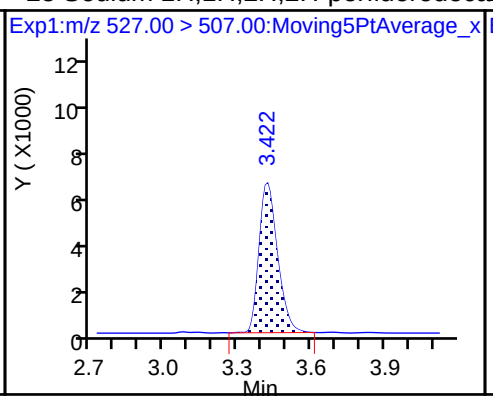
68 Perfluorononanesulfonic acid



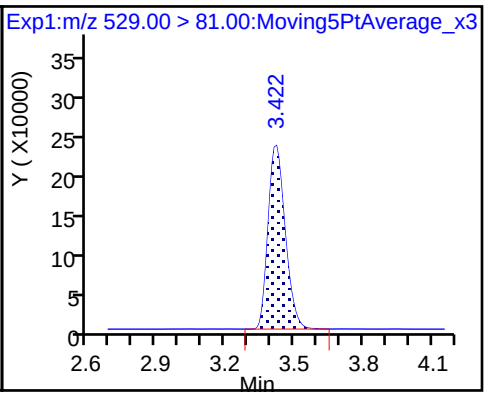
68 Perfluorononanesulfonic acid



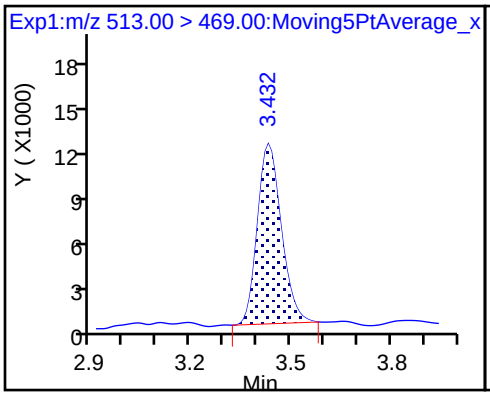
25 Sodium 1H,1H,2H,2H-perfluorodecane



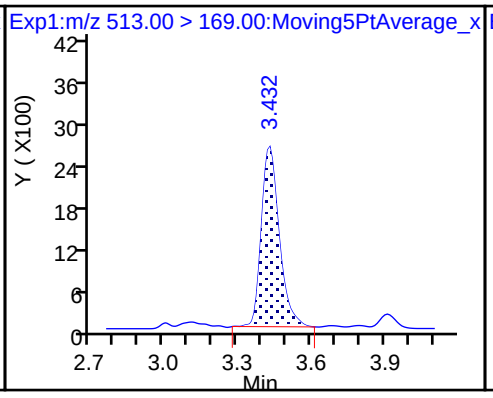
D 26 M2-8:2FTS



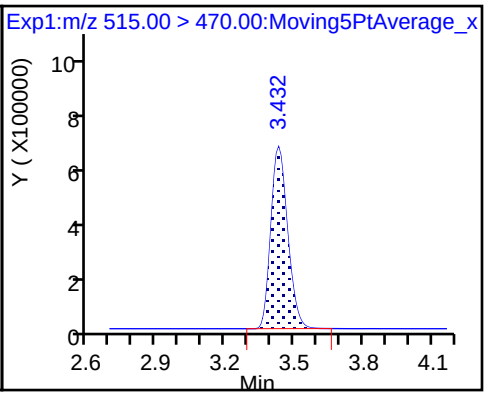
24 Perfluorodecanoic acid



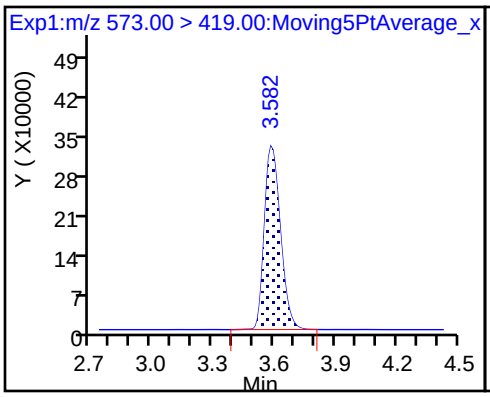
24 Perfluorodecanoic acid



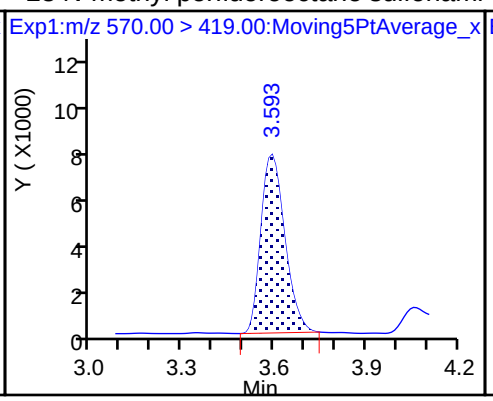
D 23 13C2 PFDA



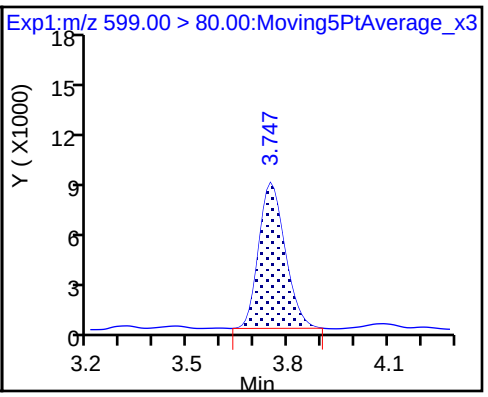
D 27 d3-NMeFOSAA



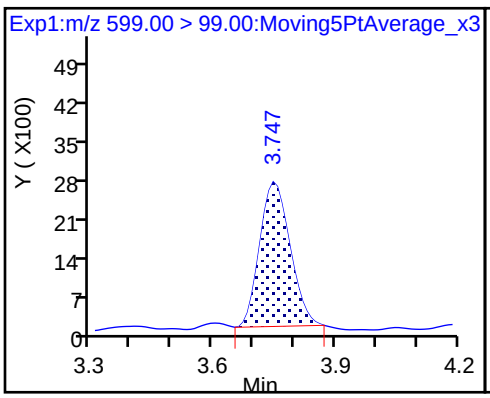
28 N-methyl perfluorooctane sulfonami



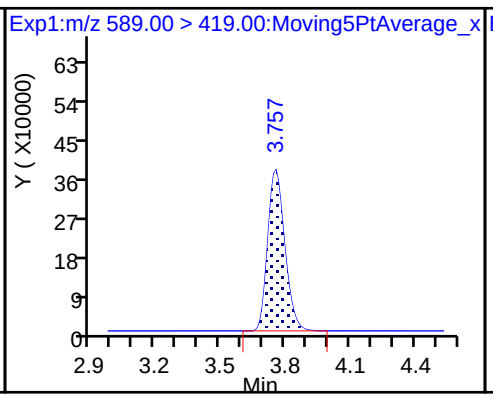
29 Perfluorodecane Sulfonic acid



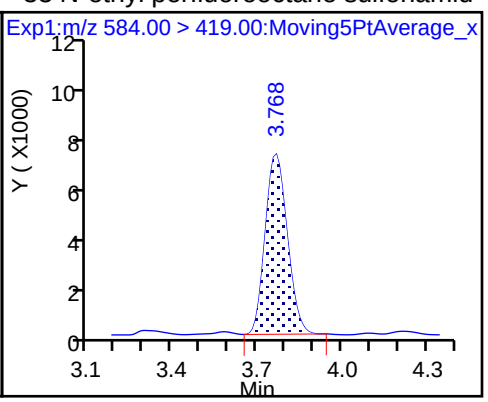
29 Perfluorodecane Sulfonic acid



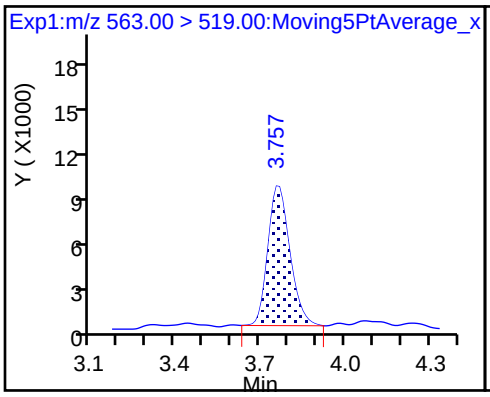
D 32 d5-NEtFOSAA



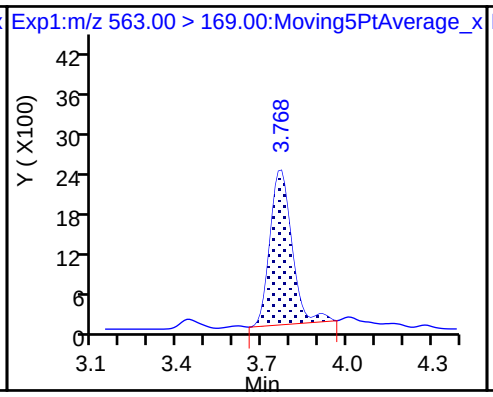
33 N-ethyl perfluorooctane sulfonamid



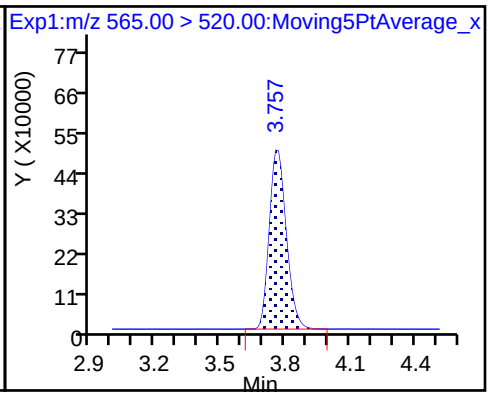
31 Perfluoroundecanoic acid



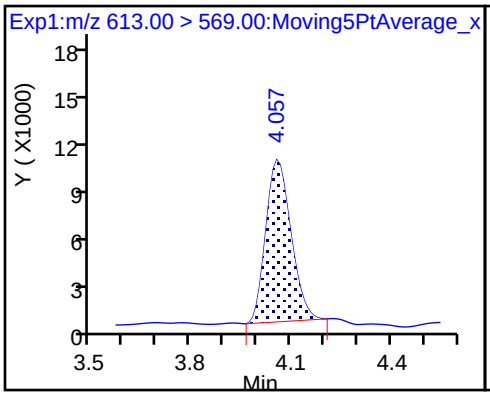
31 Perfluoroundecanoic acid



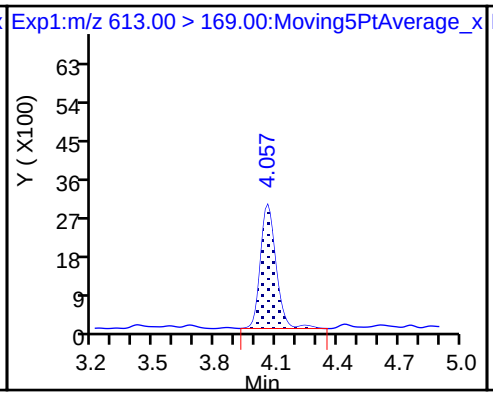
D 30 13C2 PFUnA



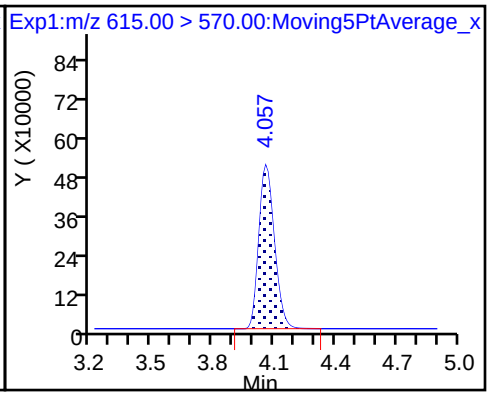
37 Perfluorododecanoic acid



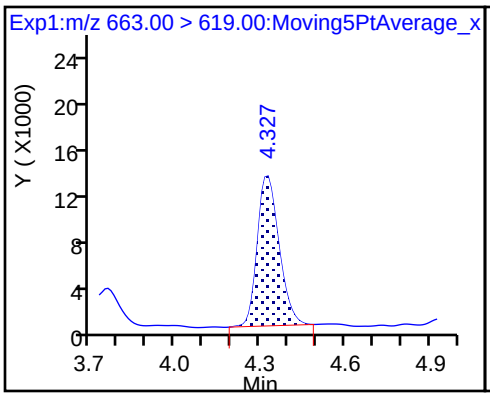
37 Perfluorododecanoic acid



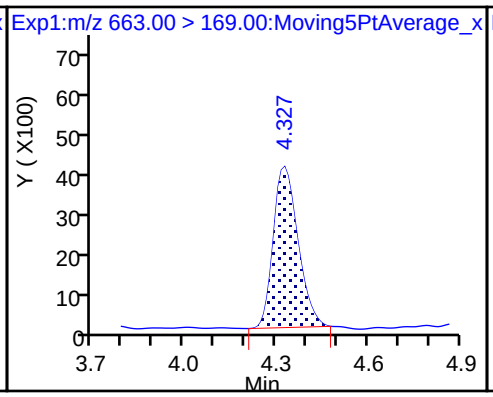
D 36 13C2 PFDoA



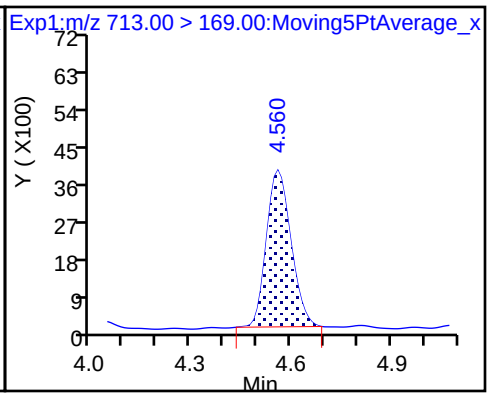
41 Perfluorotridecanoic acid



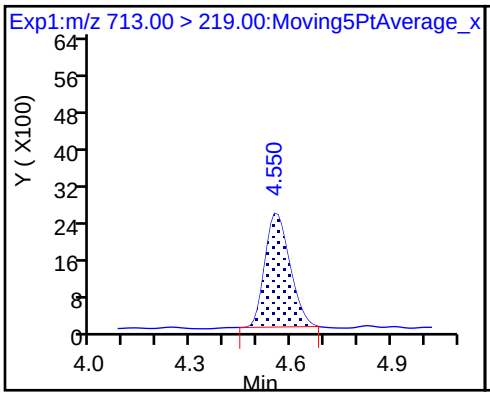
41 Perfluorotridecanoic acid



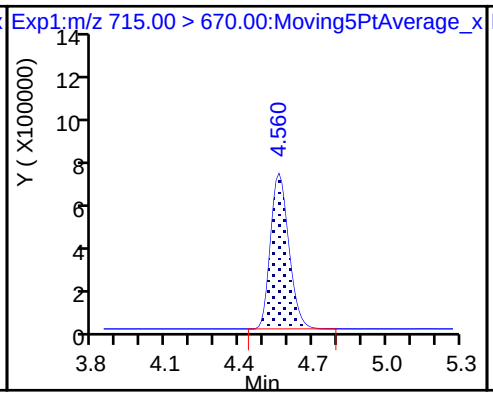
42 Perfluorotetradecanoic acid



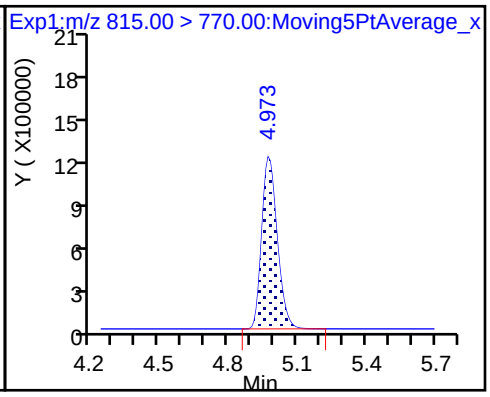
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/3 Calibration Date: 04/21/2018 12:10

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.21LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.9214		0.992	1.00	-0.8	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.139		0.956	1.00	-4.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	78.06		0.881	0.884	-0.3	30.0
4:2 FTS	AveID	16.03	16.97		0.988	0.934	5.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	1.023		1.01	1.00	0.7	30.0
Perfluoropentanesulfonic acid	AveID	71.51	66.66		0.874	0.938	-6.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.047		1.05	1.00	4.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.036		0.833	0.910	-8.5	30.0
6:2FTS	AveID	1.691	1.567		0.879	0.948	-7.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.341		0.962	0.952	1.0	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.123		0.972	1.00	-2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.066		0.909	0.928	-2.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.012		0.971	1.00	-2.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	0.9729		0.962	1.00	-3.8	30.0
8:2FTS	AveID	1.265	1.250		0.946	0.958	-1.2	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7559		0.908	0.960	-5.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	0.9892		0.959	1.00	-4.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.023		1.03	1.00	2.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6674		0.991	0.964	2.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.8614		0.922	1.00	-7.8	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.7556		0.894	1.00	-10.6	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	1.039		0.996	1.00	-0.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.174		0.966	1.00	-3.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2574		1.02	1.00	2.5	30.0
13C4 PFBA	Ave	1.345	1.364		2.53	2.50	1.4	30.0
13C5 PFPeA	Ave	0.8672	0.8977		2.59	2.50	3.5	30.0
13C3-PFBS	Ave	0.0199	0.0202		2.36	2.33	1.6	30.0
13C2 PFHxA	Ave	0.9590	0.9694		2.53	2.50	1.1	30.0
13C4-PFHpA	Ave	0.9333	0.9490		2.54	2.50	1.7	30.0
18O2 PFHxS	Ave	1.152	1.178		2.42	2.37	2.2	30.0
M2-6:2FTS	Ave	0.2000	0.2185		2.60	2.38	9.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/3 Calibration Date: 04/21/2018 12:10

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.21LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9612		2.59	2.50	3.6	30.0
13C4 PFOS	Ave	0.8066	0.8195		2.43	2.39	1.6	30.0
13C5 PFNA	Ave	0.7973	0.8097		2.54	2.50	1.6	30.0
13C8 FOSA	Ave	1.007	1.010		2.51	2.50	0.3	30.0
M2-8:2FTS	Ave	0.2409	0.2595		2.58	2.40	7.7	30.0
13C2 PFDA	Ave	0.6701	0.6784		2.53	2.50	1.2	30.0
d3-NMeFOSAA	Ave	0.3798	0.3937		2.59	2.50	3.7	30.0
13C2 PFUnA	Ave	0.5781	0.5959		2.58	2.50	3.1	30.0
d5-NEtFOSAA	Ave	0.3749	0.4208		2.81	2.50	12.2	30.0
13C2 PFDoA	Ave	0.6242	0.6103		2.44	2.50	-2.2	30.0
13C2-PFTeDA	Ave	0.7915	0.7594		2.40	2.50	-4.1	30.0
13C2-PFHxDA	Ave	1.288	1.269		2.46	2.50	-1.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.21LLA_006.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 21-Apr-2018 12:10:56 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\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Apr-2018 11:41:42 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 23-Apr-2018 11:41:42

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	1.439	1.439	0.0	1.000	2266952	0.99		99.2	767	
D 1 13C4 PFBA										
217.00 > 172.00	1.439	1.441	-0.002	1.000	6150961	2.53		101	39573	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.708	1.708	0.0	1.000	1844480	0.9559		95.6	1919	
D 3 13C5-PFPeA										
267.90 > 223.00	1.708	1.703	0.005	0.558	4047773	2.59		104	68912	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.744	1.744	0.0	1.005	2516522	0.8814		99.7	10238	
298.90 > 99.00	1.744	1.744	0.0	1.005	1057578		2.38(1.25-3.74)		10369	
D 47 13C3-PFBS										
301.90 > 83.00	1.735	1.739	-0.004	1.000	84792	2.36		102	827	
D 60 M2-4:2FTS										
329.00 > 81.00	1.956	1.947	0.009	1.000	742643	NC			6630	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.956	1.956	0.0	1.000	577912	0.9884		106	32047	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.988	1.988	0.0	1.000	1788535	1.01		101	2458	
313.00 > 119.00	1.988	1.988	0.0	1.000	165863		10.78(5.03-15.10)		1727	
D 7 13C2 PFHxA										
315.00 > 270.00	1.988	1.990	-0.002	1.000	4371291	2.53		101	89229	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.019	2.019	0.0	1.000	2280437	0.8744		93.2	17991	
349.00 > 99.00	2.019	2.019	0.0	1.000	817369		2.79(1.36-4.07)		10014	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.087	2.087	0.0	0.995	261828	NC			1768	

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	2.098	2.092	0.006	1.000	211884	NC			5913	
D 9 13C4-PFHpA										
367.00 > 322.00	2.326	2.318	0.008	1.000	4279392	2.54		102	61231	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.326	2.326	0.0	1.000	1792136	1.05		105	2341	
363.00 > 169.00	2.326	2.326	0.0	1.000	681655		2.63(1.13-3.40)		3353	
D 11 18O2 PFHxS										
403.00 > 84.00	2.339	2.331	0.008	1.000	5024084	2.42		102	53396	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.339	2.339	0.0	1.000	2002108	0.8327		91.5	5633	
399.00 > 99.00	2.339	2.339	0.0	1.000	652529		3.07(1.50-4.49)		3803	
65 Adona										
377.00 > 251.00	2.378	2.378	0.0	1.000	5314380	NC			57462	
377.00 > 85.00	2.378	2.378	0.0	1.000	3119871		1.70(0.84-2.53)		42162	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.663	2.663	0.0	1.000	585457	0.8786		92.7	6729	
D 12 M2-6:2FTS										
429.00 > 81.00	2.663	2.658	0.005	1.000	936161	2.60		109	13921	
* 62 13C2-PFOA										
415.00 > 370.00	2.686	2.686	0.0		4509303	2.50			55704	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.693	2.693	0.0	1.003	1946493	0.9717		97.2	1388	
413.00 > 169.00	2.686	2.693	-0.007	1.000	991912		1.96(0.84-2.52)		3456	
D 14 13C4 PFOA										
417.00 > 372.00	2.686	2.681	0.005	1.000	4334157	2.59		104	50880	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.693	2.693	0.0	1.000	1887701	0.9619		101	12216	
449.00 > 99.00	2.693	2.693	0.0	1.000	511392		3.69(1.94-5.82)		10797	
20 Perfluorononanoic acid										
463.00 > 419.00	3.070	3.070	0.0	1.002	1478252	0.9707		97.1	5471	
463.00 > 169.00	3.063	3.070	-0.007	1.000	361064		4.09(1.90-5.69)		7233	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.063	3.063	0.0	1.000	1462186	0.9093		98.0	6545	
499.00 > 99.00	3.063	3.063	0.0	1.000	332427		4.40(2.31-6.93)		4835	
D 19 13C5 PFNA										
468.00 > 423.00	3.063	3.054	0.009	1.000	3651243	2.54		102	67026	
D 18 13C4 PFOS										
503.00 > 80.00	3.063	3.054	0.009	1.000	3532907	2.43		102	23214	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.276	3.276	0.0	1.000	2500773	NC			37542	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.403	3.403	0.0	1.000	1772767	0.9618		96.2	17501	
D 21 13C8 FOSA										
506.00 > 78.00	3.403	3.391	0.012	1.000	4555433	2.51		100	34649	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.413	3.413	0.0	1.000	1072716	0.9078		94.6	10762	
549.00 > 99.00	3.413	3.413	0.0	1.000	409164		2.62(1.33-3.97)		8049	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.413	3.413	0.0	1.000	560614	0.9465		98.8	27307	
D 26 M2-8:2FTS										
529.00 > 81.00	3.413	3.410	0.003	1.000	1121108	2.58		108	11480	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.431	3.431	0.0	1.000	1210433	0.9589		95.9	5065	
513.00 > 169.00	3.431	3.431	0.0	1.000	218787		5.53(2.36-7.09)		4743	
D 23 13C2 PFDA										
515.00 > 470.00	3.431	3.419	0.012	1.000	3059200	2.53		101	67282	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.582	3.568	0.014	1.000	1775419	2.59		104	22271	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.582	3.582	0.0	1.000	726747	1.03		103	5934	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.747	3.747	0.0	1.000	951002	0.99		103	8814	
599.00 > 99.00	3.736	3.747	-0.011	0.997	317840		2.99(1.39-4.16)		7423	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.757	3.743	0.014	1.000	1897487	2.81		112	20303	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.757	3.757	0.0	1.000	653783	0.9218		92.2	7423	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.757	3.757	0.0	1.000	812146	0.8940		89.4	3728	
563.00 > 169.00	3.757	3.757	0.0	1.000	216661		3.75(2.12-6.36)		6749	
D 30 13C2 PFUnA										
565.00 > 520.00	3.757	3.753	0.004	1.000	2687276	2.58		103	42535	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.913	3.913	0.0	1.000	3888721	NC			53310	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.056	4.056	0.0	1.000	1143934	1.00		99.6	1699	
613.00 > 169.00	4.056	4.056	0.0	1.000	284689		4.02(2.13-6.40)		3213	
D 36 13C2 PFDoA										
615.00 > 570.00	4.056	4.042	0.014	1.000	2752014	2.44		97.8	28987	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.316	4.316	0.0	1.000	1292417	0.9660		96.6	1590	
663.00 > 169.00	4.316	4.316	0.0	1.000	405032		3.19(1.25-3.76)		3510	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.551	4.551	0.0	1.000	352536	1.02		102	3810	
713.00 > 219.00	4.551	4.551	0.0	1.000	247264		1.43(0.71-2.13)		4377	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.551	4.547	0.004	1.000	3424373	2.40		95.9	25548	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.973	4.961	0.012	1.000	5724123	2.46		98.6	16600	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.973	4.973	0.0	1.000	2128874	NC			995	
813.00 > 169.00	4.973	4.973	0.0	1.000	352069		6.05(2.86-8.58)		2434	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.334	5.334	0.0	1.000	2169841	NC			810	
913.00 > 169.00	5.334	5.334	0.0	1.000	269596		8.05(3.83-11.48)		1793	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 23-Apr-2018 11:41:44 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.21LLA_006.d

Injection Date: 21-Apr-2018 12:10:56 Instrument ID: A8_N

Lims ID: CCV L4

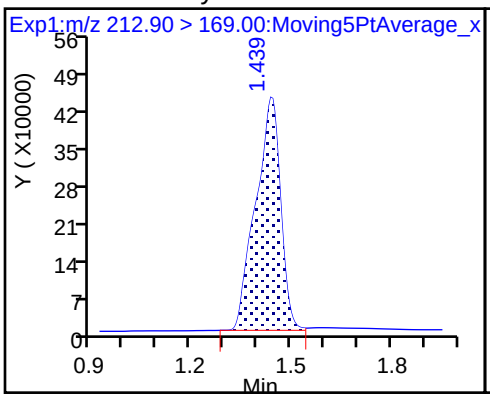
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 3

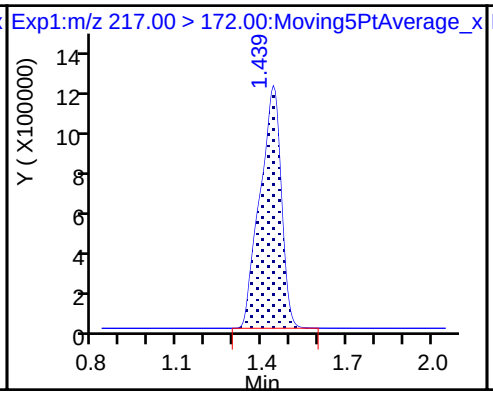
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

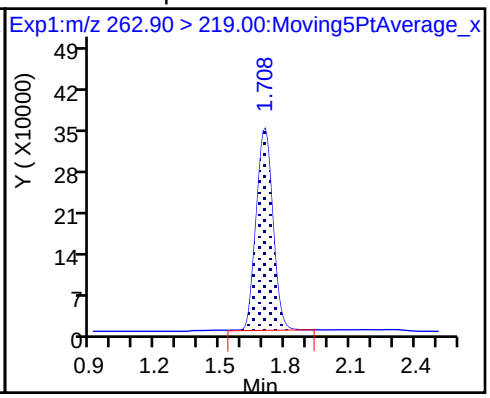
2 Perfluorobutyric acid



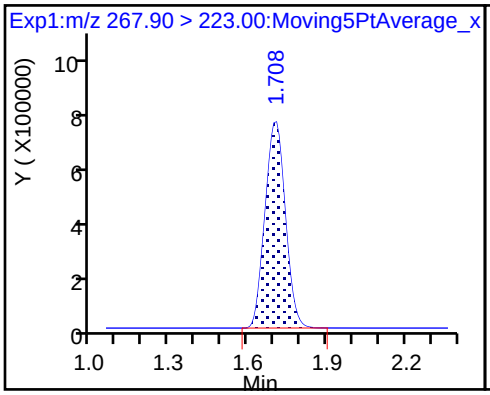
D 1 13C4 PFBA



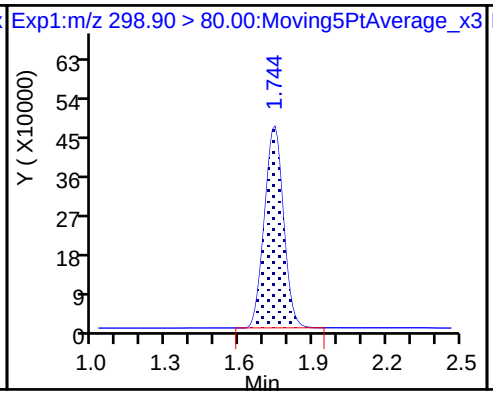
4 Perfluoropentanoic acid



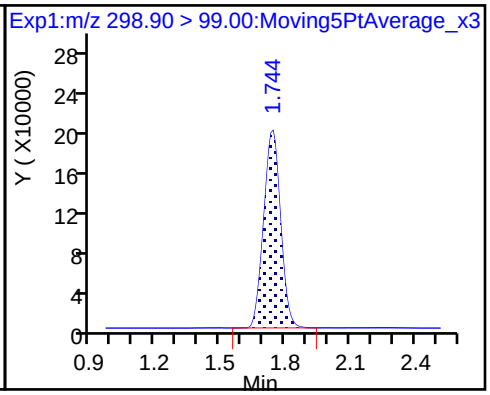
D 3 13C5-PFPeA



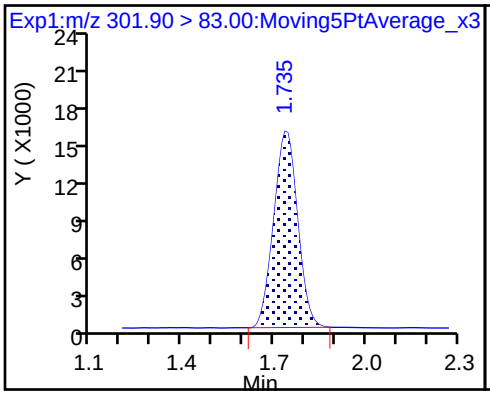
5 Perfluorobutanesulfonic acid



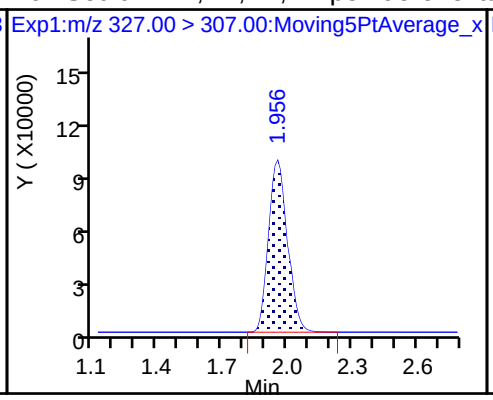
5 Perfluorobutanesulfonic acid



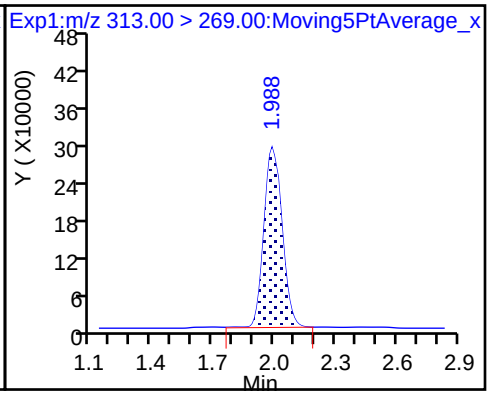
D 47 13C3-PFBS



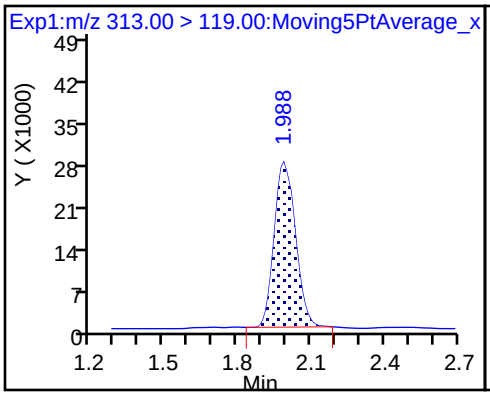
61 Sodium 1H,1H,2H,2H-perfluorohexane



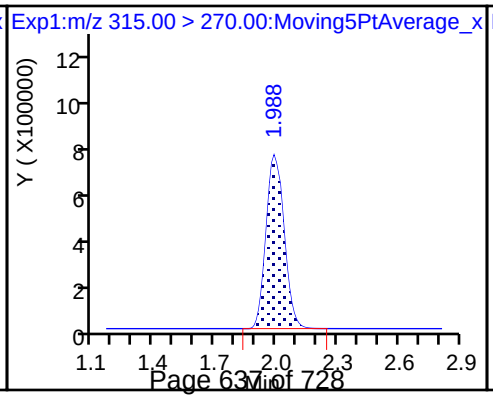
6 Perfluorohexanoic acid



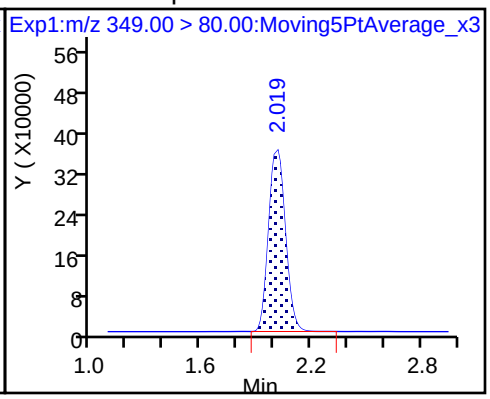
6 Perfluorohexanoic acid



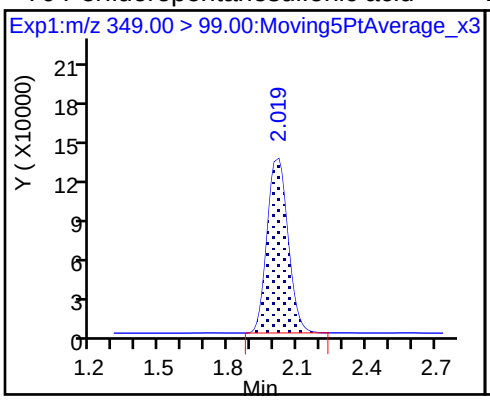
D 7 13C2 PFHxA



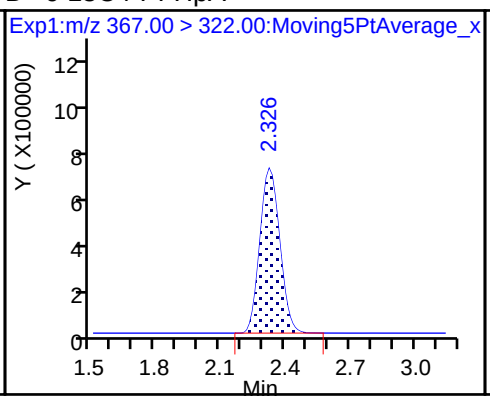
70 Perfluoropentanesulfonic acid



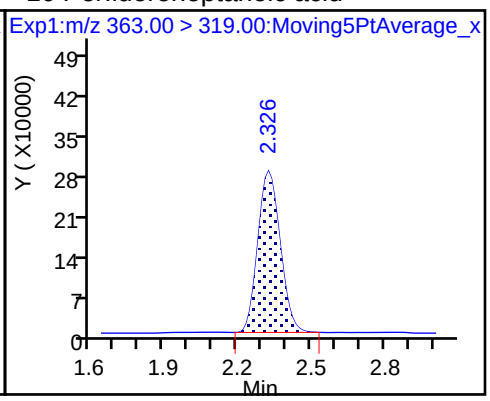
70 Perfluoropentanesulfonic acid



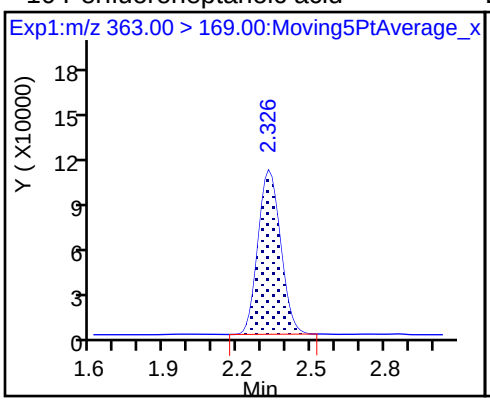
D 9 13C4-PFHpA



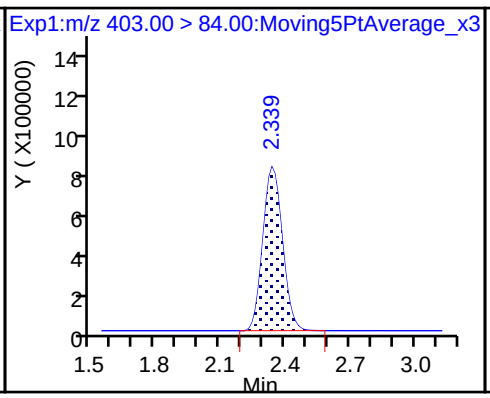
10 Perfluoroheptanoic acid



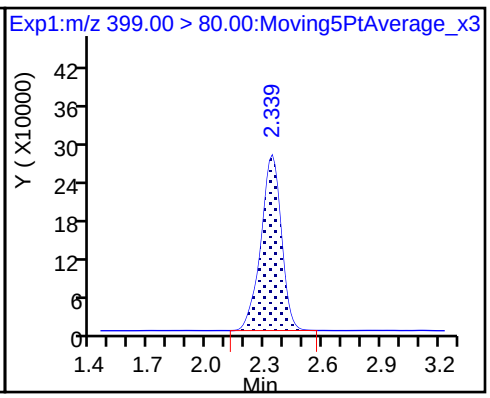
10 Perfluoroheptanoic acid



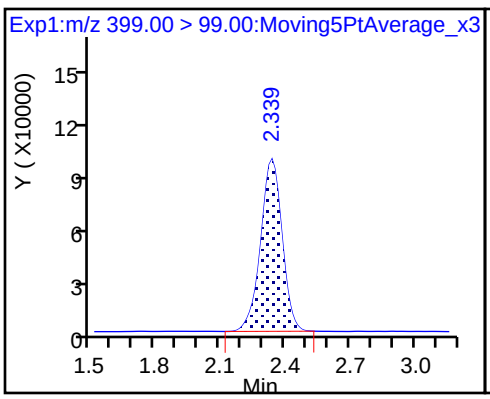
D 11 18O2 PFHxS



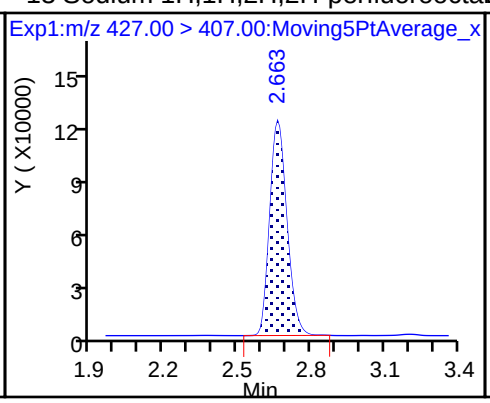
8 Perfluorohexanesulfonic acid



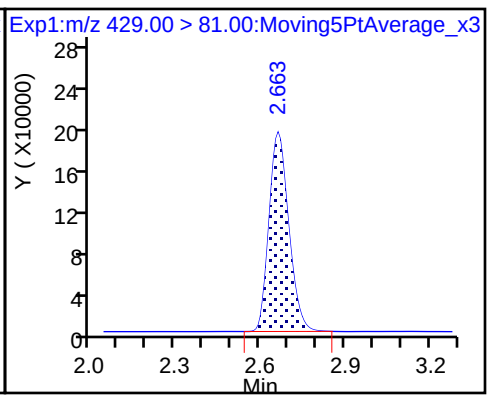
8 Perfluorohexanesulfonic acid



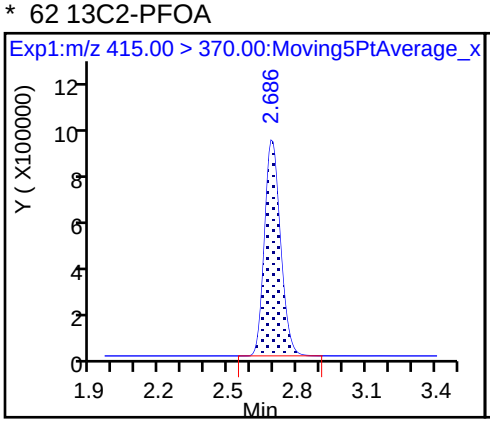
13 Sodium 1H,1H,2H,2H-perfluorooctane



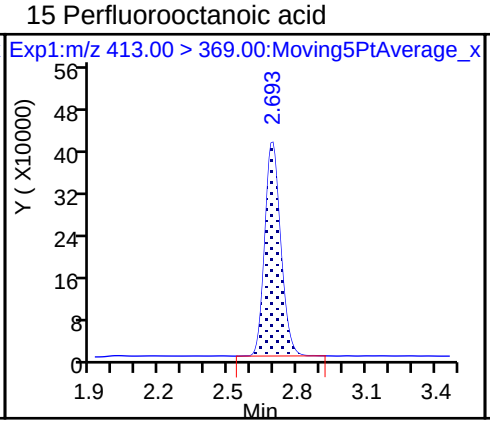
D 12 M2-6:2FTS



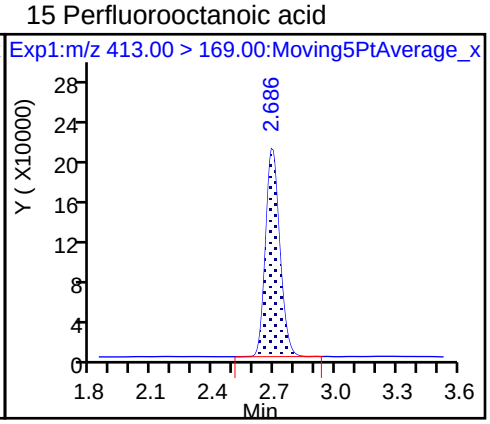
* 62 13C2-PFOA



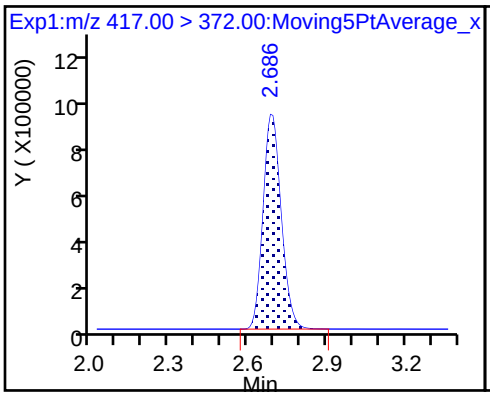
15 Perfluorooctanoic acid



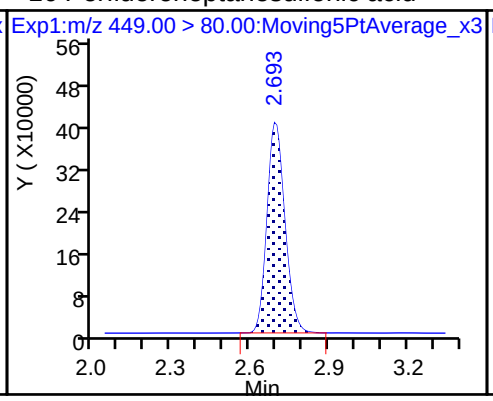
15 Perfluorooctanoic acid



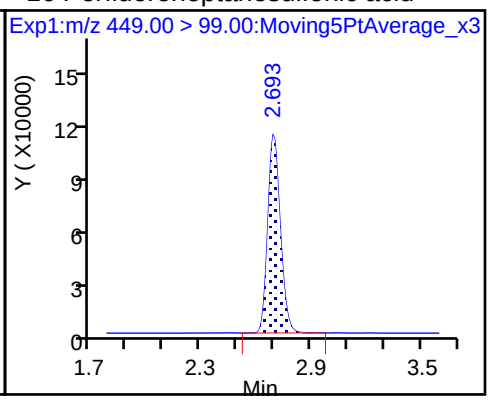
D 14 13C4 PFOA



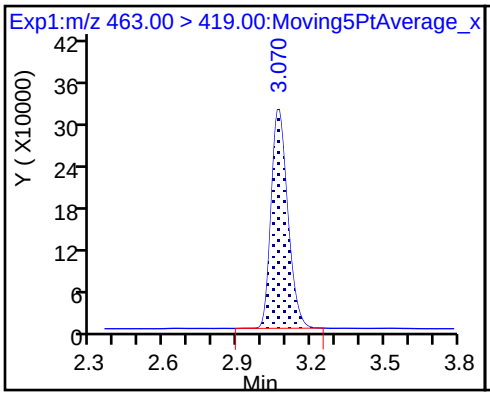
16 Perfluoroheptanesulfonic acid



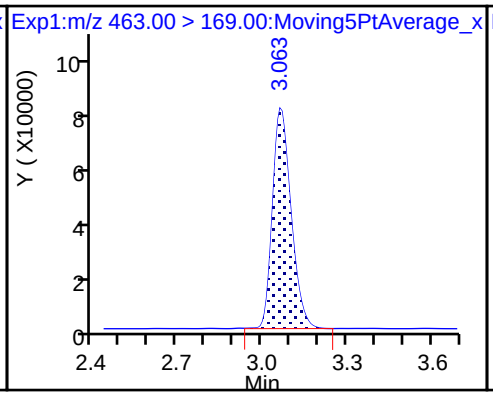
16 Perfluoroheptanesulfonic acid



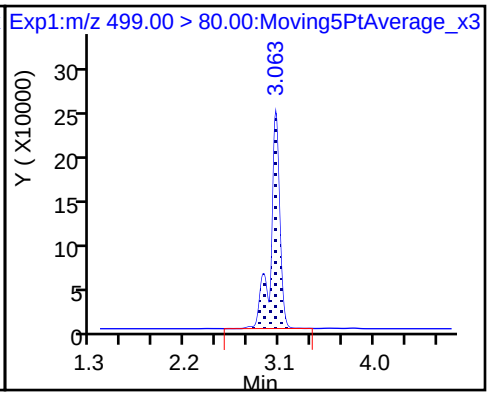
20 Perfluorononanoic acid



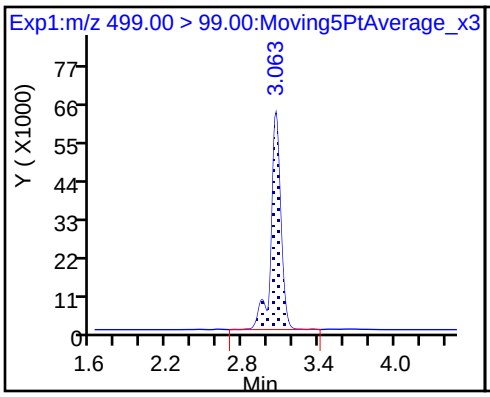
20 Perfluorononanoic acid



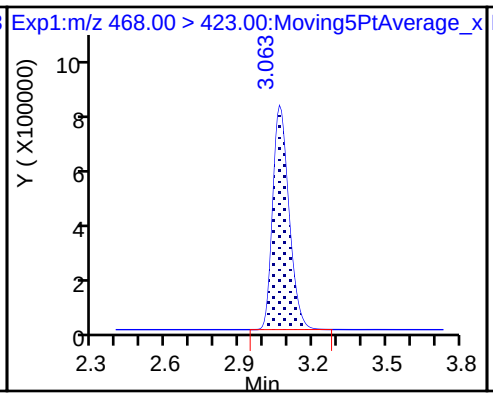
17 Perfluorooctane sulfonic acid



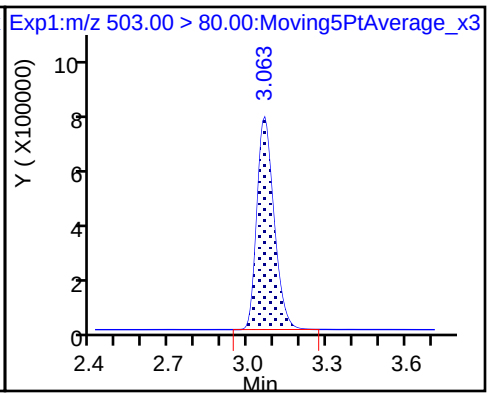
17 Perfluorooctane sulfonic acid



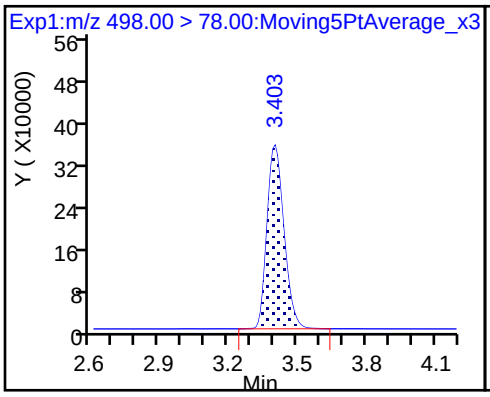
D 19 13C5 PFNA



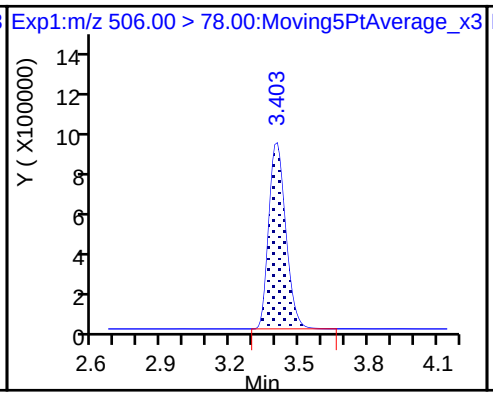
D 18 13C4 PFOS



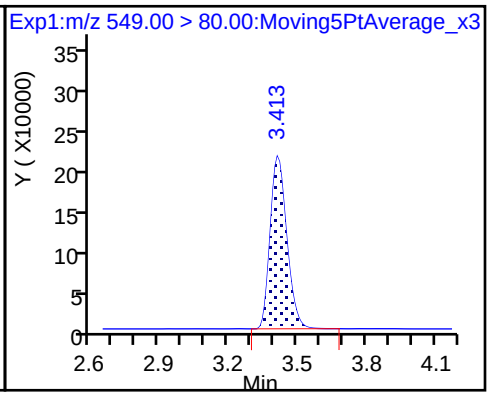
22 Perfluorooctane Sulfonamide



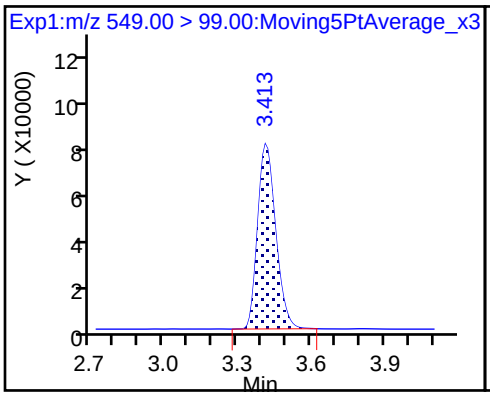
D 21 13C8 FOSA



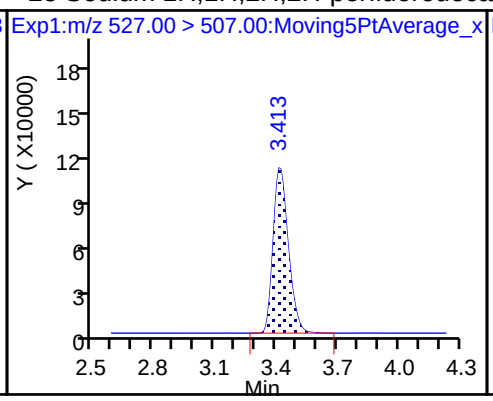
68 Perfluorononanesulfonic acid



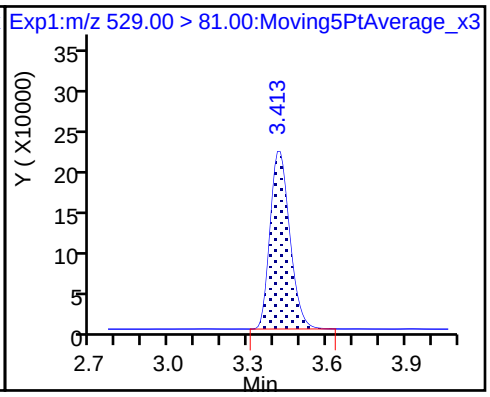
68 Perfluorononanesulfonic acid



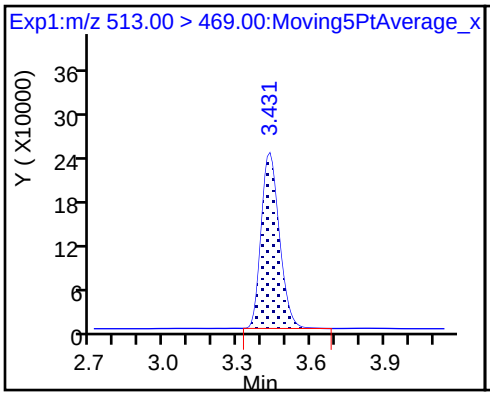
25 Sodium 1H,1H,2H,2H-perfluorodecan



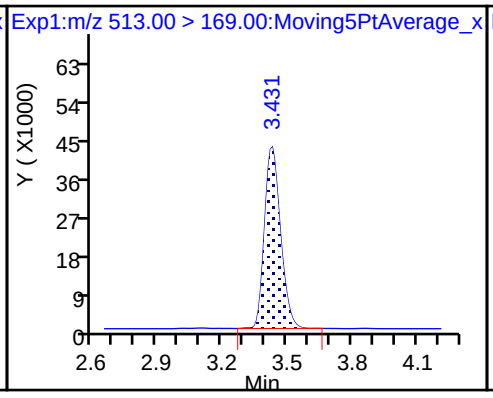
D 26 M2-8:2FTS



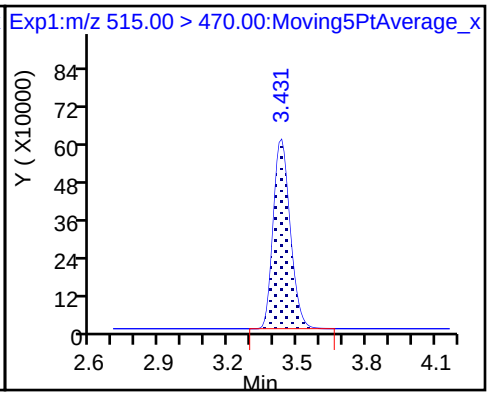
24 Perfluorodecanoic acid



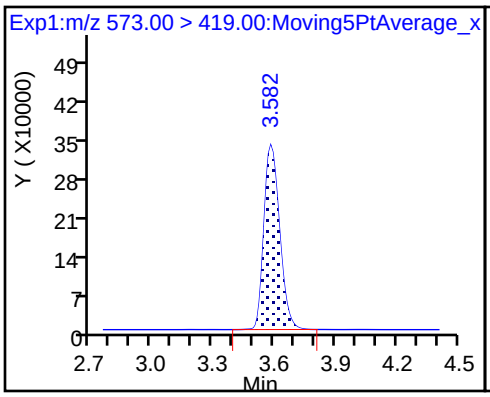
24 Perfluorodecanoic acid



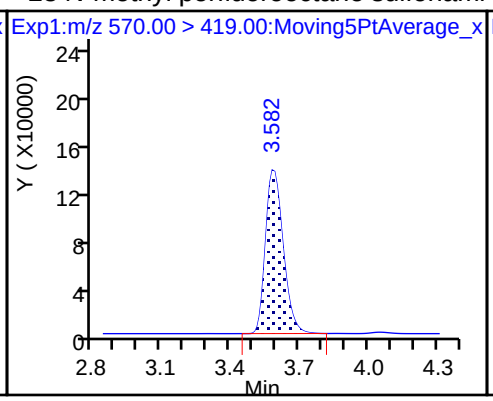
D 23 13C2 PFDA



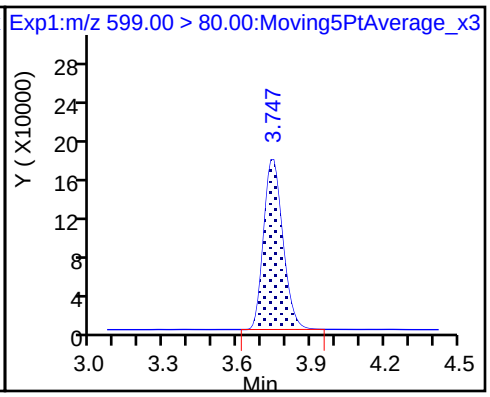
D 27 d3-NMeFOSAA



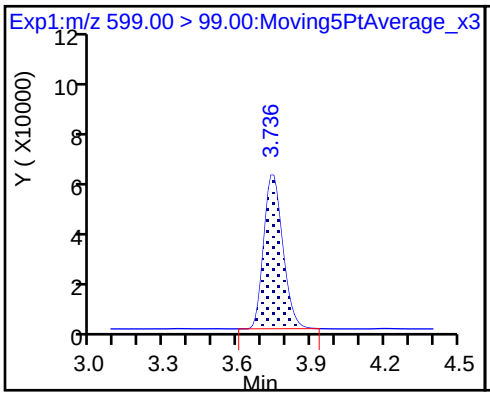
28 N-methyl perfluorooctane sulfonami



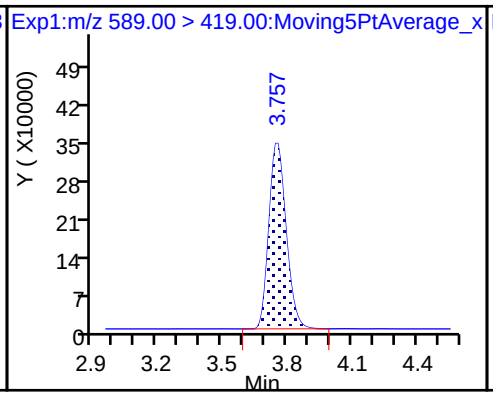
29 Perfluorodecane Sulfonic acid



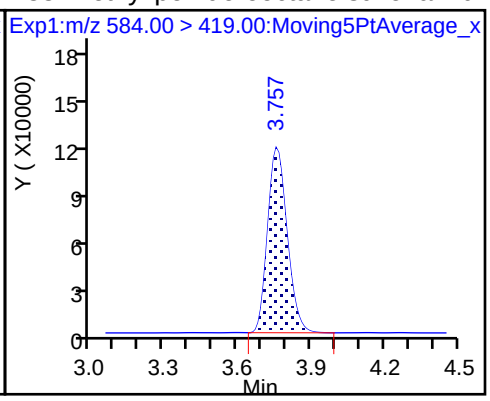
29 Perfluorodecane Sulfonic acid



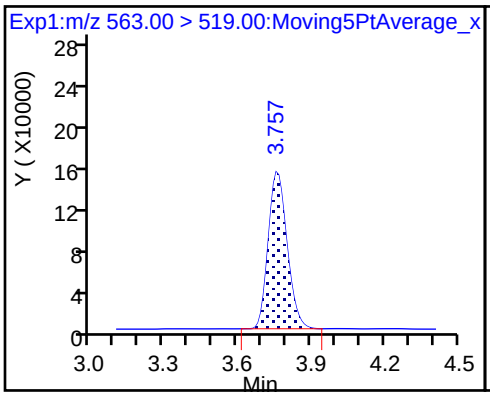
D 32 d5-NEtFOSAA



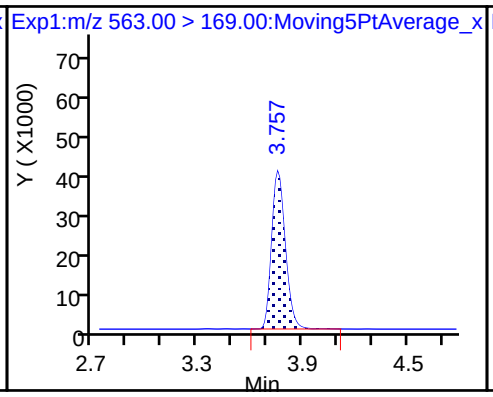
33 N-ethyl perfluorooctane sulfonamid



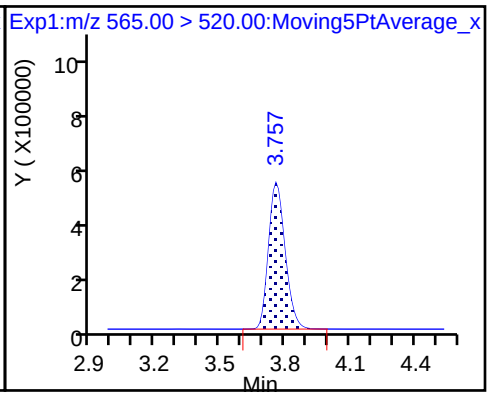
31 Perfluoroundecanoic acid



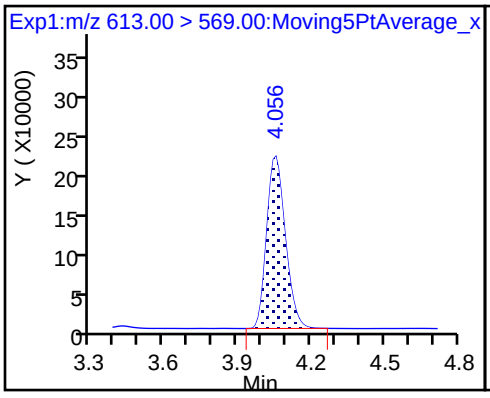
31 Perfluoroundecanoic acid



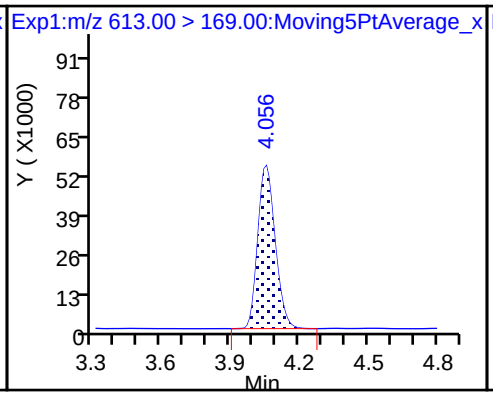
D 30 13C2 PFUnA



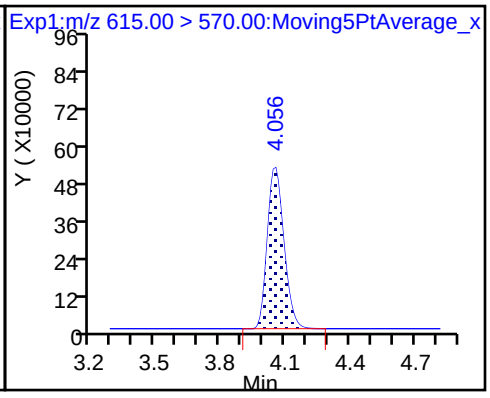
37 Perfluorododecanoic acid



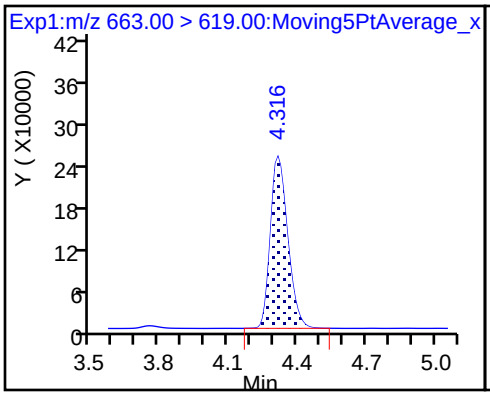
37 Perfluorododecanoic acid



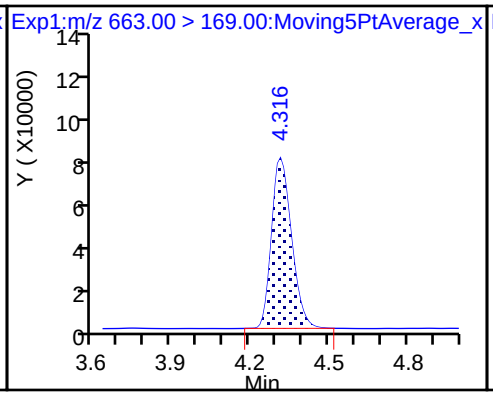
D 36 13C2 PFDoA



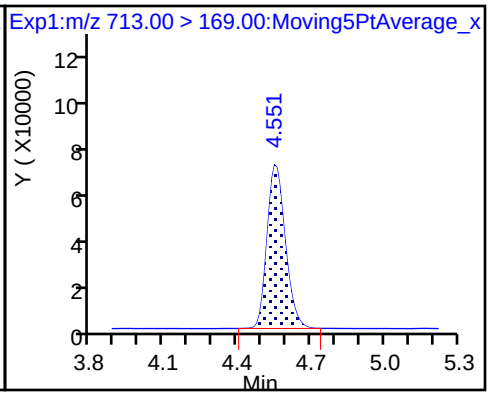
41 Perfluorotridecanoic acid



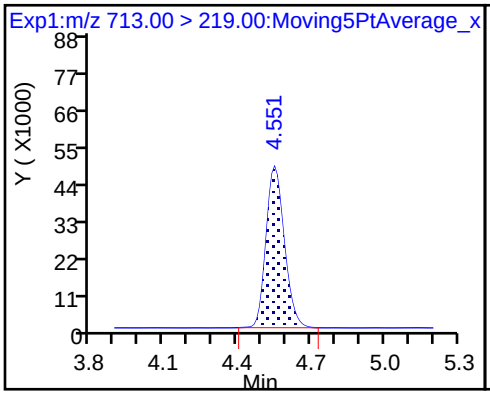
41 Perfluorotridecanoic acid



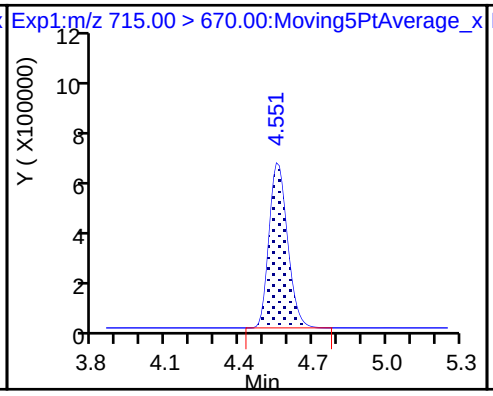
42 Perfluorotetradecanoic acid



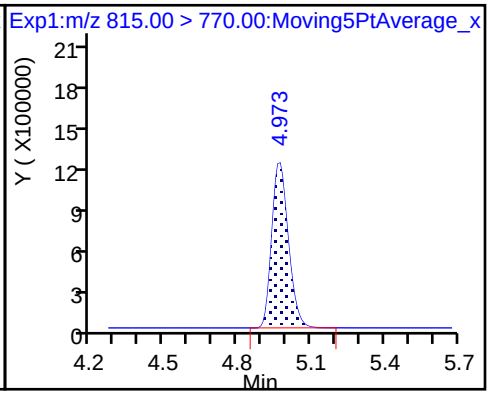
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/14 Calibration Date: 04/21/2018 13:37

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.20LLCX_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.9113		0.981	1.00	-1.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.159		0.973	1.00	-2.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	76.96		0.869	0.884	-1.7	30.0
4:2 FTS	AveID	16.03	16.31		0.950	0.934	1.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	0.9640		0.949	1.00	-5.1	30.0
Perfluoropentanesulfonic acid	AveID	71.51	70.21		0.921	0.938	-1.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.043		1.04	1.00	4.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.052		0.846	0.910	-7.1	30.0
6:2FTS	AveID	1.691	1.588		0.890	0.948	-6.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.123		0.972	1.00	-2.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.296		0.929	0.952	-2.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.041		0.998	1.00	-0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.030		0.879	0.928	-5.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	1.000		0.988	1.00	-1.2	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7293		0.876	0.960	-8.8	30.0
8:2FTS	AveID	1.265	1.259		0.953	0.958	-0.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	0.9949		0.964	1.00	-3.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.012		1.01	1.00	1.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6304		0.936	0.964	-2.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.9123		0.976	1.00	-2.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.8656		1.02	1.00	2.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	1.054		1.01	1.00	1.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.227		1.01	1.00	1.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2470		0.984	1.00	-1.6	30.0
13C4 PFBA	Ave	1.345	1.338		2.49	2.50	-0.6	30.0
13C5 PFPeA	Ave	0.8672	0.8707		2.51	2.50	0.4	30.0
13C3-PFBS	Ave	0.0199	0.0199		2.33	2.33	0.0	30.0
13C2 PFHxA	Ave	0.9590	0.9494		2.48	2.50	-1.0	30.0
13C4-PFHpA	Ave	0.9333	0.9307		2.49	2.50	-0.3	30.0
18O2 PFHxS	Ave	1.152	1.132		2.32	2.37	-1.8	30.0
M2-6:2FTS	Ave	0.2000	0.2230		2.65	2.38	11.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/14 Calibration Date: 04/21/2018 13:37

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.20LLCX_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9043		2.44	2.50	-2.5	30.0
13C4 PFOS	Ave	0.8066	0.8064		2.39	2.39	-0.0	30.0
13C5 PFNA	Ave	0.7973	0.7750		2.43	2.50	-2.8	30.0
13C8 FOSA	Ave	1.007	1.004		2.49	2.50	-0.4	30.0
M2-8:2FTS	Ave	0.2409	0.2408		2.39	2.40	-0.0	30.0
13C2 PFDA	Ave	0.6701	0.6674		2.49	2.50	-0.4	30.0
d3-NMeFOSAA	Ave	0.3798	0.3973		2.61	2.50	4.6	30.0
d5-NEtFOSAA	Ave	0.3749	0.3998		2.67	2.50	6.6	30.0
13C2 PFUnA	Ave	0.5781	0.5394		2.33	2.50	-6.7	30.0
13C2 PFDoA	Ave	0.6242	0.5743		2.30	2.50	-8.0	30.0
13C2-PFTeDA	Ave	0.7915	0.7476		2.36	2.50	-5.5	30.0
13C2-PFHxDA	Ave	1.288	1.206		2.34	2.50	-6.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_048.d
Lims ID: CCV L4
Client ID:
Sample Type: CCVIS
Inject. Date: 21-Apr-2018 13:37:04 ALS Bottle#: 13 Worklist Smp#: 14
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\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:27:18 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

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	1.441	-0.005	1.000	6211485	2.49		99.4	44205	
2 Perfluorobutyric acid										
212.90 > 169.00	1.436	1.436	0.0	1.000	2264148	0.9814		98.1	1053	
D 3 13C5-PFPeA										
267.90 > 223.00	1.703	1.703	0.0	0.558	4042321	2.51		100	75923	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.703	1.703	0.0	1.000	1874436	0.9727		97.3	1763	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.739	1.739	0.0	1.005	2515899	0.8690		98.3	10820	
298.90 > 99.00	1.739	1.739	0.0	1.005	1031773		2.44(1.25-3.74)		7914	
D 47 13C3-PFBS										
301.90 > 83.00	1.730	1.739	-0.009	1.000	85981	2.33		100	720	
D 60 M2-4:2FTS										
329.00 > 81.00	1.949	1.947	0.002	1.000	684055	NC			5424	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.949	1.949	0.0	1.000	563298	0.9501		102	32532	
D 7 13C2 PFHxA										
315.00 > 270.00	1.982	1.990	-0.008	1.000	4408098	2.48		99.0	93835	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.982	1.982	0.0	1.000	1699747	0.9487		94.9	2125	
313.00 > 119.00	1.982	1.982	0.0	1.000	177676		9.57(5.03-15.10)		2302	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.004	2.004	0.0	1.000	2435390	0.9209		98.2	15396	
349.00 > 99.00	2.004	2.004	0.0	1.000	864384		2.82(1.36-4.07)		11149	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.083	2.092	-0.009	1.000	218427	NC			7450	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.083	2.083	0.0	1.000	256752	NC			1668	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 9 13C4-PFHpA										
367.00 > 322.00	2.320	2.318	0.002	1.000	4321174	2.49		99.7	85609	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.320	2.320	0.0	1.000	1801941	1.04		104	2228	
363.00 > 169.00	2.320	2.320	0.0	1.000	695128		2.59(1.13-3.40)		3238	
D 11 18O2 PFHxS										
403.00 > 84.00	2.333	2.331	0.002	1.000	4969767	2.32		98.2	65648	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.333	2.333	0.0	1.000	2011088	0.8456		92.9	5462	
399.00 > 99.00	2.333	2.333	0.0	1.000	657467		3.06(1.50-4.49)		3469	
65 Adona										
377.00 > 251.00	2.360	2.360	0.0	1.000	5099746	NC			48581	
377.00 > 85.00	2.360	2.360	0.0	1.000	2998263		1.70(0.84-2.53)		41005	
D 12 M2-6:2FTS										
429.00 > 81.00	2.653	2.658	-0.005	1.000	983748	2.65		112	10260	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.653	2.653	0.0	1.000	623461	0.8904		93.9	7292	
D 14 13C4 PFOA										
417.00 > 372.00	2.676	2.681	-0.005	1.000	4198643	2.44		97.5	55092	
* 62 13C2-PFOA										
415.00 > 370.00	2.676	2.676	0.0		4642897	2.50			61030	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.676	2.676	0.0	1.000	1886026	0.9719		97.2	1299	
413.00 > 169.00	2.676	2.676	0.0	1.000	980659		1.92(0.84-2.52)		3503	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.683	2.683	0.0	1.000	1847312	0.9290		97.6	11032	
449.00 > 99.00	2.683	2.683	0.0	1.000	513827		3.60(1.94-5.82)		9988	
D 18 13C4 PFOS										
503.00 > 80.00	3.047	3.054	-0.007	1.000	3579412	2.39		100.0	21447	
D 19 13C5 PFNA										
468.00 > 423.00	3.054	3.054	0.0	1.000	3598366	2.43		97.2	42178	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.054	3.054	0.0	1.002	1431320	0.8785		94.7	6026	
499.00 > 99.00	3.047	3.054	-0.007	1.000	319870		4.47(2.31-6.93)		4795	
20 Perfluorononanoic acid										
463.00 > 419.00	3.054	3.054	0.0	1.000	1498106	1.00		99.8	4426	
463.00 > 169.00	3.054	3.054	0.0	1.000	347771		4.31(1.90-5.69)		7737	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.266	3.266	0.0	1.000	2521263	NC			52515	
D 21 13C8 FOSA										
506.00 > 78.00	3.389	3.391	-0.002	1.000	4659469	2.49		99.6	39190	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.389	3.389	0.0	1.000	1863418	0.9884		98.8	24982	
D 26 M2-8:2FTS										
529.00 > 81.00	3.408	3.410	-0.002	1.000	1071013	2.39		100.0	9989	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.399	3.399	0.0	1.000	1048584	0.8759		91.2	8725	
549.00 > 99.00	3.399	3.399	0.0	1.000	411692		2.55(1.33-3.97)		11718	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.408	3.408	0.0	1.000	539480	0.9534		99.5	35383	
D 23 13C2 PFDA										
515.00 > 470.00	3.417	3.419	-0.002	1.000	3098612	2.49		99.6	67800	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.417	3.417	0.0	1.000	1233146	0.9645		96.4	6099	
513.00 > 169.00	3.417	3.417	0.0	1.000	215473		5.72(2.36-7.09)		3865	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.566	3.568	-0.002	1.000	1844459	2.61		105	24987	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.576	3.576	0.0	1.003	746608	1.01		101	6166	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.730	3.730	0.0	1.000	910179	0.9361		97.1	9491	
599.00 > 99.00	3.730	3.730	0.0	1.000	300417		3.03(1.39-4.16)		6288	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.741	3.743	-0.002	1.000	1856235	2.67		107	22789	
D 30 13C2 PFUnA										
565.00 > 520.00	3.751	3.753	-0.002	1.000	2504271	2.33		93.3	51588	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.751	3.751	0.0	1.000	867092	1.02		102	4181	
563.00 > 169.00	3.751	3.751	0.0	1.000	216513		4.00(2.12-6.36)		4463	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.751	3.751	0.0	1.003	677338	0.9762		97.6	10280	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.908	3.908	0.0	1.000	3789341	NC			42367	
D 36 13C2 PFDoA										
615.00 > 570.00	4.040	4.042	-0.002	1.000	2666218	2.30		92.0	23821	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.040	4.040	0.0	1.000	1124441	1.01		101	1453	
613.00 > 169.00	4.040	4.040	0.0	1.000	285824		3.93(2.13-6.40)		3437	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.308	4.308	0.0	1.000	1308699	1.01		101	1552	
663.00 > 169.00	4.308	4.308	0.0	1.000	429356		3.05(1.25-3.76)		4916	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.543	4.547	-0.004	1.000	3471129	2.36		94.5	21610	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.543	4.543	0.0	1.000	342982	0.9836		98.4	3328	
713.00 > 219.00	4.543	4.543	0.0	1.000	237763		1.44(0.71-2.13)		4546	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.958	4.961	-0.003	1.000	5598098	2.34		93.6	18506	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.967	4.967	0.0	1.002	2093659	NC			961	
813.00 > 169.00	4.967	4.967	0.0	1.002	332636		6.29(2.86-8.58)		2363	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.329	5.329	0.0	1.000	2286523	NC			828	
913.00 > 169.00	5.329	5.329	0.0	1.000	278246		8.22(3.83-11.48)		1990	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00004 Amount Added: 1.00 Units: mL

