

N60087_003862
BRUNSWICK_NAS
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-30556-1, NAS BRUNSWICK ME
08/30/2018
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-30556-1

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
8/30/2017 3:36 PM

David R Alltucker, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4383
david.alltucker@testamericainc.com
08/30/2017

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Definitions/Glossary

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

TestAmerica Job ID: 320-30556-1

Qualifiers

LCMS

Qualifier	Qualifier Description
D	The reported value is from a dilution.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation

Glossary

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

Job Narrative
320-30556-1

Receipt

The samples were received on 8/9/2017 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

LCMS

Method(s) 537 (modified): 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) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) within the calibration range: TP-PFC-020-TPI (320-30556-1). Elevated reporting limits (RLs) are provided.

Method(s) 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for 13C4-PFHpA in the following sample: TP-PFC-020-MID-CARBON (320-30556-2). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. Reanalysis confirmed this result.

Method(s) 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples are below the method recommended limit for 13C8 FOSA: TP-PFC-020-TPI (320-30556-1), TP-PFC-020-MID-CARBON (320-30556-2), TP-PFC-020-TPE (320-30556-3) and TP-PFC-020-TPE-D (320-30556-4). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. Reanalysis confirmed these results.

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

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-179613.

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

Detection Summary

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

TestAmerica Job ID: 320-30556-1

Client Sample ID: TP-PFC-020-TPI

Lab Sample ID: 320-30556-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	75	M	2.4	0.44	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	200		2.4	0.95	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	350		2.4	0.75	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	75		2.4	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	2.3	J	2.4	0.63	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.0	J	2.4	0.42	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	56		2.4	0.88	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	330		2.4	0.83	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	9.0		2.4	0.68	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	330		3.8	1.2	ng/L	1		537 (modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	2.2	J M	38	0.61	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1700	D M	24	7.2	ng/L	10		537 (modified)	Total/NA

Client Sample ID: TP-PFC-020-MID-CARBON

Lab Sample ID: 320-30556-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	120		2.4	0.44	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	29		2.4	0.96	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.8	J	2.4	0.76	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.4	0.89	ng/L	1		537 (modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	1.1	J	39	0.62	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-020-TPE

Lab Sample ID: 320-30556-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	100		2.4	0.44	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	31		2.4	0.94	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	6.7		2.4	0.75	ng/L	1		537 (modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.73	J	38	0.61	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-020-TPE-D

Lab Sample ID: 320-30556-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	100		2.4	0.44	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	30		2.4	0.95	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	7.0		2.4	0.75	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.82	J M	2.4	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4.2		3.8	1.2	ng/L	1		537 (modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	1.3	J	38	0.61	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-30556-1

Client Sample ID: TP-PFC-020-TPI

Date Collected: 08/08/17 09:00

Date Received: 08/09/17 09:45

Lab Sample ID: 320-30556-1

Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	75	M	2.4	0.44	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluoropentanoic acid (PFPeA)	200		2.4	0.95	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorohexanoic acid (PFHxA)	350		2.4	0.75	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluoroheptanoic acid (PFHpA)	75		2.4	0.77	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorononanoic acid (PFNA)	2.3	J	2.4	0.63	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorodecanoic acid (PFDA)	1.0	J	2.4	0.42	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	0.72	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorododecanoic acid (PFDoA)	1.9	U M	2.4	0.56	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	0.53	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorotetradecanoic acid (PFTeA)	0.96	U	2.4	0.38	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorobutanesulfonic acid (PFBS)	56		2.4	0.88	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorohexanesulfonic acid (PFHxS)	330		2.4	0.83	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluoroheptanesulfonic Acid (PFHpS)	9.0		2.4	0.68	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorooctanesulfonic acid (PFOS)	330		3.8	1.2	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	1.2	ng/L		08/16/17 09:20	08/29/17 11:18	1
Perfluorooctane Sulfonamide (FOSA)	2.2	J M	38	0.61	ng/L		08/16/17 09:20	08/29/17 11:18	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	1	Q	25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C4 PFBA	75		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C2 PFHxA	81		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C5 PFNA	95		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C2 PFDA	106		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C2 PFUnA	96		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C2 PFDoA	89		25 - 150	08/16/17 09:20	08/29/17 11:18	1
18O2 PFHxS	84		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C4 PFOS	88		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C4-PFHpA	99		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C5 PFPeA	83		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C3-PFBS	83		25 - 150	08/16/17 09:20	08/29/17 11:18	1
13C2-PFTeDA	88		25 - 150	08/16/17 09:20	08/29/17 11:18	1

Method: 537 (modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1700	D M	24	7.2	ng/L	—	08/16/17 09:20	08/29/17 10:51	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	109		25 - 150				08/16/17 09:20	08/29/17 10:51	10

Client Sample ID: TP-PFC-020-MID-CARBON

Date Collected: 08/08/17 09:05

Date Received: 08/09/17 09:45

Lab Sample ID: 320-30556-2

Matrix: Water

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	120		2.4	0.44	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluoropentanoic acid (PFPeA)	29		2.4	0.96	ng/L		08/16/17 09:20	08/29/17 10:57	1

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-30556-1

Client Sample ID: TP-PFC-020-MID-CARBON

Lab Sample ID: 320-30556-2

Date Collected: 08/08/17 09:05

Matrix: Water

Date Received: 08/09/17 09:45

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	1.8	J	2.4	0.76	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	0.77	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorooctanoic acid (PFOA)	1.9	U M	2.4	0.72	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	0.63	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorodecanoic acid (PFDA)	0.97	U	2.4	0.43	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	0.72	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	0.56	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	0.53	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorotetradecanoic acid (PFTeA)	0.97	U	2.4	0.39	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.4	0.89	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	0.84	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	0.69	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.9	1.2	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.9	1.2	ng/L		08/16/17 09:20	08/29/17 10:57	1
Perfluorooctane Sulfonamide (FOSA)	1.1	J	39	0.62	ng/L		08/16/17 09:20	08/29/17 10:57	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>13C8 FOSA</i>	2	Q	25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C4 PFBA</i>	112		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C2 PFHxA</i>	127		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C4 PFOA</i>	140		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C5 PFNA</i>	120		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C2 PFDA</i>	110		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C2 PFUnA</i>	93		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C2 PFDoA</i>	101		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>18O2 PFHxS</i>	126		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C4 PFOS</i>	126		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C4-PFHpA</i>	151	Q	25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C5 PFPeA</i>	128		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C3-PFBS</i>	129		25 - 150	08/16/17 09:20	08/29/17 10:57	1
<i>13C2-PFTeDA</i>	143		25 - 150	08/16/17 09:20	08/29/17 10:57	1

Client Sample ID: TP-PFC-020-TPE

Lab Sample ID: 320-30556-3

Date Collected: 08/08/17 09:10

Matrix: Water

Date Received: 08/09/17 09:45

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	100		2.4	0.44	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluoropentanoic acid (PFPeA)	31		2.4	0.94	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorohexanoic acid (PFHxA)	6.7		2.4	0.75	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	0.76	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorooctanoic acid (PFOA)	1.9	U M	2.4	0.71	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	0.62	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorodecanoic acid (PFDA)	0.95	U	2.4	0.42	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	0.71	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	0.55	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	0.52	ng/L		08/16/17 09:20	08/29/17 11:04	1

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-30556-1

Client Sample ID: TP-PFC-020-TPE

Lab Sample ID: 320-30556-3

Date Collected: 08/08/17 09:10

Matrix: Water

Date Received: 08/09/17 09:45

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	0.95	U	2.4	0.38	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	0.87	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	0.83	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	0.68	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.8	1.2	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	1.1	ng/L		08/16/17 09:20	08/29/17 11:04	1
Perfluorooctane Sulfonamide (FOSA)	0.73	J	38	0.61	ng/L		08/16/17 09:20	08/29/17 11:04	1

Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	5	Q	25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C4 PFBA	80		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C2 PFHxA	95		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C4 PFOA	96		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C5 PFNA	84		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C2 PFDA	89		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C2 PFUnA	99		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C2 PFDoA	107		25 - 150				08/16/17 09:20	08/29/17 11:04	1
18O2 PFHxS	115		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C4 PFOS	118		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C4-PFHpA	108		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C5 PFPeA	90		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C3-PFBS	118		25 - 150				08/16/17 09:20	08/29/17 11:04	1
13C2-PFTeDA	141		25 - 150				08/16/17 09:20	08/29/17 11:04	1

Client Sample ID: TP-PFC-020-TPE-D

Lab Sample ID: 320-30556-4

Date Collected: 08/08/17 00:00

Matrix: Water

Date Received: 08/09/17 09:45

Method: 537 (modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	100		2.4	0.44	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluoropentanoic acid (PFPeA)	30		2.4	0.95	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorohexanoic acid (PFHxA)	7.0		2.4	0.75	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	0.77	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorooctanoic acid (PFOA)	0.82	J M	2.4	0.72	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	0.63	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorodecanoic acid (PFDA)	0.96	U	2.4	0.42	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	0.72	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	0.56	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	0.53	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorotetradecanoic acid (PFTeA)	0.96	U	2.4	0.38	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	0.88	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	0.83	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	0.68	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorooctanesulfonic acid (PFOS)	4.2		3.8	1.2	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	1.2	ng/L		08/16/17 09:20	08/29/17 11:11	1
Perfluorooctane Sulfonamide (FOSA)	1.3	J	38	0.61	ng/L		08/16/17 09:20	08/29/17 11:11	1

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-30556-1

Project/Site: TT: PFAS, Brunswick, Discharge

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C8 FOSA	3	Q	25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C4 PFBA	87		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C2 PFHxA	102		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C4 PFOA	111		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C5 PFNA	101		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C2 PFDA	103		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C2 PFUnA	94		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C2 PFDoA	92		25 - 150	08/16/17 09:20	08/29/17 11:11	1
18O2 PFHxS	98		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C4 PFOS	99		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C4-PFHpA	113		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C5 PFPeA	98		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C3-PFBS	94		25 - 150	08/16/17 09:20	08/29/17 11:11	1
13C2-PFTeDA	113		25 - 150	08/16/17 09:20	08/29/17 11:11	1

Default Detection Limits

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

TestAmerica Job ID: 320-30556-1

Method: 537 (modified) - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.5	0.92	ng/L	537 (modified)
Perfluorobutanoic acid (PFBA)	2.5	0.46	ng/L	537 (modified)
Perfluorodecanesulfonic acid (PFDS)	4.0	1.2	ng/L	537 (modified)
Perfluorodecanoic acid (PFDA)	2.5	0.44	ng/L	537 (modified)
Perfluorododecanoic acid (PFDoA)	2.5	0.58	ng/L	537 (modified)
Perfluoroheptanesulfonic Acid (PFHpS)	2.5	0.71	ng/L	537 (modified)
Perfluoroheptanoic acid (PFHpA)	2.5	0.80	ng/L	537 (modified)
Perfluorohexanesulfonic acid (PFHxS)	2.5	0.87	ng/L	537 (modified)
Perfluorohexanoic acid (PFHxA)	2.5	0.79	ng/L	537 (modified)
Perfluorononanoic acid (PFNA)	2.5	0.65	ng/L	537 (modified)
Perfluorooctane Sulfonamide (FOSA)	40	0.64	ng/L	537 (modified)
Perfluorooctanesulfonic acid (PFOS)	4.0	1.3	ng/L	537 (modified)
Perfluorooctanoic acid (PFOA)	2.5	0.75	ng/L	537 (modified)
Perfluoropentanoic acid (PFPeA)	2.5	0.99	ng/L	537 (modified)
Perfluorotetradecanoic acid (PFTeA)	2.5	0.40	ng/L	537 (modified)
Perfluorotridecanoic Acid (PFTriA)	2.5	0.55	ng/L	537 (modified)
Perfluoroundecanoic acid (PFUnA)	2.5	0.75	ng/L	537 (modified)

Isotope Dilution Summary

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

TestAmerica Job ID: 320-30556-1

Method: 537 (modified) - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	³ C4 PFO/ (25-150)
320-30556-1 - DL	TP-PFC-020-TPI	109

Surrogate Legend

¹³C4 PFOA = ¹³C4 PFOA

Method: 537 (modified) - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	³ C8 FOS/ (25-150)	³ C4 PFB/ (25-150)	³ C2 PFHx (25-150)	³ C4 PFO/ (25-150)	³ C5 PFN/ (25-150)	³ C2 PFD/ (25-150)	³ C2 PFUn (25-150)	³ C2 PFDa (25-150)
320-30556-1	TP-PFC-020-TPI	1 Q	75	81		95	106	96	89
320-30556-2	TP-PFC-020-MID-CARBON	2 Q	112	127	140	120	110	93	101
320-30556-3	TP-PFC-020-TPE	5 Q	80	95	96	84	89	99	107
320-30556-4	TP-PFC-020-TPE-D	3 Q	87	102	111	101	103	94	92
LCS 320-179613/2-A	Lab Control Sample	54	108	123	136	131	141	131	121
LCSD 320-179613/3-A	Lab Control Sample Dup	68	95	110	121	113	114	108	105
MB 320-179613/1-A	Method Blank	66	111	126	137	133	134	124	121

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	³ O2 PFHx (25-150)	³ C4 PFO/ (25-150)	³ C4-PFHp (25-150)	³ C5 PFPe (25-150)	³ C3-PFBS (25-150)	³ C2-PFTeA (25-150)
320-30556-1	TP-PFC-020-TPI	84	88	99	83	83	88
320-30556-2	TP-PFC-020-MID-CARBON	126	126	151 Q	128	129	143
320-30556-3	TP-PFC-020-TPE	115	118	108	90	118	141
320-30556-4	TP-PFC-020-TPE-D	98	99	113	98	94	113
LCS 320-179613/2-A	Lab Control Sample	109	105	139	113	110	119
LCSD 320-179613/3-A	Lab Control Sample Dup	94	95	117	105	93	110
MB 320-179613/1-A	Method Blank	106	106	131	117	106	121

Surrogate Legend

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

QC Sample Results

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

TestAmerica Job ID: 320-30556-1

Method: 537 (modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-179613/1-A

Matrix: Water

Analysis Batch: 181833

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 179613

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.0	U	2.5	0.46	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluoropentanoic acid (PFPeA)	2.0	U	2.5	0.99	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorohexanoic acid (PFHxA)	2.0	U	2.5	0.79	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	0.80	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorooctanoic acid (PFOA)	2.0	U	2.5	0.75	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorononanoic acid (PFNA)	2.0	U	2.5	0.65	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.5	0.44	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluoroundecanoic acid (PFUnA)	2.0	U	2.5	0.75	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorododecanoic acid (PFDoA)	2.0	U	2.5	0.58	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorotridecanoic Acid (PFTriA)	2.0	U	2.5	0.55	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.5	0.40	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	0.92	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	0.87	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluoroheptanesulfonic Acid (PFHpS)	2.0	U	2.5	0.71	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U M	4.0	1.3	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorodecanesulfonic acid (PFDS)	3.0	U	4.0	1.2	ng/L		08/16/17 09:20	08/29/17 09:14	1
Perfluorooctane Sulfonamide (FOSA)	1.26	J	40	0.64	ng/L		08/16/17 09:20	08/29/17 09:14	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	66		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C4 PFBA	111		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C2 PFHxA	126		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C4 PFOA	137		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C5 PFNA	133		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C2 PFDA	134		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C2 PFUnA	124		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C2 PFDoA	121		25 - 150	08/16/17 09:20	08/29/17 09:14	1
18O2 PFHxS	106		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C4 PFOS	106		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C4-PFHpA	131		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C5 PFPeA	117		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C3-PFBS	106		25 - 150	08/16/17 09:20	08/29/17 09:14	1
13C2-PFTeA	121		25 - 150	08/16/17 09:20	08/29/17 09:14	1

Lab Sample ID: LCS 320-179613/2-A

Matrix: Water

Analysis Batch: 181833

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 179613

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	40.0	44.4		ng/L		111	60 - 140
Perfluoropentanoic acid (PFPeA)	40.0	42.6		ng/L		107	60 - 140
Perfluorohexanoic acid (PFHxA)	40.0	42.4		ng/L		106	60 - 140
Perfluoroheptanoic acid (PFHpA)	40.0	41.0		ng/L		102	60 - 140
Perfluorooctanoic acid (PFOA)	40.0	39.5		ng/L		99	60 - 140
Perfluorononanoic acid (PFNA)	40.0	40.5		ng/L		101	60 - 140
Perfluorodecanoic acid (PFDA)	40.0	41.3		ng/L		103	60 - 140
Perfluoroundecanoic acid (PFUnA)	40.0	36.1		ng/L		90	60 - 140

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-30556-1

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-179613/2-A

Matrix: Water

Analysis Batch: 181833

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 179613

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	40.0	39.2		ng/L		98	60 - 140
Perfluorotridecanoic Acid (PFTriA)	40.0	40.1		ng/L		100	50 - 150
Perfluorotetradecanoic acid (PFTeA)	40.0	36.4		ng/L		91	50 - 150
Perfluorobutanesulfonic acid (PFBS)	35.4	36.5		ng/L		103	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.7		ng/L		104	60 - 140
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	43.7		ng/L		115	50 - 150
Perfluorooctanesulfonic acid (PFOS)	37.1	39.7		ng/L		107	60 - 140
Perfluorodecanesulfonic acid (PFDS)	38.6	42.0		ng/L		109	50 - 150
Perfluorooctane Sulfonamide (FOSA)	40.0	43.6		ng/L		109	60 - 140

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C8 FOSA	54		25 - 150
13C4 PFBA	108		25 - 150
13C2 PFHxA	123		25 - 150
13C4 PFOA	136		25 - 150
13C5 PFNA	131		25 - 150
13C2 PFDA	141		25 - 150
13C2 PFUnA	131		25 - 150
13C2 PFDoA	121		25 - 150
18O2 PFHxS	109		25 - 150
13C4 PFOS	105		25 - 150
13C4-PFHpA	139		25 - 150
13C5 PFPeA	113		25 - 150
13C3-PFBS	110		25 - 150
13C2-PFTeDA	119		25 - 150

Lab Sample ID: LCSD 320-179613/3-A

Matrix: Water

Analysis Batch: 181833

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 179613

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	44.7		ng/L		112	60 - 140	1	30
Perfluoropentanoic acid (PFPeA)	40.0	40.6		ng/L		101	60 - 140	5	30
Perfluorohexanoic acid (PFHxA)	40.0	42.3		ng/L		106	60 - 140	0	30
Perfluoroheptanoic acid (PFHpA)	40.0	43.6		ng/L		109	60 - 140	6	30
Perfluorooctanoic acid (PFOA)	40.0	40.1		ng/L		100	60 - 140	2	30
Perfluorononanoic acid (PFNA)	40.0	42.3		ng/L		106	60 - 140	4	30
Perfluorodecanoic acid (PFDA)	40.0	42.8		ng/L		107	60 - 140	3	30
Perfluoroundecanoic acid (PFUnA)	40.0	37.4		ng/L		94	60 - 140	4	30
Perfluorododecanoic acid (PFDoA)	40.0	41.4		ng/L		104	60 - 140	6	30

TestAmerica Sacramento

QC Sample Results

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

TestAmerica Job ID: 320-30556-1

Method: 537 (modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-179613/3-A

Matrix: Water

Analysis Batch: 181833

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 179613

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic Acid (PFTriA)	40.0	43.5		ng/L		109	50 - 150	8	30
Perfluorotetradecanoic acid (PFTeA)	40.0	38.0		ng/L		95	50 - 150	5	30
Perfluorobutanesulfonic acid (PFBS)	35.4	37.7		ng/L		107	50 - 150	3	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	39.0		ng/L		107	60 - 140	3	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	42.3		ng/L		111	50 - 150	3	30
Perfluorooctanesulfonic acid (PFOS)	37.1	39.5		ng/L		107	60 - 140	0	30
Perfluorodecanesulfonic acid (PFDS)	38.6	41.6		ng/L		108	50 - 150	1	30
Perfluorooctane Sulfonamide (FOSA)	40.0	46.0		ng/L		115	60 - 140	5	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C8 FOSA	68		25 - 150
13C4 PFBA	95		25 - 150
13C2 PFHxA	110		25 - 150
13C4 PFOA	121		25 - 150
13C5 PFNA	113		25 - 150
13C2 PFDA	114		25 - 150
13C2 PFUnA	108		25 - 150
13C2 PFDoA	105		25 - 150
18O2 PFHxS	94		25 - 150
13C4 PFOS	95		25 - 150
13C4-PFHpA	117		25 - 150
13C5 PFPeA	105		25 - 150
13C3-PFBS	93		25 - 150
13C2-PFTeDA	110		25 - 150

QC Association Summary

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

TestAmerica Job ID: 320-30556-1

LCMS

Prep Batch: 179613

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-30556-1 - DL	TP-PFC-020-TPI	Total/NA	Water	3535	
320-30556-1	TP-PFC-020-TPI	Total/NA	Water	3535	
320-30556-2	TP-PFC-020-MID-CARBON	Total/NA	Water	3535	
320-30556-3	TP-PFC-020-TPE	Total/NA	Water	3535	
320-30556-4	TP-PFC-020-TPE-D	Total/NA	Water	3535	
MB 320-179613/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-179613/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-179613/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 181833

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-30556-1 - DL	TP-PFC-020-TPI	Total/NA	Water	537 (modified)	179613
320-30556-1	TP-PFC-020-TPI	Total/NA	Water	537 (modified)	179613
320-30556-2	TP-PFC-020-MID-CARBON	Total/NA	Water	537 (modified)	179613
320-30556-3	TP-PFC-020-TPE	Total/NA	Water	537 (modified)	179613
320-30556-4	TP-PFC-020-TPE-D	Total/NA	Water	537 (modified)	179613
MB 320-179613/1-A	Method Blank	Total/NA	Water	537 (modified)	179613
LCS 320-179613/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	179613
LCSD 320-179613/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	179613

Lab Chronicle

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

TestAmerica Job ID: 320-30556-1

Client Sample ID: TP-PFC-020-TPI

Date Collected: 08/08/17 09:00

Date Received: 08/09/17 09:45

Lab Sample ID: 320-30556-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		179613	08/16/17 09:20	J1S	TAL SAC
Total/NA	Analysis	537 (modified)	DL	10	181833	08/29/17 10:51	SBC	TAL SAC
Total/NA	Prep	3535			179613	08/16/17 09:20	J1S	TAL SAC
Total/NA	Analysis	537 (modified)		1	181833	08/29/17 11:18	SBC	TAL SAC

Client Sample ID: TP-PFC-020-MID-CARBON

Date Collected: 08/08/17 09:05

Date Received: 08/09/17 09:45

Lab Sample ID: 320-30556-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			179613	08/16/17 09:20	J1S	TAL SAC
Total/NA	Analysis	537 (modified)		1	181833	08/29/17 10:57	SBC	TAL SAC

Client Sample ID: TP-PFC-020-TPE

Date Collected: 08/08/17 09:10

Date Received: 08/09/17 09:45

Lab Sample ID: 320-30556-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			179613	08/16/17 09:20	J1S	TAL SAC
Total/NA	Analysis	537 (modified)		1	181833	08/29/17 11:04	SBC	TAL SAC

Client Sample ID: TP-PFC-020-TPE-D

Date Collected: 08/08/17 00:00

Date Received: 08/09/17 09:45

Lab Sample ID: 320-30556-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			179613	08/16/17 09:20	J1S	TAL SAC
Total/NA	Analysis	537 (modified)		1	181833	08/29/17 11:11	SBC	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

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

TestAmerica Job ID: 320-30556-1

Laboratory: TestAmerica Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-28-18

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
537 (modified)	3535	Water	Perfluorobutanesulfonic acid (PFBS)
537 (modified)	3535	Water	Perfluorobutanoic acid (PFBA)
537 (modified)	3535	Water	Perfluorodecanesulfonic acid (PFDS)
537 (modified)	3535	Water	Perfluorodecanoic acid (PFDA)
537 (modified)	3535	Water	Perfluorododecanoic acid (PFDoA)
537 (modified)	3535	Water	Perfluoroheptanesulfonic Acid (PFHpS)
537 (modified)	3535	Water	Perfluoroheptanoic acid (PFHpA)
537 (modified)	3535	Water	Perfluorohexanesulfonic acid (PFHxS)
537 (modified)	3535	Water	Perfluorohexanoic acid (PFHxA)
537 (modified)	3535	Water	Perfluorononanoic acid (PFNA)
537 (modified)	3535	Water	Perfluorooctane Sulfonamide (FOSA)
537 (modified)	3535	Water	Perfluorooctanesulfonic acid (PFOS)
537 (modified)	3535	Water	Perfluorooctanoic acid (PFOA)
537 (modified)	3535	Water	Perfluoropentanoic acid (PFPeA)
537 (modified)	3535	Water	Perfluorotetradecanoic acid (PFTeA)
537 (modified)	3535	Water	Perfluorotridecanoic Acid (PFTriA)
537 (modified)	3535	Water	Perfluoroundecanoic acid (PFUnA)

Method Summary

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

TestAmerica Job ID: 320-30556-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

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: 320-30556-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-30556-1	TP-PFC-020-TPI	Water	08/08/17 09:00	08/09/17 09:45
320-30556-2	TP-PFC-020-MID-CARBON	Water	08/08/17 09:05	08/09/17 09:45
320-30556-3	TP-PFC-020-TPE	Water	08/08/17 09:10	08/09/17 09:45
320-30556-4	TP-PFC-020-TPE-D	Water	08/08/17 00:00	08/09/17 09:45

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 180980Lab Sample ID: IC 320-180980/4 Client Sample ID: _____Date Analyzed: 08/24/17 10:16 Lab File ID: 2017.08.24A_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	3.08	Assign Peak	phomsopha t	08/24/17 10:47
Perfluorododecanoic acid (PFDoA)	4.08	Assign Peak	phomsopha t	08/24/17 10:48

Lab Sample ID: IC 320-180980/5 Client Sample ID: _____Date Analyzed: 08/24/17 10:23 Lab File ID: 2017.08.24A_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	3.10	Assign Peak	phomsopha t	08/24/17 10:49

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 181763Lab Sample ID: CCVL 320-181763/4 Client Sample ID: _____Date Analyzed: 08/29/17 04:17 Lab File ID: 2017.08.28B_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.06	Baseline	chandrase nas	08/29/17 11:36

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 181833Lab Sample ID: MB 320-179613/1-A Client Sample ID: _____Date Analyzed: 08/29/17 09:14 Lab File ID: 2017.08.28B_047.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.07	Baseline	chandrase nas	08/29/17 14:12

Lab Sample ID: CCV 320-181833/12 Client Sample ID: _____Date Analyzed: 08/29/17 10:23 Lab File ID: 2017.08.28B_057.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.09	Isomers	chandrase nas	08/29/17 14:20

Lab Sample ID: 320-30556-1 DL Client Sample ID: TP-PFC-020-TPI DLDate Analyzed: 08/29/17 10:51 Lab File ID: 2017.08.28B_061.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.73	Isomers	chandrase nas	08/29/17 14:25

Lab Sample ID: 320-30556-2 Client Sample ID: TP-PFC-020-MID-CARBONDate Analyzed: 08/29/17 10:57 Lab File ID: 2017.08.28B_062.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.36	Baseline	chandrase nas	08/29/17 14:25
Perfluorooctanoic acid (PFOA)	2.72	Isomers	chandrase nas	08/29/17 14:26
Perfluorooctanesulfonic acid (PFOS)	3.10	Baseline	chandrase nas	08/29/17 14:26

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 181833Lab Sample ID: 320-30556-3 Client Sample ID: TP-PFC-020-TPEDate Analyzed: 08/29/17 11:04 Lab File ID: 2017.08.28B_063.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.37	Baseline	chandrase nas	08/29/17 14:26
Perfluorooctanoic acid (PFOA)	2.73	Isomers	chandrase nas	08/29/17 14:26
Perfluorooctanesulfonic acid (PFOS)	3.10	Baseline	chandrase nas	08/29/17 14:27

Lab Sample ID: 320-30556-4 Client Sample ID: TP-PFC-020-TPE-DDate Analyzed: 08/29/17 11:11 Lab File ID: 2017.08.28B_064.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.39	Baseline	chandrase nas	08/29/17 14:27
Perfluorooctanoic acid (PFOA)	2.74	Isomers	chandrase nas	08/29/17 14:28

Lab Sample ID: 320-30556-1 Client Sample ID: TP-PFC-020-TPIDate Analyzed: 08/29/17 11:18 Lab File ID: 2017.08.28B_065.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.56	Baseline	chandrase nas	08/29/17 14:29
Perfluorooctane Sulfonamide (FOSA)	3.46	Baseline	chandrase nas	08/29/17 14:29
Perfluorododecanoic acid (PFDoA)	4.08	Baseline	chandrase nas	08/29/17 14:29

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCM2-4:2FTSIC_00003	12/30/17	08/07/17	MeOH/H2O, Lot 09285	5000 uL	LCPFCIS_00003	50 uL	13C2-PFOA	50 ng/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCMPFC_ALL_SU_00006	02/09/18	08/09/17	Methanol, Lot Baker 141039	200 mL	LCd-NETfOSA-M_00005	200 uL	d-N-EtFOSA-M	0.05 ug/mL
					LCd-NMeFOSA-M_00004	200 uL	d-N-MeFOSA-M	0.05 ug/mL
					LCd3-NMeFOSAA_00004	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETfOSA-M_00004	200 uL	d5-NETfOSA-M	0.05 ug/mL
					LCM2-6:FTS_00004	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00004	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00010	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00009	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00009	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00010	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00013	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00010	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00003	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00015	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00010	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00016	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00010	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00010	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00014	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00022	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00011	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd-NETfOSA-M_00005	06/10/21		WELLINGTON, Lot dNETFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
.LCd-NMeFOSA-M_00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
.LCd3-NMeFOSAA_00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NETfOSA-M_00004	11/22/21		WELLINGTON, Lot d5NETfOSA1116		(Purchased Reagent)		d5-NETfOSA-M	50 ug/mL
.LCM2-6:FTS_00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00009	12/07/20		Wellington Laboratories, Lot M2PFTeDA0217		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00009	05/27/21		Wellington Laboratories, Lot M4PFHpa0516		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
.LCM5PFPEA_00010	11/22/21		Wellington Laboratories, Lot M5PFPeA1116		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA_00013	12/22/20		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00010	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00003	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00015	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00010	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00016	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00010	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00010	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00014	04/12/22		Wellington Laboratories, Lot MPFOA0417		(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00022	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUDa_00011	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_FULL-L1_00005	12/27/17	07/07/17	MeOH/H2O, Lot 90285	5000 uL	LCMPFC_ALL_SU_00001	250 uL	d-N-EtFOSA-M	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
							13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFC_ALL_SP_00001	25 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.467 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.479 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	0.5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
							MeFOSA	0.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
							Perfluorobutanoic acid (PFBA)	0.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.455 ng/mL
							Perfluorononanoic acid (PFNA)	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctadecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.5 ng/mL
					LCPFCIS 00003	50 uL	13C2-PFOA	50 ng/mL
.LCMPFC_ALL_SU_00001	12/29/17	06/29/17	Methanol, Lot Baker 141039	10000 uL	LCd-NETFOSA-M_00005	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M 00004	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA 00004	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NETFOSAA 00004	200 uL	d5-NETFOSAA	1 ug/mL
					LCM2-6:FTS 00004	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00004	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA 00010	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00009	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00009	200 uL	13C4-PFHpa	1 ug/mL
					LCM5PFPEA 00010	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA 00013	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00010	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS 00003	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA 00015	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00010	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00016	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00010	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA 00010	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00014	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00022	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUDa 00011	200 uL	13C2 PFUnA	1 ug/mL
..LCd-NETFOSA-M 00005	06/10/21		WELLINGTON, Lot dNetFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M 00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA 00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA 00004	11/22/21		WELLINGTON, Lot d5NETFOSAA1116		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FTS 00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS 00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA 00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00009	12/07/20		Wellington Laboratories, Lot M2PFTeDA0217		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM4PFHPA 00009	05/27/21		Wellington Laboratories, Lot M4PFHPA0516		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA 00010	11/22/21		Wellington Laboratories, Lot M5PFPeA1116		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00013	12/22/20		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00010	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00003	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00015	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00010	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00016	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00010	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00010	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00014	04/12/22		Wellington Laboratories, Lot MPFOA0417		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00022	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00011	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC_ALL_SP_00001	12/27/17	07/07/17	Methanol, Lot 157237	10000 uL	LCPFC2SP_00037	1000 uL	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-ethylperfluoro-1-octanesulfoamide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
					LCPFCSP_00103	1000 uL	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
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFC2SP_00037	01/07/18	07/07/17	Methanol, Lot 104453	10 mL	LC4:2FTS_00002	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-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00002	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00003	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
...LC4:2FTS_00002	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-EtFOSA-M_00004	05/24/21		WELLINGTON, Lot NETFOSA0516M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
...LCN-EtFOSAA_00002	01/20/21		WELLINGTON, Lot NETFOSAA0116		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00003	05/24/21		WELLINGTON, Lot NMeFOSA0516M		(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00003	01/20/21		WELLINGTON, Lot NMeFOSAA0116		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFCSP_00103	12/27/17	06/27/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00006	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00006	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFDS_00005	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LCPFBFA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDDA_00006	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDDoA_00006	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00003	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_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFuDA_00006	08/19/20	Wellington Laboratories, Lot PFUDa0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_FULL-L2_00006	12/27/17	07/07/17	MeOH/H2O, Lot 090285	5000 uL	LCMPFC_ALL_SU_00001	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
							13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFC_ALL_SP_00001	50 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-ethylperfluoro-1-octanesulfoamide	1 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							MeFOSA	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid (PFDoA)	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
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFC_ALL_SU_00001	12/29/17	06/29/17	Methanol, Lot Baker 141039	10000 uL	LCPFCIS_00003	50 uL	13C2-PFOA	50 ng/mL
					LCd-NETFOSA-M_00005	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NETFOSAA_00004	200 uL	d5-NETFOSAA	1 ug/mL
					LCM2-6:FTS_00004	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	200 uL	13C4 PFOS	0.956 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd-NETFOSA-M 00005	06/10/21		WELLINGTON, Lot dNetFOSA0616M		LCMPFUDa 00011	200 uL	13C2 PFUnA	1 ug/mL
..LCd-NMeFOSA-M 00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd3-NMeFOSAA 00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA 00004	11/22/21		WELLINGTON, Lot d5NetFOSAA1116		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FTS 00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS 00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA 00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00009	12/07/20		Wellington Laboratories, Lot M2PFTeDA0217		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00009	05/27/21		Wellington Laboratories, Lot M4PFHpA0516		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA 00010	11/22/21		Wellington Laboratories, Lot M5PFPeA1116		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00013	12/22/20		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00010	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00003	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00015	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00010	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00016	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00010	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2-PFHxS	47.3 ug/mL
..LCMPFNA 00010	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00014	04/12/22		Wellington Laboratories, Lot MPFOA0417		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00022	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00011	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC_ALL_SP_00001	12/27/17	07/07/17	Methanol, Lot 157237	10000 uL	LCPFC2SP_00037	1000 uL	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-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
					LCPFCSP_00103	1000 uL	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	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
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFC2SP_00037	01/07/18	07/07/17	Methanol, Lot 104453	10 mL	LC4:2FTS_00002	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-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00002	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00003	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
...LC4:2FTS_00002	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-EtFOSA-M_00004	05/24/21		WELLINGTON, Lot NetFOSA0516M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
...LCN-EtFOSAA_00002	01/20/21		WELLINGTON, Lot NetFOSAA0116		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCN-MeFOSA-M_00003	05/24/21		WELLINGTON, Lot NMeFOSA0516M		(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00003	01/20/21		WELLINGTON, Lot NMeFOSAA0116		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFCSP_00103	12/27/17	06/27/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00006	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00006	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LCPFBA_00006	05/27/21		Wellington Laboratories, Lot PFBA0516		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00006	03/15/21		Wellington Laboratories, Lot LPFBS0316		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00006	05/31/21		Wellington Laboratories, Lot PFDA0516		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00006	05/31/21		Wellington Laboratories, Lot PFDoA0516		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00005	07/02/20		Wellington Laboratories, Lot LPFDS0615		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00006	01/22/21		Wellington Laboratories, Lot PFHpA0116		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00010	11/06/20		Wellington Laboratories, Lot LPFHpS1115		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00005	12/22/20		Wellington Laboratories, Lot PFHxA1215		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00007	05/25/21		Wellington Laboratories, Lot PFHxDA0516		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00003	07/03/20		Wellington Laboratories, Lot brPFHxSK0615		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFNA_00007	10/23/20		Wellington Laboratories, Lot PFNA1015		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00007	08/02/21		Wellington Laboratories, Lot PFOA0716		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00007	04/29/21		Wellington Laboratories, Lot PFODA0416		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00003	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_00006	05/31/21		Wellington Laboratories, Lot PFPeA0516		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00005	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTTrDA_00005	02/12/21		Wellington Laboratories, Lot PFTTrDA0216		(Purchased Reagent)		Perfluorotridecanoic Acid (PFTTriA)	50 ug/mL
...LCPFUdA_00006	08/19/20		Wellington Laboratories, Lot PFUdA0815		(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_FULL-L2_00009	12/27/17	07/07/17	MeOH/H2O, Lot 090285	5000 uL	LCMPFC_ALL_SU_00001	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
							13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFC_ALL_SP_00001	50 uL	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFC_ALL_SU_00001	12/29/17	06/29/17	Methanol, Lot Baker 141039	10000 uL	LCd-NETFOSA-M_00005	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NETFOSAA_00004	200 uL	d5-NETFOSAA	1 ug/mL
					LCM2-6:FTS_00004	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	200 uL	13C4-PFHxPA	1 ug/mL
					LCM5PFPEA_00010	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00010	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	200 uL	13C2 PFUnA	1 ug/mL
..LCd-NETFOSA-M_00005	06/10/21		WELLINGTON, Lot dNetFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00004	11/22/21		WELLINGTON, Lot d5NetFOSAA1116		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20		Wellington Laboratories, Lot M2PFTeDA0217		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM4PFHPA 00009	05/27/21		Wellington Laboratories, Lot M4PFHPA0516		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA 00010	11/22/21		Wellington Laboratories, Lot M5PFPEA1116		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00013	12/22/20		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00010	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00003	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00015	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00010	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00016	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00010	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00010	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00014	04/12/22		Wellington Laboratories, Lot MPFOA0417		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00022	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFudA 00011	11/22/21		Wellington Laboratories, Lot MPFudA1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC_ALL_SP_00001	12/27/17	07/07/17	Methanol, Lot 157237	10000 uL	LCPFCSP_00103	1000 uL	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
							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
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00103	12/27/17	06/27/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00006	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00006	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUDa_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBs_00006	03/15/21	Wellington Laboratories, Lot LFPBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00006	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00006	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LFPDS0615			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LFPHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00003	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_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUDa_00006	08/19/20	Wellington Laboratories, Lot PFUDa0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCPFC_FULL-L3_00005	12/27/17	07/07/17	MeOH/H2O, Lot 090285	5000 uL	LCPFC_ALL_SU_00001	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
							13C2-PFHxDA	50 ng/mL
							13C2-PFTEdA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFC_ALL_SP_00001	250 uL	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-ethylperfluoro-1-octanesulfoamide	5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							MeFOSA	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
					LCPFCIS 00003	50 uL	13C2-PFOA	50 ng/mL
..LCMPFC_ALL_SU_00001	12/29/17	06/29/17	Methanol, Lot Baker 141039	10000 uL	LCd-NETFOSA-M_00005	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NETFOSAA_00004	200 uL	d5-NETFOSAA	1 ug/mL
					LCM2-6:FTS_00004	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	200 uL	13C4-PFHpa	1 ug/mL
					LCM5PFPEA_00010	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00010	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUDa_00011	200 uL	13C2 PFUnA	1 ug/mL
..LCd-NETFOSA-M_00005	06/10/21		WELLINGTON, Lot dNetFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00004	11/22/21		WELLINGTON, Lot d5NETFOSAA1116		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFTeDA 00009	12/07/20	Wellington Laboratories, Lot M2PFTeDA0217			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00009	05/27/21	Wellington Laboratories, Lot M4PFHpa0516			(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA 00010	11/22/21	Wellington Laboratories, Lot M5PFPeA1116			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00013	12/22/20	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00010	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00003	08/02/21	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00015	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00010	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00016	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00010	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00010	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00014	04/12/22	Wellington Laboratories, Lot MPFOA0417			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00022	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00011	11/22/21	Wellington Laboratories, Lot MPFUDa1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC_ALL_SP_00001	12/27/17	07/07/17	Methanol, Lot 157237	10000 uL	LCPFC2SP_00037	1000 uL	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-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
					LCPFCSP_00103	1000 uL	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
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFC2SP_00037	01/07/18	07/07/17	Methanol, Lot 104453	10 mL	LC4:2FTS_00002	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-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00002	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00003	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
...LC4:2FTS_00002	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-EtFOSA-M_00004	05/24/21		WELLINGTON, Lot NETFOSA0516M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
...LCN-EtFOSAA_00002	01/20/21		WELLINGTON, Lot NETFOSAA0116		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00003	05/24/21		WELLINGTON, Lot NMeFOSA0516M		(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00003	01/20/21		WELLINGTON, Lot NMeFOSAA0116		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFCSP_00103	12/27/17	06/27/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00006	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00006	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFDS_00005	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LCPFBFA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDDA_00006	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDDA_00006	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00003	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_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFuDA_00006	08/19/20	Wellington Laboratories, Lot PFUDa0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_FULL-L4_00008	12/27/17	07/07/17	MeOH/H2O, Lot 090285	5000 uL	LCMPFC_ALL_SU_00001	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
							13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFC2SP_00037	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	18.68 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	18.96 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	19.16 ng/mL
							N-ethylperfluoro-1-octanesulfoamide	20 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
							MeFOSA	20 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
							LCPFCIS_00003	50 uL
					LCPFCSP_00103	100 uL	Perfluorobutanoic acid (PFBA)	20 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid (PFDA)	20 ng/mL
							Perfluorododecanoic acid (PFDoA)	20 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	19.04 ng/mL
							Perfluorohexanoic acid (PFHxA)	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	18.2 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctadecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	20 ng/mL
							Perfluoropentanoic acid (PFPeA)	20 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	20 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	20 ng/mL
							Perfluoroundecanoic acid (PFUnA)	20 ng/mL
.LCMPFC_ALL_SU_00001	12/29/17	06/29/17	Methanol, Lot Baker 141039	10000 uL	LCd-NETFOSA-M_00005	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NETFOSAA_00004	200 uL	d5-NETFOSAA	1 ug/mL
					LCM2-6:FTS_00004	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	200 uL	13C4 PFOS	0.956 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd-NETFOA-M 00005	06/10/21		WELLINGTON, Lot dNetFOA0616M		LCMPFUDa 00011	200 uL	13C2 PFUnA	1 ug/mL
..LCd-NMeFOA-M 00004	06/10/21		WELLINGTON, Lot dNMeFOA0616M		(Purchased Reagent)		d-N-EtFOA-M	50 ug/mL
..LCd3-NMeFOA-M 00004	11/22/21		WELLINGTON, Lot d3NMeFOA1116		(Purchased Reagent)		d3-NMeFOA-M	50 ug/mL
..LCd5-NETFOA-M 00004	11/22/21		WELLINGTON, Lot d5NetFOA1116		(Purchased Reagent)		d5-NETFOA-M	50 ug/mL
..LCM2-6:FTS 00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS 00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA 00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00009	12/07/20		Wellington Laboratories, Lot M2PFTeDA0217		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHxA 00009	05/27/21		Wellington Laboratories, Lot M4PFHxA0516		(Purchased Reagent)		13C4-PFHxA	50 ug/mL
..LCM5PFPEA 00010	11/22/21		Wellington Laboratories, Lot M5PFPEA1116		(Purchased Reagent)		13C5 PFPEA	50 ug/mL
..LCM8FOA 00013	12/22/20		Wellington Laboratories, Lot M8FOA1215I		(Purchased Reagent)		13C8 FOA	50 ug/mL
..LCMPFBA 00010	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00003	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00015	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00010	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00016	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00010	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00010	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00014	04/12/22		Wellington Laboratories, Lot MPFOA0417		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00022	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00011	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC2SP_00037	01/07/18	07/07/17	Methanol, Lot 104453	10 mL	LC4:2FTS_00002	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-EtFOA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOA-M_00002	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOA-M_00003	200 uL	MeFOA	1 ug/mL
					LCN-MeFOA-M_00003	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
..LC4:2FTS_00002	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-EtFOA-M_00004	05/24/21		WELLINGTON, Lot NETFOA0516M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCN-EtFOSAA_00002	01/20/21		WELLINGTON, Lot NETFOSAA0116		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21		WELLINGTON, Lot NMeFOSA0516M		(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00003	01/20/21		WELLINGTON, Lot NMeFOSAA0116		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCPFCSP_00103	12/27/17	06/27/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00006	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00006	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHXS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHXS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LCPFBA_00006	05/27/21		Wellington Laboratories, Lot PFBA0516		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00006	03/15/21		Wellington Laboratories, Lot LPFBS0316		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00006	05/31/21		Wellington Laboratories, Lot PFDA0516		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00006	05/31/21		Wellington Laboratories, Lot PFDoA0516		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00005	07/02/20		Wellington Laboratories, Lot LPFDS0615		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00006	01/22/21		Wellington Laboratories, Lot PFHpA0116		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20		Wellington Laboratories, Lot LPFHpS1115		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxA_00005	12/22/20		Wellington Laboratories, Lot PFHxA1215		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21		Wellington Laboratories, Lot PFHxDA0516		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00003	07/03/20		Wellington Laboratories, Lot brPFHxSK0615		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20		Wellington Laboratories, Lot PFNA1015		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21		Wellington Laboratories, Lot PFOA0716		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21		Wellington Laboratories, Lot PFODA0416		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	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_00006	05/31/21		Wellington Laboratories, Lot PFPeA0516		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00005	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00005	02/12/21		Wellington Laboratories, Lot PFTrDA0216		(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00006	08/19/20		Wellington Laboratories, Lot PFUdA0815		(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_FULL-L5_00008	12/27/17	07/07/17	MeOH/H2O, Lot 090285	5000 uL	LCMPFC_ALL_SU_00001	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NMeFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
							13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFC2SP_00037	250 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-ethylperfluoro-1-octanesulfo namide	50 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	50 ng/mL
							MeFOSA	50 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	50 ng/mL
					LCPFCIS_00003	50 uL	13C2-PFOA	50 ng/mL
					LCPFCSP_00103	250 uL	Perfluorobutanoic acid (PFBA)	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid (PFDA)	50 ng/mL
							Perfluorododecanoic acid (PFDoA)	50 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	48.2 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ng/mL
							Perfluorohexanoic acid (PFHxA)	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctadecanoic acid	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	46.4 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	50 ng/mL
							Perfluoropentanoic acid (PFPeA)	50 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	50 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	50 ng/mL
							Perfluoroundecanoic acid (PFUnA)	50 ng/mL
.LCMPFC_ALL_SU_00001	12/29/17	06/29/17	Methanol, Lot Baker 141039	10000 uL	Lcd-NEtFOSA-M_00005	200 uL	d-N-EtFOSA-M	1 ug/mL
					Lcd-NMeFOSA-M_00004	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00009	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00010	200 uL	13C5 PFPeA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM8FOSA_00013	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUDa_00011	200 uL	13C2 PFUnA	1 ug/mL
..LCd-NETFOSA-M_00005	06/10/21		WELLINGTON, Lot dNetFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00004	11/22/21		WELLINGTON, Lot d5NETFOSAA1116		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20		Wellington Laboratories, Lot M2PFTeDA0217		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00009	05/27/21		Wellington Laboratories, Lot M4PFHPA0516		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00010	11/22/21		Wellington Laboratories, Lot M5PFPeA1116		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22		Wellington Laboratories, Lot MPFOA0417		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00011	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFC2SP_00037	01/07/18	07/07/17	Methanol, Lot 104453	10 mL	LC4:2FTS_00002	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-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfoamide	1 ug/mL
					LCN-EtFOSAA_00002	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00003	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC4:2FTS_00002	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-EtFOSA-M_00004	05/24/21		WELLINGTON, Lot NETFOSA0516M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
..LCN-EtFOSAA_00002	01/20/21		WELLINGTON, Lot NETFOSAA0116		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21		WELLINGTON, Lot NMeFOSA0516M		(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00003	01/20/21		WELLINGTON, Lot NMeFOSAA0116		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCPFCSP_00103	12/27/17	06/27/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00006	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00006	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHXS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHXS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTriDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUDA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LCPFBA_00006	05/27/21		Wellington Laboratories, Lot PFBA0516		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00006	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00006	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	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_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTTriA)	50 ug/mL
..LCPFUdA_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_FULL-L6_00006	12/27/17	07/07/17	MeOH/H2O, Lot 090285	5000 uL	LCMPFC_ALL_SU_00001	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NETFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
							13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFC2SP_00037	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	93.4 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	94.8 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	95.8 ng/mL
							N-ethylperfluoro-1-octanesulfoamide	100 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	100 ng/mL
							MeFOSA	100 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	100 ng/mL
					LCPFCIS_00003	50 uL	13C2-PFOA	50 ng/mL
					LCPFCSP_00103	500 uL	Perfluorobutanoic acid (PFBA)	100 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	88.4 ng/mL
							Perfluorodecanoic acid (PFDA)	100 ng/mL
							Perfluorododecanoic acid (PFDoA)	100 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	96.4 ng/mL
							Perfluoroheptanoic acid (PFHpA)	100 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	95.2 ng/mL
							Perfluorohexanoic acid (PFHxA)	100 ng/mL
							Perfluorohexadecanoic acid	100 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	91 ng/mL
							Perfluorononanoic acid (PFNA)	100 ng/mL
							Perfluorooctanoic acid (PFOA)	100 ng/mL
							Perfluorooctadecanoic acid	100 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	92.8 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	100 ng/mL
							Perfluoropentanoic acid (PFPeA)	100 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	100 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	100 ng/mL
							Perfluoroundecanoic acid (PFUnA)	100 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC_ALL_SU_00001	12/29/17	06/29/17	Methanol, Lot Baker 141039	10000 uL	LCd-NEtFOSA-M_00005	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHFA_00009	200 uL	13C4-PFHFA	1 ug/mL
					LCM5PFPEA_00010	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00010	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00011	200 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21		WELLINGTON, Lot dNetFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21		WELLINGTON, Lot d5NetFOSAA1116		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20		Wellington Laboratories, Lot M2PFTeDA0217		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHFA_00009	05/27/21		Wellington Laboratories, Lot M4PFHFA0516		(Purchased Reagent)		13C4-PFHFA	50 ug/mL
..LCM5PFPEA_00010	11/22/21		Wellington Laboratories, Lot M5PFPeA1116		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00015	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22		Wellington Laboratories, Lot MPFOA0417		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00011	11/22/21		Wellington Laboratories, Lot MPFUdA1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC2SP_00037	01/07/18	07/07/17	Methanol, Lot 104453	10 mL	LC4:2FTS_00002	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

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-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00002	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00003	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
..LC4:2FTS_00002	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-EtFOSA-M_00004	05/24/21		WELLINGTON, Lot NETFOSA0516M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
..LCN-EtFOSAA_00002	01/20/21		WELLINGTON, Lot NETFOSAA0116		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21		WELLINGTON, Lot NMeFOSA0516M		(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00003	01/20/21		WELLINGTON, Lot NMeFOSAA0116		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00103	12/27/17	06/27/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00006	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00006	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUDa_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBs_00006	03/15/21	Wellington Laboratories, Lot LFPBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00006	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00006	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LFPDS0615			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LFPHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	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_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUDa_00006	08/19/20	Wellington Laboratories, Lot PFUDa0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_FULLL-L7_00004	12/27/17	07/07/17	MeOH/H2O, Lot 090285	5000 uL	LCMPFC_ALL_SU_00001	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5 PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C3-PFBS	46.5 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFC2SP_00037	1000 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	186.8 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	189.6 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	191.6 ng/mL
							N-ethylperfluoro-1-octanesulfoamide	200 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
							MeFOSA	200 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
							13C2-PFOA	50 ng/mL
					LCPFCIS 00003	50 uL	13C2-PFOA	50 ng/mL
					LCPFCSP_00103	1000 uL	Perfluorobutanoic acid (PFBA)	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid (PFDA)	200 ng/mL
							Perfluorododecanoic acid (PFDoA)	200 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	192.8 ng/mL
							Perfluoroheptanoic acid (PFHpA)	200 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	190.4 ng/mL
							Perfluorohexanoic acid (PFHxA)	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	182 ng/mL
							Perfluorononanoic acid (PFNA)	200 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctadecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	185.6 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	200 ng/mL
							Perfluoropentanoic acid (PFPeA)	200 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	200 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	200 ng/mL
							Perfluoroundecanoic acid (PFUnA)	200 ng/mL
.LCMPFC_ALL_SU_00001	12/29/17	06/29/17	Methanol, Lot Baker 141039	10000 uL	LCd-NEtFOSA-M_00005	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00004	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00004	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00010	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00009	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHFA_00009	200 uL	13C4-PFHFA	1 ug/mL
					LCM5PFPEA_00010	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00013	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00010	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00003	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00015	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00010	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00016	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00010	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00010	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00014	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00022	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUDa_00011	200 uL	13C2 PFUnA	1 ug/mL
..LCd-NEtFOSA-M_00005	06/10/21		WELLINGTON, Lot dNetFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00004	11/22/21		WELLINGTON, Lot d5NetFOSAA1116		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00010	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00009	12/07/20		Wellington Laboratories, Lot M2PFTeDA0217		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHFA_00009	05/27/21		Wellington Laboratories, Lot M4PFHFA0516		(Purchased Reagent)		13C4-PFHFA	50 ug/mL
..LCM5PFPEA_00010	11/22/21		Wellington Laboratories, Lot M5PFPeA1116		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00013	12/22/20		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00010	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00003	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFDA_00015	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00010	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00016	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00010	02/17/22		Wellington Laboratories, Lot MPFHxS0217		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00010	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00014	04/12/22		Wellington Laboratories, Lot MPFOA0417		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00022	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00011	11/22/21		Wellington Laboratories, Lot MPFUDa1116		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC2SP_00037	01/07/18	07/07/17	Methanol, Lot 104453	10 mL	LC4:2FTS_00002	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-EtFOSA-M_00004	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00002	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00003	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00003	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
..LC4:2FTS_00002	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-EtFOSA-M_00004	05/24/21		WELLINGTON, Lot NEtFOSA0516M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
..LCN-EtFOSAA_00002	01/20/21		WELLINGTON, Lot NEtFOSAA0116		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00003	05/24/21		WELLINGTON, Lot NMeFOSA0516M		(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00003	01/20/21		WELLINGTON, Lot NMeFOSAA0116		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCPFCIS_00003	12/30/17	06/30/17	Methanol, Lot 14139	5000 uL	LCM2PFOA_00005	500 uL	13C2-PFOA	5 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00103	12/27/17	06/27/17	Methanol, Lot 090285	10000 uL	LCPFBA_00006	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00006	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00006	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00006	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00010	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00007	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00003	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00007	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00007	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00007	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00003	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00006	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00006	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LCPFBA_00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00006	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00006	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00006	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00003	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_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUDa_00006	08/19/20	Wellington Laboratories, Lot PFUDa0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFCIC_FULL_00003	09/02/17	05/30/17	MeOH/H2O, Lot 09285	5050 uL	LCMPFC2SU_00019	250 uL	d-N-EtFOSA-M	49.505 ng/mL
							d-N-MeFOSA-M	49.505 ng/mL
							d3-NMeFOSAA	49.505 ng/mL
							d5-NEtFOSAA	49.505 ng/mL
							M2-6:2FTS	47.0297 ng/mL
							M2-8:2FTS	47.4257 ng/mL
					LCMPFCSU_00069	250 uL	13C2-PFHxDA	49.505 ng/mL
							13C2-PFTeDA	49.505 ng/mL
							13C4-PFHpA	49.505 ng/mL
							13C5 PFPeA	49.505 ng/mL
							13C8 FOSA	49.505 ng/mL
							13C4 PFBA	49.505 ng/mL
							13C3-PFBS	46.0396 ng/mL
							13C2 PFDA	49.505 ng/mL
							13C2 PFDoA	49.505 ng/mL
							13C2 PFHxA	49.505 ng/mL
							18O2 PFHxS	46.8317 ng/mL
							13C5 PFNA	49.505 ng/mL
							13C4 PFOA	49.505 ng/mL
							13C4 PFOS	47.3267 ng/mL
							13C2 PFUnA	49.505 ng/mL
					LCPFACMXB_00007	125 uL	Perfluorobutanesulfonic acid (PFBS)	43.8119 ng/mL
							Perfluorobutanoic acid (PFBA)	49.505 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	47.7723 ng/mL
							Perfluorodecanoic acid (PFDA)	49.505 ng/mL
							Perfluorododecanoic acid (PFDoA)	49.505 ng/mL
							Perfluoroheptanoic acid (PFHpA)	49.505 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	46.7822 ng/mL
							Perfluorohexanoic acid (PFHxA)	49.505 ng/mL
							Perfluorononanoic acid (PFNA)	49.505 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.2772 ng/mL
							Perfluorooctanoic acid (PFOA)	49.505 ng/mL
							Perfluoropentanoic acid (PFPeA)	49.505 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	49.505 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	49.505 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroundecanoic acid (PFUnA)	49.505 ng/mL
					LCPFC3IM_00007	250 uL	Perfluoroheptanesulfonic Acid (PFHpS)	47.1287 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	49.505 ng/mL
.LCMPFC2SU_00019	11/30/17	05/30/17	Methanol, Lot 104453	5000 uL	LCd-NETfOSA-M_00005	100 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00004	100 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00004	100 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NETFOSAA_00004	100 uL	d5-NETFOSAA	1 ug/mL
					LCM2-6:FTS_00004	100 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00004	100 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NETfOSA-M_00005	06/10/21		WELLINGTON, Lot dNetFOSA0616M		(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00004	06/10/21		WELLINGTON, Lot dNMeFOSA0616M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00004	11/22/21		WELLINGTON, Lot d3NMeFOSAA1116		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00004	11/22/21		WELLINGTON, Lot d5NetFOSAA1116		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FTS_00004	02/17/22		WELLINGTON, Lot M262FTS0217		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00004	08/22/21		WELLINGTON, Lot M282FTS0816		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCMPFCSU_00069	11/24/17	05/24/17	Methanol, Lot Baker 141039	10000 uL	LCM2PFHxDA_00009	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00008	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHFA_00008	200 uL	13C4-PFHFA	1 ug/mL
					LCM5PFPEA_00009	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00012	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00009	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00002	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00013	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00009	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00014	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00009	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00009	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00013	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00020	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUDa_00010	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00009	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00008	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHFA_00008	05/27/21		Wellington Laboratories, Lot M4PFHFA0516		(Purchased Reagent)		13C4-PFHFA	50 ug/mL
..LCM5PFPEA_00009	11/22/21		Wellington Laboratories, Lot M5PFPeA1116		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00012	12/22/20		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00009	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00002	08/02/21		Wellington Laboratories, Lot M3PFBS0815		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00013	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00009	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00014	11/22/21		Wellington Laboratories, Lot MPFHxA1116		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00009	10/23/20		Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00009	09/30/21		Wellington Laboratories, Lot MPFNA0916		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00013	10/18/21		Wellington Laboratories, Lot MPFOA1016		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00020	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFUdA_00010	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00007	11/06/20	Wellington Laboratories, Lot PFACMXB1115			(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
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 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							
.LCPFC3IM_00007	09/02/17	05/30/17	Methanol, Lot 090285	5 mL	LCPFHpS_00010	0.1 mL	Perfluoroheptanesulfonic Acid (PFHpS)	952 ng/mL
					LCPFOSA_00009	0.1 mL	Perfluorooctane Sulfonamide (FOSA)	1000 ng/mL
..LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFOSA_00009	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFCSP_00110	01/21/18	07/21/17	Methanol, Lot 090285	250 mL	LC4:2FTS_00003	100 uL	Sodium 1H, 1H, 2H, 2H-perfluorohexane sulfonate (4:2)	0.01868 ug/mL
					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
					LCN-EtFOSA-M_00004	100 uL	N-ethylperfluoro-1-octanesulfo namide	0.02 ug/mL
					LCN-EtFOSAA_00003	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCN-MeFOSA-M_00003	100 uL	MeFOSA	0.02 ug/mL
					LCN-MeFOSAA_00004	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFBA_00006	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00006	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
					LCPFDS_00007	100 uL	Perfluorodecane Sulfonate	0.01928 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00007	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpS_00010	100 uL	Perfluoroheptane Sulfonate	0.01904 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00006	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00007	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00003	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00007	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFOA_00007	100 uL	Perfluorooctanoic acid (PFOA)	0.02 ug/mL
					LCPFODA_00007	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00003	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00010	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00006	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFTeDA_00007	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTriDA_00007	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUDa_00006	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 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-EtFOSA-M_00004	05/24/21		WELLINGTON, Lot NetFOSA0516M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
.LCN-EtFOSAA_00003	09/30/21		WELLINGTON, Lot NetFOSAA0916		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCN-MeFOSA-M_00003	05/24/21		WELLINGTON, Lot NMeFOSA0516M		(Purchased Reagent)		MeFOSA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCPFBA 00006	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00006	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
.LCPFDS_00007	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00007	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00010	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
.LCPFHxA 00006	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA 00007	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00003	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA 00007	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA 00007	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA 00007	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00003	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_00006	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 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_00006	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

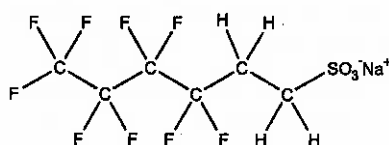
LC4 : 2FTS_00002

R: 8BC 3/31/17

896827
ID: LC4:2FTS_00002
Exp: 12/12/21 Prpd:
4:2FTS**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS1216
COMPOUND: Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_6H_4F_9SO_3Na$ **MOLECULAR WEIGHT:** 350.13
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt) **SOLVENT(S):** Methanol
 $46.7 \pm 2.3 \mu\text{g/ml}$ (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. ChittimDate: 12/21/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

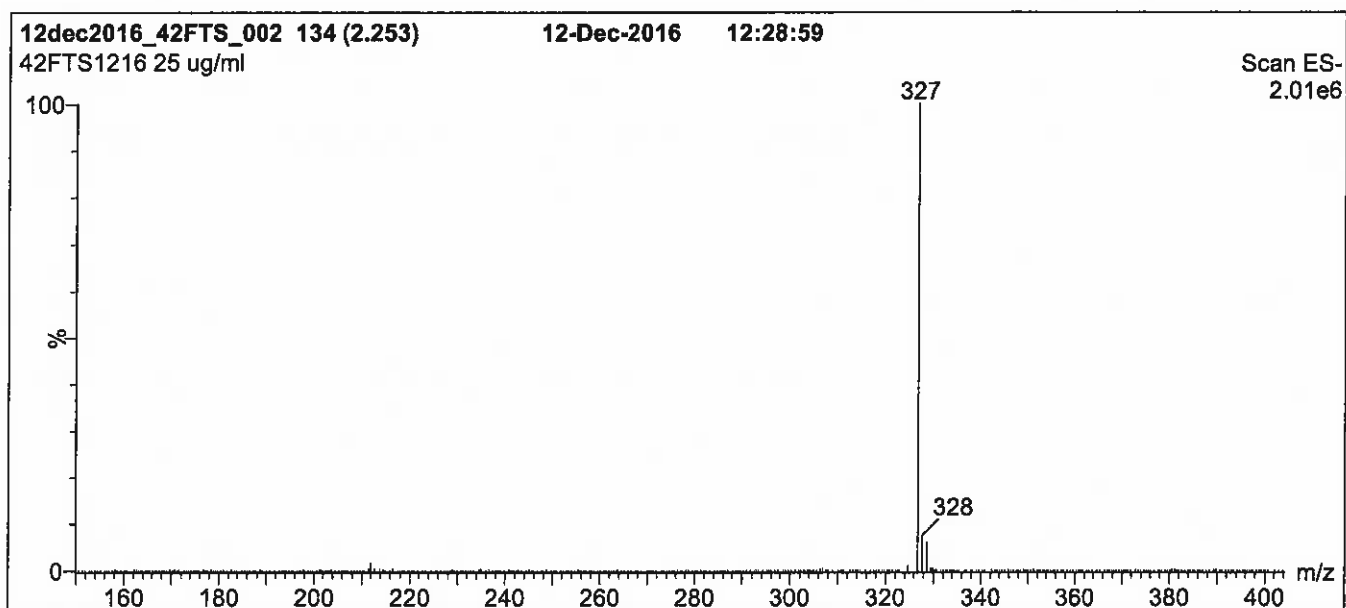
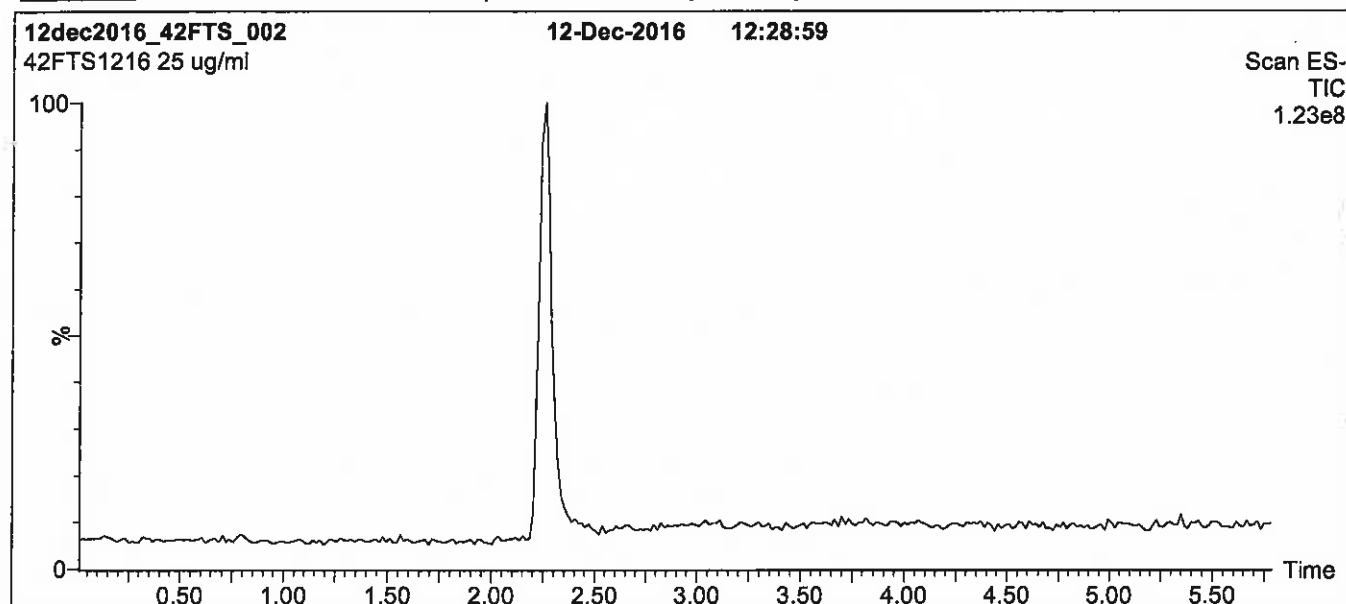
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

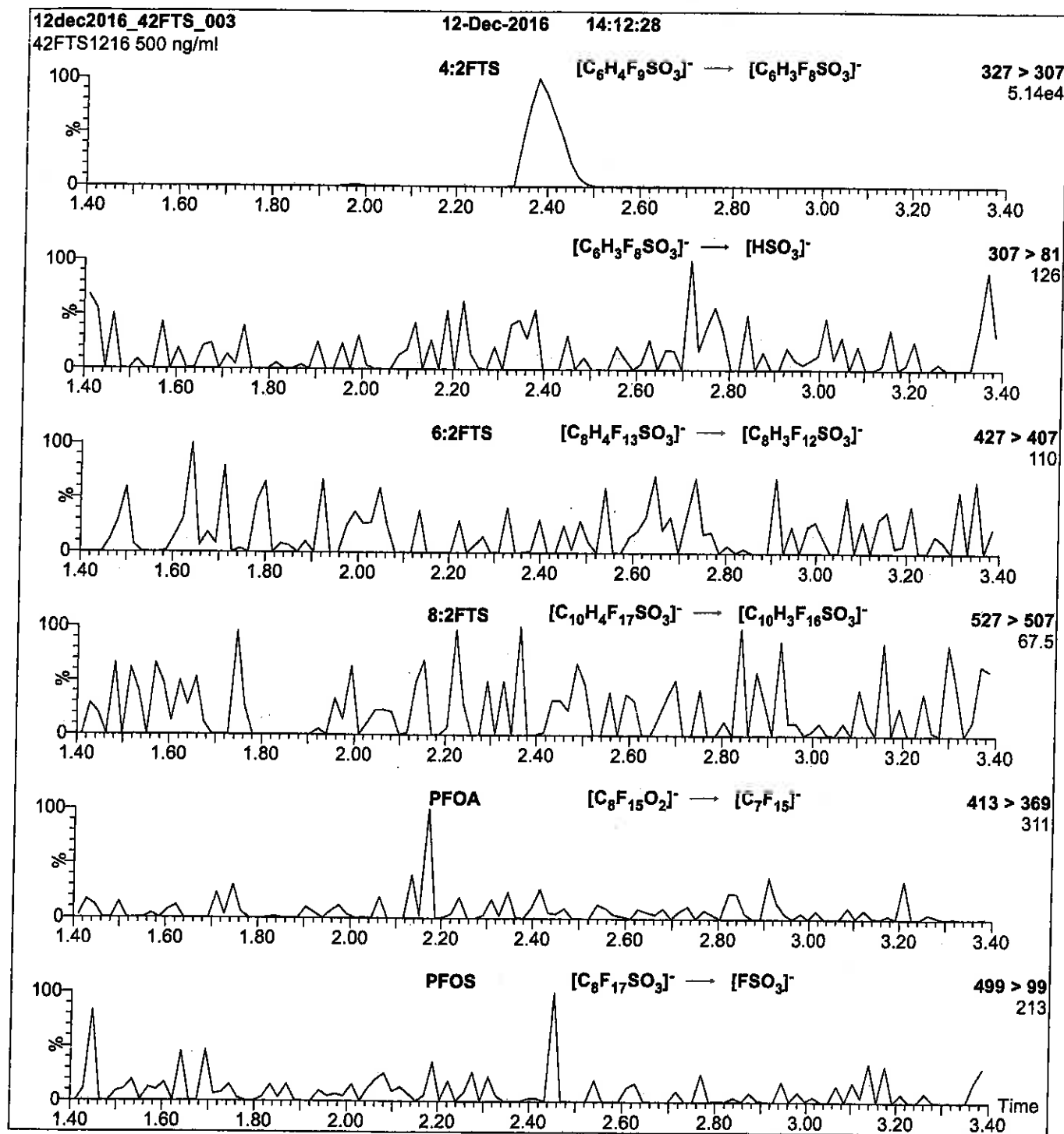
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 25.00

Cone Gas Flow (l/hr) = 100

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LC4 : 2FTS_00003



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

4:2FTS

LOT NUMBER:

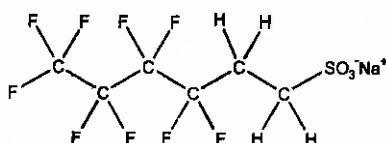
42FTS1216

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)
 46.7 ± 2.3 µg/ml (4:2FTS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/12/2016

EXPIRY DATE: (mm/dd/yyyy)

12/12/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

• See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/21/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

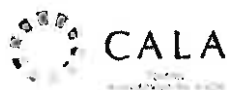
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

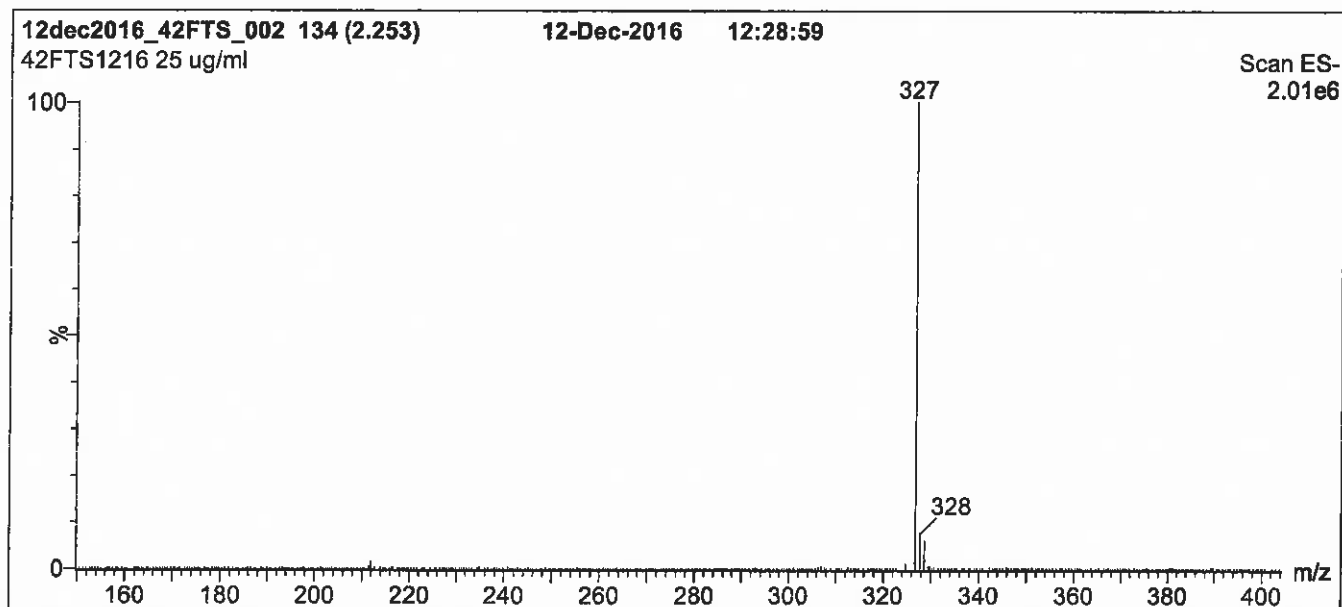
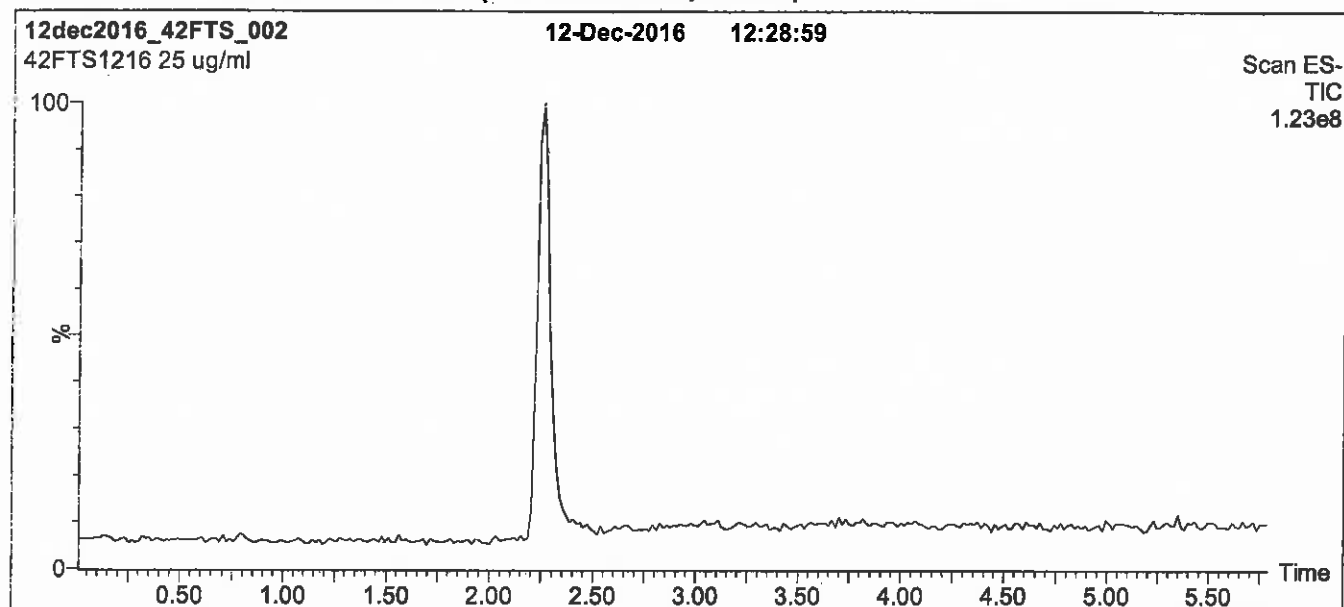
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

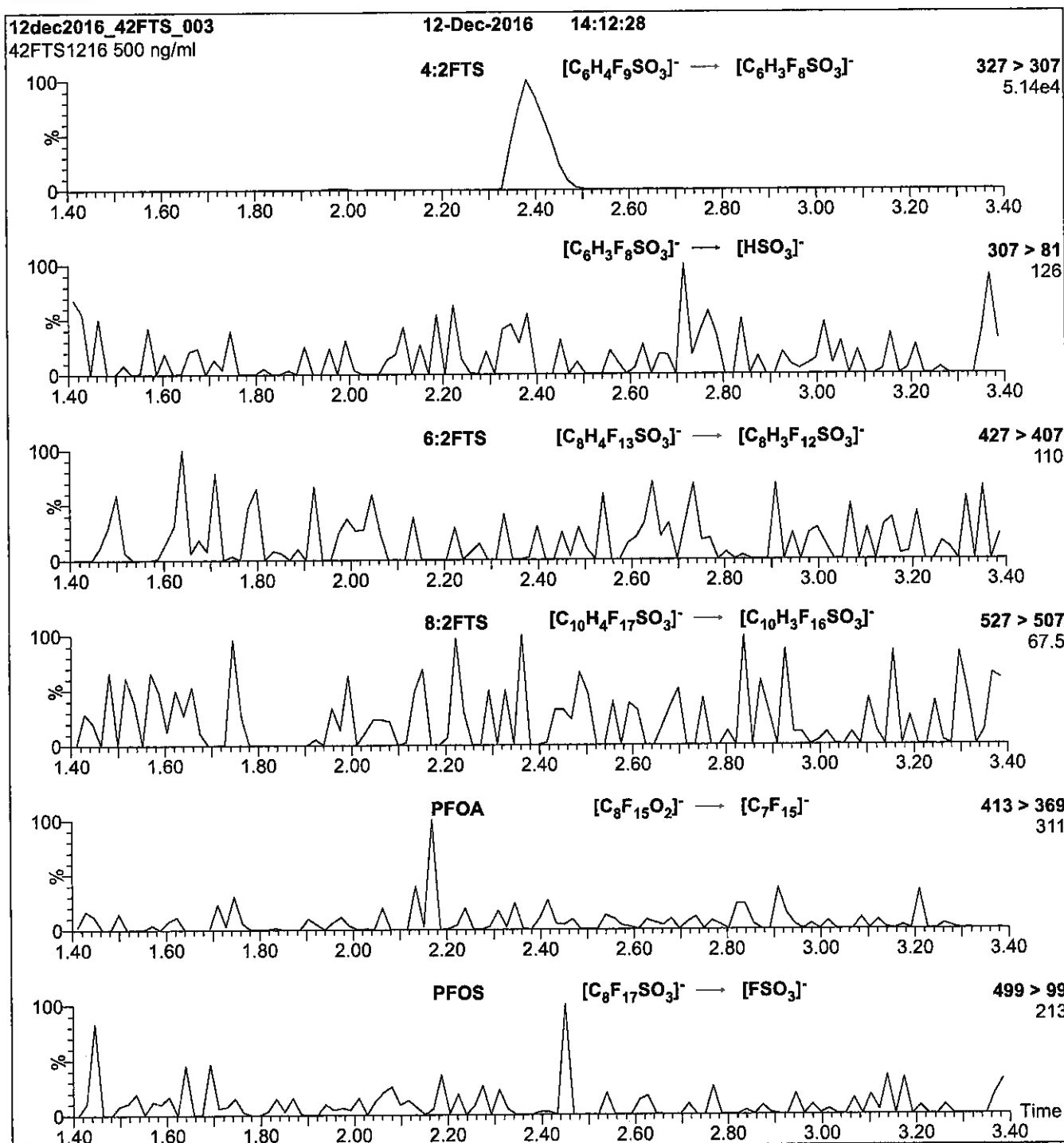
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 25

Reagent

LC6:2FTS_00003

P: 12/29/16 SKV

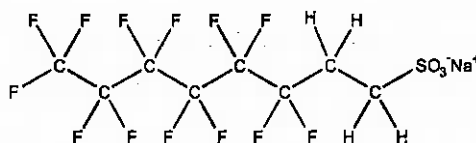


WELLINGTON LABORATORIES

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: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt) **SOLVENT(S):** Methanol
 $47.4 \pm 2.4 \mu\text{g/ml}$ (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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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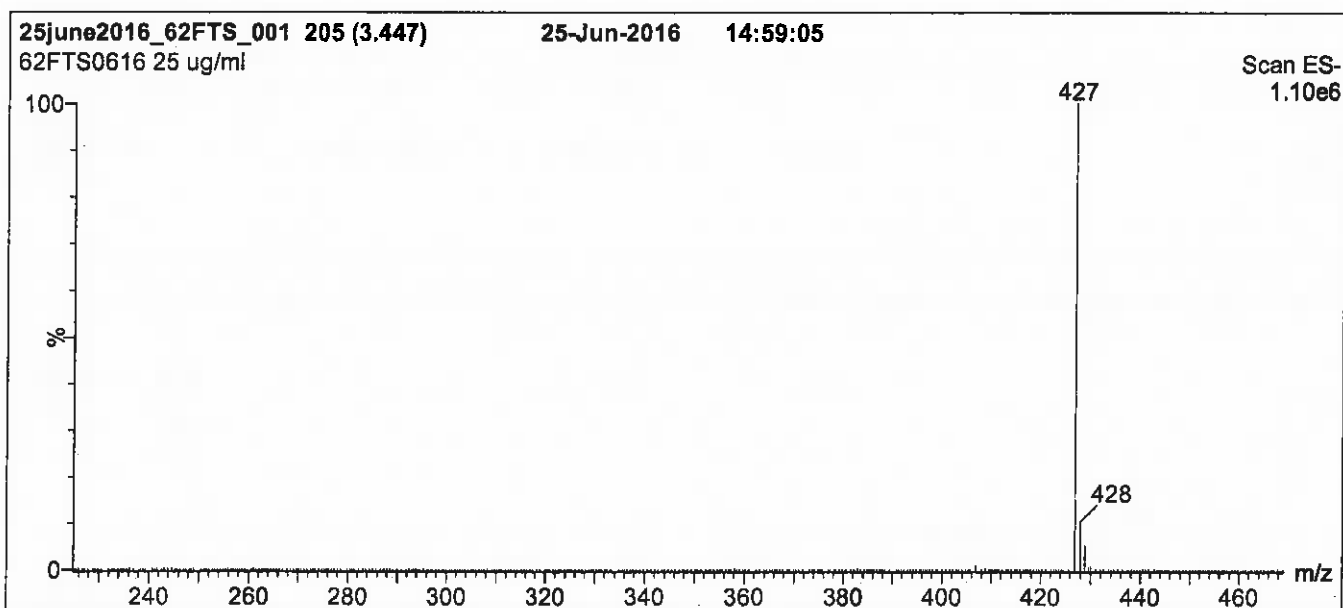
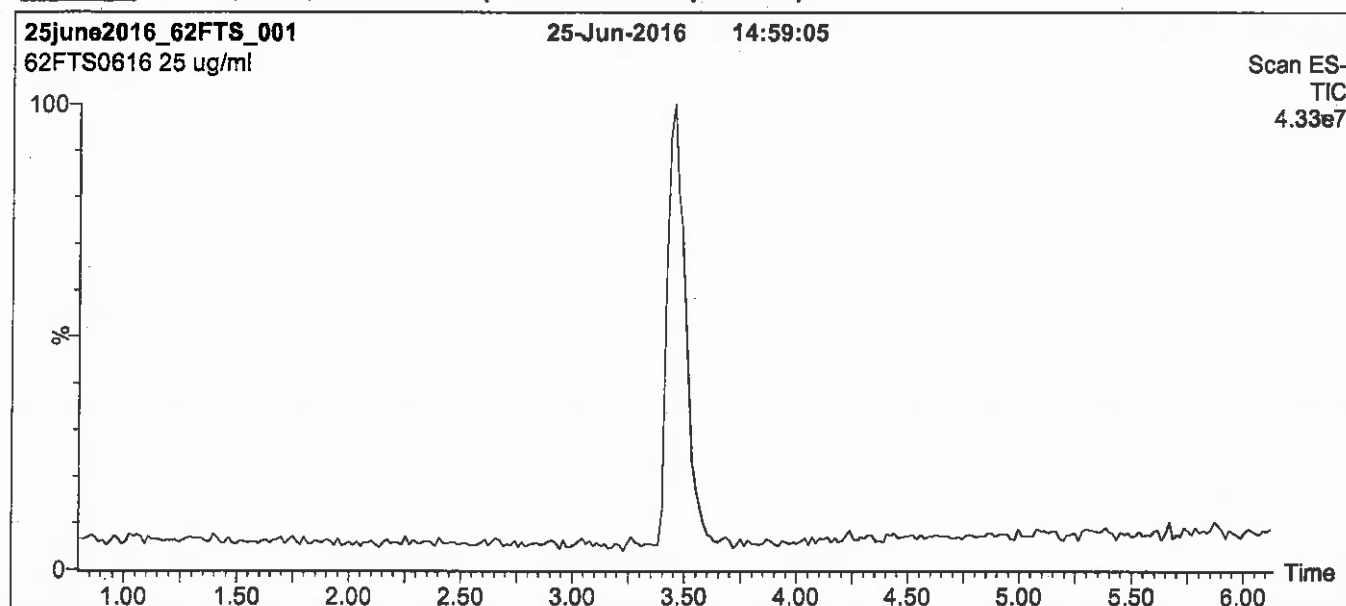
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

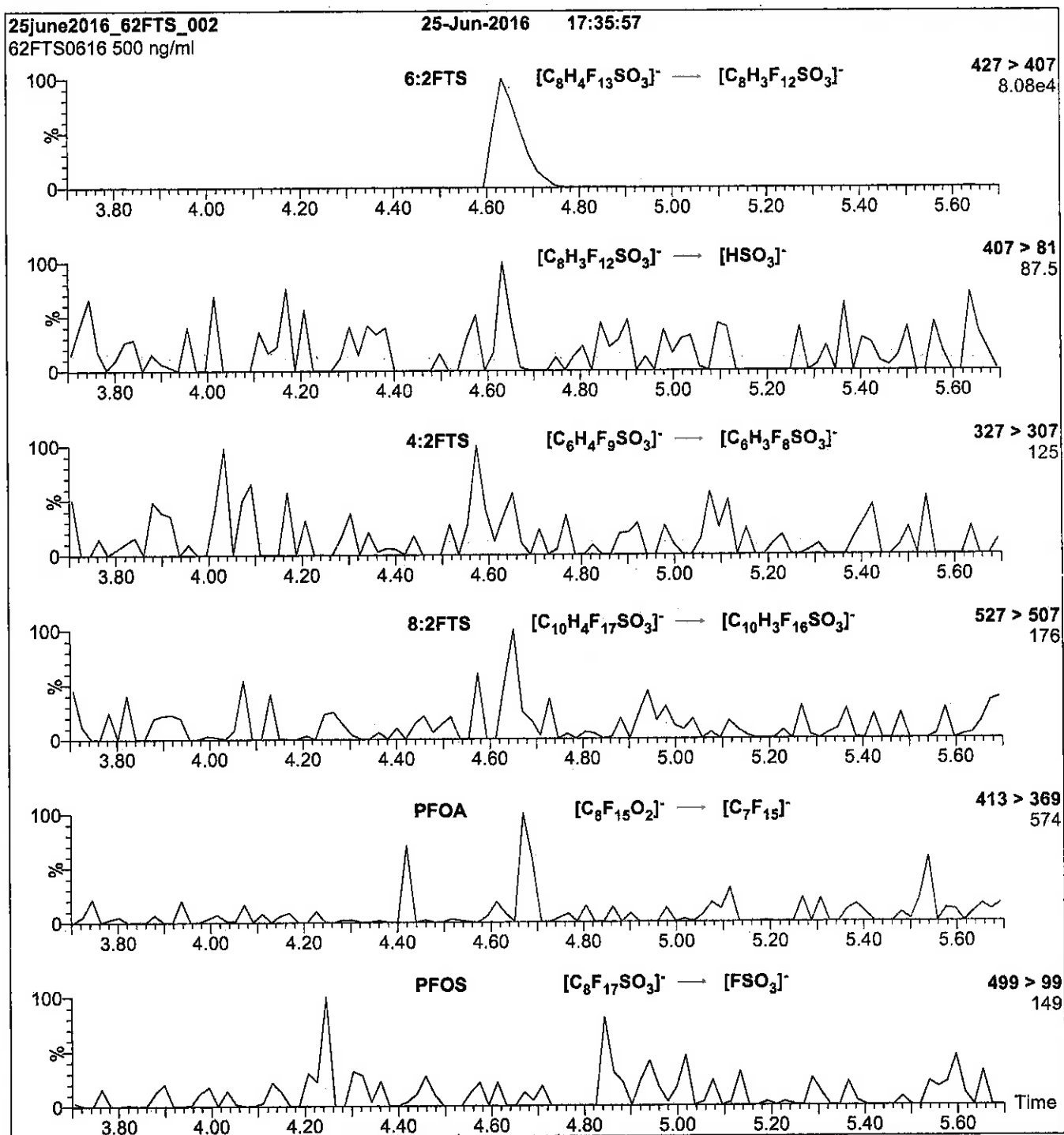
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

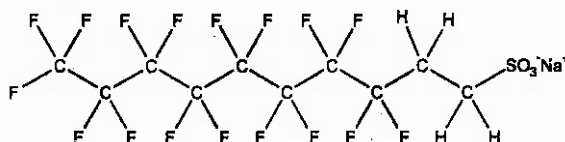
LC8 : 2FTS_00003



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: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt) **SOLVENT(S):** Methanol
 $47.9 \pm 2.4 \mu\text{g/ml}$ (8:2FTS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 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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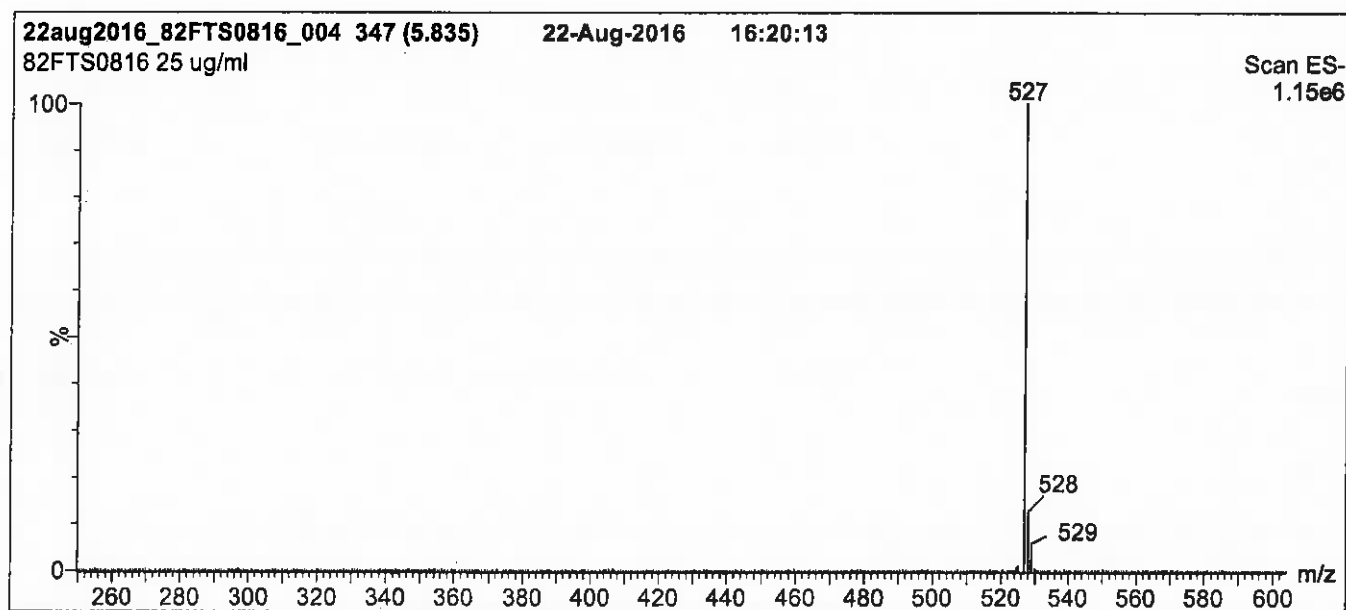
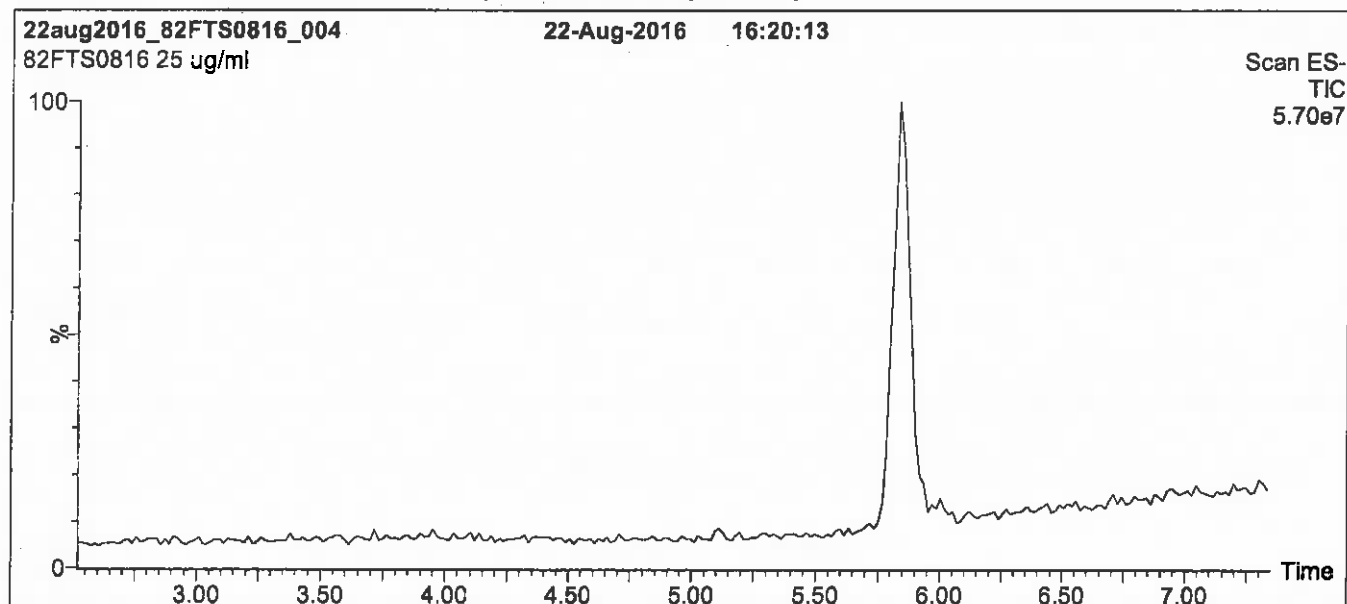
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

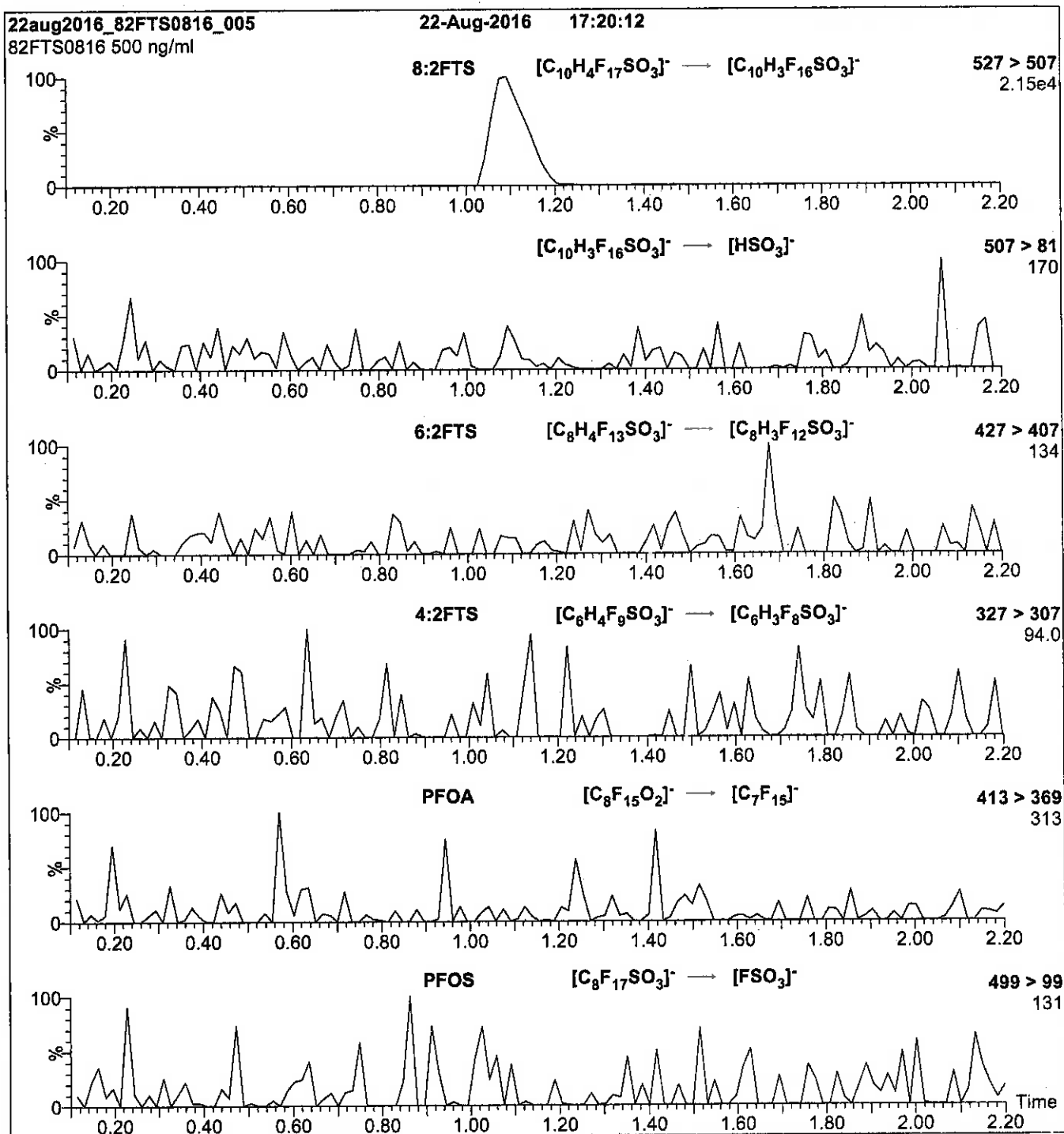
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml 8:2FTS)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 30

Reagent

LCd-NEtFOSA-M_00005

R: 3720/17



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d-N-EtFOSA-M

LOT NUMBER:

dNEtFOSA0616M

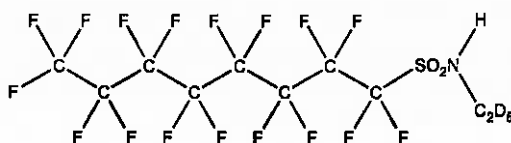
COMPOUND:

N-ethyl-d₅-perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₁₀D₅HF₁₇NO₂S

MOLECULAR WEIGHT:

532.23

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥98% ²H₅

LAST TESTED: (mm/dd/yyyy)

06/10/2016

EXPIRY DATE: (mm/dd/yyyy)

06/10/2021

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 ~ 0.5% of N-methyl-d₅-perfluoro-1-octanesulfonamide (d-N-MeFOSA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 07/14/2016

(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:

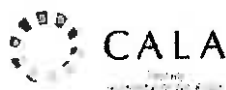
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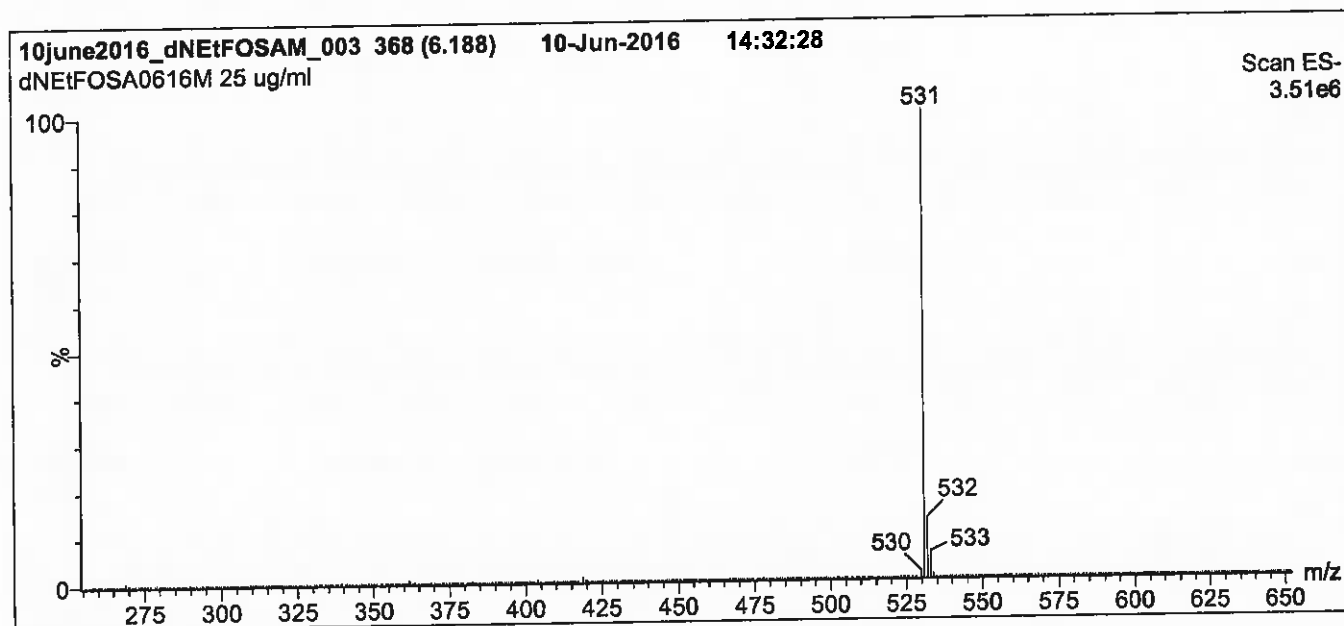
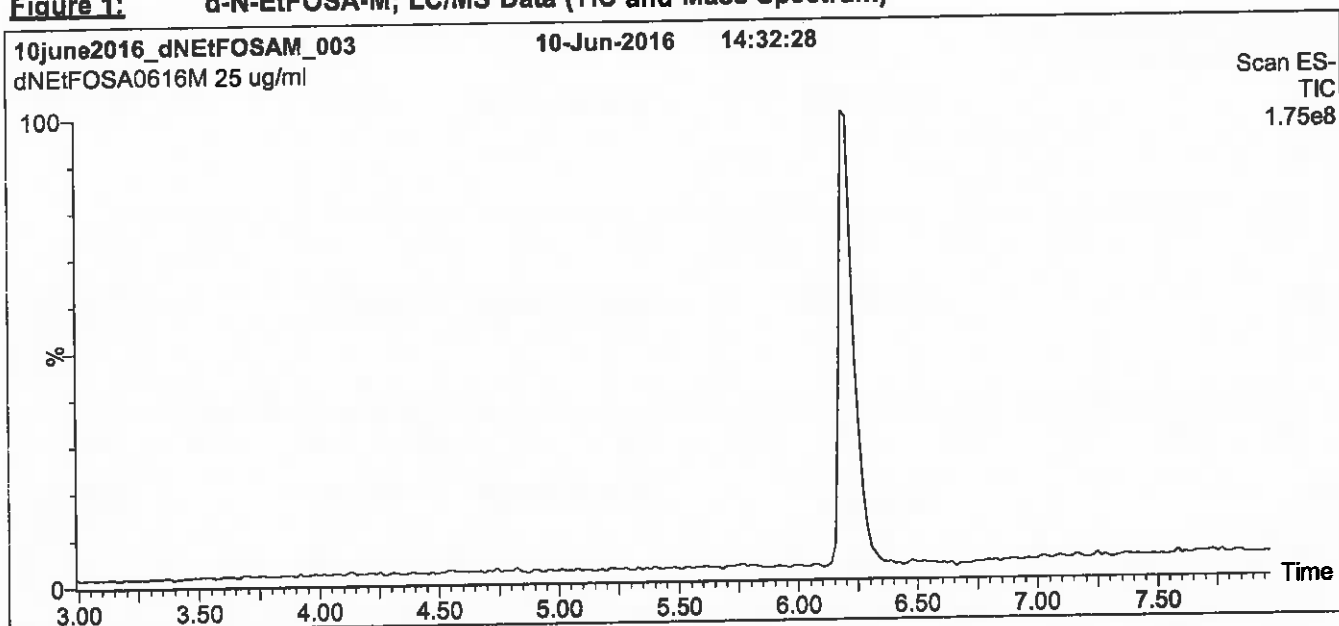
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Figure 1: d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

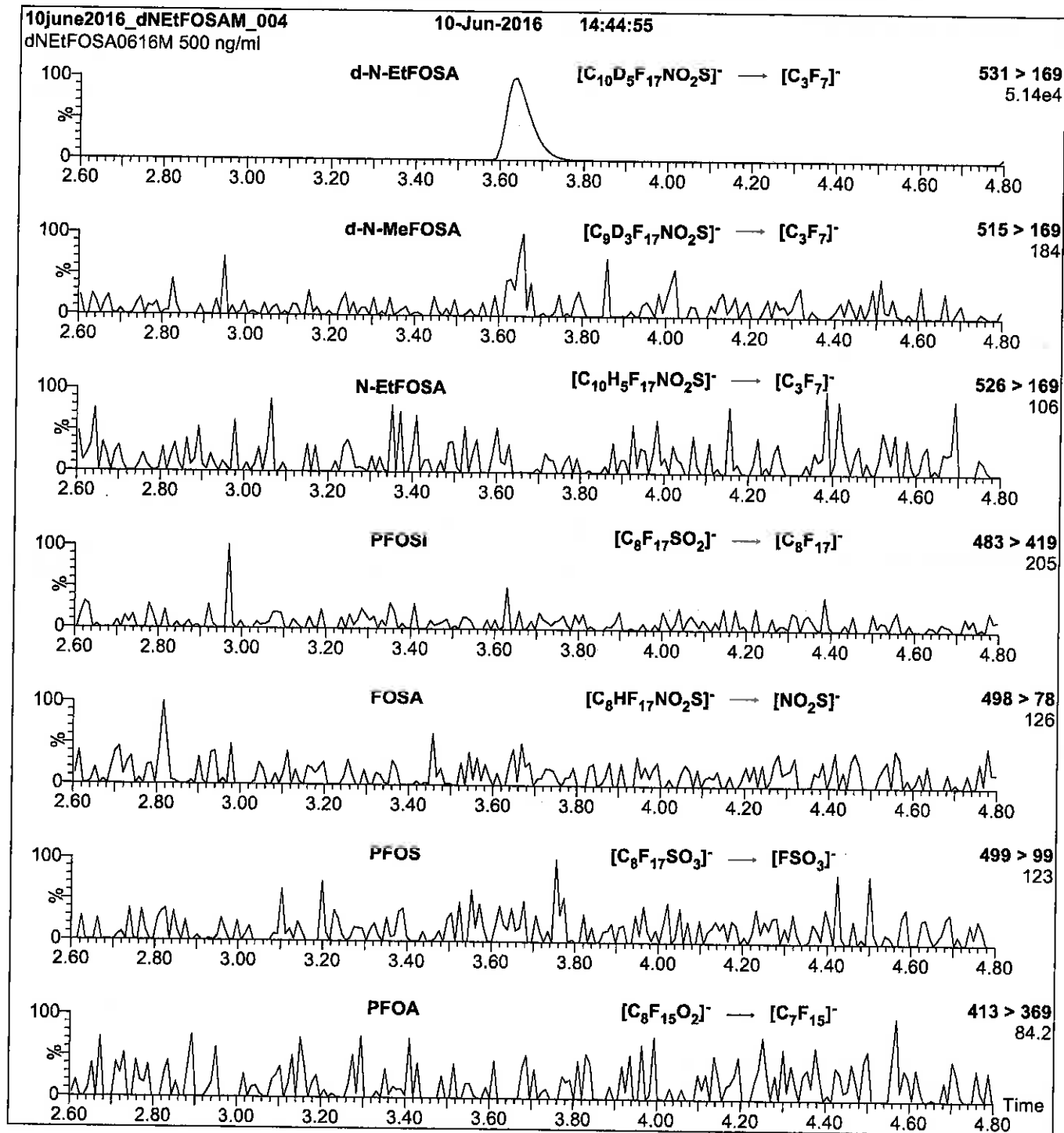
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml d-N-EtFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00004



WELLINGTON LABORATORIES

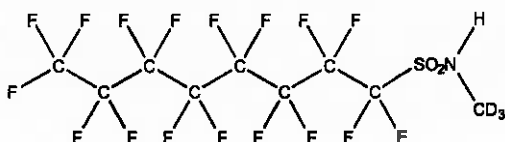
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-MeFOSA-M
COMPOUND: N-methyl-d₃-perfluoro-1-octanesulfonamide

LOT NUMBER: dNMeFOSA0616M

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₈D₃HF₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/10/2016
EXPIRY DATE: (mm/dd/yyyy) 06/10/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 516.19
SOLVENT(S): Methanol
ISOTOPIC PURITY: ≥98% ²H₃

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 06/16/2016

(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

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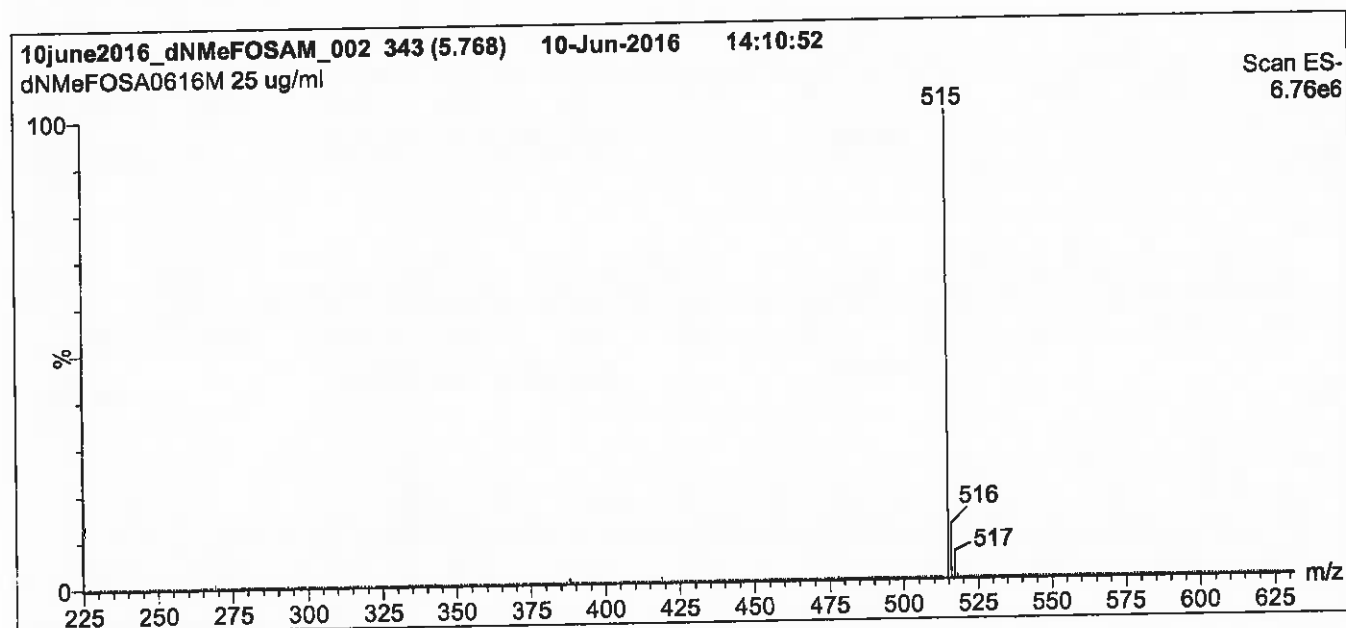
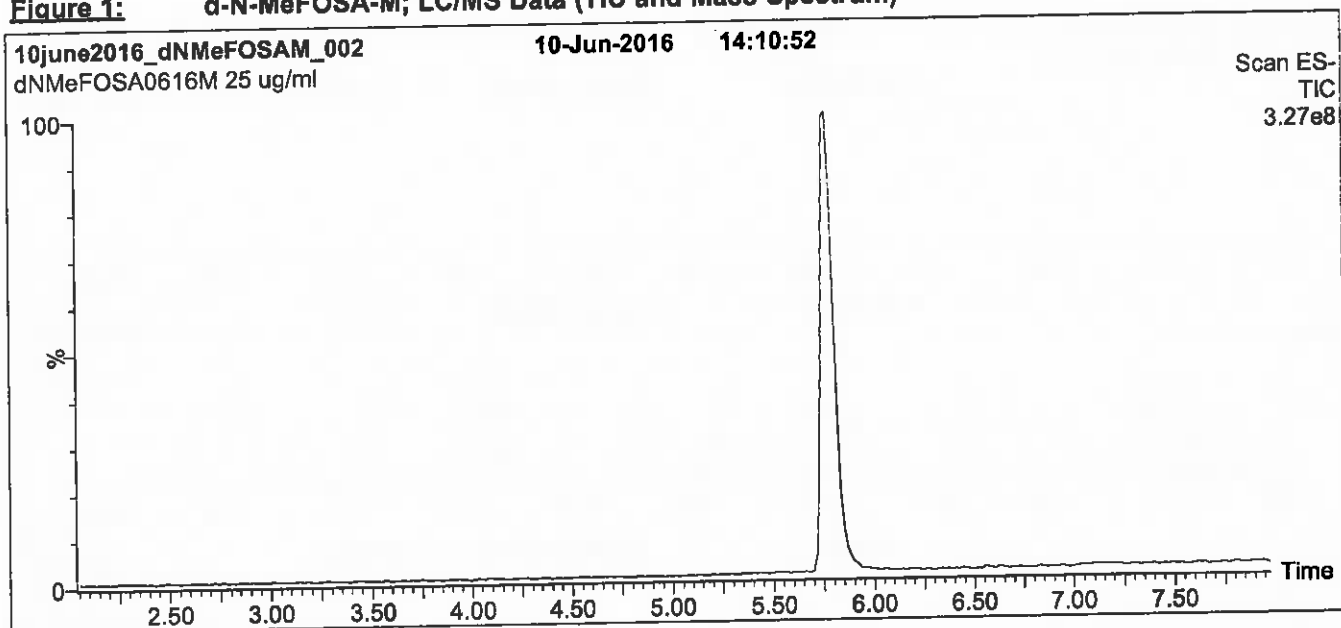
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Conditions for Figure 1:

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

Chromatographic Conditions

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

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

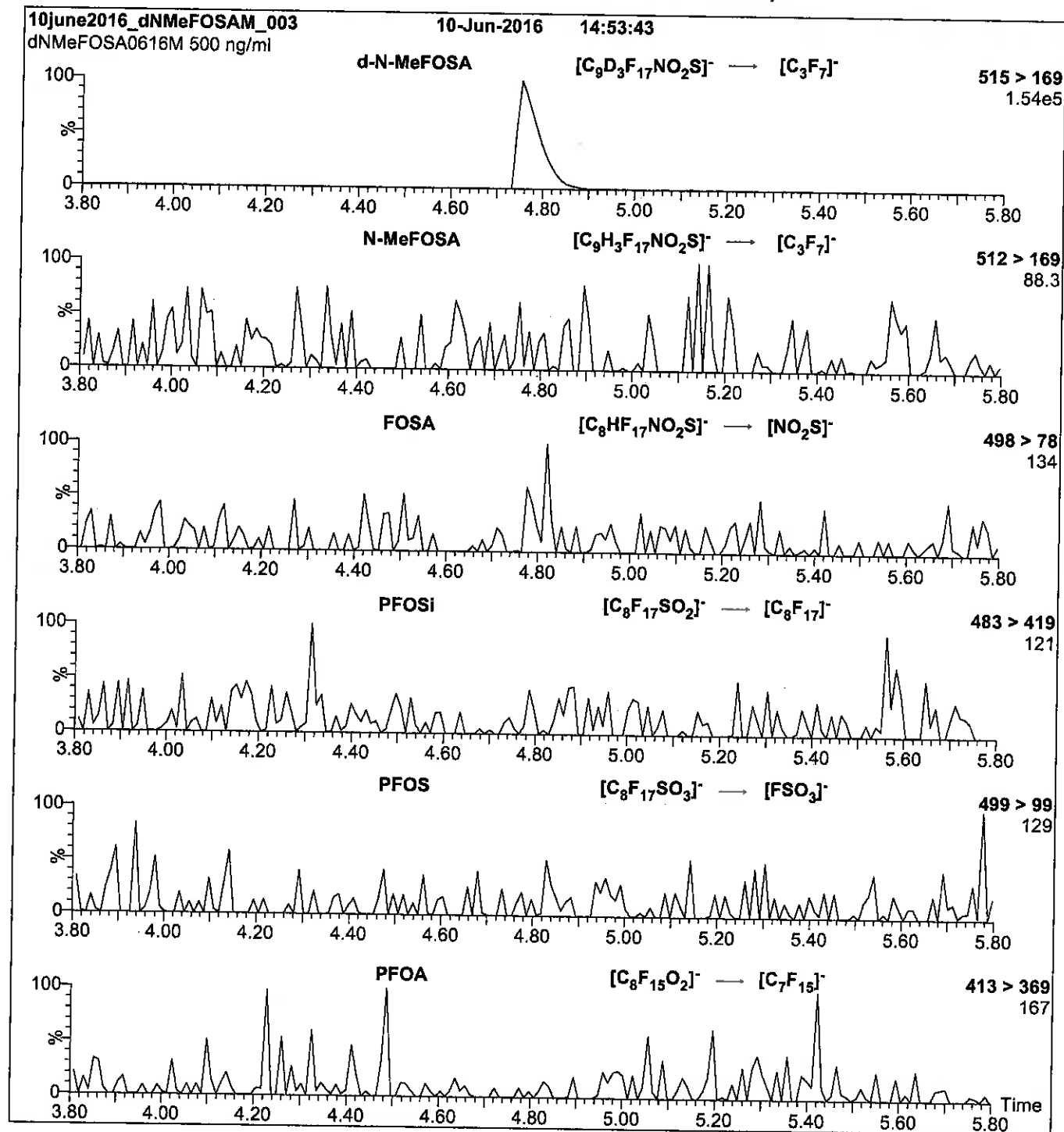
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml d-N-MeFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00004

3: 3/20/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d3-N-MeFOSAA

LOT NUMBER:

d3NMeFOSAA1116

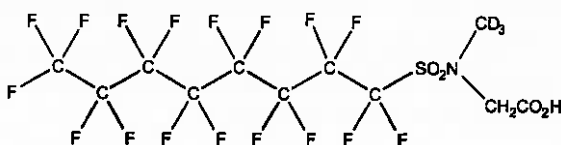
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₁₁D₃H₃F₁₇NO₄S

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

574.23

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥98% ²H₃

LAST TESTED: (mm/dd/yyyy)

11/22/2016

EXPIRY DATE: (mm/dd/yyyy)

11/22/2021

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.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/07/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

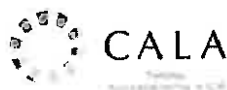
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

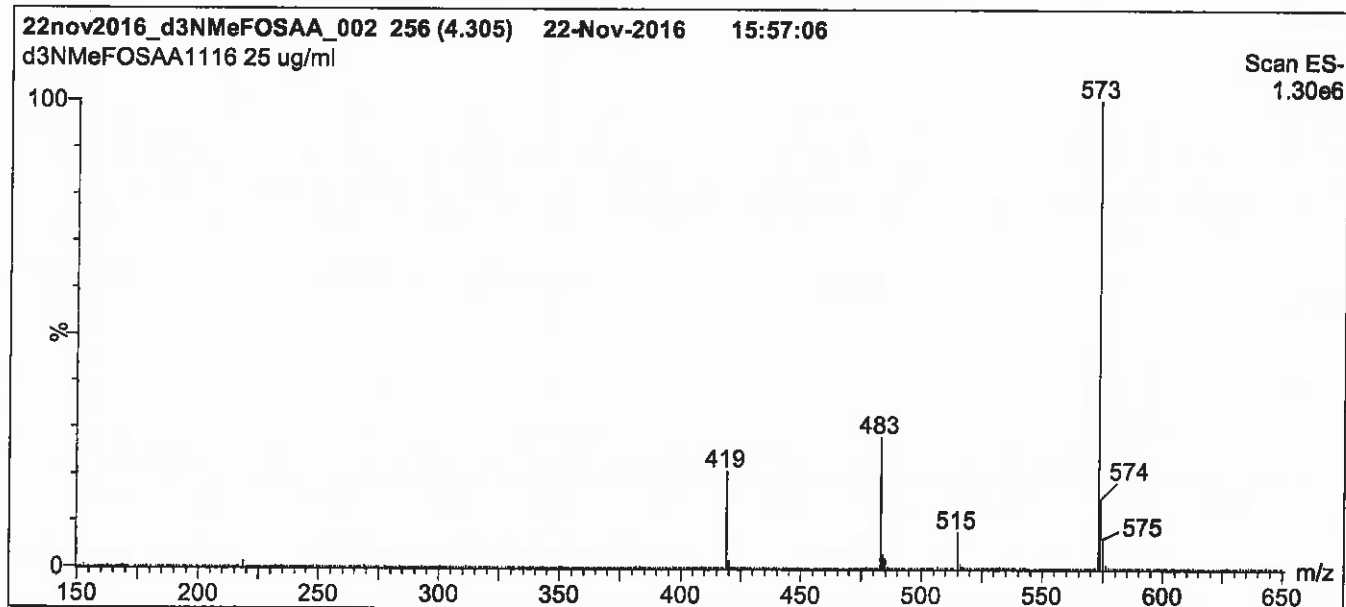
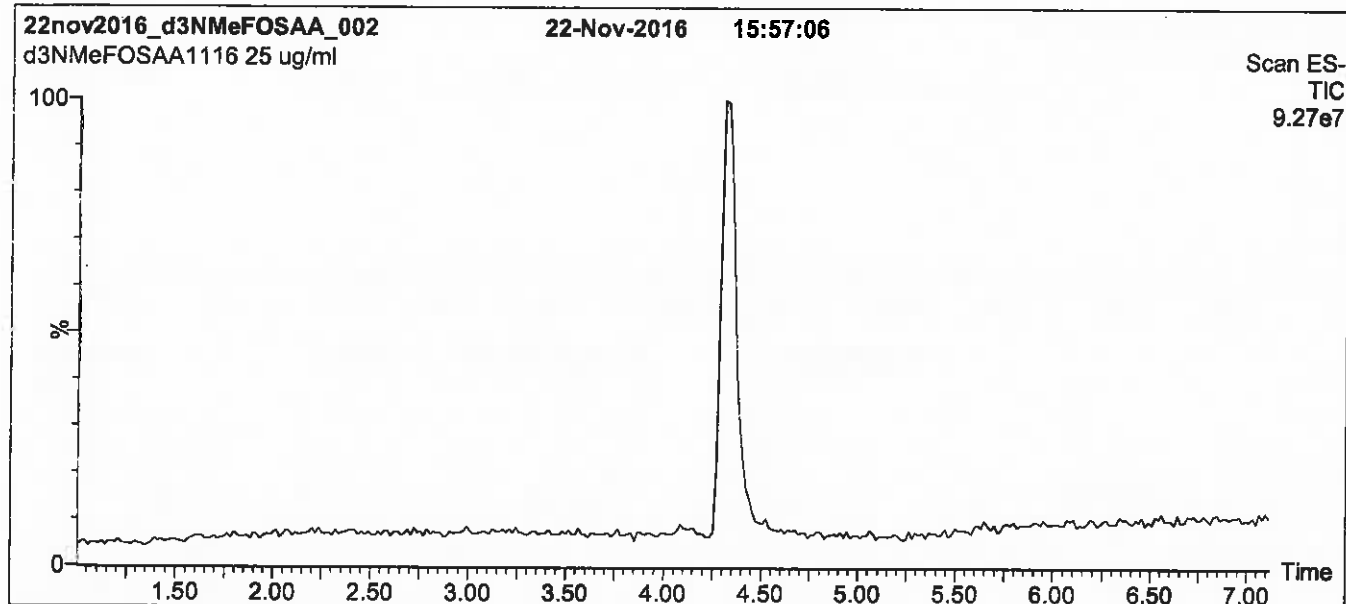
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

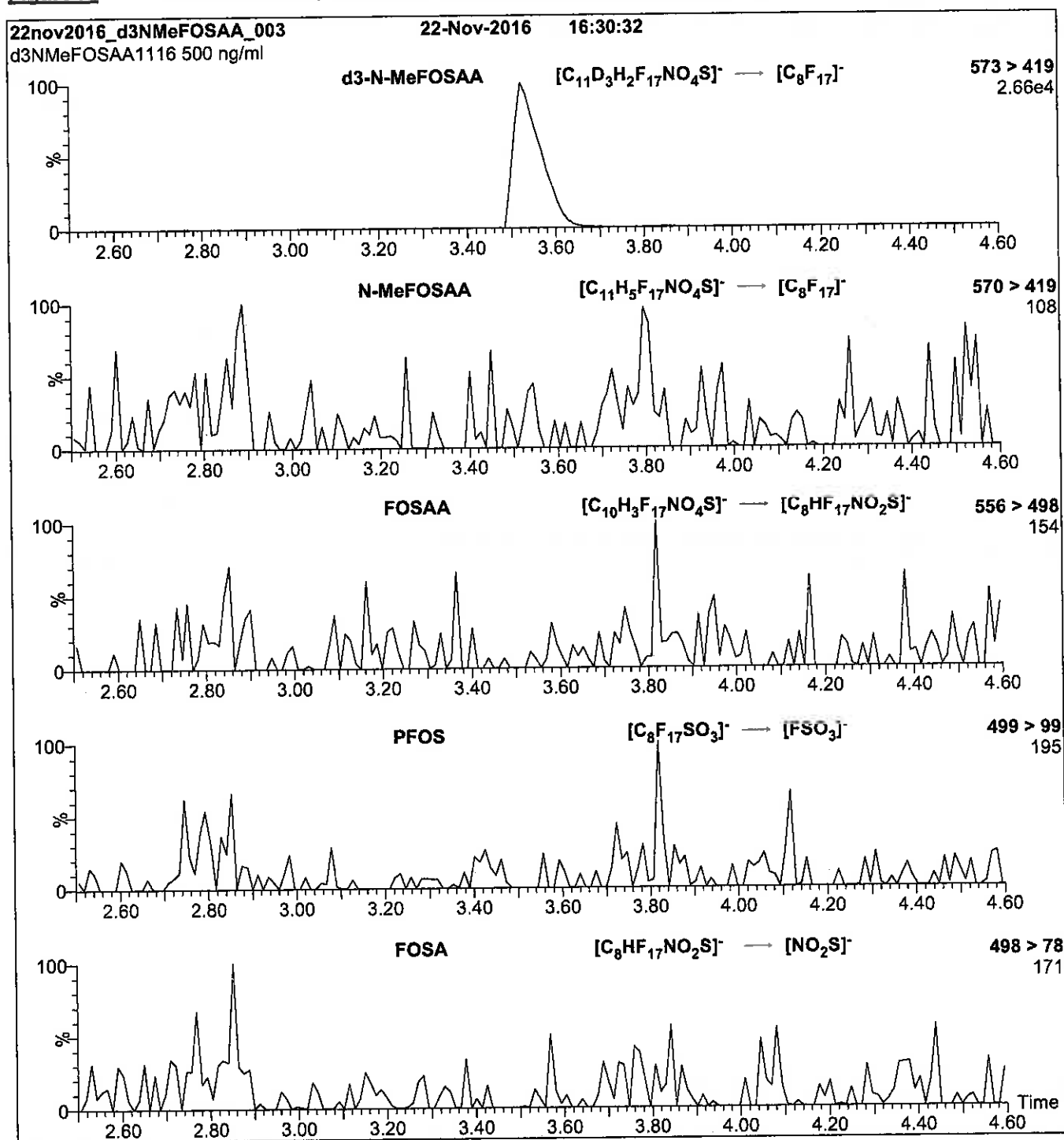
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop Injection
10 μ l (500 ng/ml d3-N-MeFOSAA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd5-NEtFOSAA_00004

P: 3/20/17 SW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d5-N-EtFOSAA

LOT NUMBER:

d5NEtFOSAA1116

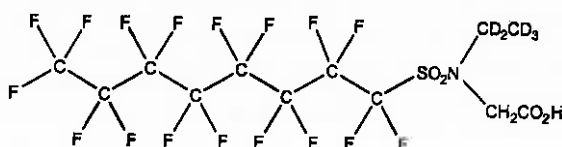
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₁₂D₆H₃F₁₇NO₄S

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

590.26

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%)

LAST TESTED: (mm/dd/yyyy)

11/22/2016

EXPIRY DATE: (mm/dd/yyyy)

11/22/2021

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.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/01/2016
(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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UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

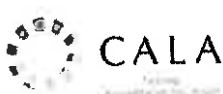
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

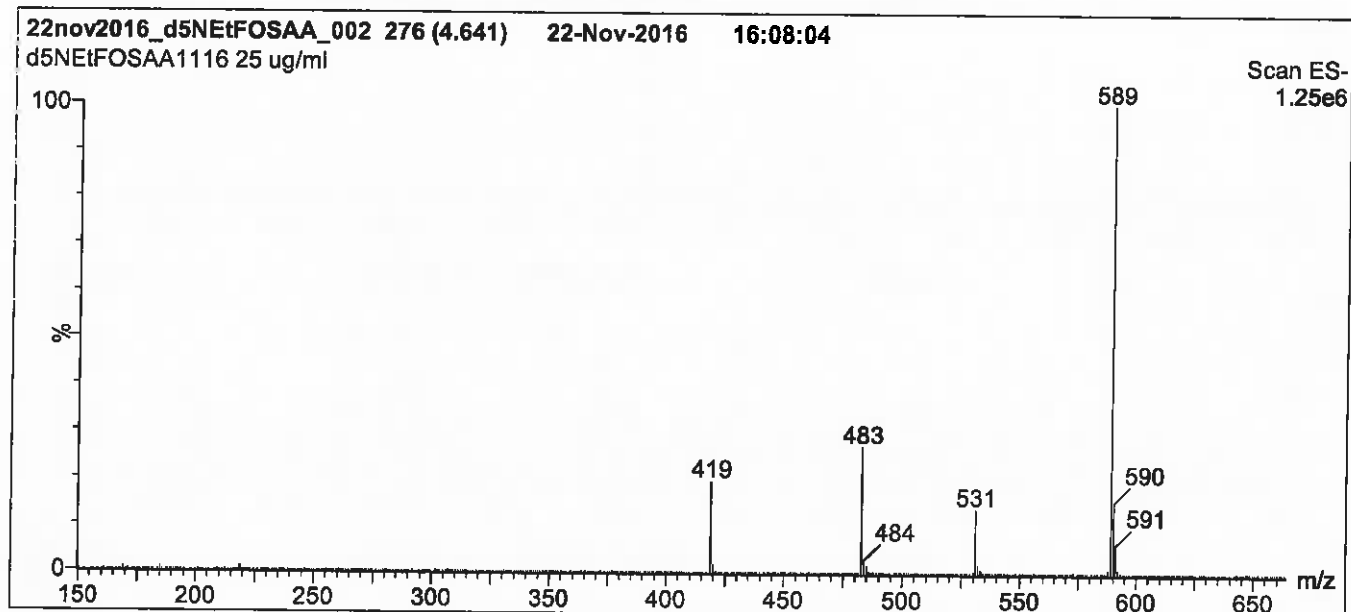
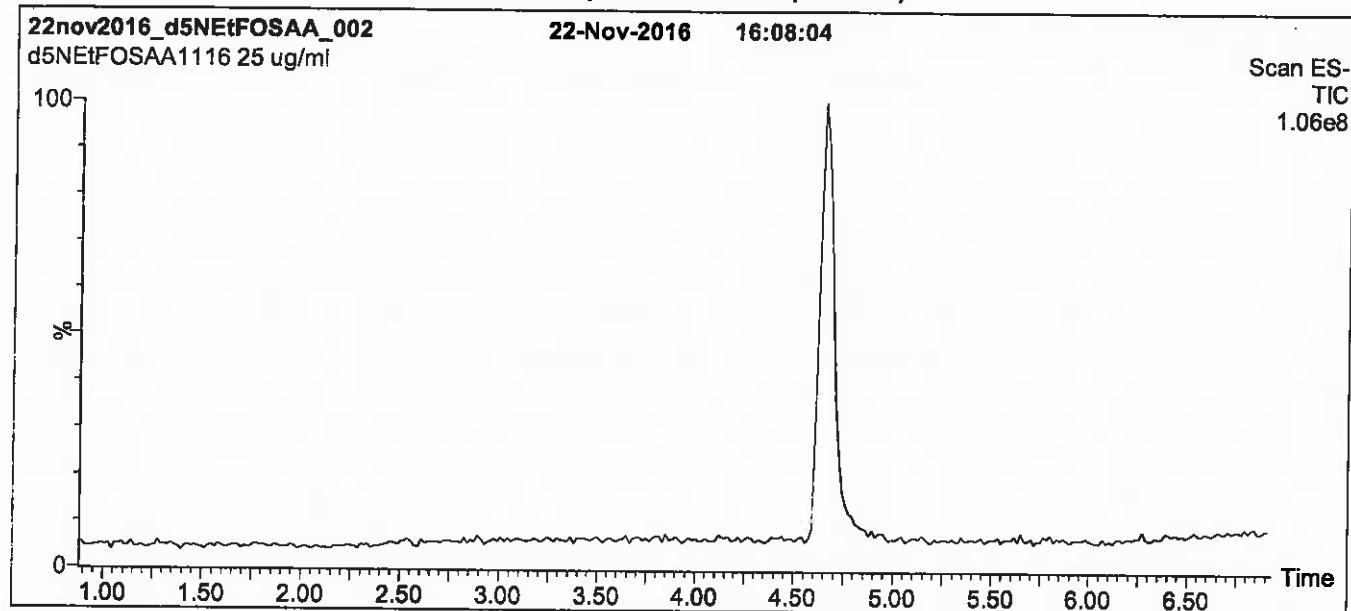
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