Report Date: 24-Apr-2018 17:27:19 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_048.d

Injection Date: 21-Apr-2018 13:37:04 Instrument ID: A8_N

Lims ID: CCV L4

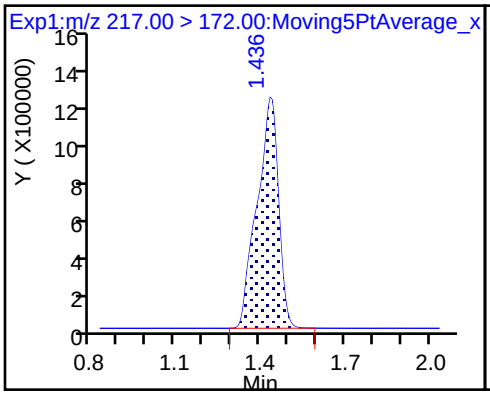
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 14

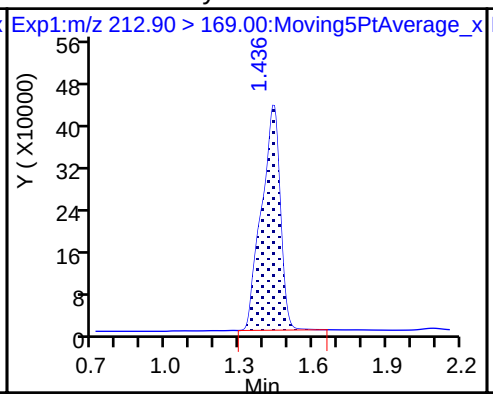
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

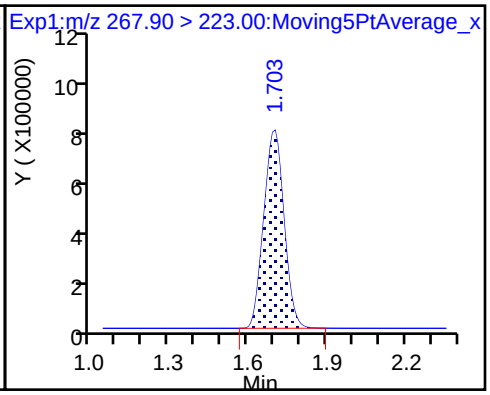
D 1 13C4 PFBA



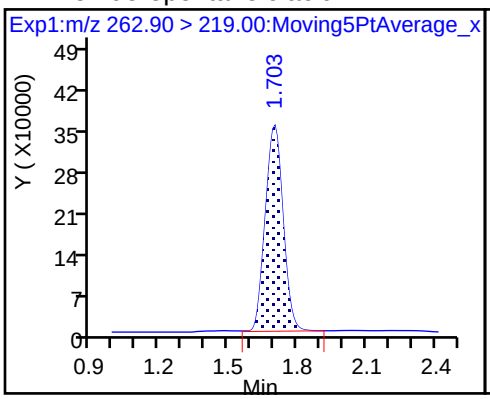
2 Perfluorobutyric acid



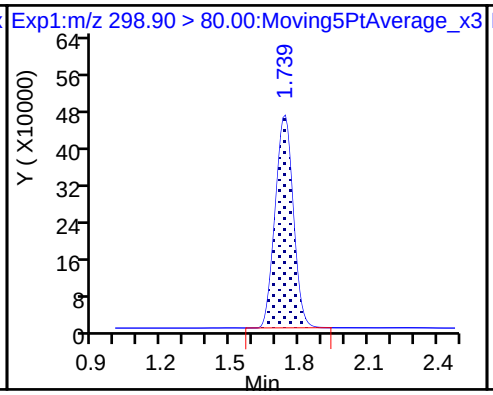
D 3 13C5-PFPeA



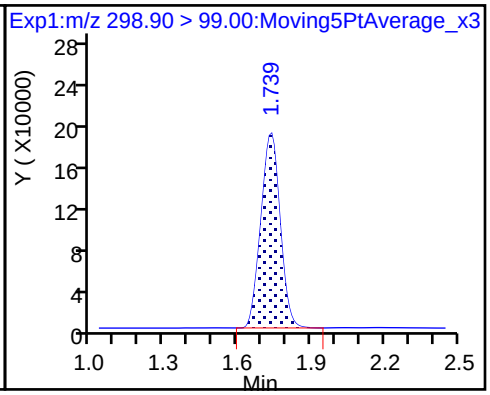
4 Perfluoropentanoic acid



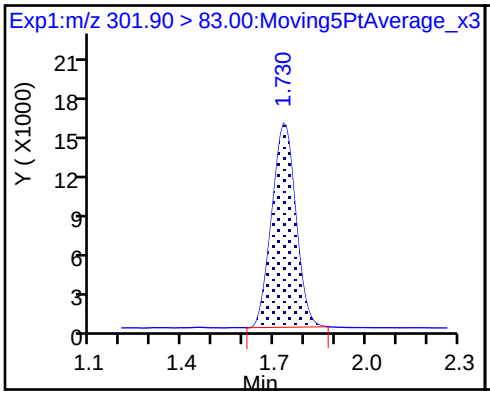
5 Perfluorobutanesulfonic acid



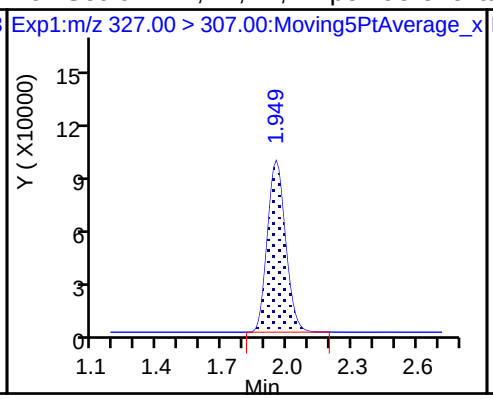
5 Perfluorobutanesulfonic acid



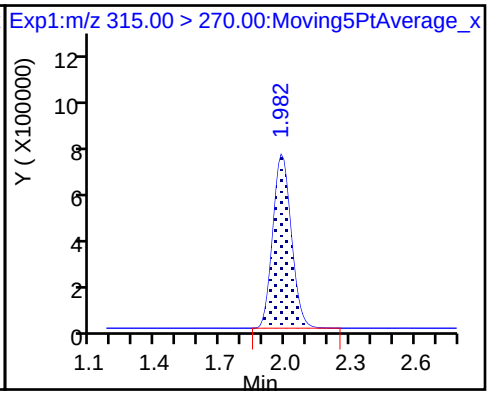
D 47 13C3-PFBS



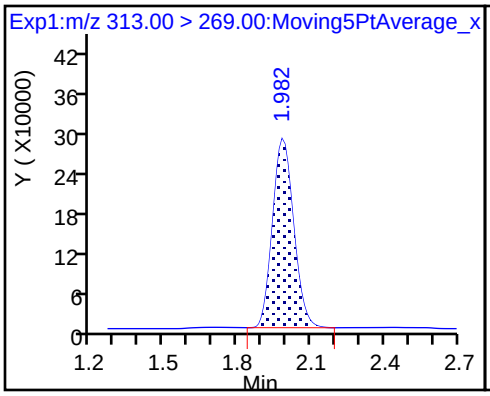
61 Sodium 1H,1H,2H,2H-perfluorohexa



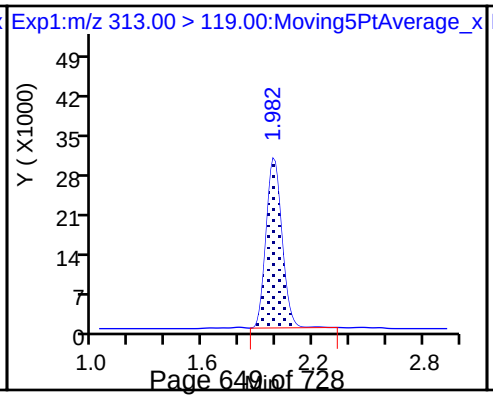
D 7 13C2 PFHxA



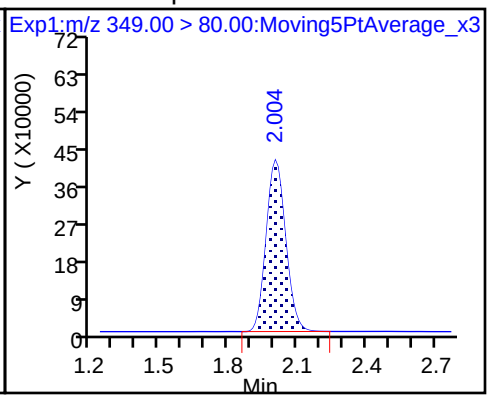
6 Perfluorohexanoic acid



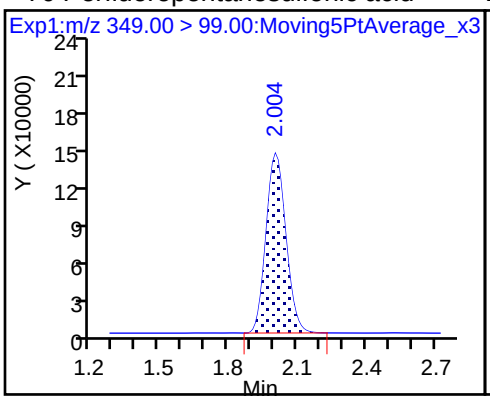
6 Perfluorohexanoic acid



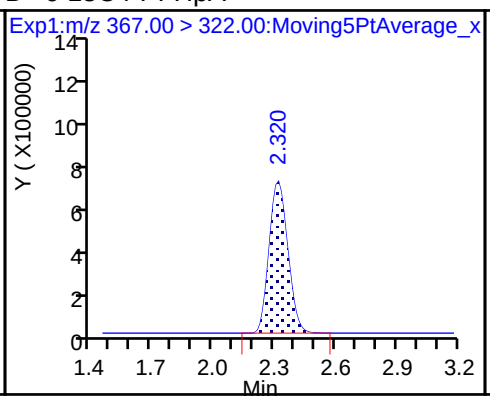
70 Perfluoropentanesulfonic acid



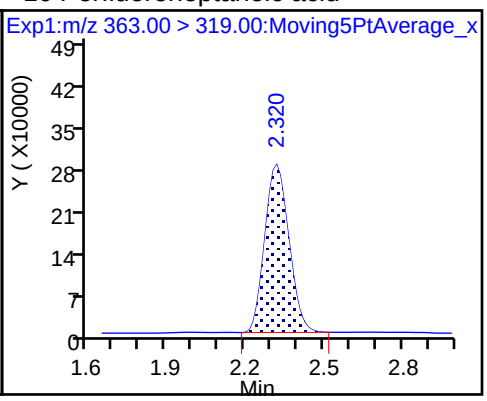
70 Perfluoropentanesulfonic acid



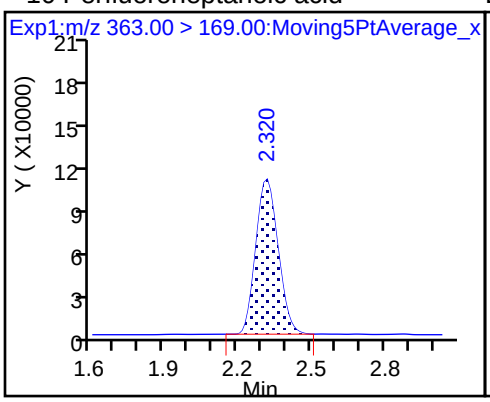
D 9 13C4-PFHpA



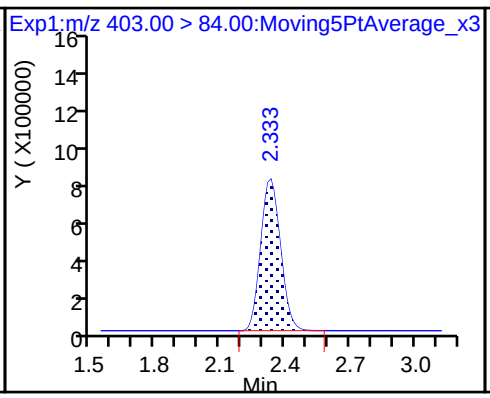
10 Perfluoroheptanoic acid



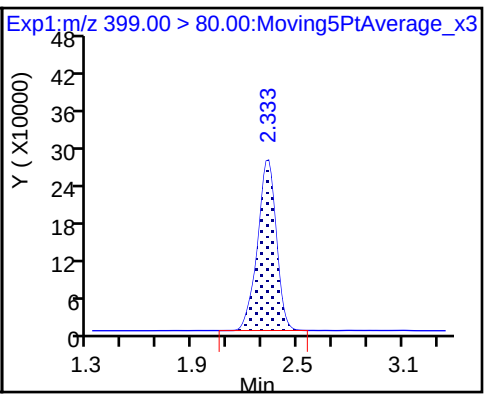
10 Perfluoroheptanoic acid



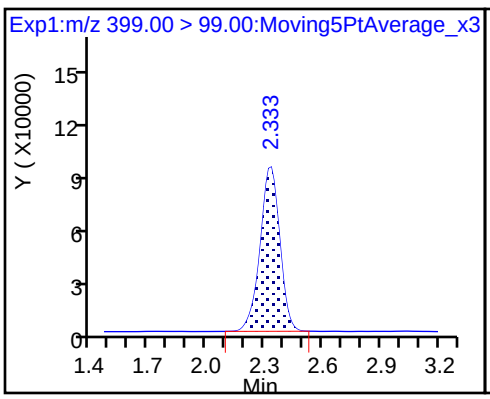
D 11 18O2 PFHxS



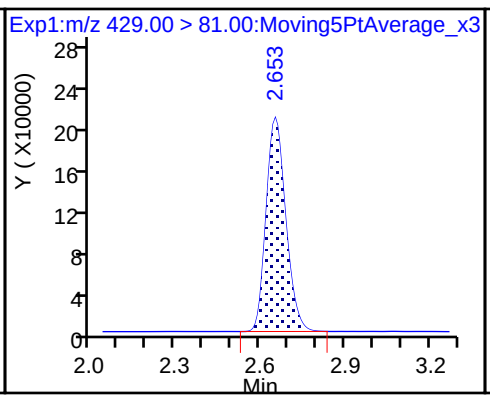
8 Perfluorohexanesulfonic acid



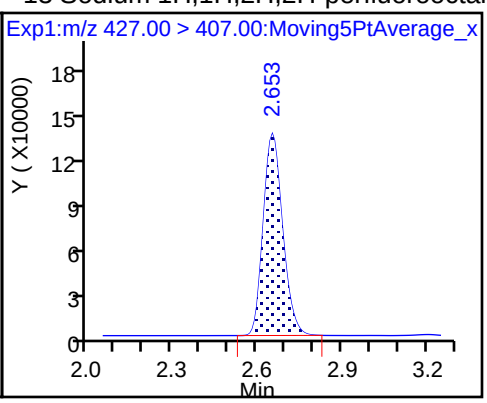
8 Perfluorohexanesulfonic acid



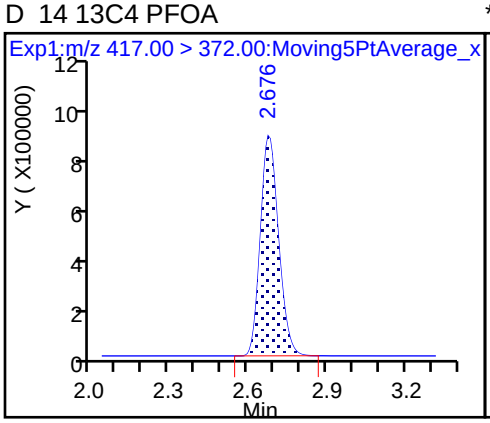
D 12 M2-6:2FTS



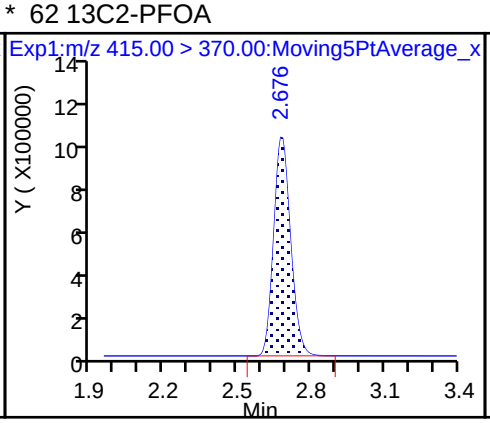
13 Sodium 1H,1H,2H,2H-perfluorooctane



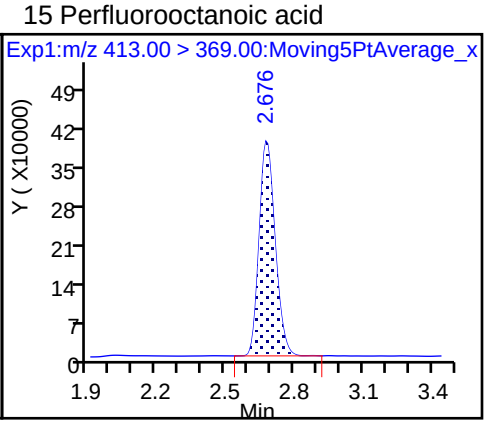
D 14 13C4 PFOA



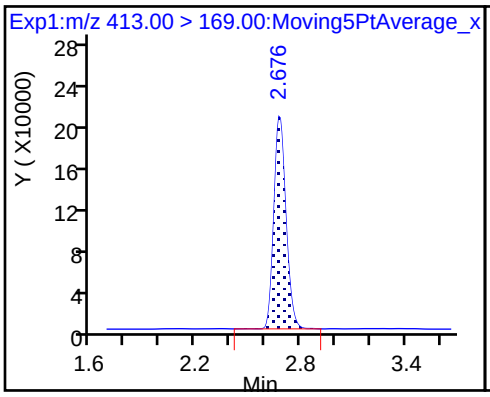
* 62 13C2-PFOA



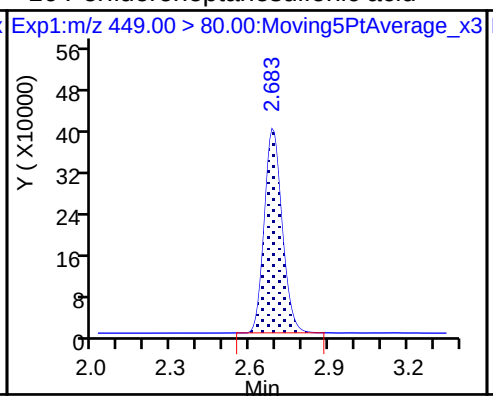
15 Perfluorooctanoic acid



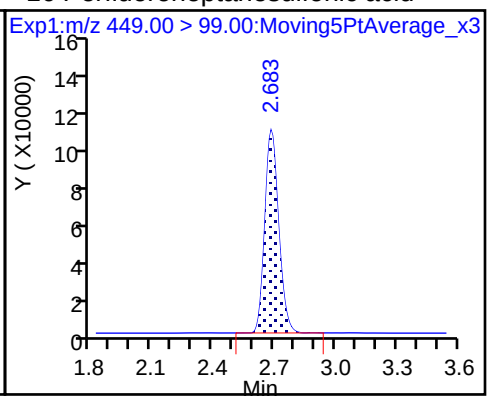
15 Perfluorooctanoic acid



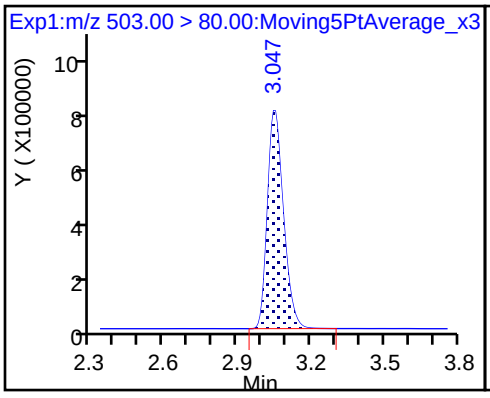
16 Perfluoroheptanesulfonic acid



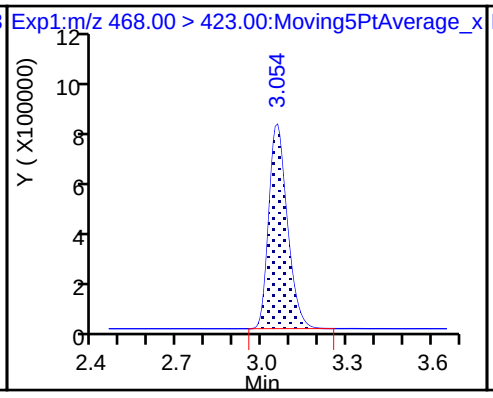
16 Perfluoroheptanesulfonic acid



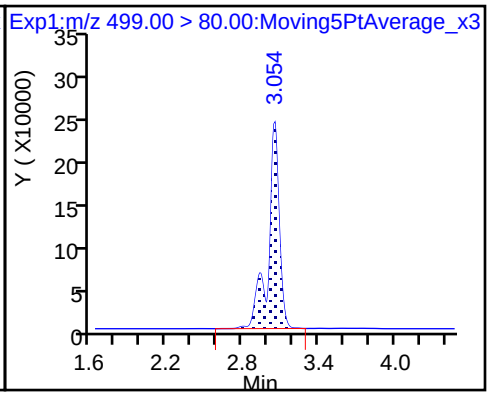
D 18 13C4 PFOS



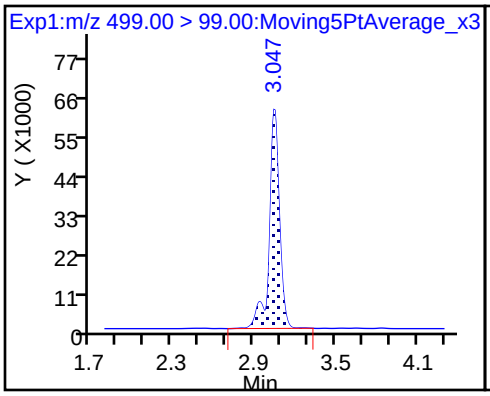
D 19 13C5 PFNA



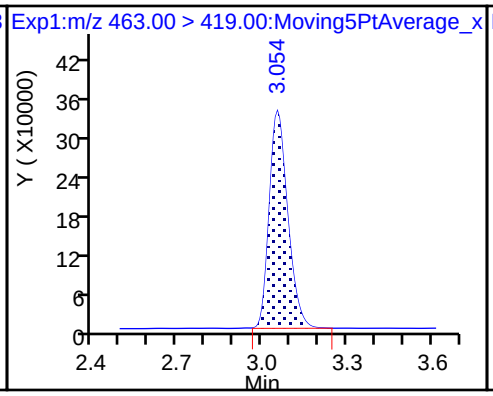
17 Perfluorooctane sulfonic acid



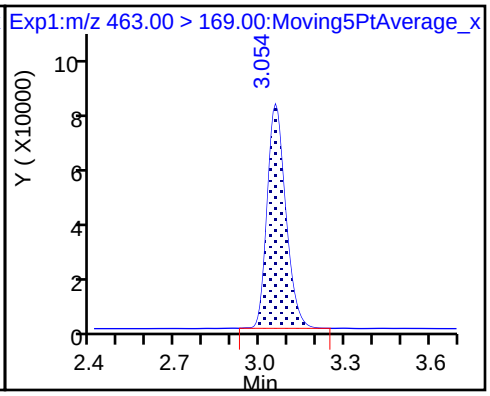
17 Perfluorooctane sulfonic acid



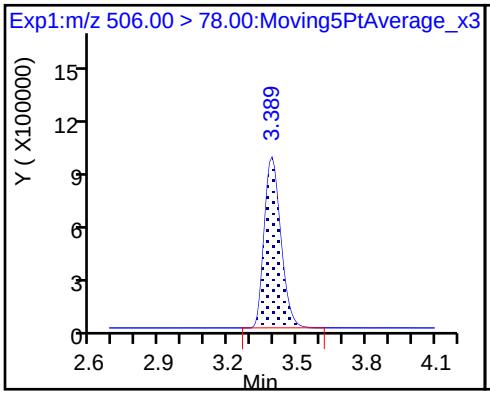
20 Perfluorononanoic acid



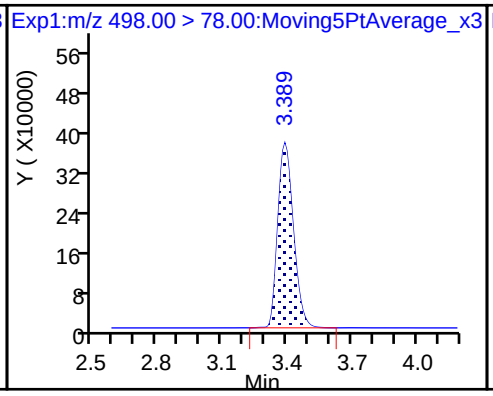
20 Perfluorononanoic acid



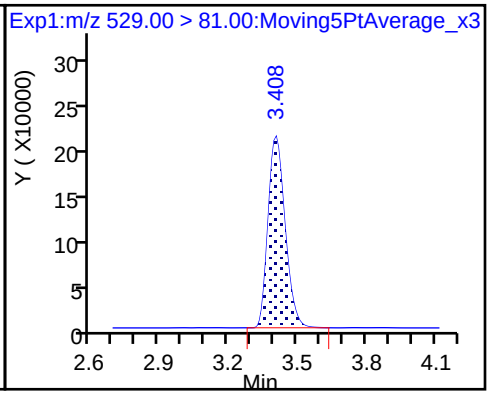
D 21 13C8 FOSA



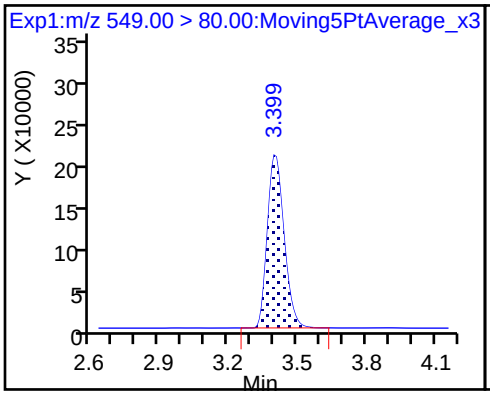
22 Perfluorooctane Sulfonamide



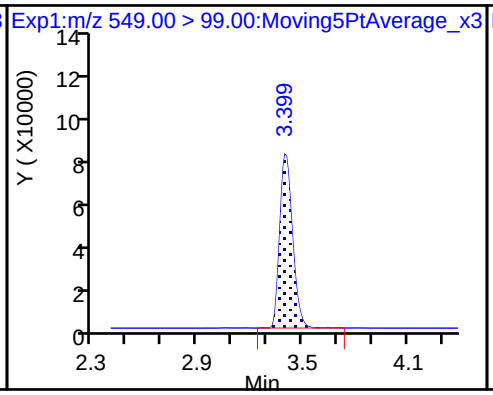
D 26 M2-8:2FTS



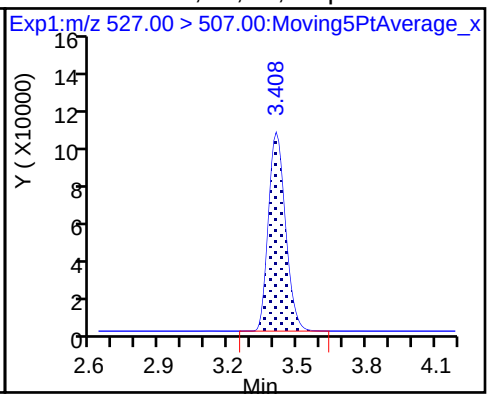
68 Perfluorononanesulfonic acid



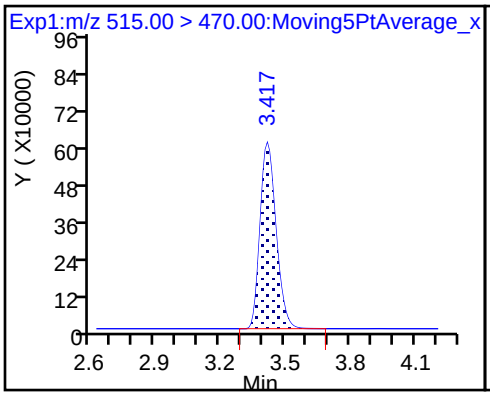
68 Perfluorononanesulfonic acid



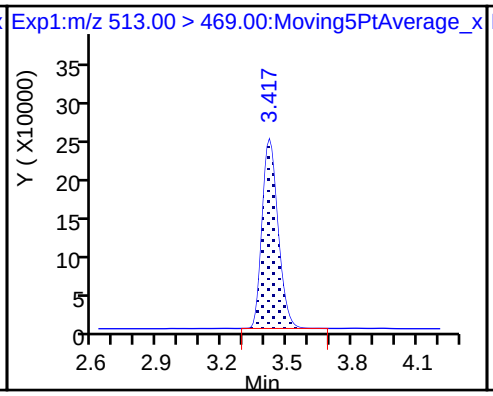
25 Sodium 1H,1H,2H,2H-perfluorodecane



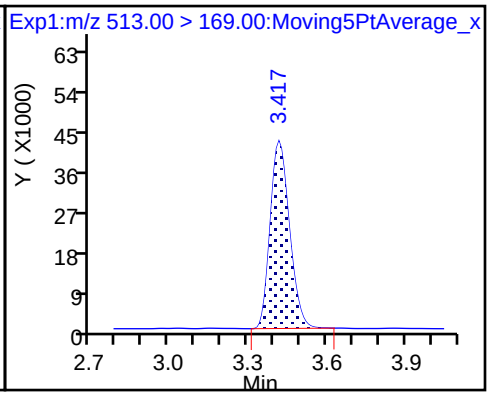
D 23 13C2 PFDA



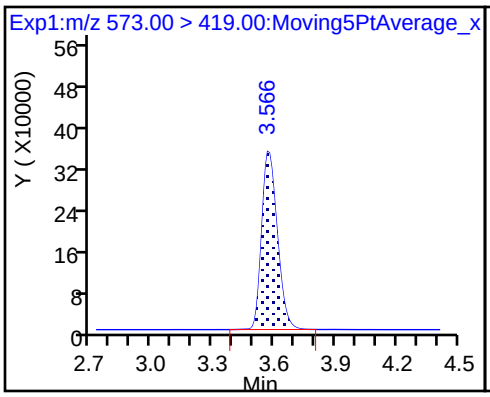
24 Perfluorodecanoic acid



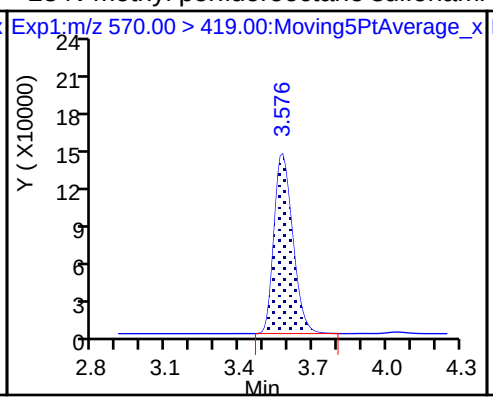
24 Perfluorodecanoic acid



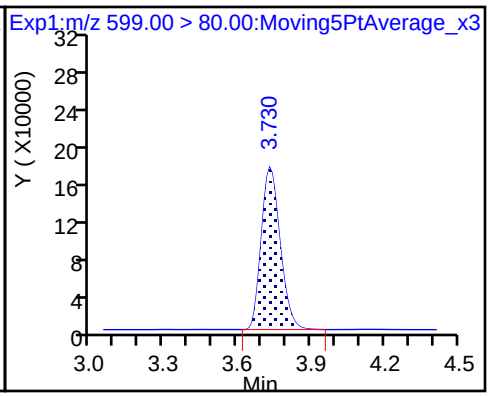
D 27 d3-NMeFOSAA



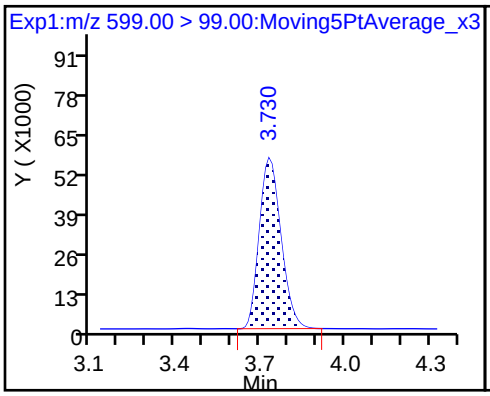
28 N-methyl perfluorooctane sulfonami



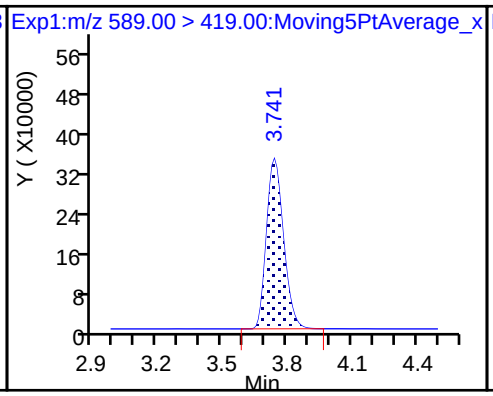
29 Perfluorodecane Sulfonic acid



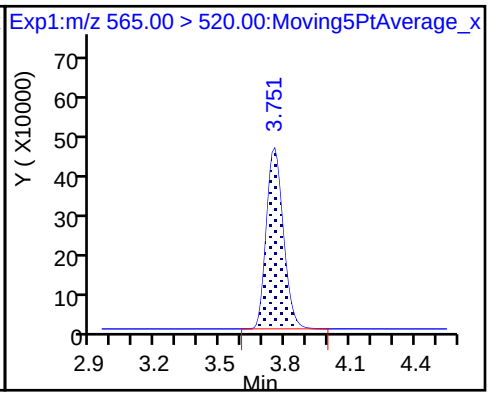
29 Perfluorodecane Sulfonic acid



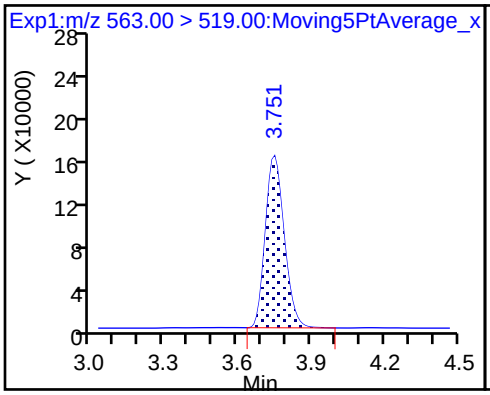
D 32 d5-NEtFOSAA



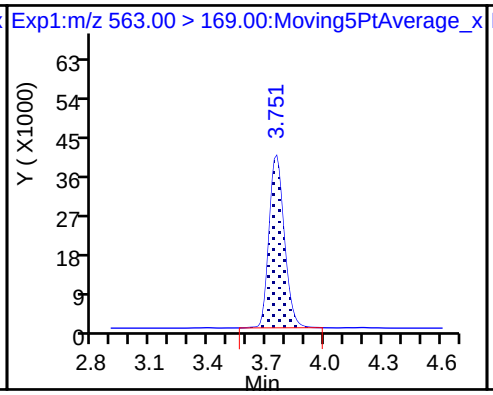
D 30 13C2 PFUnA



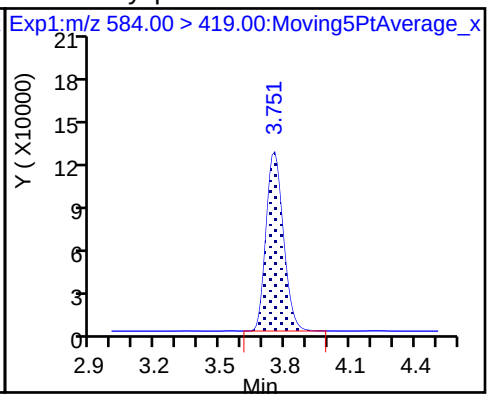
31 Perfluoroundecanoic acid



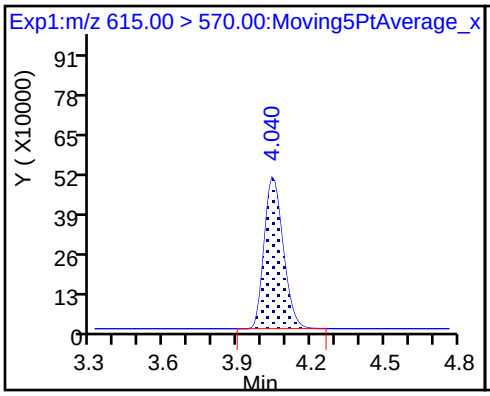
31 Perfluoroundecanoic acid



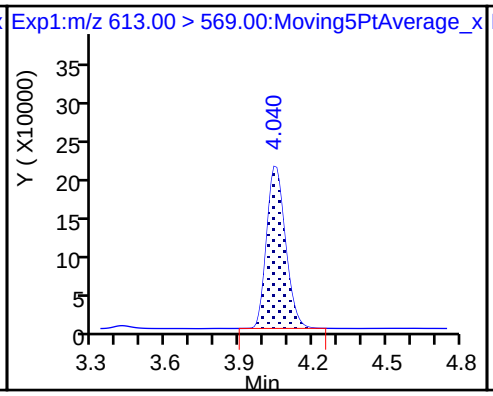
33 N-ethyl perfluorooctane sulfonamid



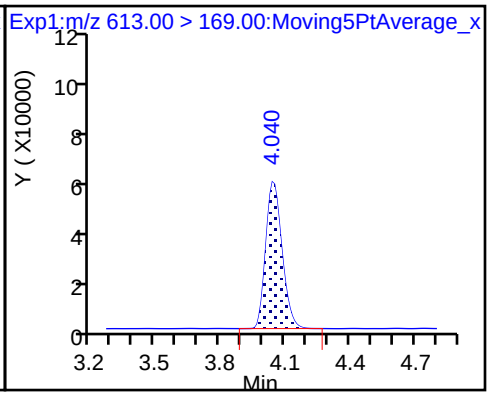
D 36 13C2 PFDoA



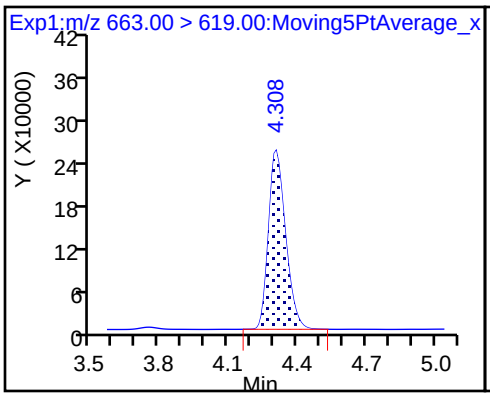
37 Perfluorododecanoic acid



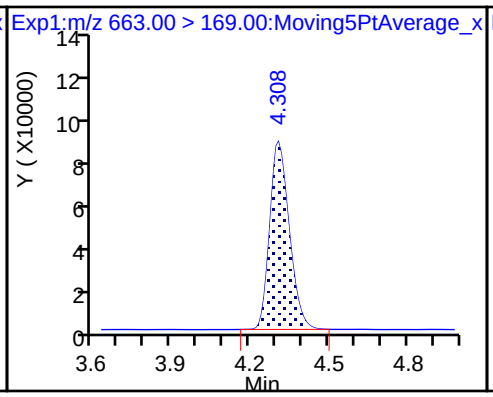
37 Perfluorododecanoic acid



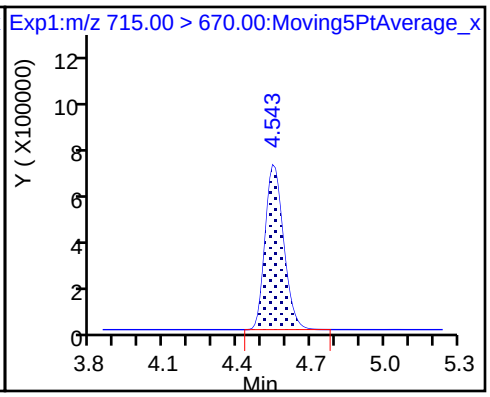
41 Perfluorotridecanoic acid



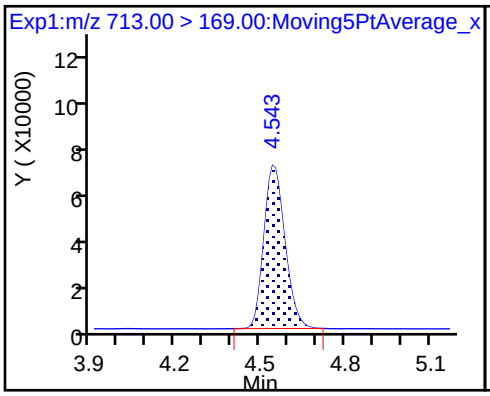
41 Perfluorotridecanoic acid



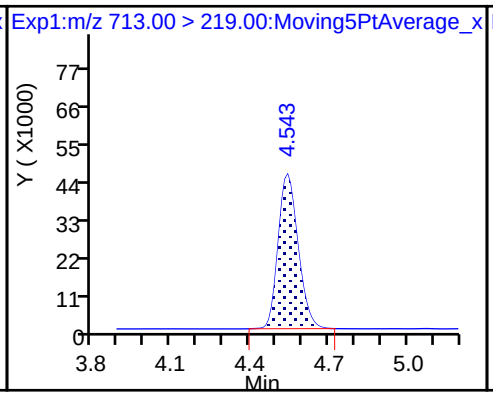
D 43 13C2-PFTeDA



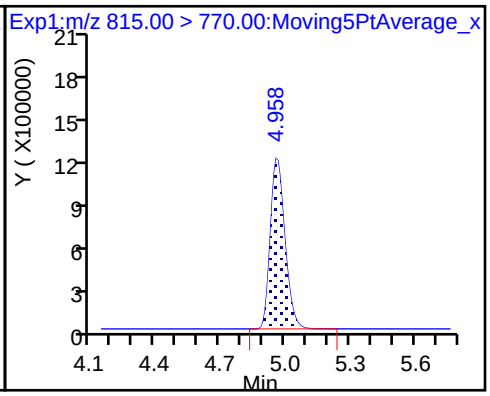
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/19 Calibration Date: 04/21/2018 14:16

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.20LLCX_053.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.9557		2.57	2.50	2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.204		2.53	2.50	1.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	81.91		2.31	2.21	4.6	30.0
4:2 FTS	AveID	16.03	17.36		2.53	2.34	8.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	1.047		2.58	2.50	3.0	30.0
Perfluoropentanesulfonic acid	AveID	71.51	74.45		2.44	2.35	4.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.080		2.70	2.50	7.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.077		2.16	2.28	-4.9	30.0
6:2FTS	AveID	1.691	1.684		2.36	2.37	-0.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.093		2.37	2.50	-5.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.396		2.50	2.38	5.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.077		2.58	2.50	3.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.112		2.37	2.32	2.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	1.082		2.67	2.50	7.0	30.0
8:2FTS	AveID	1.265	1.268		2.40	2.40	0.2	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7643		2.29	2.40	-4.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	0.9868		2.39	2.50	-4.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.012		2.54	2.50	1.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6632		2.46	2.41	2.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.9043		2.42	2.50	-3.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.8265		2.44	2.50	-2.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	1.092		2.62	2.50	4.7	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.229		2.53	2.50	1.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2669		2.66	2.50	6.3	30.0
13C4 PFBA	Ave	1.345	1.385		2.57	2.50	2.9	30.0
13C5 PFPeA	Ave	0.8672	0.8727		2.52	2.50	0.6	30.0
13C3-PFBS	Ave	0.0199	0.0202		2.36	2.33	1.6	30.0
13C2 PFHxA	Ave	0.9590	0.9719		2.53	2.50	1.4	30.0
13C4-PFHpA	Ave	0.9333	0.9155		2.45	2.50	-1.9	30.0
18O2 PFHxS	Ave	1.152	1.141		2.34	2.37	-1.0	30.0
M2-6:2FTS	Ave	0.2000	0.2267		2.69	2.38	13.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/19 Calibration Date: 04/21/2018 14:16

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.20LLCX_053.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9528		2.57	2.50	2.7	30.0
13C4 PFOS	Ave	0.8066	0.8164		2.42	2.39	1.2	30.0
13C5 PFNA	Ave	0.7973	0.7929		2.49	2.50	-0.6	30.0
13C8 FOSA	Ave	1.007	0.9725		2.41	2.50	-3.4	30.0
M2-8:2FTS	Ave	0.2409	0.2526		2.51	2.40	4.9	30.0
13C2 PFDA	Ave	0.6701	0.6800		2.54	2.50	1.5	30.0
d3-NMeFOSAA	Ave	0.3798	0.3954		2.60	2.50	4.1	30.0
d5-NEtFOSAA	Ave	0.3749	0.4004		2.67	2.50	6.8	30.0
13C2 PFUnA	Ave	0.5781	0.5626		2.43	2.50	-2.7	30.0
13C2 PFDoA	Ave	0.6242	0.5805		2.32	2.50	-7.0	30.0
13C2-PFTeDA	Ave	0.7915	0.7132		2.25	2.50	-9.9	30.0
13C2-PFHxDA	Ave	1.288	1.239		2.40	2.50	-3.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_053.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 21-Apr-2018 14:16:07 ALS Bottle#: 14 Worklist Smp#: 19
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\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:27:26 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:26:11

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	1.446	1.446	0.0	1.004	6112536	2.57		103	3081	
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.441	0.0	1.000	6395742	2.57		103	43764	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.711	1.711	0.0	1.005	4851203	2.53		101	4320	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.703	-0.001	0.557	4030266	2.52		101	67481	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.738	1.738	0.0	1.000	6760992	2.31		105	24720	
298.90 > 99.00	1.738	1.738	0.0	1.000	2771383		2.44(1.25-3.74)		20377	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.739	-0.001	1.000	86837	2.36		102	2281	
D 60 M2-4:2FTS										
329.00 > 81.00	1.959	1.947	0.012	1.000	675499	NC			4279	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.959	1.959	0.0	1.000	1513745	2.53		108	64435	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.991	1.991	0.0	1.000	4700183	2.58		103	6916	
313.00 > 119.00	1.991	1.991	0.0	1.000	414517		11.34(5.03-15.10)		4945	
D 7 13C2 PFHxA										
315.00 > 270.00	1.991	1.990	0.001	1.000	4488620	2.53		101	94813	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.014	2.014	0.0	1.000	6520851	2.44		104	47688	
349.00 > 99.00	2.014	2.014	0.0	1.000	2388978		2.73(1.36-4.07)		30602	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.093	2.093	0.0	1.000	729598	NC			4085	

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	2.092	0.001	1.000	231393	NC			7807	
D 9 13C4-PFHpA										
367.00 > 322.00	2.319	2.318	0.001	1.000	4227961	2.45		98.1	73114	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.319	2.319	0.0	1.000	4564370	2.70		108	5763	
363.00 > 169.00	2.319	2.319	0.0	1.000	1768015		2.58(1.13-3.40)		8163	
D 11 18O2 PFHxS										
403.00 > 84.00	2.332	2.331	0.001	1.000	4983535	2.34		99.0	46157	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.332	2.332	0.0	1.000	5161449	2.16		95.1	11883	
399.00 > 99.00	2.332	2.332	0.0	1.000	1740601		2.97(1.50-4.49)		9617	
65 Adona										
377.00 > 251.00	2.372	2.372	0.0	1.000	14400149	NC			138317	
377.00 > 85.00	2.372	2.372	0.0	1.000	8448633		1.70(0.84-2.53)		91337	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.659	2.659	0.0	1.000	1671889	2.36		99.6	16978	
D 12 M2-6:2FTS										
429.00 > 81.00	2.659	2.658	0.001	1.000	994747	2.69		113	11050	
* 62 13C2-PFOA										
415.00 > 370.00	2.682	2.682	0.0		4618295	2.50			74722	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.682	2.682	0.0	1.000	4811410	2.37		94.6	3223	
413.00 > 169.00	2.682	2.682	0.0	1.000	2559147		1.88(0.84-2.52)		8253	
D 14 13C4 PFOA										
417.00 > 372.00	2.682	2.681	0.001	1.000	4400165	2.57		103	73110	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.689	2.689	0.0	1.000	5011180	2.50		105	22265	
449.00 > 99.00	2.689	2.689	0.0	1.000	1298173		3.86(1.94-5.82)		19409	
20 Perfluorononanoic acid										
463.00 > 419.00	3.055	3.055	0.0	1.000	3942188	2.58		103	11278	
463.00 > 169.00	3.055	3.055	0.0	1.000	959040		4.11(1.90-5.69)		21310	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.055	3.055	0.0	1.000	3890628	2.37		102	16971	
499.00 > 99.00	3.055	3.055	0.0	1.000	870489		4.47(2.31-6.93)		9078	
D 19 13C5 PFNA										
468.00 > 423.00	3.055	3.054	0.001	1.000	3661769	2.49		99.4	72582	
D 18 13C4 PFOS										
503.00 > 80.00	3.055	3.054	0.001	1.000	3604536	2.42		101	23292	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.269	3.269	0.0	1.000	6680416	NC			72400	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.393	3.393	0.0	1.000	4859499	2.67		107	44208	
D 21 13C8 FOSA										
506.00 > 78.00	3.393	3.391	0.002	1.000	4491085	2.41		96.6	35820	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.411	3.411	0.0	1.000	2766545	2.29		95.6	20805	
549.00 > 99.00	3.402	3.411	-0.009	0.997	1095218		2.53(1.33-3.97)		16641	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.411	3.411	0.0	1.000	1417152	2.40		100	68630	
D 26 M2-8:2FTS										
529.00 > 81.00	3.411	3.410	0.001	1.000	1117567	2.51		105	10317	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.421	3.421	0.0	1.000	3099247	2.39		95.7	13149	
513.00 > 169.00	3.421	3.421	0.0	1.000	554651		5.59(2.36-7.09)		8991	
D 23 13C2 PFDA										
515.00 > 470.00	3.421	3.419	0.002	1.000	3140638	2.54		101	57007	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.579	3.568	0.011	1.000	1825961	2.60		104	18162	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.579	3.579	0.0	1.000	1847084	2.54		101	11653	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.732	3.732	0.0	1.000	2410413	2.46		102	22340	
599.00 > 99.00	3.732	3.732	0.0	1.000	775007		3.11(1.39-4.16)		17987	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.743	3.743	0.0	1.000	1849297	2.67		107	37098	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.754	3.754	0.0	1.003	1672242	2.42		96.8	37743	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.754	3.754	0.0	1.000	2147396	2.44		97.8	11192	
563.00 > 169.00	3.754	3.754	0.0	1.000	541972		3.96(2.12-6.36)		11228	
D 30 13C2 PFUnA										
565.00 > 520.00	3.754	3.753	0.001	1.000	2598327	2.43		97.3	43768	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.911	3.911	0.0	1.000	10212874	NC			85551	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.054	4.054	0.0	1.003	2927255	2.62		105	3988	
613.00 > 169.00	4.044	4.054	-0.010	1.000	711404		4.11(2.13-6.40)		7084	
D 36 13C2 PFDoA										
615.00 > 570.00	4.044	4.042	0.002	1.000	2680702	2.32		93.0	36068	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.314	4.314	0.0	1.000	3293358	2.53		101	3788	
663.00 > 169.00	4.314	4.314	0.0	1.000	1074235		3.07(1.25-3.76)		8944	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.549	4.549	0.0	1.000	879228	2.66		106	7622	
713.00 > 219.00	4.549	4.549	0.0	1.000	629459		1.40(0.71-2.13)		8650	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.549	4.547	0.002	1.000	3293969	2.25		90.1	25301	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.963	4.961	0.002	1.000	5720259	2.40		96.2	17817	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.972	4.972	0.0	1.002	5488854	NC			2385	
813.00 > 169.00	4.963	4.972	-0.009	1.000	885669		6.20(2.86-8.58)		4946	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.333	5.333	0.0	1.000	6135059	NC			2020	
913.00 > 169.00	5.326	5.333	-0.007	0.999	749096		8.19(3.83-11.48)		4429	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00004 Amount Added: 1.00 Units: mL

Report Date: 24-Apr-2018 17:27:27 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_053.d

Injection Date: 21-Apr-2018 14:16:07 Instrument ID: A8_N

Lims ID: CCV L5

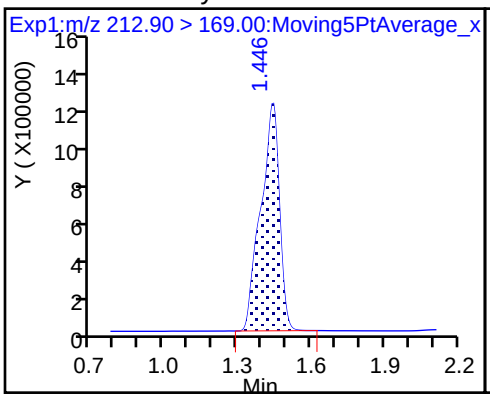
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 19

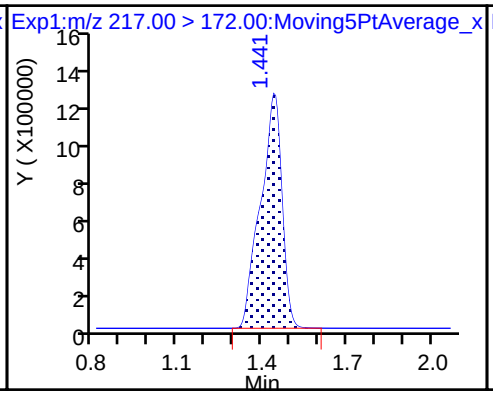
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

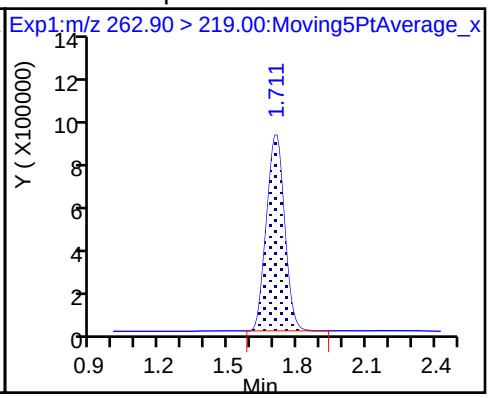
2 Perfluorobutyric acid



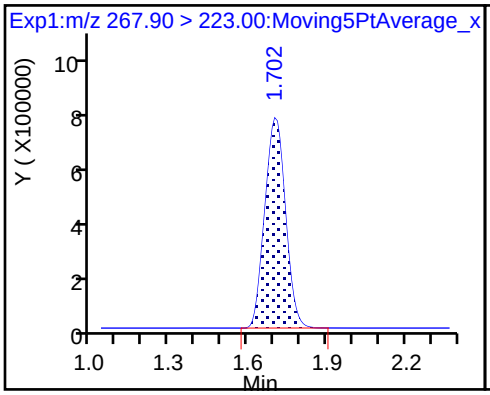
D 1 13C4 PFBA



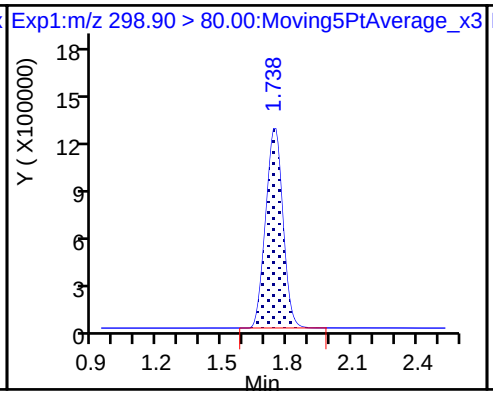
4 Perfluoropentanoic acid



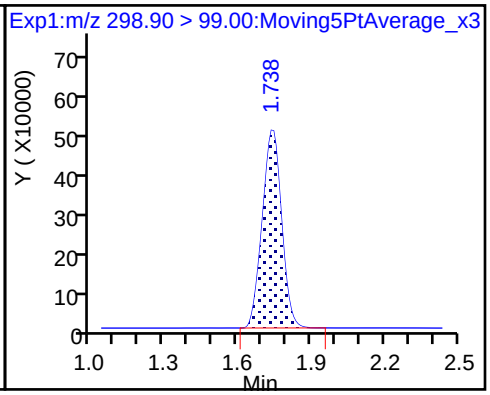
D 3 13C5-PFPeA



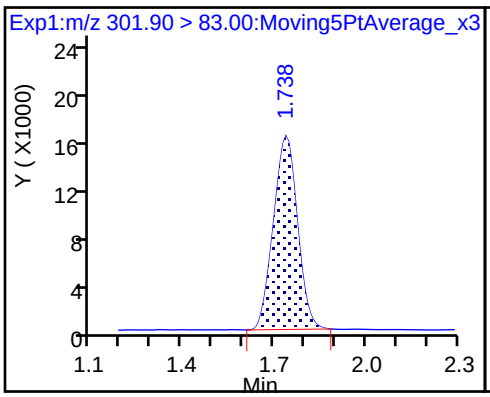
5 Perfluorobutanesulfonic acid



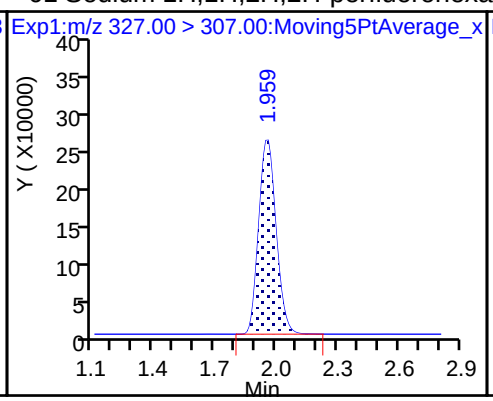
5 Perfluorobutanesulfonic acid



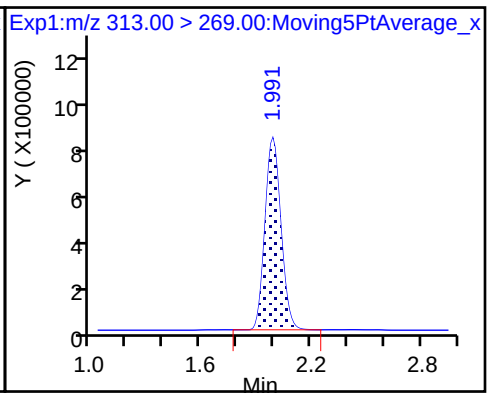
D 47 13C3-PFBS



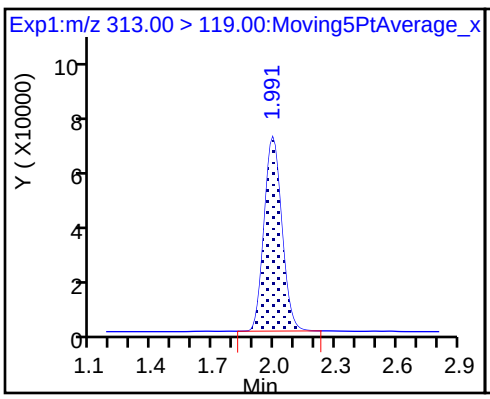
61 Sodium 1H,1H,2H,2H-perfluorohexane



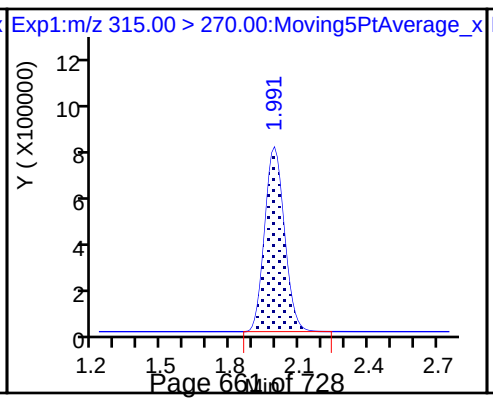
6 Perfluorohexanoic acid



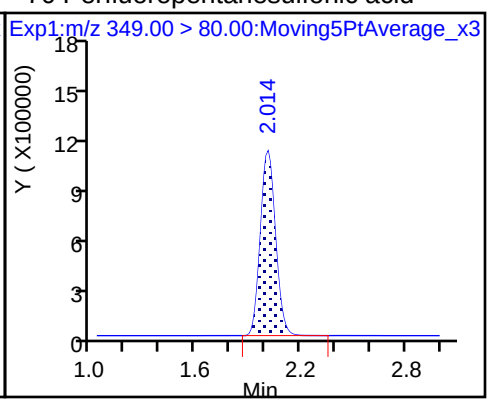
6 Perfluorohexanoic acid



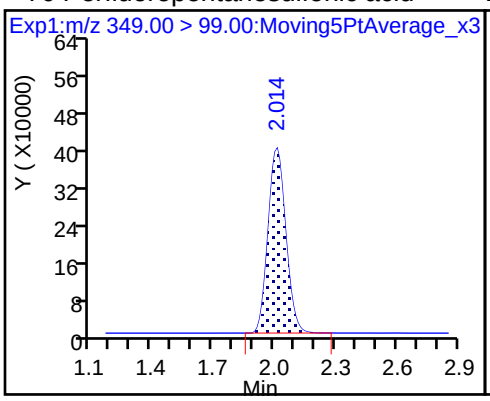
D 7 13C2 PFHxA



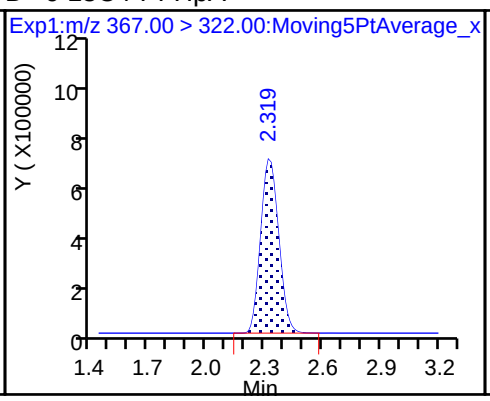
70 Perfluoropentanesulfonic acid



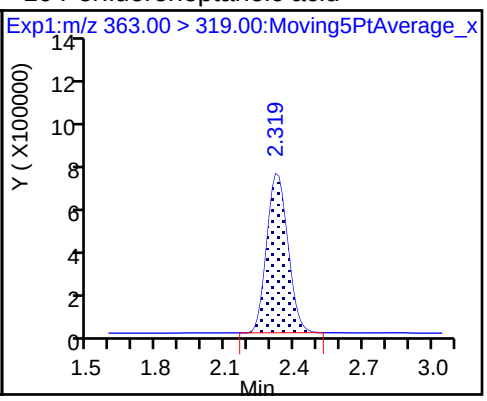
70 Perfluoropentanesulfonic acid



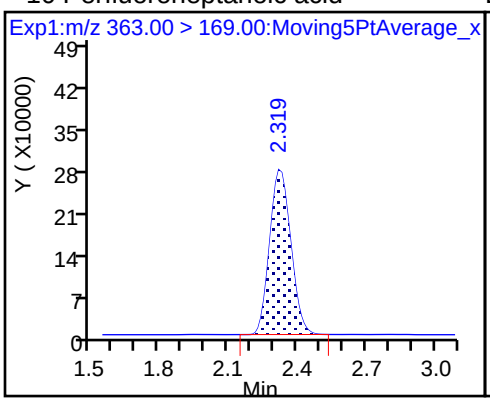
D 9 13C4-PFHpA



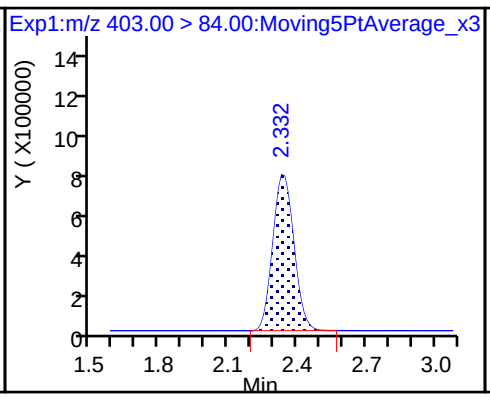
10 Perfluoroheptanoic acid



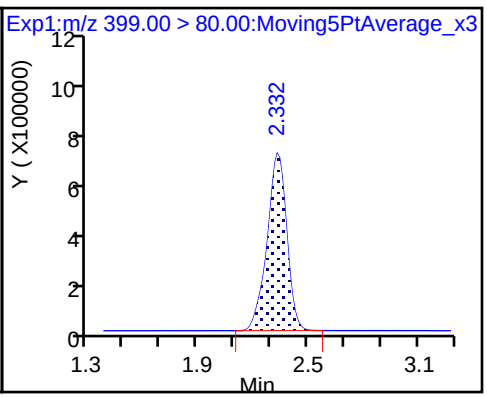
10 Perfluoroheptanoic acid



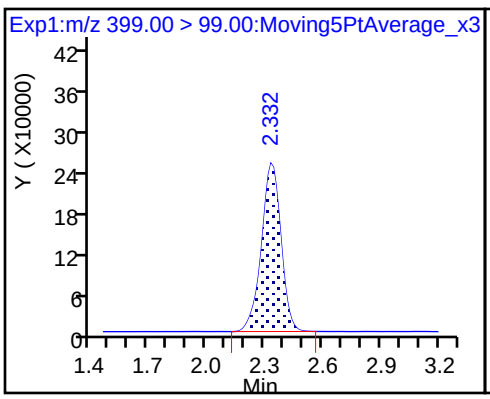
D 11 18O2 PFHxS



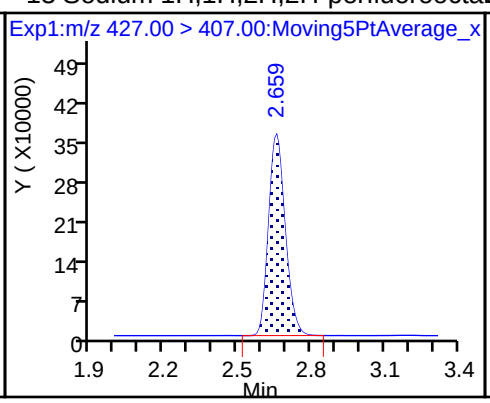
8 Perfluorohexanesulfonic acid



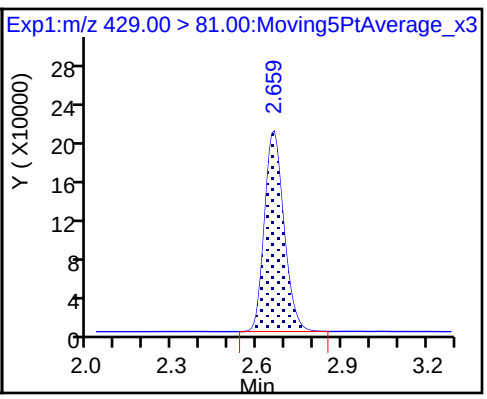
8 Perfluorohexanesulfonic acid



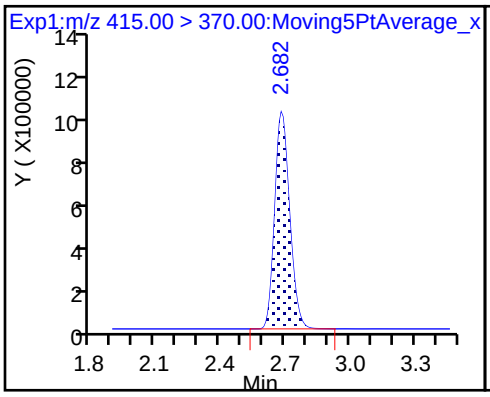
13 Sodium 1H,1H,2H,2H-perfluorooctane



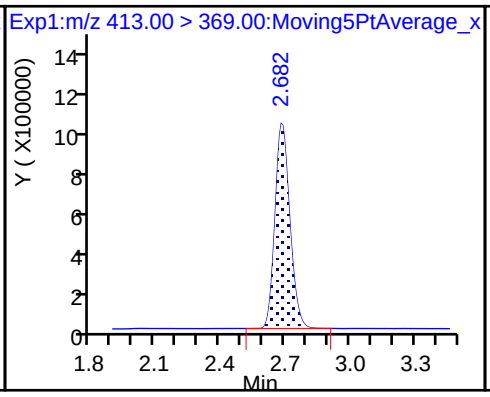
D 12 M2-6:2FTS



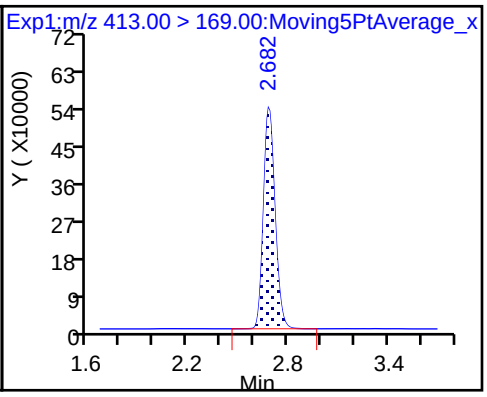
* 62 13C2-PFOA



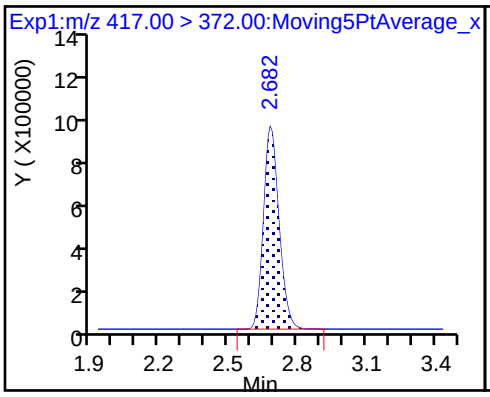
15 Perfluorooctanoic acid



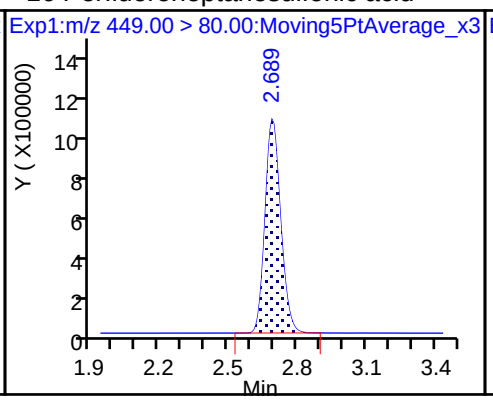
15 Perfluorooctanoic acid



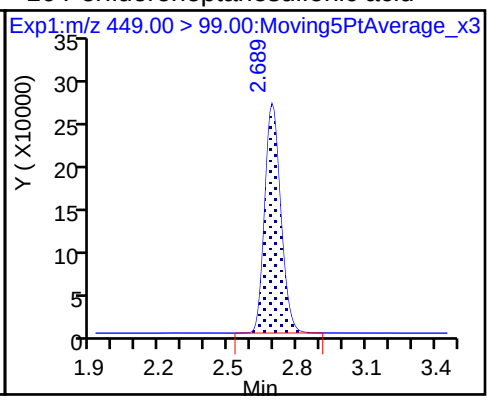
D 14 13C4 PFOA



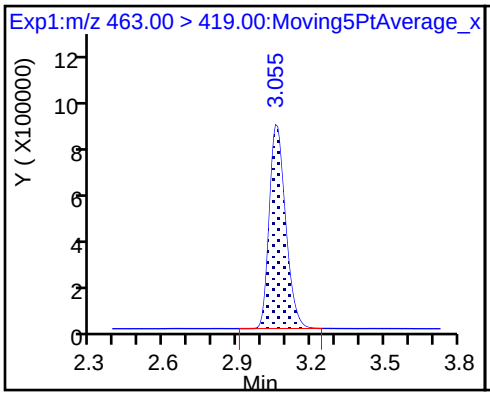
16 Perfluoroheptanesulfonic acid



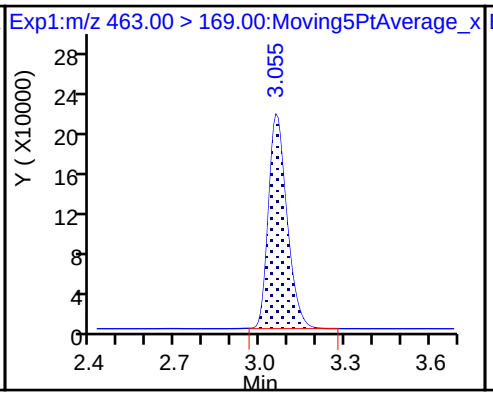
16 Perfluoroheptanesulfonic acid



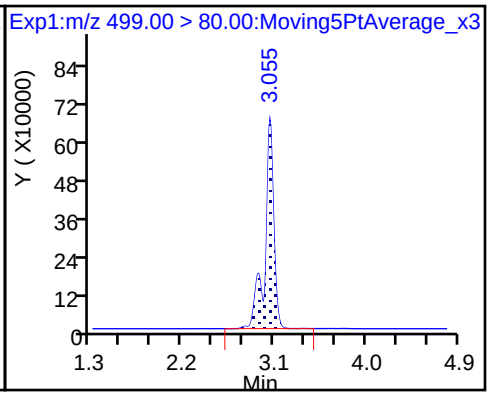
20 Perfluorononanoic acid



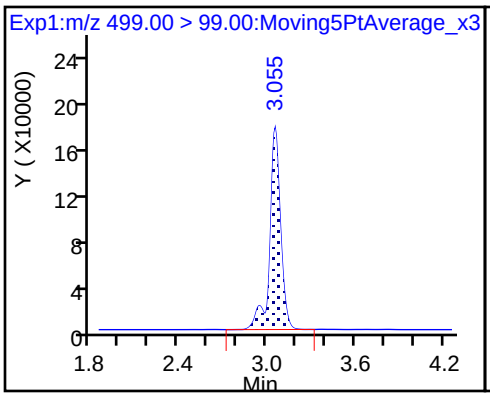
20 Perfluorononanoic acid



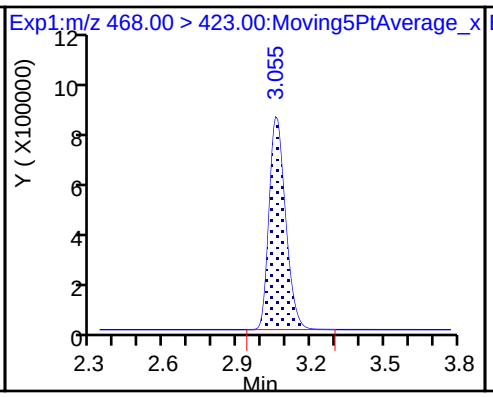
17 Perfluorooctane sulfonic acid



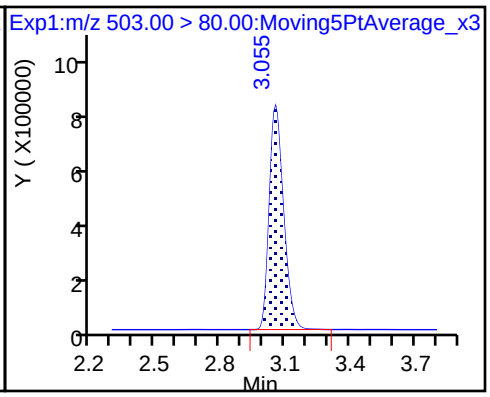
17 Perfluorooctane sulfonic acid



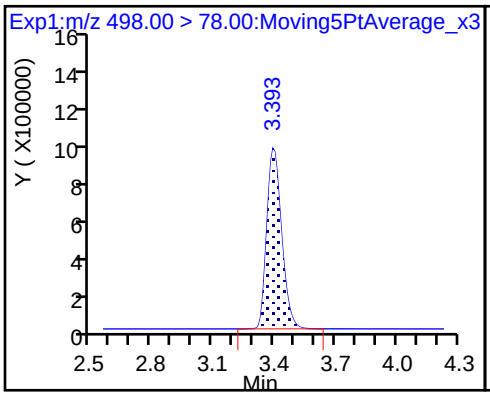
D 19 13C5 PFNA



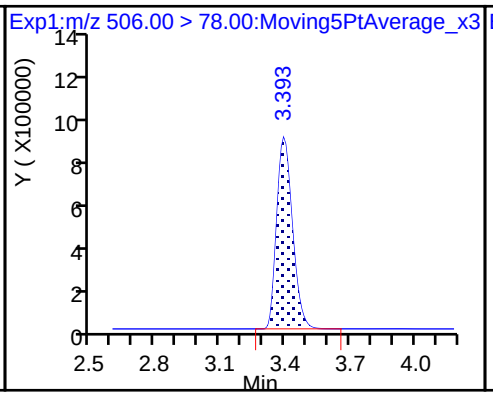
D 18 13C4 PFOS



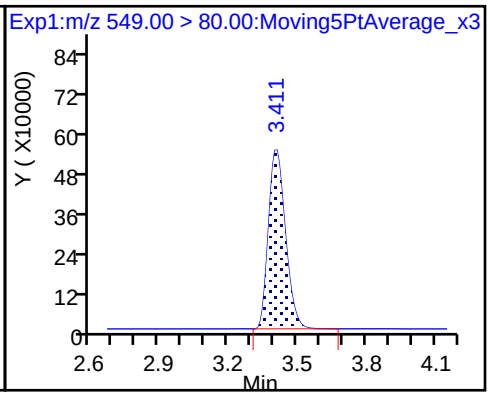
22 Perfluorooctane Sulfonamide



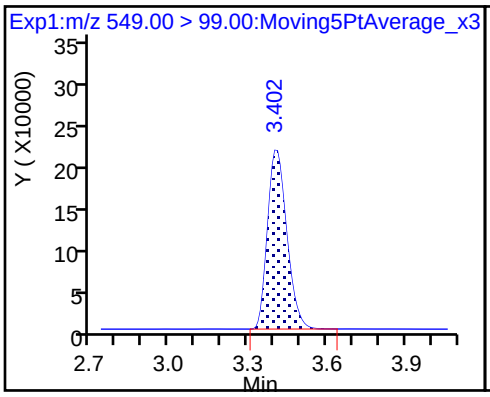
D 21 13C8 FOSA



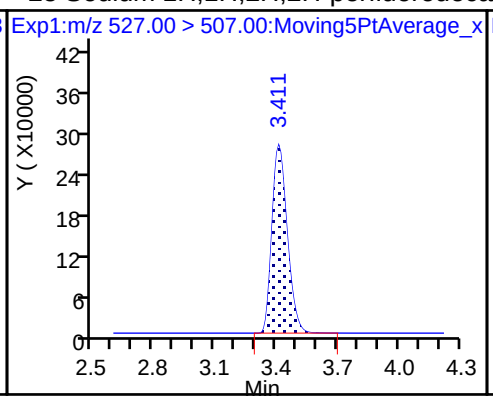
68 Perfluorononanesulfonic acid



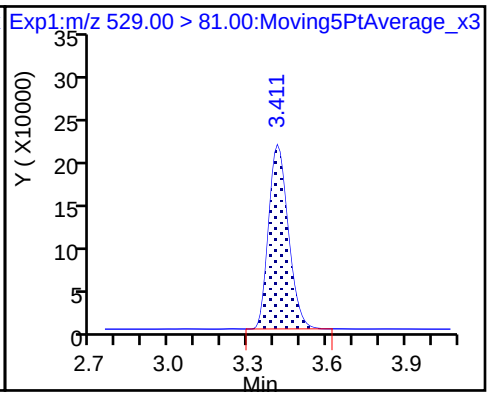
68 Perfluorononanesulfonic acid



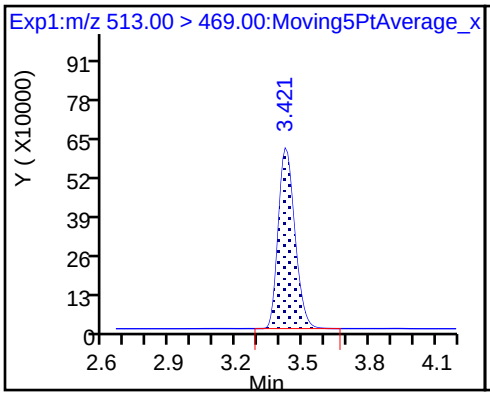
25 Sodium 1H,1H,2H,2H-perfluorodecan



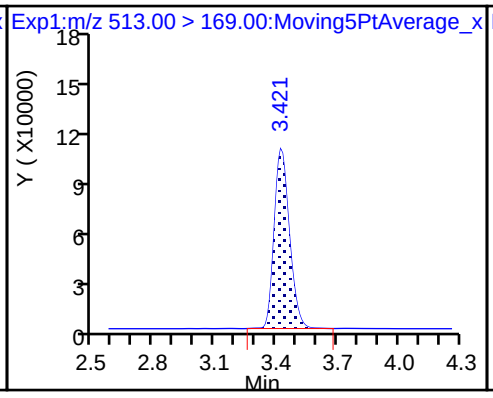
D 26 M2-8:2FTS



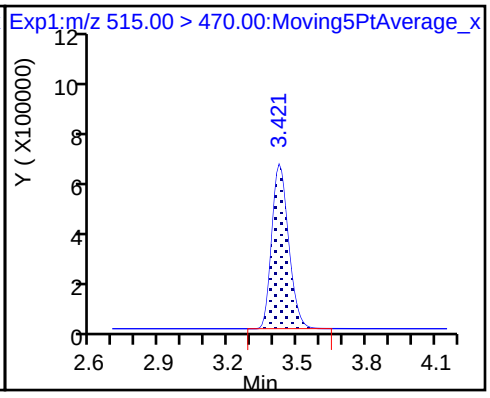
24 Perfluorodecanoic acid



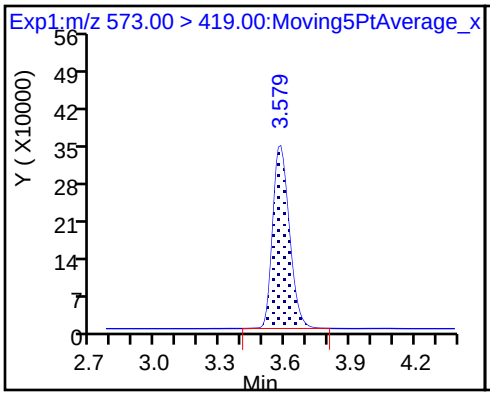
24 Perfluorodecanoic acid



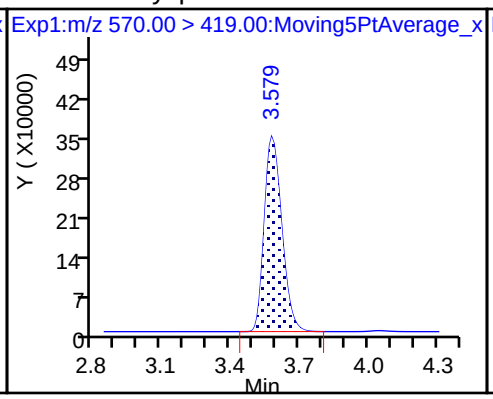
D 23 13C2 PFDA



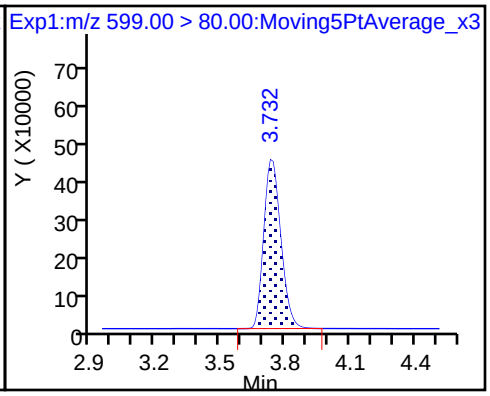
D 27 d3-NMeFOSAA



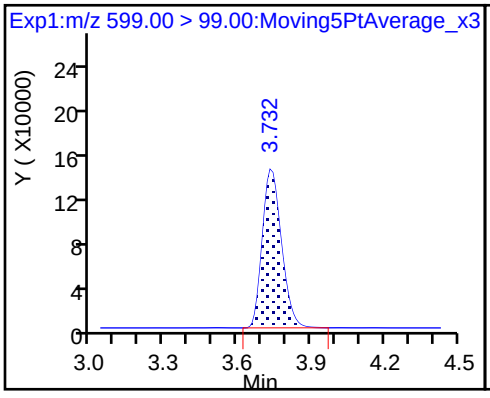
28 N-methyl perfluorooctane sulfonami



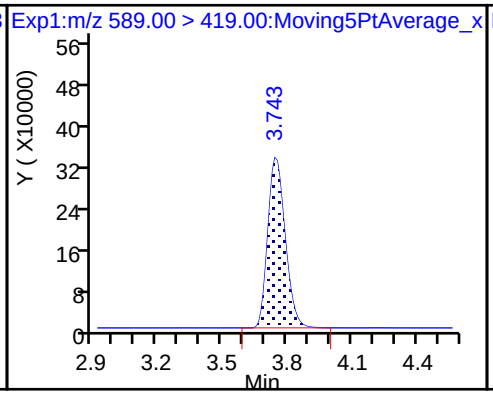
29 Perfluorodecane Sulfonic acid



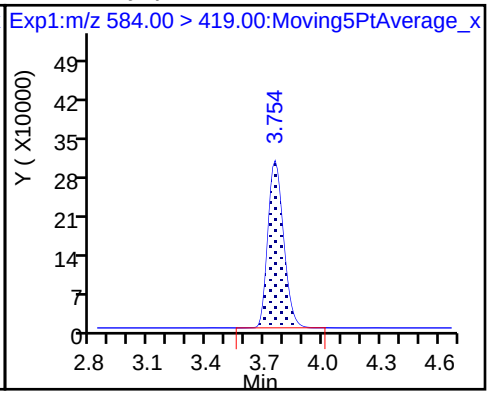
29 Perfluorodecane Sulfonic acid



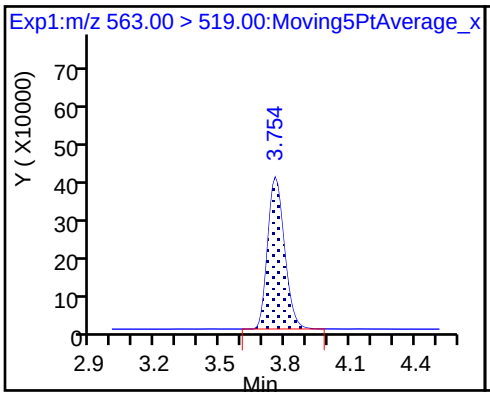
D 32 d5-NEtFOSAA



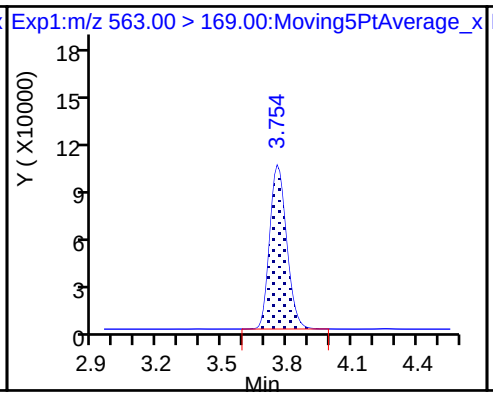
33 N-ethyl perfluorooctane sulfonamid



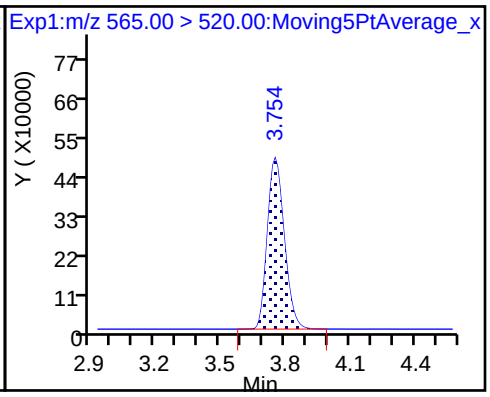
31 Perfluoroundecanoic acid



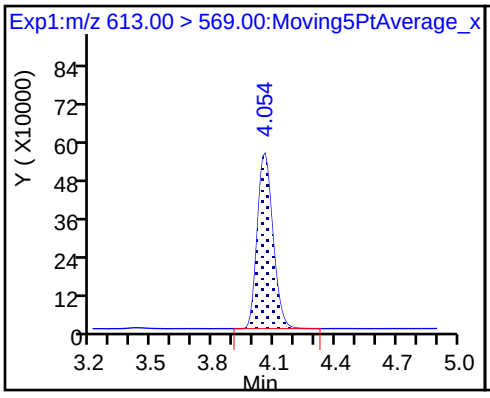
31 Perfluoroundecanoic acid



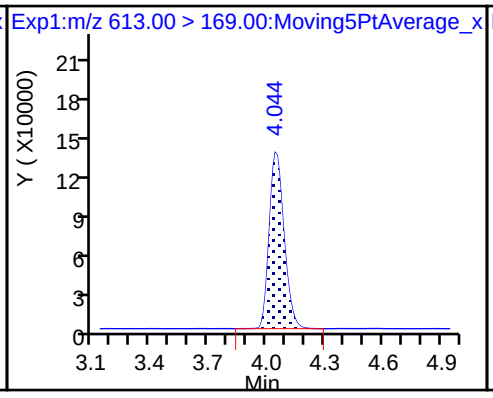
D 30 13C2 PFUnA



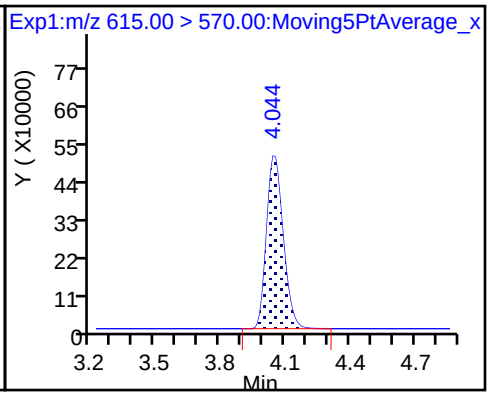
37 Perfluorododecanoic acid



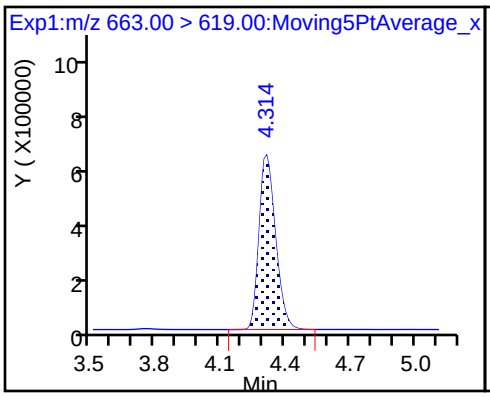
37 Perfluorododecanoic acid



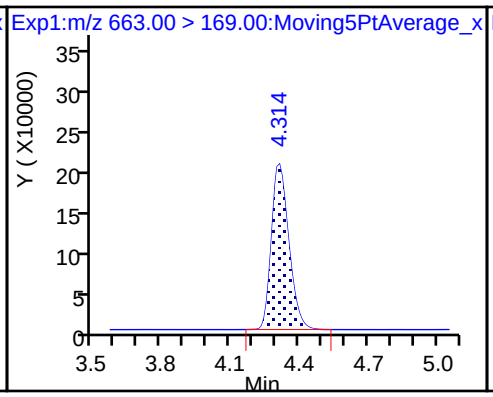
D 36 13C2 PFDoA



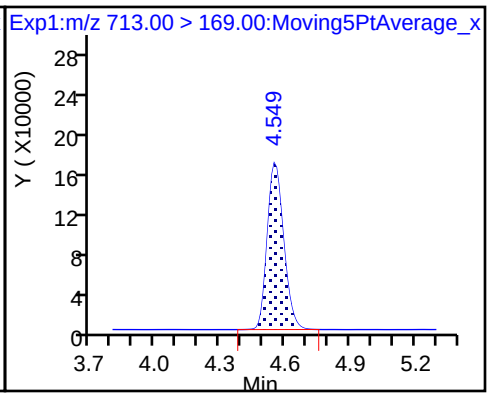
41 Perfluorotridecanoic acid



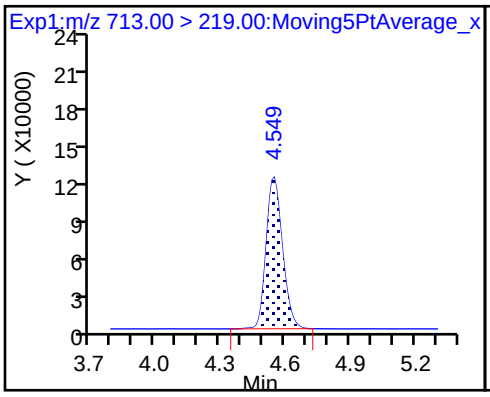
41 Perfluorotridecanoic acid



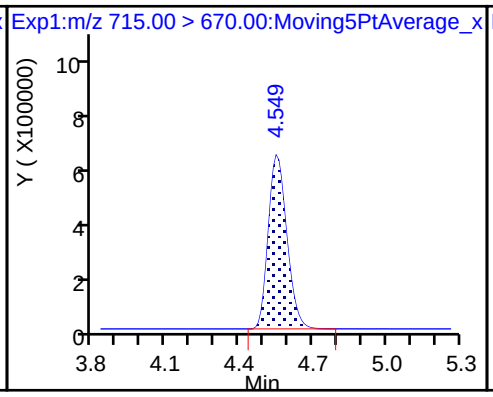
42 Perfluorotetradecanoic acid



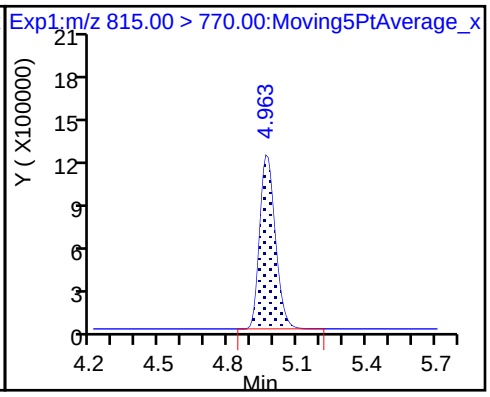
42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-218592/1-A

Matrix: Water | Lab File ID: 2018.04.20LLCX_038.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 250(mL) | Date Analyzed: 04/21/2018 12:18

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | 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 M	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-218592/1-A

Matrix: Water Lab File ID: 2018.04.20LLCX_038.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 04/18/2018 10:32

Sample wt/vol: 250(mL) Date Analyzed: 04/21/2018 12:18

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	78		50-150
STL00992	13C4 PFBA	88		50-150
STL01893	13C5 PFPeA	93		50-150
STL00993	13C2 PFHxA	90		50-150
STL01892	13C4-PFHpA	90		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	90		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	18O2 PFHxS	91		50-150
STL02116	13C2-PFTeDA	80		50-150
STL00991	13C4 PFOS	93		50-150
STL02337	13C3-PFBS	88		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_038.d
Lims ID: MB 320-218592/1-A
Client ID:
Sample Type: MB
Inject. Date: 21-Apr-2018 12:18:44 ALS Bottle#: 27 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-218592/1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:26:11 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:14:41

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	1.441	-0.005	1.000	5737829	2.21		88.4	40308	
2 Perfluorobutyric acid										
212.90 > 169.00	1.436	1.446	-0.010	1.000	5889	0.002763			1.8	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.703	-0.001	0.556	3907563	2.33		93.4	70049	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.711	-0.009	1.000	6034	0.003239			4.9	
D 47 13C3-PFBS										
301.90 > 83.00	1.729	1.739	-0.010	1.000	78997	2.06		88.5	725	
D 7 13C2 PFHxA										
315.00 > 270.00	1.982	1.990	-0.008	1.000	4146866	2.24		89.6	81793	
D 9 13C4-PFHpA										
367.00 > 322.00	2.322	2.318	0.004	1.000	4067426	2.26		90.3	94831	
D 11 18O2 PFHxS										
403.00 > 84.00	2.335	2.331	0.004	1.000	4776296	2.15		90.8	71586	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.335	2.332	0.003	1.000	16510	0.007223			54.0	
399.00 > 99.00	2.335	2.332	0.003	1.000	4552		3.63(1.50-4.49)		27.5	
D 12 M2-6:2FTS										
429.00 > 81.00	2.660	2.658	0.002	1.000	945780	2.45		103	11980	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.660	2.659	0.001	1.000	107085	0.1591			1237	
D 14 13C4 PFOA										
417.00 > 372.00	2.683	2.681	0.002	1.000	3992767	2.23		89.2	61700	
* 62 13C2-PFOA										
415.00 > 370.00	2.683	2.682	0.001		4825971	2.50			75962	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.690	2.682	0.008	1.003	7267	0.003938			4.5	
413.00 > 169.00	2.675	2.682	-0.007	0.997	5621		1.29(0.84-2.52)		14.5	
D 18 13C4 PFOS										
503.00 > 80.00	3.057	3.054	0.003	1.000	3448927	2.21		92.7	18224	
D 19 13C5 PFNA										
468.00 > 423.00	3.064	3.054	0.010	1.000	3499547	2.27		91.0	56014	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.057	3.055	0.002	1.000	42504	0.0271			134	M
499.00 > 99.00	3.057	3.055	0.002	1.000	15453		2.75(2.31-6.93)		139	
D 21 13C8 FOSA										
506.00 > 78.00	3.398	3.391	0.007	1.000	3810346	1.96		78.4	42276	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.407	3.393	0.014	1.003	2755	0.001787			21.7	
D 26 M2-8:2FTS										
529.00 > 81.00	3.416	3.410	0.006	1.000	1104490	2.38		99.2	11668	
D 23 13C2 PFDA										
515.00 > 470.00	3.426	3.419	0.007	1.000	2901653	2.24		89.7	41329	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.575	3.568	0.007	1.000	1553755	2.12		84.8	17087	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.750	3.743	0.007	1.000	1622491	2.24		89.7	23036	
D 30 13C2 PFUnA										
565.00 > 520.00	3.761	3.753	0.008	1.000	2496876	2.24		89.5	66885	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.750	3.754	-0.004	0.997	7873	0.009328			30.6	
563.00 > 169.00	3.761	3.754	0.007	1.000	1448		5.44(2.12-6.36)		35.0	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.750	3.754	-0.004	1.000	1794	0.002958			27.6	
D 36 13C2 PFDoA										
615.00 > 570.00	4.050	4.042	0.008	1.000	2567867	2.13		85.2	29001	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.547	0.005	1.000	3042288	1.99		79.6	24547	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.965	4.961	0.004	1.000	4075873	1.64		65.6	13749	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.965	4.972	-0.007	1.000	34070	NC			18.3	
813.00 > 169.00	4.965	4.972	-0.007	1.000	5579		6.11(2.86-8.58)		57.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 24-Apr-2018 17:27:01 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_038.d

Injection Date: 21-Apr-2018 12:18:44 Instrument ID: A8_N

Lims ID: MB 320-218592/1-A

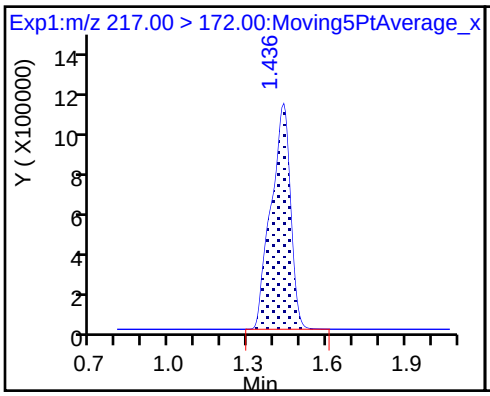
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 27 Worklist Smp#: 4

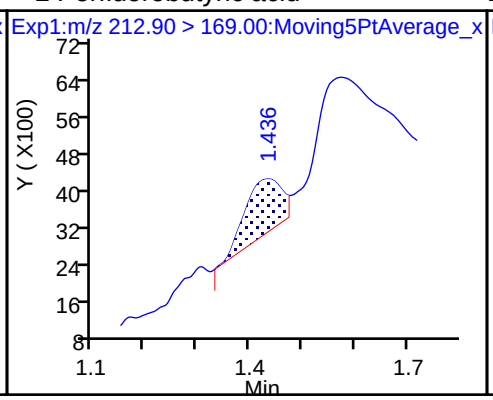
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

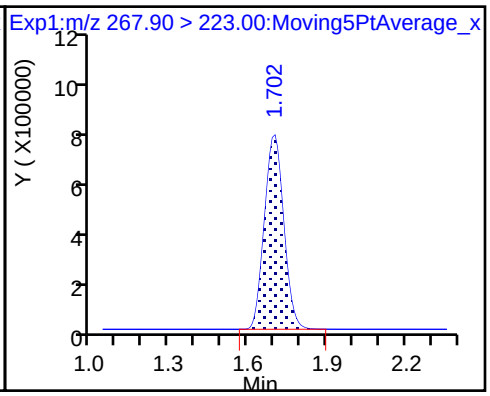
D 1 13C4 PFBA



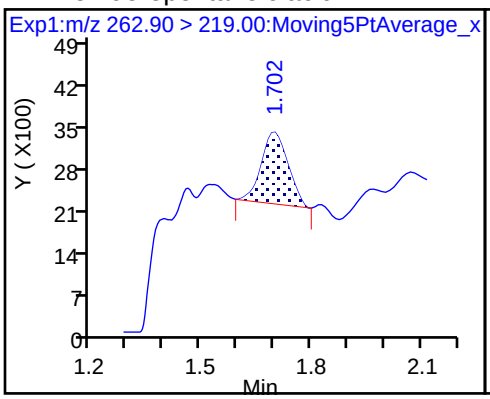
2 Perfluorobutyric acid



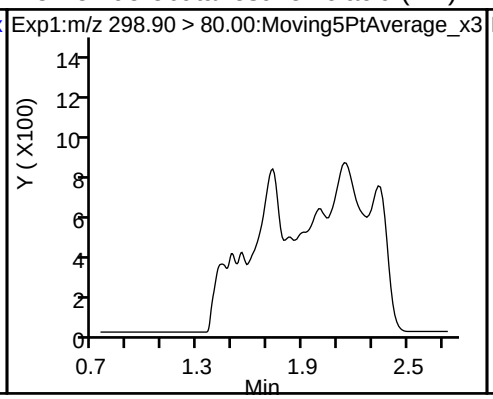
D 3 13C5-PFPeA



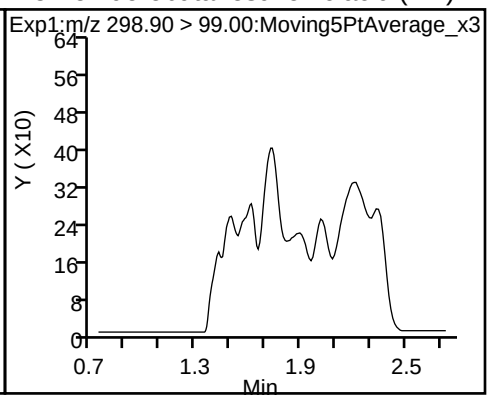
4 Perfluoropentanoic acid



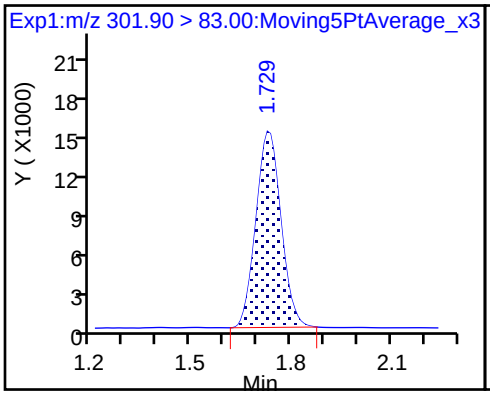
5 Perfluorobutanesulfonic acid (ND)



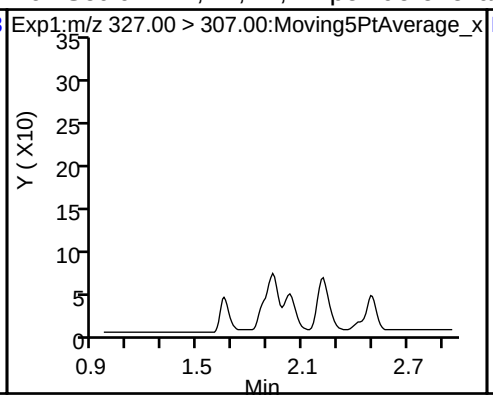
5 Perfluorobutanesulfonic acid (ND)



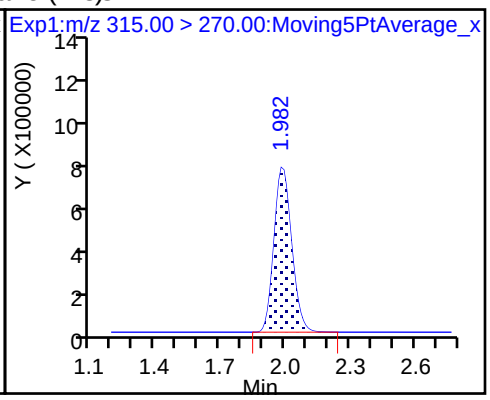
D 47 13C3-PFBS



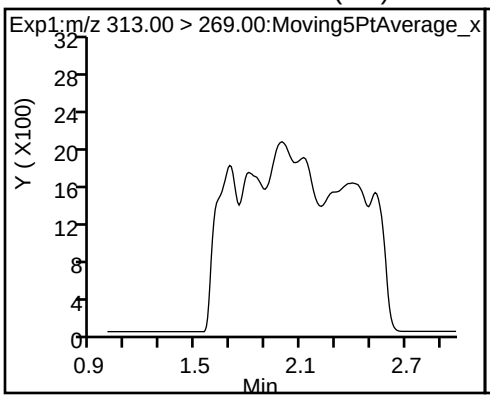
61 Sodium 1H,1H,2H,2H-perfluorohexane (ND)



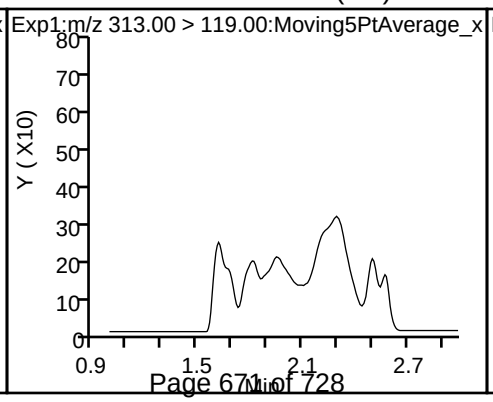
D 7 13C2 PFHxA



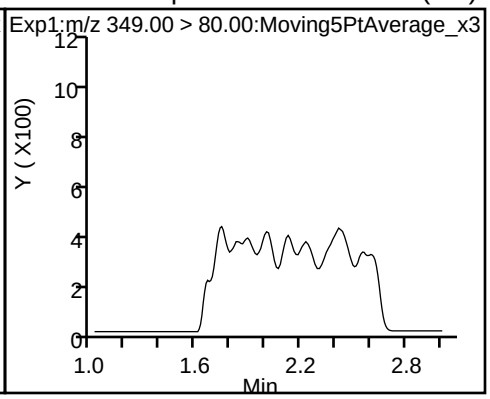
6 Perfluorohexanoic acid (ND)



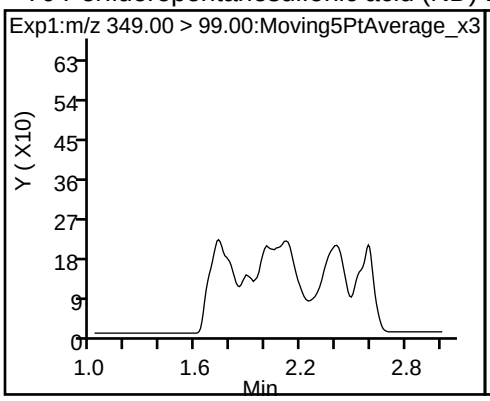
6 Perfluorohexanoic acid (ND)



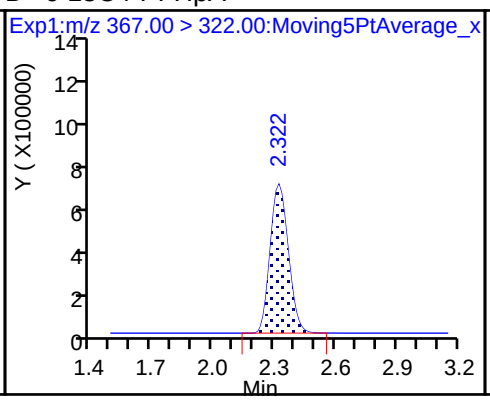
70 Perfluoropentanesulfonic acid (ND)



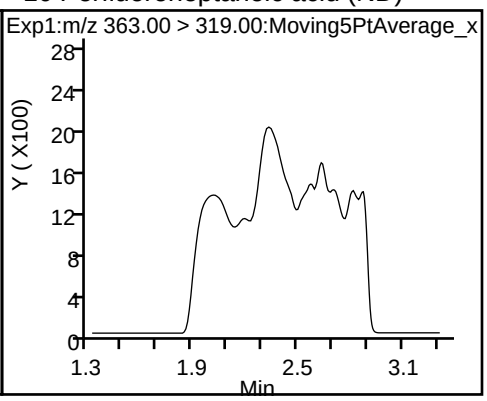
70 Perfluoropentanesulfonic acid (ND)



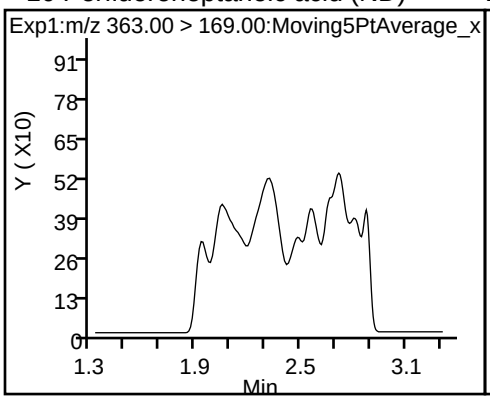
D 9 13C4-PFHpA



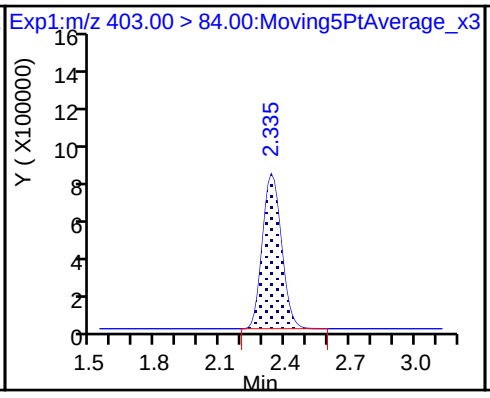
10 Perfluoroheptanoic acid (ND)



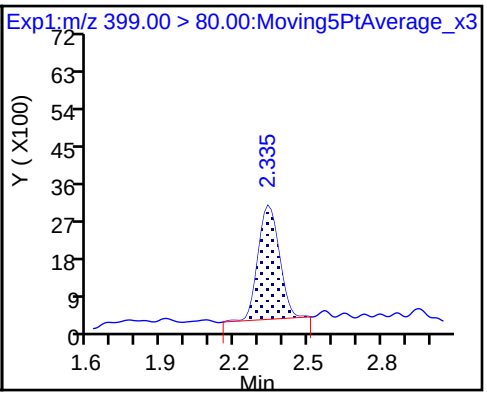
10 Perfluoroheptanoic acid (ND)



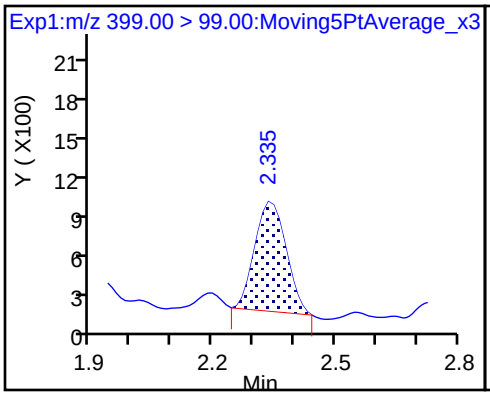
D 11 18O2 PFHxS



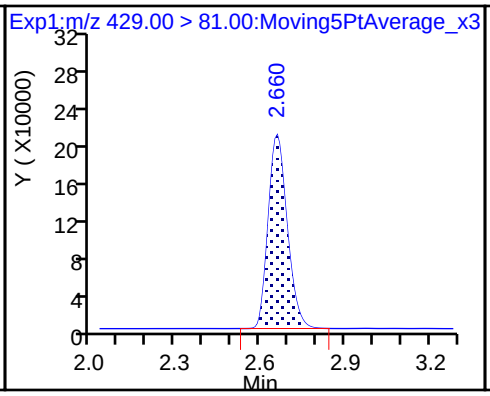
8 Perfluorohexanesulfonic acid



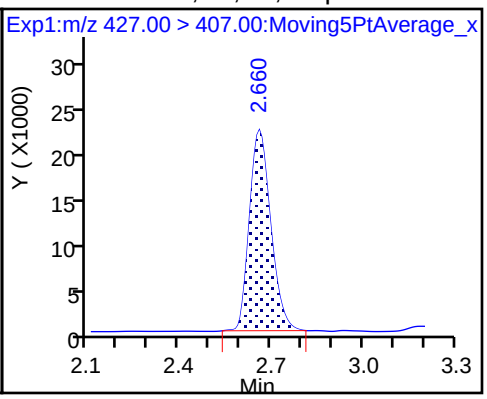
8 Perfluorohexanesulfonic acid



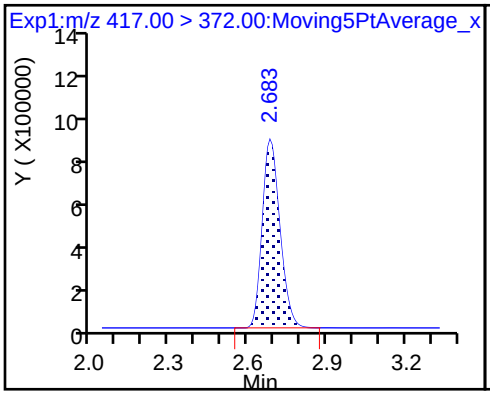
D 12 M2-6:2FTS



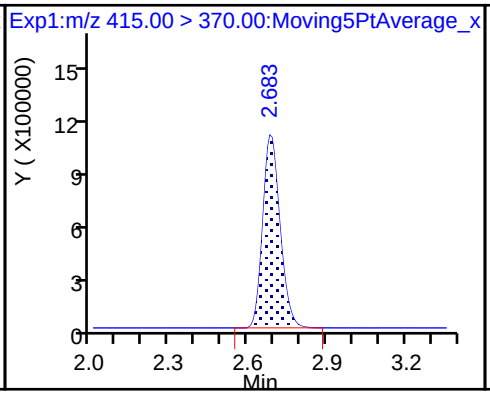
13 Sodium 1H,1H,2H,2H-perfluorooctane



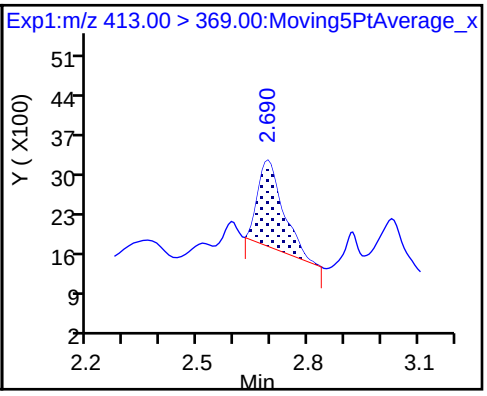
D 14 13C4 PFOA



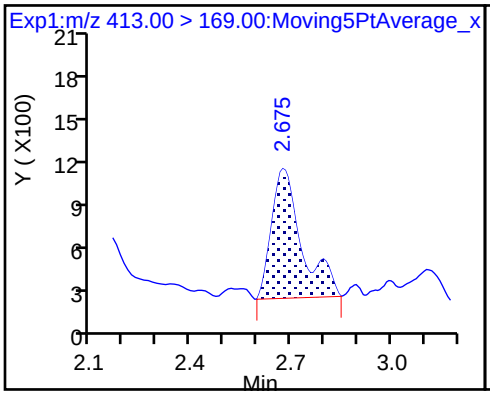
* 62 13C2-PFOA



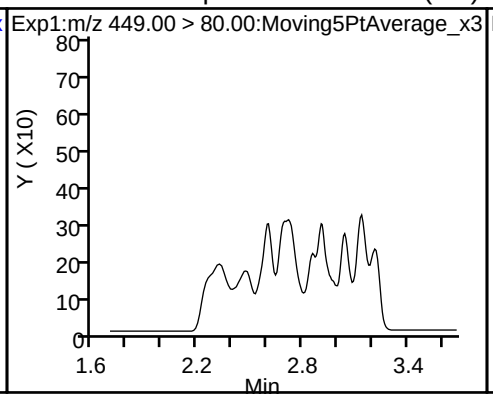
15 Perfluorooctanoic acid



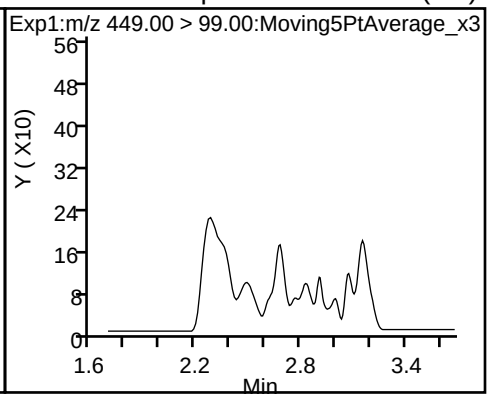
15 Perfluorooctanoic acid



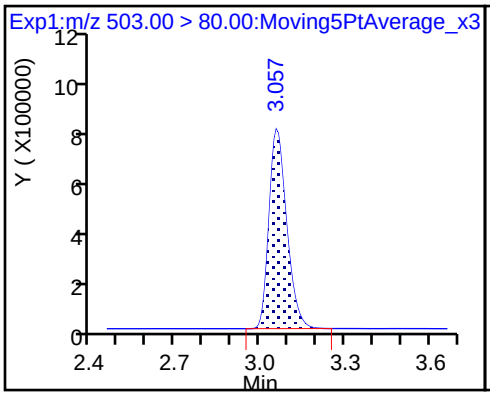
16 Perfluoroheptanesulfonic acid (ND)



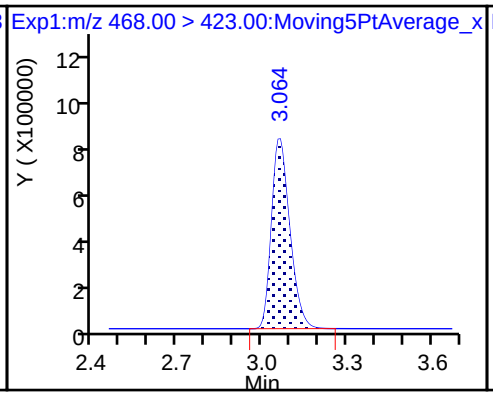
16 Perfluoroheptanesulfonic acid (ND)



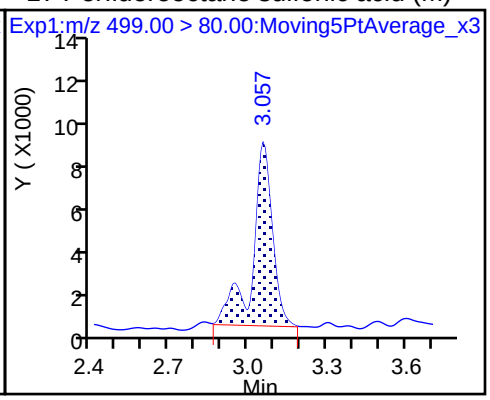
D 18 13C4 PFOS



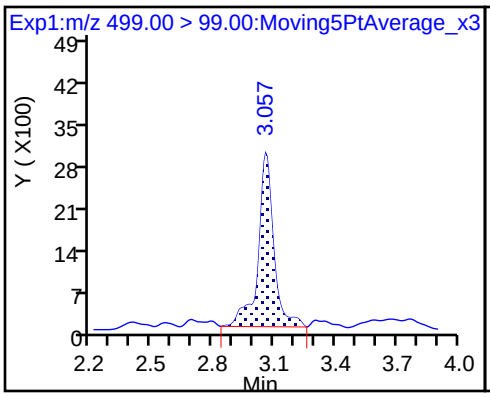
D 19 13C5 PFNA



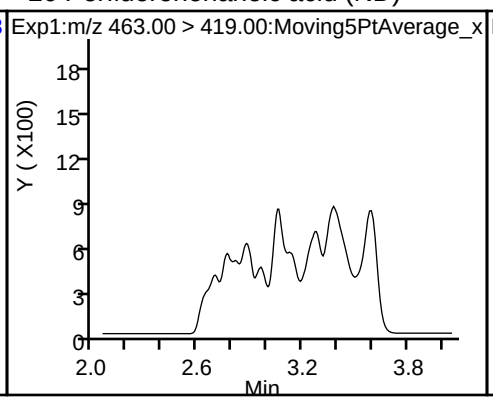
17 Perfluorooctane sulfonic acid (M)



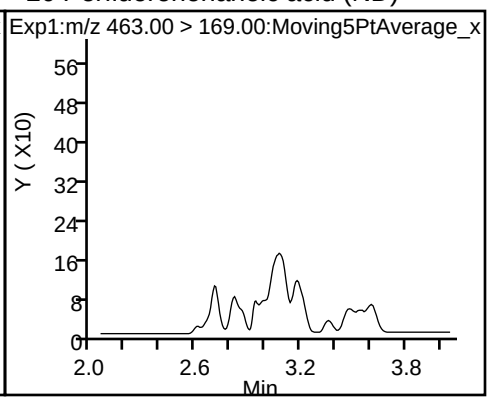
17 Perfluorooctane sulfonic acid



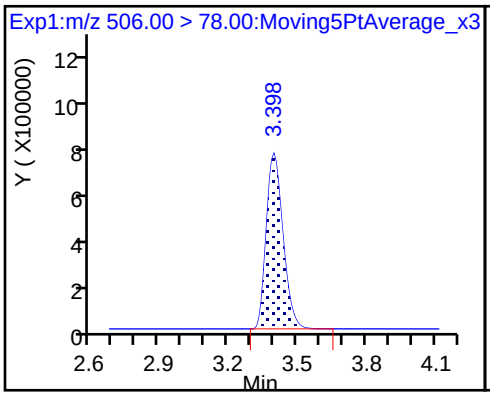
20 Perfluorononanoic acid (ND)



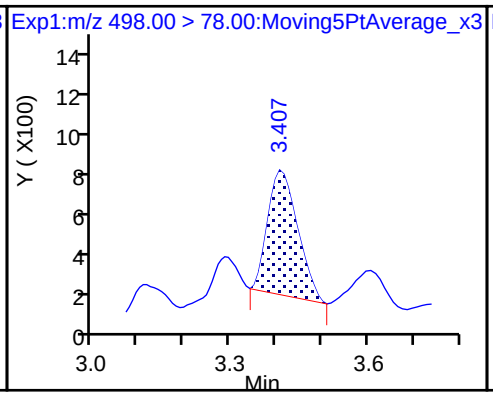
20 Perfluorononanoic acid (ND)



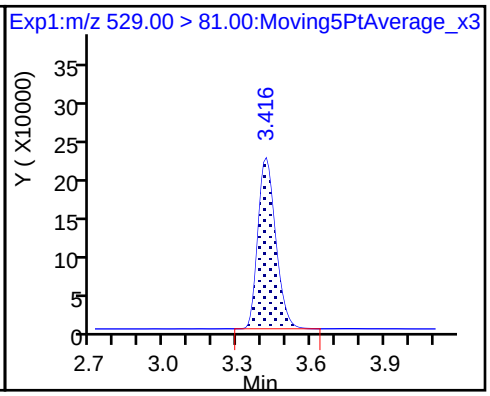
D 21 13C8 FOSA



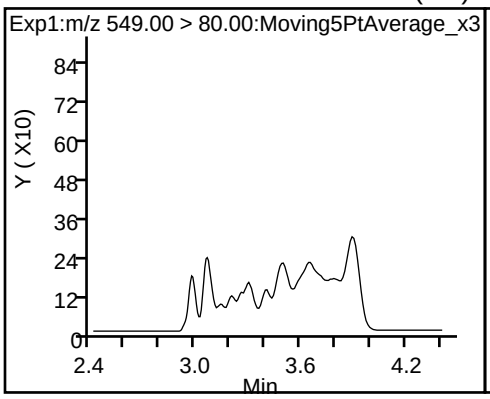
22 Perfluorooctane Sulfonamide



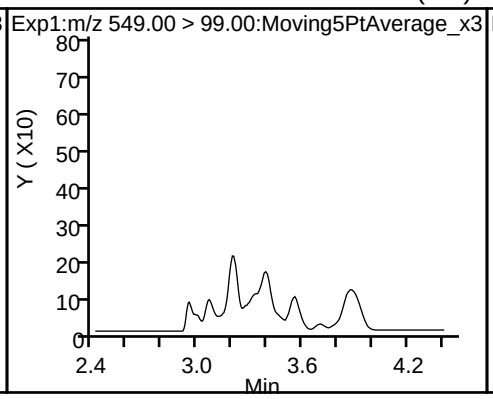
D 26 M2-8:2FTS



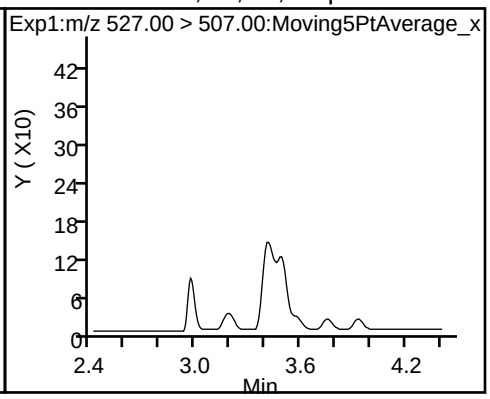
68 Perfluorononanesulfonic acid (ND)



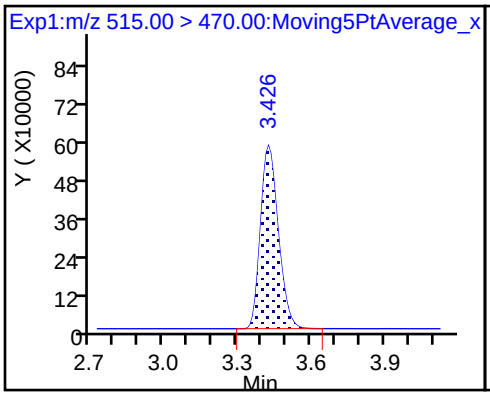
68 Perfluorononanesulfonic acid (ND)



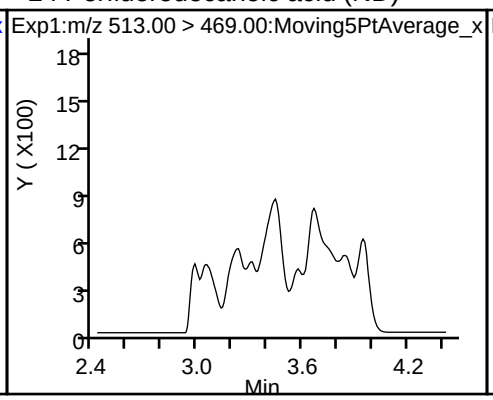
25 Sodium 1H,1H,2H,2H-perfluorodecane (ND)



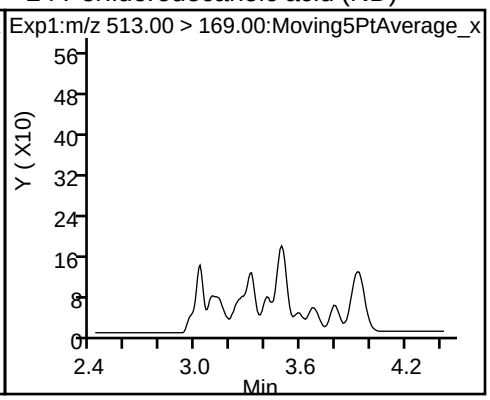
D 23 13C2 PFDA



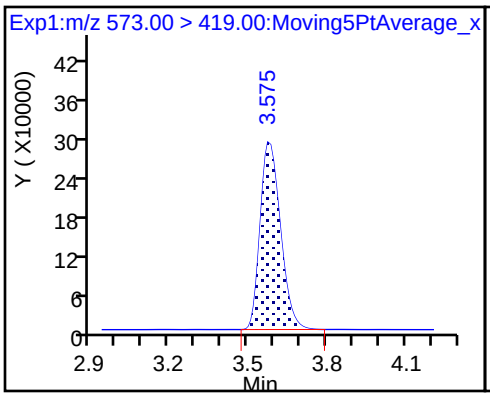
24 Perfluorodecanoic acid (ND)



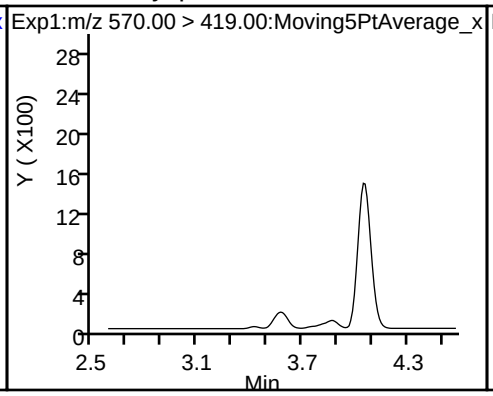
24 Perfluorodecanoic acid (ND)



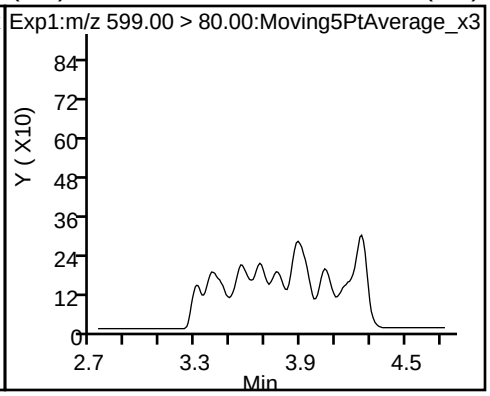
D 27 d3-NMeFOSAA



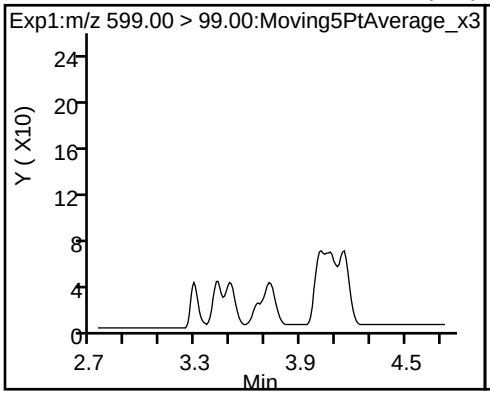
28 N-methyl perfluorooctane sulfonami (ND)



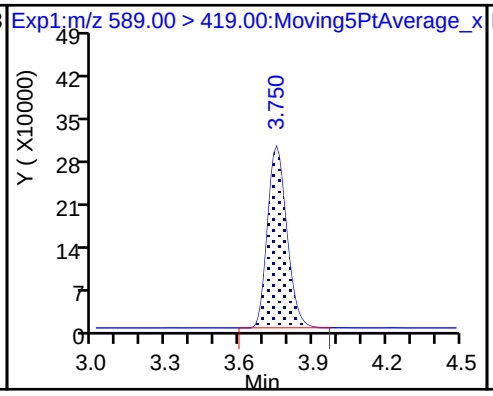
29 Perfluorodecane Sulfonic acid (ND)



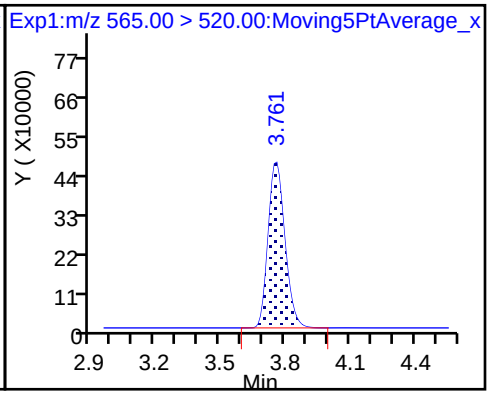
29 Perfluorodecane Sulfonic acid (ND)



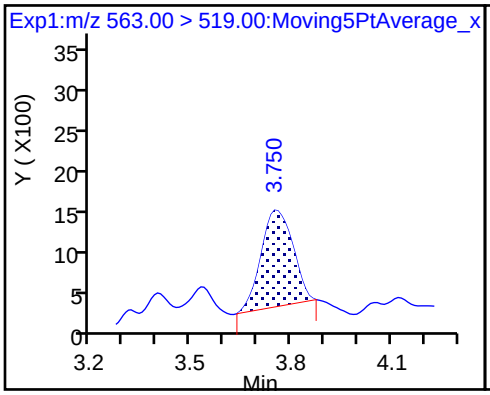
D 32 d5-NEtFOSAA



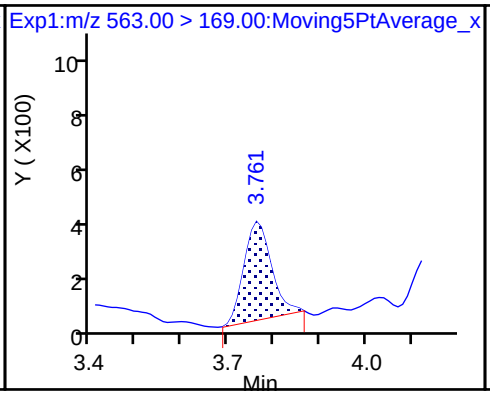
D 30 13C2 PFUnA



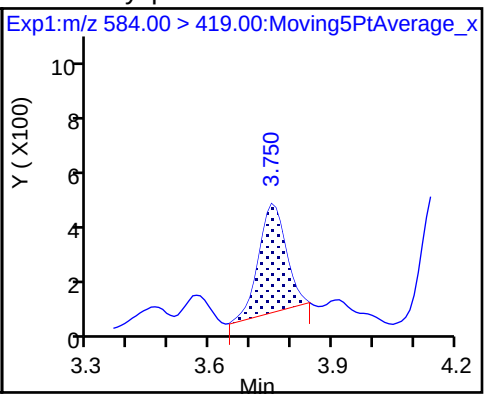
31 Perfluoroundecanoic acid



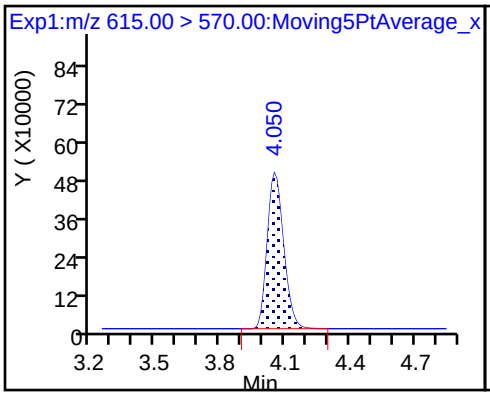
31 Perfluoroundecanoic acid



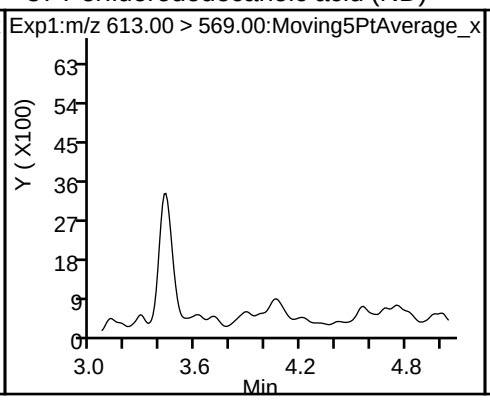
33 N-ethyl perfluorooctane sulfonamid



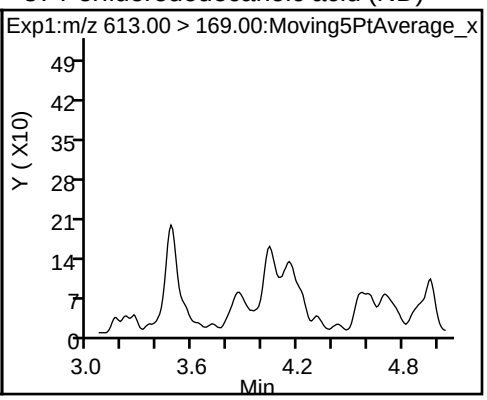
D 36 13C2 PFDoA



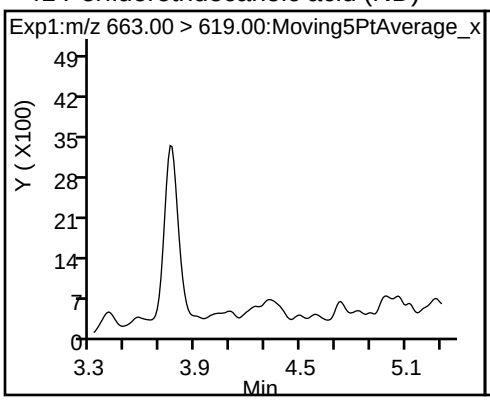
37 Perfluorododecanoic acid (ND)



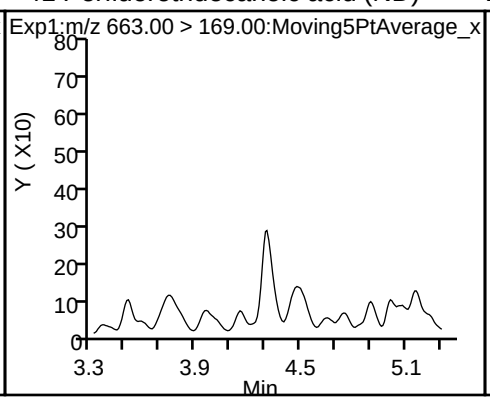
37 Perfluorododecanoic acid (ND)



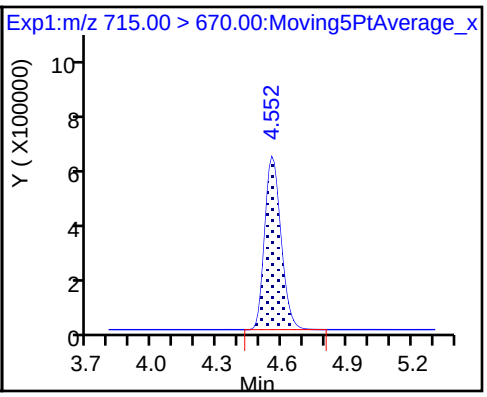
41 Perfluorotridecanoic acid (ND)



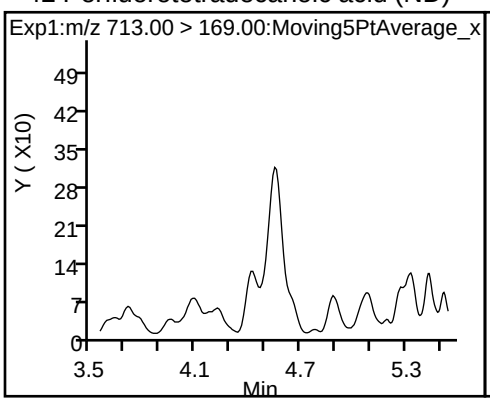
41 Perfluorotridecanoic acid (ND)



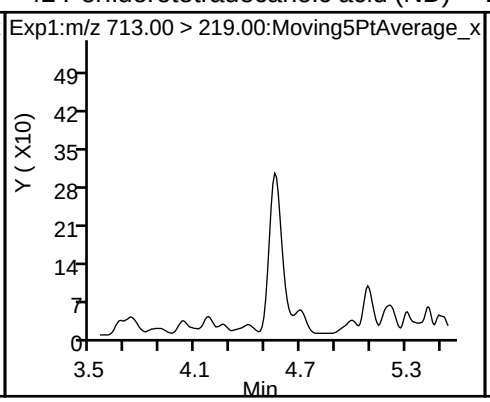
D 43 13C2-PFTeDA



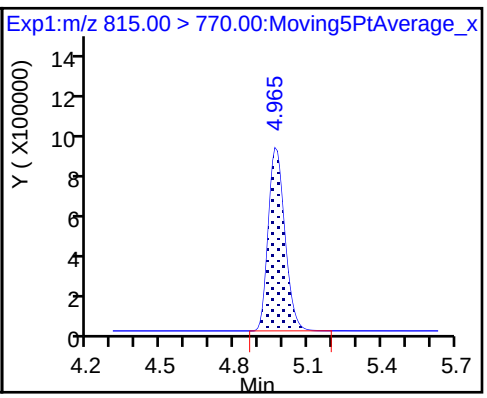
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

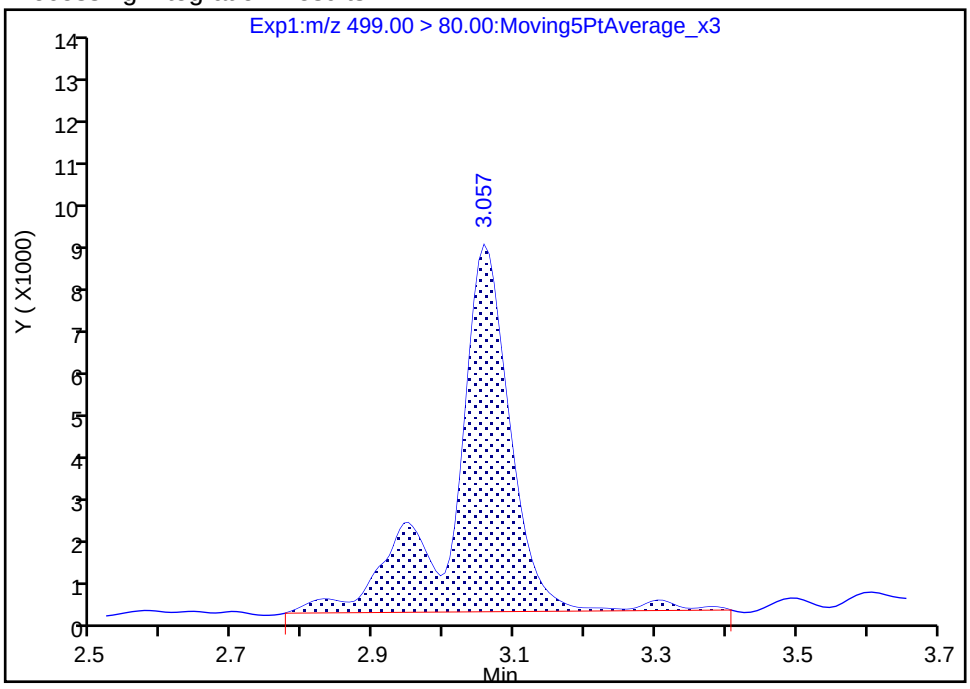
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_038.d				
Injection Date:	21-Apr-2018 12:18:44	Instrument ID:	A8_N		
Lims ID:	MB 320-218592/1-A				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	27	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

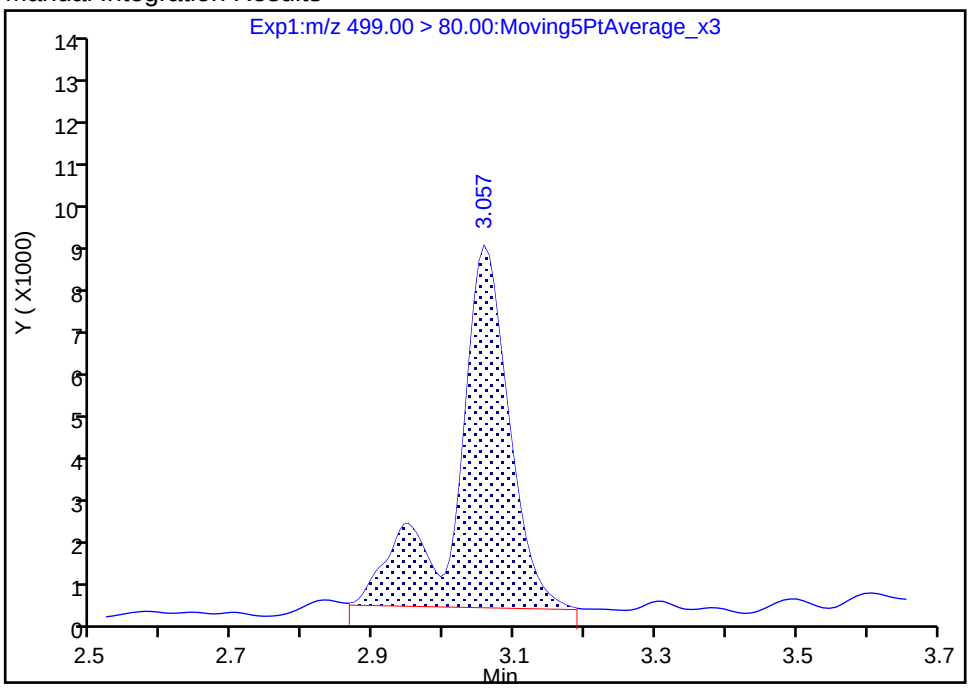
Processing Integration Results

RT: 3.06
Area: 47115
Amount: 0.030013
Amount Units: ng/ml



Manual Integration Results

RT: 3.06
Area: 42504
Amount: 0.027076
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:14:24

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: | Lab Sample ID: CCB 320-219174/1

Matrix: Water | Lab File ID: 2018.04.21LLA_004.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 04/21/2018 11:55

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.: 219174 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00698	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.: 320-37938-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 320-219174/1

Matrix: Water Lab File ID: 2018.04.21LLA_004.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 04/21/2018 11:55

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.: 219174 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	97		50-150
STL00992	13C4 PFBA	99		50-150
STL01893	13C5 PFPeA	97		50-150
STL00993	13C2 PFHxA	101		50-150
STL01892	13C4-PFHpA	98		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	101		50-150
STL00996	13C2 PFDA	103		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	94		50-150
STL00994	18O2 PFHxS	99		50-150
STL02116	13C2-PFTeDA	99		50-150
STL00991	13C4 PFOS	101		50-150
STL02337	13C3-PFBS	100		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.21LLA_004.d
Lims ID: CCB
Client ID:
Sample Type: CCB
Inject. Date: 21-Apr-2018 11:55:18 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\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 23-Apr-2018 08:23:03 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK037

First Level Reviewer: hannigana Date: 23-Apr-2018 11:36:43

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	0.996	5108	0.002312			2.0	
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.441	0.0	1.000	5948894	2.49		99.4	41354	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.703	-0.001	1.000	5685	0.003188			4.7	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.703	-0.001	0.556	3741213	2.43		97.0	69628	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.739	-0.001	1.000	82589	2.33		100	642	
D 60 M2-4:2FTS										
329.00 > 81.00	1.959	1.947	0.012	1.000	647495	NC			6251	
D 7 13C2 PFHxA										
315.00 > 270.00	1.991	1.990	0.001	1.000	4318724	2.53		101	91808	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.093	2.092	0.001	1.000	237769	NC			8237	
D 9 13C4-PFHpA										
367.00 > 322.00	2.319	2.318	0.001	1.000	4075379	2.45		98.2	57897	
D 11 18O2 PFHxS										
403.00 > 84.00	2.345	2.331	0.014	1.000	4785957	2.34		98.8	49981	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.332	2.333	-0.001	0.994	15991	0.006982			53.1	
399.00 > 99.00	2.345	2.333	0.012	1.000	4089		3.91(1.50-4.49)		23.0	
D 12 M2-6:2FTS										
429.00 > 81.00	2.659	2.658	0.001	1.000	929058	2.61		110	12150	
* 62 13C2-PFOA										
415.00 > 370.00	2.689	2.676	0.013		4447416	2.50			55766	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.689	2.676	0.013	1.000	10218	0.005420			6.0	
413.00 > 169.00	2.681	2.676	0.005	0.997	0		0.00(0.84-2.52)			
D 14 13C4 PFOA										
417.00 > 372.00	2.689	2.681	0.008	1.000	4079535	2.47		98.9	78181	
20 Perfluorononanoic acid										R
463.00 > 419.00	2.954	3.054	-0.100	0.964	1957	0.001312			7.3	R
463.00 > 169.00	2.967	3.054	-0.087	0.969	1605		1.22(1.90-5.69)		27.9	
D 19 13C5 PFNA										
468.00 > 423.00	3.063	3.054	0.009	1.000	3576452	2.52		101	67134	
D 18 13C4 PFOS										
503.00 > 80.00	3.063	3.054	0.009	1.000	3463828	2.41		101	23064	
D 21 13C8 FOSA										
506.00 > 78.00	3.402	3.391	0.011	1.000	4358458	2.43		97.3	32886	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.402	3.408	-0.006	0.997	1166	0.002049			102	
D 26 M2-8:2FTS										
529.00 > 81.00	3.412	3.410	0.002	1.000	1077170	2.51		105	8348	
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.419	0.011	1.000	3058598	2.57		103	87209	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.579	3.568	0.011	1.000	1784427	2.64		106	21165	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.754	3.743	0.011	1.000	1860616	2.79		112	23099	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.764	3.751	0.013	1.003	4250	0.005188			19.4	
563.00 > 169.00	3.764	3.751	0.013	1.003	1466		2.90(2.12-6.36)		41.7	
D 30 13C2 PFUnA										
565.00 > 520.00	3.754	3.753	0.001	1.000	2423410	2.36		94.3	45149	
D 36 13C2 PFDoA										
615.00 > 570.00	4.052	4.042	0.010	1.000	2610271	2.35		94.0	29103	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.553	4.547	0.006	1.000	3471663	2.47		98.6	30839	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.975	4.961	0.014	1.000	5615992	2.45		98.0	17946	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.975	4.967	0.008	1.000	51470	NC			26.8	
813.00 > 169.00	4.975	4.967	0.008	1.000	8079		6.37(2.86-8.58)		59.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL0_00006 Amount Added: 1.00 Units: mL

Report Date: 23-Apr-2018 11:36:44 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.21LLA_004.d

Injection Date: 21-Apr-2018 11:55:18 Instrument ID: A8_N

Lims ID: CCB

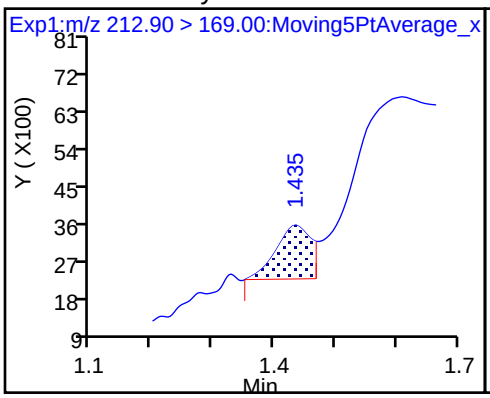
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 1

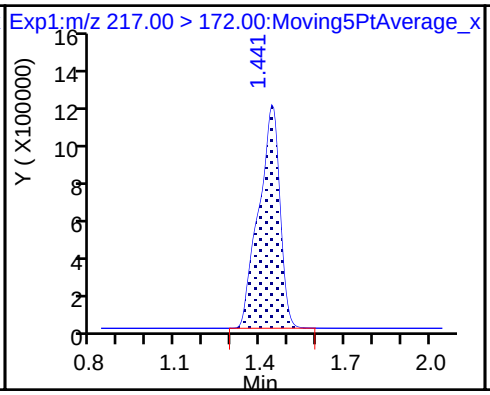
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

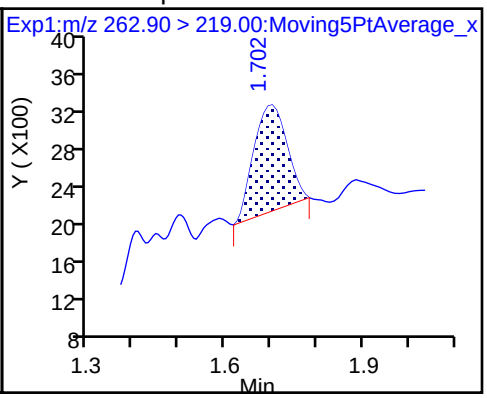
2 Perfluorobutyric acid



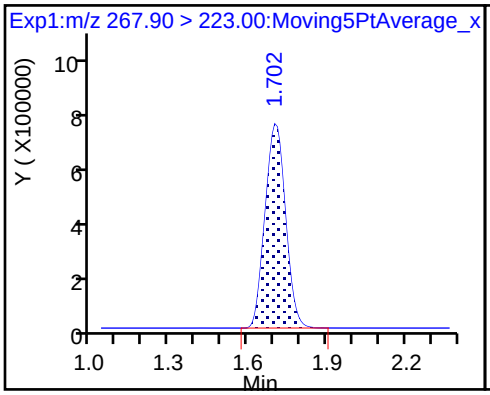
D 1 13C4 PFBA



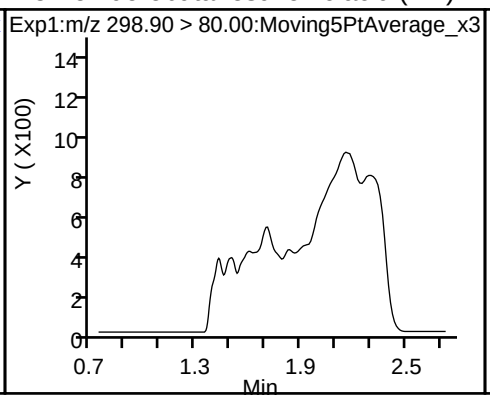
4 Perfluoropentanoic acid



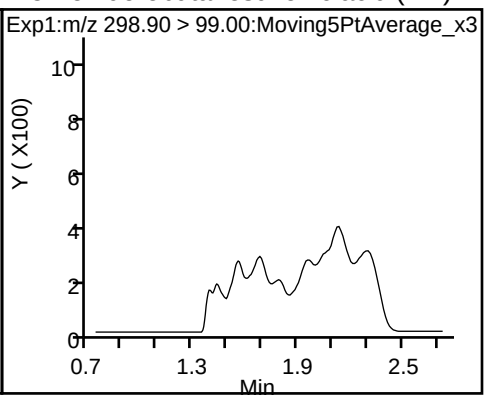
D 3 13C5-PFPeA



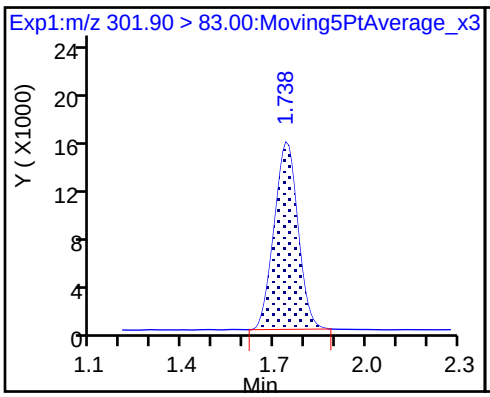
5 Perfluorobutanesulfonic acid (ND)



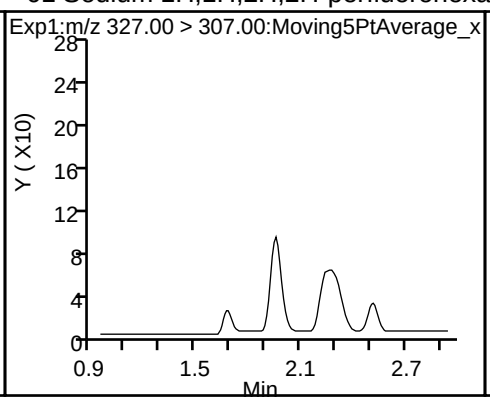
5 Perfluorobutanesulfonic acid (ND)