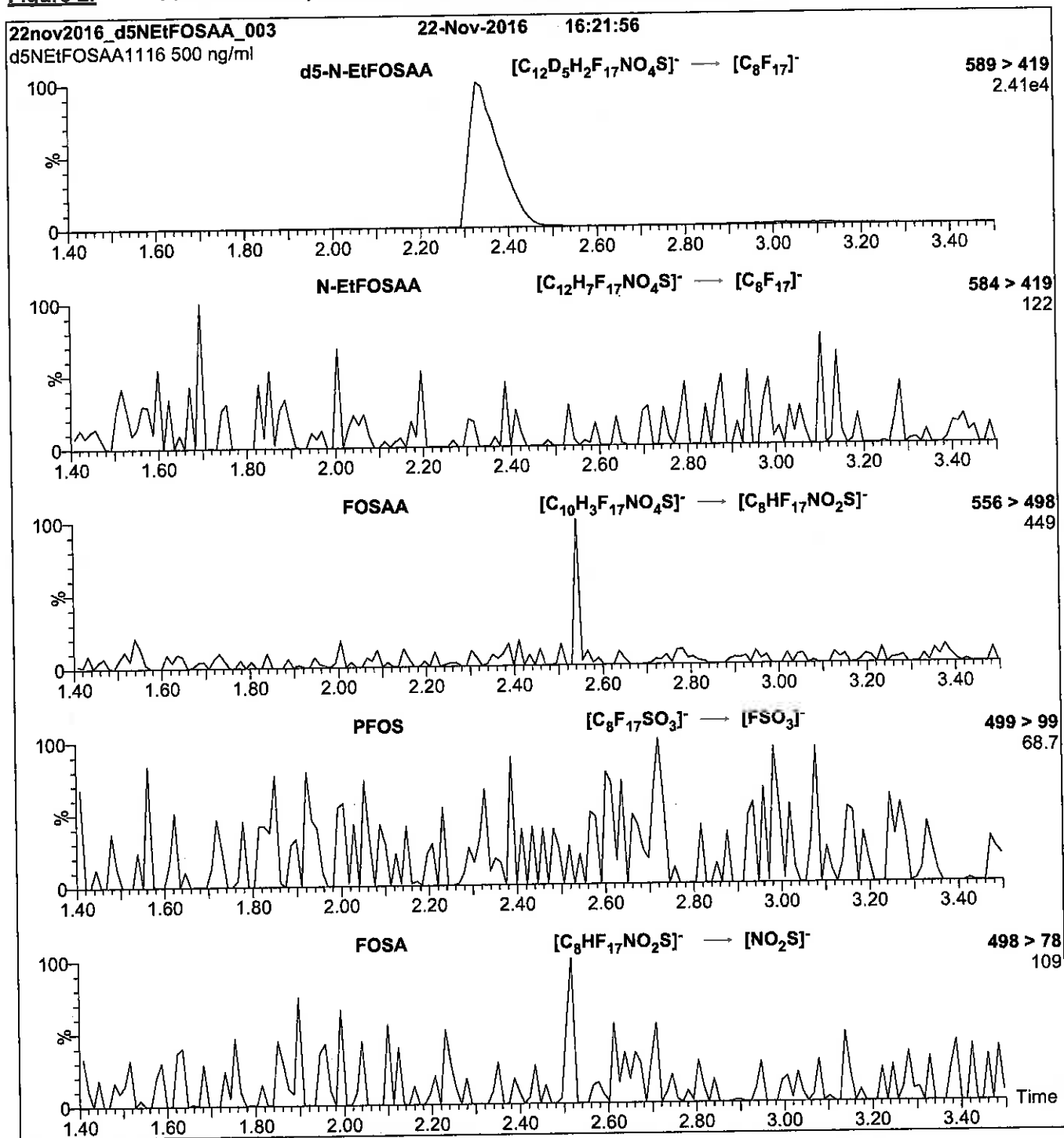
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = $3.43e-3$

Collision Energy (eV) = 20

Reagent

LCM2-6:FTS_00004

03/20/17 SKV

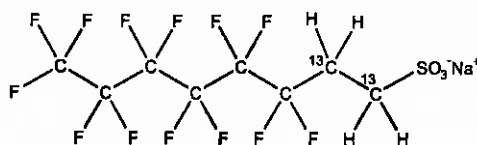


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0217
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]octane sulfonate

STRUCTURE: **CAS #:** Not available



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

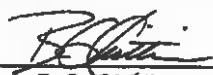
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

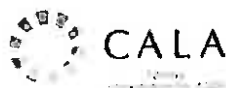
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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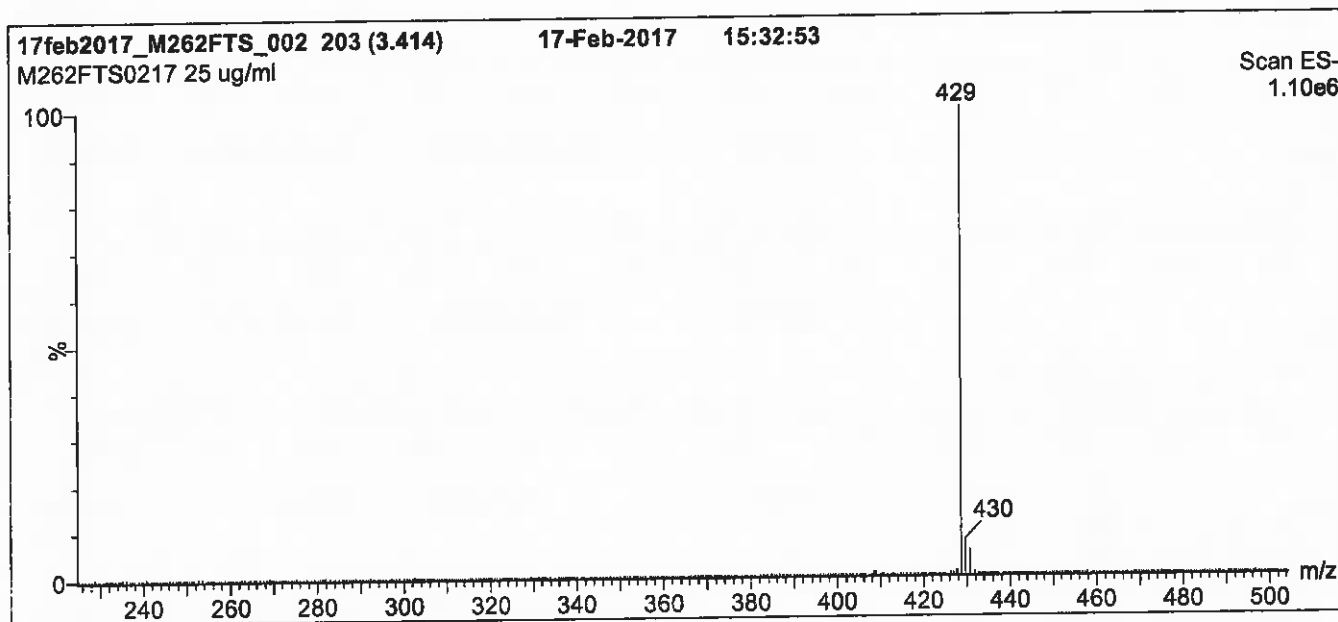
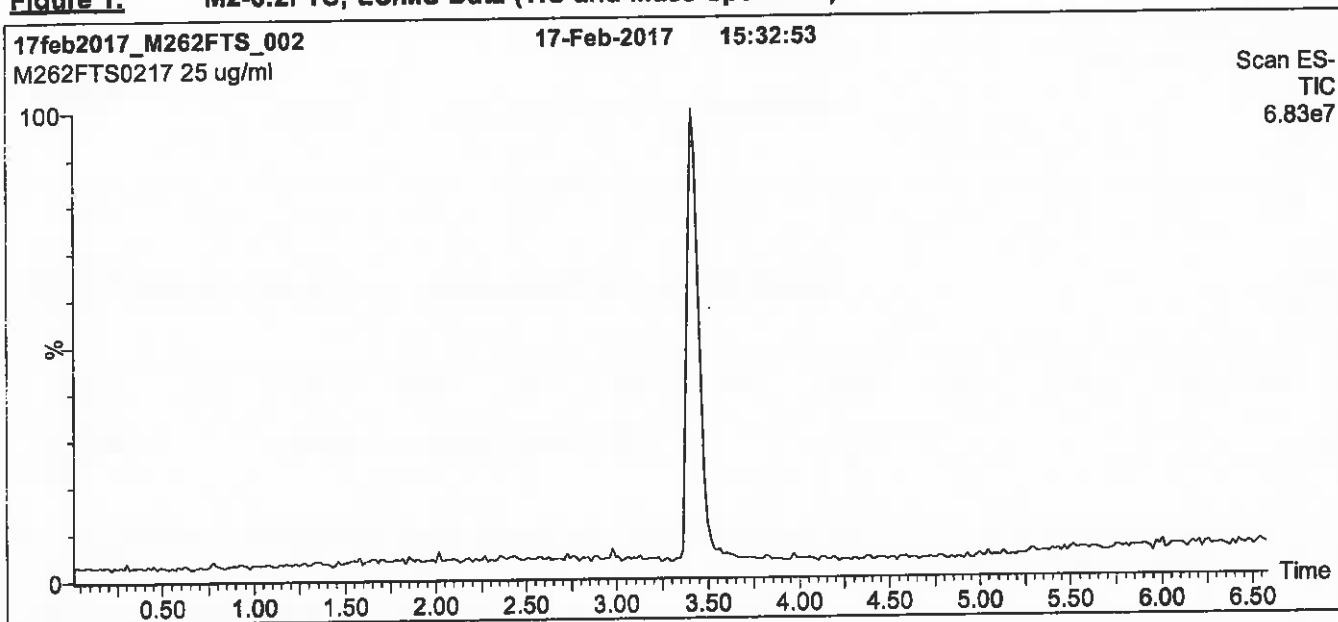
QUALITY MANAGEMENT:

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



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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 RP₁₈,
1.7 μ m, 2.1 x 100 mm

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

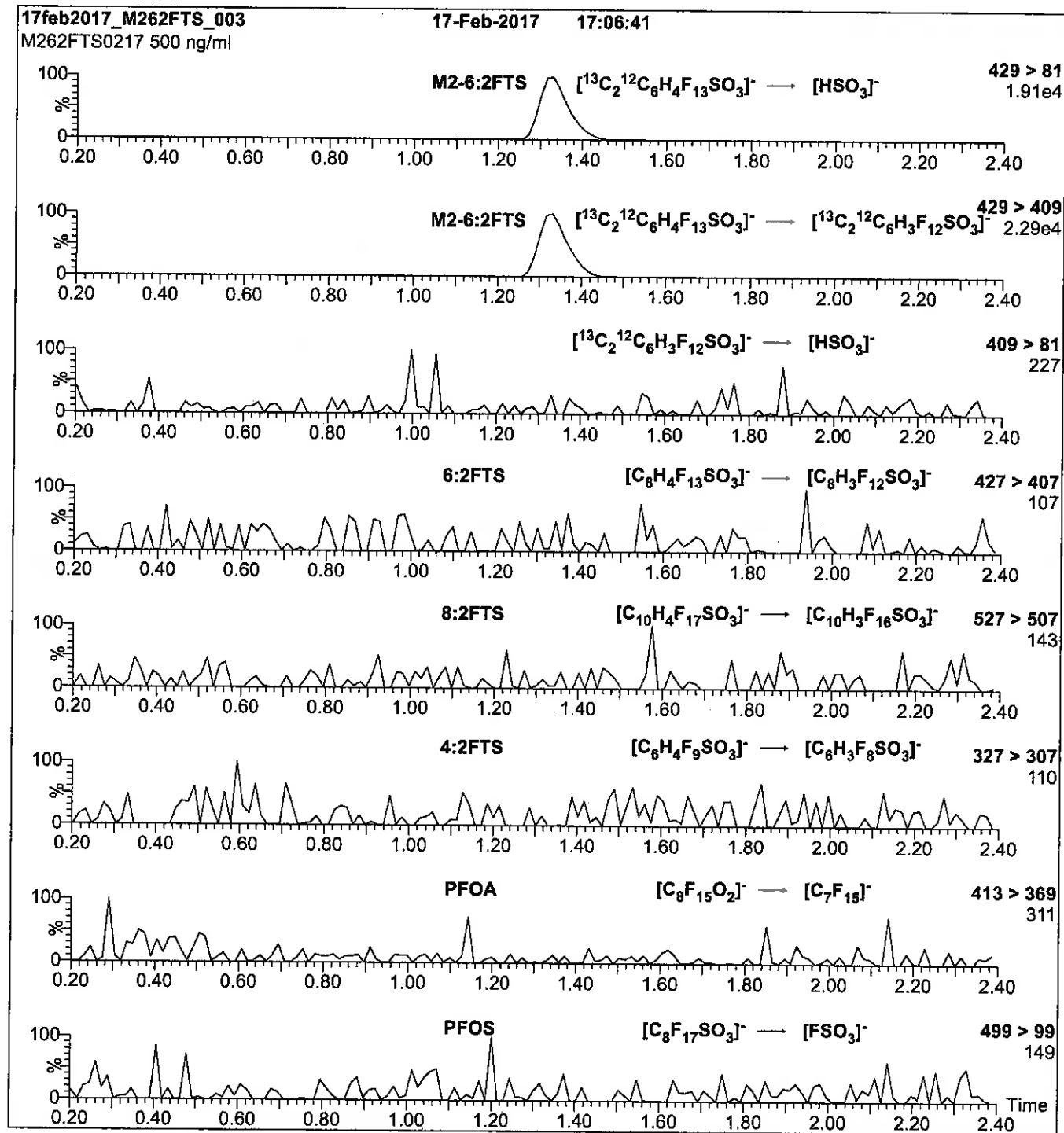
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM2-8 : 2FTS_00004

r: 3/2017 sev

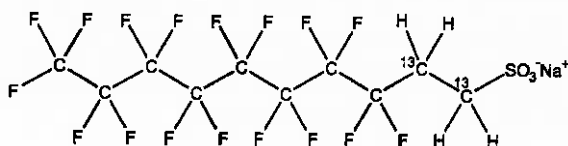


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0816
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈H₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 552.15
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 47.9 ± 2.4 µg/ml (M2-8:2FTS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 08/22/2016 (1,2-¹³C₂)
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.
- The native 8:2FTS contains 4.22% of ³⁴S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 09/02/2016
(mm/dd/yyyy)

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

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

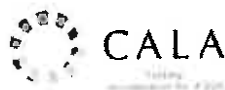
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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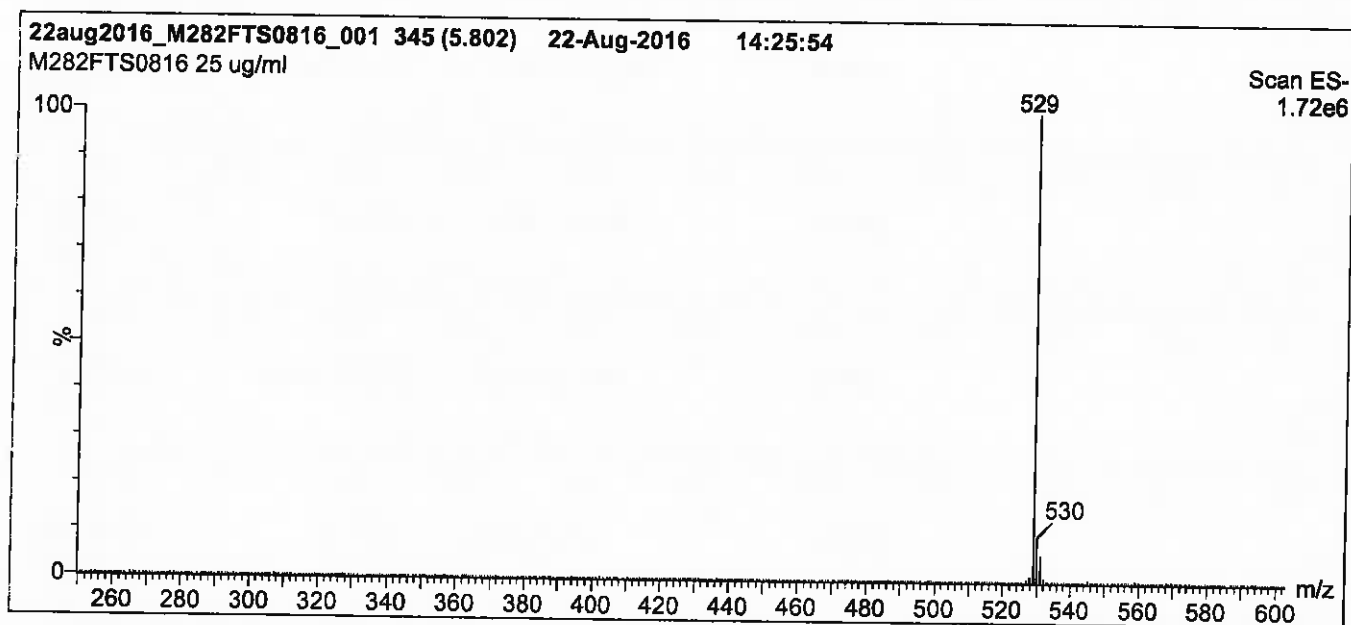
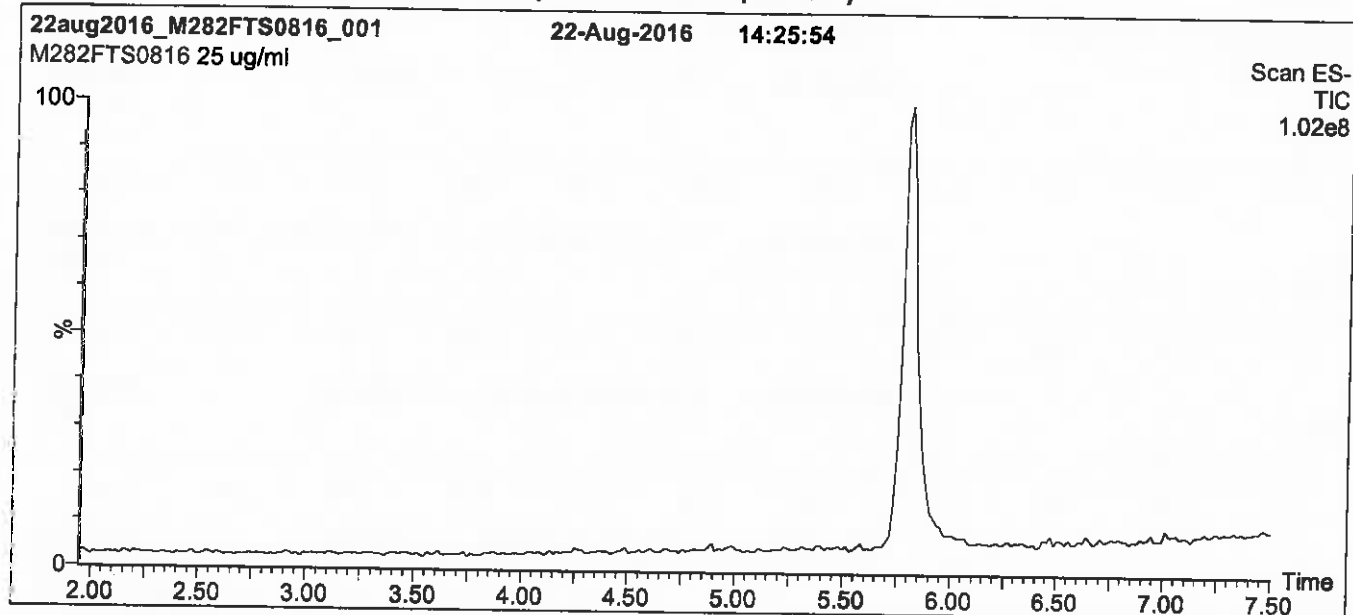
QUALITY MANAGEMENT:

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



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Figure 1: 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: Agilent Zorbax Bonus-RP
1.8 μ m, 2.1 x 100 mm

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

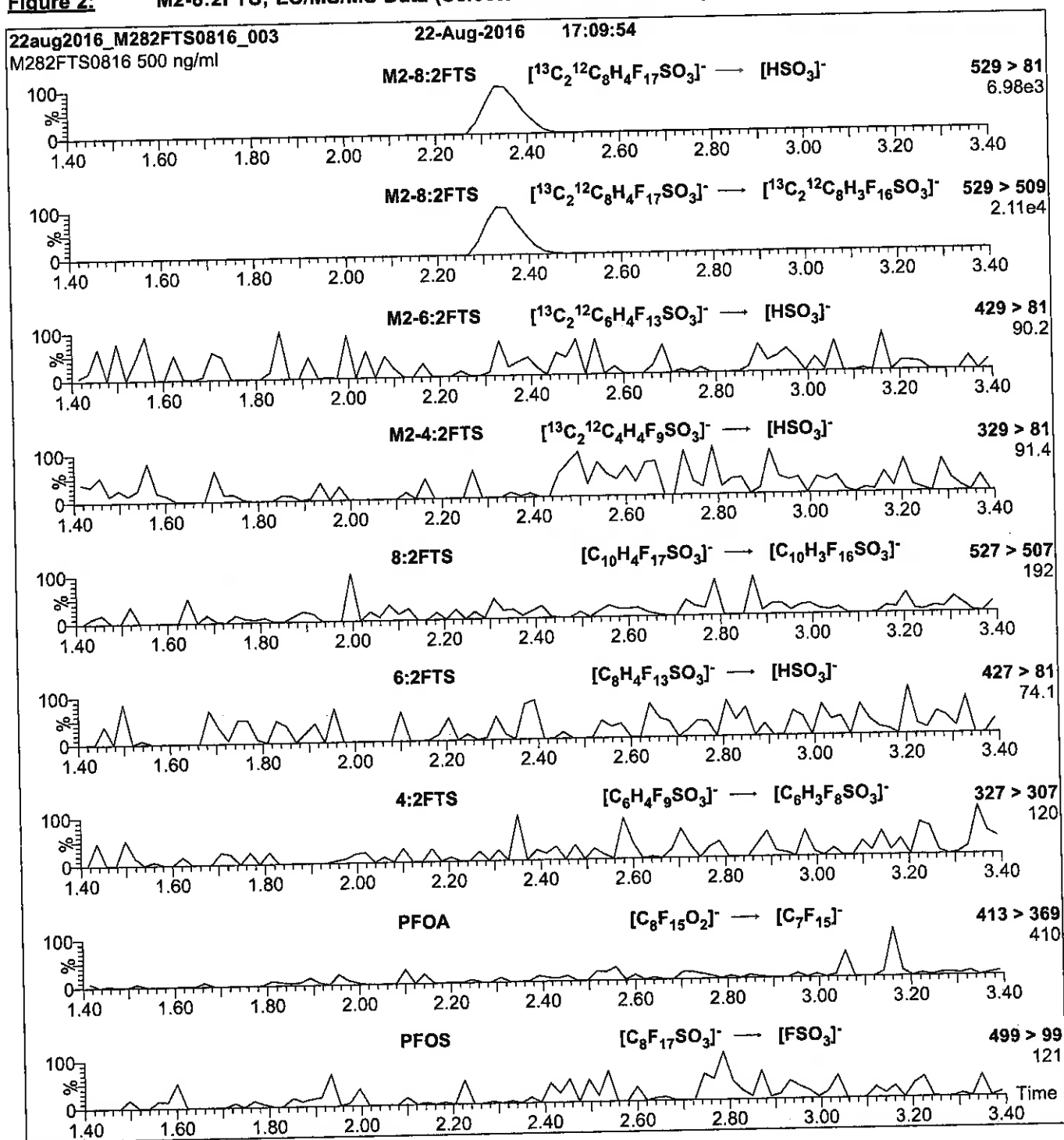
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM2PFHxDA_00009

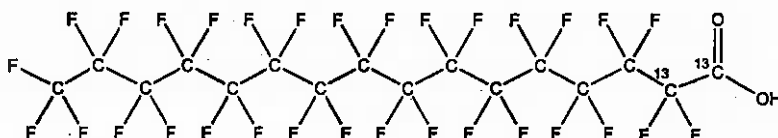


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA **LOT NUMBER:** M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexadecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₄HF₃₁O₂ **MOLECULAR WEIGHT:** 816.11
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
 (1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 01/07/2016
EXPIRY DATE: (mm/dd/yyyy) 01/07/2021
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 native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/11/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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LIMITED WARRANTY:

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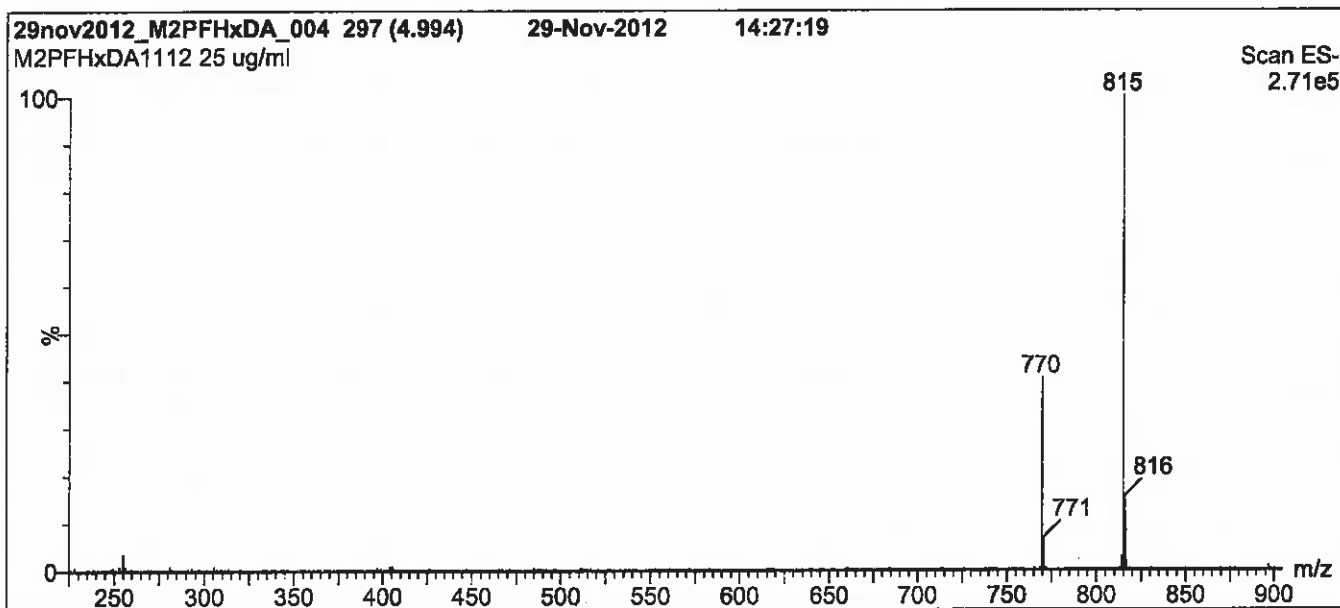
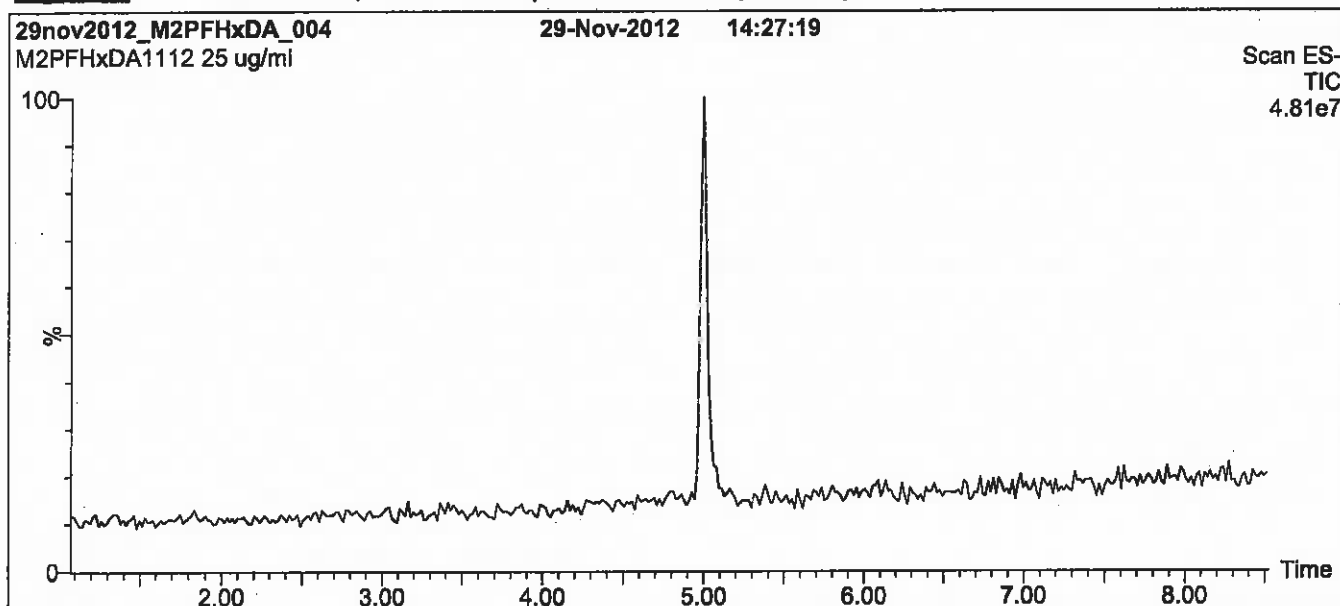
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 100% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

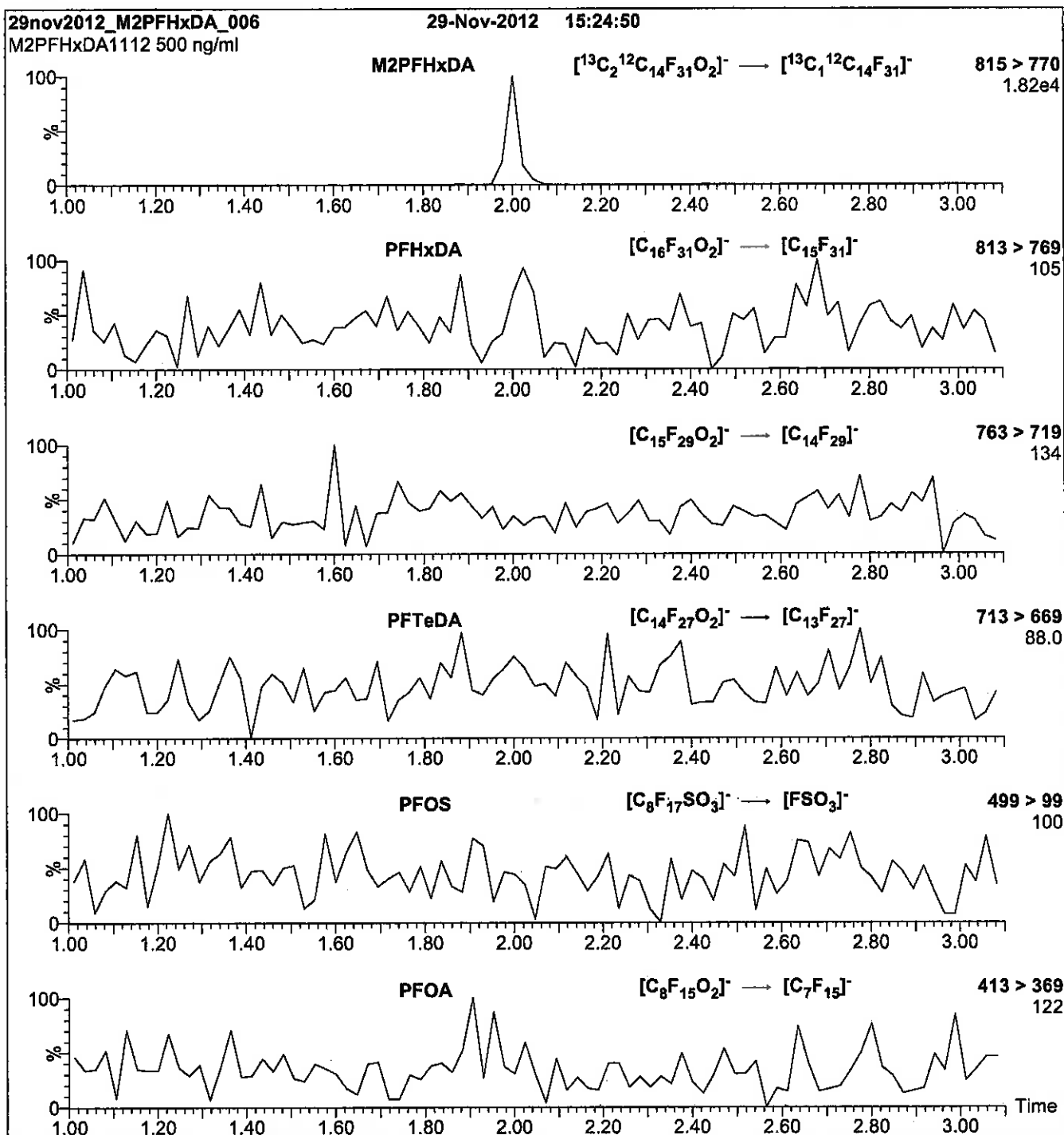
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCM2PFHxDA_00010

n: 5/3/17 SKV

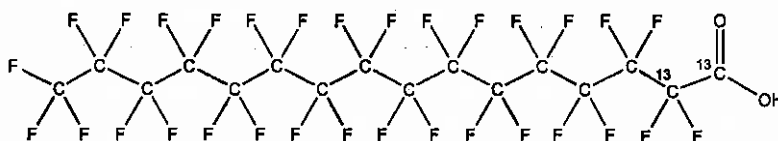


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA **LOT NUMBER:** M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexadecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₁₄ HF ₃₁ O ₂	MOLECULAR WEIGHT:	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2- ¹³ C ₂)
LAST TESTED: (mm/dd/yyyy)	01/07/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/07/2021		
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 native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/11/2016
(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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EXPIRY DATE / PERIOD OF VALIDITY:

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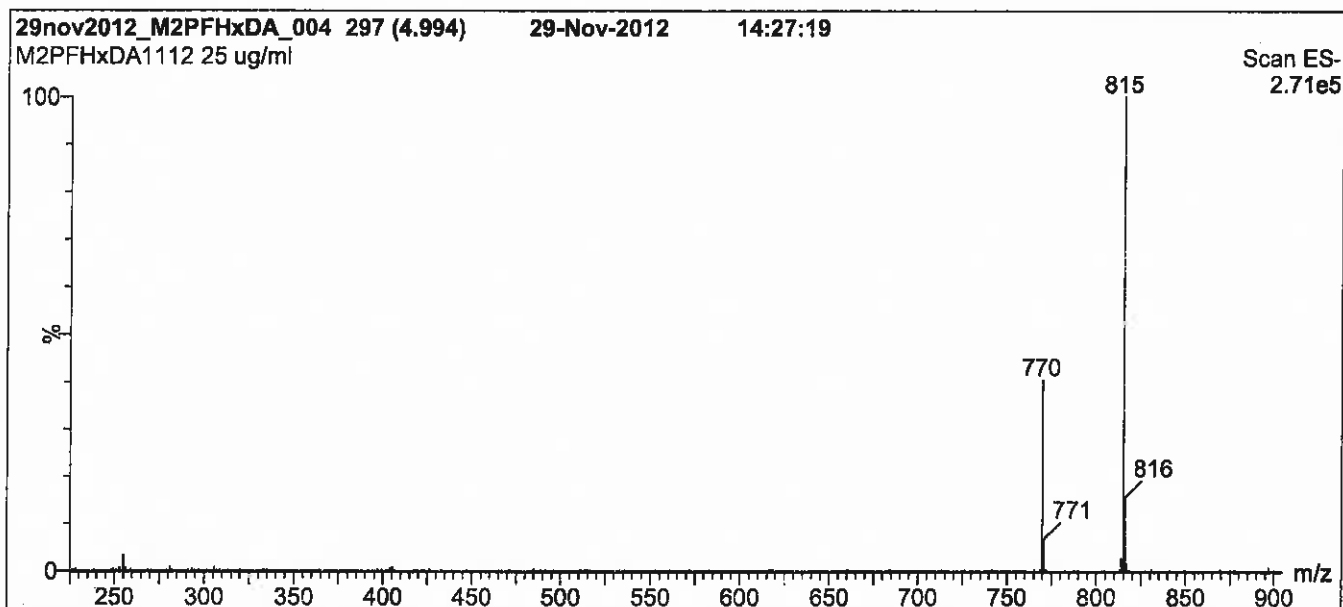
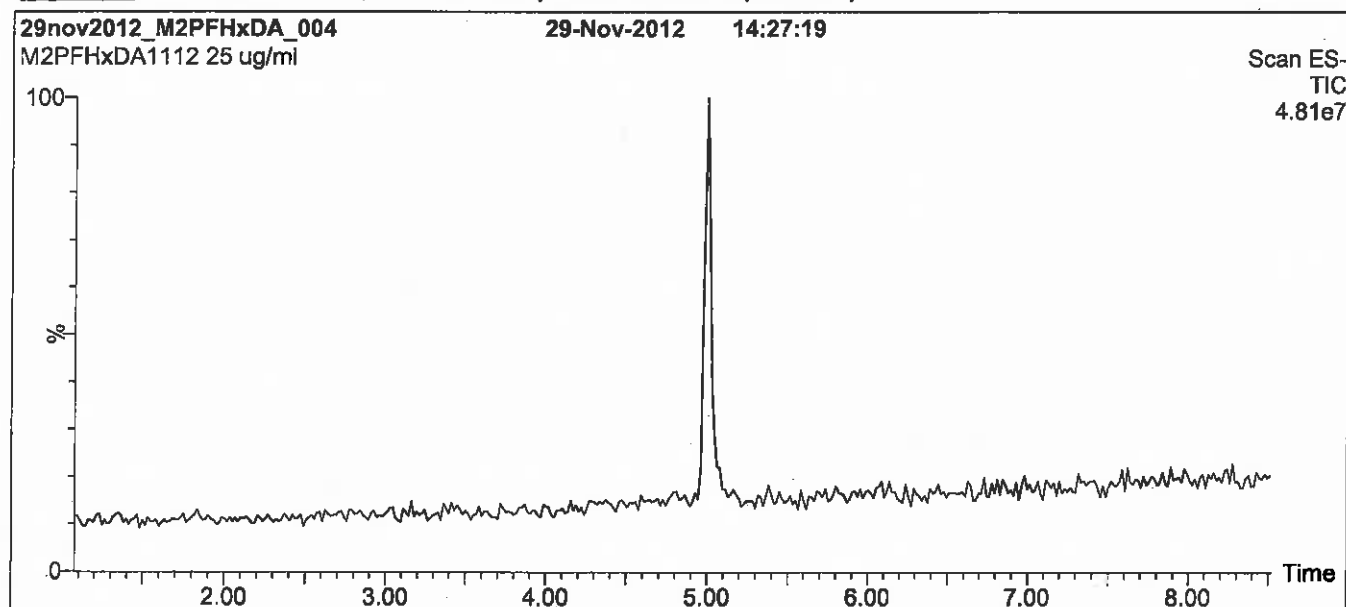
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 100% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

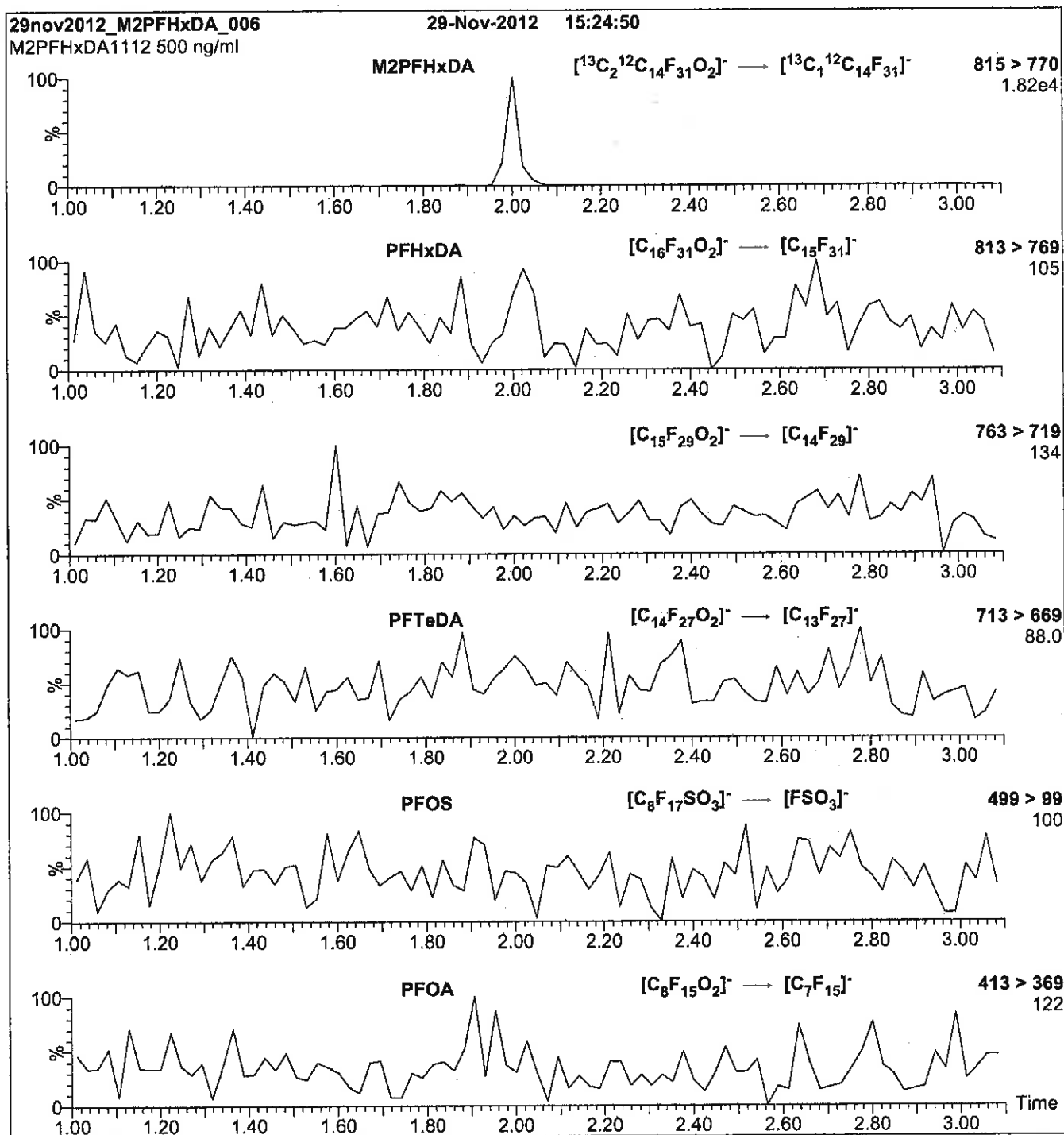
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCM2PFOA_00005



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

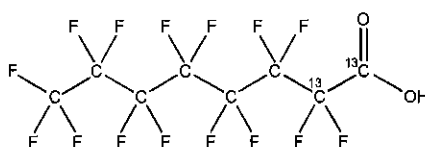
M2PFOA

LOT NUMBER:

M2PFOA0613

COMPOUND:Perfluoro-n-[1,2-¹³C₂]octanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₆H₁₅O₂**MOLECULAR WEIGHT:**

416.05

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C**LAST TESTED:** (mm/dd/yyyy)

06/19/2013

(1,2-¹³C₂)**EXPIRY DATE:** (mm/dd/yyyy)

06/19/2018

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: 07/16/2013

(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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LIMITED WARRANTY:

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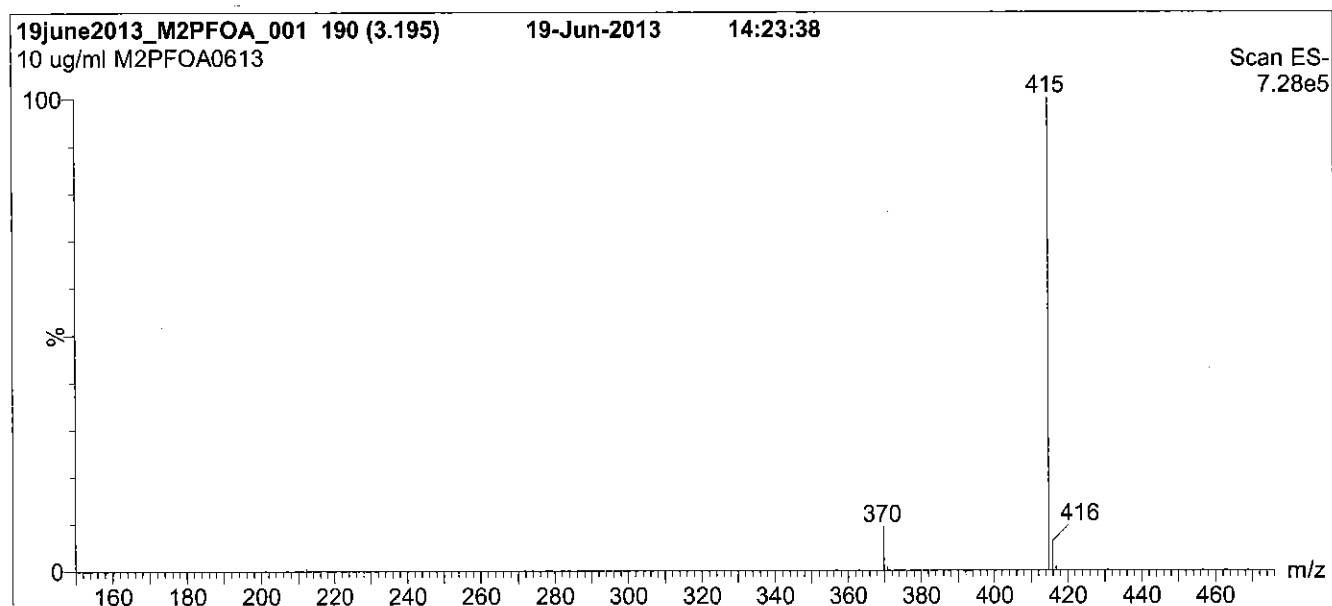
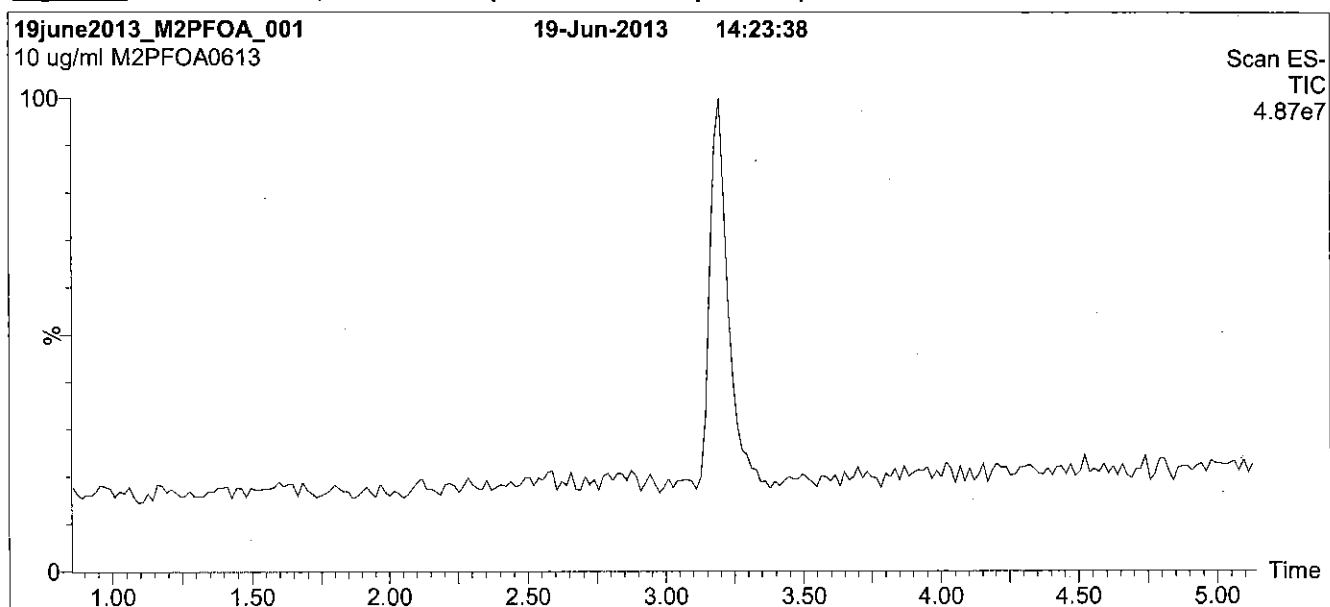
QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

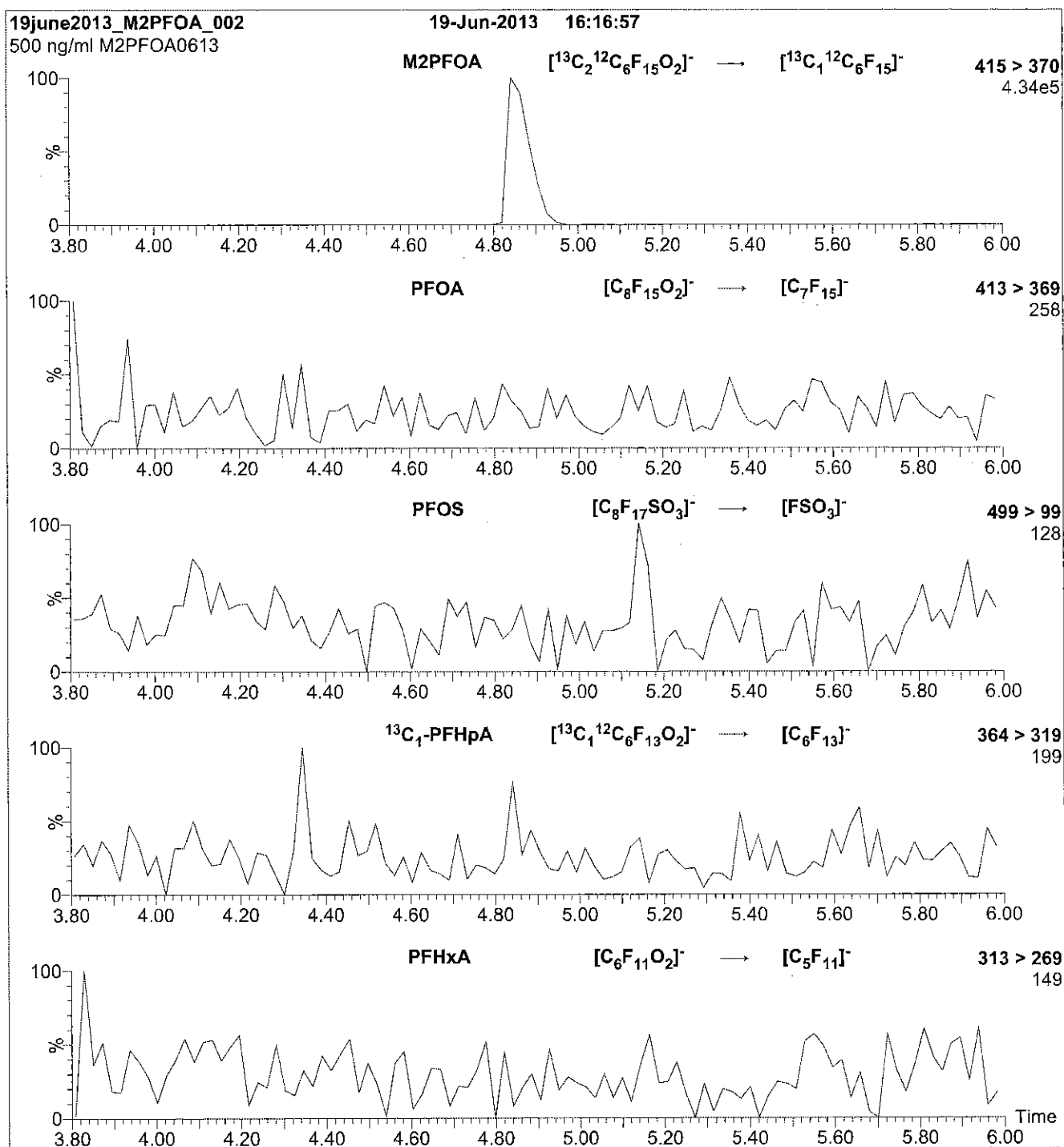
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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: M2PFOA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 11

Reagent

LCM2PFTeDA_00008

r:3k/17 sev

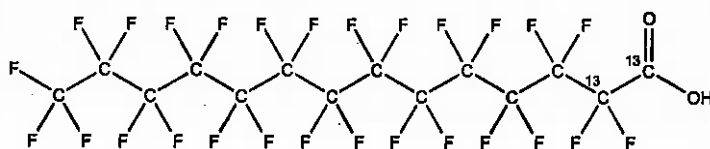


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA **LOT NUMBER:** M2PFTeDA1115
COMPOUND: Perfluoro-n-[1,2-¹³C₂]tetradecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₁₂ HF ₂₇ O ₂	MOLECULAR WEIGHT:	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2- ¹³ C ₂)
LAST TESTED: (mm/dd/yyyy)	12/07/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/07/2020		
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/08/2015
(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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

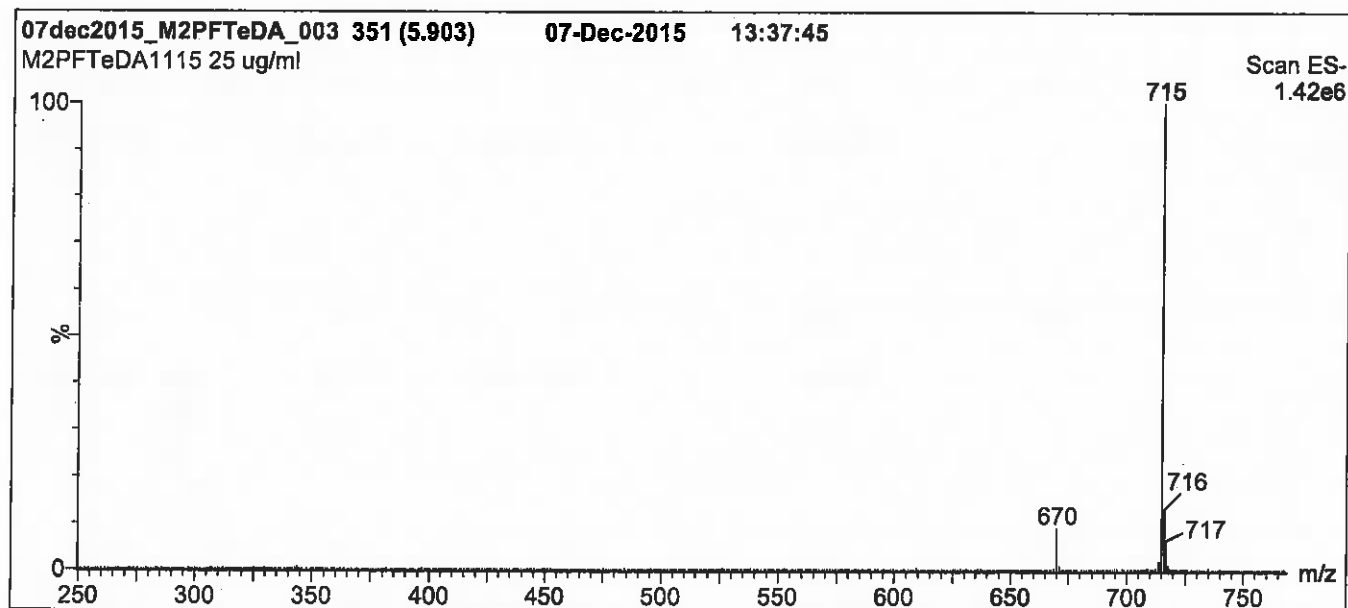
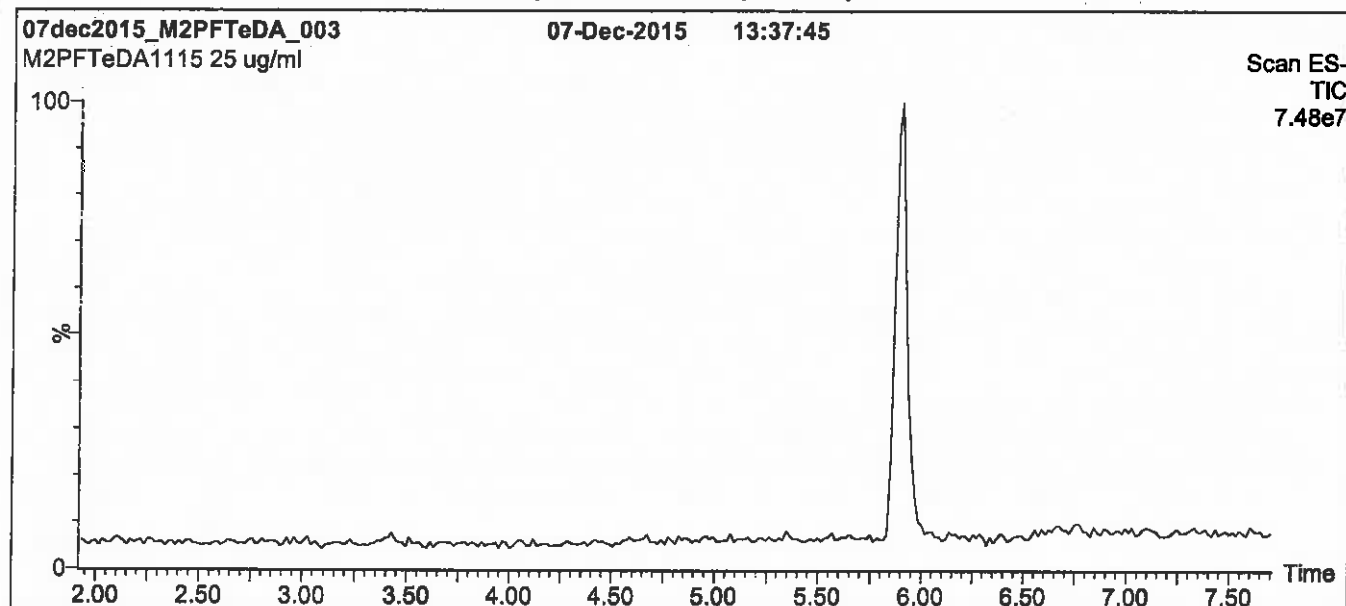
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 65% (80:20 MeOH:ACN) / 35% H₂O

(both with 10 mM NH₄OAc buffer)

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

Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)

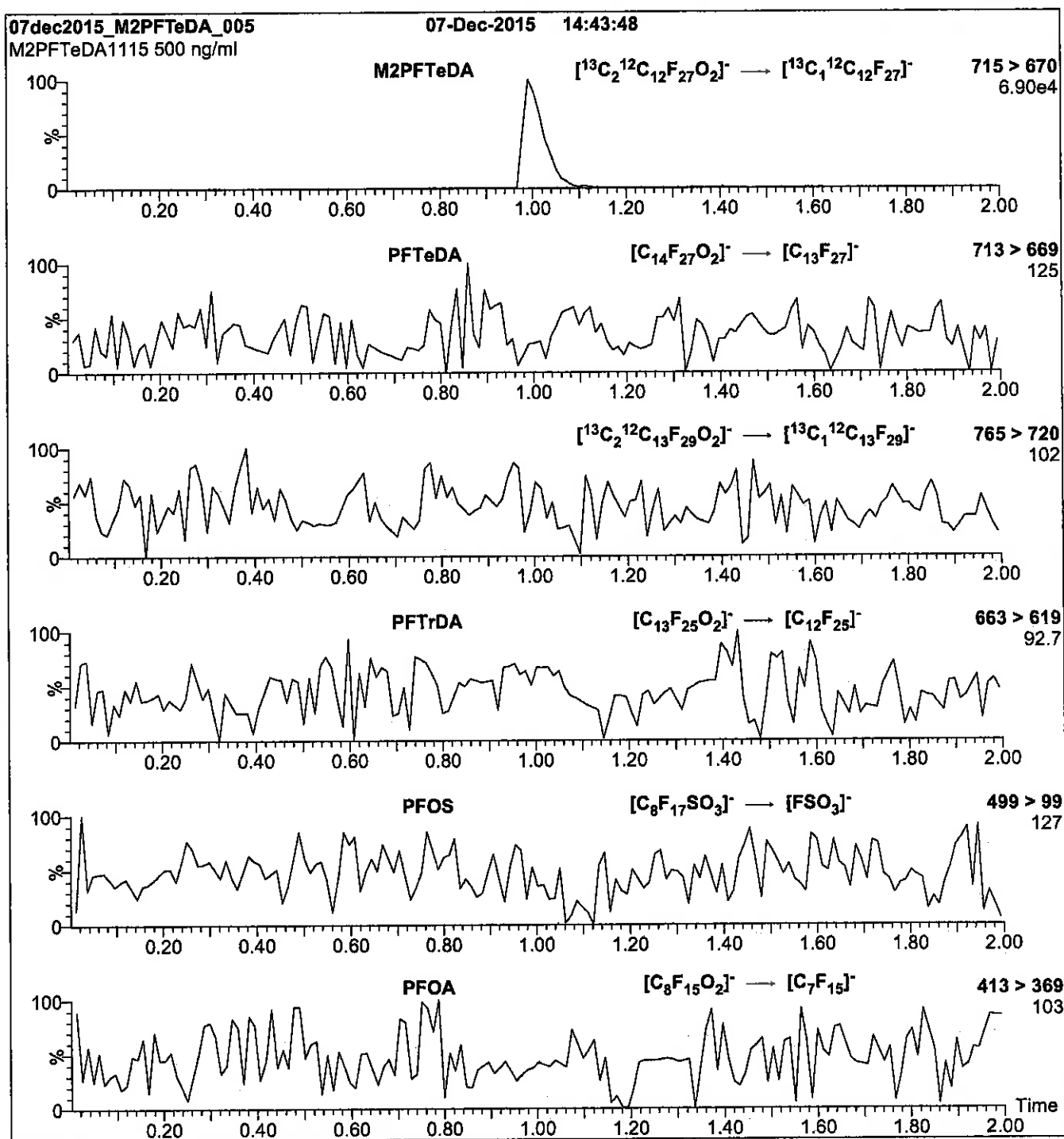
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 15.00

Cone Gas Flow (l/hr) = 60

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 14

Reagent

LCM2PFTeDA_00009

R: 5/31/17 SGL

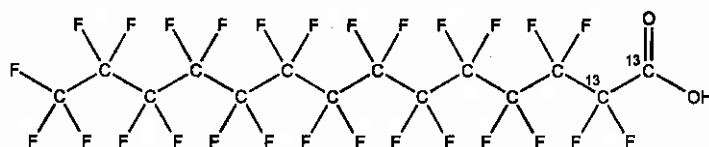


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA **LOT NUMBER:** M2PFTeDA0217
COMPOUND: Perfluoro-n-[1,2-¹³C₂]tetradecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₁₂ HF ₂₇ O ₂	MOLECULAR WEIGHT:	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2- ¹³ C ₂)
LAST TESTED: (mm/dd/yyyy)	03/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	03/01/2022		
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 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim, General Manager

Date: 03/07/2017
(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:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

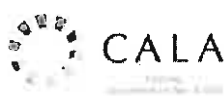
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

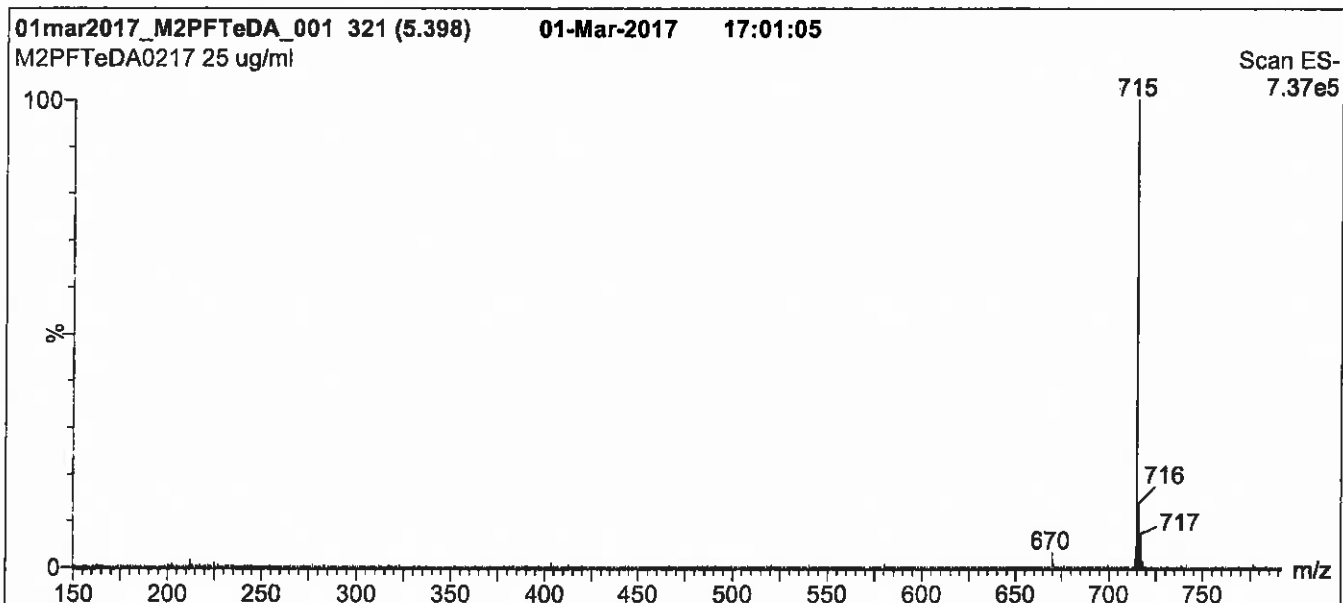
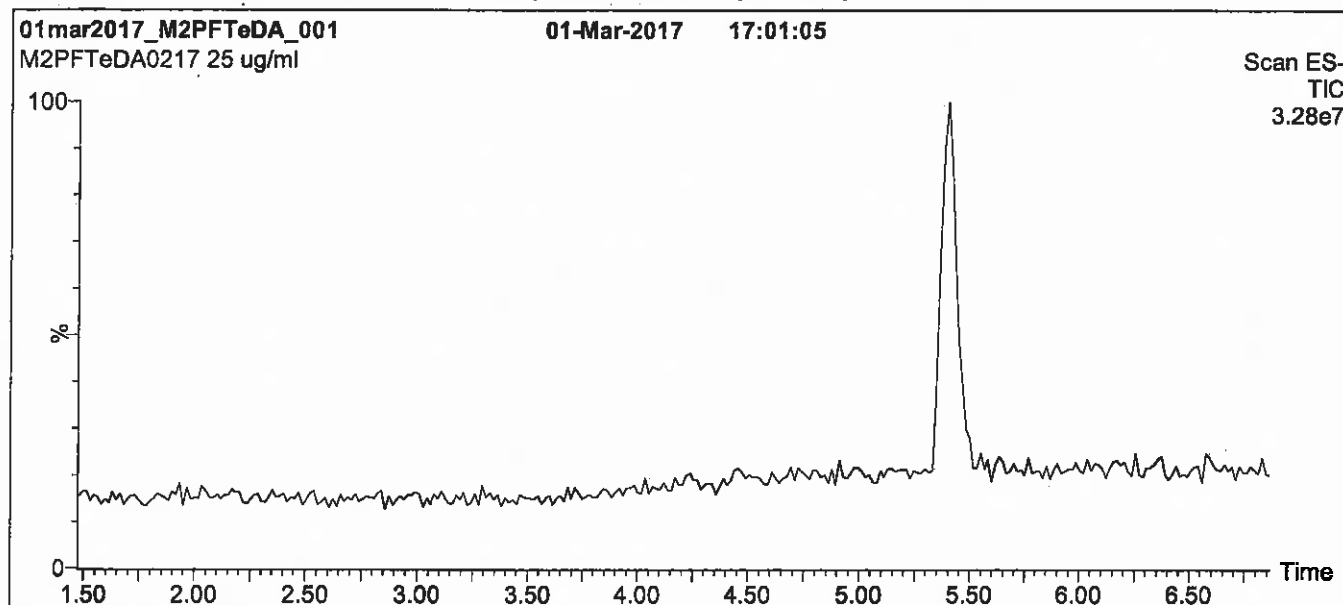
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

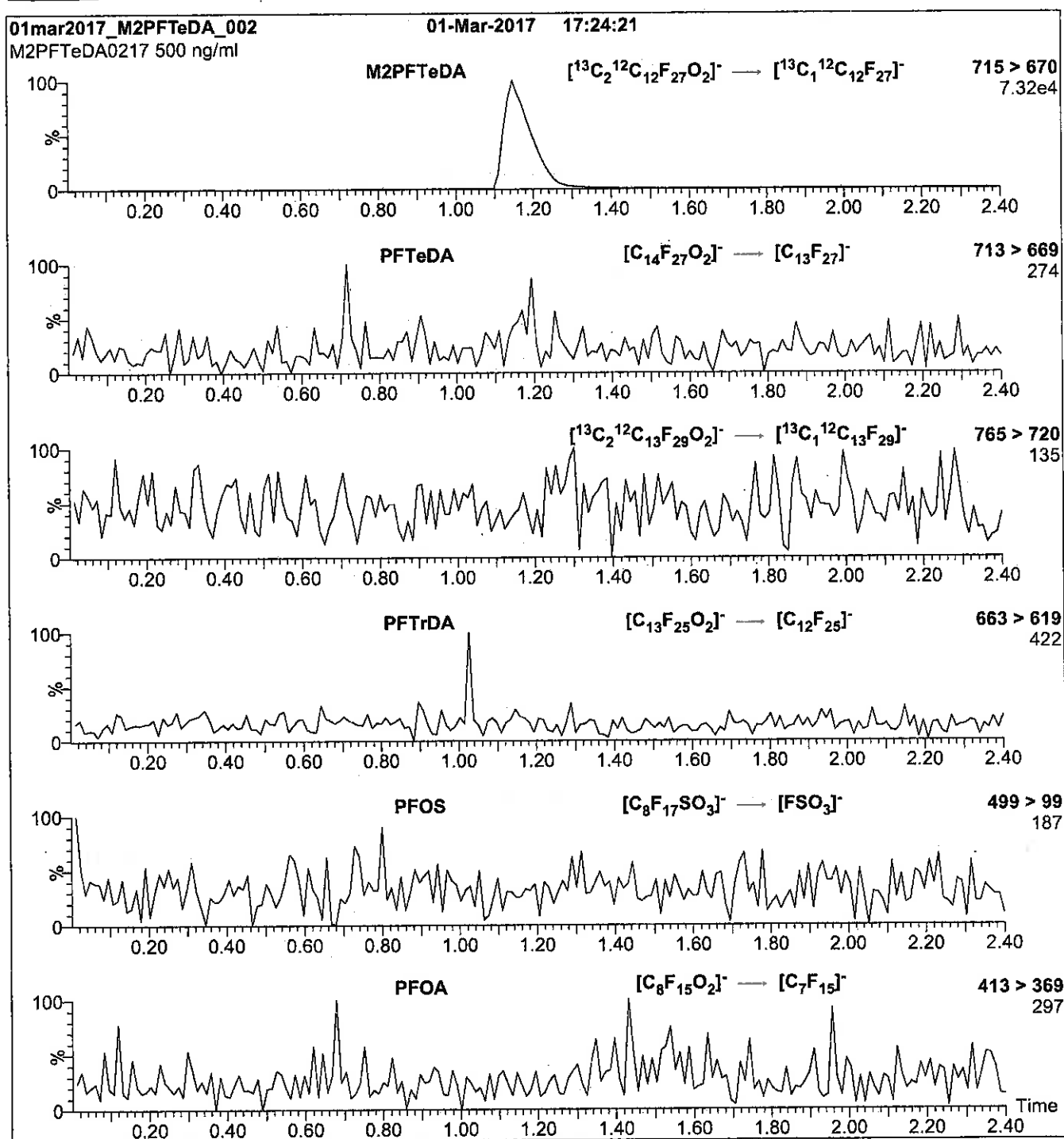
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 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: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.46\text{e-}3$
 Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00008



WELLINGTON LABORATORIES

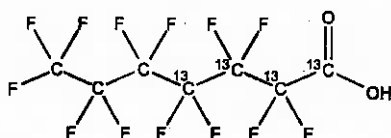
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]heptanoic acid

LOT NUMBER: M4PFHpA0516

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₄¹²C₃HF₁₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99%¹³C
(1,2,3,4-¹³C₄)

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: 07/05/2016
(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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SYNTHESIS / CHARACTERIZATION:

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

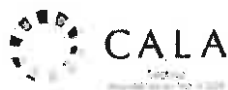
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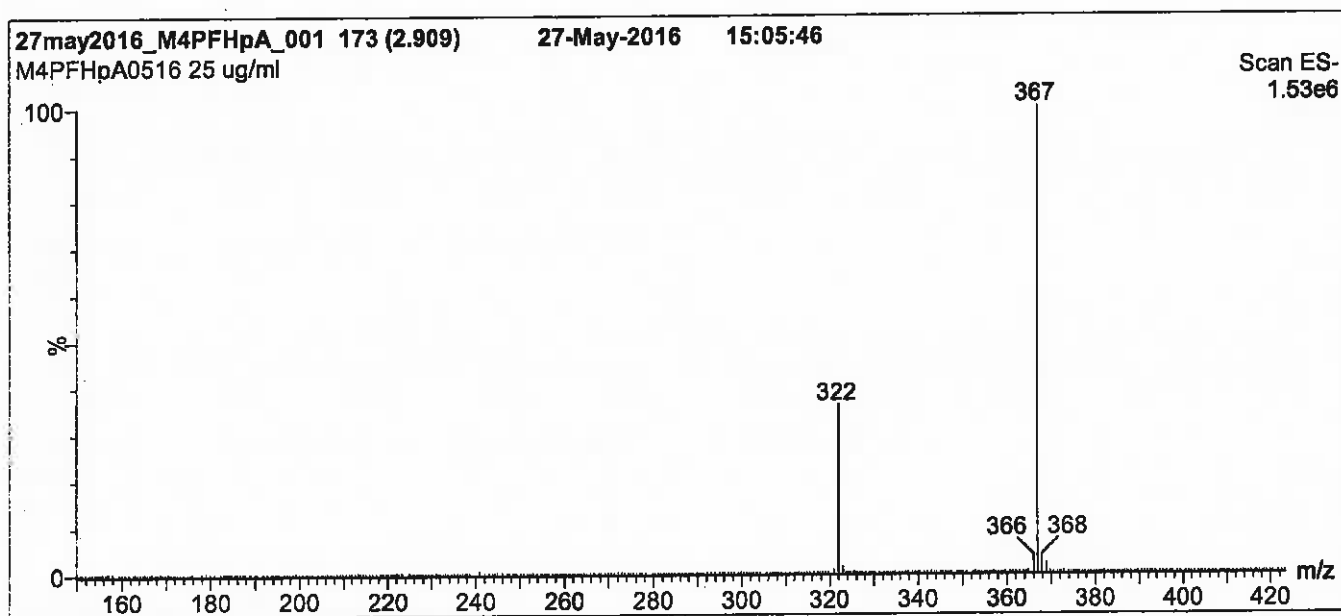
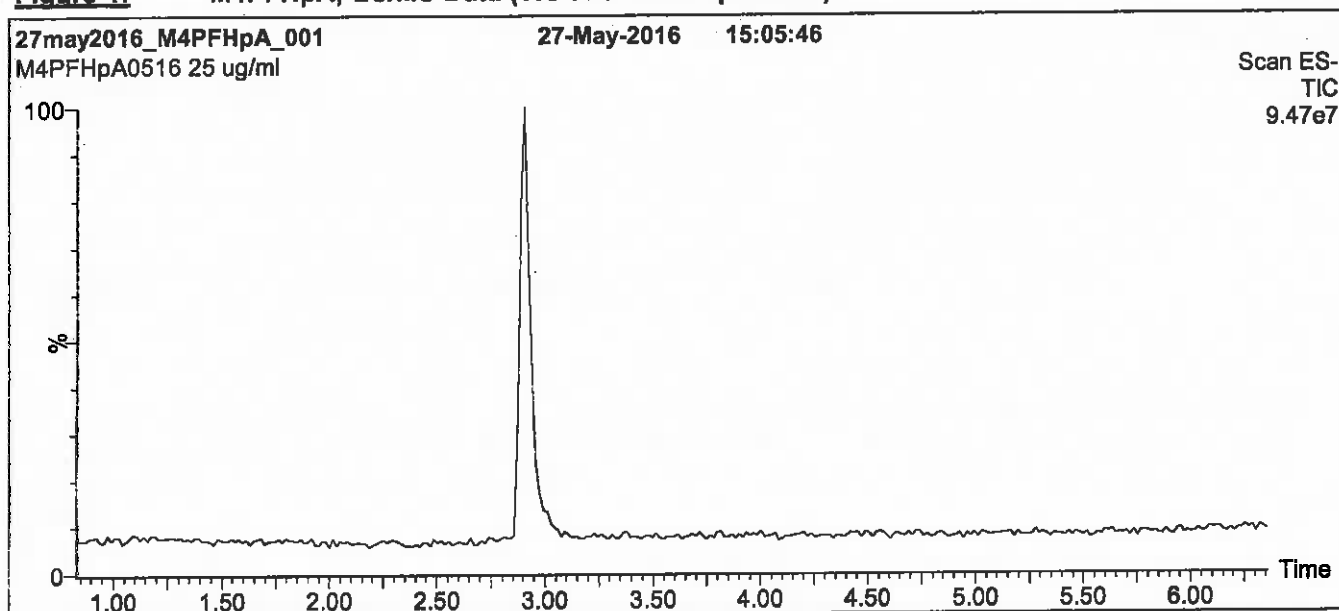
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

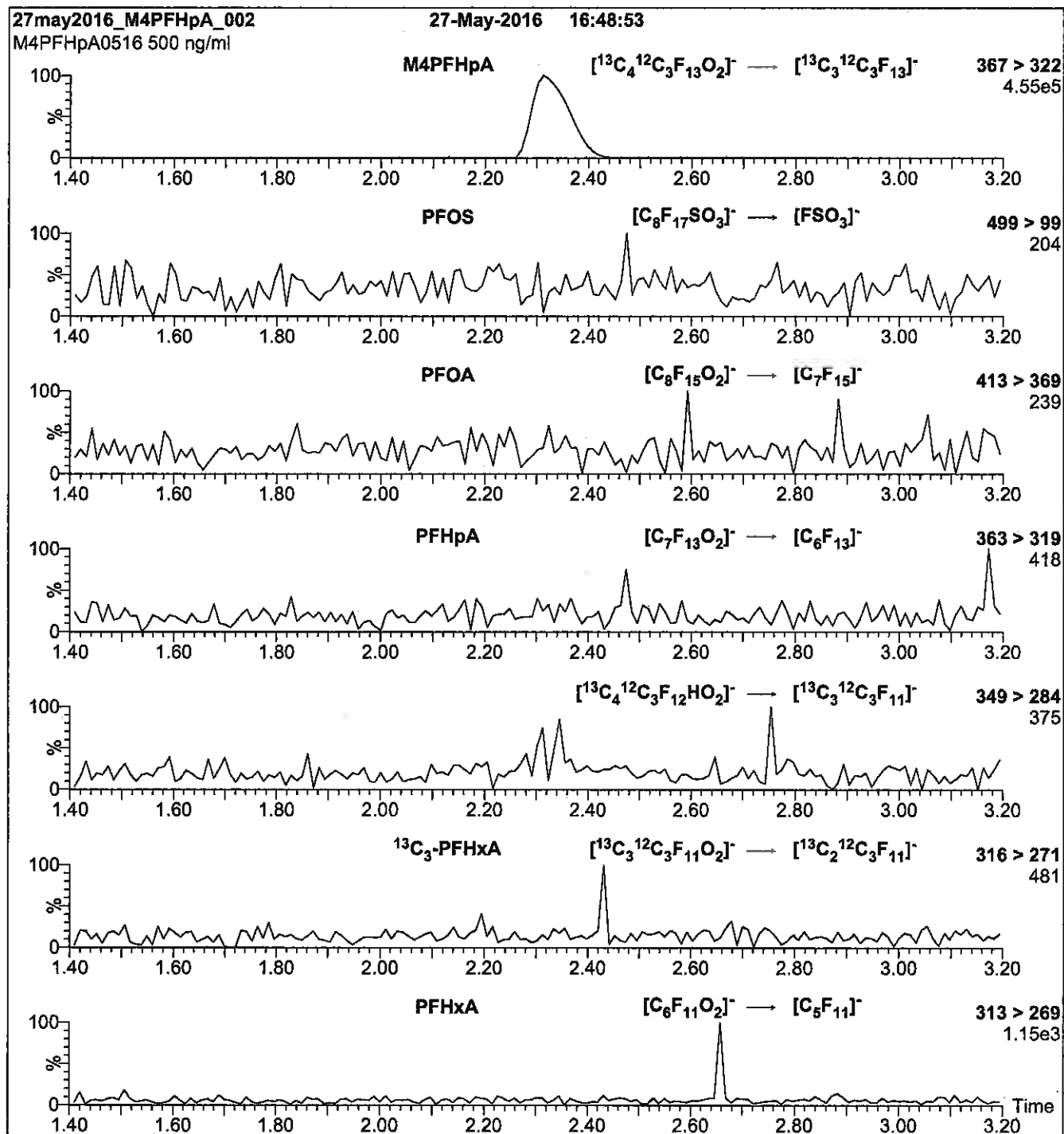
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCM4PFHPA_00009



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

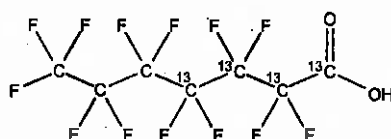
M4PFHpA

LOT NUMBER:

M4PFHpA0516

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

Not available

**MOLECULAR FORMULA:**¹³C₄¹²C₃HF₁₃O₂**CONCENTRATION:**

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

368.03

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99%¹³C**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

(1,2,3,4-¹³C₄)**DOCUMENTATION/ DATA ATTACHED:**

Figure 1: 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: 07/05/2016

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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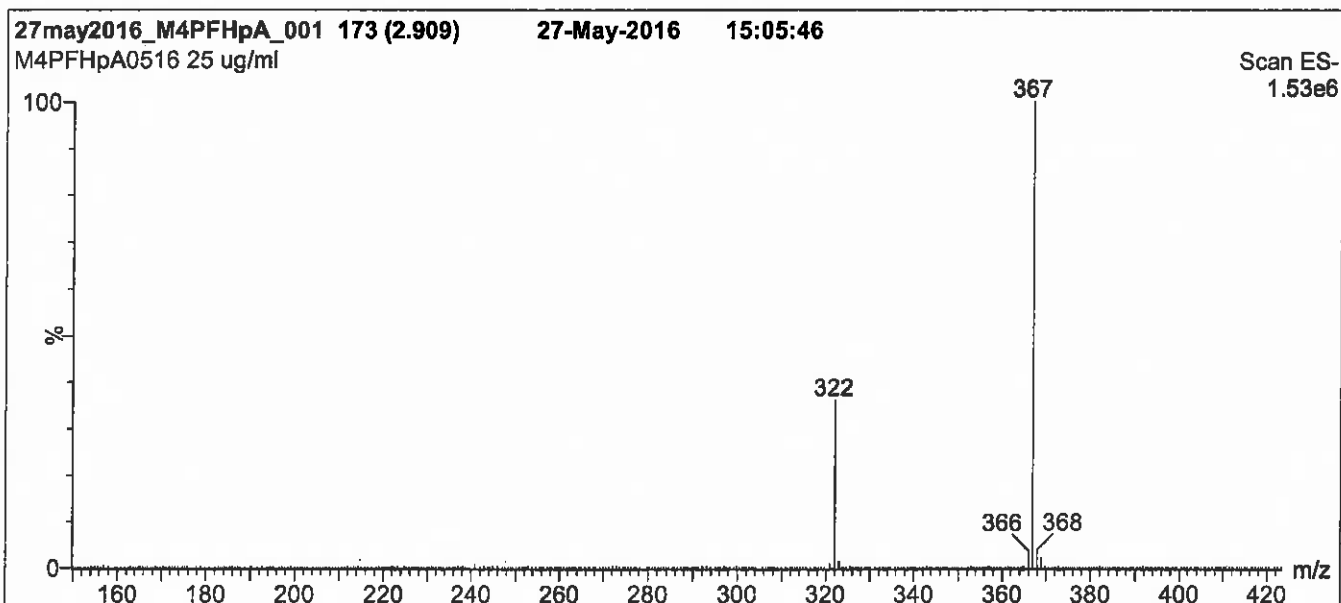
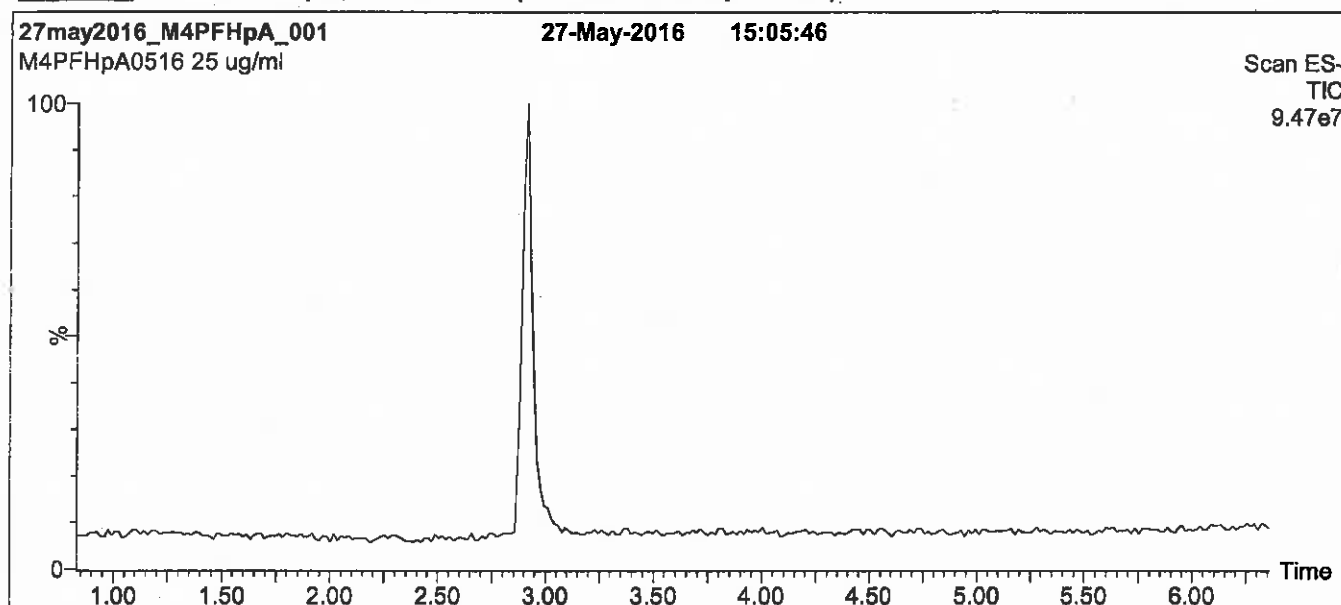
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

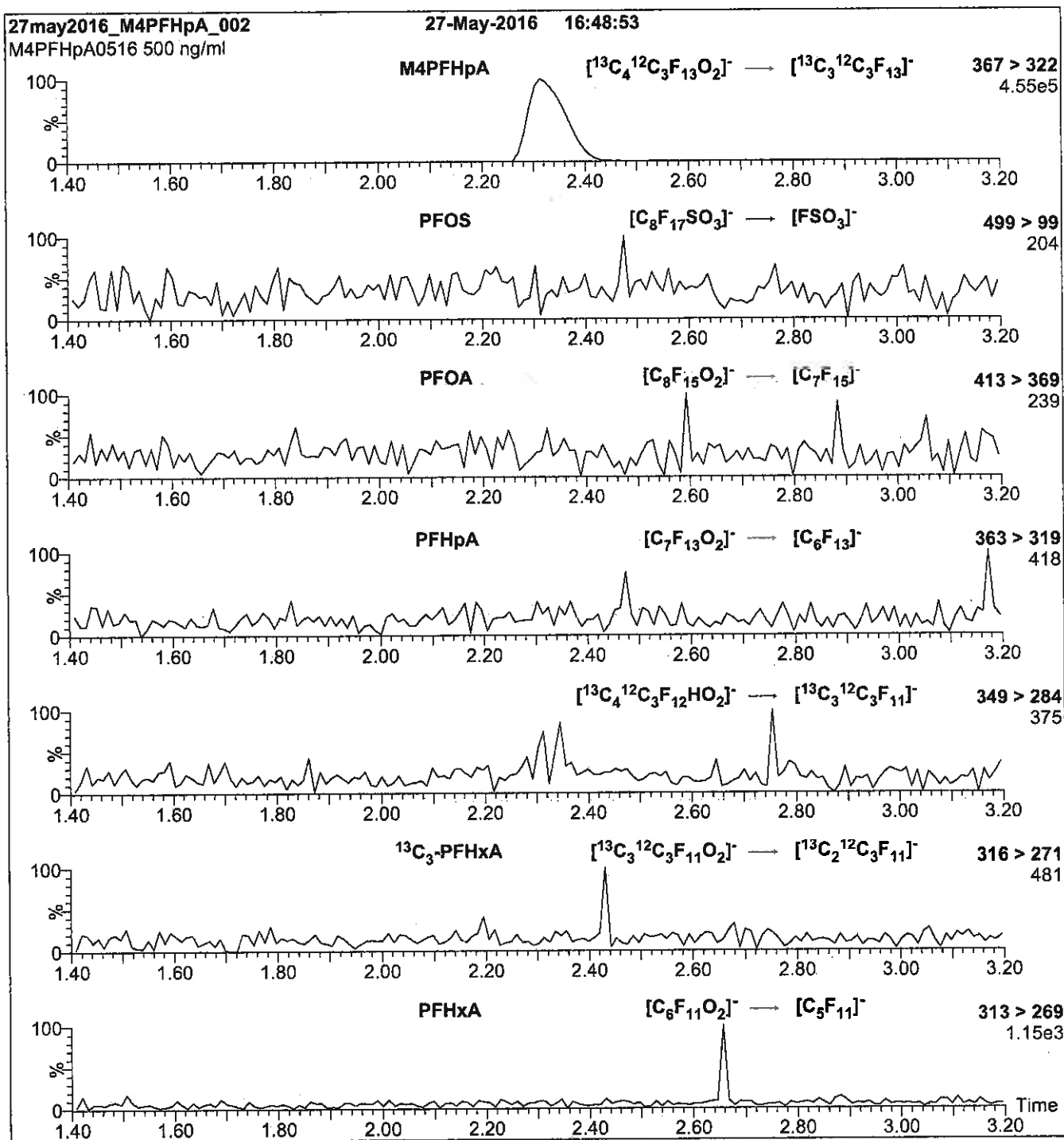
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCM5PFPEA_00009



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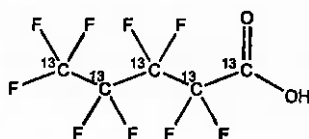
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[¹³C]₅pentanoic acid

LOT NUMBER: M5PFPeA1116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₅HF₈O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 269.01
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(¹³C₅)

LAST TESTED: (mm/dd/yyyy) 11/22/2016

EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/09/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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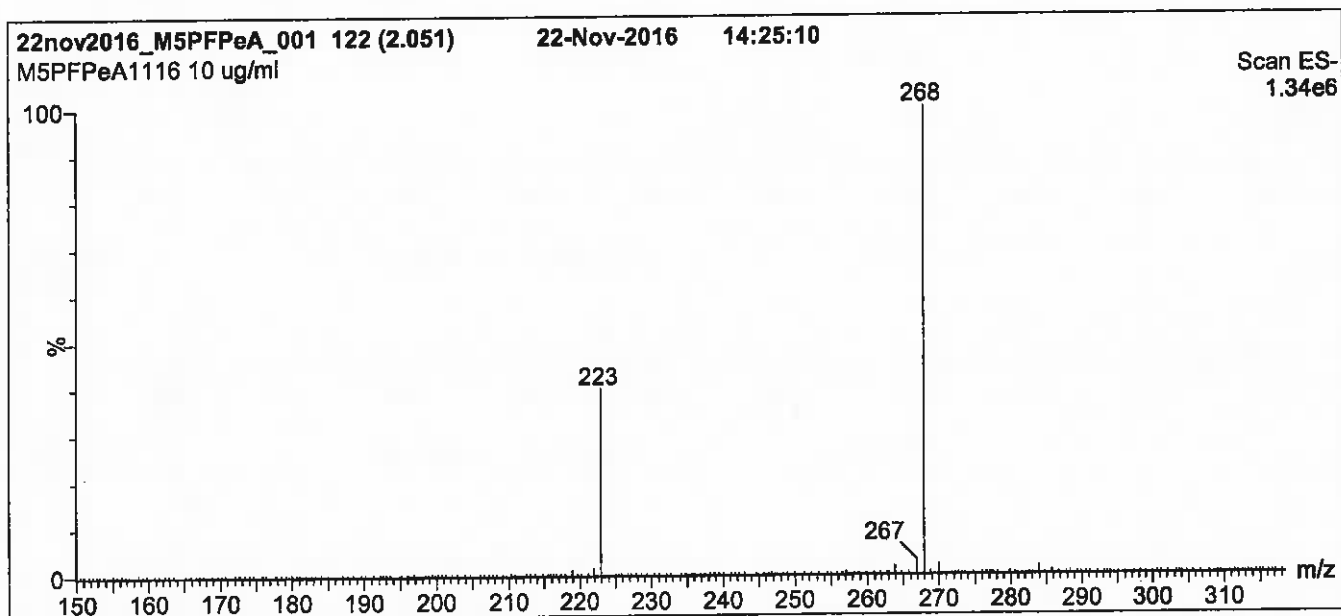
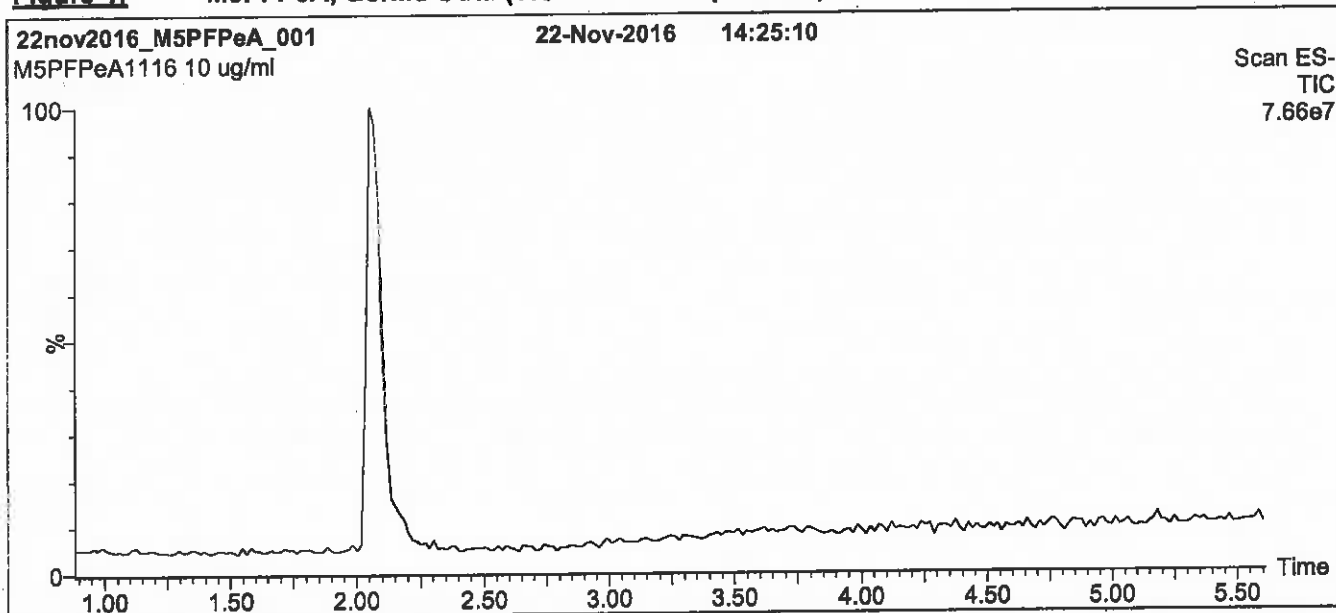
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

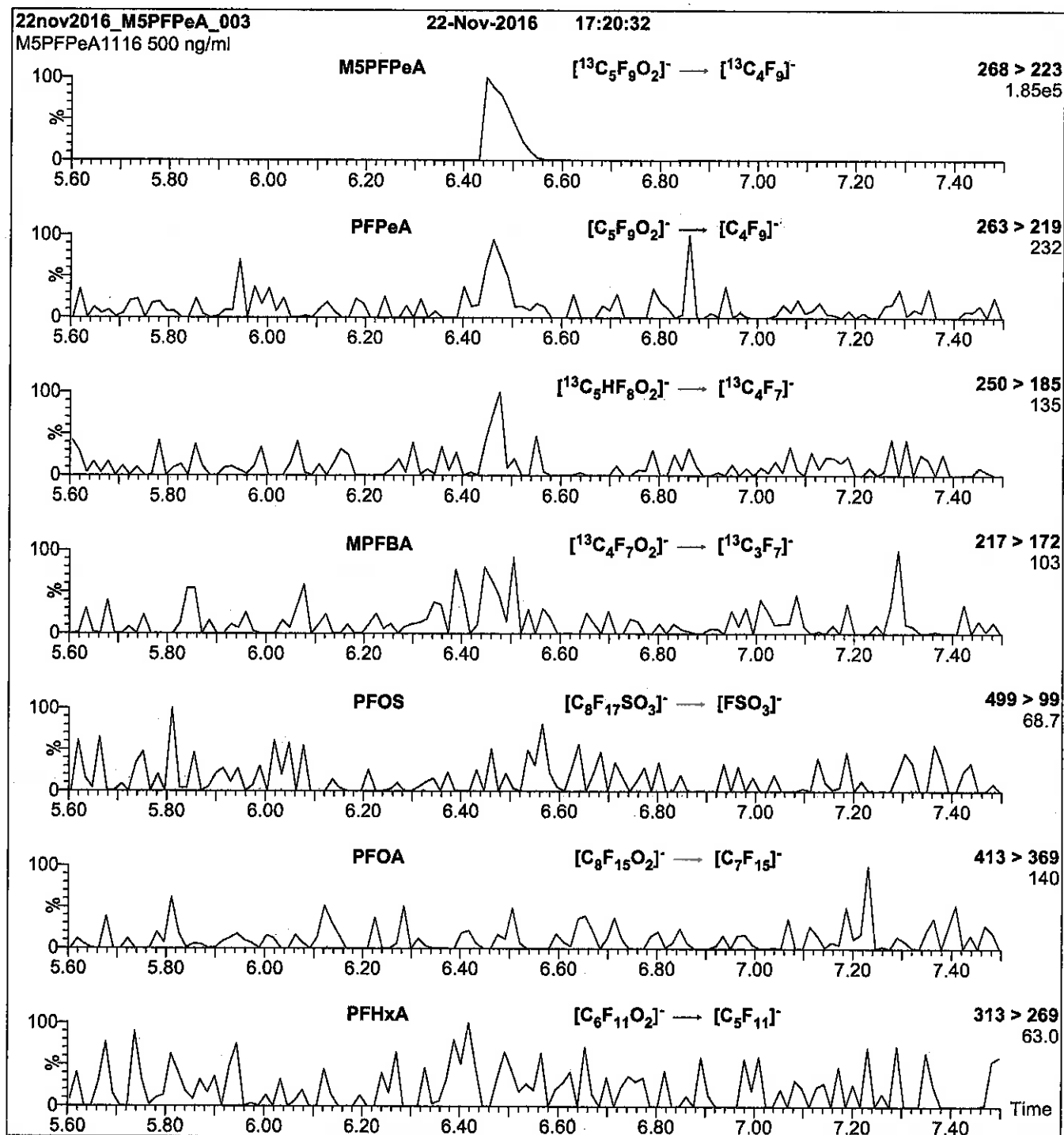
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM5PFPEA_00010



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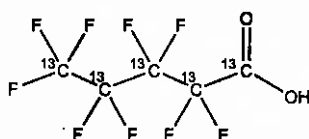
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M5PFPeA1116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₅HF₉O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 269.01
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/22/2016

ISOTOPIC PURITY: ≥99% ¹³C
(¹³C₅)

EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/09/2016
(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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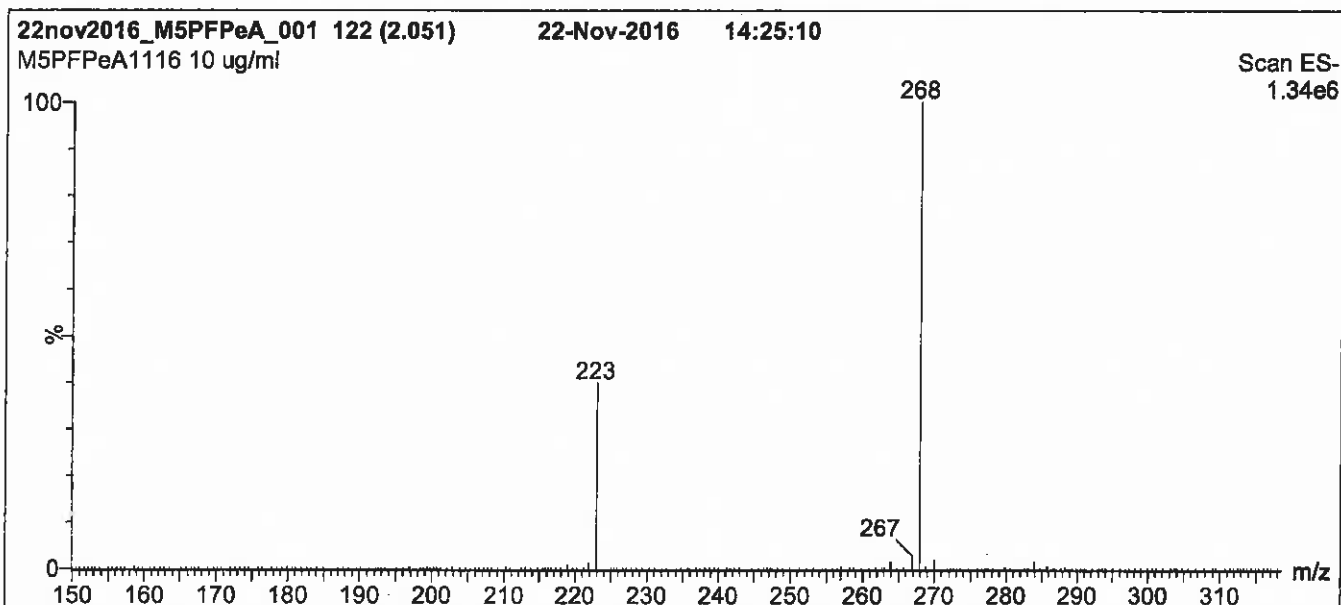
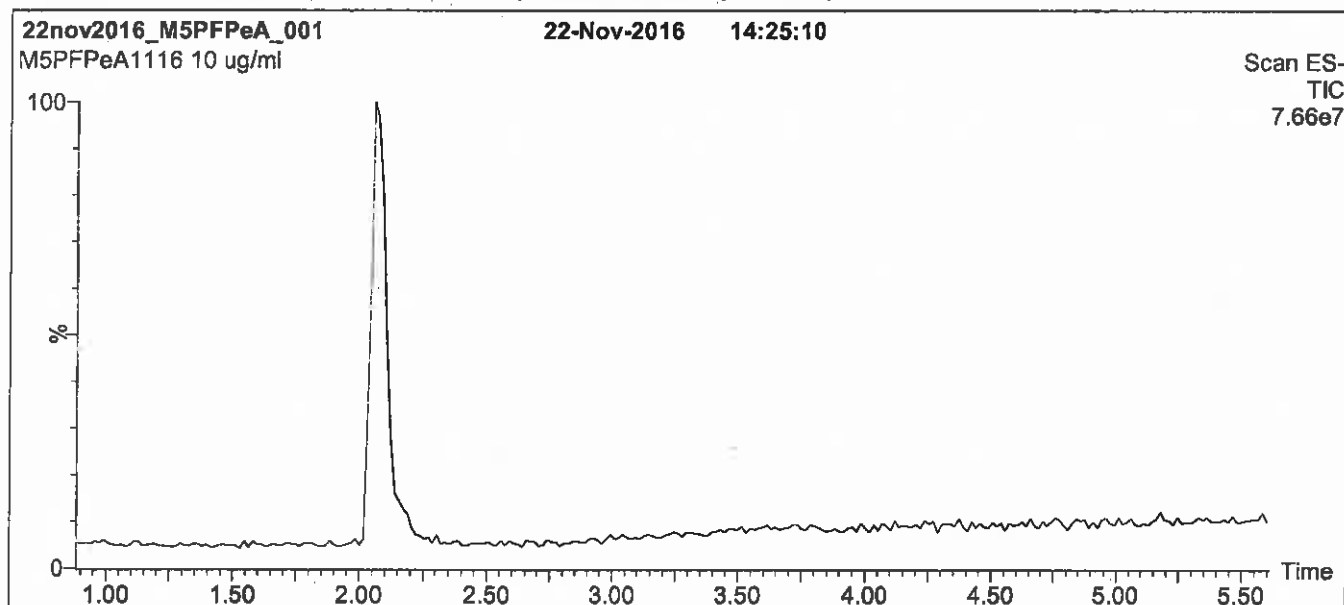
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

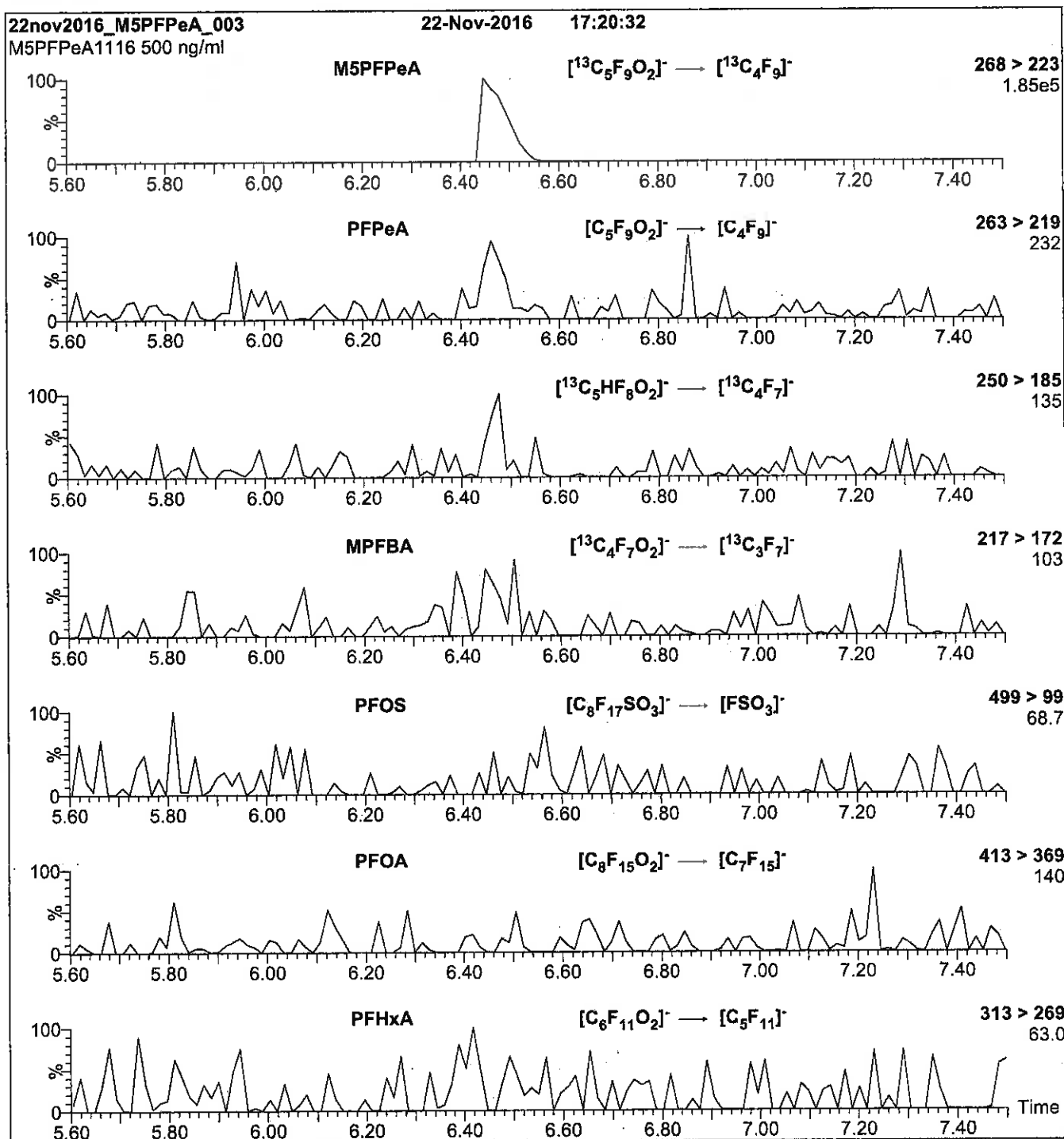
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM8FOSA_00012



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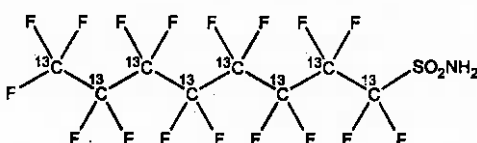
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1- $^{13}\text{C}_8$ octanesulfonamide

LOT NUMBER: M8FOSA1215I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}\text{C}_8\text{H}_2\text{F}_{17}\text{NO}_2\text{S}$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 507.09
SOLVENT(S): Isopropanol
ISOTOPIC PURITY: $\geq 99\% ^{13}\text{C}$
($^{13}\text{C}_8$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: 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: 12/13/2016
(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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$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

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EXPIRY DATE / PERIOD OF VALIDITY:

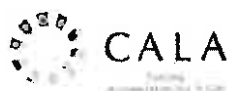
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

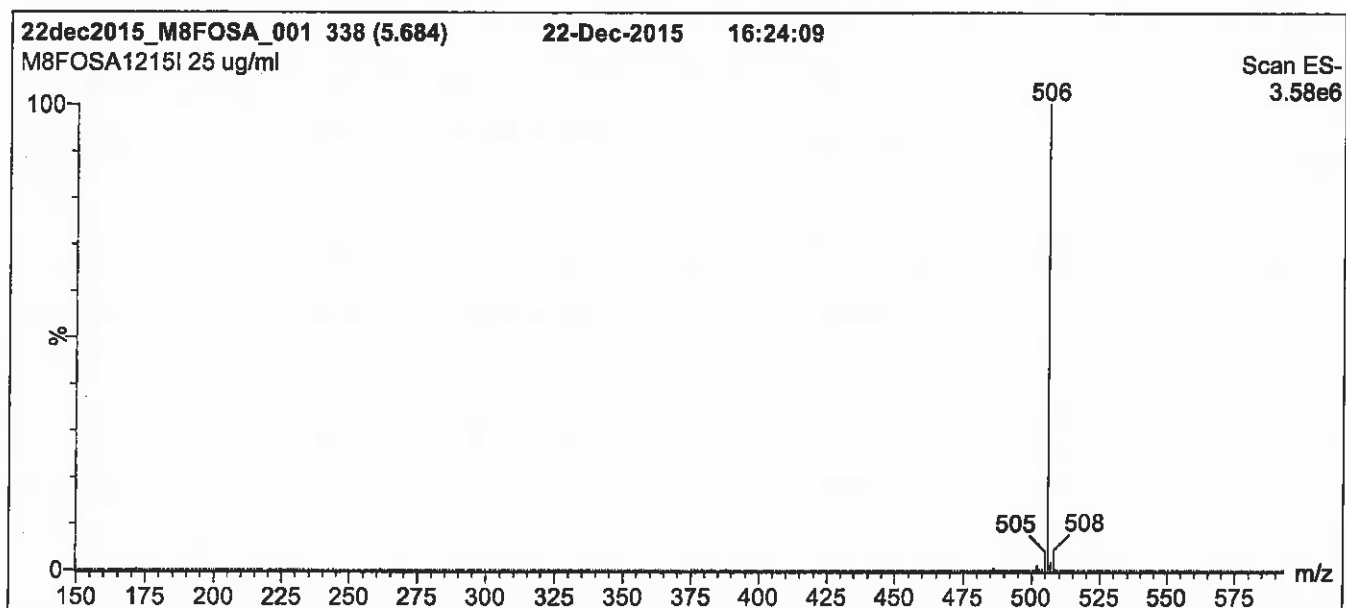
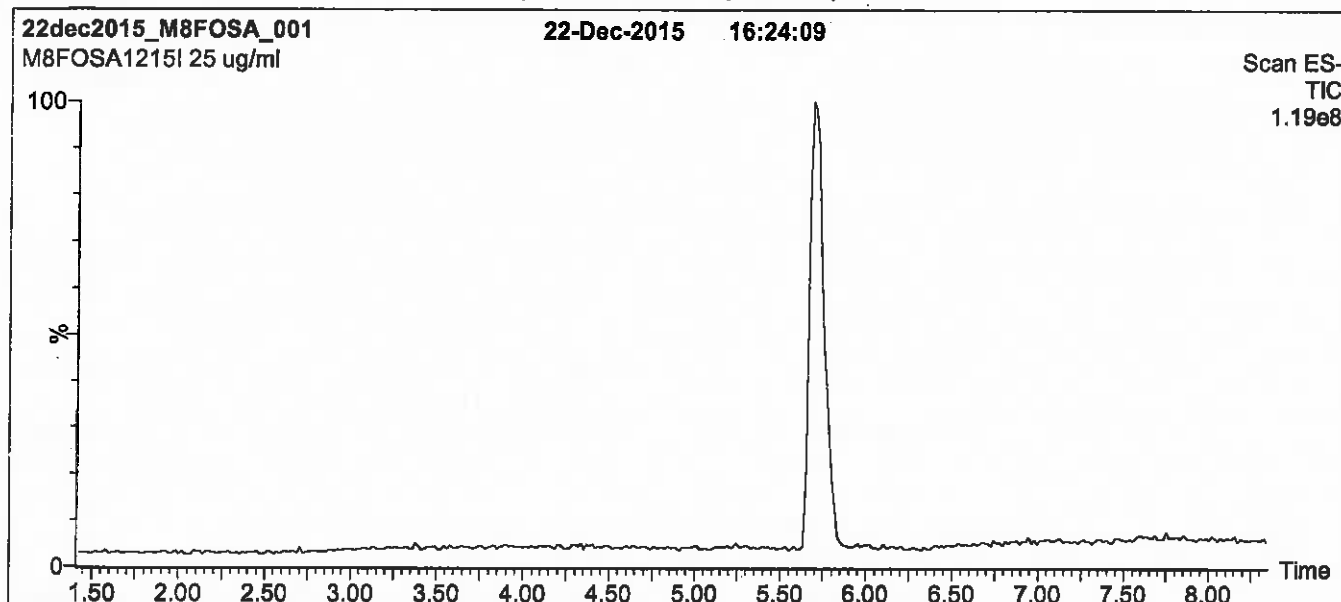
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

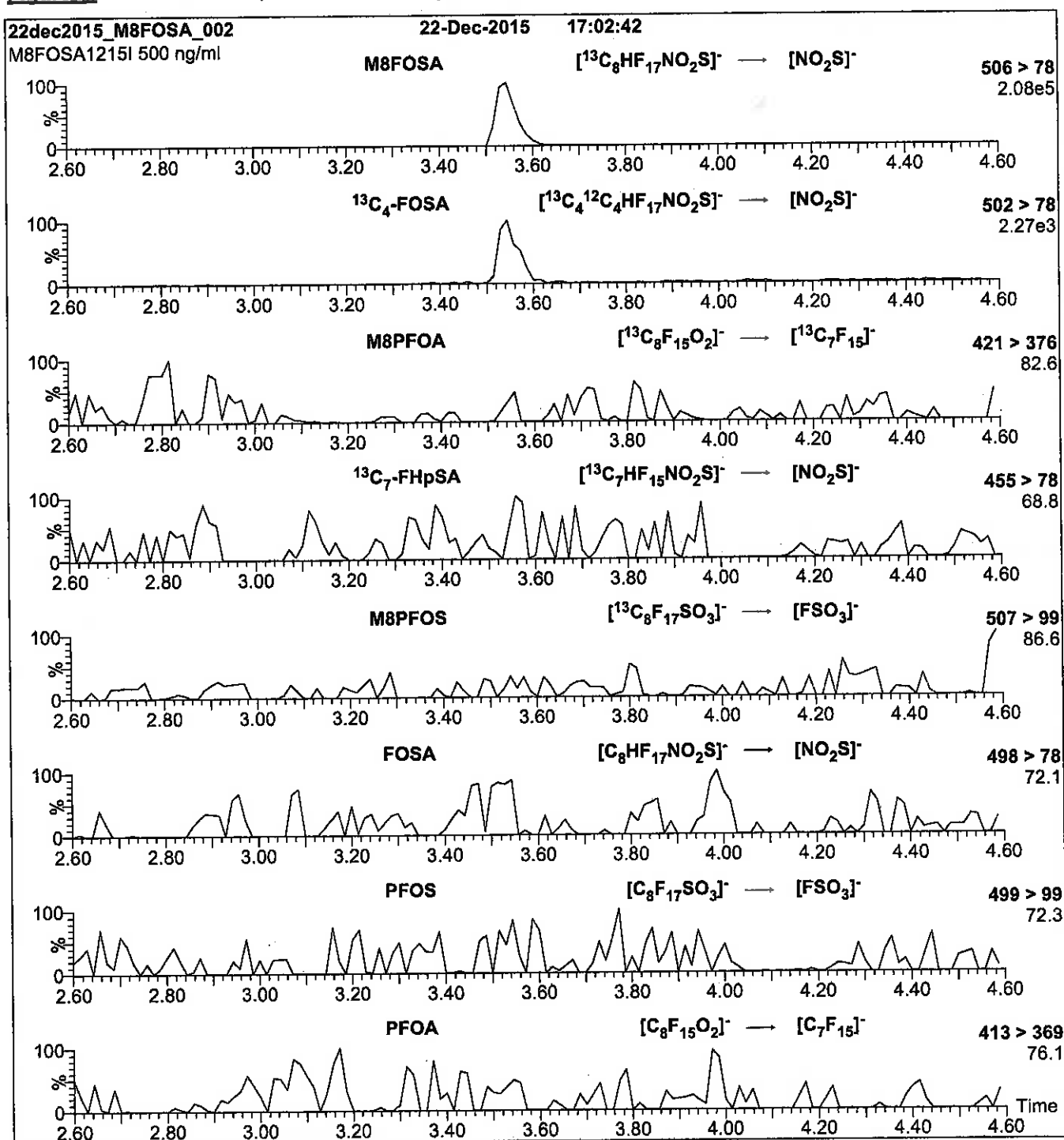
Capillary Voltage (kV) = 2.50

Cone Voltage (V) = 40.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM8FOSA_00013

r: 5/3/17 ~~SPV~~



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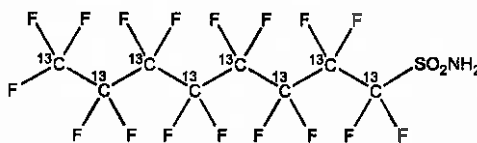
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-¹³C₈octanesulfonamide

LOT NUMBER: M8FOSA1215I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₈H₂F₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Refrigerate ampoule

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/13/2016
(mm/dd/yyyy)

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

INTENDED USE:

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:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

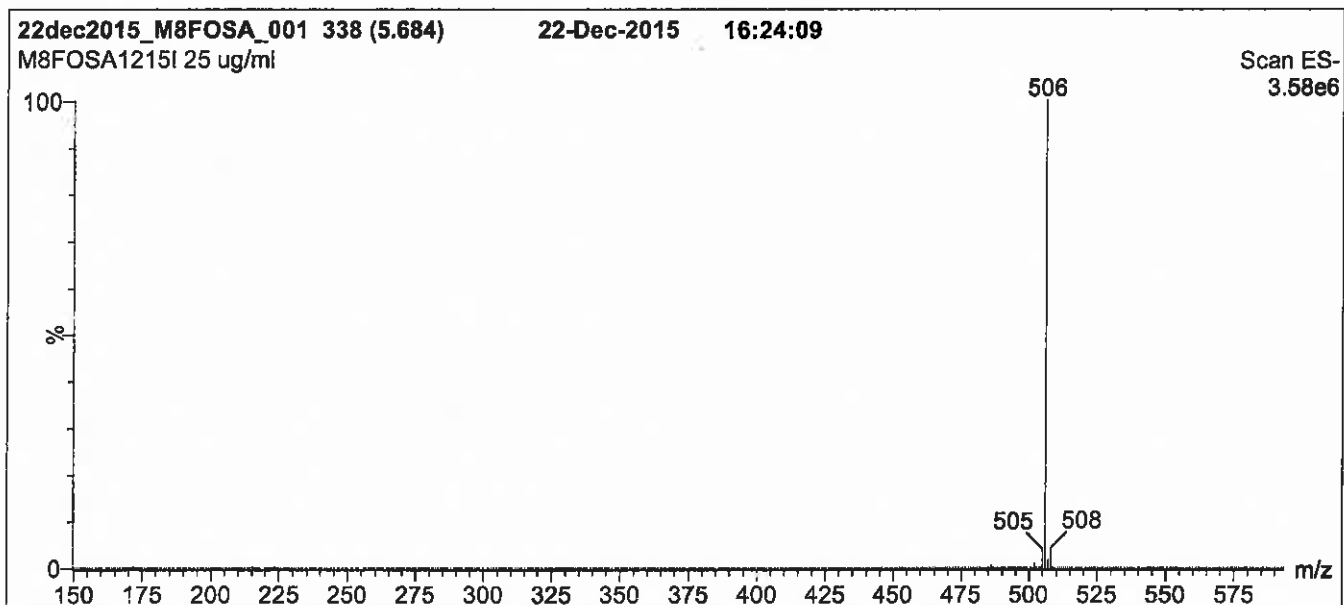
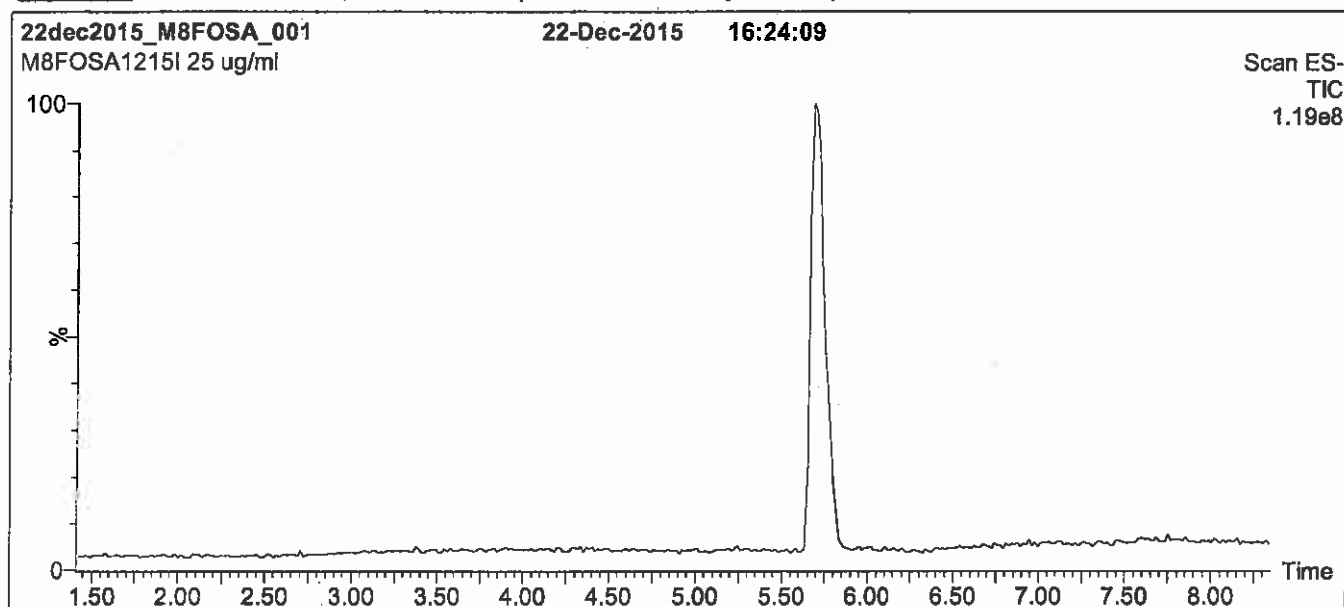
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

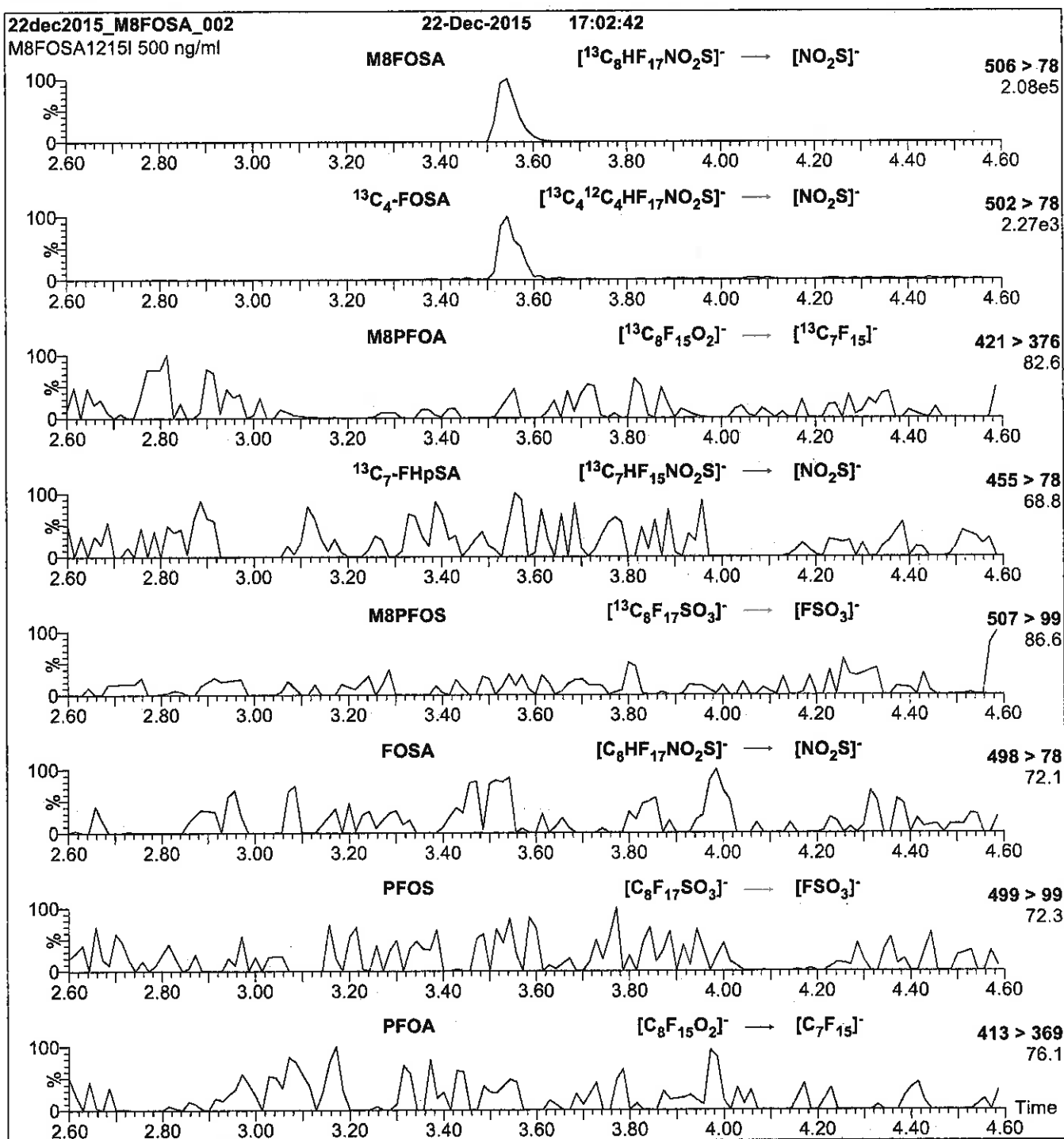
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFBA_00009



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

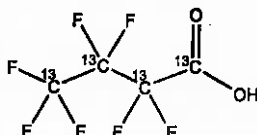
MPFBA

LOT NUMBER:

MPFBA0516

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

Not available

**MOLECULAR FORMULA:**¹³C₄HF₇O₂**CONCENTRATION:**

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

218.01

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99%¹³C(1,2,3,4-¹³C₄)**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 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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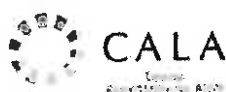
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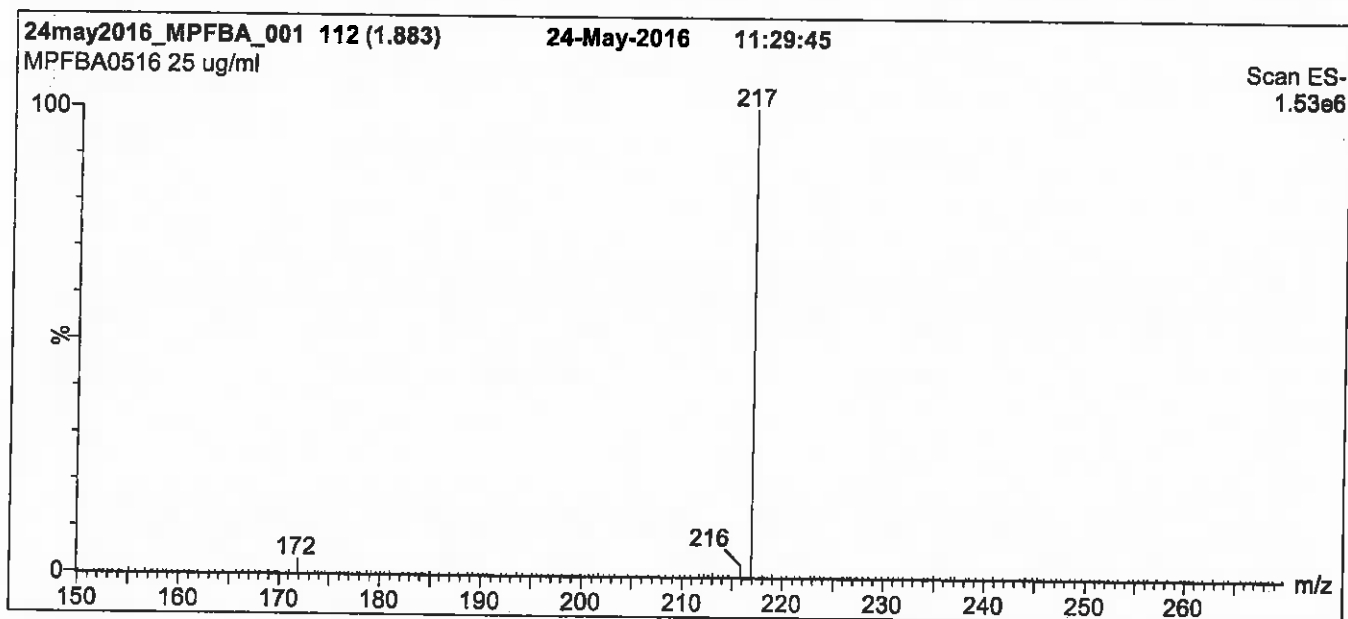
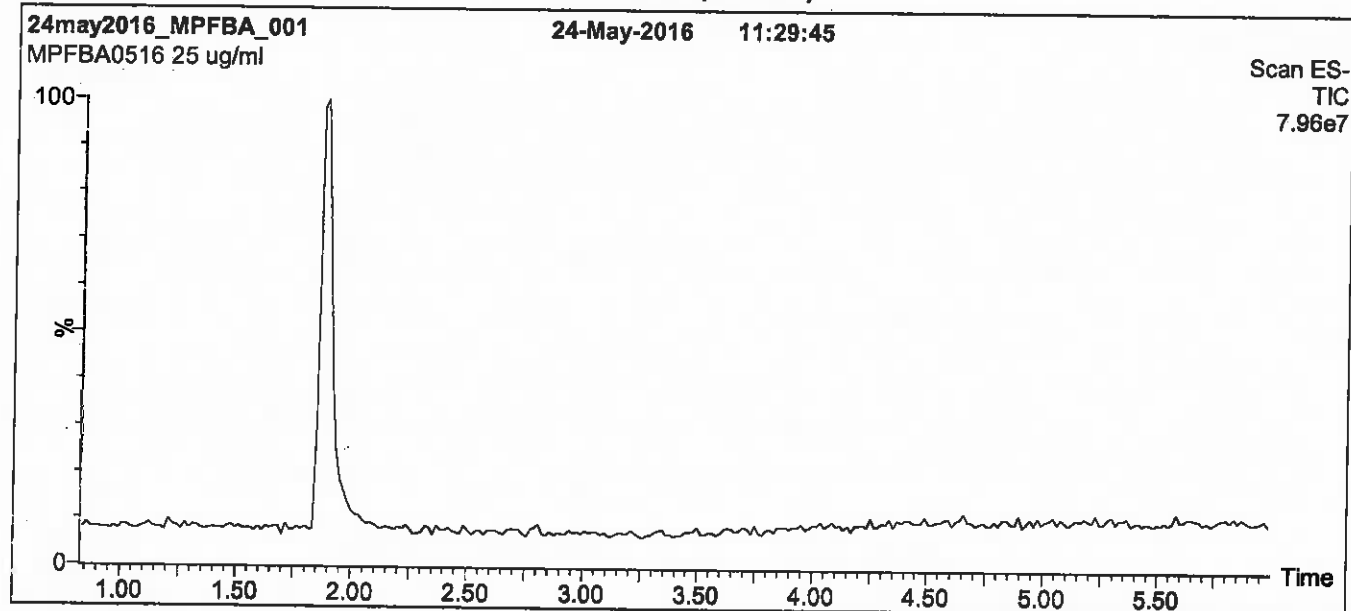
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Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

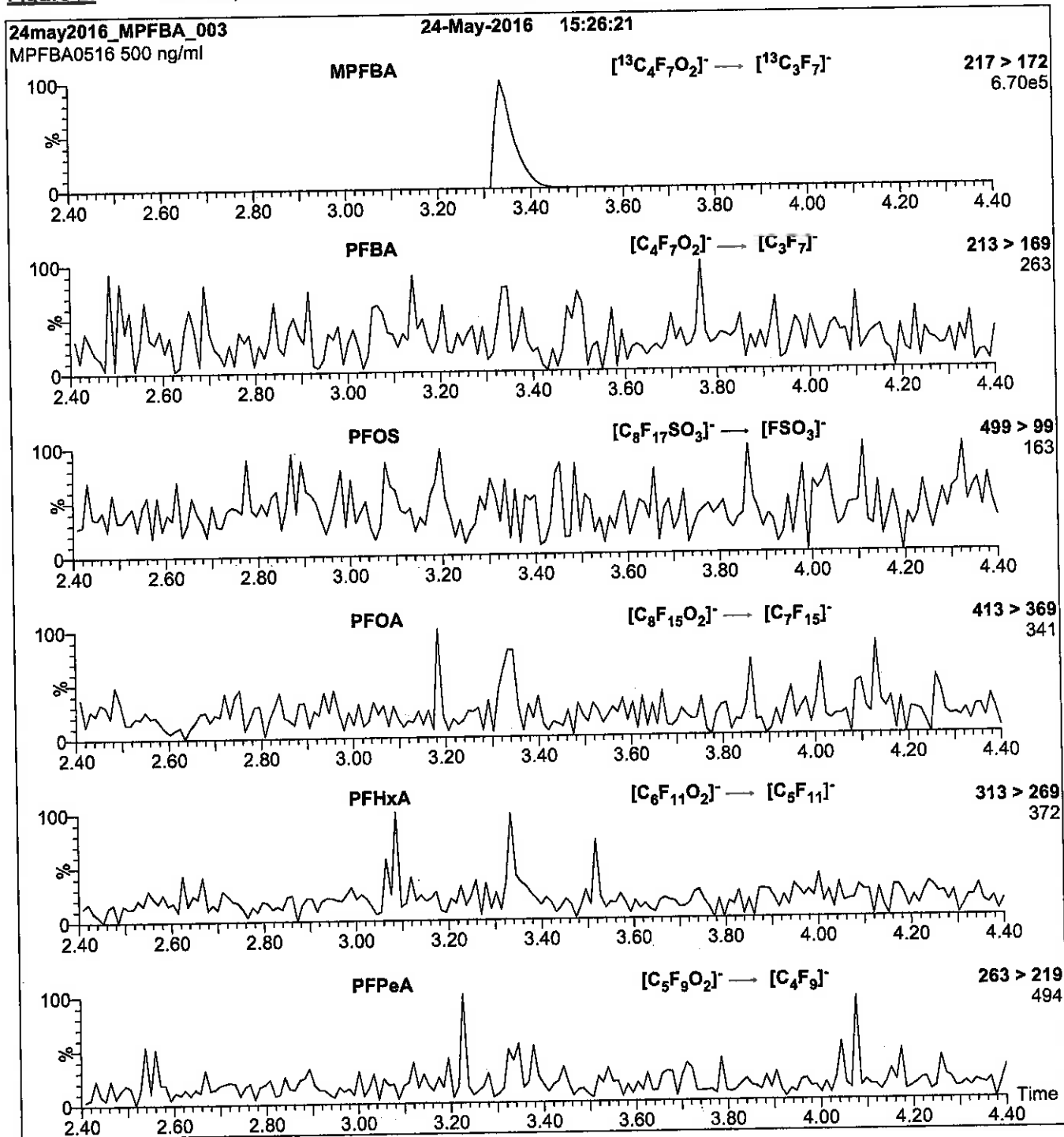
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 10

Reagent

LCMPFBA_00010

17: 513/17 SPV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFBA

LOT NUMBER:

MPFBA0516

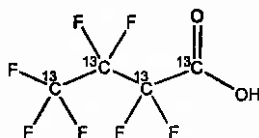
COMPOUND:

Perfluoro-n-[1,2,3,4-¹³C₄]butanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₄HF₇O₂

MOLECULAR WEIGHT:

218.01

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

05/24/2016

(1,2,3,4-¹³C₄)

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

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Certified By:

B.G. Chittim

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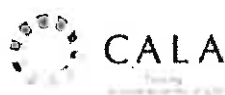
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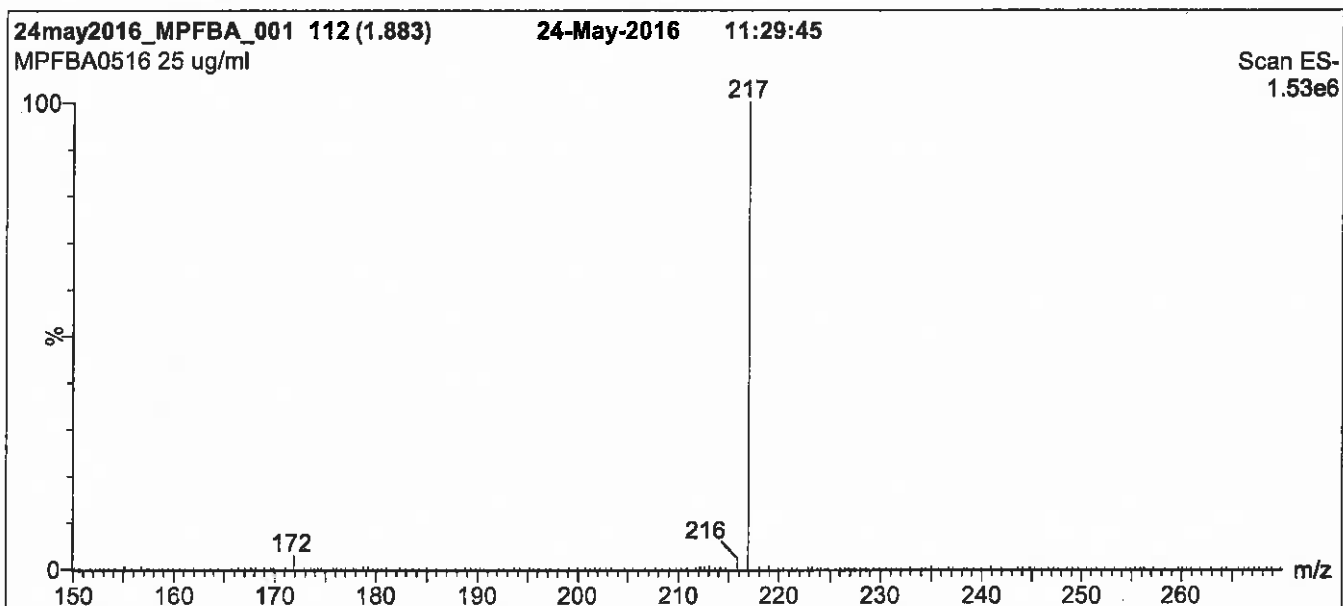
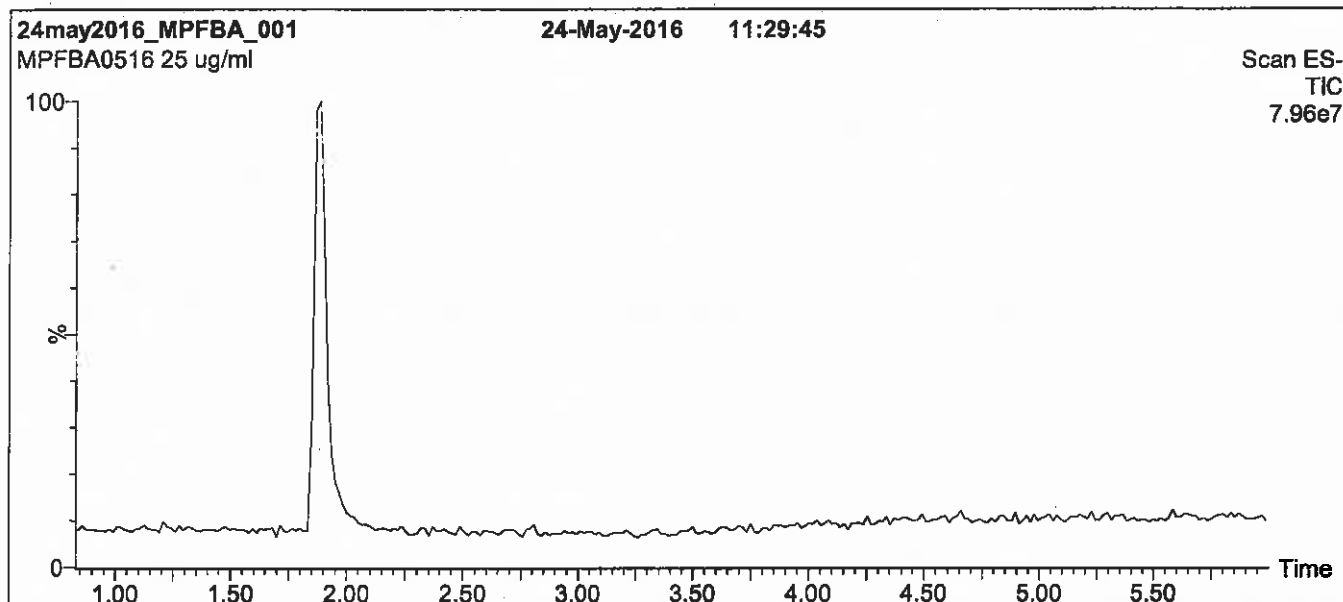
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Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

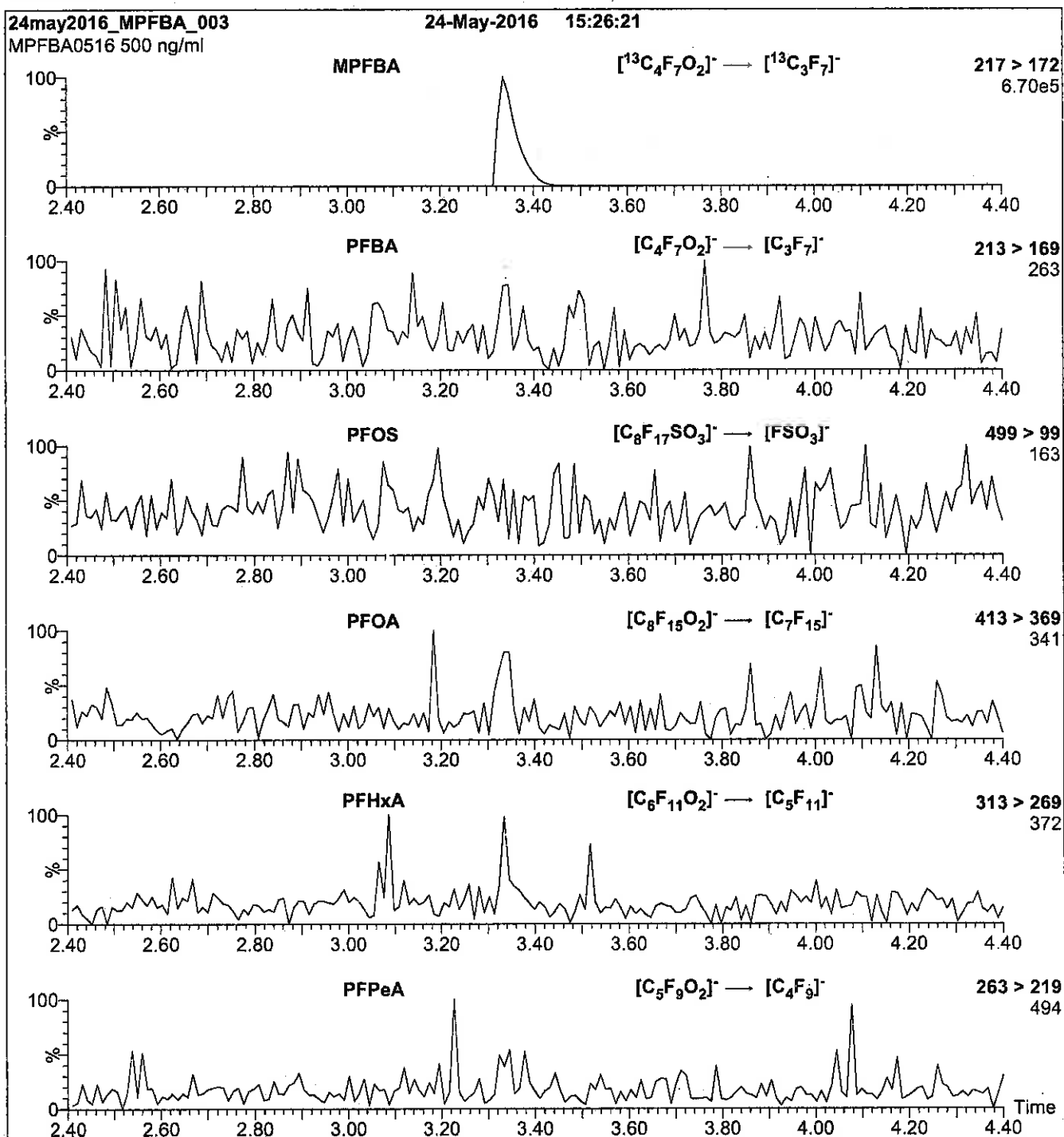
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 10

Reagent

LCMPFBS_00002



Scanned 10/14/16 R: 8BC 9/22/16
WELLINGTON
LABORATORIES



739640

ID: LCMFBS_00002

Exp: 08/02/21 Prod: 58C

13C3-Perfluorobutanesulfo

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

M3PFBS

LOT NUMBER:

M3PFBS0815

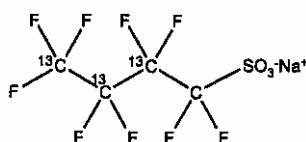
COMPOUND:

Sodium perfluoro-1-[2,3,4-¹³C₃]butanesulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₃¹²CF₉SO₃Na

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)

46.5 ± 2.3 µg/ml (M3PFBS anion)

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

MOLECULAR WEIGHT:

325.06

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

≥99% ¹³C
(2,3,4-¹³C₃)

DOCUMENTATION/ DATA ATTACHED:

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

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

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See page 2 for further details.