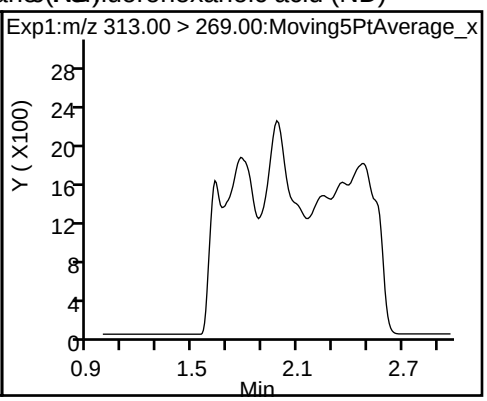
D 47 13C3-PFBS



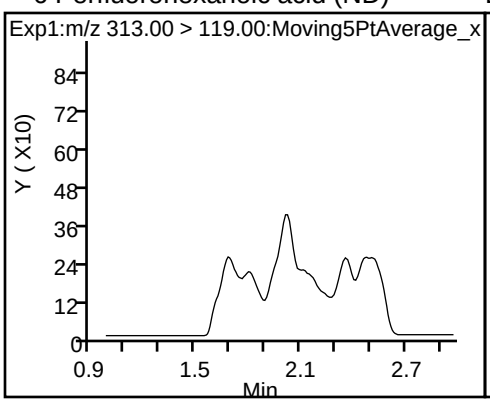
61 Sodium 1H,1H,2H,2H-perfluorohexane6(ND)



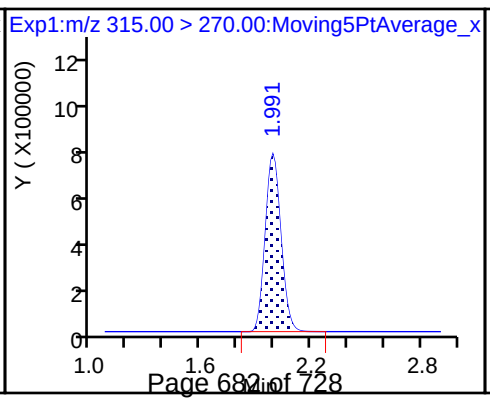
6 Perfluorohexanoic acid (ND)



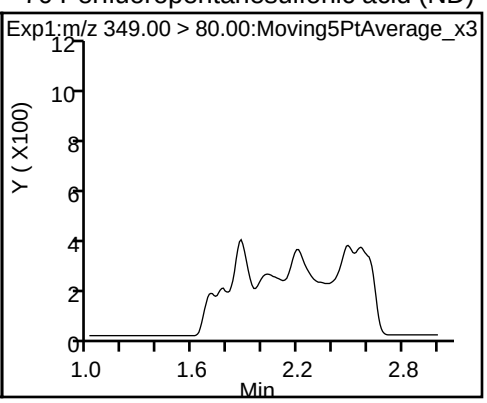
6 Perfluorohexanoic acid (ND)



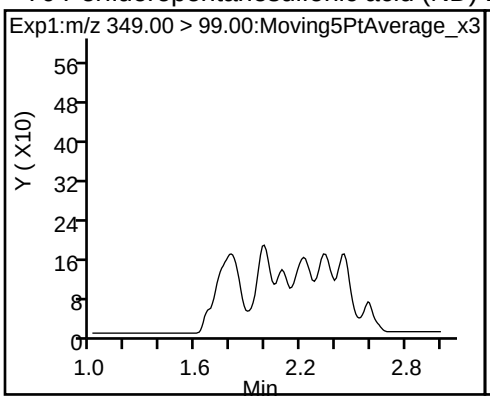
D 7 13C2 PFHxA



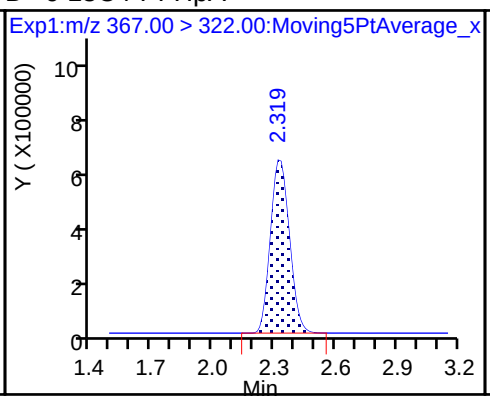
70 Perfluoropentanesulfonic acid (ND)



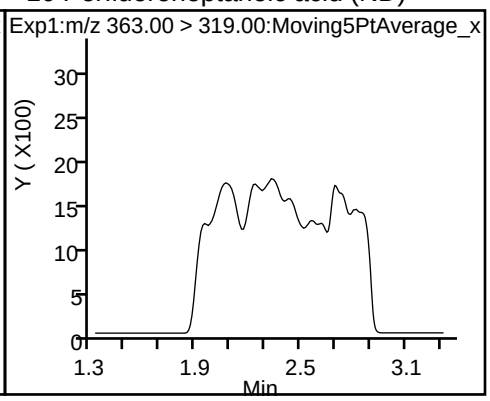
70 Perfluoropentanesulfonic acid (ND)



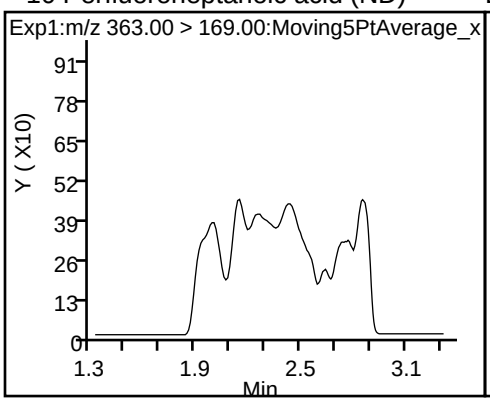
D 9 13C4-PFHpA



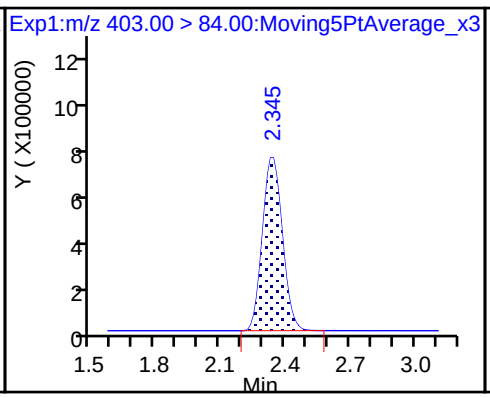
10 Perfluoroheptanoic acid (ND)



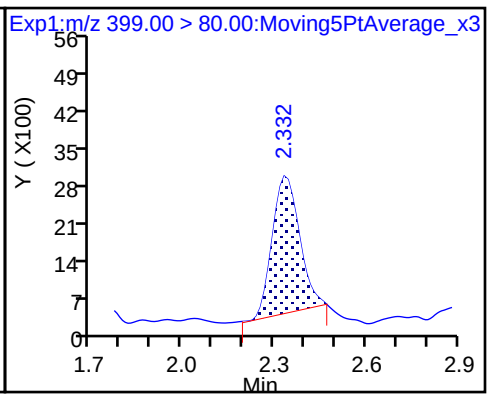
10 Perfluoroheptanoic acid (ND)



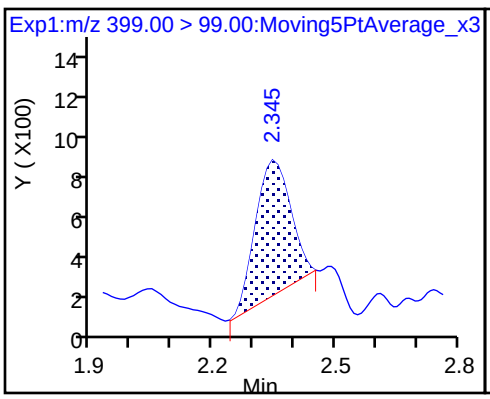
D 11 18O2 PFHxS



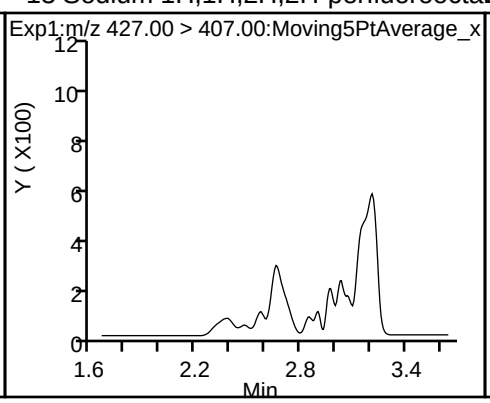
8 Perfluorohexanesulfonic acid



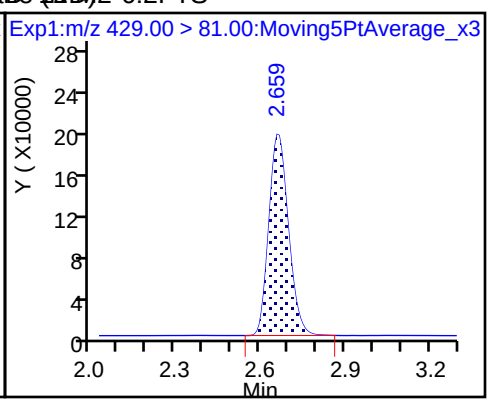
8 Perfluorohexanesulfonic acid



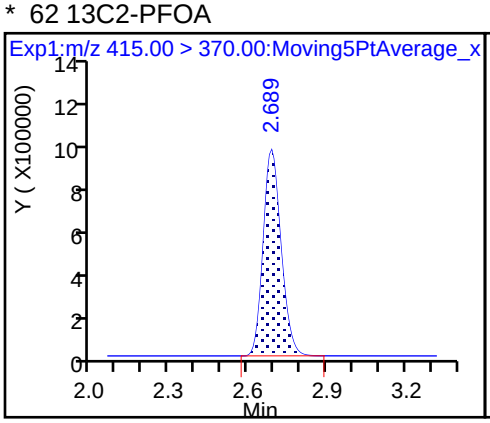
13 Sodium 1H,1H,2H,2H-perfluorooctane [(D)



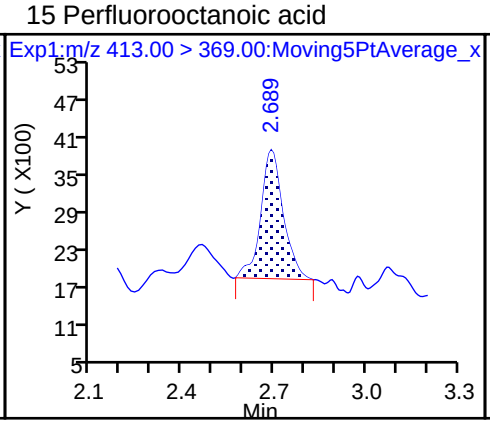
D 12 D2-6:2FTS



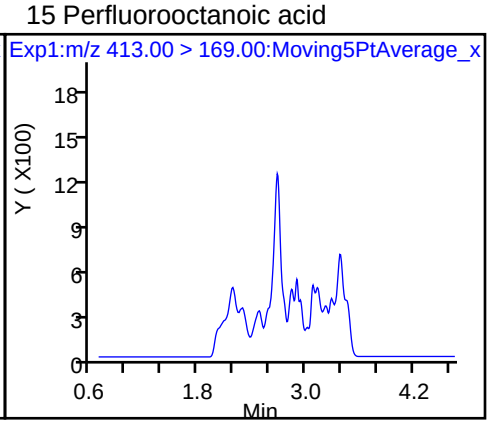
* 62 13C2-PFOA



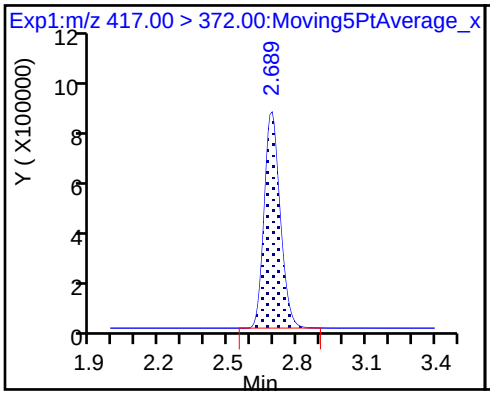
15 Perfluorooctanoic acid



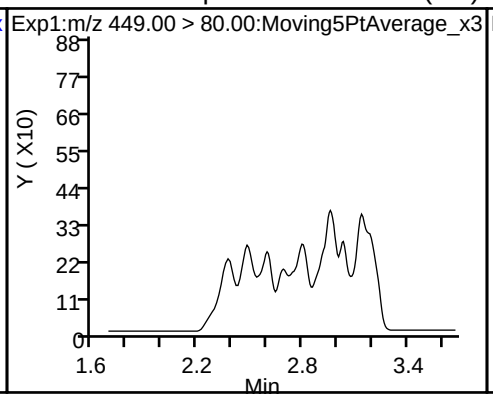
15 Perfluorooctanoic acid



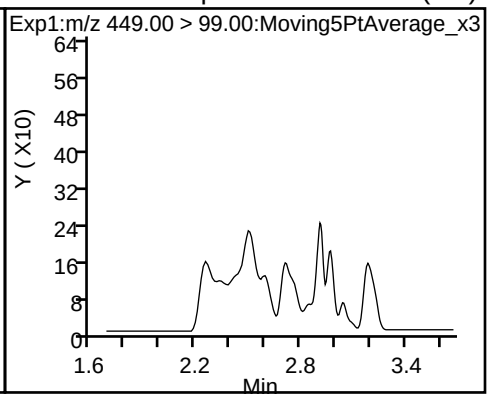
D 14 13C4 PFOA



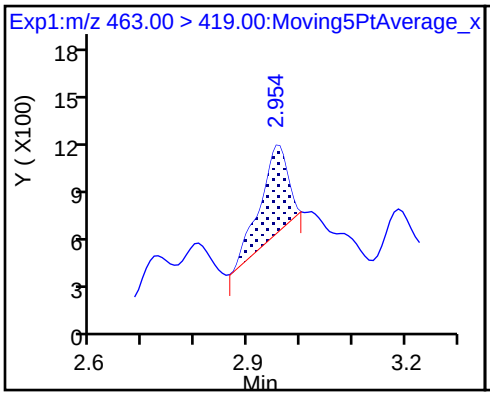
16 Perfluoroheptanesulfonic acid (ND)



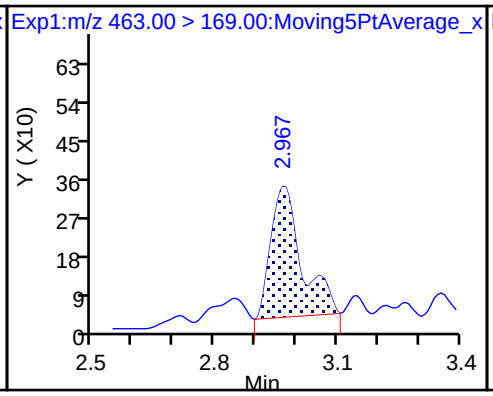
16 Perfluoroheptanesulfonic acid (ND)



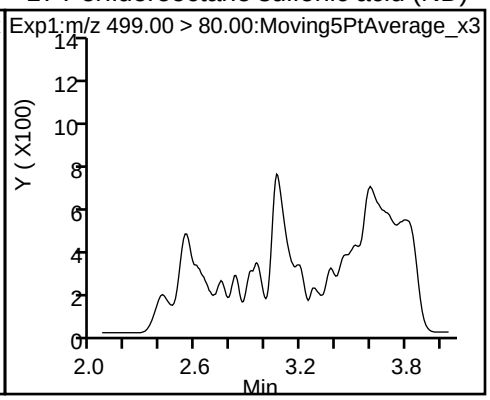
20 Perfluorononanoic acid



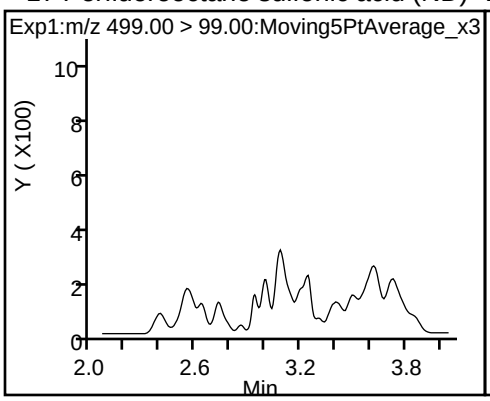
20 Perfluorononanoic acid



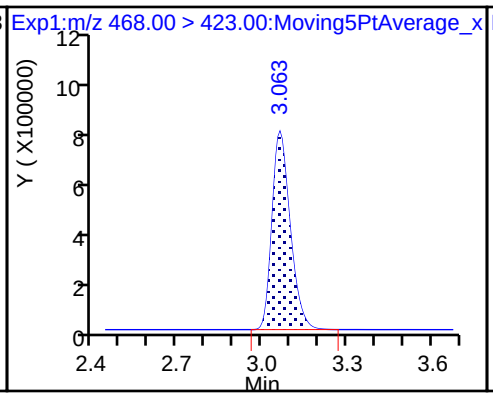
17 Perfluorooctane sulfonic acid (ND)



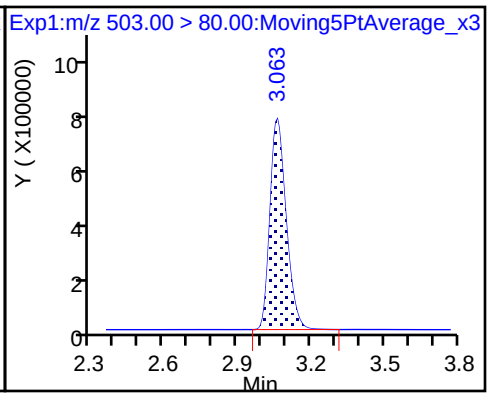
17 Perfluorooctane sulfonic acid (ND)



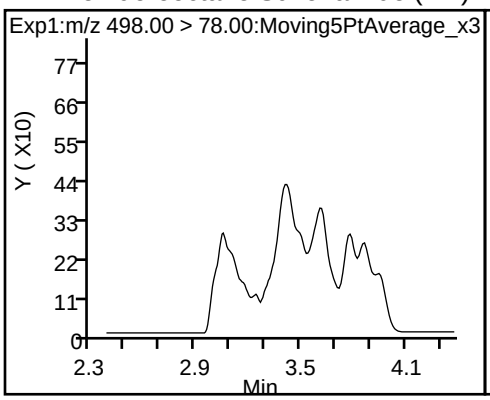
D 19 13C5 PFNA



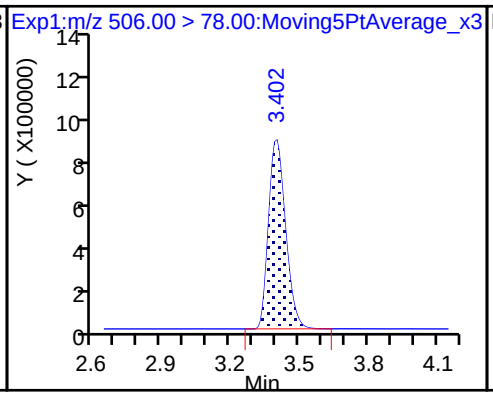
D 18 13C4 PFOS



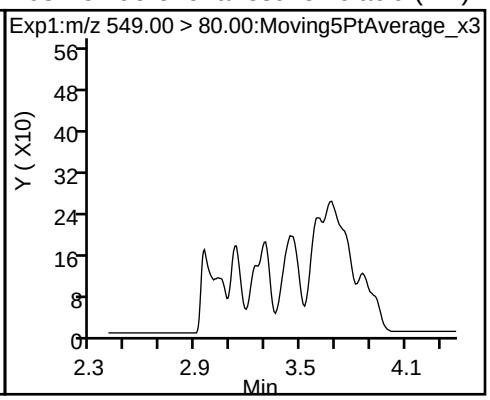
22 Perfluorooctane Sulfonamide (ND)



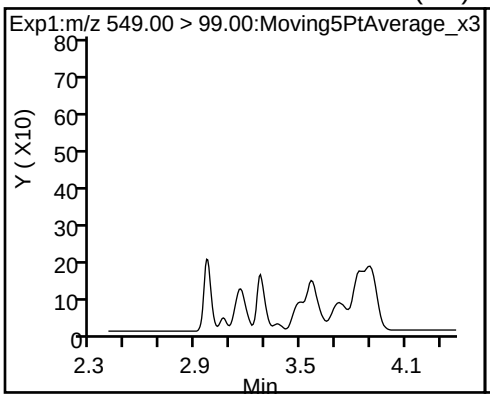
D 21 13C8 FOSA



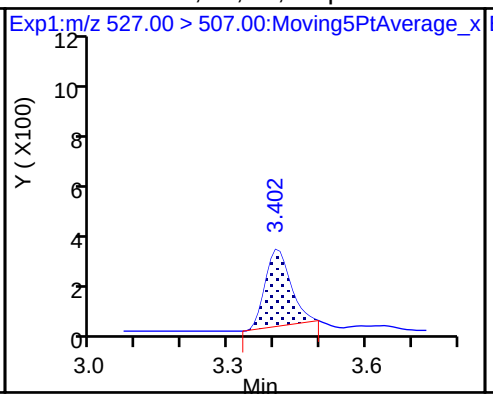
68 Perfluorononanesulfonic acid (ND)



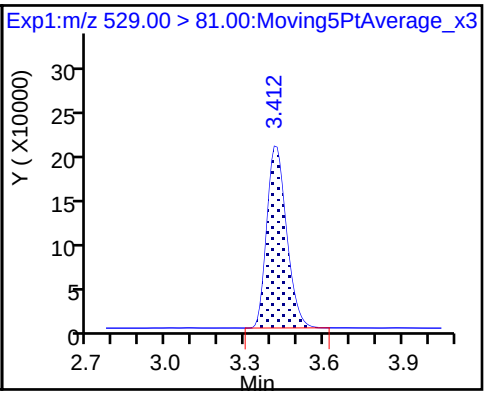
68 Perfluorononanesulfonic acid (ND)



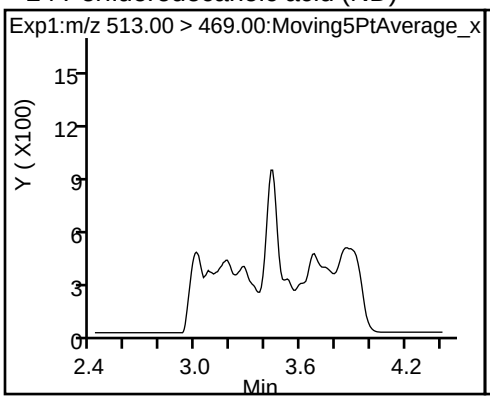
25 Sodium 1H,1H,2H,2H-perfluorodecan



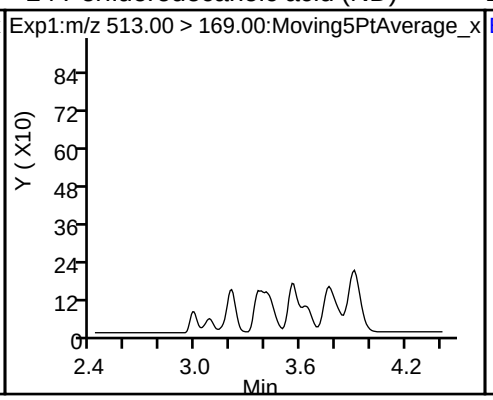
D 26 M2-8:2FTS



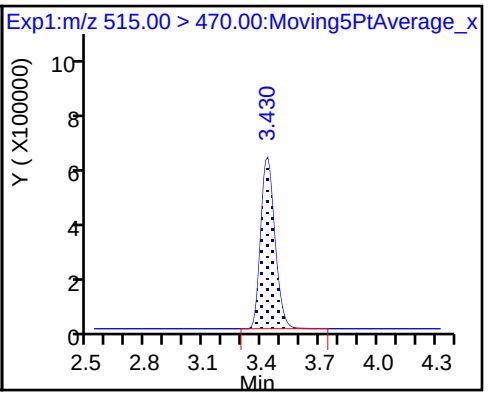
24 Perfluorodecanoic acid (ND)



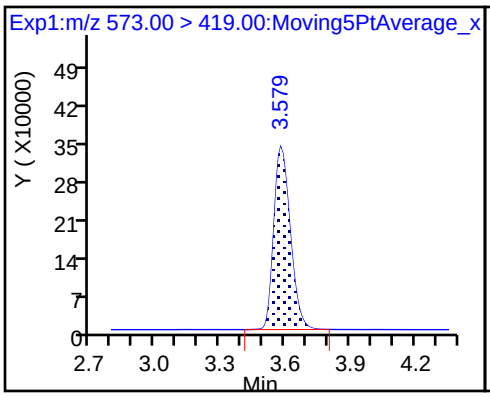
24 Perfluorodecanoic acid (ND)



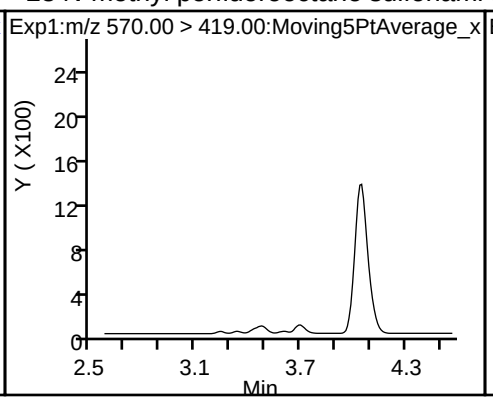
D 23 13C2 PFDA



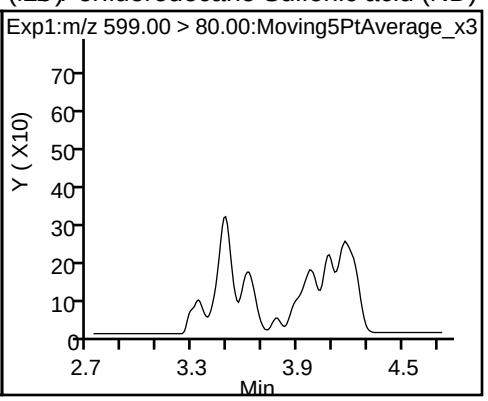
D 27 d3-NMeFOSAA



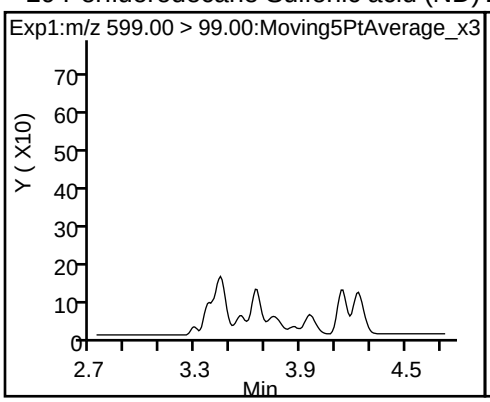
28 N-methyl perfluorooctane sulfonami (ND)



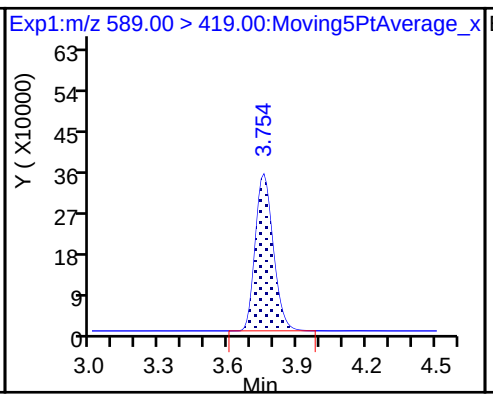
29 Perfluorodecane Sulfonic acid (ND)



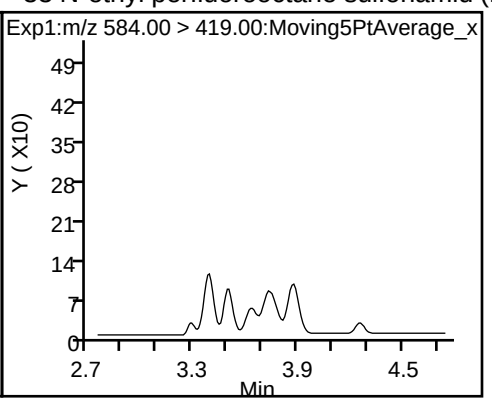
29 Perfluorodecane Sulfonic acid (ND)



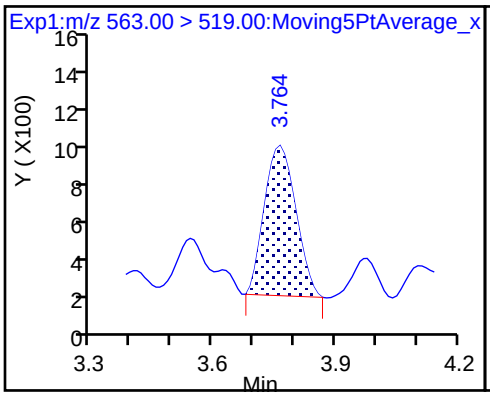
D 32 d5-NEtFOSAA



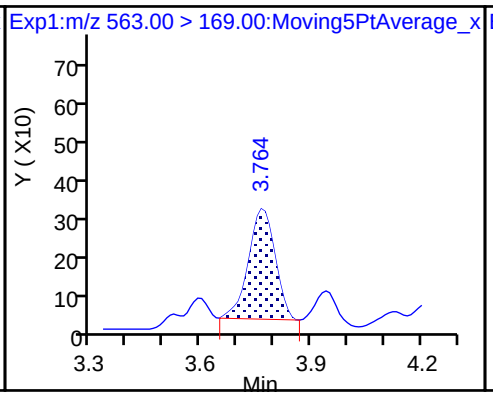
33 N-ethyl perfluorooctane sulfonamid (ND)



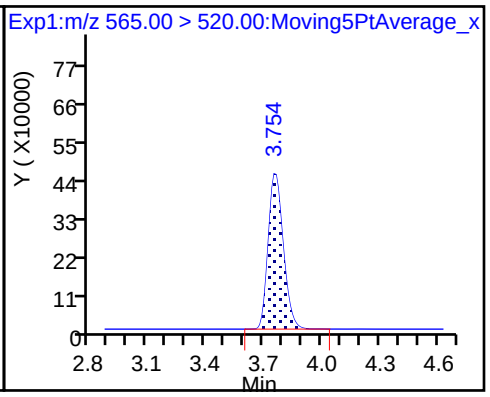
31 Perfluoroundecanoic acid



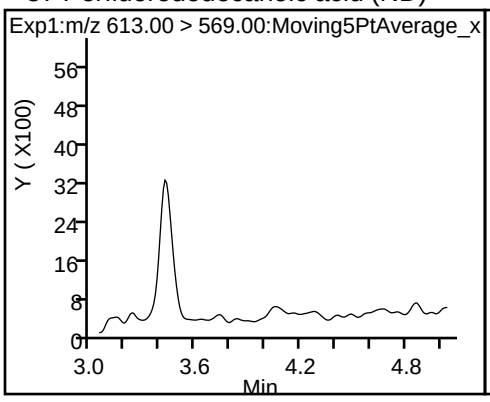
31 Perfluoroundecanoic acid



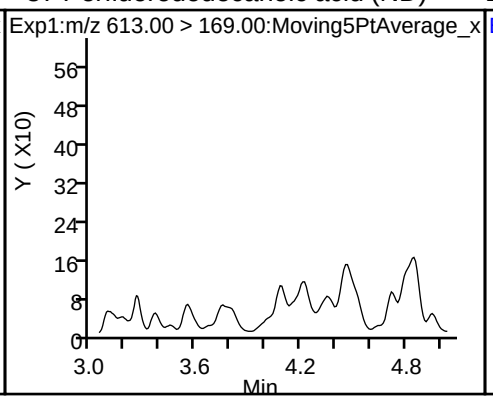
D 30 13C2 PFUnA



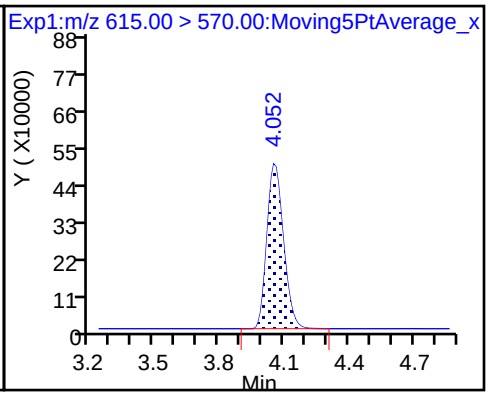
37 Perfluorododecanoic acid (ND)



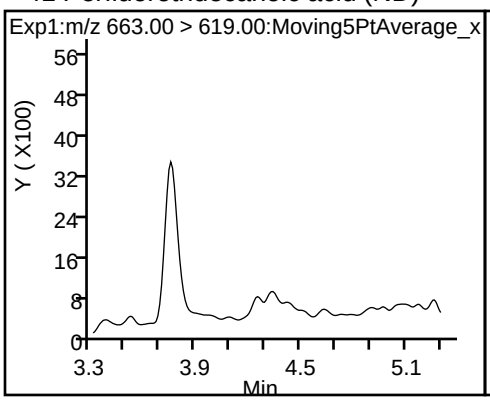
37 Perfluorododecanoic acid (ND)



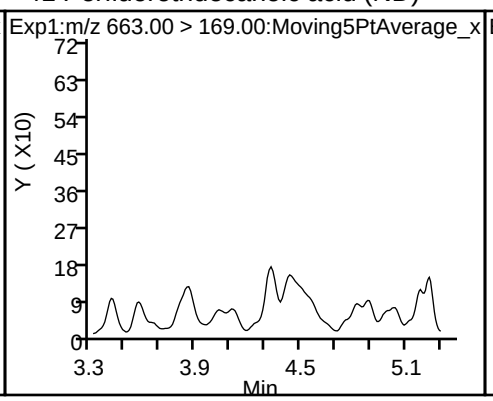
D 36 13C2 PFDoA



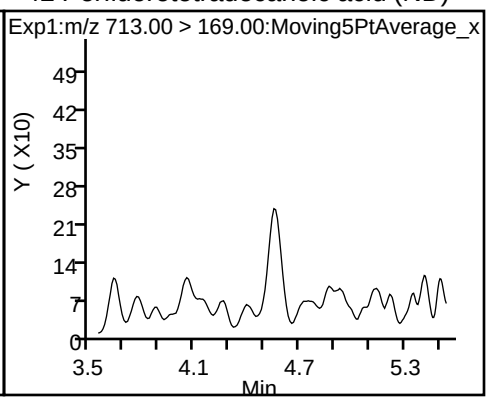
41 Perfluorotridecanoic acid (ND)



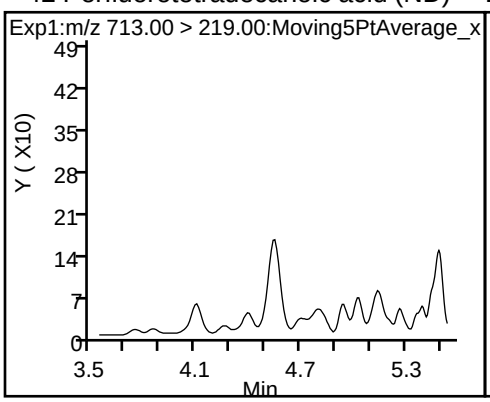
41 Perfluorotridecanoic acid (ND)



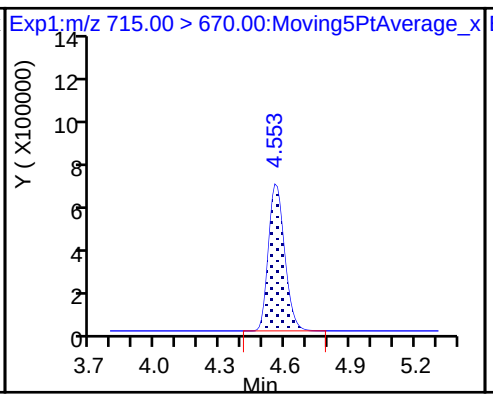
42 Perfluorotetradecanoic acid (ND)



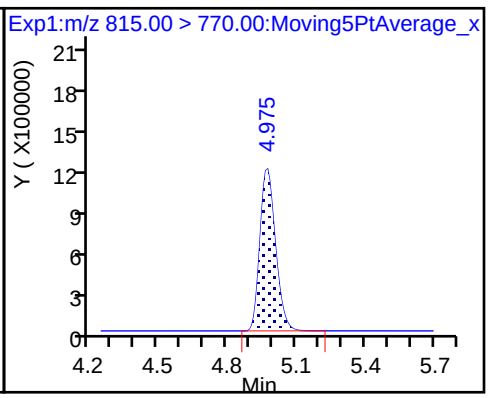
42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: | Lab Sample ID: ICB 320-217360/9

Matrix: Water | Lab File ID: 2018.04.10LLICAL_009.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 04/10/2018 19:34

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.: 217360 | Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U M	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00667	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.: 320-37938-1

SDG No.:

Client Sample ID: | Lab Sample ID: ICB 320-217360/9

Matrix: Water | Lab File ID: 2018.04.10LLICAL_009.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: | Date Extracted:

Sample wt/vol: 1(mL) | Date Analyzed: 04/10/2018 19:34

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.: 217360 | Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	108		50-150
STL00992	13C4 PFBA	101		50-150
STL01893	13C5 PFPeA	102		50-150
STL00993	13C2 PFHxA	104		50-150
STL01892	13C4-PFHpA	101		50-150
STL00990	13C4 PFOA	104		50-150
STL00995	13C5 PFNA	105		50-150
STL00996	13C2 PFDA	106		50-150
STL00997	13C2 PFUnA	104		50-150
STL00998	13C2 PFDoA	103		50-150
STL00994	18O2 PFHxS	100		50-150
STL02116	13C2-PFTeDA	103		50-150
STL00991	13C4 PFOS	105		50-150
STL02337	13C3-PFBS	104		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_009.d
Lims ID: ICB
Client ID:
Sample Type: ICB
Inject. Date: 10-Apr-2018 19:34:21 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\20180411-56528.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 11-Apr-2018 10:51:18 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: roycea Date: 11-Apr-2018 09:21:46

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	1.431	-0.006	1.000	5988339	2.53		101	49633	
2 Perfluorobutyric acid										
212.90 > 169.00	1.431	1.432	-0.001	1.004	2822	0.001269			2.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.695	1.699	-0.004	0.557	3896291	2.56		102	81288	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.704	1.699	0.005	1.005	4469	0.002406			4.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.731	1.735	-0.004	1.000	84450	2.42		104	993	
D 60 M2-4:2FTS										
329.00 > 81.00	1.940	1.950	-0.010	1.000	614684	NC			6037	
D 7 13C2 PFHxA										
315.00 > 270.00	1.983	1.985	-0.002	1.000	4372834	2.60		104	108440	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.073	2.084	-0.011	1.000	264100	NC			9144	
D 9 13C4-PFHpA										
367.00 > 322.00	2.310	2.314	-0.004	1.000	4123975	2.52		101	84304	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.323	2.323	0.0	1.000	15225	0.006668			55.6	
399.00 > 99.00	2.336	2.323	0.013	1.006	5190		2.93(1.50-4.49)		60.2	
D 11 18O2 PFHxS										
403.00 > 84.00	2.323	2.327	-0.004	1.000	4771601	2.36		99.7	65091	
65 Adona										
377.00 > 251.00	2.362	2.360	0.002	1.000	5360	NC			71.4	
377.00 > 85.00	2.362	2.360	0.002	1.000	2767		1.94(0.84-2.53)		86.0	
D 12 M2-6:2FTS										
429.00 > 81.00	2.645	2.649	-0.004	1.000	855370	2.44		103	13477	

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	2.668	2.673	-0.005	1.000	4248710	2.61		104	59569	
* 62 13C2-PFOA										
415.00 > 370.00	2.668	2.674	-0.006		4390532	2.50			65390	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.668	2.674	-0.006	1.000	14114	0.007188			6.3	
413.00 > 169.00	2.676	2.674	0.002	1.003	7151		1.97(0.84-2.52)		24.8	
D 18 13C4 PFOS										
503.00 > 80.00	3.044	3.041	0.003	1.000	3571642	2.52		105	27192	
D 19 13C5 PFNA										
468.00 > 423.00	3.044	3.045	-0.001	1.000	3674409	2.62		105	74947	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.259	3.253	0.006	1.000	2956	NC			64.8	
D 26 M2-8:2FTS										
529.00 > 81.00	3.387	3.390	-0.003	1.000	1036814	2.45		102	11574	
D 21 13C8 FOSA										
506.00 > 78.00	3.396	3.397	-0.001	1.000	4787559	2.71		108	54092	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.396	3.401	-0.005	1.000	3355	0.001732			48.9	
D 23 13C2 PFDA										
515.00 > 470.00	3.406	3.401	0.005	1.000	3132762	2.66		106	66334	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.415	3.402	0.013	1.003	2790	0.002158			13.3	R
513.00 > 169.00	3.406	3.402	0.004	1.000	2086		1.34(2.36-7.09)		43.4	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.555	3.553	0.002	1.000	1673582	2.51		100	22764	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.555	3.558	-0.003	1.000	6482	0.009709			57.7	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.718	3.722	-0.004	1.000	1824305	2.77		111	14843	
D 30 13C2 PFUnA										
565.00 > 520.00	3.728	3.727	0.001	1.000	2640942	2.60		104	52105	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.728	3.727	0.001	1.003	4748	0.006963			63.1	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.728	3.727	0.001	1.000	6596	0.007388			31.7	
563.00 > 169.00	3.728	3.727	0.001	1.000	2314		2.85(2.12-6.36)		69.7	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.895	3.883	0.012	1.000	5108	NC			72.3	
D 36 13C2 PFDoA										
615.00 > 570.00	4.018	4.017	0.001	1.000	2830680	2.58		103	31838	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.511	4.513	-0.002	1.000	3591841	2.58		103	24995	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.922	4.918	0.004	1.000	5966986	2.64		106	16793	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.922	4.920	0.002	1.000	56935	NC			17.6	
813.00 > 169.00	4.922	4.920	0.002	1.000	9542		5.97(2.86-8.58)		77.6	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL0_00006 Amount Added: 1.00 Units: mL

Report Date: 11-Apr-2018 10:51:22 Chrom Revision: 2.2 13-Mar-2018 08:45:20

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_009.d

Injection Date: 10-Apr-2018 19:34:21 Instrument ID: A8_N

Lims ID: ICB

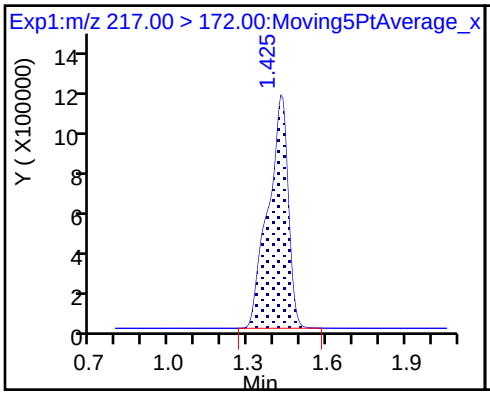
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 20 Worklist Smp#: 9

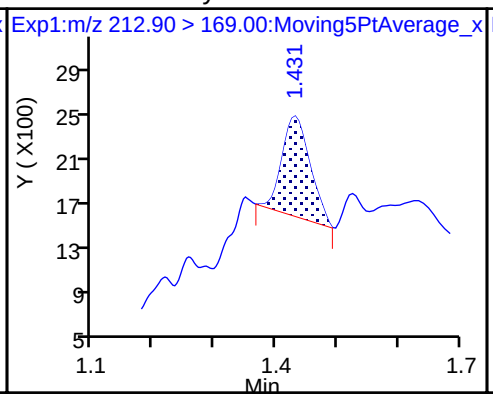
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

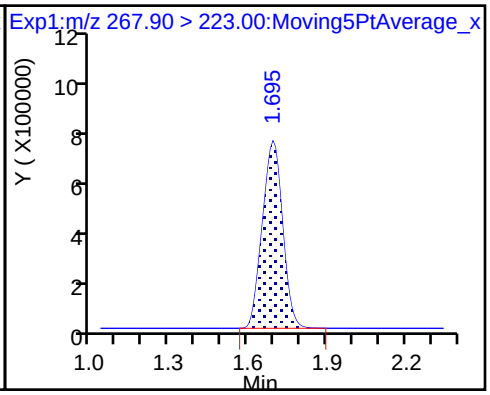
D 1 13C4 PFBA



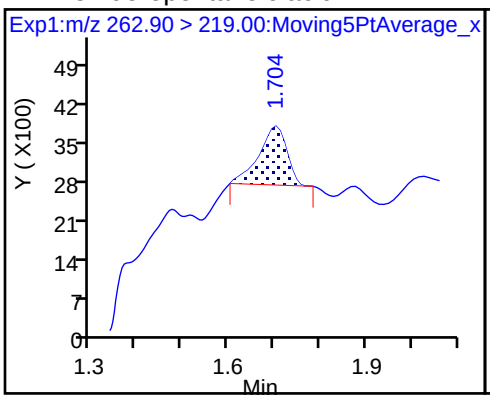
2 Perfluorobutyric acid



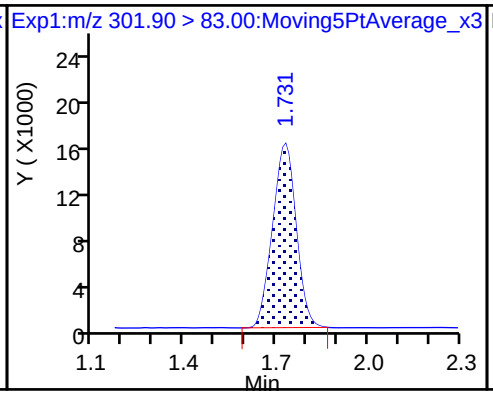
D 3 13C5-PFPeA



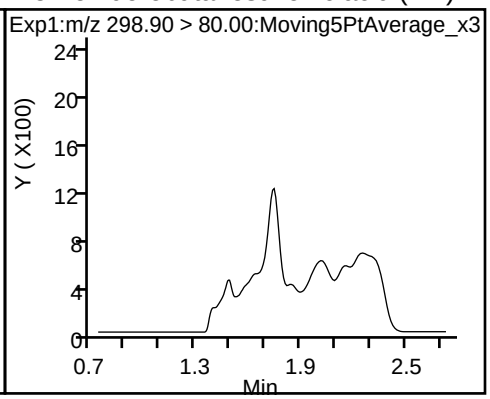
4 Perfluoropentanoic acid



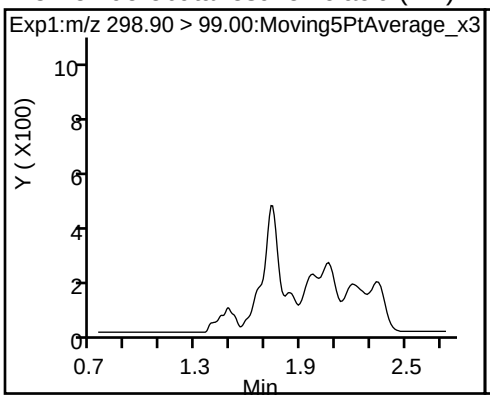
D 47 13C3-PFBS



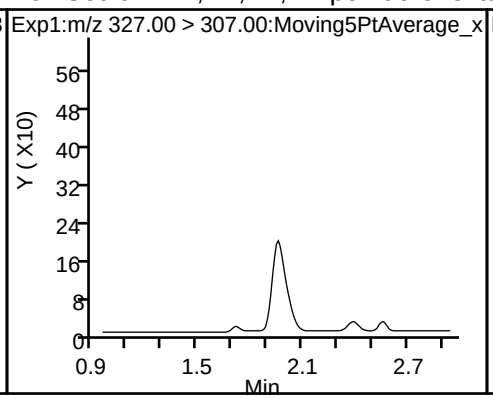
5 Perfluorobutanesulfonic acid (ND)



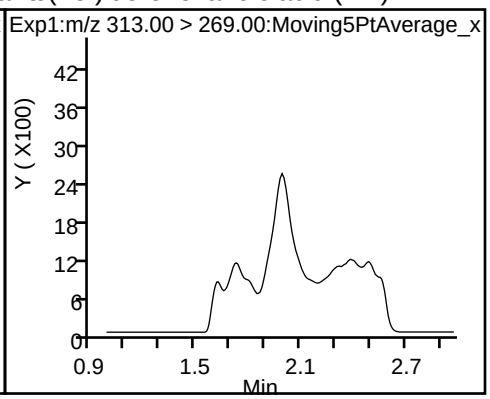
5 Perfluorobutanesulfonic acid (ND)



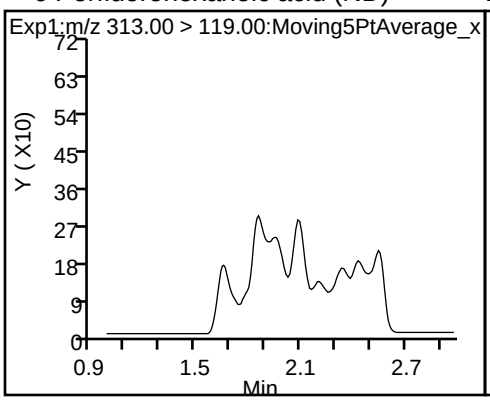
61 Sodium 1H,1H,2H,2H-perfluorohexane6(ND)



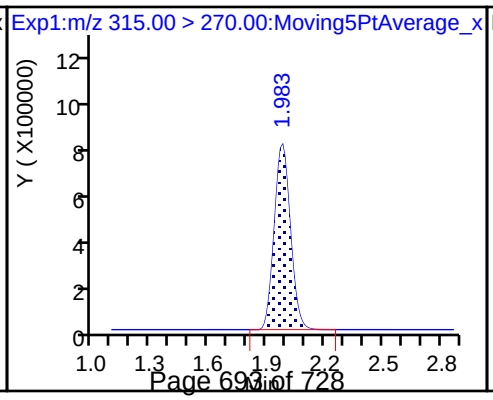
6 Perfluorohexanoic acid (ND)



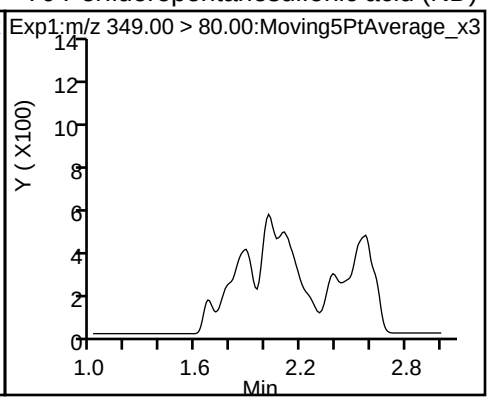
6 Perfluorohexanoic acid (ND)



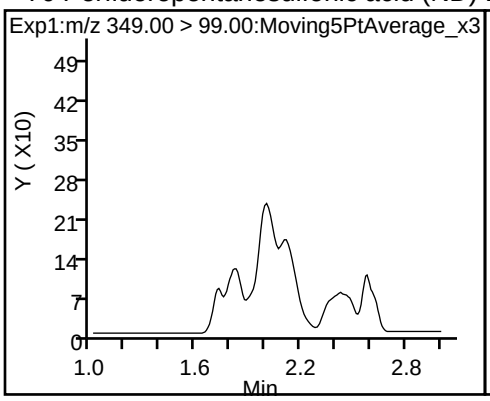
D 7 13C2 PFHxA



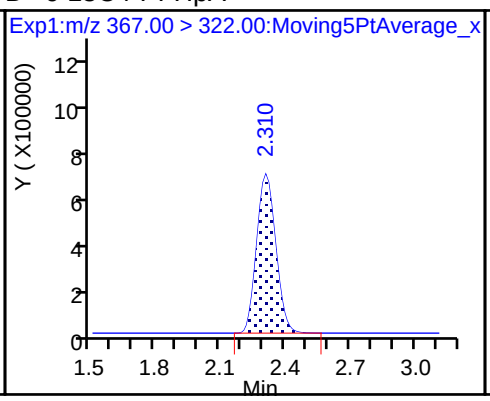
70 Perfluoropentanesulfonic acid (ND)



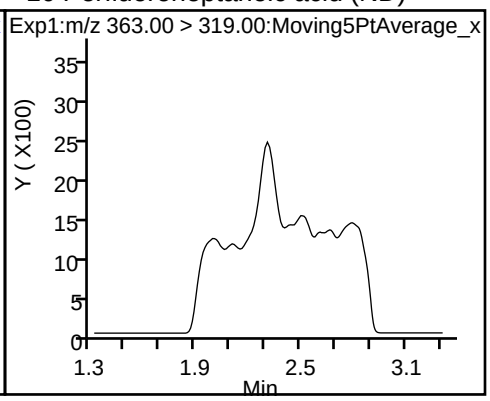
70 Perfluoropentanesulfonic acid (ND)



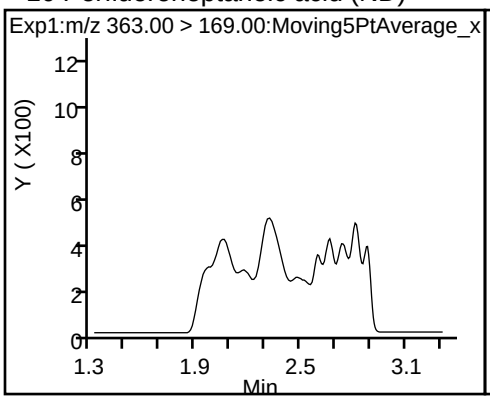
D 9 13C4-PFHpA



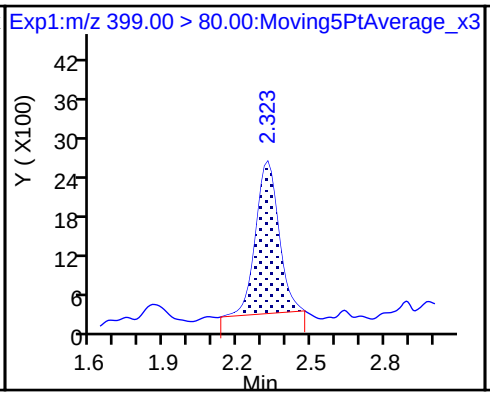
10 Perfluoroheptanoic acid (ND)



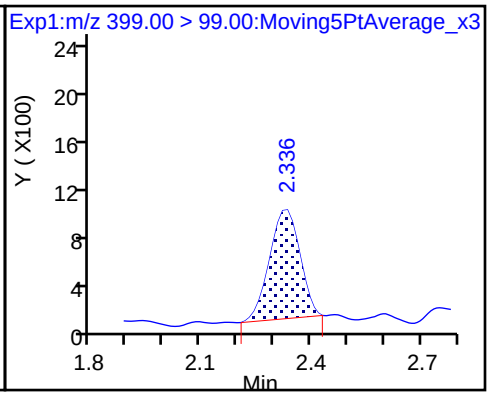
10 Perfluoroheptanoic acid (ND)



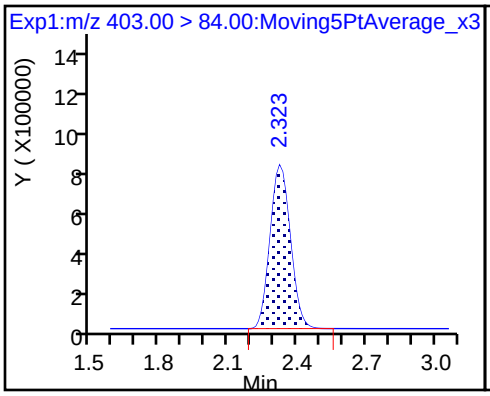
8 Perfluorohexanesulfonic acid



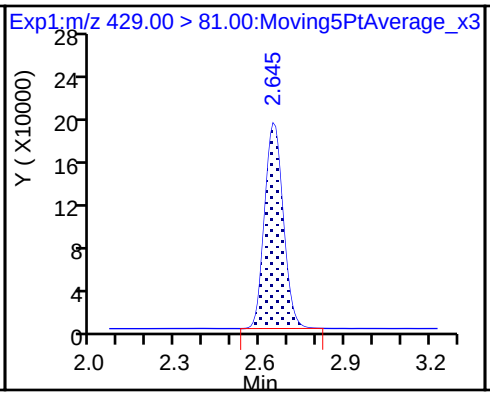
8 Perfluorohexanesulfonic acid



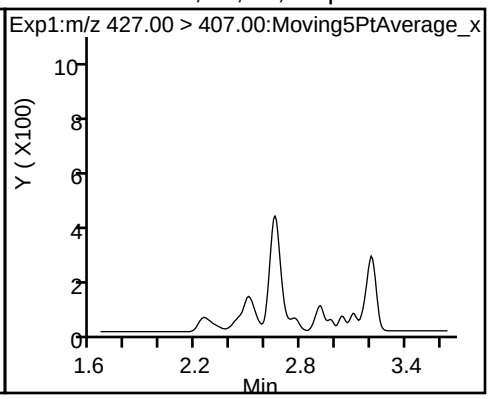
D 11 18O2 PFHxS



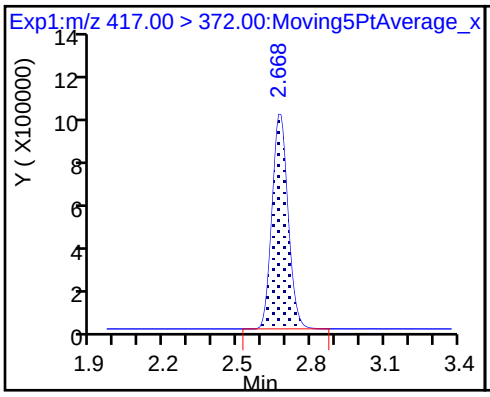
D 12 M2-6:2FTS



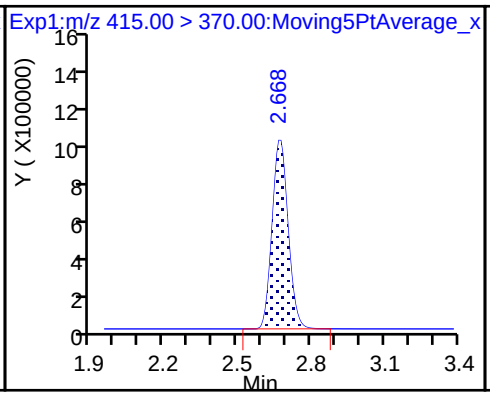
13 Sodium 1H,1H,2H,2H-perfluorooctane (ND)



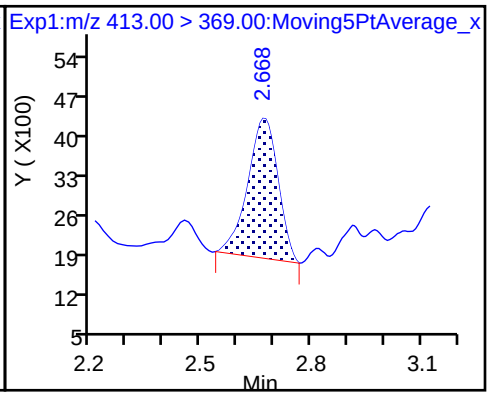
D 14 13C4 PFOA



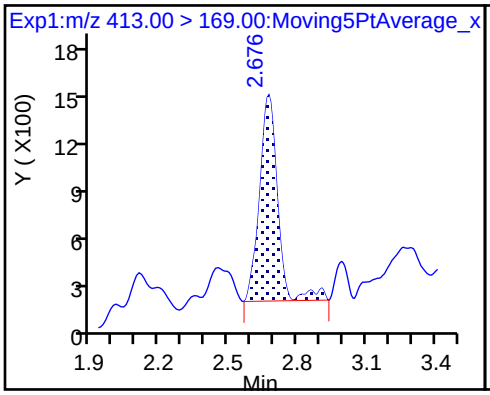
* 62 13C2-PFOA



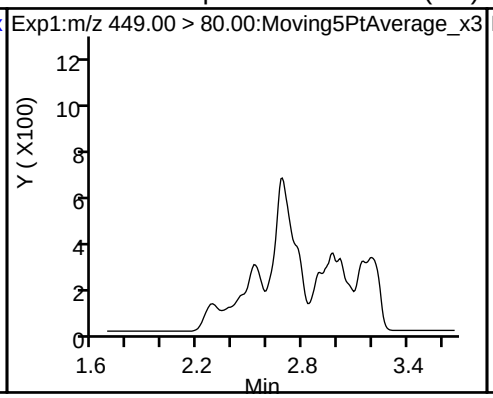
15 Perfluorooctanoic acid



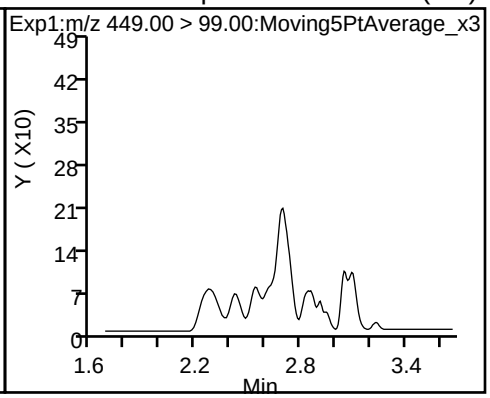
15 Perfluorooctanoic acid



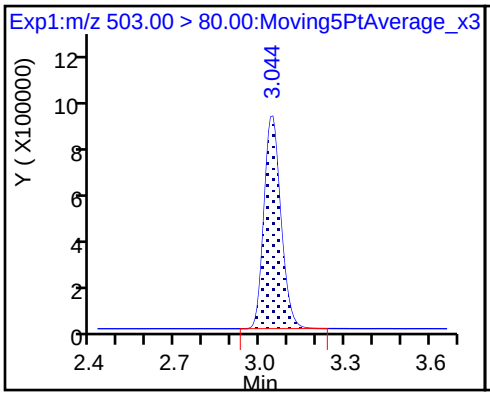
16 Perfluoroheptanesulfonic acid (ND)



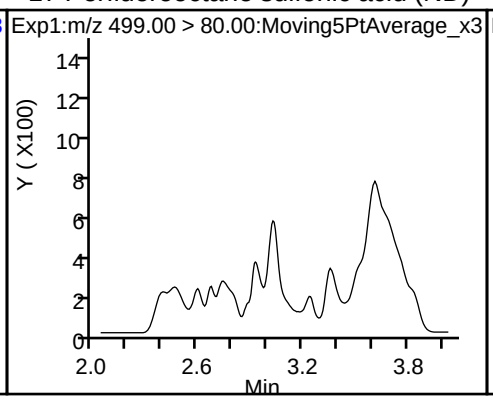
16 Perfluoroheptanesulfonic acid (ND)



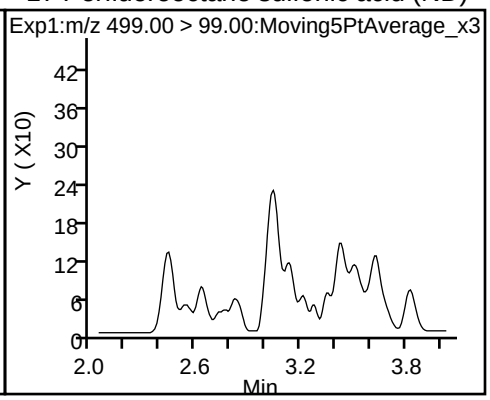
D 18 13C4 PFOS



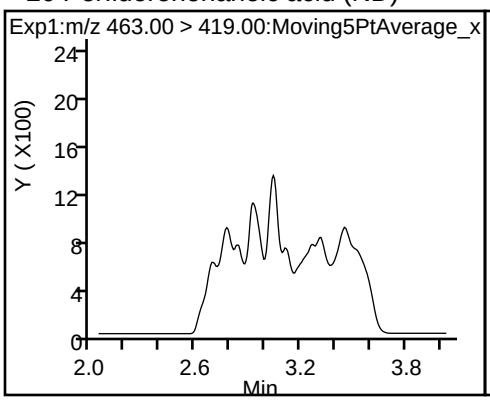
17 Perfluorooctane sulfonic acid (ND)



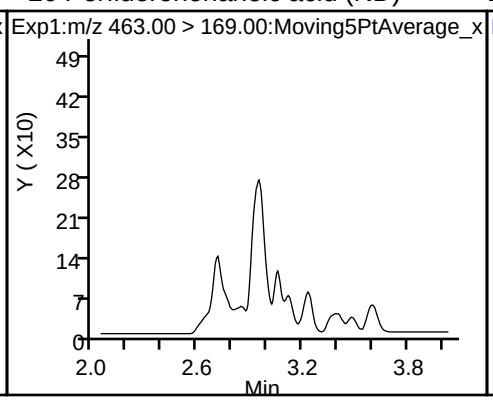
17 Perfluorooctane sulfonic acid (ND)



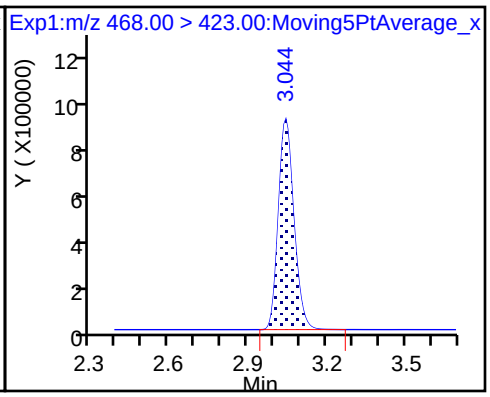
20 Perfluorononanoic acid (ND)



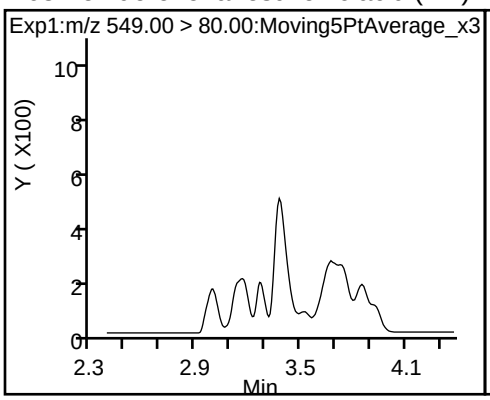
20 Perfluorononanoic acid (ND)



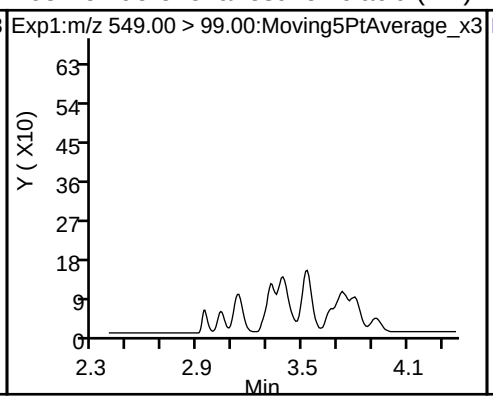
D 19 13C5 PFNA



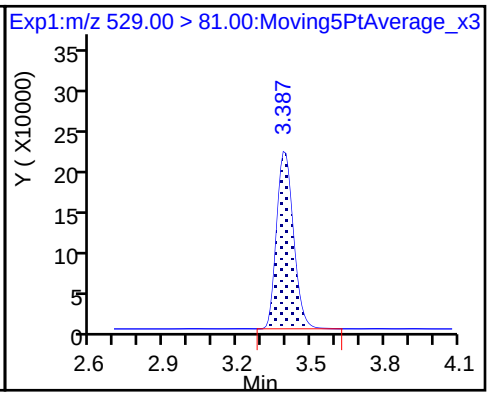
68 Perfluorononanesulfonic acid (ND)



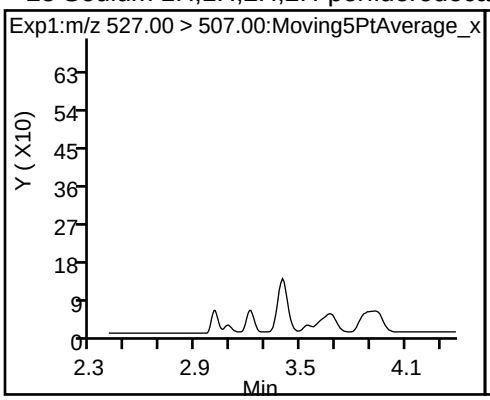
68 Perfluorononanesulfonic acid (ND)



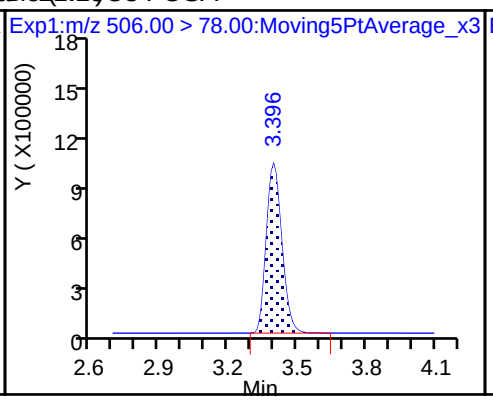
D 26 M2-8:2FTS



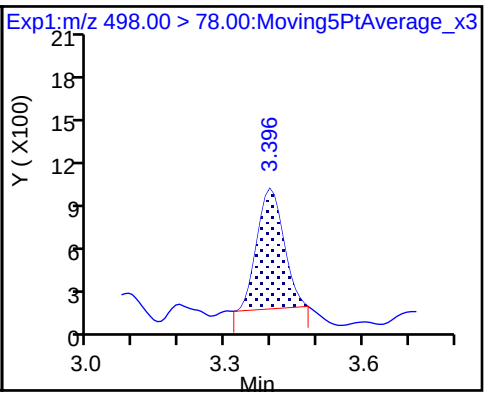
25 Sodium 1H,1H,2H,2H-perfluorodecane2(ND)



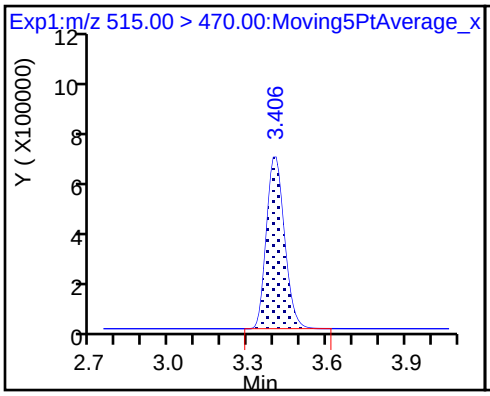
D 21 13C8 FOSA



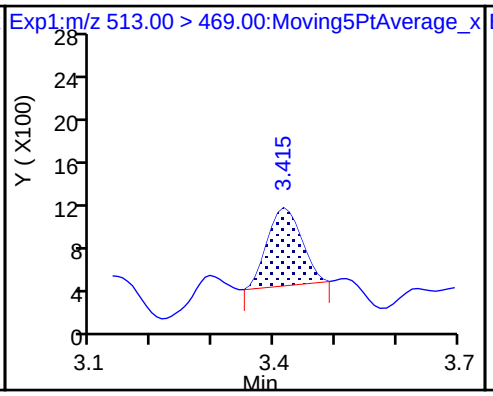
22 Perfluorooctane Sulfonamide



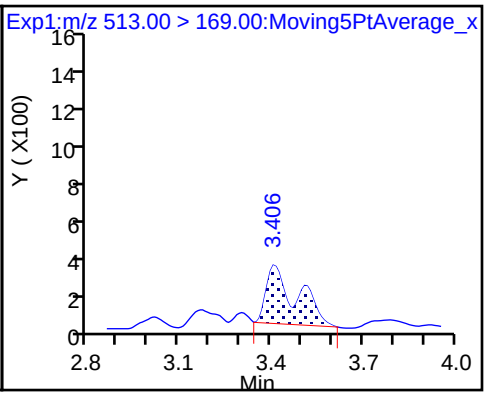
D 23 13C2 PFDA



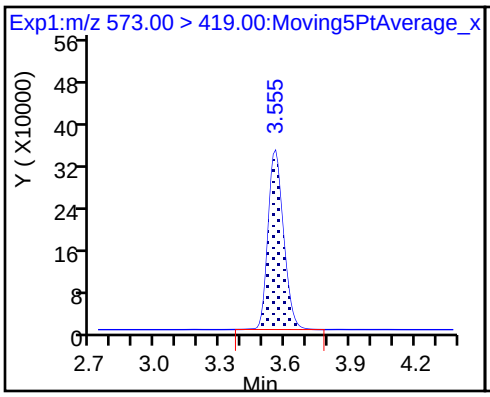
24 Perfluorodecanoic acid



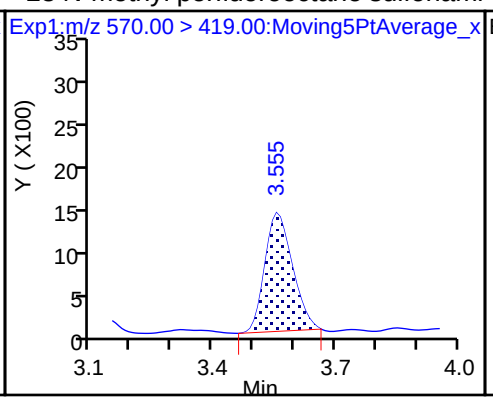
24 Perfluorodecanoic acid



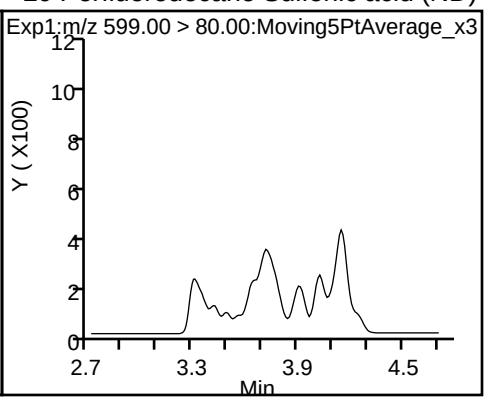
D 27 d3-NMeFOSAA



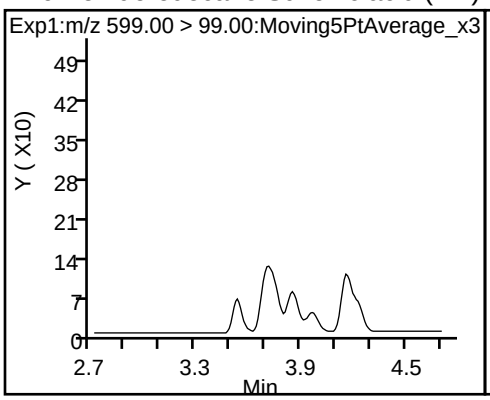
28 N-methyl perfluorooctane sulfonami



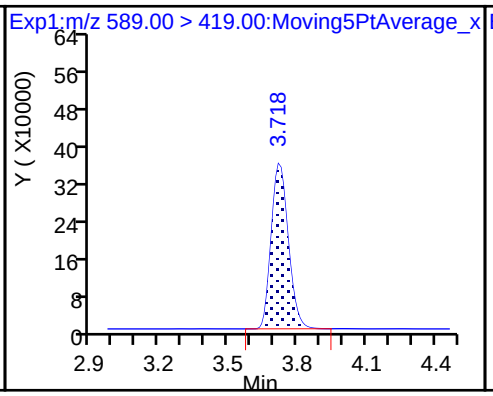
29 Perfluorodecane Sulfonic acid (ND)



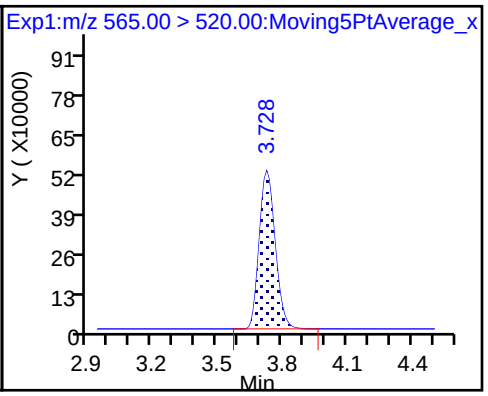
29 Perfluorodecane Sulfonic acid (ND)



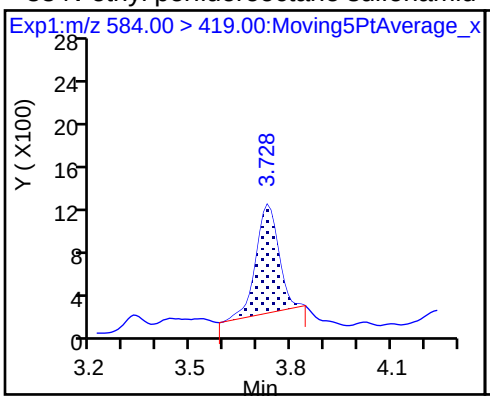
D 32 d5-NEtFOSAA



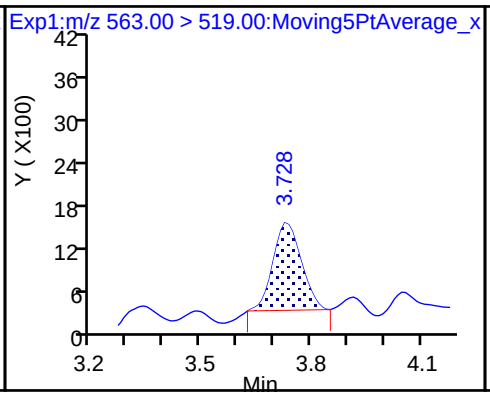
D 30 13C2 PFUnA



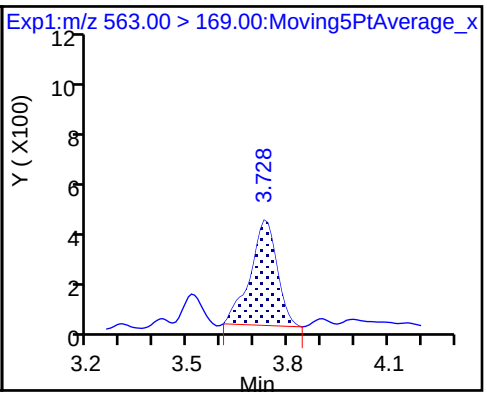
33 N-ethyl perfluorooctane sulfonamid



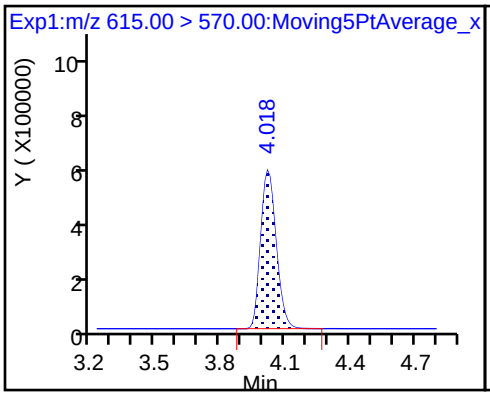
31 Perfluoroundecanoic acid



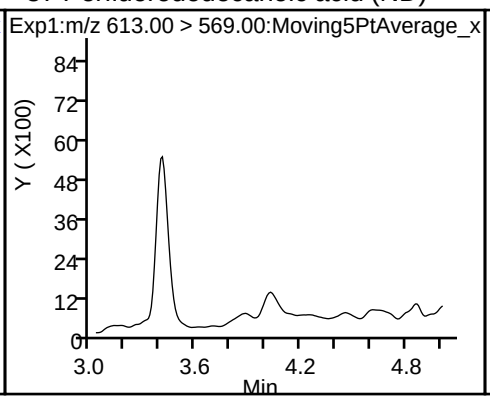
31 Perfluoroundecanoic acid



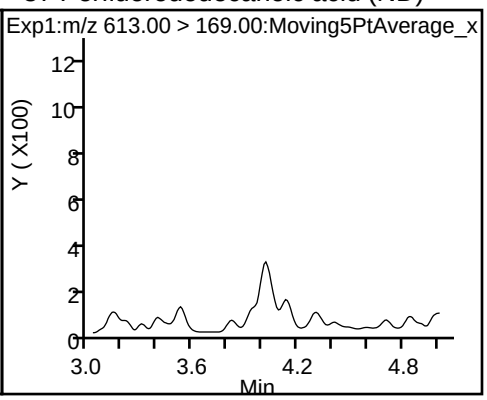
D 36 13C2 PFDoA



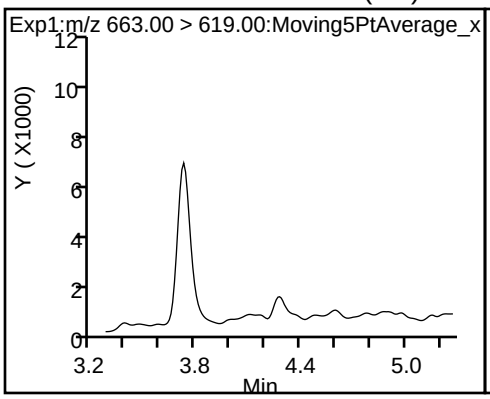
37 Perfluorododecanoic acid (ND)



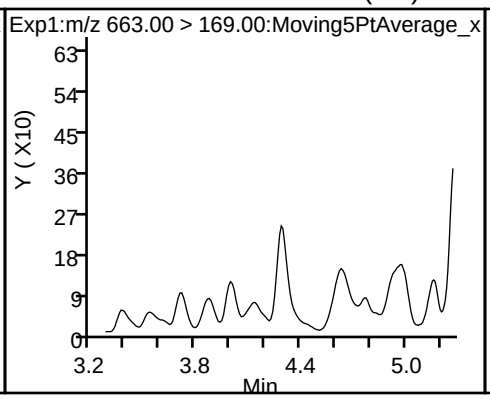
37 Perfluorododecanoic acid (ND)



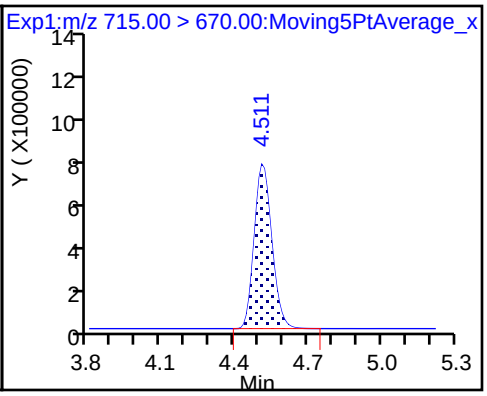
41 Perfluorotridecanoic acid (ND)



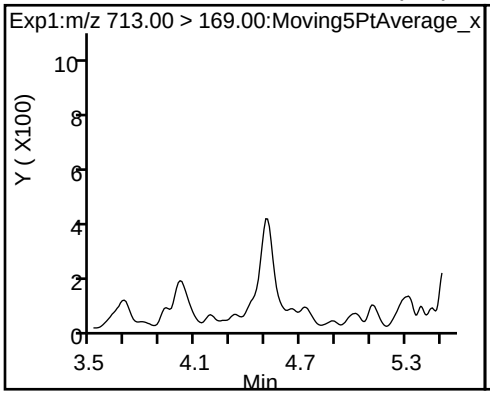
41 Perfluorotridecanoic acid (ND)



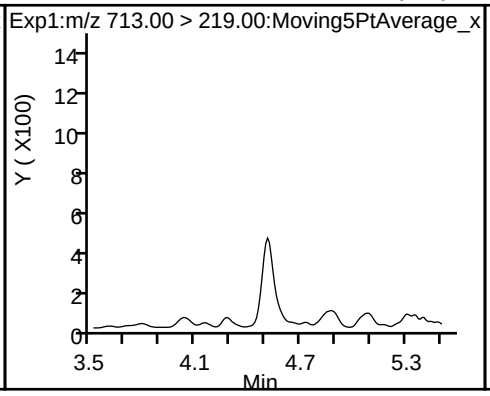
D 43 13C2-PFTeDA



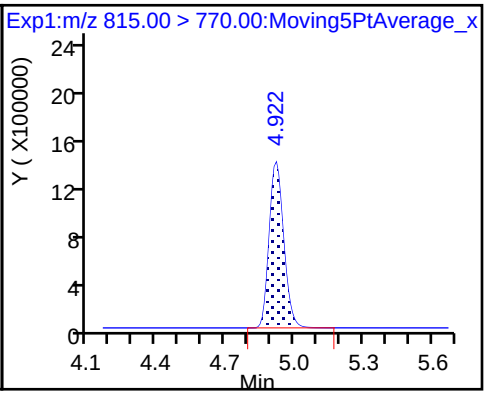
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-218592/2-A

Matrix: Water | Lab File ID: 2018.04.20LLCX_039.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 250(mL) | Date Analyzed: 04/21/2018 12:26

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	40.8		2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	39.0		2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	39.7		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	37.5		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	38.8		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	37.5		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	38.3		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	35.4		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	38.4		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	36.1		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	37.4		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.3		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	32.8		2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	37.8		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	40.0		4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	36.7		2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	37.2		4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 320-218592/2-A

Matrix: Water Lab File ID: 2018.04.20LLCX_039.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 04/18/2018 10:32

Sample wt/vol: 250(mL) Date Analyzed: 04/21/2018 12:26

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	81		50-150
STL00992	13C4 PFBA	89		50-150
STL01893	13C5 PFPeA	88		50-150
STL00993	13C2 PFHxA	90		50-150
STL01892	13C4-PFHpA	98		50-150
STL00990	13C4 PFOA	91		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	90		50-150
STL00997	13C2 PFUnA	85		50-150
STL00998	13C2 PFDoA	83		50-150
STL00994	18O2 PFHxS	93		50-150
STL02116	13C2-PFTeDA	81		50-150
STL00991	13C4 PFOS	89		50-150
STL02337	13C3-PFBS	91		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_039.d
Lims ID: LCS 320-218592/2-A
Client ID:
Sample Type: LCS
Inject. Date: 21-Apr-2018 12:26:32 ALS Bottle#: 28 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-218592/2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:26:11 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:15:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.441	0.0	1.000	5673690	2.23		89.1	38259	
2 Perfluorobutyric acid										
212.90 > 169.00	1.441	1.446	-0.005	1.000	2148733	1.02		102	885	
D 3 13C5-PFPeA										
267.90 > 223.00	1.711	1.703	0.008	0.557	3605814	2.20		87.9	69777	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.711	1.711	0.0	1.000	1674529	0.9742		97.4	1993	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.747	1.738	0.009	1.005	2288155	0.8573		97.0	9911	
298.90 > 99.00	1.747	1.738	0.009	1.005	940603		2.43(1.25-3.74)		7603	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.739	-0.001	1.000	79266	2.10		90.5	698	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.959	1.959	0.0	1.000	579172	1.06		113	25977	
D 7 13C2 PFHxA										
315.00 > 270.00	1.991	1.990	0.001	1.000	4068289	2.24		89.6	89527	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.991	1.991	0.0	1.000	1639846	0.99		99.2	2261	
313.00 > 119.00	1.991	1.991	0.0	1.000	141715		11.57(5.03-15.10)		1636	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	2.014	2.014	0.0	1.000	2148628	0.8813		94.0	16535	
349.00 > 99.00	2.014	2.014	0.0	1.000	800690		2.68(1.36-4.07)		14200	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.093	2.093	0.0	1.000	259643	NC			1811	
D 9 13C4-PFHpA										
367.00 > 322.00	2.332	2.318	0.014	1.000	4321777	2.45		97.8	101087	

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	2.332	2.319	0.013	1.000	1622527	0.9377		93.8	1967	
363.00 > 169.00	2.332	2.319	0.013	1.000	651589		2.49(1.13-3.40)		3657	
D 11 18O2 PFHxS										
403.00 > 84.00	2.345	2.331	0.014	1.000	4789068	2.20		92.9	112916	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.345	2.332	0.013	1.000	1878972	0.8199		90.1	5158	
399.00 > 99.00	2.345	2.332	0.013	1.000	608752		3.09(1.50-4.49)		3220	
65 Adona										
377.00 > 251.00	2.372	2.372	0.0	1.000	4854538	NC			62605	
377.00 > 85.00	2.372	2.372	0.0	1.000	2963998		1.64(0.84-2.53)		38327	
D 12 M2-6:2FTS										
429.00 > 81.00	2.667	2.658	0.009	1.000	922064	2.44		103	11637	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.667	2.659	0.008	1.000	750152	1.14		121	10250	
D 14 13C4 PFOA										
417.00 > 372.00	2.689	2.681	0.008	1.000	3993441	2.27		91.0	66031	
* 62 13C2-PFOA										
415.00 > 370.00	2.689	2.682	0.007		4732969	2.50			114876	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.697	2.682	0.015	1.003	1790868	0.9703		97.0	1290	
413.00 > 169.00	2.697	2.682	0.015	1.003	940055		1.91(0.84-2.52)		3641	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.697	2.689	0.008	1.000	1705146	0.9444		99.2	14005	
449.00 > 99.00	2.697	2.689	0.008	1.000	464148		3.67(1.94-5.82)		8567	
D 18 13C4 PFOS										
503.00 > 80.00	3.065	3.054	0.011	1.000	3250308	2.13		89.1	23757	
D 19 13C5 PFNA										
468.00 > 423.00	3.071	3.054	0.017	1.000	3418404	2.26		90.6	68552	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.065	3.055	0.010	1.000	1479215	1.00		108	5832	
499.00 > 99.00	3.065	3.055	0.010	1.000	321878		4.60(2.31-6.93)		4554	
20 Perfluorononanoic acid										
463.00 > 419.00	3.071	3.055	0.016	1.000	1336873	0.9377		93.8	4834	
463.00 > 169.00	3.071	3.055	0.016	1.000	345560		3.87(1.90-5.69)		12773	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.279	3.269	0.010	1.000	2219677	NC			38494	
D 21 13C8 FOSA										
506.00 > 78.00	3.406	3.391	0.015	1.000	3847455	2.02		80.7	45955	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.406	3.393	0.013	1.000	1446381	0.9291		92.9	15323	
D 26 M2-8:2FTS										
529.00 > 81.00	3.424	3.410	0.014	1.000	1059168	2.32		97.0	10544	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.415	3.411	0.004	1.000	970769	0.8930		93.0	8465	
549.00 > 99.00	3.415	3.411	0.004	1.000	365984		2.65(1.33-3.97)		6717	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.424	3.411	0.013	1.000	548754	0.9806		102	21467	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.434	3.419	0.015	1.000	2849841	2.25		89.9	47323	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.434	3.421	0.013	1.000	1125850	0.9574		95.7	5164	
513.00 > 169.00	3.434	3.421	0.013	1.000	204832		5.50(2.36-7.09)		4153	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.584	3.568	0.016	1.000	1454716	2.02		80.9	14453	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.595	3.579	0.016	1.003	648349	1.12		112	4855	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.749	3.732	0.017	1.000	810341	0.9178		95.2	6908	
599.00 > 99.00	3.749	3.732	0.017	1.000	273017		2.97(1.39-4.16)		6434	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.749	3.743	0.006	1.000	1533870	2.16		86.4	21486	
D 30 13C2 PFUnA										
565.00 > 520.00	3.759	3.753	0.006	1.000	2338194	2.14		85.5	48693	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.759	3.754	0.005	1.000	700299	0.8860		88.6	3598	
563.00 > 169.00	3.759	3.754	0.005	1.000	173693		4.03(2.12-6.36)		3986	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.759	3.754	0.005	1.003	577544	1.01		101	9503	
66 11-Chloroeicosafluoro-3-oxaundecan										
631.00 > 451.00	3.916	3.911	0.005	1.000	3457605	NC			51117	
D 36 13C2 PFDoA										
615.00 > 570.00	4.059	4.042	0.017	1.000	2465609	2.09		83.5	33488	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.059	4.054	0.005	1.000	988271	0.9609		96.1	1426	
613.00 > 169.00	4.059	4.054	0.005	1.000	251671		3.93(2.13-6.40)		3166	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.318	4.314	0.004	1.000	1081285	0.9021		90.2	1350	
663.00 > 169.00	4.318	4.314	0.004	1.000	369215		2.93(1.25-3.76)		3334	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.558	4.547	0.011	1.000	3023051	2.02		80.7	22686	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.558	4.549	0.009	1.000	284014	0.9352		93.5	2891	
713.00 > 219.00	4.548	4.549	-0.001	0.998	205752		1.38(0.71-2.13)		3305	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.970	4.961	0.009	1.000	4318072	1.77		70.8	14470	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.979	4.972	0.007	1.002	1644076	NC			824	
813.00 > 169.00	4.970	4.972	-0.002	1.000	273326		6.02(2.86-8.58)		1961	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.339	5.333	0.006	1.000	1101946	NC			483	
913.00 > 169.00	5.339	5.333	0.006	1.000	139183		7.92(3.83-11.48)		1067	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 24-Apr-2018 17:27:03 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_039.d

Injection Date: 21-Apr-2018 12:26:32 Instrument ID: A8_N

Lims ID: LCS 320-218592/2-A

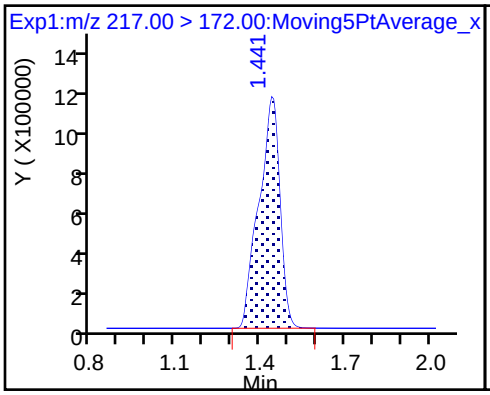
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 28 Worklist Smp#: 5

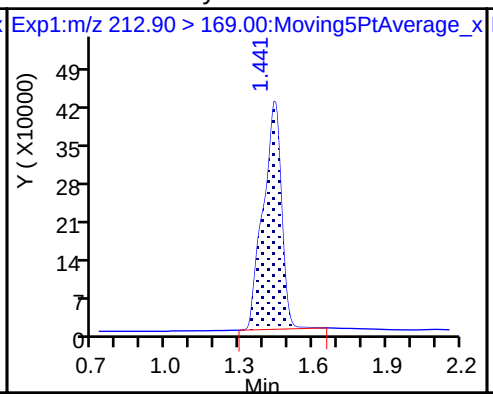
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

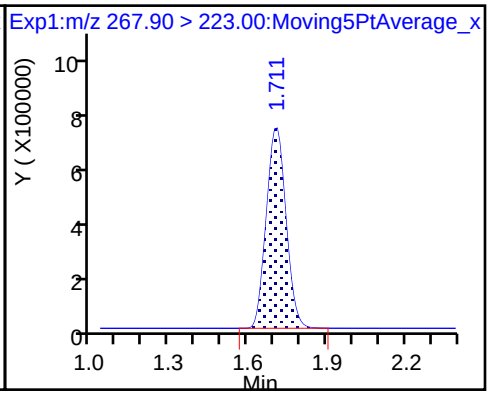
D 1 13C4 PFBA



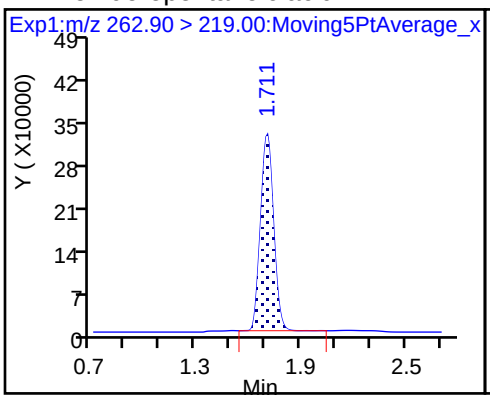
2 Perfluorobutyric acid



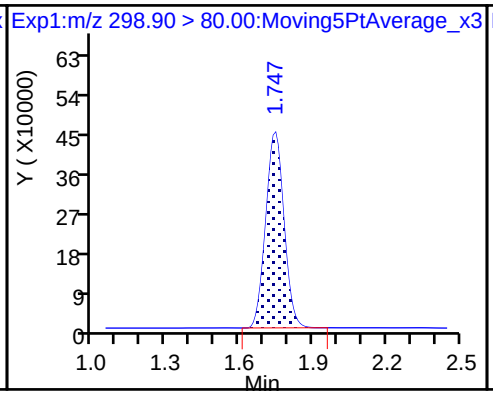
D 3 13C5-PFPeA



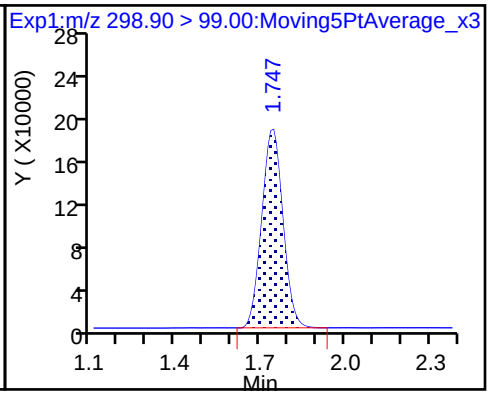
4 Perfluoropentanoic acid



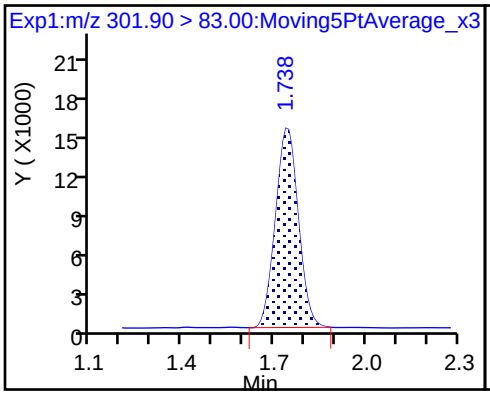
5 Perfluorobutanesulfonic acid



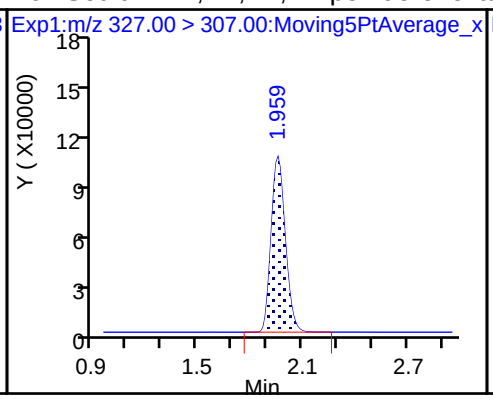
5 Perfluorobutanesulfonic acid



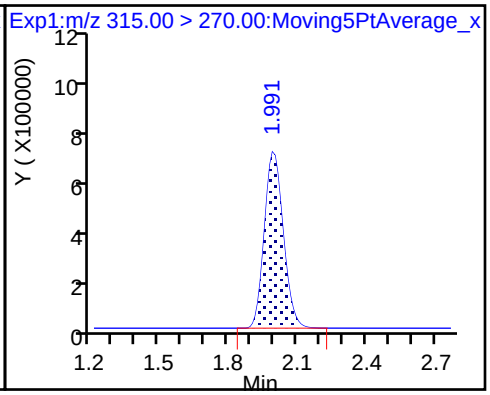
D 47 13C3-PFBS



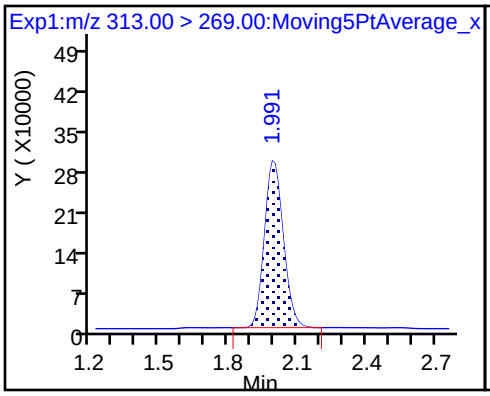
61 Sodium 1H,1H,2H,2H-perfluorohexa



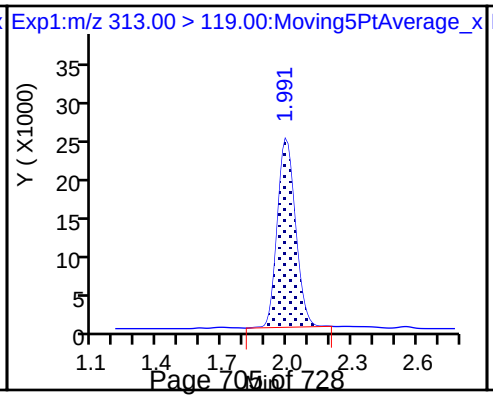
De 7 13C2 PFHxA



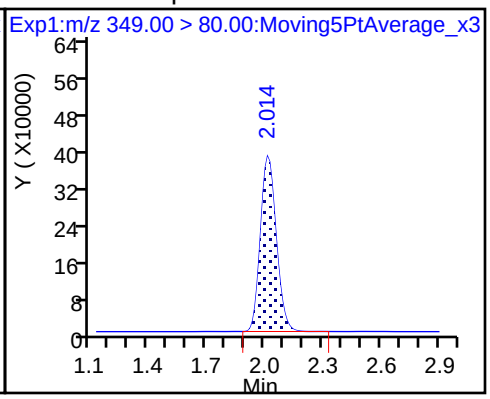
6 Perfluorohexanoic acid



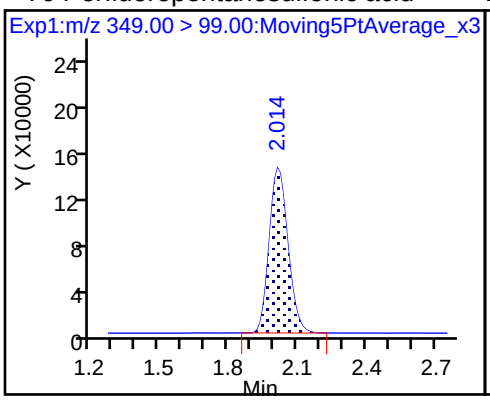
6 Perfluorohexanoic acid



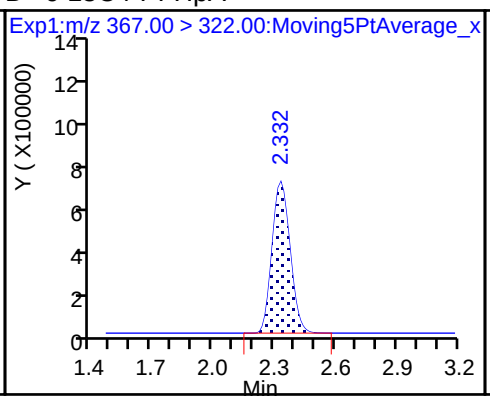
70 Perfluoropentanesulfonic acid



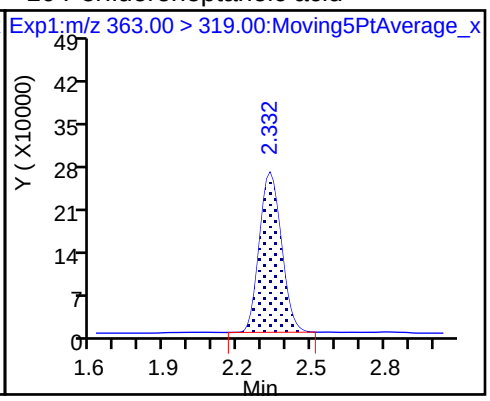
70 Perfluoropentanesulfonic acid



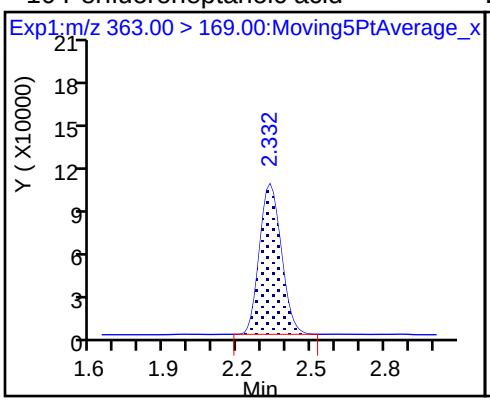
D 9 13C4-PFHpA



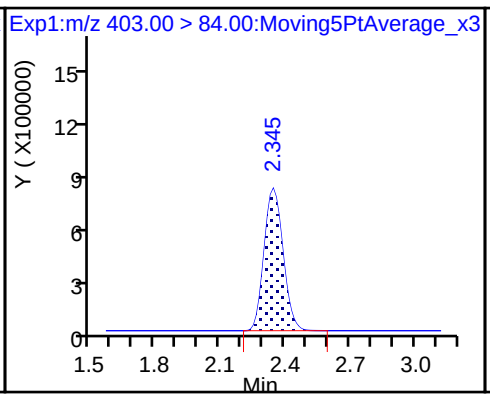
10 Perfluoroheptanoic acid



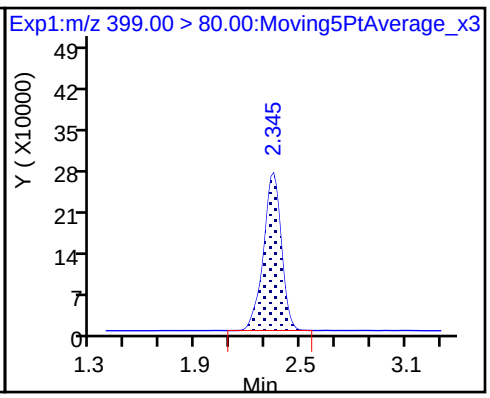
10 Perfluoroheptanoic acid



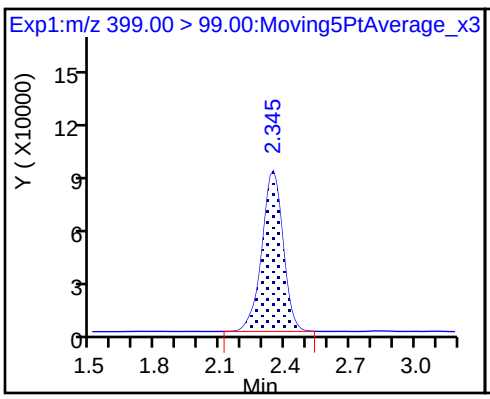
D 11 18O2 PFHxS



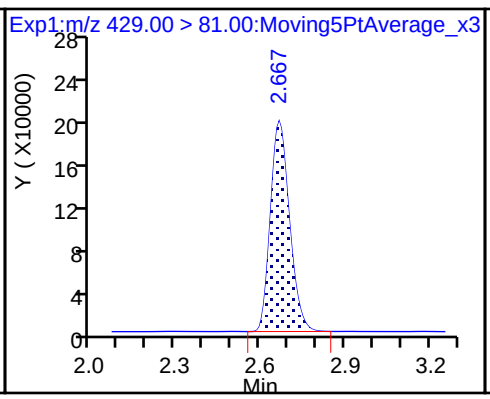
8 Perfluorohexanesulfonic acid



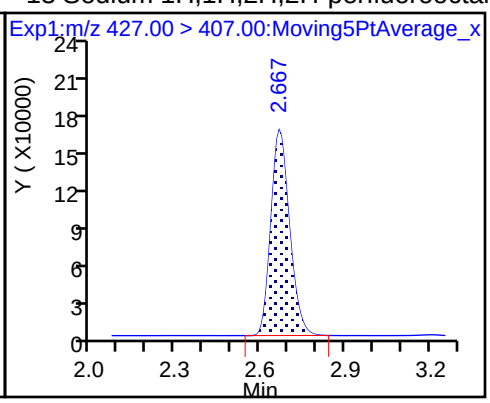
8 Perfluorohexanesulfonic acid



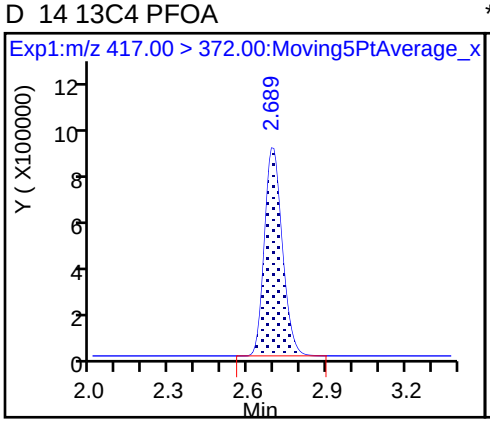
D 12 M2-6:2FTS



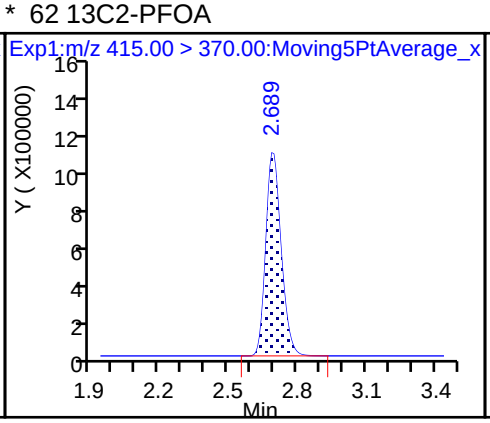
13 Sodium 1H,1H,2H,2H-perfluorooctane



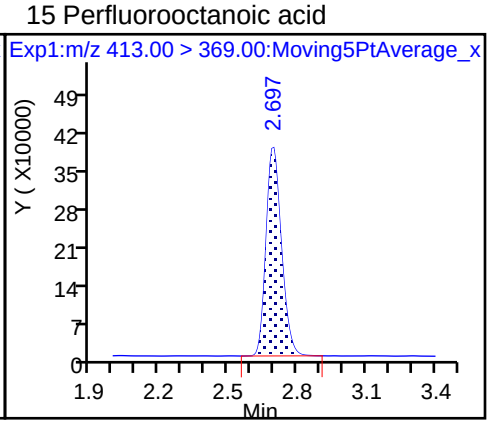
D 14 13C4 PFOA



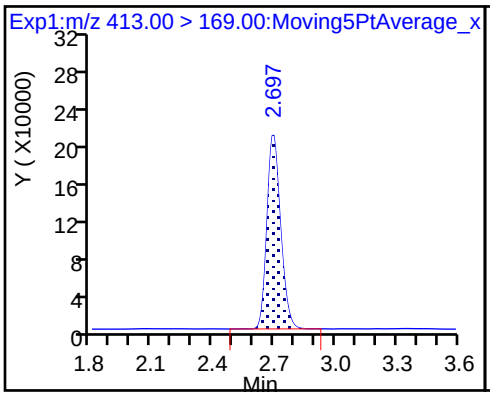
* 62 13C2-PFOA



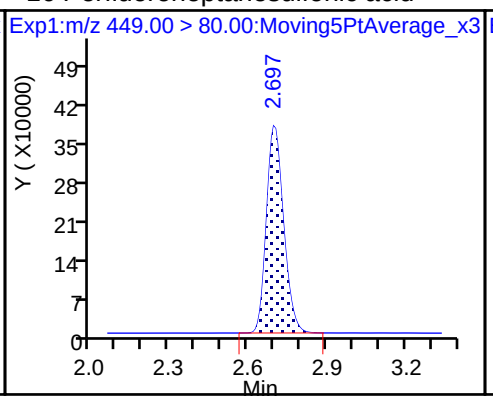
15 Perfluorooctanoic acid



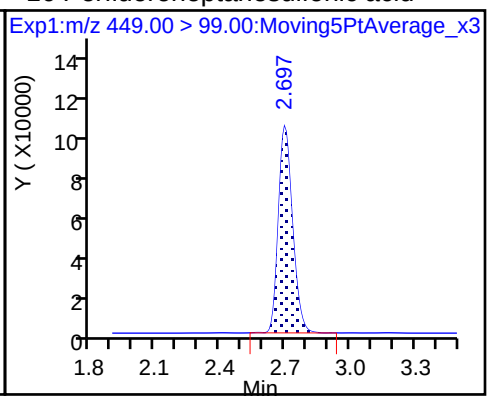
15 Perfluorooctanoic acid



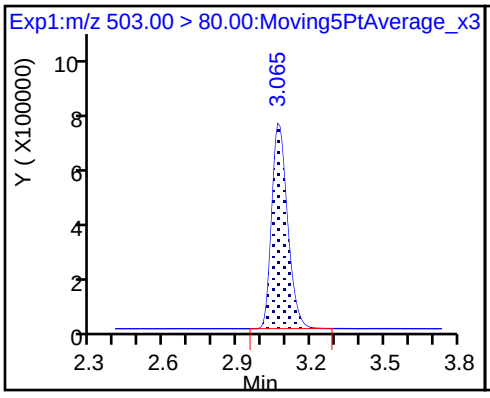
16 Perfluoroheptanesulfonic acid



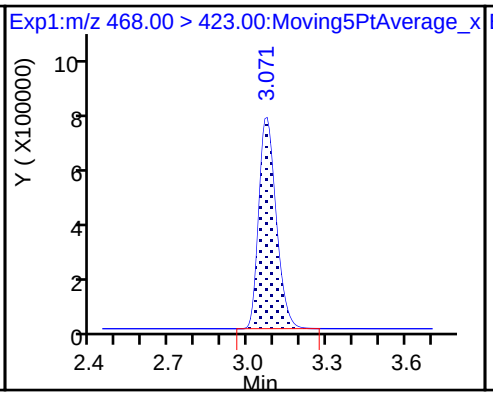
16 Perfluoroheptanesulfonic acid



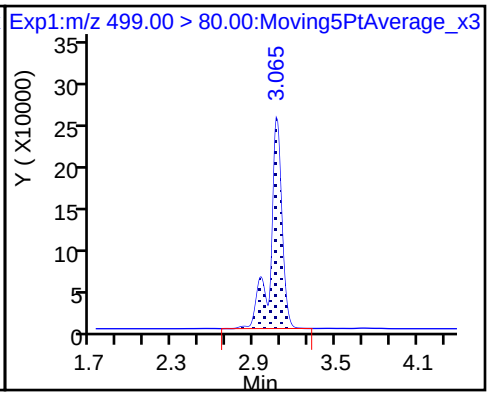
D 18 13C4 PFOS



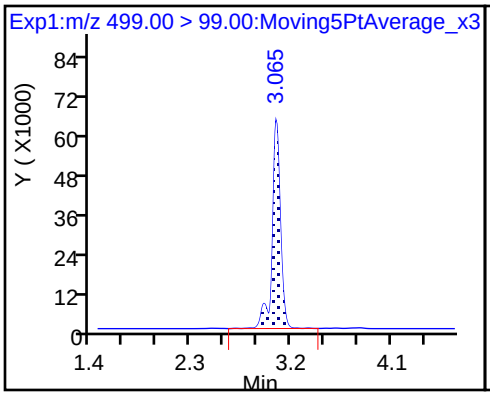
D 19 13C5 PFNA



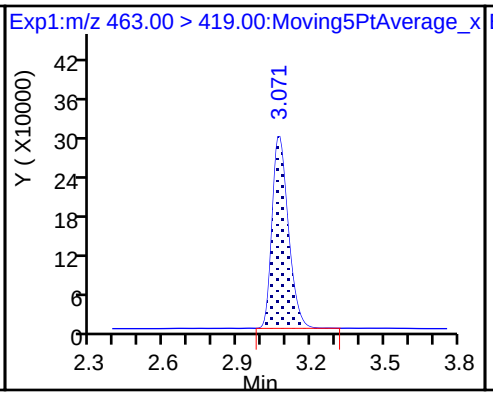
17 Perfluorooctane sulfonic acid



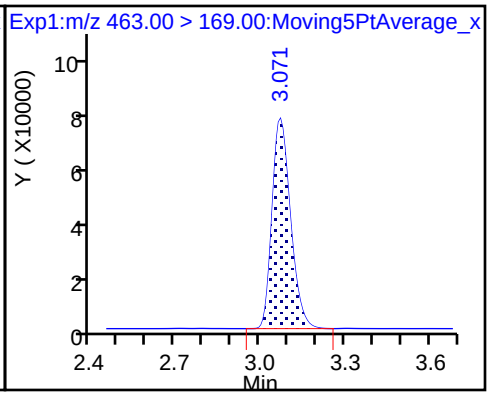
17 Perfluorooctane sulfonic acid



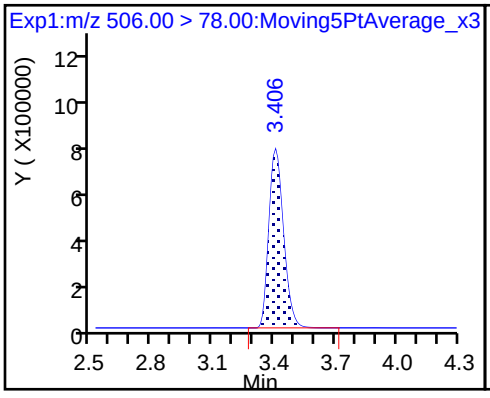
20 Perfluorononanoic acid



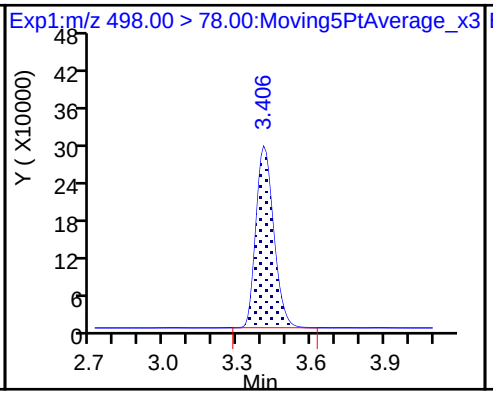
20 Perfluorononanoic acid



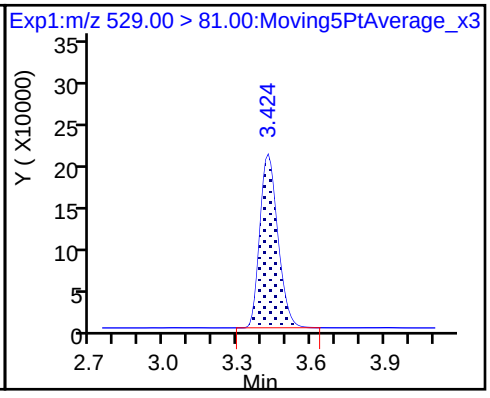
D 21 13C8 FOSA



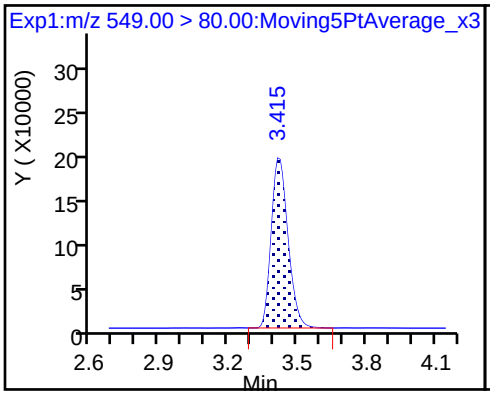
22 Perfluorooctane Sulfonamide



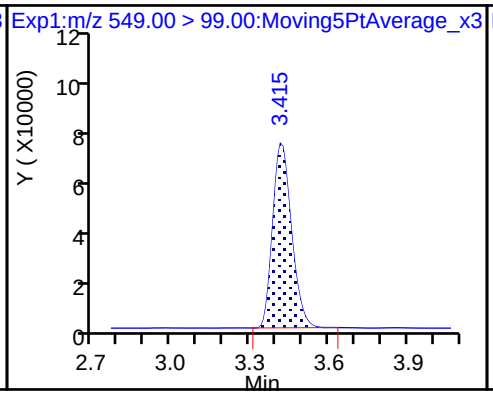
D 26 M2-8:2FTS



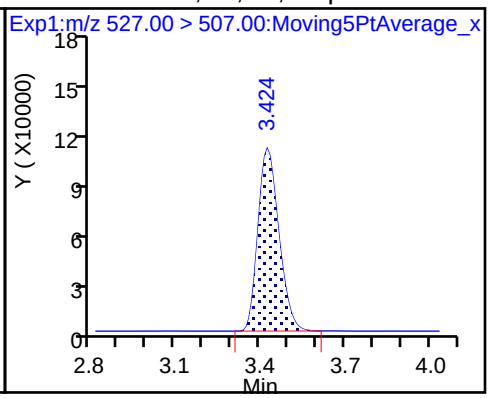
68 Perfluorononanesulfonic acid



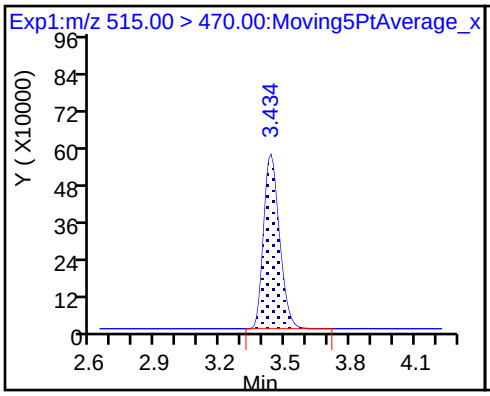
68 Perfluorononanesulfonic acid



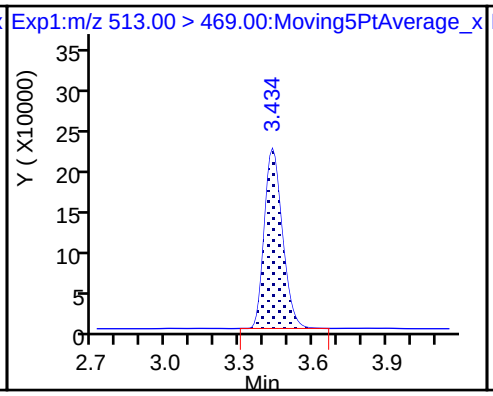
25 Sodium 1H,1H,2H,2H-perfluorodecane



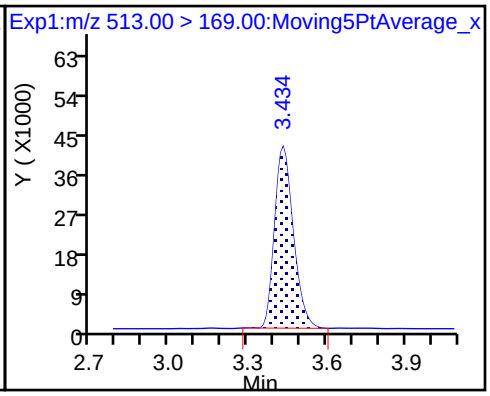
D 23 13C2 PFDA



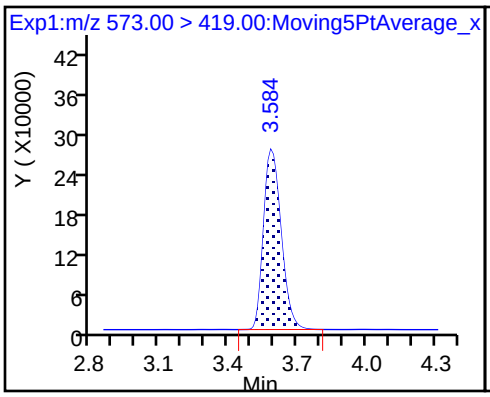
24 Perfluorodecanoic acid



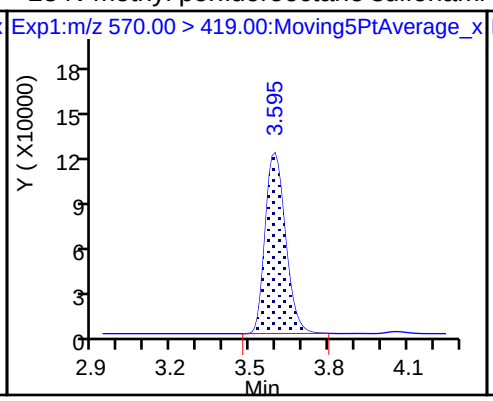
24 Perfluorodecanoic acid



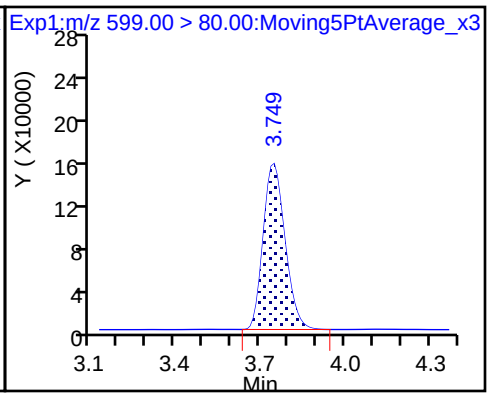
D 27 d3-NMeFOSAA



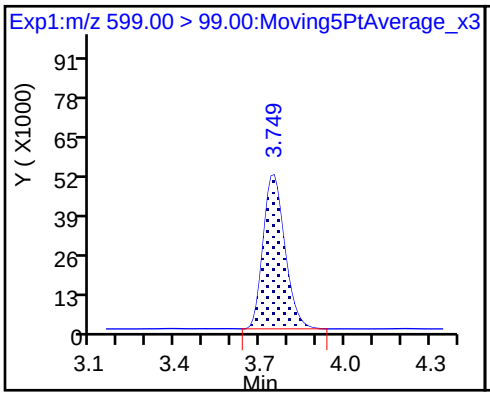
28 N-methyl perfluorooctane sulfonami



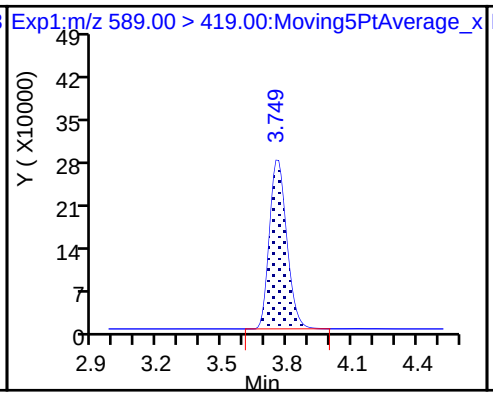
29 Perfluorodecane Sulfonic acid



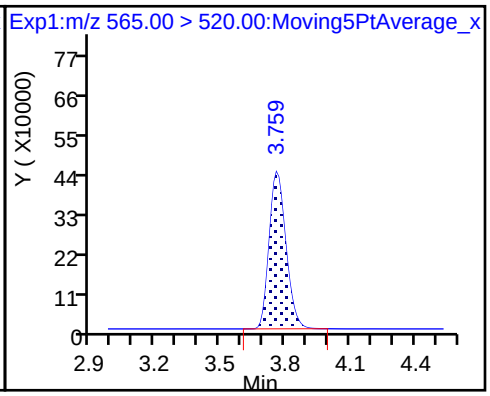
29 Perfluorodecane Sulfonic acid



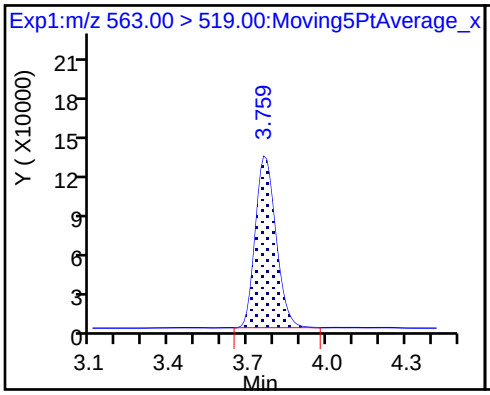
D 32 d5-NEtFOSAA



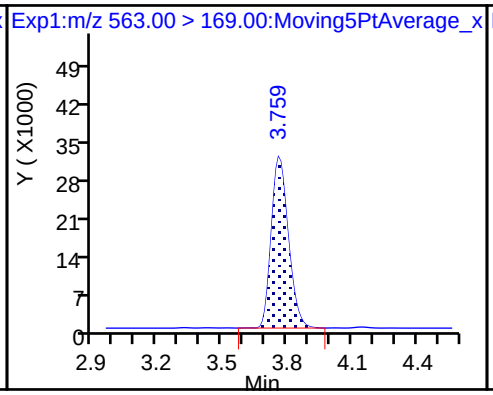
D 30 13C2 PFUnA



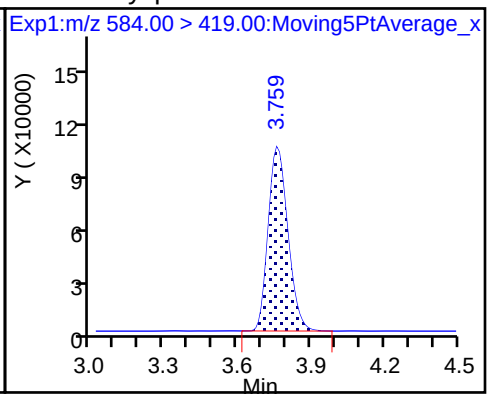
31 Perfluoroundecanoic acid



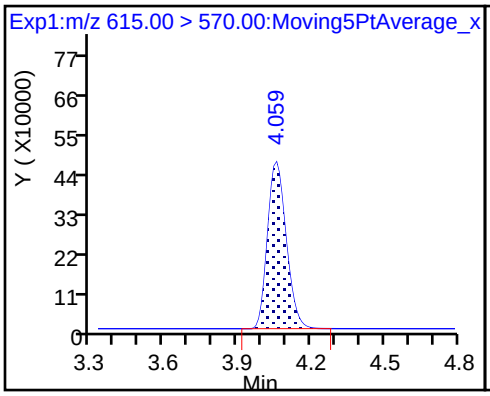
31 Perfluoroundecanoic acid



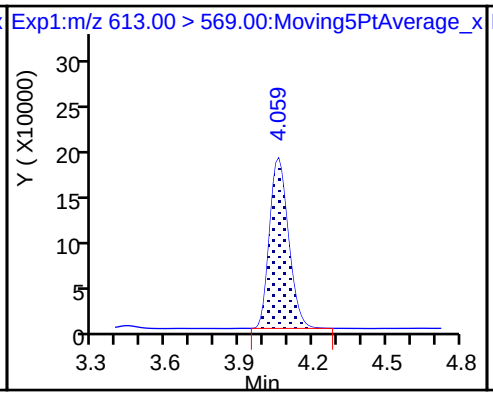
33 N-ethyl perfluorooctane sulfonamid



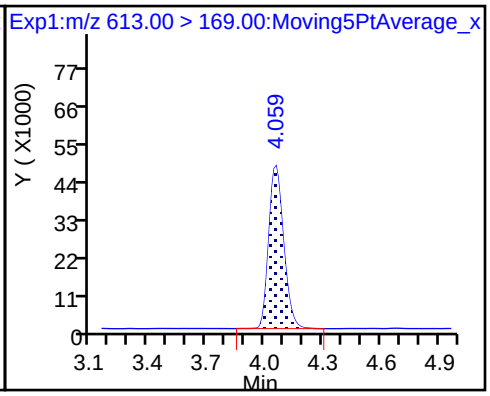
D 36 13C2 PFDoA



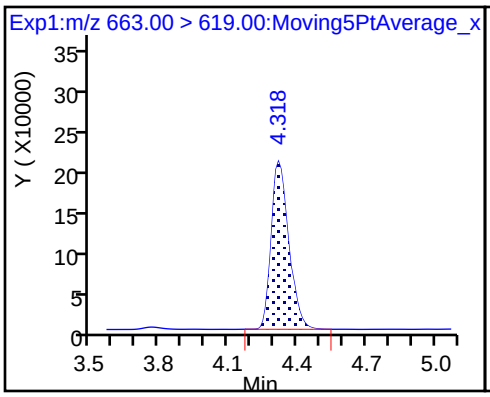
37 Perfluorododecanoic acid



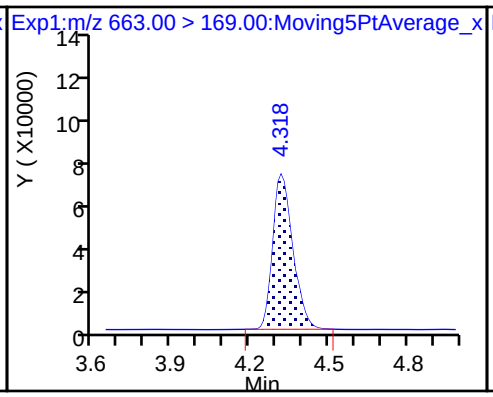
37 Perfluorododecanoic acid



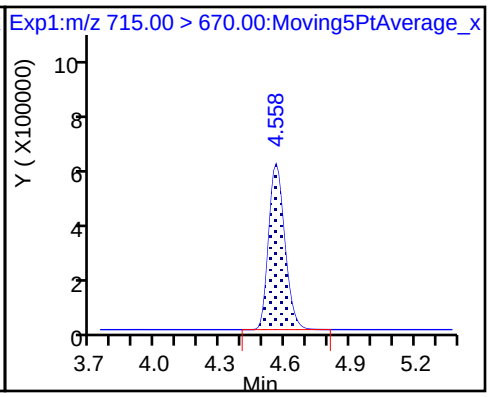
41 Perfluorotridecanoic acid



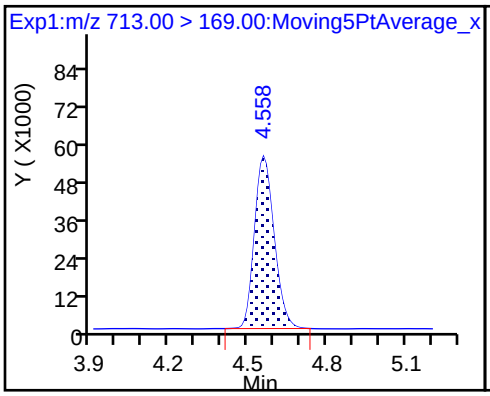
41 Perfluorotridecanoic acid



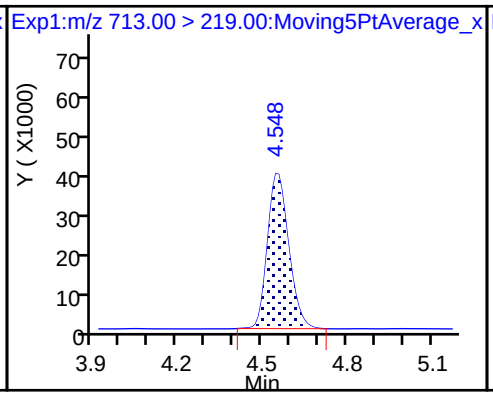
D 43 13C2-PFTeDA



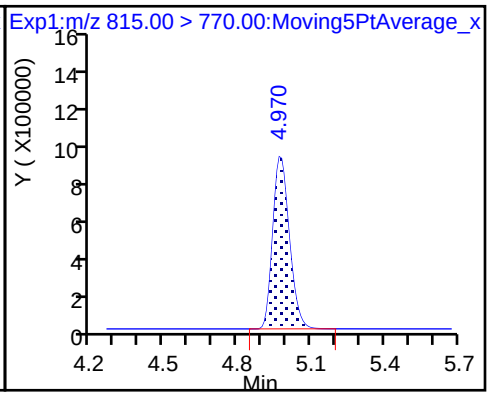
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 44 13C2-PFHxDA



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Instrument ID: A8_N Start Date: 04/10/2018 18:31

Analysis Batch Number: 217360 End Date: 04/10/2018 19:50

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		04/10/2018 18:31	1		GeminiC18 3x100 3(mm)
IC 320-217360/2		04/10/2018 18:39	1	2018.04.10LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-217360/3		04/10/2018 18:47	1	2018.04.10LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-217360/4		04/10/2018 18:55	1	2018.04.10LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-217360/5 ICIS		04/10/2018 19:03	1	2018.04.10LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-217360/6		04/10/2018 19:10	1	2018.04.10LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-217360/7		04/10/2018 19:18	1	2018.04.10LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-217360/8		04/10/2018 19:26	1	2018.04.10LLICAL 008.d	GeminiC18 3x100 3(mm)
ICB 320-217360/9		04/10/2018 19:34	1	2018.04.10LLICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-217360/10		04/10/2018 19:42	1	2018.04.10LLICAL 010.d	GeminiC18 3x100 3(mm)
CCB 320-217360/11		04/10/2018 19:50	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Instrument ID: A8_N Start Date: 04/21/2018 11:55

Analysis Batch Number: 219174 End Date: 04/21/2018 14:16

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-219174/1		04/21/2018 11:55	1	2018.04.21LLA_004.d	GeminiC18 3x100 3(mm)
CCVL 320-219174/2		04/21/2018 12:03	1	2018.04.21LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-219174/3 CCVIS		04/21/2018 12:10	1	2018.04.21LLA_006.d	GeminiC18 3x100 3(mm)
MB 320-218592/1-A		04/21/2018 12:18	1	2018.04.20LLCX_038.d	GeminiC18 3x100 3(mm)
LCS 320-218592/2-A		04/21/2018 12:26	1	2018.04.20LLCX_039.d	GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 12:34	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 12:42	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 12:50	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 12:57	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 13:05	1		GeminiC18 3x100 3(mm)
320-37938-1 DL		04/21/2018 13:13	20	2018.04.20LLCX_045.d	GeminiC18 3x100 3(mm)
320-37938-2		04/21/2018 13:21	1	2018.04.20LLCX_046.d	GeminiC18 3x100 3(mm)
320-37938-3		04/21/2018 13:29	1	2018.04.20LLCX_047.d	GeminiC18 3x100 3(mm)
CCV 320-219174/14		04/21/2018 13:37	1	2018.04.20LLCX_048.d	GeminiC18 3x100 3(mm)
320-37938-4		04/21/2018 13:44	1	2018.04.20LLCX_049.d	GeminiC18 3x100 3(mm)
320-37938-1		04/21/2018 13:52	1	2018.04.20LLCX_050.d	GeminiC18 3x100 3(mm)
CCV 320-219174/19		04/21/2018 14:16	1	2018.04.20LLCX_053.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Batch Number: 218592 Batch Start Date: 04/18/18 10:28 Batch Analyst: Long, Tyrel W

Batch Method: 3535 Batch End Date: 04/18/18 17:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00054	LCPFC-IS 00036
MB 320-218592/1		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCS 320-218592/2		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
320-37938-A-1	TP-PFC-028-TPI	3535, EPA 537 (Mod)	T	317.87 g	28.54 g	289.3 mL	10.00 mL	500 uL	500 uL
320-37938-A-2	TP-PFC-028-MID-CARB	3535, EPA 537 (Mod)	T	332.56 g	28.59 g	304 mL	10.00 mL	500 uL	500 uL
320-37938-A-3	TP-PFC-028-TPE	3535, EPA 537 (Mod)	T	323.74 g	27.98 g	295.8 mL	10.00 mL	500 uL	500 uL
320-37938-A-4	TP-PFC-028-TPE-D	3535, EPA 537 (Mod)	T	323.89 g	27.70 g	296.2 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00138					
MB 320-218592/1		3535, EPA 537 (Mod)							
LCS 320-218592/2		3535, EPA 537 (Mod)		500 uL					
320-37938-A-1	TP-PFC-028-TPI	3535, EPA 537 (Mod)	T						
320-37938-A-2	TP-PFC-028-MID-CARB	3535, EPA 537 (Mod)	T						
320-37938-A-3	TP-PFC-028-TPE	3535, EPA 537 (Mod)	T						
320-37938-A-4	TP-PFC-028-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.: 320-37938-1

SDG No.:

Batch Number: 218592 Batch Start Date: 04/18/18 10:28 Batch Analyst: Long, Tyrel W

Batch Method: 3535 Batch End Date: 04/18/18 17:45

Batch Notes	
Analyst ID - Aliquot Step	TWL
Balance ID	QA-078
Batch Comment	ENVI Carb Lot # 97221, client labels match : TWL 04/18/18
Analyst ID - Final Volume Step	TWL
H2O ID	04/18/18
Hexane ID	1175187
Internal Standard ID#	1208926
Manifold ID	6
Methanol ID	1207207
Sodium Hydroxide ID	1196582
Pipette ID	I46360G
Analyst ID - Reagent Drop	TWL
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	VPM
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	SKD
Solvent Lot #	1213091
Solvent Name	0.3%NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003737320A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 37964, 37938 Work List ID(s): 57030

Extraction Batch: 218592 Analysis Batch(es): 219174

Delivery Rank 4 Due Date: 4-27-18

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch#	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).			✓
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?			✓
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits? NCM	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?			✓
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation 123206 123205 123204			
1. Are all non-conformances documented/attached? NCM# 123203	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?		✓	
5. Was QC Checker run for this job?	✓	✓	

**Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.*

1st Level (Analyst): JRB Date: 4-24-18

2nd Level Reviewer: Mwalf Date: 4/26/2018

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 21APR2018NC_2A_PFC Worklist Number: 57030
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 219172	LC PFC ICAL Raw Batch: 219173	LC PFC_QSM5-1 ICAL Raw Batch: 219174
# 1 CCB	# 1 CCB	# 1 CCB	# 1 CCB
# 2 CCVL	# 2 CCVL	# 2 CCVL	# 2 CCVL
# 3 CCV L4	# 3 CCV L4	# 3 CCV L4	# 3 CCV L4
# 4 MB 320-218592/1-A			# 4 MB 320-218592/1-A
# 5 LCS 320-218592/2-A			# 5 LCS 320-218592/2-A
# 6 320-37964-A-1-A			# 6 320-37964-A-1-A
# 7 320-37964-A-2-A			# 7 320-37964-A-2-A
# 8 320-37964-A-2-B MS			# 8 320-37964-A-2-B MS
# 9 320-37964-A-2-C MSD			# 9 320-37964-A-2-C MSD
#10 320-37964-A-3-A			#10 320-37964-A-3-A
#11 320-37938-A-1-A			#11 320-37938-A-1-A
#12 320-37938-A-2-A			#12 320-37938-A-2-A
#13 320-37938-A-3-A			#13 320-37938-A-3-A
#14 CCV L4			#14 CCV L4
#15 320-37938-A-4-A			#15 320-37938-A-4-A
#16 320-37938-A-1-A			#16 320-37938-A-1-A
#17 RB			#17 RB
#18 RB			#18 RB
#19 CCV L5			#19 CCV L5

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 21APR2018NC_2A_PFC Worklist Num: 57030
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b
Anaylysis Type: SemiVOA Creator: Royce, Amani A
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCB	320-0057030-001	CCB	21-Apr-2018 11:55:18	2018.04.21LLA_004.d	20	1.0		sv
CCVL	320-0057030-002	CCVL	21-Apr-2018 12:03:07	2018.04.21LLA_005.d	21	1.0		sv
CCV L4	320-0057030-003	CCVIS	21-Apr-2018 12:10:56	2018.04.21LLA_006.d	13	1.0		sv
MB 320-218592/1-A	320-0057030-004	MB	21-Apr-2018 12:18:44	2018.04.20LLCX_038.d	27	1.0		sv
LCS 320-218592/2-A	320-0057030-005	LCS	21-Apr-2018 12:26:32	2018.04.20LLCX_039.d	28	1.0		sv
320-37964-A-1-A	320-0057030-006	Client	21-Apr-2018 12:34:23	2018.04.20LLCX_040.d	29	1.0	MW-MEM04-01-01	sv
320-37964-A-2-A	320-0057030-007	Client	21-Apr-2018 12:42:13	2018.04.20LLCX_041.d	30	1.0	MW-MEM01-01-01	sv
320-37964-A-2-B MS	320-0057030-008	MS	21-Apr-2018 12:50:02	2018.04.20LLCX_042.d	31	1.0	MW-MEM01-01-01	sv
320-37964-A-2-C MSD	320-0057030-009	MSD	21-Apr-2018 12:57:51	2018.04.20LLCX_043.d	32	1.0	MW-MEM01-01-01	sv
320-37964-A-3-A	320-0057030-010	Client	21-Apr-2018 13:05:43	2018.04.20LLCX_044.d	33	1.0	MW-MEM01-01-01D	sv
320-37938-A-1-A	320-0057030-011	Client	21-Apr-2018 13:13:35	2018.04.20LLCX_045.d	34	20.0	TP-PFC-028-TPI	sv
320-37938-A-2-A	320-0057030-012	Client	21-Apr-2018 13:21:27	2018.04.20LLCX_046.d	35	1.0	TP-PFC-028-MID-CARB	sv
320-37938-A-3-A	320-0057030-013	Client	21-Apr-2018 13:29:16	2018.04.20LLCX_047.d	36	1.0	TP-PFC-028-TPE	sv
CCV L4	320-0057030-014	CCVIS	21-Apr-2018 13:37:04	2018.04.20LLCX_048.d	13	1.0		sv
320-37938-A-4-A	320-0057030-015	Client	21-Apr-2018 13:44:53	2018.04.20LLCX_049.d	37	1.0	TP-PFC-028-TPE-D	sv
320-37938-A-1-A	320-0057030-016	Client	21-Apr-2018 13:52:43	2018.04.20LLCX_050.d	38	1.0	TP-PFC-028-TPI	sv
RB	320-0057030-017	RB	21-Apr-2018 14:00:32	2018.04.20LLCX_051.d	54	1.0		sv
RB	320-0057030-018	RB	21-Apr-2018 14:08:20	2018.04.20LLCX_052.d	54	1.0		sv
CCV L5	320-0057030-019	CCV	21-Apr-2018 14:16:07	2018.04.20LLCX_053.d	14	1.0		sv

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

MB 4/19/18
66 AS 4/20/18

Batch Number: 320-218592 ✓
Method Code: 320-3535_PFC-320

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM
Batch End: 4/18/2018 5:45:00PM

Solid-Phase Extraction (SPE)

Due: 4/27

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB-320-218592/1 N/A	N/A		250 mL	NA			N/A	N/A	N/A	R1	MB 320-218592/1-A
				10.00 mL								
2	LCS-320-218592/2 N/A	N/A		250 mL	NA			N/A	N/A	N/A		LCS 320-218592/2-A
				10.00 mL								
3	320-37964-A-1 (PFC_IDA_DOD5.1) 4/30	N/A (320-37964-1)	309.90 g	281 mL	NA			4/25/18	16_Days	4		320-37964-A-1-A
			28.90 g	10.00 mL								
4	320-37964-A-2 (PFC_IDA_DOD5.1)	N/A (320-37964-1)	283.30 g	254.6 mL	NA			4/25/18	16_Days	4		320-37964-A-2-A
			28.69 g	10.00 mL								
5	320-37964-A-2-MS (PFC_IDA_DOD5.1)	N/A (320-37964-1)	290.37 g	262.7 mL	NA			4/25/18	16_Days	4		320-37964-A-2-B MS
			27.71 g	10.00 mL								
6	320-37964-A-2-MSD (PFC_IDA_DOD5.1)	N/A (320-37964-1)	277.83 g	250.1 mL	NA			4/25/18	16_Days	4		320-37964-A-2-C MSD
			27.70 g	10.00 mL								
7	320-37964-A-3 (PFC_IDA_DOD5.1)	N/A (320-37964-1)	279.73 g	252.2 mL	NA			4/25/18	16_Days	4		320-37964-A-3-A
			27.50 g	10.00 mL								
8	320-37938-A-1 (PFC_IDA_DOD5.1) 4/27	N/A (320-37938-1)	317.87 g	289.3 mL	NA			4/22/18	16_Days	4	20X	320-37938-A-1-A
			28.54 g	10.00 mL								
9	320-37938-A-2 (PFC_IDA_DOD5.1)	N/A (320-37938-1)	332.56 g	304 mL	NA			4/22/18	16_Days	4		320-37938-A-2-A
			28.59 g	10.00 mL								
10	320-37938-A-3 (PFC_IDA_DOD5.1)	N/A (320-37938-1)	323.74 g	295.8 mL	NA			4/22/18	16_Days	4		320-37938-A-3-A
			27.98 g	10.00 mL								

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Method Code: 320-3535_PFC-320

Batch End: 4/18/2018 5:45:00PM

11	320-37938-A-4 (PFC_IDA_DOD5.1)	N/A (320-37938-1)	323.89 g 27.70 g	296.2 mL 10.00 mL	NA			4/22/18	16_Days	4	R1	320-37938-A-4-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Method Code: 320-3535_PFC-320

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Batch End: 4/18/2018 5:45:00PM

Batch Notes

Manifold ID	6
Methanol ID	1207207
Hexane ID	1175187
Sodium Hydroxide ID	1196582
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003737320A
Balance ID	QA-078
H2O ID	04/18/18
Pipette ID	I46360G
Solvent Name	0.3%NH4OH/MeOH
Solvent Lot #	1213091
Analyst ID - Reagent Drop	TWL
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	SKD
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
Analyst ID - IS Reagent Drop	TWL

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Method Code: 320-3535_PFC-320

Batch End: 4/18/2018 5:45:00PM

Analyst ID - IS Reagent Drop	VPM
Witness	
Internal Standard ID#	1208926
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	TWL
Analyst ID - Final Volume Step	TWL
SOP Number	WS-LC-0025
Batch Comment	ENVI Carb Lot # 97221, client labels match : TWL 04/18/18

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Method Code: 320-3535_PFC-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-218592/1	LCMPFC_ALL_SU_00049	500 uL	10.00 mL	TLL 4/18/18	SKD 4/18/18
LCS 320-218592/2	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
LCS 320-218592/2	LCPFCSP_00138	500 uL	10.00 mL		
320-37964-A-1	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37964-A-2	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37964-A-2 MS	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37964-A-2 MS	LCPFCSP_00138	500 uL	10.00 mL		
320-37964-A-2 MSD	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37964-A-2 MSD	LCPFCSP_00138	500 uL	10.00 mL		
320-37964-A-3	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37938-A-1	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37938-A-2	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37938-A-3	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37938-A-4	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Method Code: 320-3535_PFC-320

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 218592 Test 3535_PFC

Earliest Holding Time 4/22/18

Batch Information	1st Level Reviewer	2nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary batch information complete and entered into TALS correctly	✓	✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	**1st Level Reviewer**	**2nd Level Reviewer**
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	NA	NA
NCM for any anomalies filed	✓	✓
All NCMs include method code, matrix, and prep batch	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	✓	✓
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	✓	✓
The pH is transcribed properly in TALS	✓	✓
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: [signature] Date: 4/18/18

2nd Level Reviewer: VPM Date: 4/18/18

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA

Analyst (Print Name) Amani Royce **Reagent ID** LC-8012O-00003

Date 4/20/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
480-133780	1	10,000	30	300	10X
	2	↓	↓	↓	↓
	3		60		5X
320-37965	7		15		20X
320-37938	1		↓		20X
320-37947	1		30	1500	50X
↓	3		15	300	20X
	6		30	1500	50X
	7		↓	300	10X
	8				
	9				

aak 4/20/18

Comments:

Shipping and Receiving Documents

TestAmerica Sacramento
~~880 Riverside Parkway~~
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 227770

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: JEFF ORIENT	Site Contact: DAN GRIBEN	Date: 4/5/2018	COC No: 22770
Company Name: TETRATECH	Tel/Fax: 412-921-8650	Lab Contact: DAVID AUTTICKE	Carrier: FEDEX	1 of 1 COCs
Address: 881 ANDERSON DR. FOSTER PLAZA 7	Analysis Turnaround Time			Sampler: DAN GRIBEN
City/State/Zip: PITTSBURGH/PA/015210	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 412-921-8650	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: BRUNSWICK GWETS	☐ 1 week			Job / SDG No.:
Site: FORMER NAS BRUNSWICK	☐ 2 days			
PO # 112G08005-WE21	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	PFC (FULL LIST)	Sample Specific Notes:
TP-PFC-028-TPI	4/5/18	0915	G	W	4	N	N	X	
TP-PFC-028-MID-CARB	4/5/18	0920	G	W	4	N	N	X	
TP-PFC-028-TPE	4/6/18	0925	G	W	4	N	N	X	
TP-PFC-028-TPE-D	4/6/18	0000	G	W	4	N	N	X	

DC

320-37938 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 7.1 Corr'd: 7.1 | Therm ID No.: AK2 melt water

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	T+	4/5/18 1430	[signature]	TA-SAC	4/6/18 0850
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-37938-1

Login Number: 37938
List Number: 1
Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	7.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","370","ng/L","D","19","DL","","TRG","","","69","LOQ","YES","-99","","289.3","10.00","52",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","26","ng/L","U","12","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","26",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","180","ng/L","D","7.4","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","17",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","370","ng/L","D","8.1","DL","","TRG","","","35","LOQ","YES","-99","","289.3","10.00","17",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","26","ng/L","U","9.0","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","26",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1800","ng/L","D","9.3","DL","","TRG","","","35","LOQ","YES","-99","","289.3","10.00","26",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","17","ng/L","U","8.3","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","17",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","26","ng/L","U","9.7","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","26",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","380","ng/L","D","6.6","DL","","TRG","","","35","LOQ","YES","-99","","289.3","10.00","17",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","76","ng/L","D","10","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","26",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","52","ng/L","D","8.0","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","17",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","80","ng/L","D","11","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","26",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","9.0","ng/L","J D","6.4","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","17",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","26","ng/L","U","9.0","DL","","TRG","","","35","LOQ","NO","-99","","289.3","10.00","26",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","52","ng/L","U","14","DL","","TRG","","","69","LOQ","NO","-99","","289.3","10.00","52",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","52","ng/L","U","13","DL","","TRG","","","69","LOQ","NO","-99","","289.3","10.00","52",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","52","ng/L","U","22","DL","","TRG","","","69","LOQ","NO","-99","","289.3","10.00","52",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00990","13C4 PFOA","80","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00991","13C4 PFOS","71","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","82.6","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00992","13C4 PFBA","79","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00993","13C2 PFHxA","79","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00994","18O2 PFHxS","73","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","81.7","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00995","13C5 PFNA","81","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00996","13C2 PFDA","87","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00997","13C2 PFUnA","74","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL00998","13C2 PFDoA","72","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL01056","13C8

FOSA","72","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL01892","13C4-
PFHpA","81","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL01893","13C5
PFPeA","85","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL02116","13C2-
PFTeDA","69","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","86.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","DL","320-37938-1","TALSAC","STL02337","13C3-
PFBS","71","ng/L","M","-99","DL","","TRG","88","","-99","LOQ","YES","80.4","","289.3","10.00","1700",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","360","ng/L","E","0.95","DL","","TRG","","","3.5","LOQ","NO","-99","","289.3","10.00","2.6",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","1.3","ng/L","U","0.62","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","1.3",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","200","ng/L","","0.37","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","0.86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","360","ng/L","E","0.41","DL","","TRG","","","1.7","LOQ","NO","-99","","289.3","10.00","0.86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.3","ng/L","U","0.45","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","1.3",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1400","ng/L","E","0.47","DL","","TRG","","","1.7","LOQ","NO","-99","","289.3","10.00","1.3",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.81","ng/L","J M","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","0.86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.48","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","1.3",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","380","ng/L","E","0.33","DL","","TRG","","","1.7","LOQ","NO","-99","","289.3","10.00","0.86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","74","ng/L","","0.51","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","1.3",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","50","ng/L","","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","0.86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","81","ng/L","","0.53","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","1.3",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","7.3","ng/L","","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","0.86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.7","ng/L","","0.45","DL","","TRG","","","1.7","LOQ","YES","-99","","289.3","10.00","1.3",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","2.6","ng/L","U","0.72","DL","","TRG","","","3.5","LOQ","YES","-99","","289.3","10.00","2.6",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.6","ng/L","U","0.66","DL","","TRG","","","3.5","LOQ","YES","-99","","289.3","10.00","2.6",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","2.6","ng/L","U M","1.1","DL","","TRG","","","3.5","LOQ","YES","-99","","289.3","10.00","2.6",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00990","13C4
PFOA","81","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00991","13C4
PFOS","86","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","82.6","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00992","13C4
PFBA","85","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00993","13C2
PFHxA","90","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00994","18O2
PFHxS","86","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","81.7","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00995","13C5