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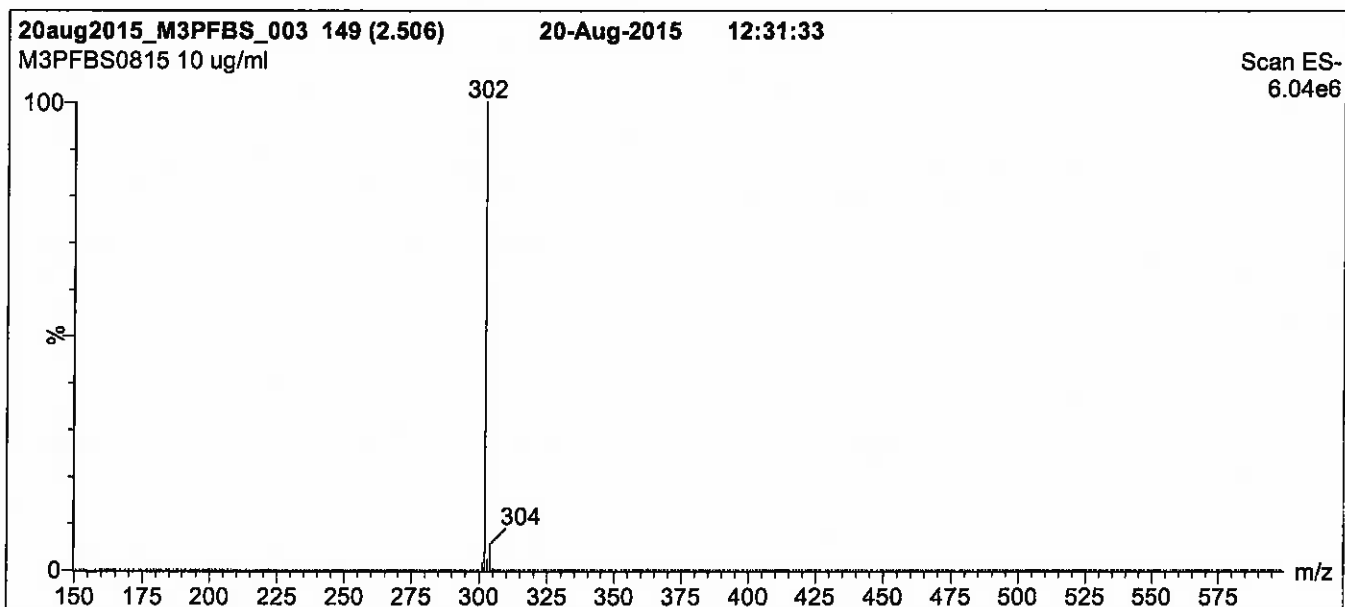
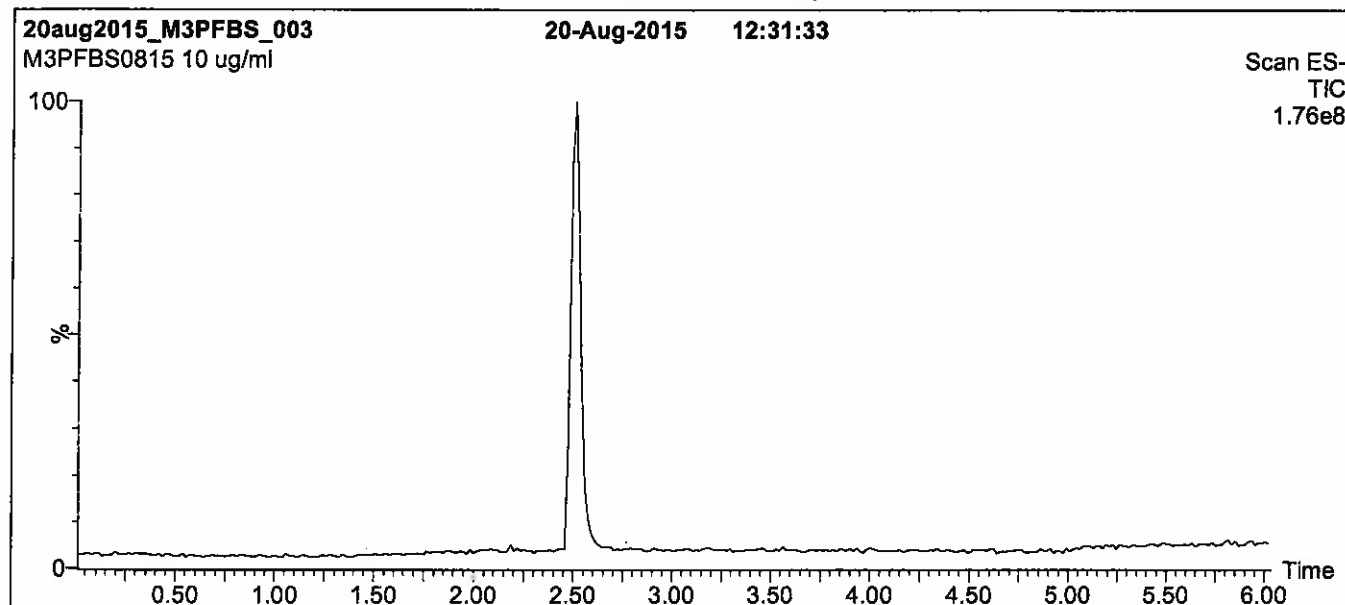
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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

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

Mobile phase: Gradient

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

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

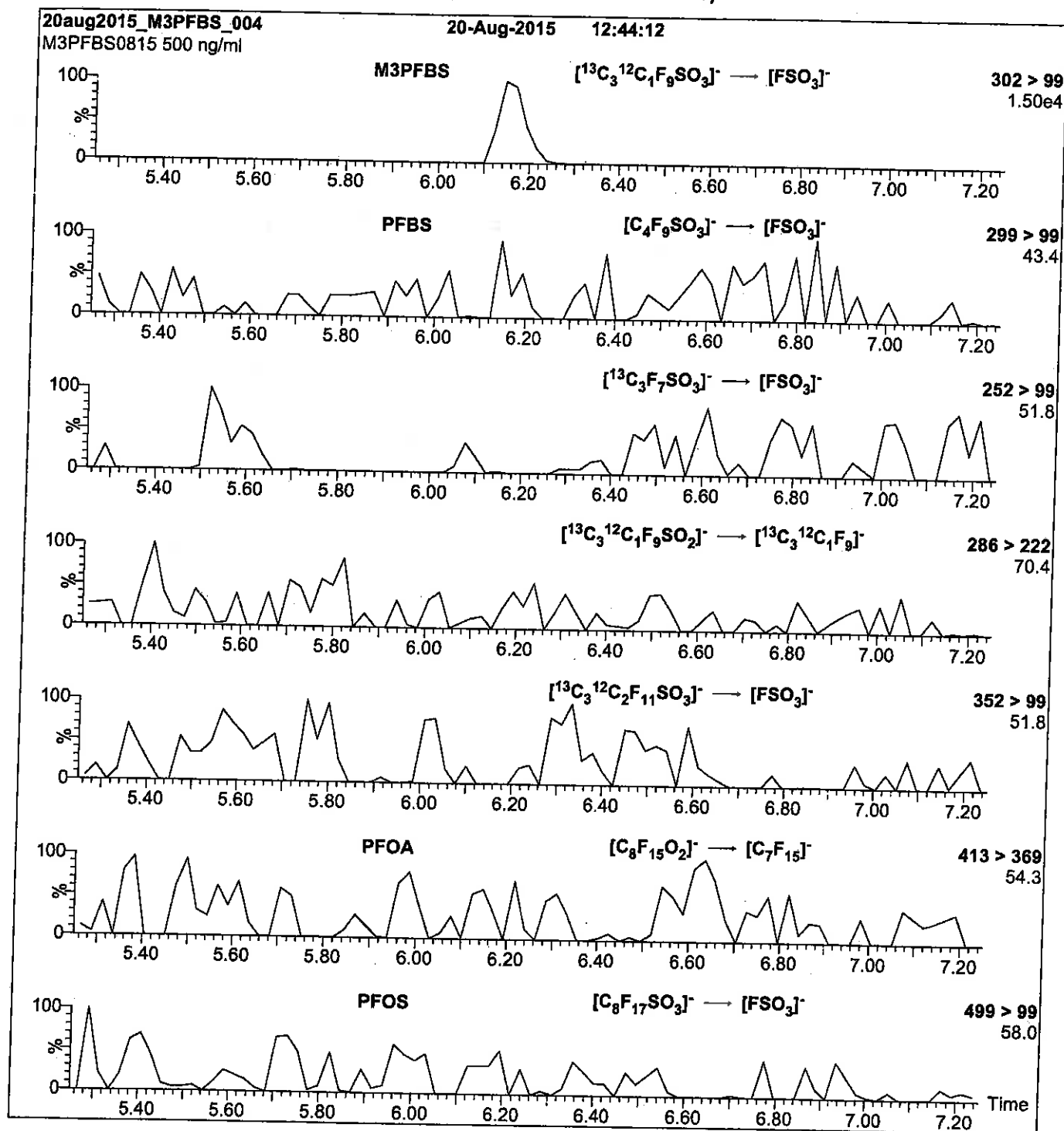
Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 40.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFBS_00003

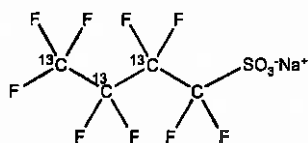


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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBS **LOT NUMBER:** M3PFBS0815
COMPOUND: Sodium perfluoro-1-[2,3,4-¹³C₃]butanesulfonate

STRUCTURE: **CAS #:** Not available



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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 08/05/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

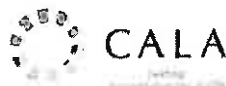
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

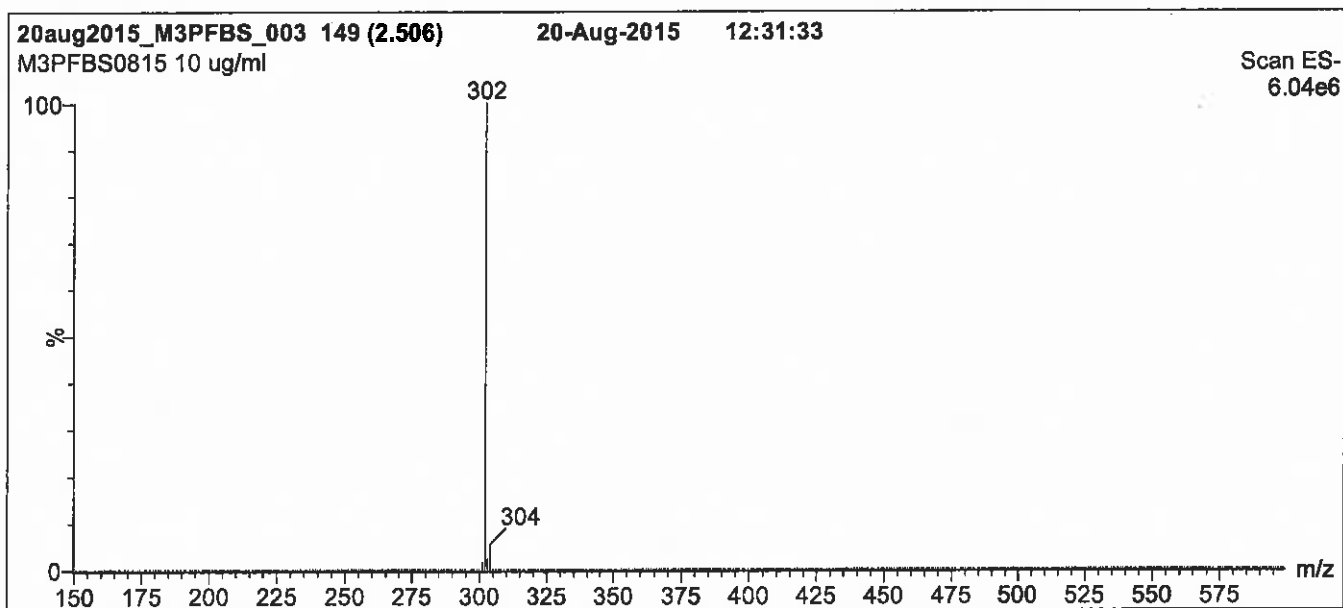
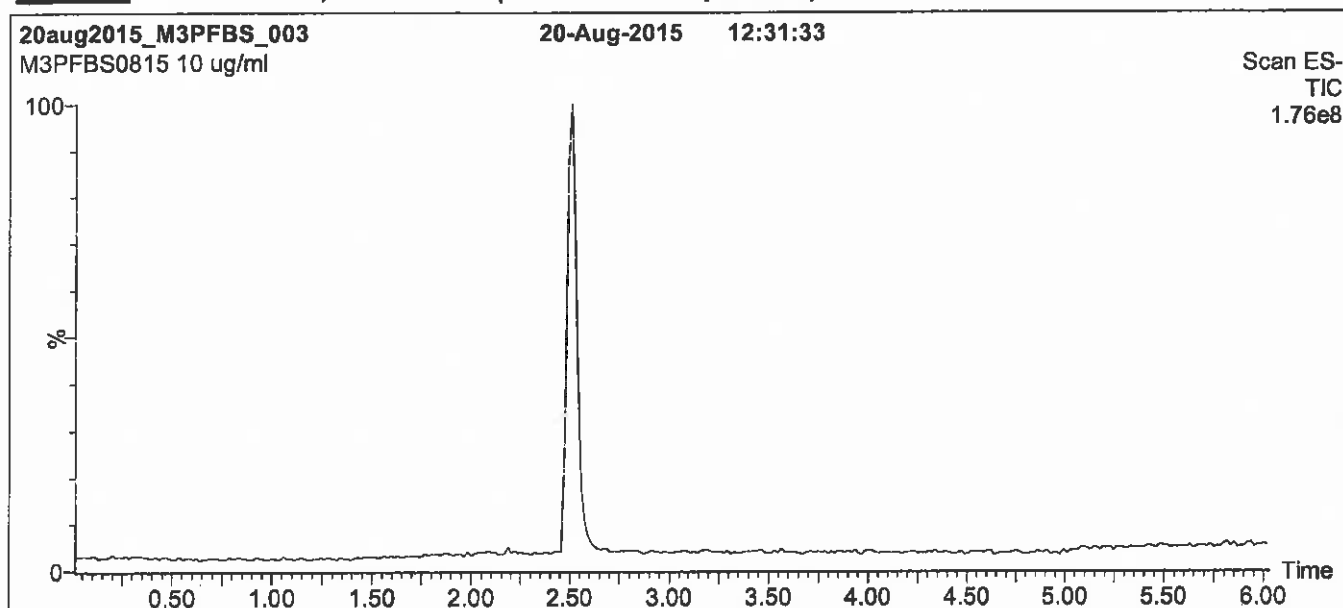
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

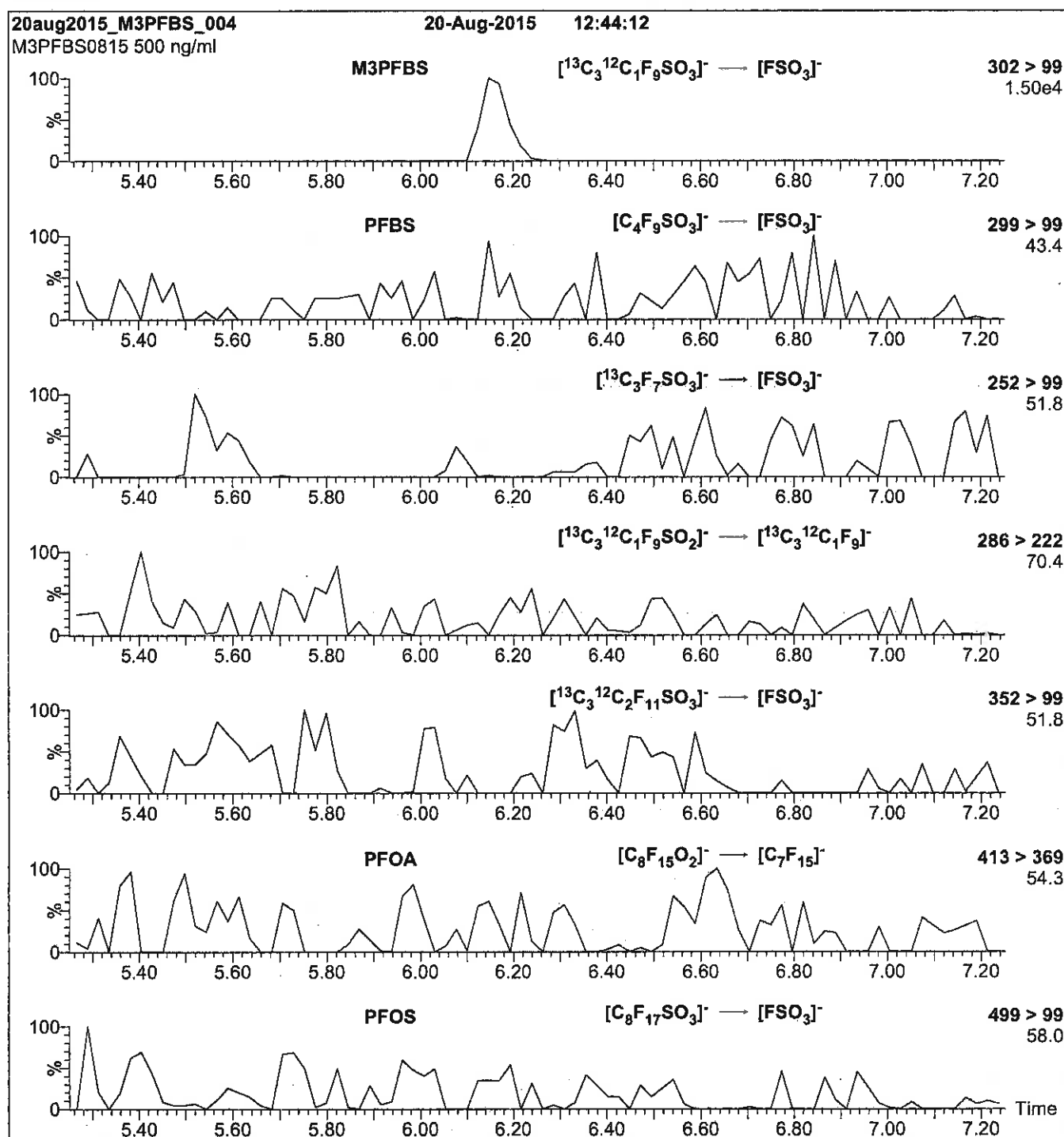
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFDA_00013



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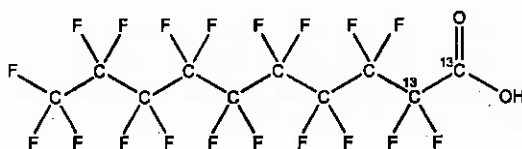
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFDA0916

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of ¹³C₁-PFNA.

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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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

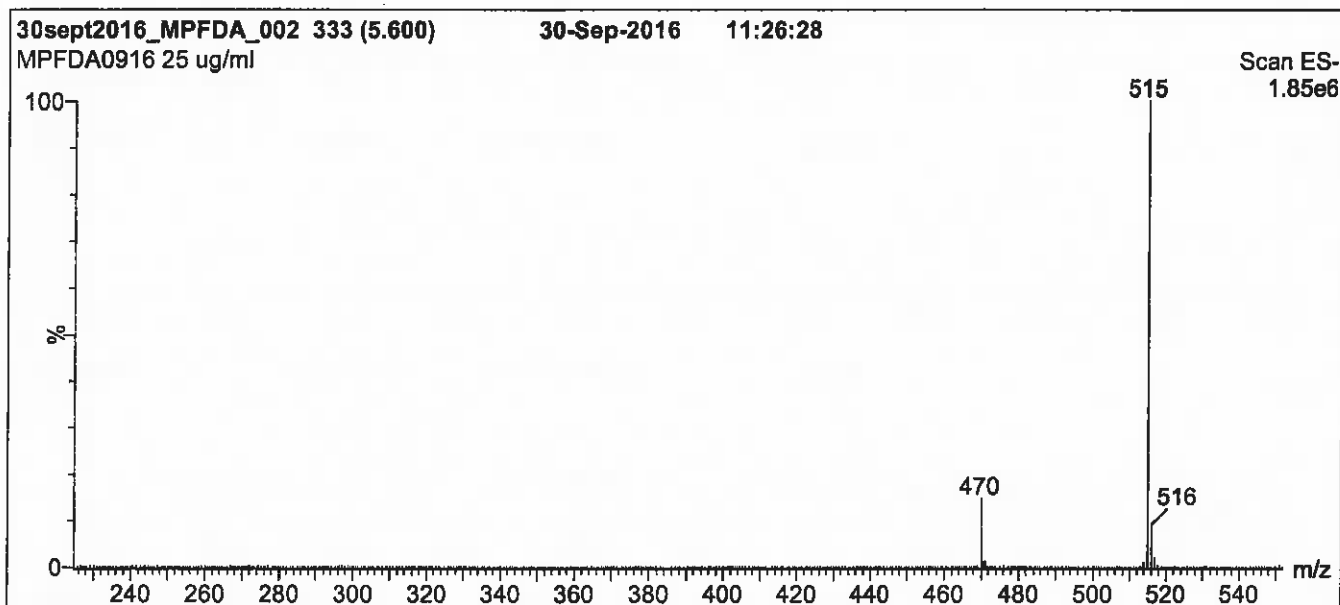
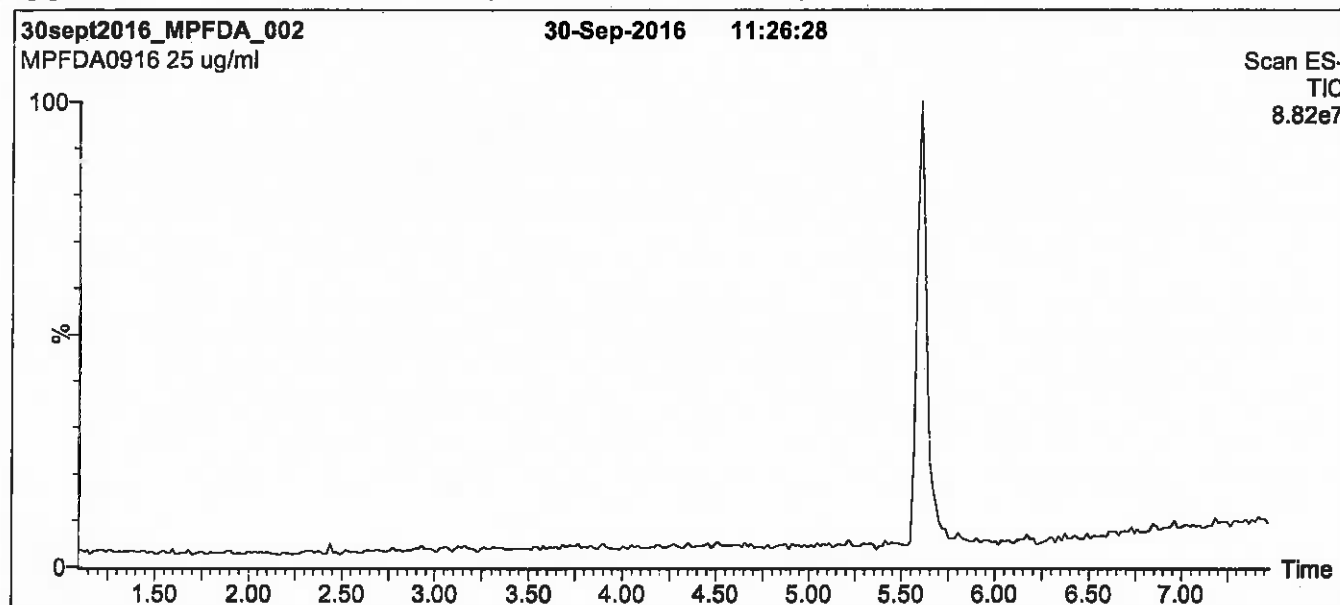
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

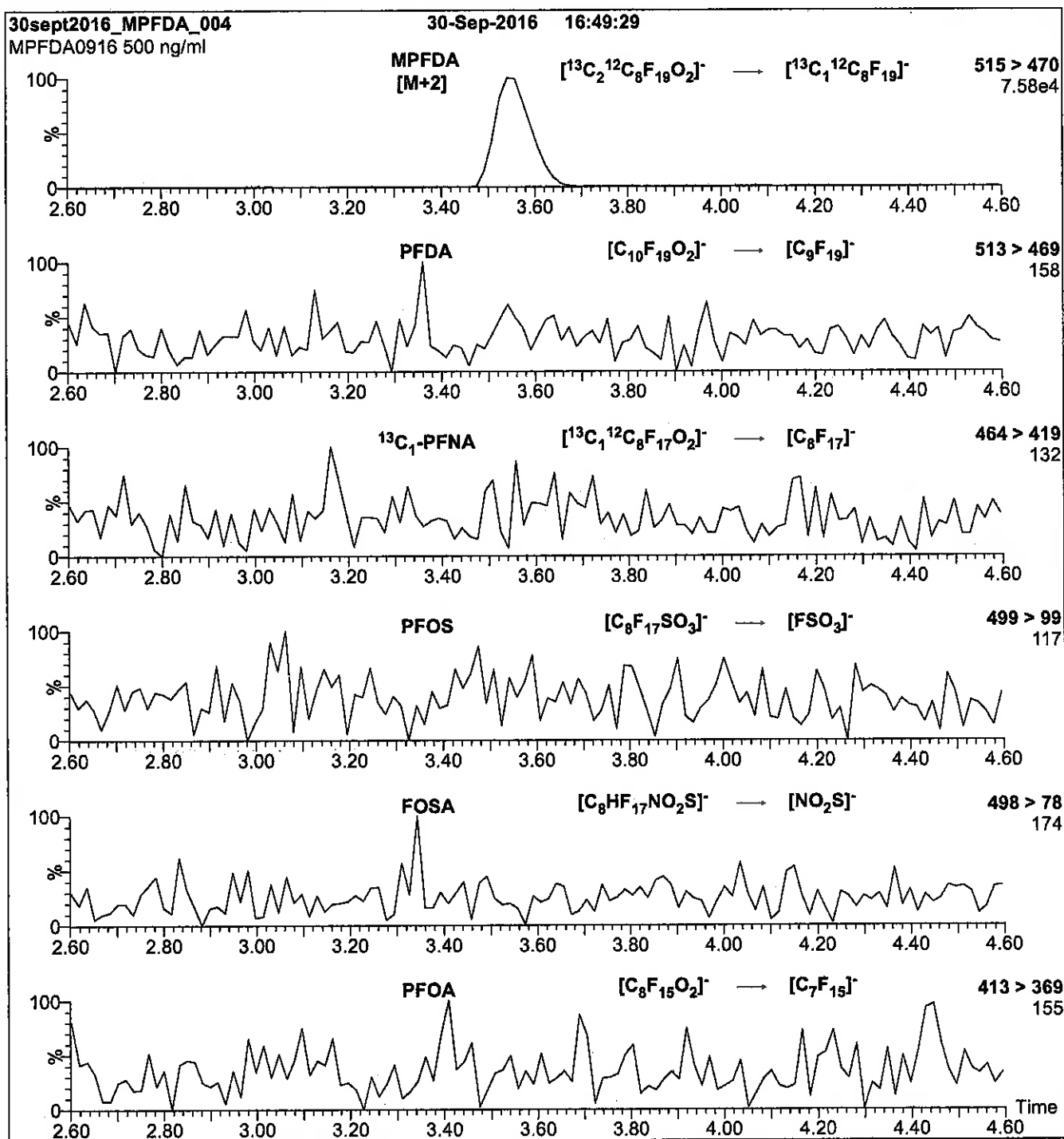
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.31\text{e-}3$
Collision Energy (eV) = 13

Reagent

LCMPFDA_00015

P: 5/31/17-SK
S: 5/18/17-SK



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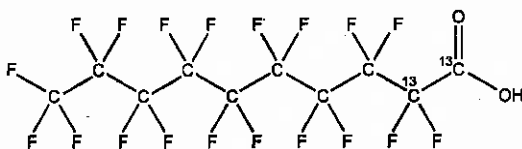
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFDA0916

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of ¹³C₁-PFNA.

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

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EXPIRY DATE / PERIOD OF VALIDITY:

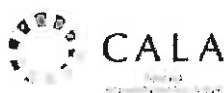
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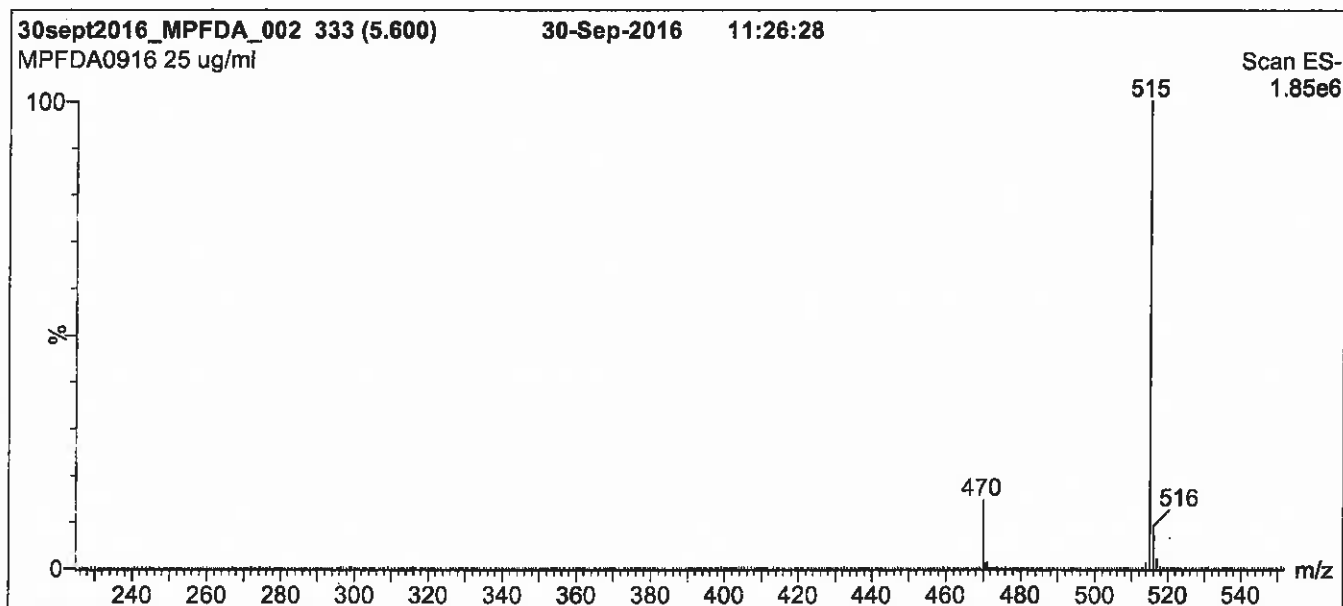
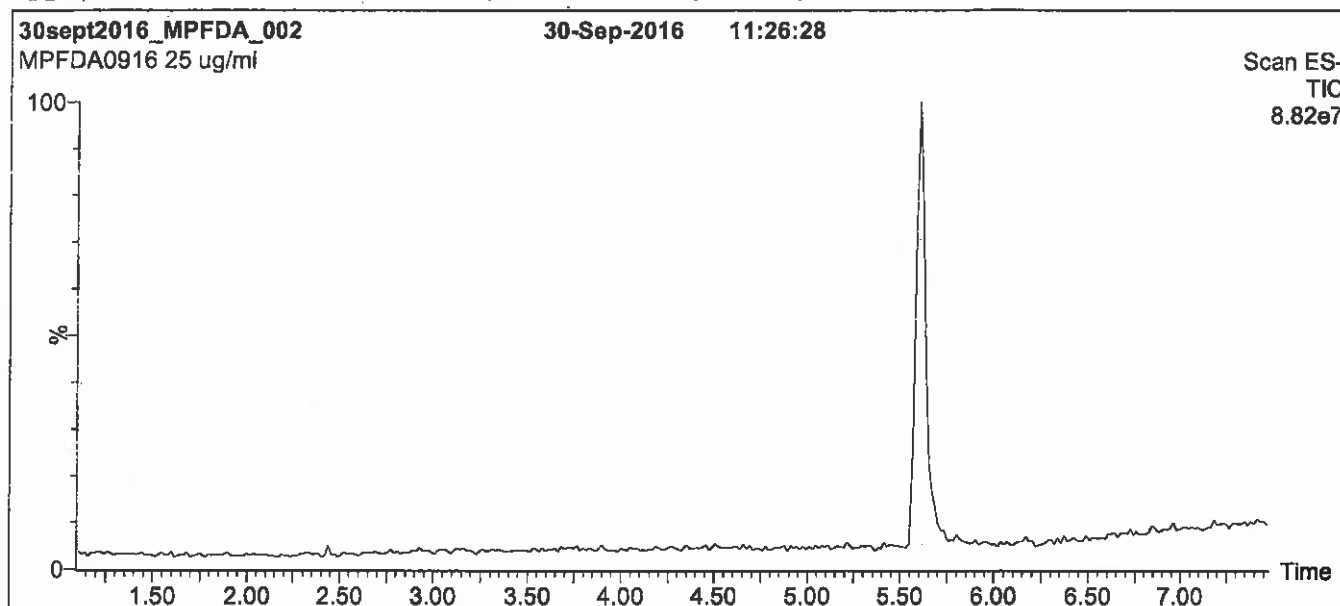
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

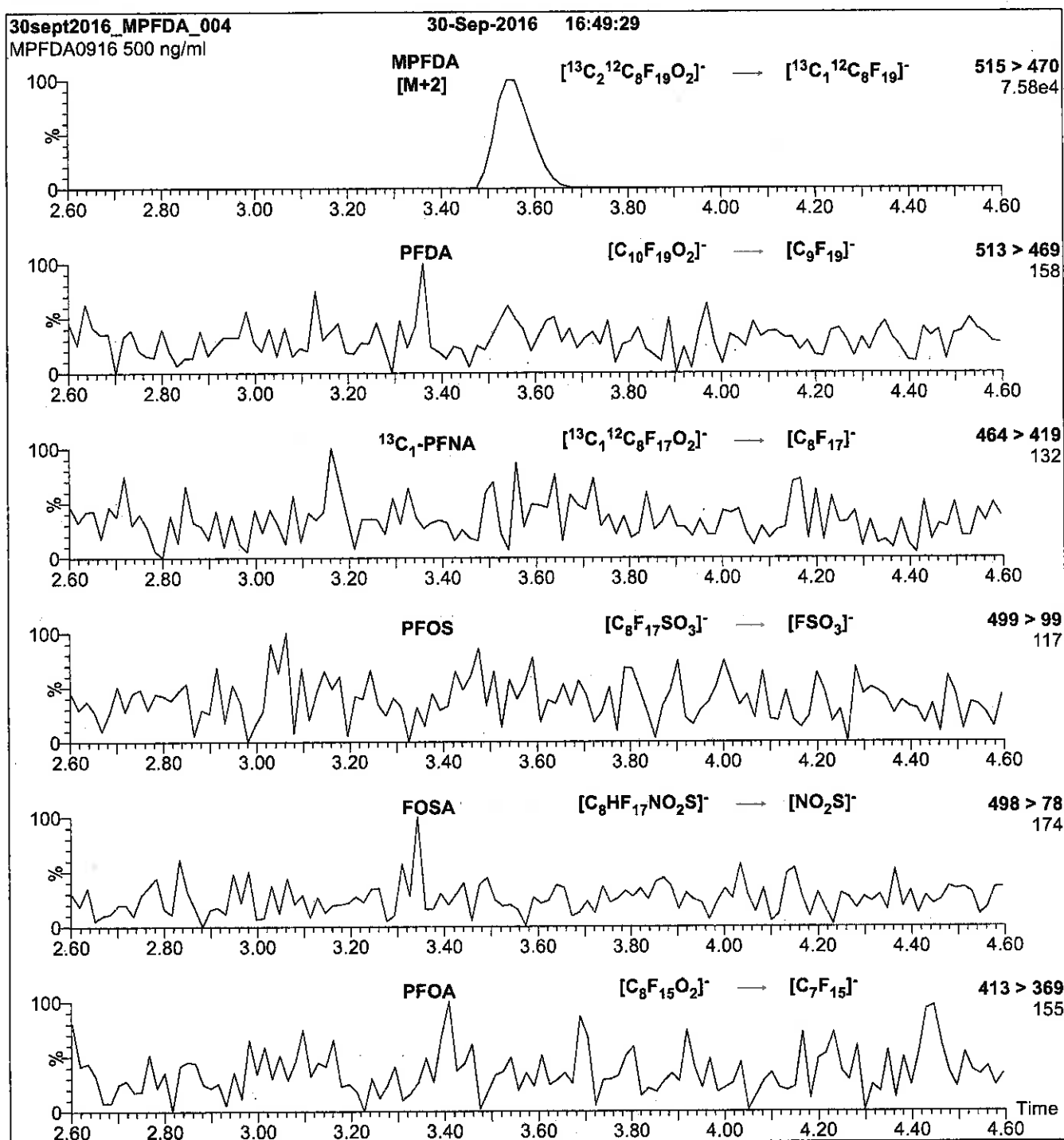
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFD_oA_00009

P: 3/9/17 SKJ



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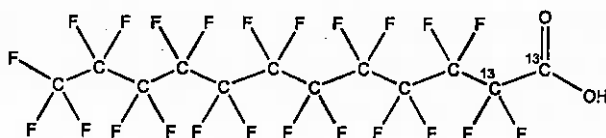
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]dodecanolic acid

LOT NUMBER: MPFDoA0416

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₀HF₂₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 616.08
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/08/2016
EXPIRY DATE: (mm/dd/yyyy) 04/08/2021
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: 04/15/2016
(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:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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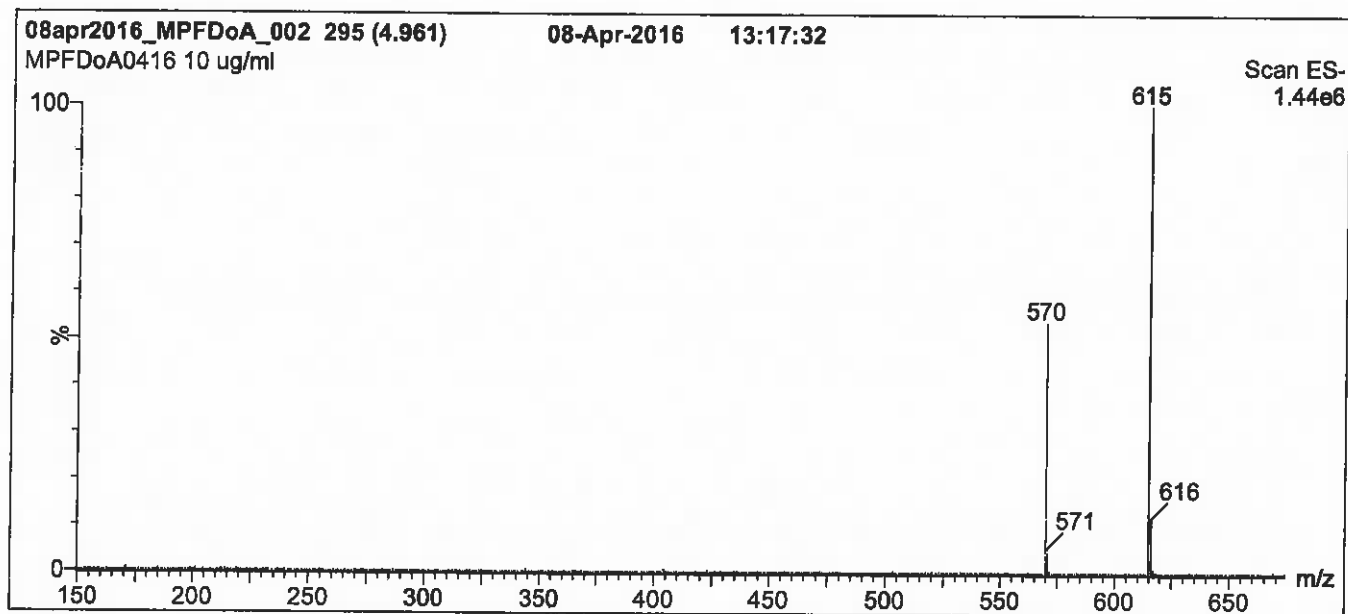
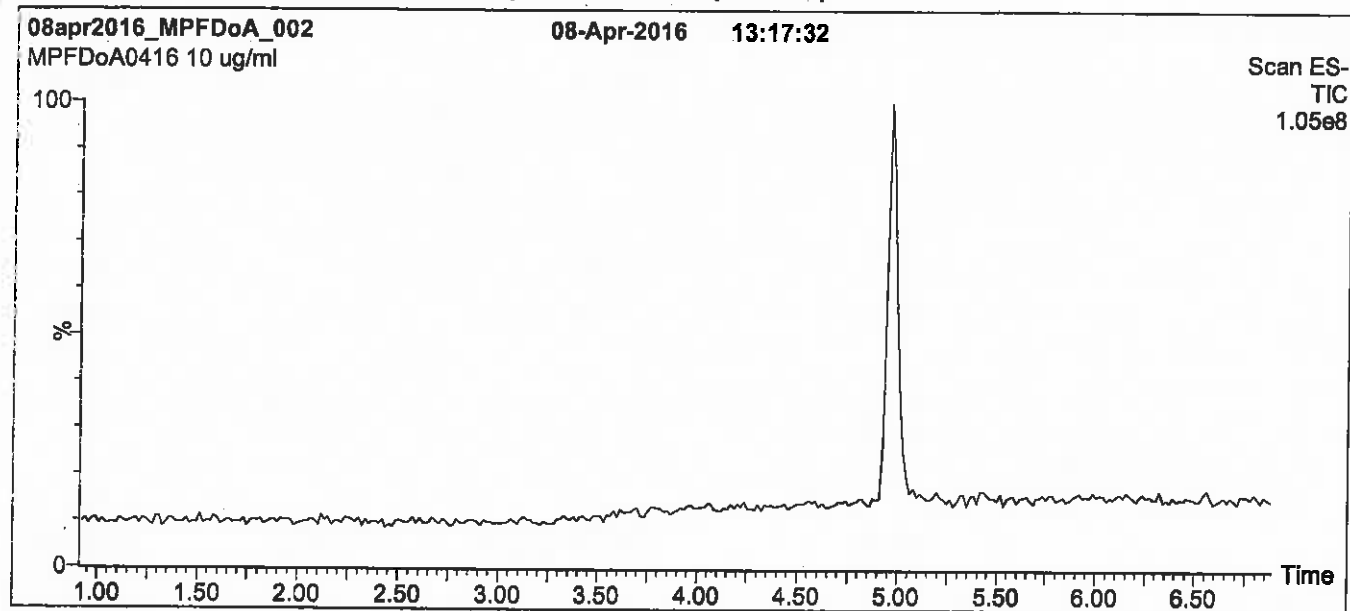
QUALITY MANAGEMENT:

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).



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

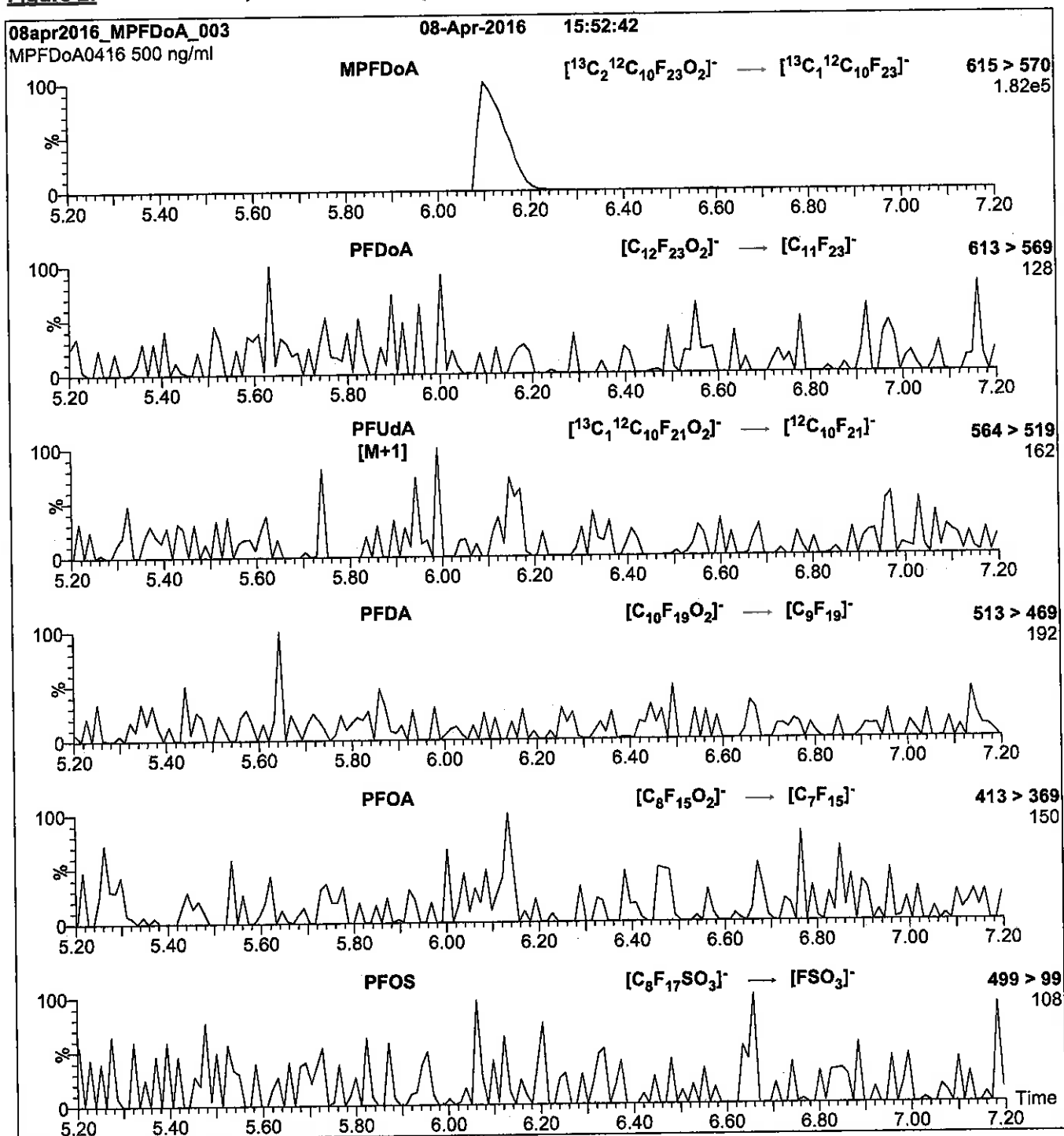
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 13

Reagent

LCMPFD_oA_00010

r: 5/3/17 SKV



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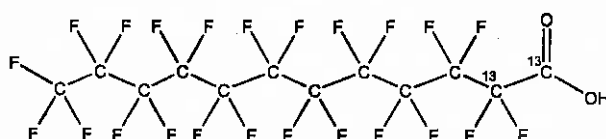
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFDoA0416

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₀HF₂₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/08/2016
EXPIRY DATE: (mm/dd/yyyy) 04/08/2021

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 04/15/2016
(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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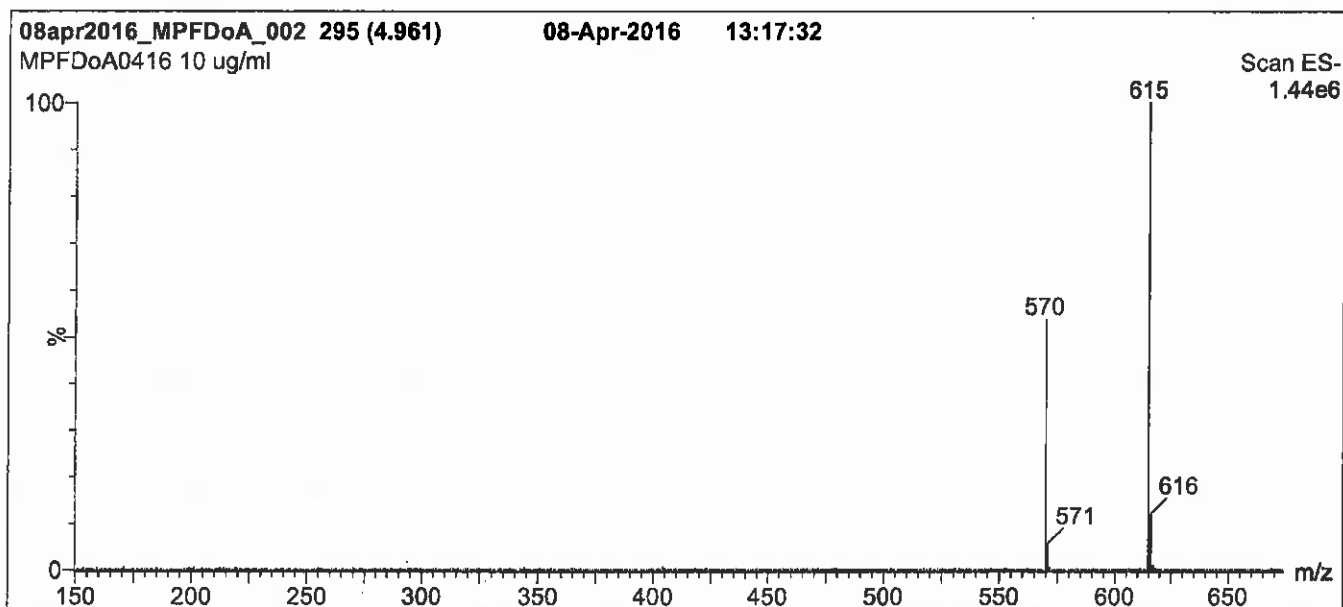
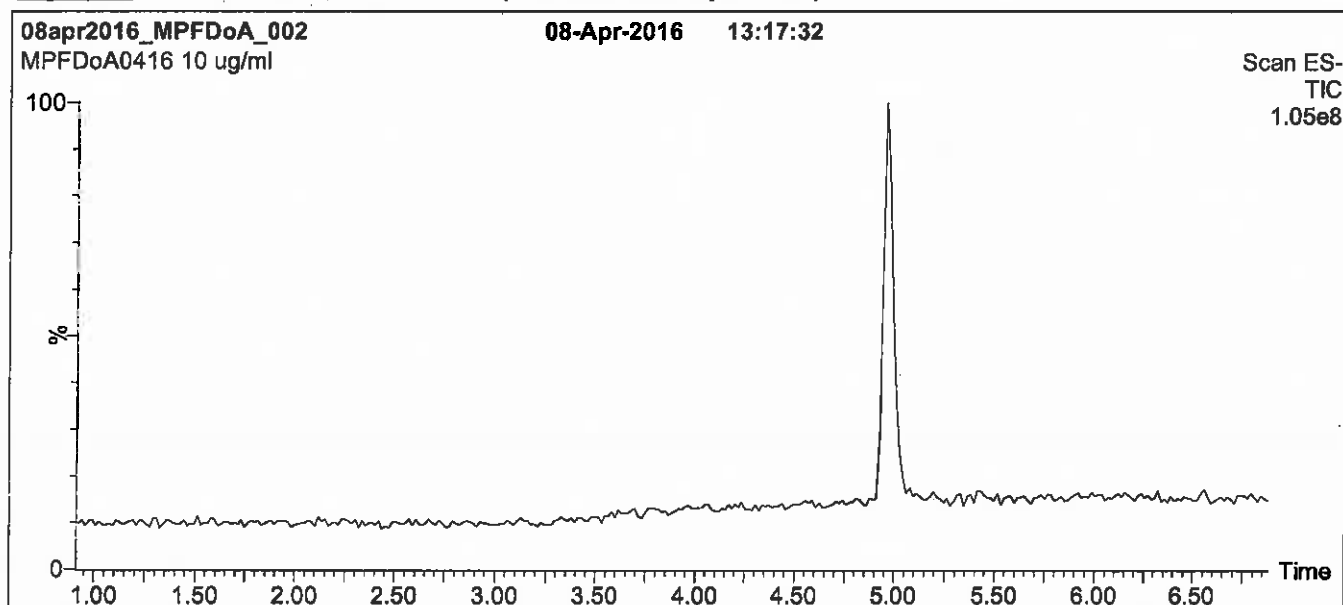
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

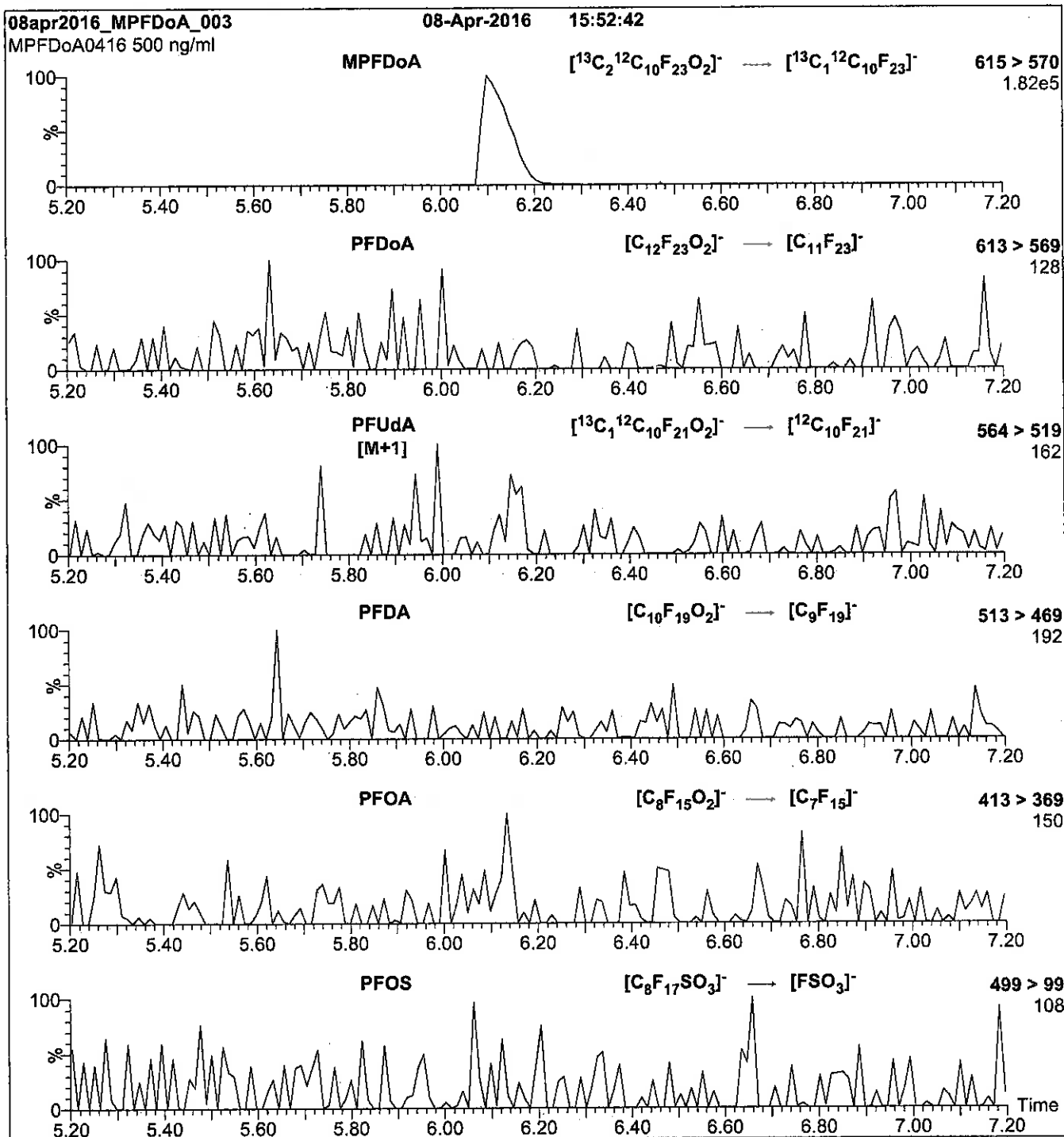
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.24\text{e-}3$
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00014



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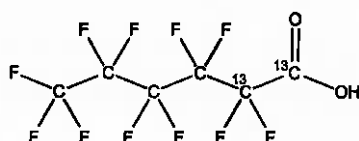
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA1116

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/13/2016
(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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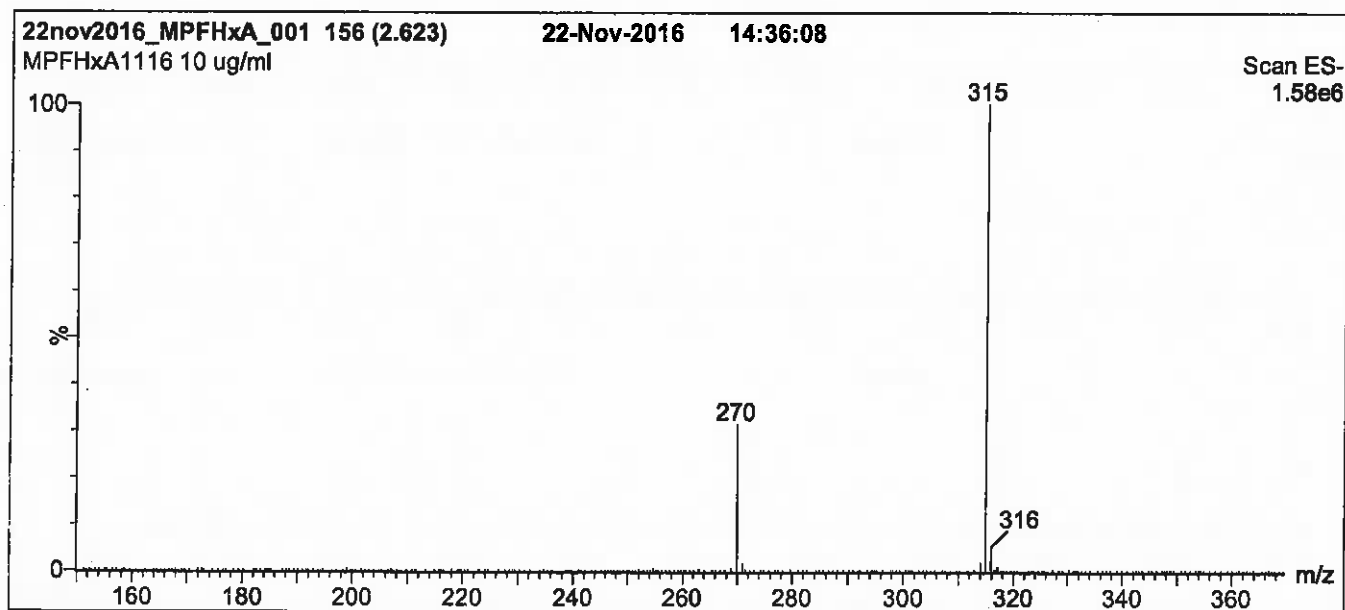
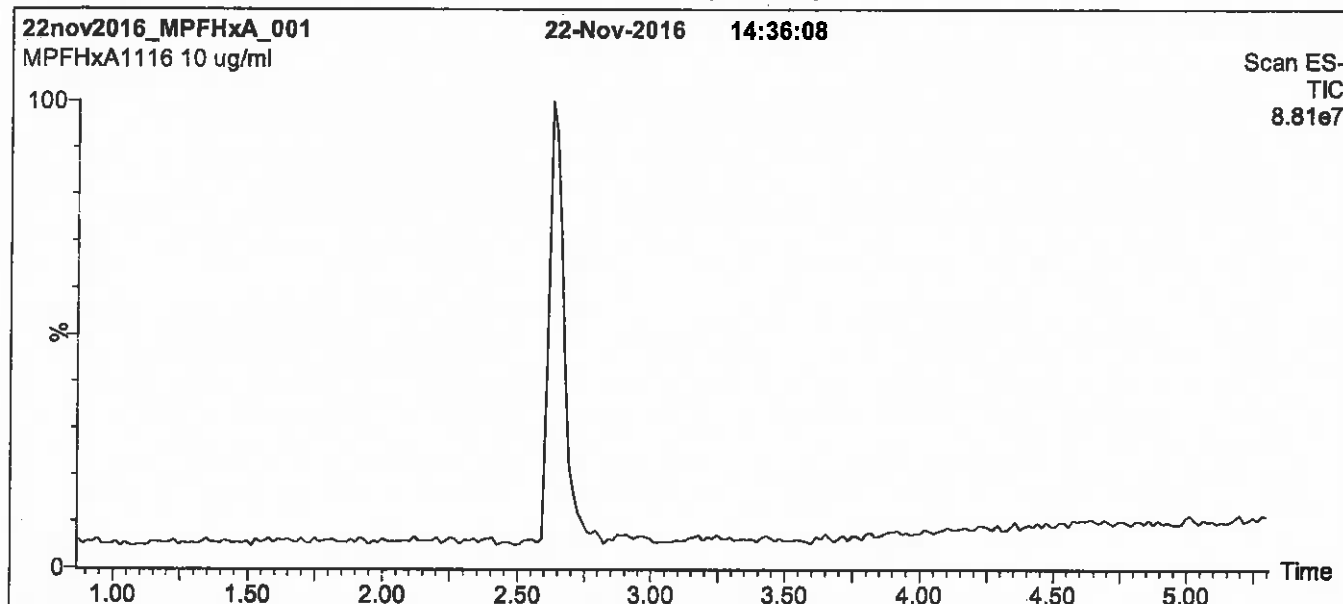
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

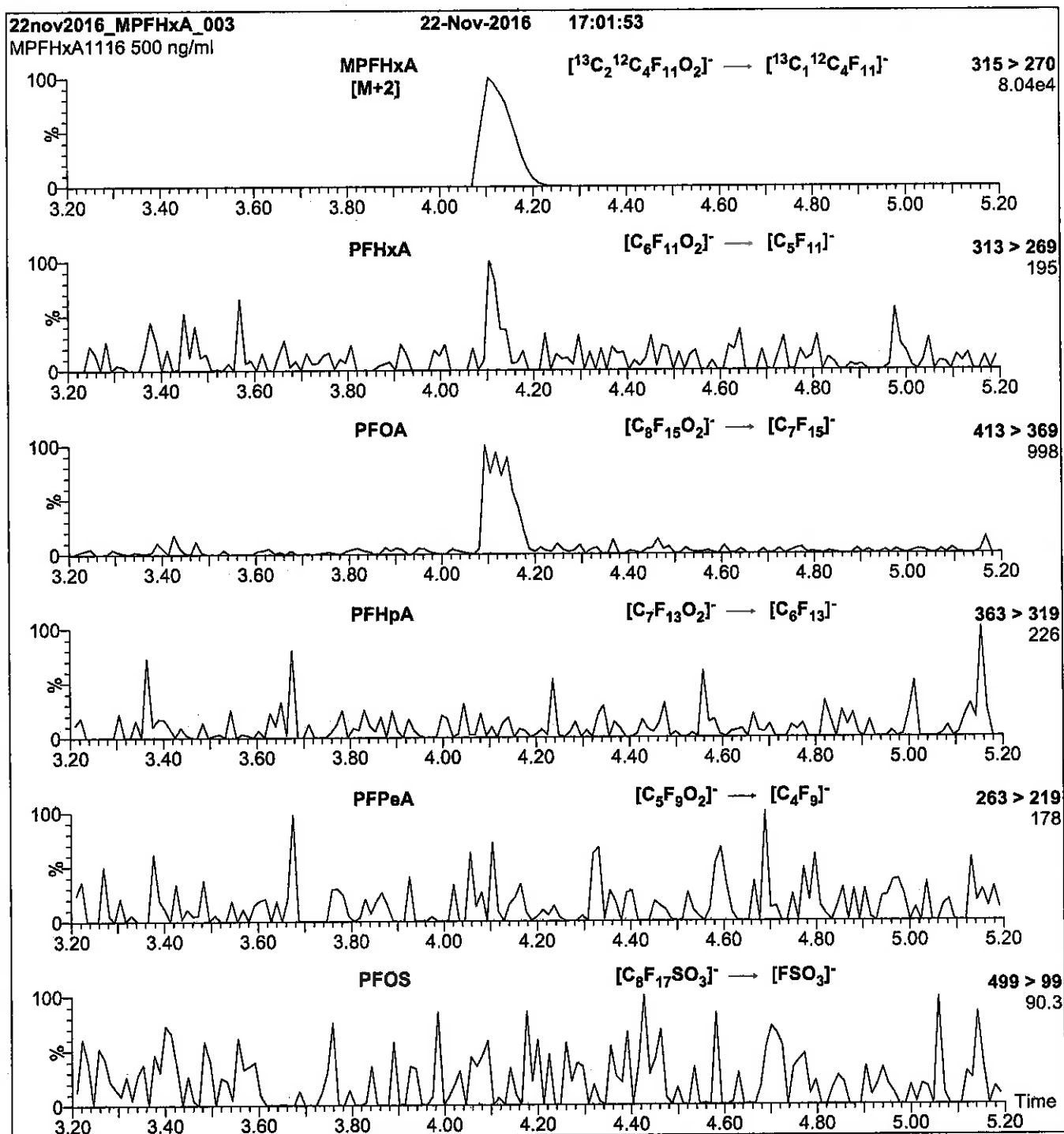
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxA_00016

R: 5/31/17 SKV
S: 5/31/17 SKV



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

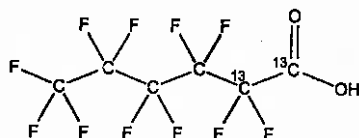
MPFHxA

LOT NUMBER:

MPFHxA1116

COMPOUND:Perfluoro-n-[1,2-¹³C₂]hexanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₄HF₁₁O₂**CONCENTRATION:**

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

316.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99%¹³C(1,2-¹³C₂)**LAST TESTED:** (mm/dd/yyyy)

11/22/2016

EXPIRY DATE: (mm/dd/yyyy)

11/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/13/2016

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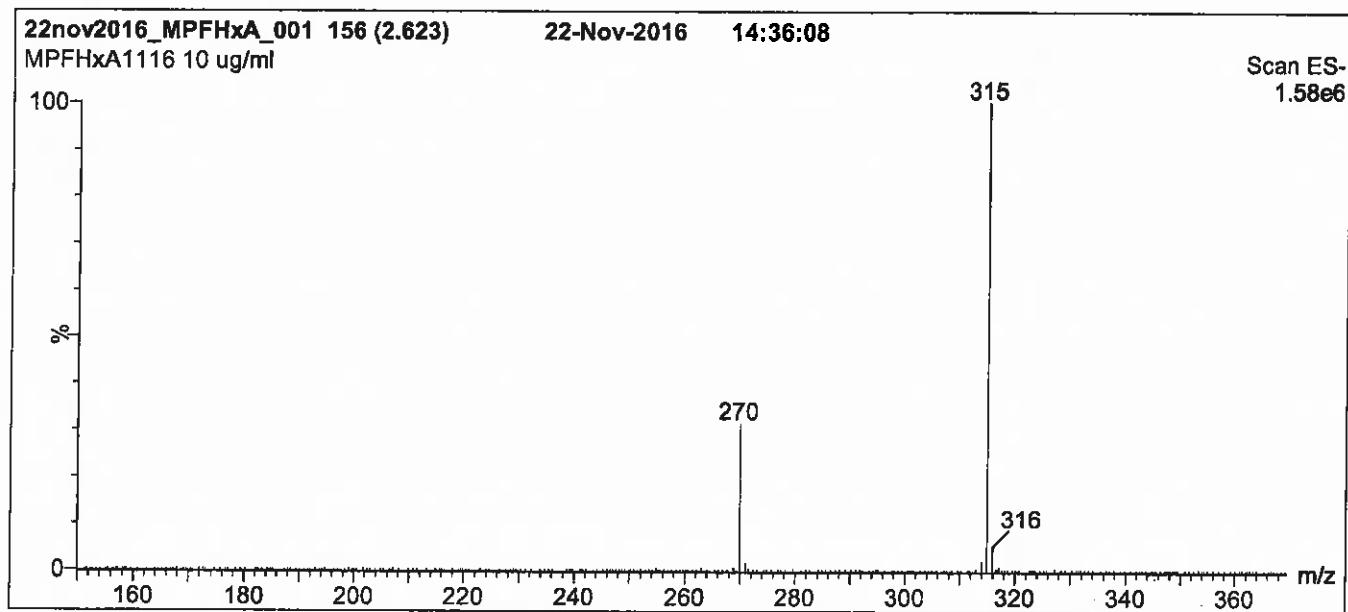
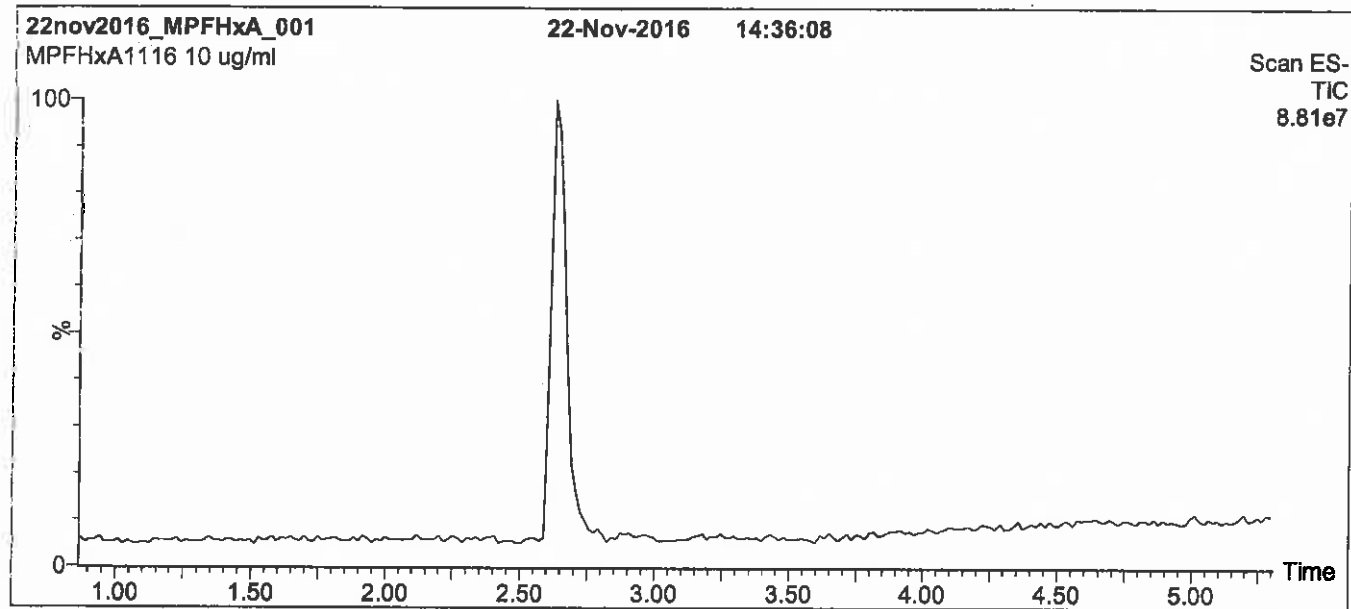
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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

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

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

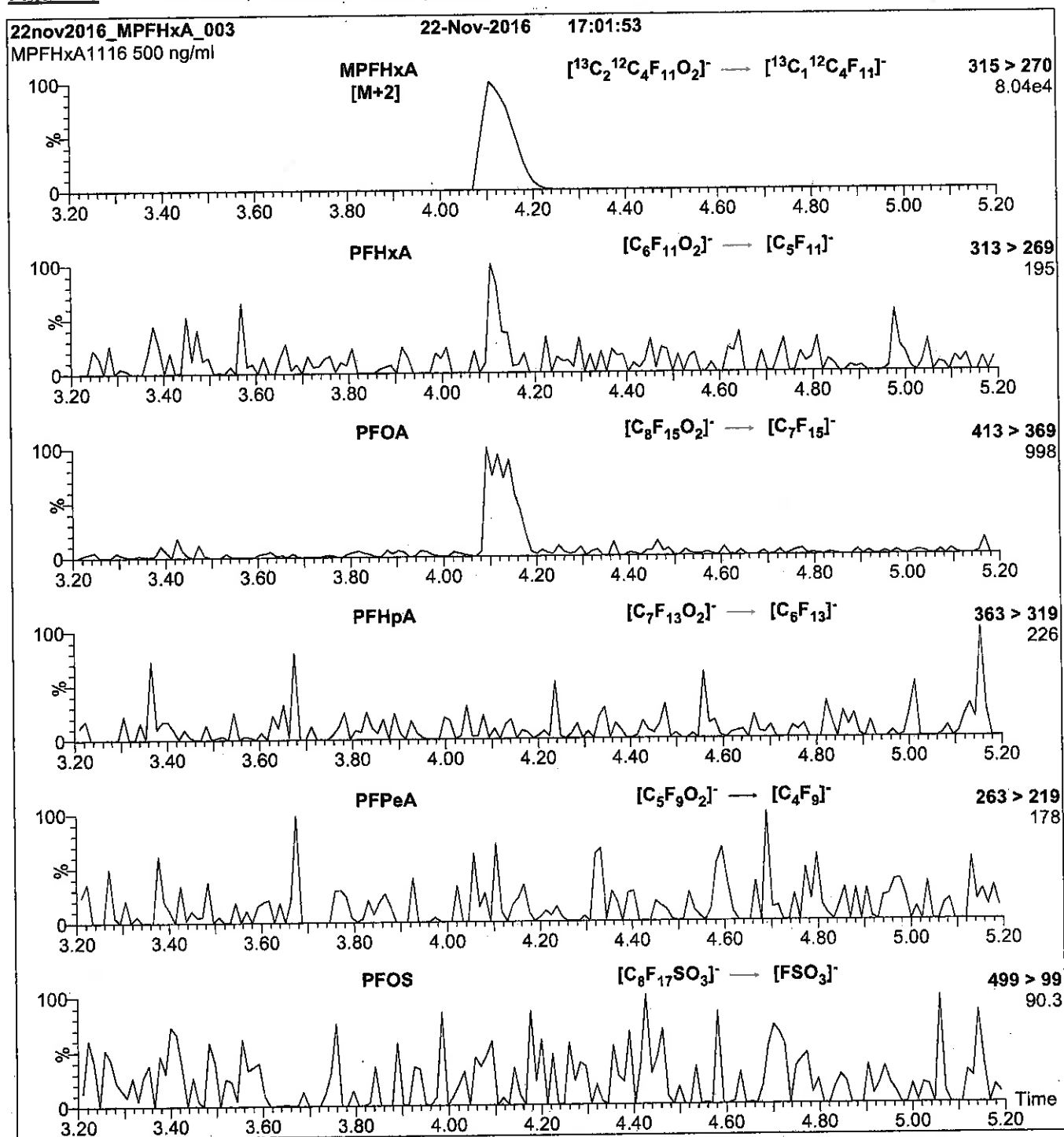
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCMPFHXS_00009



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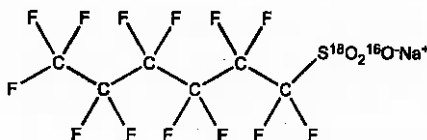
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS
COMPOUND: Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate

LOT NUMBER: MPFHxS1015

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₆F₁₃S¹⁸O₂¹⁶ONa
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.3 ± 2.4 µg/ml (MPFHxS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/23/2015
EXPIRY DATE: (mm/dd/yyyy) 10/23/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 426.10
SOLVENT(S): Methanol
ISOTOPIC PURITY: >94% (¹⁸O₂)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS (C₆F₁₃S¹⁸O₂¹⁶O⁻) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁸O₃⁻) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material (¹⁸O₂ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/28/2015
(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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

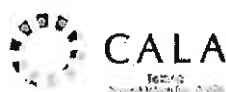
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

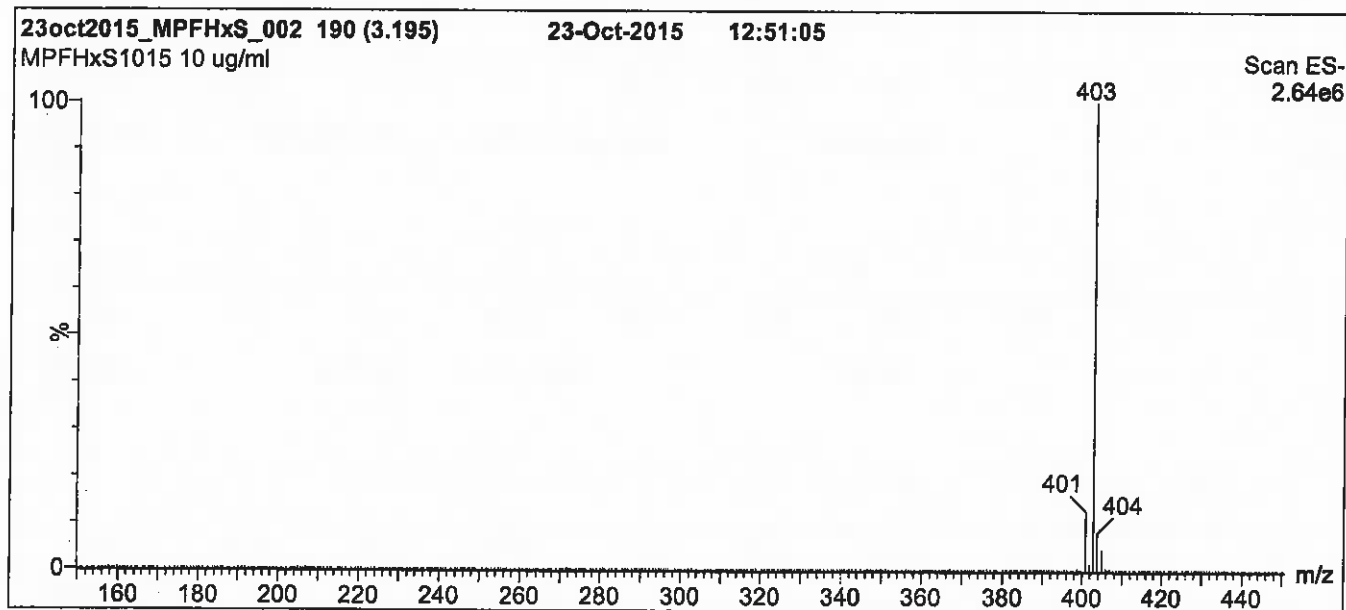
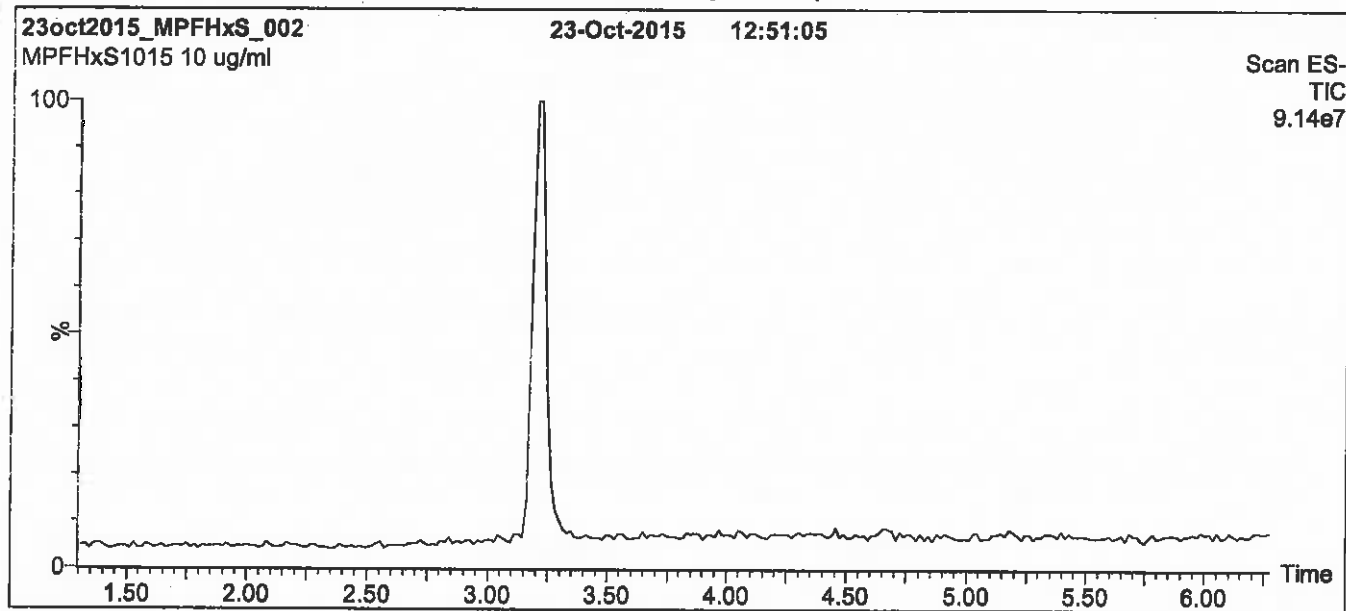
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

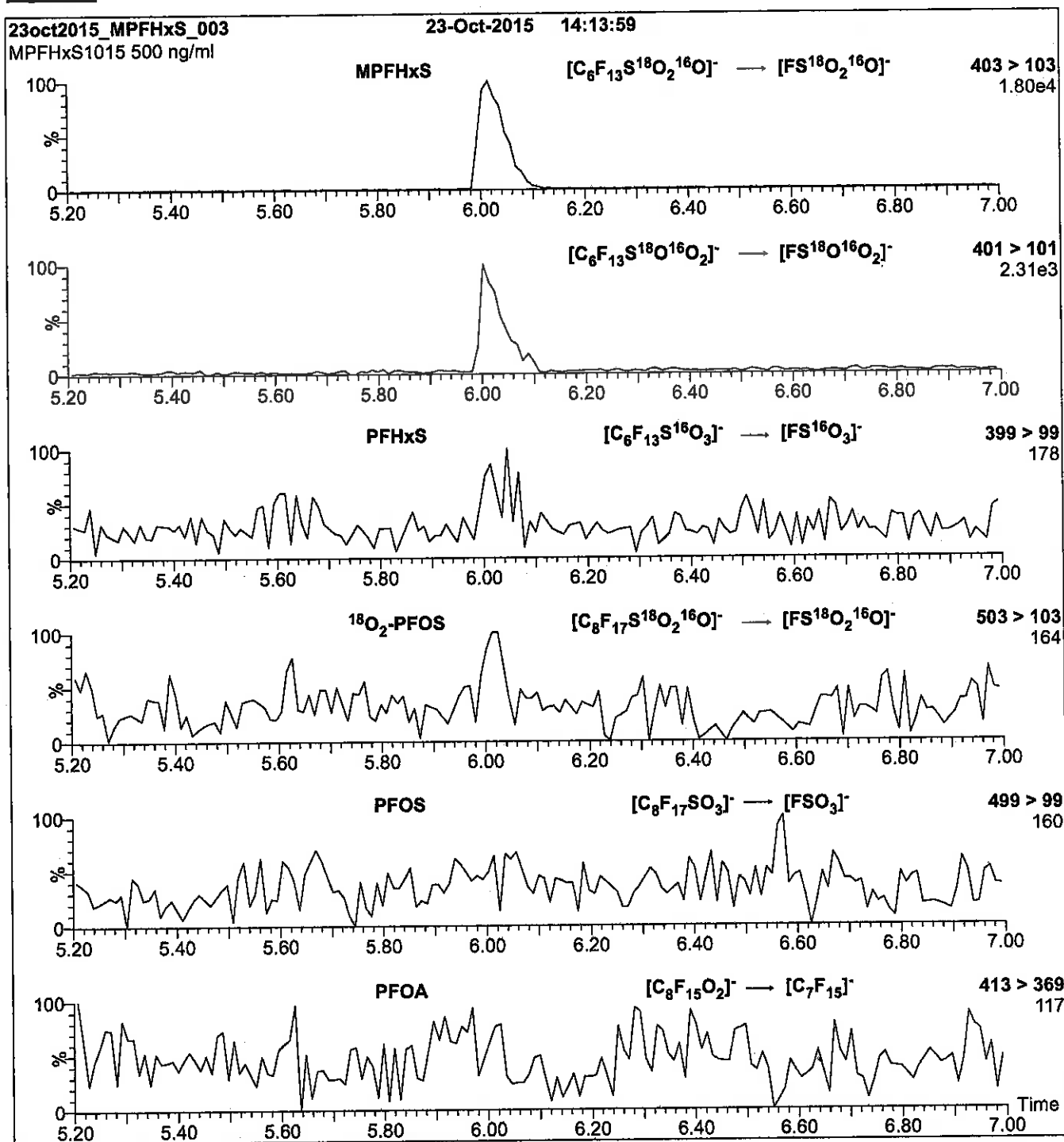
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

LCMPFHxS_00010



WELLINGTON LABORATORIES

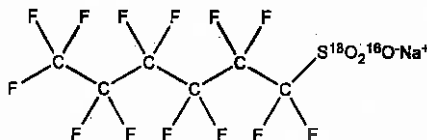
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxS
COMPOUND: Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate

LOT NUMBER: MPFHxS0217

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₆F₁₃S¹⁸O₂¹⁶ONa
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.3 ± 2.4 µg/ml (MPFHxS anion)
CHEMICAL PURITY: >98%
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

MOLECULAR WEIGHT: 426.10
SOLVENT(S): Methanol
ISOTOPIC PURITY: >94% (¹⁸O₂)

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS (C₆F₁₃S¹⁸O₂¹⁶O⁻) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁸O₃⁻) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[¹⁸O₂]sulfonate (¹⁸O₂-PFOS).
- Due to the isotopic purity of the starting material (¹⁸O₂ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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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EXPIRY DATE / PERIOD OF VALIDITY:

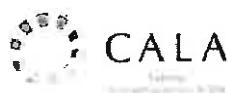
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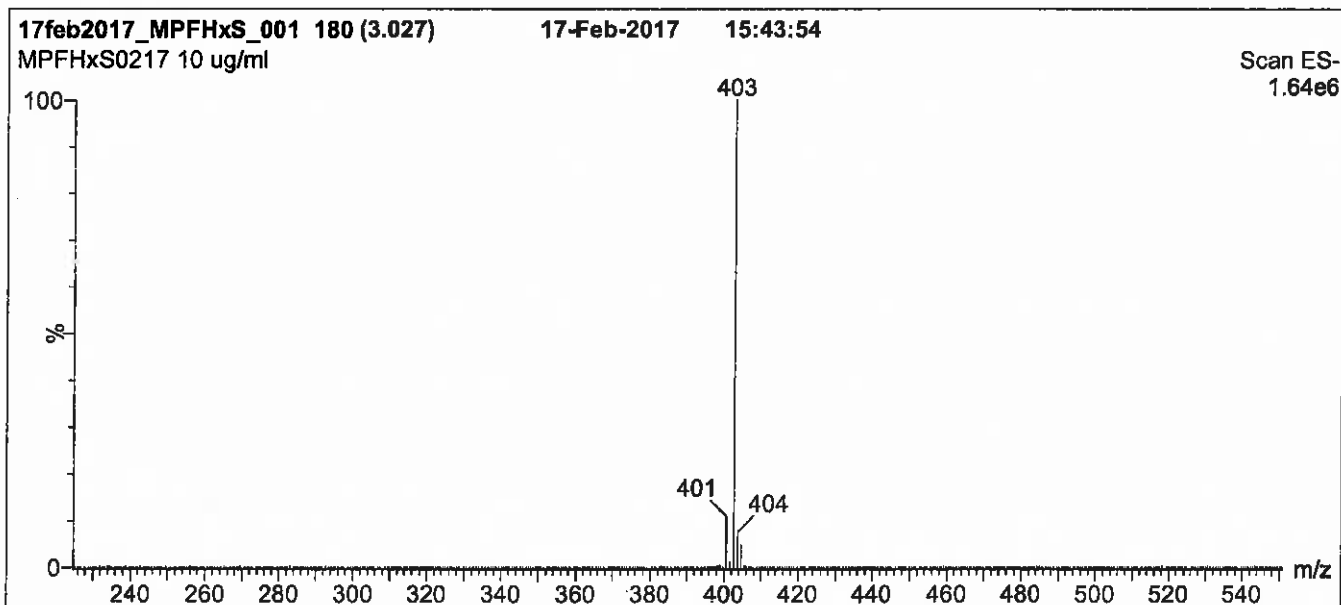
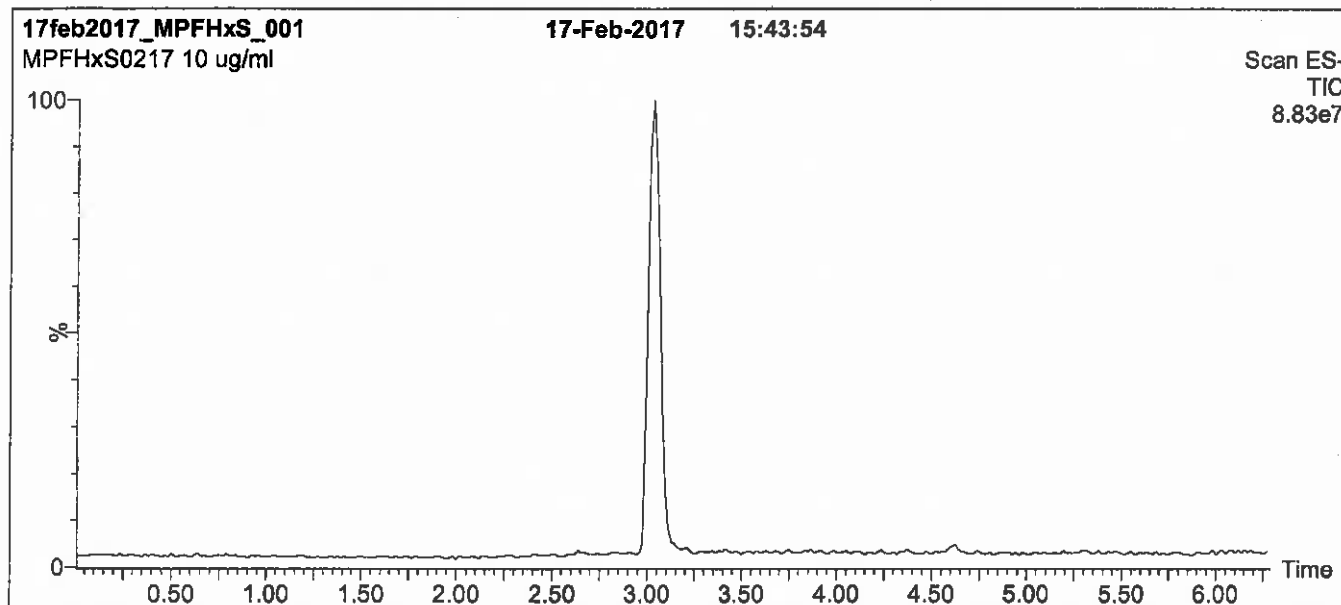
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

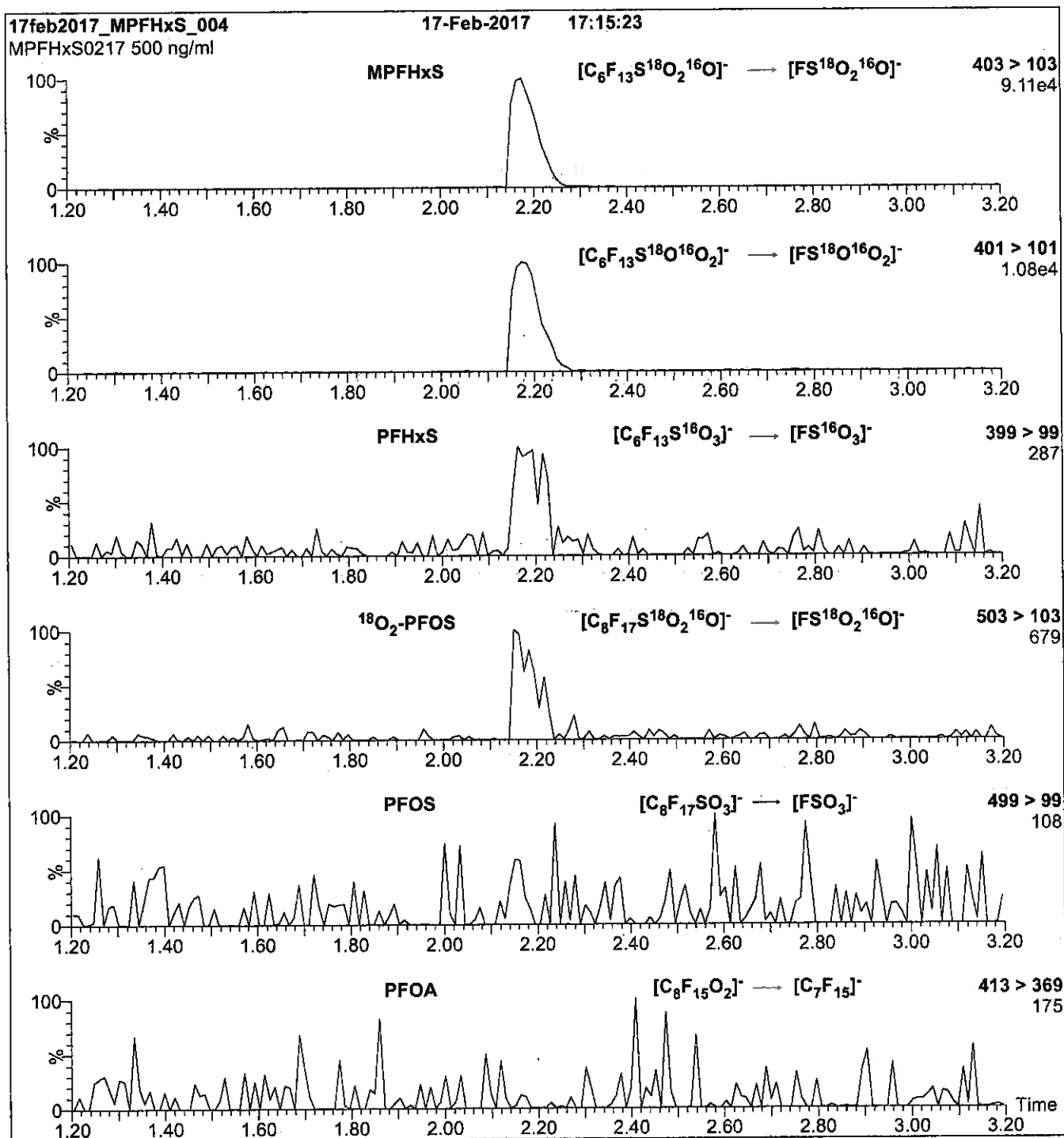
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFNA_00009

P: 3/9/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0916

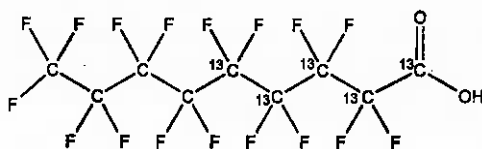
COMPOUND:

Perfluoro-n-[1,2,3,4,5-¹³C₅]nonanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₅¹²C₄HF₁₇O₂

MOLECULAR WEIGHT:

469.04

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

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

(1,2,3,4,5-¹³C₅)

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/11/2016
(mm/dd/yyyy)

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EXPIRY DATE / PERIOD OF VALIDITY:

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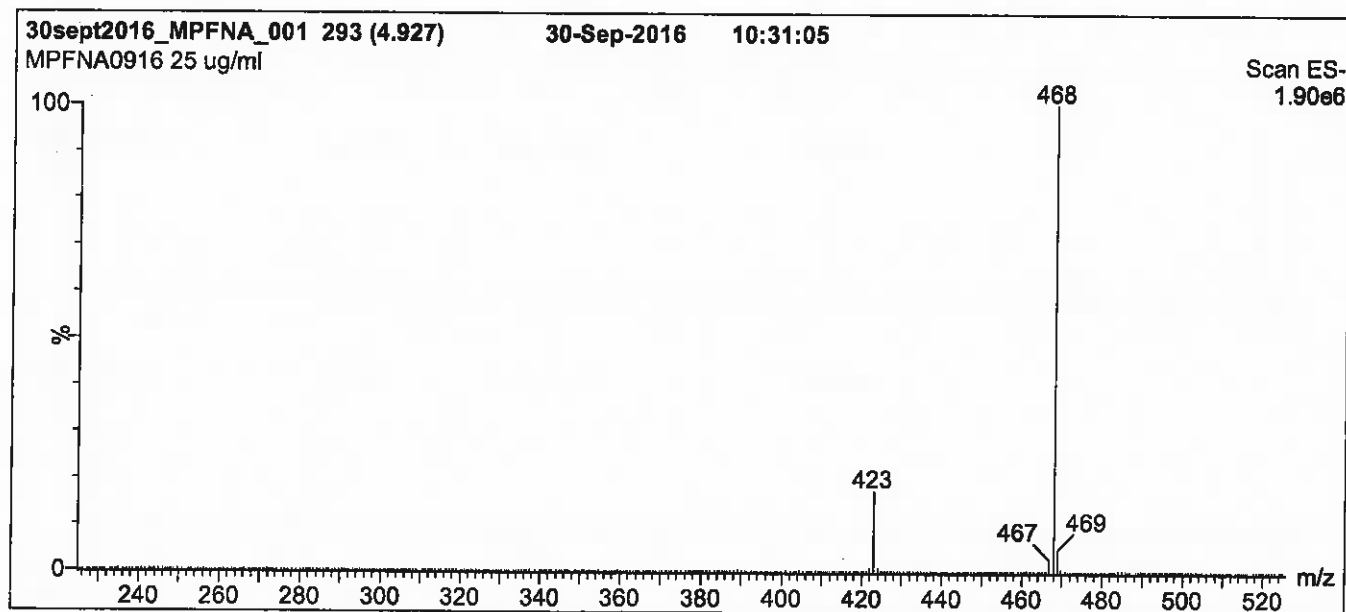
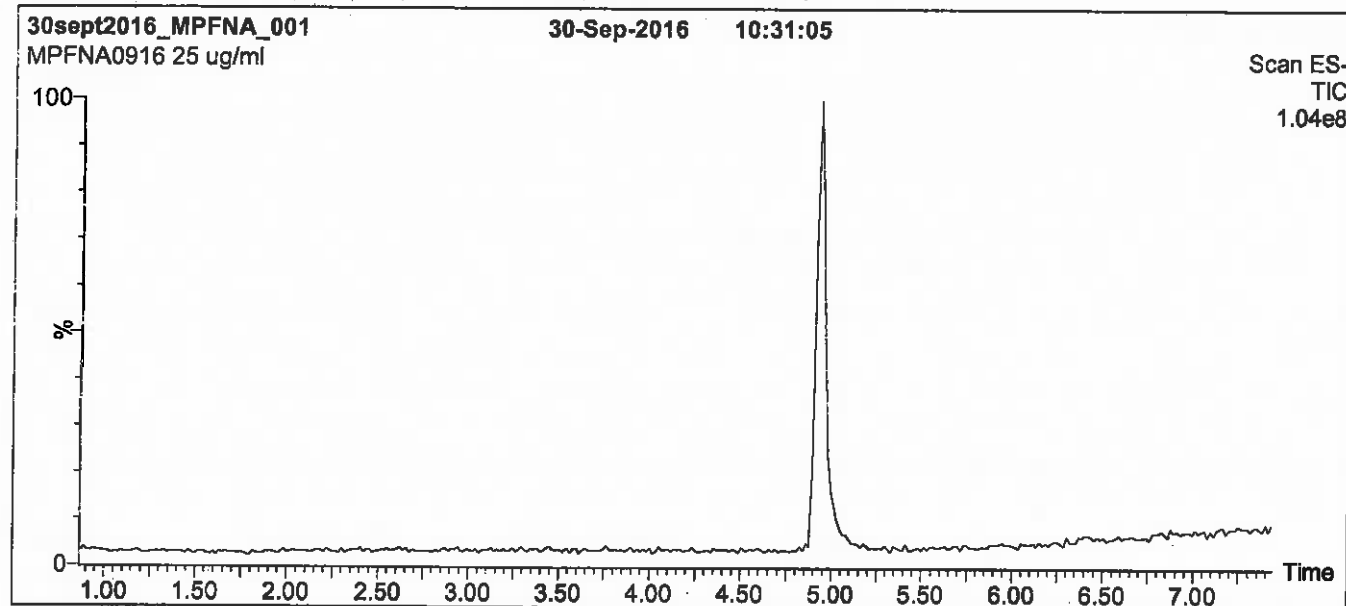
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Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

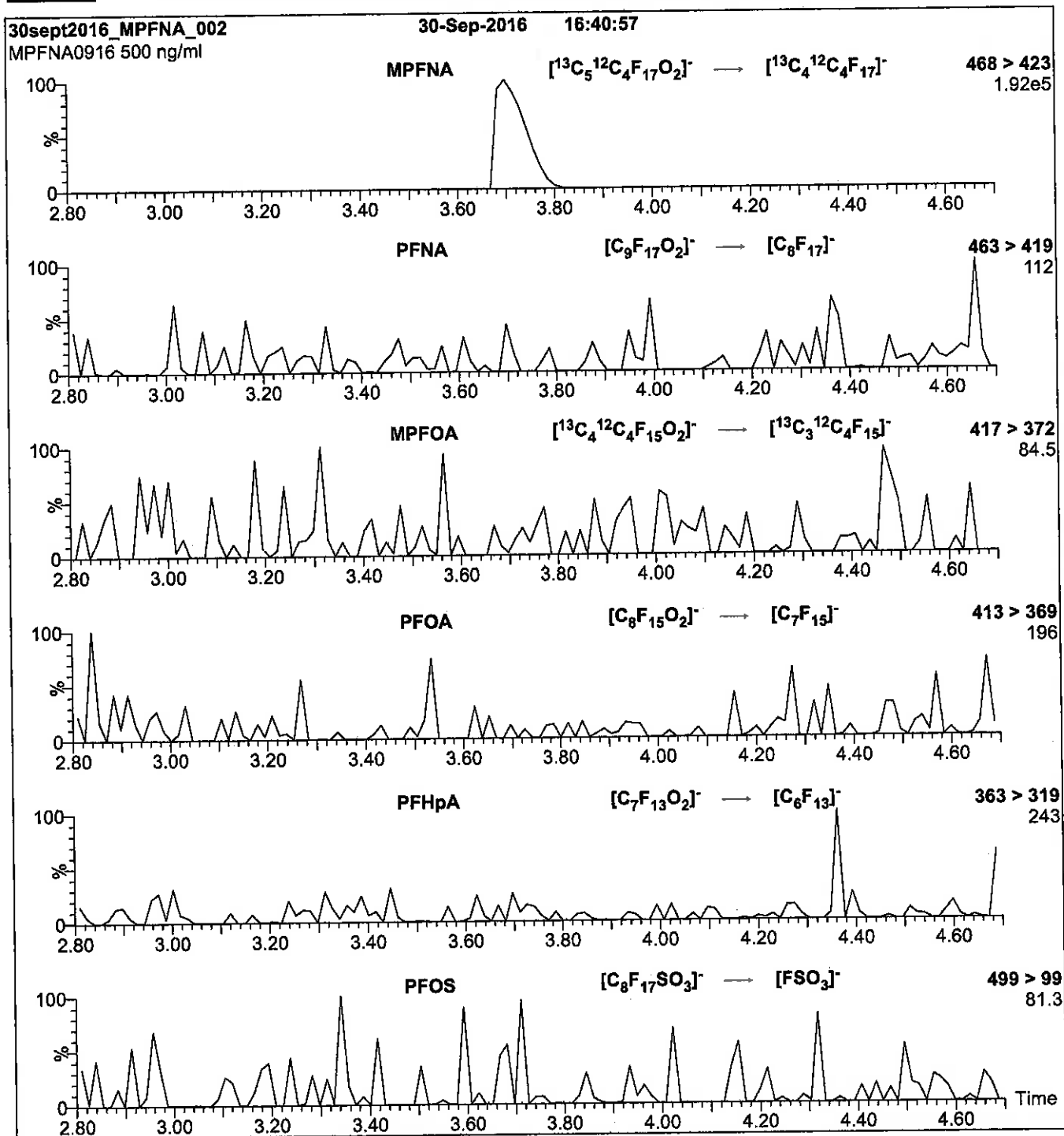
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFNA_00010

r: 5/3/19 SCV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0916

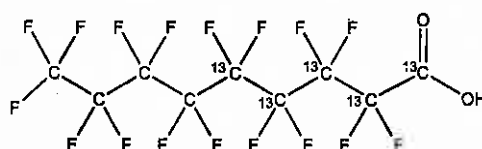
COMPOUND:

Perfluoro-n-[1,2,3,4,5-¹³C₅]nonanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₅¹²C₄HF₁₇O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

469.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

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

(1,2,3,4,5-¹³C₅)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: 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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The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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

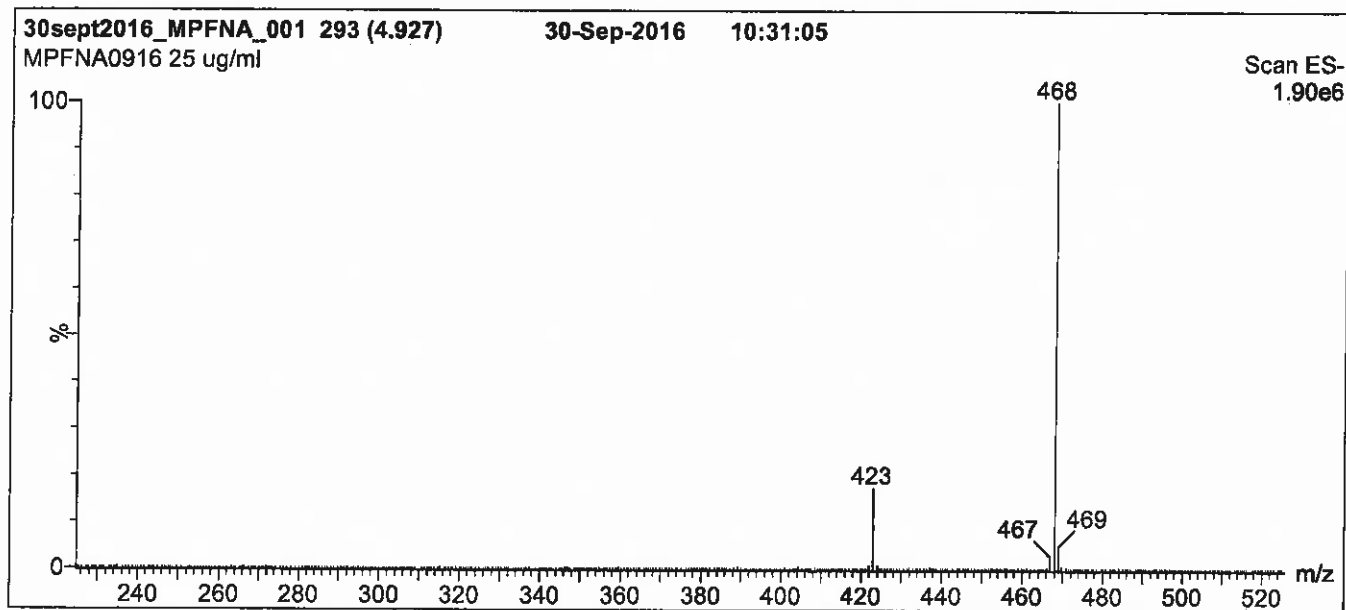
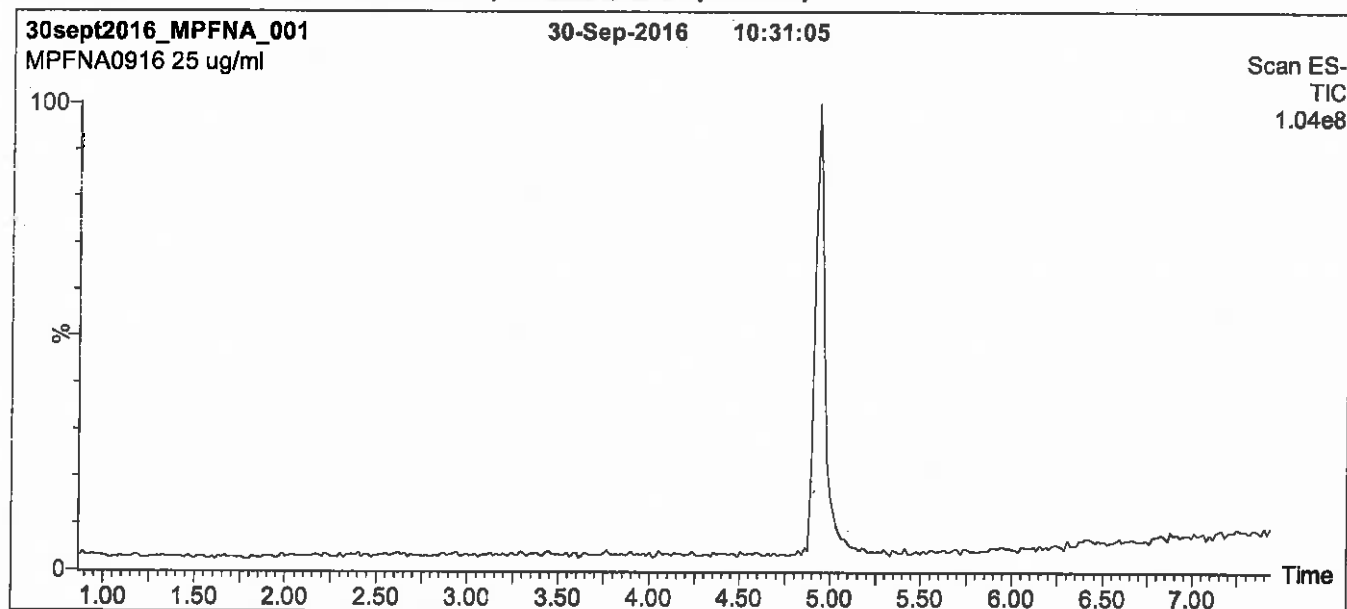
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

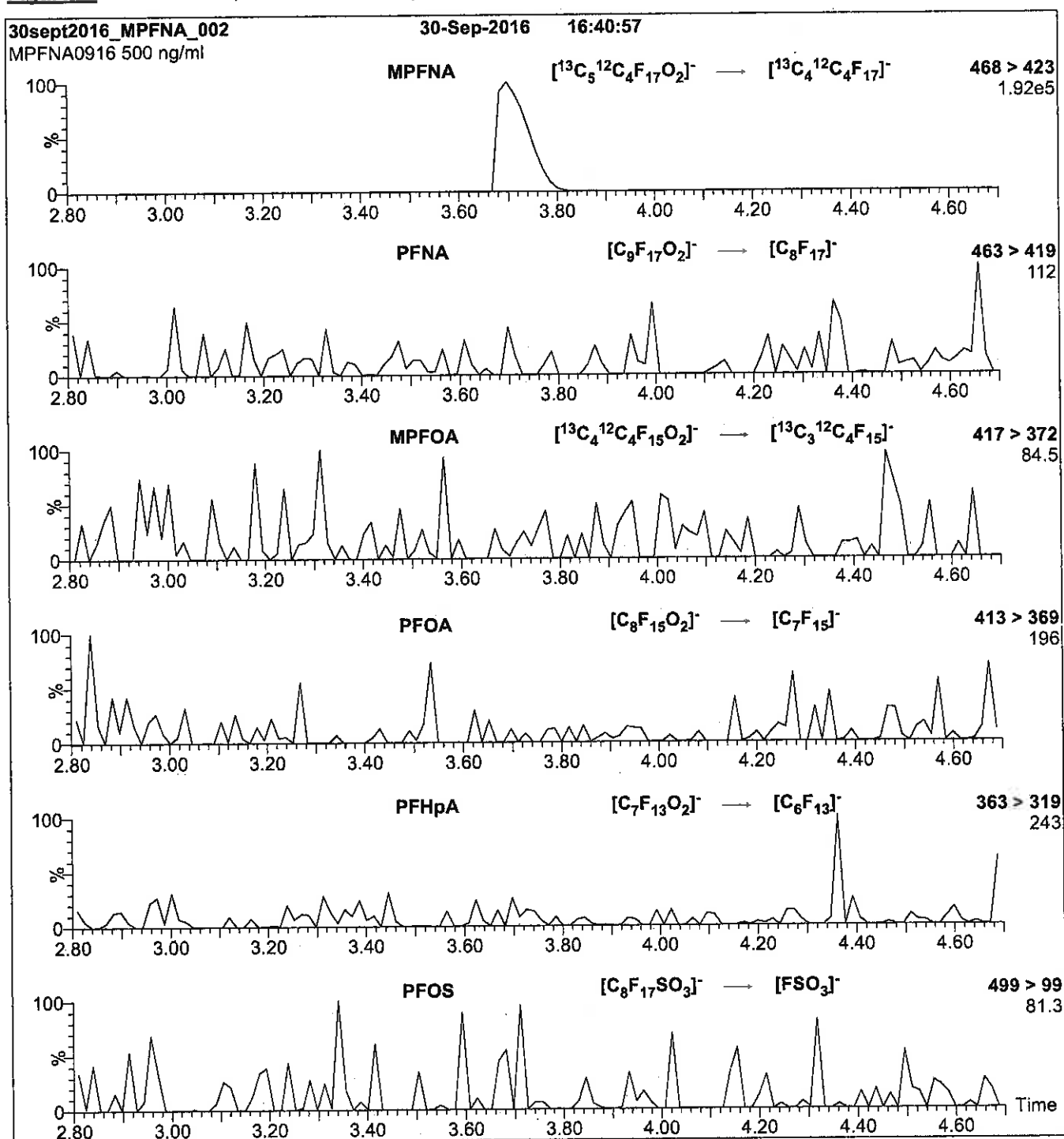
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFOA_00013



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

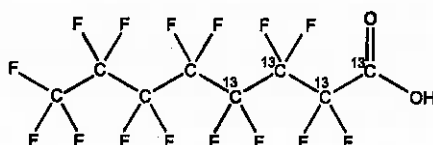
MPFOA

LOT NUMBER:

MPFOA1016

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

Not available

**MOLECULAR FORMULA:** $^{13}\text{C}_4^{12}\text{C}_4\text{HF}_{16}\text{O}_2$ **CONCENTRATION:** $50 \pm 2.5 \mu\text{g/ml}$ **MOLECULAR WEIGHT:**

418.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY: $\geq 99\% ^{13}\text{C}$ **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.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

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:

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UNCERTAINTY:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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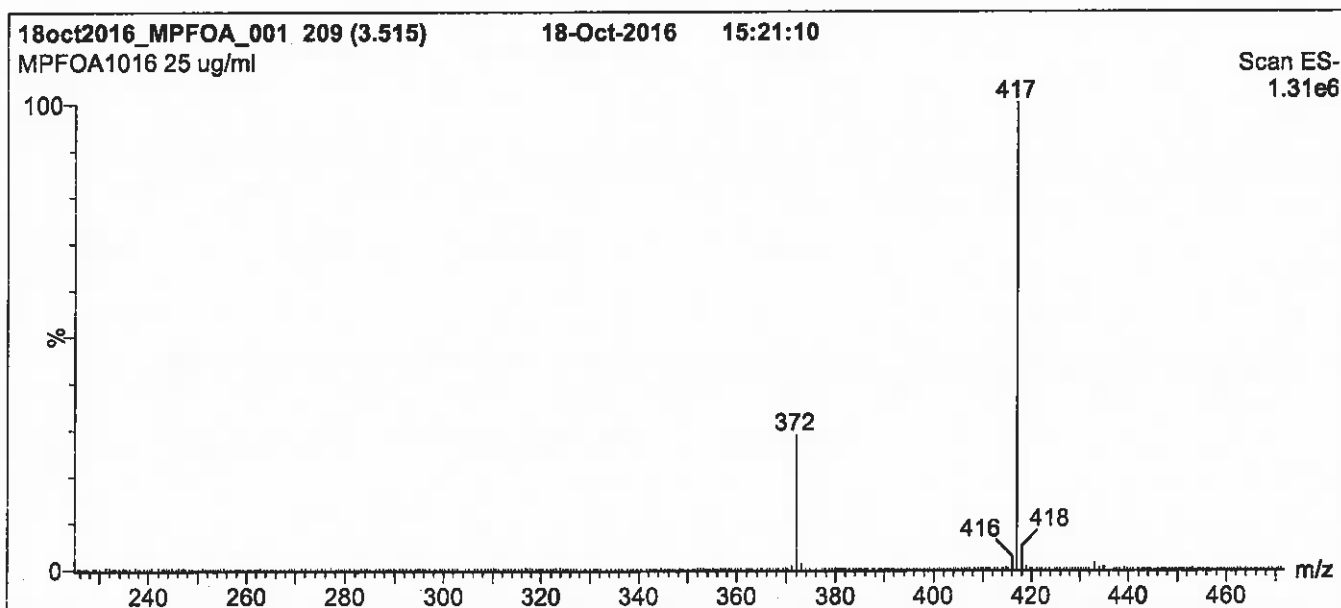
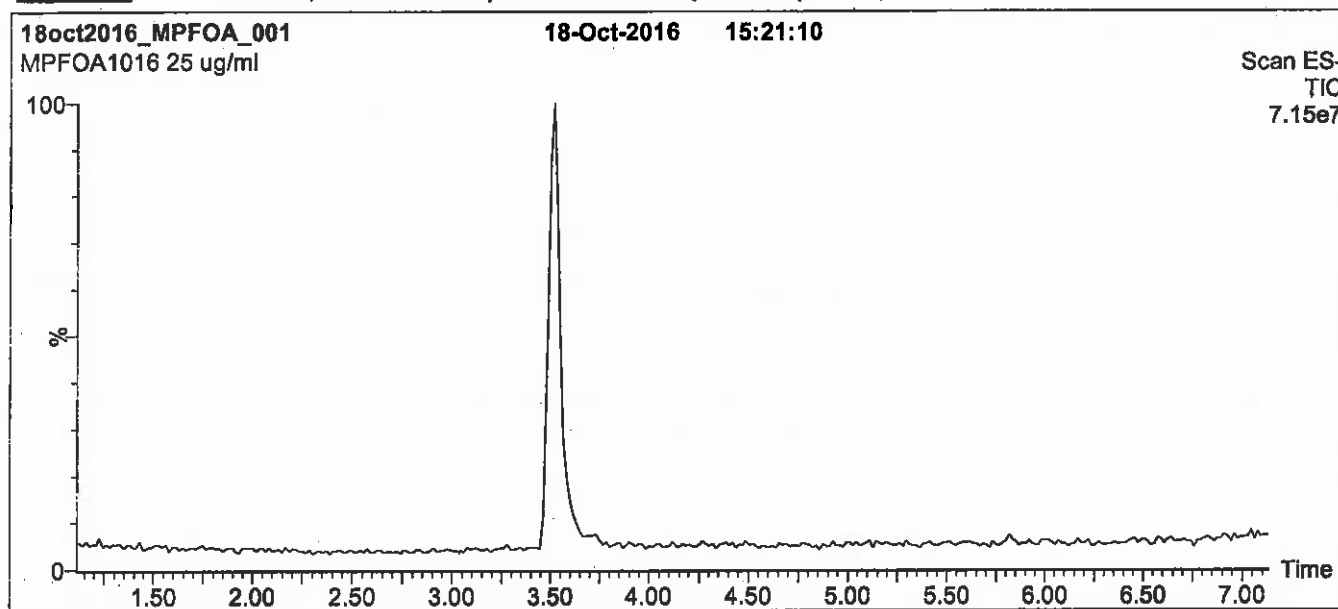
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

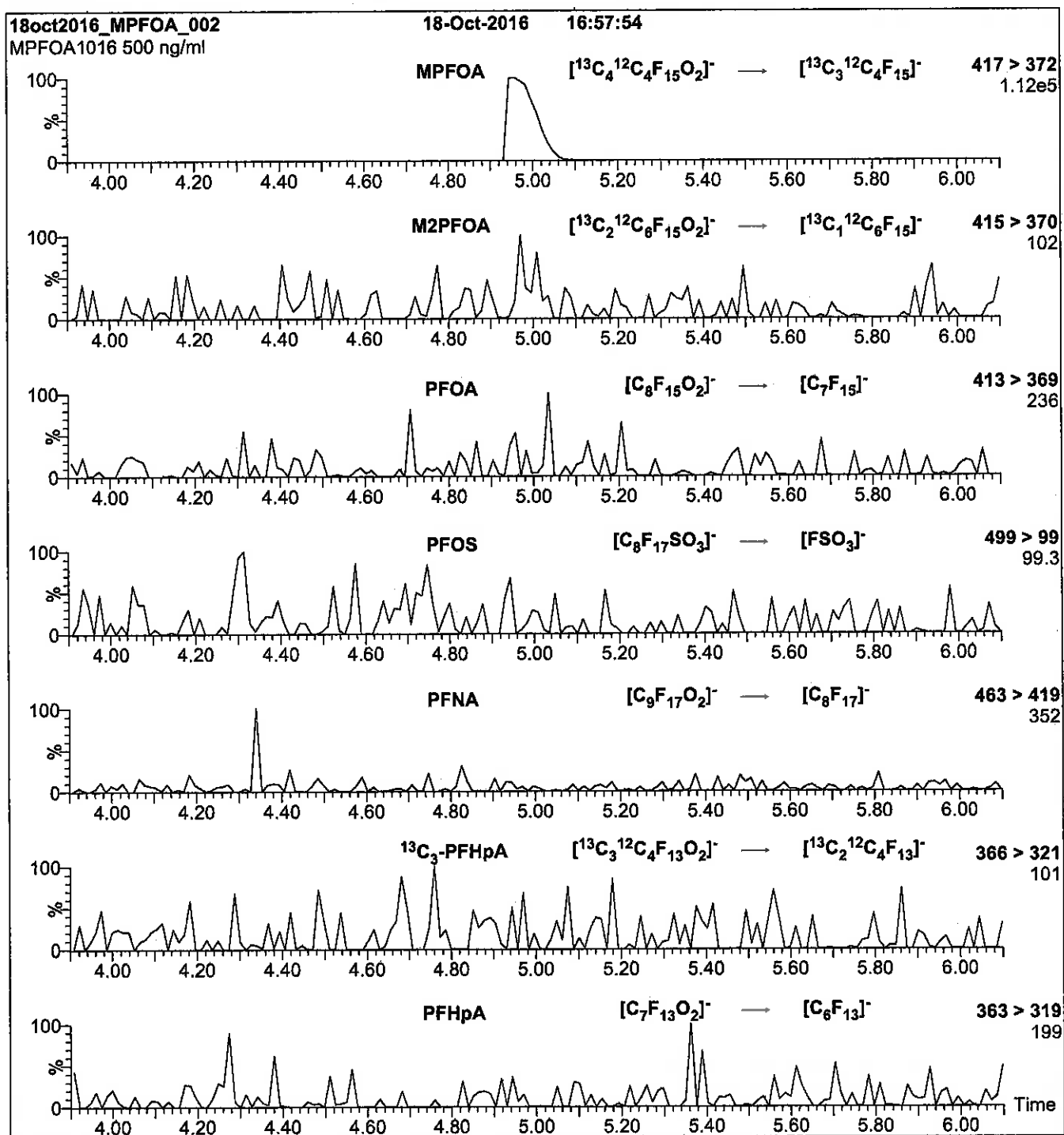
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFOA_00014



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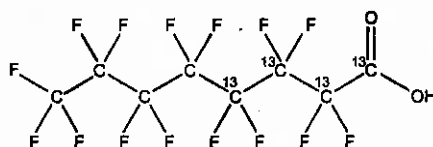
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]octanoic acid

LOT NUMBER: MPFOA0417

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99% ¹³C
(1,2,3,4-¹³C₄)

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim, General Manager

Date: 04/28/2017
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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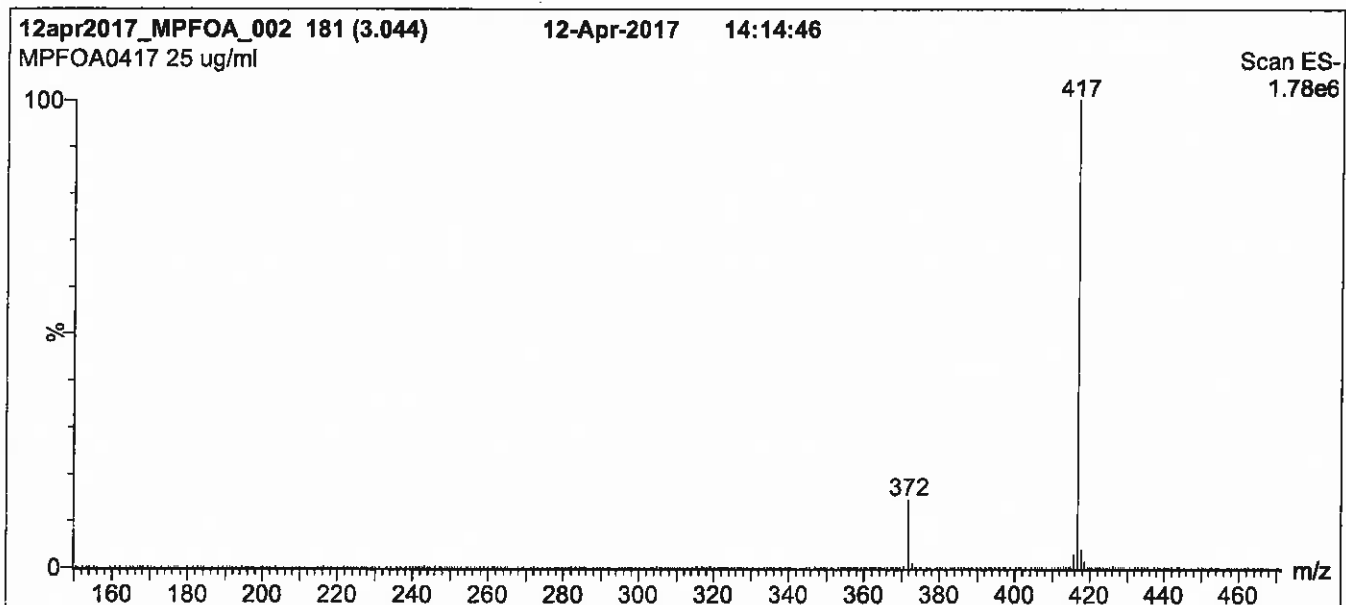
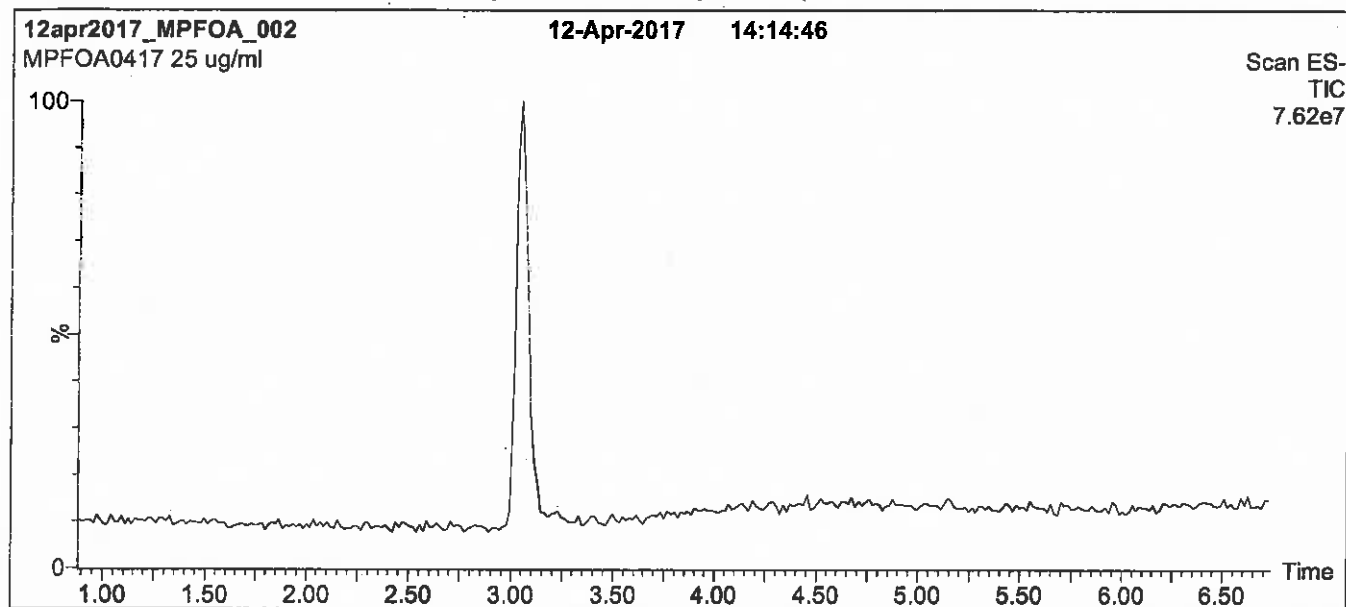
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

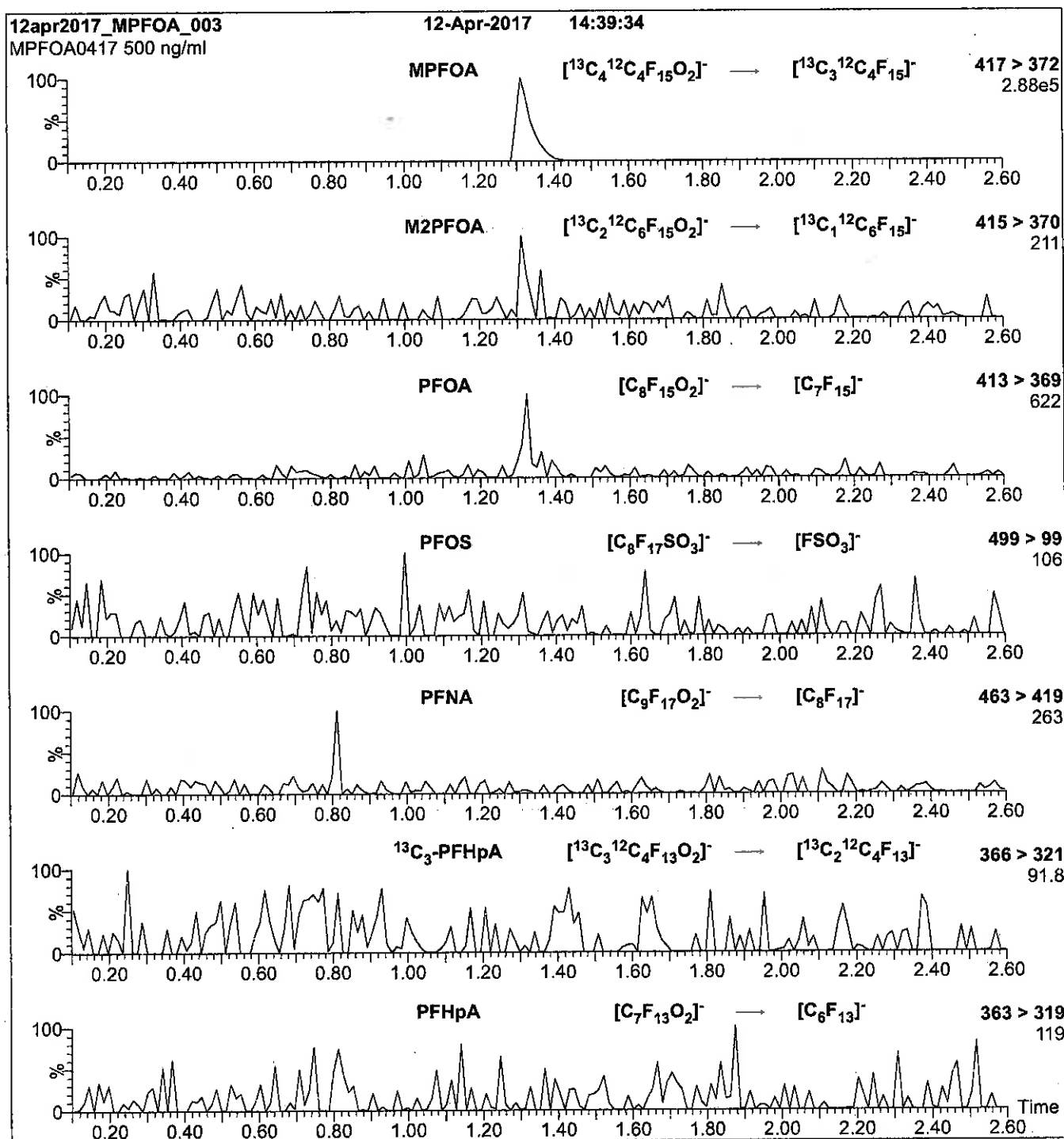
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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: MPFOA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCMPFOS_00020

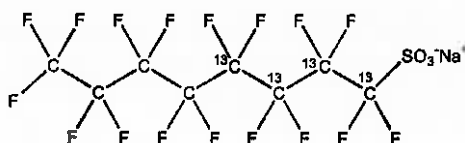


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1216
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ ¹² C ₄ F ₁₇ SO ₃ Na	MOLECULAR WEIGHT:	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	SOLVENT(S):	Methanol
CHEMICAL PURITY:	>98%	ISOTOPIC PURITY:	≥99% ¹³ C (1,2,3,4- ¹³ C ₄)
LAST TESTED: (mm/dd/yyyy)	12/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021		
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 ~ 0.8% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim **Date:** 12/14/2016
(mm/dd/yyyy)

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

INTENDED USE:

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EXPIRY DATE / PERIOD OF VALIDITY:

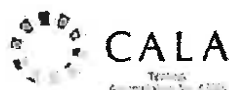
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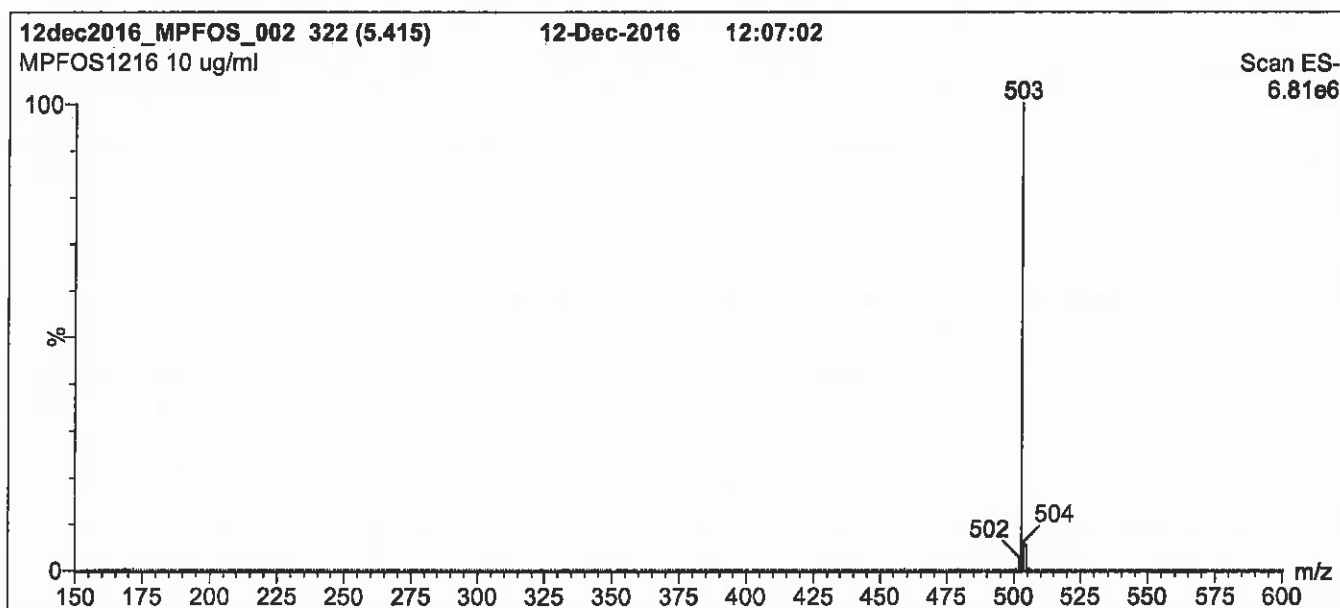
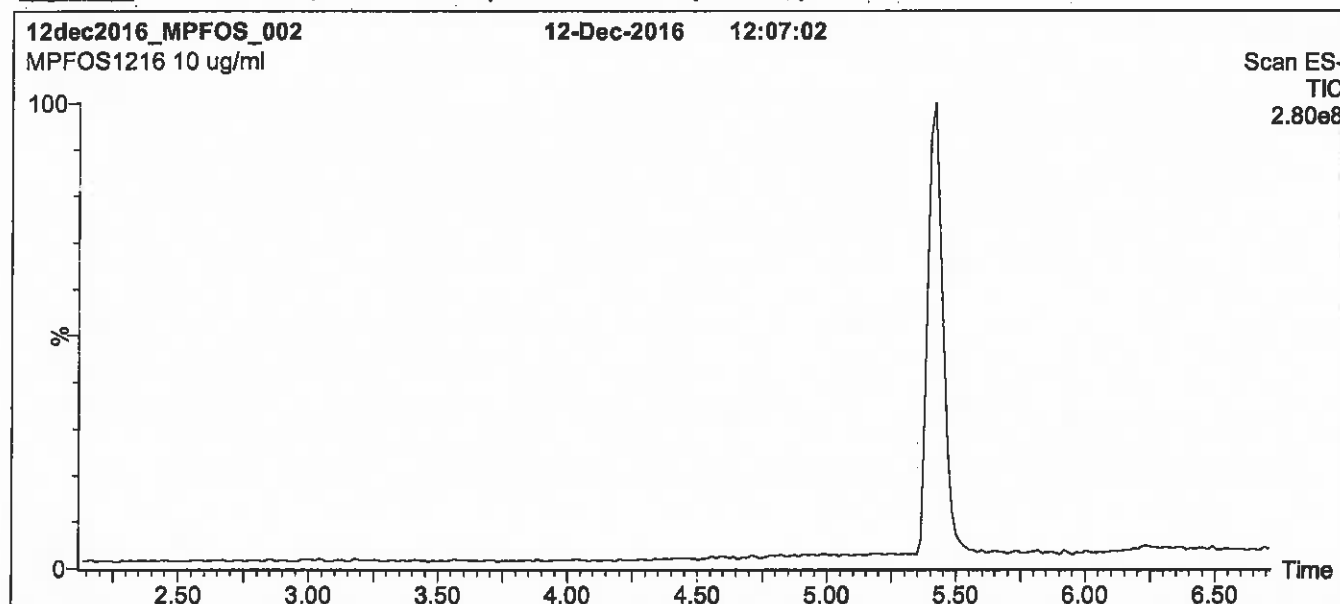
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

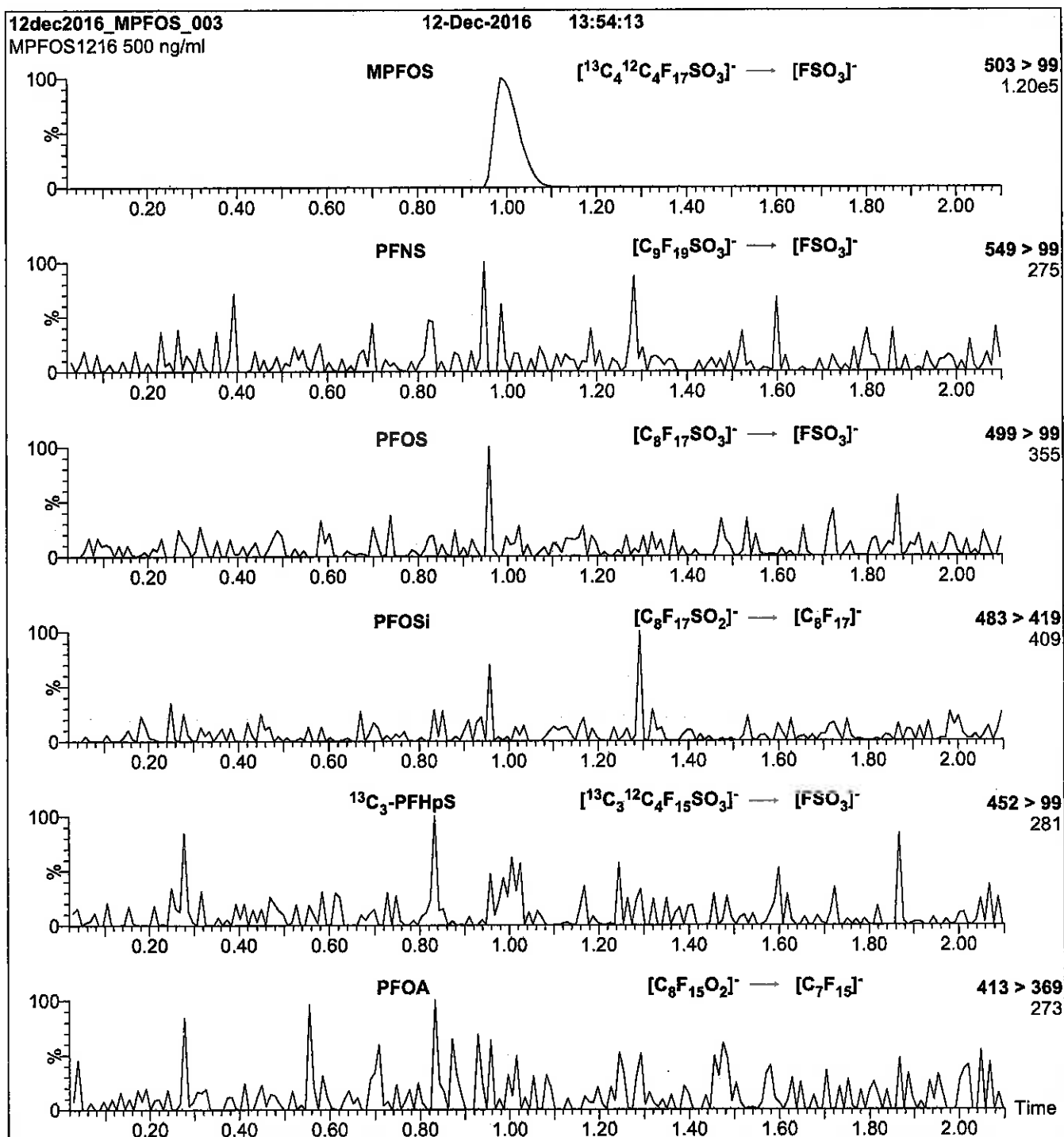
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.35\text{e-}3$
Collision Energy (eV) = 40

Reagent

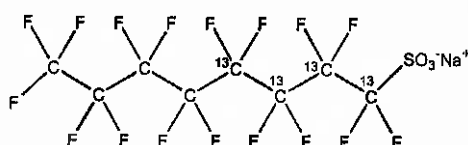
LCMPFOS_00022



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1216
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 526.08
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 47.8 ± 2.4 µg/ml (MPFOS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 12/12/2016 (1,2,3,4-¹³C₄)
EXPIRY DATE: (mm/dd/yyyy) 12/12/2021
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 ~ 0.8% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/14/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

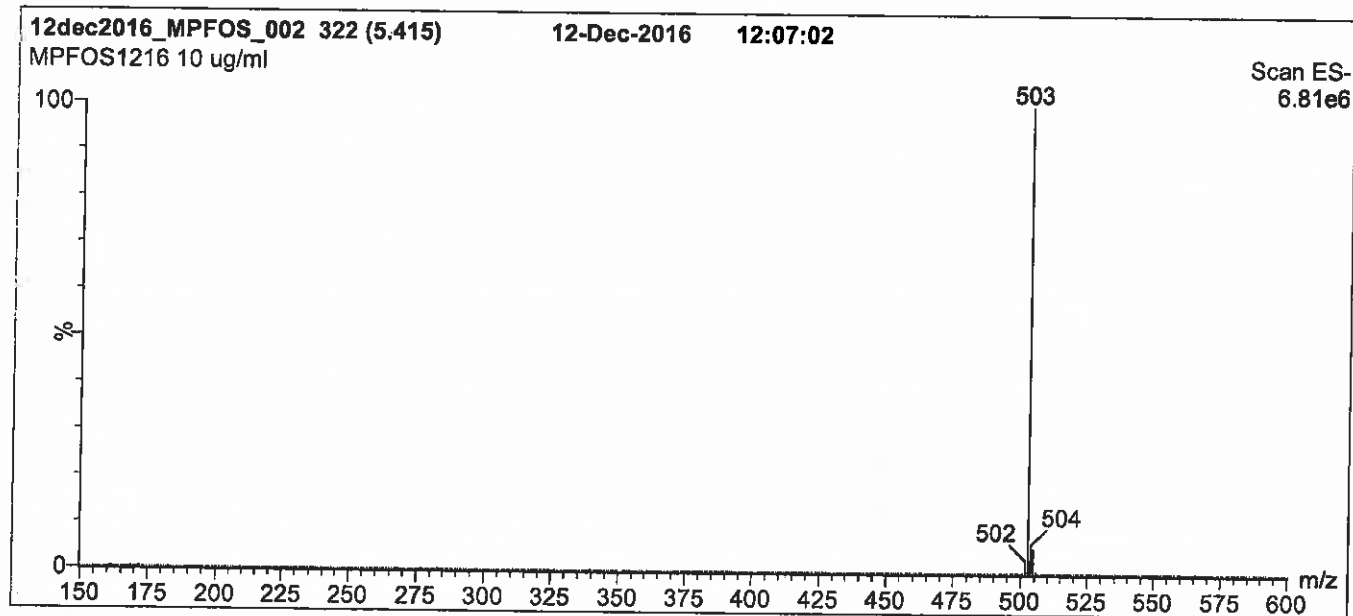
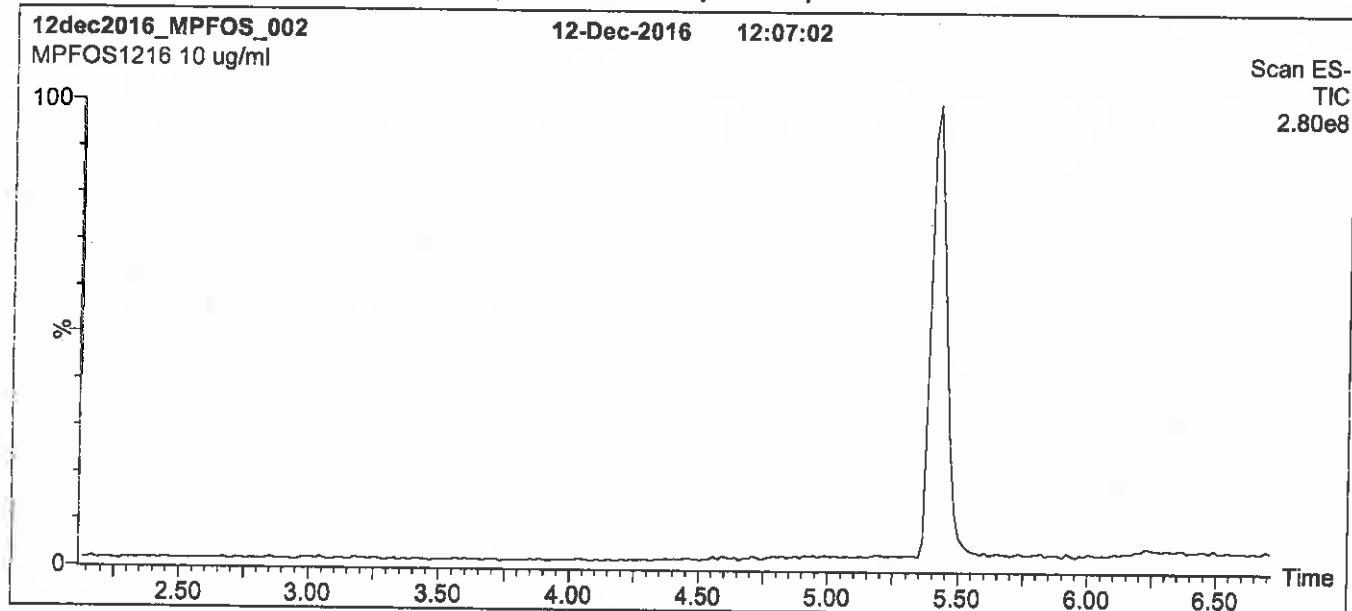
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

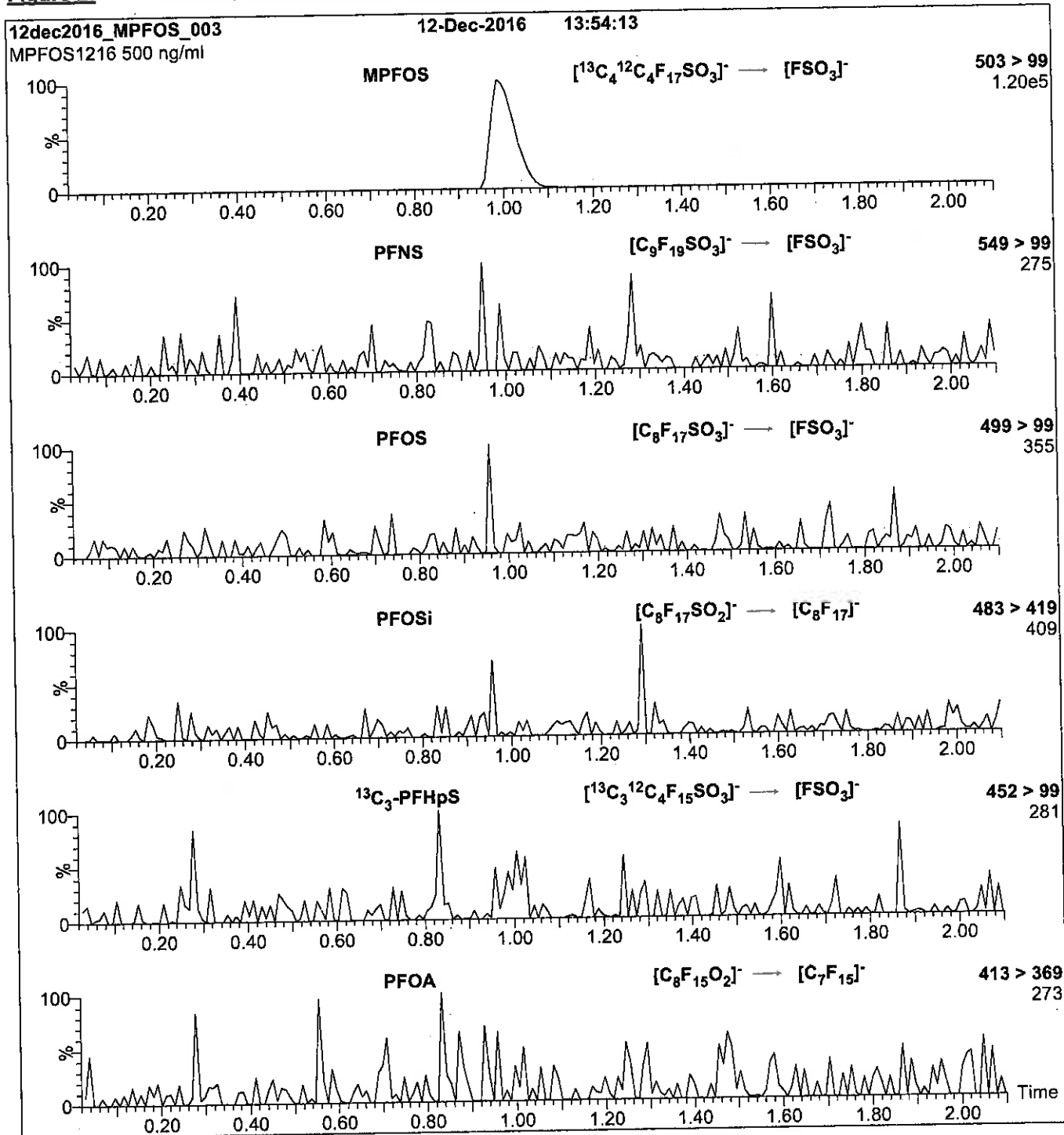
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00010

R:3/9/17 SD



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA1116

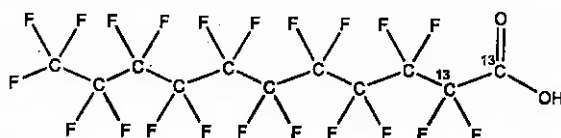
COMPOUND:

Perfluoro-n-[1,2-¹³C₂]undecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₉HF₂₁O₂

MOLECULAR WEIGHT:

566.08

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy)

11/22/2016

EXPIRY DATE: (mm/dd/yyyy)

11/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-¹³C₁-PFUdA (~1%; see Figure 2), 2-¹³C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

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Certified By:

B.G. Chittim

Date: 12/07/2016

(mm/dd/yyyy)

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EXPIRY DATE / PERIOD OF VALIDITY:

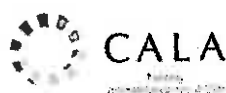
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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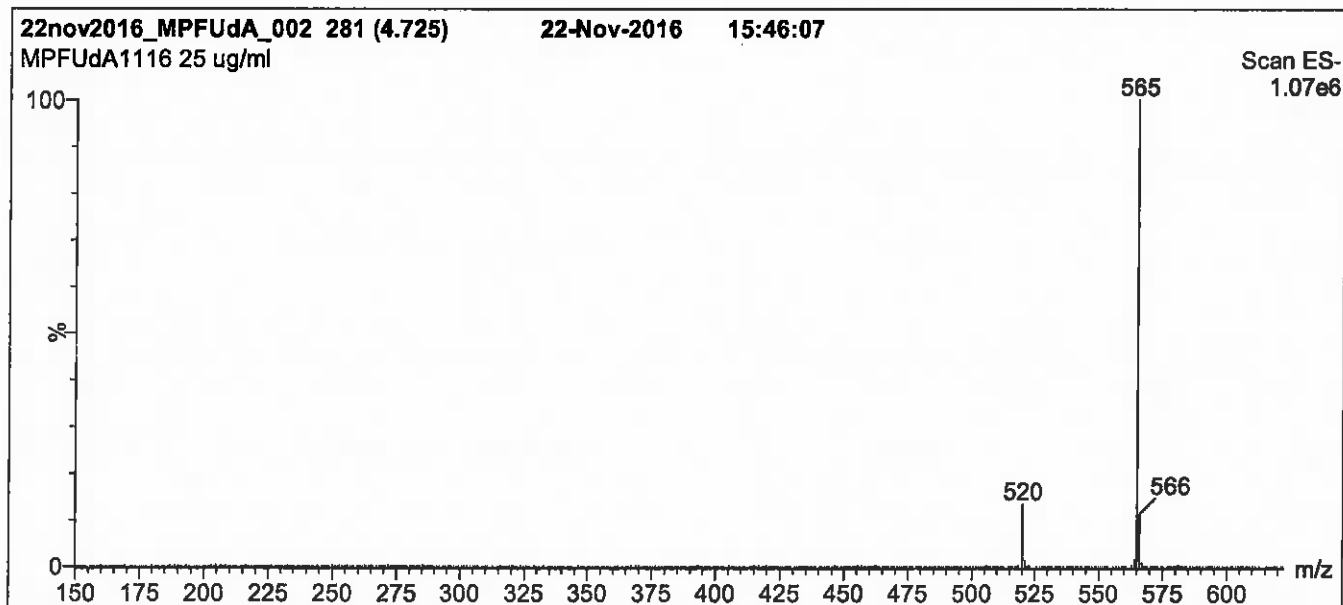
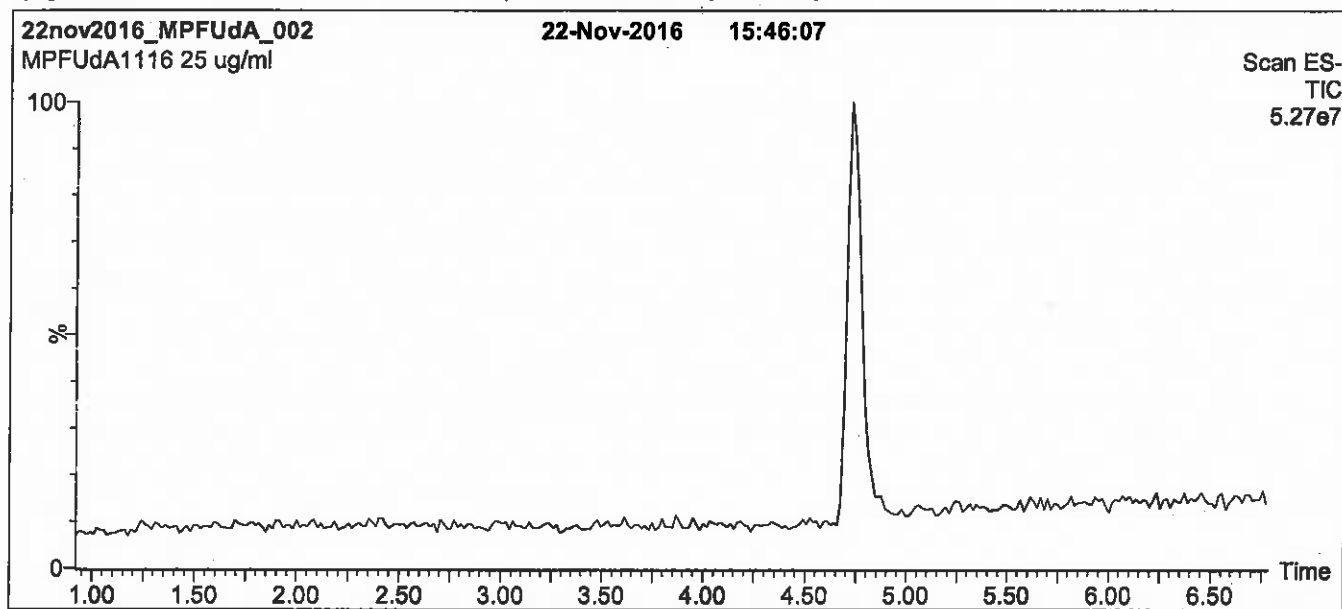
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

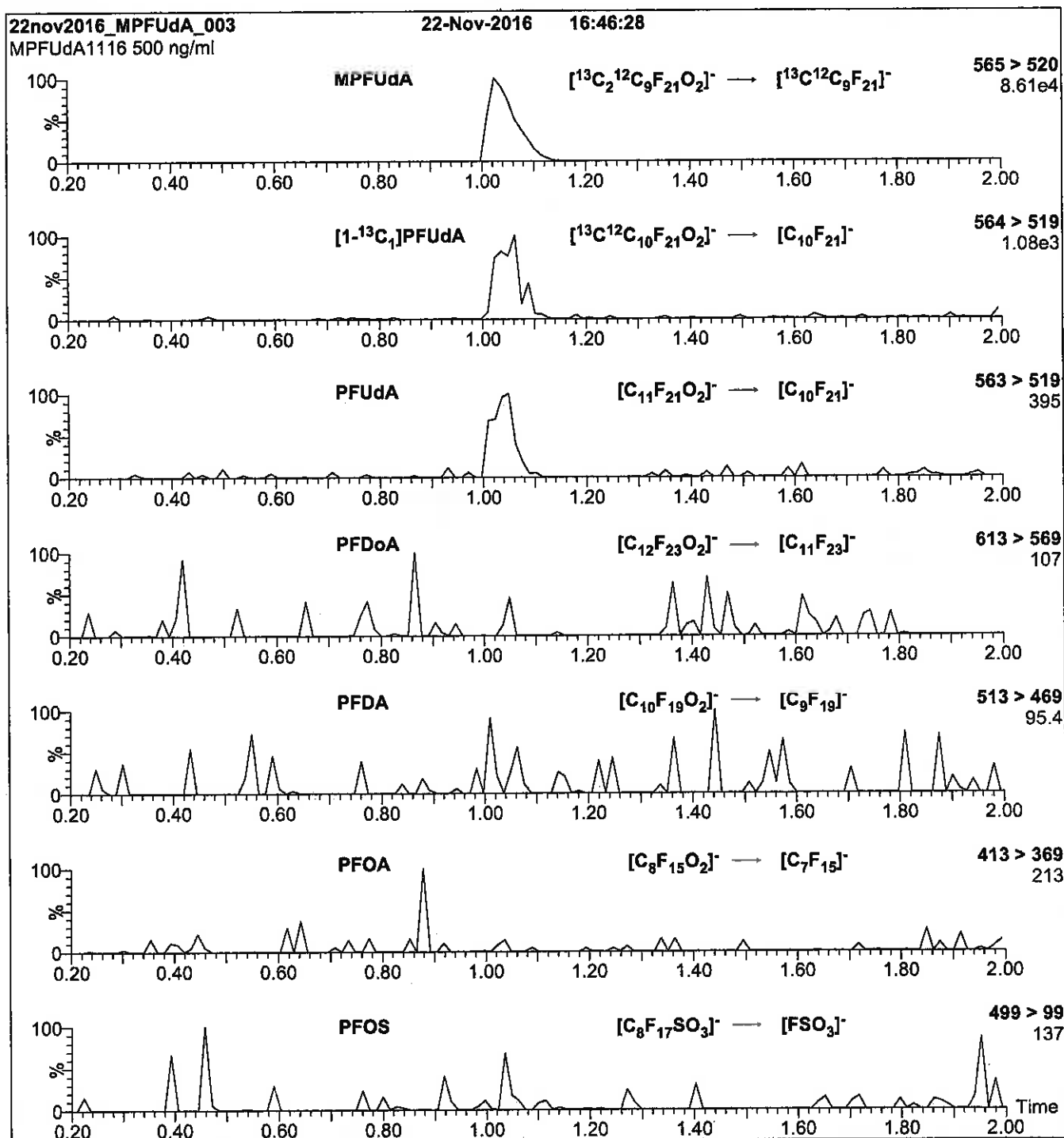
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFUdA_00011



WELLINGTON LABORATORIES

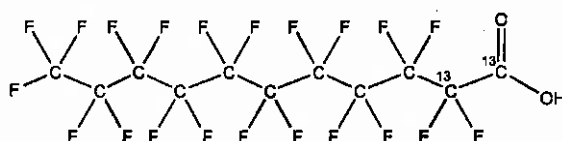
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]undecanoic acid

LOT NUMBER: MPFUdA1116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₉HF₂₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-¹³C₁-PFUdA (~1%; see Figure 2), 2-¹³C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

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Certified By:

B.G. Chittim

Date: 12/07/2016
(mm/dd/yyyy)

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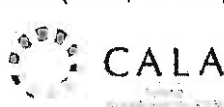
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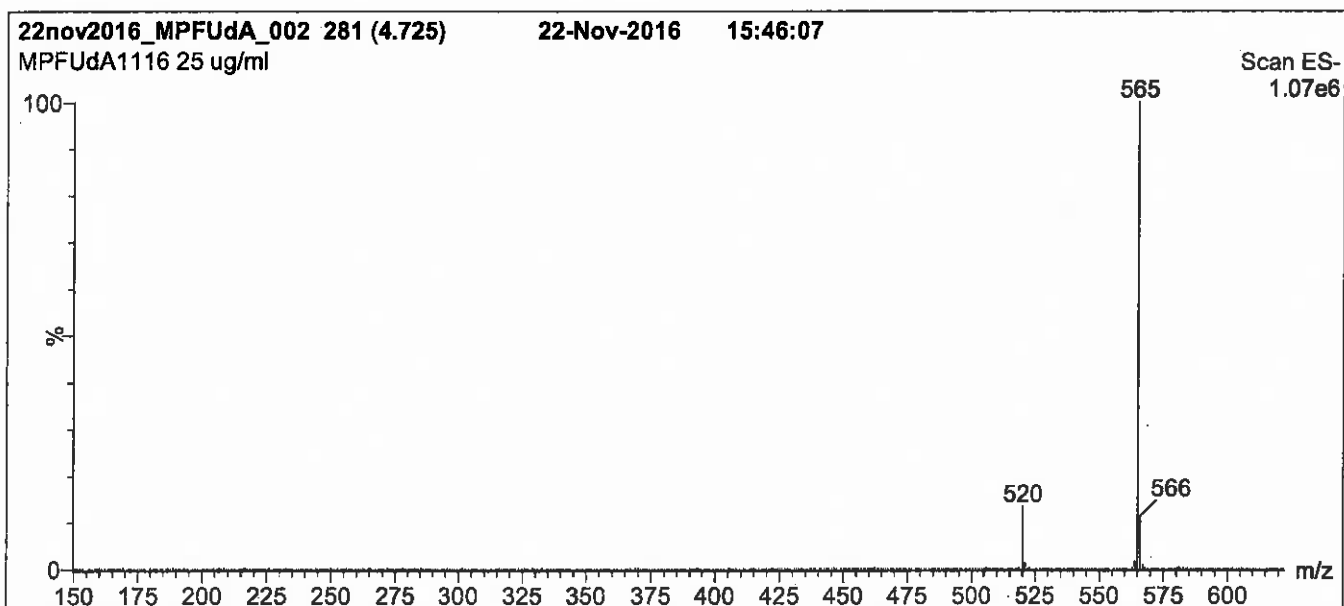
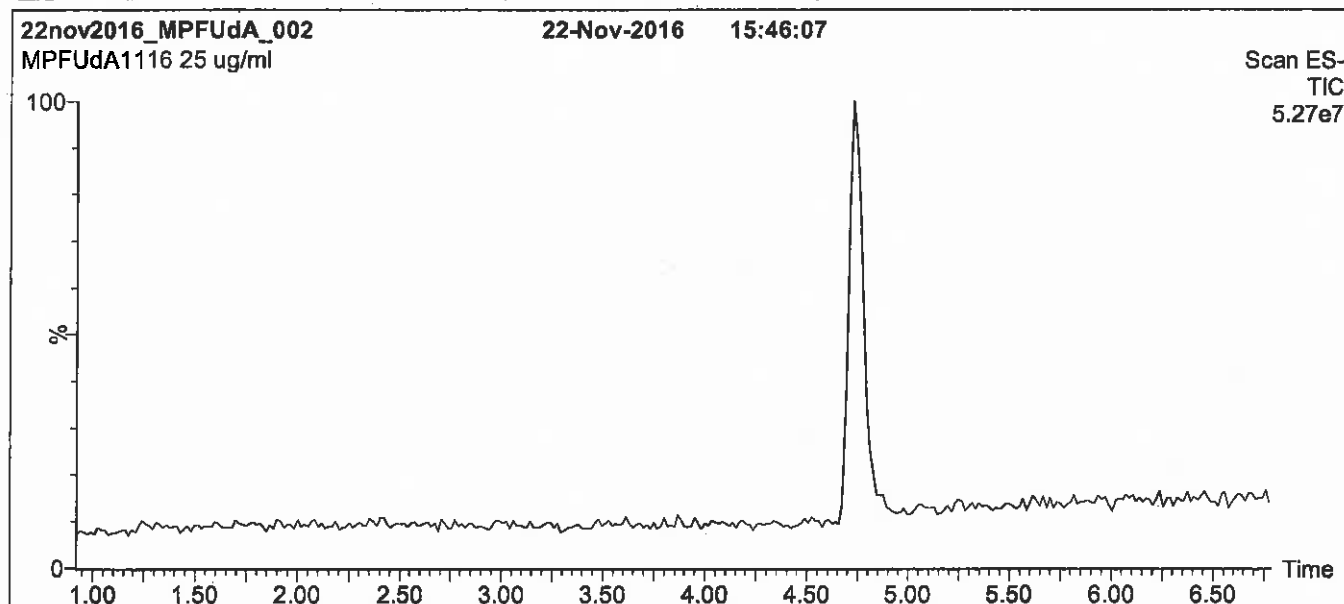
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Figure 1: MPFUdA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

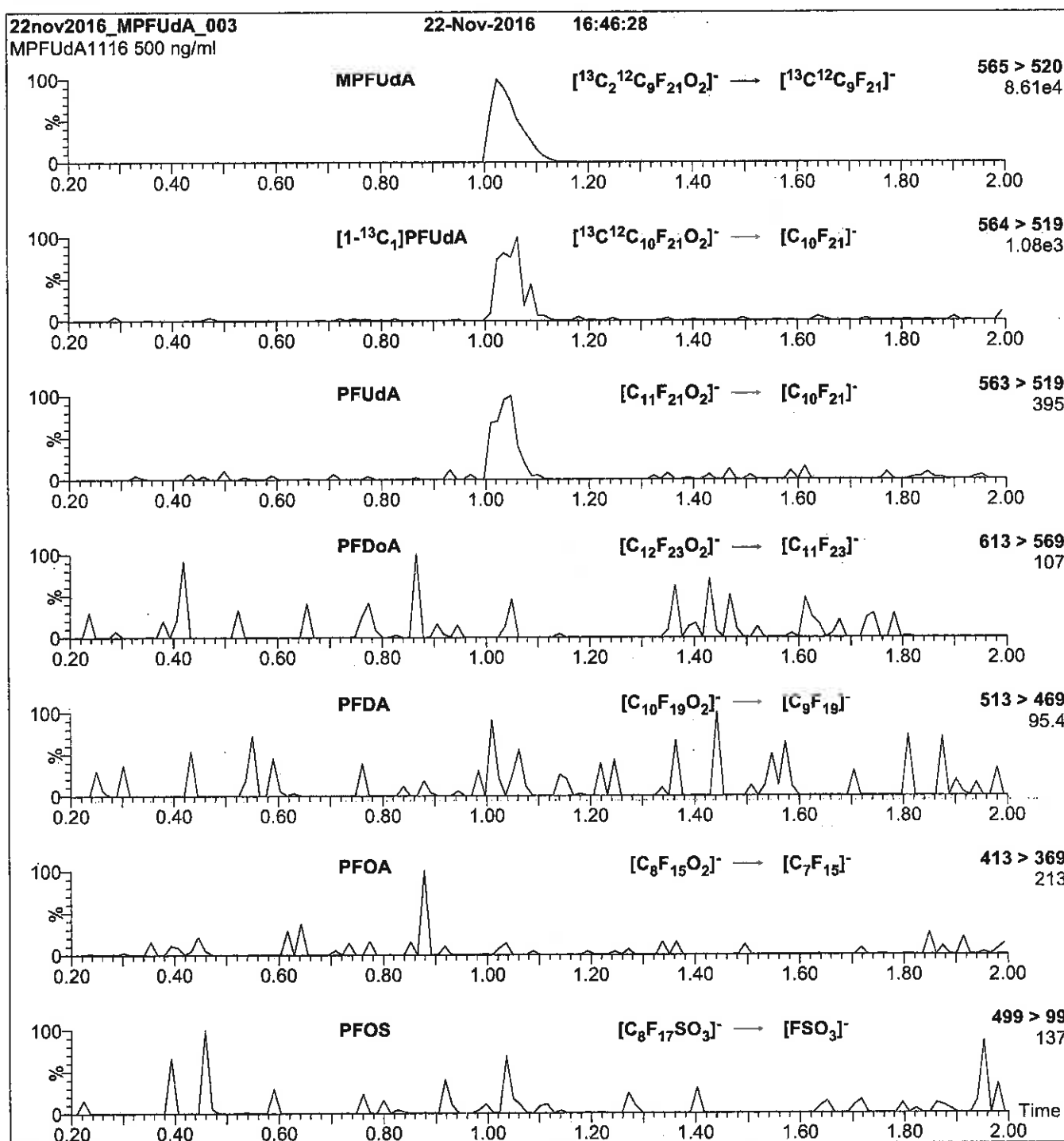
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCN-EtFOSA-M_00004

R: 12/29/16 SKV



WELLINGTON LABORATORIES

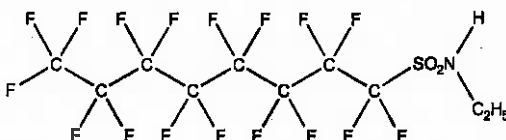
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide

LOT NUMBER: NEtFOSA0516M

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA: $C_{10}H_{18}F_{17}NO_2S$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
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

MOLECULAR WEIGHT: 527.20
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By:

B.G. Chittim

Date: 05/27/2016
(mm/dd/yyyy)

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EXPIRY DATE / PERIOD OF VALIDITY:

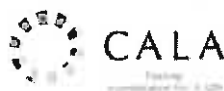
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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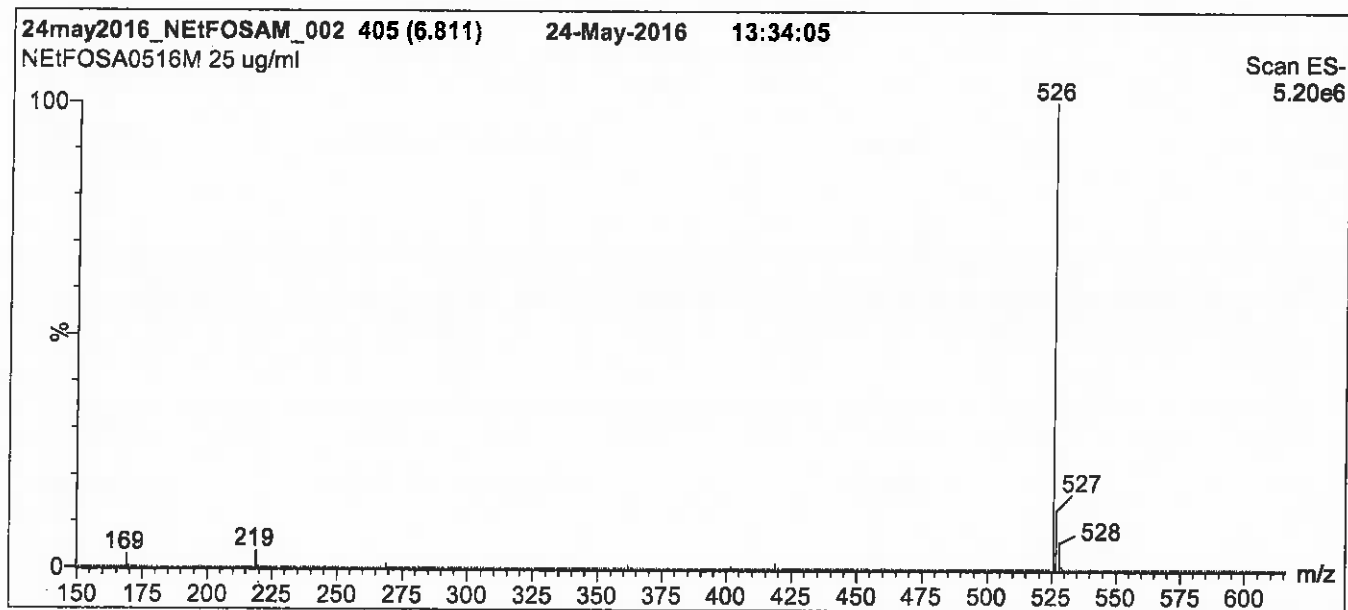
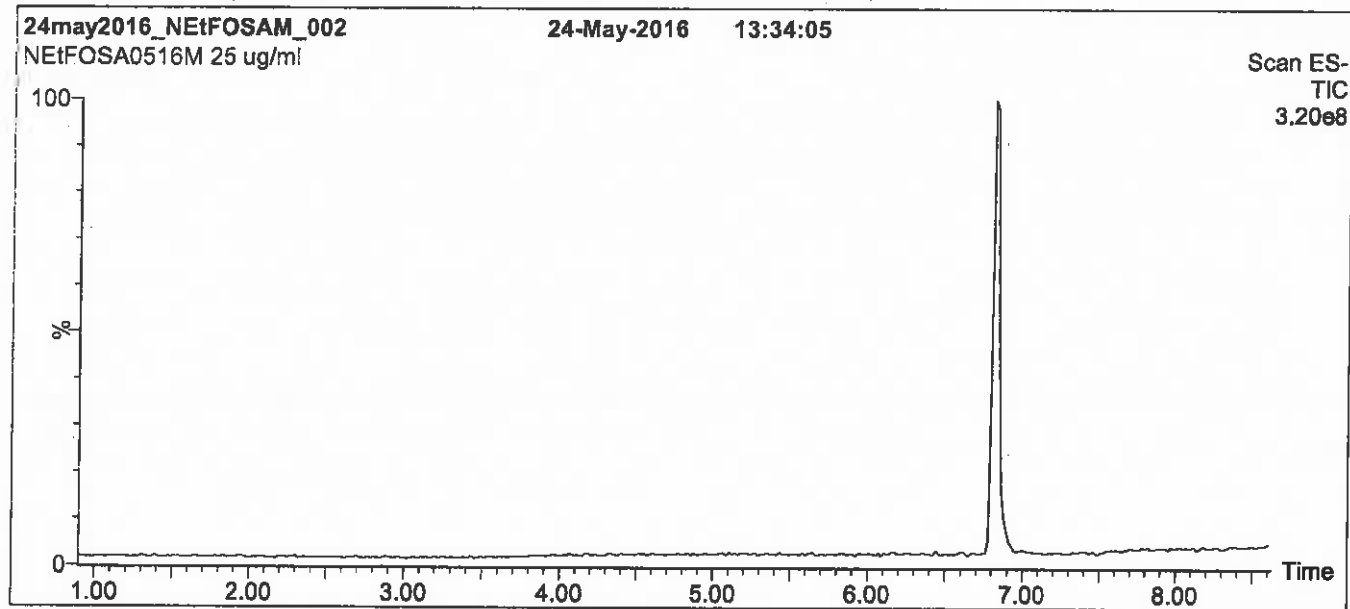
QUALITY MANAGEMENT:

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



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

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

Mobile phase: Gradient

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

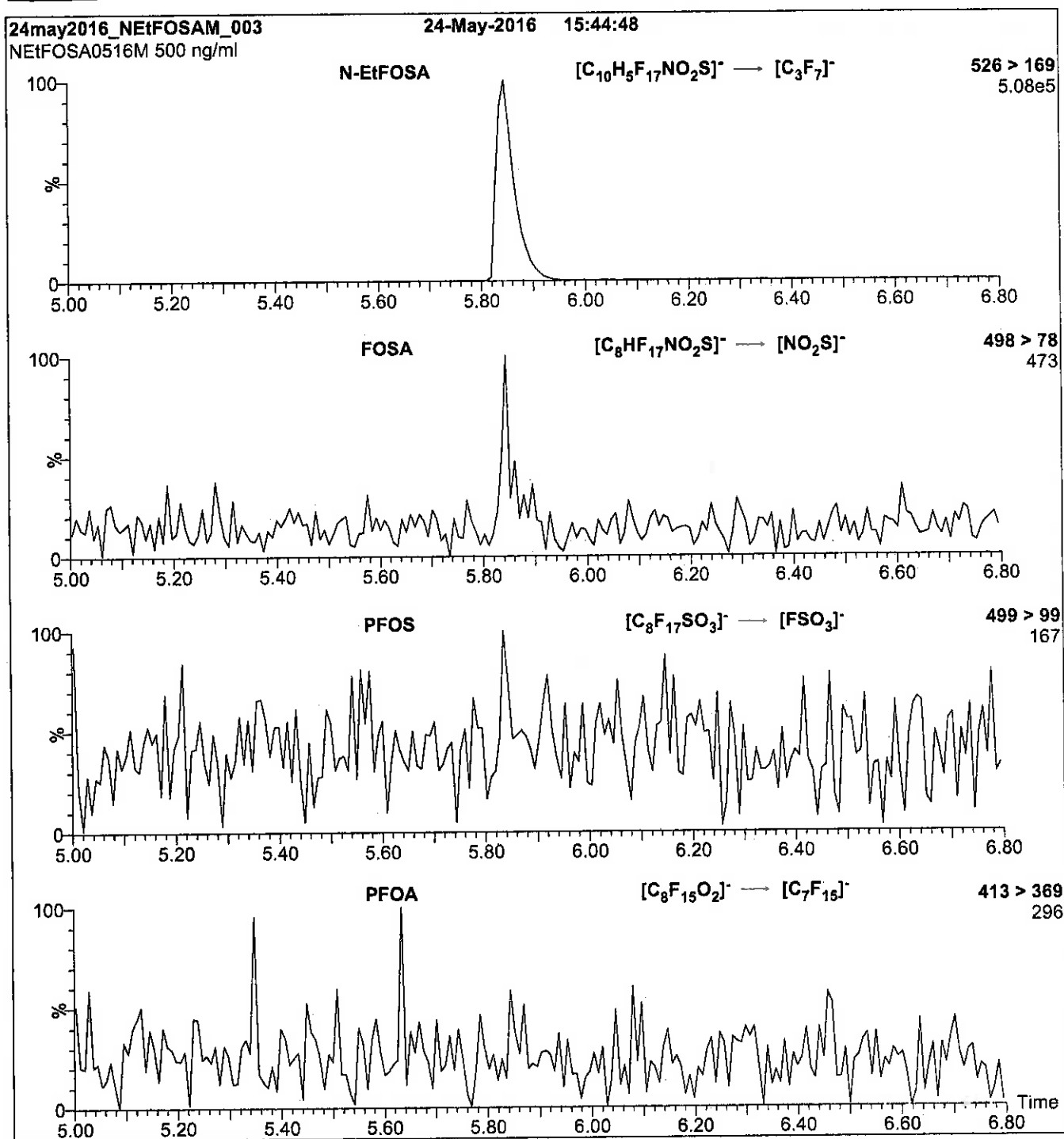
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSAA_00002

R: 8/23/16 SBC



715561

ID: LCN-EtFOSAA_00002

Exp: 01/20/21 Ppd: SBC

N-EtFOSAA



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSAA

LOT NUMBER:

NEtFOSAA0116

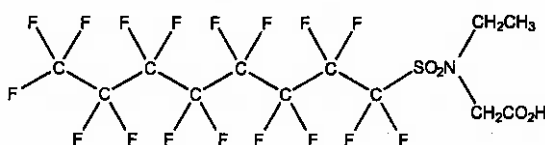
COMPOUND:

N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2991-50-6



MOLECULAR FORMULA:

C₁₂H₈F₁₇NO₄S

MOLECULAR WEIGHT:

585.23

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

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 moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/21/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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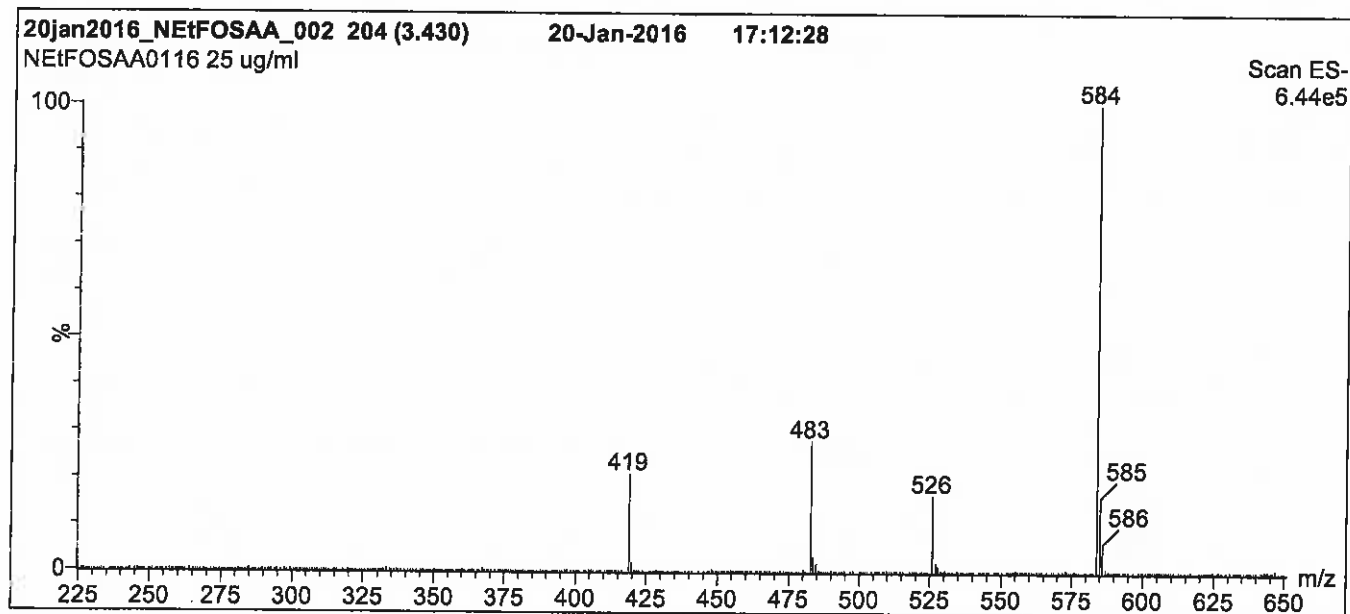
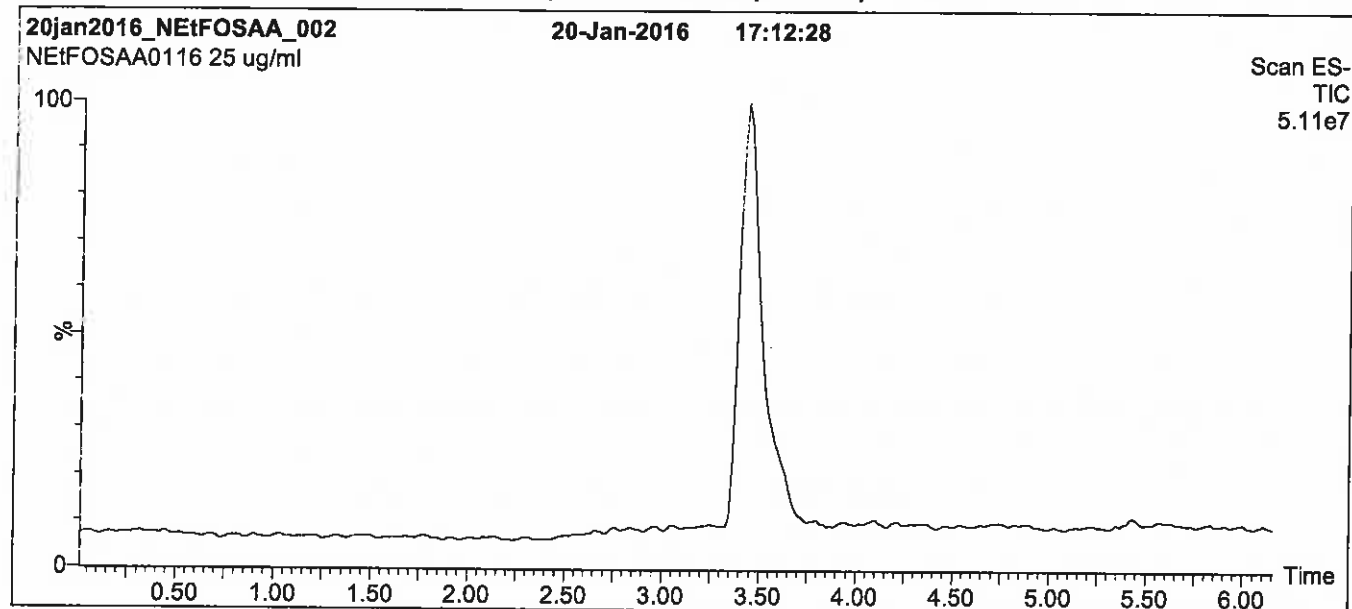
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

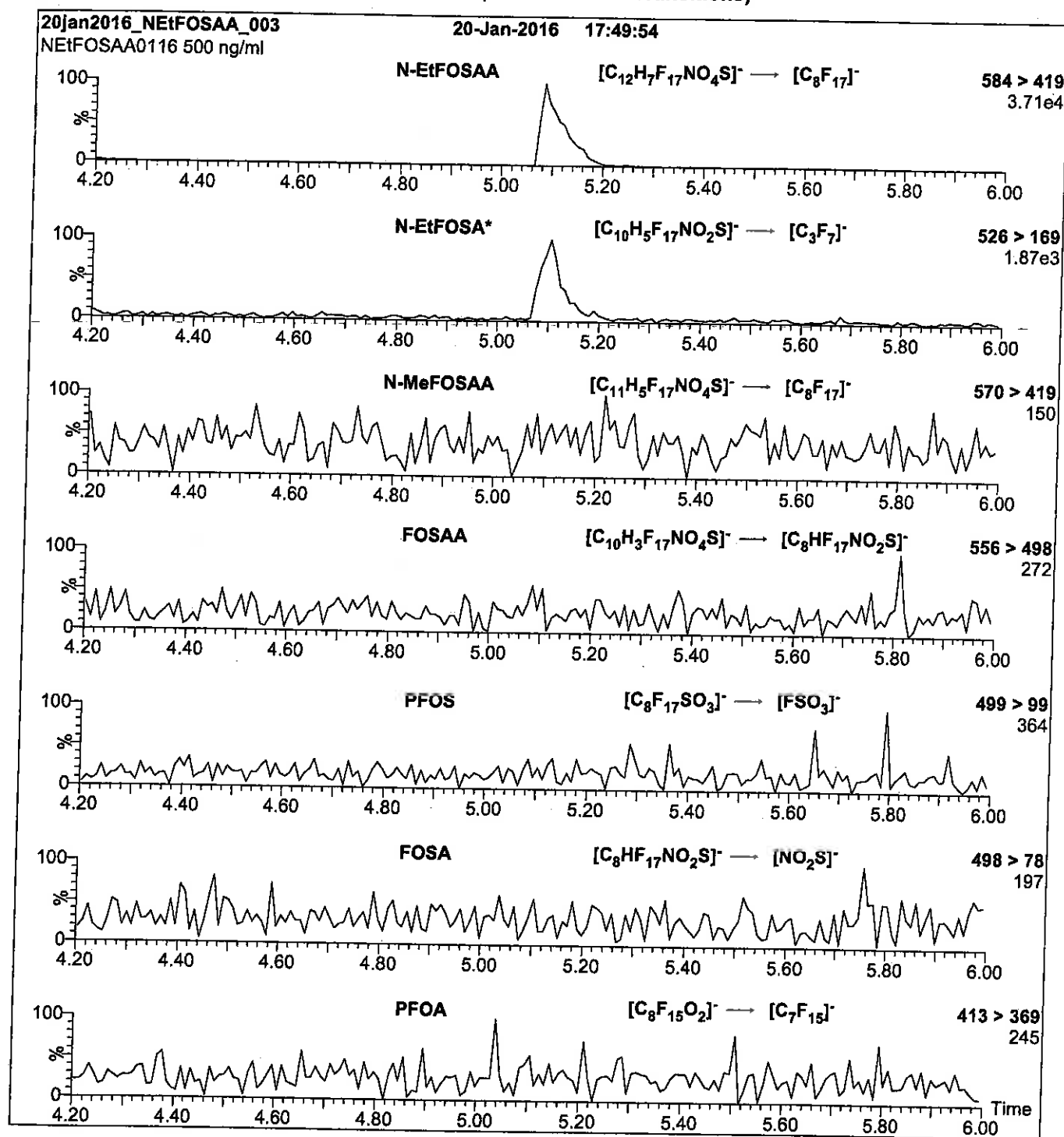
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: 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 μ l (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 μ l/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 25

Reagent

LCN-EtFOSAA_00003

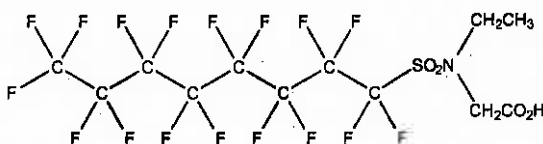


WELLINGTON LABORATORIES

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: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
 Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

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

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

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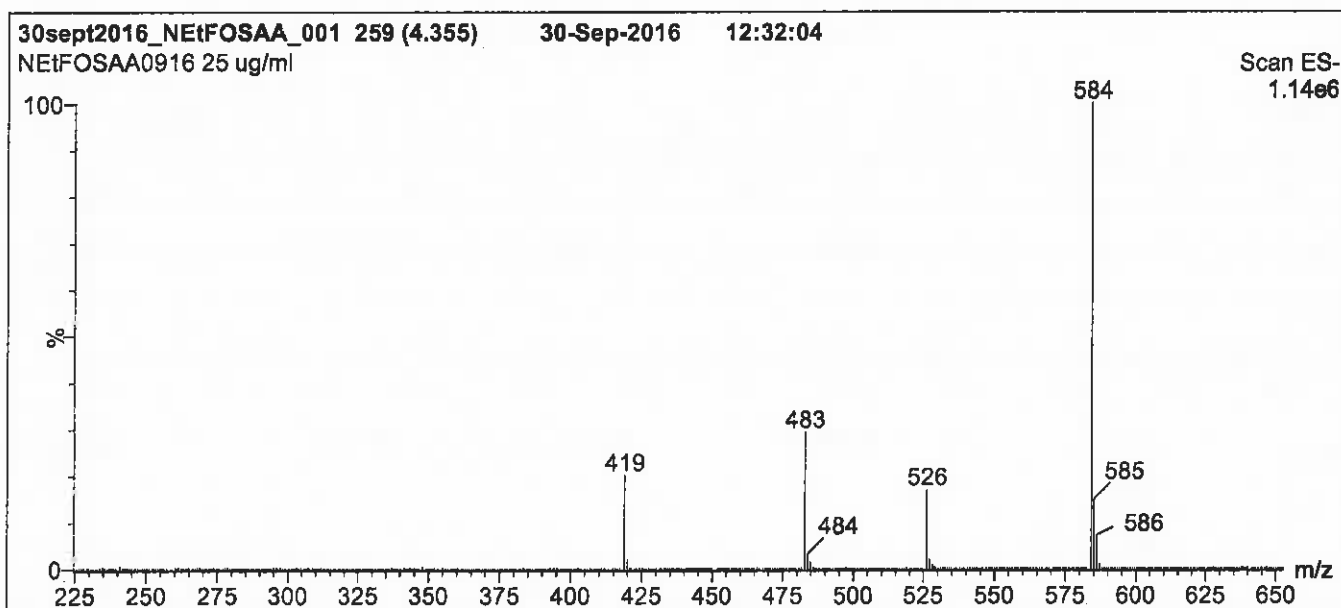
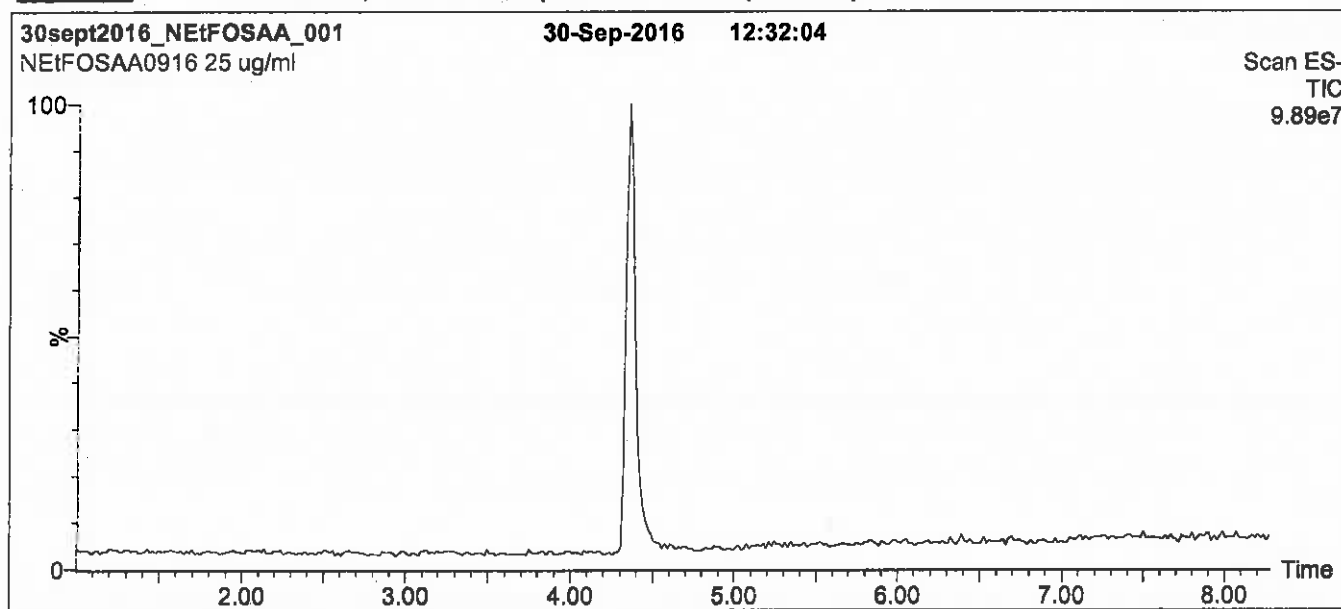
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

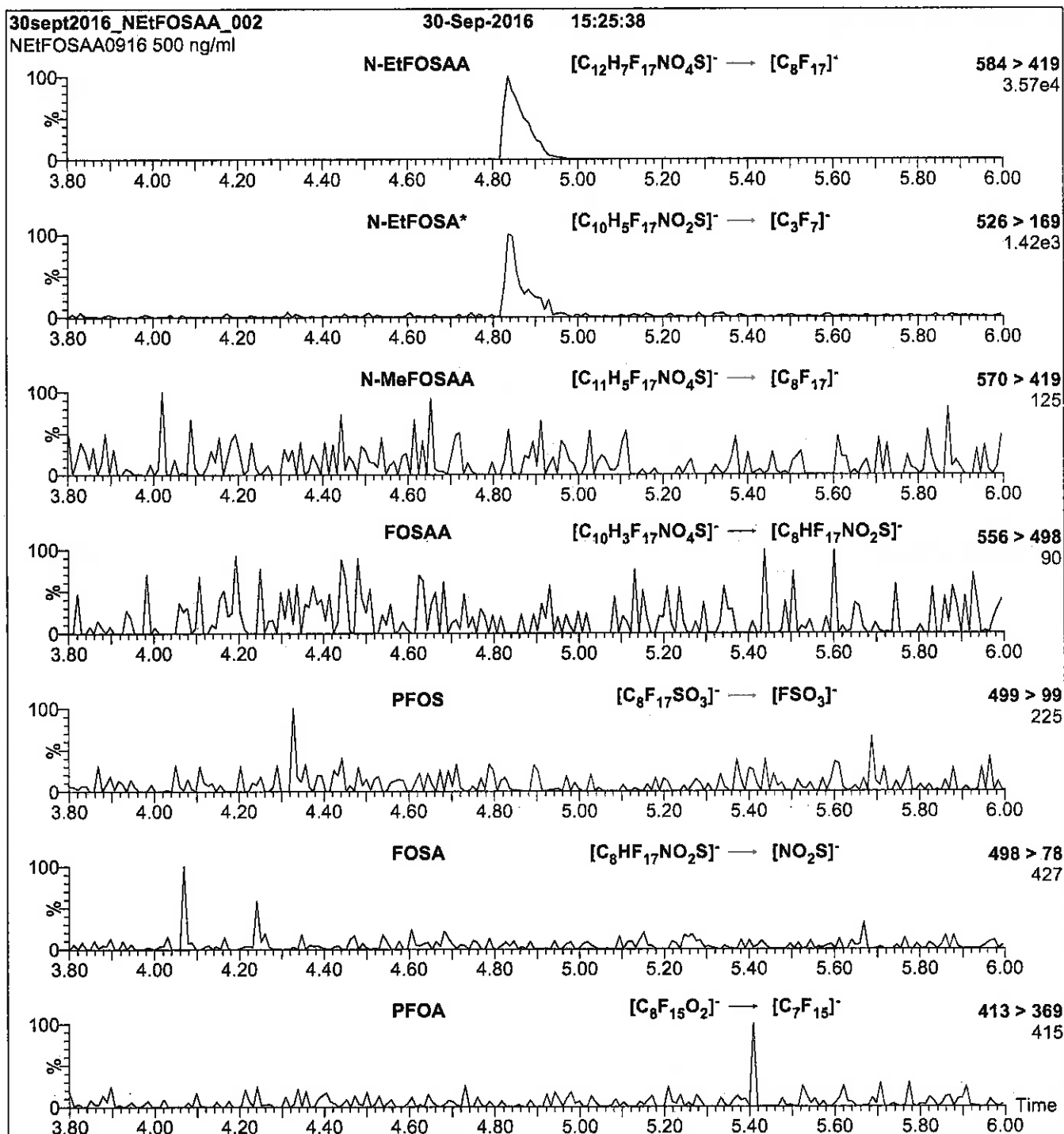
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 μ l (500 ng/ml N-EtFOSAA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-MeFOSA-M_00003



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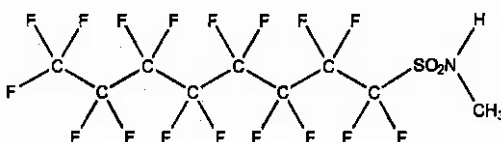
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA0516M

STRUCTURE:

CAS #: 31506-32-8



MOLECULAR FORMULA: $C_8H_4F_{17}NO_2S$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
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

MOLECULAR WEIGHT: 513.17
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

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:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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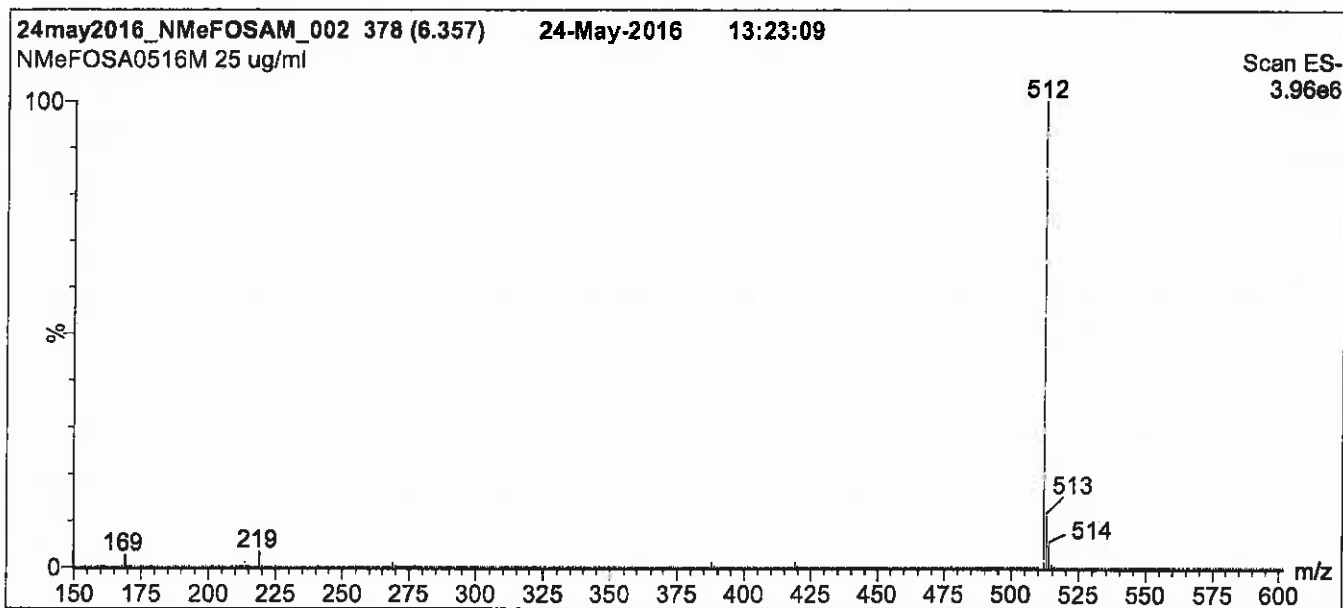
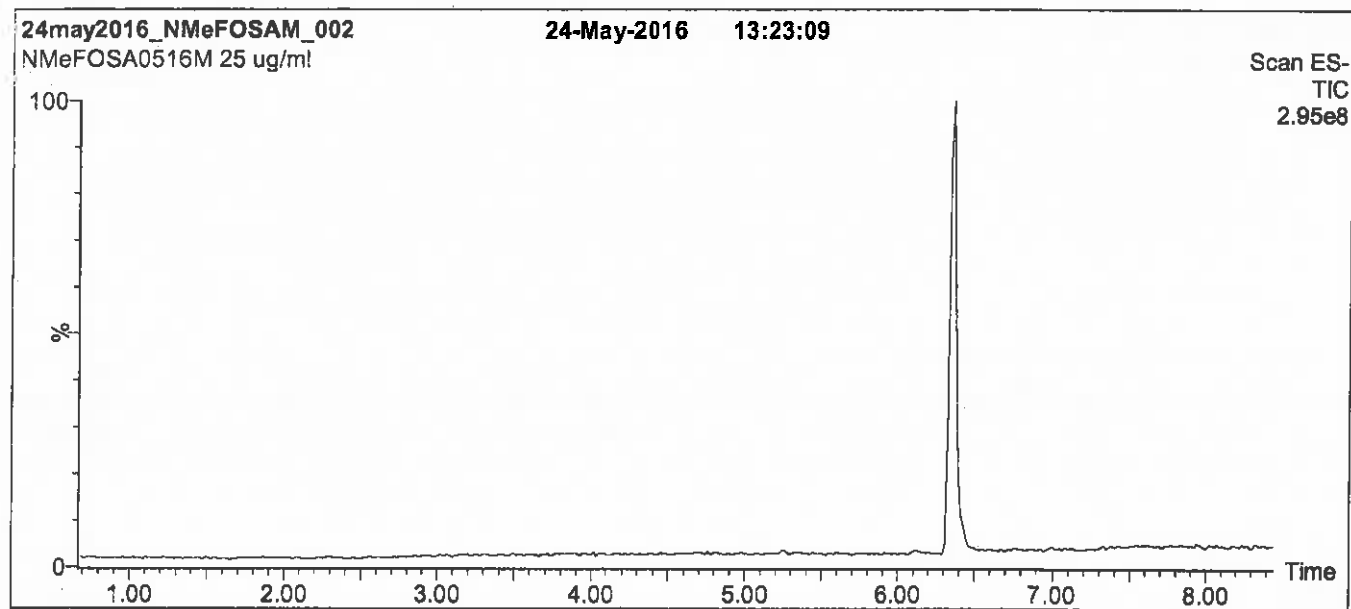
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

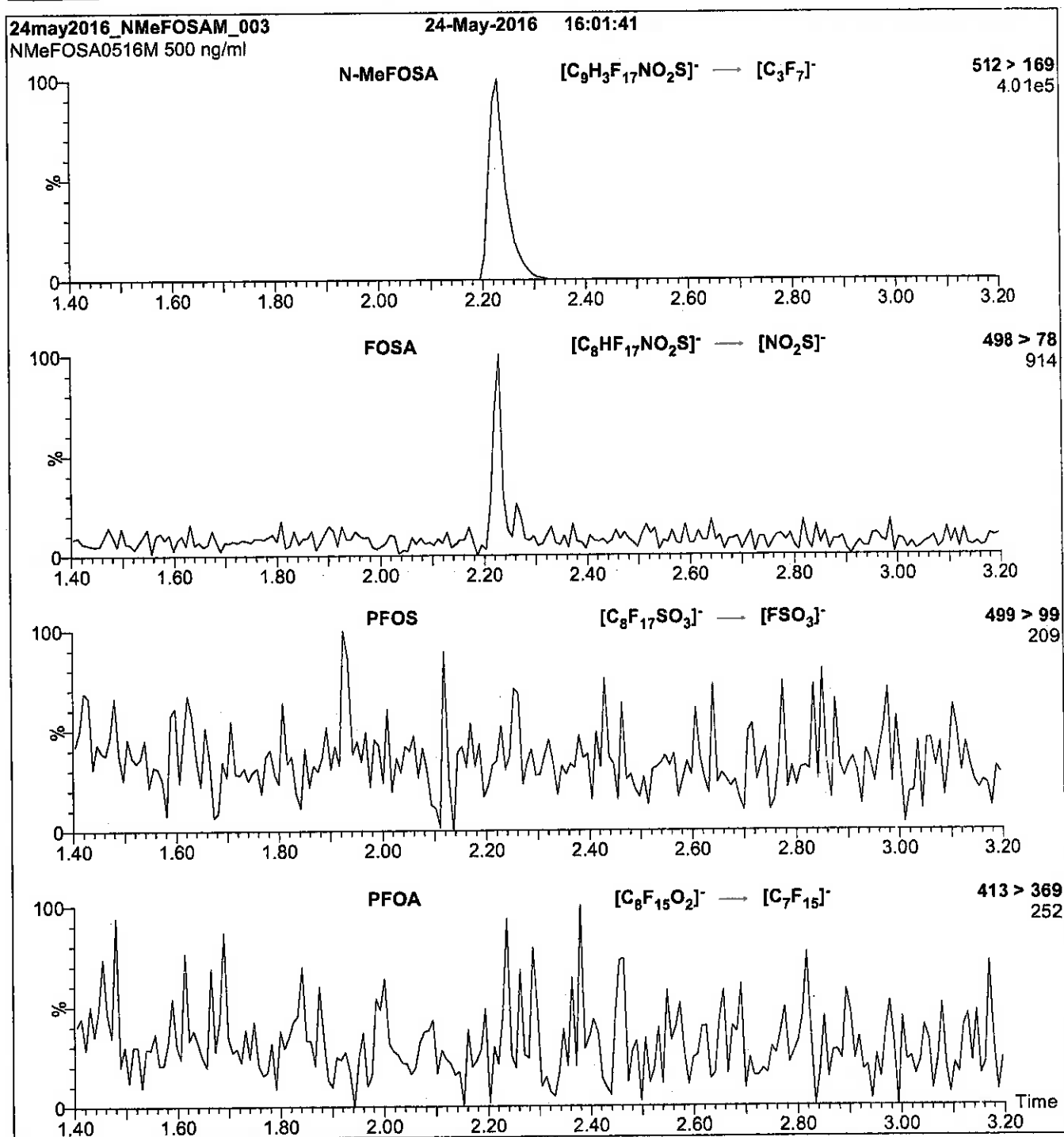
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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 μ l (500 ng/ml N-MeFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00003

R: 8/23/16 SAE

715562
ID: LCN-MeFOSAA_00003
Exp: 01/20/21 Prod: SEC
N-MeFOSAA

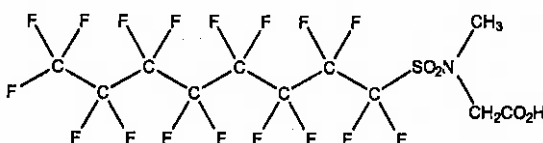


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSAA **LOT NUMBER:** NMeFOSAA0116
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: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/20/2016
EXPIRY DATE: (mm/dd/yyyy) 01/20/2021
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 moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 01/21/2016
(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

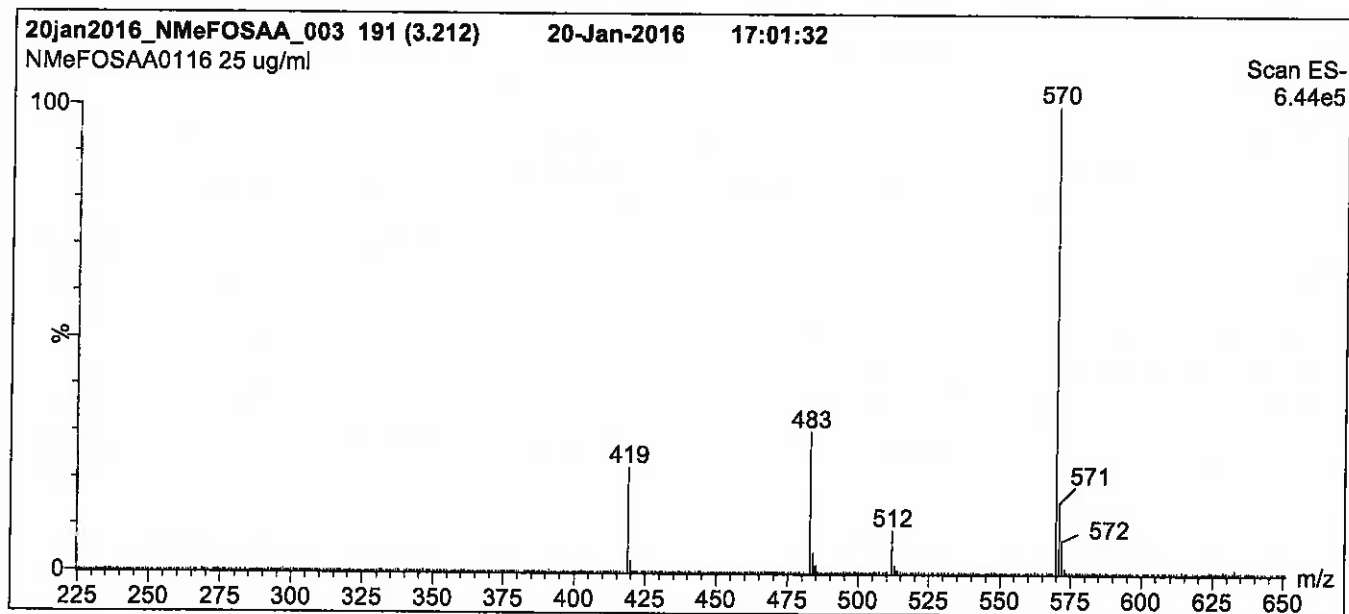
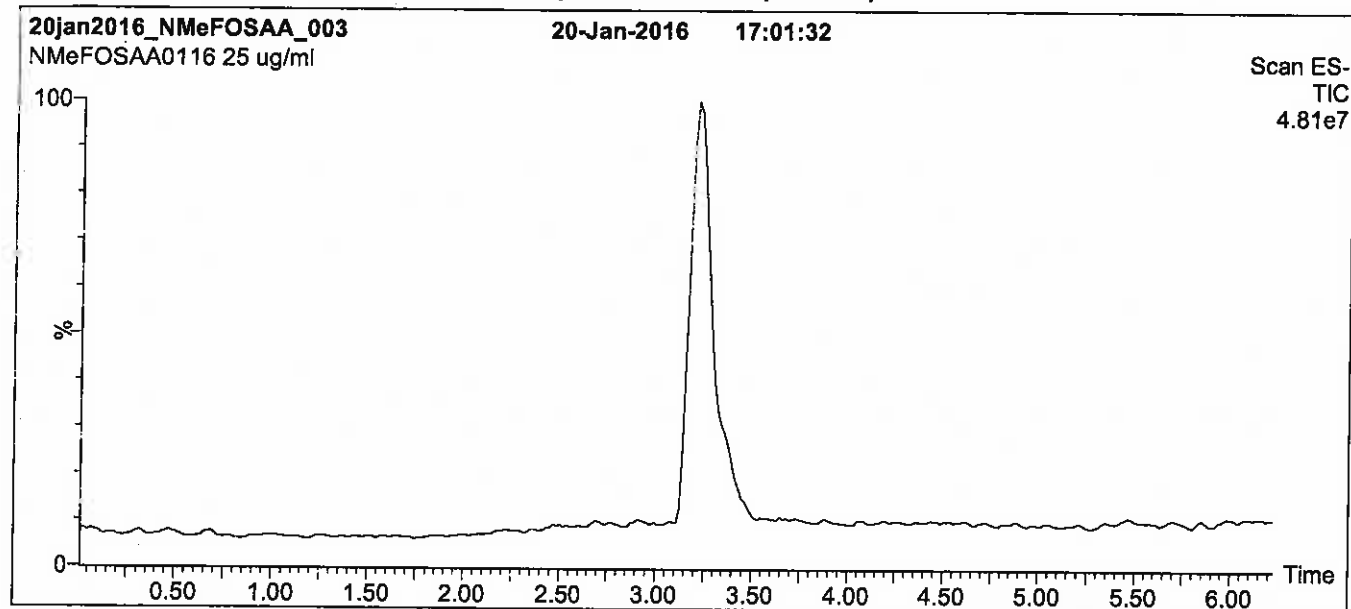
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

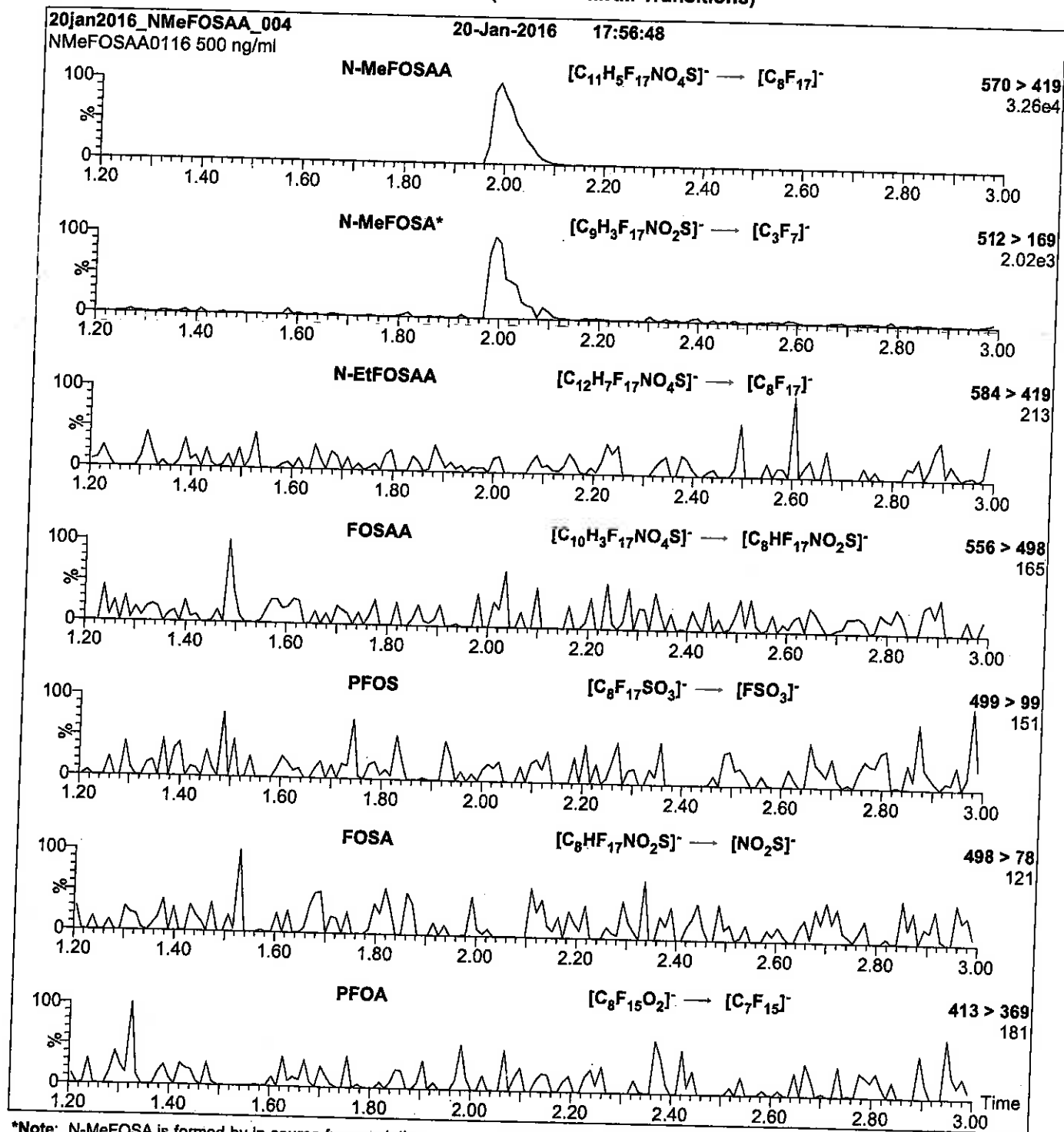
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: 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 μ l (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 μ l/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 25

Reagent

LCN-MeFOSAA_00004

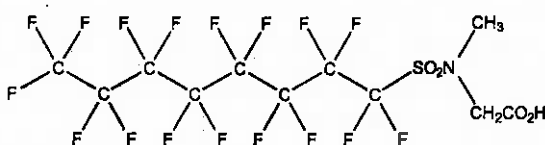


WELLINGTON LABORATORIES

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: $50 \pm 2.5 \mu\text{g/ml}$ **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 moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/25/2016
(mm/dd/yyyy)

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

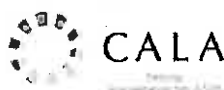
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LIMITED WARRANTY:

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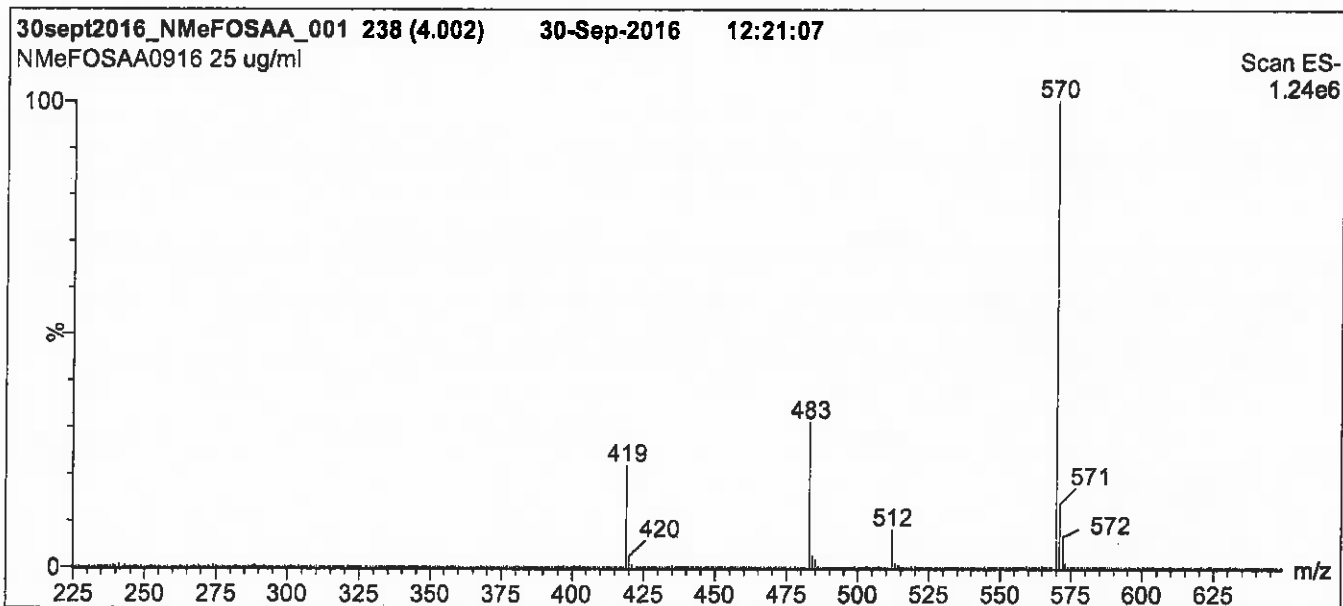
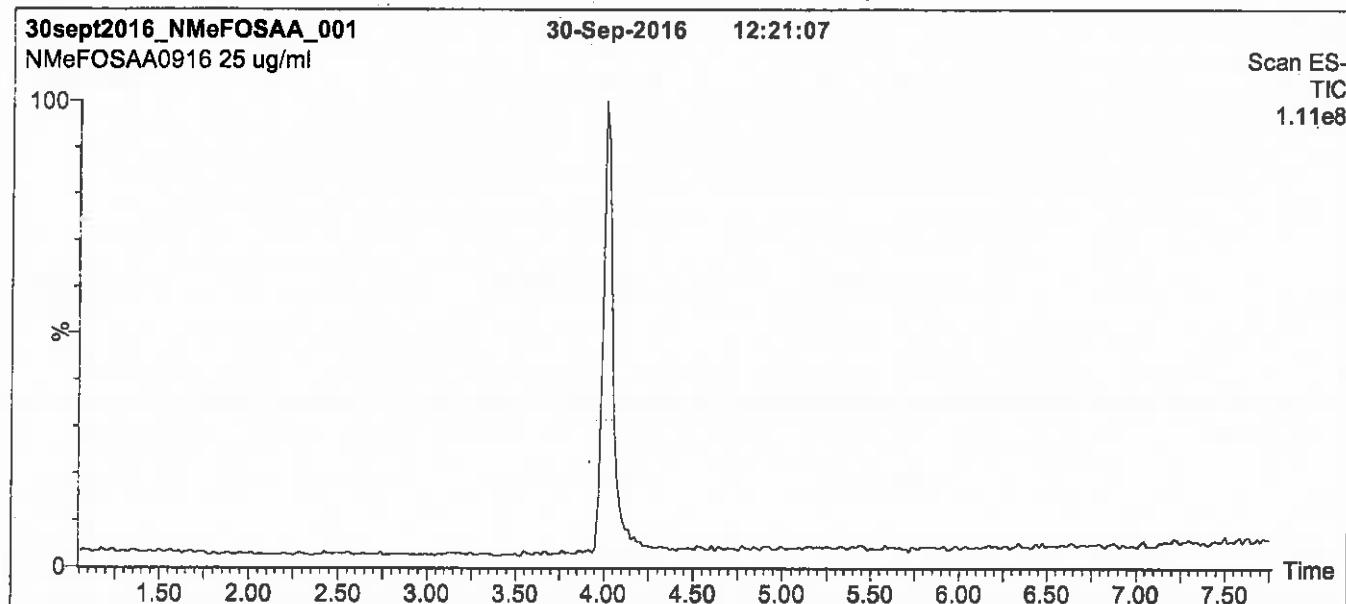
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

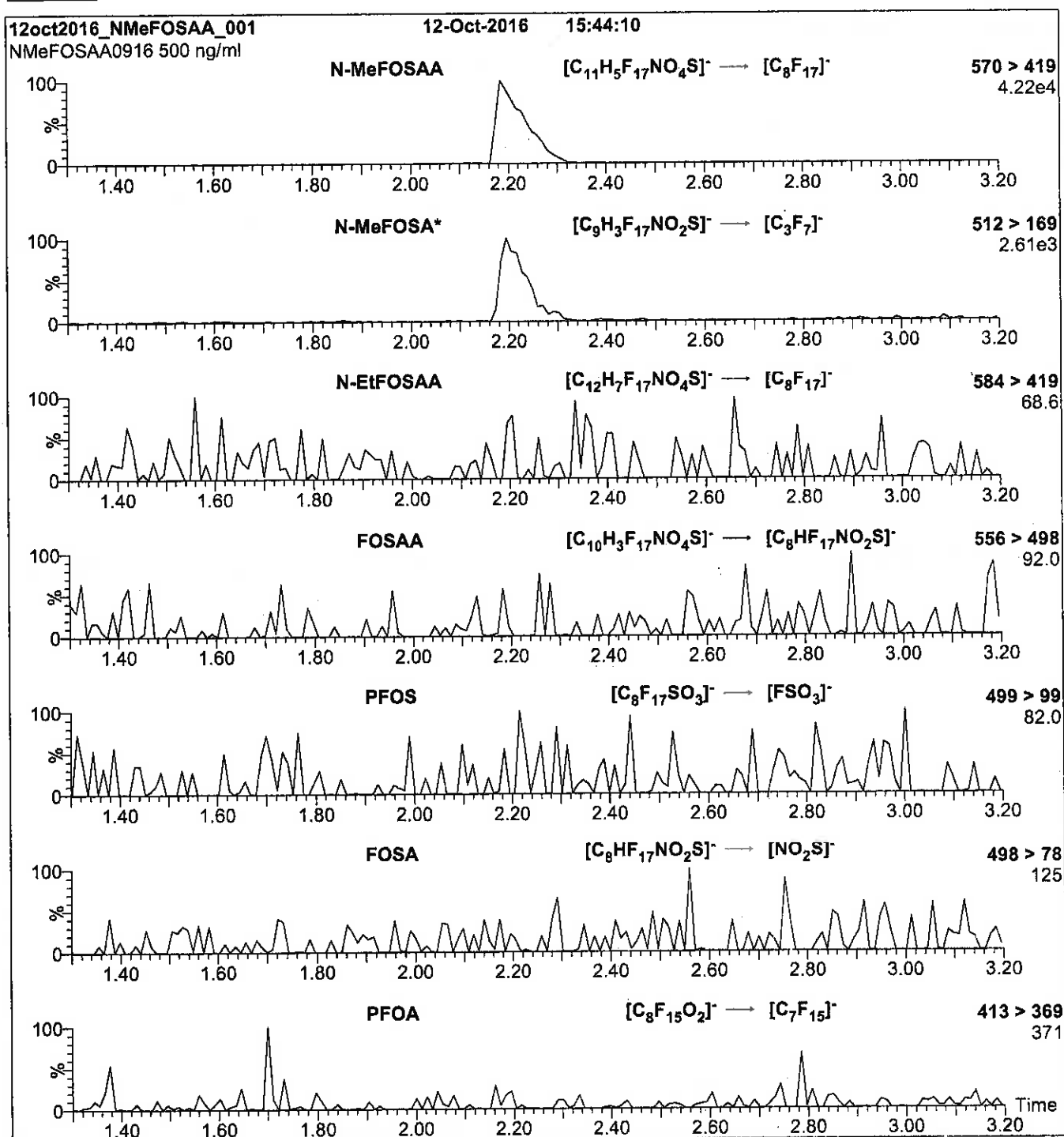
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 μ l (500 ng/ml N-MeFOSAA)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 20

Reagent

LCPFACMXB_00007



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXB

**Solution/Mixture of Native
Perfluoroalkylcarboxylic Acids and
Native Perfluoroalkylsulfonates**

PRODUCT CODE: PFAC-MXB
LOT NUMBER: PFACMXB1115
SOLVENT(S): Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy) 11/04/2015
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXB is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids (C₄-C₁₄, C₁₆, and C₁₈) and four native perfluoroalkylsulfonates (C₄, C₆, C₈ and C₁₀). The full name, abbreviation and concentration for each of the components are given in Table A.

The individual perfluoroalkylcarboxylic acids and perfluoroalkylsulfonates all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
 Figure 1: LC/MS Data (SiR)
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)
 Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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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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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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Table A: PFAC-MXB; Components and Concentrations (ng/ml, $\pm$ 5% in Methanol / Water (<1%))

Name	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	D	
Perfluoro-n-heptanoic acid	PFHpA	2000	E	
Perfluoro-n-octanoic acid	PFOA	2000	G	
Perfluoro-n-nonanoic acid	PFNA	2000	H	
Perfluoro-n-decanoic acid	PFDA	2000	J	
Perfluoro-n-undecanoic acid	PFUdA	2000	K	
Perfluoro-n-dodecanoic acid	PFDoA	2000	M	
Perfluoro-n-tridecanoic acid	PFTrDA	2000	N	
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	O	
Perfluoro-n-hexadecanoic acid	PFHxDA	2000	P	
Perfluoro-n-octadecanoic acid	PFODA	2000	Q	
Name	Abbreviation	Concentration (ng/ml)		Peak Assignment In Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-buthanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	I
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

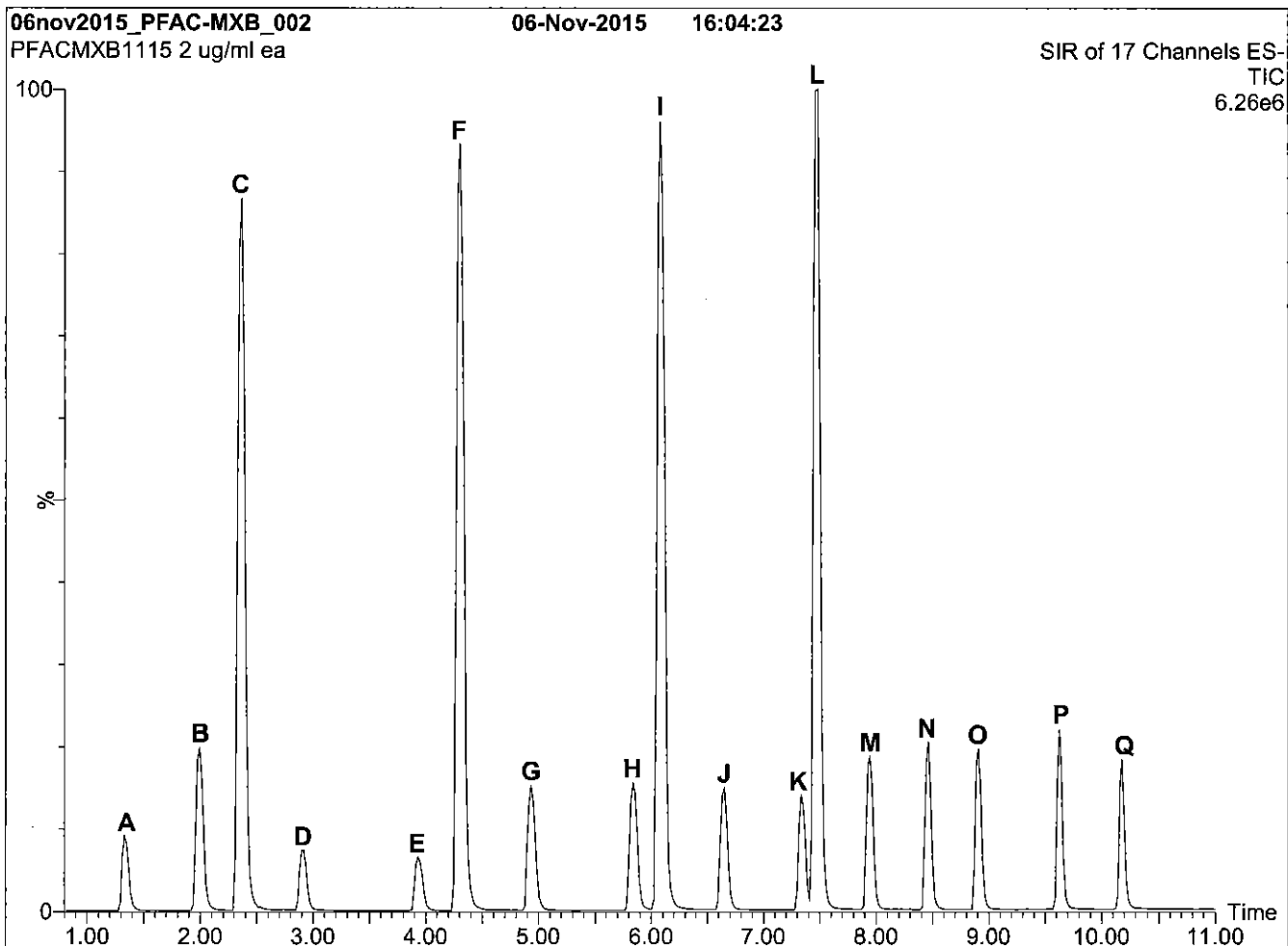
Certified By:


B.G. Chittim

Date: 11/11/2015

(mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 55% H₂O / 45% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc buffer)
Ramp to 95% organic over 10 min and hold for 1 min
before returning to initial conditions in 0.5 min.

Time: 12 min

Flow: 300 μ l/min

MS Parameters

Experiment: SIR of 17 Channels

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-MXB; LC/MS/MS Data (Selected MRM Transitions)

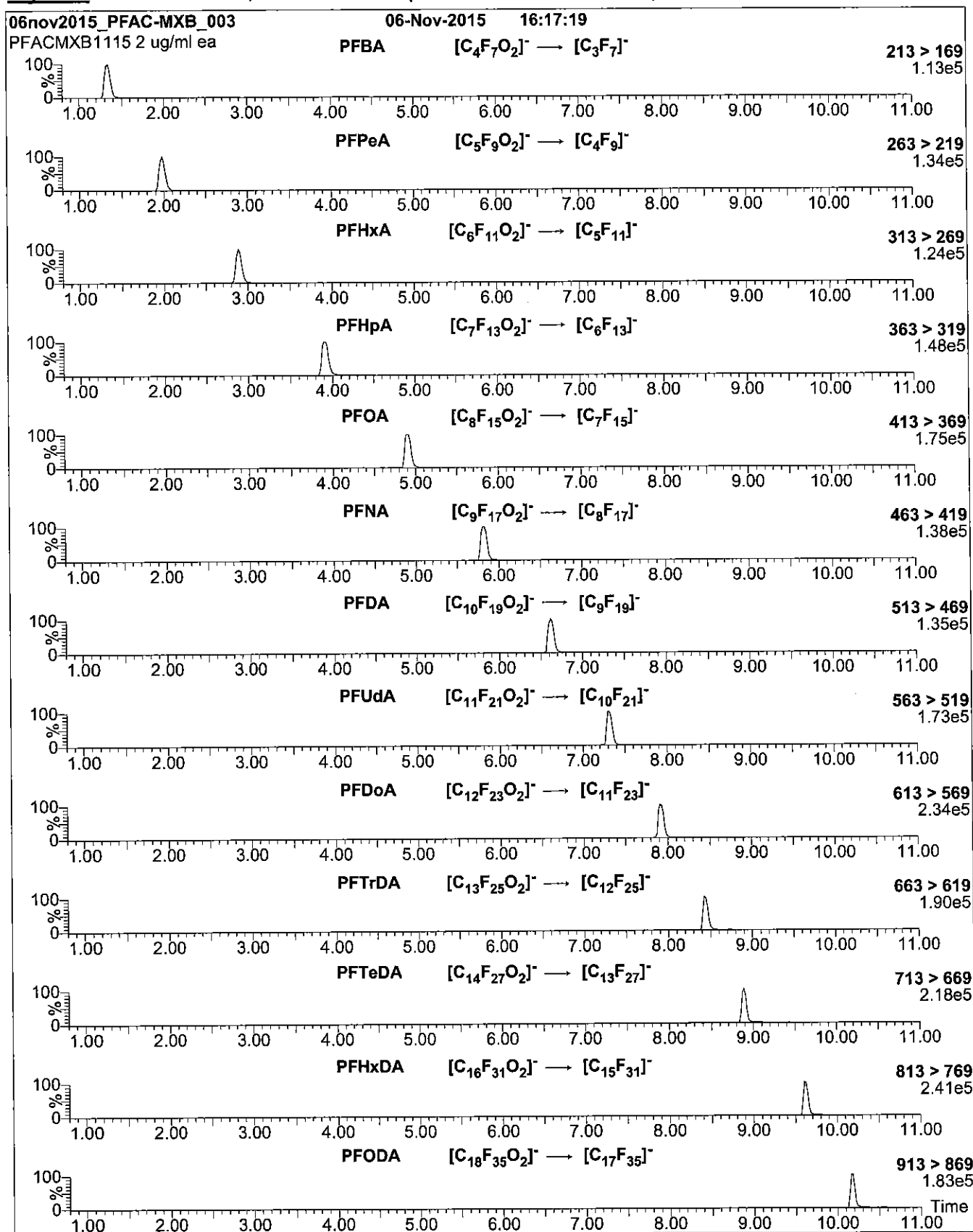
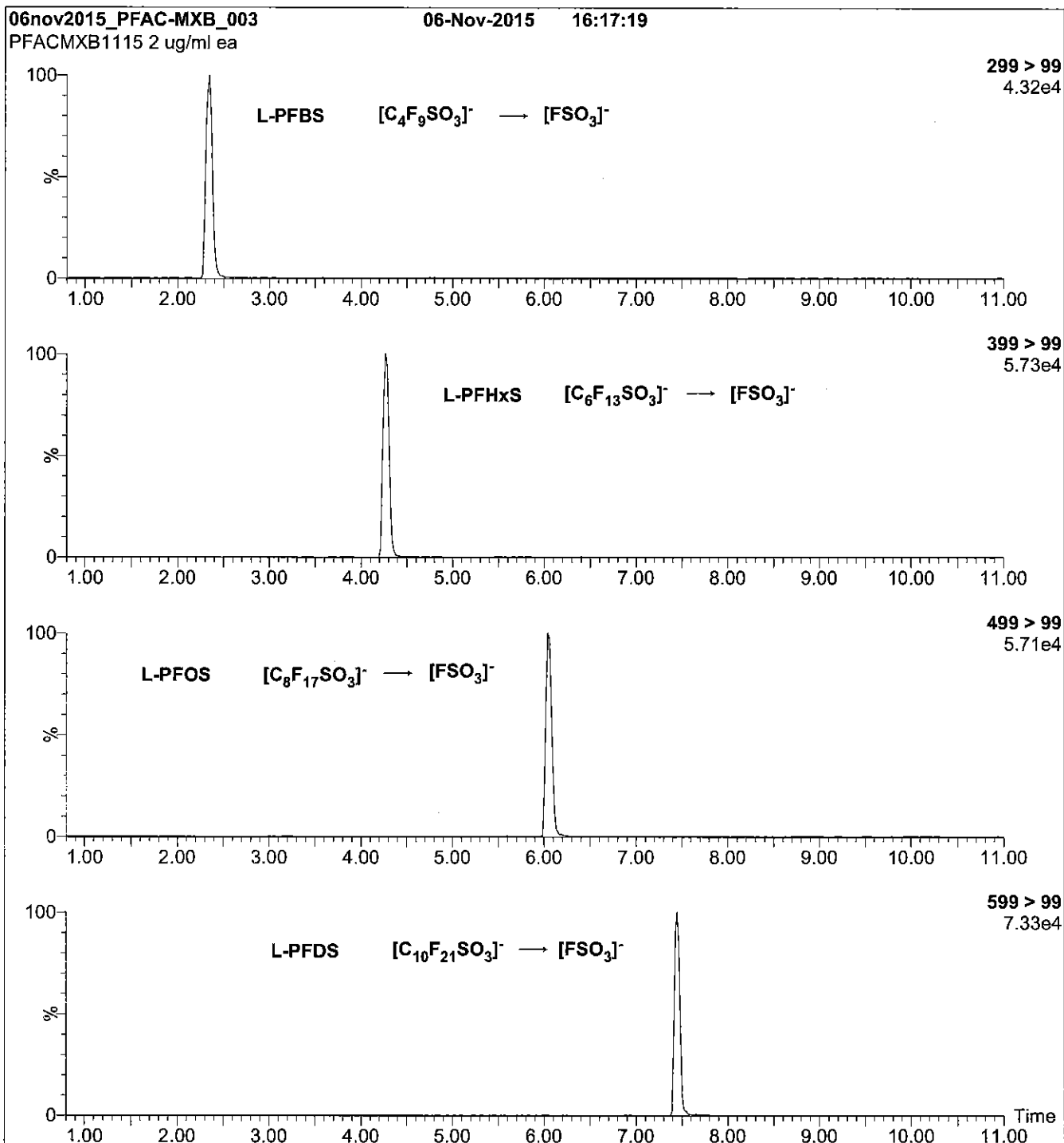


Figure 3: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 μ /min

MS Parameters

Collision Gas (mbar) = 3.24e-3

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

Reagent

LCPFBA_00006

Scanned
10/16/14

R: SBC 9/13/16



WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

730531
ID: LCPFBA_00005
Exp: 05/27/21 Ppd: SBC
PF-n-butanoic acid

730532
ID: LCPFBA_00006
Exp: 05/27/21 Ppd: SBC
PF-n-butanoic acid

PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0516

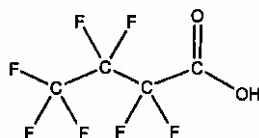
COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4



MOLECULAR FORMULA:

C₄HF₇O₂

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.