PFNA","92","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00996","13C2
PFDA","95","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00997","13C2
PFUnA","92","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL00998","13C2
PFDoA","88","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL01056","13C8
FOSA","87","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL01892","13C4-
PFHpA","91","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL01893","13C5
PFPeA","92","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL02116","13C2-
PFTeDA","83","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","86.4","","289.3","10.00","86",""
"TP-PFC-028-TPI","EPA 537 (Mod)","RES","320-37938-1","TALSAC","STL02337","13C3-
PFBS","87","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","80.4","","289.3","10.00","86",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","2.5","ng/L","U","0.90","DL","","TRG","","","3.3","LOQ","YES","-99","","304","10.00","2.5",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","2058-94-8","Perfluoroundecanoic
acid (PFUnA)","1.2","ng/L","U","0.59","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","1.2",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","230","ng/L","","0.35","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","0.82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","140","ng/L","","0.39","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","0.82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","1.2","ng/L","U","0.43","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","1.2",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","33","ng/L","M","0.44","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","1.2",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.82","ng/L","U","0.39","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","0.82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","335-77-3","Perfluorodecanesulfonic
acid (PFDS)","1.2","ng/L","U","0.46","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","1.2",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","2.0","ng/L","","0.31","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","0.82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","120","ng/L","","0.49","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","1.2",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","375-73-5","Perfluorobutanesulfonic
acid (PFBS)","4.1","ng/L","","0.38","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","0.82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.0","ng/L","","0.50","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","1.2",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.82","ng/L","U","0.30","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","0.82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.2","ng/L","U","0.43","DL","","TRG","","","1.6","LOQ","YES","-99","","304","10.00","1.2",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","376-06-7","Perfluorotetradecanoic
acid (PFTeA)","2.5","ng/L","U","0.68","DL","","TRG","","","3.3","LOQ","YES","-99","","304","10.00","2.5",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","72629-94-8","Perfluorotridecanoic
Acid (PFTriA)","2.5","ng/L","U","0.63","DL","","TRG","","","3.3","LOQ","YES","-99","","304","10.00","2.5",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","754-91-6","Perfluorooctane
Sulfonamide (FOSA)","2.5","ng/L","U","1.1","DL","","TRG","","","3.3","LOQ","YES","-99","","304","10.00","2.5",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00990","13C4

PFOA","72","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00991","13C4
PFOS","64","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","78.6","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00992","13C4
PFBA","71","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00993","13C2
PFHxA","69","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00994","18O2
PFHxS","67","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","77.8","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00995","13C5
PFNA","68","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00996","13C2
PFDA","71","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00997","13C2
PFUnA","66","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL00998","13C2
PFDoA","62","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL01056","13C8
FOSA","63","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL01892","13C4-
PFHpA","70","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL01893","13C5
PFPeA","68","ng/L","","-99","DL","","TRG","82","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL02116","13C2-
PFTeDA","60","ng/L","","-99","DL","","TRG","73","","-99","LOQ","YES","82.2","","304","10.00","82",""
"TP-PFC-028-MID-CARB","EPA 537 (Mod)","RES","320-37938-2","TALSAC","STL02337","13C3-
PFBS","66","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","76.5","","304","10.00","82",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.5","ng/L","U","0.93","DL","","TRG","","","3.4","LOQ","YES","-99","","295.8","10.00","2.5",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","1.3","ng/L","U","0.61","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","1.3",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","190","ng/L","","0.36","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","0.85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","65","ng/L","","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","0.85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.3","ng/L","U","0.44","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","1.3",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","2.8","ng/L","M","0.46","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","1.3",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.85","ng/L","U","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","0.85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.47","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","1.3",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.36","ng/L","J","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","0.85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","130","ng/L","","0.50","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","1.3",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","1.1","ng/L","J","0.39","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","0.85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","1.3","ng/L","J M","0.52","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","1.3",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.85","ng/L","U","0.31","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","0.85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA)","1.3","ng/L","U","0.44","DL","","TRG","","","1.7","LOQ","YES","-99","","295.8","10.00","1.3",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","2.5","ng/L","U","0.70","DL","","TRG","","","3.4","LOQ","YES","-99","","295.8","10.00","2.5",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.5","ng/L","U","0.64","DL","","TRG","","","3.4","LOQ","YES","-99","","295.8","10.00","2.5",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","2.5","ng/L","U M","1.1","DL","","TRG","","","3.4","LOQ","YES","-99","","295.8","10.00","2.5",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00990","13C4
PFOA","75","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00991","13C4
PFOS","70","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","80.8","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00992","13C4
PFBA","73","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00993","13C2
PFHxA","74","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00994","18O2
PFHxS","70","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","80.0","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00995","13C5
PFNA","75","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00996","13C2
PFDA","73","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00997","13C2
PFUnA","70","ng/L","","-99","DL","","TRG","82","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL00998","13C2
PFDoA","68","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL01056","13C8
FOSA","67","ng/L","","-99","DL","","TRG","79","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL01892","13C4-
PFHpA","73","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL01893","13C5
PFPeA","70","ng/L","","-99","DL","","TRG","82","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL02116","13C2-
PFTeDA","64","ng/L","","-99","DL","","TRG","76","","-99","LOQ","YES","84.5","","295.8","10.00","85",""
"TP-PFC-028-TPE","EPA 537 (Mod)","RES","320-37938-3","TALSAC","STL02337","13C3-
PFBS","68","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","78.6","","295.8","10.00","85",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.5","ng/L","U","0.93","DL","","TRG","","","3.4","LOQ","YES","-99","","296.2","10.00","2.5",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","1.3","ng/L","U","0.61","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","1.3",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","180","ng/L","","0.36","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","0.84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","64","ng/L","","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","0.84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.3","ng/L","U","0.44","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","1.3",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","2.8","ng/L","M","0.46","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","1.3",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.84","ng/L","U","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","0.84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.47","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","1.3",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.47","ng/L","J","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","0.84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","375-22-4","Perfluorobutanoic acid

(PFBA)","130","ng/L","","0.50","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","1.3",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","1.1","ng/L","J","0.39","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","0.84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","1.3","ng/L","J","0.51","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","1.3",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","375-92-8","Perfluoroheptanesulfonic
Acid (PFHpS)","0.84","ng/L","U","0.31","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","0.84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.3","ng/L","U","0.44","DL","","TRG","","","1.7","LOQ","YES","-99","","296.2","10.00","1.3",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","2.5","ng/L","U","0.70","DL","","TRG","","","3.4","LOQ","YES","-99","","296.2","10.00","2.5",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.5","ng/L","U","0.64","DL","","TRG","","","3.4","LOQ","YES","-99","","296.2","10.00","2.5",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","2.5","ng/L","U","1.1","DL","","TRG","","","3.4","LOQ","YES","-99","","296.2","10.00","2.5",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00990","13C4
PFOA","76","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00991","13C4
PFOS","71","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","80.7","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00992","13C4
PFBA","74","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00993","13C2
PFHxA","75","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00994","18O2
PFHxS","71","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","79.8","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00995","13C5
PFNA","76","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00996","13C2
PFDA","75","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00997","13C2
PFUnA","71","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL00998","13C2
PFDoA","68","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL01056","13C8
FOSA","68","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL01892","13C4-
PFHpA","76","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL01893","13C5
PFPeA","73","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL02116","13C2-
PFTeDA","64","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","84.4","","296.2","10.00","84",""
"TP-PFC-028-TPE-D","EPA 537 (Mod)","RES","320-37938-4","TALSAC","STL02337","13C3-
PFBS","70","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","78.5","","296.2","10.00","84",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","40.0","ng/L","","1.1","DL","","SPK","108","","4.0","LOQ","YES","37.1","","250","10.00","3.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","2058-94-
8","Perfluoroundecanoic acid
(PFUnA)","35.4","ng/L","","0.72","DL","","SPK","89","","2.0","LOQ","YES","40.0","","250","10.00","1.5",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","39.0","ng/L","","0.43","DL","","SPK","97","","2.0","LOQ","YES","40.0","","250","10.00","1.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","39.7","ng/L","","0.47","DL","","SPK","99","","2.0","LOQ","YES","40.0","","250","10.00","1.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","307-55-

1","Perfluorododecanoic acid
(PFDoA)","38.4","ng/L","","0.52","DL","","SPK","96","","2.0","LOQ","YES","40.0","","250","10.00","1.5",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","38.8","ng/L","","0.54","DL","","SPK","97","","2.0","LOQ","YES","40.0","","250","10.00","1.5",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","38.3","ng/L","","0.48","DL","","SPK","96","","2.0","LOQ","YES","40.0","","250","10.00","1.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","36.7","ng/L","","0.56","DL","","SPK","95","","2.0","LOQ","YES","38.6","","250","10.00","1.5",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","32.8","ng/L","","0.38","DL","","SPK","90","","2.0","LOQ","YES","36.4","","250","10.00","1.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","40.8","ng/L","","0.59","DL","","SPK","102","","2.0","LOQ","YES","40.0","","250","10.00","1.5",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","34.3","ng/L","","0.46","DL","","SPK","97","","2.0","LOQ","YES","35.4","","250","10.00","1.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","37.5","ng/L","","0.61","DL","","SPK","94","","2.0","LOQ","YES","40.0","","250","10.00","1.5",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","37.8","ng/L","","0.37","DL","","SPK","99","","2.0","LOQ","YES","38.1","","250","10.00","1.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","37.5","ng/L","","0.52","DL","","SPK","94","","2.0","LOQ","YES","40.0","","250","10.00","1.5",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","37.4","ng/L","","0.83","DL","","SPK","94","","4.0","LOQ","YES","40.0","","250","10.00","3.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","72629-94-
8","Perfluorotridecanoic Acid
(PFTriA)","36.1","ng/L","","0.76","DL","","SPK","90","","4.0","LOQ","YES","40.0","","250","10.00","3.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","37.2","ng/L","","1.3","DL","","SPK","93","","4.0","LOQ","YES","40.0","","250","10.00","3.0",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00990","13C4
PFOA","91.0","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00991","13C4
PFOS","85.1","ng/L","","-99","DL","","SPK","89","","-99","LOQ","YES","95.6","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00992","13C4
PFBA","89.1","ng/L","","-99","DL","","SPK","89","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00993","13C2
PFHxA","89.6","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00994","18O2
PFHxS","87.8","ng/L","","-99","DL","","SPK","93","","-99","LOQ","YES","94.6","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00995","13C5
PFNA","90.6","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00996","13C2
PFDA","89.9","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00997","13C2
PFUnA","85.5","ng/L","","-99","DL","","SPK","85","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL00998","13C2
PFDoA","83.5","ng/L","","-99","DL","","SPK","83","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL01056","13C8
FOSA","80.7","ng/L","","-99","DL","","SPK","81","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL01892","13C4-

PFHpA","97.8","ng/L","","-99","DL","","SPK","98","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL01893","13C5
PFPeA","87.9","ng/L","","-99","DL","","SPK","88","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL02116","13C2-
PFTeDA","80.7","ng/L","","-99","DL","","SPK","81","","-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-218592/2-A","EPA 537 (Mod)","RES","LCS 320-218592/2-A","TALSAC","STL02337","13C3-
PFBS","84.2","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","93.0","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid (PFOS)","3.0","ng/L","U
M","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.00","3.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","2058-94-
8","Perfluoroundecanoic acid
(PFUnA)","1.5","ng/L","U","0.72","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","1.0","ng/L","U","0.43","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","1.0","ng/L","U","0.47","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","1.5","ng/L","U","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","1.5","ng/L","U","0.54","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","1.0","ng/L","U","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","1.5","ng/L","U","0.56","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","1.0","ng/L","U","0.38","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","1.5","ng/L","U","0.59","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","1.0","ng/L","U","0.46","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","1.5","ng/L","U","0.61","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","1.0","ng/L","U","0.37","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","1.5","ng/L","U","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","3.0","ng/L","U","0.83","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.00","3.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","72629-94-
8","Perfluorotridecanoic Acid
(PFTriA)","3.0","ng/L","U","0.76","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.00","3.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","754-91-6","Perfluorooctane
Sulfonamide (FOSA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.00","3.0",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00990","13C4
PFOA","89.2","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00991","13C4
PFOS","88.6","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","95.6","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00992","13C4

PFBA","88.4","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00993","13C2
PFHxA","89.6","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00994","18O2
PFHxS","85.9","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","94.6","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00995","13C5
PFNA","91.0","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00996","13C2
PFDA","89.7","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00997","13C2
PFUnA","89.5","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL00998","13C2
PFDoA","85.2","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL01056","13C8
FOSA","78.4","ng/L","","-99","DL","","TRG","78","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL01892","13C4-
PFHpA","90.3","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL01893","13C5
PFPeA","93.4","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL02116","13C2-
PFTeDA","79.6","ng/L","","-99","DL","","TRG","80","","-99","LOQ","YES","100","","250","10.00","100",""
"MB 320-218592/1-A","EPA 537 (Mod)","RES","MB 320-218592/1-A","TALSAC","STL02337","13C3-
PFBS","82.3","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","93.0","","250","10.00","100",""
"Unknown","Unknown","TP-PFC-028-TPI","04/05/2018 09:15","AQ","320-37938-1","NM","","7.10","EPA 537
(Mod)","3535","DL","04/18/2018 10:32","04/21/2018
13:13","TALSAC","COA","WET","NA","20","NA","NA","","100","320-218592","320-218592","NA","320-
219174","320-37938-1","04/06/2018 08:50","04/09/2018 17:05",""
"Unknown","Unknown","TP-PFC-028-TPI","04/05/2018 09:15","AQ","320-37938-1","NM","","7.10","EPA 537
(Mod)","3535","RES","04/18/2018 10:32","04/21/2018
13:52","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218592","320-218592","NA","320-
219174","320-37938-1","04/06/2018 08:50","04/09/2018 17:05",""
"Unknown","Unknown","TP-PFC-028-MID-CARB","04/05/2018 09:20","AQ","320-37938-2","NM","","7.10","EPA
537 (Mod)","3535","RES","04/18/2018 10:32","04/21/2018
13:21","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218592","320-218592","NA","320-
219174","320-37938-1","04/06/2018 08:50","04/09/2018 17:05",""
"Unknown","Unknown","TP-PFC-028-TPE","04/05/2018 09:25","AQ","320-37938-3","NM","","7.10","EPA 537
(Mod)","3535","RES","04/18/2018 10:32","04/21/2018
13:29","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218592","320-218592","NA","320-
219174","320-37938-1","04/06/2018 08:50","04/09/2018 17:05",""
"Unknown","Unknown","TP-PFC-028-TPE-D","04/05/2018 00:00","AQ","320-37938-4","FD","","7.10","EPA 537
(Mod)","3535","RES","04/18/2018 10:32","04/21/2018
13:44","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218592","320-218592","NA","320-
219174","320-37938-1","04/06/2018 08:50","04/09/2018 17:05",""
"Unknown","Unknown","LCS 320-218592/2-A","","AQ","LCS 320-218592/2-A","LCS","","-99","EPA 537
(Mod)","3535","RES","04/18/2018 10:32","04/21/2018
12:26","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218592","320-218592","NA","320-
219174","320-37938-1","04/18/2018 10:32","04/09/2018 17:05",""
"Unknown","Unknown","MB 320-218592/1-A","","AQ","MB 320-218592/1-A","MB","","-99","EPA 537
(Mod)","3535","RES","04/18/2018 10:32","04/21/2018
12:18","TALSAC","COA","WET","NA","1","NA","NA","","100","320-218592","320-218592","NA","320-
219174","320-37938-1","04/18/2018 10:32","04/09/2018 17:05",""

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **J. ORIENT** **DATE:** **JULY 11, 2018**

FROM: **MICHELLE L. WOEBER** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)**
FORMER NAVAL AIR STATION (NAS) BRUNSWICK, BRUNSWICK, ME
CTO WE21 PFC ASSESSMENT
SAMPLE DELIVERY GROUP (SDG) 320-37938-1

SAMPLES: 4/Aqueous/PFAS

TP-PFC-028-MID-CARB TP-PFC-028-TPE TP-PFC-028-TPE-D
TP-PFC-028-TPI

Overview

The sample set for former NAS Brunswick, SDG 320-37938-1 consisted of four (4) aqueous environmental samples. All four (4) aqueous samples were analyzed for Polyfluoroalkyl Substances (PFAS). One field duplicate pair was included in these Sample Delivery Groups (SDGs): TP-PFC-028-TPE/TP-PFC-028-TPE-D.

The samples were collected by Tetra Tech, Inc. on April 5, 2018 and analyzed by Test America, Inc. The analyses were conducted using EPA Method 537 (Modified) analytical and reporting protocols. The data was evaluated based on the following parameters:

* • Data completeness
* • Hold times/Sample Preservation
* • Mass Calibration
* • LC/MS/MS System Tuning and Performance
* • Mass Spectral Acquisition Rate
* • Instrument Sensitivity Check
* • Ion Transition Check
* • Initial/Continuing Calibrations
* • Laboratory Method Blank Results
* • Extraction Internal Standard (Surrogate) Recoveries
• Injection Internal Standard Recoveries
* • Laboratory Control Sample Recoveries
* • Field Duplicate Precision
* • Compound Identification
* • Compound Quantitation
* • Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B, and Appendix C contains the documentation to support the findings as discussed in this data validation report. An EPA Region 1 tier II validation was performed on the data in this SDG. The text of this report has been formulated to address only those areas affecting data quality.

PFAS

The 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-028-TPI. Detected results in the dilution analysis were qualified as estimated, (J).

NOTES

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentrations of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)), perfluorohexanoic acid (PFHxA), perfluorohexanesulfonic acid (PFHxS), and perfluorooctanesulfonic acid (PFOS) exceeded the instrument calibration range in sample TP-PFC-028-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 the Limit of Detection (LOD).

EXECUTIVE SUMMARY

Laboratory Performance: The injected internal standard area was low in the diluted sample.

Other Factors Affecting Data Quality: One sample was further diluted. Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the EPA New England Environmental Data Review Supplement for Regional Data Review Elements Superfund Guidance/Procedures (April 2013), National Functional Guidelines for Organic Data Validation (January 2017), and the 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.

for 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 method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

APPENDIX A

QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-028-MID-CARB			TP-PFC-028-TPE			TP-PFC-028-TPE-D			TP-PFC-028-TPI		
SDG: 320-37938-1	LAB_ID	320-37938-2			320-37938-3			320-37938-4			320-37938-1		
FRACTION: PFAS	SAMP_DATE	4/5/2018			4/5/2018			4/5/2018			4/5/2018		
MEDIA: WATER	QC_TYPE	NM			NM			FD			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							TP-PFC-028-TPE					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		33			2.8			2.8					
PERFLUOROBUTANESULFONIC ACID (PFBS)		4.1			1.1	J	P	1.1	J	P	50		
PERFLUOROBUTANOIC ACID (PFBA)		120			130			130			74		
PERFLUORODECANESULFONIC ACID (PFDS)		1.2	U		1.3	U		1.3	U		1.3	U	
PERFLUORODECANOIC ACID (PFDA)		0.82	U		0.85	U		0.84	U		0.81	J	P
PERFLUORODODECANOIC ACID (PFDOA)		1.2	U		1.3	U		1.3	U		1.3	U	
PERFLUOROHEPTANESULFONIC ACID		0.82	U		0.85	U		0.84	U		7.3		
PERFLUOROHEPTANOIC ACID (PFHPA)		6			1.3	J	P	1.3	J	P	81		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2			0.36	J	P	0.47	J	P			
PERFLUOROHEXANOIC ACID (PFHXA)		140			65			64					
PERFLUORONONANOIC ACID (PFNA)		1.2	U		1.3	U		1.3	U		2.7		
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2.5	U		2.5	U		2.5	U		2.6	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2.5	U		2.5	U		2.5	U				
PERFLUOROPENTANOIC ACID (PFPEA)		230			190			180			200		
PERFLUOROTETRADECANOIC ACID (PFTEA)		2.5	U		2.5	U		2.5	U		2.6	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2.5	U		2.5	U		2.5	U		2.6	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.2	U		1.3	U		1.3	U		1.3	U	

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-028-TPI-DL		
SDG: 320-37938-1	LAB_ID	320-37938-1		
FRACTION: PFAS	SAMP_DATE	4/5/2018		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1800	J	N
PERFLUOROBUTANESULFONIC ACID (PFBS)				
PERFLUOROBUTANOIC ACID (PFBA)				
PERFLUORODECANESULFONIC ACID (PFDS)				
PERFLUORODECANOIC ACID (PFDA)				
PERFLUORODODECANOIC ACID (PFDOA)				
PERFLUOROHEPTANESULFONIC ACID				
PERFLUOROHEPTANOIC ACID (PFHPA)				
PERFLUOROHEXANESULFONIC ACID (PFHXS)		380	J	N
PERFLUOROHEXANOIC ACID (PFHXA)		370	J	N
PERFLUORONONANOIC ACID (PFNA)				
PERFLUOROOCTANE SULFONAMIDE (FOSA)				
PERFLUOROOCTANESULFONIC ACID (PFOS)		370	J	N
PERFLUOROPENTANOIC ACID (PFPEA)				
PERFLUOROTETRADECANOIC ACID (PFTEA)				
PERFLUOROTRIDECANOIC ACID (PFTRIA)				
PERFLUOROUNDECANOIC ACID (PFUNA)				

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPI | Lab Sample ID: 320-37938-1

Matrix: Water | Lab File ID: 2018.04.20LLCX_050.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:15

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 289.3(mL) | Date Analyzed: 04/21/2018 13:52

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74		1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		1.7	0.86	0.37
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*360*	*E*	*1.7*	0.86	*0.41*
375-85-9	Perfluoroheptanoic acid (PFHpA)	81		1.7	1.3	0.53
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1400*	*E*	*1.7*	1.3	*0.47*
375-95-1	Perfluorononanoic acid (PFNA)	2.7		1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.81	J M	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	2.6	0.66
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	2.6	0.72
375-73-5	Perfluorobutanesulfonic acid (PFBS)	50		1.7	0.86	0.40
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*380*	*E*	*1.7*	0.86	*0.33*
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.3		1.7	0.86	0.32
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*360*	*E*	*3.5*	2.6	*0.95*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U M	3.5	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPI Lab Sample ID: 320-37938-1

Matrix: Water Lab File ID: 2018.04.20LLCX_050.d

Analysis Method: EPA 537 (Mod) Date Collected: 04/05/2018 09:15

Extraction Method: 3535 Date Extracted: 04/18/2018 10:32

Sample wt/vol: 289.3(mL) Date Analyzed: 04/21/2018 13:52

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	101		50-150
STL00992	13C4 PFBA	98		50-150
STL01893	13C5 PFPeA	106		50-150
STL00993	13C2 PFHxA	104		50-150
STL01892	13C4-PFHpA	105		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	106		50-150
STL00996	13C2 PFDA	110		50-150
STL00997	13C2 PFUnA	106		50-150
STL00998	13C2 PFDoA	101		50-150
STL00994	18O2 PFHxS	105		50-150
STL02116	13C2-PFTeDA	96		50-150
STL00991	13C4 PFOS	104		50-150
STL02337	13C3-PFBS	108		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPI DL | Lab Sample ID: 320-37938-1 DL

Matrix: Water | Lab File ID: 2018.04.20LLCX_045.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:15

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 289.3(mL) | Date Analyzed: 04/21/2018 13:13

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*76*	*D*	*35*	26	*10*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*180*	*D*	*35*	17	*7.4*
307-24-4	Perfluorohexanoic acid (PFHxA)	370	D	35	17	8.1
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*80*	*D*	*35*	26	*11*
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D	35	26	9.3
375-95-1	*Perfluorononanoic acid (PFNA)*	*26*	*U*	*35*	26	*9.0*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*17*	*U*	*35*	17	*8.3*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*26*	*U*	*35*	26	*12*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*26*	*U*	*35*	26	*9.0*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*52*	*U*	*69*	52	*13*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*52*	*U*	*69*	52	*14*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*52*	*D*	*35*	17	*8.0*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	380	D	35	17	6.6
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*9.0*	*J D*	*35*	17	*6.4*
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	370	D	69	52	19
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*26*	*U*	*35*	26	*9.7*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*52*	*U*	*69*	52	*22*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPI DL | Lab Sample ID: 320-37938-1 DL

Matrix: Water | Lab File ID: 2018.04.20LLCX_045.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:15

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 289.3(mL) | Date Analyzed: 04/21/2018 13:13

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 20

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	84		50-150
STL00992	13C4 PFBA	92		50-150
STL01893	13C5 PFPeA	98		50-150
STL00993	13C2 PFHxA	92		50-150
STL01892	13C4-PFHpA	93		50-150
STL00990	13C4 PFOA	92		50-150
STL00995	13C5 PFNA	94		50-150
STL00996	13C2 PFDA	100		50-150
STL00997	13C2 PFUnA	85		50-150
STL00998	13C2 PFDoA	83		50-150
STL00994	18O2 PFHxS	90		50-150
STL02116	13C2-PFTeDA	80		50-150
STL00991	13C4 PFOS	86		50-150
STL02337	13C3-PFBS	88	M	50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-MID-CARB | Lab Sample ID: 320-37938-2

Matrix: Water | Lab File ID: 2018.04.20LLCX_046.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:20

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 304(mL) | Date Analyzed: 04/21/2018 13:21

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		1.6	1.2	0.49
2706-90-3	Perfluoropentanoic acid (PFPeA)	230		1.6	0.82	0.35
307-24-4	Perfluorohexanoic acid (PFHxA)	140		1.6	0.82	0.39
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.0		1.6	1.2	0.50
335-67-1	Perfluorooctanoic acid (PFOA)	33	M	1.6	1.2	0.44
375-95-1	Perfluorononanoic acid (PFNA)	1.2	U	1.6	1.2	0.43
335-76-2	Perfluorodecanoic acid (PFDA)	0.82	U	1.6	0.82	0.39
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.2	U	1.6	1.2	0.59
307-55-1	Perfluorododecanoic acid (PFDoA)	1.2	U	1.6	1.2	0.43
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.3	2.5	0.63
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.3	2.5	0.68
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.1		1.6	0.82	0.38
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0		1.6	0.82	0.31
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.82	U	1.6	0.82	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.3	2.5	0.90
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.2	U	1.6	1.2	0.46
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.3	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-MID-CARB | Lab Sample ID: 320-37938-2

Matrix: Water | Lab File ID: 2018.04.20LLCX_046.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:20

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 304(mL) | Date Analyzed: 04/21/2018 13:21

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	76		50-150
STL00992	13C4 PFBA	86		50-150
STL01893	13C5 PFPeA	82		50-150
STL00993	13C2 PFHxA	84		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	83		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	80		50-150
STL00998	13C2 PFDoA	75		50-150
STL00994	18O2 PFHxS	86		50-150
STL02116	13C2-PFTeDA	73		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	86		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPE | Lab Sample ID: 320-37938-3

Matrix: Water | Lab File ID: 2018.04.20LLCX_047.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 09:25

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 295.8(mL) | Date Analyzed: 04/21/2018 13:29

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.7	1.3	0.50
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		1.7	0.85	0.36
307-24-4	Perfluorohexanoic acid (PFHxA)	65		1.7	0.85	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	J M	1.7	1.3	0.52
335-67-1	Perfluorooctanoic acid (PFOA)	2.8	M	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
335-76-2	Perfluorodecanoic acid (PFDA)	0.85	U	1.7	0.85	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.61
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.44
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	2.5	0.64
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.4	2.5	0.70
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.1	J	1.7	0.85	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.36	J	1.7	0.85	0.32
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.85	U	1.7	0.85	0.31
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.5	U	3.4	2.5	0.93
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.47
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U M	3.4	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPE Lab Sample ID: 320-37938-3

Matrix: Water Lab File ID: 2018.04.20LLCX_047.d

Analysis Method: EPA 537 (Mod) Date Collected: 04/05/2018 09:25

Extraction Method: 3535 Date Extracted: 04/18/2018 10:32

Sample wt/vol: 295.8(mL) Date Analyzed: 04/21/2018 13:29

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	86		50-150
STL01893	13C5 PFPeA	82		50-150
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	86		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	88		50-150
STL00996	13C2 PFDA	87		50-150
STL00997	13C2 PFUnA	82		50-150
STL00998	13C2 PFDoA	81		50-150
STL00994	18O2 PFHxS	88		50-150
STL02116	13C2-PFTeDA	76		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	87		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPE-D | Lab Sample ID: 320-37938-4

Matrix: Water | Lab File ID: 2018.04.20LLCX_049.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 00:00

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 296.2(mL) | Date Analyzed: 04/21/2018 13:44

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.7	1.3	0.50
2706-90-3	Perfluoropentanoic acid (PFPeA)	180		1.7	0.84	0.36
307-24-4	Perfluorohexanoic acid (PFHxA)	64		1.7	0.84	0.40
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.3	J	1.7	1.3	0.51
335-67-1	Perfluorooctanoic acid (PFOA)	2.8	M	1.7	1.3	0.46
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.44
335-76-2	Perfluorodecanoic acid (PFDA)	0.84	U	1.7	0.84	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.61
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.44
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.5	U	3.4	2.5	0.64
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.5	U	3.4	2.5	0.70
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.1	J	1.7	0.84	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.47	J	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	3.4	2.5	0.93
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.47
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.5	U	3.4	2.5	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: TP-PFC-028-TPE-D | Lab Sample ID: 320-37938-4

Matrix: Water | Lab File ID: 2018.04.20LLCX_049.d

Analysis Method: EPA 537 (Mod) | Date Collected: 04/05/2018 00:00

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 296.2(mL) | Date Analyzed: 04/21/2018 13:44

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	80		50-150
STL00992	13C4 PFBA	88		50-150
STL01893	13C5 PFPeA	86		50-150
STL00993	13C2 PFHxA	88		50-150
STL01892	13C4-PFHpA	90		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	90		50-150
STL00996	13C2 PFDA	89		50-150
STL00997	13C2 PFUnA	84		50-150
STL00998	13C2 PFDoA	81		50-150
STL00994	18O2 PFHxS	88		50-150
STL02116	13C2-PFTeDA	75		50-150
STL00991	13C4 PFOS	88		50-150
STL02337	13C3-PFBS	89		50-150

APPENDIX C

SUPPORT DOCUMENTATION

NAS BRUNSWICK
SDG 320-37938-1

SAMPLE IDENTIFICATION	TP-PFC-028-TPI	
COMPOUND	PENTADECAFLUOROOCTANOIC ACID	
COMPOUND AREA	4953381	
INTERNAL STANDARD AMOUNT (ng/ml)	0.25	
DILUTION FACTOR	20	
INTERNAL STANDARD AREA	201676	
AVERAGE RRF	1.155	
SAMPLE VOLUME (ml)	289.3	
VOLUME EXTRACT (ml)	10	
VOLUME INJECTED (µl)	2	
ml to L	1000	
CONCENTRATION =	1837.63	ng/L

4953381 x 0.25ng/ml x 1000ml x 10ml x 20/(201676 x 1.155 x 289.3ml x 2µl x 1L)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_045.d
Lims ID: 320-37938-A-1-A
Client ID: TP-PFC-028-TPI
Sample Type: Client
Inject. Date: 21-Apr-2018 13:13:35 ALS Bottle#: 34 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Sample Info: 320-37938-a-1-a 20X
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:26:11 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:19:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.441	0.0	1.000	292254	0.1149		91.9	2597	
2 Perfluorobutyric acid										
212.90 > 169.00	1.446	1.446	0.0	1.004	237842	0.1096			105	
D 3 13C5-PFPeA										
267.90 > 223.00	1.711	1.703	0.008	0.559	200593	0.1224		97.9	3999	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.711	1.711	0.0	1.000	495739	0.2592			416	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.747	1.738	0.009	1.005	195158	0.0749			660	
298.90 > 99.00	1.747	1.738	0.009	1.005	85617		2.28(1.25-3.74)		700	
D 47 13C3-PFBS										M
301.90 > 83.00	1.738	1.739	-0.001	1.000	3870	0.1029		88.5	33.2	M
D 7 13C2 PFHxA										
315.00 > 270.00	1.991	1.990	0.001	1.000	208079	0.1148		91.8	5252	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.991	1.991	0.0	1.000	900952	0.5326			1080	
313.00 > 119.00	2.003	1.991	0.012	1.006	73016		12.34(5.03-15.10)		982	
D 9 13C4-PFHpA										
367.00 > 322.00	2.332	2.318	0.014	1.000	205545	0.1165		93.2	5550	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.332	2.319	0.013	1.000	189537	0.1152			212	
363.00 > 169.00	2.332	2.319	0.013	1.000	71439		2.65(1.13-3.40)		298	
D 11 18O2 PFHxS										
403.00 > 84.00	2.345	2.331	0.014	1.000	230565	0.1059		89.5	7568	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.345	2.332	0.013	1.000	1208765	0.5478			3302	
399.00 > 99.00	2.345	2.332	0.013	1.000	410048		2.95(1.50-4.49)		2457	

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	2.689	2.681	0.008	1.000	201676	0.1150		92.0	6386	
* 62 13C2-PFOA										
415.00 > 370.00	2.689	2.682	0.007		236312	0.1250			7444	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.689	2.682	0.007	1.000	4953381	2.66			4520	
413.00 > 169.00	2.689	2.682	0.007	1.000	2818524		1.76(0.84-2.52)		9596	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.697	2.689	0.008	1.000	22706	0.0131			82.7	
449.00 > 99.00	2.697	2.689	0.008	1.000	7017		3.24(1.94-5.82)		84.8	
D 18 13C4 PFOS										
503.00 > 80.00	3.062	3.054	0.008	1.000	156218	0.1024		85.7	1243	
D 19 13C5 PFNA										
468.00 > 423.00	3.062	3.054	0.008	1.000	177423	0.1177		94.2	8194	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.062	3.055	0.007	1.000	757008	0.5323			2229	
499.00 > 99.00	3.062	3.055	0.007	1.000	166859		4.54(2.31-6.93)		1774	
20 Perfluorononanoic acid										
463.00 > 419.00	3.069	3.055	0.014	1.002	5275	0.003564			14.6	
463.00 > 169.00	3.076	3.055	0.021	1.005	1858		2.84(1.90-5.69)		51.6	
D 21 13C8 FOSA										
506.00 > 78.00	3.402	3.391	0.011	1.000	199188	0.1046		83.7	2814	
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.419	0.011	1.000	159115	0.1256		100	4012	
D 30 13C2 PFUnA										
565.00 > 520.00	3.764	3.753	0.011	1.000	116543	0.1066		85.3	3585	
D 36 13C2 PFDoA										
615.00 > 570.00	4.051	4.042	0.009	1.000	122746	0.1040		83.2	2590	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.552	4.547	0.005	1.000	149786	0.1001		80.1	1683	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 24-Apr-2018 17:27:14 Chrom Revision: 2.2 17-Apr-2018 19:19:24

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_045.d

Injection Date: 21-Apr-2018 13:13:35 Instrument ID: A8_N

Lims ID: 320-37938-A-1-A Lab Sample ID: 320-37938-1

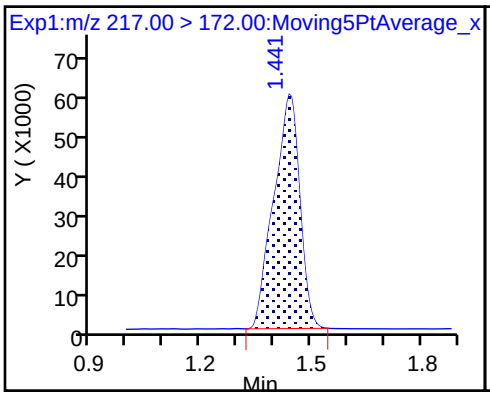
Client ID: TP-PFC-028-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 34 Worklist Smp#: 11

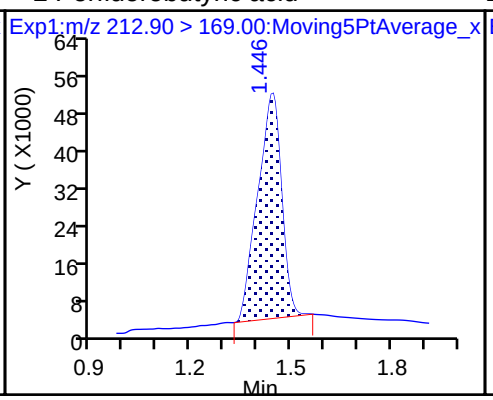
Injection Vol: 2.0 ul Dil. Factor: 20.0000

Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL

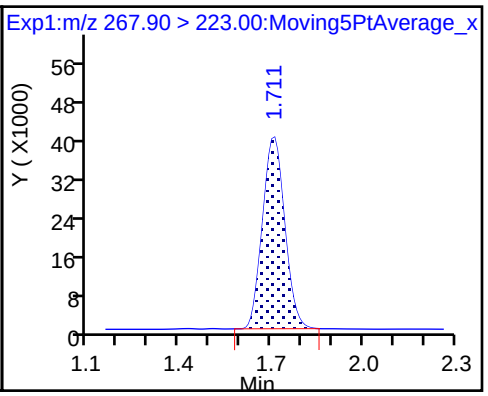
D 1 13C4 PFBA



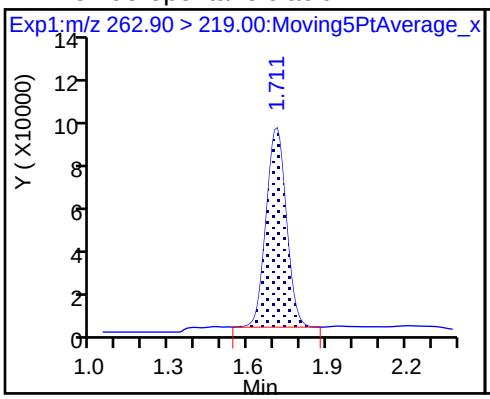
2 Perfluorobutyric acid



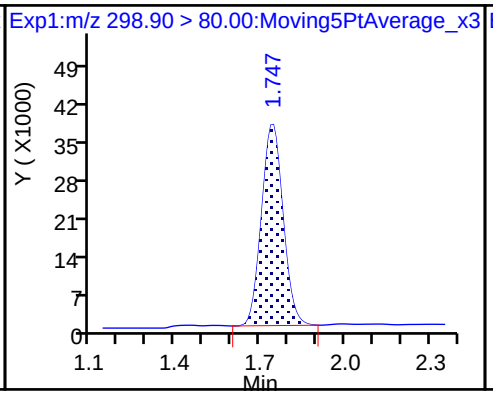
D 3 13C5-PFPeA



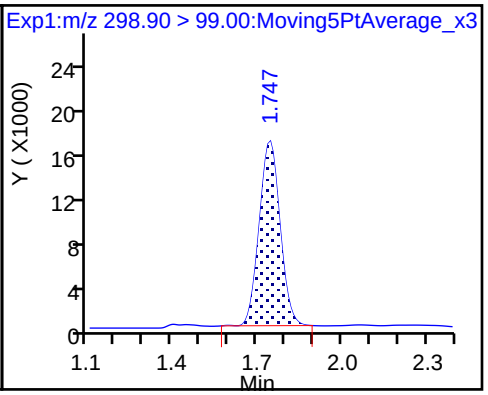
4 Perfluoropentanoic acid



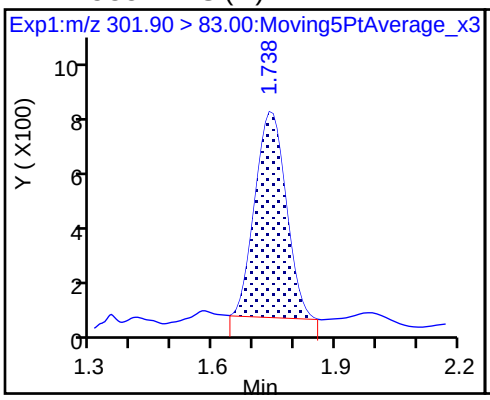
5 Perfluorobutanesulfonic acid



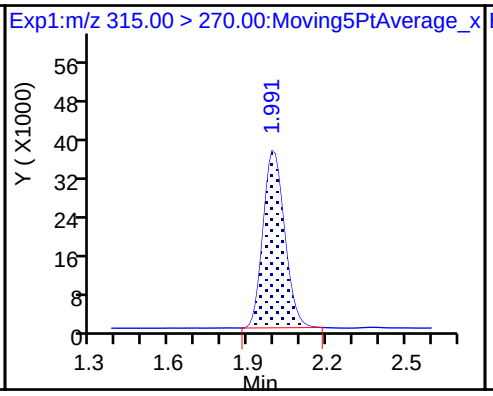
5 Perfluorobutanesulfonic acid



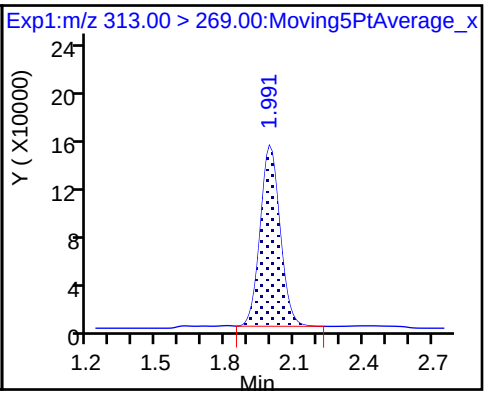
D 47 13C3-PFBS (M)



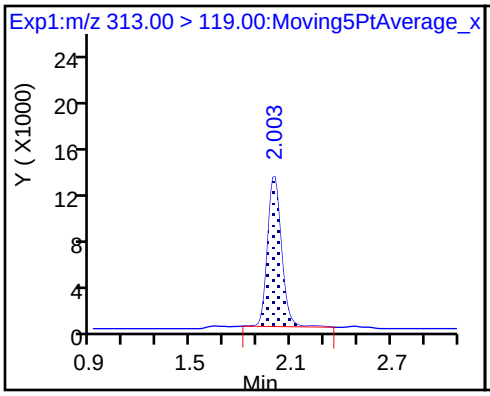
D 7 13C2 PFHxA



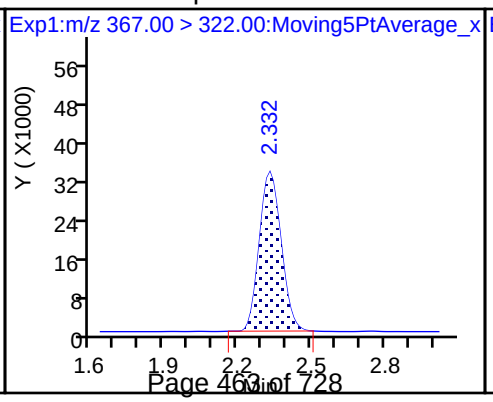
6 Perfluorohexanoic acid



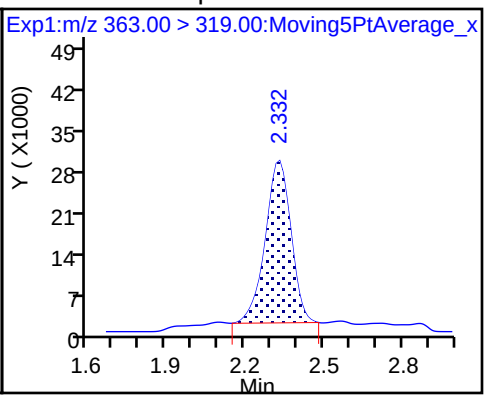
6 Perfluorohexanoic acid



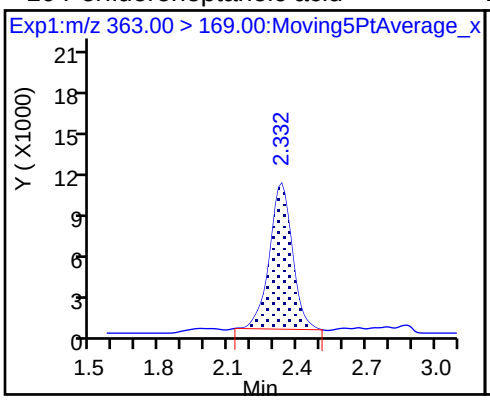
D 9 13C4-PFHpA



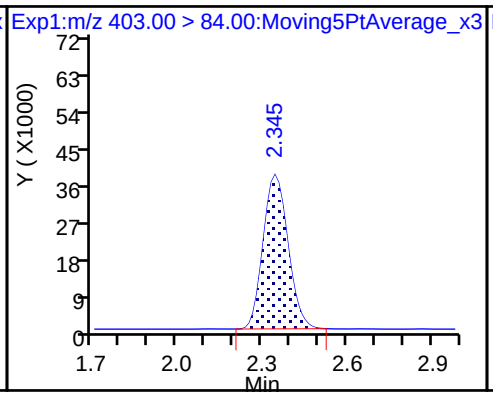
10 Perfluoroheptanoic acid



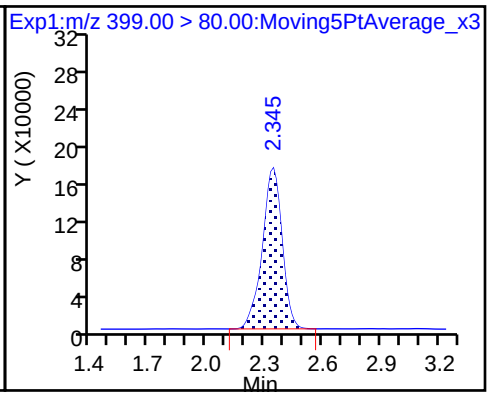
10 Perfluoroheptanoic acid



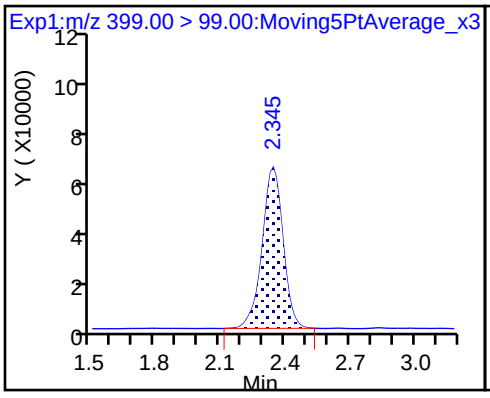
D 11 18O2 PFHxS



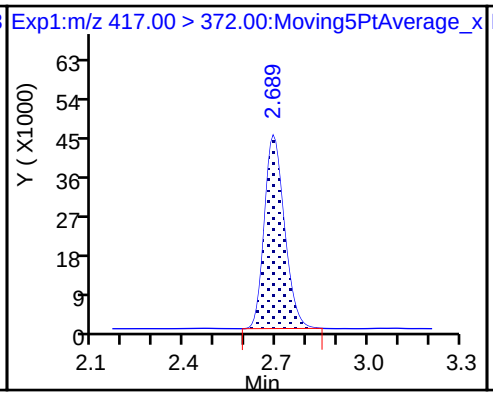
8 Perfluorohexanesulfonic acid



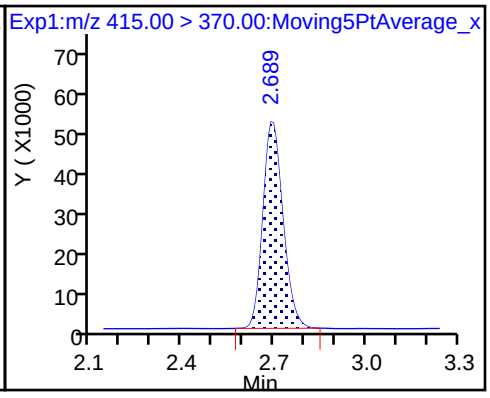
8 Perfluorohexanesulfonic acid



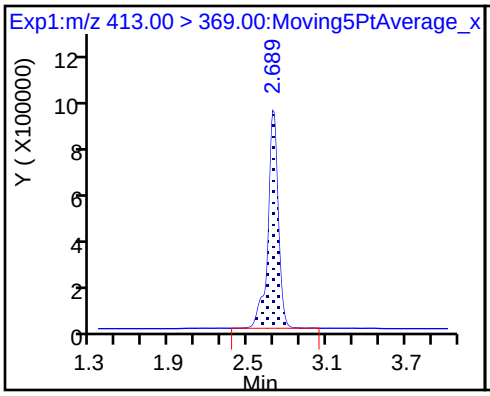
D 14 13C4 PFOA



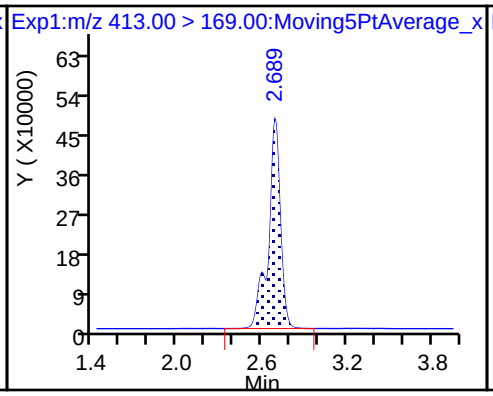
* 62 13C2-PFOA



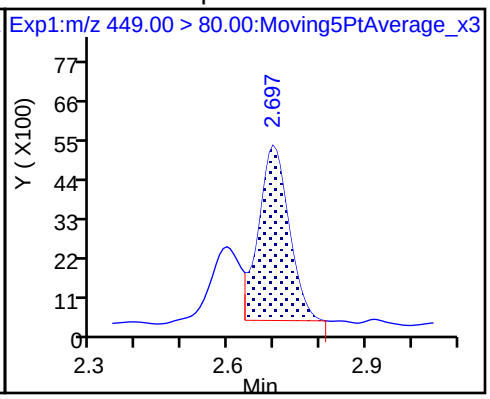
15 Perfluorooctanoic acid



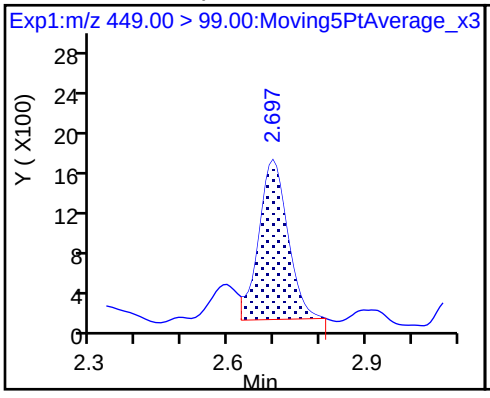
15 Perfluorooctanoic acid



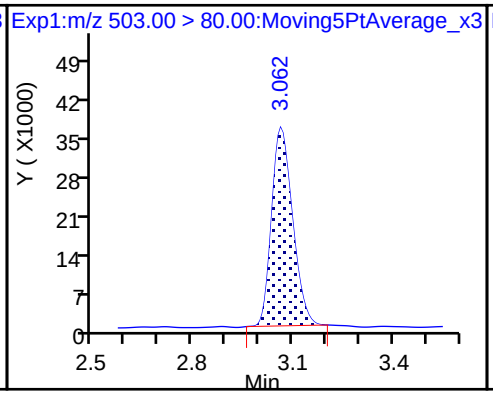
16 Perfluoroheptanesulfonic acid



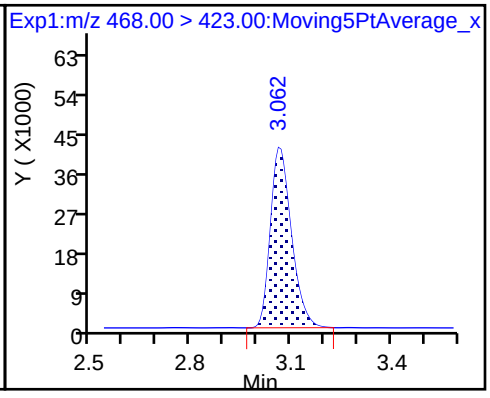
16 Perfluoroheptanesulfonic acid



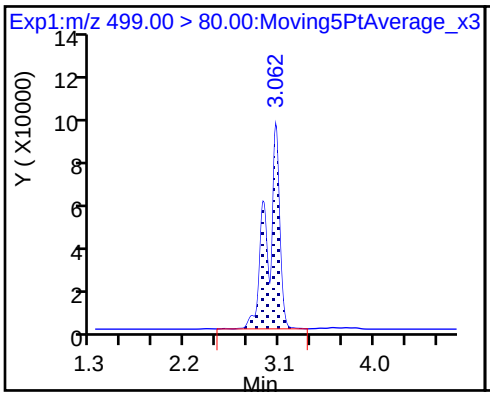
D 18 13C4 PFOS



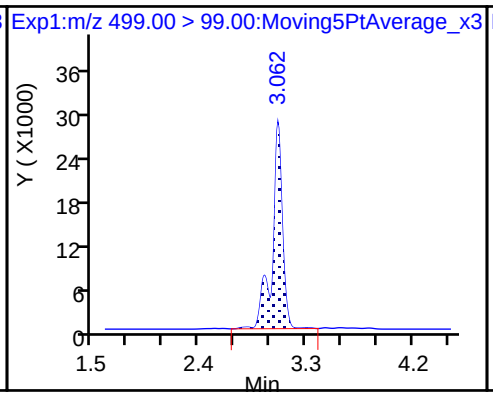
D 19 13C5 PFNA



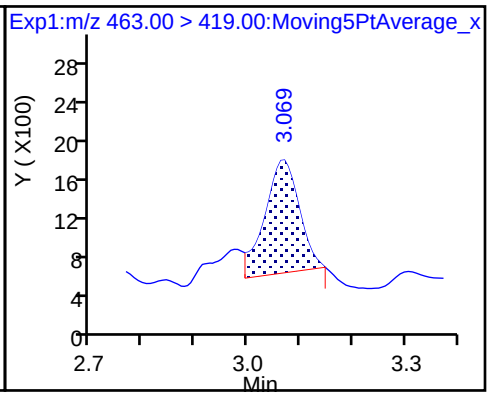
17 Perfluorooctane sulfonic acid



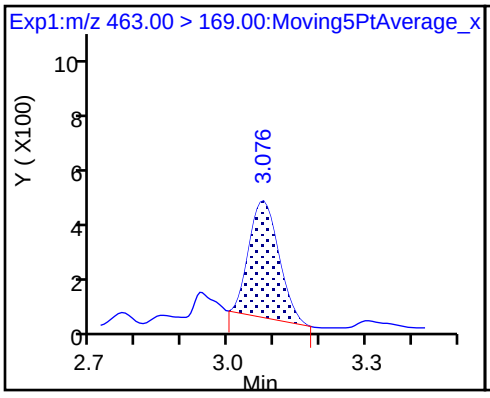
17 Perfluorooctane sulfonic acid



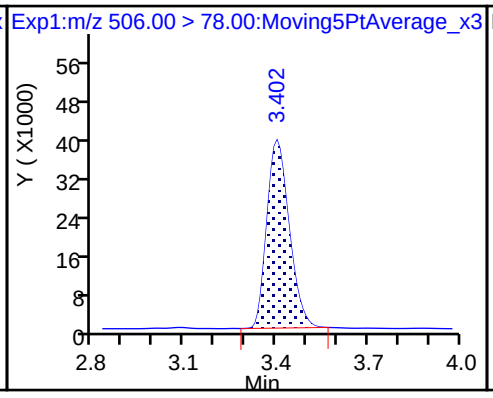
20 Perfluorononanoic acid



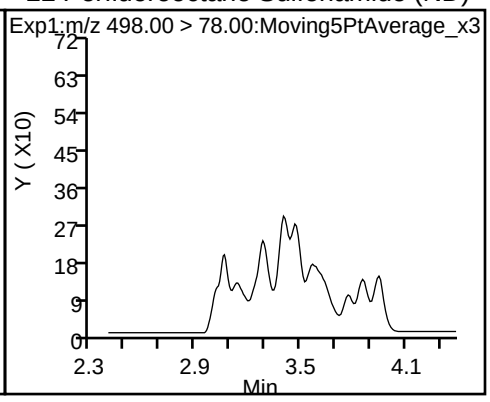
20 Perfluorononanoic acid



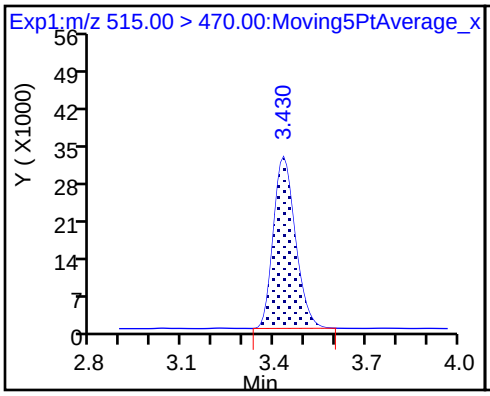
D 21 13C8 FOSA



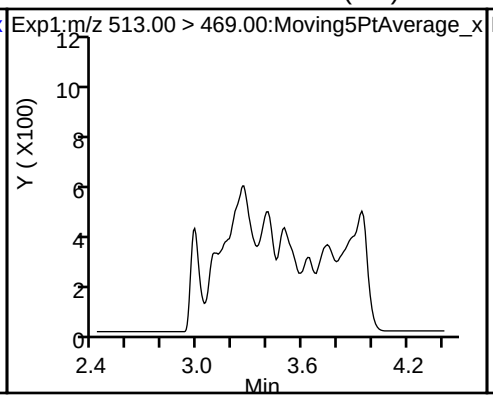
22 Perfluorooctane Sulfonamide (ND)



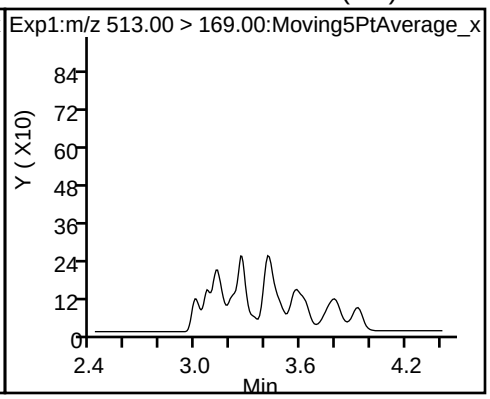
D 23 13C2 PFDA



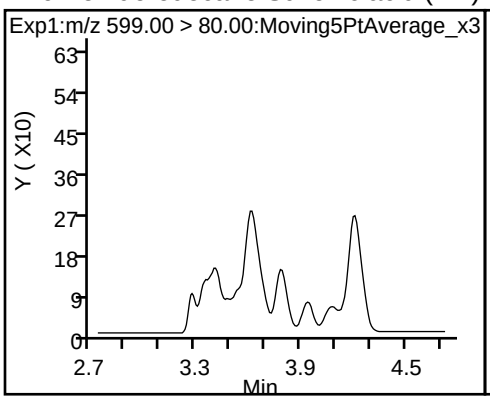
24 Perfluorodecanoic acid (ND)



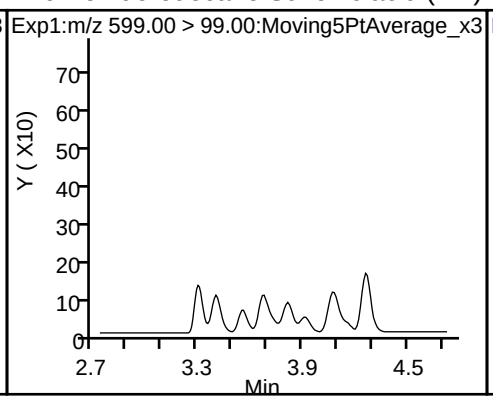
24 Perfluorodecanoic acid (ND)



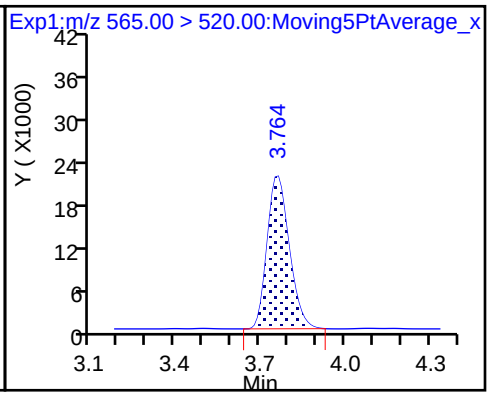
29 Perfluorodecane Sulfonic acid (ND)



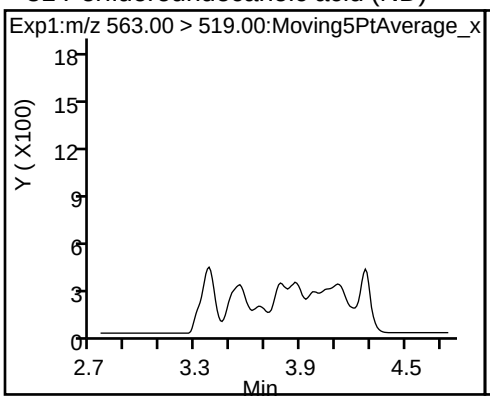
29 Perfluorodecane Sulfonic acid (ND)



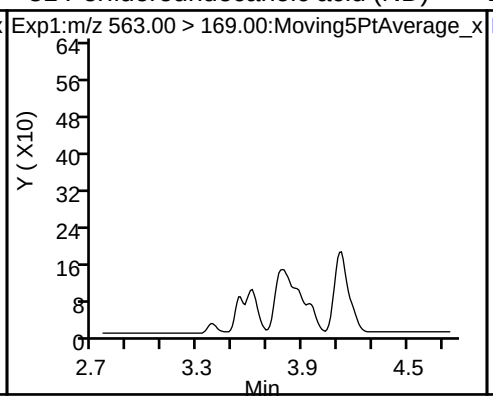
D 30 13C2 PFUnA



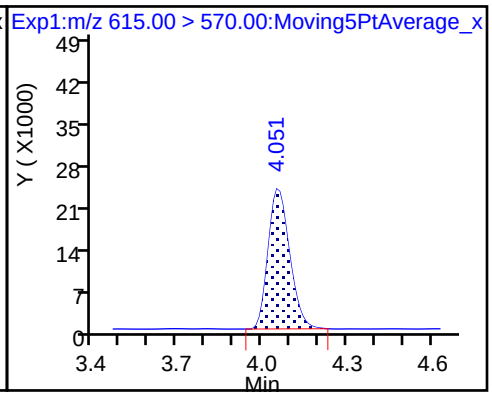
31 Perfluoroundecanoic acid (ND)



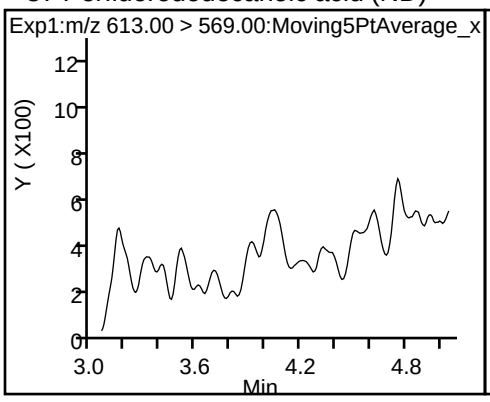
31 Perfluoroundecanoic acid (ND)



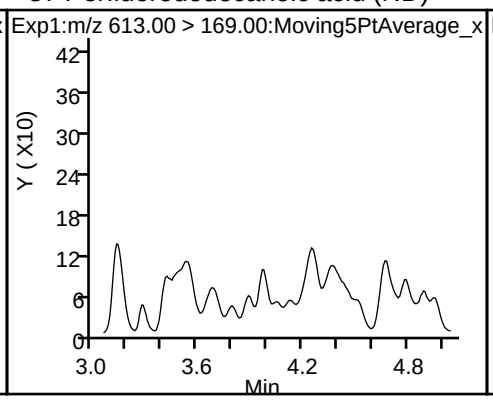
D 36 13C2 PFDoA



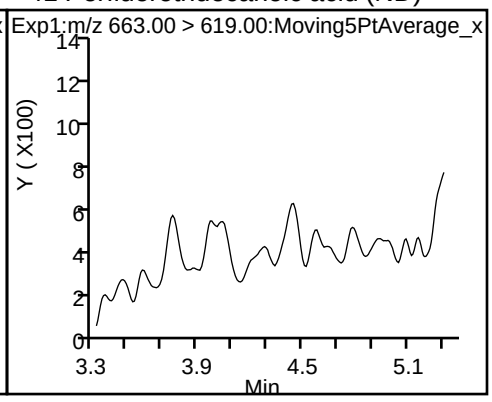
37 Perfluorododecanoic acid (ND)



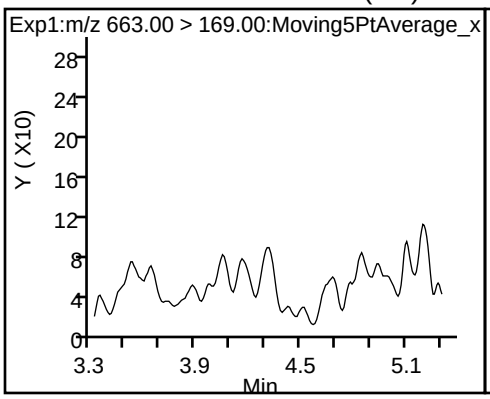
37 Perfluorododecanoic acid (ND)



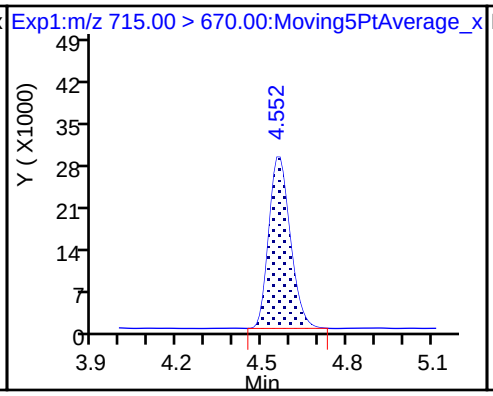
41 Perfluorotridecanoic acid (ND)



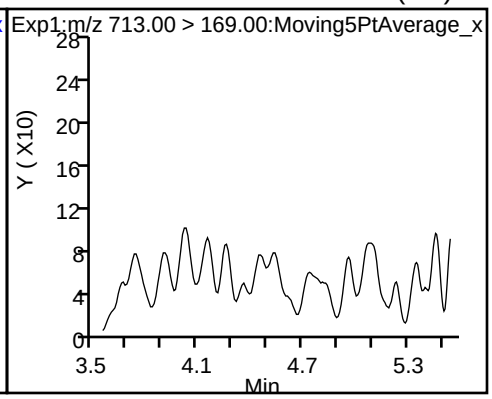
41 Perfluorotridecanoic acid (ND)



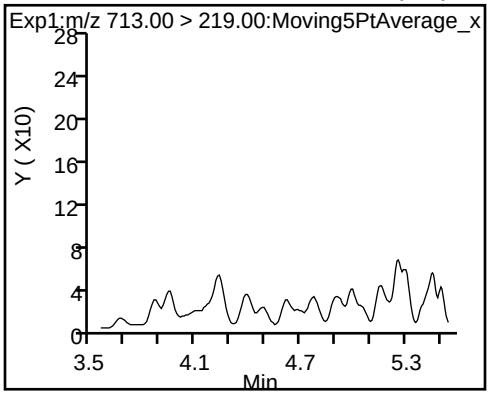
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

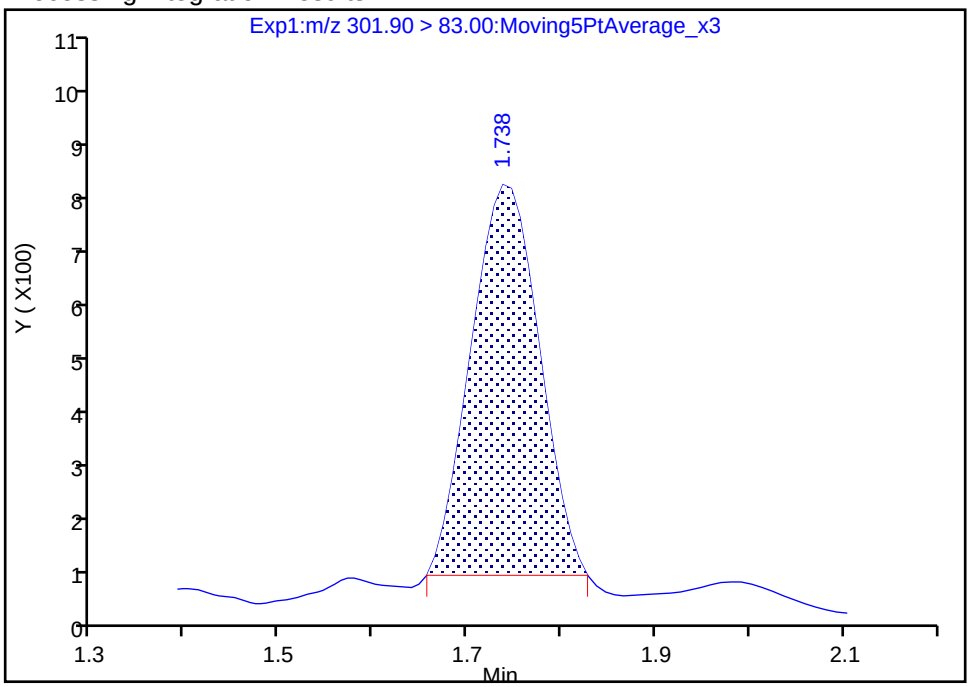
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_045.d				
Injection Date:	21-Apr-2018 13:13:35	Instrument ID:	A8_N		
Lims ID:	320-37938-A-1-A	Lab Sample ID:	320-37938-1		
Client ID:	TP-PFC-028-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	34	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	20.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

D 47 13C3-PFBS, CAS: STL02337

Signal: 1

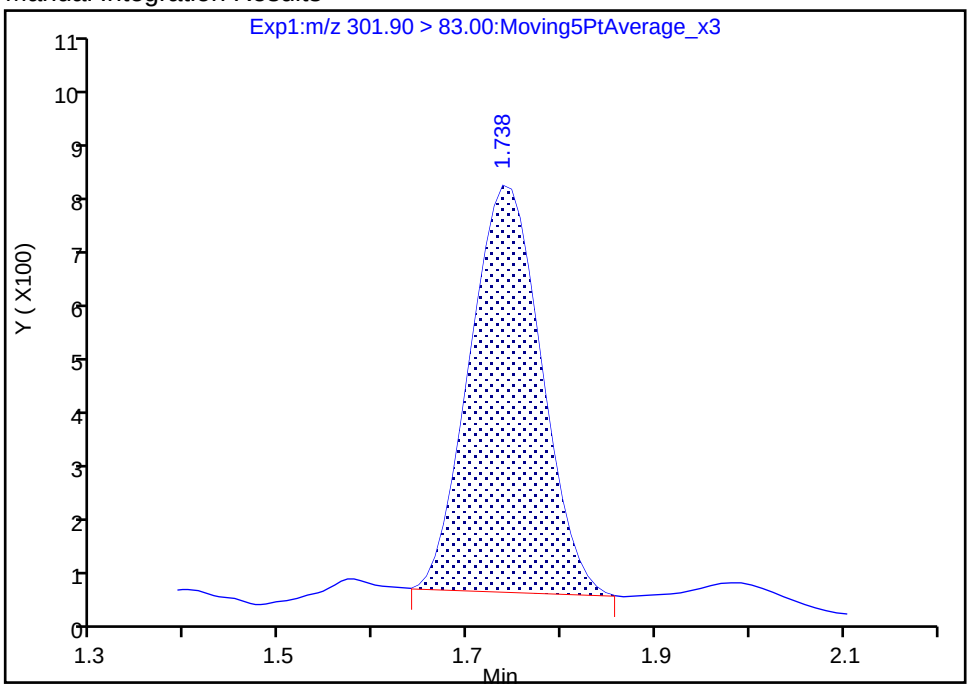
Processing Integration Results

RT: 1.74
Area: 3539
Amount: 0.094078
Amount Units: ng/ml



Manual Integration Results

RT: 1.74
Area: 3870
Amount: 0.102877
Amount Units: ng/ml



Reviewer: barnettj, 24-Apr-2018 17:20:25

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2xRL
PENTADECAFLUOROOCTANOIC ACID (PFOA)	2.8	2.8	1.7	0.00	FALSE	FALSE	FALSE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	1.1	1.1	1.7	0.00	FALSE	FALSE	FALSE	FALSE
PERFLUOROBUTANOIC ACID (PFBA) (PFBA)	130	130	1.7	0.00	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEPTANOIC ACID (PFHPA)	1.3	1.3	1.7	0.00	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	0.36	0.47	1.7	26.51	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEXANOIC ACID (PFHXA)	65	64	1.7	1.55	FALSE	TRUE	TRUE	FALSE
PERFLUOROPENTANOIC ACID (PFPEA)	190	180	1.7	5.41	FALSE	TRUE	TRUE	TRUE

SDG 320-378938-1

TP-PFC-028-TPE/TP-PFC-028-TPE-D

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 227770

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: JEFF ORIENT	Site Contact: DAN GRIBEN	Date: 4/5/2018	COC No: 22770
Company Name: TETRATECH	Tel/Fax: 412-921-8650	Lab Contact: DAVID AULTCKER	Carrier: FEDEX	1 of 1 COCs
Address: 881 ANDERSON DR. FOSTER PLAZA 7	Analysis Turnaround Time			Sampler: DAN GRIBEN
City/State/Zip: PITTSBURGH/PA/015210	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 412-921-8650	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: BRUNSWICK GWETS	☐ 1 week			
Site: FORMER NAS BRUNSWICK	☐ 2 days			Job / SDG No.:
PO # 112G08005-WE21	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFC (FULL LIST)	Sample Specific Notes:
TP-PFC-028-TPI	4/5/18	0915	G	W	4	N	N	X	
TP-PFC-028-MID-CARB	4/5/18	0920	G	W	4	N	N	X	
TP-PFC-028-TPE	4/6/18	0925	G	W	4	N	N	X	
TP-PFC-028-TPE-D	4/6/18	0000	G	W	4	N	N	X	

DC

320-37938 Chain of Custody

DC

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 7.1 Corr'd: 7.1 | Therm ID No.: AK2 melt water

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	T+	4/5/18 1430	[signature]	TA-SAC	4/6/18 0850
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-37938-1

Login Number: 37938
List Number: 1
Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	7.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative
320-37938-1

Receipt
The samples were received on 4/6/2018 8:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.1° 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 matrix spike duplicate (MSD) recoveries for preparation batch 320-218592 and analytical batch 320-219174 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) EPA 537 (Mod): The concentration of one or more analytes associated with the following sample exceeded the instrument calibration range: TP-PFC-028-TPI (320-37938-1). These analytes have been qualified. The sample was also run at dilution to bring the analytes within the calibration range. Both sets of data are reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

LCMS

Qualifier	Qualifier Description
M	Manual integrated compound.
D	The reported value is from a dilution.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-37938-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-37938-1	TP-PFC-028-TPI	Water	04/05/18 09:15	04/06/18 08:50
320-37938-2	TP-PFC-028-MID-CARB	Water	04/05/18 09:20	04/06/18 08:50
320-37938-3	TP-PFC-028-TPE	Water	04/05/18 09:25	04/06/18 08:50
320-37938-4	TP-PFC-028-TPE-D	Water	04/05/18 00:00	04/06/18 08:50

Method Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-37938-1

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.: 320-37938-1

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 #	PFOS #
TP-PFC-028-TPI	320-37938-1	98	106	108	104	105	105	94	104
TP-PFC-028-TPI DL	320-37938-1 DL	92	98	88 M	92	93	90	92	86
TP-PFC-028-MID-CARB	320-37938-2	86	82	86	84	85	86	87	81
TP-PFC-028-TPE	320-37938-3	86	82	87	88	86	88	89	87
TP-PFC-028-TPE-D	320-37938-4	88	86	89	88	90	88	90	88
	MB 320-218592/1-A	88	93	88	90	90	91	89	93
	LCS 320-218592/2-A	89	88	91	90	98	93	91	89

	QC LIMITS
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFOS = 13C4 PFOS	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFNA #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-028-TPI	320-37938-1	106	101	110	106	101	96
TP-PFC-028-TPI DL	320-37938-1 DL	94	84	100	85	83	80
TP-PFC-028-MID-CAR B	320-37938-2	83	76	86	80	75	73
TP-PFC-028-TPE	320-37938-3	88	79	87	82	81	76
TP-PFC-028-TPE-D	320-37938-4	90	80	89	84	81	75
	MB 320-218592/1-A	91	78	90	90	85	80
	LCS 320-218592/2-A	91	81	90	85	83	81

	QC LIMITS
PFNA = 13C5 PFNA	50-150
PFOSA = 13C8 FOSA	50-150
PFDA = 13C2 PFDA	50-150
PFUnA = 13C2 PFUnA	50-150
PFDoA = 13C2 PFDoA	50-150
PFTDA = 13C2-PFTeDA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Sample No.: IC 320-217360/5 Date Analyzed: 04/10/2018 19:03

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.04.10LLICAL_00 Heated Purge: (Y/N) N

Calibration ID: 38528

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		4623888	2.67				
UPPER LIMIT		6935832	2.87				
LOWER LIMIT		2311944	2.47				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICB 320-217360/9		4390532	2.67				
ICV 320-217360/10		4377627	2.68				
CCV 320-219174/3 CCVIS		4509303	2.69				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII EPA 537 (MOD)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Sample No.: CCV 320-219174/3 Date Analyzed: 04/21/2018 12:10

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.04.21LLA_006.d Heated Purge: (Y/N) N

Calibration ID: 38528

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		4509303	2.69				
UPPER LIMIT		6763955	2.89				
LOWER LIMIT		2254652	2.49				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-219174/1		4447416	2.69				
CCVL 320-219174/2		4804487	2.69				
MB 320-218592/1-A		4825971	2.68				
LCS 320-218592/2-A		4732969	2.69				
320-37938-1 DL	TP-PFC-028-TPI DL	236312Q	2.69				
320-37938-2	TP-PFC-028-MID-CARB	4939939	2.69				
320-37938-3	TP-PFC-028-TPE	5066384	2.68				
CCV 320-219174/14		4642897	2.68				
CCV 320-219174/19		4618295	2.68				
320-37938-4	TP-PFC-028-TPE-D	4975840	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 EPA 537 (MOD)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\2018.04.20LLCX_049.d
Lims ID: 320-37938-A-4-A
Client ID: TP-PFC-028-TPE-D
Sample Type: Client
Inject. Date: 21-Apr-2018 13:44:53 ALS Bottle#: 37 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-37938-a-4-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b\A8_N.m
Limit Group: LC PFC_QSM5-1 ICAL
Last Update: 24-Apr-2018 17:27:18 Calib Date: 10-Apr-2018 19:26:34
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180411-56528.b\2018.04.10LLICAL_008.d

Column 1 : Det: EXP1
Process Host: XAWRK014

First Level Reviewer: barnettj Date: 24-Apr-2018 17:24:29

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	1.441	1.436	0.005	1.000	8455845	3.88			4378	
D 1 13C4 PFBA										
217.00 > 172.00	1.441	1.441	0.0	1.000	5872038	2.19		87.7	40879	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.702	1.703	-0.001	1.000	9575810	5.39			13562	
D 3 13C5-PFPeA										
267.90 > 223.00	1.702	1.703	-0.001	0.557	3729312	2.16		86.4	60408	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.738	1.739	-0.001	1.000	89412	0.0326			333	
298.90 > 99.00	1.729	1.739	-0.010	0.995	45749		1.95(1.25-3.74)		328	
D 47 13C3-PFBS										
301.90 > 83.00	1.738	1.739	-0.001	1.000	81557	2.06		88.6	788	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.970	1.982	-0.012	0.989	3274345	1.91			3906	R
313.00 > 119.00	1.992	1.982	0.010	1.000	173345		18.89(5.03-15.10)		1891	
D 7 13C2 PFHxA										
315.00 > 270.00	1.992	1.990	0.002	1.000	4218500	2.21		88.4	93106	
D 9 13C4-PFHpA										
367.00 > 322.00	2.320	2.318	0.002	1.000	4171890	2.25		89.8	67769	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.281	2.320	-0.040	0.983	64124	0.0384			53.6	
363.00 > 169.00	2.267	2.320	-0.053	0.977	23298		2.75(1.13-3.40)		87.5	
D 11 18O2 PFHxS										
403.00 > 84.00	2.333	2.331	0.002	1.000	4793967	2.09		88.4	97945	
8 Perfluorohexanesulfonic acid										R
399.00 > 80.00	2.333	2.333	0.0	1.000	31978	0.0139			94.8	R
399.00 > 99.00	2.333	2.333	0.0	1.000	6075		5.26(1.50-4.49)		38.6	

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	2.676	0.007		4975840	2.50			78961	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.597	2.676	-0.079	0.968	160389	0.0837			54.4	M
413.00 > 169.00	2.589	2.676	-0.087	0.965	122486		1.31(0.84-2.52)		219	
D 14 13C4 PFOA										
417.00 > 372.00	2.683	2.681	0.002	1.000	4145914	2.25		89.8	64966	
D 19 13C5 PFNA										
468.00 > 423.00	3.057	3.054	0.003	1.000	3588193	2.26		90.4	63561	
D 18 13C4 PFOS										
503.00 > 80.00	3.057	3.054	0.003	1.000	3372379	2.10		87.9	22926	
D 21 13C8 FOSA										
506.00 > 78.00	3.395	3.391	0.004	1.000	4023547	2.01		80.3	40638	
D 23 13C2 PFDA										
515.00 > 470.00	3.423	3.419	0.004	1.000	2975557	2.23		89.2	66436	
D 30 13C2 PFUnA										
565.00 > 520.00	3.747	3.753	-0.006	1.000	2419372	2.10		84.1	56483	
D 36 13C2 PFDoA										
615.00 > 570.00	4.047	4.042	0.005	1.000	2516727	2.03		81.0	26850	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.550	4.547	0.003	1.000	2966455	1.88		75.3	24923	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab File ID: 2018.04.20LLCX_038.d Lab Sample ID: MB 320-218592/1-A

Matrix: Water Date Extracted: 04/18/2018 10:32

Instrument ID: A8_N Date Analyzed: 04/21/2018 12:18

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-218592/2-A	2018.04.20LLCX_039.d	04/21/2018 12:26
TP-PFC-028-TPI DL	320-37938-1 DL	2018.04.20LLCX_045.d	04/21/2018 13:13
TP-PFC-028-MID-CARB	320-37938-2	2018.04.20LLCX_046.d	04/21/2018 13:21
TP-PFC-028-TPE	320-37938-3	2018.04.20LLCX_047.d	04/21/2018 13:29
TP-PFC-028-TPE-D	320-37938-4	2018.04.20LLCX_049.d	04/21/2018 13:44
TP-PFC-028-TPI	320-37938-1	2018.04.20LLCX_050.d	04/21/2018 13:52

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-37938-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-218592/1-A

Matrix: Water | Lab File ID: 2018.04.20LLCX_038.d

Analysis Method: EPA 537 (Mod) | Date Collected:

Extraction Method: 3535 | Date Extracted: 04/18/2018 10:32

Sample wt/vol: 250(mL) | Date Analyzed: 04/21/2018 12:18

Con. Extract Vol.: 10.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 | 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 M	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-218592/1-A

Matrix: Water Lab File ID: 2018.04.20LLCX_038.d

Analysis Method: EPA 537 (Mod) Date Collected:

Extraction Method: 3535 Date Extracted: 04/18/2018 10:32

Sample wt/vol: 250(mL) Date Analyzed: 04/21/2018 12:18

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 219174 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	78		50-150
STL00992	13C4 PFBA	88		50-150
STL01893	13C5 PFPeA	93		50-150
STL00993	13C2 PFHxA	90		50-150
STL01892	13C4-PFHpA	90		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	91		50-150
STL00996	13C2 PFDA	90		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	18O2 PFHxS	91		50-150
STL02116	13C2-PFTeDA	80		50-150
STL00991	13C4 PFOS	93		50-150
STL02337	13C3-PFBS	88		50-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.04.20LLCX_039.d

Lab ID: LCS 320-218592/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	40.8	102	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	39.0	97	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	39.7	99	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	37.5	94	80-113	
Perfluorooctanoic acid (PFOA)	40.0	38.8	97	80-107	
Perfluorononanoic acid (PFNA)	40.0	37.5	94	83-113	
Perfluorodecanoic acid (PFDA)	40.0	38.3	96	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	35.4	89	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	38.4	96	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	36.1	90	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	37.4	94	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.3	97	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	32.8	90	81-106	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.8	99	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	40.0	108	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	36.7	95	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	37.2	93	85-114	
13C8 FOSA	100	80.7	81	50-150	
13C4 PFBA	100	89.1	89	50-150	
13C5 PFPeA	100	87.9	88	50-150	
13C2 PFHxA	100	89.6	90	50-150	
13C4-PFHpA	100	97.8	98	50-150	
13C4 PFOA	100	91.0	91	50-150	
13C5 PFNA	100	90.6	91	50-150	
13C2 PFDA	100	89.9	90	50-150	
13C2 PFUnA	100	85.5	85	50-150	
13C2 PFDoA	100	83.5	83	50-150	
18O2 PFHxS	94.6	87.8	93	50-150	
13C2-PFTeDA	100	80.7	81	50-150	
13C4 PFOS	95.6	85.1	89	50-150	
13C3-PFBS	93.0	84.2	91	50-150	

Column to be used to flag recovery and RPD values

FORM III EPA 537 (Mod)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Instrument ID: A8_N Start Date: 04/10/2018 18:31

Analysis Batch Number: 217360 End Date: 04/10/2018 19:50

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		04/10/2018 18:31	1		GeminiC18 3x100 3(mm)
IC 320-217360/2		04/10/2018 18:39	1	2018.04.10LLICAL 002.d	GeminiC18 3x100 3(mm)
IC 320-217360/3		04/10/2018 18:47	1	2018.04.10LLICAL 003.d	GeminiC18 3x100 3(mm)
IC 320-217360/4		04/10/2018 18:55	1	2018.04.10LLICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-217360/5 ICIS		04/10/2018 19:03	1	2018.04.10LLICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-217360/6		04/10/2018 19:10	1	2018.04.10LLICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-217360/7		04/10/2018 19:18	1	2018.04.10LLICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-217360/8		04/10/2018 19:26	1	2018.04.10LLICAL 008.d	GeminiC18 3x100 3(mm)
ICB 320-217360/9		04/10/2018 19:34	1	2018.04.10LLICAL 009.d	GeminiC18 3x100 3(mm)
ICV 320-217360/10		04/10/2018 19:42	1	2018.04.10LLICAL 010.d	GeminiC18 3x100 3(mm)
CCB 320-217360/11		04/10/2018 19:50	1		GeminiC18 3x100 3(mm)

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-217360/2	2018.04.10LLICAL_002.d
Level 2	IC 320-217360/3	2018.04.10LLICAL_003.d
Level 3	IC 320-217360/4	2018.04.10LLICAL_004.d
Level 4	IC 320-217360/5	2018.04.10LLICAL_005.d
Level 5	IC 320-217360/6	2018.04.10LLICAL_006.d
Level 6	IC 320-217360/7	2018.04.10LLICAL_007.d
Level 7	IC 320-217360/8	2018.04.10LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.9087 0.9558	0.9215 0.9254	0.9250	0.9115	0.9520	AveID		0.9286				2.0		20.0			
Perfluoropentanoic acid (PFPeA)	1.2578 1.1682	1.2108 1.1732	1.1604	1.1461	1.2257	AveID		1.1918				3.4		20.0			
Perfluorobutanesulfonic acid (PFBS)	76.893 81.717	82.786 71.544	78.801	75.066	81.197	AveID		78.286				5.2		20.0			
4:2 FTS	14.379 16.335	17.388 16.450	16.158	15.381	16.133	AveID		16.032				5.9		20.0			
Perfluorohexanoic acid (PFHxA)	0.9165 1.0971	1.0419 0.9805	0.9871	1.0324	1.0575	AveID		1.0161				5.9		20.0			
Perfluoropentanesulfonic acid	72.651 73.152	73.718 66.574	72.295	69.587	72.578	AveID		71.508				3.6		20.0			
Perfluoroheptanoic acid (PFHpA)	0.8886 1.0632	0.8961 1.0895	1.0153	1.0044	1.0491	AveID		1.0009				7.9		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.3313 1.0960	1.2076 1.0563	1.0824	1.0501	1.0988	AveID		1.1318				9.0		20.0			
6:2FTS	1.5421 1.7475	1.9455 1.7701	1.5586	1.6684	1.6013	AveID		1.6905				8.5		20.0			
Perfluorooctanoic acid (PFOA)	1.2196 1.1748	1.2108 1.1155	1.1409	1.0810	1.1452	AveID		1.1554				4.3		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2050 1.3855	1.3067 1.3134	1.3594	1.3058	1.4180	AveID		1.3277				5.2		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.0579 1.1424	1.0586 1.1443	1.0560	1.0546	1.1010	AveID		1.0878				3.8		20.0			
Perfluorononanoic acid (PFNA)	0.9233 1.1269	1.1068 1.0188	1.0452	1.0400	1.0380	AveID		1.0427				6.3		20.0			
Perfluorononanesulfonic acid	0.8421 0.8194	0.8119 0.7979	0.7759	0.7194	0.8292	AveID		0.7994				5.2		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
8:2FTS	1.4631 1.3212	1.2394 1.2657	1.1167	1.2298	1.2217	AveID		1.2654				8.4		20.0			
Perfluorooctane Sulfonamide (FOSA)	0.9307 1.0709	1.0441 0.9800	1.0023	1.0041	1.0484	AveID		1.0115				4.7		20.0			
Perfluorodecanoic acid (PFDA)	1.0885 0.9859	1.1057 1.0134	0.9627	1.0005	1.0643	AveID		1.0316				5.3		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9083 1.1043	0.8872 1.0603	1.0109	0.9545	1.0557	AveID		0.9973				8.3		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.5294 0.7137	0.6184 0.7022	0.6496	0.6477	0.6837	AveID		0.6492				9.6		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.7913 0.9588	0.9928 0.9829	0.9228	0.9274	0.9655	AveID		0.9345				7.3		20.0			
Perfluoroundecanoic acid (PFUnA)	0.9440 0.8695	0.9150 0.8330	0.7542	0.7914	0.8086	AveID		0.8451				8.1		20.0			
Perfluorododecanoic acid (PFDoA)	1.0500 1.0844	0.9584 1.0838	1.0669	0.9590	1.0976	AveID		1.0429				5.7		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.2989 1.2824	1.2093 1.2168	1.1646	1.1001	1.2353	AveID		1.2153				5.6		20.0			
Perfluorotetradecanoic acid (PFTeA)	0.2445 0.2592	0.2707 0.2509	0.2469	0.2461	0.2397	AveID		0.2511				4.2		20.0			
13C4 PFBA	1.2940 1.4238	1.3269 1.4303	1.2929	1.3278	1.3223	Ave		1.3454				4.3		20.0			
13C5 PFPeA	0.8504 0.9141	0.8510 0.9065	0.8296	0.8639	0.8548	Ave		0.8672				3.6		20.0			
13C3-PFBS	0.0195 0.0202	0.0192 0.0216	0.0190	0.0203	0.0195	Ave		0.0199				4.6		20.0			
13C2 PFHxA	0.9705 0.9727	0.9235 1.0286	0.9450	0.9498	0.9228	Ave		0.9590				3.8		20.0			
13C4-PFHpA	0.9512 0.9245	0.9580 0.9305	0.9001	0.9261	0.9425	Ave		0.9333				2.1		20.0			
18O2 PFHxS	1.1389 1.1679	1.1640 1.1715	1.1515	1.1448	1.1247	Ave		1.1519				1.5		20.0			
M2-6:2FTS	0.2013 0.2035	0.1892 0.1970	0.2051	0.2032	0.2005	Ave		0.2000				2.7		20.0			
13C4 PFOA	0.9343 0.9540	0.9073 0.9397	0.9043	0.9264	0.9275	Ave		0.9276				1.9		20.0			
13C4 PFOS	0.7935 0.8268	0.8168 0.8235	0.7958	0.8102	0.7798	Ave		0.8066				2.2		20.0			
13C5 PFNA	0.8203 0.7821	0.8002 0.8169	0.7761	0.7954	0.7901	Ave		0.7973				2.1		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1 Analy Batch No.: 217360

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/10/2018 18:39 Calibration End Date: 04/10/2018 19:26 Calibration ID: 38528

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
M2-8:2FTS	0.2407 0.2360	0.2491 0.2358	0.2375	0.2469	0.2400	Ave		0.2409				2.2		20.0			
13C8 FOSA	1.0076 1.0108	1.0097 1.0199	0.9999	1.0220	0.9804	Ave		1.0072				1.4		20.0			
13C2 PFDA	0.6589 0.7306	0.6313 0.6919	0.6468	0.6894	0.6418	Ave		0.6701				5.3		20.0			
d3-NMeFOSAA	0.3521 0.3880	0.3703 0.4138	0.3721	0.3933	0.3693	Ave		0.3798				5.3		20.0			
d5-NEtFOSAA	0.3917 0.3803	0.3750 0.3593	0.3725	0.3713	0.3740	Ave		0.3749				2.6		20.0			
13C2 PFUnA	0.5883 0.5911	0.5771 0.5697	0.5957	0.5619	0.5626	Ave		0.5781				2.4		20.0			
13C2 PFDoA	0.5964 0.6225	0.6348 0.6364	0.6241	0.6615	0.5939	Ave		0.6242				3.8		20.0			
13C2-PFTeDA	0.7749 0.7948	0.7757 0.8130	0.7679	0.8272	0.7873	Ave		0.7915				2.8		20.0			
13C2-PFHxDA	1.2936 1.3188	1.2730 1.3422	1.2549	1.2935	1.2397	Ave		1.2879				2.8		20.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

Calibration / Perfluorobutyric acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

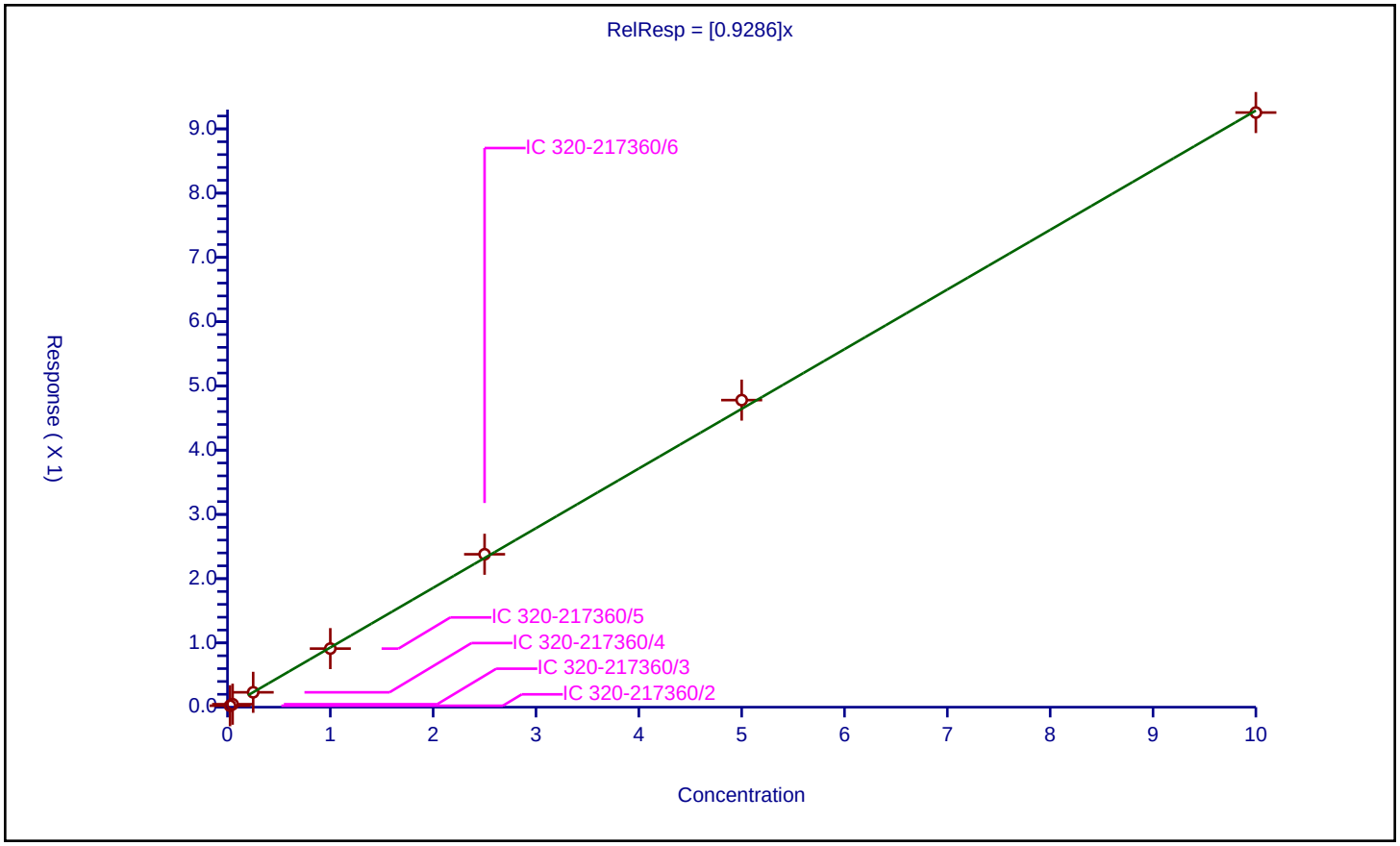
Curve Coefficients

Intercept:	0
Slope:	0.9286

Error Coefficients

Standard Error:	10700000
Relative Standard Error:	2.0
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.022718	2.5	6181350.0	0.908734	Y
2	IC 320-217360/3	0.05	0.046075	2.5	6122262.0	0.921506	Y
3	IC 320-217360/4	0.25	0.231256	2.5	6279614.0	0.925025	Y
4	IC 320-217360/5	1.0	0.911451	2.5	6139471.0	0.911451	Y
5	IC 320-217360/6	2.5	2.379922	2.5	6113537.0	0.951969	Y
6	IC 320-217360/7	5.0	4.77902	2.5	6997865.0	0.955804	Y
7	IC 320-217360/8	10.0	9.254324	2.5	5884851.0	0.925432	Y



Calibration / Perfluoropentanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

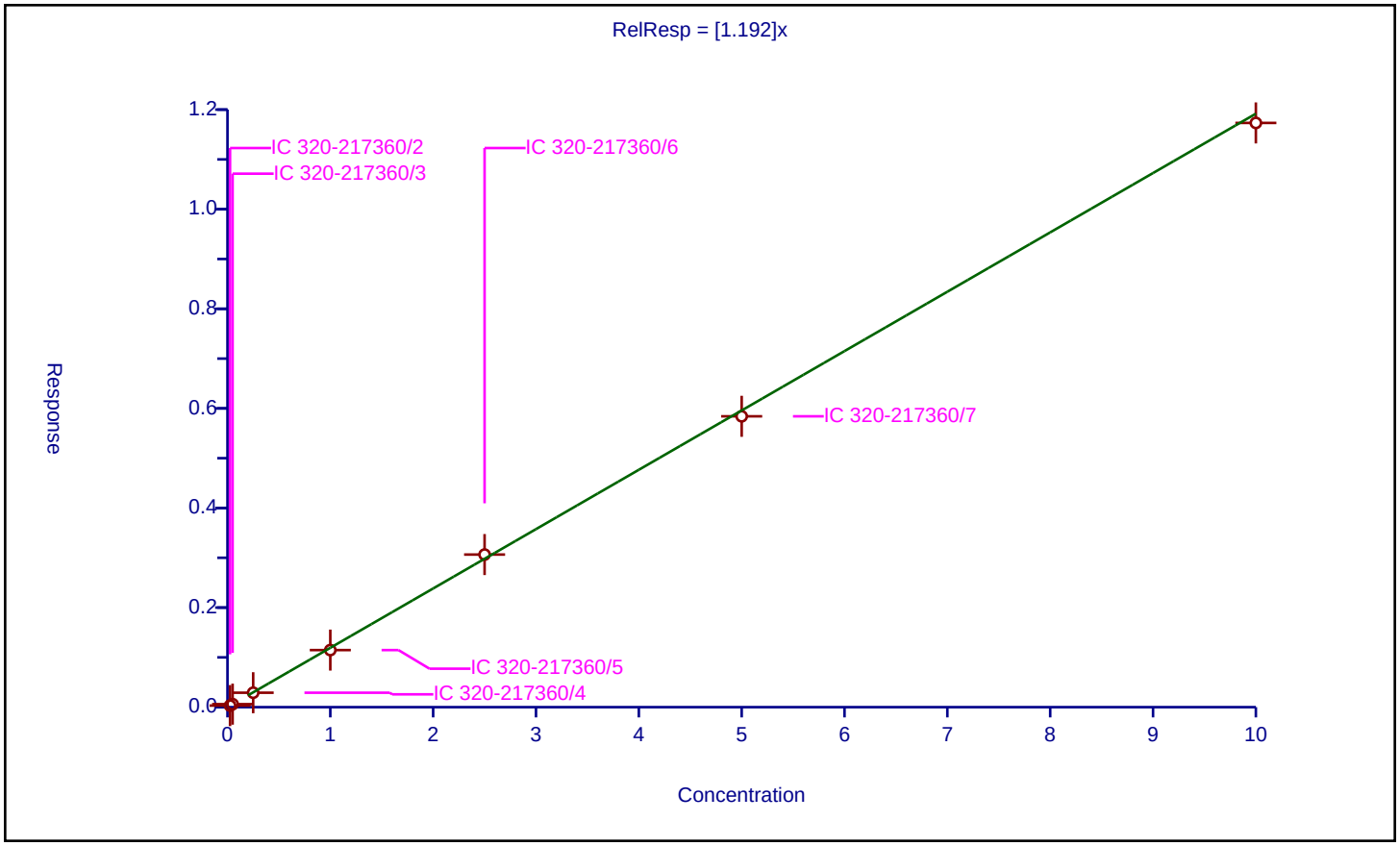
Curve Coefficients

Intercept:	0
Slope:	1.192

Error Coefficients

Standard Error:	8600000
Relative Standard Error:	3.4
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.031446	2.5	4062250.0	1.25785	Y
2	IC 320-217360/3	0.05	0.060542	2.5	3926283.0	1.21084	Y
3	IC 320-217360/4	0.25	0.290098	2.5	4029236.0	1.160391	Y
4	IC 320-217360/5	1.0	1.146149	2.5	3994638.0	1.146149	Y
5	IC 320-217360/6	2.5	3.064326	2.5	3952401.0	1.22573	Y
6	IC 320-217360/7	5.0	5.840968	2.5	4492903.0	1.168194	Y
7	IC 320-217360/8	10.0	11.732396	2.5	3729652.0	1.17324	Y



Calibration / Perfluorobutanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

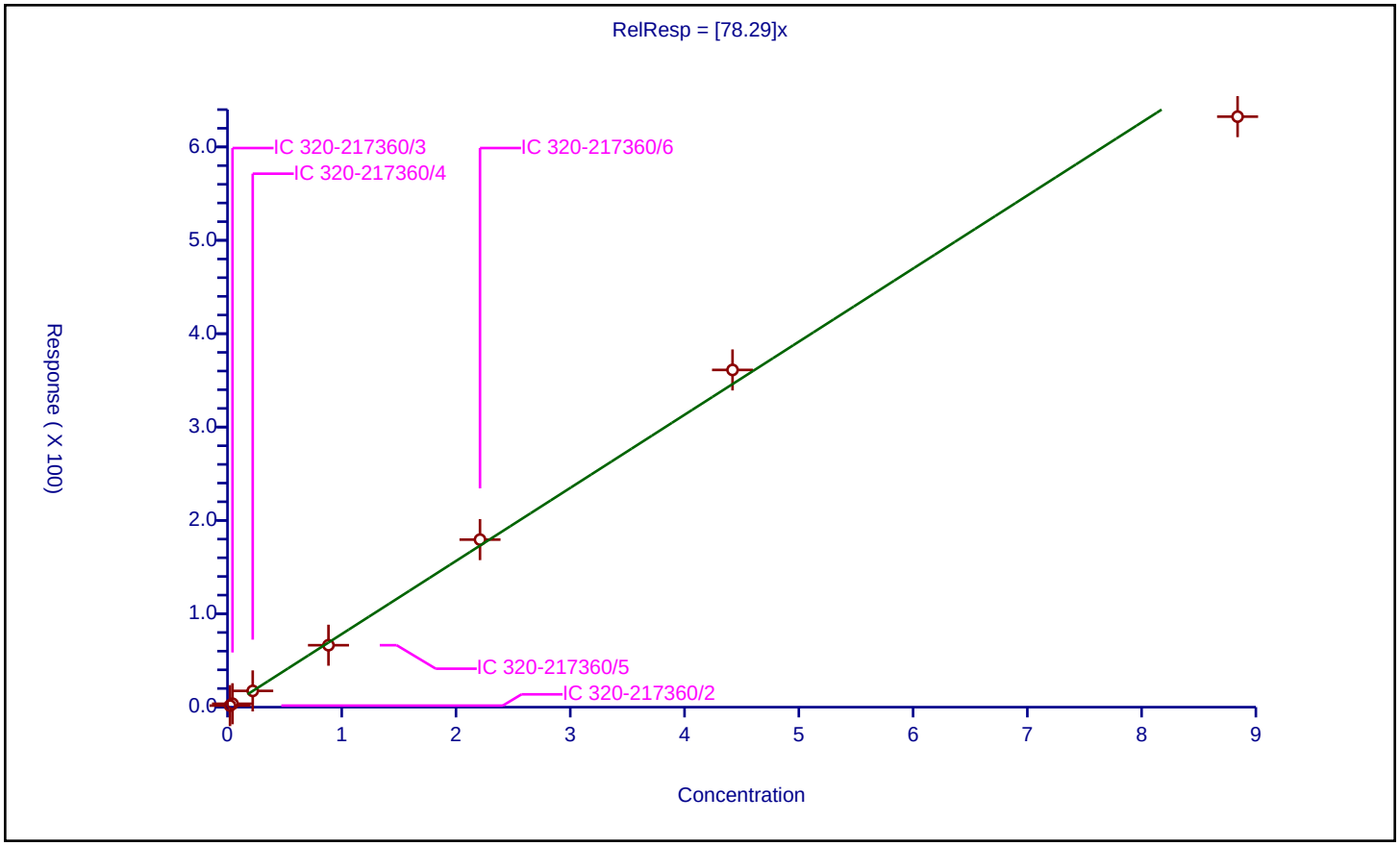
Curve Coefficients

Intercept:	0
Slope:	78.29

Error Coefficients

Standard Error:	11300000
Relative Standard Error:	5.2
Correlation Coefficient:	0.984
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0221	1.699333	2.325	86409.0	76.892914	Y
2	IC 320-217360/3	0.0442	3.659132	2.325	82315.0	82.785785	Y
3	IC 320-217360/4	0.221	17.415084	2.325	85829.0	78.801285	Y
4	IC 320-217360/5	0.884	66.358602	2.325	87216.0	75.066292	Y
5	IC 320-217360/6	2.21	179.444609	2.325	83922.0	81.196656	Y
6	IC 320-217360/7	4.42	361.190473	2.325	92353.0	81.717302	Y
7	IC 320-217360/8	8.84	632.452403	2.325	82834.0	71.54439	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

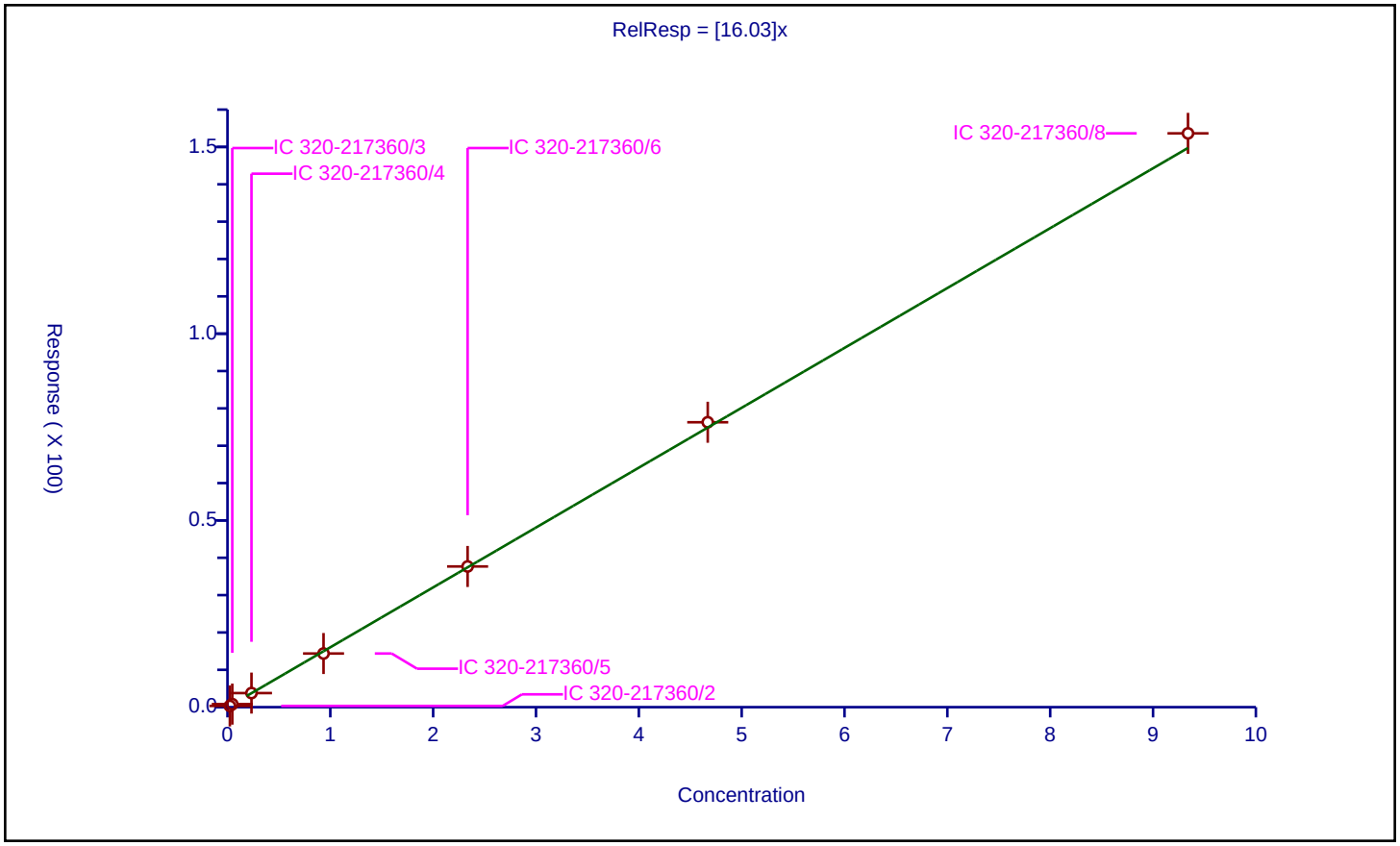
Curve Coefficients

Intercept:	0
Slope:	16.03

Error Coefficients

Standard Error:	2620000
Relative Standard Error:	5.9
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.02335	0.335745	2.325	86409.0	14.378781	Y
2	IC 320-217360/3	0.0467	0.81202	2.325	82315.0	17.388008	Y
3	IC 320-217360/4	0.2335	3.772785	2.325	85829.0	16.157538	Y
4	IC 320-217360/5	0.934	14.366184	2.325	87216.0	15.381353	Y
5	IC 320-217360/6	2.335	37.671472	2.325	83922.0	16.133393	Y
6	IC 320-217360/7	4.67	76.28592	2.325	92353.0	16.335315	Y
7	IC 320-217360/8	9.34	153.639011	2.325	82834.0	16.449573	Y



Calibration / Perfluorohexanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

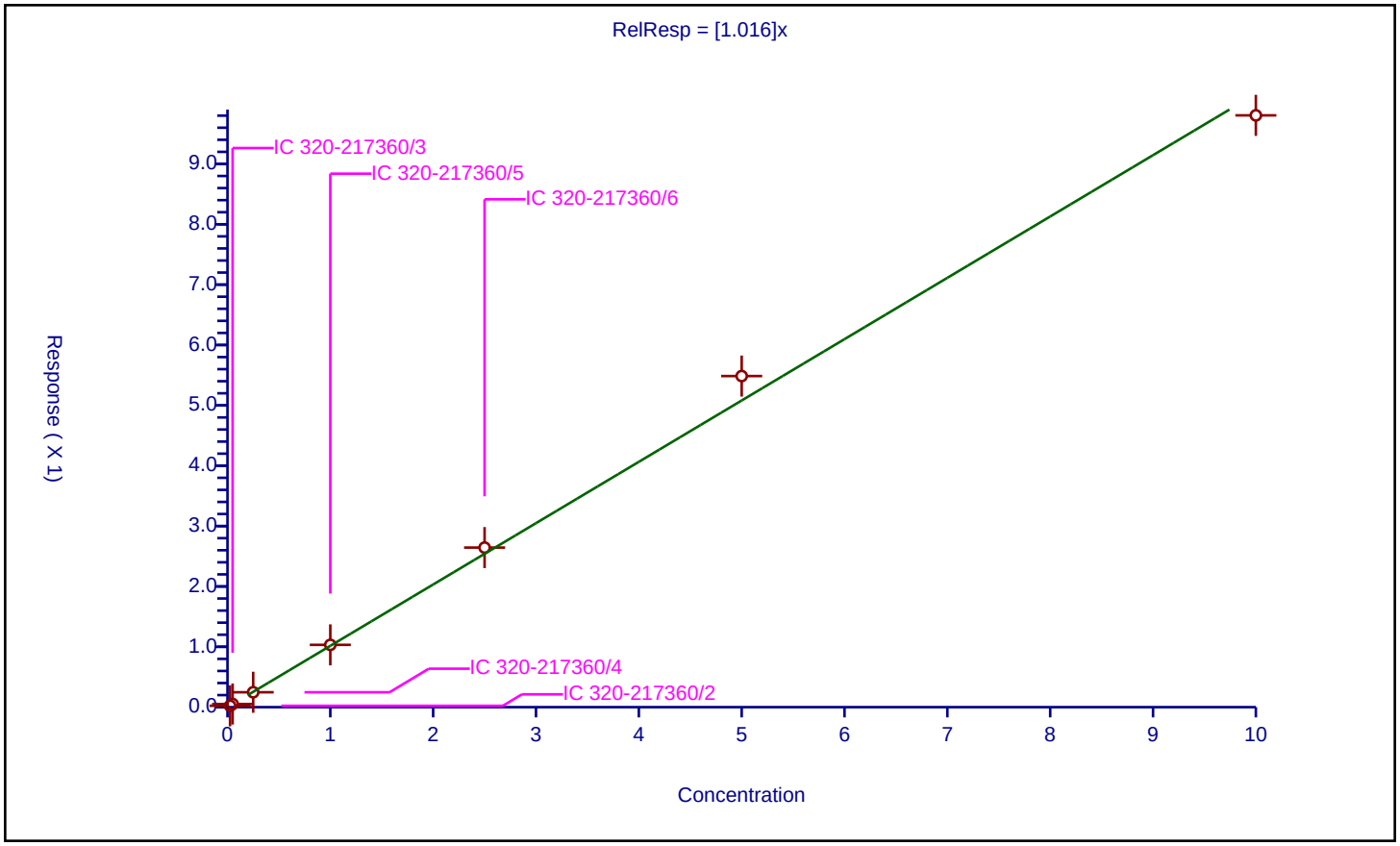
Curve Coefficients

Intercept:	0
Slope:	1.016

Error Coefficients

Standard Error:	8260000
Relative Standard Error:	5.9
Correlation Coefficient:	0.985
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.022912	2.5	4636047.0	0.916492	Y
2	IC 320-217360/3	0.05	0.052095	2.5	4260718.0	1.041902	Y
3	IC 320-217360/4	0.25	0.246769	2.5	4589544.0	0.987076	Y
4	IC 320-217360/5	1.0	1.032426	2.5	4391788.0	1.032426	Y
5	IC 320-217360/6	2.5	2.643853	2.5	4266668.0	1.057541	Y
6	IC 320-217360/7	5.0	5.485579	2.5	4780636.0	1.097116	Y
7	IC 320-217360/8	10.0	9.804566	2.5	4231897.0	0.980457	Y



Calibration / Perfluoropentanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

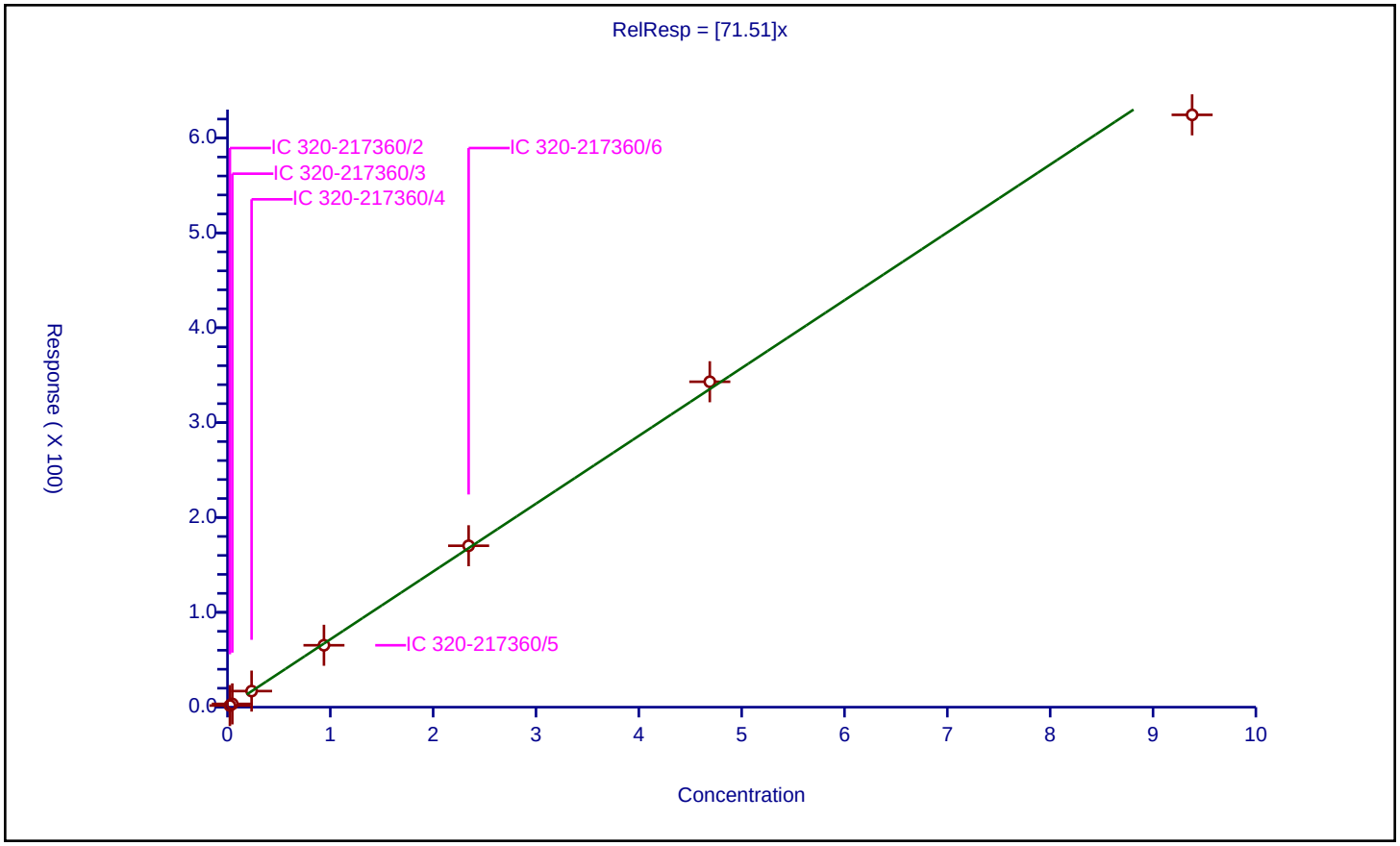
Curve Coefficients

Intercept:	0
Slope:	71.51

Error Coefficients

Standard Error:	11000000
Relative Standard Error:	3.6
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.02345	1.703665	2.325	86409.0	72.650977	Y
2	IC 320-217360/3	0.0469	3.457377	2.325	82315.0	73.71805	Y
3	IC 320-217360/4	0.2345	16.953113	2.325	85829.0	72.294723	Y
4	IC 320-217360/5	0.938	65.272477	2.325	87216.0	69.586862	Y
5	IC 320-217360/6	2.345	170.194532	2.325	83922.0	72.577626	Y
6	IC 320-217360/7	4.69	343.084686	2.325	92353.0	73.152385	Y
7	IC 320-217360/8	9.38	624.465714	2.325	82834.0	66.57417	Y



Calibration / Perfluoroheptanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

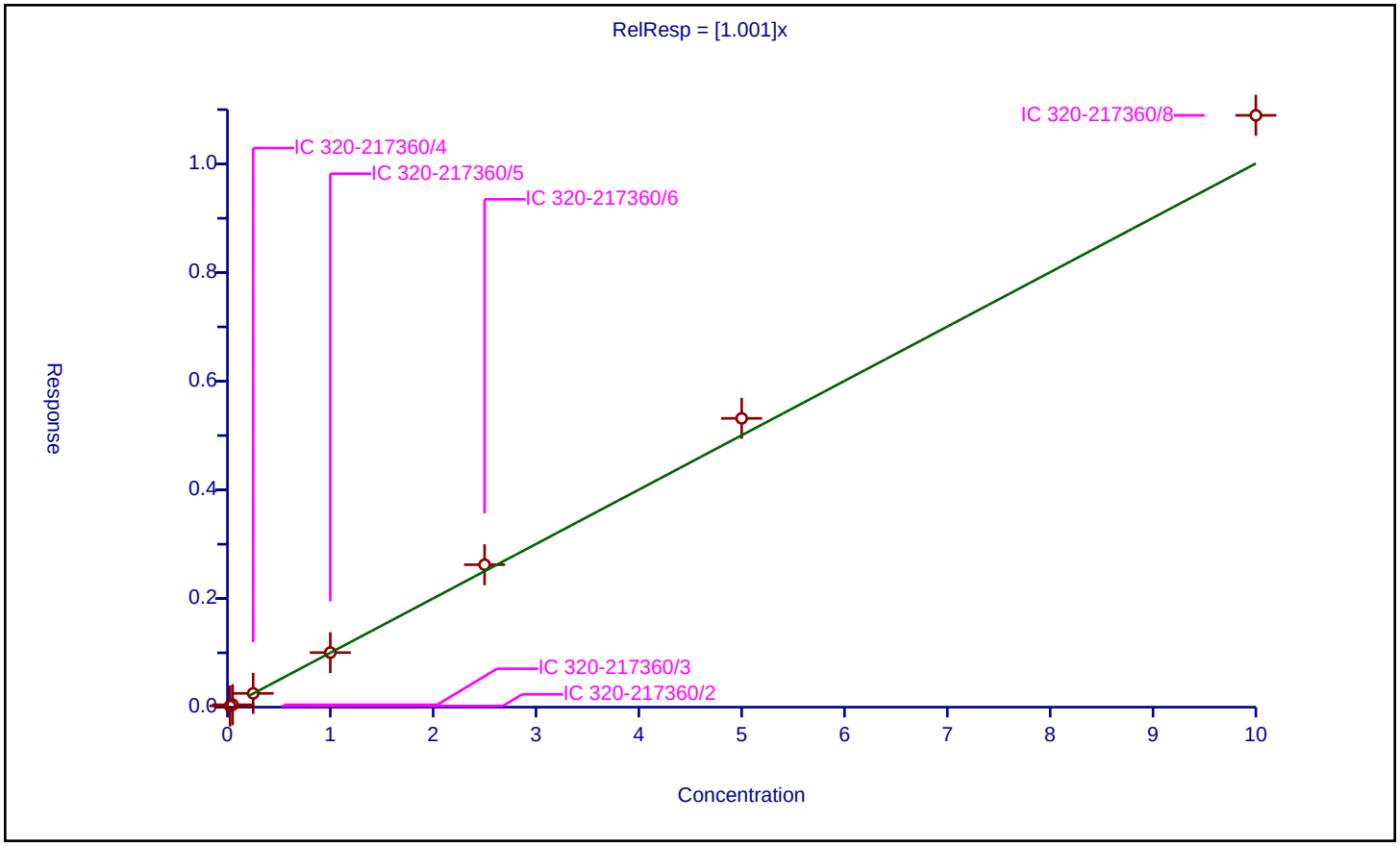
Curve Coefficients

Intercept:	0
Slope:	1.001

Error Coefficients

Standard Error:	8120000
Relative Standard Error:	7.9
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.022216	2.5	4543661.0	0.888623	Y
2	IC 320-217360/3	0.05	0.044804	2.5	4420246.0	0.896081	Y
3	IC 320-217360/4	0.25	0.253814	2.5	4371595.0	1.015256	Y
4	IC 320-217360/5	1.0	1.004439	2.5	4282212.0	1.004439	Y
5	IC 320-217360/6	2.5	2.622762	2.5	4357585.0	1.049105	Y
6	IC 320-217360/7	5.0	5.316234	2.5	4543925.0	1.063247	Y
7	IC 320-217360/8	10.0	10.894615	2.5	3828332.0	1.089461	Y



Calibration / Perfluorohexanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

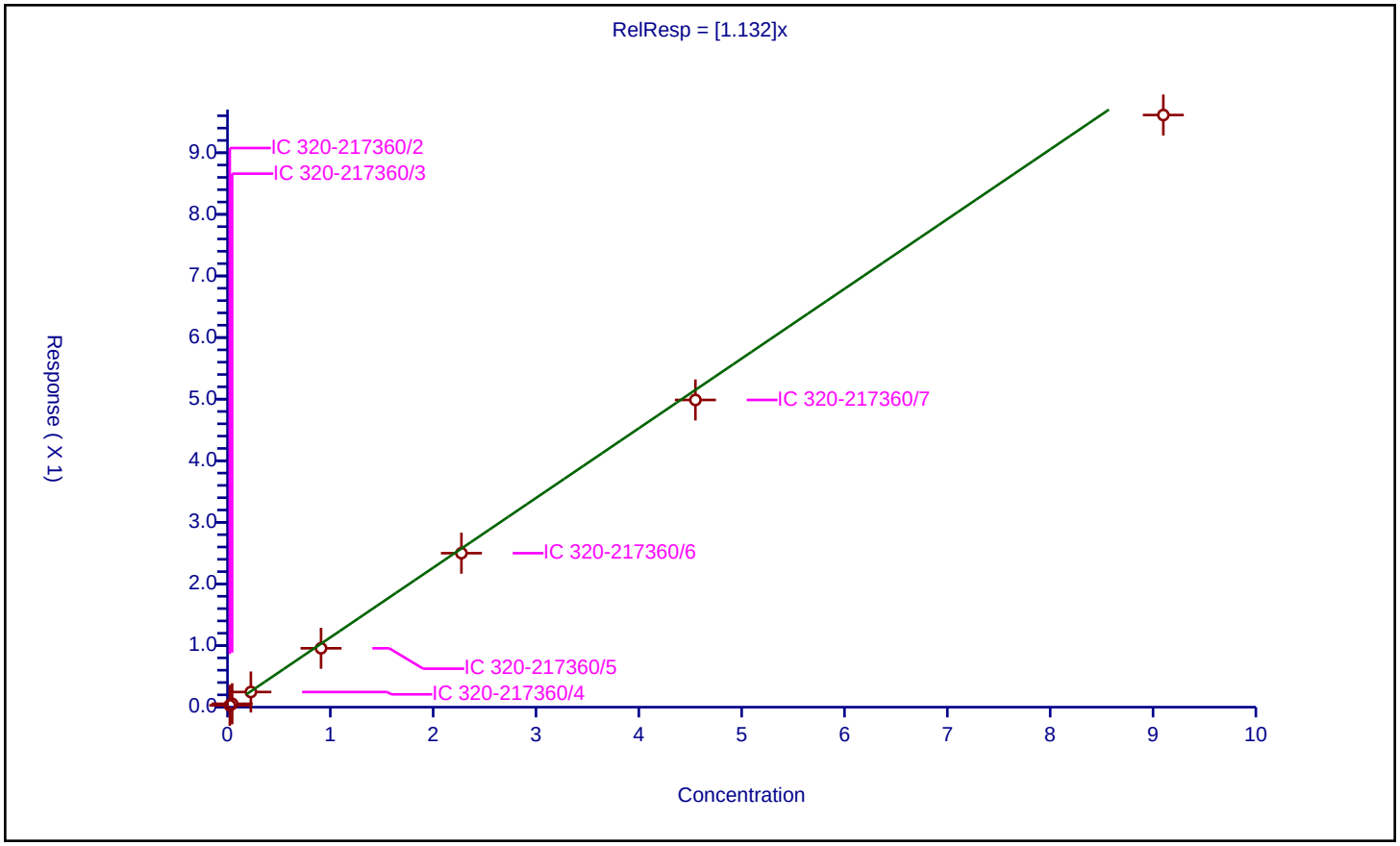
Curve Coefficients

Intercept:	0
Slope:	1.132

Error Coefficients

Standard Error:	9180000
Relative Standard Error:	9.0
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.989

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.02275	0.030286	2.365	5146760.0	1.331253	Y
2	IC 320-217360/3	0.0455	0.054946	2.365	5080567.0	1.207607	Y
3	IC 320-217360/4	0.2275	0.246238	2.365	5290521.0	1.082367	Y
4	IC 320-217360/5	0.91	0.955604	2.365	5007633.0	1.050114	Y
5	IC 320-217360/6	2.275	2.499688	2.365	4919272.0	1.098764	Y
6	IC 320-217360/7	4.55	4.986956	2.365	5430236.0	1.096034	Y
7	IC 320-217360/8	9.1	9.611927	2.365	4559710.0	1.056256	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

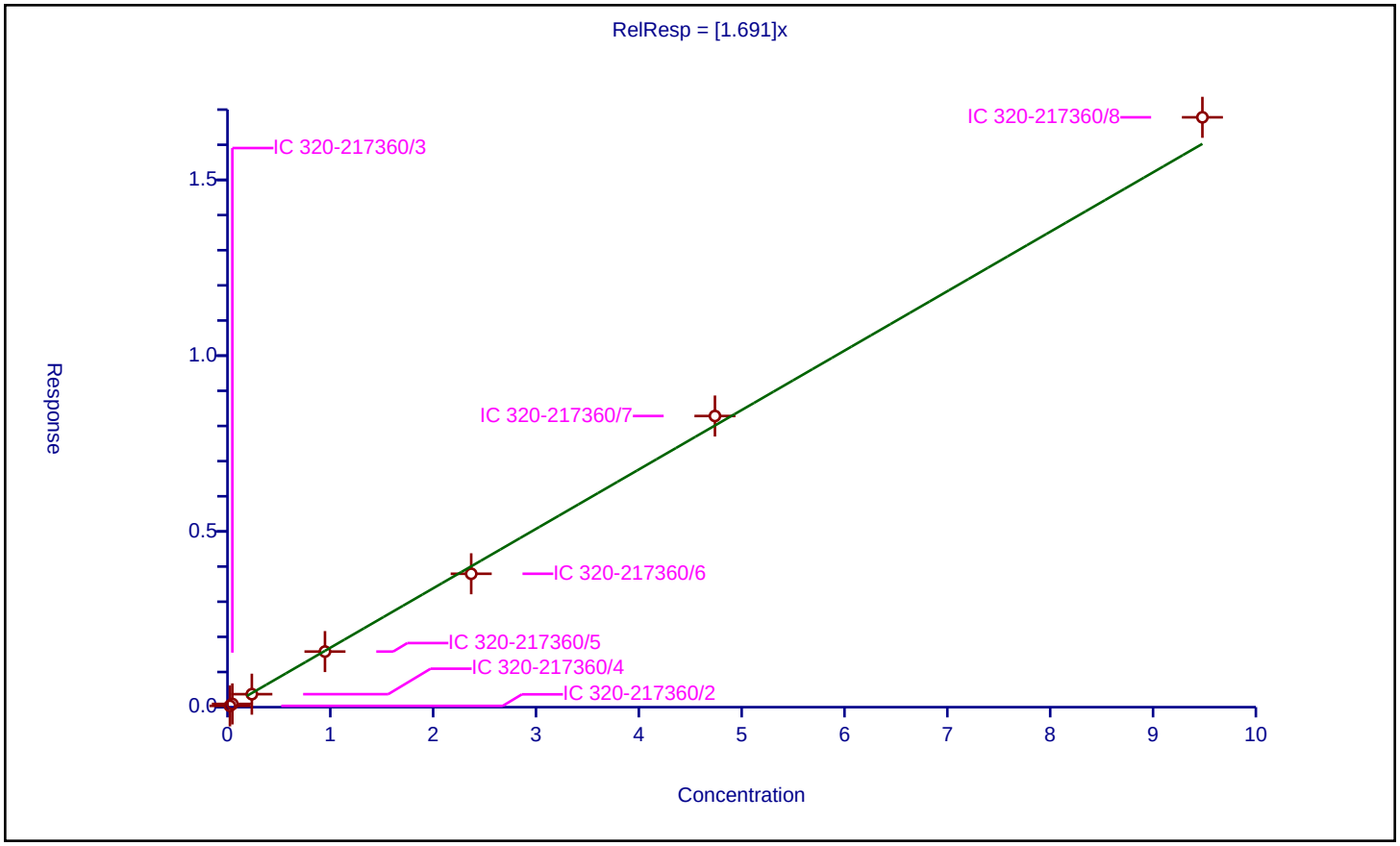
Curve Coefficients

Intercept:	0
Slope:	1.691

Error Coefficients

Standard Error:	2680000
Relative Standard Error:	8.5
Correlation Coefficient:	0.990
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0237	0.036548	2.375	913336.0	1.542111	Y
2	IC 320-217360/3	0.0474	0.092216	2.375	829435.0	1.945478	Y
3	IC 320-217360/4	0.237	0.369395	2.375	946554.0	1.558628	Y
4	IC 320-217360/5	0.948	1.581622	2.375	892700.0	1.668377	Y
5	IC 320-217360/6	2.37	3.79502	2.375	880882.0	1.601274	Y
6	IC 320-217360/7	4.74	8.283238	2.375	950305.0	1.747519	Y
7	IC 320-217360/8	9.48	16.780757	2.375	769923.0	1.770122	Y



Calibration / Perfluorooctanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

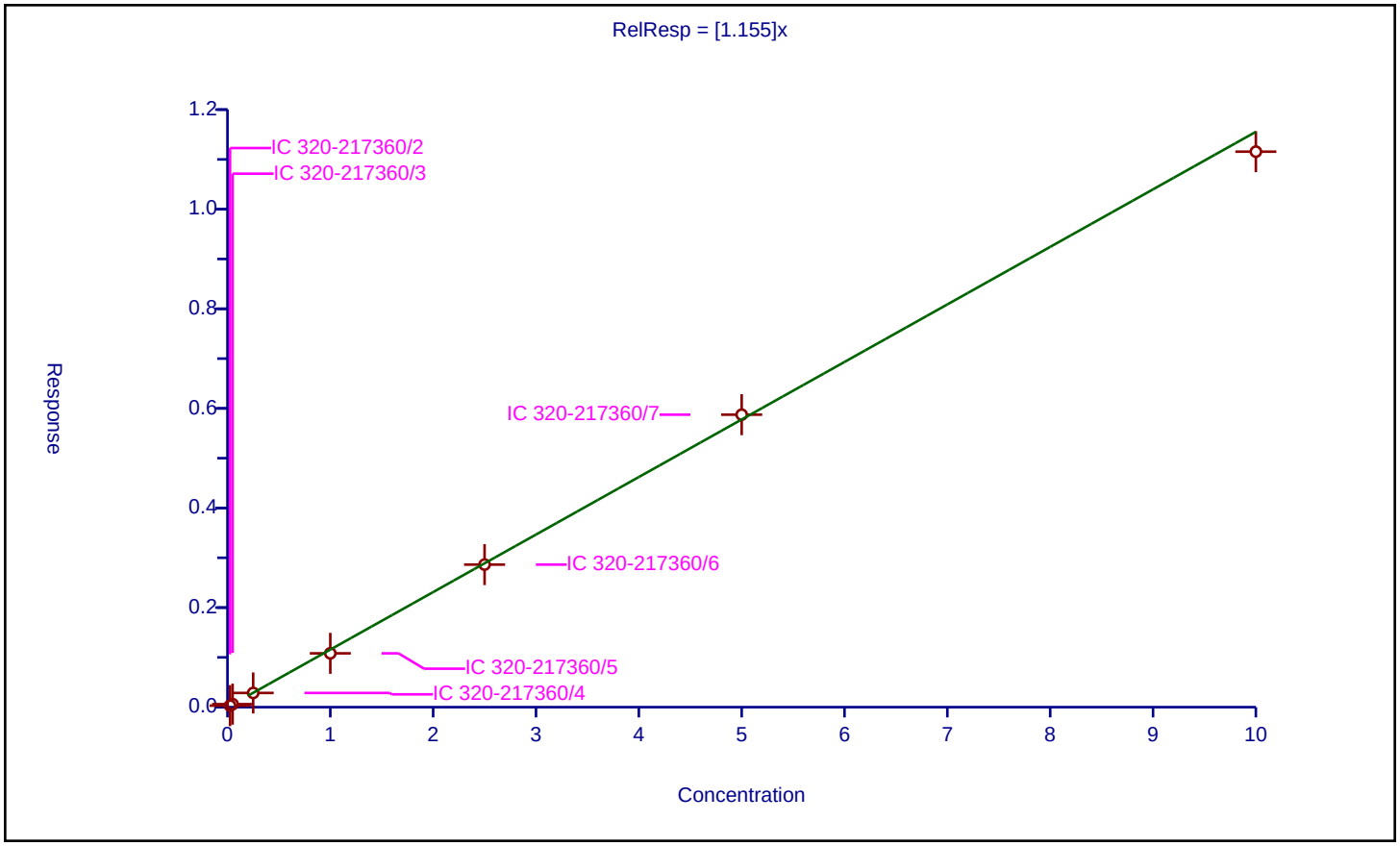
Curve Coefficients

Intercept:	0
Slope:	1.155

Error Coefficients

Standard Error:	8630000
Relative Standard Error:	4.3
Correlation Coefficient:	0.984
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.030489	2.5	4463374.0	1.219571	Y
2	IC 320-217360/3	0.05	0.060539	2.5	4186198.0	1.210788	Y
3	IC 320-217360/4	0.25	0.285222	2.5	4391971.0	1.140889	Y
4	IC 320-217360/5	1.0	1.08103	2.5	4283435.0	1.08103	Y
5	IC 320-217360/6	2.5	2.86303	2.5	4288230.0	1.145212	Y
6	IC 320-217360/7	5.0	5.874124	2.5	4688766.0	1.174825	Y
7	IC 320-217360/8	10.0	11.155425	2.5	3866213.0	1.115543	Y



Calibration / Perfluoroheptanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

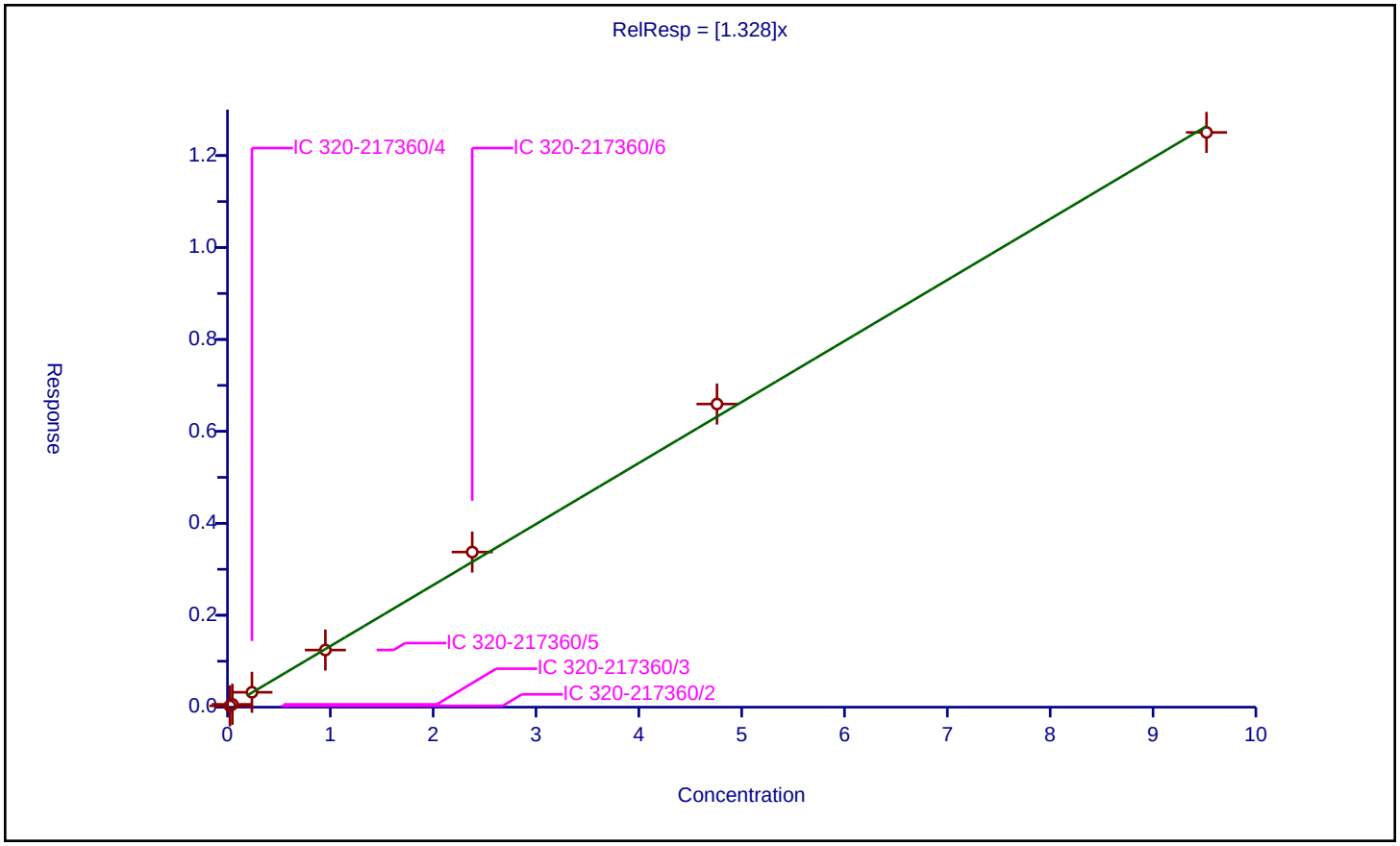
Curve Coefficients

Intercept:	0
Slope:	1.328

Error Coefficients

Standard Error:	8460000
Relative Standard Error:	5.2
Correlation Coefficient:	0.985
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0238	0.028678	2.39	3623690.0	1.204979	Y
2	IC 320-217360/3	0.0476	0.062197	2.39	3602676.0	1.306653	Y
3	IC 320-217360/4	0.238	0.323529	2.39	3695054.0	1.359368	Y
4	IC 320-217360/5	0.952	1.2431	2.39	3581436.0	1.305777	Y
5	IC 320-217360/6	2.38	3.374764	2.39	3447017.0	1.417968	Y
6	IC 320-217360/7	4.76	6.594826	2.39	3884830.0	1.385468	Y
7	IC 320-217360/8	9.52	12.503774	2.39	3239063.0	1.313422	Y



Calibration / Perfluorononanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

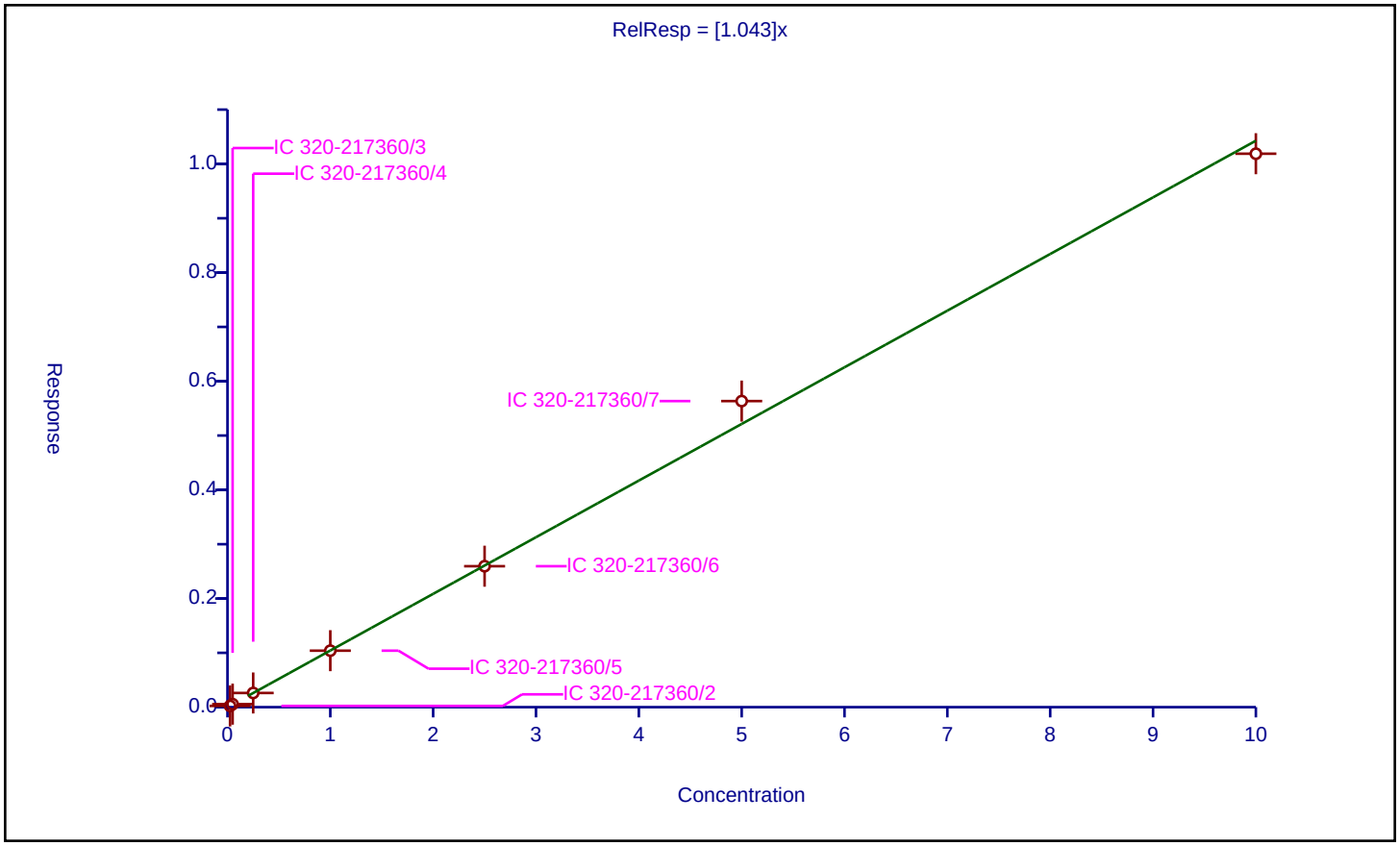
Curve Coefficients

Intercept:	0
Slope:	1.043

Error Coefficients

Standard Error:	6830000
Relative Standard Error:	6.3
Correlation Coefficient:	0.985
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.023084	2.5	3918358.0	0.923346	Y
2	IC 320-217360/3	0.05	0.055338	2.5	3691890.0	1.106764	Y
3	IC 320-217360/4	0.25	0.261311	2.5	3769499.0	1.045242	Y
4	IC 320-217360/5	1.0	1.039953	2.5	3677661.0	1.039953	Y
5	IC 320-217360/6	2.5	2.595069	2.5	3653281.0	1.038027	Y
6	IC 320-217360/7	5.0	5.634366	2.5	3844023.0	1.126873	Y
7	IC 320-217360/8	10.0	10.187911	2.5	3361051.0	1.018791	Y



Calibration / Perfluorooctane sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

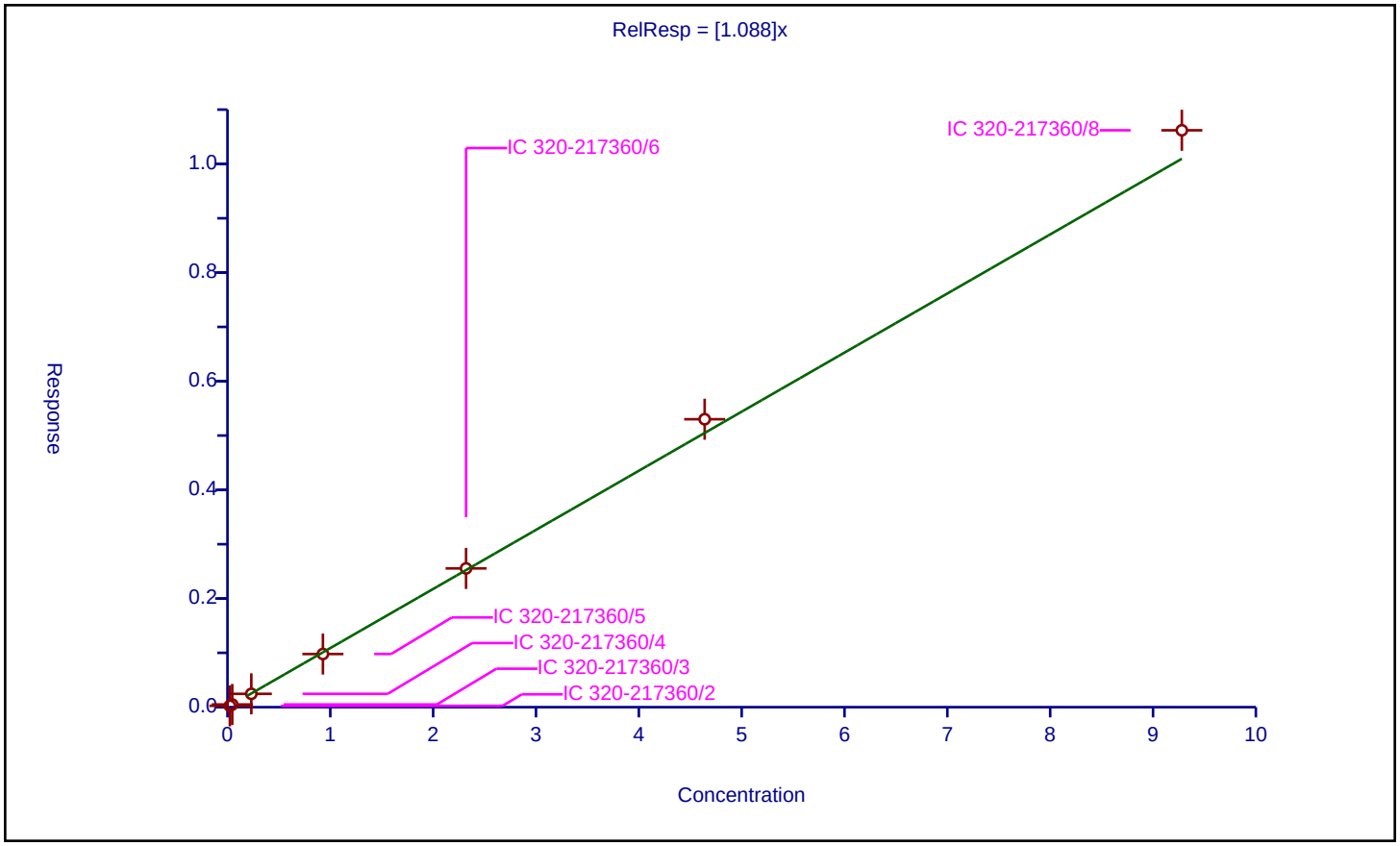
Curve Coefficients

Intercept:	0
Slope:	1.088

Error Coefficients

Standard Error:	7040000
Relative Standard Error:	3.8
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0232	0.024544	2.39	3623690.0	1.057922	Y
2	IC 320-217360/3	0.0464	0.04912	2.39	3602676.0	1.058617	Y
3	IC 320-217360/4	0.232	0.244992	2.39	3695054.0	1.055999	Y
4	IC 320-217360/5	0.928	0.978666	2.39	3581436.0	1.054597	Y
5	IC 320-217360/6	2.32	2.554434	2.39	3447017.0	1.101049	Y
6	IC 320-217360/7	4.64	5.300541	2.39	3884830.0	1.142358	Y
7	IC 320-217360/8	9.28	10.61917	2.39	3239063.0	1.144307	Y



Calibration / Perfluorononanesulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

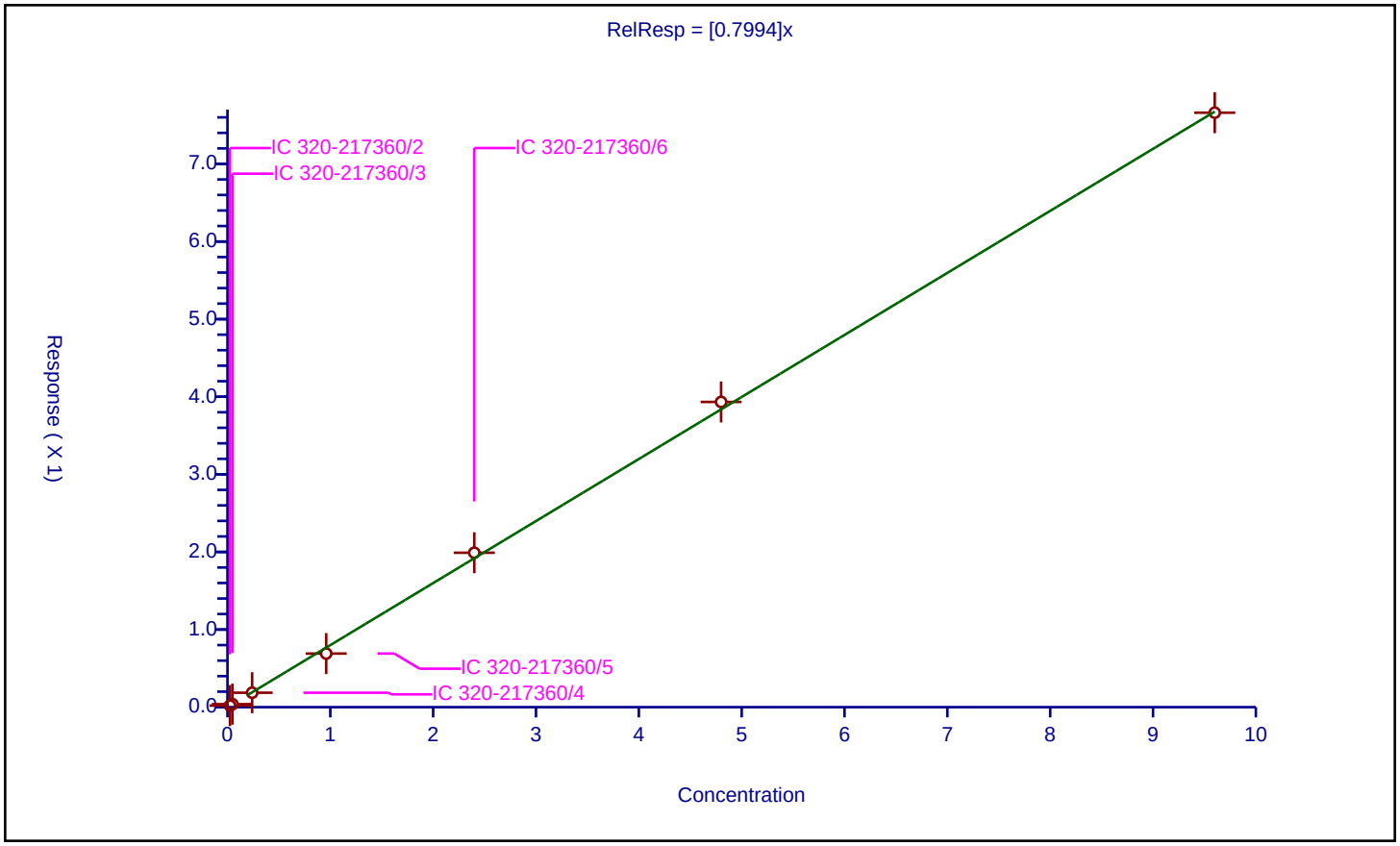
Curve Coefficients

Intercept:	0
Slope:	0.7994

Error Coefficients

Standard Error:	5130000
Relative Standard Error:	5.2
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.024	0.020209	2.39	3623690.0	0.842051	Y
2	IC 320-217360/3	0.048	0.038971	2.39	3602676.0	0.811886	Y
3	IC 320-217360/4	0.24	0.186218	2.39	3695054.0	0.775909	Y
4	IC 320-217360/5	0.96	0.690641	2.39	3581436.0	0.719417	Y
5	IC 320-217360/6	2.4	1.989988	2.39	3447017.0	0.829162	Y
6	IC 320-217360/7	4.8	3.93292	2.39	3884830.0	0.819358	Y
7	IC 320-217360/8	9.6	7.660244	2.39	3239063.0	0.797942	Y