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Certified By:

B.G. Chittim

Date: 05/31/2016

(mm/dd/yyyy)

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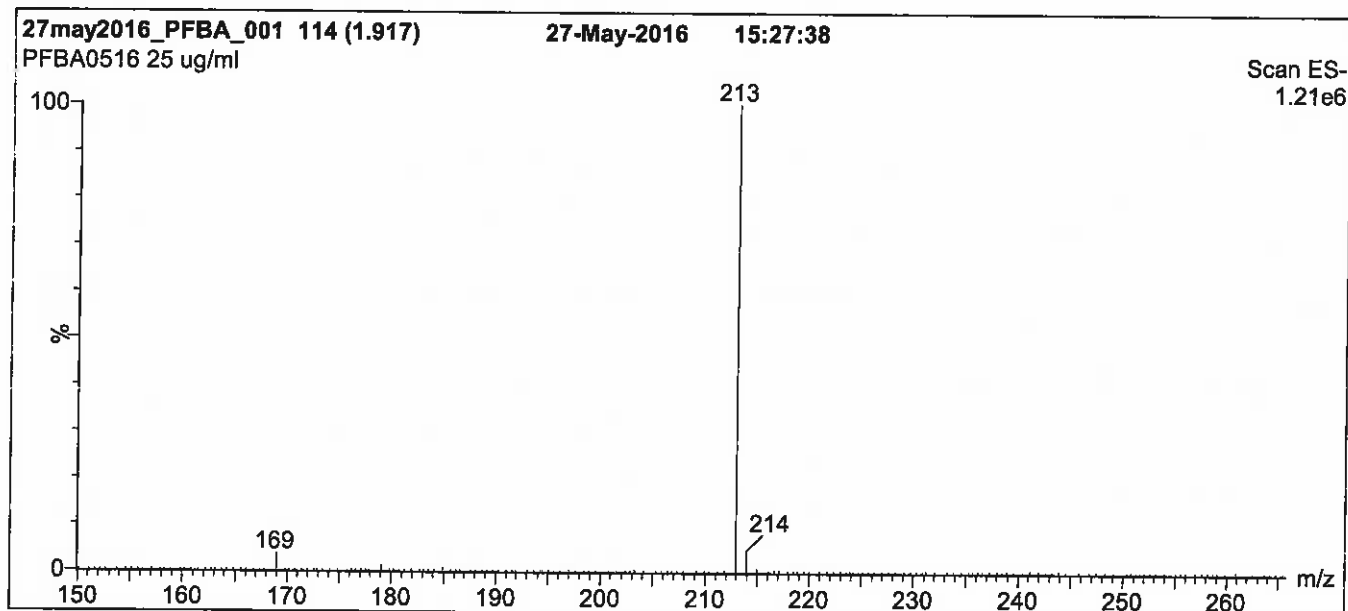
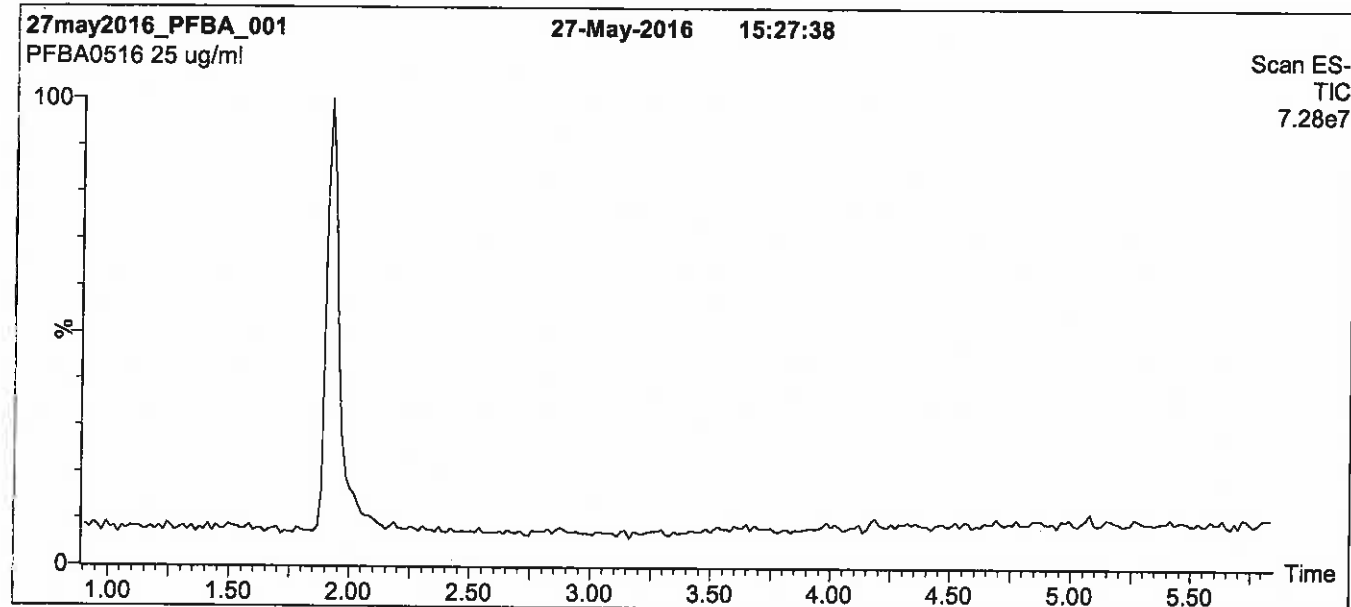
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

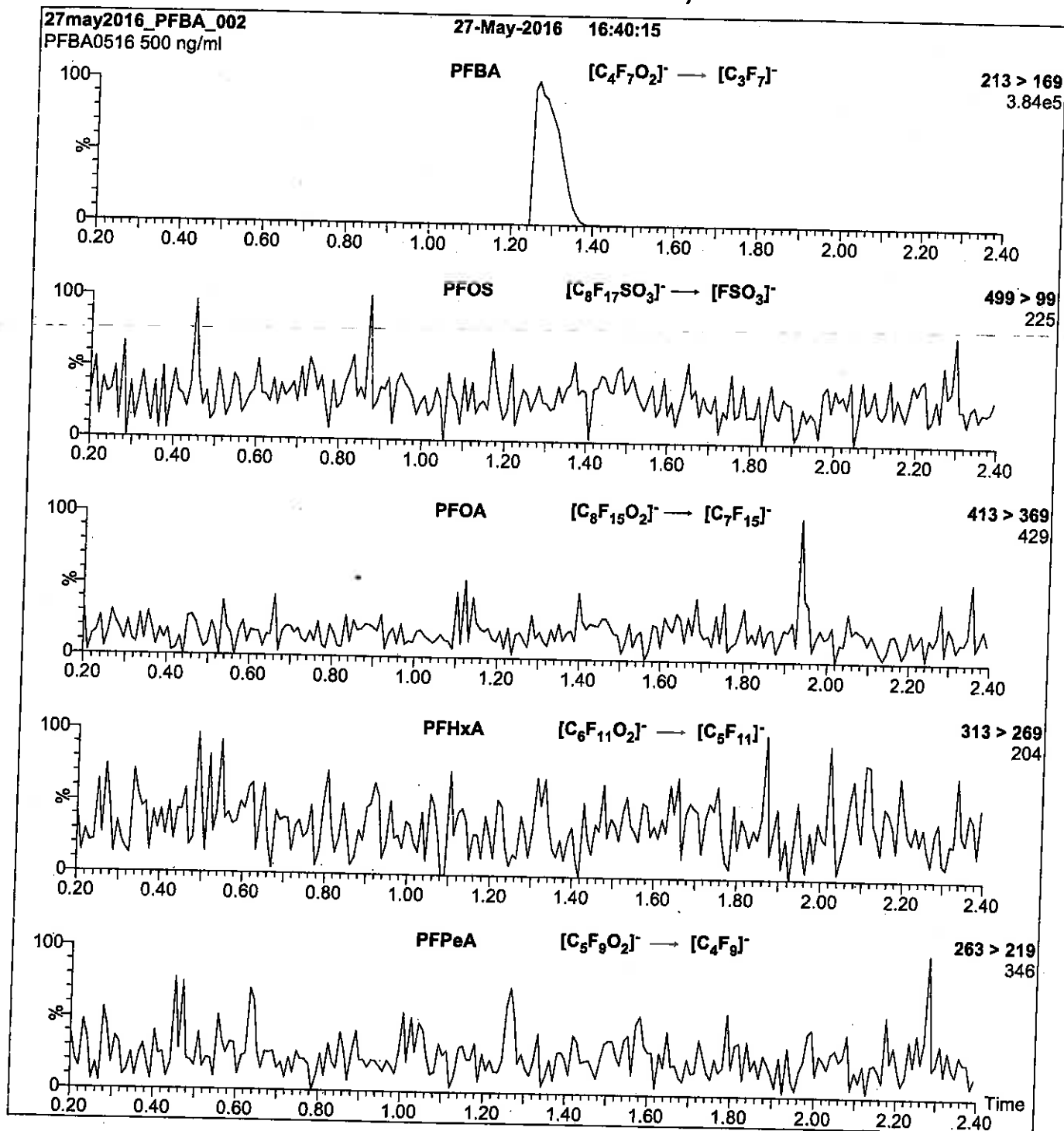
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00006

R: SBC 9/13/16



730511

ID: LCPFBFS_00005

Exp: 03/15/21 Pripd: SBC

PF-1-butanedisulfonate K sa



730512

ID: LCPFBFS_00006

Exp: 03/15/21 Pripd: SBC

PF-1-butanedisulfonate K sa



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

COMPOUND:

Potassium perfluoro-1-butanedisulfonate

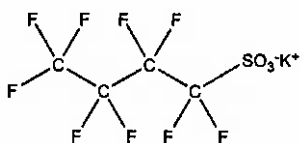
LOT NUMBER:

LPFBS0316

STRUCTURE:

CAS #:

29420-49-3



MOLECULAR FORMULA:

C₄F₉SO₃K

CONCENTRATION:

50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)

MOLECULAR WEIGHT:

338.19

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:

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HOMOGENEITY:

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

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

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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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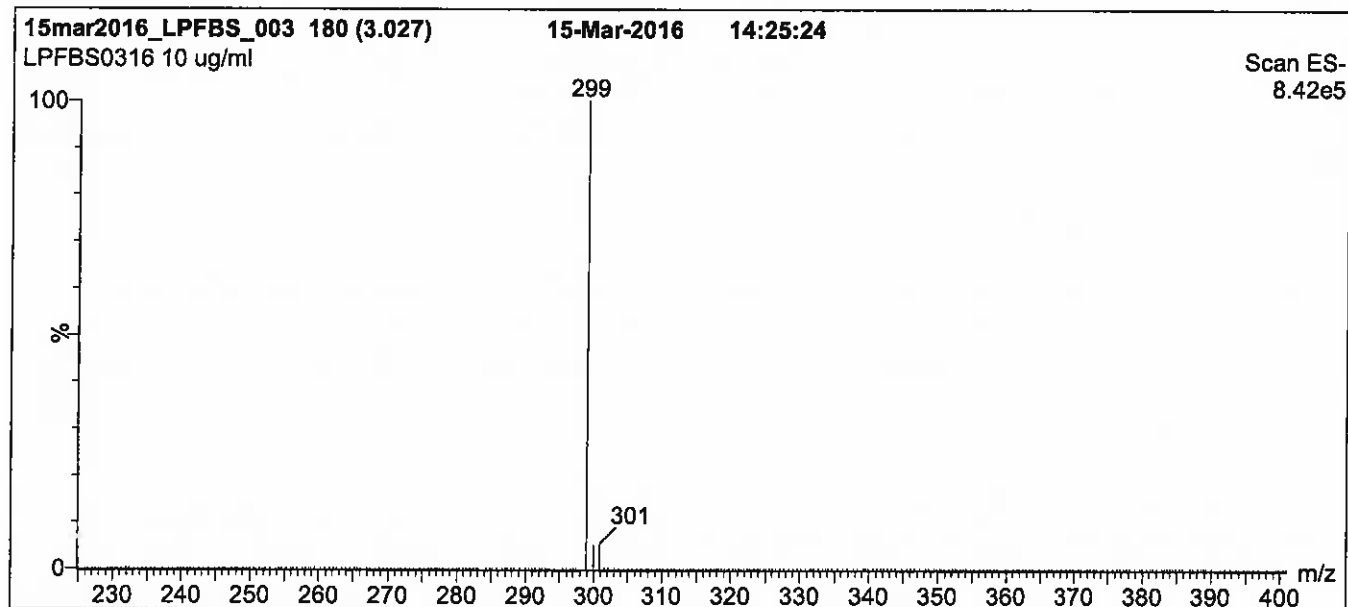
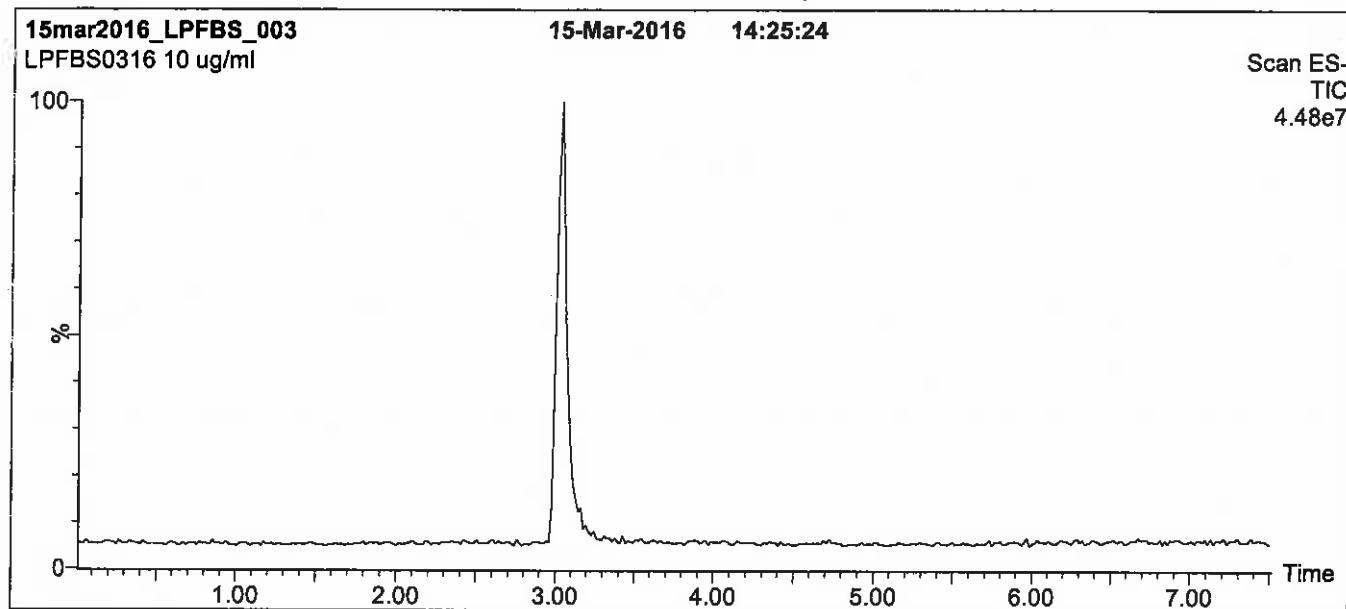
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

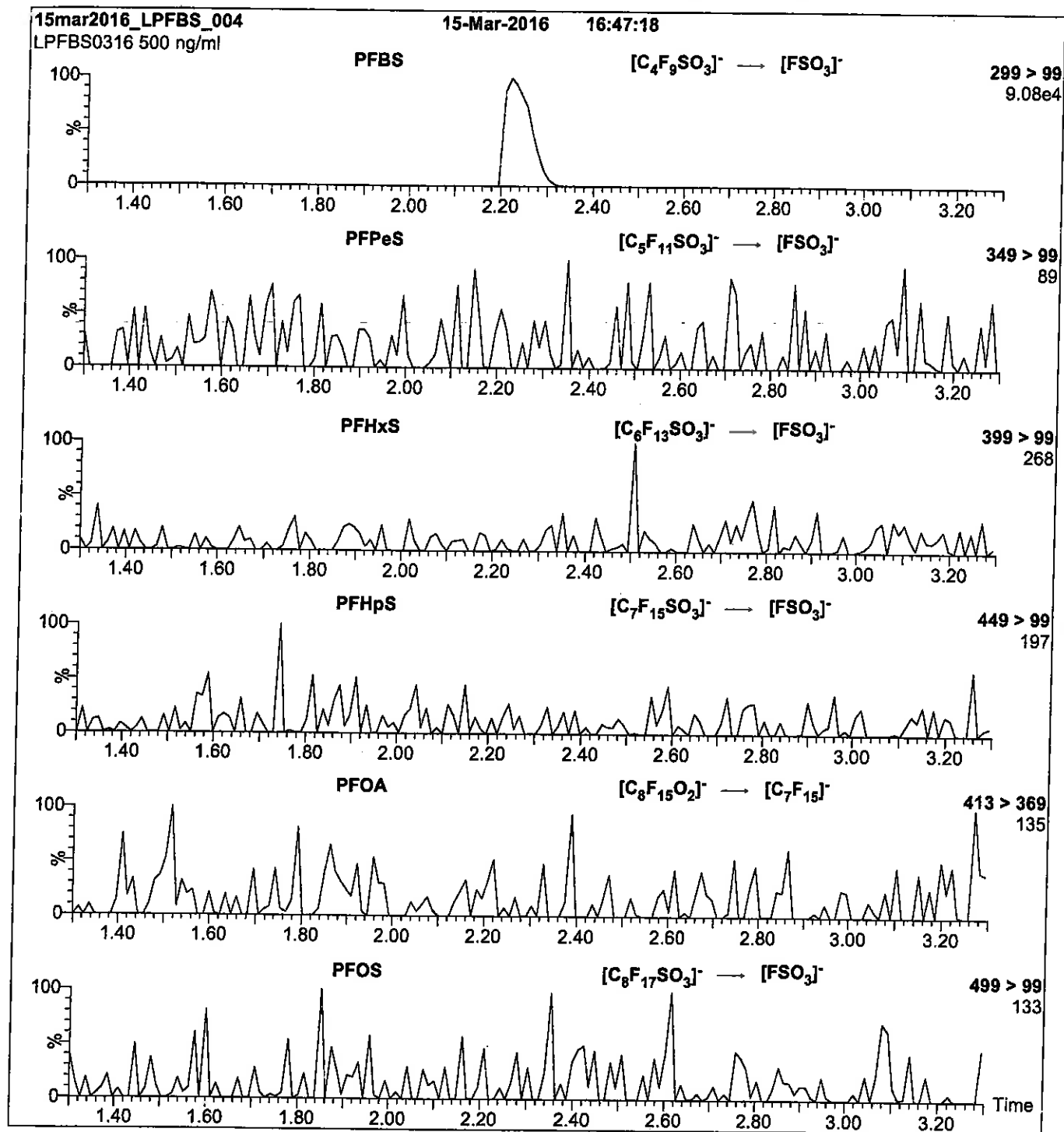
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDA_00006

R: 8BZ 9/13/16
Scanned 10/14/16 SR



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



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



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

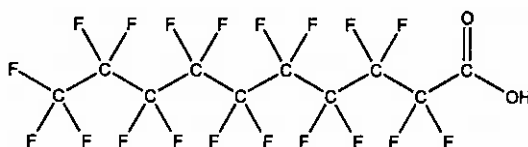
PFDA0516

COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:**CAS #:**

335-76-2

**MOLECULAR FORMULA:** $C_{10}H_{18}F_{20}O_2$ **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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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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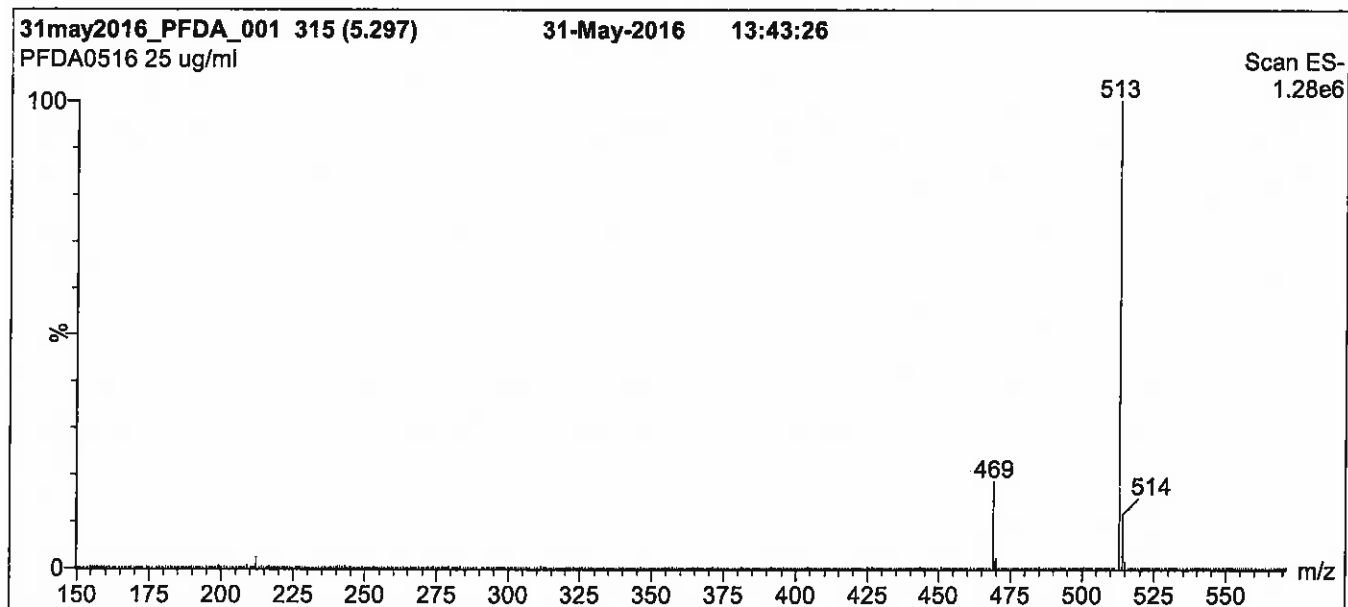
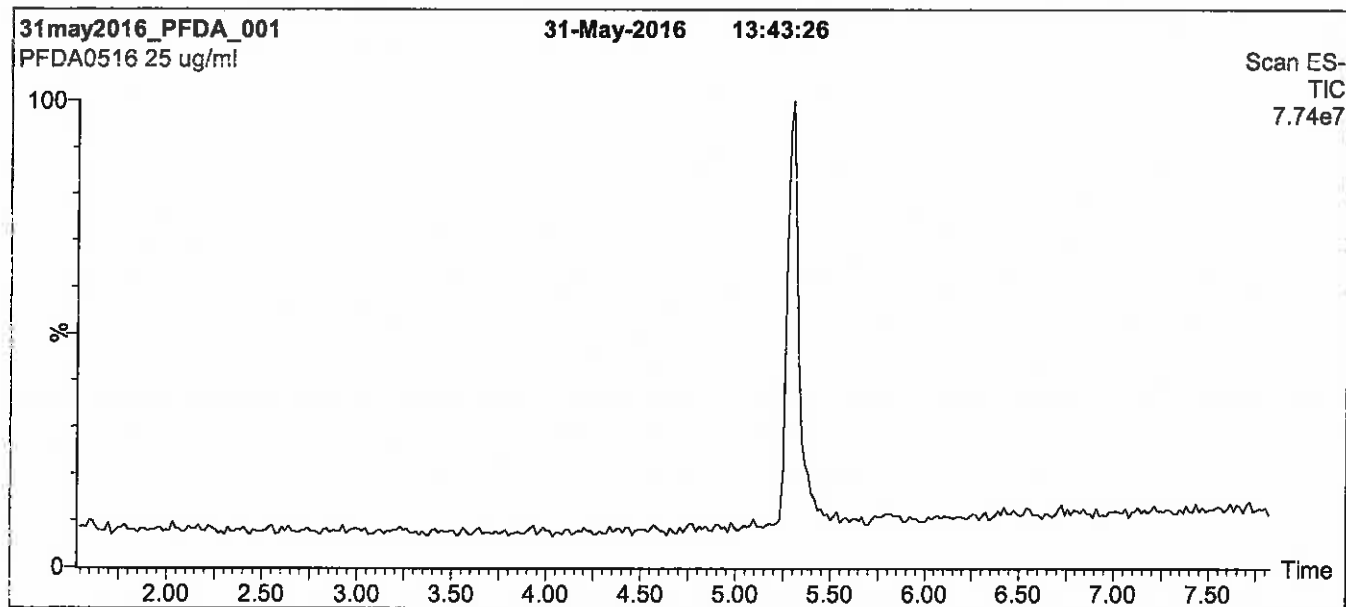
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

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

Ramp to 90% organic over 7.5 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

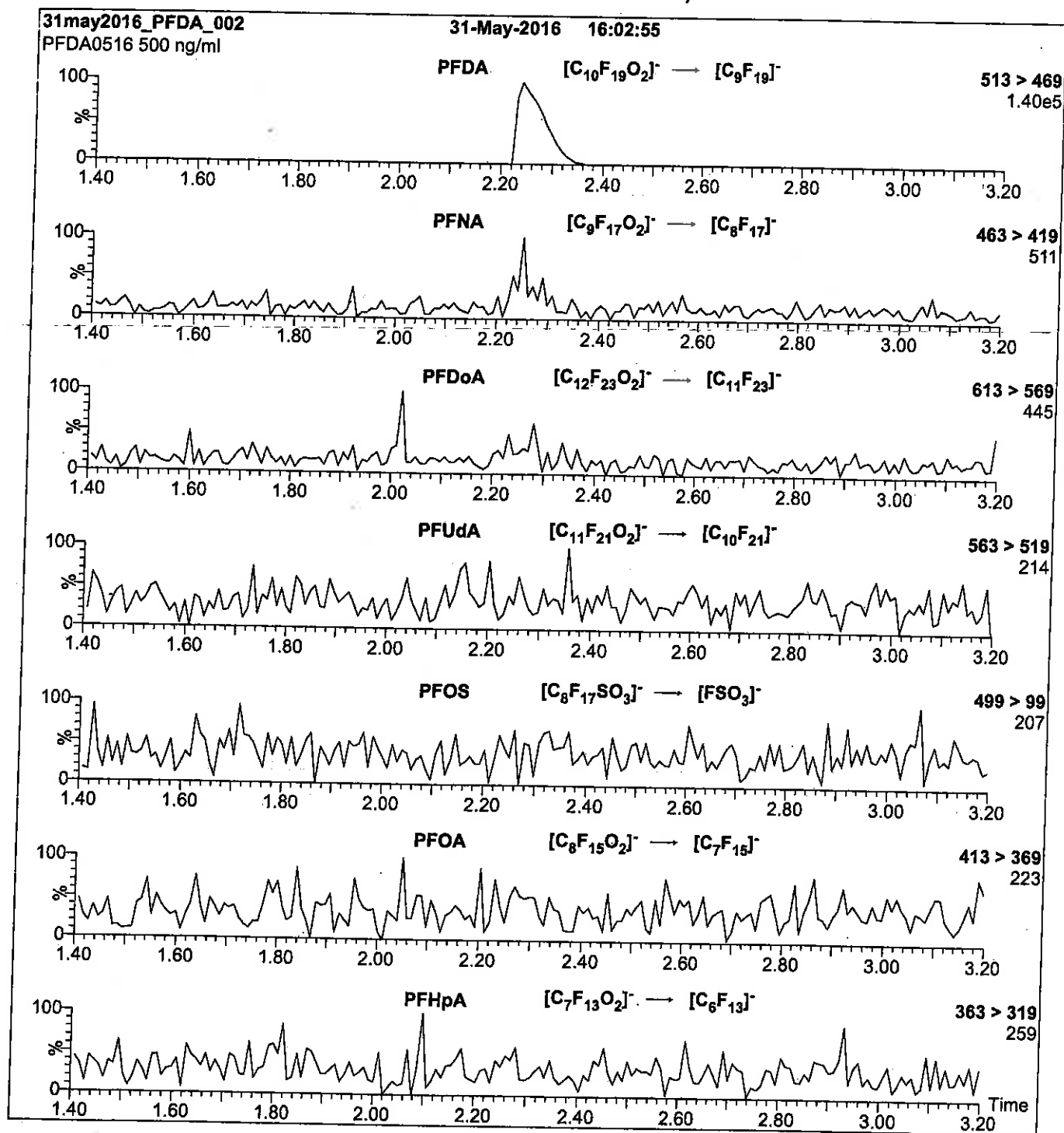
Capillary Voltage (kV) = 2.00

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 μ l (500 ng/ml PFDA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDA_00007

R: 8BZ 9/13/16
Scanned 10/14/16 SR



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



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



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CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0516

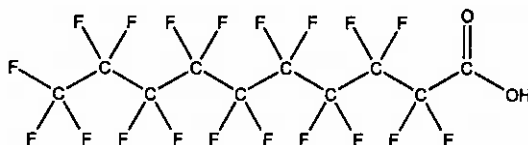
COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2



MOLECULAR FORMULA:

C₁₀HF₁₉O₂

MOLECULAR WEIGHT:

514.08

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/31/2016

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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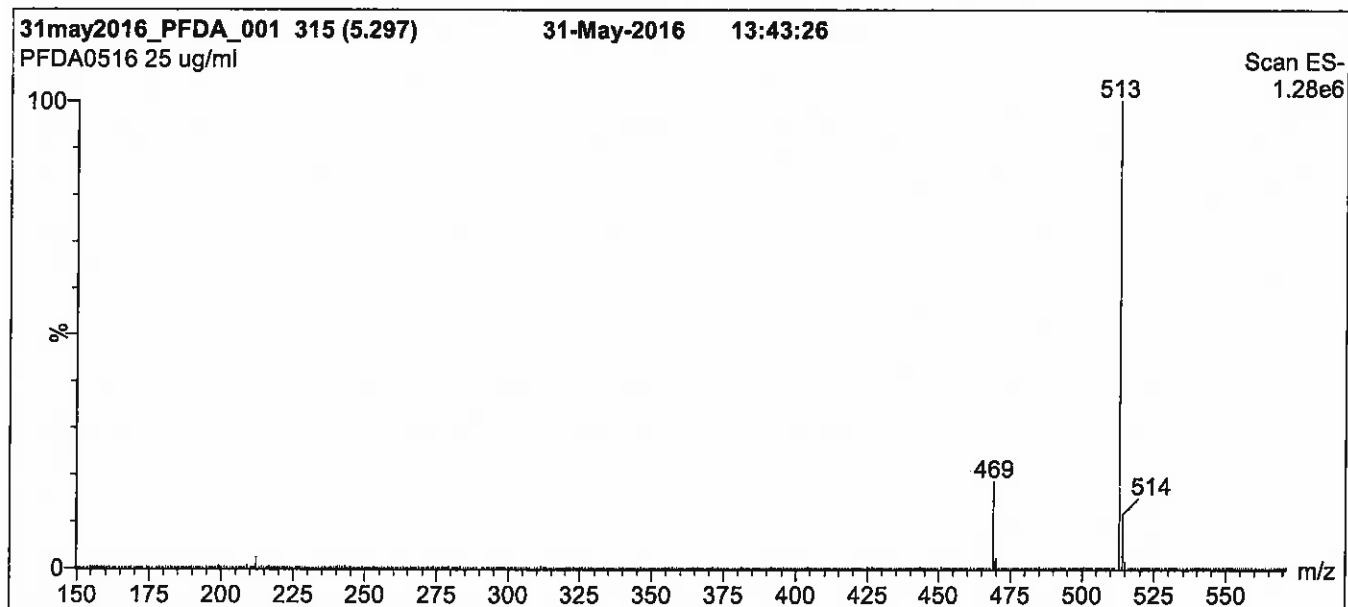
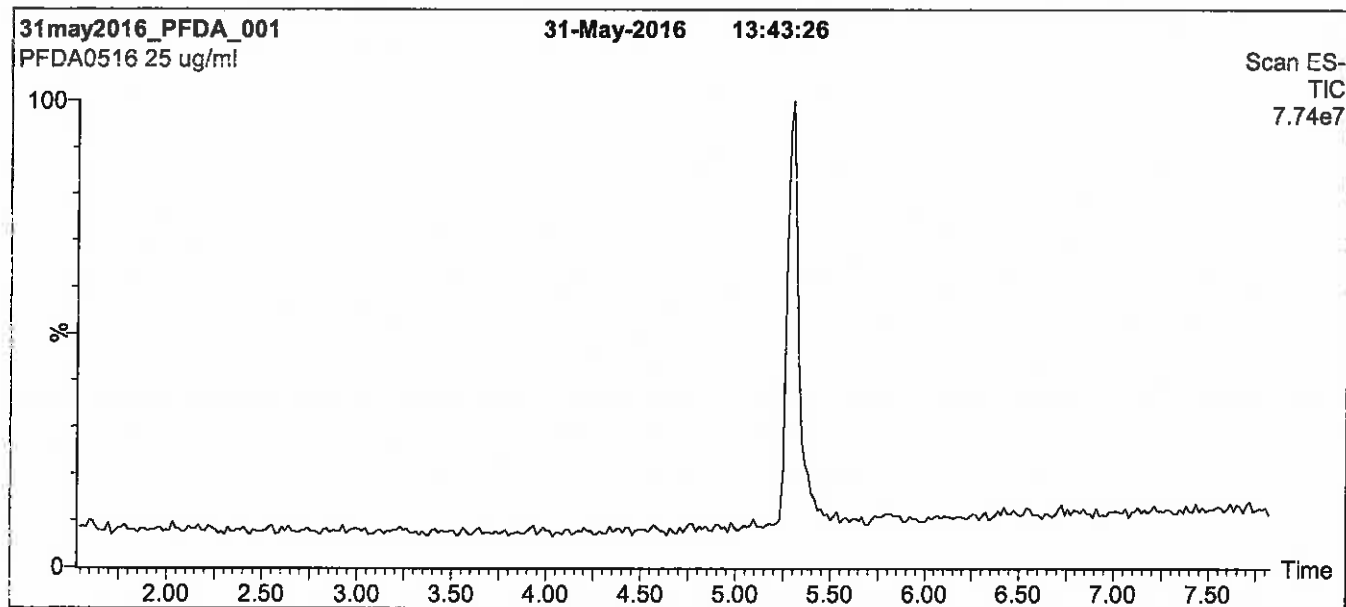
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Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

Ramp to 90% organic over 7.5 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

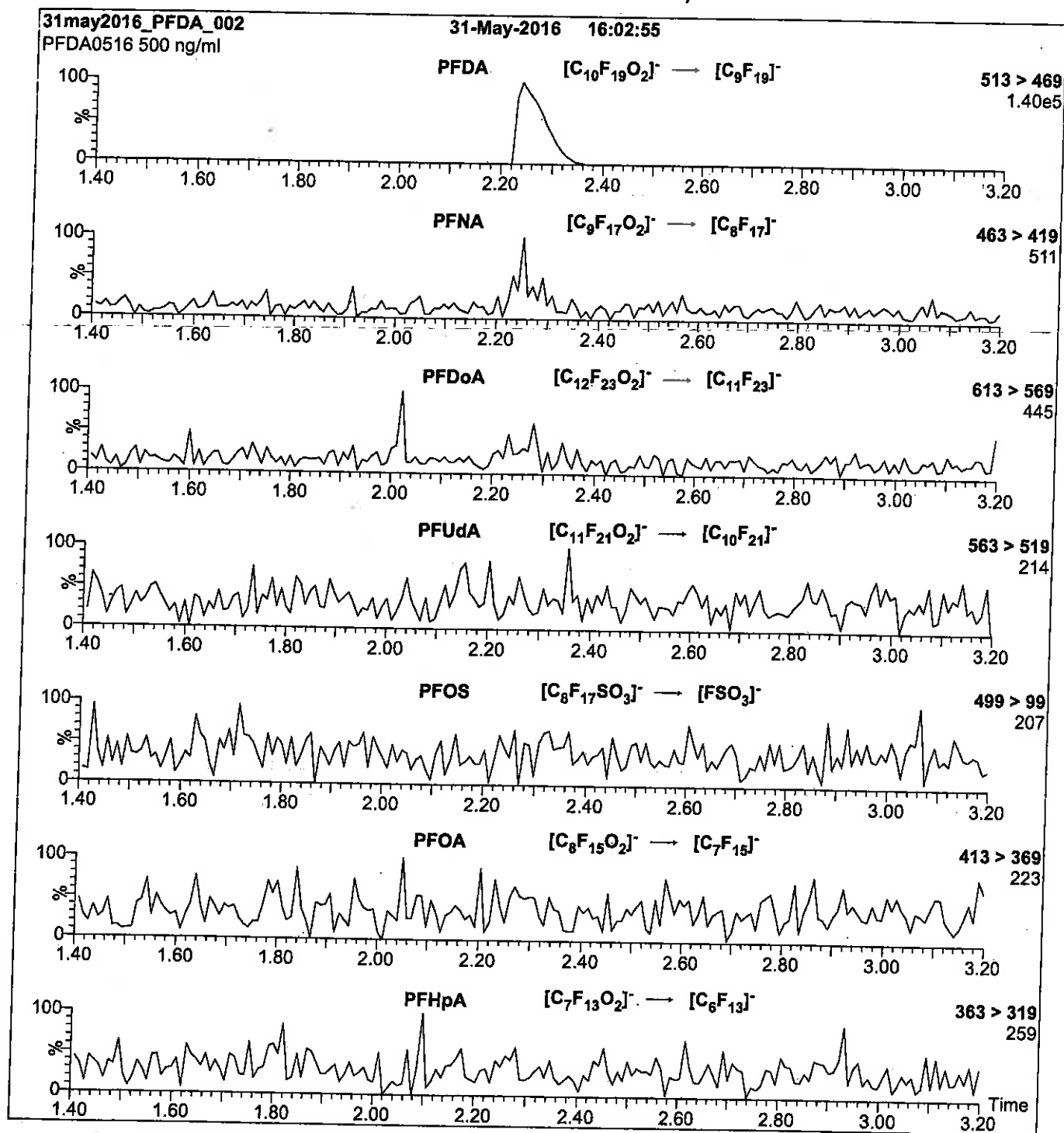
Capillary Voltage (kV) = 2.00

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 μ l (500 ng/ml PFDA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDoA_00006

r: 12/21/16 SPV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFD0A

LOT NUMBER: PFD0A0516

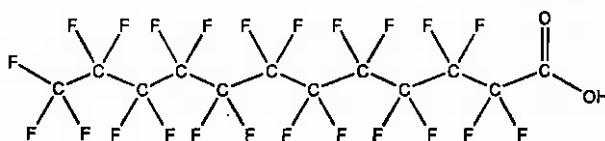
COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1



MOLECULAR FORMULA:

C₁₂HF₂₃O₂

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

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HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

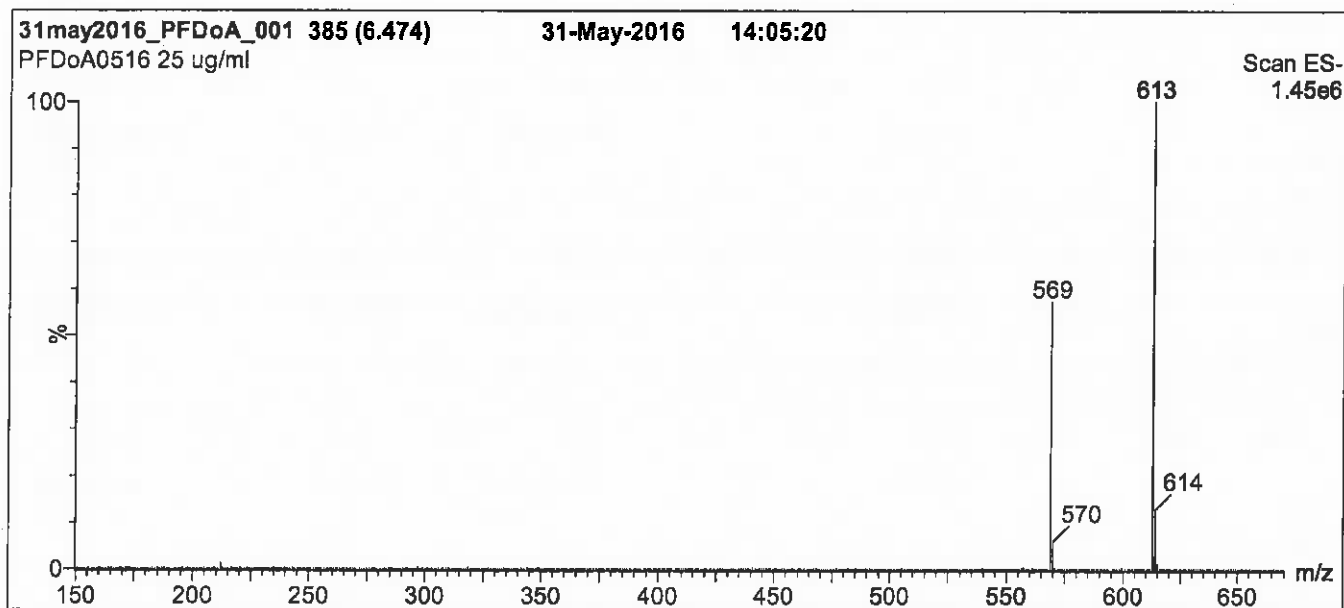
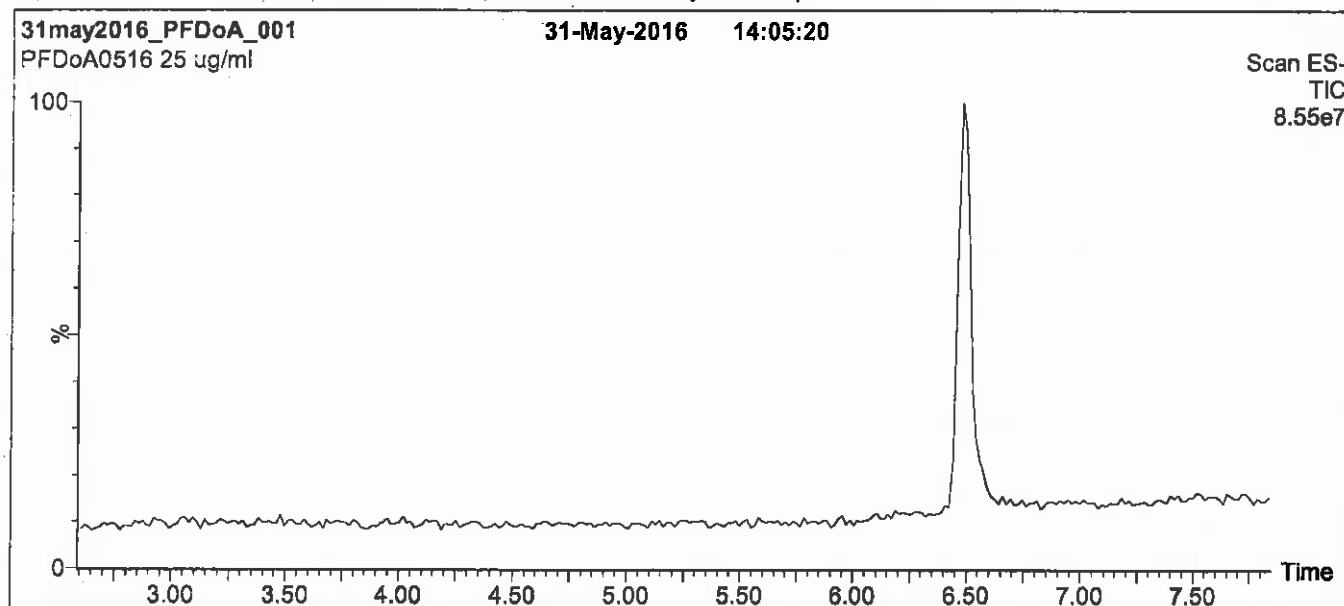
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O

(both with 10 mM NH₄OAc buffer)

Ramp to 90% organic over 7.5 min and hold for
1.5 min before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

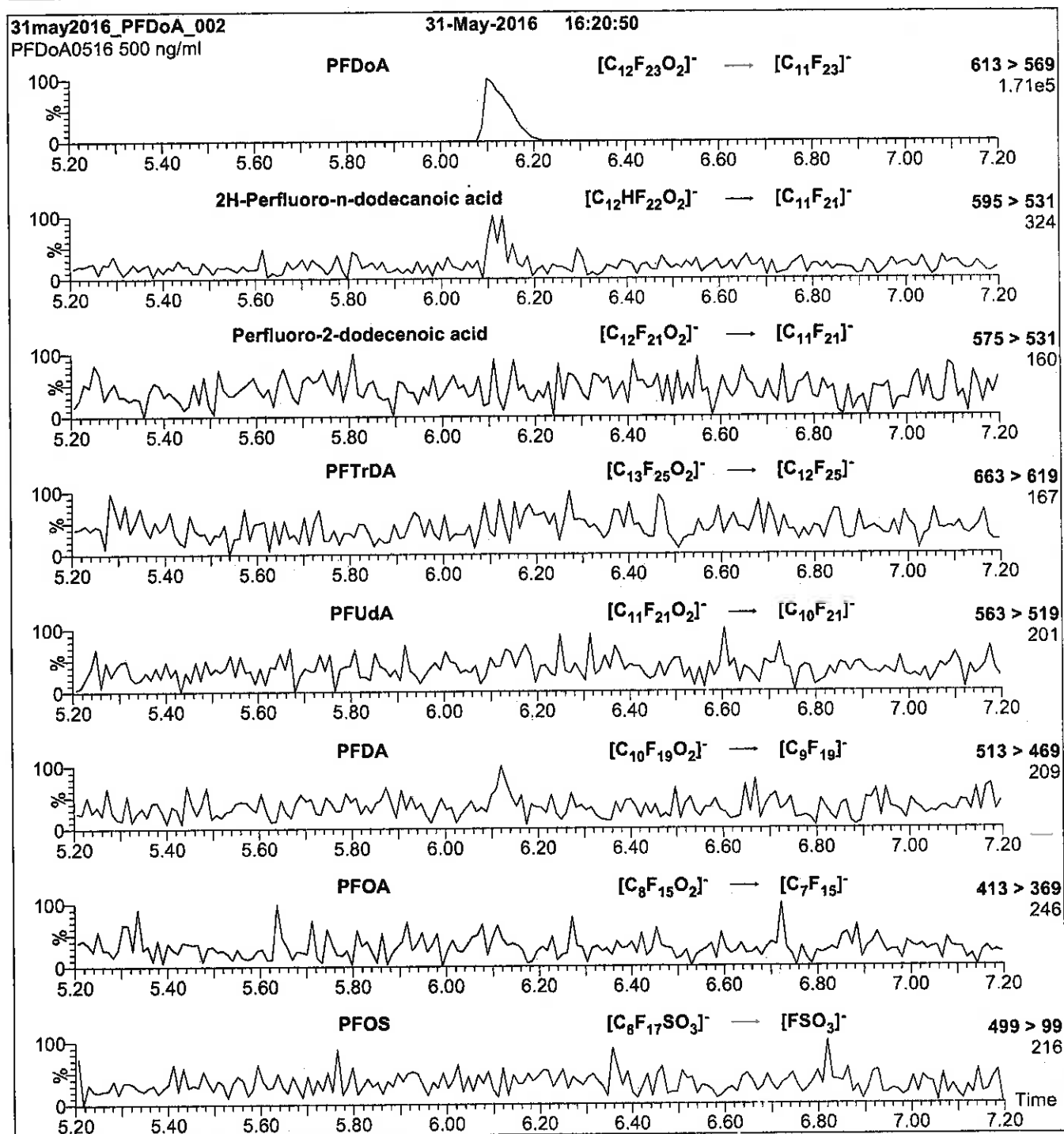
Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 20.00

Cone Gas Flow (l/hr) = 100

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDoA_00007

r: 12/21/16 SPV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFD0A

LOT NUMBER: PFD0A0516

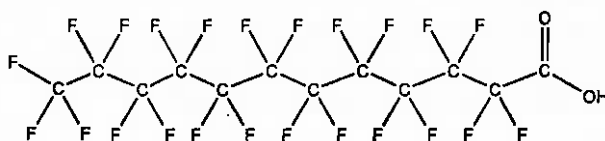
COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1



MOLECULAR FORMULA:

C₁₂HF₂₃O₂

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

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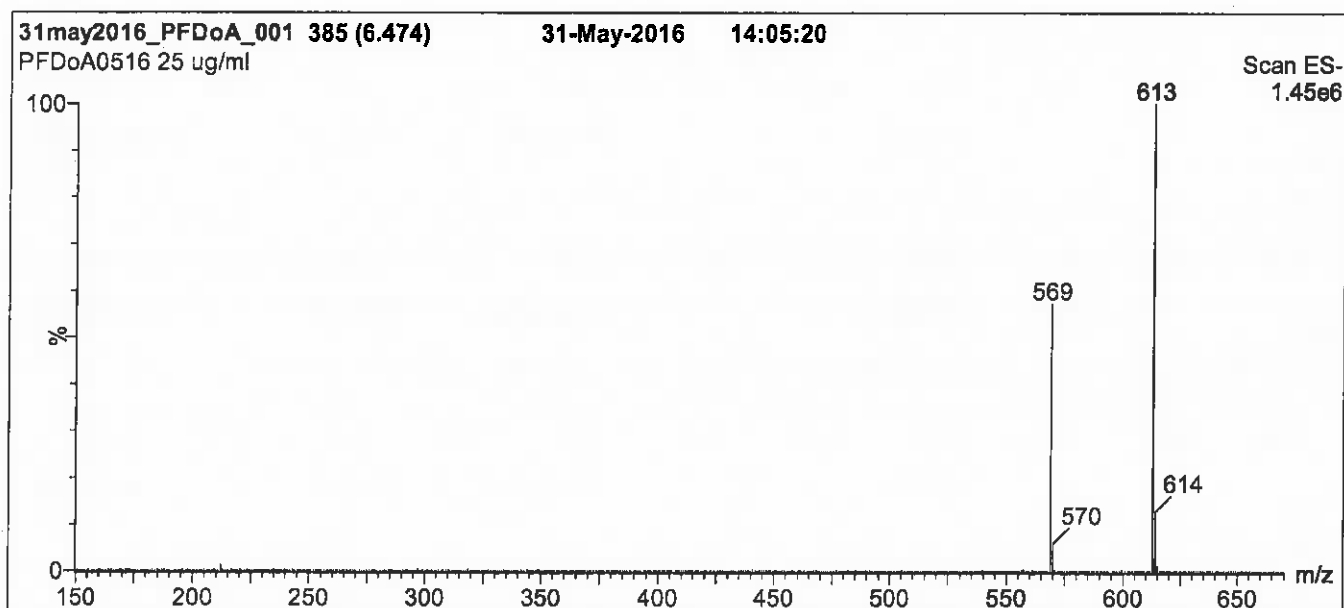
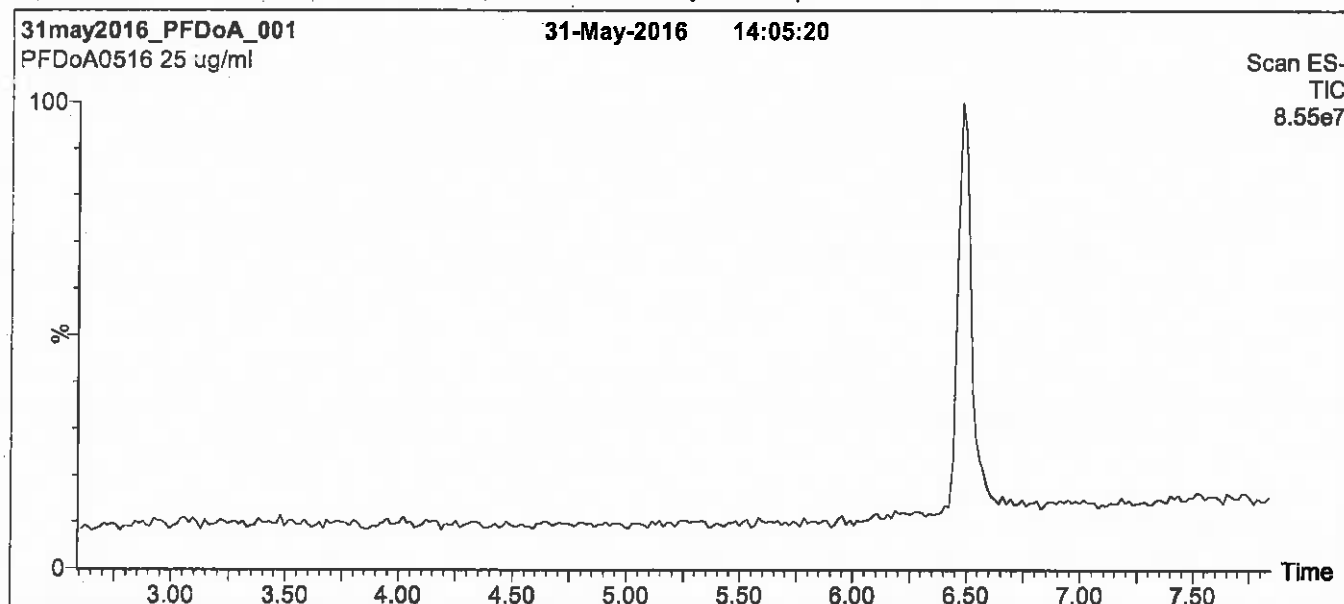
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

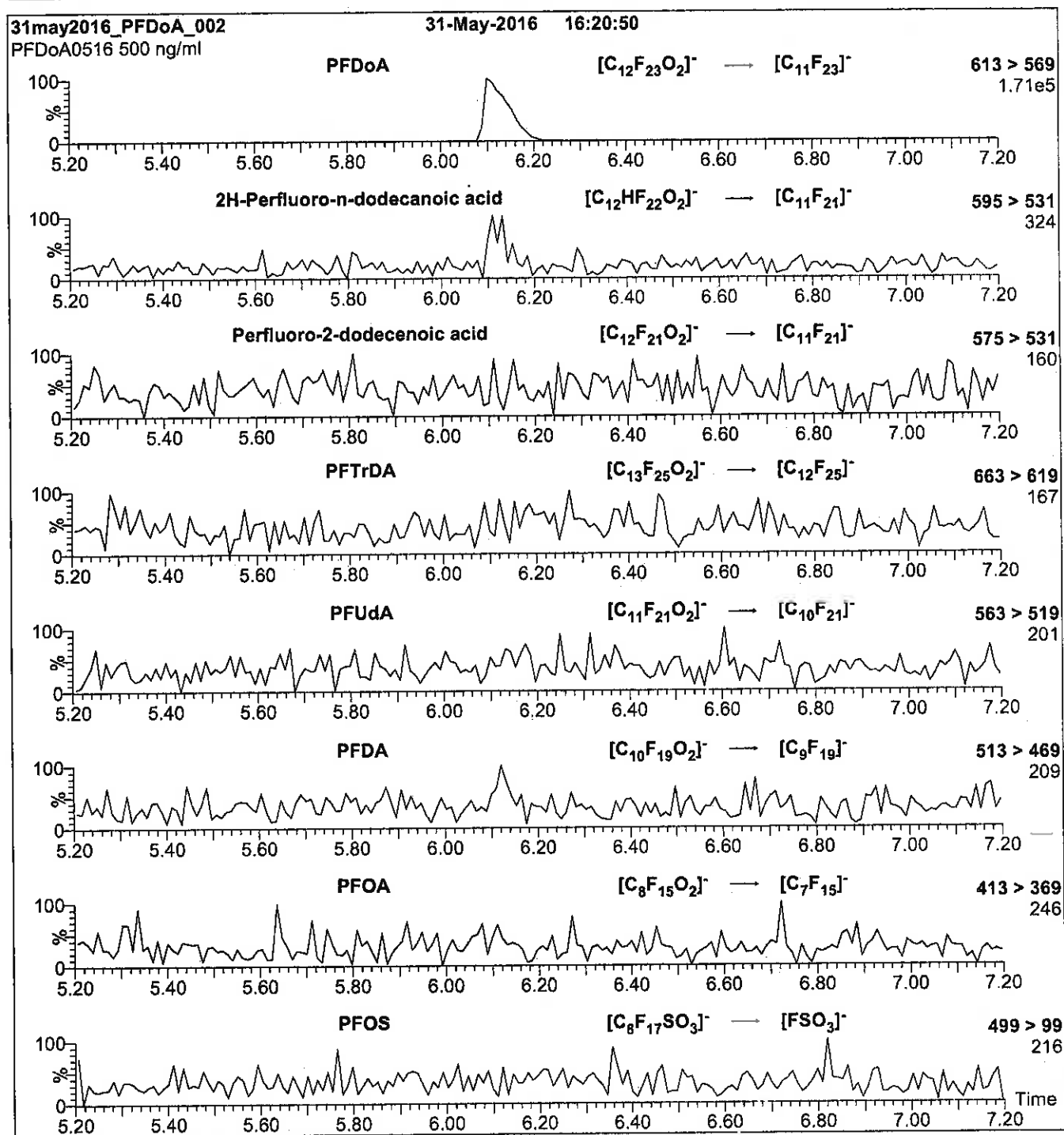
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDS_00005



ID: LCPFDS_00005
Exp: 07/02/20 Prpd: CBW
PF-1-decanesulfonate sodi

Rec. 3/29/16 JRB



CERTIFICATE OF ANALYSIS

DOCUMENTATION

PRODUCT CODE:

L-PFDS

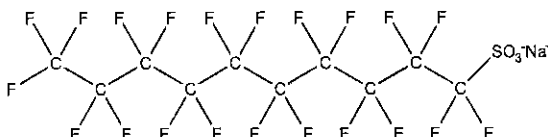
LOT NUMBER: LPFDS0615

COMPOUND:

Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #: 2806-15-7



MOLECULAR FORMULA:

$$\text{C}_{10}\text{F}_{21}\text{SO}_3\text{Na}$$

MOLECULAR WEIGHT: 622.13

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)

SOLVENT(S): Methanol

 $48.2 \pm 2.4 \text{ } \mu\text{g/ml}$ (PFDS anion)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/02/2015

EXPIRY DATE: (mm/dd/yyyy)

07/02/2020

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 ~ 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: 12/07/2015
(mm/dd/yyyy)

(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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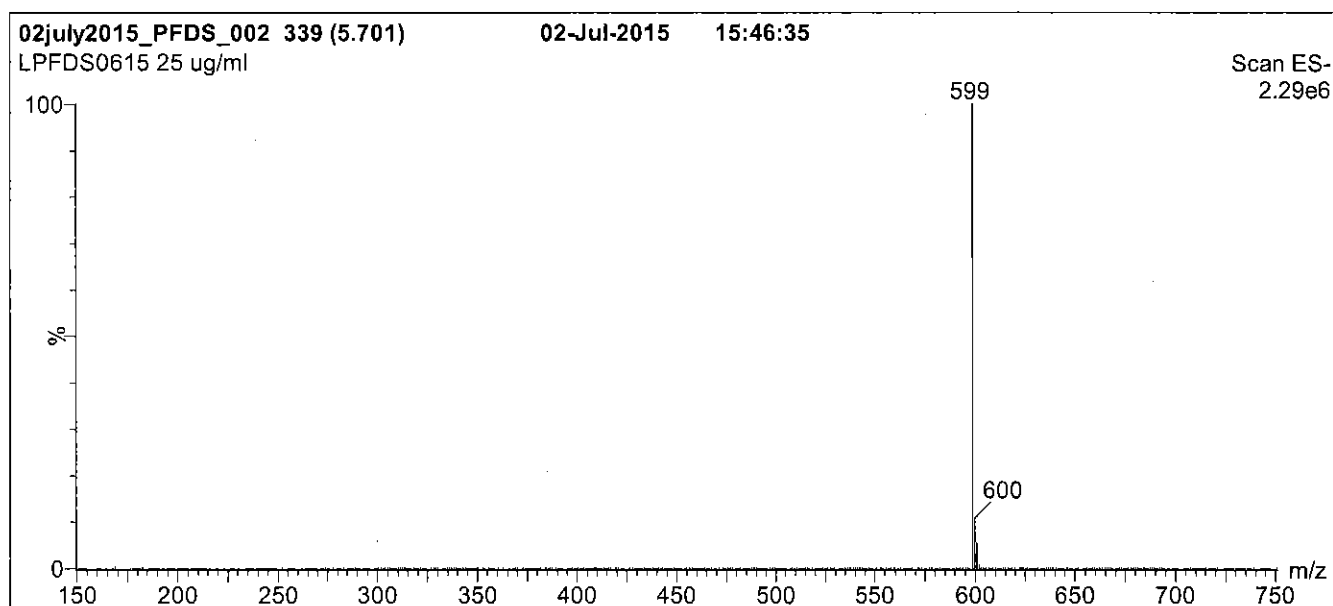
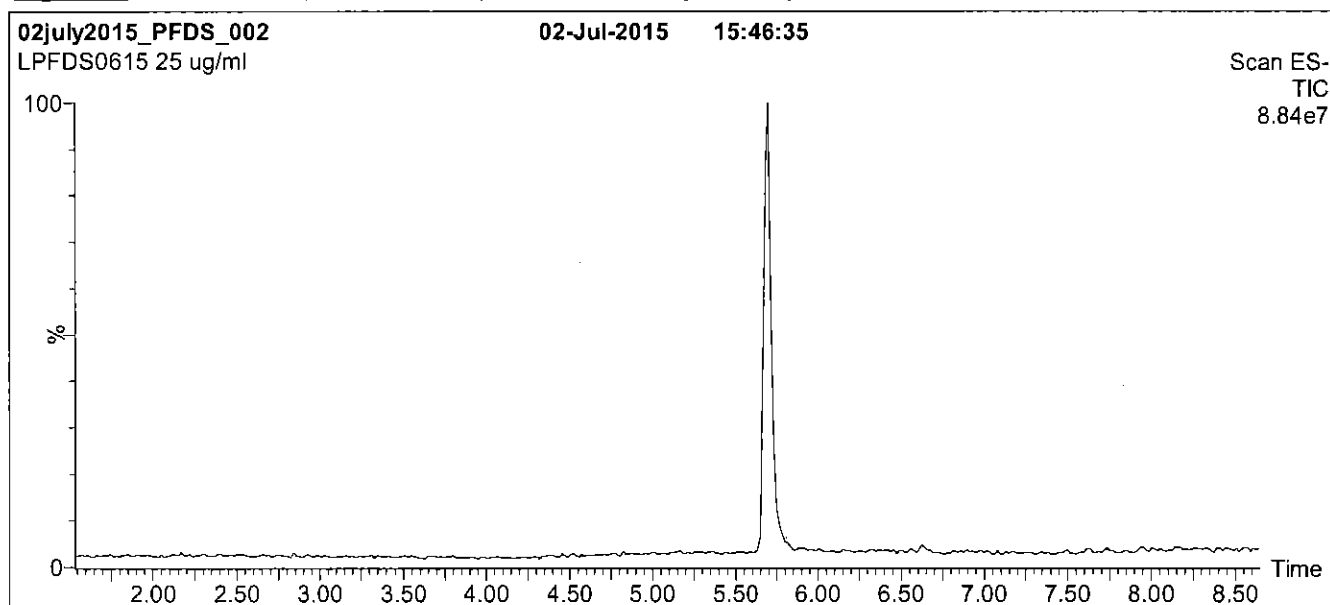
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

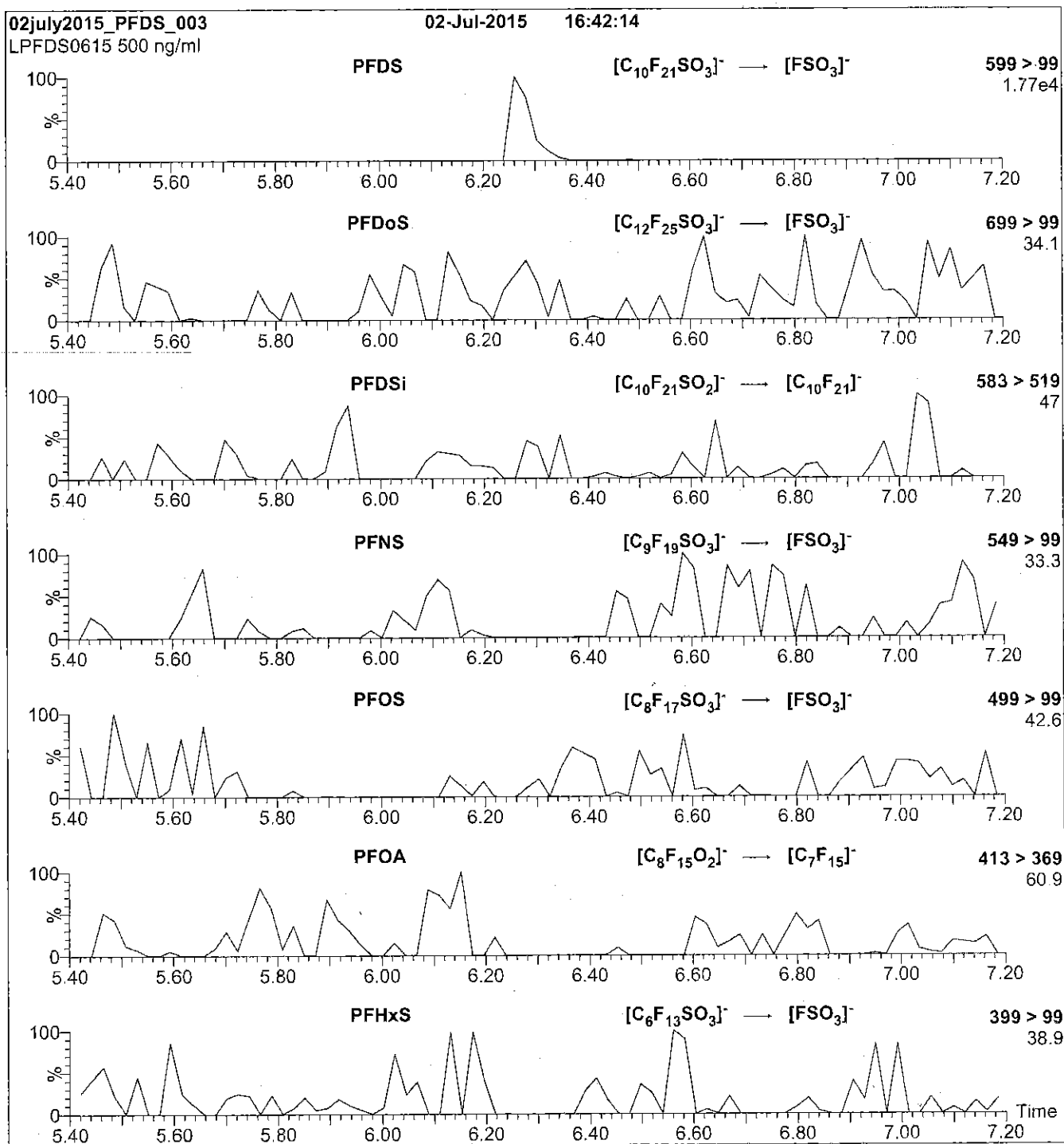
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFDS)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 50

Reagent

LCPFDS_00007

Scanned
10/14/16 SP R: 88C 9/13/16



730549

ID: LCPFDS_00006

Exp: 05/24/21 Ppdt: SBC

PF-1-decanesulfonate sodi



730550

ID: LCPFDS_00007

Exp: 05/24/21 Ppdt: SBC

PF-1-decanesulfonate sodi



WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

L-PFDS

LOT NUMBER:

LPFDS0516

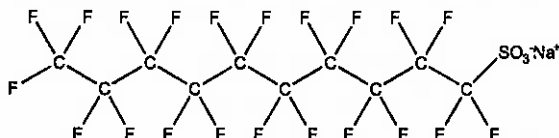
COMPOUND:

Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #:

2806-15-7



MOLECULAR FORMULA:

$C_{10}F_{21}SO_3Na$

MOLECULAR WEIGHT:

622.13

CONCENTRATION:

$50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt)

SOLVENT(S):

Methanol

$48.2 \pm 2.4 \mu\text{g/ml}$ (PFDS anion)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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)

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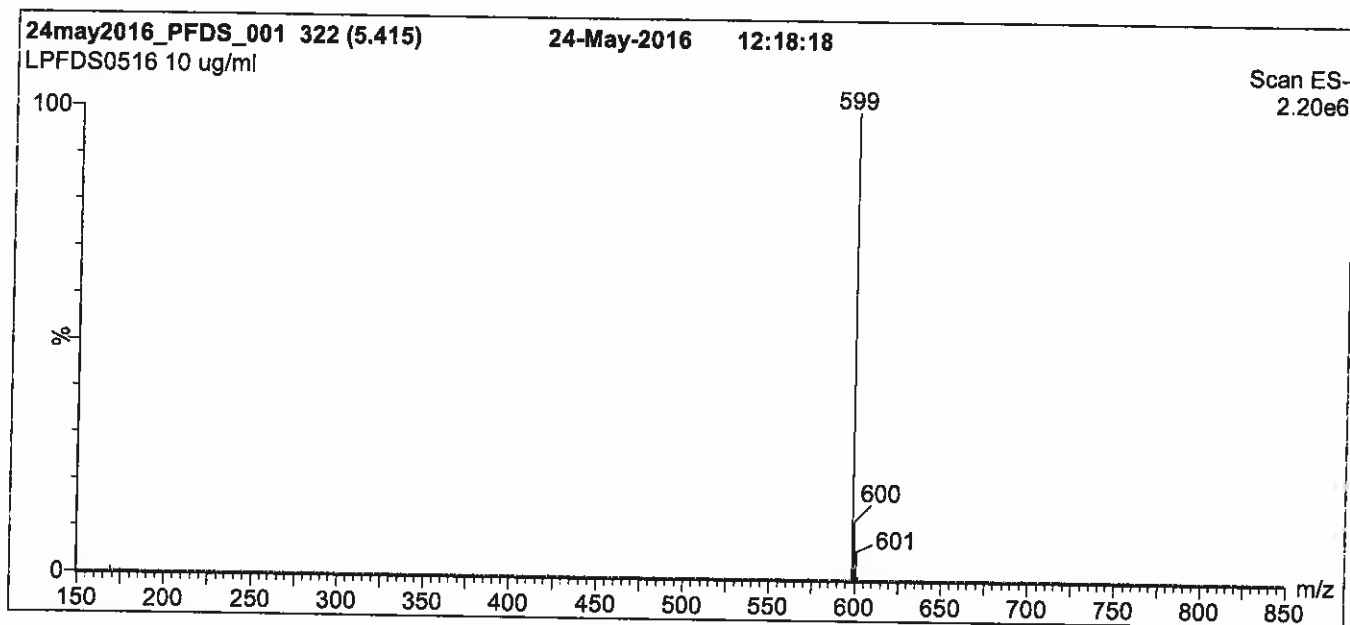
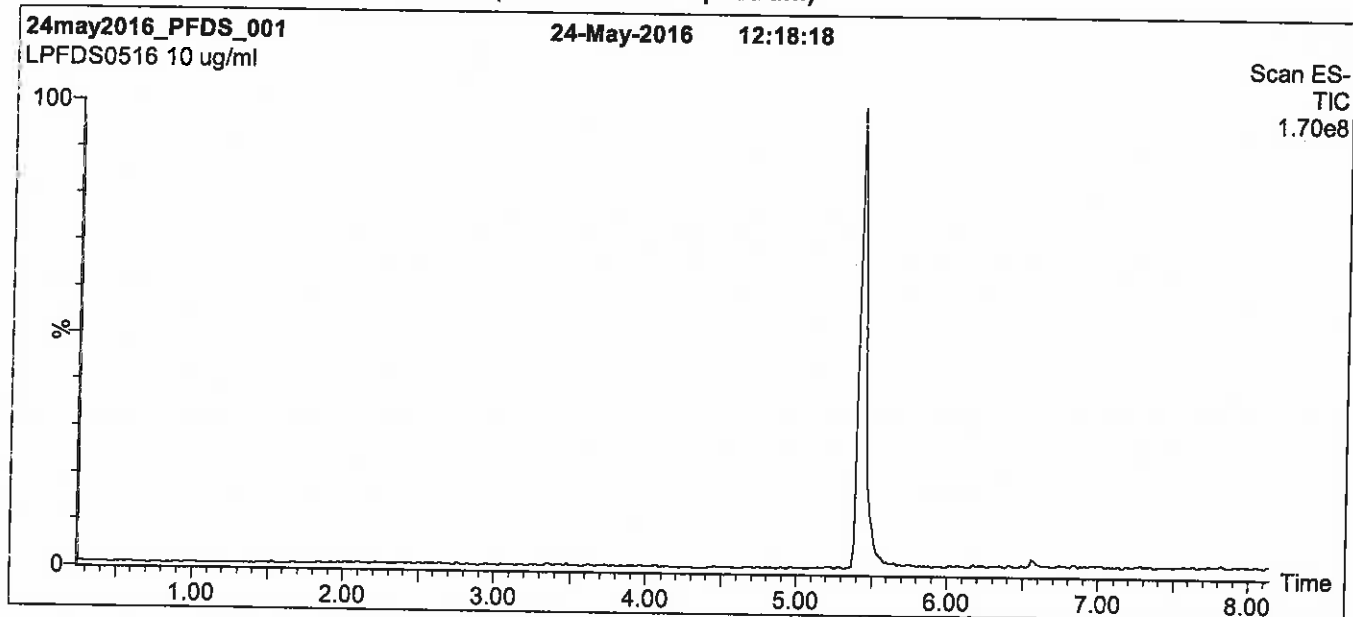
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1.7 μ m, 2.1 x 100 mm

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

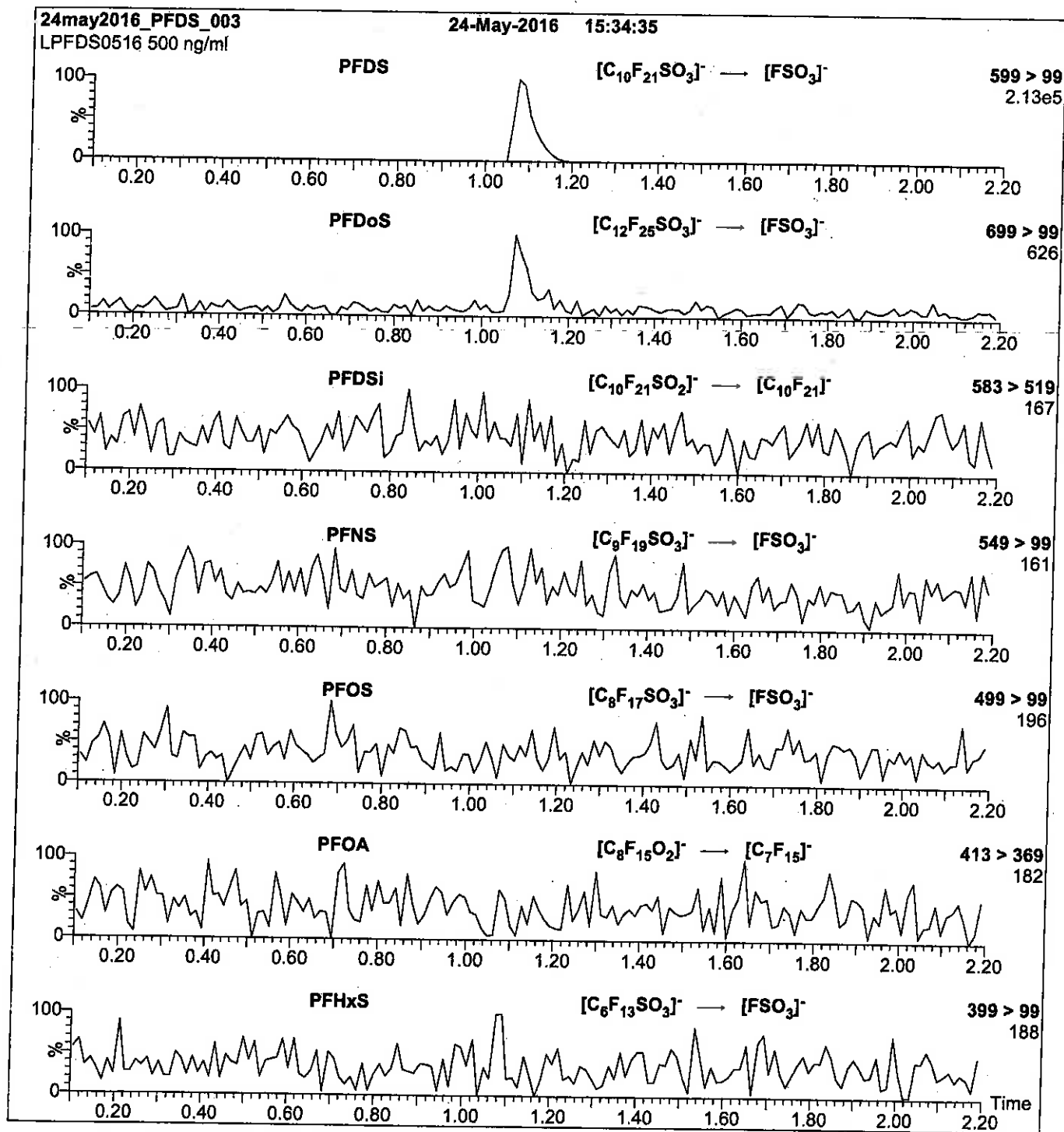
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MS Parameters

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 μ l (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 μ l/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00006

Scanned R: SBC 9/13/16
10/14/16 JK



730517
ID: LCPFHpa_00006
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid



730518
ID: LCPFHpa_00007
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHpA

LOT NUMBER:

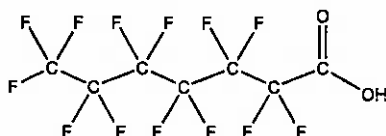
PFHpA0116

COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:**CAS #:**

375-85-9

**MOLECULAR FORMULA:** $C_7H_2F_{13}O_2$ **MOLECULAR WEIGHT:**

364.06

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/02/2016

(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:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

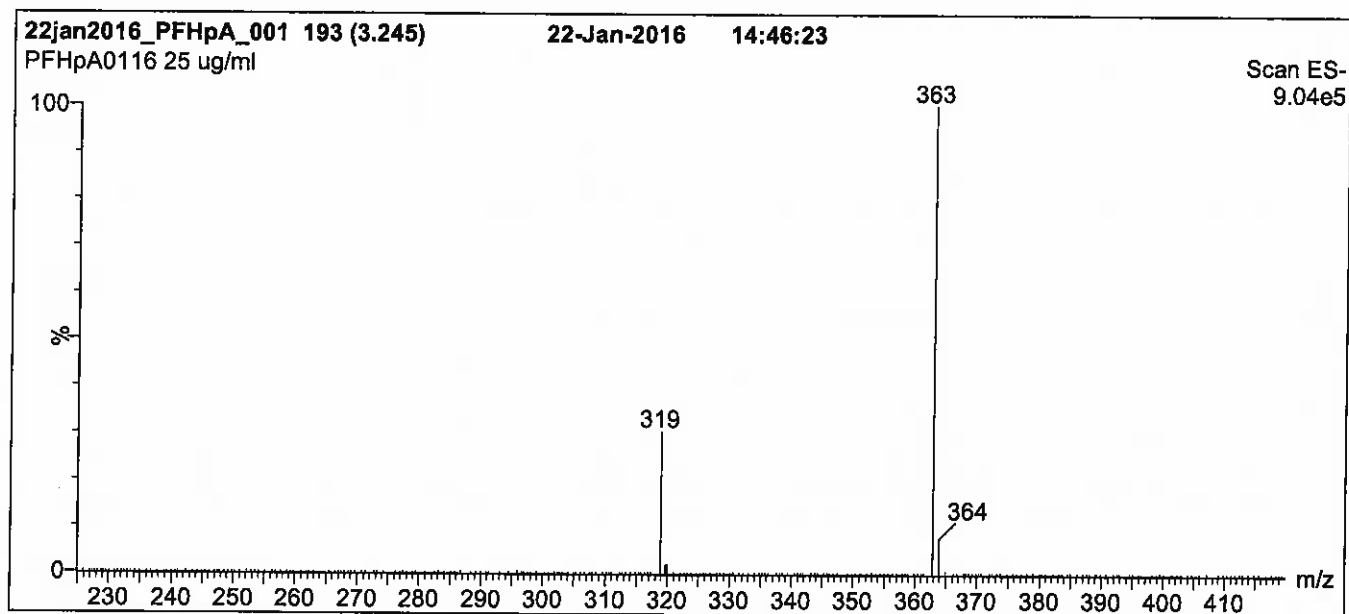
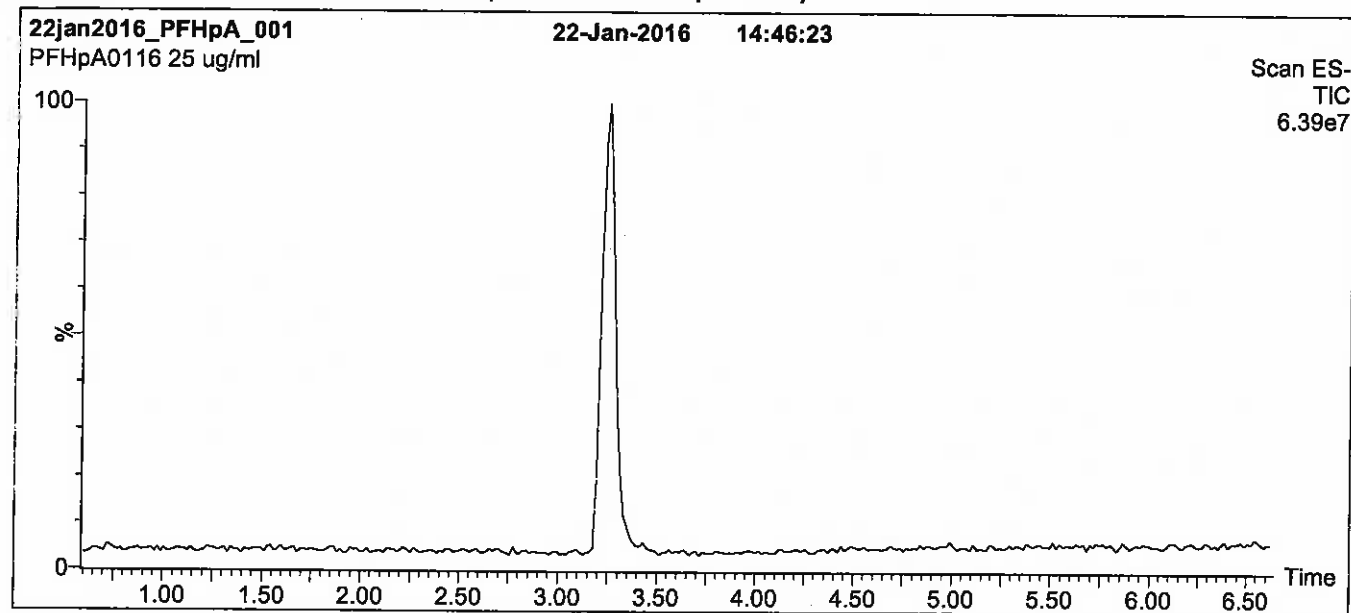
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

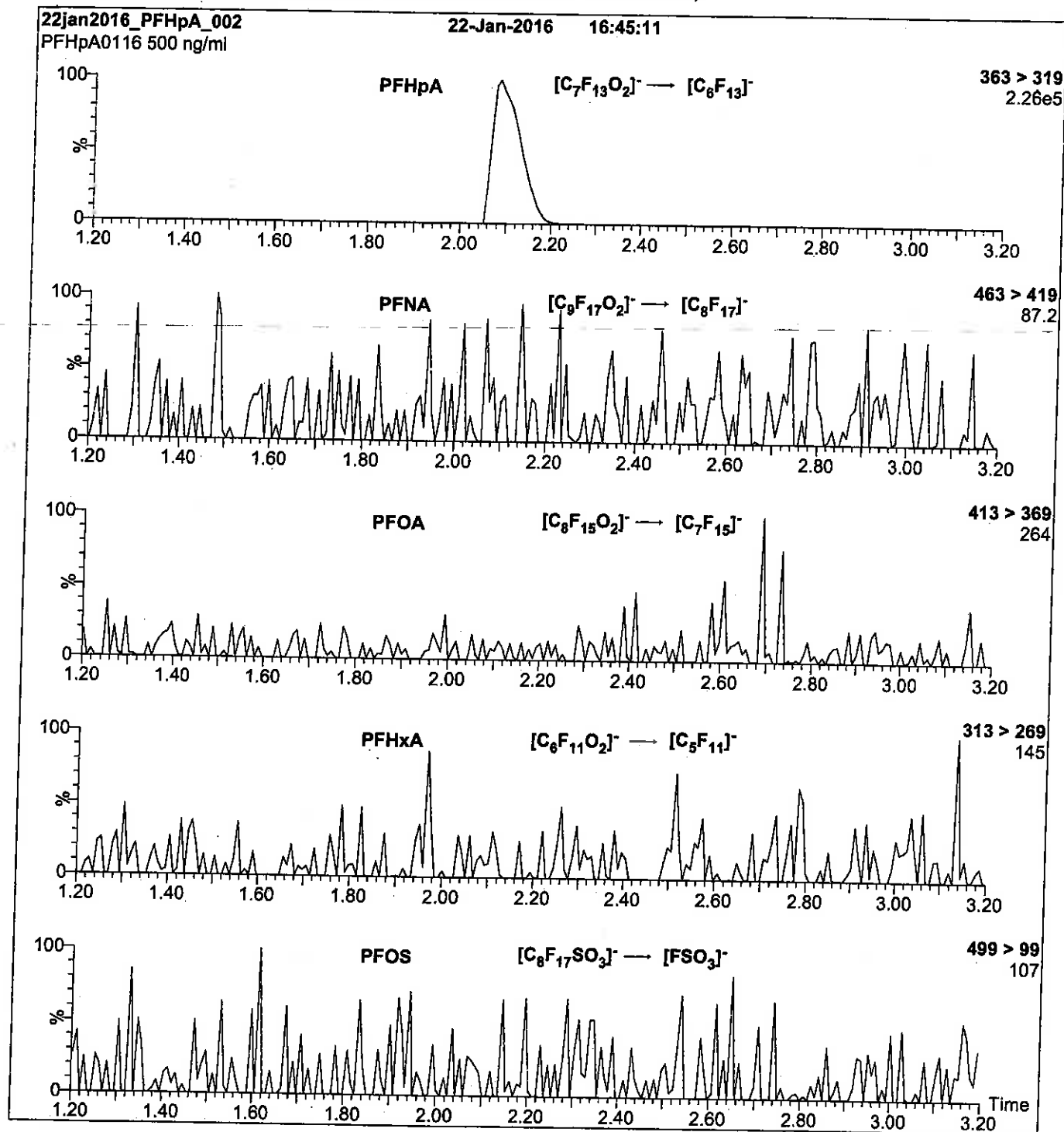
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHpA_00007

Scanned R: SBC 9/13/16
10/14/16 JK



730517
ID: LCPFHpa_00006
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid



730518
ID: LCPFHpa_00007
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHpA

LOT NUMBER:

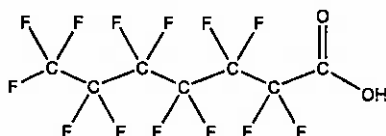
PFHpA0116

COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:**CAS #:**

375-85-9

**MOLECULAR FORMULA:** $C_7H_2F_{13}O_2$ **MOLECULAR WEIGHT:**

364.06

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/02/2016

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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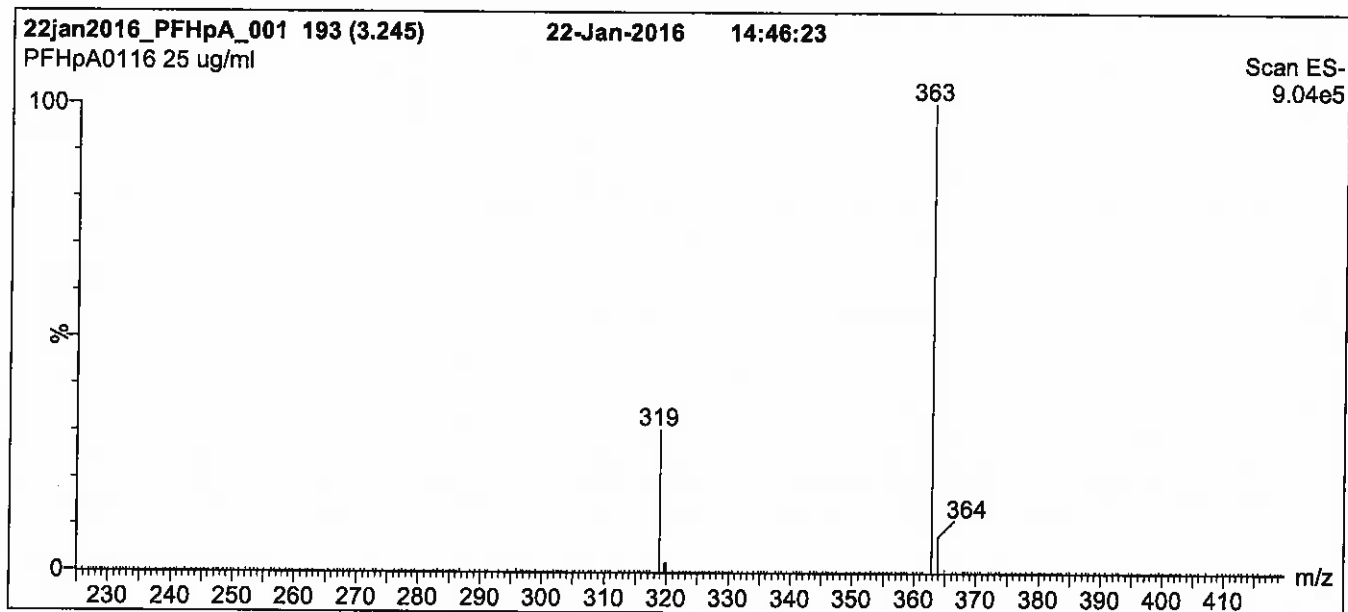
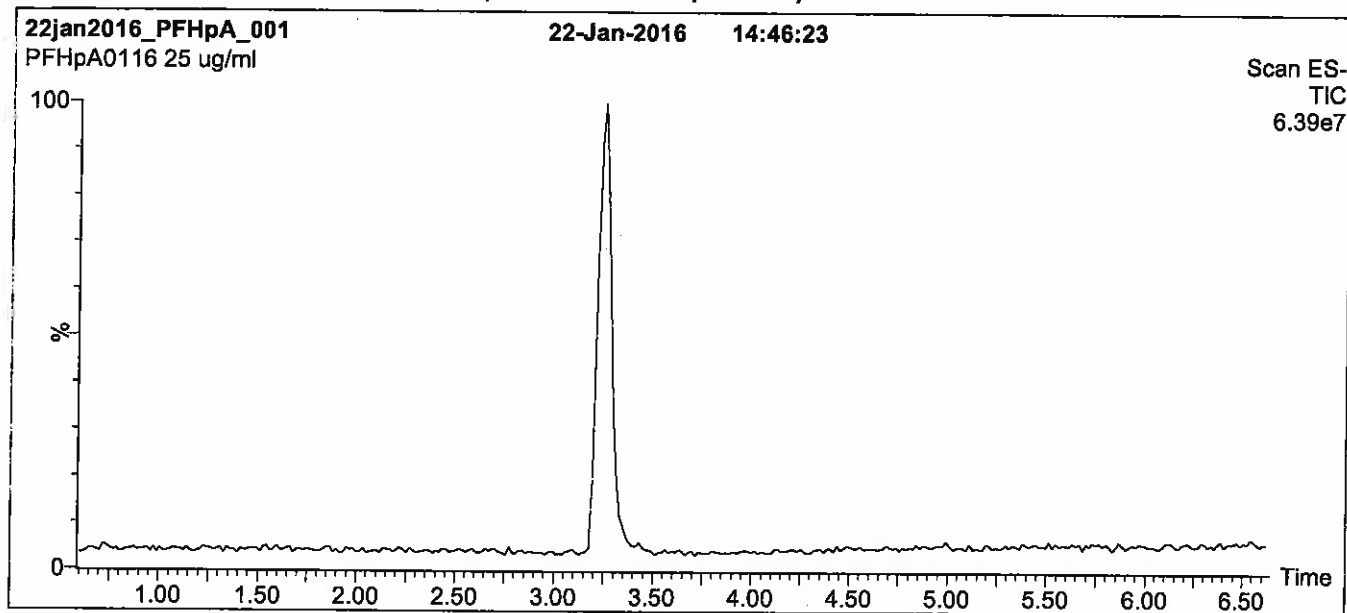
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

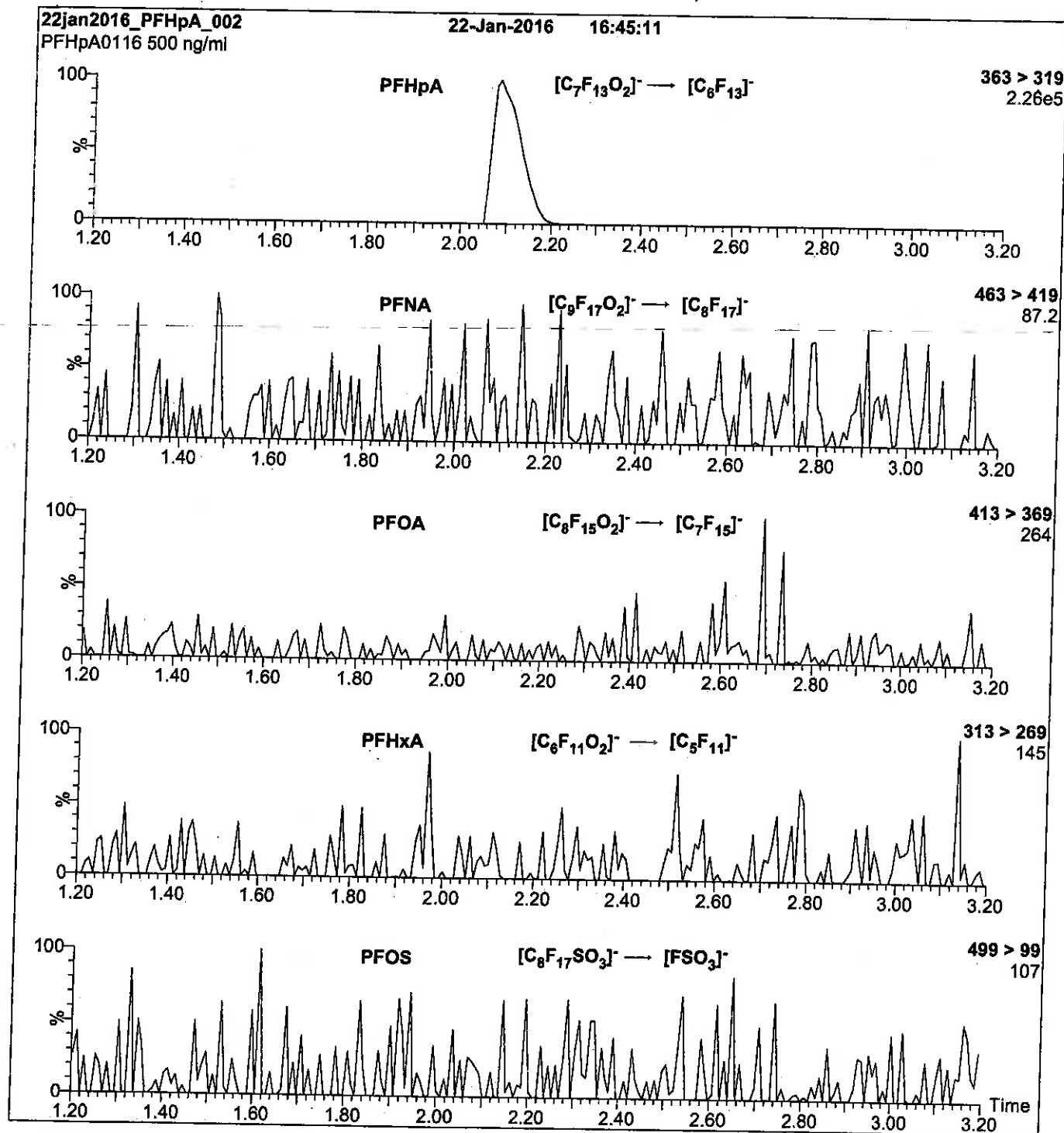
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHpS_00010

Scanned
10/14/16 SP
R: 8BC 9/13/16

730635
ID: LCPFHPS_00009
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/mL

730639
ID: LCPFHPS_00010
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/mL



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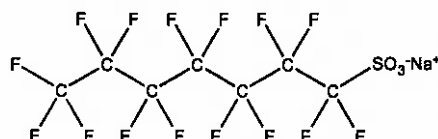
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate

LOT NUMBER: LPFHpS1115

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $C_7F_{15}SO_3Na$
CONCENTRATION: $50.0 \pm 2.5 \mu g/mL$ (Na salt)
 $47.6 \pm 2.4 \mu g/mL$ (PFHpS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 472.10
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 11/09/2015
(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:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

LIMITED WARRANTY:

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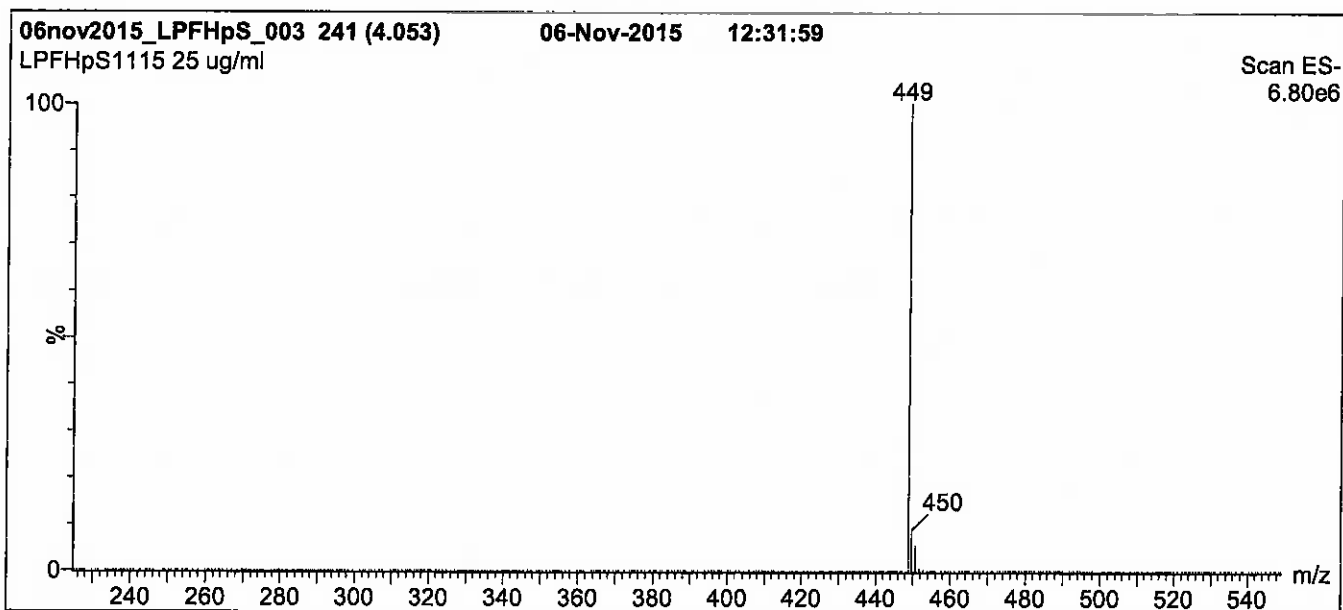
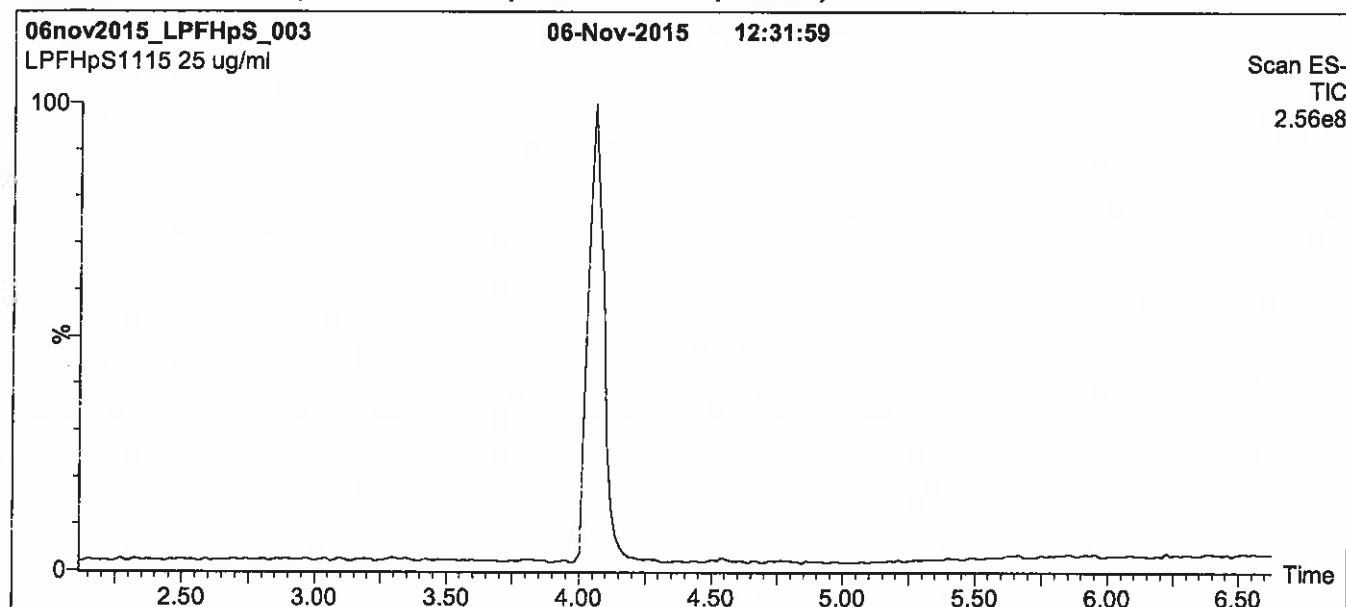
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

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

Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

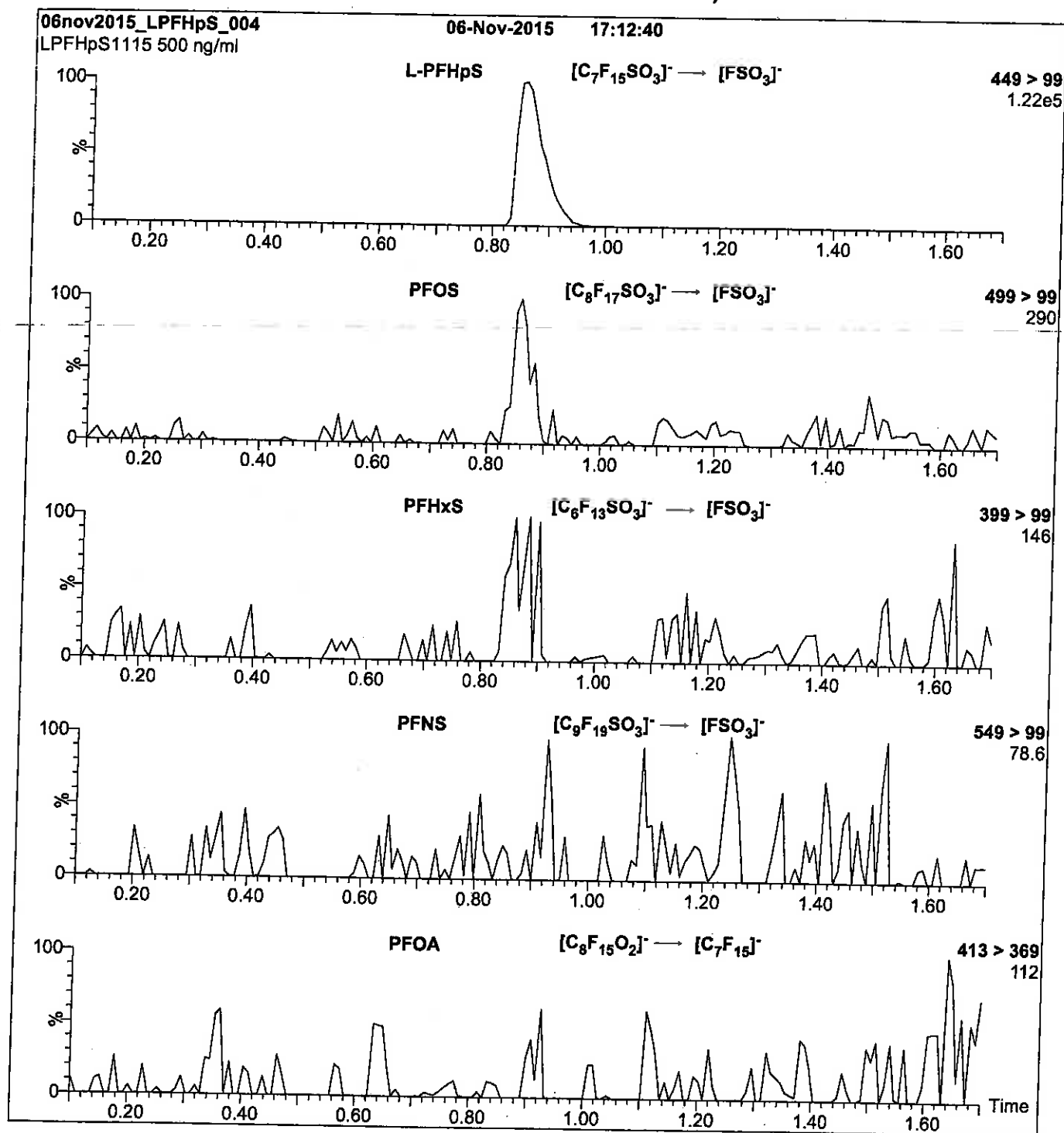
Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 60.00

Cone Gas Flow (l/hr) = 60

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFHpS)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00005

R: 832 9/13/16



730551

ID: LCPFHxA_00005

Exp: 12/22/20 Prod: SBC

PF-n-hexanoic acid



730552

ID: LCPFHxA_00006

Exp: 12/22/20 Prod: SBC

PF-n-hexanoic acid



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LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

PFHxA

LOT NUMBER:

PFHxA1215

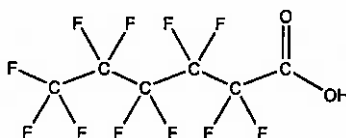
COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #:

307-24-4



MOLECULAR FORMULA:

$C_6H_{11}F_{11}O_2$

MOLECULAR WEIGHT:

314.05

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/23/2015

(mm/dd/yyyy)

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

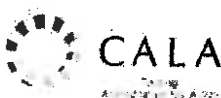
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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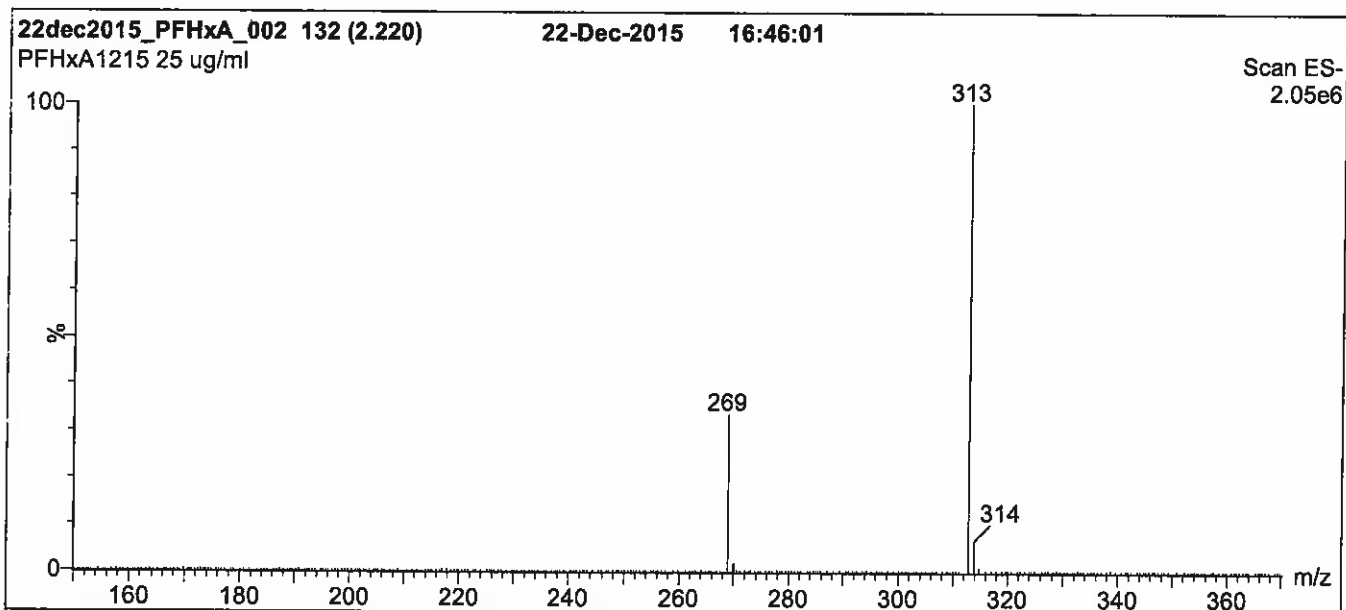
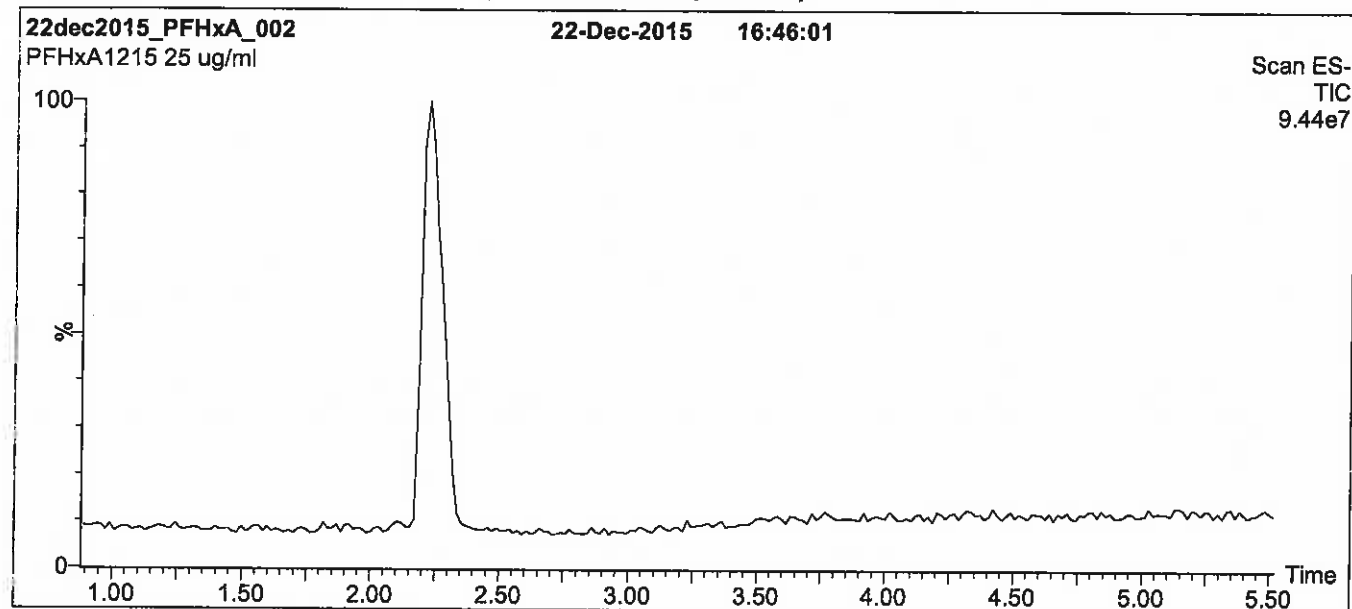
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

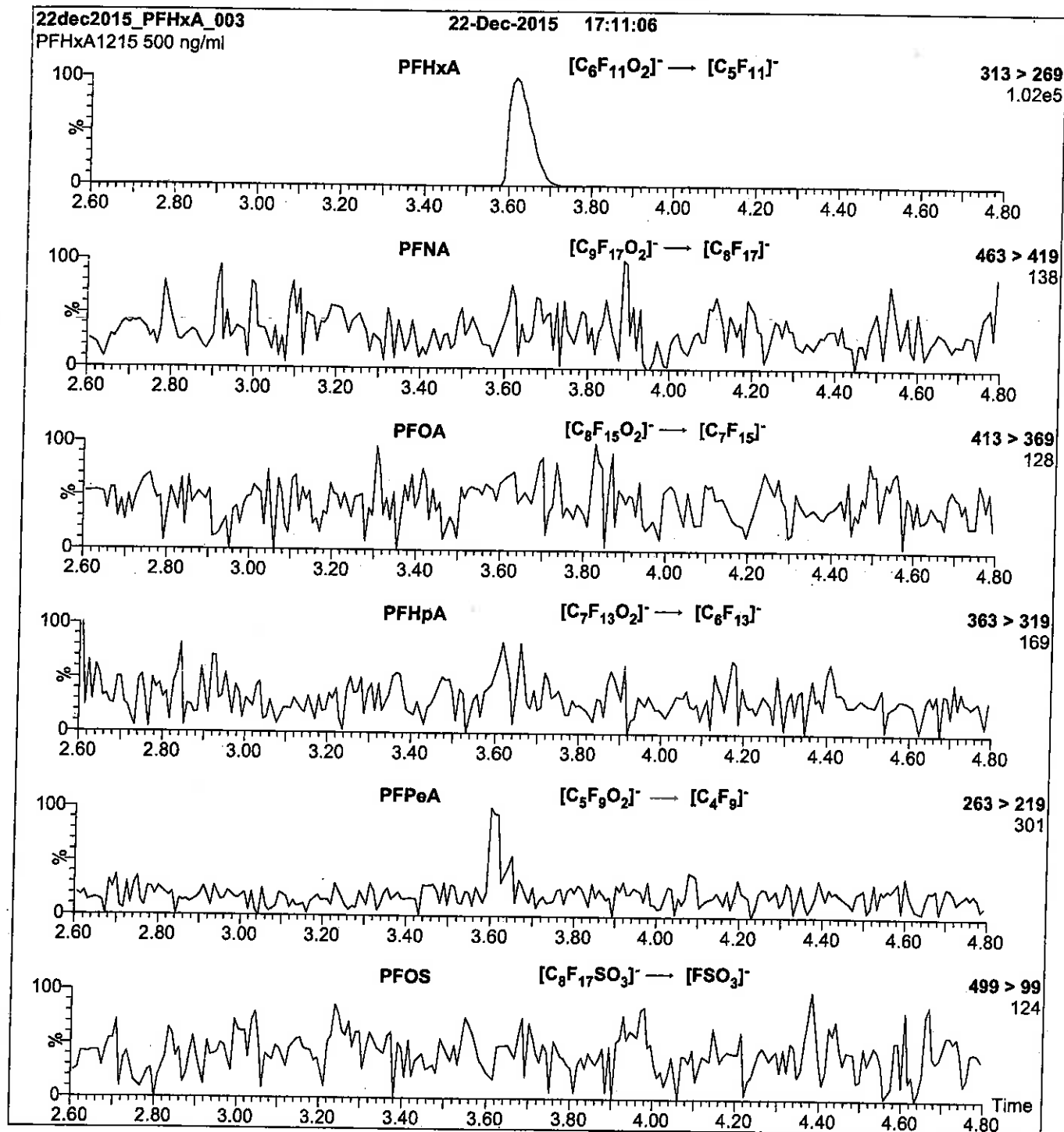
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxA_00006

R: 832 9/13/16



730551
ID: LCPFHxA_00005
Exp: 12/22/20 Prod: SBC
PF-n-hexanoic acid



730552
ID: LCPFHxA_00006
Exp: 12/22/20 Prod: SBC
PF-n-hexanoic acid



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHxA

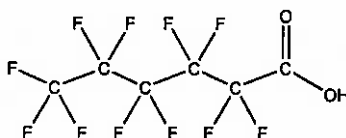
LOT NUMBER: PFHxA1215

COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA:

$C_6H_{11}F_{11}O_2$

MOLECULAR WEIGHT: 314.05

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S): Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/23/2015
(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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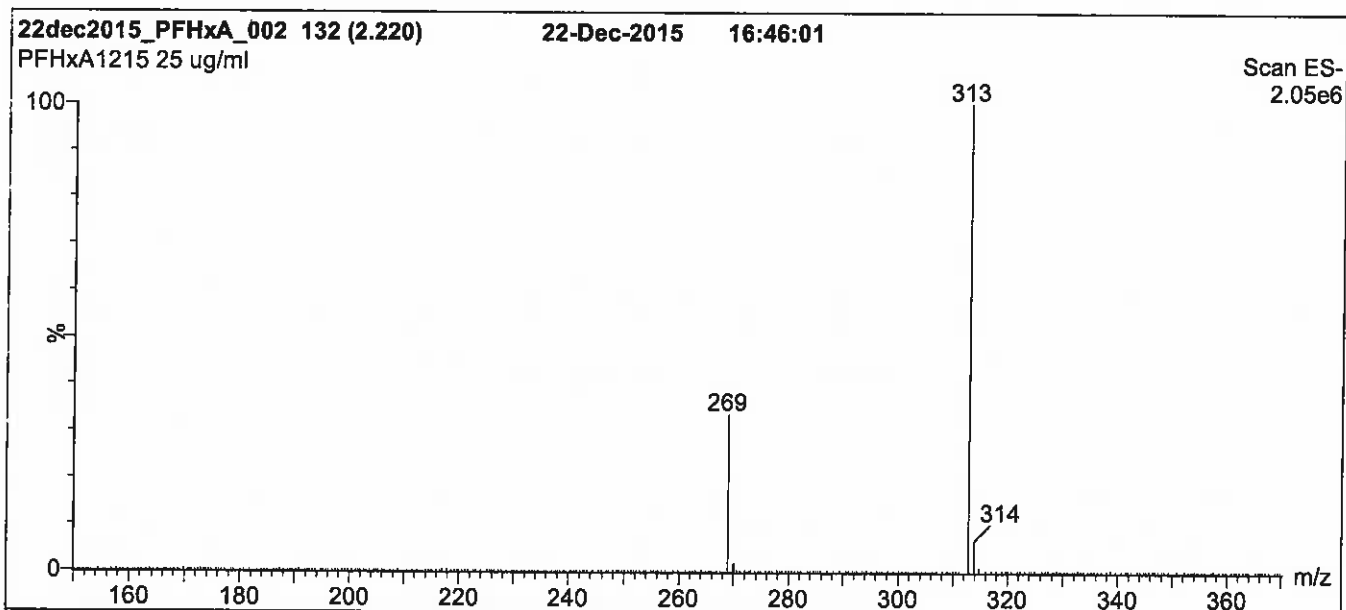
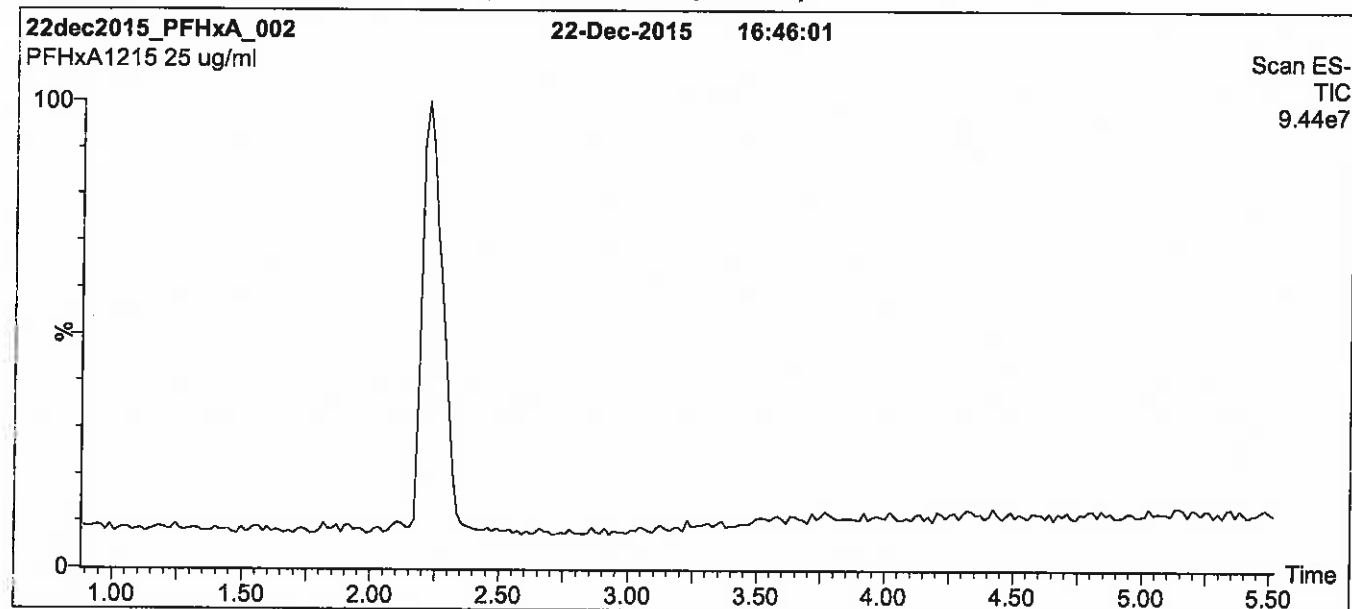
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

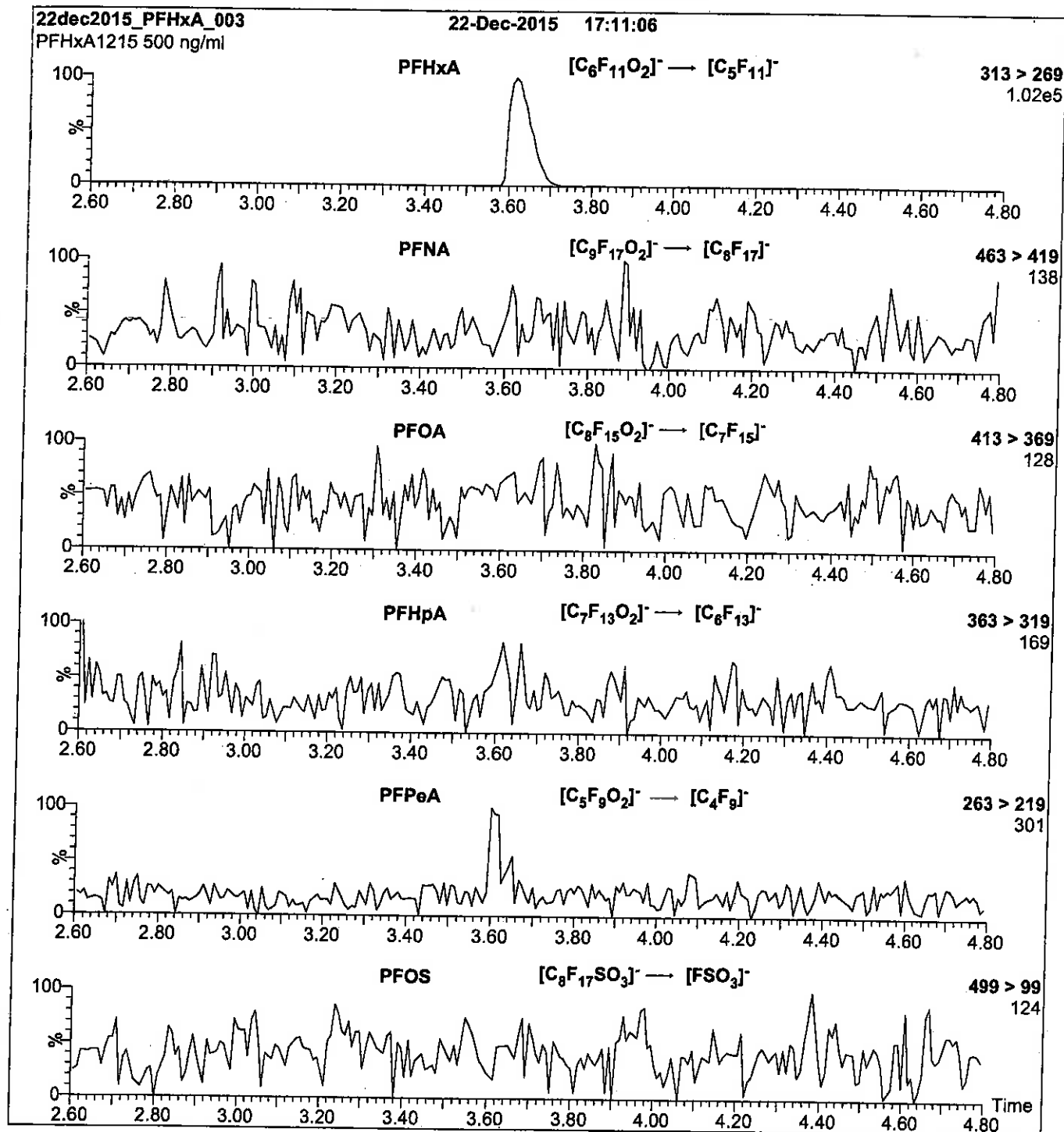
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxDA_00007



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730630
ID: LCPFHxDA_00006
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL



730631
ID: LCPFHxDA_00007
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHxDA

LOT NUMBER:

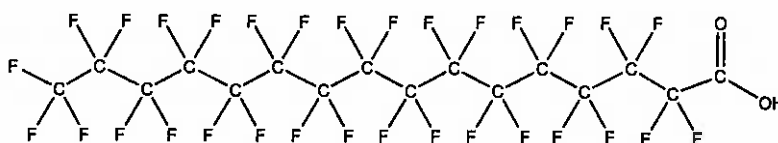
PFHxDA0516

COMPOUND:

Perfluoro-n-hexadecanoic acid

STRUCTURE:**CAS #:**

67905-19-5

**MOLECULAR FORMULA:** $C_{16}H_{31}O_2$ **MOLECULAR WEIGHT:**

814.13

CONCENTRATION: $50 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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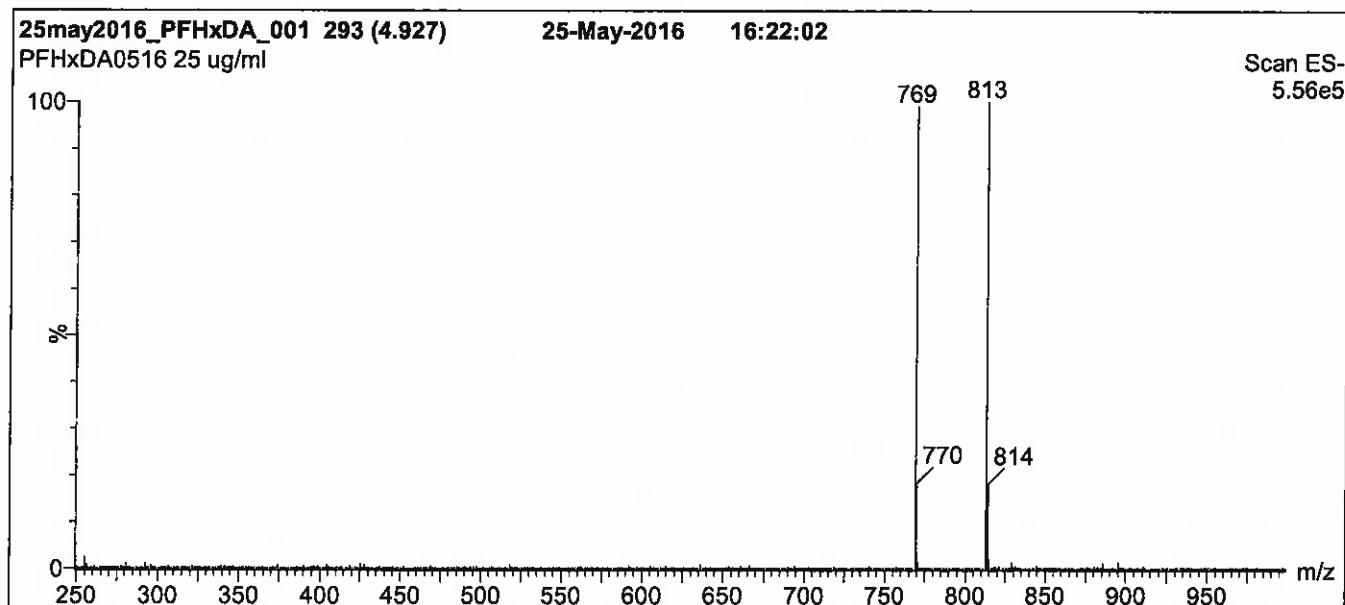
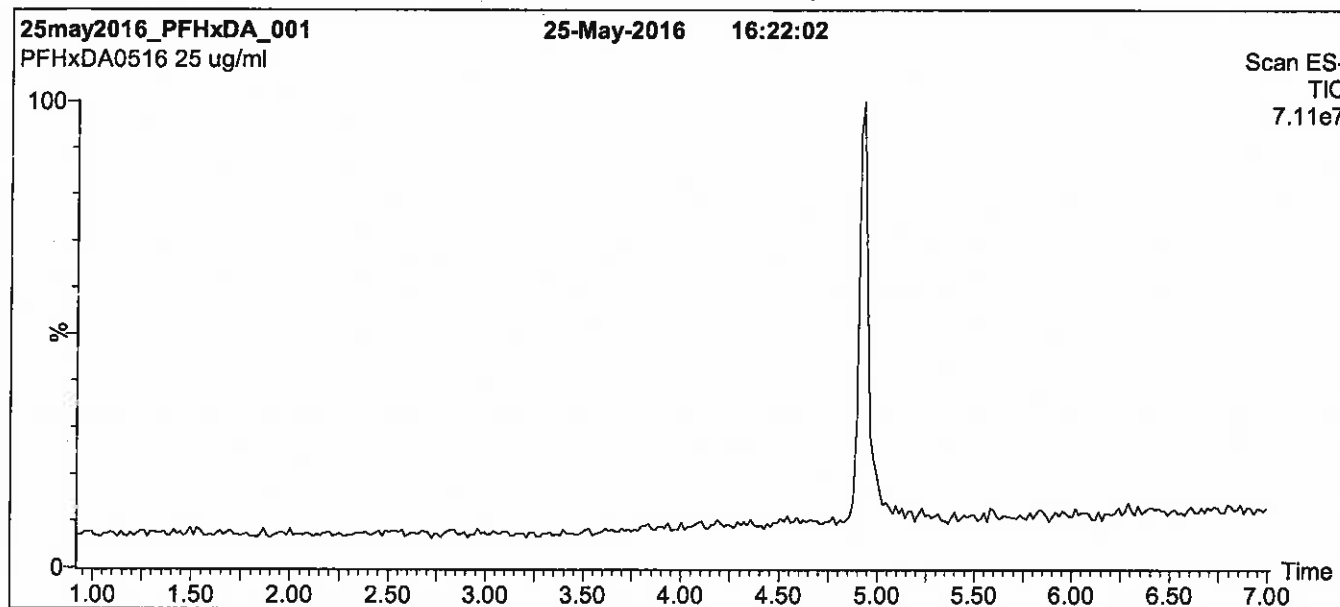
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Figure 1: PFHxDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

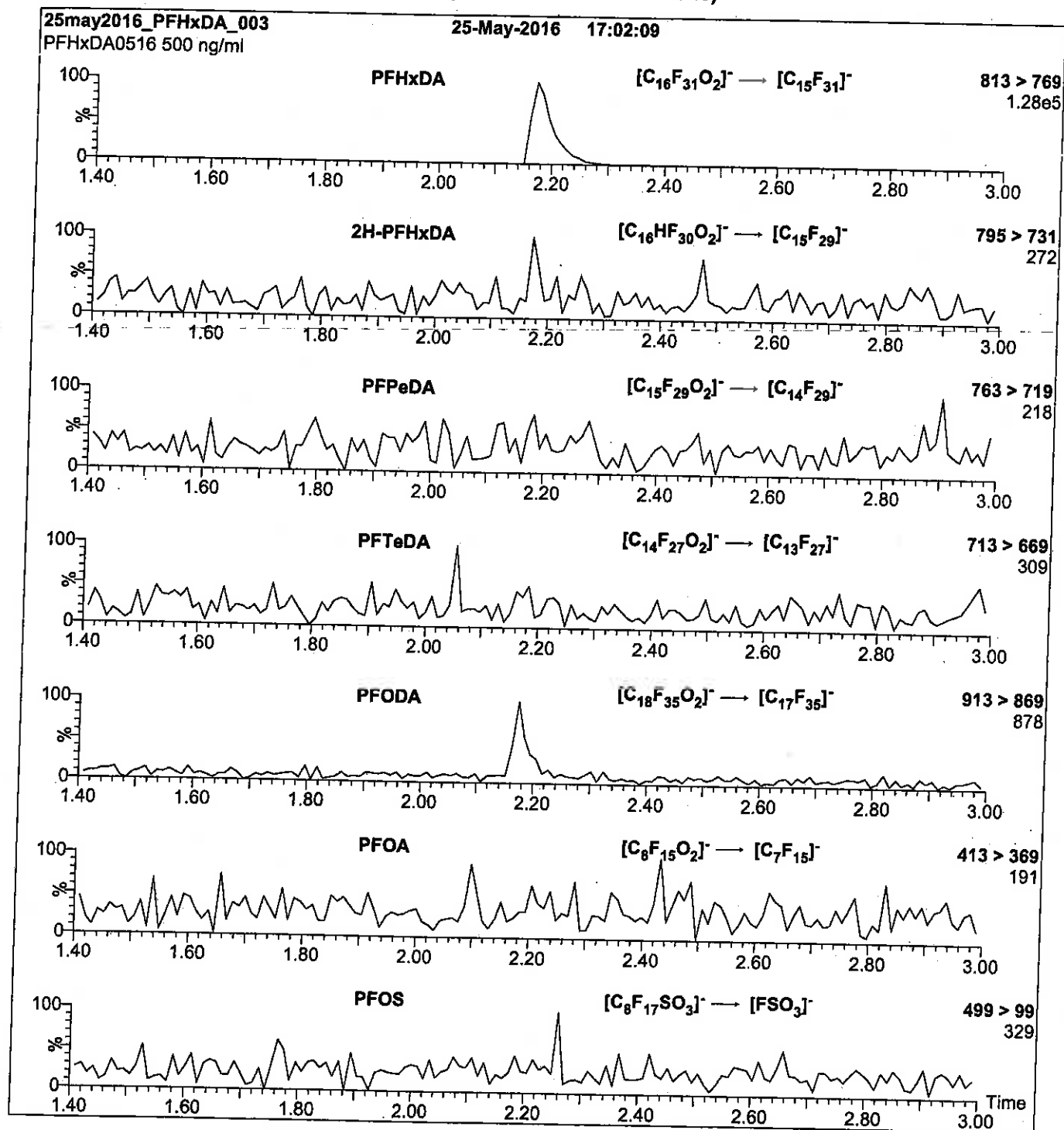
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00003

SBC
R: 9/13/16



730513
ID: LCPFHxS-br_00002
Exp: 07/03/20 Pripd: SBC
Potassium Perfluorohexane



730514
ID: LCPFHxS-br_00003
Exp: 07/03/20 Pripd: SBC
Potassium Perfluorohexane



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

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CCF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	0.2
7	Other Unidentified Isomers		0.5

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

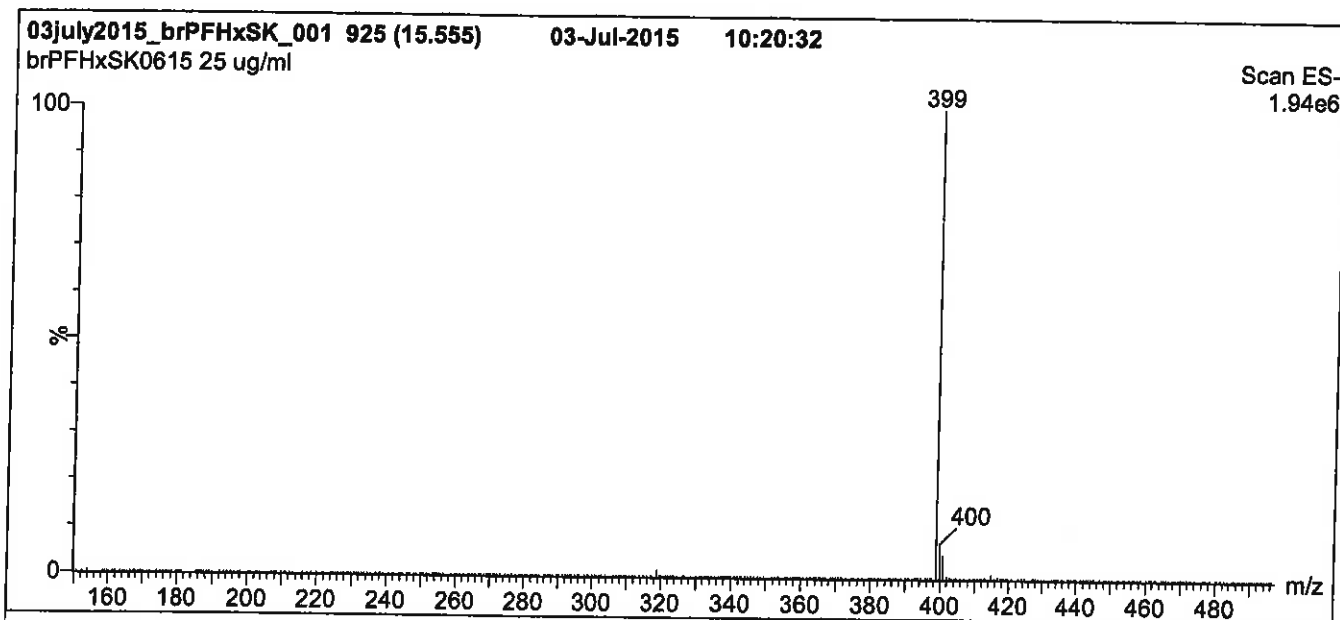
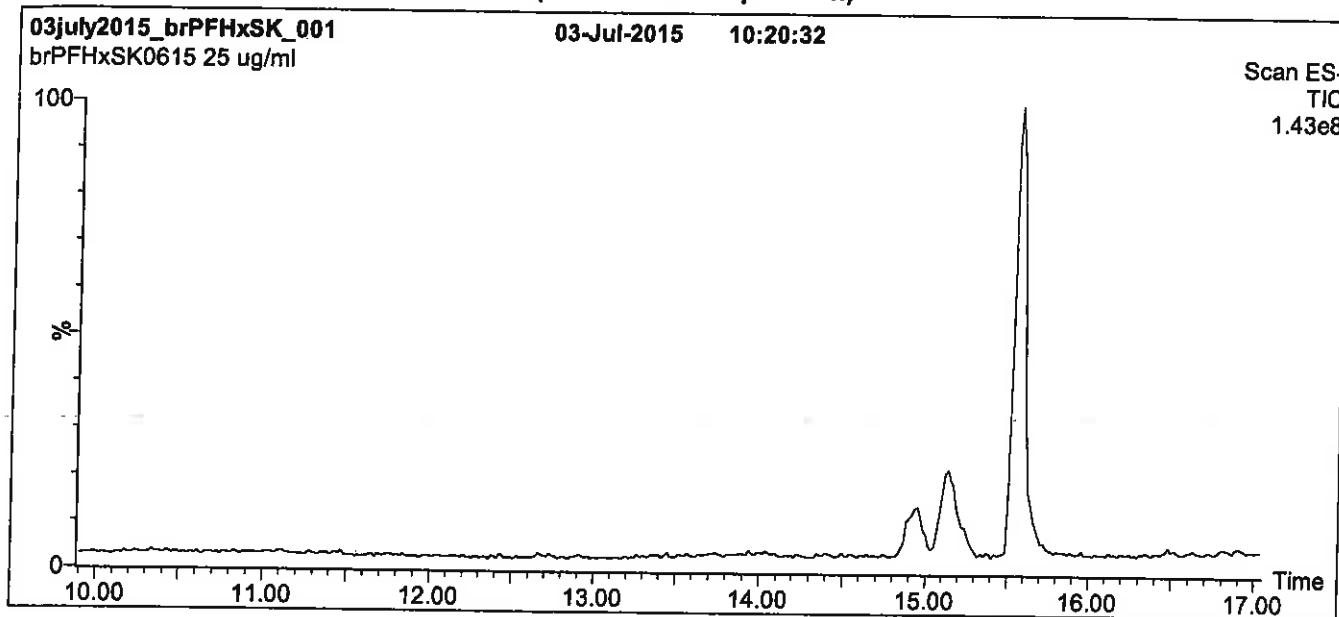
Certified By:


B.G. Chittim

Date: 07/15/2015

(mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

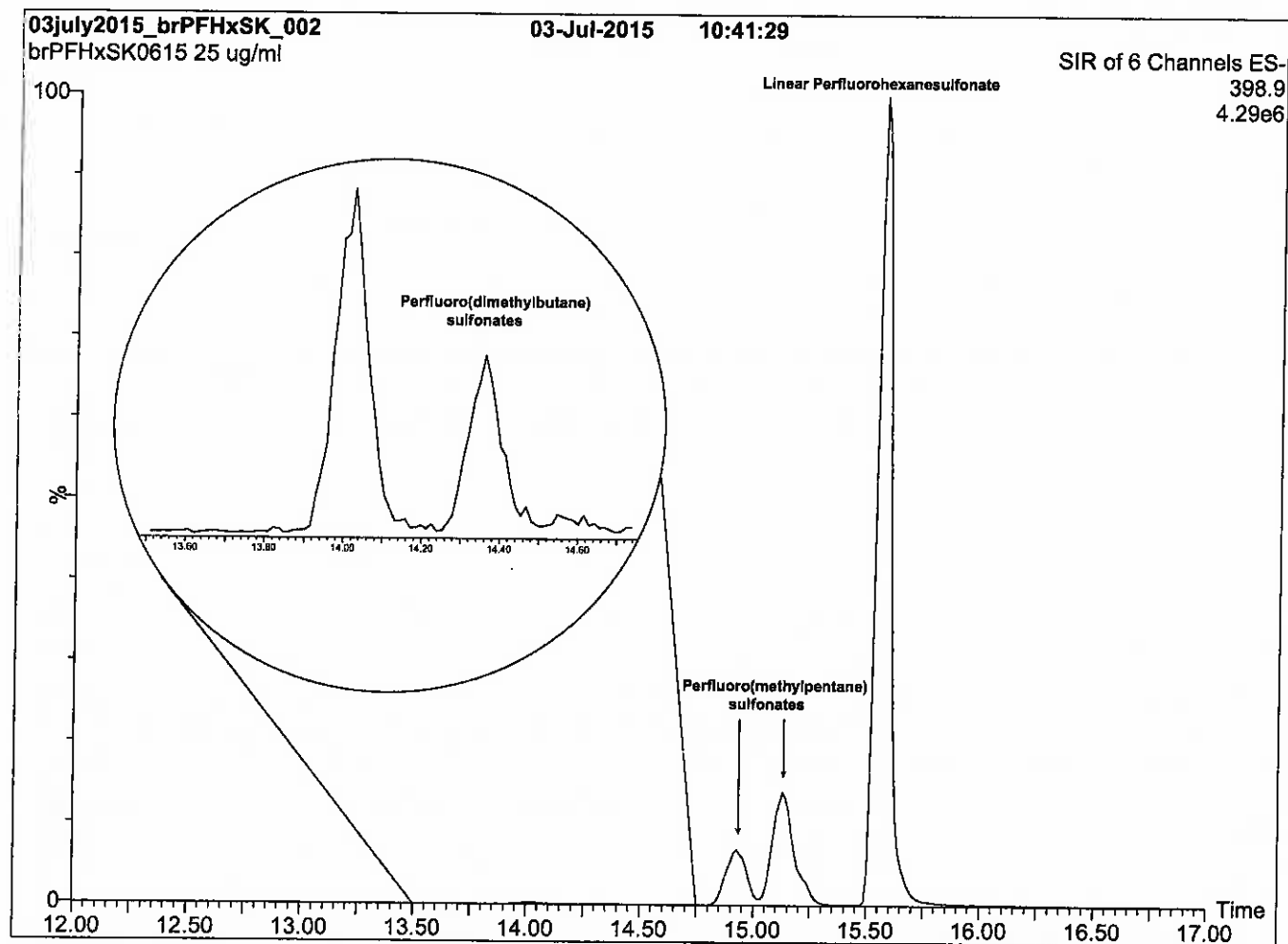
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min.
before returning to initial conditions in 0.5 min.
Time: 20 min

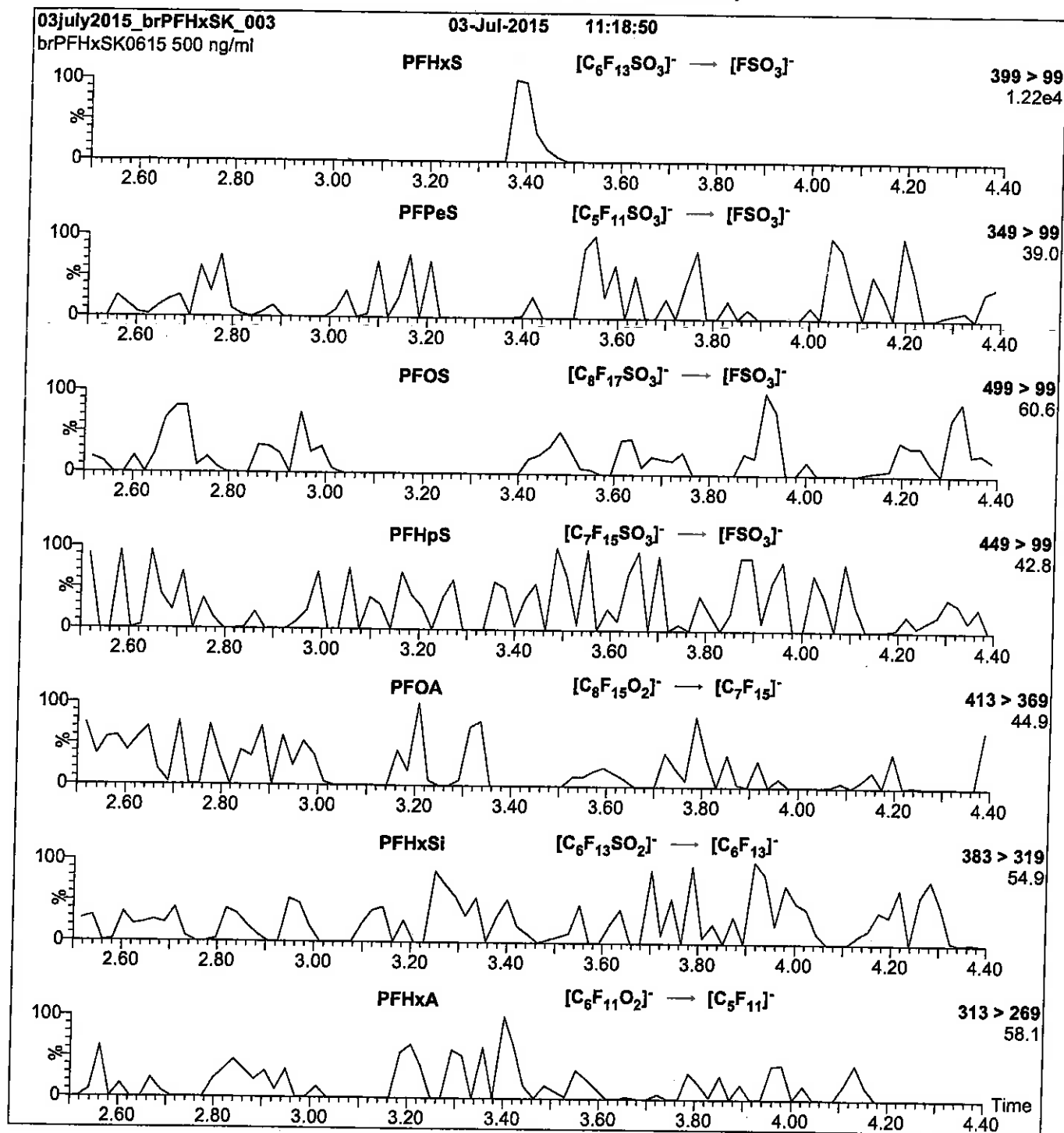
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 μ l (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 μ l/min

MS Parameters

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

Reagent

LCPFNA_00007



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730559
ID: LCPFNA_00006
Exp: 10/23/20 Ppfd: SBC
PF-n-nonanoic acid



730560
ID: LCPFNA_00007
Exp: 10/23/20 Ppfd: SBC
PF-n-nonanoic acid

CERTIFICATE OF ANALYSIS
DOCUMENTATION

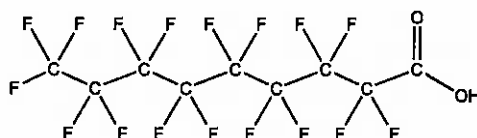
PRODUCT CODE:
COMPOUND:

PFNA
Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA1015

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA:
CONCENTRATION:

$C_9H_{17}O_2$
 $50 \pm 2.5 \mu\text{g/ml}$

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

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 ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/30/2015
(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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