Calibration / Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

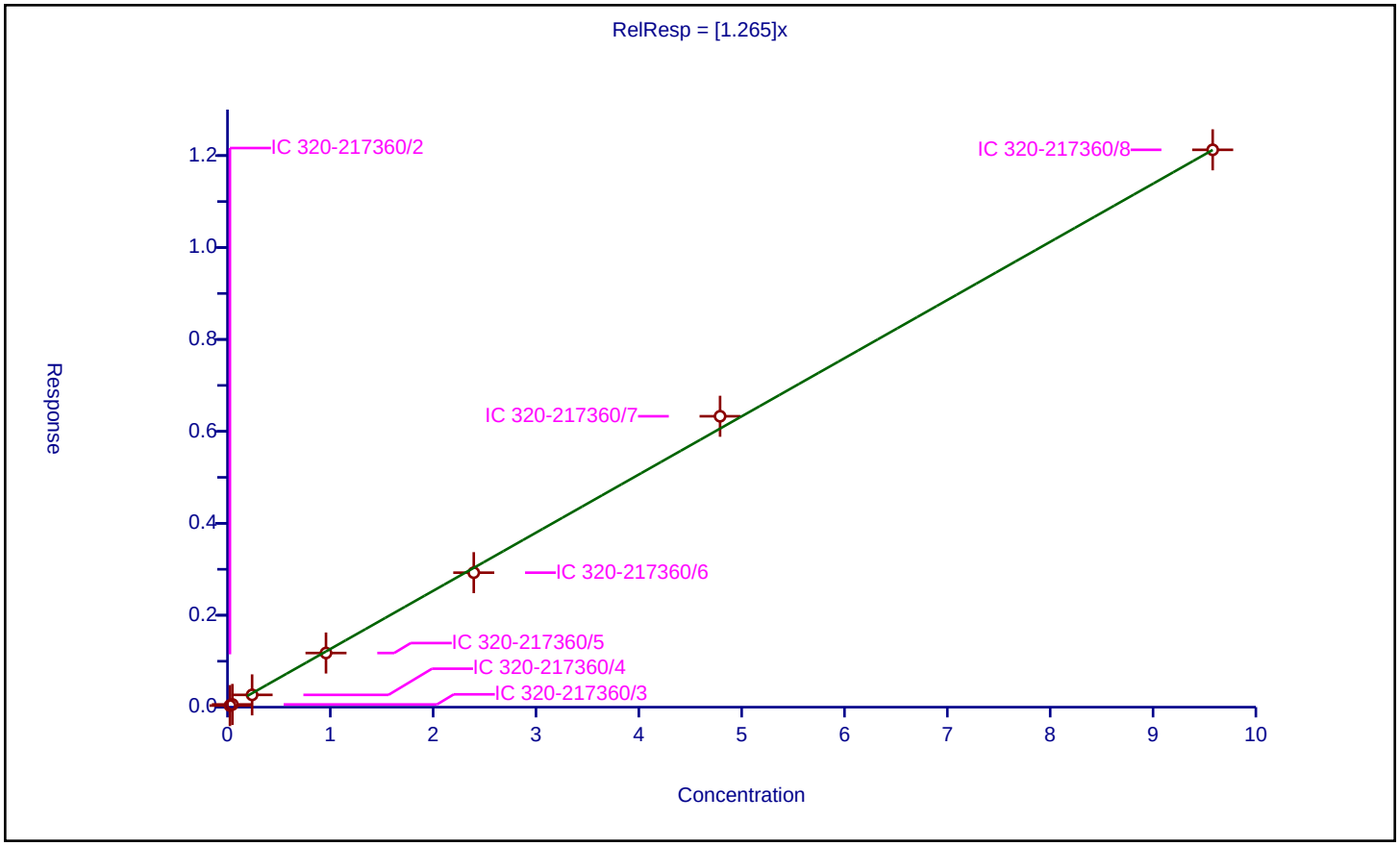
Curve Coefficients

Intercept:	0
Slope:	1.265

Error Coefficients

Standard Error:	2340000
Relative Standard Error:	8.4
Correlation Coefficient:	0.987
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.02395	0.035041	2.395	1101720.0	1.463076	Y
2	IC 320-217360/3	0.0479	0.059367	2.395	1101099.0	1.239398	Y
3	IC 320-217360/4	0.2395	0.267448	2.395	1105113.0	1.116691	Y
4	IC 320-217360/5	0.958	1.178106	2.395	1093693.0	1.229756	Y
5	IC 320-217360/6	2.395	2.926029	2.395	1063168.0	1.221724	Y
6	IC 320-217360/7	4.79	6.328663	2.395	1111203.0	1.321224	Y
7	IC 320-217360/8	9.58	12.124954	2.395	929210.0	1.265653	Y



Calibration / Perfluorodecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

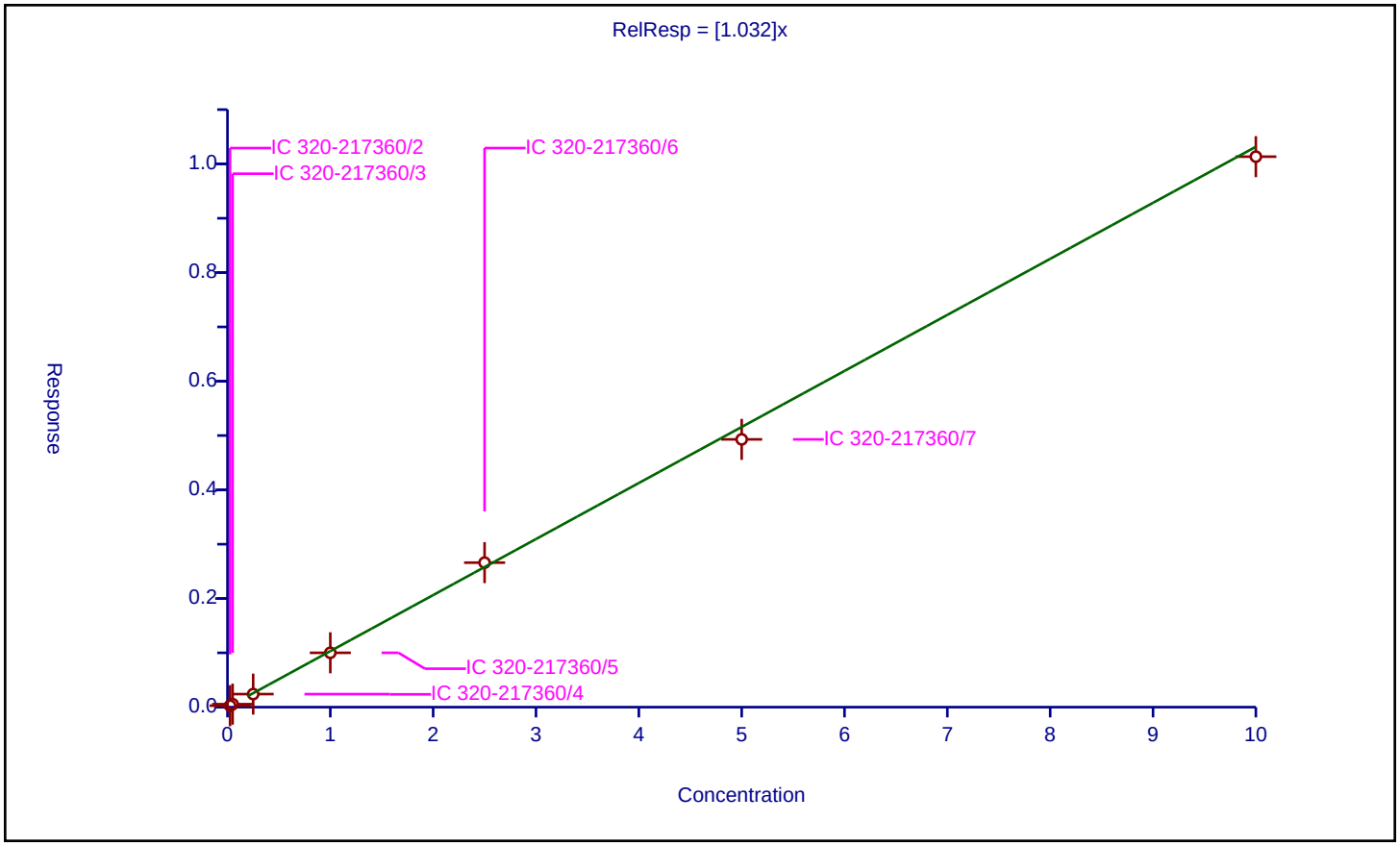
Curve Coefficients

Intercept:	0
Slope:	1.032

Error Coefficients

Standard Error:	5700000
Relative Standard Error:	5.3
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.027214	2.5	3147491.0	1.08855	Y
2	IC 320-217360/3	0.05	0.055287	2.5	2912736.0	1.105747	Y
3	IC 320-217360/4	0.25	0.240666	2.5	3141564.0	0.962664	Y
4	IC 320-217360/5	1.0	1.000535	2.5	3187733.0	1.000535	Y
5	IC 320-217360/6	2.5	2.660682	2.5	2967373.0	1.064273	Y
6	IC 320-217360/7	5.0	4.929623	2.5	3590754.0	0.985925	Y
7	IC 320-217360/8	10.0	10.133933	2.5	2846573.0	1.013393	Y



Calibration / Perfluorooctane Sulfonamide

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

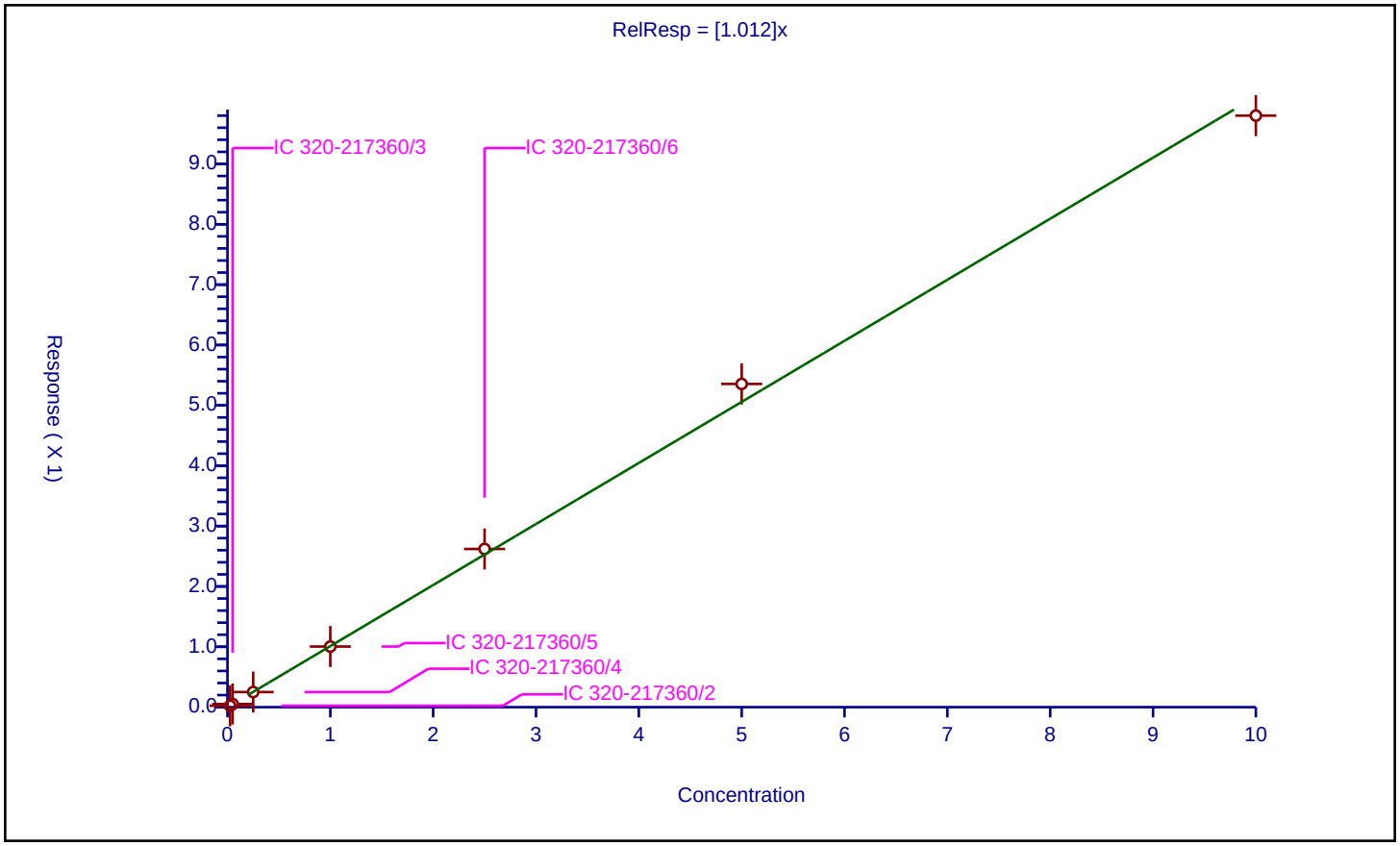
Curve Coefficients

Intercept:	0
Slope:	1.012

Error Coefficients

Standard Error:	8270000
Relative Standard Error:	4.7
Correlation Coefficient:	0.982
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.023268	2.5	4813462.0	0.930723	Y
2	IC 320-217360/3	0.05	0.052203	2.5	4658336.0	1.044053	Y
3	IC 320-217360/4	0.25	0.250574	2.5	4856180.0	1.002296	Y
4	IC 320-217360/5	1.0	1.004073	2.5	4725832.0	1.004073	Y
5	IC 320-217360/6	2.5	2.620964	2.5	4533137.0	1.048386	Y
6	IC 320-217360/7	5.0	5.354645	2.5	4967723.0	1.070929	Y
7	IC 320-217360/8	10.0	9.800427	2.5	4196317.0	0.980043	Y



Calibration / N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

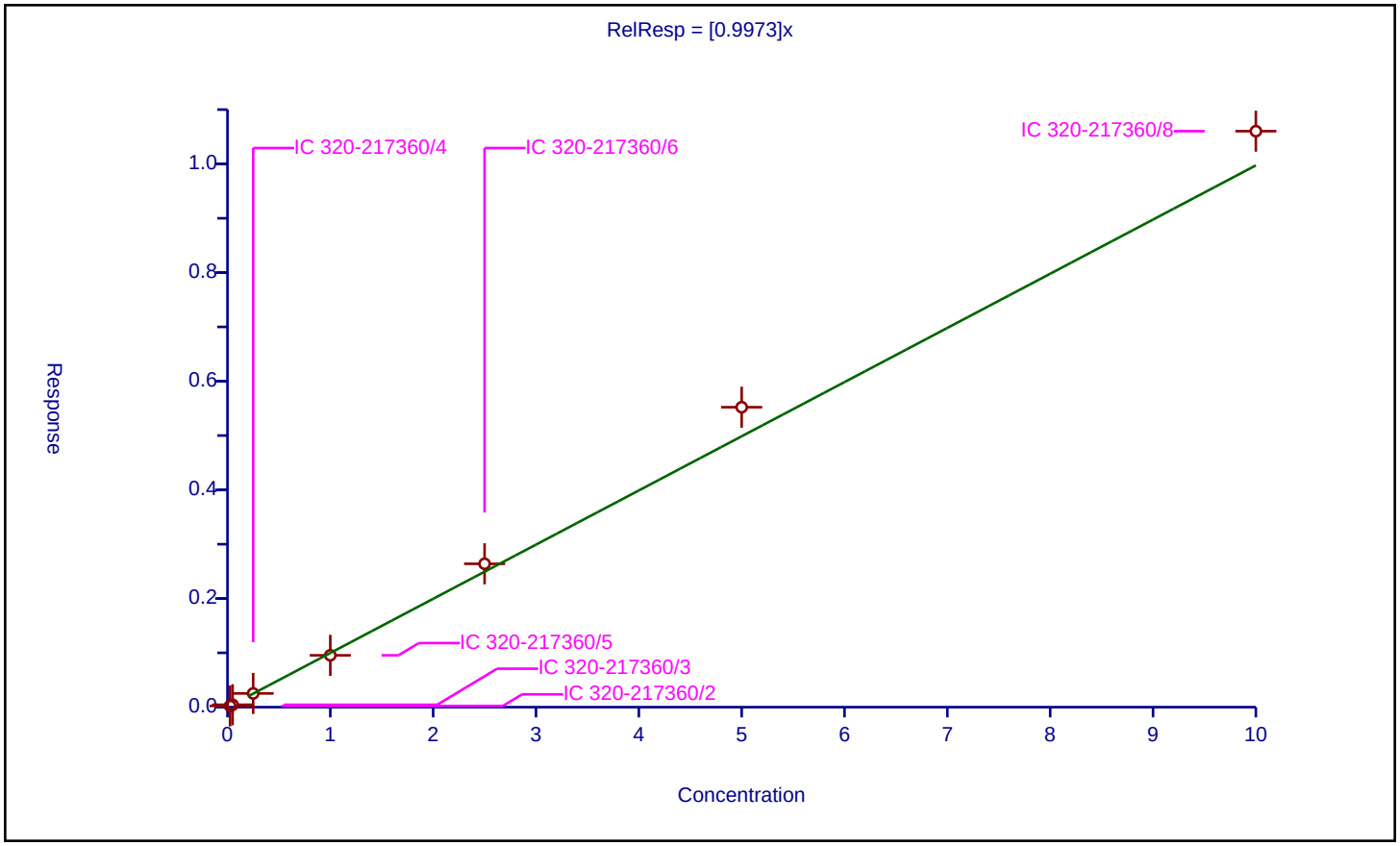
Curve Coefficients

Intercept:	0
Slope:	0.9973

Error Coefficients

Standard Error:	3500000
Relative Standard Error:	8.3
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.022707	2.5	1681961.0	0.908285	Y
2	IC 320-217360/3	0.05	0.044358	2.5	1708589.0	0.887165	Y
3	IC 320-217360/4	0.25	0.252726	2.5	1807153.0	1.010905	Y
4	IC 320-217360/5	1.0	0.954456	2.5	1818526.0	0.954456	Y
5	IC 320-217360/6	2.5	2.639289	2.5	1707705.0	1.055716	Y
6	IC 320-217360/7	5.0	5.52157	2.5	1906740.0	1.104314	Y
7	IC 320-217360/8	10.0	10.603094	2.5	1702670.0	1.060309	Y



Calibration / Perfluorodecane Sulfonic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

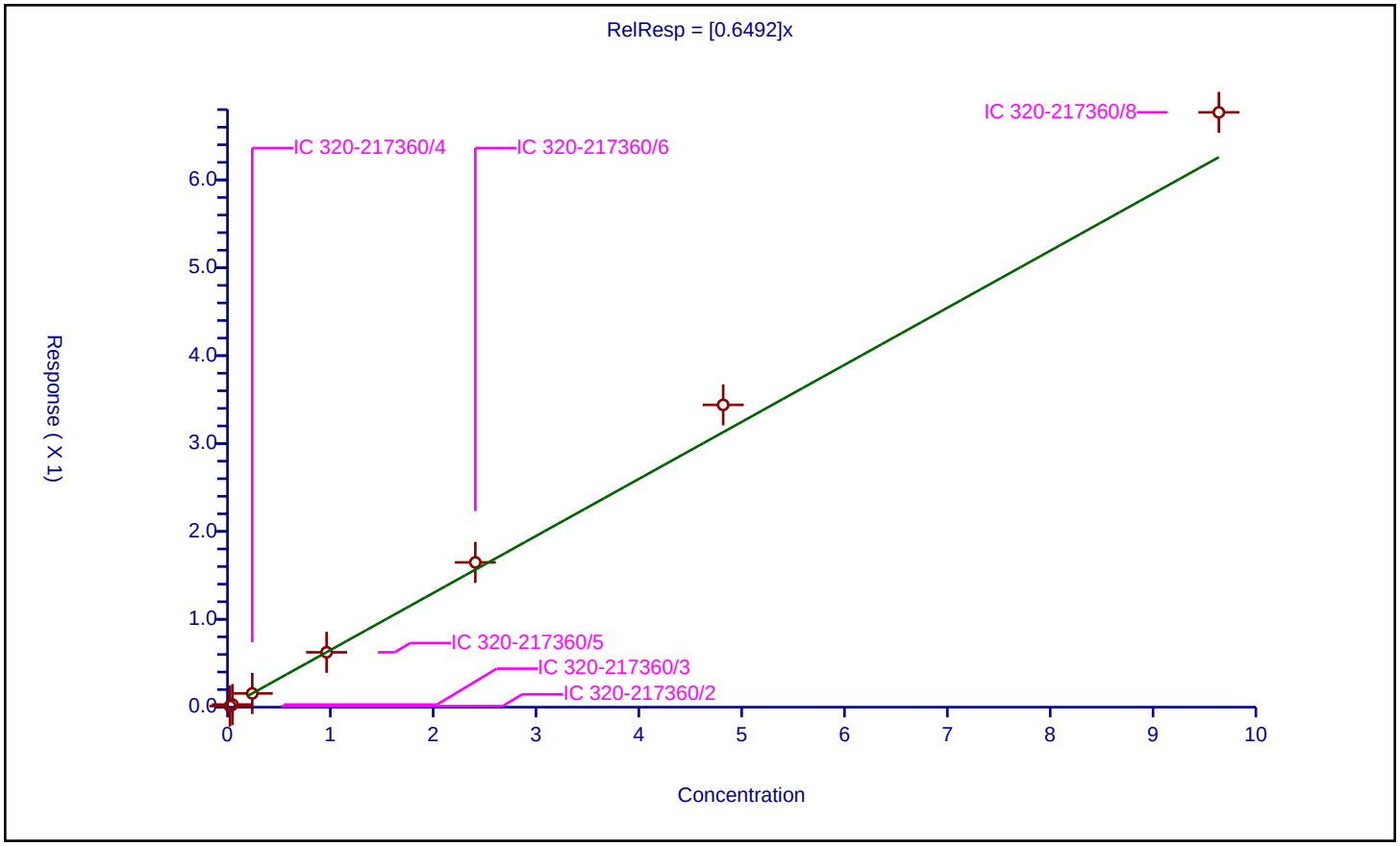
Curve Coefficients

Intercept:	0
Slope:	0.6492

Error Coefficients

Standard Error:	4510000
Relative Standard Error:	9.6
Correlation Coefficient:	0.989
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.0241	0.012758	2.39	3623690.0	0.52939	Y
2	IC 320-217360/3	0.0482	0.029806	2.39	3602676.0	0.618389	Y
3	IC 320-217360/4	0.241	0.156564	2.39	3695054.0	0.649645	Y
4	IC 320-217360/5	0.964	0.624421	2.39	3581436.0	0.647739	Y
5	IC 320-217360/6	2.41	1.647684	2.39	3447017.0	0.683686	Y
6	IC 320-217360/7	4.82	3.439976	2.39	3884830.0	0.713688	Y
7	IC 320-217360/8	9.64	6.768895	2.39	3239063.0	0.702168	Y



Calibration / Perfluoroundecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

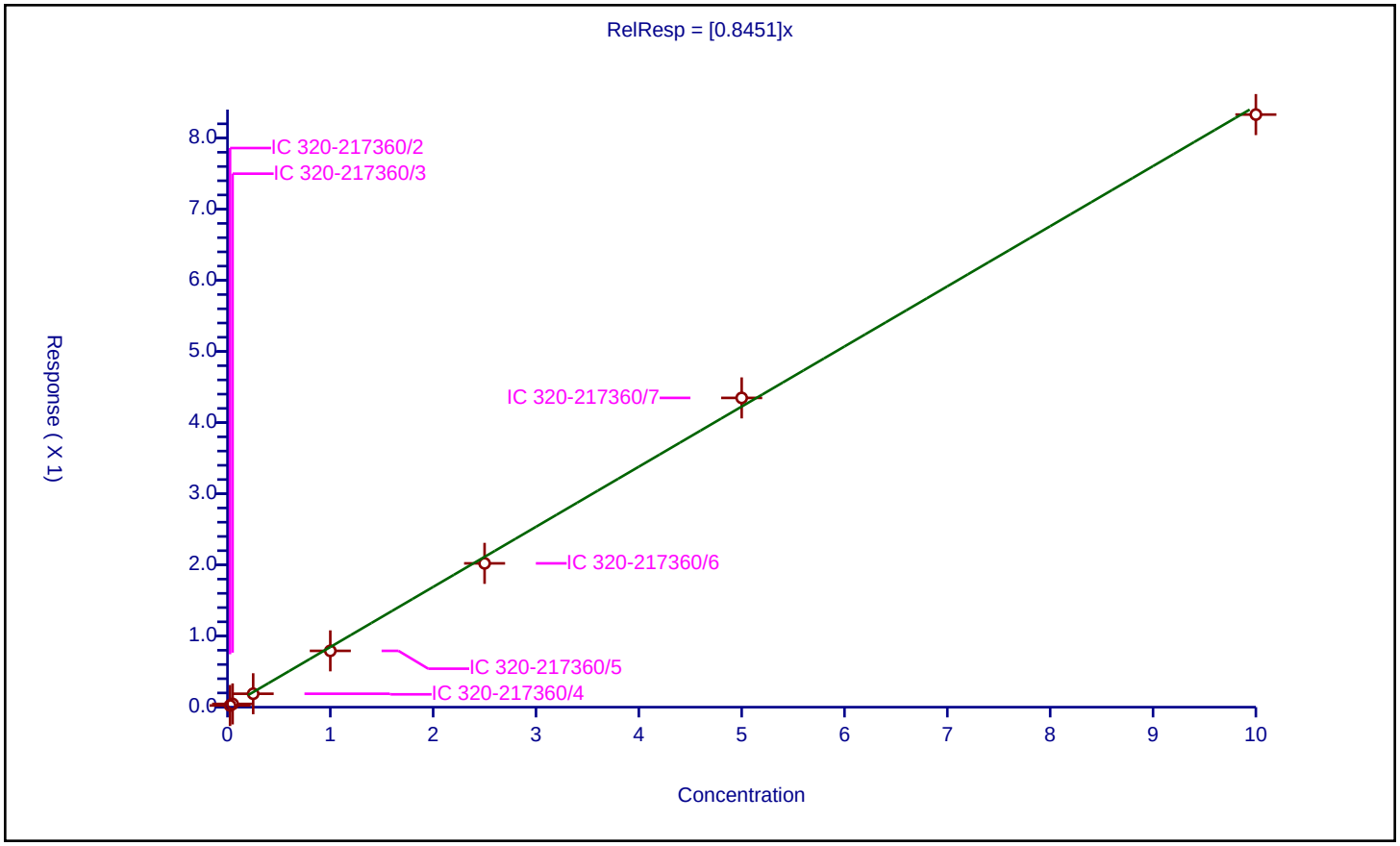
Curve Coefficients

Intercept:	0
Slope:	0.8451

Error Coefficients

Standard Error:	3910000
Relative Standard Error:	8.1
Correlation Coefficient:	0.982
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.023599	2.5	2810450.0	0.943977	Y
2	IC 320-217360/3	0.05	0.04575	2.5	2662627.0	0.914999	Y
3	IC 320-217360/4	0.25	0.188558	2.5	2893419.0	0.754232	Y
4	IC 320-217360/5	1.0	0.79142	2.5	2598322.0	0.79142	Y
5	IC 320-217360/6	2.5	2.021429	2.5	2601195.0	0.808571	Y
6	IC 320-217360/7	5.0	4.347294	2.5	2905024.0	0.869459	Y
7	IC 320-217360/8	10.0	8.330328	2.5	2344065.0	0.833033	Y



Calibration / N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

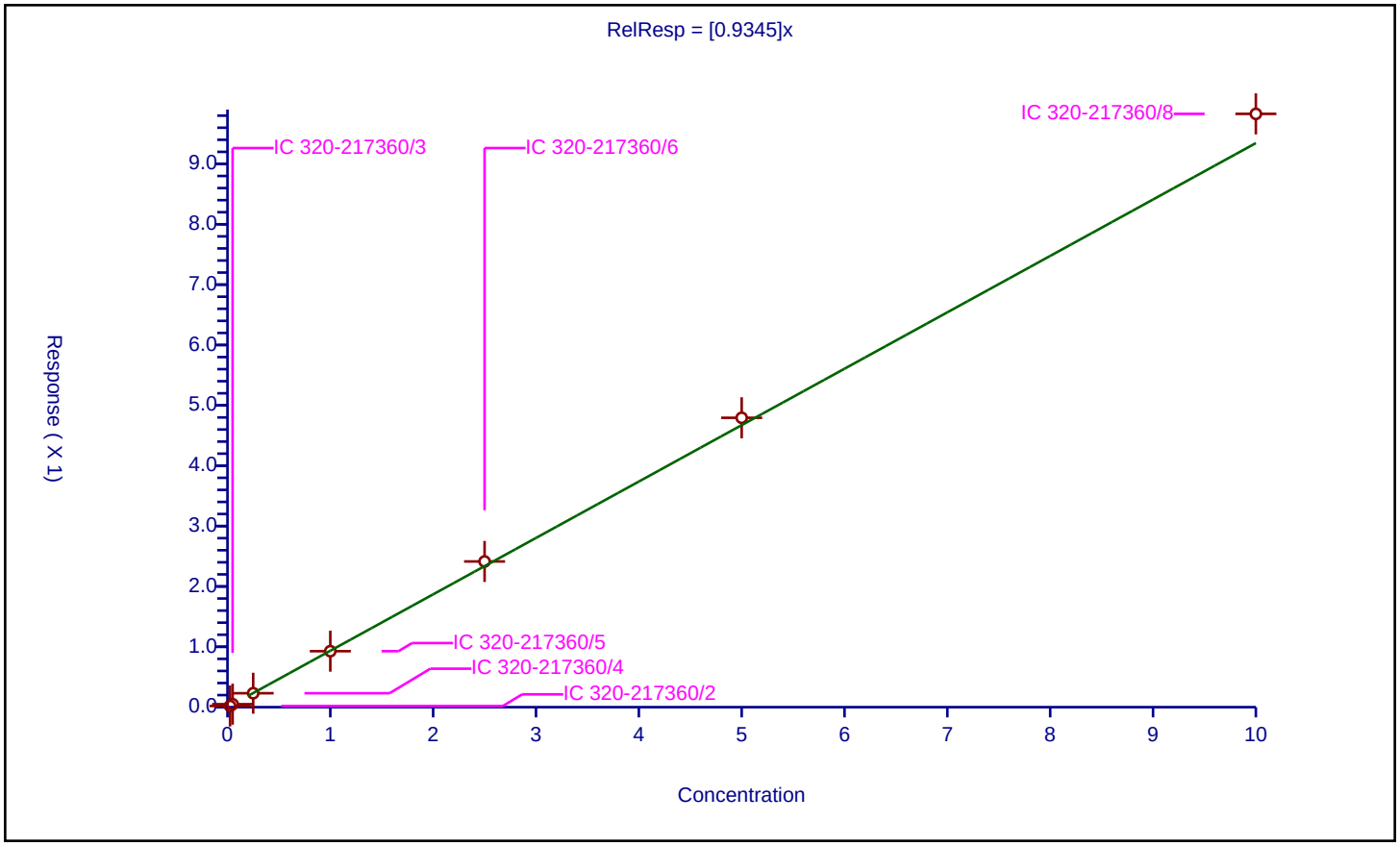
Curve Coefficients

Intercept:	0
Slope:	0.9345

Error Coefficients

Standard Error:	2880000
Relative Standard Error:	7.3
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.019782	2.5	1870983.0	0.791295	Y
2	IC 320-217360/3	0.05	0.049639	2.5	1730407.0	0.992772	Y
3	IC 320-217360/4	0.25	0.230695	2.5	1809132.0	0.92278	Y
4	IC 320-217360/5	1.0	0.927424	2.5	1716798.0	0.927424	Y
5	IC 320-217360/6	2.5	2.4138	2.5	1729345.0	0.96552	Y
6	IC 320-217360/7	5.0	4.793989	2.5	1869135.0	0.958798	Y
7	IC 320-217360/8	10.0	9.829224	2.5	1478400.0	0.982922	Y



Calibration / Perfluorododecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

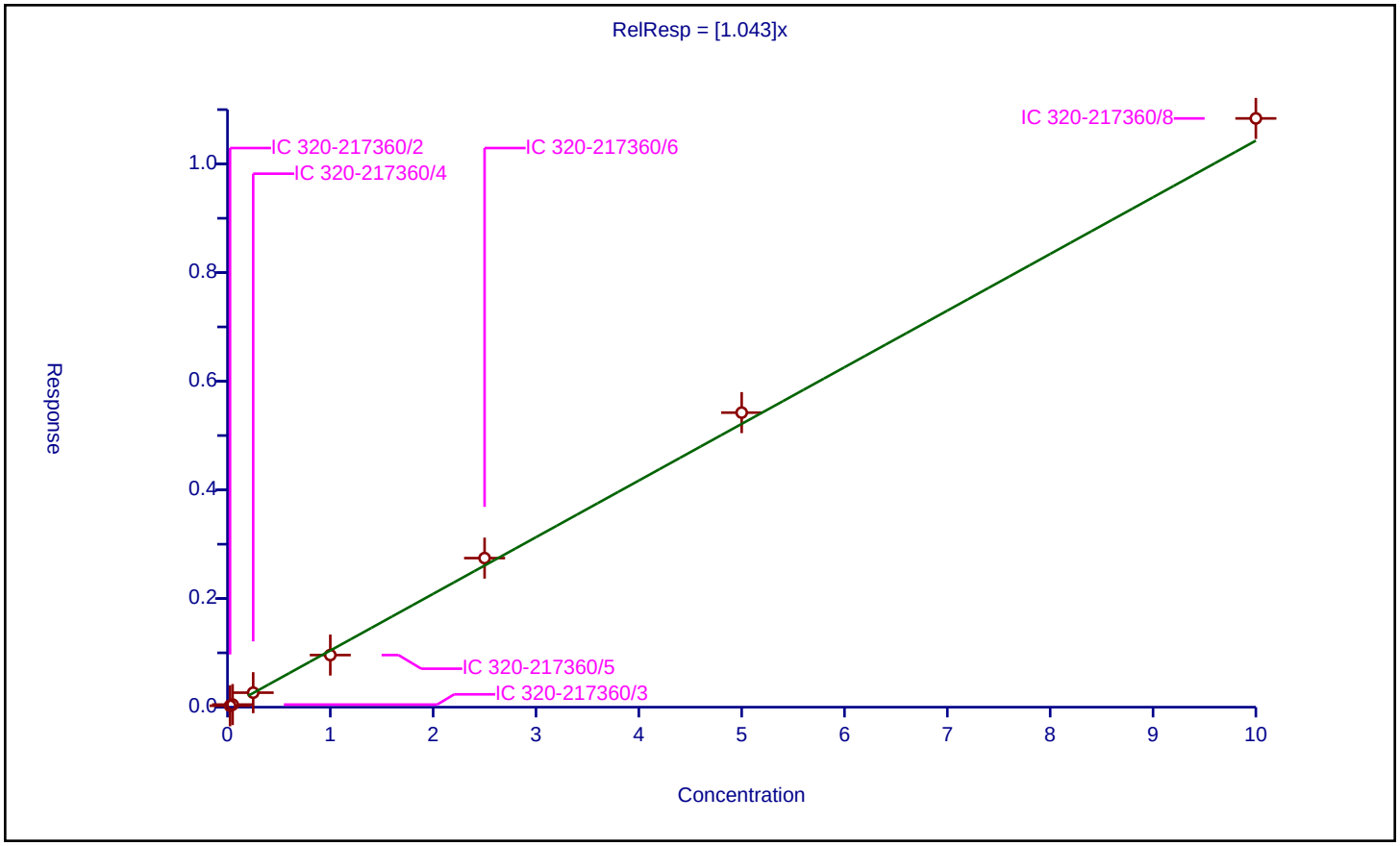
Curve Coefficients

Intercept:	0
Slope:	1.043

Error Coefficients

Standard Error:	5530000
Relative Standard Error:	5.7
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.02625	2.5	2848895.0	1.049986	Y
2	IC 320-217360/3	0.05	0.047921	2.5	2928766.0	0.958424	Y
3	IC 320-217360/4	0.25	0.266715	2.5	3031255.0	1.066858	Y
4	IC 320-217360/5	1.0	0.959045	2.5	3058842.0	0.959045	Y
5	IC 320-217360/6	2.5	2.743946	2.5	2745849.0	1.097579	Y
6	IC 320-217360/7	5.0	5.422065	2.5	3059706.0	1.084413	Y
7	IC 320-217360/8	10.0	10.837968	2.5	2618174.0	1.083797	Y



Calibration / Perfluorotridecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

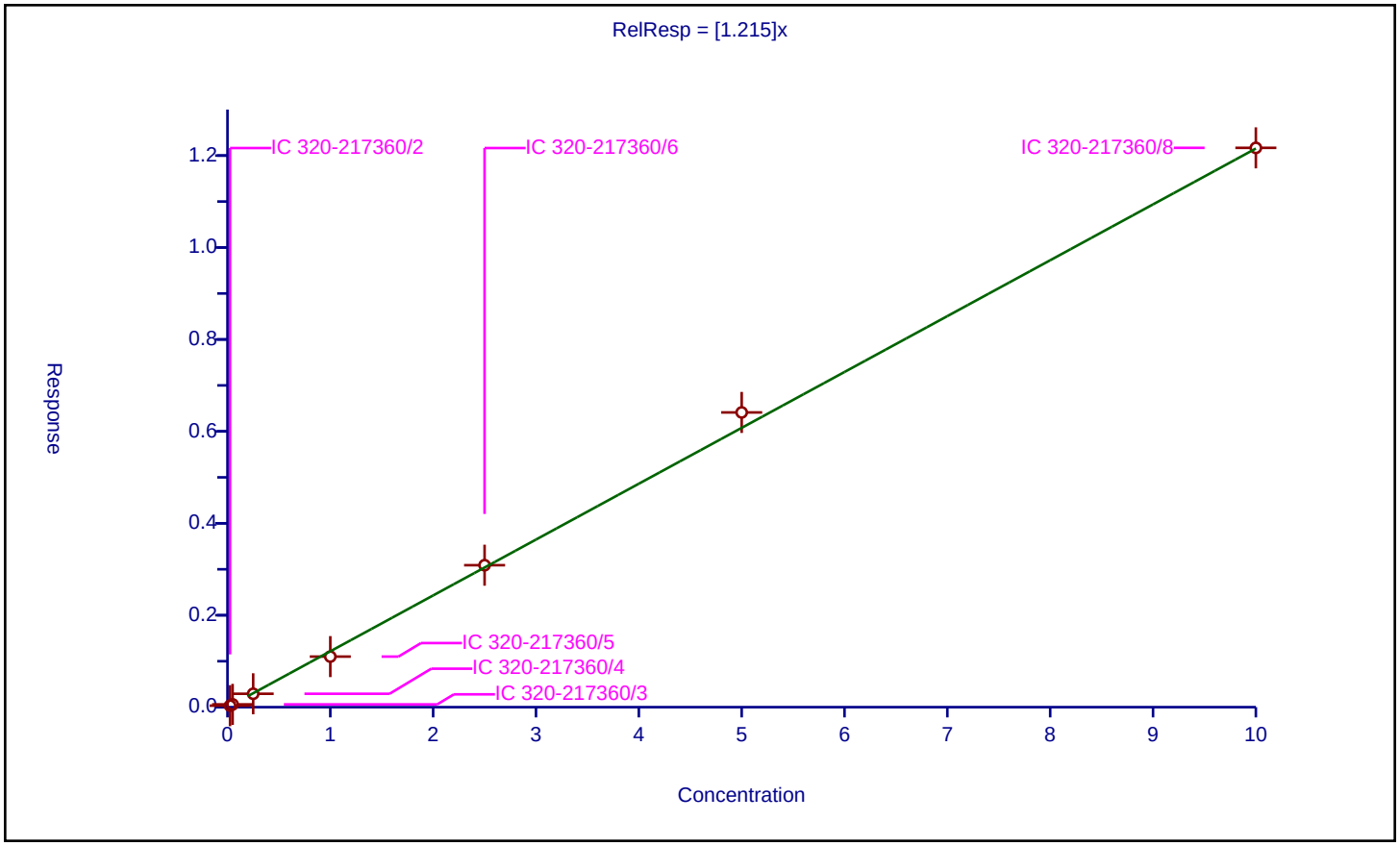
Curve Coefficients

Intercept:	0
Slope:	1.215

Error Coefficients

Standard Error:	6290000
Relative Standard Error:	5.6
Correlation Coefficient:	0.988
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.032472	2.5	2848895.0	1.29889	Y
2	IC 320-217360/3	0.05	0.060465	2.5	2928766.0	1.209298	Y
3	IC 320-217360/4	0.25	0.291158	2.5	3031255.0	1.164633	Y
4	IC 320-217360/5	1.0	1.100149	2.5	3058842.0	1.100149	Y
5	IC 320-217360/6	2.5	3.088228	2.5	2745849.0	1.235291	Y
6	IC 320-217360/7	5.0	6.411815	2.5	3059706.0	1.282363	Y
7	IC 320-217360/8	10.0	12.167871	2.5	2618174.0	1.216787	Y



Calibration / Perfluorotetradecanoic acid

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	
RF Rounding:	0

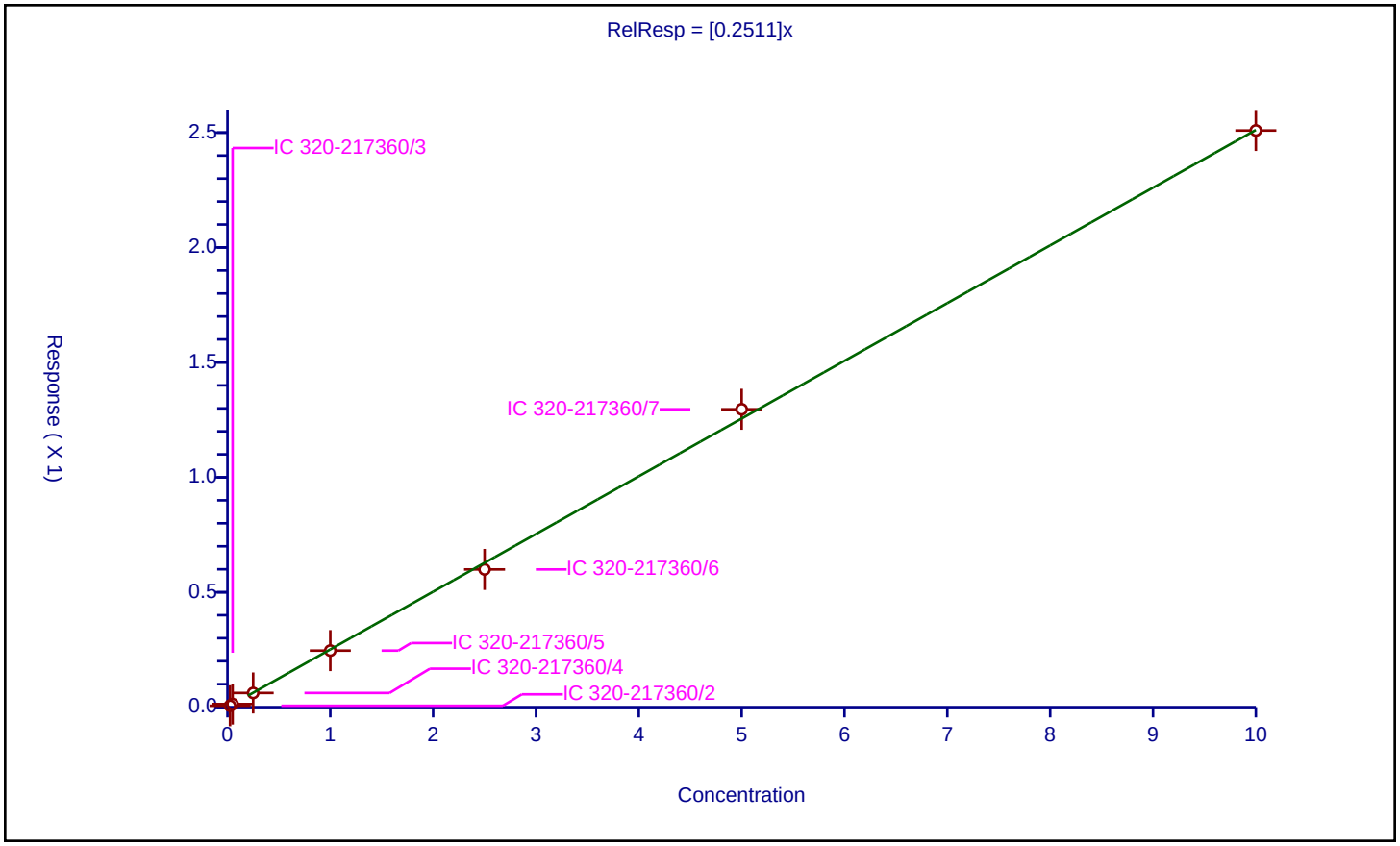
Curve Coefficients

Intercept:	0
Slope:	0.2511

Error Coefficients

Standard Error:	1650000
Relative Standard Error:	4.2
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-217360/2	0.025	0.006114	2.5	3701548.0	0.244546	Y
2	IC 320-217360/3	0.05	0.013533	2.5	3578927.0	0.270654	Y
3	IC 320-217360/4	0.25	0.061716	2.5	3729686.0	0.246865	Y
4	IC 320-217360/5	1.0	0.246119	2.5	3824690.0	0.246119	Y
5	IC 320-217360/6	2.5	0.599264	2.5	3639964.0	0.239706	Y
6	IC 320-217360/7	5.0	1.29612	2.5	3906384.0	0.259224	Y
7	IC 320-217360/8	10.0	2.50918	2.5	3344927.0	0.250918	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: ICV 320-217360/10 Calibration Date: 04/10/2018 19:42

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.10LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.9456		2.55	2.50	1.8	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.133		2.38	2.50	-5.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	82.79		2.34	2.21	5.8	30.0
4:2 FTS	AveID	16.03	17.79		2.59	2.34	11.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	1.124		2.77	2.50	10.6	30.0
Perfluoropentanesulfonic acid	AveID	71.51	72.96		2.40	2.35	2.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.015		2.54	2.50	1.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.112		2.24	2.28	-1.7	30.0
6:2FTS	AveID	1.691	1.750		2.46	2.38	3.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.174		2.54	2.50	1.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.287		2.30	2.38	-3.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.033		2.48	2.50	-0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.066		2.27	2.31	-2.0	30.0
8:2FTS	AveID	1.265	1.321		2.51	2.40	4.4	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7710		2.31	2.40	-3.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	1.008		2.44	2.50	-2.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	1.087		2.69	2.50	7.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.055		2.65	2.50	5.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6537		2.43	2.41	0.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.9922		2.65	2.50	6.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.8169		2.42	2.50	-3.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	1.064		2.55	2.50	2.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.212		2.49	2.50	-0.3	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2481		2.47	2.50	-1.2	30.0
13C4 PFBA	Ave	1.345	1.348		2.51	2.50	0.2	30.0
13C5 PFPeA	Ave	0.8672	0.8855		2.55	2.50	2.1	30.0
13C3-PFBS	Ave	0.0199	0.0197		2.31	2.33	-0.8	30.0
13C2 PFHxA	Ave	0.9590	0.9273		2.42	2.50	-3.3	30.0
13C4-PFHpA	Ave	0.9333	0.9503		2.55	2.50	1.8	30.0
18O2 PFHxS	Ave	1.152	1.130		2.32	2.37	-1.9	30.0
M2-6:2FTS	Ave	0.2000	0.1936		2.30	2.38	-3.2	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: ICV 320-217360/10 Calibration Date: 04/10/2018 19:42

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.10LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9247		2.49	2.50	-0.3	30.0
13C4 PFOS	Ave	0.8066	0.8532		2.53	2.39	5.8	30.0
13C5 PFNA	Ave	0.7973	0.8279		2.60	2.50	3.8	30.0
M2-8:2FTS	Ave	0.2409	0.2384		2.37	2.40	-1.0	30.0
13C2 PFDA	Ave	0.6701	0.6944		2.59	2.50	3.6	30.0
13C8 FOSA	Ave	1.007	1.012		2.51	2.50	0.5	30.0
d3-NMeFOSAA	Ave	0.3798	0.3981		2.62	2.50	4.8	30.0
d5-NEtFOSAA	Ave	0.3749	0.3684		2.46	2.50	-1.7	30.0
13C2 PFUnA	Ave	0.5781	0.5516		2.39	2.50	-4.6	30.0
13C2 PFDoA	Ave	0.6242	0.6257		2.51	2.50	0.2	30.0
13C2-PFTeDA	Ave	0.7915	0.8266		2.61	2.50	4.4	30.0
13C2-PFHxDA	Ave	1.288	1.382		2.68	2.50	7.3	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Instrument ID: A8_N Start Date: 04/21/2018 11:55

Analysis Batch Number: 219174 End Date: 04/21/2018 14:16

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-219174/1		04/21/2018 11:55	1	2018.04.21LLA_004.d	GeminiC18 3x100 3(mm)
CCVL 320-219174/2		04/21/2018 12:03	1	2018.04.21LLA_005.d	GeminiC18 3x100 3(mm)
CCV 320-219174/3 CCVIS		04/21/2018 12:10	1	2018.04.21LLA_006.d	GeminiC18 3x100 3(mm)
MB 320-218592/1-A		04/21/2018 12:18	1	2018.04.20LLCX_038.d	GeminiC18 3x100 3(mm)
LCS 320-218592/2-A		04/21/2018 12:26	1	2018.04.20LLCX_039.d	GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 12:34	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 12:42	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 12:50	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 12:57	1		GeminiC18 3x100 3(mm)
ZZZZZ		04/21/2018 13:05	1		GeminiC18 3x100 3(mm)
320-37938-1 DL		04/21/2018 13:13	20	2018.04.20LLCX_045.d	GeminiC18 3x100 3(mm)
320-37938-2		04/21/2018 13:21	1	2018.04.20LLCX_046.d	GeminiC18 3x100 3(mm)
320-37938-3		04/21/2018 13:29	1	2018.04.20LLCX_047.d	GeminiC18 3x100 3(mm)
CCV 320-219174/14		04/21/2018 13:37	1	2018.04.20LLCX_048.d	GeminiC18 3x100 3(mm)
320-37938-4		04/21/2018 13:44	1	2018.04.20LLCX_049.d	GeminiC18 3x100 3(mm)
320-37938-1		04/21/2018 13:52	1	2018.04.20LLCX_050.d	GeminiC18 3x100 3(mm)
CCV 320-219174/19		04/21/2018 14:16	1	2018.04.20LLCX_053.d	GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCVL 320-219174/2 Calibration Date: 04/21/2018 12:03

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.21LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.8687		0.0468	0.0500	-6.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.201		0.0504	0.0500	0.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	80.19		0.0453	0.0442	2.4	30.0
4:2 FTS	AveID	16.03	16.26		0.400	0.0467	1.4	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	1.136		0.0559	0.0500	11.8	30.0
Perfluoropentanesulfonic acid	AveID	71.51	66.02		0.0433	0.0469	-7.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.270		0.0634	0.0500	26.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.133		0.0455	0.0455	0.1	30.0
6:2FTS	AveID	1.691	1.701		0.400	0.0474	0.6	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.222		0.0529	0.0500	5.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.289		0.0462	0.0476	-2.9	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.086		0.0521	0.0500	4.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.045		0.0446	0.0464	-3.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	1.088		0.0538	0.0500	7.6	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7080		0.0425	0.0480	-11.4	30.0
8:2FTS	AveID	1.265	1.404		0.0531	0.0479	11.0	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	0.9619		0.0466	0.0500	-6.8	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.119		0.400	0.0500	12.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6151		0.0457	0.0482	-5.3	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.9181		0.0543	0.0500	8.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.9466		0.0506	0.0500	1.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	0.9877		0.0474	0.0500	-5.3	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.283		0.0528	0.0500	5.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2714		0.0540	0.0500	8.1	30.0
13C4 PFBA	Ave	1.345	1.351		2.51	2.50	0.4	30.0
13C5 PFPeA	Ave	0.8672	0.8660		2.50	2.50	-0.1	30.0
13C3-PFBS	Ave	0.0199	0.0199		2.32	2.33	-0.3	30.0
13C2 PFHxA	Ave	0.9590	0.9588		2.50	2.50	-0.0	30.0
13C4-PFHpA	Ave	0.9333	0.9047		2.42	2.50	-3.1	30.0
18O2 PFHxS	Ave	1.152	1.182		2.43	2.37	2.6	30.0
M2-6:2FTS	Ave	0.2000	0.2302		2.73	2.38	15.1	30.0

FORM VII EPA 537 (Mod)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCVL 320-219174/2 Calibration Date: 04/21/2018 12:03

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.21LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9648		2.60	2.50	4.0	30.0
13C4 PFOS	Ave	0.8066	0.8203		2.43	2.39	1.7	30.0
13C5 PFNA	Ave	0.7973	0.7862		2.47	2.50	-1.4	30.0
13C8 FOSA	Ave	1.007	0.9479		2.35	2.50	-5.9	30.0
M2-8:2FTS	Ave	0.2409	0.2604		2.59	2.40	8.1	30.0
13C2 PFDA	Ave	0.6701	0.6483		2.42	2.50	-3.3	30.0
d3-NMeFOSAA	Ave	0.3798	0.3729		2.45	2.50	-1.8	30.0
13C2 PFUnA	Ave	0.5781	0.5505		2.38	2.50	-4.8	30.0
d5-NEtFOSAA	Ave	0.3749	0.4222		2.82	2.50	12.6	30.0
13C2 PFDoA	Ave	0.6242	0.5548		2.22	2.50	-11.1	30.0
13C2-PFTeDA	Ave	0.7915	0.7376		2.33	2.50	-6.8	30.0
13C2-PFHxDA	Ave	1.288	1.173		2.28	2.50	-9.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/3 Calibration Date: 04/21/2018 12:10

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.21LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.9214		0.992	1.00	-0.8	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.139		0.956	1.00	-4.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	78.06		0.881	0.884	-0.3	30.0
4:2 FTS	AveID	16.03	16.97		0.988	0.934	5.8	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	1.023		1.01	1.00	0.7	30.0
Perfluoropentanesulfonic acid	AveID	71.51	66.66		0.874	0.938	-6.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.047		1.05	1.00	4.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.036		0.833	0.910	-8.5	30.0
6:2FTS	AveID	1.691	1.567		0.879	0.948	-7.3	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.341		0.962	0.952	1.0	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.123		0.972	1.00	-2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.066		0.909	0.928	-2.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.012		0.971	1.00	-2.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	0.9729		0.962	1.00	-3.8	30.0
8:2FTS	AveID	1.265	1.250		0.946	0.958	-1.2	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7559		0.908	0.960	-5.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	0.9892		0.959	1.00	-4.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.023		1.03	1.00	2.6	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6674		0.991	0.964	2.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.8614		0.922	1.00	-7.8	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.7556		0.894	1.00	-10.6	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	1.039		0.996	1.00	-0.4	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.174		0.966	1.00	-3.4	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2574		1.02	1.00	2.5	30.0
13C4 PFBA	Ave	1.345	1.364		2.53	2.50	1.4	30.0
13C5 PFPeA	Ave	0.8672	0.8977		2.59	2.50	3.5	30.0
13C3-PFBS	Ave	0.0199	0.0202		2.36	2.33	1.6	30.0
13C2 PFHxA	Ave	0.9590	0.9694		2.53	2.50	1.1	30.0
13C4-PFHpA	Ave	0.9333	0.9490		2.54	2.50	1.7	30.0
18O2 PFHxS	Ave	1.152	1.178		2.42	2.37	2.2	30.0
M2-6:2FTS	Ave	0.2000	0.2185		2.60	2.38	9.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/3 Calibration Date: 04/21/2018 12:10

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.21LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9612		2.59	2.50	3.6	30.0
13C4 PFOS	Ave	0.8066	0.8195		2.43	2.39	1.6	30.0
13C5 PFNA	Ave	0.7973	0.8097		2.54	2.50	1.6	30.0
13C8 FOSA	Ave	1.007	1.010		2.51	2.50	0.3	30.0
M2-8:2FTS	Ave	0.2409	0.2595		2.58	2.40	7.7	30.0
13C2 PFDA	Ave	0.6701	0.6784		2.53	2.50	1.2	30.0
d3-NMeFOSAA	Ave	0.3798	0.3937		2.59	2.50	3.7	30.0
13C2 PFUnA	Ave	0.5781	0.5959		2.58	2.50	3.1	30.0
d5-NEtFOSAA	Ave	0.3749	0.4208		2.81	2.50	12.2	30.0
13C2 PFDoA	Ave	0.6242	0.6103		2.44	2.50	-2.2	30.0
13C2-PFTeDA	Ave	0.7915	0.7594		2.40	2.50	-4.1	30.0
13C2-PFHxDA	Ave	1.288	1.269		2.46	2.50	-1.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/14 Calibration Date: 04/21/2018 13:37

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.20LLCX_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.9113		0.981	1.00	-1.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.159		0.973	1.00	-2.7	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	76.96		0.869	0.884	-1.7	30.0
4:2 FTS	AveID	16.03	16.31		0.950	0.934	1.7	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	0.9640		0.949	1.00	-5.1	30.0
Perfluoropentanesulfonic acid	AveID	71.51	70.21		0.921	0.938	-1.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.043		1.04	1.00	4.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.052		0.846	0.910	-7.1	30.0
6:2FTS	AveID	1.691	1.588		0.890	0.948	-6.1	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.123		0.972	1.00	-2.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.296		0.929	0.952	-2.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.041		0.998	1.00	-0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.030		0.879	0.928	-5.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	1.000		0.988	1.00	-1.2	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7293		0.876	0.960	-8.8	30.0
8:2FTS	AveID	1.265	1.259		0.953	0.958	-0.5	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	0.9949		0.964	1.00	-3.6	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.012		1.01	1.00	1.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6304		0.936	0.964	-2.9	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.9123		0.976	1.00	-2.4	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.8656		1.02	1.00	2.4	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	1.054		1.01	1.00	1.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.227		1.01	1.00	1.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2470		0.984	1.00	-1.6	30.0
13C4 PFBA	Ave	1.345	1.338		2.49	2.50	-0.6	30.0
13C5 PFPeA	Ave	0.8672	0.8707		2.51	2.50	0.4	30.0
13C3-PFBS	Ave	0.0199	0.0199		2.33	2.33	0.0	30.0
13C2 PFHxA	Ave	0.9590	0.9494		2.48	2.50	-1.0	30.0
13C4-PFHpA	Ave	0.9333	0.9307		2.49	2.50	-0.3	30.0
18O2 PFHxS	Ave	1.152	1.132		2.32	2.37	-1.8	30.0
M2-6:2FTS	Ave	0.2000	0.2230		2.65	2.38	11.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/14 Calibration Date: 04/21/2018 13:37

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.20LLCX_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9043		2.44	2.50	-2.5	30.0
13C4 PFOS	Ave	0.8066	0.8064		2.39	2.39	-0.0	30.0
13C5 PFNA	Ave	0.7973	0.7750		2.43	2.50	-2.8	30.0
13C8 FOSA	Ave	1.007	1.004		2.49	2.50	-0.4	30.0
M2-8:2FTS	Ave	0.2409	0.2408		2.39	2.40	-0.0	30.0
13C2 PFDA	Ave	0.6701	0.6674		2.49	2.50	-0.4	30.0
d3-NMeFOSAA	Ave	0.3798	0.3973		2.61	2.50	4.6	30.0
d5-NEtFOSAA	Ave	0.3749	0.3998		2.67	2.50	6.6	30.0
13C2 PFUnA	Ave	0.5781	0.5394		2.33	2.50	-6.7	30.0
13C2 PFDoA	Ave	0.6242	0.5743		2.30	2.50	-8.0	30.0
13C2-PFTeDA	Ave	0.7915	0.7476		2.36	2.50	-5.5	30.0
13C2-PFHxDA	Ave	1.288	1.206		2.34	2.50	-6.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/19 Calibration Date: 04/21/2018 14:16

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.20LLCX_053.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9286	0.9557		2.57	2.50	2.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.192	1.204		2.53	2.50	1.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	78.29	81.91		2.31	2.21	4.6	30.0
4:2 FTS	AveID	16.03	17.36		2.53	2.34	8.3	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.016	1.047		2.58	2.50	3.0	30.0
Perfluoropentanesulfonic acid	AveID	71.51	74.45		2.44	2.35	4.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.001	1.080		2.70	2.50	7.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.132	1.077		2.16	2.28	-4.9	30.0
6:2FTS	AveID	1.691	1.684		2.36	2.37	-0.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.155	1.093		2.37	2.50	-5.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.328	1.396		2.50	2.38	5.2	30.0
Perfluorononanoic acid (PFNA)	AveID	1.043	1.077		2.58	2.50	3.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.088	1.112		2.37	2.32	2.2	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.012	1.082		2.67	2.50	7.0	30.0
8:2FTS	AveID	1.265	1.268		2.40	2.40	0.2	30.0
Perfluorononanesulfonic acid	AveID	0.7994	0.7643		2.29	2.40	-4.4	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.032	0.9868		2.39	2.50	-4.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.997	1.012		2.54	2.50	1.4	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6492	0.6632		2.46	2.41	2.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9345	0.9043		2.42	2.50	-3.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.8451	0.8265		2.44	2.50	-2.2	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.043	1.092		2.62	2.50	4.7	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.215	1.229		2.53	2.50	1.1	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2511	0.2669		2.66	2.50	6.3	30.0
13C4 PFBA	Ave	1.345	1.385		2.57	2.50	2.9	30.0
13C5 PFPeA	Ave	0.8672	0.8727		2.52	2.50	0.6	30.0
13C3-PFBS	Ave	0.0199	0.0202		2.36	2.33	1.6	30.0
13C2 PFHxA	Ave	0.9590	0.9719		2.53	2.50	1.4	30.0
13C4-PFHpA	Ave	0.9333	0.9155		2.45	2.50	-1.9	30.0
18O2 PFHxS	Ave	1.152	1.141		2.34	2.37	-1.0	30.0
M2-6:2FTS	Ave	0.2000	0.2267		2.69	2.38	13.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Lab Sample ID: CCV 320-219174/19 Calibration Date: 04/21/2018 14:16

Instrument ID: A8_N Calib Start Date: 04/10/2018 18:39

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 04/10/2018 19:26

Lab File ID: 2018.04.20LLCX_053.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9276	0.9528		2.57	2.50	2.7	30.0
13C4 PFOS	Ave	0.8066	0.8164		2.42	2.39	1.2	30.0
13C5 PFNA	Ave	0.7973	0.7929		2.49	2.50	-0.6	30.0
13C8 FOSA	Ave	1.007	0.9725		2.41	2.50	-3.4	30.0
M2-8:2FTS	Ave	0.2409	0.2526		2.51	2.40	4.9	30.0
13C2 PFDA	Ave	0.6701	0.6800		2.54	2.50	1.5	30.0
d3-NMeFOSAA	Ave	0.3798	0.3954		2.60	2.50	4.1	30.0
d5-NEtFOSAA	Ave	0.3749	0.4004		2.67	2.50	6.8	30.0
13C2 PFUnA	Ave	0.5781	0.5626		2.43	2.50	-2.7	30.0
13C2 PFDoA	Ave	0.6242	0.5805		2.32	2.50	-7.0	30.0
13C2-PFTeDA	Ave	0.7915	0.7132		2.25	2.50	-9.9	30.0
13C2-PFHxDA	Ave	1.288	1.239		2.40	2.50	-3.8	30.0

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-37938-1

SDG No.:

Batch Number: 218592 Batch Start Date: 04/18/18 10:28 Batch Analyst: Long, Tyrel W

Batch Method: 3535 Batch End Date: 04/18/18 17:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00054	LCPFC-IS 00036
MB 320-218592/1		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCS 320-218592/2		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
320-37938-A-1	TP-PFC-028-TPI	3535, EPA 537 (Mod)	T	317.87 g	28.54 g	289.3 mL	10.00 mL	500 uL	500 uL
320-37938-A-2	TP-PFC-028-MID-CARB	3535, EPA 537 (Mod)	T	332.56 g	28.59 g	304 mL	10.00 mL	500 uL	500 uL
320-37938-A-3	TP-PFC-028-TPE	3535, EPA 537 (Mod)	T	323.74 g	27.98 g	295.8 mL	10.00 mL	500 uL	500 uL
320-37938-A-4	TP-PFC-028-TPE-D	3535, EPA 537 (Mod)	T	323.89 g	27.70 g	296.2 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00138					
MB 320-218592/1		3535, EPA 537 (Mod)							
LCS 320-218592/2		3535, EPA 537 (Mod)		500 uL					
320-37938-A-1	TP-PFC-028-TPI	3535, EPA 537 (Mod)	T						
320-37938-A-2	TP-PFC-028-MID-CARB	3535, EPA 537 (Mod)	T						
320-37938-A-3	TP-PFC-028-TPE	3535, EPA 537 (Mod)	T						
320-37938-A-4	TP-PFC-028-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.: 320-37938-1

SDG No.:

Batch Number: 218592 Batch Start Date: 04/18/18 10:28 Batch Analyst: Long, Tyrel W

Batch Method: 3535 Batch End Date: 04/18/18 17:45

Batch Notes	
Analyst ID - Aliquot Step	TWL
Balance ID	QA-078
Batch Comment	ENVI Carb Lot # 97221, client labels match : TWL 04/18/18
Analyst ID - Final Volume Step	TWL
H2O ID	04/18/18
Hexane ID	1175187
Internal Standard ID#	1208926
Manifold ID	6
Methanol ID	1207207
Sodium Hydroxide ID	1196582
Pipette ID	I46360G
Analyst ID - Reagent Drop	TWL
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	VPM
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	SKD
Solvent Lot #	1213091
Solvent Name	0.3%NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003737320A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 37964, 37938 Work List ID(s): 57030

Extraction Batch: 218592 Analysis Batch(es): 219174

Delivery Rank 4 Due Date: 4-27-18

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch#	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).			✓
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?			✓
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits? NCM	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?			✓
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation 123206 123205 123204			
1. Are all non-conformances documented/attached? NCM# 123203	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?		✓	
5. Was QC Checker run for this job?	✓	✓	

**Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.*

1st Level (Analyst): JRB Date: 4-24-18

2nd Level Reviewer: Mwalf Date: 4/26/2018

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 21APR2018NC_2A_PFC Worklist Number: 57030
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 219172	LC PFC ICAL Raw Batch: 219173	LC PFC_QSM5-1 ICAL Raw Batch: 219174
# 1 CCB	# 1 CCB	# 1 CCB	# 1 CCB
# 2 CCVL	# 2 CCVL	# 2 CCVL	# 2 CCVL
# 3 CCV L4	# 3 CCV L4	# 3 CCV L4	# 3 CCV L4
# 4 MB 320-218592/1-A			# 4 MB 320-218592/1-A
# 5 LCS 320-218592/2-A			# 5 LCS 320-218592/2-A
# 6 320-37964-A-1-A			# 6 320-37964-A-1-A
# 7 320-37964-A-2-A			# 7 320-37964-A-2-A
# 8 320-37964-A-2-B MS			# 8 320-37964-A-2-B MS
# 9 320-37964-A-2-C MSD			# 9 320-37964-A-2-C MSD
#10 320-37964-A-3-A			#10 320-37964-A-3-A
#11 320-37938-A-1-A			#11 320-37938-A-1-A
#12 320-37938-A-2-A			#12 320-37938-A-2-A
#13 320-37938-A-3-A			#13 320-37938-A-3-A
#14 CCV L4			#14 CCV L4
#15 320-37938-A-4-A			#15 320-37938-A-4-A
#16 320-37938-A-1-A			#16 320-37938-A-1-A
#17 RB			#17 RB
#18 RB			#18 RB
#19 CCV L5			#19 CCV L5

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 21APR2018NC_2A_PFC Worklist Num: 57030
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180421-57030.b
Anaylysis Type: SemiVOA Creator: Royce, Amani A
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCB	320-0057030-001	CCB	21-Apr-2018 11:55:18	2018.04.21LLA_004.d	20	1.0		SV
CCVL	320-0057030-002	CCVL	21-Apr-2018 12:03:07	2018.04.21LLA_005.d	21	1.0		SV
CCV L4	320-0057030-003	CCVIS	21-Apr-2018 12:10:56	2018.04.21LLA_006.d	13	1.0		SV
MB 320-218592/1-A	320-0057030-004	MB	21-Apr-2018 12:18:44	2018.04.20LLCX_038.d	27	1.0		SV
LCS 320-218592/2-A	320-0057030-005	LCS	21-Apr-2018 12:26:32	2018.04.20LLCX_039.d	28	1.0		SV
320-37964-A-1-A	320-0057030-006	Client	21-Apr-2018 12:34:23	2018.04.20LLCX_040.d	29	1.0	MW-MEM04-01-01	SV
320-37964-A-2-A	320-0057030-007	Client	21-Apr-2018 12:42:13	2018.04.20LLCX_041.d	30	1.0	MW-MEM01-01-01	SV
320-37964-A-2-B MS	320-0057030-008	MS	21-Apr-2018 12:50:02	2018.04.20LLCX_042.d	31	1.0	MW-MEM01-01-01	SV
320-37964-A-2-C MSD	320-0057030-009	MSD	21-Apr-2018 12:57:51	2018.04.20LLCX_043.d	32	1.0	MW-MEM01-01-01	SV
320-37964-A-3-A	320-0057030-010	Client	21-Apr-2018 13:05:43	2018.04.20LLCX_044.d	33	1.0	MW-MEM01-01-01D	SV
320-37938-A-1-A	320-0057030-011	Client	21-Apr-2018 13:13:35	2018.04.20LLCX_045.d	34	20.0	TP-PFC-028-TPI	SV
320-37938-A-2-A	320-0057030-012	Client	21-Apr-2018 13:21:27	2018.04.20LLCX_046.d	35	1.0	TP-PFC-028-MID-CARB	SV
320-37938-A-3-A	320-0057030-013	Client	21-Apr-2018 13:29:16	2018.04.20LLCX_047.d	36	1.0	TP-PFC-028-TPE	SV
CCV L4	320-0057030-014	CCVIS	21-Apr-2018 13:37:04	2018.04.20LLCX_048.d	13	1.0		SV
320-37938-A-4-A	320-0057030-015	Client	21-Apr-2018 13:44:53	2018.04.20LLCX_049.d	37	1.0	TP-PFC-028-TPE-D	SV
320-37938-A-1-A	320-0057030-016	Client	21-Apr-2018 13:52:43	2018.04.20LLCX_050.d	38	1.0	TP-PFC-028-TPI	SV
RB	320-0057030-017	RB	21-Apr-2018 14:00:32	2018.04.20LLCX_051.d	54	1.0		SV
RB	320-0057030-018	RB	21-Apr-2018 14:08:20	2018.04.20LLCX_052.d	54	1.0		SV
CCV L5	320-0057030-019	CCV	21-Apr-2018 14:16:07	2018.04.20LLCX_053.d	14	1.0		SV

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

MB 4/19/18
66 AS 4/20/18

Batch Number: 320-218592 ✓
Method Code: 320-3535_PFC-320

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM
Batch End: 4/18/2018 5:45:00PM

Solid-Phase Extraction (SPE)

Due: 4/27

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB-320-218592/1 N/A	N/A		250 mL	NA			N/A	N/A	N/A	R1	MB 320-218592/1-A
				10.00 mL								
2	LCS-320-218592/2 N/A	N/A		250 mL	NA			N/A	N/A	N/A		LCS 320-218592/2-A
				10.00 mL								
3	320-37964-A-1 (PFC_IDA_DOD5.1) 4/30	N/A (320-37964-1)	309.90 g	281 mL	NA			4/25/18	16_Days	4		320-37964-A-1-A
			28.90 g	10.00 mL								
4	320-37964-A-2 (PFC_IDA_DOD5.1)	N/A (320-37964-1)	283.30 g	254.6 mL	NA			4/25/18	16_Days	4		320-37964-A-2-A
			28.69 g	10.00 mL								
5	320-37964-A-2-MS (PFC_IDA_DOD5.1)	N/A (320-37964-1)	290.37 g	262.7 mL	NA			4/25/18	16_Days	4		320-37964-A-2-B MS
			27.71 g	10.00 mL								
6	320-37964-A-2-MSD (PFC_IDA_DOD5.1)	N/A (320-37964-1)	277.83 g	250.1 mL	NA			4/25/18	16_Days	4		320-37964-A-2-C MSD
			27.70 g	10.00 mL								
7	320-37964-A-3 (PFC_IDA_DOD5.1)	N/A (320-37964-1)	279.73 g	252.2 mL	NA			4/25/18	16_Days	4		320-37964-A-3-A
			27.50 g	10.00 mL								
8	320-37938-A-1 (PFC_IDA_DOD5.1) 4/27	N/A (320-37938-1)	317.87 g	289.3 mL	NA			4/22/18	16_Days	4	20X	320-37938-A-1-A
			28.54 g	10.00 mL								
9	320-37938-A-2 (PFC_IDA_DOD5.1)	N/A (320-37938-1)	332.56 g	304 mL	NA			4/22/18	16_Days	4		320-37938-A-2-A
			28.59 g	10.00 mL								
10	320-37938-A-3 (PFC_IDA_DOD5.1)	N/A (320-37938-1)	323.74 g	295.8 mL	NA			4/22/18	16_Days	4		320-37938-A-3-A
			27.98 g	10.00 mL								

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Method Code: 320-3535_PFC-320

Batch End: 4/18/2018 5:45:00PM

11	320-37938-A-4 (PFC_IDA_DOD5.1)	N/A (320-37938-1)	323.89 g 27.70 g	296.2 mL 10.00 mL	NA			4/22/18	16_Days	4	R1	320-37938-A-4-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Method Code: 320-3535_PFC-320

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Batch End: 4/18/2018 5:45:00PM

Batch Notes

Manifold ID	6
Methanol ID	1207207
Hexane ID	1175187
Sodium Hydroxide ID	1196582
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003737320A
Balance ID	QA-078
H2O ID	04/18/18
Pipette ID	I46360G
Solvent Name	0.3%NH4OH/MeOH
Solvent Lot #	1213091
Analyst ID - Reagent Drop	TWL
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	SKD
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
Analyst ID - IS Reagent Drop	TWL

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Method Code: 320-3535_PFC-320

Batch End: 4/18/2018 5:45:00PM

Analyst ID - IS Reagent Drop	VPM
Witness	
Internal Standard ID#	1208926
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	TWL
Analyst ID - Final Volume Step	TWL
SOP Number	WS-LC-0025
Batch Comment	ENVI Carb Lot # 97221, client labels match : TWL 04/18/18

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Method Code: 320-3535_PFC-320

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-218592/1	LCMPFC_ALL_SU_00049	500 uL	10.00 mL	TLL 4/18/18	SKD 4/18/18
LCS 320-218592/2	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
LCS 320-218592/2	LCPFCSP_00138	500 uL	10.00 mL		
320-37964-A-1	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37964-A-2	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37964-A-2 MS	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37964-A-2 MS	LCPFCSP_00138	500 uL	10.00 mL		
320-37964-A-2 MSD	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37964-A-2 MSD	LCPFCSP_00138	500 uL	10.00 mL		
320-37964-A-3	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37938-A-1	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37938-A-2	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37938-A-3	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		
320-37938-A-4	LCMPFC_ALL_SU_00049	500 uL	10.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-218592

Analyst: Long, Tyrel W

Batch Open: 4/18/2018 10:28:00AM

Method Code: 320-3535_PFC-320

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 218592 Test 3535_PFC

Earliest Holding Time 4/22/18

Batch Information	1st Level Reviewer	2nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary batch information complete and entered into TALS correctly	✓	✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	**1st Level Reviewer**	**2nd Level Reviewer**
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	NA	NA
NCM for any anomalies filed	✓	✓
All NCMs include method code, matrix, and prep batch	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	✓	✓
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	✓	✓
The pH is transcribed properly in TALS	✓	✓
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: [signature] Date: 4/18/18

2nd Level Reviewer: VPM Date: 4/18/18

Comments:

TestAmerica
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Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA

Analyst (Print Name) Amani Royce **Reagent ID** LC-8012O-00003

Date 4/20/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
480-133780	1	10,000	30	300	10X
	2	↓	↓	↓	↓
	3		60		5X
320-37965	7		15		20X
320-37938	1		↓		20X
320-37947	1		30	1500	50X
↓	3		15	300	20X
	6		30	1500	50X
	7		↓	300	10X
	8				
	9				

aak 4/20/18

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	320-37938-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-028-MID-CARB	Ground water	Normal (Regular)	5-Apr-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-37938-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-028-TPI	Ground water	Normal (Regular)	5-Apr-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-37938-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-028-TPE-D	Ground water	Field duplicate	5-Apr-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-37938-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-028-TPE	Ground water	Normal (Regular)	5-Apr-18	537	Perfluoroalkyl Compounds