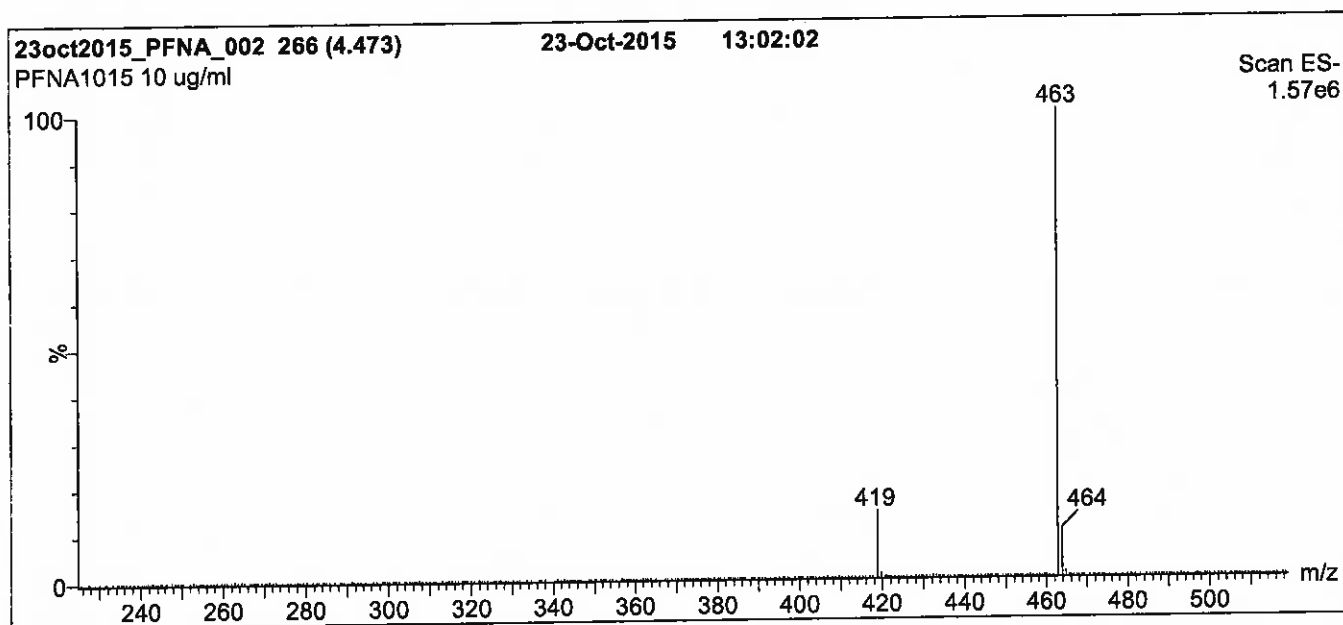
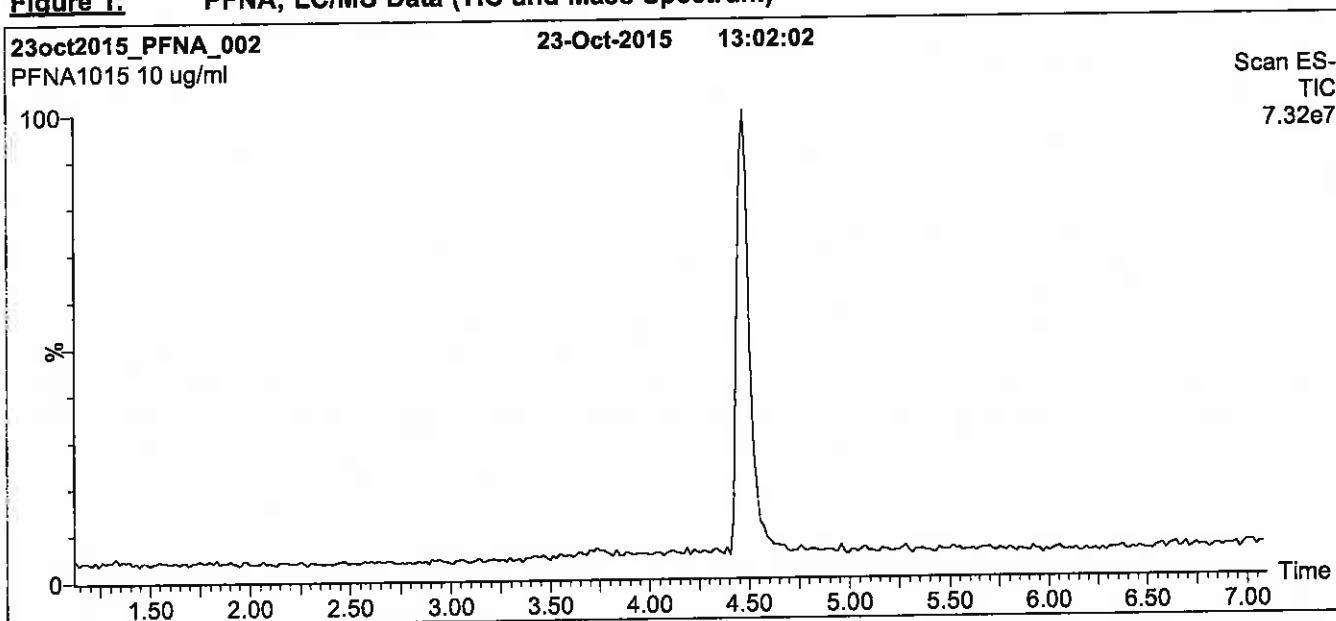
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

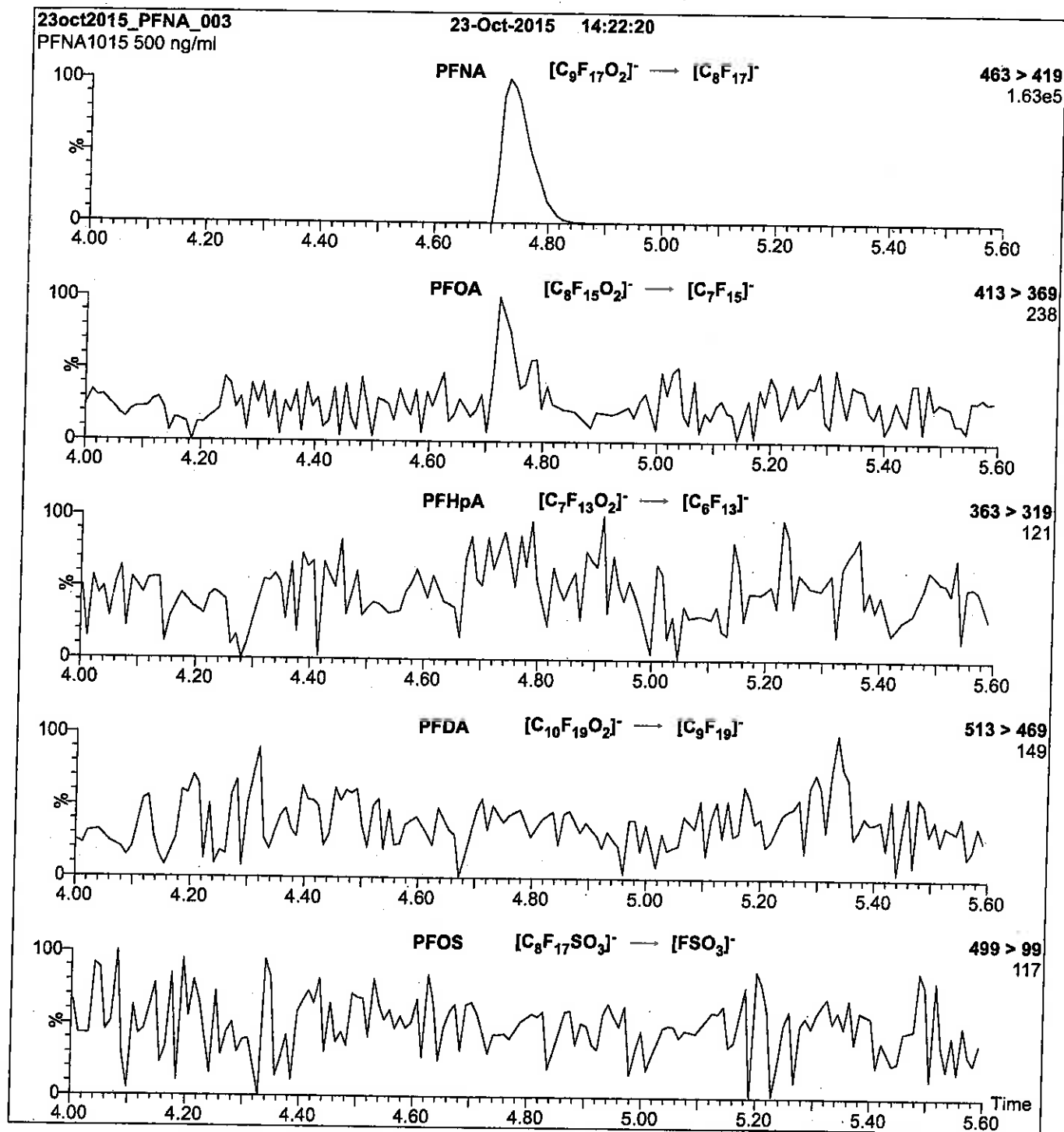
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFOA_00007

n: 12/24/16 Spd



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFOA

LOT NUMBER:

PFOA0716

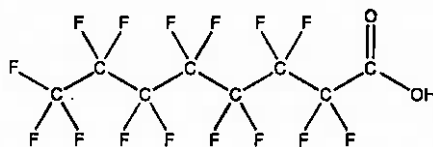
COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1



MOLECULAR FORMULA:

$C_8H_{16}F_{16}O_2$

MOLECULAR WEIGHT:

414.07

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

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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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

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

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

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

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

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

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

TRACEABILITY:

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

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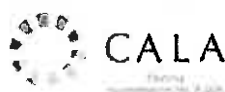
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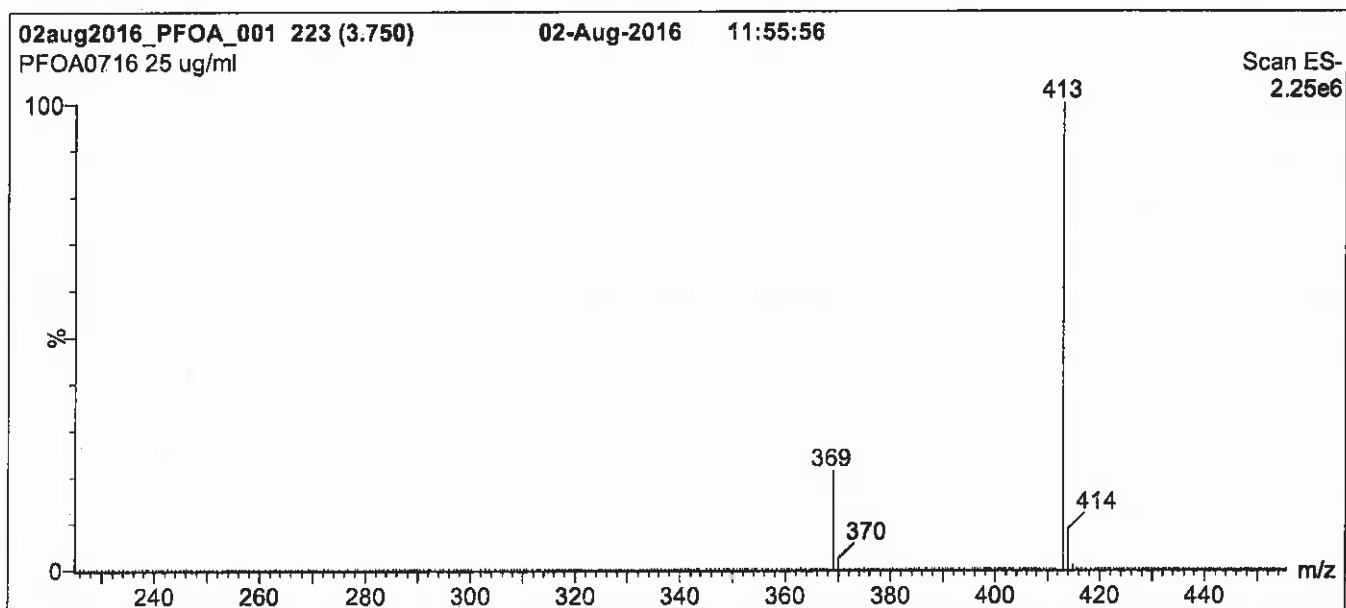
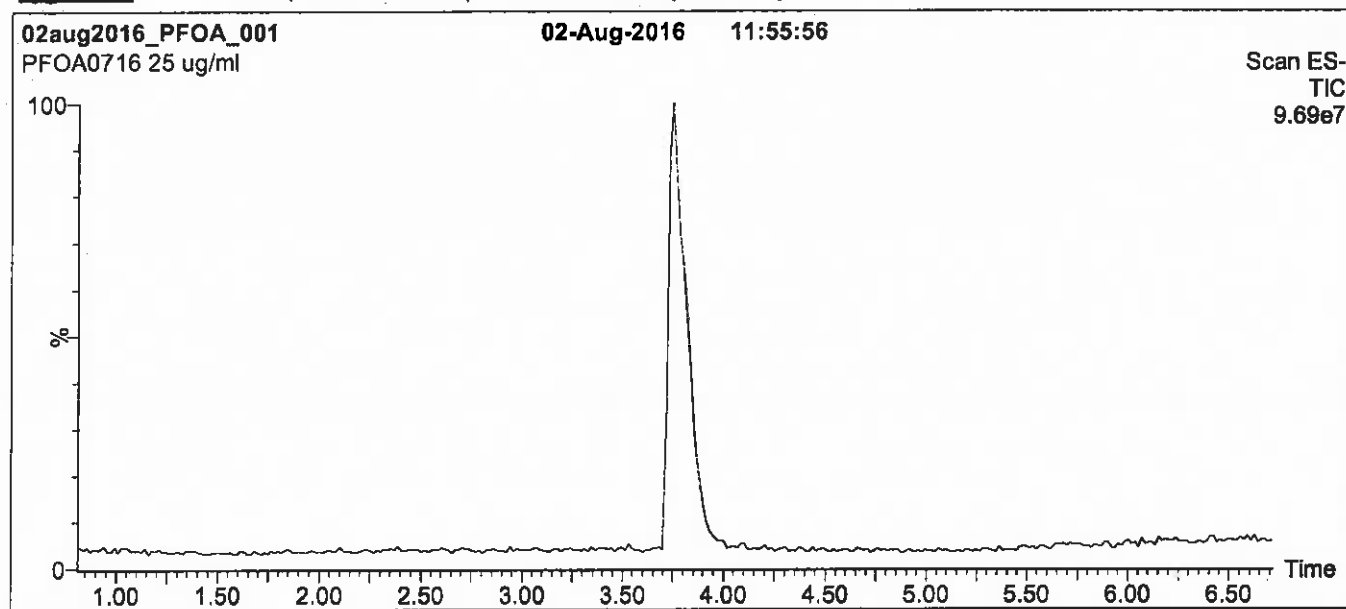
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Figure 1: PFOA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

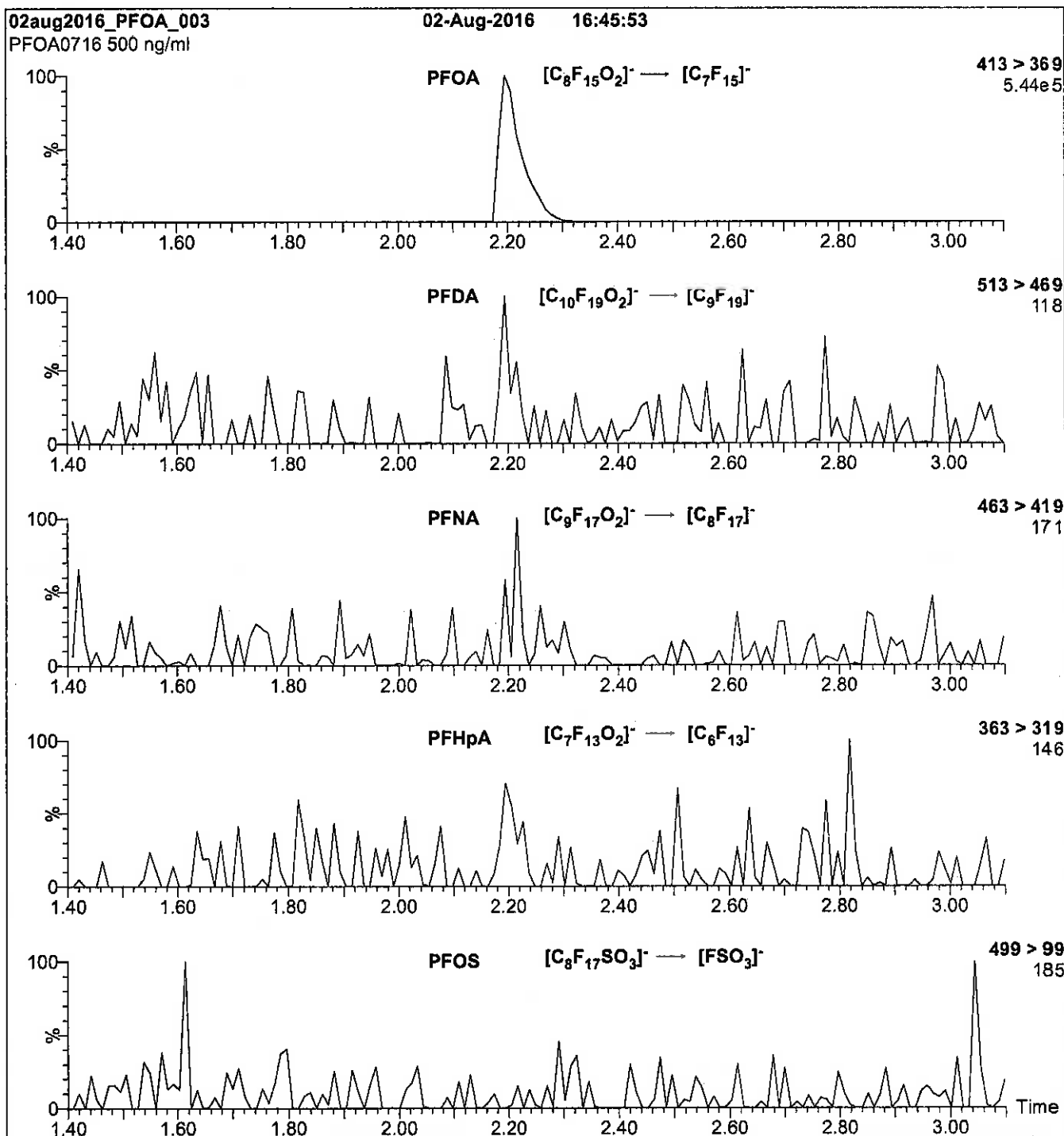
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00007



Scanned
10/14/16
P: SBC
9/13/16

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730632
ID: LCPFODA_00006
Exp: 04/29/21 Prod: SBC
PFODA stock 50ug/mL

730633
ID: LCPFODA_00007
Exp: 04/29/21 Prod: SBC
PFODA stock 50ug/mL

**CERTIFICATE OF ANALYSIS
DOCUMENTATION**

PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0416

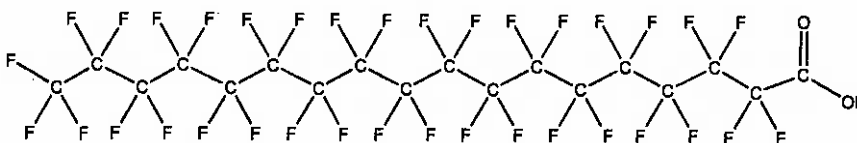
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

$C_{18}H_{36}O_2$

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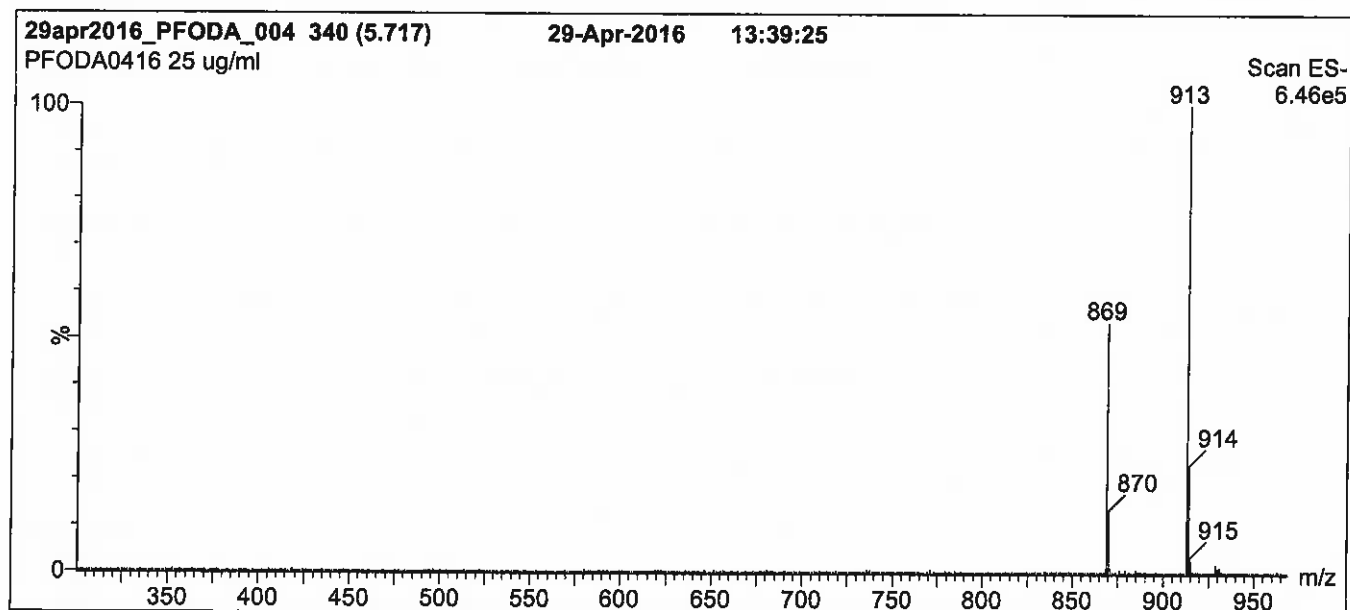
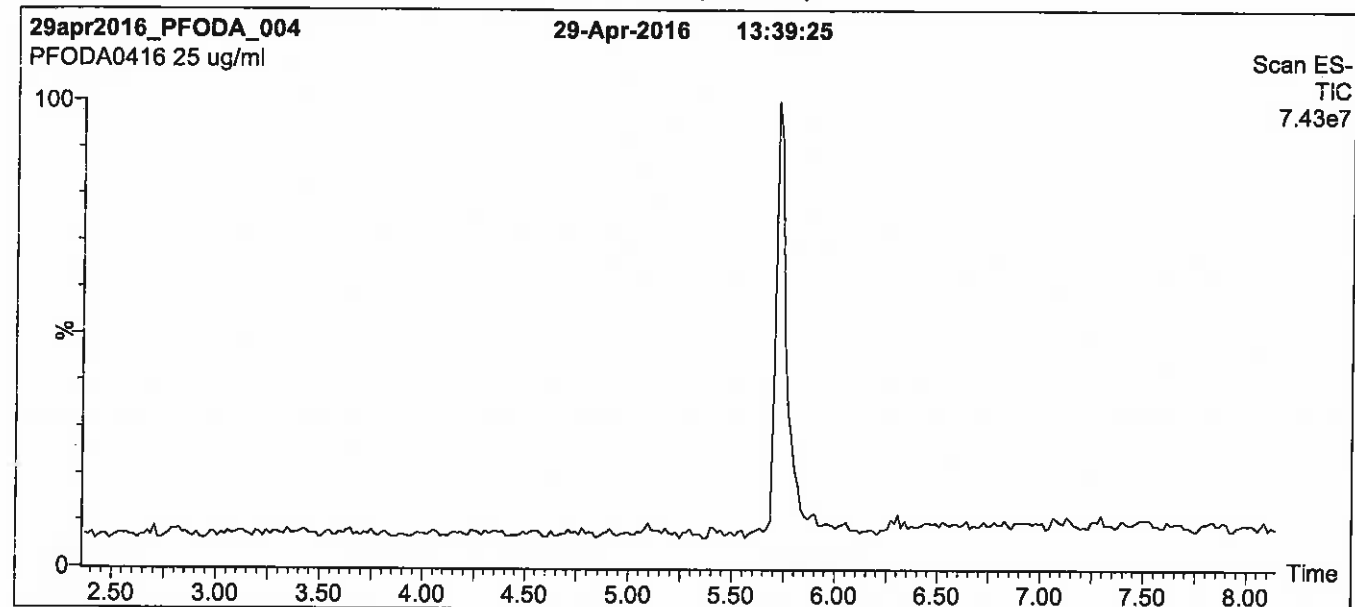
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Figure 1: PFODA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

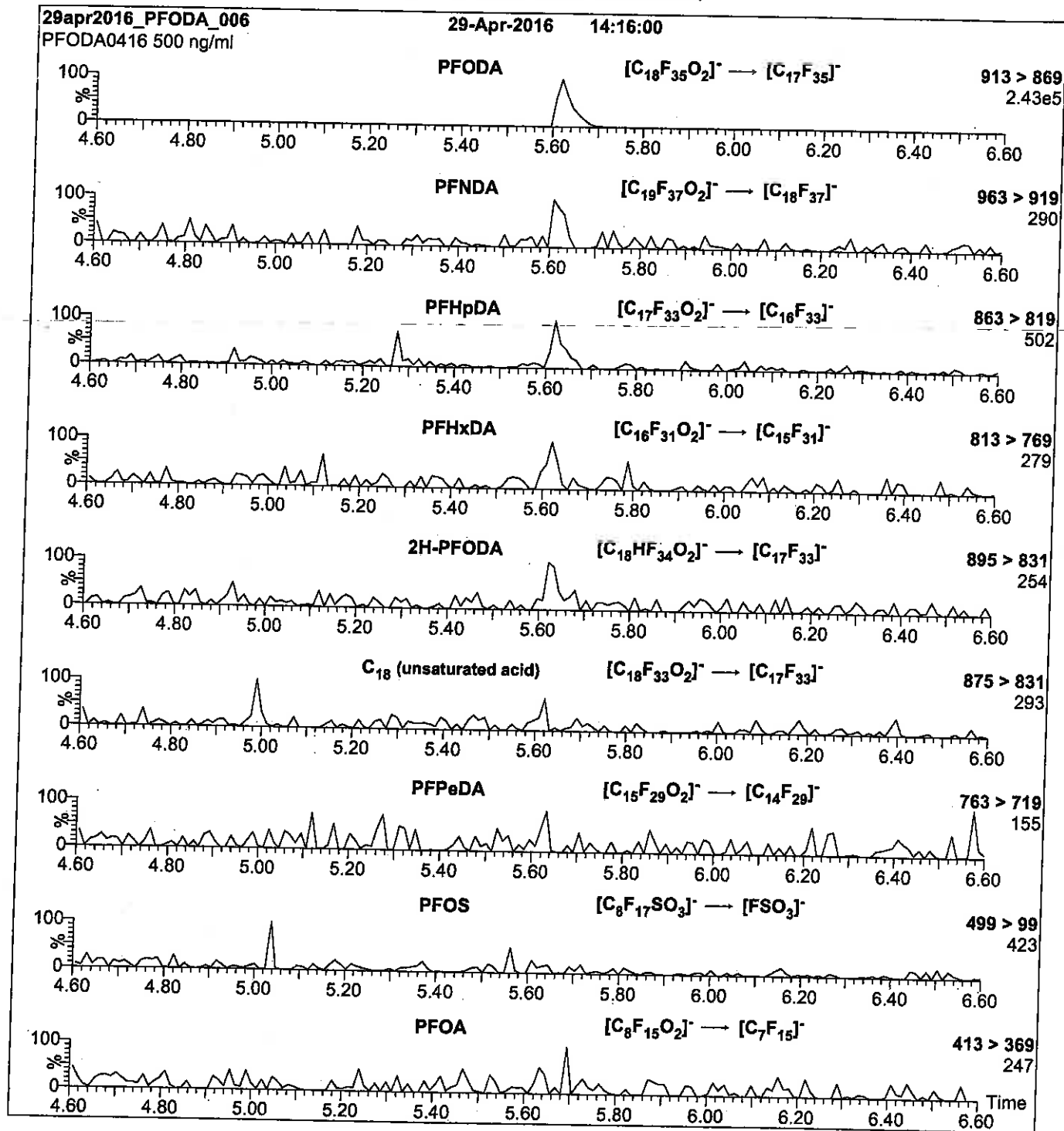
Flow: 300 μ l/min

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 μ l (500 ng/ml PFODA)

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00003

Scanned
10/14/16 SR

R: SBC 9/13/16



730515

ID: LCPFOS-br_00002

Exp: 10/14/20 Ppdt: SBC

Potassium Perfluorooctane



730516

ID: LCPFOS-br_00003

Exp: 10/14/20 Ppdt: SBC

Potassium Perfluorooctane



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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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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HAZARDS:

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

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

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

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃ K ⁺)CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(CF ₃)SO ₃ K ⁺	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(CF ₃)CF ₂ SO ₃ K ⁺	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ K ⁺	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ K ⁺	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ K ⁺	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF(CF ₃)CF ₂ SO ₃ K ⁺	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF(CF ₃)CF(CF ₃)CF ₂ CF ₂ SO ₃ K ⁺	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF(CF ₃)CF ₂ SO ₃ K ⁺	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.

** Systematic Name: Potassium perfluorooctane-2-sulfonate.

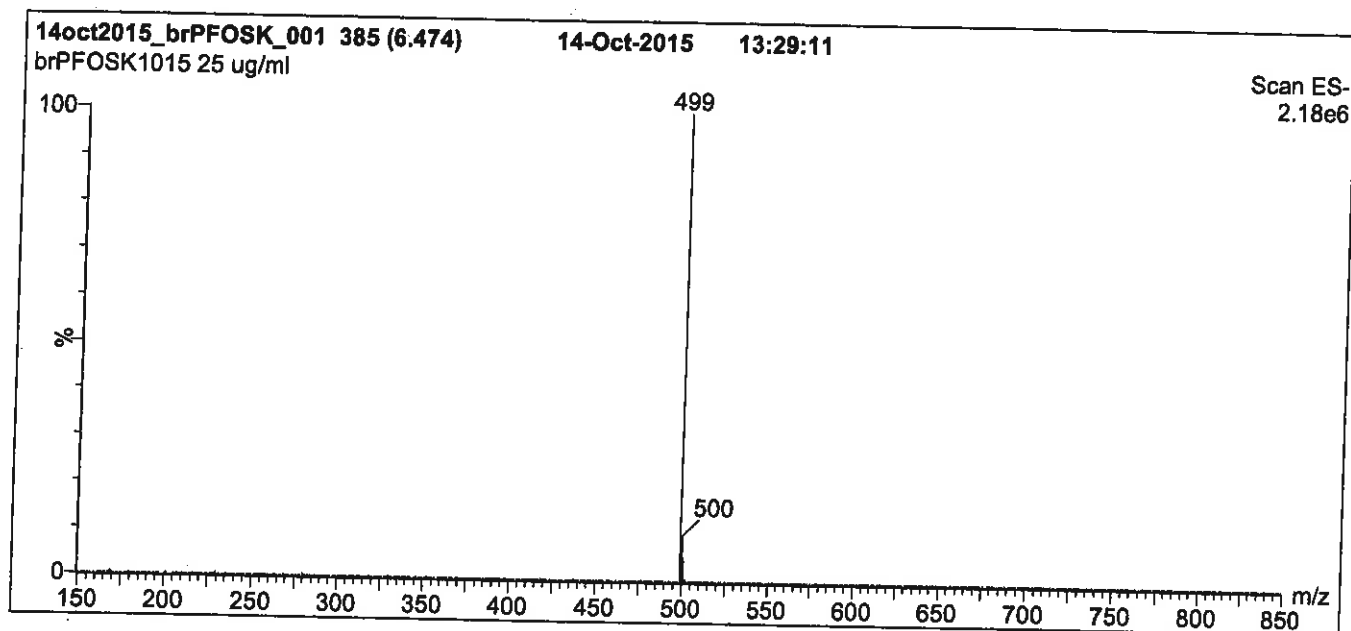
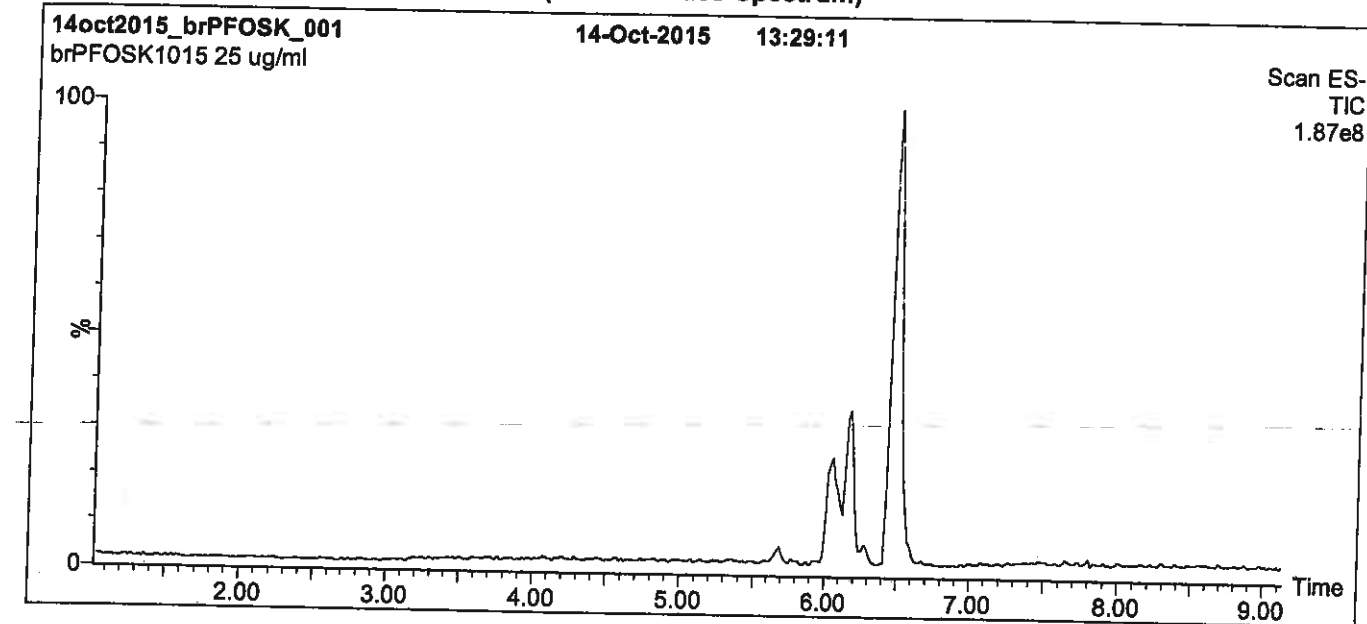
Certified By:


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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

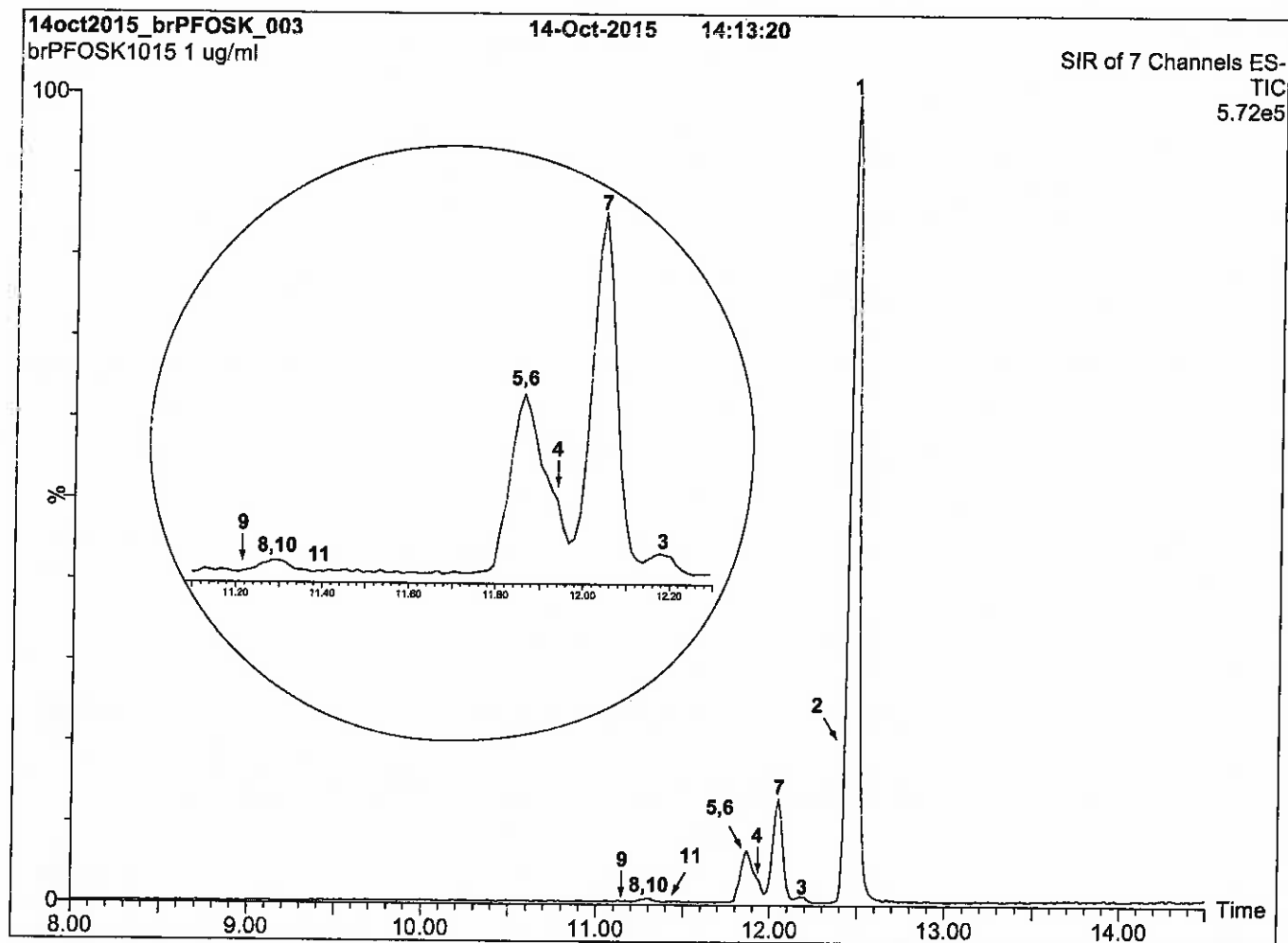
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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

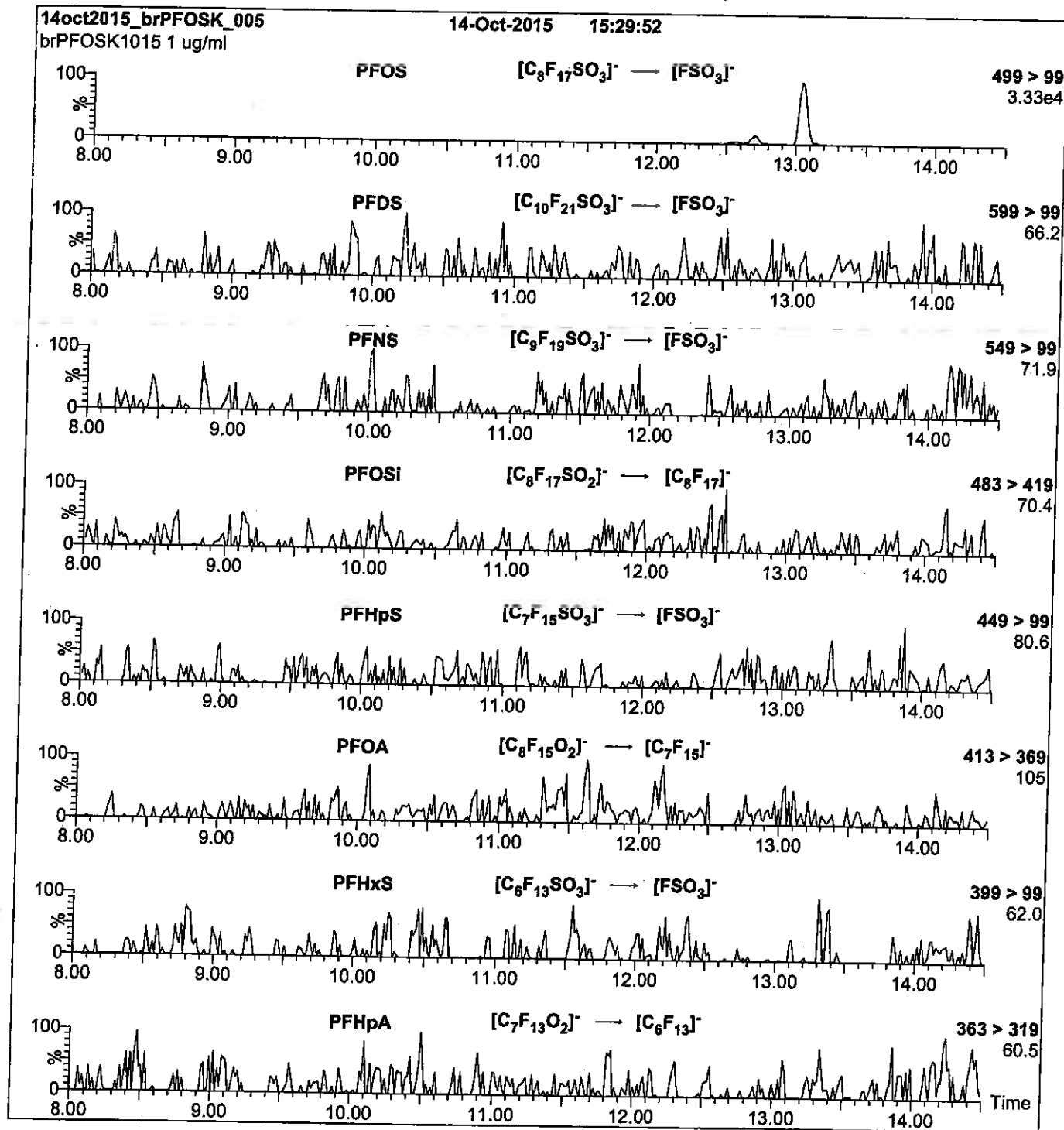
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min
Flow: 300 μ l/min

MS Conditions:

SIR (ES)
Source = 110 $^{\circ}$ C
Desolvation = 325 $^{\circ}$ C
Cone Voltage = 60V

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



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ /min

MS Parameters

Collision Gas (mbar) = 3.06e-3

Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00010

12/20/16 Spt



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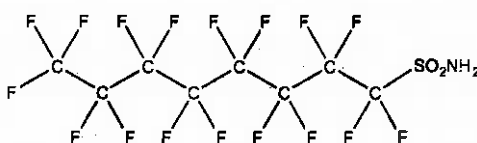
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0916I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA: $C_8H_2F_{17}NO_2S$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/30/2016
EXPIRY DATE: (mm/dd/yyyy) 09/30/2021
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 499.14
SOLVENT(S): Isopropanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: 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: 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

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EXPIRY DATE / PERIOD OF VALIDITY:

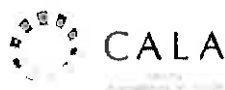
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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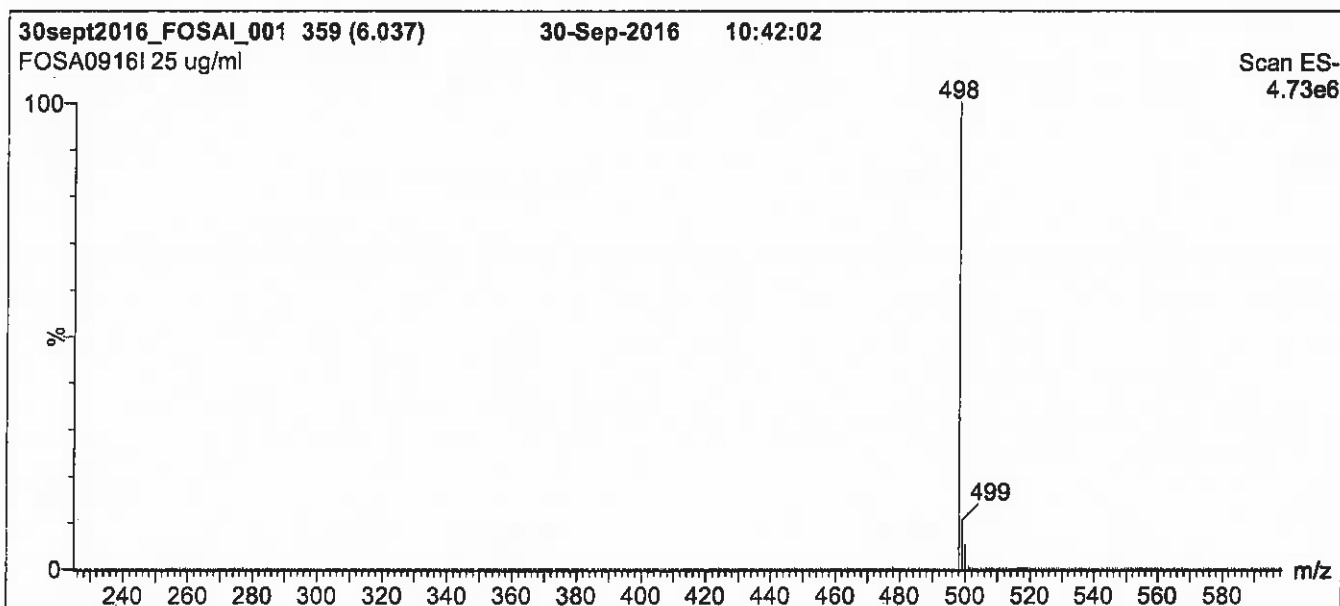
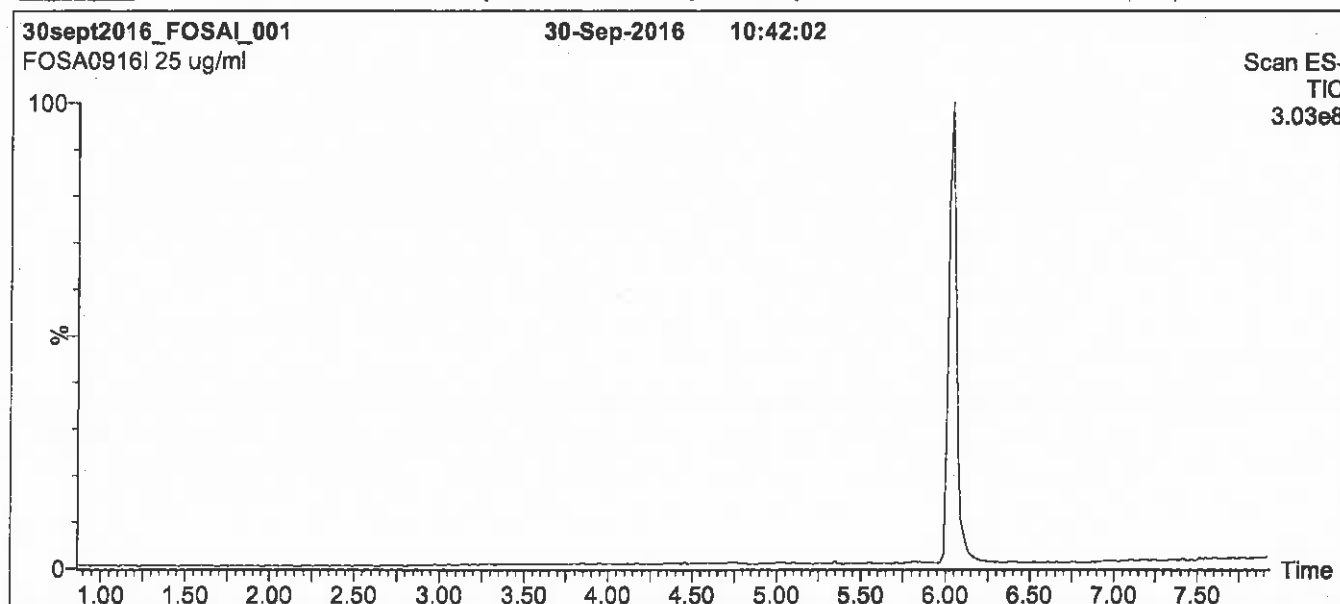
QUALITY MANAGEMENT:

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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 RP₁₈,
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

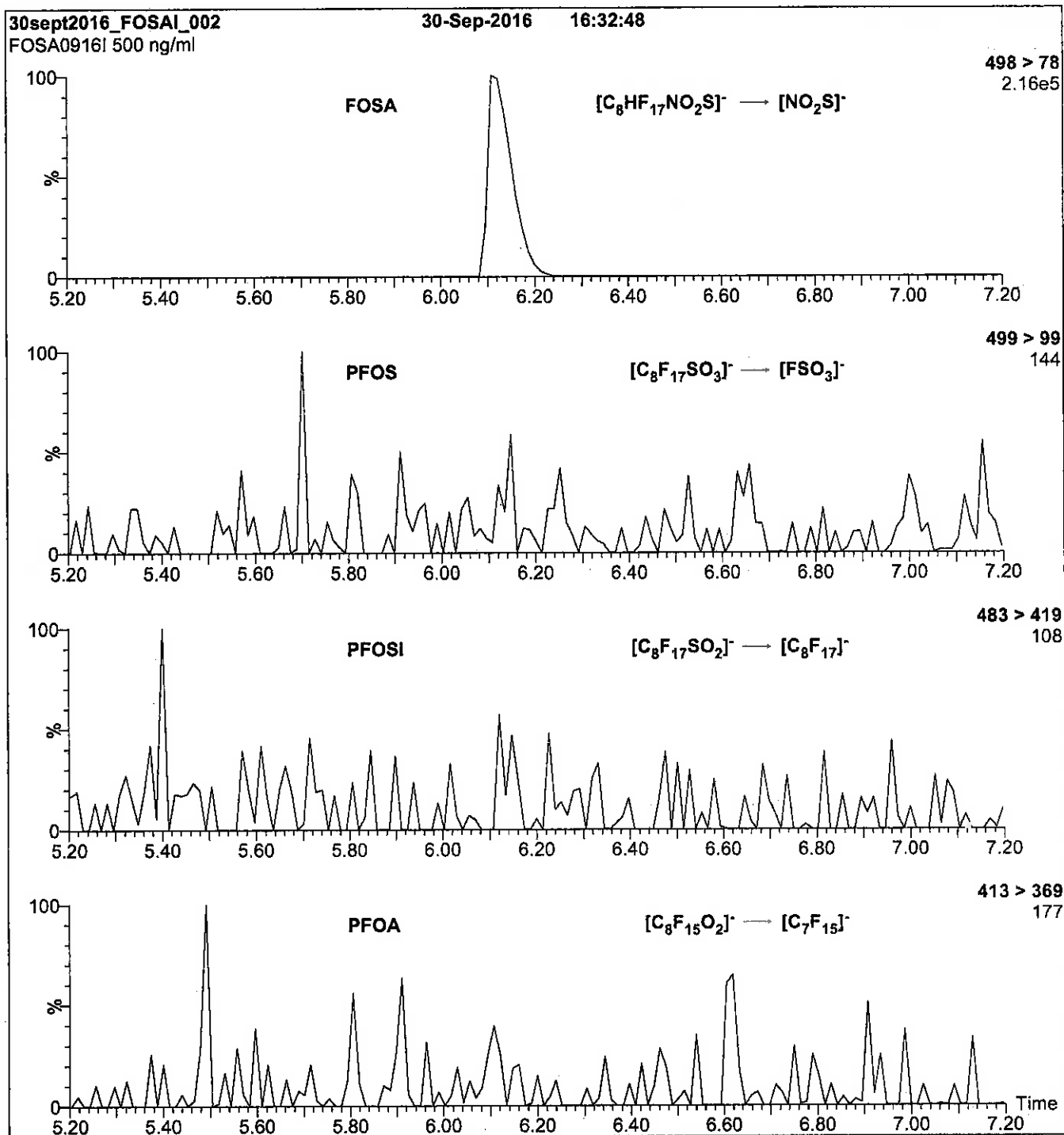
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
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% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3

Collision Energy (eV) = 30

Reagent

LCPFPeA_00006

r: 12/20/16 Std
s: 1/6/17 Std



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFPeA

LOT NUMBER:

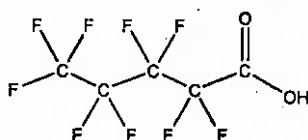
PFPeA0516

COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:**CAS #:**

2706-90-3

**MOLECULAR FORMULA:** $C_5HF_8O_2$ **MOLECULAR WEIGHT:**

264.05

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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)

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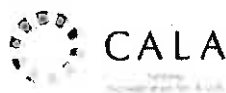
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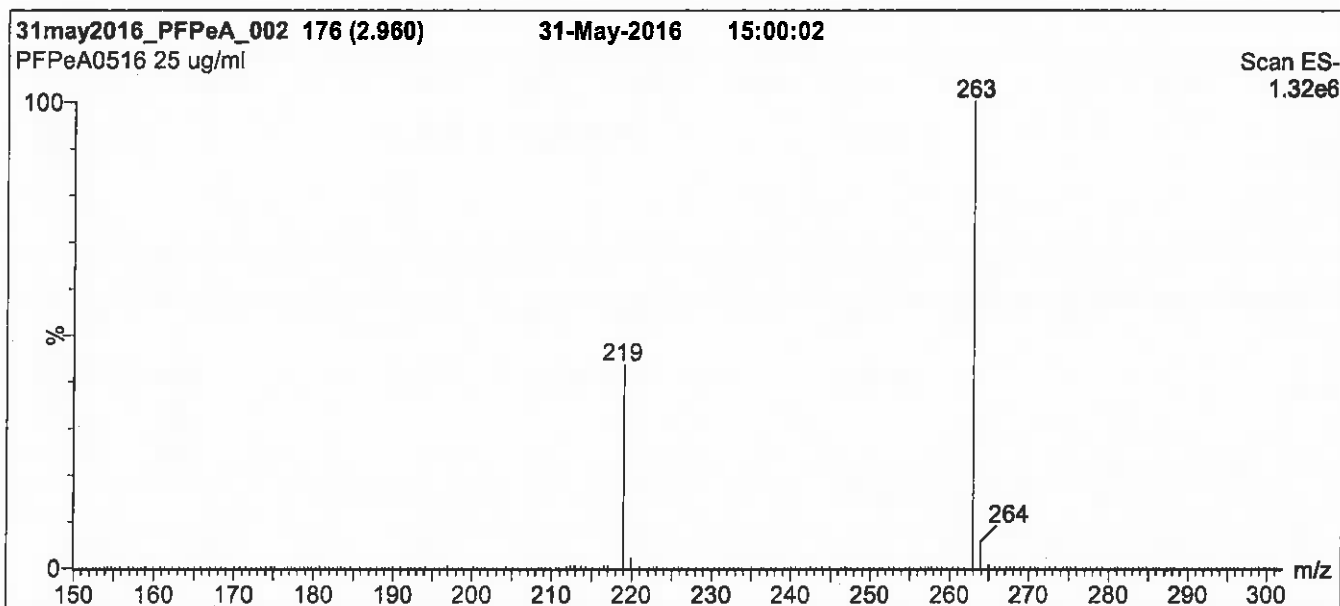
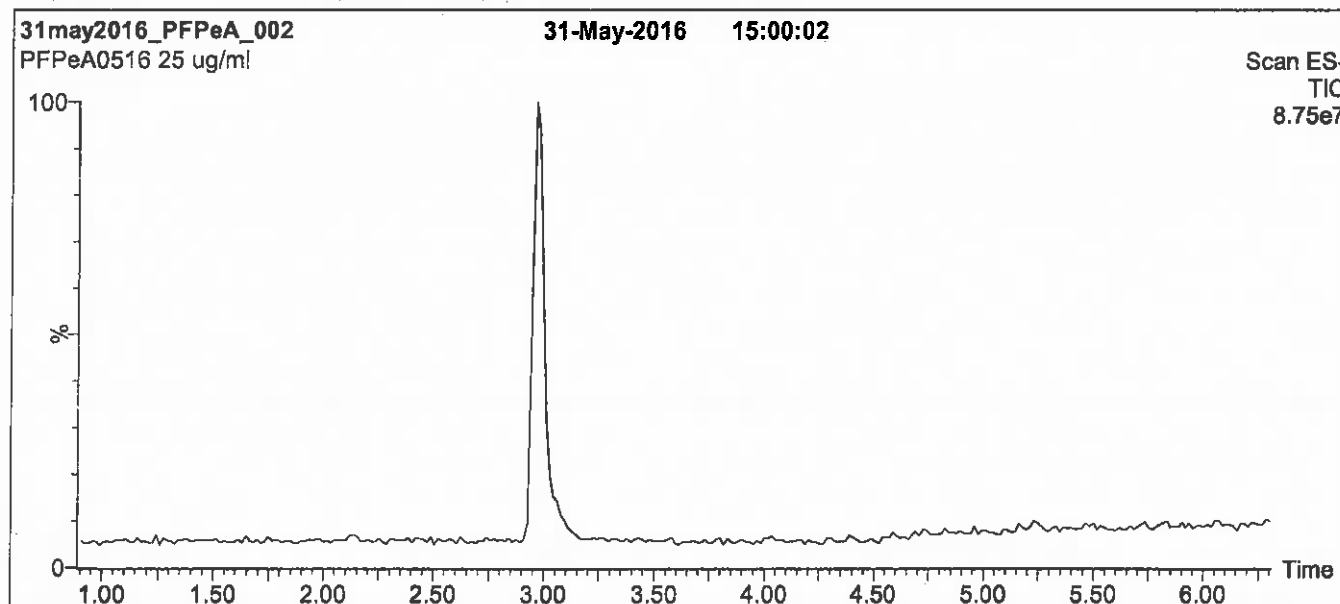
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Figure 1: PFPeA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

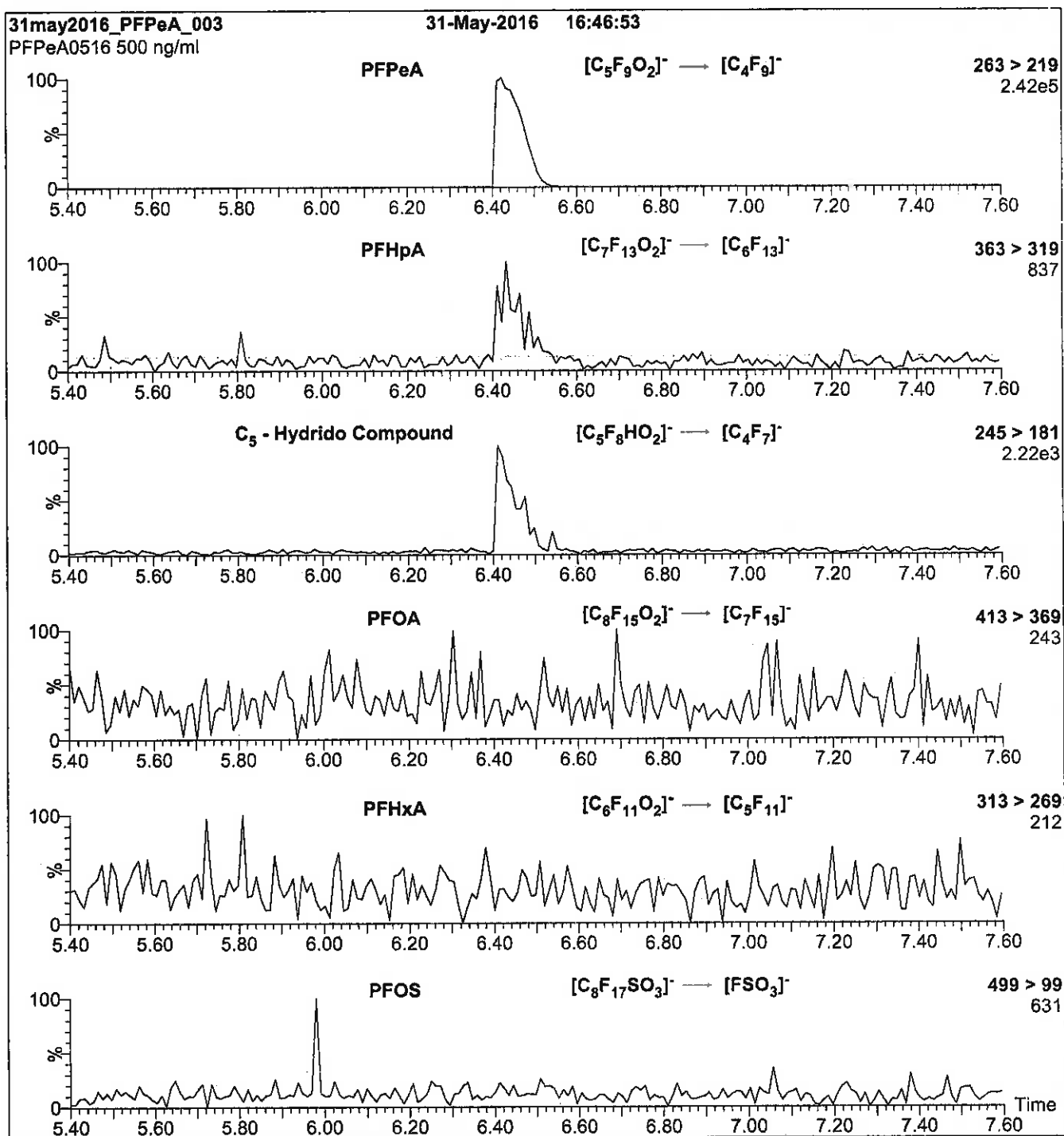
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFTeDA_00005

P: SBG 9/13/16



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



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



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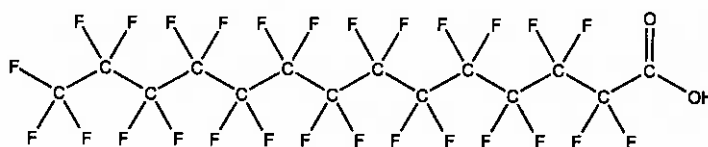
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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: $50 \pm 2.5 \mu\text{g/ml}$

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 ($C_{16}HF_{29}O_2$).

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Certified By:

B.G. Chittim

Date: 12/09/2015
(mm/dd/yyyy)

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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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.

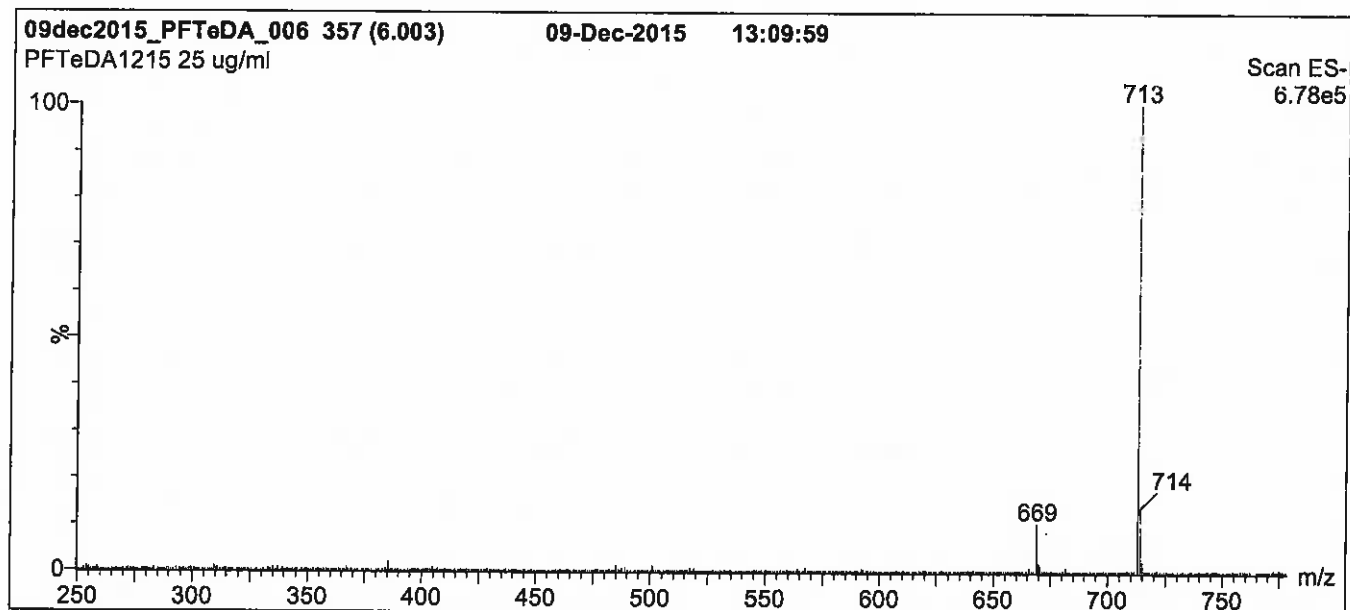
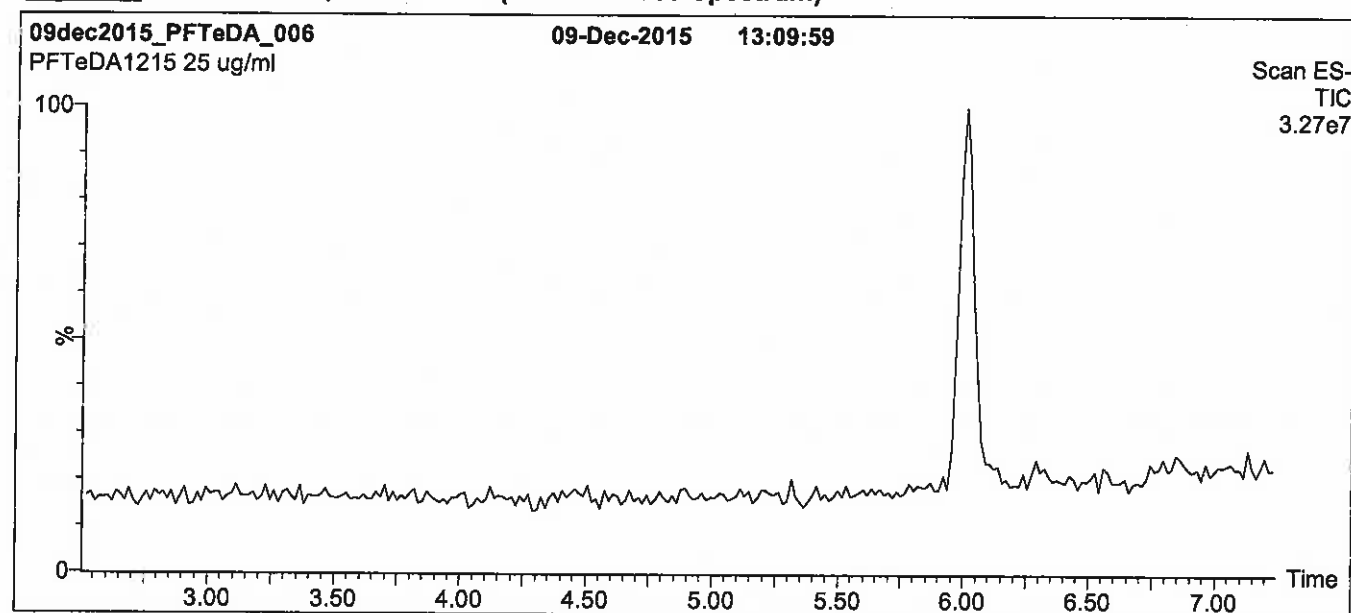
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

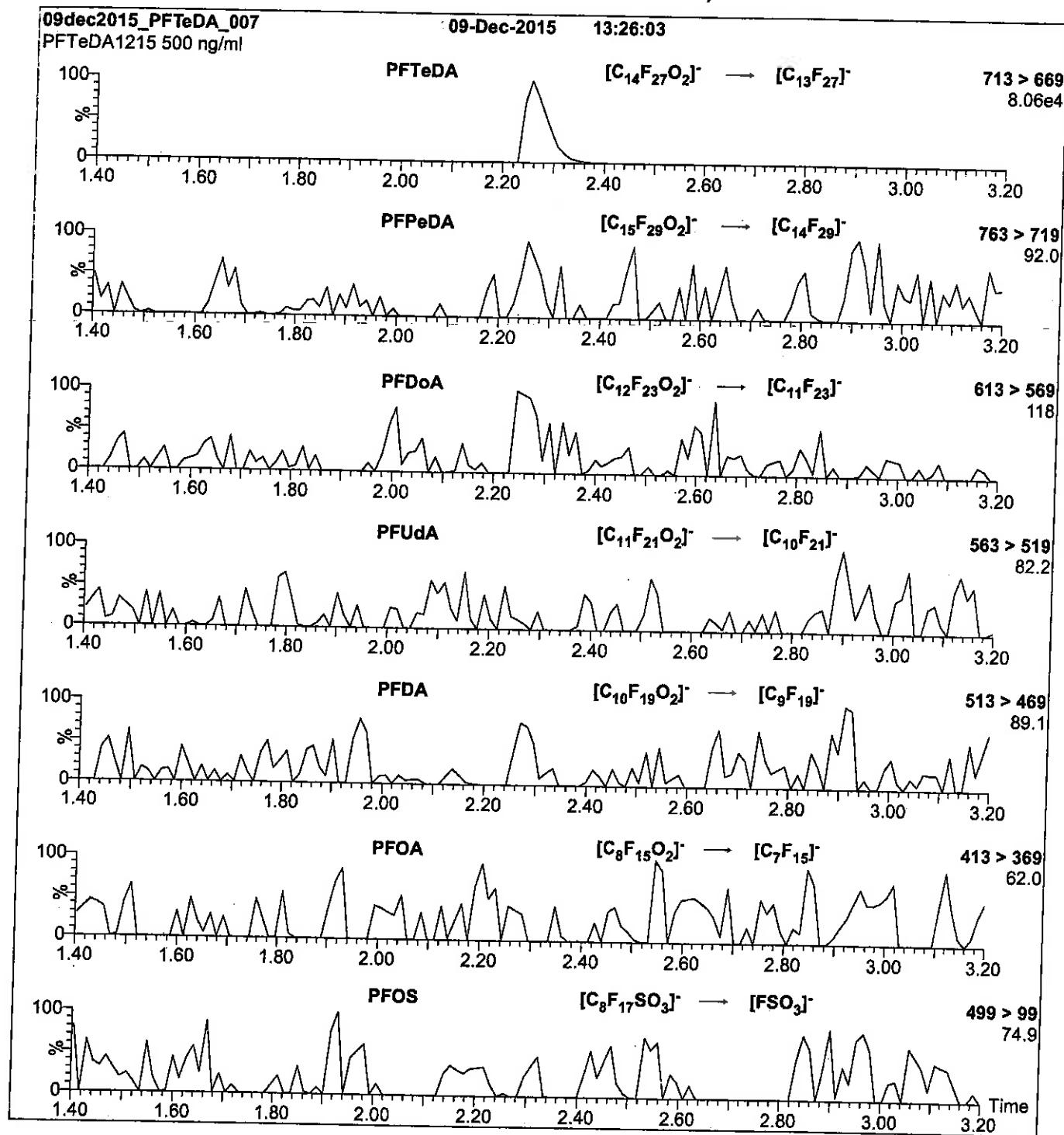
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTeDA_00007



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

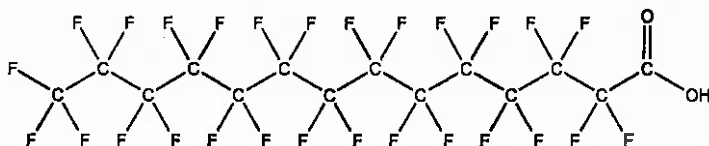
PFTeDA0916

COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:**CAS #:**

376-06-7

**MOLECULAR FORMULA:** $C_{14}HF_{27}O_2$ **MOLECULAR WEIGHT:**

714.11

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/30/2016

EXPIRY DATE: (mm/dd/yyyy)

09/30/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDa ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**Certified By:**

B.G. Chittim
Date: 10/05/2016

(mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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EXPIRY DATE / PERIOD OF VALIDITY:

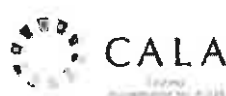
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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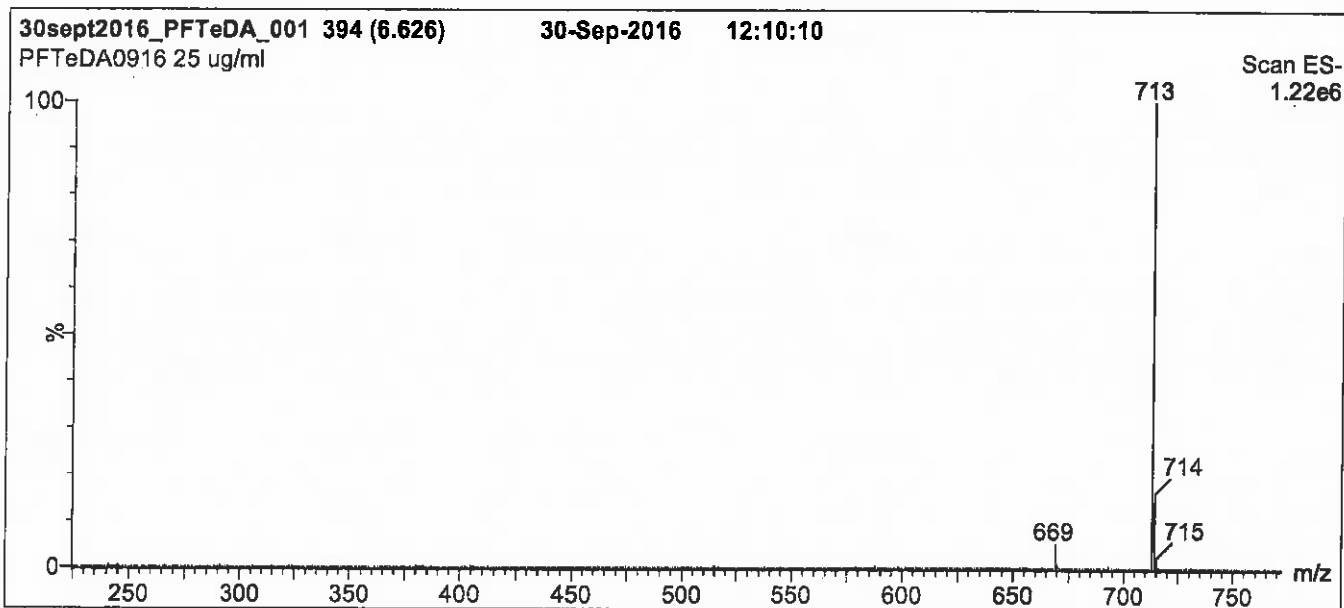
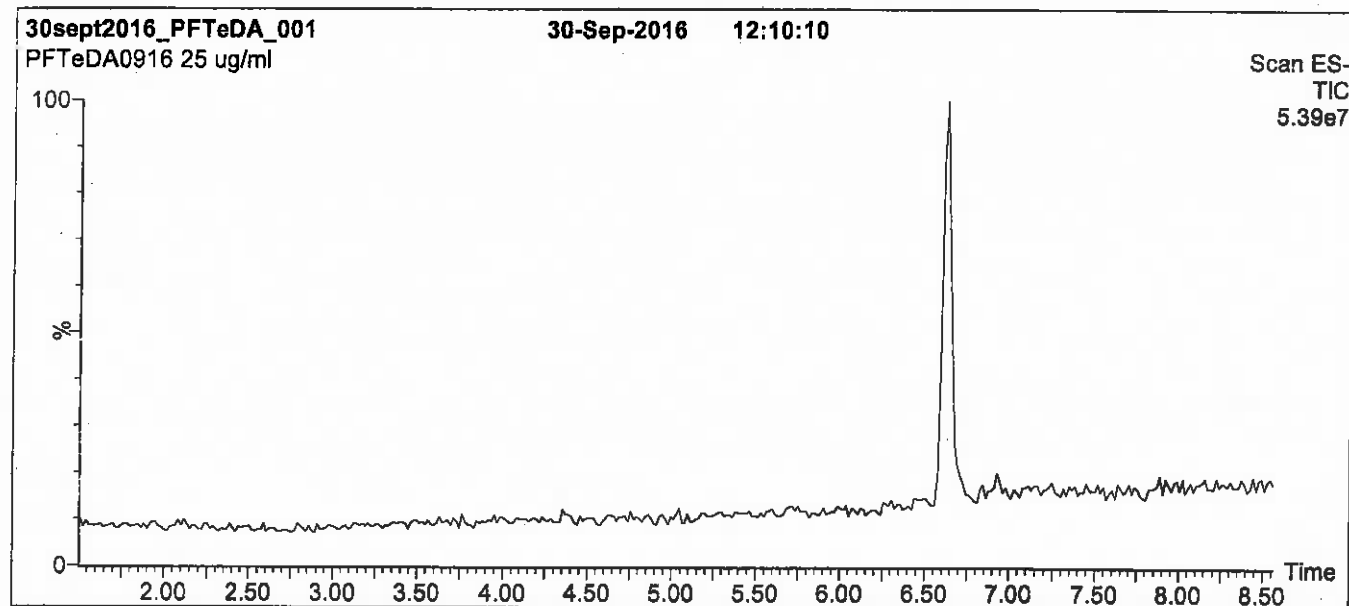
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

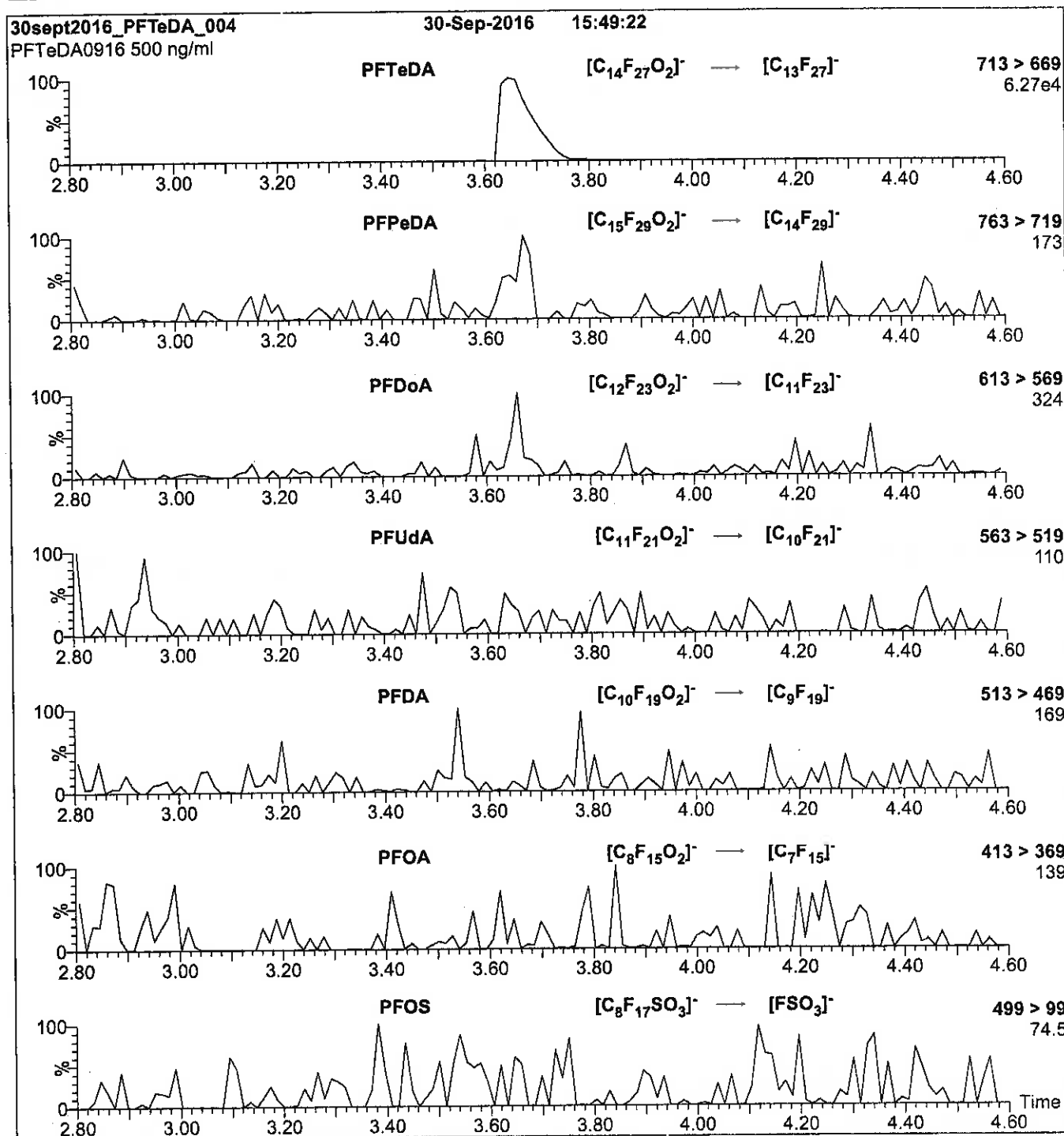
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFT_rDA_00005

R: SBC 9/13/16



730665
ID: LCPFTDA_00005
Exp: 02/12/21 Prod: SBC
PF-n-tridecanoic acid



730666
ID: LCPFTDA_00006
Exp: 02/12/21 Prod: SBC
PF-n-tridecanoic acid



WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

PFTTrDA

LOT NUMBER:

PFTTrDA0216

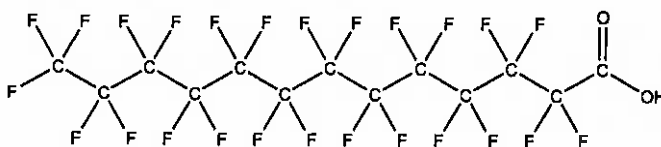
COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:

CAS #:

72629-94-8



MOLECULAR FORMULA:

$C_{13}H_{25}O_2$

MOLECULAR WEIGHT:

664.11

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

02/12/2016

EXPIRY DATE: (mm/dd/yyyy)

02/12/2021

RECOMMENDED STORAGE:

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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.
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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

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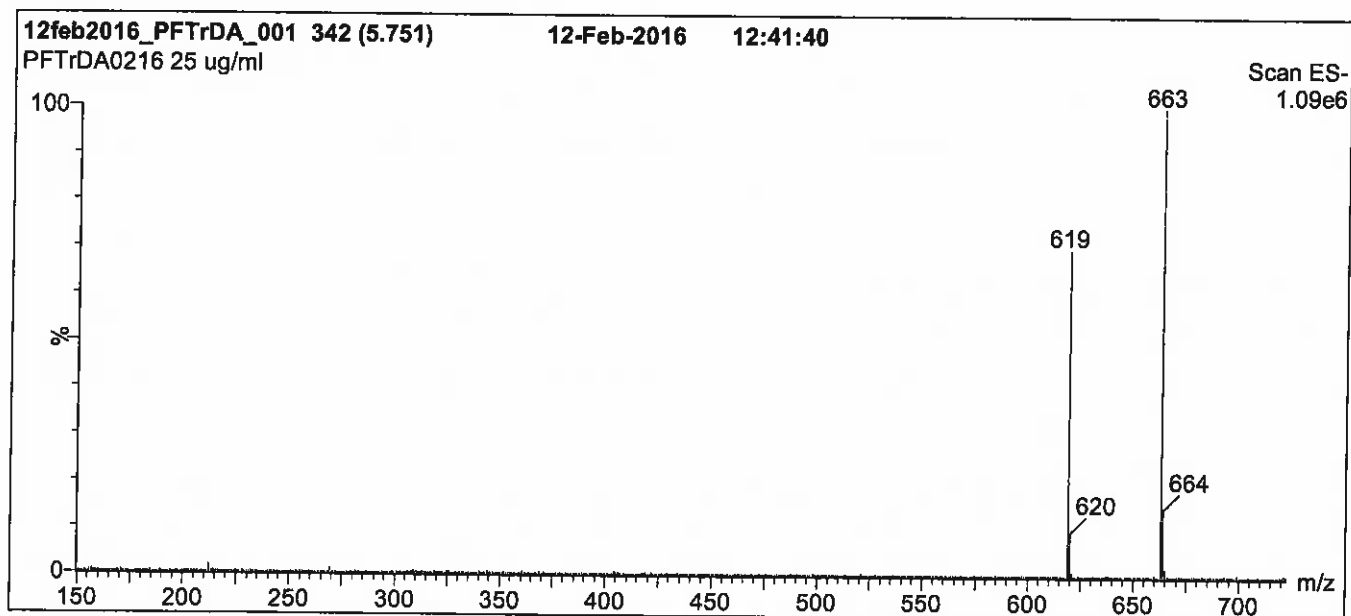
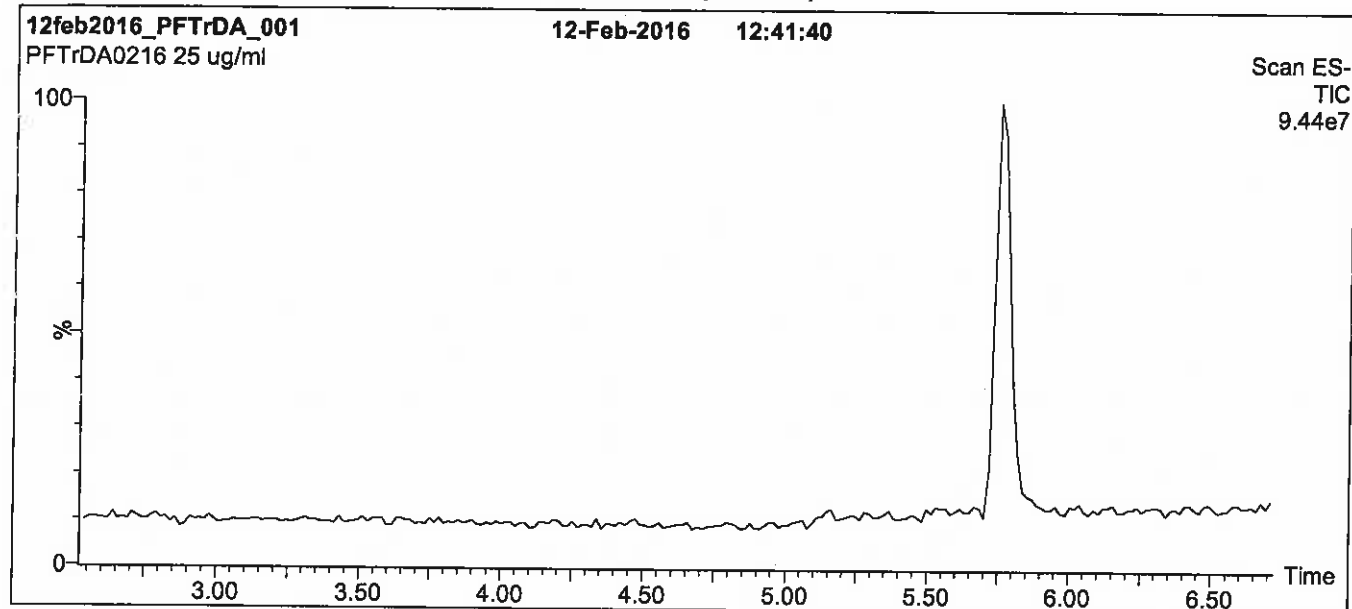
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

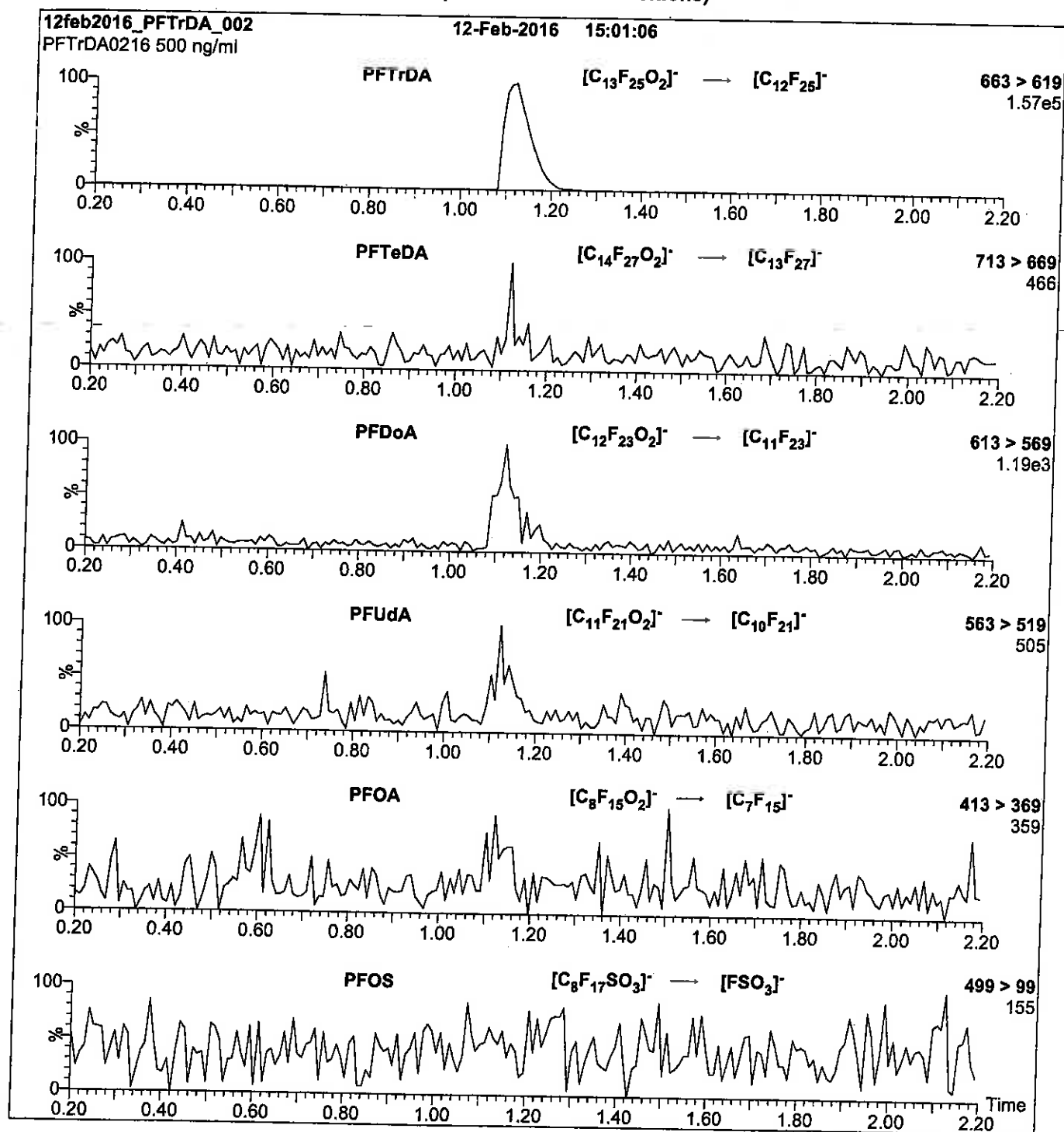
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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 μ l (500 ng/ml PFTTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H₂O

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 15

Reagent

LCPFT_rDA_00007

r : 12/29/16 S4/



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTrDA

LOT NUMBER:

PFTrDA0216

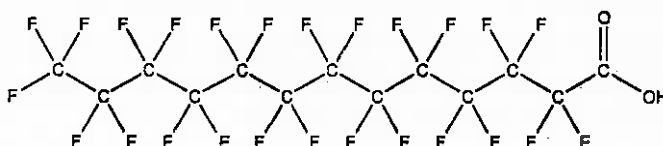
COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:

CAS #:

72629-94-8



MOLECULAR FORMULA:

$C_{13}H_{25}O_2$

MOLECULAR WEIGHT:

664.11

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

02/12/2016

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02/12/2021

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.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}H_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}H_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}H_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/16/2016

(mm/dd/yyyy)

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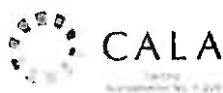
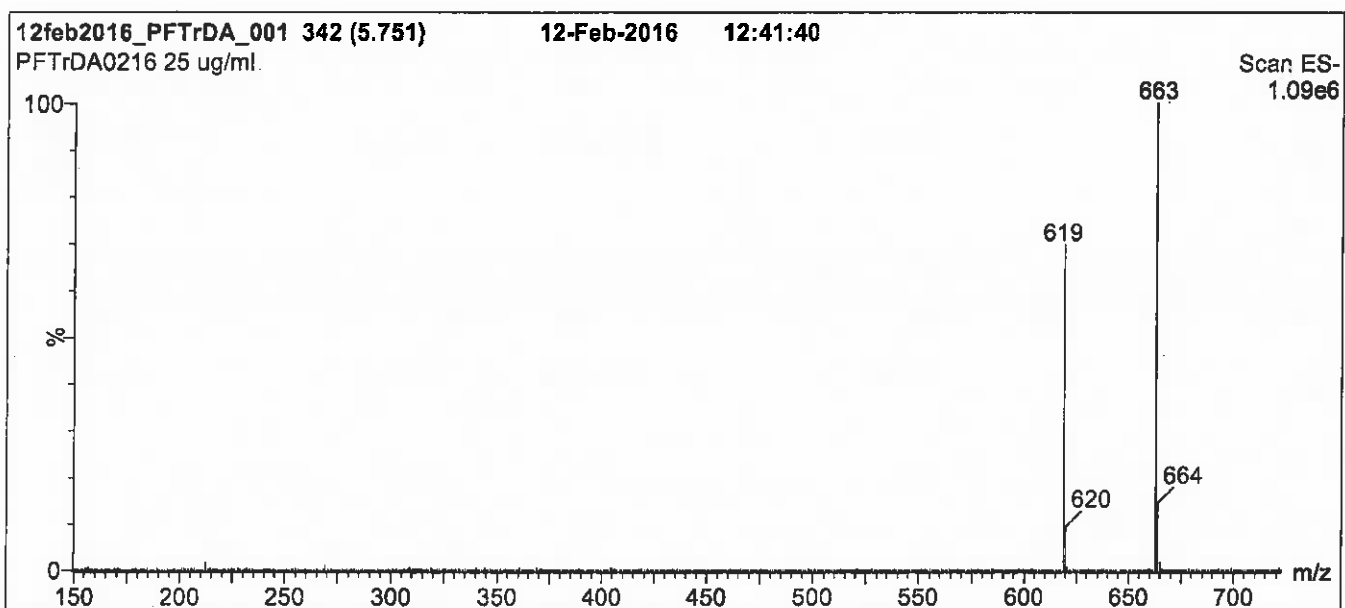
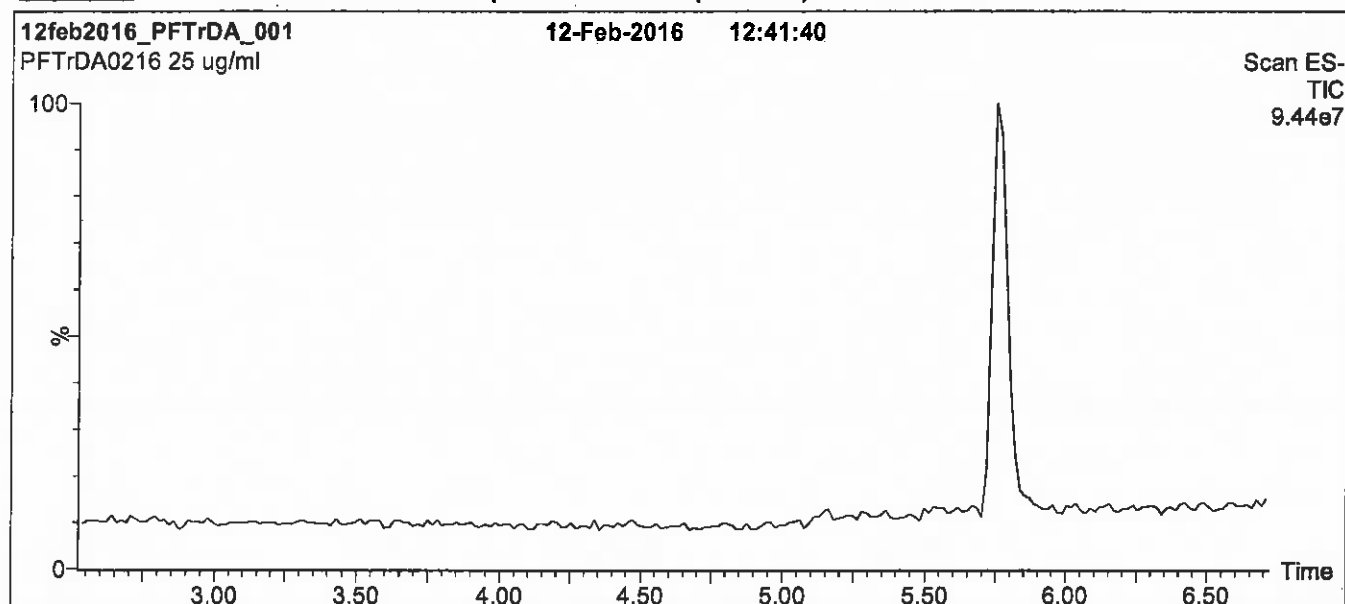


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MS: Micromass Quattro micro API MS

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1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

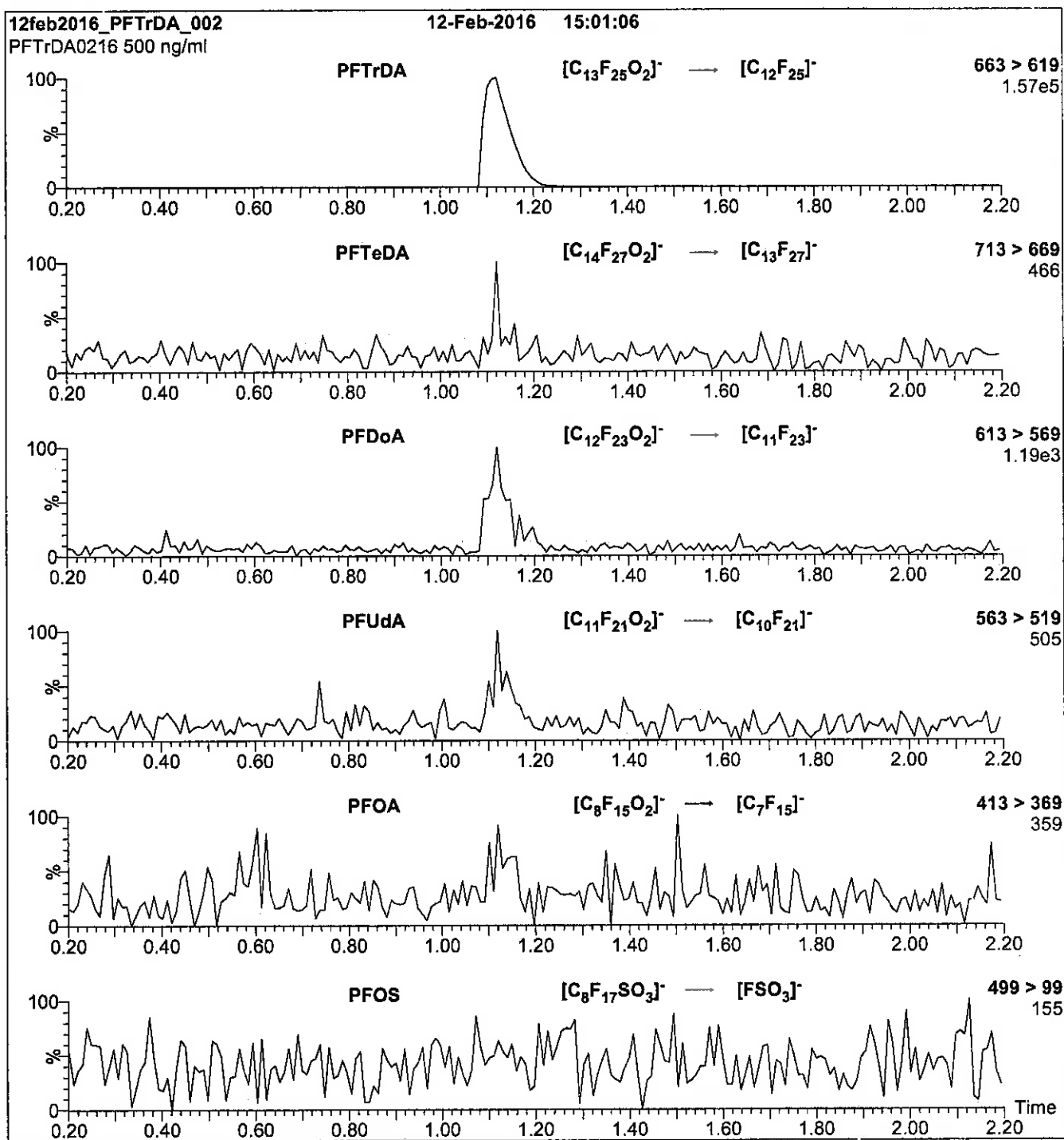
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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 μ l (500 ng/ml PFTTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H₂O

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00006

Scanned
10/14/16 R: SBC 9/13/16



730535
ID: LCPFUdA_00005
Exp: 08/19/20 Prpd: SBC
PF-n-undecanoic acid



730536
ID: LCPFUdA_00006
Exp: 08/19/20 Prpd: SBC
PF-n-undecanoic acid



WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

PFUdA

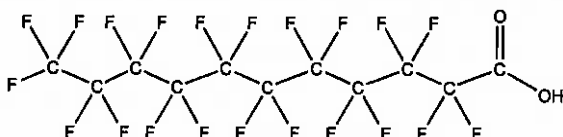
LOT NUMBER: PFUdA0815

COMPOUND:

Perfluoro-n-undecanoic acid

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA:

$C_{11}HF_{21}O_2$

MOLECULAR WEIGHT: 564.09

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S): Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

08/19/2015

EXPIRY DATE: (mm/dd/yyyy)

08/19/2020

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 08/21/2015
(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 $x_1, x_2, \dots, x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

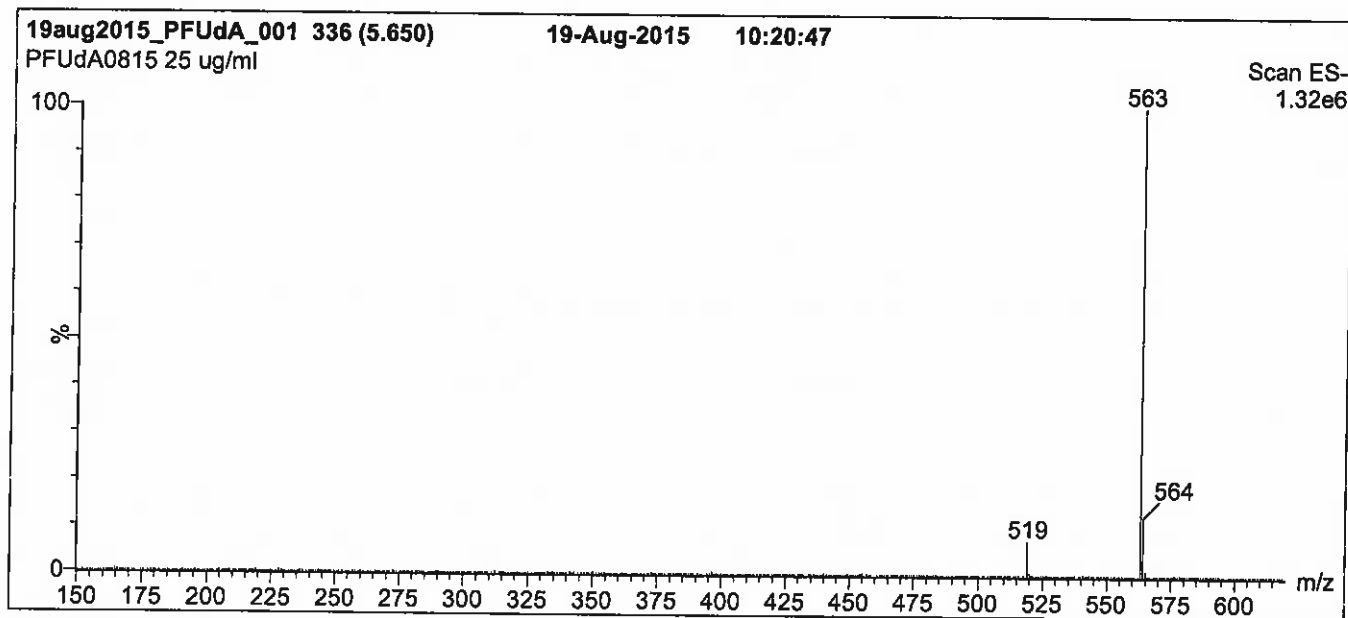
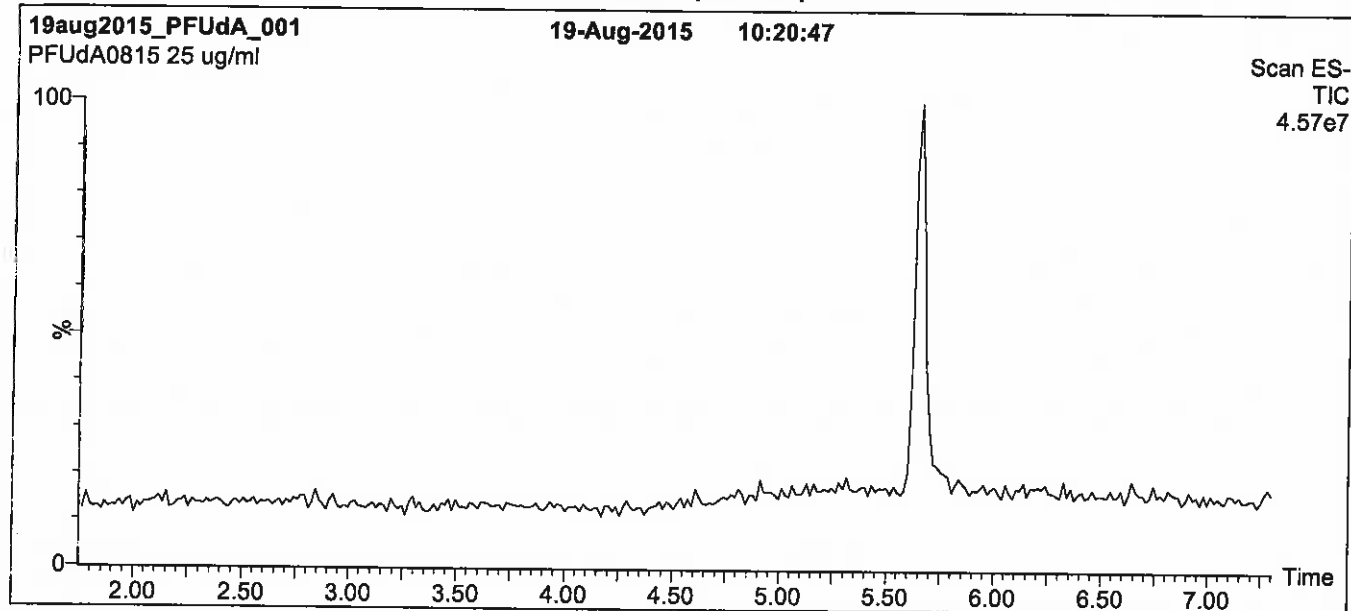
QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



****For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com****

Figure 1: PFUdA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

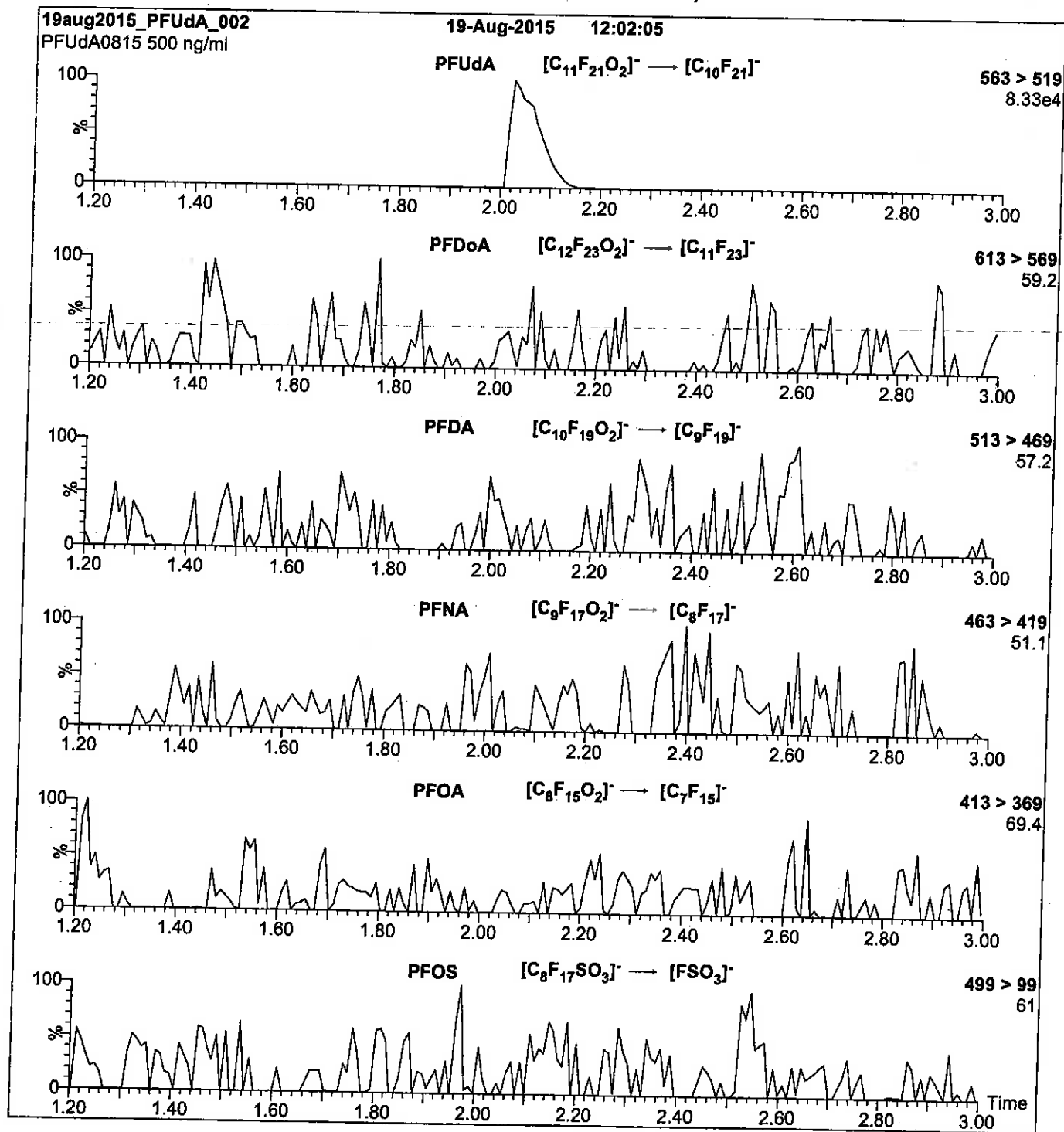
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS)
by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Matrix: Water Level: Low
 GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	3C3-PFB:#	PFHxA #	PFHpA #	PFHxS #	PFNA #	PFOS #
TP-PFC-020-TPI	320-30556-1	75	83	83	81	99	84	95	88

	<u>QC LIMITS</u>
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
13C3-PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFNA = 13C5 PFNA	25-150
PFOS = 13C4 PFOS	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFDA #	PFOSA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-020-TPI	320-30556-1	106	1	96	89	88

	<u>QC LIMITS</u>
PFDA = 13C2 PFDA	25-150
PFOSA = 13C8 FOSA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	3C3-PFB:#	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-020-MID-CAR BON	320-30556-2	112	128	129	127	151	126	140	120
TP-PFC-020-TPE	320-30556-3	80	90	118	95	108	115	96	84
TP-PFC-020-TPE-D	320-30556-4	87	98	94	102	113	98	111	101
	MB 320-179613/1-A	111	117	106	126	131	106	137	133
	LCS 320-179613/2-A	108	113	110	123	139	109	136	131
	LCSD 320-179613/3-A	95	105	93	110	117	94	121	113

	<u>QC LIMITS</u>
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
13C3-PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 1802 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFDA #	PFOSA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-020-MID-CAR BON	320-30556-2	126	110	2 Q	93	101	143
TP-PFC-020-TPE	320-30556-3	118	89	5 Q	99	107	141
TP-PFC-020-TPE-D	320-30556-4	99	103	3 Q	94	92	113
	MB 320-179613/1-A	106	134	66	124	121	121
	LCS 320-179613/2-A	105	141	54	131	121	119
	LCSD 320-179613/3-A	95	114	68	108	105	110

	<u>QC LIMITS</u>
PFOS = 13C4 PFOS	25-150
PFOSA = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Matrix: Water

Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOA #
TP-PFC-020-TPI DL	320-30556-1 DL	109

PFOA = 13C4 PFOA

QC LIMITS
25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.28B_048.d
 Lab ID: LCS 320-179613/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	44.4	111	60-140	
Perfluoropentanoic acid (PFPeA)	40.0	42.6	107	60-140	
Perfluorohexanoic acid (PFHxA)	40.0	42.4	106	60-140	
Perfluoroheptanoic acid (PFHpA)	40.0	41.0	102	60-140	
Perfluorooctanoic acid (PFOA)	40.0	39.5	99	60-140	
Perfluorononanoic acid (PFNA)	40.0	40.5	101	60-140	
Perfluorodecanoic acid (PFDA)	40.0	41.3	103	60-140	
Perfluoroundecanoic acid (PFUnA)	40.0	36.1	90	60-140	
Perfluorododecanoic acid (PFDoA)	40.0	39.2	98	60-140	
Perfluorotridecanoic Acid (PFTriA)	40.0	40.1	100	50-150	
Perfluorotetradecanoic acid (PFTeA)	40.0	36.4	91	50-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.5	103	50-150	
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.7	104	60-140	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	43.7	115	50-150	
Perfluorooctanesulfonic acid (PFOS)	37.1	39.7	107	60-140	
Perfluorodecanesulfonic acid (PFDS)	38.6	42.0	109	50-150	
Perfluorooctane Sulfonamide (FOSA)	40.0	43.6	109	60-140	
13C8 FOSA	100	53.6	54	25-150	
13C4 PFBA	100	108	108	25-150	
13C2 PFHxA	100	123	123	25-150	
13C4 PFOA	100	136	136	25-150	
13C5 PFNA	100	131	131	25-150	
13C2 PFDA	100	141	141	25-150	
13C2 PFUnA	100	131	131	25-150	
13C2 PFDoA	100	121	121	25-150	
18O2 PFHxS	94.6	104	109	25-150	
13C4 PFOS	95.6	101	105	25-150	
13C4-PFHpA	100	139	139	25-150	
13C5 PFPeA	100	113	113	25-150	
13C3-PFBS	93.0	102	110	25-150	
13C2-PFTeDA	100	119	119	25-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.28B_049.d
 Lab ID: LCSD 320-179613/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorobutanoic acid (PFBA)	40.0	44.7	112	1	30	60-140	
Perfluoropentanoic acid (PFPeA)	40.0	40.6	101	5	30	60-140	
Perfluorohexanoic acid (PFHxA)	40.0	42.3	106	0	30	60-140	
Perfluoroheptanoic acid (PFHpA)	40.0	43.6	109	6	30	60-140	
Perfluorooctanoic acid (PFOA)	40.0	40.1	100	2	30	60-140	
Perfluorononanoic acid (PFNA)	40.0	42.3	106	4	30	60-140	
Perfluorodecanoic acid (PFDA)	40.0	42.8	107	3	30	60-140	
Perfluoroundecanoic acid (PFUnA)	40.0	37.4	94	4	30	60-140	
Perfluorododecanoic acid (PFDoA)	40.0	41.4	104	6	30	60-140	
Perfluorotridecanoic Acid (PFTriA)	40.0	43.5	109	8	30	50-150	
Perfluorotetradecanoic acid (PFTeA)	40.0	38.0	95	5	30	50-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	37.7	107	3	30	50-150	
Perfluorohexanesulfonic acid (PFHxS)	36.4	39.0	107	3	30	60-140	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	42.3	111	3	30	50-150	
Perfluorooctanesulfonic acid (PFOS)	37.1	39.5	107	0	30	60-140	
Perfluorodecanesulfonic acid (PFDS)	38.6	41.6	108	1	30	50-150	
Perfluorooctane Sulfonamide (FOSA)	40.0	46.0	115	5	30	60-140	
13C8 FOSA	100	68.4	68			25-150	
13C4 PFBA	100	95.0	95			25-150	
13C2 PFHxA	100	110	110			25-150	
13C4 PFOA	100	121	121			25-150	
13C5 PFNA	100	113	113			25-150	
13C2 PFDA	100	114	114			25-150	
13C2 PFUnA	100	108	108			25-150	
13C2 PFDoA	100	105	105			25-150	
18O2 PFHxS	94.6	89.2	94			25-150	
13C4 PFOS	95.6	90.4	95			25-150	
13C4-PFHpA	100	117	117			25-150	
13C5 PFPeA	100	105	105			25-150	
13C3-PFBS	93.0	86.9	93			25-150	
13C2-PFTeDA	100	110	110			25-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab File ID: 2017.08.28B_047.d Lab Sample ID: MB 320-179613/1-A
 Matrix: Water Date Extracted: 08/16/2017 09:20
 Instrument ID: A8_N Date Analyzed: 08/29/2017 09:14
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-179613/2-A	2017.08.28B 048.d	08/29/2017 09:21
	LCSD 320-179613/3-A	2017.08.28B 049.d	08/29/2017 09:28
TP-PFC-020-TPI DL	320-30556-1 DL	2017.08.28B 061.d	08/29/2017 10:51
TP-PFC-020-MID-CARBON	320-30556-2	2017.08.28B 062.d	08/29/2017 10:57
TP-PFC-020-TPE	320-30556-3	2017.08.28B 063.d	08/29/2017 11:04
TP-PFC-020-TPE-D	320-30556-4	2017.08.28B 064.d	08/29/2017 11:11
TP-PFC-020-TPI	320-30556-1	2017.08.28B 065.d	08/29/2017 11:18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPI</u>	Lab Sample ID: <u>320-30556-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_065.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>260.8 (mL)</u>	Date Analyzed: <u>08/29/2017 11:18</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	75	M	2.4	0.96	0.44
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		2.4	1.9	0.95
307-24-4	Perfluorohexanoic acid (PFHxA)	350		2.4	1.9	0.75
375-85-9	Perfluoroheptanoic acid (PFHpA)	75		2.4	1.9	0.77
375-95-1	Perfluorononanoic acid (PFNA)	2.3	J	2.4	1.9	0.63
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	J	2.4	0.96	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	1.9	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U M	2.4	1.9	0.56
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	1.9	0.53
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.96	U	2.4	0.96	0.38
375-73-5	Perfluorobutanesulfonic acid (PFBS)	56		2.4	1.9	0.88
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	330		2.4	1.9	0.83
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	9.0		2.4	1.9	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330		3.8	2.9	1.2
335-77-3	Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	2.9	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.2	J M	38	1.9	0.61

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPI</u>	Lab Sample ID: <u>320-30556-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_065.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>260.8 (mL)</u>	Date Analyzed: <u>08/29/2017 11:18</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	1	Q	25-150
STL00992	13C4 PFBA	75		25-150
STL00993	13C2 PFHxA	81		25-150
STL00995	13C5 PFNA	95		25-150
STL00996	13C2 PFDA	106		25-150
STL00997	13C2 PFUnA	96		25-150
STL00998	13C2 PFDoA	89		25-150
STL00994	18O2 PFHxS	84		25-150
STL00991	13C4 PFOS	88		25-150
STL01892	13C4-PFHpA	99		25-150
STL01893	13C5 PFPeA	83		25-150
STL02337	13C3-PFBS	83		25-150
STL02116	13C2-PFTeDA	88		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_065.d
 Lims ID: 320-30556-A-1-A
 Client ID: TP-PFC-020-TPI
 Sample Type: Client
 Inject. Date: 29-Aug-2017 11:18:36 ALS Bottle#: 52 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30556-a-1-a
 Misc. Info.: Plate: 1 Rack: 5
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:31:01 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:29:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.563	1.564	-0.001		7820320	37.7		75.5	23722	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.563	1.564	-0.001	1.000	5552887	39.1			308	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.772	1.773	-0.001		5451372	41.5		82.9	24866	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.772	1.773	-0.001	1.000	12140184	106.7			2080	
D 47 13C3-PFBS										
301.90 > 83.00	1.800	1.792	0.008		149959	38.4		82.6	1737	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.800	1.801	-0.001	1.000	6896773	29.2			3364	
298.90 > 99.00	1.800	1.801	-0.001	1.000	2970692		2.32(0.00-0.00)		2819	
D 7 13C2 PFHxA										
315.00 > 270.00	2.040	2.041	-0.001		5582567	40.7		81.5	24553	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.040	2.041	-0.001	1.000	19254817	185.1			6628	
D 9 13C4-PFHpA										
367.00 > 322.00	2.371	2.365	0.006		6246396	49.3		98.6	28288	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.371	2.365	0.006	1.000	4728049	39.3			2738	
D 11 18O2 PFHxS										
403.00 > 84.00	2.387	2.381	0.006		8676292	39.8		84.1	25021	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.387	2.381	0.006	1.000	33347811	174.6			11584	
D 14 13C4 PFOA										
417.00 > 372.00	2.727	2.720	0.007		4577850	39.4		78.8	20825	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.734	2.720	0.014	1.000	63667309	635.5			4567	EM
413.00 > 169.00	2.727	2.720	0.007	0.997	45405980		1.40(0.90-1.10)		8282	M
* 62 13C2-PFOA										
415.00 > 370.00	2.727	2.720	0.007		63936	50.0			385	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.734	2.727	0.007	1.000	743425	4.68			162	
D 18 13C4 PFOS										
503.00 > 80.00	3.102	3.093	0.009		6343043	41.8		87.5	24881	
D 19 13C5 PFNA										
468.00 > 423.00	3.102	3.093	0.009		4235057	47.5		95.1	21484	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.102	3.093	0.009	1.000	24207550	172.1			10987	
499.00 > 99.00	3.102	3.093	0.009	1.000	5476886		4.42(0.90-1.10)		10036	
20 Perfluorononanoic acid										
463.00 > 419.00	3.102	3.093	0.009	1.000	100219	1.20			48.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.463	3.453	0.010		4073767	52.8		106	23022	
D 21 13C8 FOSA										
506.00 > 78.00	3.463	3.453	0.010		164839	0.7169		1.4	3031	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.463	3.453	0.010	1.000	39752	0.5402			66.3	
22 Perfluorooctane Sulfonamide										M
498.00 > 78.00	3.463	3.453	0.010	1.000	3469	1.14			49.3	M
D 30 13C2 PFUnA										
565.00 > 520.00	3.785	3.782	0.003		2515509	48.1		96.2	18561	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.785	3.782	0.003	1.000	14735	0.2602			23.1	
D 36 13C2 PFDaA										
615.00 > 570.00	4.083	4.072	0.011		2281395	44.5		89.0	14759	
37 Perfluorododecanoic acid										M
613.00 > 569.00	4.083	4.072	0.011	1.000	10510	0.2382			7.2	M
D 43 13C2-PFTeDA										
715.00 > 670.00	4.579	4.574	0.005		2389874	44.2		88.4	14528	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_065.d

Injection Date: 29-Aug-2017 11:18:36

Instrument ID: A8_N

Lims ID: 320-30556-A-1-A

Lab Sample ID:

Client ID: TP-PFC-020-TPI

Operator ID: SACINSTLCMS01

ALS Bottle#: 52

Worklist Smp#: 20

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

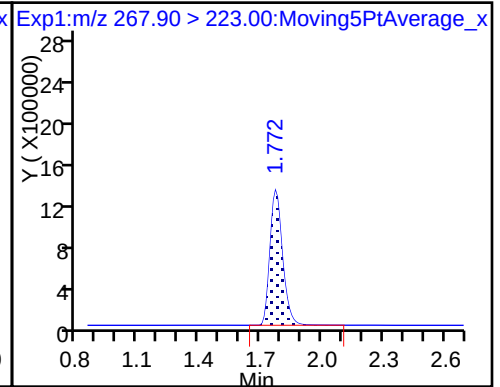
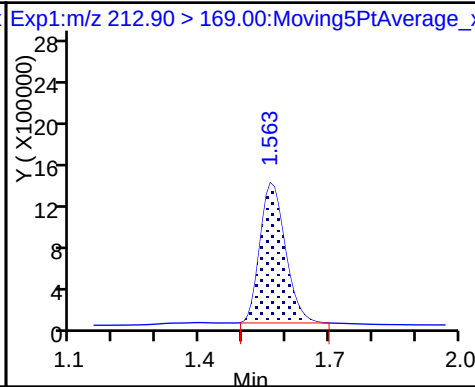
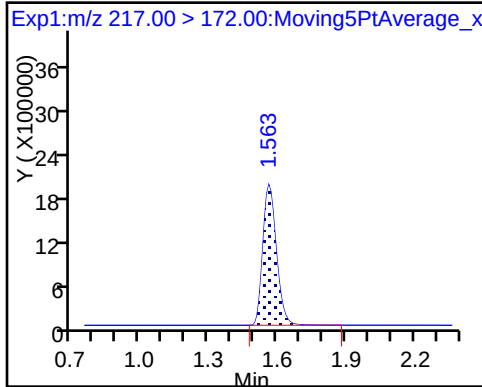
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

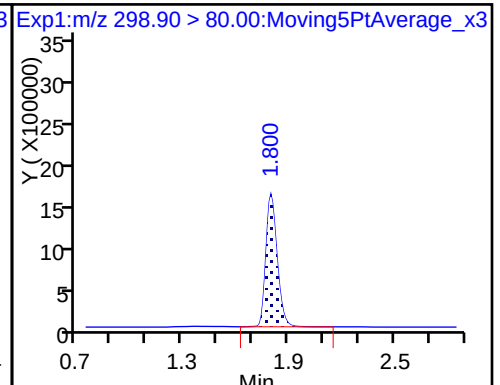
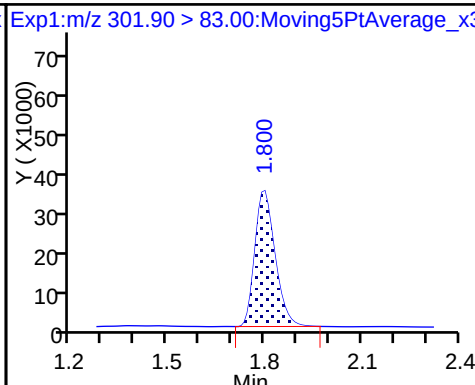
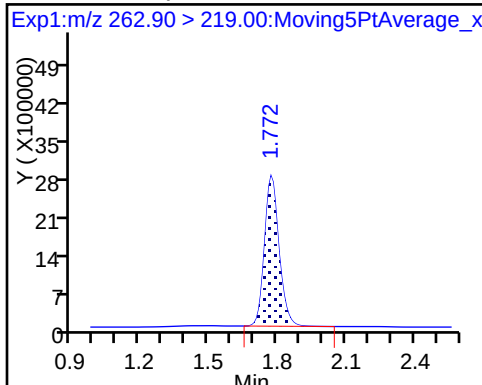
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

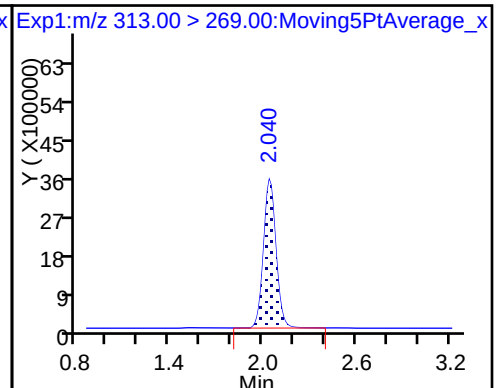
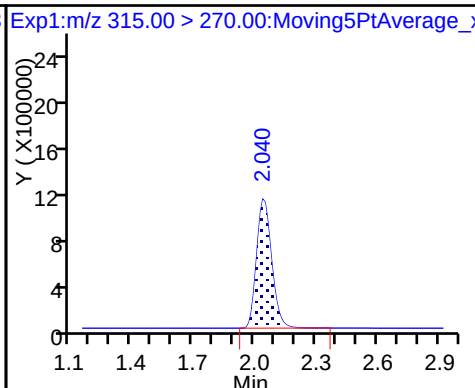
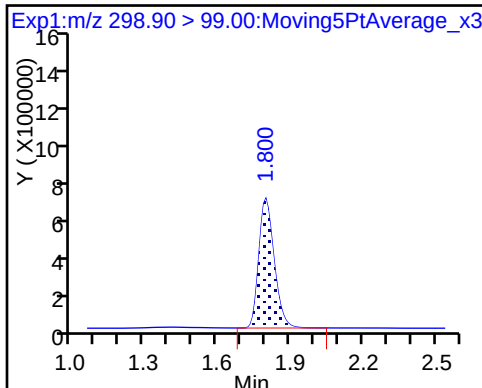
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

D 7 13C2 PFHxA

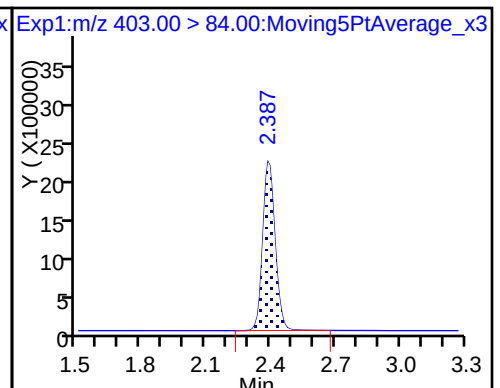
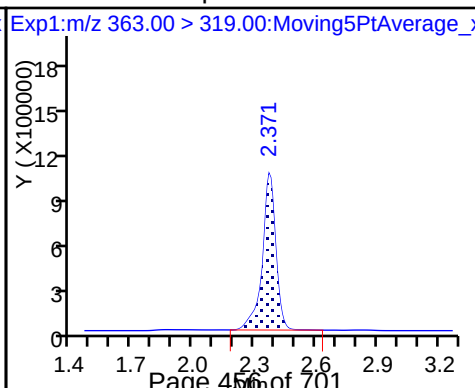
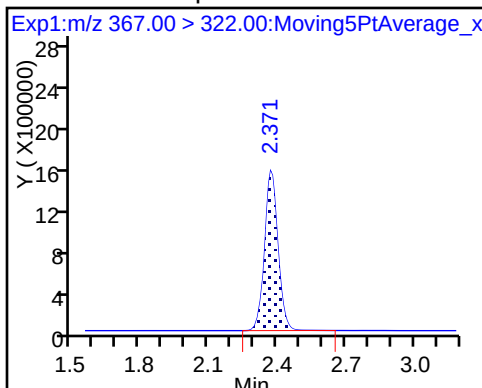
6 Perfluorohexanoic acid

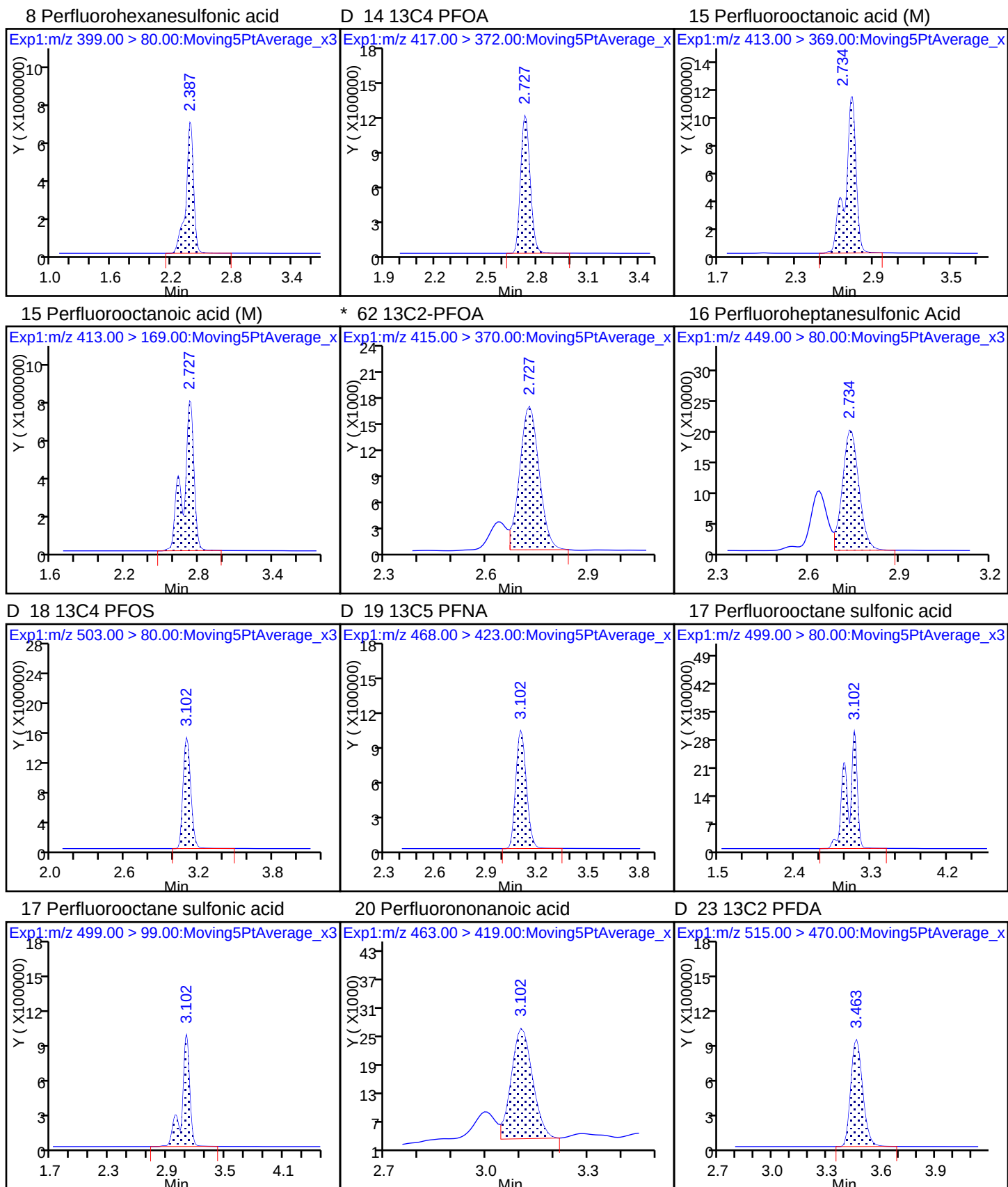


D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

D 11 18O2 PFHxS

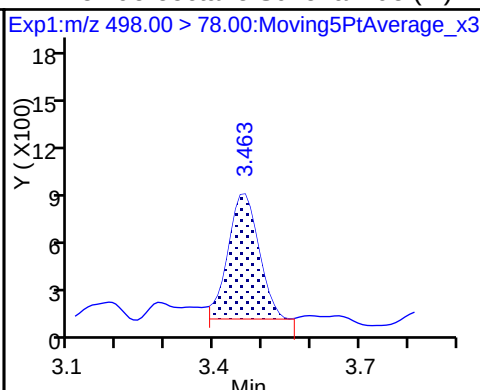
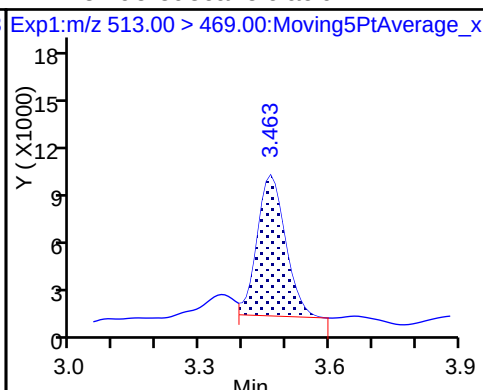
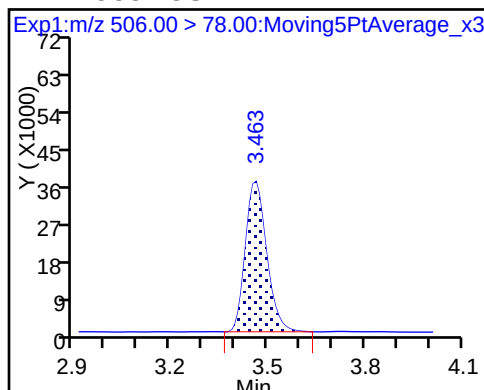




D 21 13C8 FOSA

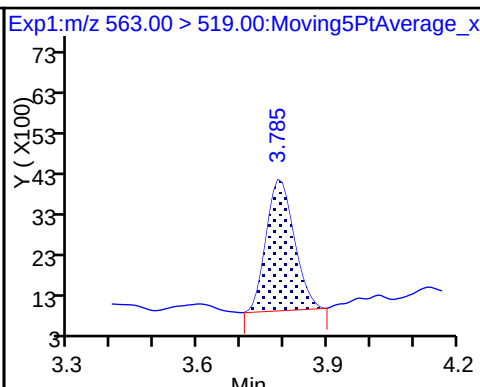
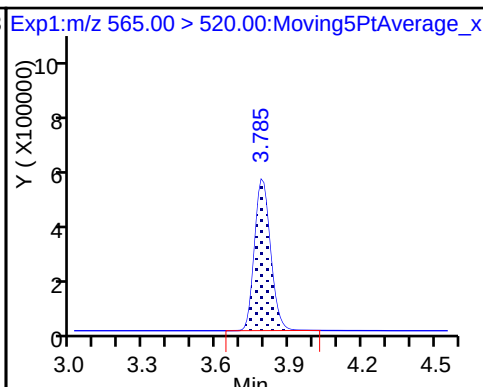
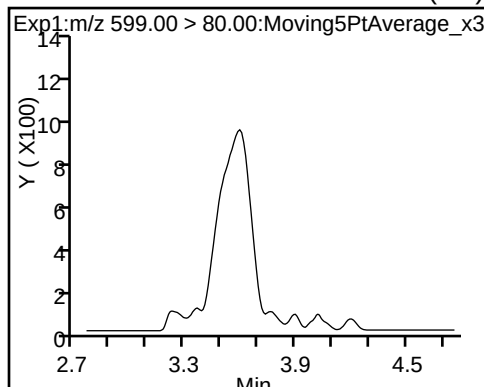
24 Perfluorodecanoic acid

22 Perfluorooctane Sulfonamide (M)



29 Perfluorodecane Sulfonic acid (ND) D 30 13C2 PFUnA

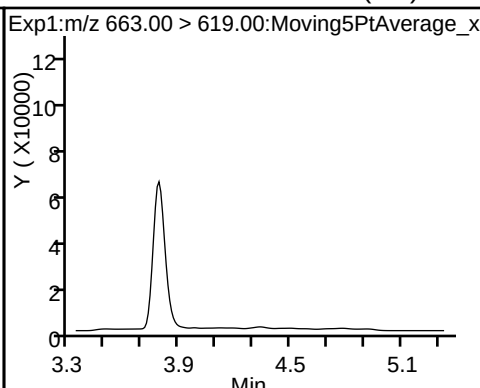
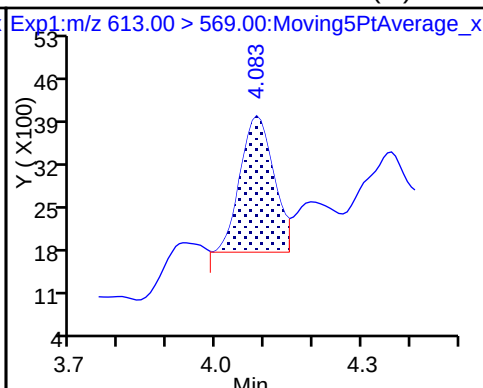
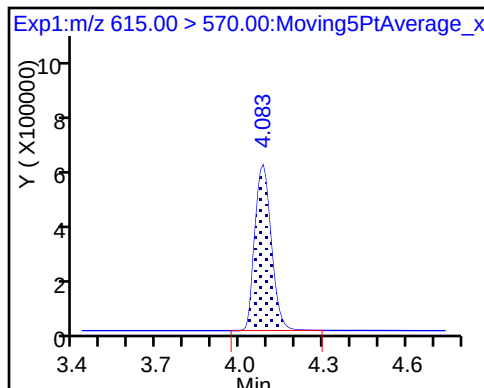
31 Perfluoroundecanoic acid



D 36 13C2 PFDaA

37 Perfluorododecanoic acid (M)

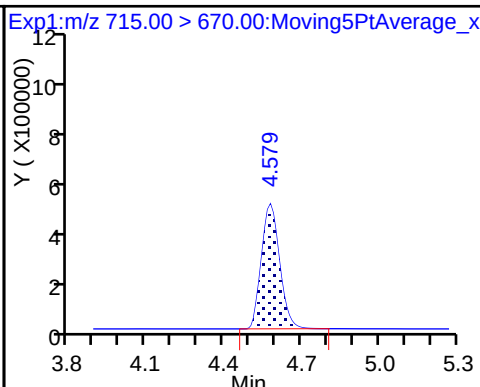
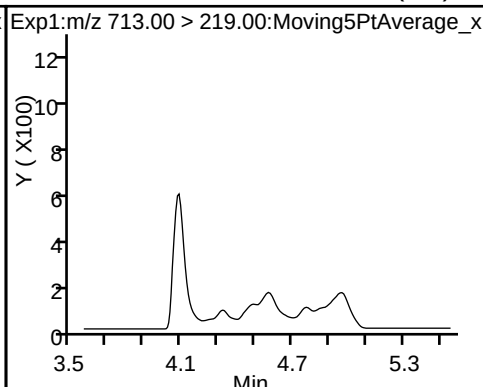
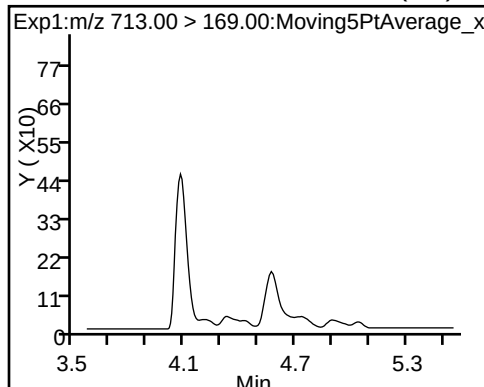
41 Perfluorotridecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

D 43 13C2-PFTeDA



TestAmerica Sacramento

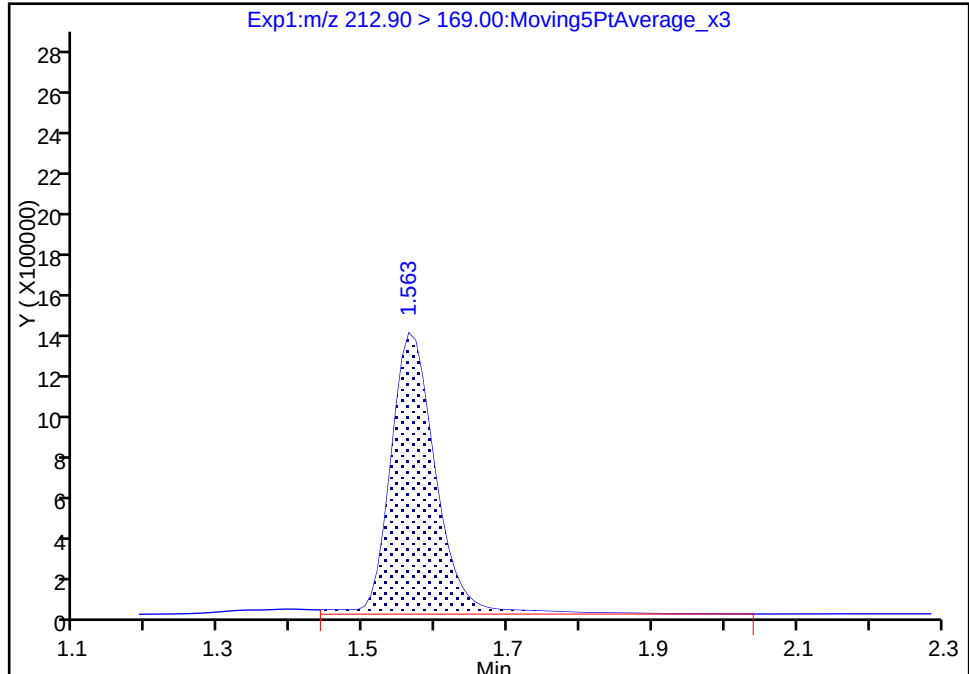
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_065.d		
Injection Date:	29-Aug-2017 11:18:36	Instrument ID:	A8_N
Lims ID:	320-30556-A-1-A	Lab Sample ID:	
Client ID:	TP-PFC-020-TPI		
Operator ID:	SACINSTLCMS01	ALS Bottle#:	52
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL
Column:		Detector:	EXP1
		Worklist Smp#:	20

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

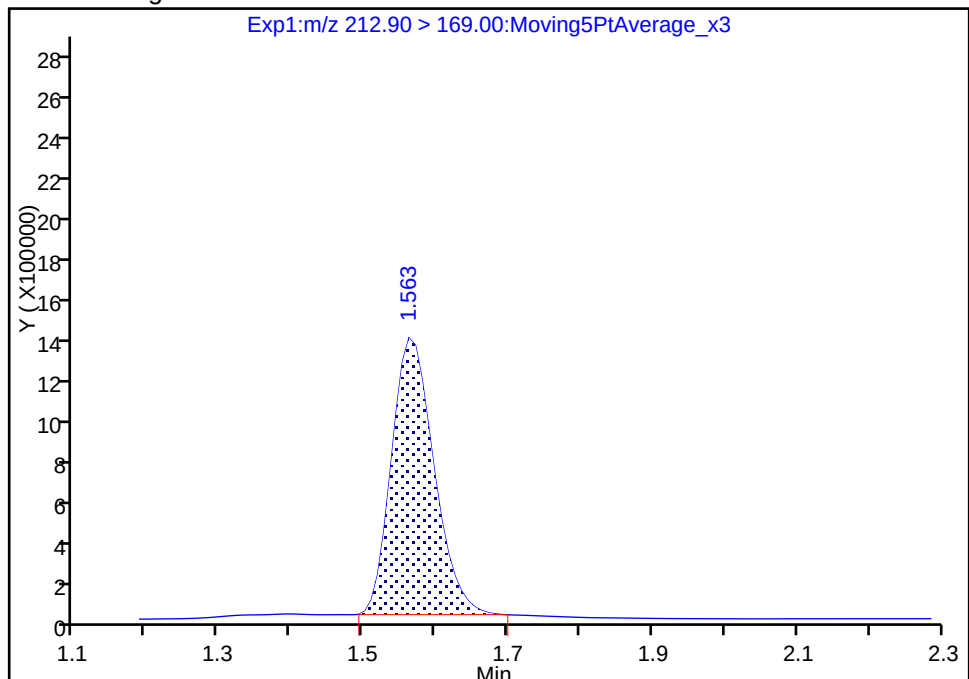
RT: 1.56
Area: 6009352
Amount: 42.329460
Amount Units: ng/ml

Processing Integration Results



RT: 1.56
Area: 5552887
Amount: 39.114152
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:29:00

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

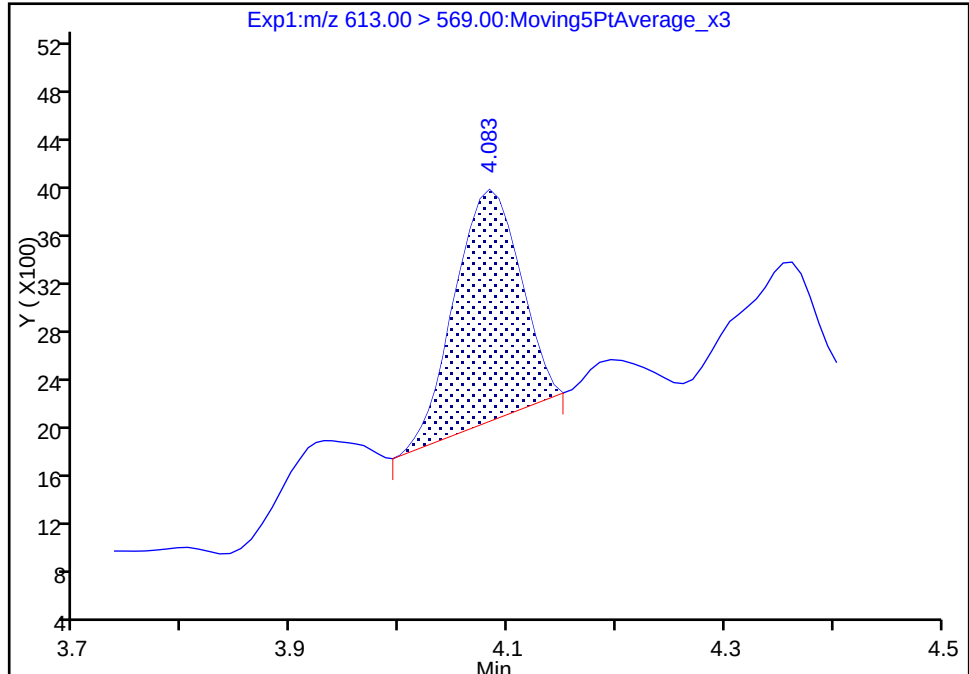
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_065.d		
Injection Date:	29-Aug-2017 11:18:36	Instrument ID:	A8_N
Lims ID:	320-30556-A-1-A	Lab Sample ID:	
Client ID:	TP-PFC-020-TPI		
Operator ID:	SACINSTLCMS01	ALS Bottle#:	52
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL
Column:		Detector:	EXP1
		Worklist Smp#:	20

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

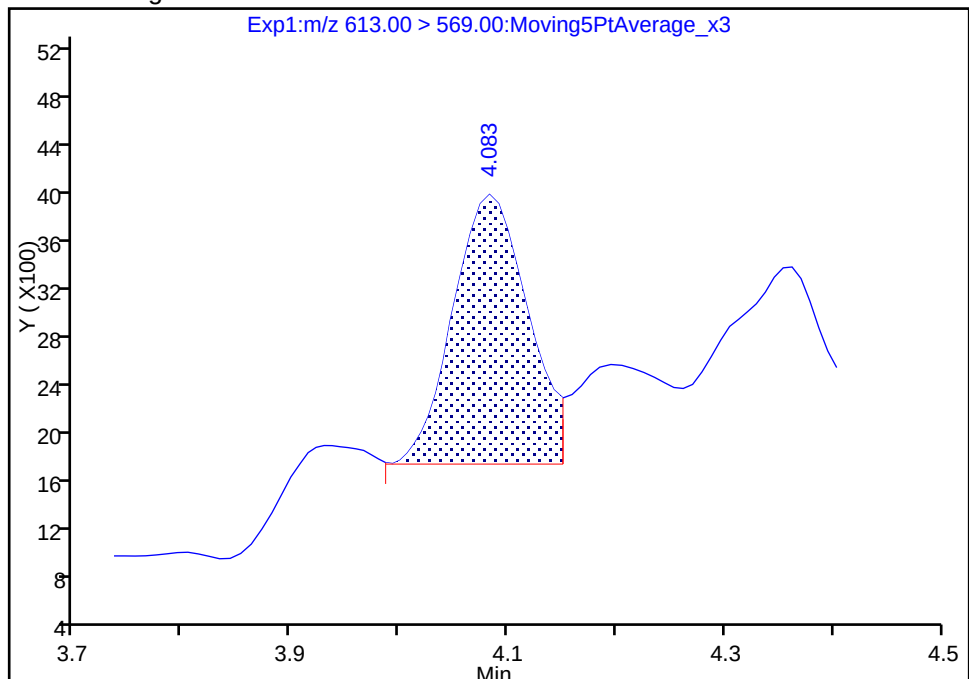
RT: 4.08
Area: 7951
Amount: 0.180181
Amount Units: ng/ml

Processing Integration Results



RT: 4.08
Area: 10510
Amount: 0.238172
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:29:41

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

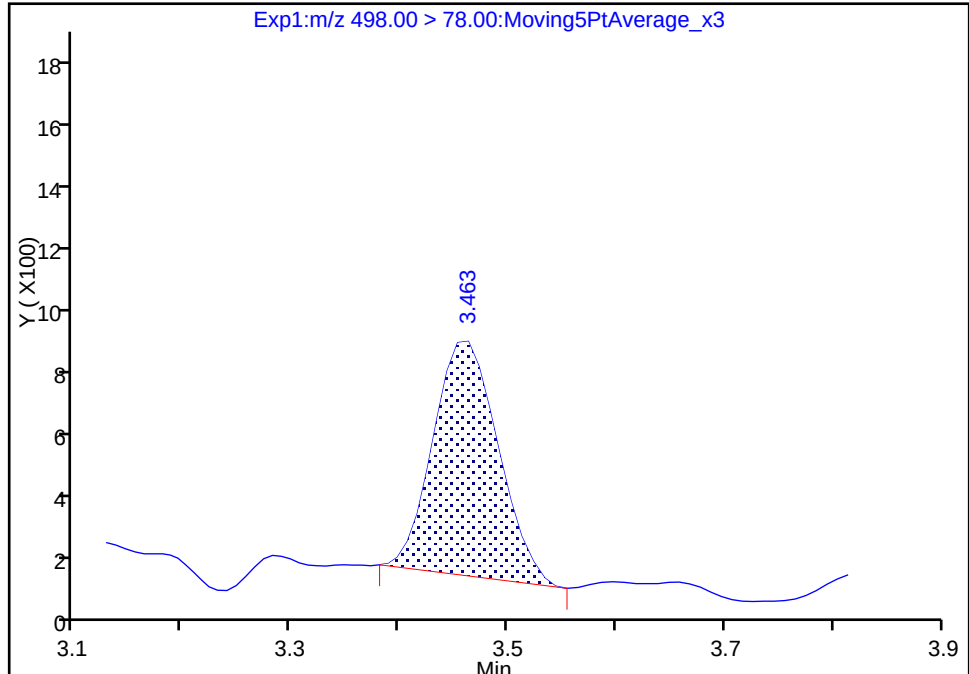
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_065.d		
Injection Date:	29-Aug-2017 11:18:36	Instrument ID:	A8_N
Lims ID:	320-30556-A-1-A	Lab Sample ID:	
Client ID:	TP-PFC-020-TPI		
Operator ID:	SACINSTLCMS01	ALS Bottle#:	52
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL
Column:		Detector	EXP1
		Worklist Smp#:	20

22 Perfluorooctane Sulfonamide, CAS: 754-91-6

Signal: 1

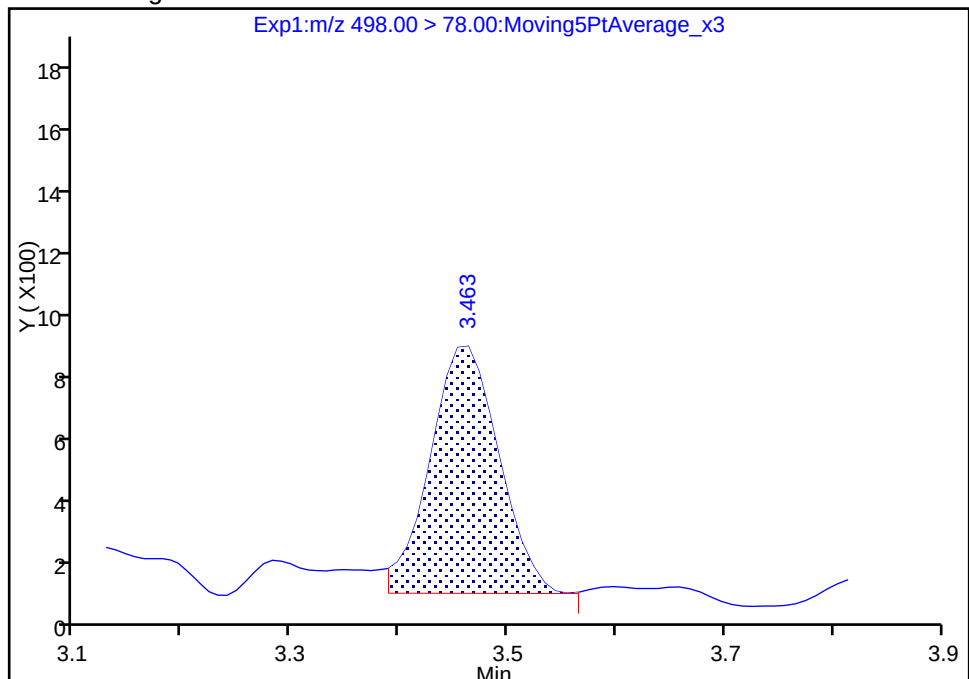
RT: 3.46
Area: 3111
Amount: 1.019869
Amount Units: ng/ml

Processing Integration Results



RT: 3.46
Area: 3469
Amount: 1.137231
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:29:28

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Client Sample ID: TP-PFC-020-TPI DL Lab Sample ID: 320-30556-1 DL

Matrix: Water Lab File ID: 2017.08.28B_061.d

Analysis Method: 537 (modified) Date Collected: 08/08/2017 09:00

Extraction Method: 3535 Date Extracted: 08/16/2017 09:20

Sample wt/vol: 260.8 (mL) Date Analyzed: 08/29/2017 10:51

Con. Extract Vol.: 0.50 (mL) Dilution Factor: 10

Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)

% Moisture: _____ GPC Cleanup: (Y/N) N

Analysis Batch No.: 181833 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D M	24	19	7.2

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	109		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_061.d
 Lims ID: 320-30556-A-1-A
 Client ID: TP-PFC-020-TPI
 Sample Type: Client
 Inject. Date: 29-Aug-2017 10:51:00 ALS Bottle#: 19 Worklist Smp#: 16
 Injection Vol: 2.0 ul Dil. Factor: 10.0000
 Sample Info: 320-30556-a-1-a 10X
 Misc. Info.: Plate: 1 Rack: 5
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:31:01 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:25:32

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	1.563	1.564	-0.001		1016997	4.91		9.8	6959	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.563	1.564	-0.001	1.000	730707	3.96			68.0	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.773	1.773	0.0		708085	5.39		10.8	8455	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.773	1.773	0.0	1.000	1687235	11.4			672	
D 47 13C3-PFBS										
301.90 > 83.00	1.791	1.792	-0.001		19037	4.88		10.5	494	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.800	1.801	-0.001	1.000	798689	2.67			2985	
298.90 > 99.00	1.800	1.801	-0.001	1.000	338051		2.36(0.00-0.00)		1604	
D 7 13C2 PFHxA										
315.00 > 270.00	2.040	2.041	-0.001		710110	5.18		10.4	10905	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.040	2.041	-0.001	1.000	2756446	20.8			2455	
D 9 13C4-PFHpA										
367.00 > 322.00	2.367	2.365	0.002		728714	5.75		11.5	10464	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.367	2.365	0.002	1.000	572243	4.07			772	
D 11 18O2 PFHxS										
403.00 > 84.00	2.384	2.381	0.003		1044254	4.79		10.1	15908	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.384	2.381	0.003	1.000	5212185	22.7			8326	M
D 14 13C4 PFOA										
417.00 > 372.00	2.725	2.720	0.005		632262	5.44		10.9	9581	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.725	2.720	0.005	1.000	12506196	90.4			2972	M
413.00 > 169.00	2.725	2.720	0.005	1.000	7596589		1.65(0.90-1.10)		10696	M
* 62 13C2-PFOA										
415.00 > 370.00	2.718	2.720	-0.002		8466	50.0			305	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.732	2.727	0.005	1.000	83524	0.5069			140	
D 18 13C4 PFOS										
503.00 > 80.00	3.093	3.093	0.0		657388	4.34		9.1	5371	
D 19 13C5 PFNA										
468.00 > 423.00	3.093	3.093	0.0		491405	5.52		11.0	7762	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.093	3.093	0.0	1.000	2638267	18.1			23578	
499.00 > 99.00	3.093	3.093	0.0	1.000	586150		4.50(0.90-1.10)		2509	
20 Perfluorononanoic acid										
463.00 > 419.00	3.102	3.093	0.009	1.000	14556	0.1503			9.1	
D 23 13C2 PFDA										
515.00 > 470.00	3.459	3.453	0.006		381078	4.94		9.9	5664	
D 21 13C8 FOSA										
506.00 > 78.00	3.449	3.453	-0.004		19335	0.0841		0.2	290	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.449	3.453	-0.004	1.000	4008	0.0582			8.5	
D 30 13C2 PFUnA										
565.00 > 520.00	3.780	3.782	-0.002		258525	4.95		9.9	4546	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.790	3.782	0.008	1.000	1916	0.0329			3.0	
D 36 13C2 PFDoA										
615.00 > 570.00	4.072	4.072	0.0		235727	4.60		9.2	3394	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.570	4.574	-0.004		263931	4.88		9.8	3950	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_061.d

Injection Date: 29-Aug-2017 10:51:00

Instrument ID: A8_N

Lims ID: 320-30556-A-1-A

Lab Sample ID: 320-30556-1

Client ID: TP-PFC-020-TPI

Operator ID: SACINSTLCMS01

ALS Bottle#: 19

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 10.0000

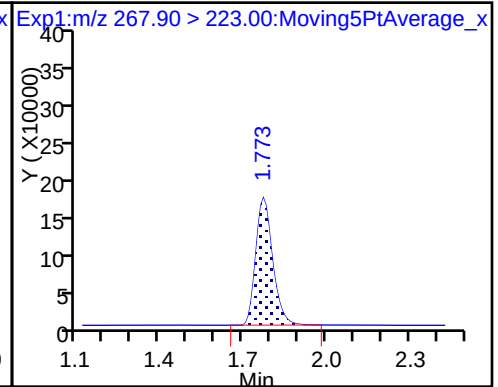
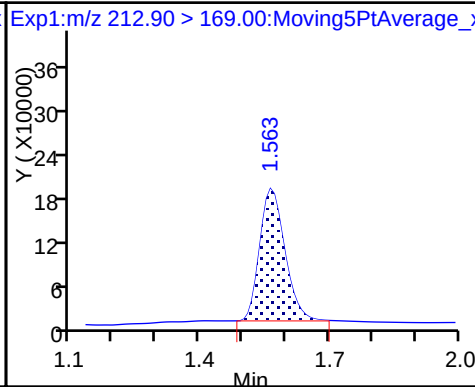
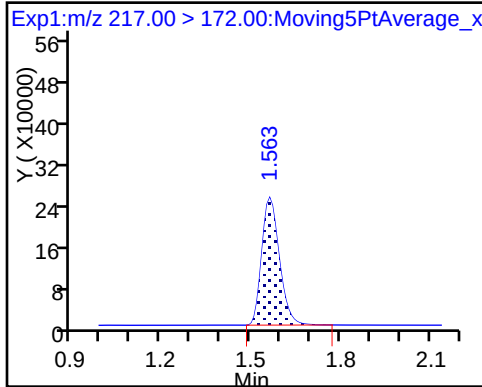
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

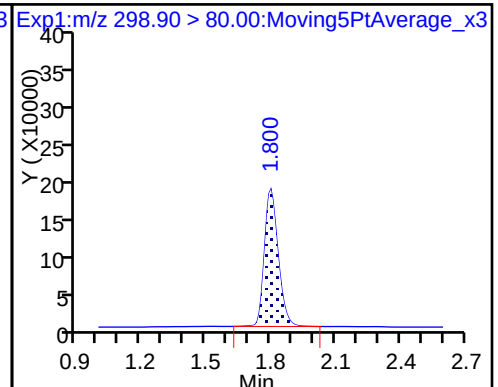
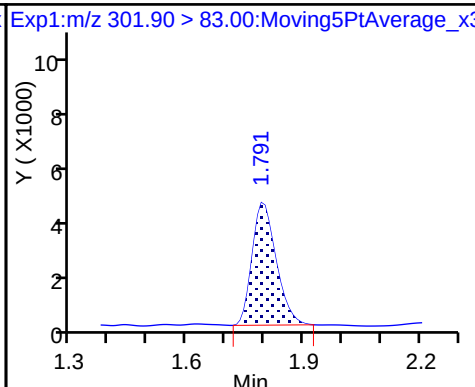
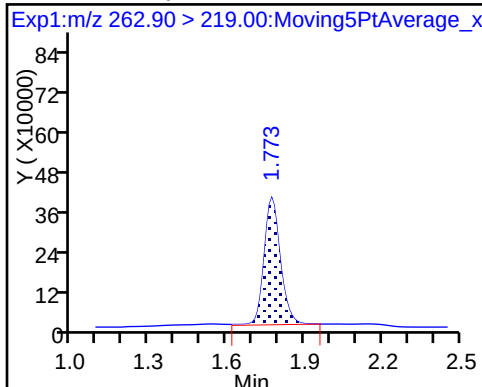
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

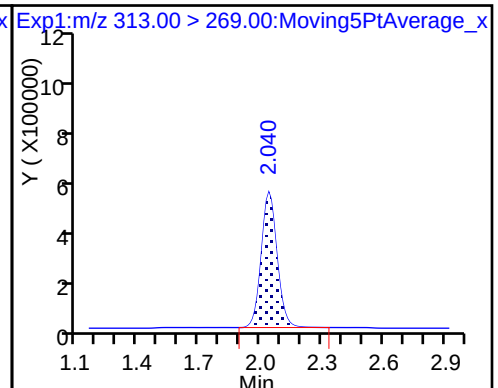
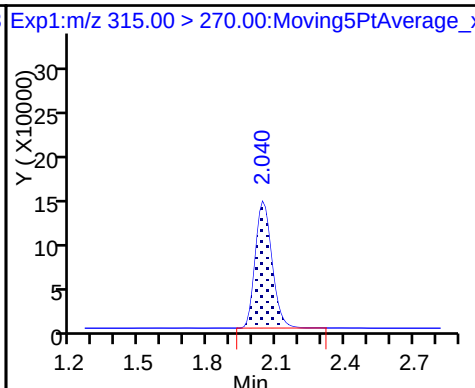
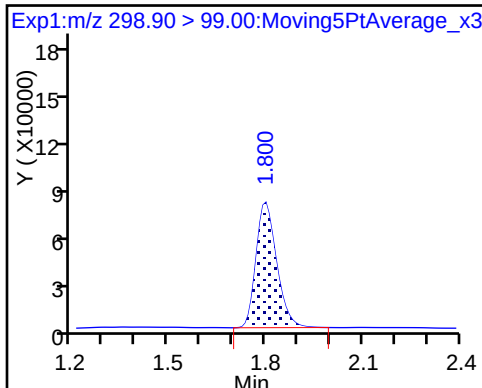
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

D 7 13C2 PFHxA

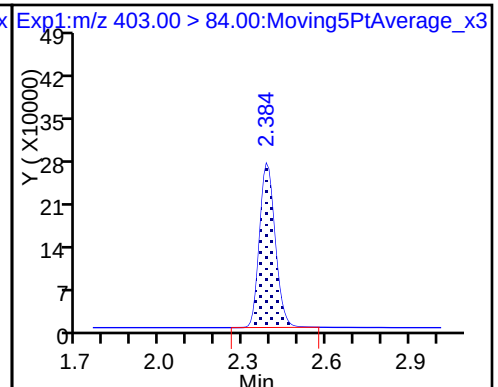
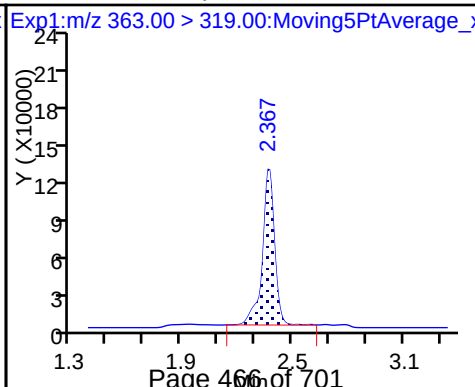
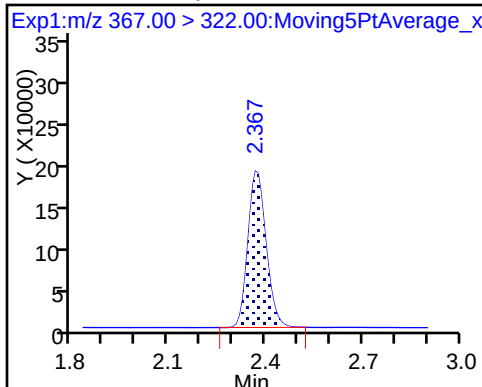
6 Perfluorohexanoic acid



D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

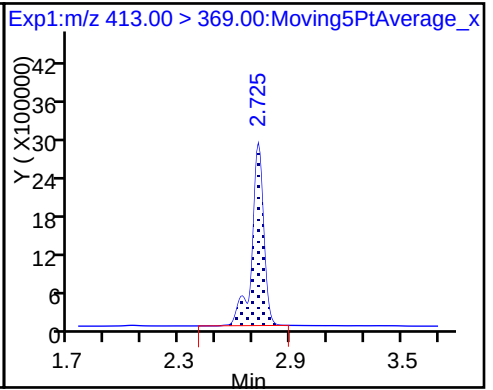
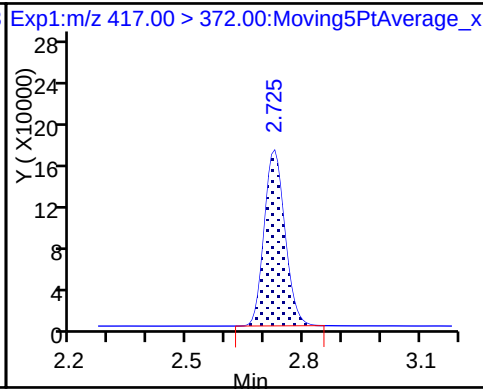
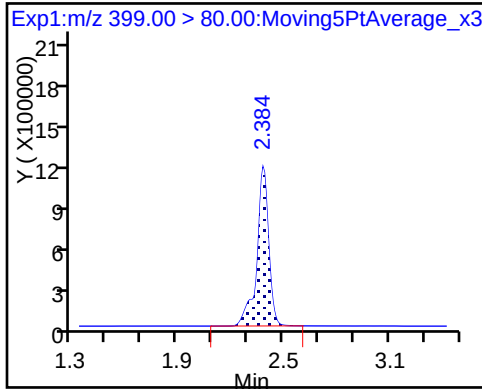
D 11 18O2 PFHxS



8 Perfluorohexanesulfonic acid (M)

D 14 13C4 PFOA

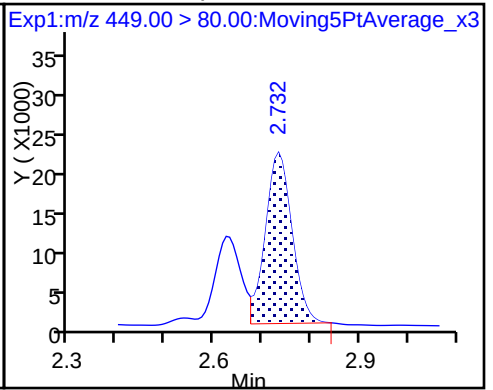
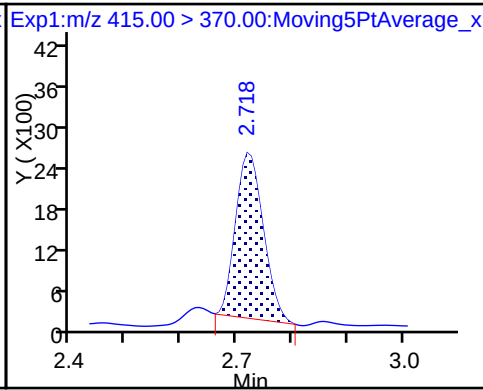
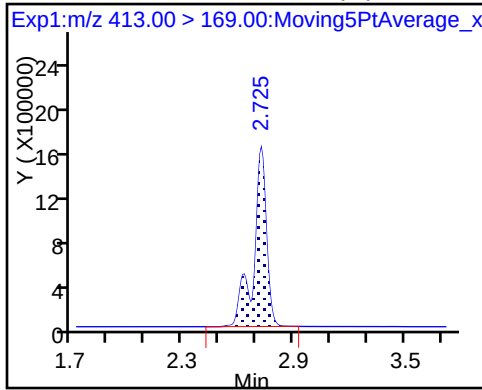
15 Perfluorooctanoic acid (M)



15 Perfluorooctanoic acid (M)

* 62 13C2-PFOA

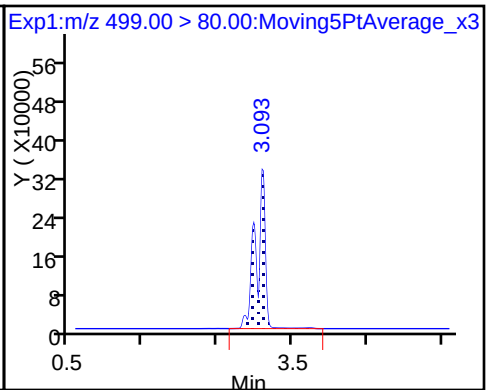
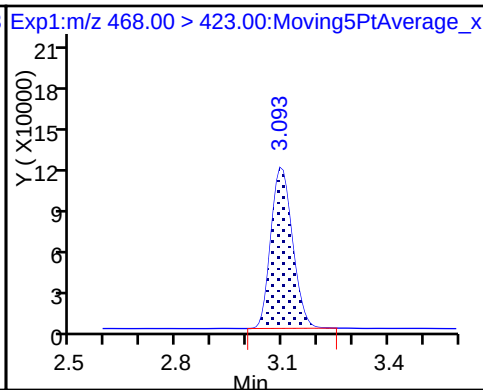
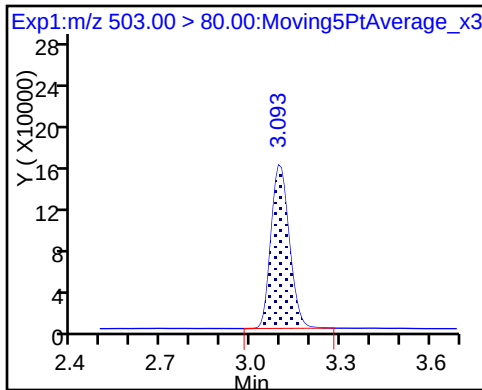
16 Perfluoroheptanesulfonic Acid



D 18 13C4 PFOS

D 19 13C5 PFNA

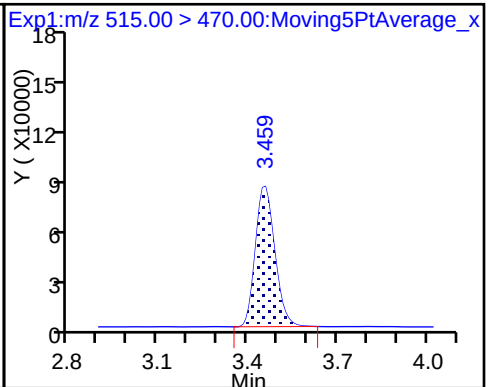
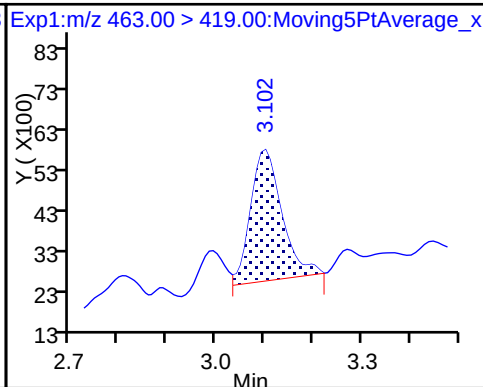
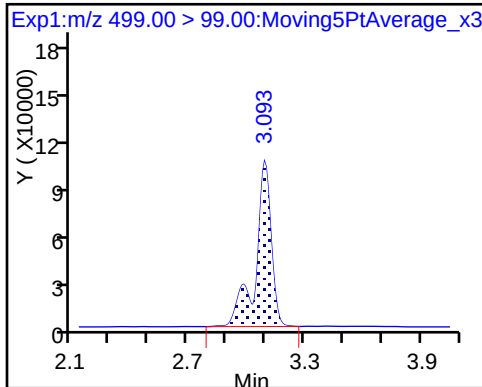
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid

20 Perfluorononanoic acid

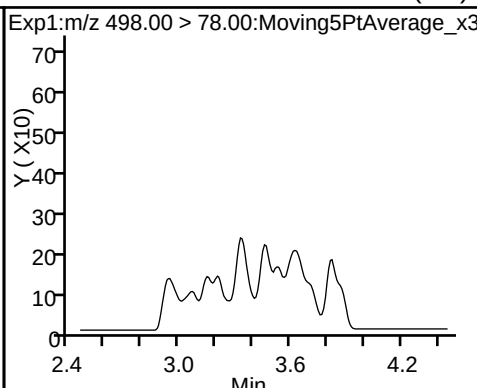
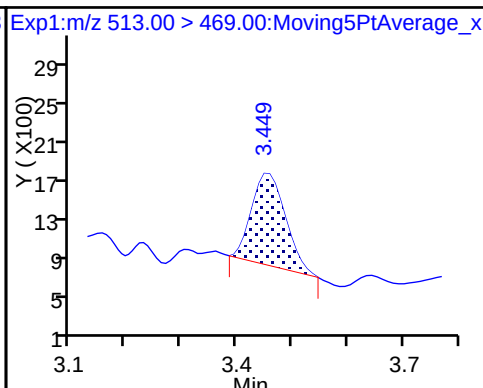
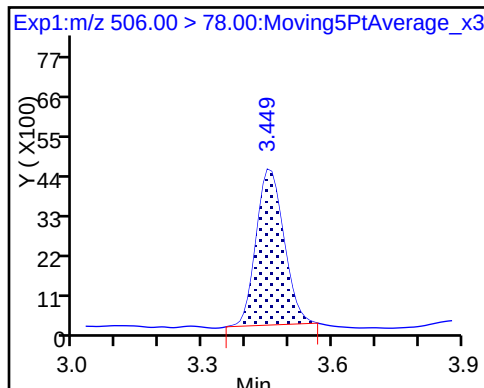
D 23 13C2 PFDA



D 21 13C8 FOSA

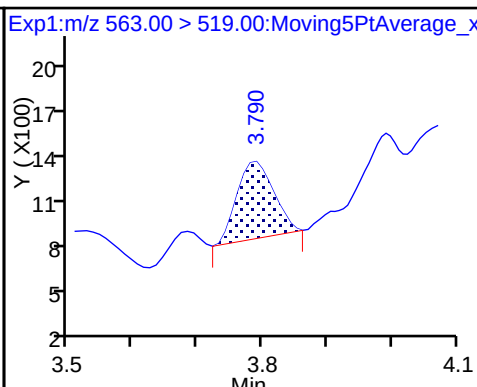
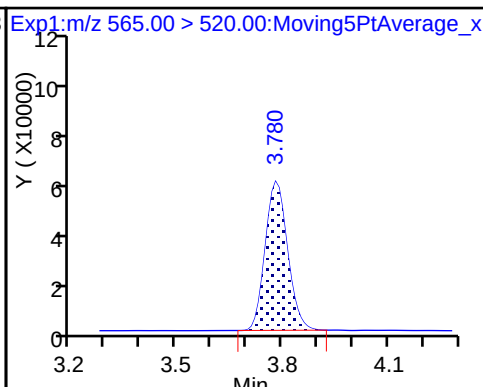
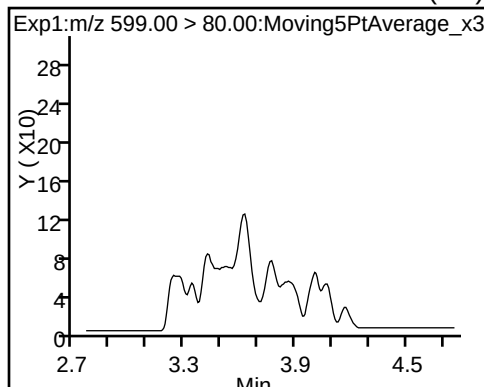
24 Perfluorodecanoic acid

22 Perfluorooctane Sulfonamide (ND)



29 Perfluorodecane Sulfonic acid (ND) D 30 13C2 PFUnA

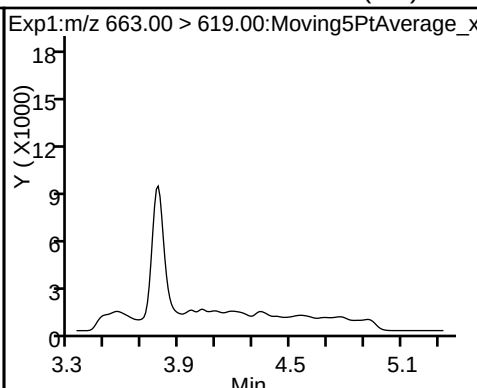
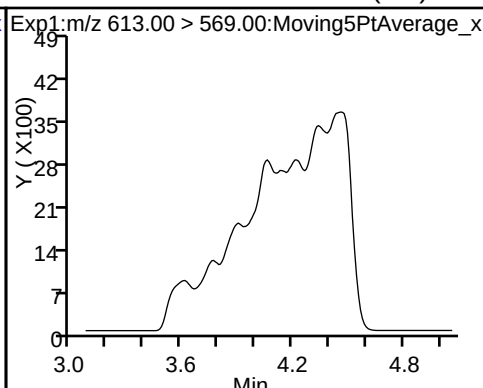
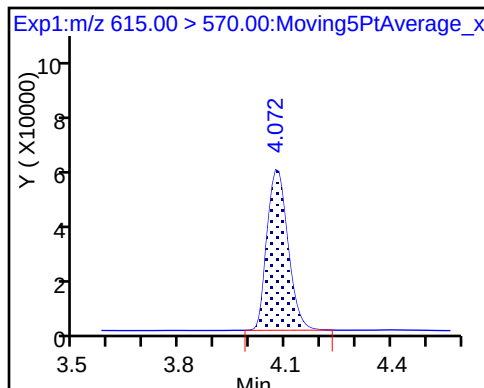
31 Perfluoroundecanoic acid



D 36 13C2 PFDaA

37 Perfluorododecanoic acid (ND)

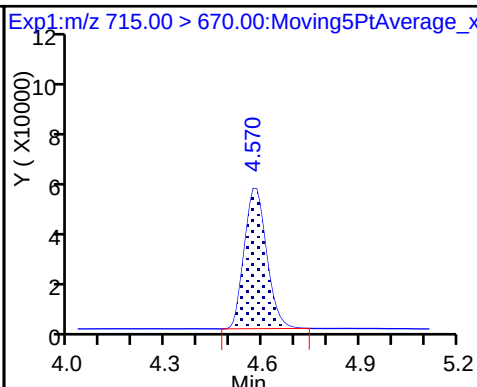
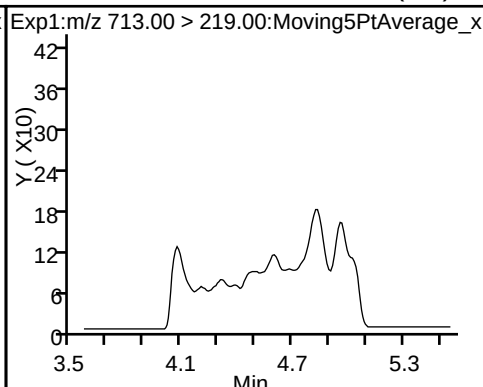
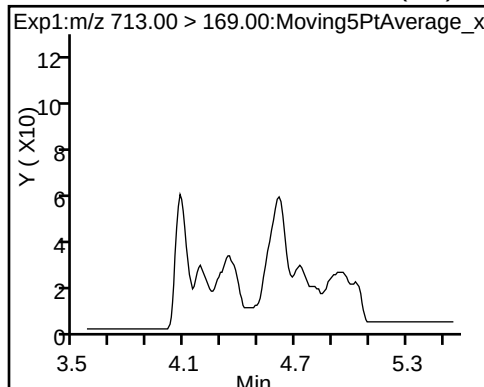
41 Perfluorotridecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

D 43 13C2-PFTeDA



TestAmerica Sacramento

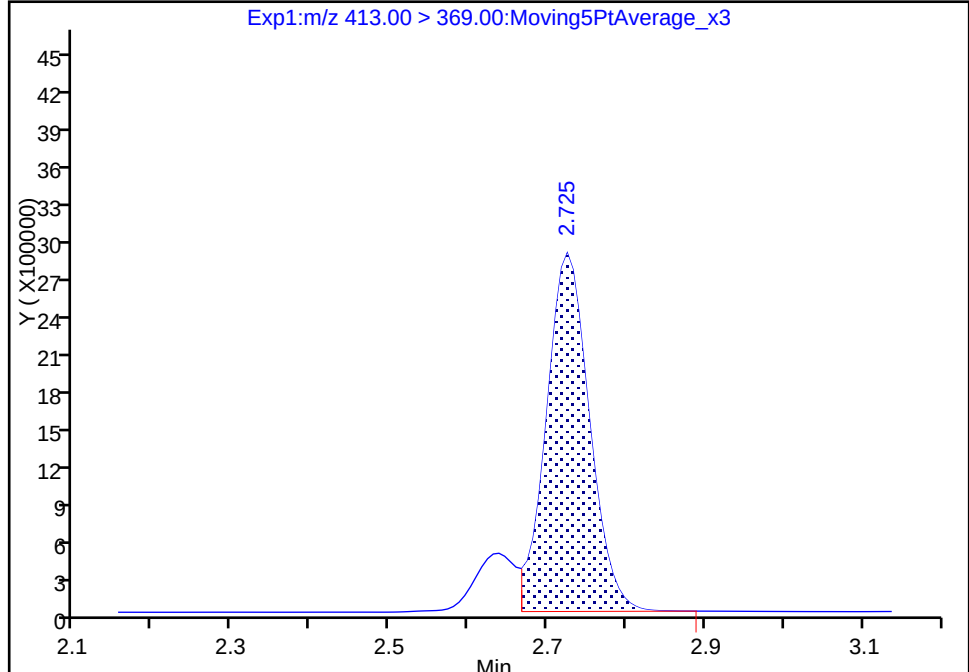
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_061.d				
Injection Date:	29-Aug-2017 10:51:00	Instrument ID:	A8_N		
Lims ID:	320-30556-A-1-A	Lab Sample ID:	320-30556-1		
Client ID:	TP-PFC-020-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	19	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

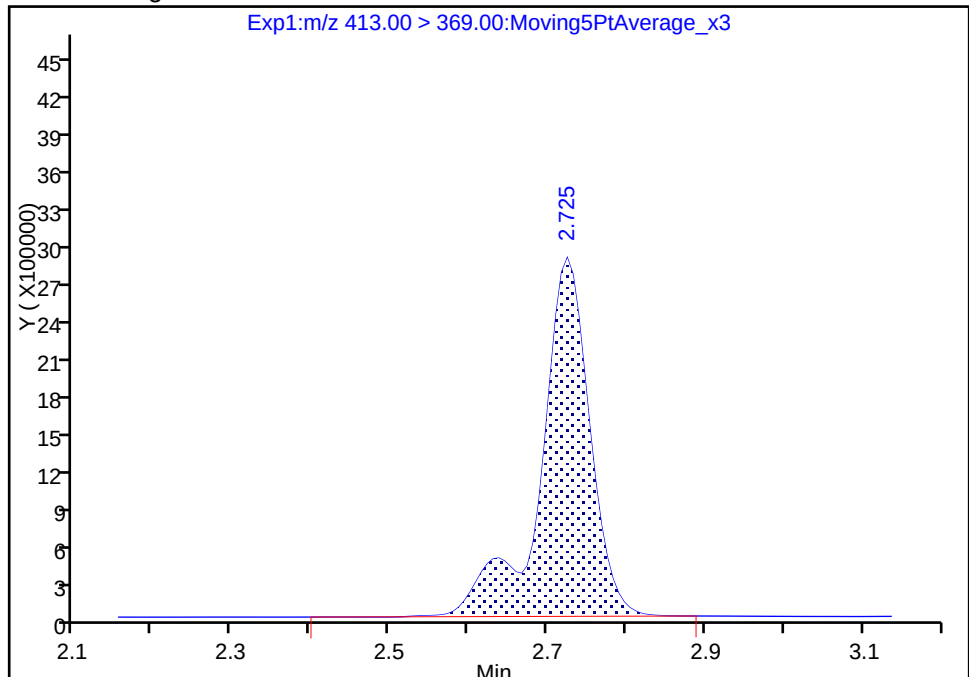
RT: 2.73
Area: 10826160
Amount: 78.247502
Amount Units: ng/ml

Processing Integration Results



RT: 2.73
Area: 12506196
Amount: 90.390184
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:25:16

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

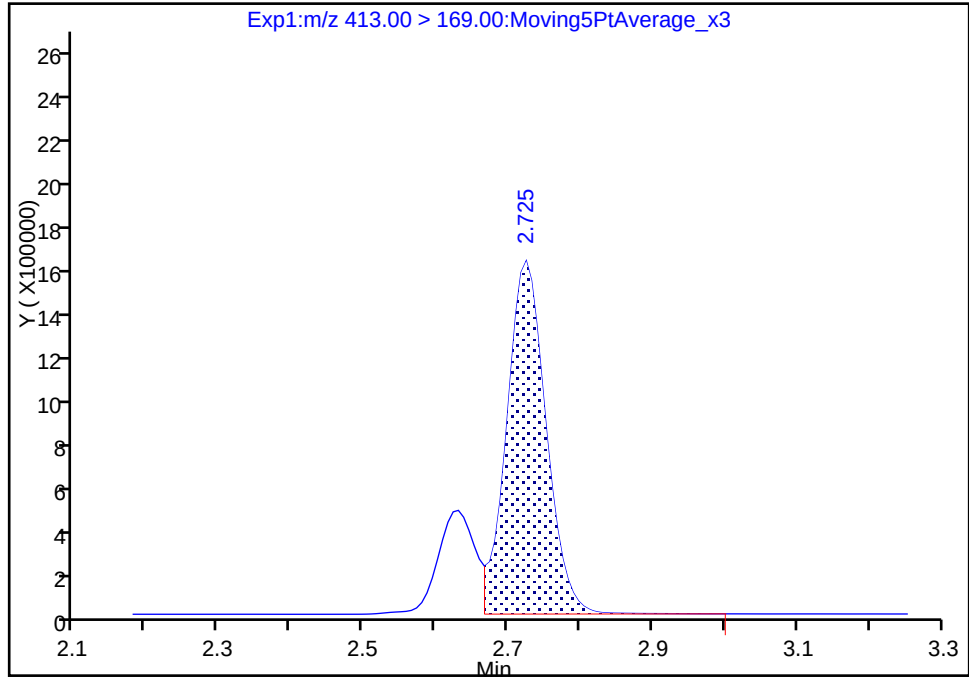
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_061.d				
Injection Date:	29-Aug-2017 10:51:00	Instrument ID:	A8_N		
Lims ID:	320-30556-A-1-A	Lab Sample ID:	320-30556-1		
Client ID:	TP-PFC-020-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	19	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

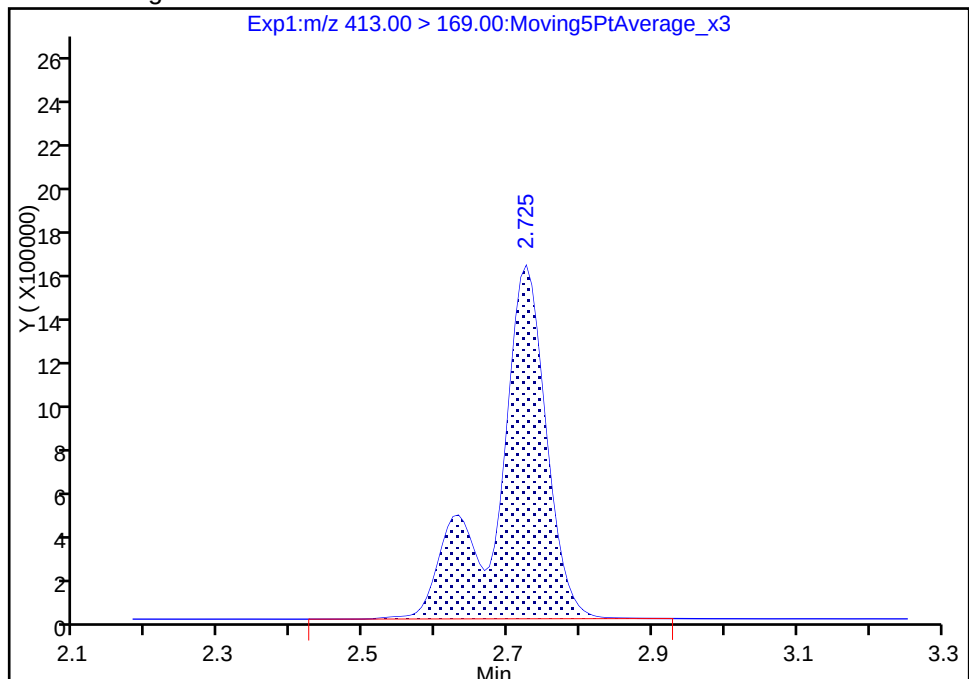
RT: 2.73
Area: 5965301
Amount: 78.247502
Amount Units: ng/ml

Processing Integration Results



RT: 2.73
Area: 7596589
Amount: 90.390184
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:25:17

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-MID-CARBON</u>	Lab Sample ID: <u>320-30556-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_062.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>258.8 (mL)</u>	Date Analyzed: <u>08/29/2017 10:57</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		2.4	0.97	0.44
2706-90-3	Perfluoropentanoic acid (PFPeA)	29		2.4	1.9	0.96
307-24-4	Perfluorohexanoic acid (PFHxA)	1.8	J	2.4	1.9	0.76
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	1.9	0.77
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U M	2.4	1.9	0.72
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.63
335-76-2	Perfluorodecanoic acid (PFDA)	0.97	U	2.4	0.97	0.43
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	1.9	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	1.9	0.56
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	1.9	0.53
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.97	U	2.4	0.97	0.39
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.4	1.9	0.89
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.84
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	1.9	0.69
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.9	2.9	1.2
335-77-3	Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.9	2.9	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.1	J	39	1.9	0.62

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-MID-CARBON</u>	Lab Sample ID: <u>320-30556-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_062.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>258.8 (mL)</u>	Date Analyzed: <u>08/29/2017 10:57</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	2	Q	25-150
STL00992	13C4 PFBA	112		25-150
STL00993	13C2 PFHxA	127		25-150
STL00990	13C4 PFOA	140		25-150
STL00995	13C5 PFNA	120		25-150
STL00996	13C2 PFDA	110		25-150
STL00997	13C2 PFUnA	93		25-150
STL00998	13C2 PFDoA	101		25-150
STL00994	18O2 PFHxS	126		25-150
STL00991	13C4 PFOS	126		25-150
STL01892	13C4-PFHpA	151	Q	25-150
STL01893	13C5 PFPeA	128		25-150
STL02337	13C3-PFBS	129		25-150
STL02116	13C2-PFTeDA	143		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_062.d
 Lims ID: 320-30556-A-2-A
 Client ID: TP-PFC-020-MID-CARBON
 Sample Type: Client
 Inject. Date: 29-Aug-2017 10:57:54 ALS Bottle#: 49 Worklist Smp#: 17
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30556-a-2-a
 Misc. Info.: Plate: 1 Rack: 5
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:31:01 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 29-Aug-2017 14:26:31

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	1.563	1.564	-0.001		11605775	56.0		112	34194	
2 Perfluorobutyric acid										
212.90 > 169.00	1.563	1.564	-0.001	1.000	13030241	61.8			1272	
D 3 13C5-PFPeA										
267.90 > 223.00	1.773	1.773	0.0		8430360	64.1		128	39430	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.754	1.773	-0.019	1.000	2617236	14.9			1329	
D 47 13C3-PFBS										
301.90 > 83.00	1.791	1.792	-0.001		233836	59.9		129	6848	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.800	1.801	-0.001	1.000	307806	0.8366			1647	
298.90 > 99.00	1.800	1.801	-0.001	1.000	117353		2.62(0.00-0.00)		794	
D 7 13C2 PFHxA										
315.00 > 270.00	2.040	2.041	-0.001		8706458	63.5		127	21966	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.006	2.041	-0.035	1.000	153756	0.9480			180	
D 9 13C4-PFHpA										
367.00 > 322.00	2.372	2.365	0.007		9566166	75.5		151	38234	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.364	2.365	-0.001	1.000	3165	0.0172			4.5	M
D 11 18O2 PFHxS										
403.00 > 84.00	2.380	2.381	-0.001		12986481	59.5		126	38033	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.388	2.381	0.007	1.000	57233	0.2002			452	
D 14 13C4 PFOA										
417.00 > 372.00	2.723	2.720	0.003		8146943	70.1		140	49207	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.723	2.720	0.003	1.000	28956	0.1624			5.9	M
413.00 > 169.00	2.723	2.720	0.003	1.000	16772		1.73(0.90-1.10)		107	M
* 62 13C2-PFOA										
415.00 > 370.00	2.723	2.720	0.003		4511	50.0			182	
D 18 13C4 PFOS										
503.00 > 80.00	3.098	3.093	0.005		9121058	60.2		126	25659	
D 19 13C5 PFNA										
468.00 > 423.00	3.098	3.093	0.005		5363774	60.2		120	30166	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.098	3.093	0.005	1.000	35686	0.1764			161	M
499.00 > 99.00	3.098	3.093	0.005	1.000	8033		4.44(0.90-1.10)		49.3	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.081	3.093	-0.012	1.000	1349	0.0128			1.3	
D 23 13C2 PFDA										
515.00 > 470.00	3.450	3.453	-0.003		4225003	54.8		110	25430	
D 21 13C8 FOSA										
506.00 > 78.00	3.450	3.453	-0.003		181173	0.7880		1.6	3060	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.459	3.453	0.006	1.000	1897	0.5658			25.3	
D 30 13C2 PFUnA										
565.00 > 520.00	3.774	3.782	-0.008		2435017	46.6		93.2	12648	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.784	3.782	0.002	1.000	5787	0.1056			10.7	
D 36 13C2 PFDaA										
615.00 > 570.00	4.075	4.072	0.002		2593419	50.6		101	14438	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.568	4.574	-0.006		3852056	71.3		143	16930	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_062.d

Injection Date: 29-Aug-2017 10:57:54

Instrument ID: A8_N

Lims ID: 320-30556-A-2-A

Lab Sample ID: 320-30556-2

Client ID: TP-PFC-020-MID-CARBON

Operator ID: SACINSTLCMS01

ALS Bottle#: 49

Worklist Smp#: 17

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

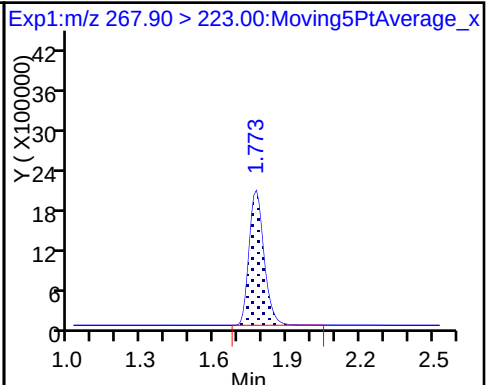
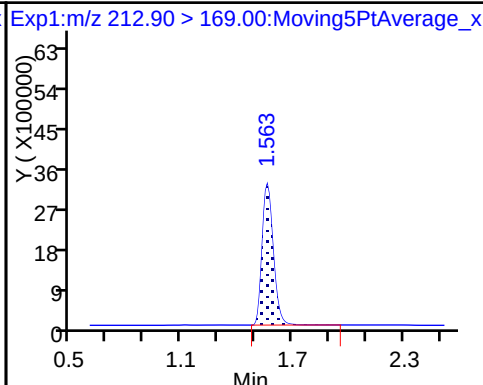
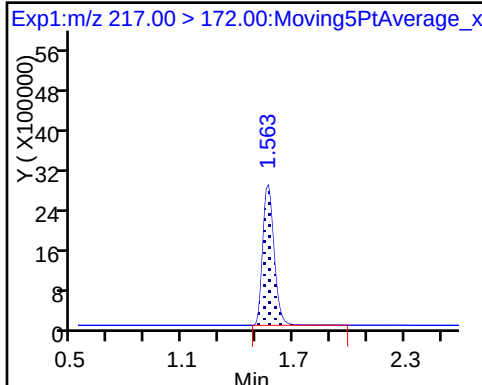
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

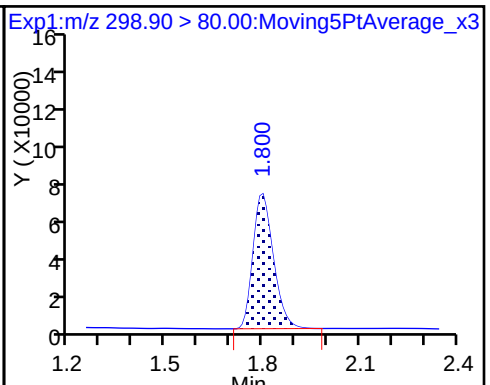
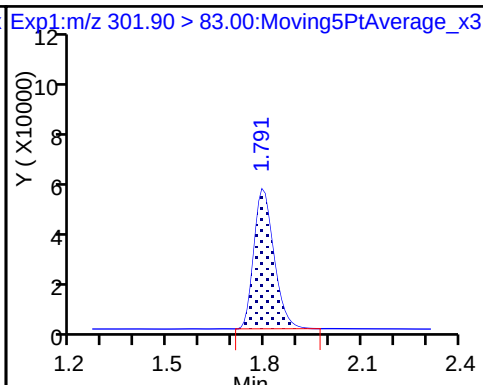
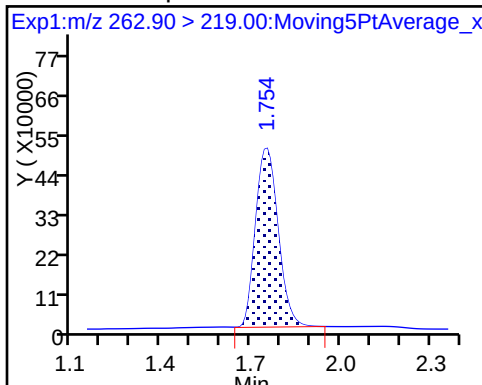
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

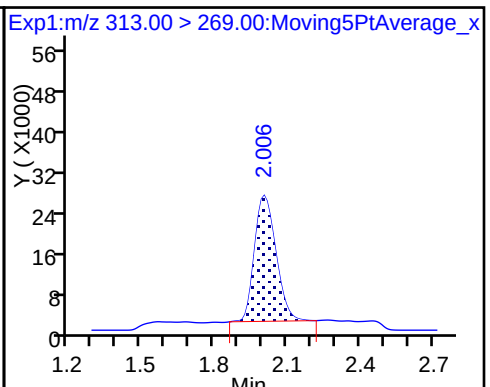
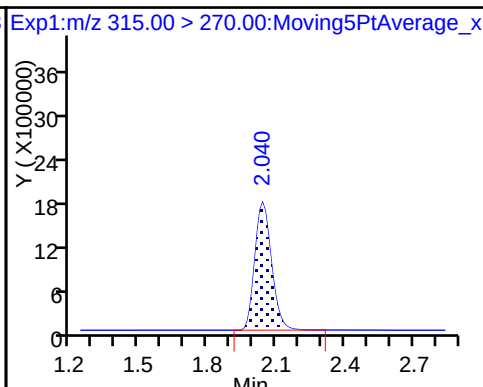
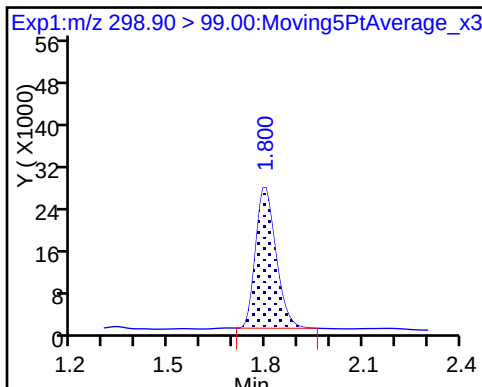
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

D 7 13C2 PFHxA

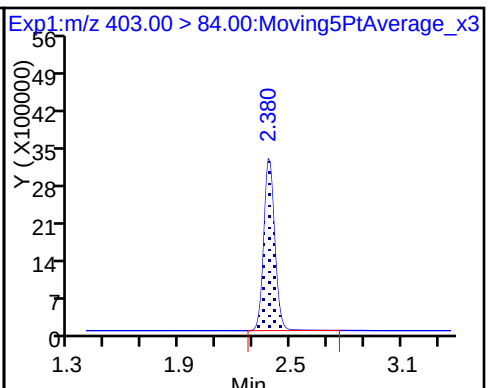
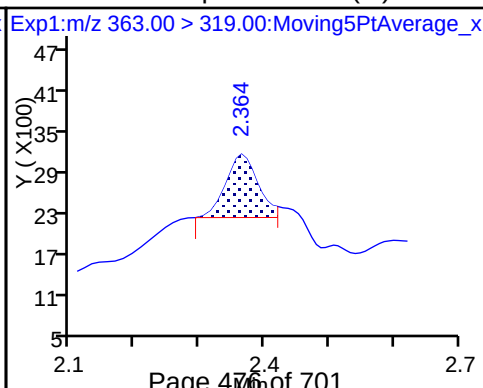
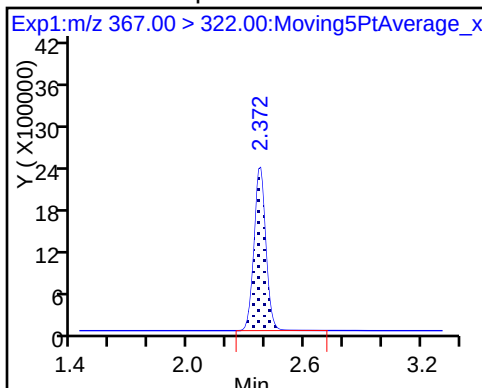
6 Perfluorohexanoic acid

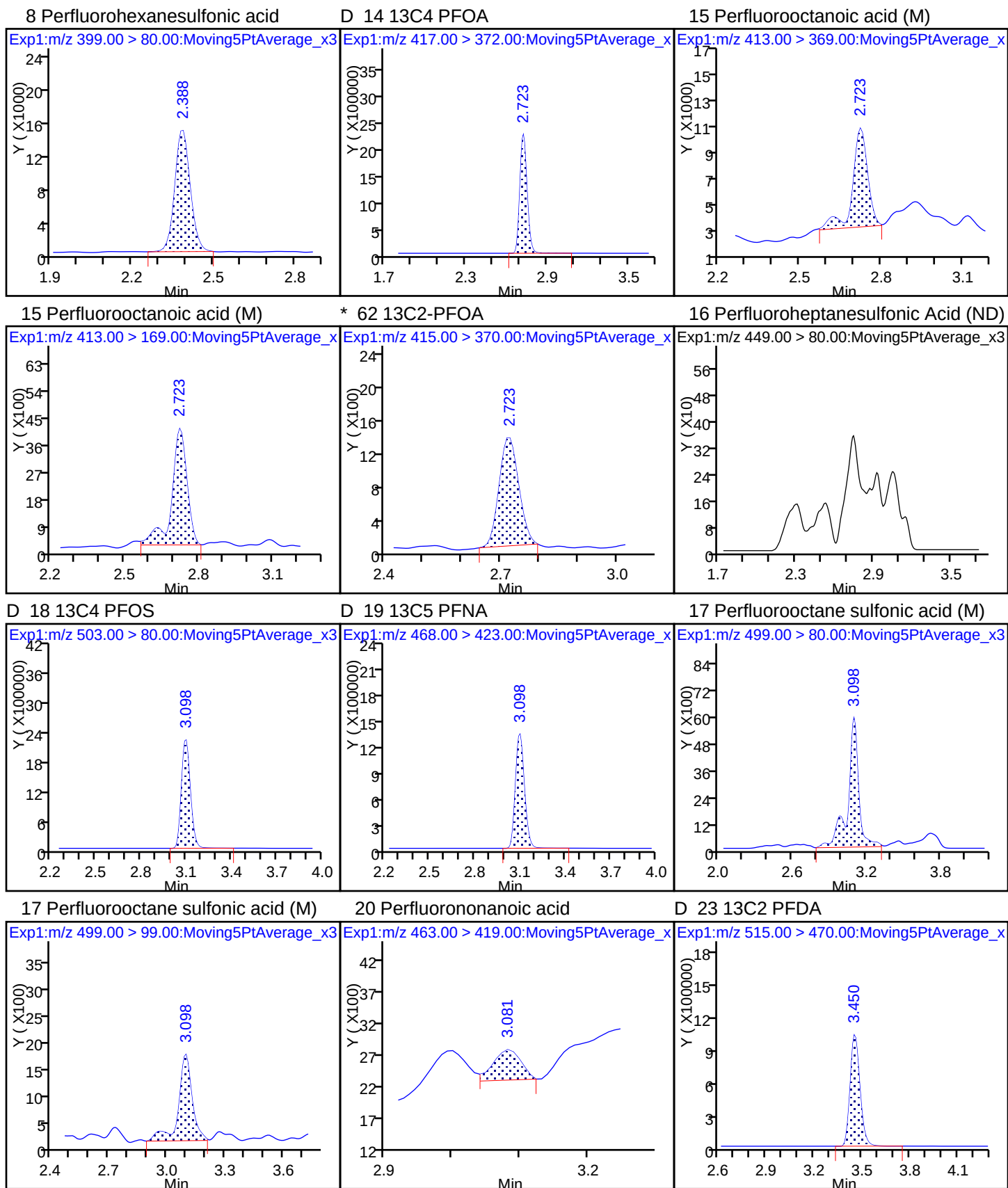


D 9 13C4-PFHpA

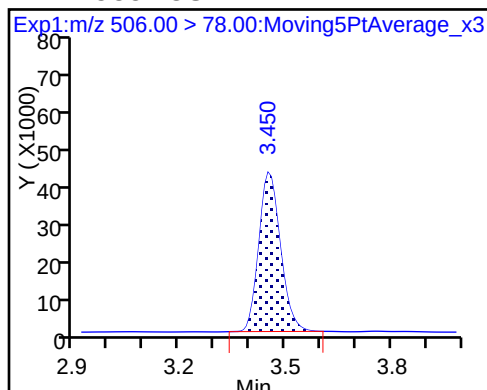
10 Perfluoroheptanoic acid (M)

D 11 18O2 PFHxS

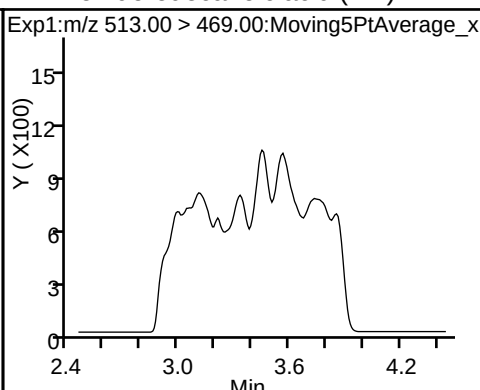




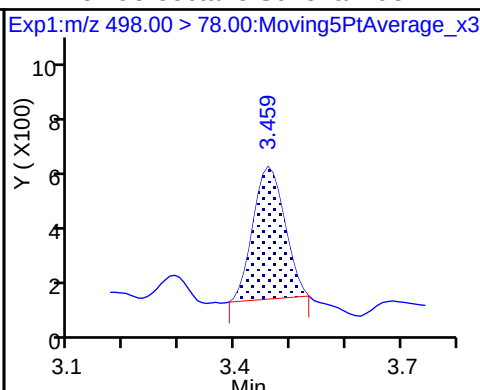
D 21 13C8 FOSA



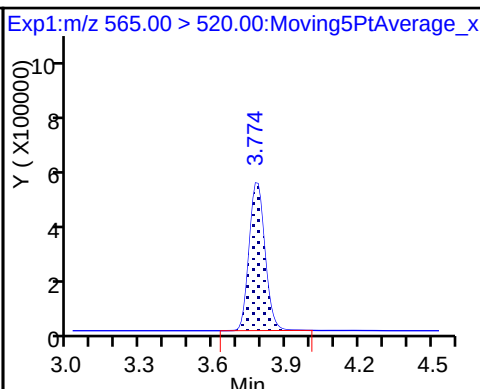
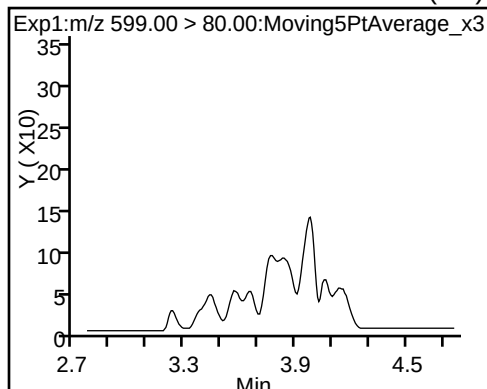
24 Perfluorodecanoic acid (ND)



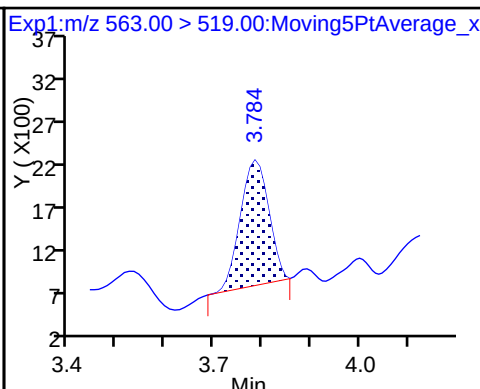
22 Perfluorooctane Sulfonamide



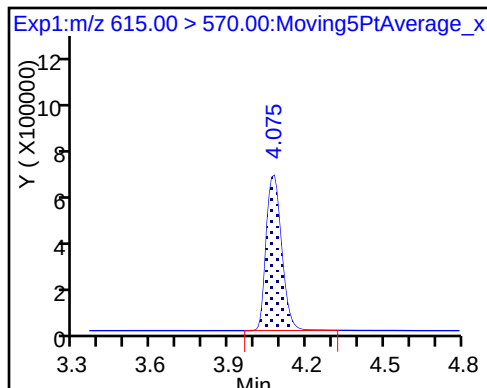
29 Perfluorodecane Sulfonic acid (ND) D 30 13C2 PFUnA



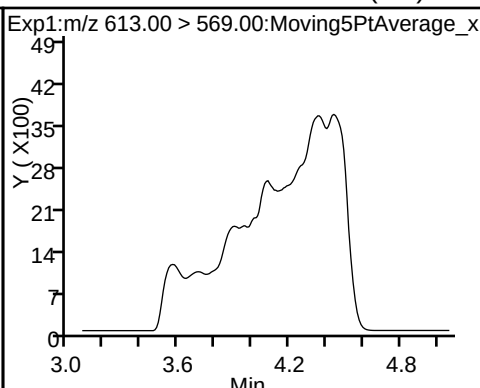
31 Perfluoroundecanoic acid



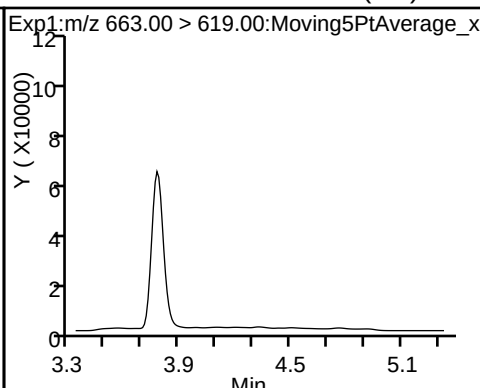
D 36 13C2 PFDaA



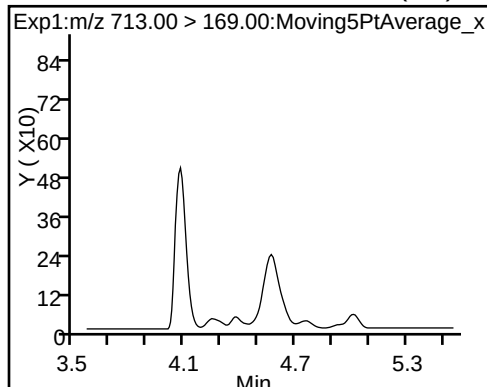
37 Perfluorododecanoic acid (ND)



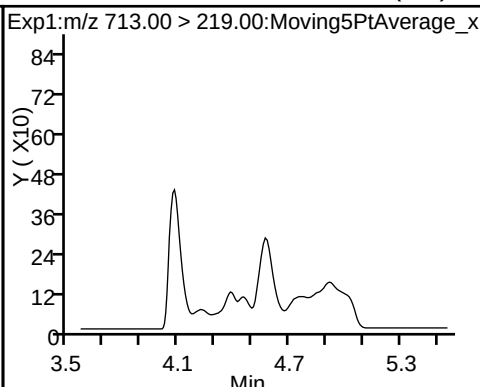
41 Perfluorotridecanoic acid (ND)



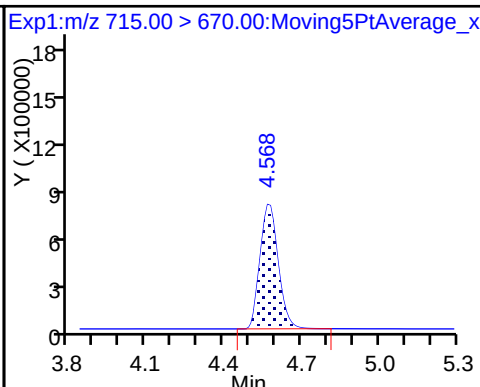
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



TestAmerica Sacramento

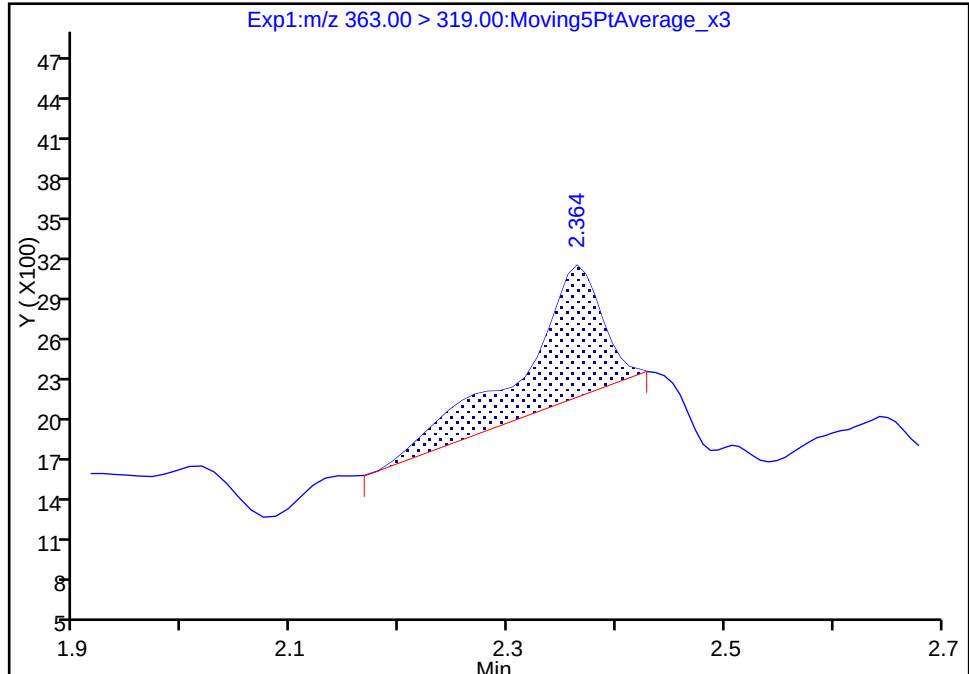
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_062.d
Injection Date: 29-Aug-2017 10:57:54 Instrument ID: A8_N
Lims ID: 320-30556-A-2-A Lab Sample ID: 320-30556-2
Client ID: TP-PFC-020-MID-CARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 49 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

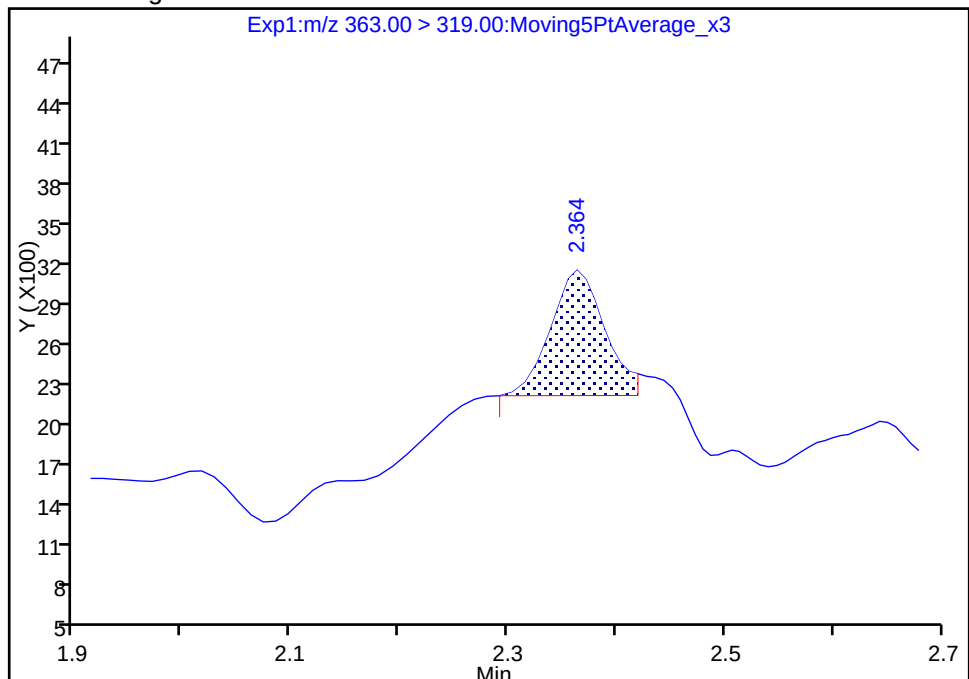
RT: 2.36
Area: 4947
Amount: 0.026834
Amount Units: ng/ml

Processing Integration Results



RT: 2.36
Area: 3165
Amount: 0.017168
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:25:50

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

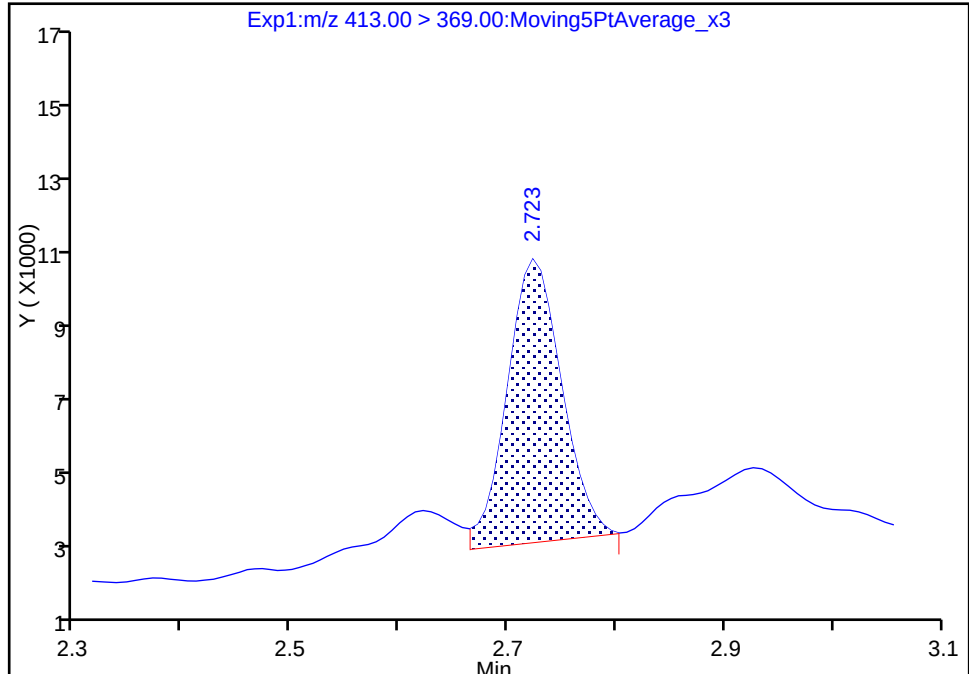
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_062.d				
Injection Date:	29-Aug-2017 10:57:54	Instrument ID:	A8_N		
Lims ID:	320-30556-A-2-A	Lab Sample ID:	320-30556-2		
Client ID:	TP-PFC-020-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	49	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

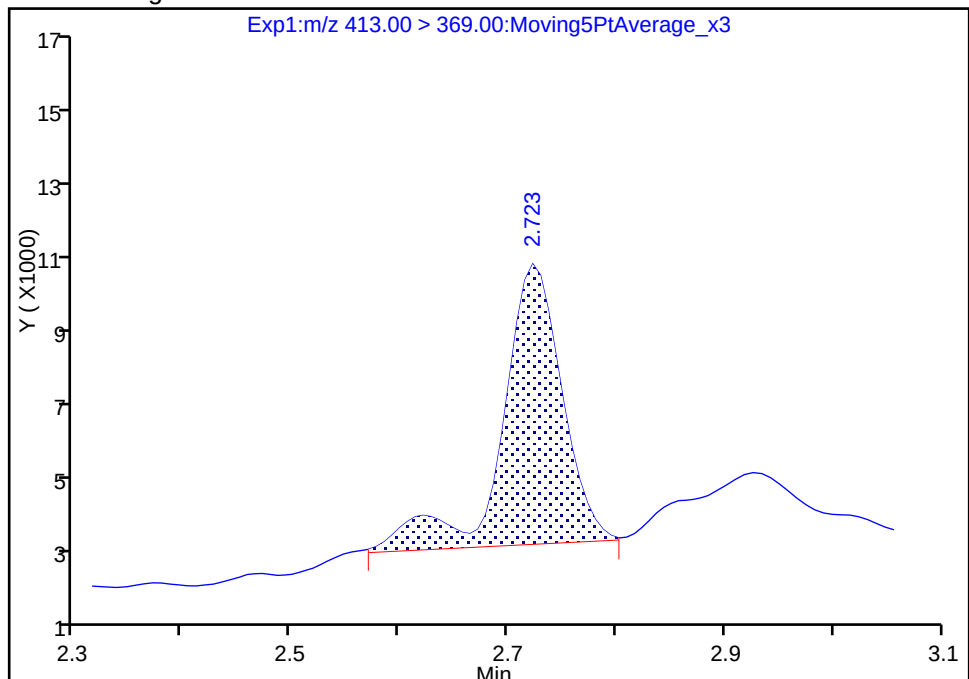
RT: 2.72
Area: 26271
Amount: 0.147358
Amount Units: ng/ml

Processing Integration Results



RT: 2.72
Area: 28956
Amount: 0.162419
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:26:03

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

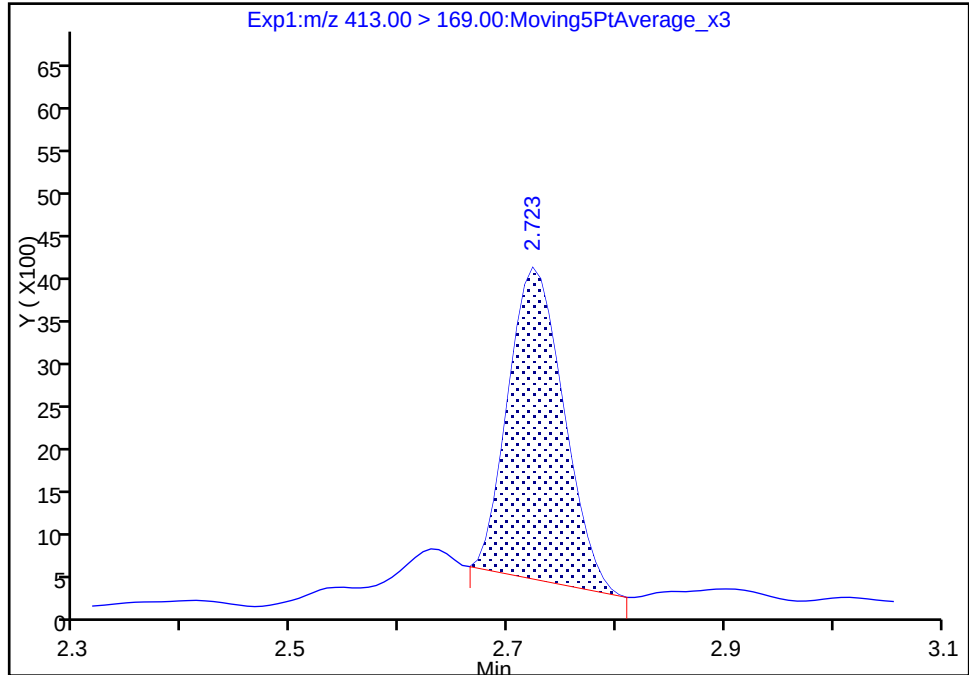
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_062.d
Injection Date: 29-Aug-2017 10:57:54 Instrument ID: A8_N
Lims ID: 320-30556-A-2-A Lab Sample ID: 320-30556-2
Client ID: TP-PFC-020-MID-CARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 49 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

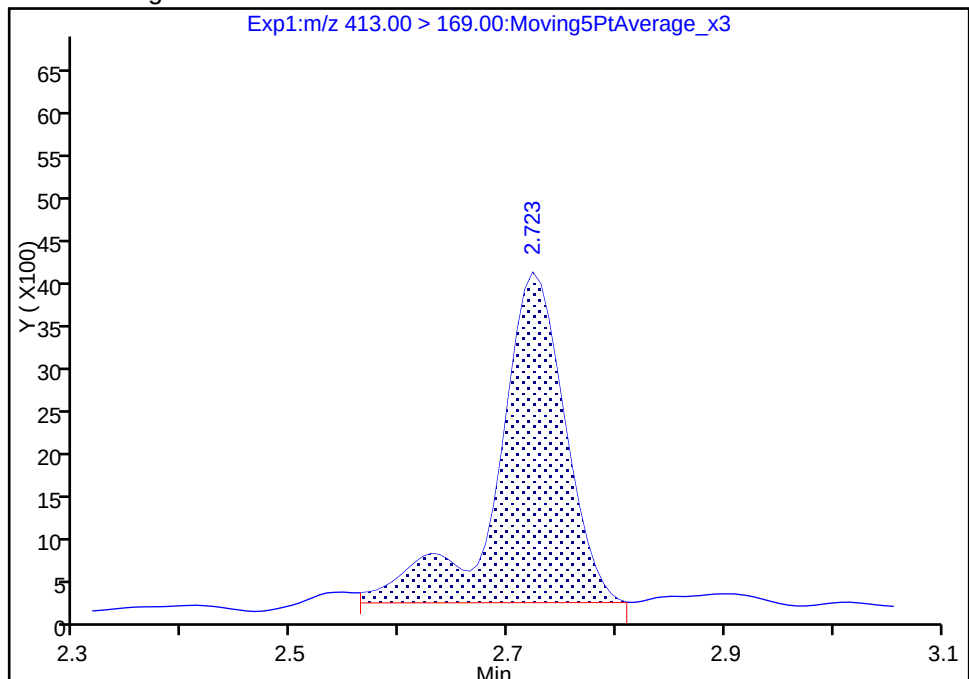
RT: 2.72
Area: 12948
Amount: 0.147358
Amount Units: ng/ml

Processing Integration Results



RT: 2.72
Area: 16772
Amount: 0.162419
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:26:08

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

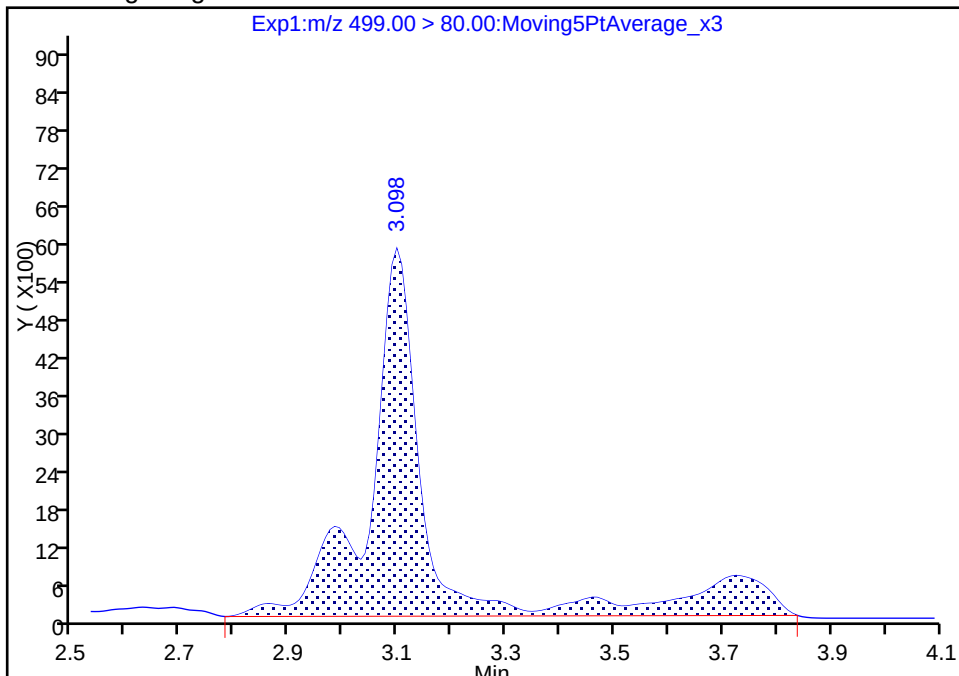
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_062.d
Injection Date: 29-Aug-2017 10:57:54 Instrument ID: A8_N
Lims ID: 320-30556-A-2-A Lab Sample ID: 320-30556-2
Client ID: TP-PFC-020-MID-CARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 49 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

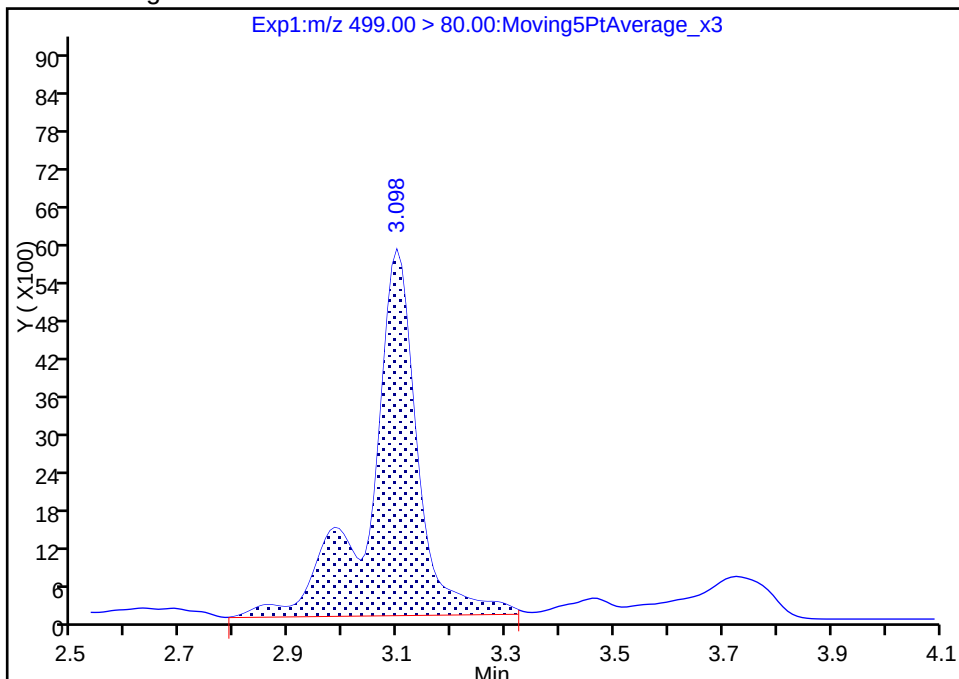
RT: 3.10
Area: 44860
Amount: 0.221785
Amount Units: ng/ml

Processing Integration Results



RT: 3.10
Area: 35686
Amount: 0.176429
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:26:17

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

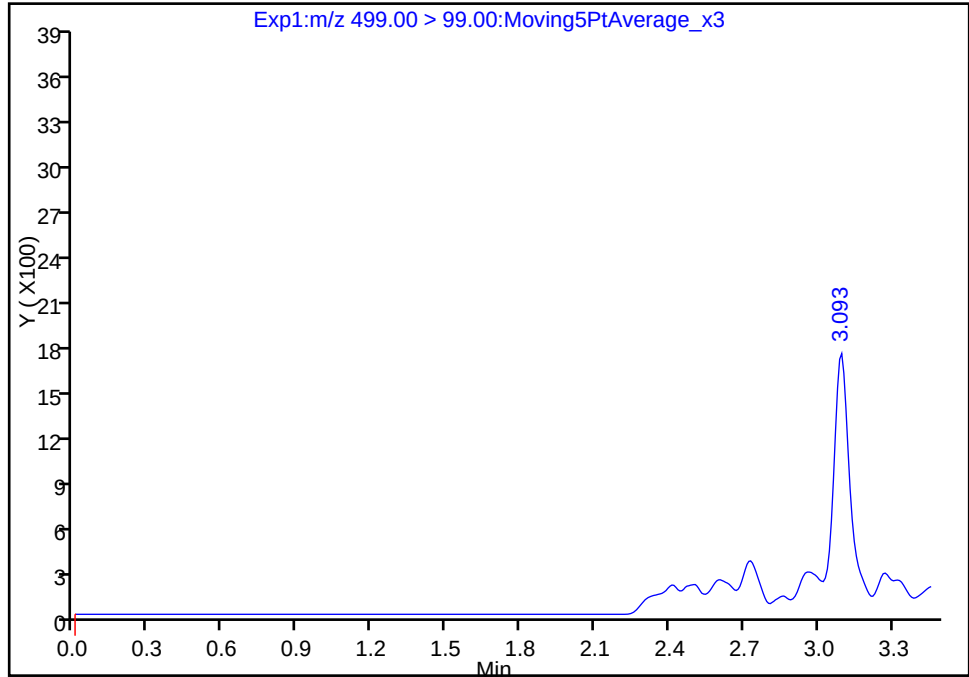
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_062.d
Injection Date: 29-Aug-2017 10:57:54 Instrument ID: A8_N
Lims ID: 320-30556-A-2-A Lab Sample ID: 320-30556-2
Client ID: TP-PFC-020-MID-CARBON
Operator ID: SACINSTLCMS01 ALS Bottle#: 49 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

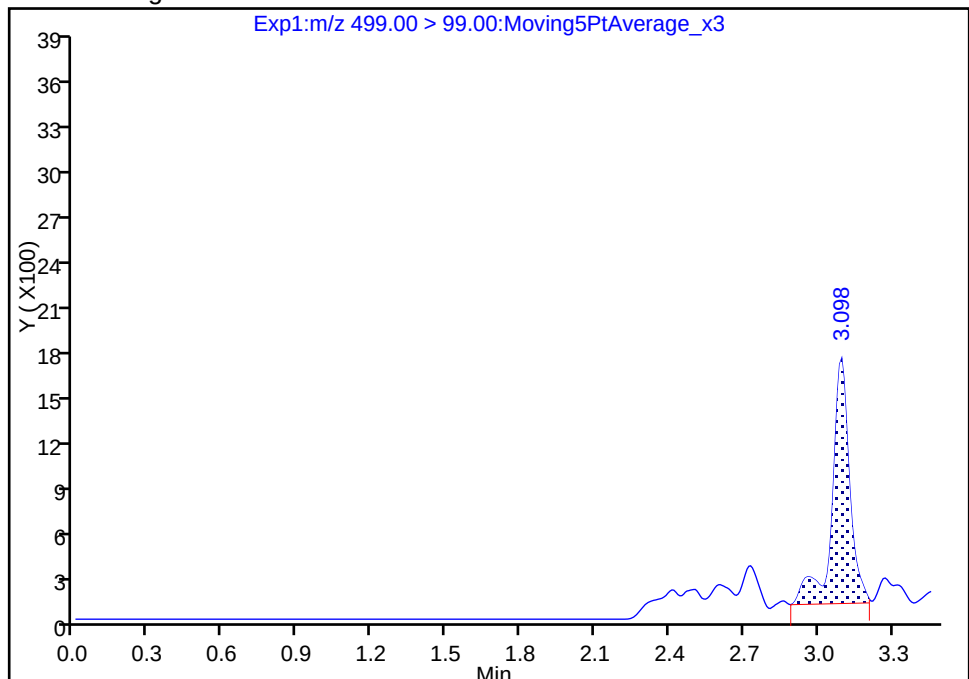
RT: 3.09
Area: 0
Amount: 0.221785
Amount Units: ng/ml

Processing Integration Results



RT: 3.10
Area: 8033
Amount: 0.176429
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:26:22

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPE</u>	Lab Sample ID: <u>320-30556-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_063.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:10</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>263.1 (mL)</u>	Date Analyzed: <u>08/29/2017 11:04</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	100		2.4	0.95	0.44
2706-90-3	Perfluoropentanoic acid (PFPeA)	31		2.4	1.9	0.94
307-24-4	Perfluorohexanoic acid (PFHxA)	6.7		2.4	1.9	0.75
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	1.9	0.76
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U M	2.4	1.9	0.71
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62
335-76-2	Perfluorodecanoic acid (PFDA)	0.95	U	2.4	0.95	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	1.9	0.71
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	1.9	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	1.9	0.52
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.95	U	2.4	0.95	0.38
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.87
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.83
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	1.9	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.8	2.9	1.2
335-77-3	Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	2.9	1.1
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.73	J	38	1.9	0.61

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPE</u>	Lab Sample ID: <u>320-30556-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_063.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:10</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>263.1 (mL)</u>	Date Analyzed: <u>08/29/2017 11:04</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	5	Q	25-150
STL00992	13C4 PFBA	80		25-150
STL00993	13C2 PFHxA	95		25-150
STL00990	13C4 PFOA	96		25-150
STL00995	13C5 PFNA	84		25-150
STL00996	13C2 PFDA	89		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	107		25-150
STL00994	18O2 PFHxS	115		25-150
STL00991	13C4 PFOS	118		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	90		25-150
STL02337	13C3-PFBS	118		25-150
STL02116	13C2-PFTeDA	141		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_063.d
 Lims ID: 320-30556-A-3-A
 Client ID: TP-PFC-020-TPE
 Sample Type: Client
 Inject. Date: 29-Aug-2017 11:04:49 ALS Bottle#: 50 Worklist Smp#: 18
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30556-a-3-a
 Misc. Info.: Plate: 1 Rack: 5
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:31:01 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:27:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

D 1 13C4 PFBA

217.00 > 172.00	1.563	1.564	-0.001		8328946	40.2		80.4	16872	

2 Perfluorobutyric acid

212.90 > 169.00	1.563	1.564	-0.001	1.000	8032192	53.1			639	

D 3 13C5-PFPeA

267.90 > 223.00	1.773	1.773	-0.001		5939536	45.2		90.4	26604	

4 Perfluoropentanoic acid

262.90 > 219.00	1.763	1.773	-0.010	1.000	2012116	16.2			1084	

D 47 13C3-PFBS

301.90 > 83.00	1.800	1.792	0.008		213446	54.7		118	5473	

5 Perfluorobutanesulfonic acid

298.90 > 80.00	1.800	1.801	-0.001	1.000	52665	0.1568			844	

298.90 > 99.00	1.800	1.801	-0.001	1.000	24146		2.18(0.00-0.00)		145	

D 7 13C2 PFHxA

315.00 > 270.00	2.040	2.041	-0.001		6529515	47.6		95.3	16559	

6 Perfluorohexanoic acid

313.00 > 269.00	2.028	2.041	-0.013	1.000	431221	3.55			479	

D 9 13C4-PFHpA

367.00 > 322.00	2.369	2.365	0.004		6868154	54.2		108	11505	

10 Perfluoroheptanoic acid

363.00 > 319.00	2.369	2.365	0.004	1.000	6380	0.0482			8.2	M

D 11 18O2 PFHxS

403.00 > 84.00	2.385	2.381	0.004		11910118	54.6		115	12417	

8 Perfluorohexanesulfonic acid

399.00 > 80.00	2.385	2.381	0.004	1.000	54024	0.2060			461	

D 14 13C4 PFOA

417.00 > 372.00	2.729	2.720	0.009		5585892	48.1		96.1	13578	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.729	2.720	0.009	1.000	41048	0.3358			7.5	M
413.00 > 169.00	2.729	2.720	0.009	1.000	24469		1.68(0.90-1.10)		126	M
* 62 13C2-PFOA										
415.00 > 370.00	2.714	2.720	-0.006		3520	50.0			172	
D 18 13C4 PFOS										
503.00 > 80.00	3.098	3.093	0.005		8553520	56.4		118	8737	
D 19 13C5 PFNA										
468.00 > 423.00	3.098	3.093	0.005		3759415	42.2		84.4	6898	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.098	3.093	0.005	1.000	23574	0.1243			110	M
499.00 > 99.00	3.098	3.093	0.005	1.000	4185		5.63(0.90-1.10)		24.1	M
D 23 13C2 PFDA										
515.00 > 470.00	3.459	3.453	0.006		3426512	44.4		88.8	9405	
D 21 13C8 FOSA										
506.00 > 78.00	3.450	3.453	-0.003		603070	2.62		5.2	3644	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.459	3.453	0.006	1.000	4281	0.3836			78.6	
D 30 13C2 PFUnA										
565.00 > 520.00	3.783	3.782	0.001		2584142	49.4		98.9	6789	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.783	3.782	0.001	1.000	5645	0.0970			11.2	
D 36 13C2 PFDaA										
615.00 > 570.00	4.074	4.072	0.002		2731753	53.3		107	24470	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.568	4.574	-0.006		3816738	70.6		141	25467	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_063.d

Injection Date: 29-Aug-2017 11:04:49

Instrument ID: A8_N

Lims ID: 320-30556-A-3-A

Lab Sample ID: 320-30556-3

Client ID: TP-PFC-020-TPE

Operator ID: SACINSTLCMS01

ALS Bottle#: 50

Worklist Smp#: 18

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

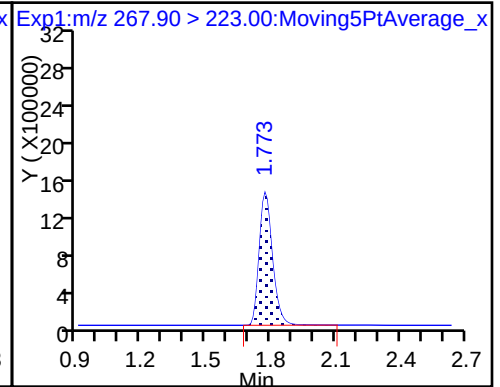
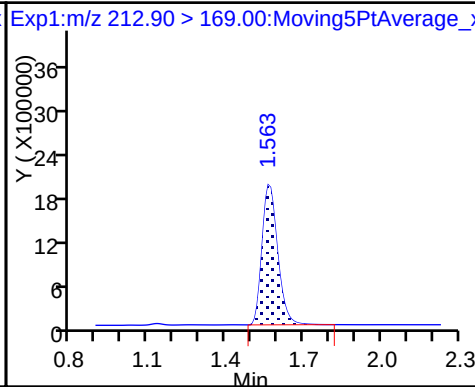
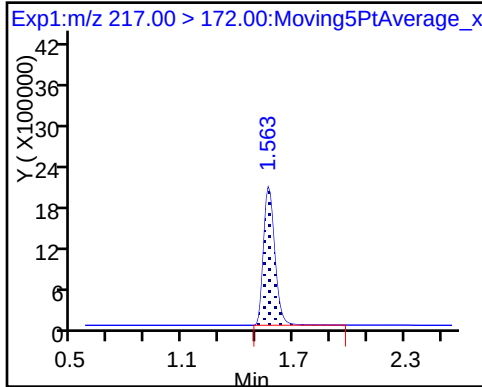
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

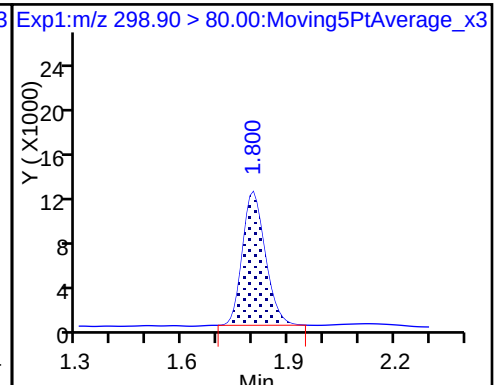
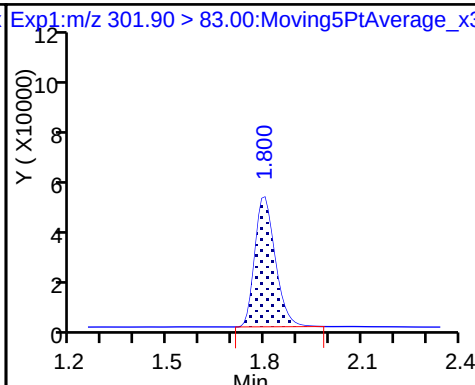
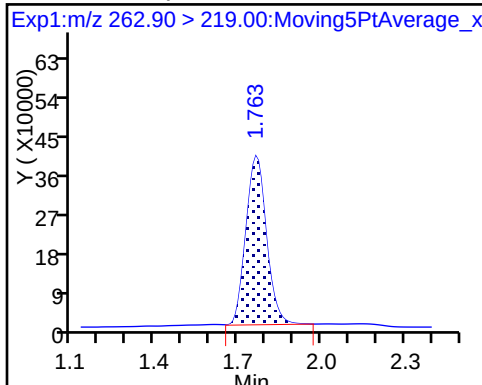
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

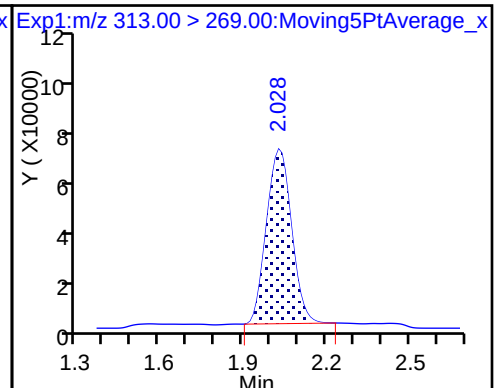
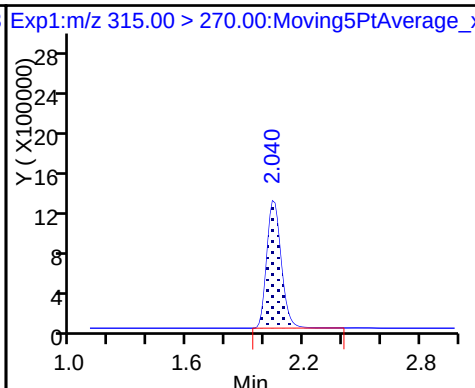
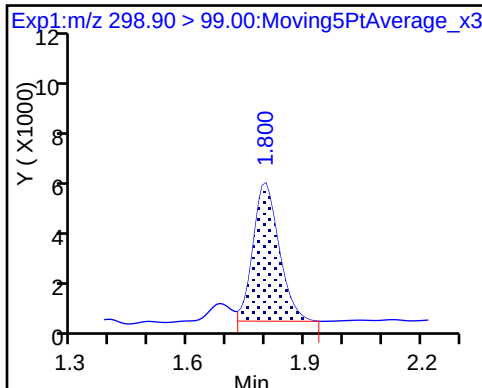
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

D 7 13C2 PFHxA

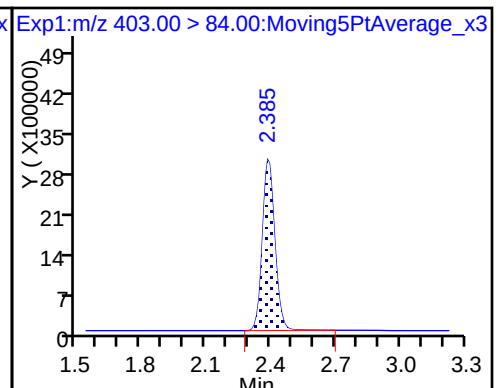
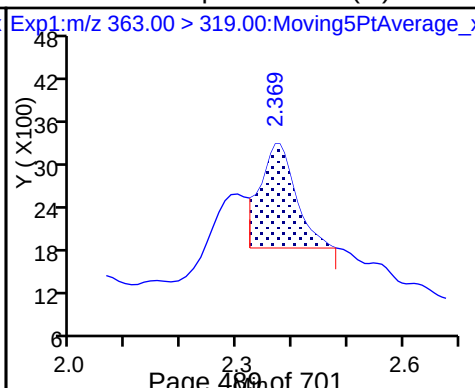
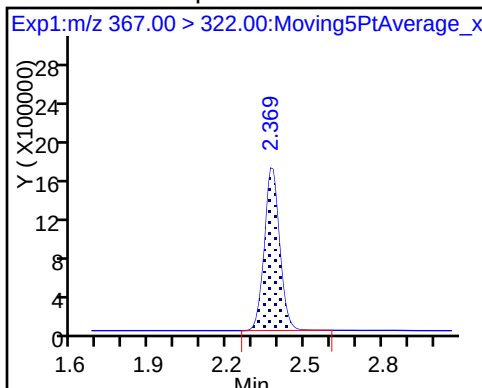
6 Perfluorohexanoic acid

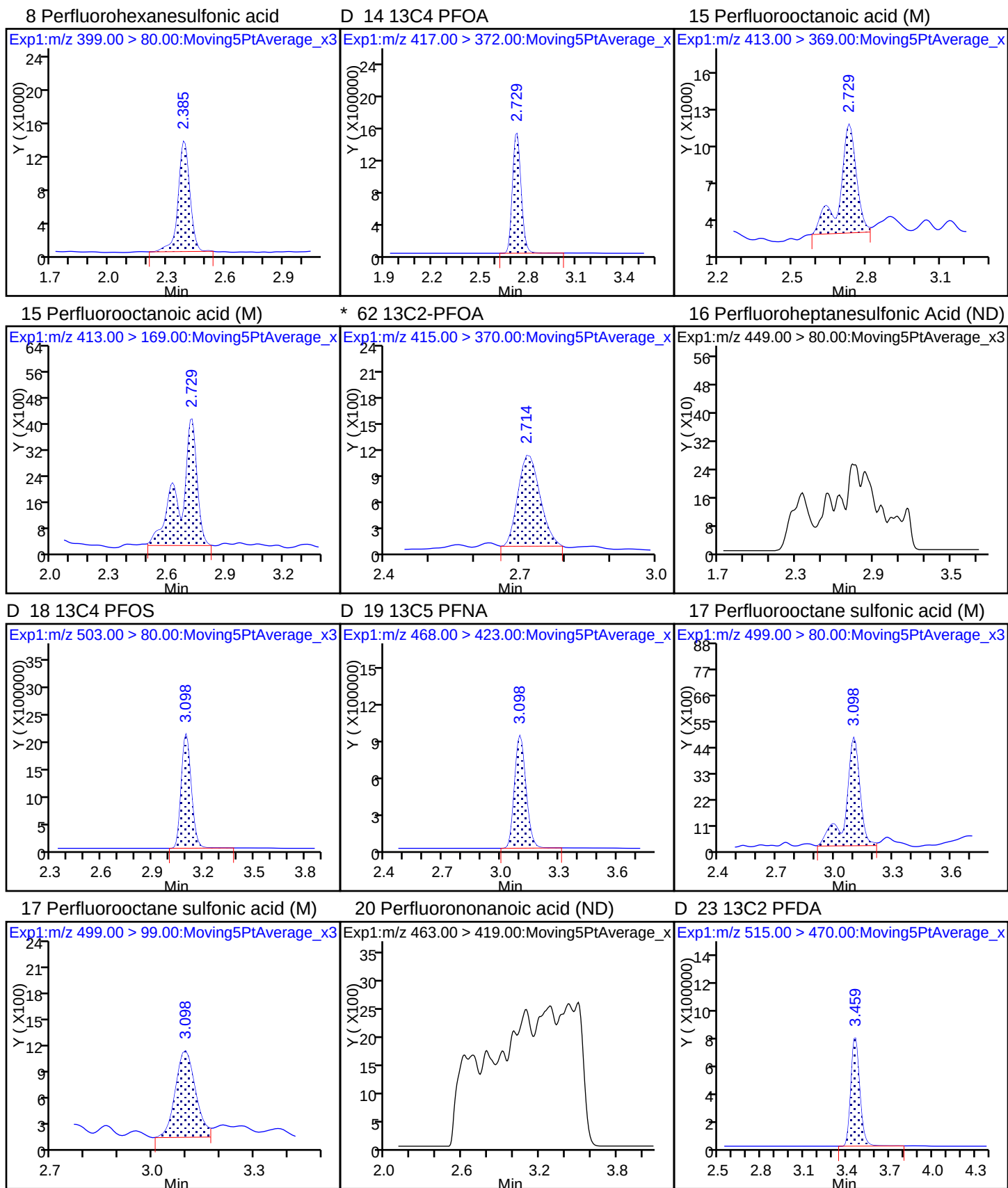


D 9 13C4-PFHpA

10 Perfluoroheptanoic acid (M)

D 11 18O2 PFHxS

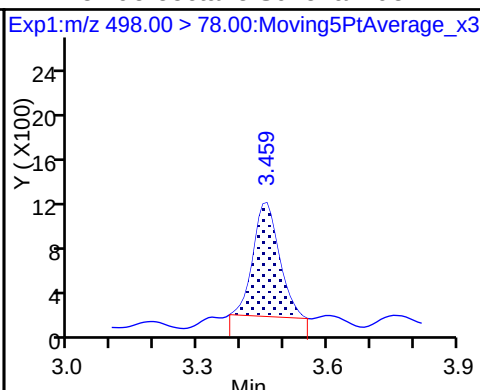
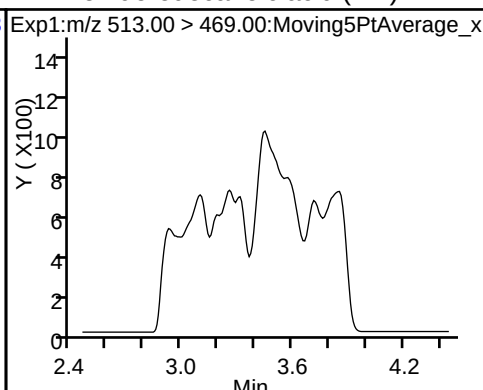
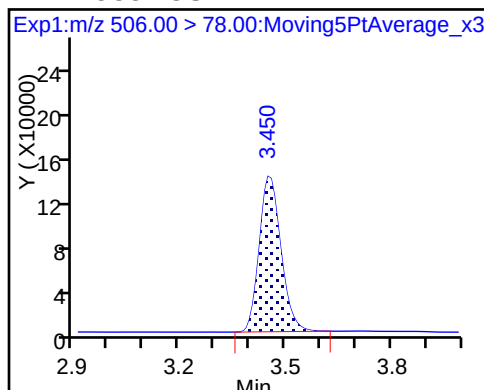




D 21 13C8 FOSA

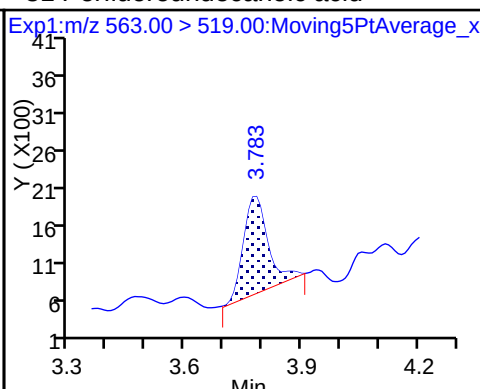
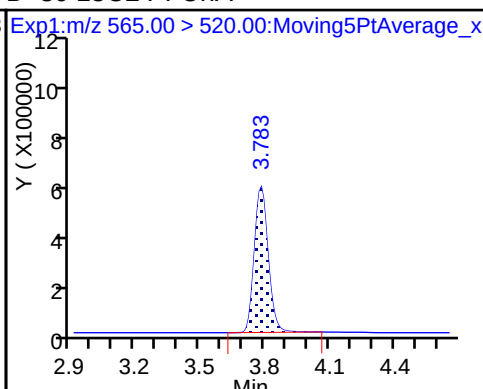
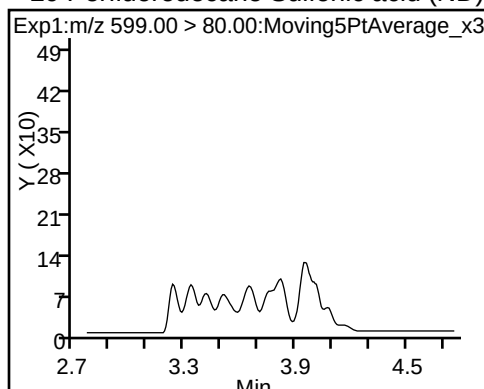
24 Perfluorodecanoic acid (ND)

22 Perfluorooctane Sulfonamide



29 Perfluorodecane Sulfonic acid (ND) D 30 13C2 PFUnA

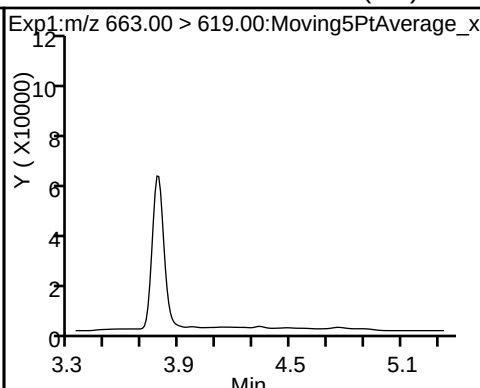
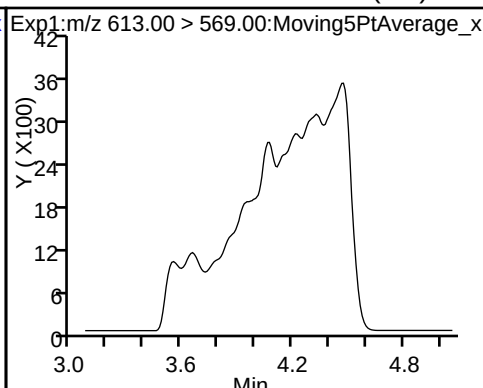
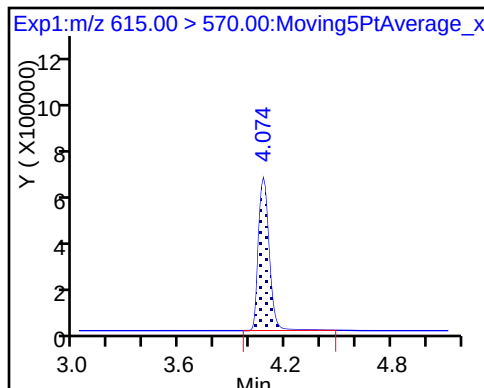
31 Perfluoroundecanoic acid



D 36 13C2 PFDaA

37 Perfluorododecanoic acid (ND)

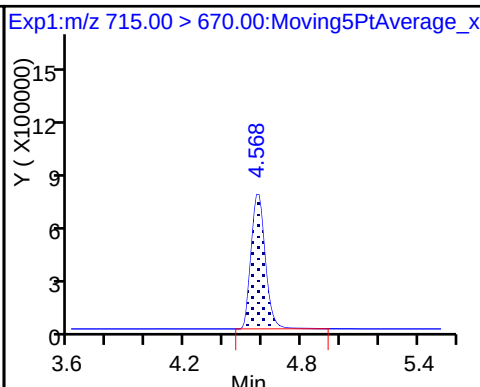
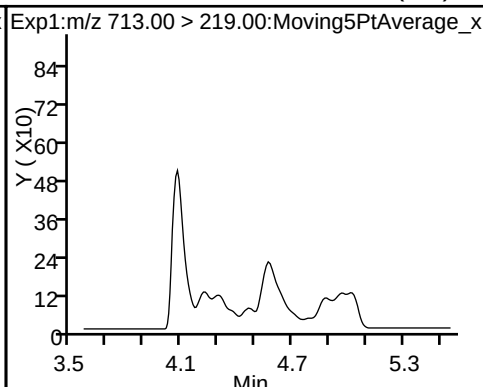
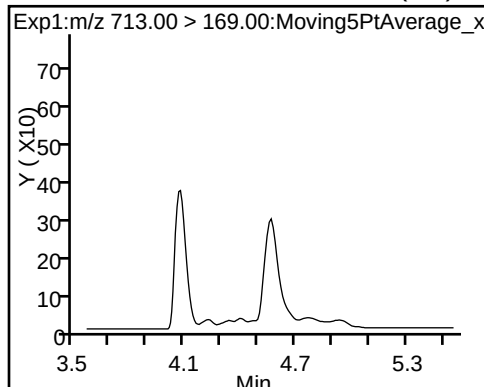
41 Perfluorotridecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)

42 Perfluorotetradecanoic acid (ND)

D 43 13C2-PFTeDA



TestAmerica Sacramento

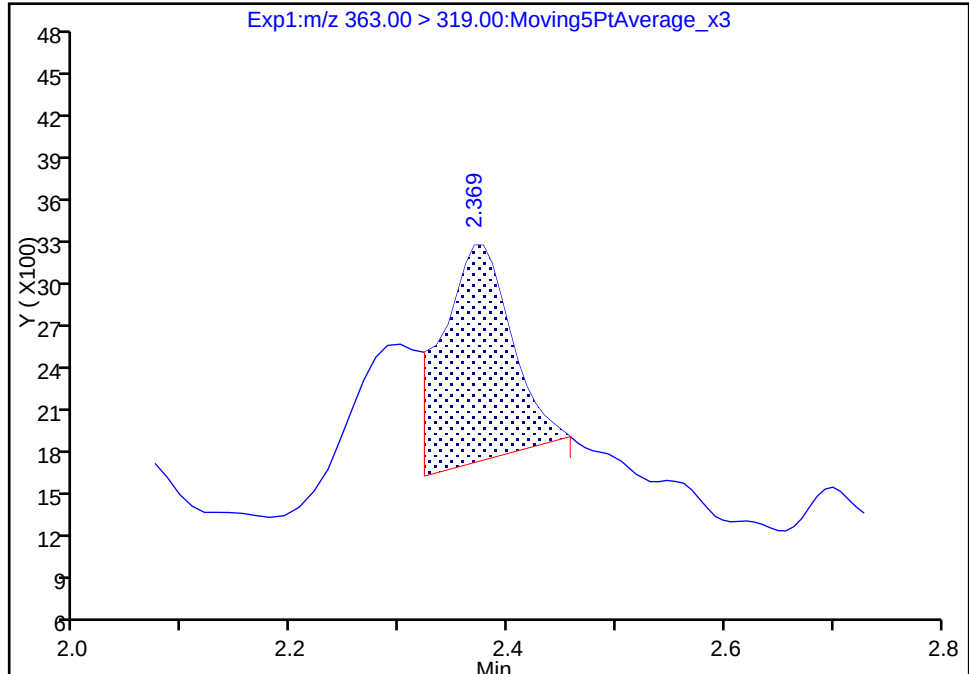
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_063.d				
Injection Date:	29-Aug-2017 11:04:49	Instrument ID:	A8_N		
Lims ID:	320-30556-A-3-A	Lab Sample ID:	320-30556-3		
Client ID:	TP-PFC-020-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	50	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

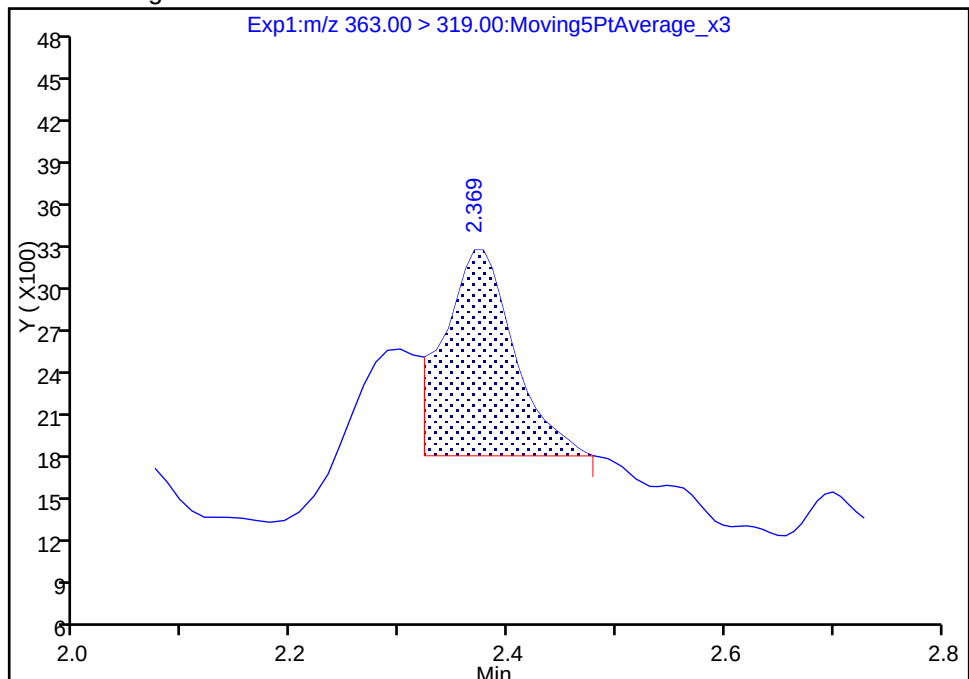
RT: 2.37
Area: 6629
Amount: 0.050083
Amount Units: ng/ml

Processing Integration Results



RT: 2.37
Area: 6380
Amount: 0.048202
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:26:48

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

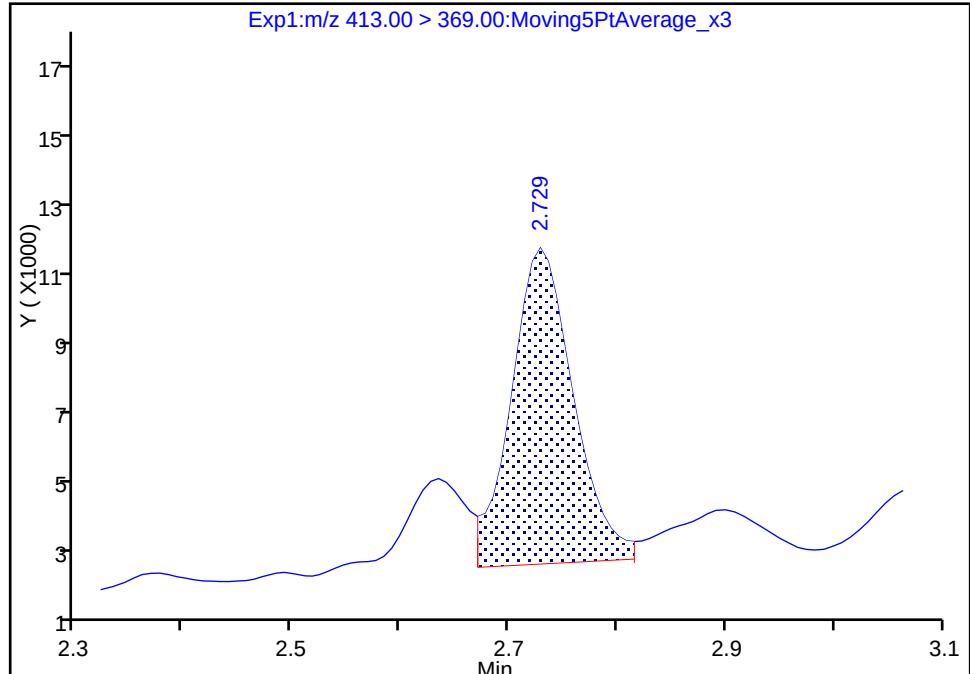
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Injection Date:	29-Aug-2017 11:04:49	Instrument ID:	A8_N		
Lims ID:	320-30556-A-3-A	Lab Sample ID:	320-30556-3		
Client ID:	TP-PFC-020-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	50	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

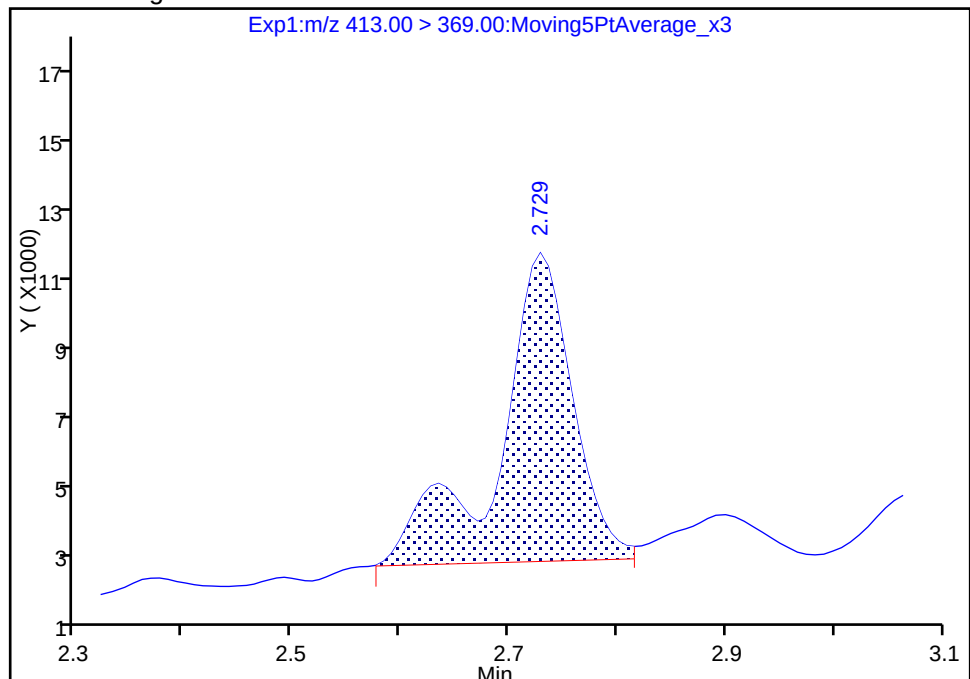
RT: 2.73
Area: 35032
Amount: 0.286593
Amount Units: ng/ml

Processing Integration Results



RT: 2.73
Area: 41048
Amount: 0.335809
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:26:56

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

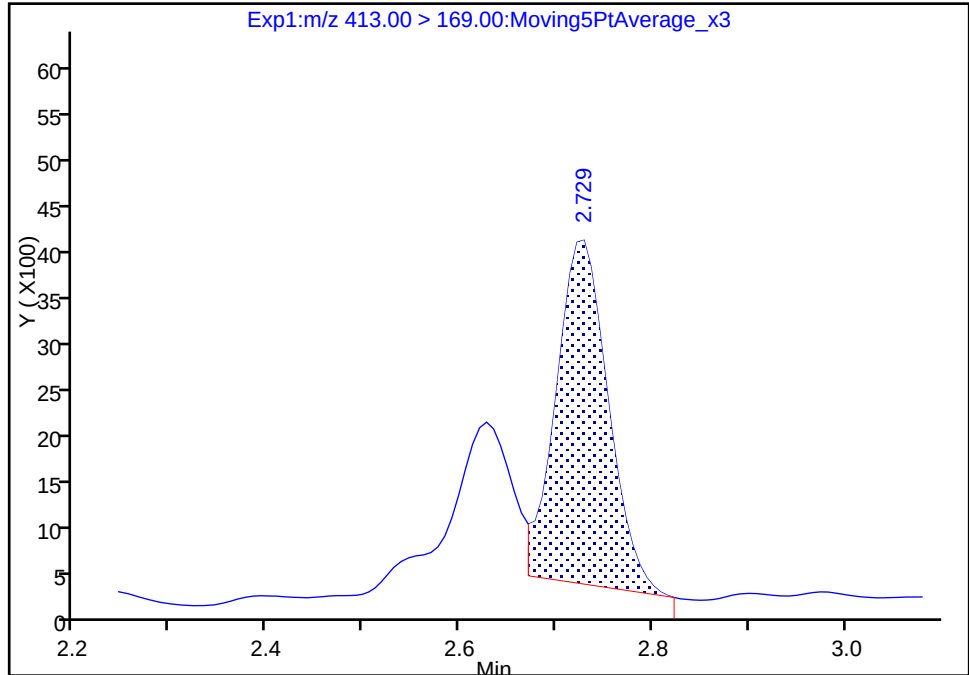
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_063.d				
Injection Date:	29-Aug-2017 11:04:49	Instrument ID:	A8_N		
Lims ID:	320-30556-A-3-A	Lab Sample ID:	320-30556-3		
Client ID:	TP-PFC-020-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	50	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

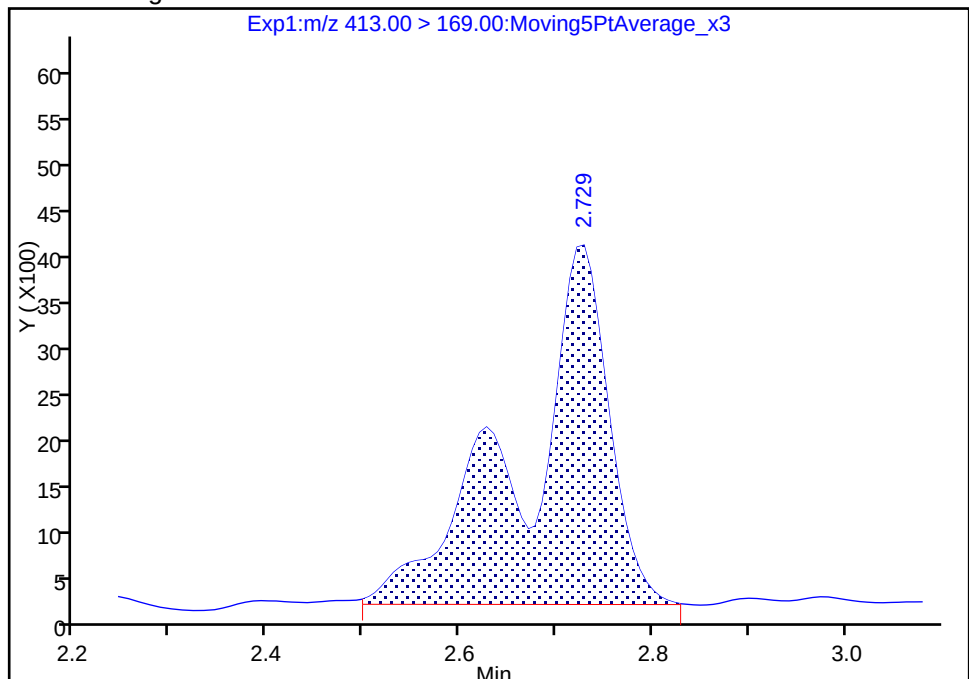
RT: 2.73
Area: 14005
Amount: 0.286593
Amount Units: ng/ml

Processing Integration Results



RT: 2.73
Area: 24469
Amount: 0.335809
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:27:02

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

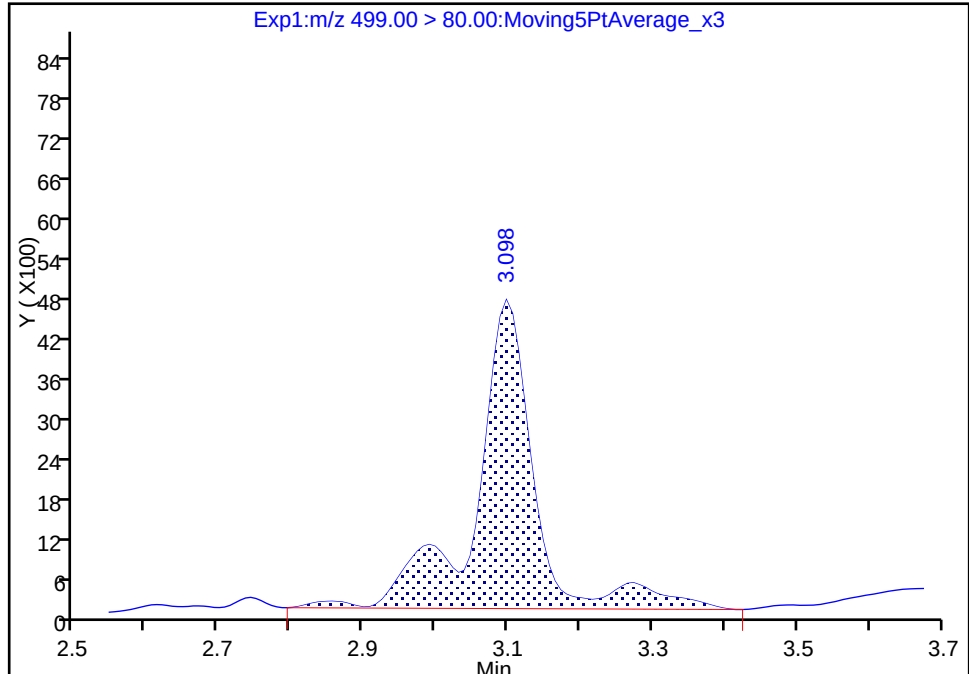
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_063.d				
Injection Date:	29-Aug-2017 11:04:49	Instrument ID:	A8_N		
Lims ID:	320-30556-A-3-A	Lab Sample ID:	320-30556-3		
Client ID:	TP-PFC-020-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	50	Worklist Smp#:	18
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

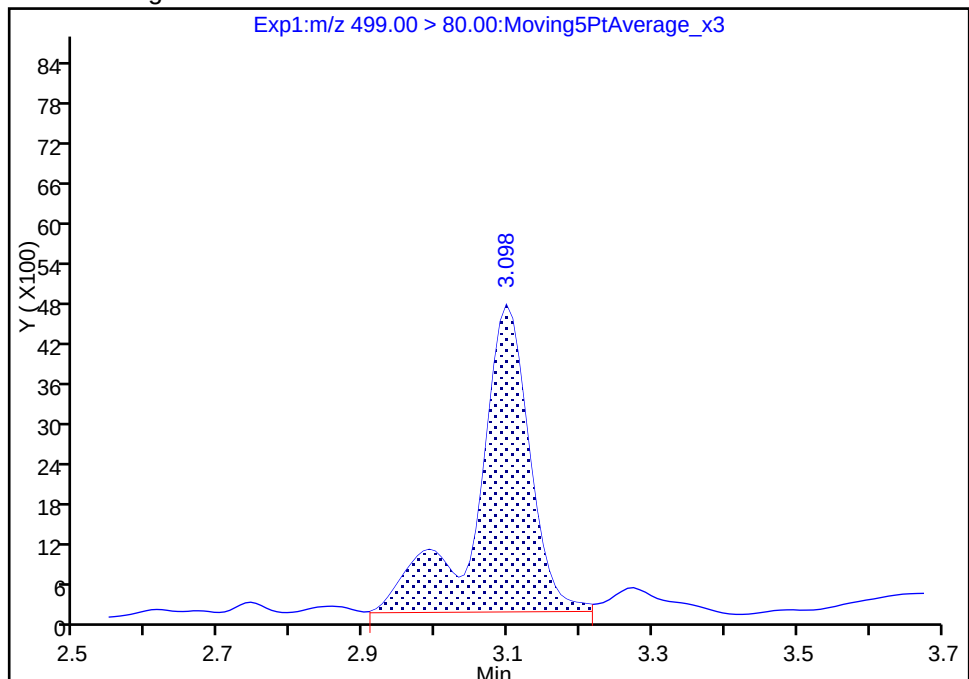
RT: 3.10
Area: 26571
Amount: 0.140082
Amount Units: ng/ml

Processing Integration Results



RT: 3.10
Area: 23574
Amount: 0.124282
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:27:12

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

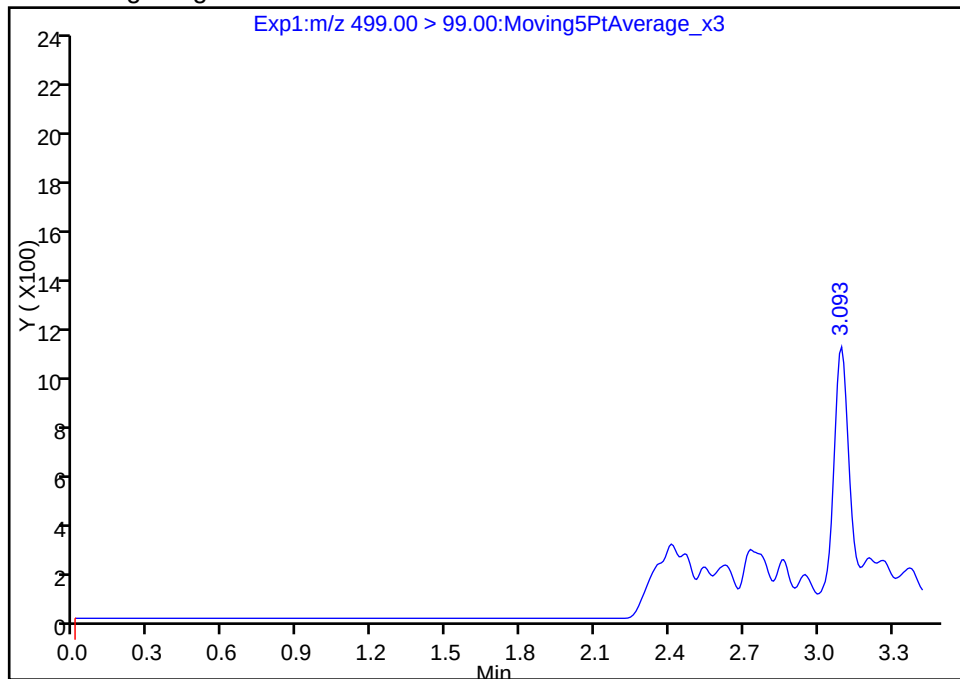
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_063.d
Injection Date: 29-Aug-2017 11:04:49 Instrument ID: A8_N
Lims ID: 320-30556-A-3-A Lab Sample ID: 320-30556-3
Client ID: TP-PFC-020-TPE
Operator ID: SACINSTLCMS01 ALS Bottle#: 50 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

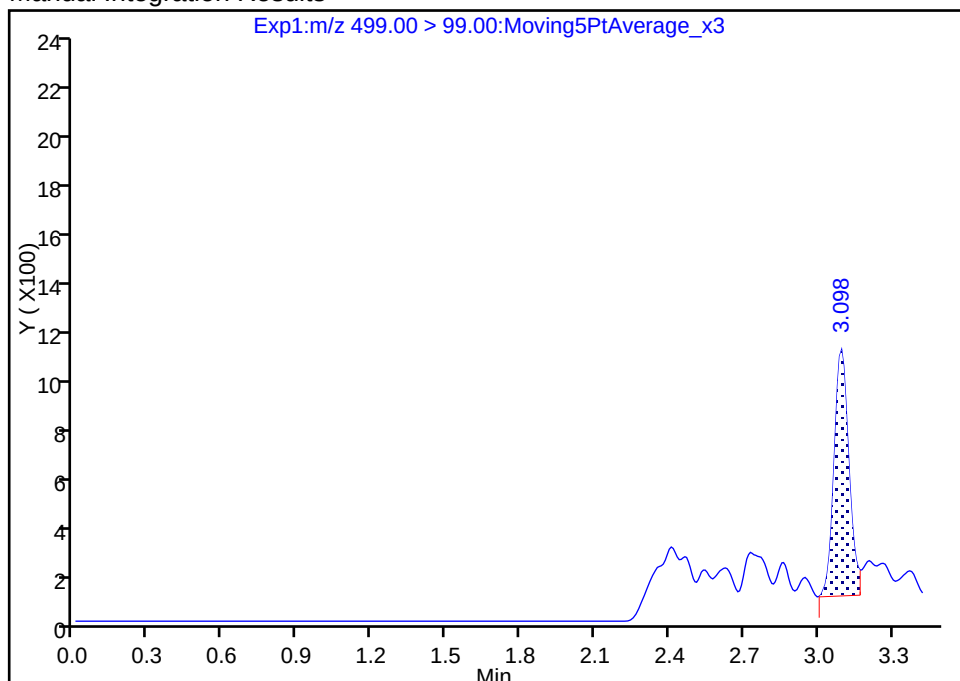
RT: 3.09
Area: 0
Amount: 0.140082
Amount Units: ng/ml

Processing Integration Results



RT: 3.10
Area: 4185
Amount: 0.124282
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:27:17

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPE-D</u>	Lab Sample ID: <u>320-30556-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_064.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 00:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>261.1 (mL)</u>	Date Analyzed: <u>08/29/2017 11:11</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	100		2.4	0.96	0.44
2706-90-3	Perfluoropentanoic acid (PFPeA)	30		2.4	1.9	0.95
307-24-4	Perfluorohexanoic acid (PFHxA)	7.0		2.4	1.9	0.75
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	1.9	0.77
335-67-1	Perfluorooctanoic acid (PFOA)	0.82	J M	2.4	1.9	0.72
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.63
335-76-2	Perfluorodecanoic acid (PFDA)	0.96	U	2.4	0.96	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	1.9	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	1.9	0.56
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	1.9	0.53
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.96	U	2.4	0.96	0.38
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.88
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.83
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	1.9	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	4.2		3.8	2.9	1.2
335-77-3	Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	2.9	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.3	J	38	1.9	0.61

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPE-D</u>	Lab Sample ID: <u>320-30556-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_064.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 00:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>261.1 (mL)</u>	Date Analyzed: <u>08/29/2017 11:11</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	3	Q	25-150
STL00992	13C4 PFBA	87		25-150
STL00993	13C2 PFHxA	102		25-150
STL00990	13C4 PFOA	111		25-150
STL00995	13C5 PFNA	101		25-150
STL00996	13C2 PFDA	103		25-150
STL00997	13C2 PFUnA	94		25-150
STL00998	13C2 PFDoA	92		25-150
STL00994	18O2 PFHxS	98		25-150
STL00991	13C4 PFOS	99		25-150
STL01892	13C4-PFHpA	113		25-150
STL01893	13C5 PFPeA	98		25-150
STL02337	13C3-PFBS	94		25-150
STL02116	13C2-PFTeDA	113		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_064.d
 Lims ID: 320-30556-A-4-A
 Client ID: TP-PFC-020-TPE-D
 Sample Type: Client
 Inject. Date: 29-Aug-2017 11:11:42 ALS Bottle#: 51 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30556-a-4-a
 Misc. Info.: Plate: 1 Rack: 5
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:31:01 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:28:35

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	1.563	1.564	-0.001		8991762	43.4		86.8	20756	
2 Perfluorobutyric acid										
212.90 > 169.00	1.572	1.564	0.008	1.000	8840752	54.2			984	
D 3 13C5-PFPeA										
267.90 > 223.00	1.782	1.773	0.009		6466617	49.2		98.4	33871	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.773	1.773	0.0	1.000	2116857	15.7			1219	
D 47 13C3-PFBS										
301.90 > 83.00	1.800	1.792	0.008		171453	43.9		94.5	5719	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.800	1.801	-0.001	1.000	31705	0.1175			201	
298.90 > 99.00	1.800	1.801	-0.001	1.000	14847		2.14(0.00-0.00)		99.9	
D 7 13C2 PFHxA										
315.00 > 270.00	2.051	2.041	0.010		6983563	51.0		102	24908	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.040	2.041	-0.001	1.000	473879	3.64			575	
D 9 13C4-PFHpA										
367.00 > 322.00	2.377	2.365	0.012		7175173	56.6		113	19705	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.385	2.365	0.020	1.000	8518	0.0616			10.3	M
D 11 18O2 PFHxS										
403.00 > 84.00	2.393	2.381	0.012		10102135	46.3		97.9	34801	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.393	2.381	0.012	1.000	45419	0.2042			369	
D 14 13C4 PFOA										
417.00 > 372.00	2.730	2.720	0.010		6463585	55.6		111	30487	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.737	2.720	0.017	1.000	60844	0.4302			9.7	M
413.00 > 169.00	2.730	2.720	0.010	0.997	28746		2.12(0.90-1.10)		149	M
* 62 13C2-PFOA										
415.00 > 370.00	2.730	2.720	0.010		3324	50.0			161	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.737	2.727	0.010	1.000	2264	0.0125			31.3	
D 18 13C4 PFOS										
503.00 > 80.00	3.107	3.093	0.014		7208975	47.5		99.5	19771	
D 19 13C5 PFNA										
468.00 > 423.00	3.107	3.093	0.014		4506636	50.6		101	26678	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.107	3.093	0.014	1.000	351938	2.20			1232	
499.00 > 99.00	3.107	3.093	0.014	1.000	81074		4.34(0.90-1.10)		551	
D 23 13C2 PFDA										
515.00 > 470.00	3.460	3.453	0.007		3973016	51.5		103	16019	
D 21 13C8 FOSA										
506.00 > 78.00	3.460	3.453	0.007		334266	1.45		2.9	4620	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.460	3.453	0.007	1.000	2116	0.0295			5.9	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.460	3.453	0.007	1.000	4229	0.6837			65.8	
D 30 13C2 PFUnA										
565.00 > 520.00	3.785	3.782	0.003		2444179	46.8		93.5	10621	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.795	3.782	0.013	1.000	5355	0.0973			10.4	
D 36 13C2 PFDoA										
615.00 > 570.00	4.081	4.072	0.009		2363525	46.1		92.3	10343	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.574	4.561	0.013	1.000	1881	0.1217			30.2	
713.00 > 219.00	4.585	4.561	0.024	1.002	1968		0.96(0.00-0.00)		24.9	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.585	4.574	0.011		3058052	56.6		113	11849	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_064.d

Injection Date: 29-Aug-2017 11:11:42

Instrument ID: A8_N

Lims ID: 320-30556-A-4-A

Lab Sample ID: 320-30556-4

Client ID: TP-PFC-020-TPE-D

Operator ID: SACINSTLCMS01

ALS Bottle#: 51

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

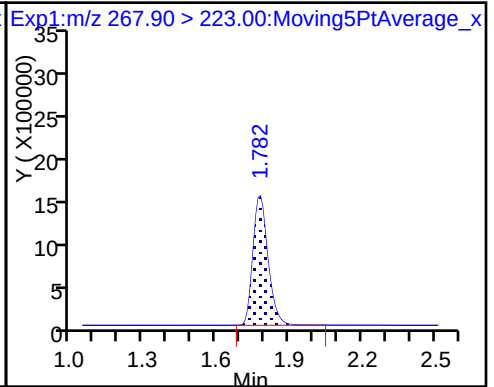
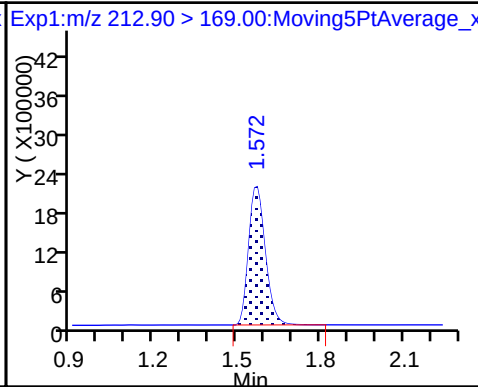
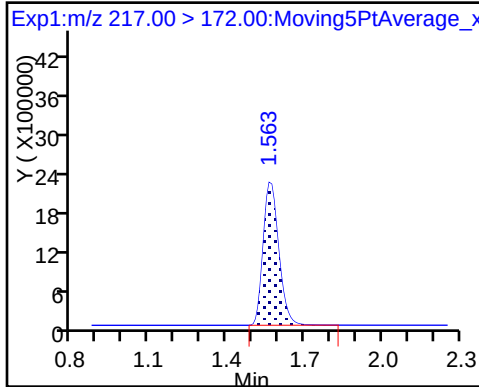
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

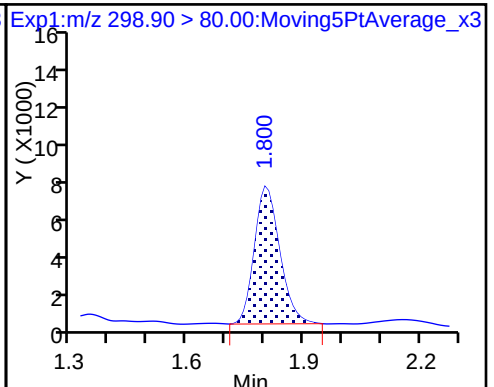
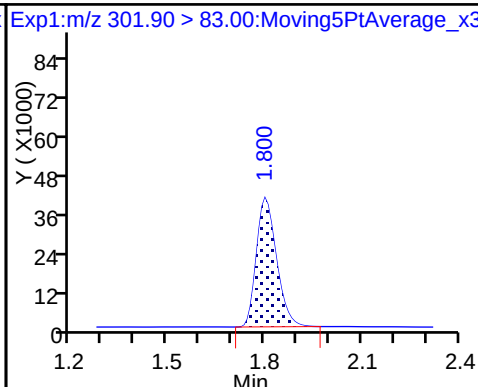
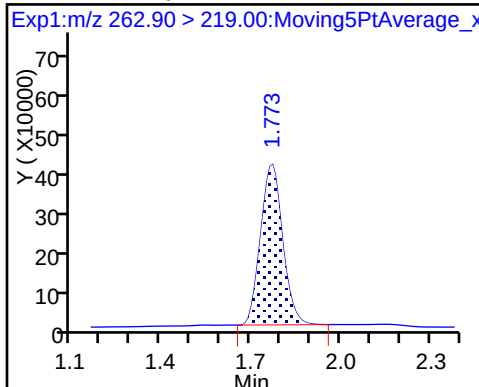
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

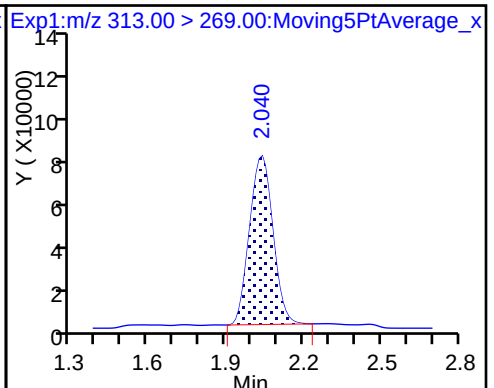
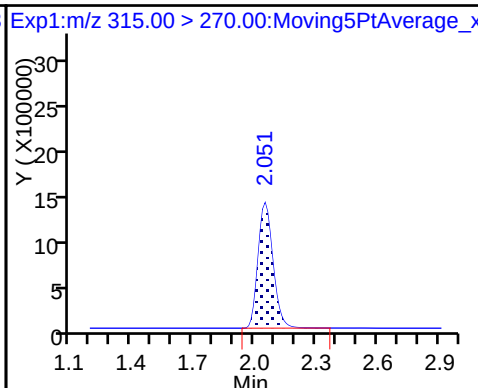
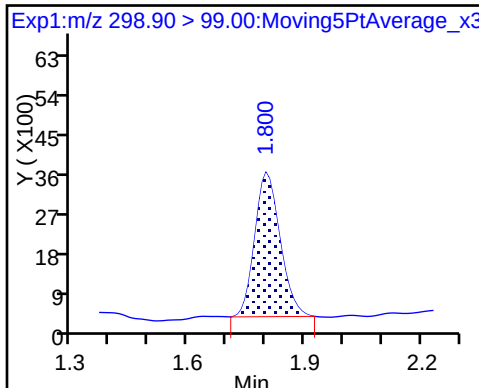
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

D 7 13C2 PFHxA

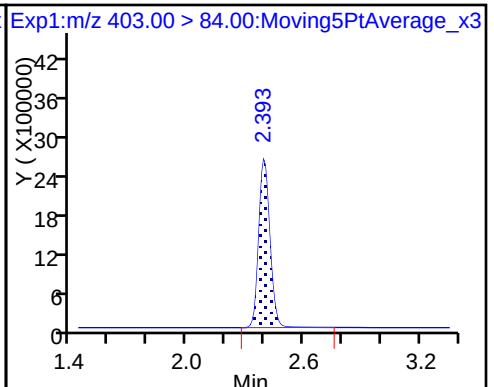
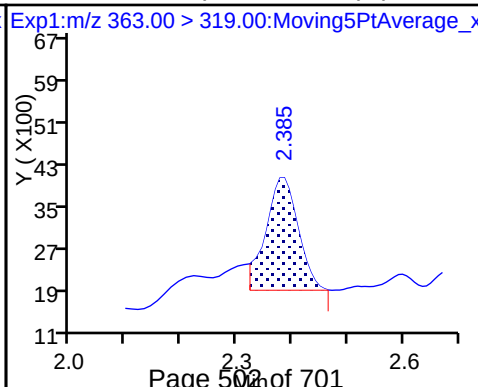
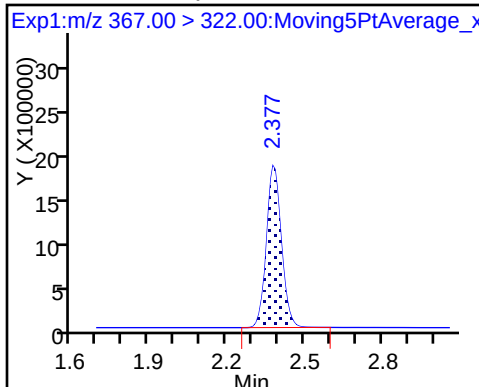
6 Perfluorohexanoic acid

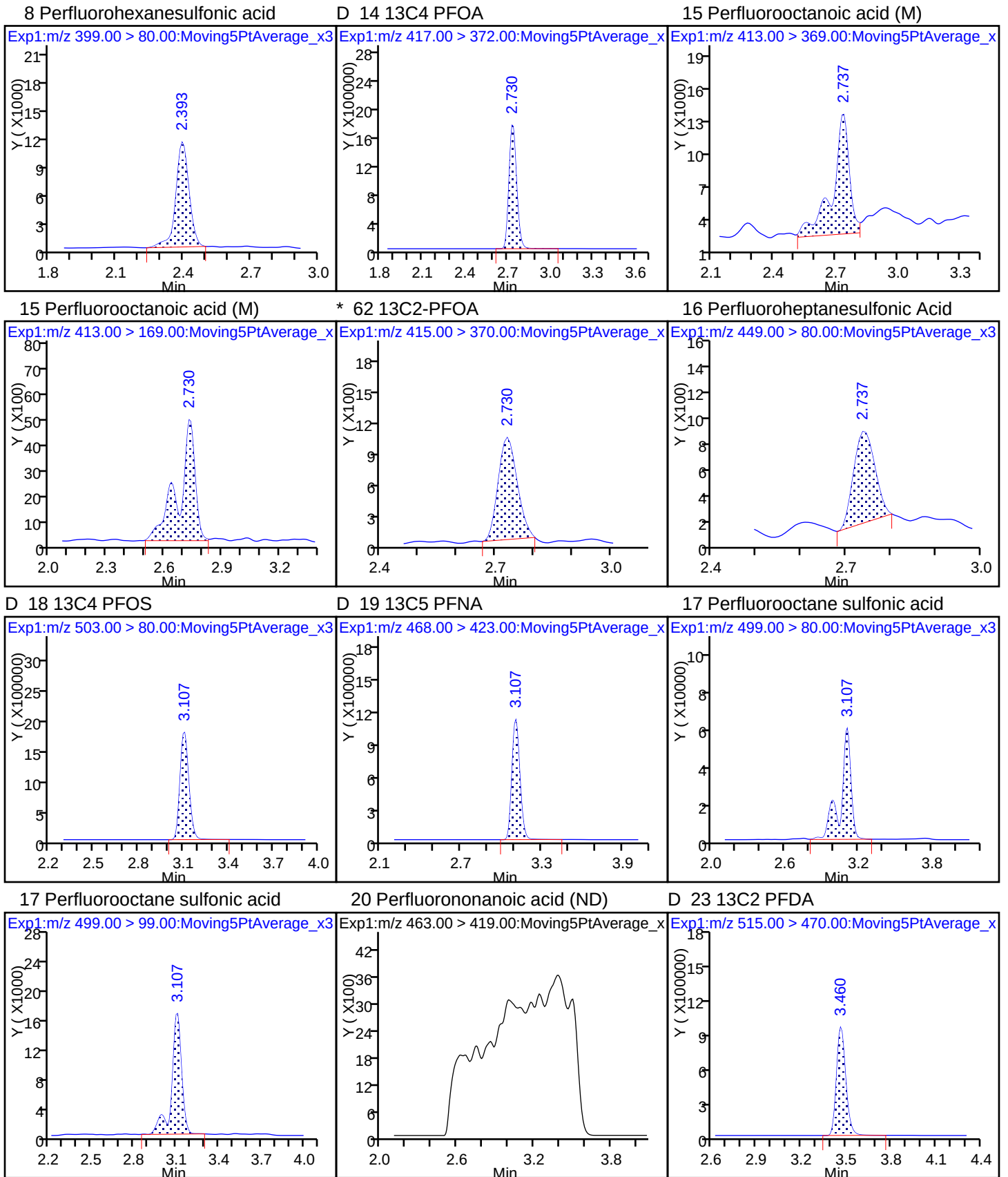


D 9 13C4-PFHpA

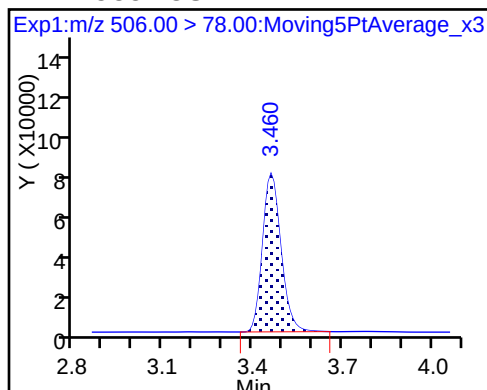
10 Perfluoroheptanoic acid (M)

D 11 18O2 PFHxS

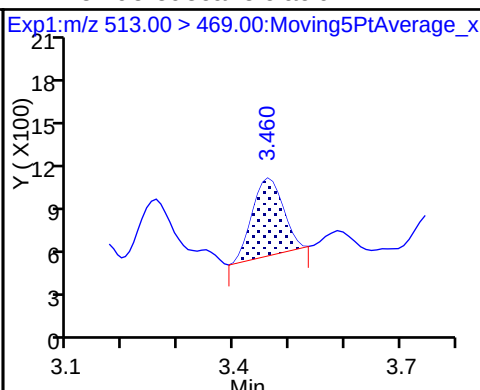




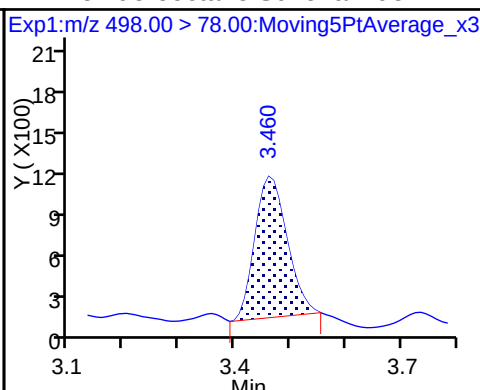
D 21 13C8 FOSA



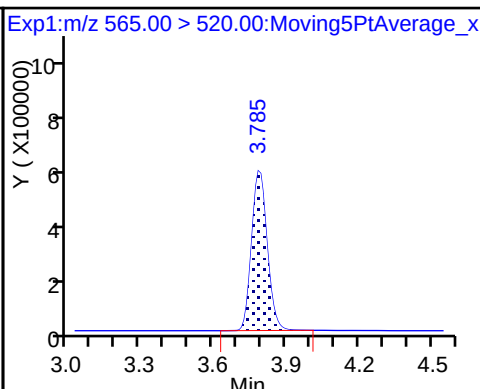
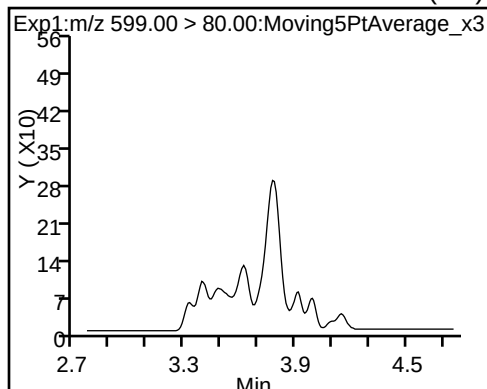
24 Perfluorodecanoic acid



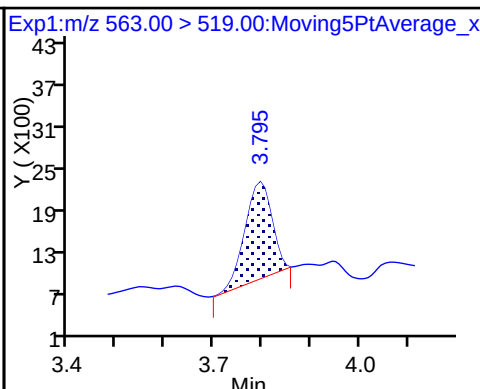
22 Perfluorooctane Sulfonamide



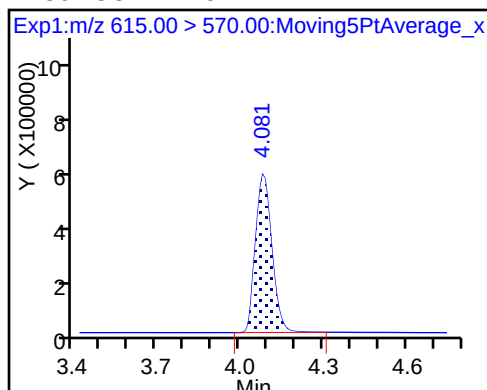
29 Perfluorodecane Sulfonic acid (ND) D 30 13C2 PFUnA



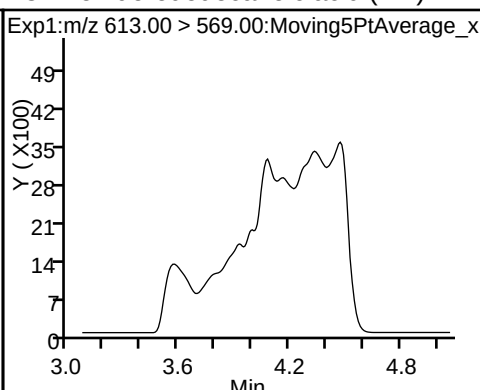
31 Perfluoroundecanoic acid



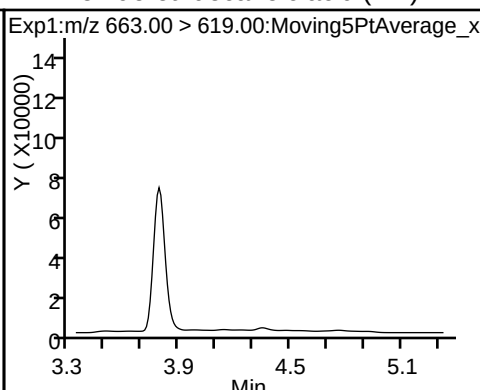
D 36 13C2 PFDaA



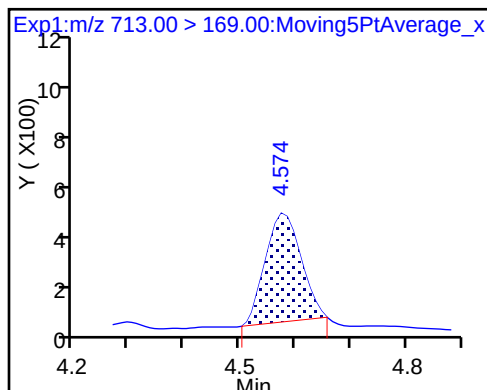
37 Perfluorododecanoic acid (ND)



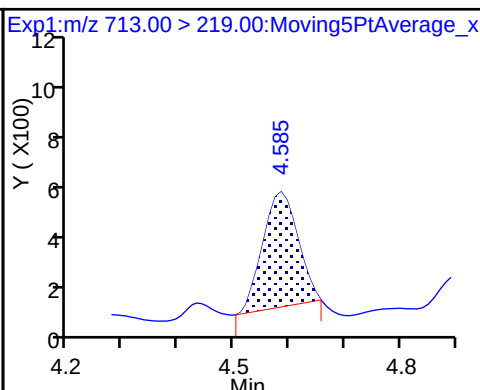
41 Perfluorotridecanoic acid (ND)



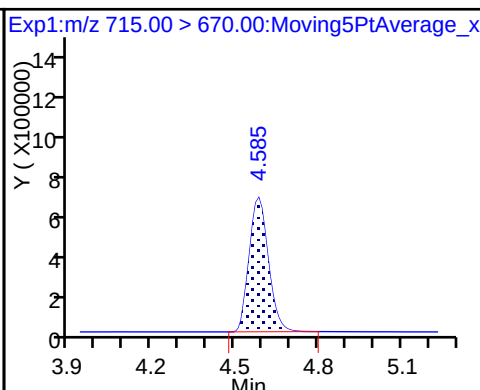
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



D 43 13C2-PFTeDA



TestAmerica Sacramento

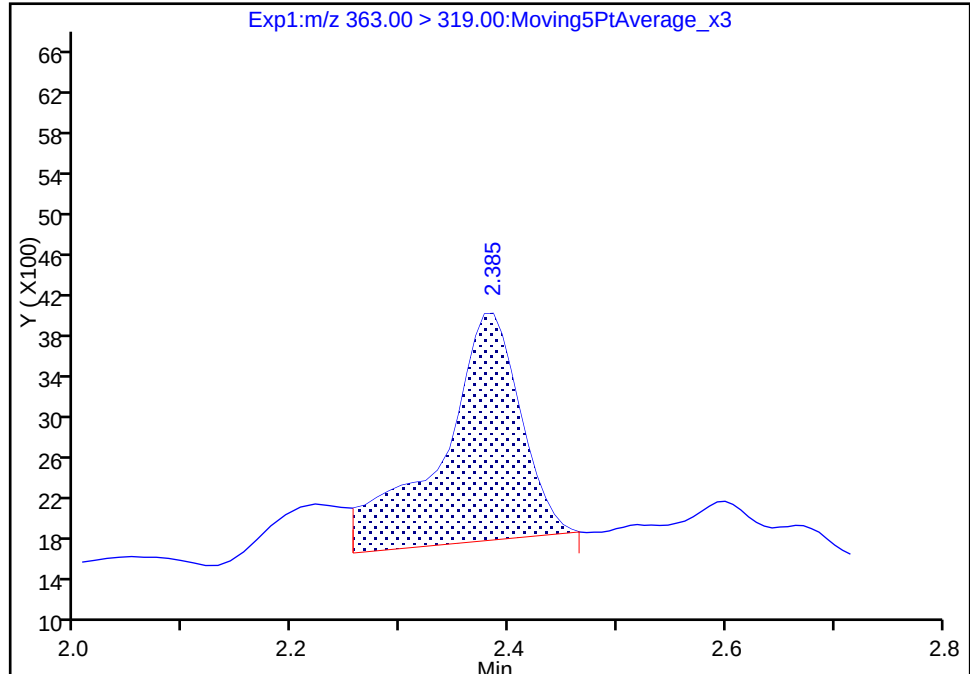
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Injection Date:	29-Aug-2017 11:11:42	Instrument ID:	A8_N		
Lims ID:	320-30556-A-4-A	Lab Sample ID:	320-30556-4		
Client ID:	TP-PFC-020-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	51	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector:	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

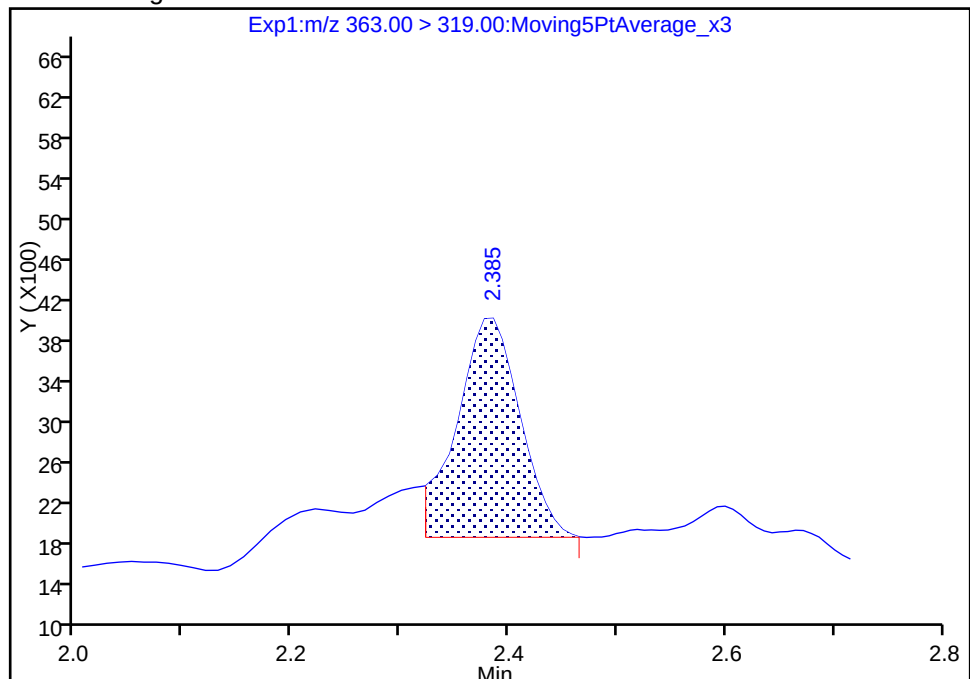
RT: 2.39
Area: 11287
Amount: 0.081626
Amount Units: ng/ml

Processing Integration Results



RT: 2.39
Area: 8518
Amount: 0.061601
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:27:50

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

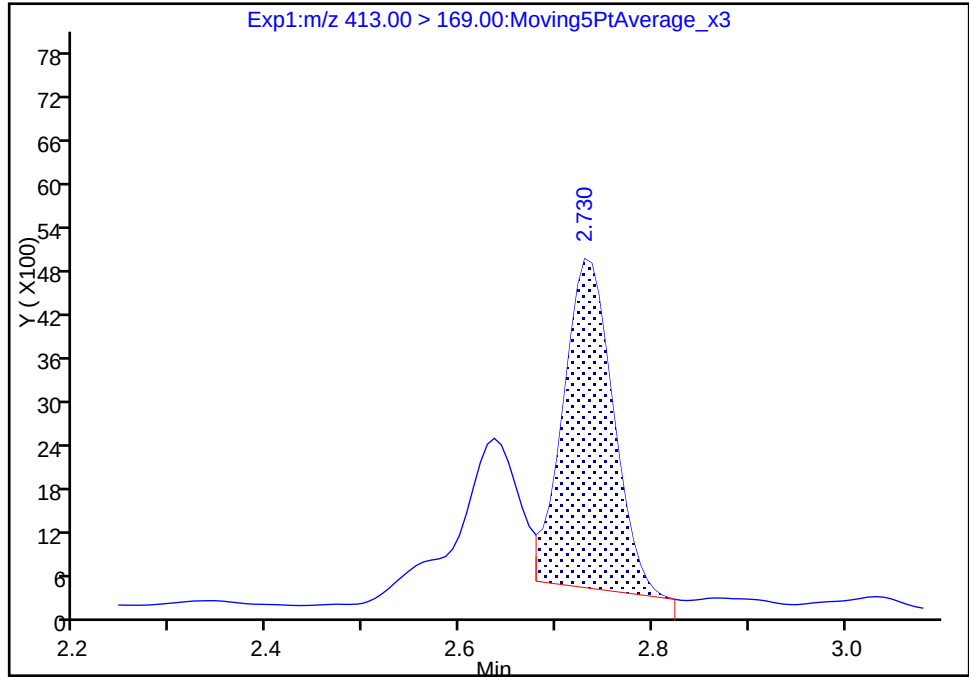
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Injection Date:	29-Aug-2017 11:11:42	Instrument ID:	A8_N		
Lims ID:	320-30556-A-4-A	Lab Sample ID:	320-30556-4		
Client ID:	TP-PFC-020-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	51	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

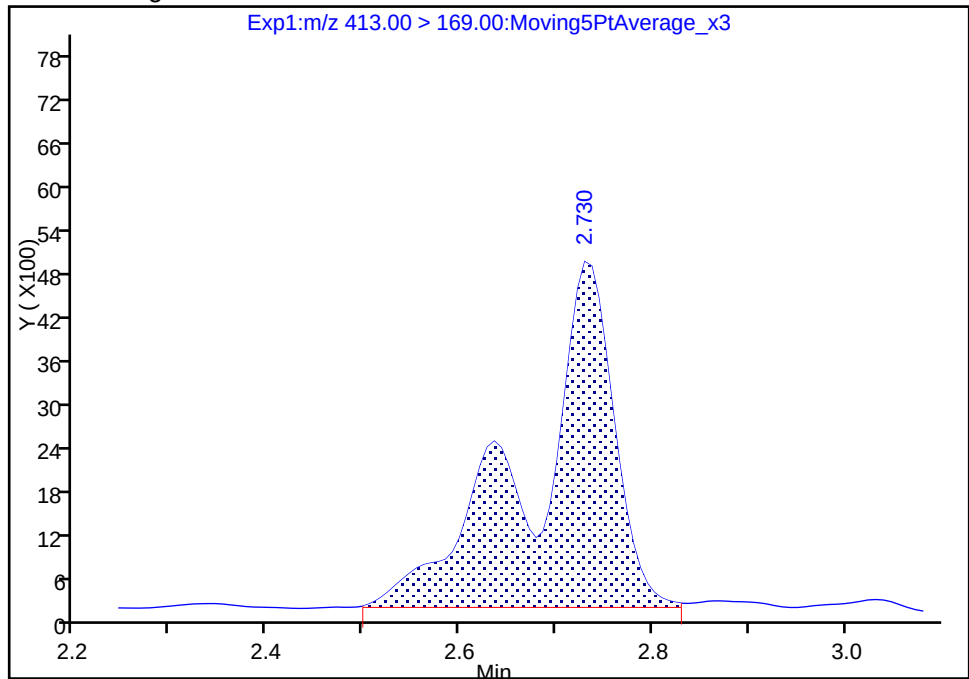
RT: 2.73
Area: 16329
Amount: 0.292896
Amount Units: ng/ml

Processing Integration Results



RT: 2.73
Area: 28746
Amount: 0.430167
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:28:00

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

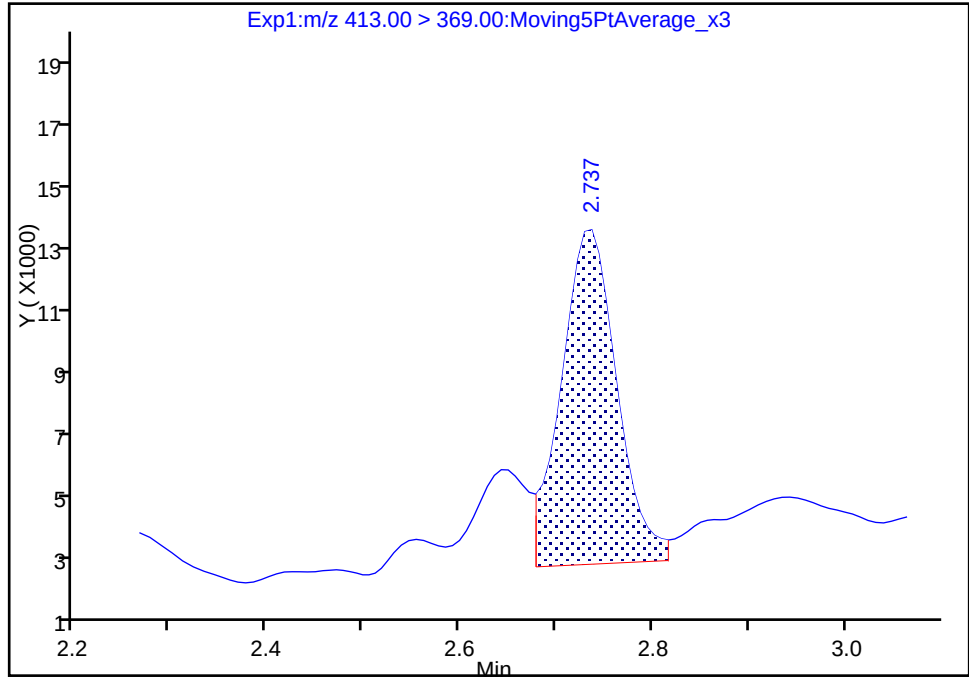
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Injection Date: 29-Aug-2017 11:11:42 Instrument ID: A8_N
Lims ID: 320-30556-A-4-A Lab Sample ID: 320-30556-4
Client ID: TP-PFC-020-TPE-D
Operator ID: SACINSTLCMS01 ALS Bottle#: 51 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

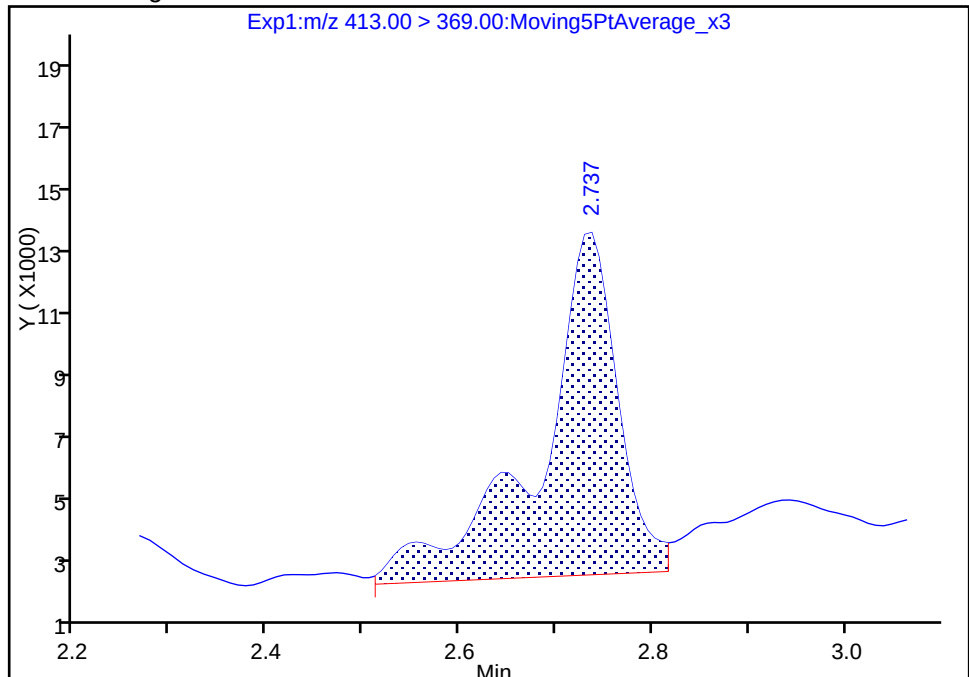
RT: 2.74
Area: 41428
Amount: 0.292896
Amount Units: ng/ml

Processing Integration Results



RT: 2.74
Area: 60844
Amount: 0.430167
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:28:13

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180980/3	2017.08.24A_003.d
Level 2	IC 320-180980/4	2017.08.24A_004.d
Level 3	IC 320-180980/5	2017.08.24A_005.d
Level 4	IC 320-180980/6	2017.08.24A_006.d
Level 5	IC 320-180980/7	2017.08.24A_007.d
Level 6	IC 320-180980/8	2017.08.24A_008.d
Level 7	IC 320-180980/9	2017.08.24A_009.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.539	1.538	1.545	1.545	1.553	1.546	1.546				1.295 - 1.795	1.545
Perfluoropentanoic acid (PFPeA)	1.747	1.747	1.755	1.754	1.754	1.755	1.746				1.501 - 2.001	1.751
Perfluorobutanesulfonic acid (PFBS)	1.766	1.766	1.773	1.781	1.782	1.773	++++				1.593 - 1.953	1.774
4:2 FTS	1.975	1.975	1.983	1.982	1.983	1.983	1.972				1.729 - 2.229	1.979
Perfluorohexanoic acid (PFHxA)	2.009	2.009	2.017	2.028	2.017	2.018	2.018				1.766 - 2.266	2.017
Perfluoroheptanoic acid (PFHpA)	2.350	2.346	2.357	2.354	2.355	2.349	2.344				2.101 - 2.601	2.351
Perfluorohexanesulfonic acid (PFHxS)	++++	2.362	2.365	2.370	2.371	2.365	2.361				2.115 - 2.615	2.366
6:2 FTS	2.679	2.677	2.687	2.686	2.685	2.679	2.677				2.431 - 2.931	2.681
Perfluorooctanoic acid (PFOA)	2.708	2.705	2.716	2.715	2.714	2.708	2.699				2.459 - 2.959	2.709
Perfluoroheptanesulfonic Acid (PFHpS)	2.715	2.713	2.723	2.722	2.721	2.716	2.714				2.468 - 2.968	2.718
Perfluorononanoic acid (PFNA)	3.084	3.081	3.096	3.091	3.090	3.082	3.081				2.837 - 3.337	3.086
Perfluorooctanesulfonic acid (PFOS)	3.084	3.081	3.096	3.091	3.090	3.082	3.081				2.837 - 3.337	3.086
Perfluorooctane Sulfonamide (FOSA)	3.419	3.415	3.425	3.426	3.428	3.420	3.417				3.171 - 3.671	3.421
8:2 FTS	3.436	3.441	3.441	3.443	3.437	3.438	3.435				3.189 - 3.689	3.439
Perfluorodecanoic acid (PFDA)	3.445	3.450	3.459	3.453	3.446	3.447	3.445				3.199 - 3.699	3.449
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.610	3.606	3.617	3.620	3.609	3.610	3.607				3.361 - 3.861	3.611
Perfluorodecanesulfonic acid (PFDS)	3.766	3.763	3.773	3.767	3.765	3.756	3.754				3.513 - 4.013	3.763
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.776	3.782	3.793	3.786	3.784	3.776	3.773				3.531 - 4.031	3.781
Perfluoroundecanoic acid (PFUnA)	3.786	3.782	3.793	3.786	3.784	3.776	3.773				3.533 - 4.033	3.783
MeFOSA	3.917	3.915	3.931	3.926	3.928	3.924	3.922				3.673 - 4.173	3.923
Perfluorododecanoic acid (PFDoA)	4.083	4.081	4.087	4.088	4.083	4.081	4.071				3.832 - 4.332	4.082
N-EtFOSA-M	4.108	4.106	4.121	4.114	4.117	4.115	4.107				3.863 - 4.363	4.113
Perfluorotridecanoic Acid (PFTriA)	4.354	4.352	4.359	4.351	4.352	4.341	4.344				4.100 - 4.600	4.350
Perfluorotetradecanoic acid (PFTeA)	4.592	4.580	4.590	4.591	4.586	4.581	4.573				4.335 - 4.835	4.585
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.009	5.008	5.018	5.018	5.009	5.006	5.000				4.760 - 5.260	5.010
Perfluoro-n-octadecanoic acid (PFODA)	5.374	5.372	5.381	5.380	5.372	5.372	5.362				5.123 - 5.623	5.373
13C4 PFBA	1.539	1.538	1.545	1.545	1.545	1.546	1.537				1.292 - 1.792	1.542
13C5 PFPeA	1.738	1.738	1.755	1.754	1.754	1.746	1.746				1.497 - 1.997	1.747
13C3-PFBS	1.766	1.766	1.773	1.772	1.773	1.773	1.773				1.671 - 1.871	1.771
13C2 PFHxA	2.009	2.009	2.017	2.028	2.017	2.018	2.018				1.766 - 2.266	2.017
13C4-PFHpA	2.342	2.346	2.357	2.354	2.355	2.349	2.344				2.099 - 2.599	2.350
18O2 PFHxS	2.358	2.362	2.365	2.370	2.363	2.365	2.361				2.113 - 2.613	2.363

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
M2-6:2FTS	2.679	2.677	2.687	2.686	2.685	2.679	2.677				2.431 - 2.931	2.681
13C4 PFOA	2.708	2.705	2.716	2.715	2.714	2.708	2.699				2.459 - 2.959	2.709
13C4 PFOS	3.084	3.081	3.087	3.091	3.081	3.082	3.081				2.834 - 3.334	3.084
13C5 PFNA	3.084	3.081	3.096	3.091	3.090	3.082	3.081				2.837 - 3.337	3.086
13C8 FOSA	3.410	3.415	3.425	3.426	3.419	3.420	3.417				3.169 - 3.669	3.419
M2-8:2FTS	3.436	3.433	3.441	3.443	3.437	3.438	3.435				3.188 - 3.688	3.438
13C2 PFDA	3.445	3.450	3.459	3.453	3.446	3.447	3.445				3.199 - 3.699	3.449
d3-NMeFOSAA	3.610	3.606	3.617	3.610	3.609	3.599	3.596				3.357 - 3.857	3.607
d5-NEtFOSAA	3.776	3.772	3.783	3.786	3.774	3.766	3.764				3.524 - 4.024	3.774
13C2 PFUnA	3.776	3.782	3.793	3.786	3.784	3.776	3.773				3.531 - 4.031	3.781
d-N-MeFOSA-M	3.909	3.915	3.923	3.926	3.920	3.916	3.914				3.667 - 4.167	3.918
13C2 PFDoA	4.083	4.081	4.087	4.088	4.083	4.081	4.071				3.832 - 4.332	4.082
d-N-EtFOSA-M	4.100	4.098	4.112	4.114	4.109	4.106	4.107				3.857 - 4.357	4.107
13C2-PFTeDA	4.592	4.591	4.602	4.591	4.597	4.581	4.585				4.341 - 4.841	4.591
13C2-PFHxDA	5.009	5.008	5.018	5.018	5.009	5.006	5.000				4.760 - 5.260	5.010

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180980/3	2017.08.24A_003.d
Level 2	IC 320-180980/4	2017.08.24A_004.d
Level 3	IC 320-180980/5	2017.08.24A_005.d
Level 4	IC 320-180980/6	2017.08.24A_006.d
Level 5	IC 320-180980/7	2017.08.24A_007.d
Level 6	IC 320-180980/8	2017.08.24A_008.d
Level 7	IC 320-180980/9	2017.08.24A_009.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4		B	M1	M2								
13C4 PFBA	205953 208740	219428 207087	217536 184480	206946	Ave		207167.071				5.5		50.0			
13C5 PFPeA	135234 128753	143355 126701	138760 116650	130761	Ave		131459.140				6.7		50.0			
13C3-PFBS	3869.3 3829.0	3980.8 4106.0	4104.3 3597.8	3838.9	Ave		3903.74501				4.6		50.0			
13C2 PFHxA	132530 135950	143392 137256	148022 124047	138067	Ave		137037.649				5.6		50.0			
13C4-PFHpA	122195 126604	135956 127895	132092 115671	126752	Ave		126738.003				5.2		50.0			
18O2 PFHxS	211958 216108	226335 227847	224321 205560	215306	Ave		218205.098				3.8		50.0			
M2-6:2FTS	50392 52293	53914 54575	51497 55317	52557	Ave		52935.0827				3.3		50.0			
13C4 PFOA	115096 120162	126360 113083	118909 100156	119986	Ave		116250.197				7.1		50.0			
13C4 PFOS	149406 148558	156113 154391	160965 142690	149229	Ave		151621.563				3.9		50.0			
13C5 PFNA	90530 84846	94002 88626	96239 79454	89843	Ave		89077.2114				6.3		50.0			
13C8 FOSA	225785 227217	236688 226234	243055 215706	234762	Ave		229921.060				3.9		50.0			
M2-8:2FTS	39773 42150	43494 44316	45194 42257	41030	Ave		42602.1742				4.4		50.0			
13C2 PFDA	78033 77185	83854 76011	80388 70179	74404	Ave		77150.4857				5.6		50.0			
d3-NMeFOSAA	19903 21153	20636 21308	20153 20912	20255	Ave		20617.0343				2.6		50.0			

Note: The M1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980
 SDG No.: _____
 Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
 Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4		B	M1	M2								
d5-NEtFOSAA	21325 21031	22088 22513	22123 20626	21250	Ave		21565.1543				3.2		50.0			
13C2 PFUnA	51366 52505	55969 53286	55840 45466	51497	Ave		52275.5971				6.8		50.0			
d-N-MeFOSA-M	53267 52716	56751 57850	55665 56185	54142	Ave		55225.2086				3.4		50.0			
13C2 PFDoA	50170 49167	54145 50715	54469 49612	50398	Ave		51239.3571				4.2		50.0			
d-N-EtFOSA-M	50587 51598	53455 56131	55284 52824	51369	Ave		53035.3829				3.9		50.0			
13C2-PFTeDA	54074 53590	55961 53633	57501 47642	55968	Ave		54052.8200				5.9		50.0			
13C2-PFHxDA	111825 106657	113322 109535	111508 105373	113362	Ave		110225.903				2.9		50.0			

Note: The M1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

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)	1.1098 0.8160	0.8979 0.6900	0.9737	0.9597	0.9067	AveID		0.9077				14.5		35.0			
Perfluoropentanoic acid (PFPeA)	1.1797 1.0171	1.0442 0.8656	1.0502	1.0783	1.0723	AveID		1.0439				9.0		35.0			
Perfluorobutanesulfonic acid (PFBS)	78.096 58.142	75.637 ++++	78.325	76.774	71.996	AveID		73.162				10.5		50.0			
4:2 FTS	0.8769 0.9601	0.9397 0.7970	0.9758	0.9226	0.9281	AveID		0.9143				6.6		35.0			
Perfluorohexanoic acid (PFHxA)	1.0236 0.9181	0.9236 0.8247	0.9090	0.9590	0.9621	AveID		0.9315				6.6		35.0			
Perfluoroheptanoic acid (PFHpA)	1.0458 0.9533	0.9683 0.8682	0.9673	0.9650	0.9772	AveID		0.9636				5.4		35.0			
Perfluorohexanesulfonic acid (PFHxS)	++++ 0.9789	1.2009 0.8850	1.1008	1.0482	1.0351	AveID		1.0415				10.3		35.0			
6:2FTS	1.0099 0.8734	0.8708 0.7425	0.8789	0.8632	0.8609	AveID		0.8714				8.9		35.0			
Perfluorooctanoic acid (PFOA)	1.3035 1.0486	1.1501 0.9745	1.0953	1.0446	1.0425	AveID		1.0942				9.8		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2720 1.1171	1.2961 0.9578	1.2258	1.2776	1.2408	AveID		1.1982				10.1		50.0			
Perfluorononanoic acid (PFNA)	1.0519 0.9854	1.0140 0.9350	0.9414	0.9470	1.0234	AveID		0.9854				4.7		35.0			
Perfluorooctanesulfonic acid (PFOS)	1.1839 1.0231	1.1437 0.9791	1.0250	1.0238	1.0415	AveID		1.0600				7.0		35.0			
Perfluorooctane Sulfonamide (FOSA)	1.0529 0.8770	0.9994 0.7214	0.9579	0.9329	0.9353	AveID		0.9253				11.4		35.0			
8:2FTS	1.0344 0.8817	0.9940 0.8039	0.9455	0.9336	0.9093	AveID		0.9289				8.1		35.0			
Perfluorodecanoic acid (PFDA)	0.9890 0.9677	0.8530 0.8804	0.8490	0.8850	0.8981	AveID		0.9032				6.0		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.1690 0.9509	0.9374 0.9808	1.0055	0.9322	0.9219	AveID		0.9854				8.7		35.0			
Perfluorodecanesulfonic acid (PFDS)	0.5922 0.5952	0.6114 0.5676	0.6173	0.6230	0.6157	AveID		0.6032				3.2		50.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.8912 0.8713	0.8066 0.8895	0.8439	0.8296	0.8755	AveID		0.8582				3.8		35.0			
Perfluoroundecanoic acid (PFUnA)	1.3469 1.0829	1.2490 1.0838	1.0636	1.0408	1.0135	AveID		1.1258				11.0		35.0			

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.: 320-30556-1 Analy Batch No.: 180980
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

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								
MeFOSA	0.9740 0.9129	0.9178 0.8793	0.9334	0.8948	0.8943	AveID		0.9152				3.4		35.0			
Perfluorododecanoic acid (PFDoA)	1.0518 0.9695	1.0699 0.9120	0.9068	0.9274	0.9326	AveID		0.9671				7.0		35.0			
N-EtFOSA-M	0.9024 0.9519	0.9493 0.9417	0.8917	0.9262	0.9369	AveID		0.9286				2.5		35.0			
Perfluorotridecanoic Acid (PFTriA)	1.0207 0.9978	0.8921 0.9435	0.9256	0.9364	0.9597	AveID		0.9537				4.6		50.0			
Perfluorotetradecanoic acid (PFTeA)	0.3069 0.2384	0.2443 0.2609	0.2470	0.2291	0.2429	AveID		0.2528				10.2		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.7431 0.9071	1.2553 0.8144	0.9907	0.8626	0.9042	L2ID	0.4298	0.8665							0.9970		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	1.0570 1.0999	1.1198 1.0235	1.0780	1.0574	1.0848	AveID		1.0743				2.9		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180980/3	2017.08.24A_003.d
Level 2	IC 320-180980/4	2017.08.24A_004.d
Level 3	IC 320-180980/5	2017.08.24A_005.d
Level 4	IC 320-180980/6	2017.08.24A_006.d
Level 5	IC 320-180980/7	2017.08.24A_007.d
Level 6	IC 320-180980/8	2017.08.24A_008.d
Level 7	IC 320-180980/9	2017.08.24A_009.d

ANALYTE	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
13C4 PFBA	Ave	10297625 10354348	10971418 9223990	10876782	10347324	10436988	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5 PFPeA	Ave	6761694 6335044	7167750 5832509	6937983	6538056	6437663	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C3-PFBS	Ave	179923 190930	185109 167298	190849	178511	178049	46.5 46.5	46.5 46.5	46.5	46.5	46.5
13C2 PFHxA	Ave	6626513 6862788	7169588 6202360	7401088	6903339	6797501	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	6109752 6394742	6797811 5783566	6604614	6337598	6330218	50.0 50.0	50.0 50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	10025604 10777172	10705636 9722992	10610397	10183997	10221910	47.3 47.3	47.3 47.3	47.3	47.3	47.3
M2-6:2FTS	Ave	2393614 2592305	2560925 2627540	2446122	2496473	2483936	47.5 47.5	47.5 47.5	47.5	47.5	47.5
13C4 PFOA	Ave	5754782 5654159	6317994 5007806	5945452	5999299	6008077	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4 PFOS	Ave	7141590 7379875	7462183 6820592	7694138	7133141	7101056	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	4526493 4431296	4700096 3972715	4811966	4492139	4242319	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C8 FOSA	Ave	11289231 11311686	11834388 10785319	12152773	11738110	11360864	50.0 50.0	50.0 50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	1905112 2122759	2083372 2024111	2164816	1965341	2018998	47.9 47.9	47.9 47.9	47.9	47.9	47.9
13C2 PFDA	Ave	3901642 3800550	4192711 3508960	4019397	3720180	3859230	50.0 50.0	50.0 50.0	50.0	50.0	50.0
d3-NMeFOSAA	Ave	995137 1065395	1031821 1045585	1007638	1012747	1057639	50.0 50.0	50.0 50.0	50.0	50.0	50.0
d5-NEtFOSAA	Ave	1066270 1125647	1104384 1031294	1106164	1062485	1051560	50.0 50.0	50.0 50.0	50.0	50.0	50.0

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

ANALYTE	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 PFUnA	Ave	2568317 2664298	2798436 2273290	2792006	2574856	2625256	50.0 50.0	50.0 50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	2663351 2892509	2837526 2809251	2783263	2707124	2635799	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	2508487 2535746	2707244 2480598	2723439	2519889	2458372	50.0 50.0	50.0 50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	2529344 2806547	2672739 2641185	2764185	2568463	2579921	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	2703706 2681670	2798051 2382081	2875053	2798407	2679519	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	5591246 5476760	5666113 5268626	5575388	5668084	5332849	50.0 50.0	50.0 50.0	50.0	50.0	50.0

Curve Type Legend:

Ave = Average

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180980/3	2017.08.24A_003.d
Level 2	IC 320-180980/4	2017.08.24A_004.d
Level 3	IC 320-180980/5	2017.08.24A_005.d
Level 4	IC 320-180980/6	2017.08.24A_006.d
Level 5	IC 320-180980/7	2017.08.24A_007.d
Level 6	IC 320-180980/8	2017.08.24A_008.d
Level 7	IC 320-180980/9	2017.08.24A_009.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	114286 16898535	197020 25456573	1059118	3971942	9462743	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	79771 12887272	149697 20195604	728652	2819891	6902883	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		AveID	133562 21103793	266173 +++++	1420884	5210859	12184780	0.442 88.4	0.884 +++++	4.42	17.7	44.2
4:2 FTS		AveID	20637 4893877	47321 8235277	234667	905815	2266455	0.467 93.4	0.934 187	4.67	18.7	46.7
Perfluorohexanoic acid (PFHxA)		AveID	67831 12601744	132443 20459197	672792	2648018	6539935	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		AveID	63893 12192211	131647 20084980	638851	2446435	6185854	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 20296054	247334 33109344	1123503	4107370	10177783	+++++ 91.0	0.910 182	4.55	18.2	45.5
6:2FTS		AveID	24123 4518882	44506 7787108	214542	860157	2133847	0.474 94.8	0.948 190	4.74	19.0	47.4
Perfluorooctanoic acid (PFOA)		AveID	75012 11858254	145328 19520592	651185	2506742	6263198	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	90463 16419172	165687 26021550	939172	3630197	8774426	0.476 95.2	0.952 190	4.76	19.0	47.6
Perfluorononanoic acid (PFNA)		AveID	47616 8732868	95318 14858303	452982	1701549	4341599	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorooctanesulfonic acid (PFOS)		AveID	82073 14658325	165687 25930106	765520	2835600	7179346	0.464 92.8	0.928 186	4.64	18.6	46.4
Perfluorooctane Sulfonamide (FOSA)		AveID	118866 19841398	236554 31120054	1164104	4380116	10626285	0.500 100	1.00 200	5.00	20.0	50.0
8:2FTS		AveID	19707 3743384	41419 6508345	204683	733921	1835859	0.479 95.8	0.958 192	4.79	19.2	47.9
Perfluorodecanoic acid (PFDA)		AveID	38586 7355422	71527 12357119	341258	1316957	3465795	0.500 100	1.00 200	5.00	20.0	50.0

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

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
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	11633 2026219	19344 4102157	101323	377640	975071	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	42650 8857990	92017 15616303	478925	1792368	4408935	0.482 96.4	0.964 193	4.82	19.3	48.2
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	9503 1961485	17815 3669288	93348	352558	920624	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoroundecanoic acid (PFUnA)		AveID	34593 5770588	69903 9854871	296955	1071917	2660804	0.500 100	1.00 200	5.00	20.0	50.0
MeFOSA		AveID	25941 5281342	52085 9880406	259795	968964	2357081	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	26385 4916676	57927 9049141	246949	934770	2292605	0.500 100	1.00 200	5.00	20.0	50.0
N-EtFOSA-M		AveID	22824 5343269	50746 9949207	246476	951552	2417225	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorotridecanoic Acid (PFTriA)		AveID	25604 5060197	48303 9361633	252078	943819	2359196	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		AveID	8297 1278556	13670 2485860	71000	256477	650916	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	97460 9935406	142257 17163735	552335	1955799	4822029	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoro-n-octadecanoic acid (PFODA)		AveID	59100 12047785	126897 21569638	601033	2397368	5785021	0.500 100	1.00 200	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_003.d
 Lims ID: IC L1 Full
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 24-Aug-2017 10:09:16 ALS Bottle#: 28 Worklist Smp#: 3
 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*sub19
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:53:57 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

First Level Reviewer: phomsophat

Date: 24-Aug-2017 10:41:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.539	1.542	-0.003		10297625	49.7		99.4	37889	
2 Perfluorobutyric acid										
212.90 > 169.00	1.539	1.545	-0.006	1.000	114286	0.6114		122	24.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.738	1.747	-0.009		6761694	51.4		103	94445	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.747	1.751	-0.004	1.000	79771	0.5650		113	55.0	
D 47 13C3-PFBS										
301.90 > 83.00	1.766	1.771	-0.005		179923	46.1		99.1	4790	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.766	1.773	-0.007	1.000	133562	0.4718		107	1178	
298.90 > 99.00	1.766	1.773	-0.007	1.000	54833		2.44(0.00-0.00)	107	462	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.975	1.979	-0.004	1.000	20637	0.4479		95.9	825	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.009	2.016	-0.007	1.000	67831	0.5495		110	97.8	
D 7 13C2 PFHxA										
315.00 > 270.00	2.009	2.016	-0.007		6626513	48.4		96.7	28655	
D 9 13C4-PFHpA										
367.00 > 322.00	2.342	2.349	-0.007		6109752	48.2		96.4	20294	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.350	2.351	-0.001	1.000	63893	0.5426		109	104	
D 11 18O2 PFHxS										
403.00 > 84.00	2.358	2.363	-0.005		10025604	45.9		97.1	33693	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.358	2.365	-0.007	1.000	139509	0.6320		139	504	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.679	2.681	-0.002	1.000	24123	0.5494		116	651	
D 12 M2-6:2FTS										
429.00 > 409.00	2.679	2.681	-0.002		2393614	45.2		95.2	15577	
* 62 13C2-PFOA										
415.00 > 370.00	2.701	2.703	-0.002		5831061	50.0			25013	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.708	2.709	-0.001	1.000	75012	0.5957		119	16.9	
413.00 > 169.00	2.701	2.709	-0.008	0.997	42879		1.75(0.90-1.10)	119	405	
D 14 13C4 PFOA										
417.00 > 372.00	2.708	2.709	-0.001		5754782	49.5		99.0	19910	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.715	2.718	-0.003	1.000	90463	0.5053		106	524	
D 18 13C4 PFOS										
503.00 > 80.00	3.084	3.084	0.0		7141590	47.1		98.5	17155	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.084	3.087	-0.003	1.000	82073	0.5182		112	108	
499.00 > 99.00	3.084	3.087	-0.003	1.000	18295		4.49(0.90-1.10)	112	107	
20 Perfluorononanoic acid										
463.00 > 419.00	3.084	3.087	-0.003	1.000	47616	0.5337		107	35.1	
D 19 13C5 PFNA										
468.00 > 423.00	3.084	3.087	-0.003		4526493	50.8		102	20890	
D 21 13C8 FOSA										
506.00 > 78.00	3.410	3.419	-0.009		11289231	49.1		98.2	43585	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.419	3.421	-0.002	1.000	118866	0.5690		114	1173	
D 26 M2-8:2FTS										
529.00 > 509.00	3.436	3.438	-0.002		1905112	44.7		93.4	20357	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.436	3.439	-0.003	1.000	19707	0.5334		111	1163	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.445	3.449	-0.004	1.000	38586	0.5475		110	89.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.445	3.449	-0.004		3901642	50.6		101	19540	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.610	3.607	0.003		995137	48.3		96.5	6067	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.610	3.611	-0.001	1.000	11633	0.5932		119	251	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.766	3.763	0.003	1.000	42650	0.4732		98.2	801	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.776	3.774	0.002		1066270	49.4		98.9	3387	
D 30 13C2 PFUnA										
565.00 > 520.00	3.776	3.781	-0.005		2568317	49.1		98.3	13365	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.776	3.781	-0.005	1.000	9503	0.5192		104	198	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.786	3.783	0.003	1.000	34593	0.5982		120	67.5	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.909	3.917	-0.008		2663351	48.2		96.5	686	
35 MeFOSA										
512.00 > 169.00	3.917	3.923	-0.006	1.000	25941	0.5321		106	535	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.083	4.082	0.001	1.000	26385	0.5438		109	6.2	
D 36 13C2 PFDaA										
615.00 > 570.00	4.083	4.082	0.001		2508487	49.0		97.9	11399	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.100	4.107	-0.007		2529344	47.7		95.4	5154	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.108	4.113	-0.005	1.000	22824	0.4859		97.2	574	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.354	4.350	0.004	1.000	25604	0.5351		107	10.7	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.592	4.585	0.007	1.000	8297	0.6070		121	170	
713.00 > 219.00	4.592	4.585	0.007	1.000	5532		1.50(0.00-0.00)	121	80.8	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.592	4.591	0.001		2703706	50.0		100	4508	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.009	5.010	-0.001	1.000	97460	0.5098		102	17.9	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.009	5.010	-0.001		5591246	50.7		101	3799	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.374	5.373	0.001	1.000	59100	0.4919		98.4	14.3	

Reagents:

LCPFC_FULL-L1_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_003.d

Injection Date: 24-Aug-2017 10:09:16

Instrument ID: A8_N

Lims ID: IC L1 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 28

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

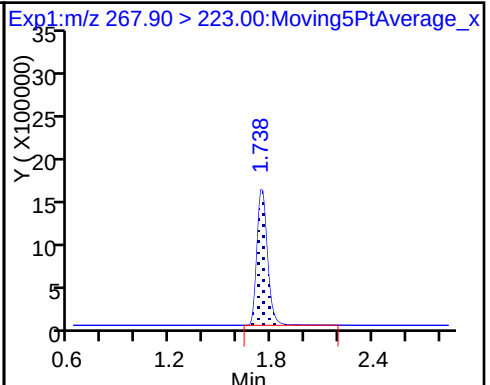
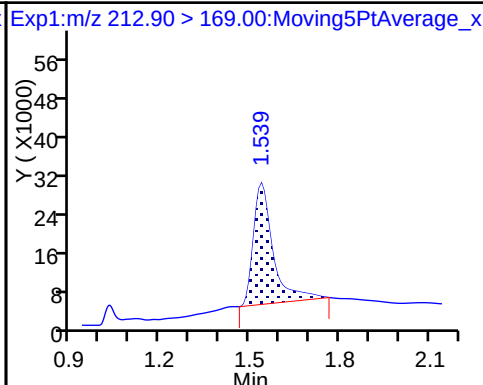
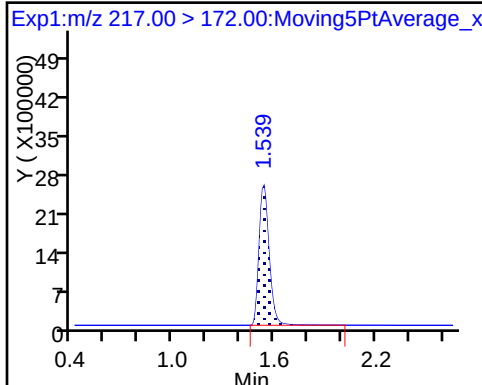
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

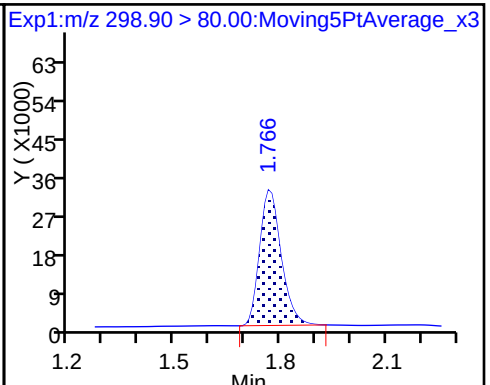
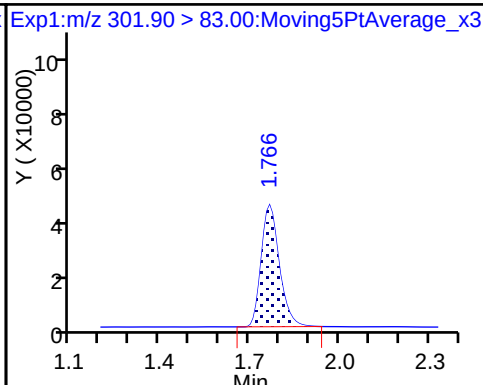
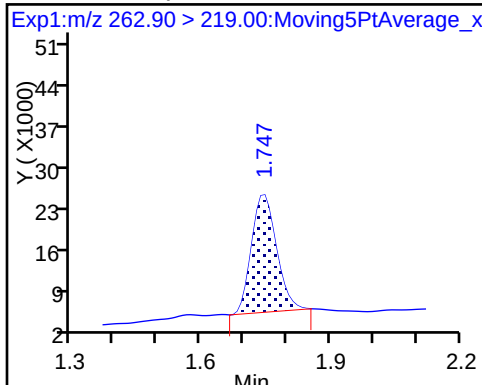
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

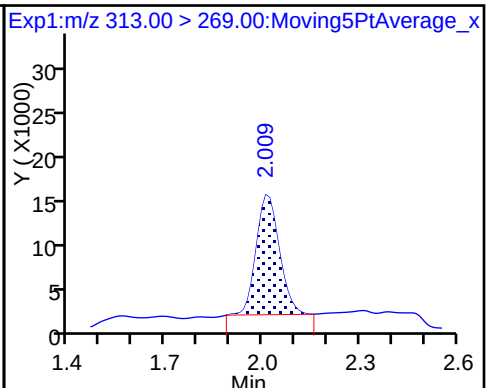
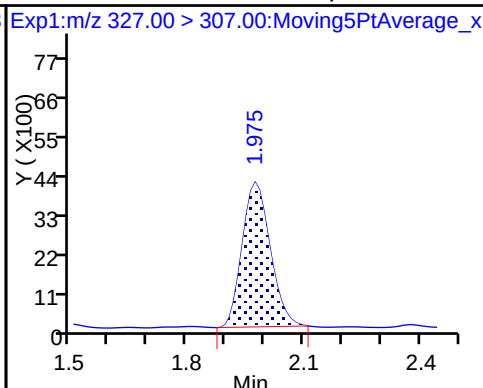
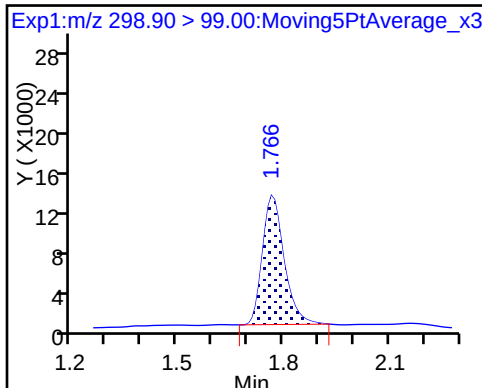
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexanoic acid

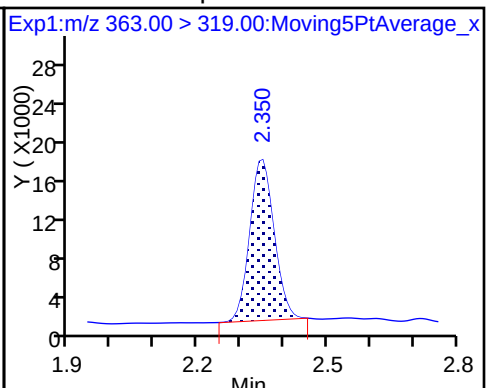
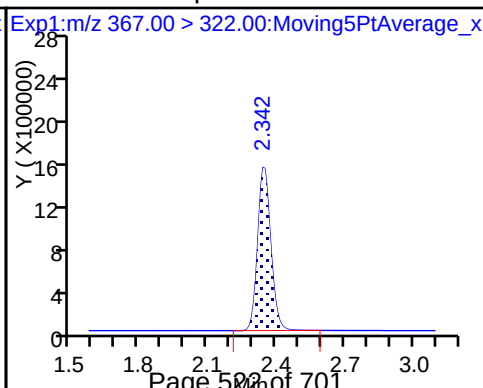
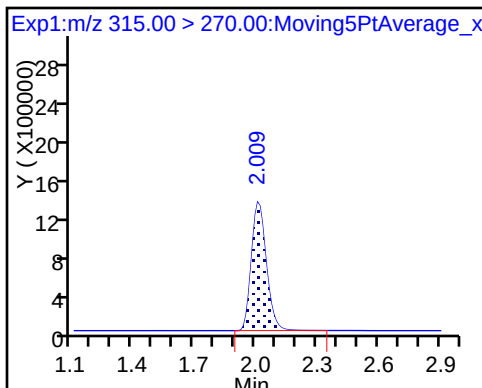
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

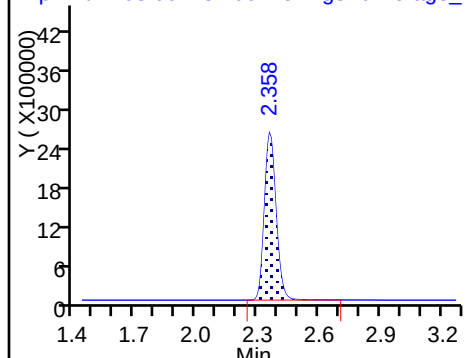


D 11 18O2 PFHxS

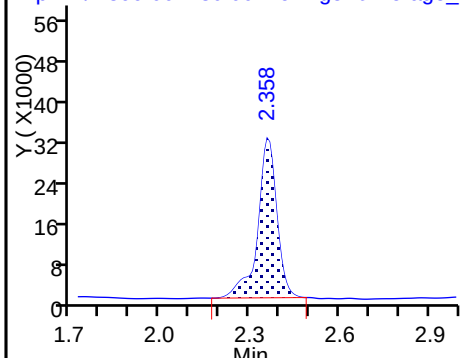
8 Perfluorohexanesulfonic acid

13 Sodium 1H,1H,2H,2H-perfluorooctane

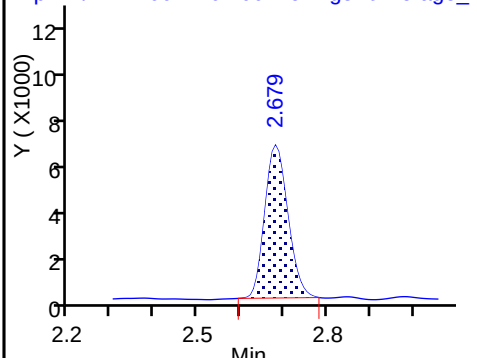
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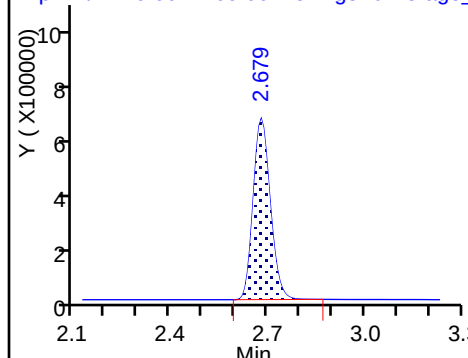


D 12 M2-6:2FTS

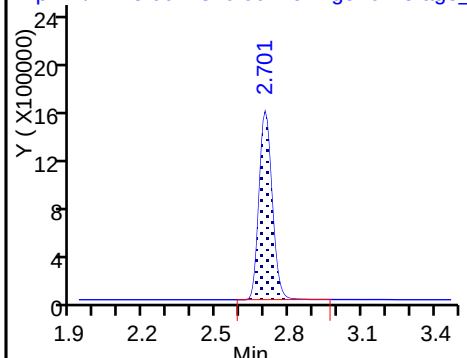
* 62 13C2-PFOA

15 Perfluorooctanoic acid

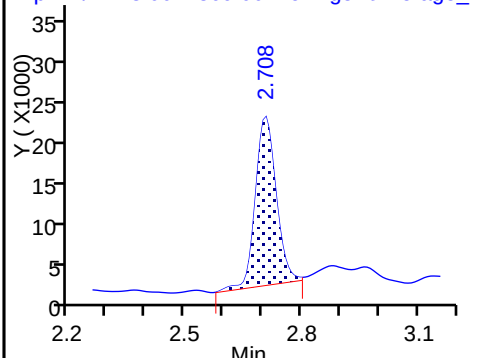
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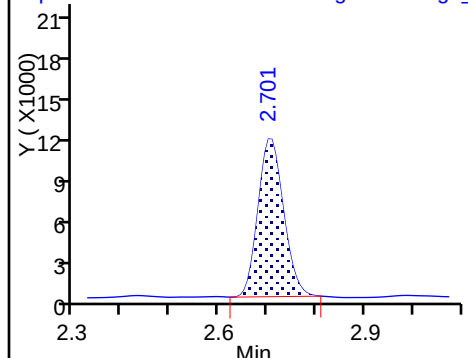


15 Perfluorooctanoic acid

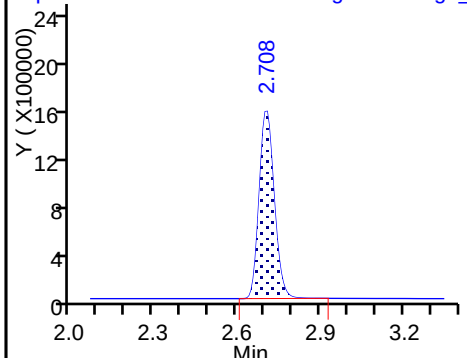
D 14 13C4 PFOA

16 Perfluoroheptanesulfonic Acid

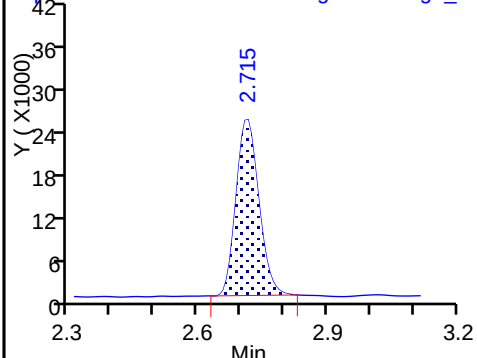
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Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

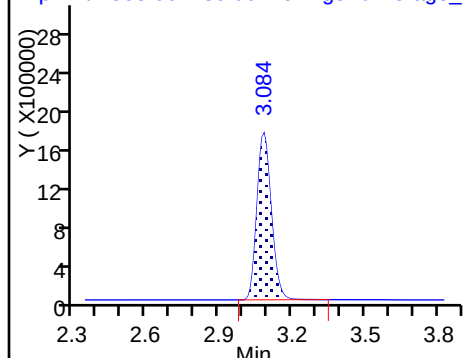


D 18 13C4 PFOS

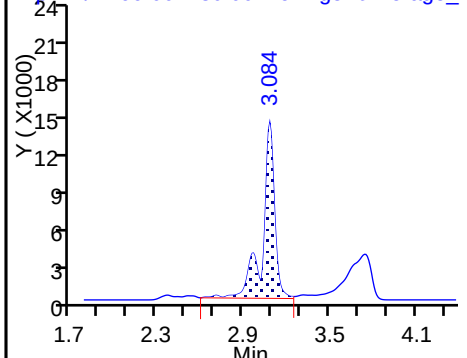
17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

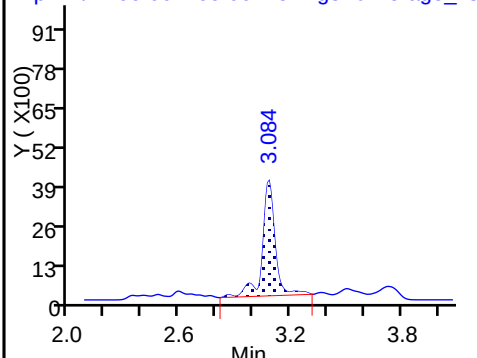
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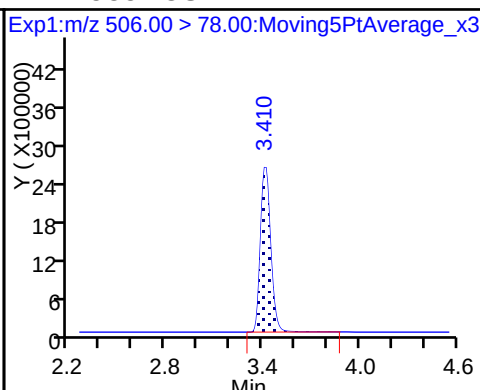
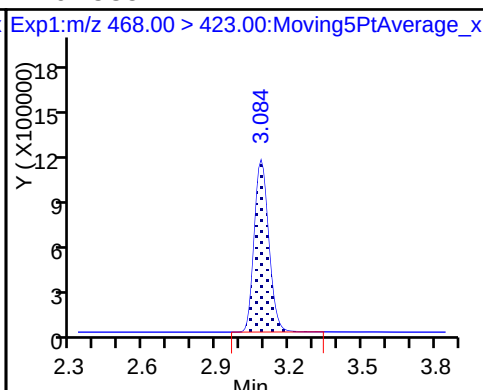
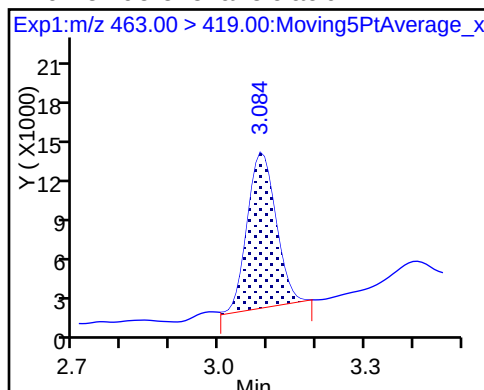
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20 Perfluorononanoic acid

D 19 13C5 PFNA

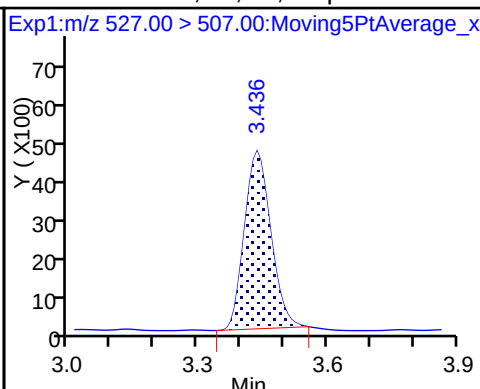
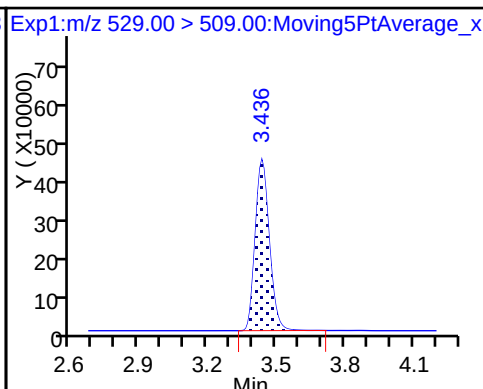
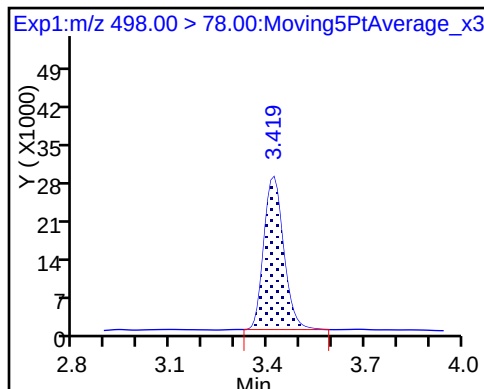
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

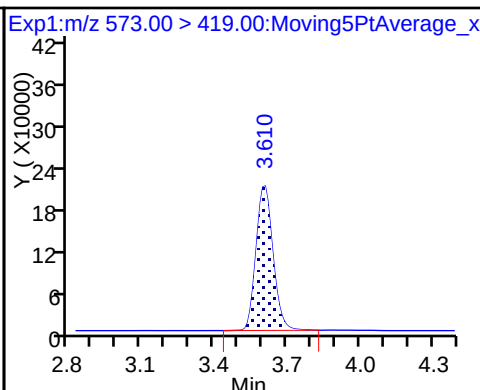
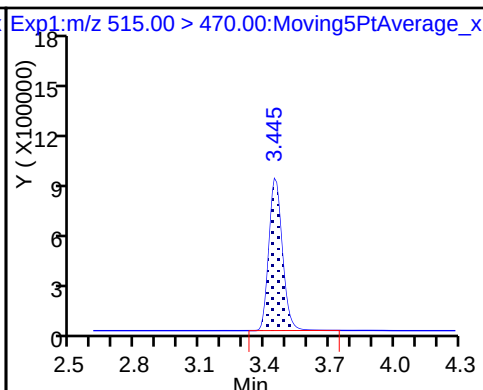
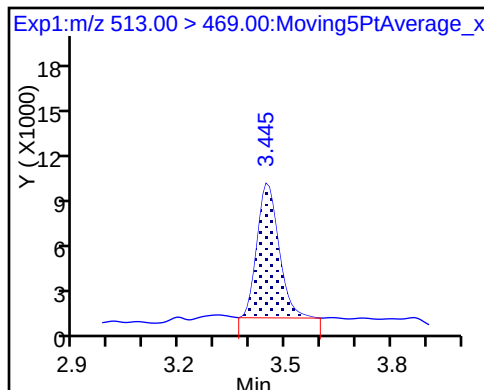
25 Sodium 1H,1H,2H,2H-perfluorodecane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

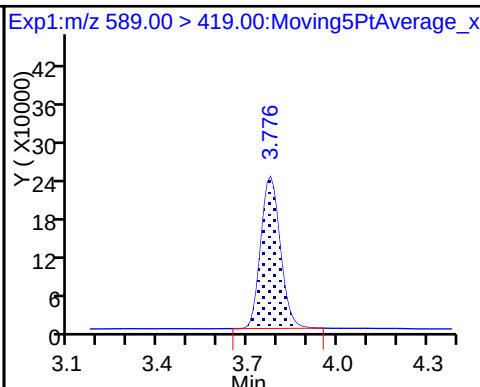
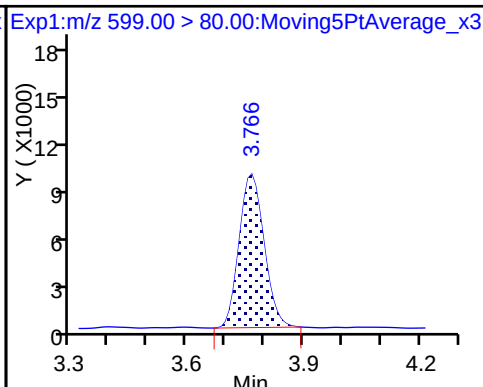
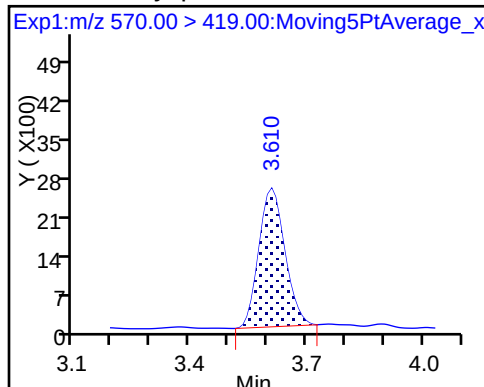
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

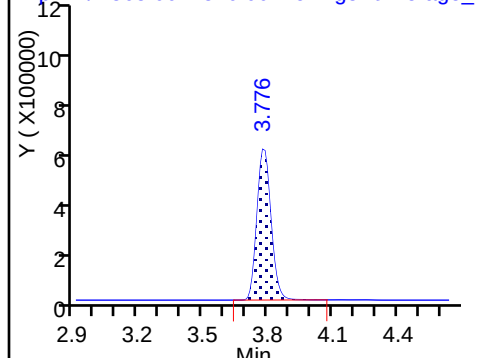


D 30 13C2 PFUnA

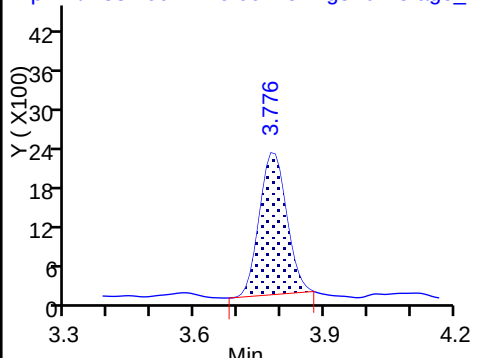
33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

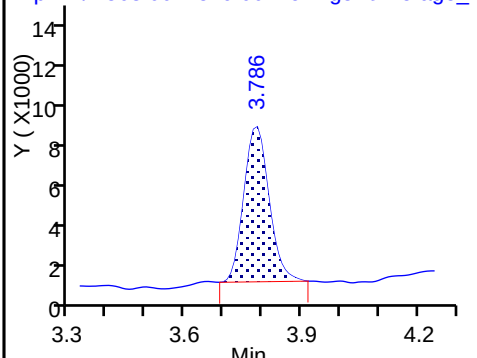
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Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x



Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x

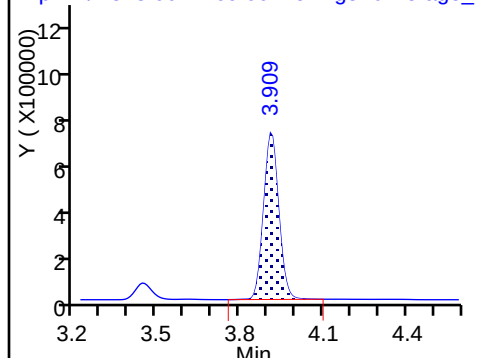


D 34 d-N-MeFOSA-M

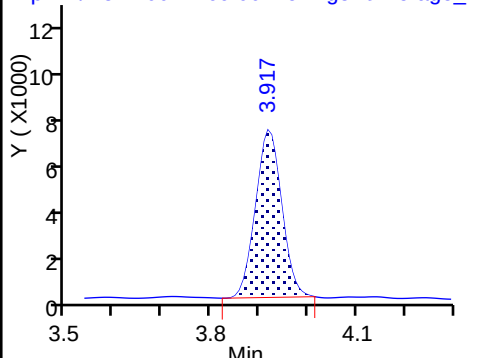
35 MeFOSA

37 Perfluorododecanoic acid

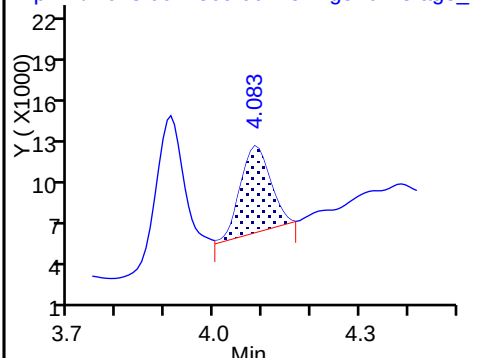
Exp1:m/z 515.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 512.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x

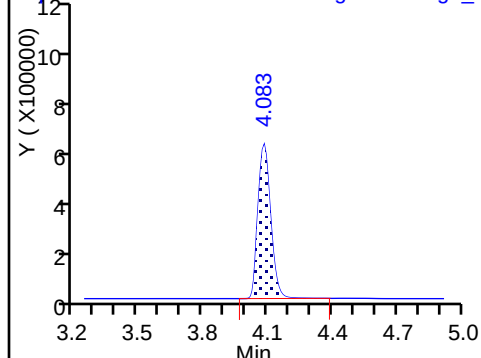


D 36 13C2 PFDaA

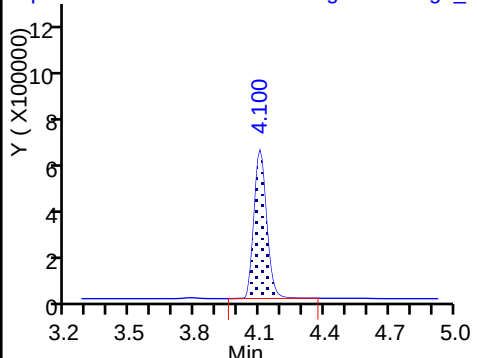
D 38 d-N-EtFOSA-M

39 N-ethylperfluoro-1-octanesulfonami

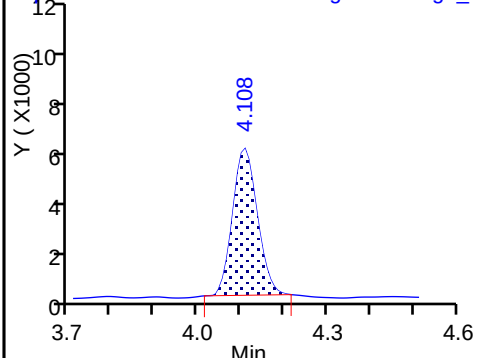
Exp1:m/z 615.00 > 570.00:Moving5PtAverage_x



Exp1:m/z 531.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 526.00 > 169.00:Moving5PtAverage_x

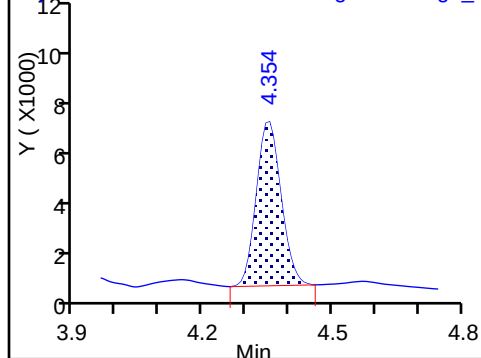


41 Perfluorotridecanoic acid

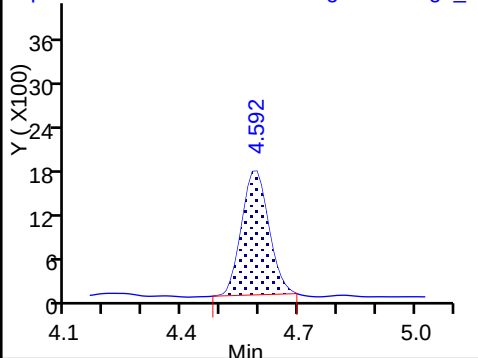
42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

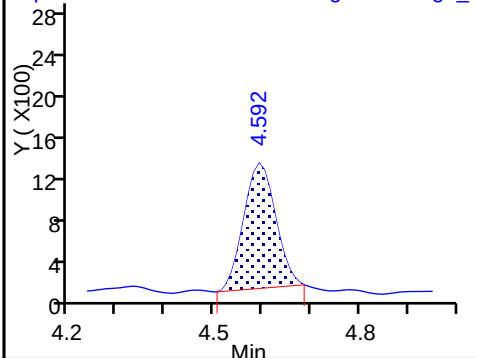
Exp1:m/z 663.00 > 619.00:Moving5PtAverage_x



Exp1:m/z 713.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 713.00 > 219.00:Moving5PtAverage_x

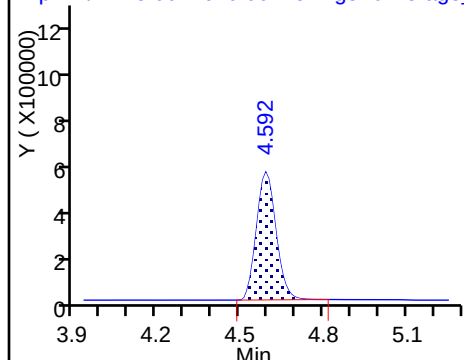


D 43 13C2-PFTeDA

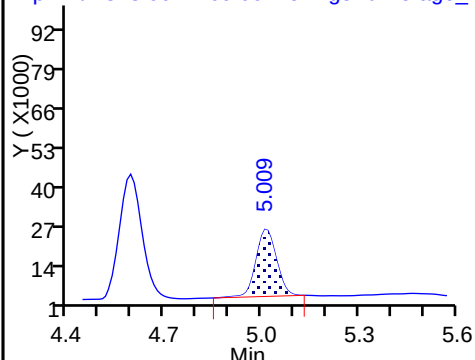
45 Perfluorohexadecanoic acid

D 44 13C2-PFHxDA

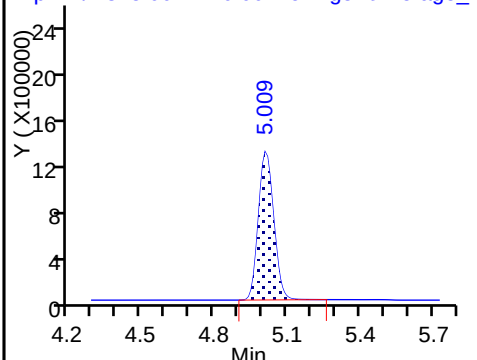
Exp1:m/z 715.00 > 670.00:Moving5PtAverage_x



Exp1:m/z 813.00 > 769.00:Moving5PtAverage_x

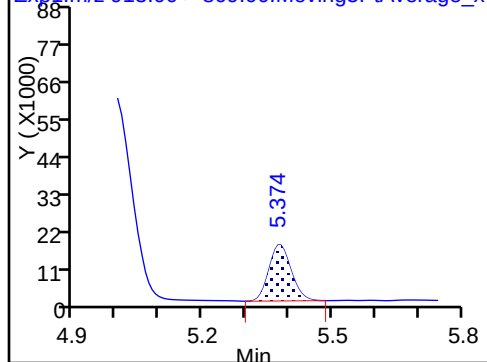


Exp1:m/z 815.00 > 770.00:Moving5PtAverage_x



46 Perfluorooctadecanoic acid

Exp1:m/z 913.00 > 869.00:Moving5PtAverage_x



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_004.d
 Lims ID: IC L2 Full
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 24-Aug-2017 10:16:10 ALS Bottle#: 29 Worklist Smp#: 4
 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*sub19
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:54:00 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

First Level Reviewer: phomsophat

Date: 24-Aug-2017 10:43:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.538	1.542	-0.004		10971418	53.0		106	16081	
2 Perfluorobutyric acid										
212.90 > 169.00	1.538	1.545	-0.007	1.000	197020	0.9892		98.9	39.0	
D 3 13C5-PFPeA										
267.90 > 223.00	1.738	1.747	-0.009		7167750	54.5		109	119157	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.747	1.751	-0.004	1.000	149697	1.00		100	102	
D 47 13C3-PFBS										
301.90 > 83.00	1.766	1.771	-0.005		185109	47.4		102	3159	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.766	1.773	-0.007	1.000	266173	0.9139		103	2093	
298.90 > 99.00	1.766	1.773	-0.007	1.000	106123		2.51(0.00-0.00)	103	898	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.975	1.979	-0.004	1.000	47321	0.9600		103	1901	
D 7 13C2 PFHxA										
315.00 > 270.00	2.009	2.016	-0.007		7169588	52.3		105	17667	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.009	2.016	-0.007	1.000	132443	0.99		99.2	185	
D 9 13C4-PFHpA										
367.00 > 322.00	2.346	2.349	-0.003		6797811	53.6		107	10885	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.346	2.351	-0.005	1.000	131647	1.00		100	225	
D 11 18O2 PFHxS										
403.00 > 84.00	2.362	2.363	-0.001		10705636	49.1		104	14479	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.362	2.365	-0.003	1.000	247334	1.05		115	775	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 M2-6:2FTS										
429.00 > 409.00	2.677	2.681	-0.004		2560925	48.4		102	11659	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.677	2.681	-0.004	1.000	44506	0.9474		99.9	991	
* 62 13C2-PFOA										
415.00 > 370.00	2.698	2.703	-0.005		6360395	50.0			37733	
D 14 13C4 PFOA										
417.00 > 372.00	2.705	2.709	-0.004		6317994	54.3		109	42940	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.705	2.709	-0.004	1.000	145328	1.05		105	32.3	
413.00 > 169.00	2.705	2.709	-0.004	1.000	78772		1.84(0.90-1.10)	105	687	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.713	2.718	-0.005	1.000	192626	1.03		108	1011	
D 18 13C4 PFOS										
503.00 > 80.00	3.081	3.084	-0.003		7462183	49.2		103	24505	
D 19 13C5 PFNA										
468.00 > 423.00	3.081	3.087	-0.006		4700096	52.8		106	27354	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.081	3.087	-0.006	1.000	95318	1.03		103	52.2	M
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.081	3.087	-0.006	1.000	165687	1.00		108	232	
499.00 > 99.00	3.081	3.087	-0.006	1.000	32545		5.09(0.90-1.10)	108	165	
D 21 13C8 FOSA										
506.00 > 78.00	3.415	3.419	-0.004		11834388	51.5		103	24494	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.415	3.421	-0.006	1.000	236554	1.08		108	1926	
D 26 M2-8:2FTS										
529.00 > 509.00	3.433	3.438	-0.005		2083372	48.9		102	21053	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.441	3.439	0.002	1.002	41419	1.03		107	1941	
D 23 13C2 PFDA										
515.00 > 470.00	3.450	3.449	0.001		4192711	54.3		109	19600	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.450	3.449	0.001	1.000	71527	0.9445		94.4	159	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.606	3.607	-0.001		1031821	50.0		100	7239	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.606	3.611	-0.005	1.000	19344	0.9513		95.1	468	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.763	3.763	-0.001	1.000	92017	0.9771		101	1586	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.772	3.774	-0.002		1104384	51.2		102	3126	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.782	3.781	0.001	1.003	17815	0.9398		94.0	286	
D 30 13C2 PFUnA										
565.00 > 520.00	3.782	3.781	0.001		2798436	53.5		107	10870	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.782	3.783	-0.001	1.000	69903	1.11		111	140	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.915	3.917	-0.002		2837526	51.4		103	715	
35 MeFOSA										
512.00 > 169.00	3.915	3.923	-0.008	1.000	52085	1.00		100	1387	
D 36 13C2 PFDaA										
615.00 > 570.00	4.081	4.082	-0.001		2707244	52.8		106	7757	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.081	4.082	-0.001	1.000	57927	1.11		111	14.6	M
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.098	4.107	-0.009		2672739	50.4		101	5125	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.106	4.113	-0.007	1.000	50746	1.02		102	1148	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.352	4.350	0.002	1.000	48303	0.9354		93.5	19.0	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.580	4.585	-0.005	1.000	13670	0.9664		96.6	260	
713.00 > 219.00	4.591	4.585	0.006	1.002	11495		1.19(0.00-0.00)	96.6	156	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.591	4.591	0.0		2798051	51.8		104	5213	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.008	5.010	-0.002		5666113	51.4		103	4606	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.008	5.010	-0.002	1.000	142257	0.9527		95.3	26.0	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.372	5.373	-0.001	1.000	126897	1.04		104	30.0	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC_FULL-L2_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_004.d

Injection Date: 24-Aug-2017 10:16:10

Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 29

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

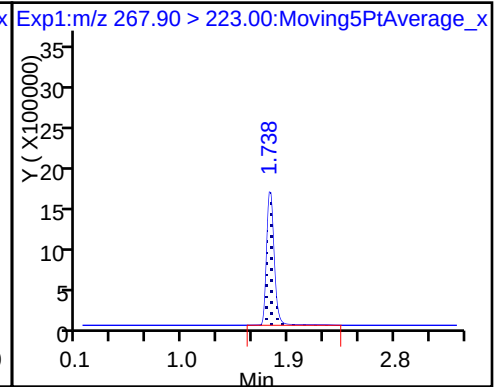
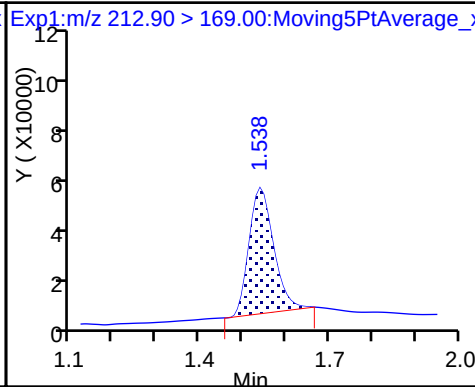
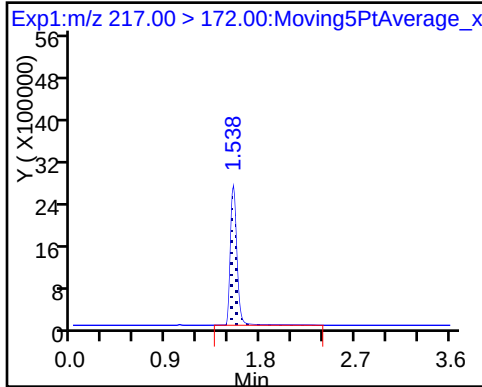
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

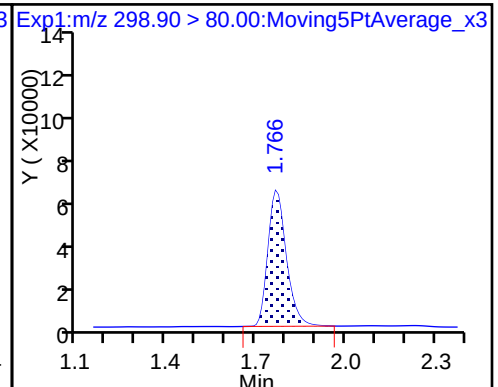
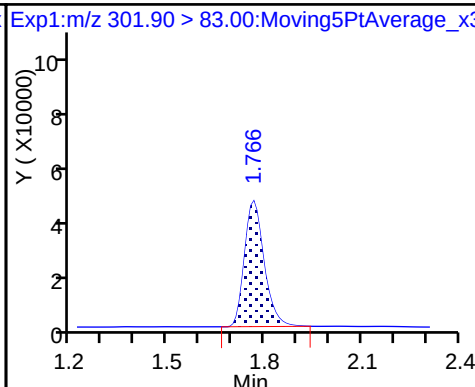
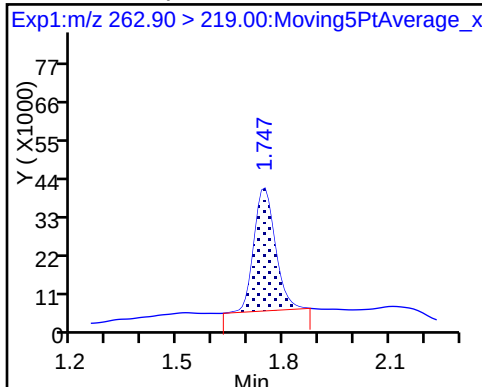
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

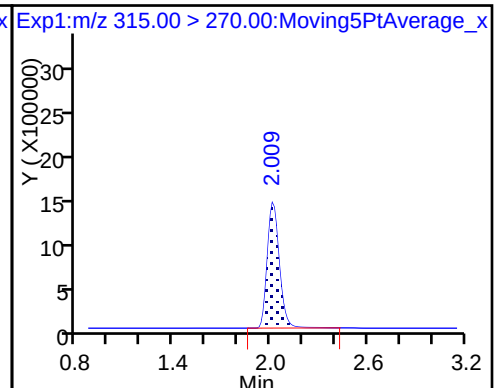
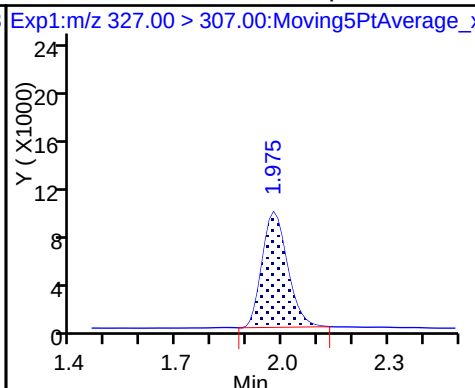
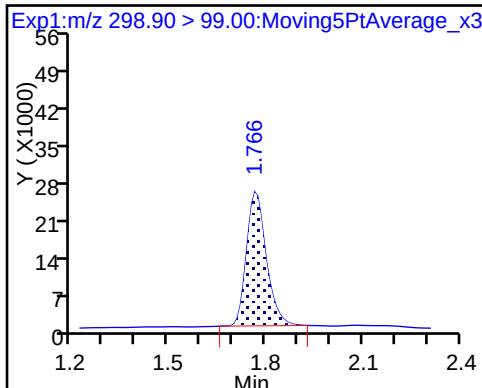
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa

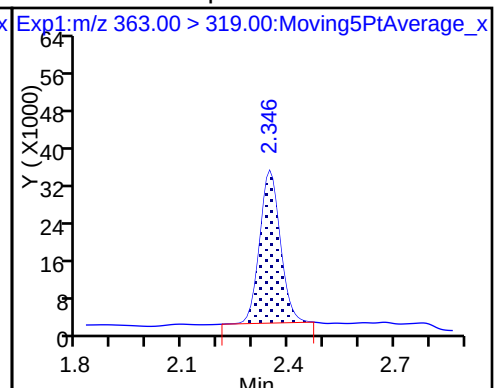
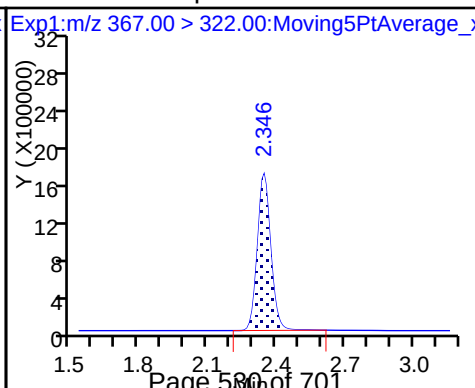
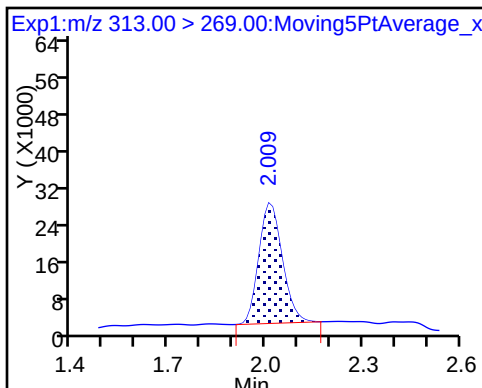
De 7 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

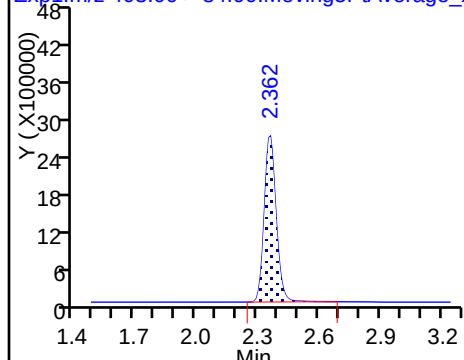


D 11 18O2 PFHxS

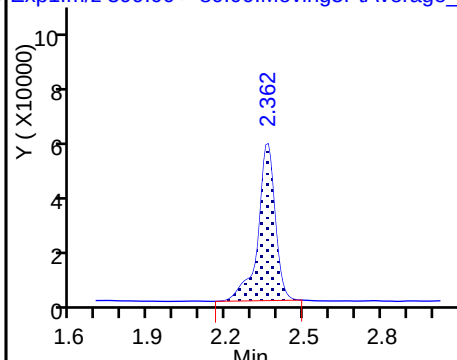
8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

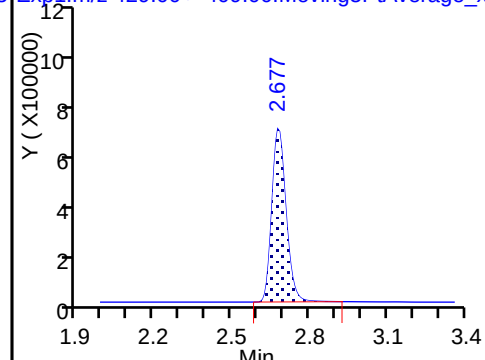
Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3



Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



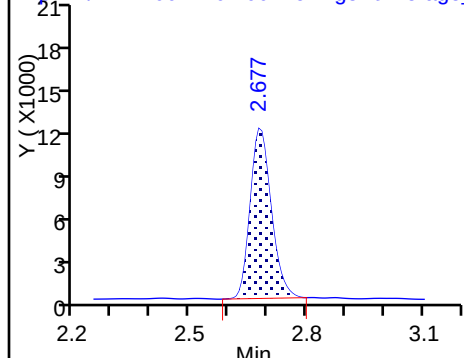
Exp1:m/z 429.00 > 409.00:Moving5PtAverage_x3



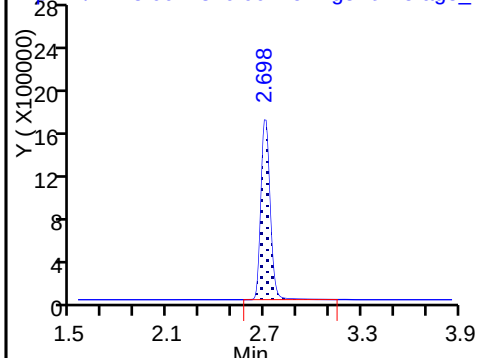
13 Sodium 1H,1H,2H,2H-perfluorooctanoate

D 14 13C4 PFOA

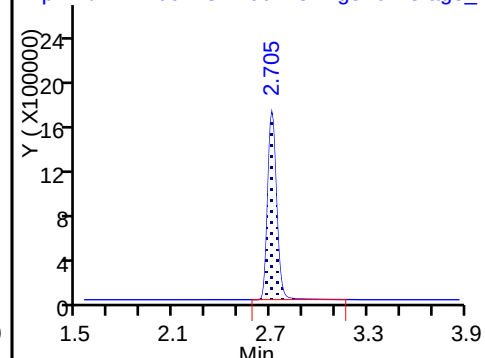
Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3



Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x3



Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3

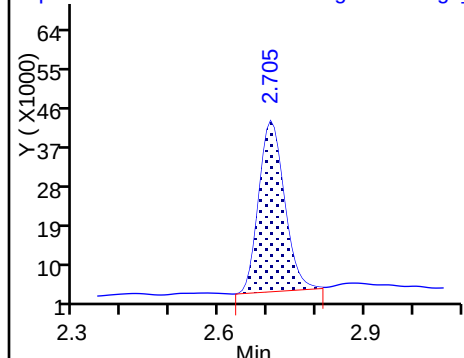


15 Perfluorooctanoic acid

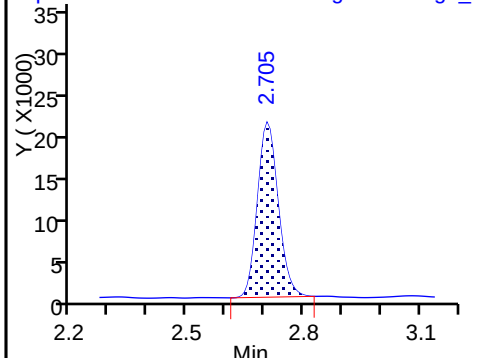
15 Perfluorooctanoic acid

16 Perfluoroheptanesulfonic Acid

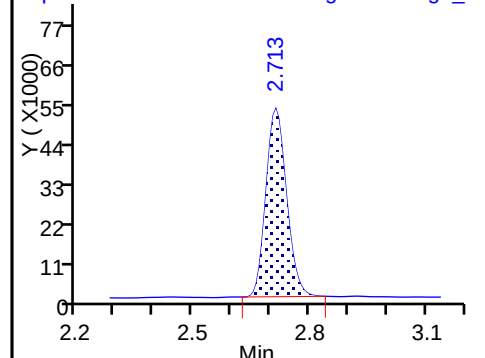
Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

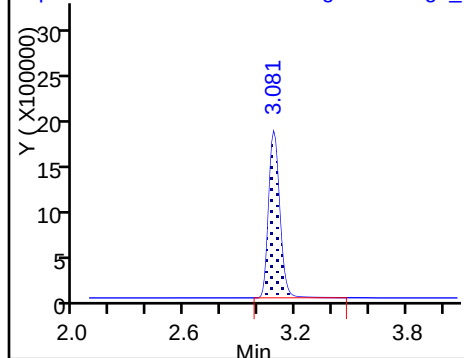


D 18 13C4 PFOS

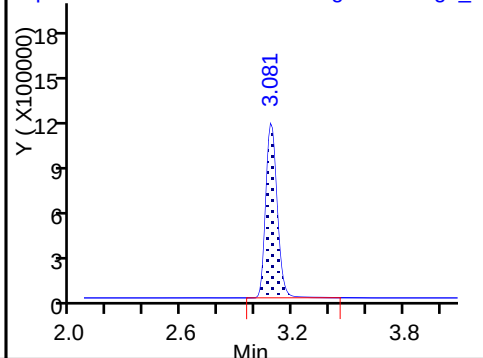
D 19 13C5 PFNA

20 Perfluorononanoic acid (M)

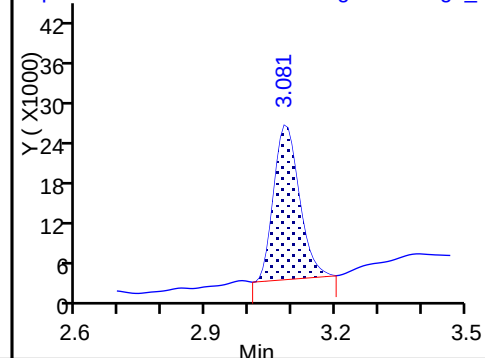
Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3



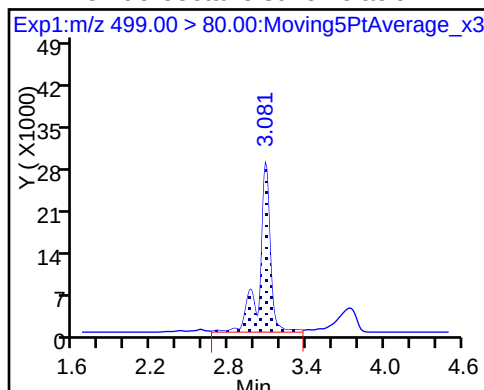
Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x3



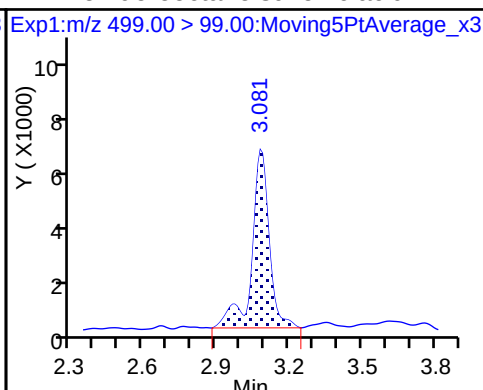
Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x3



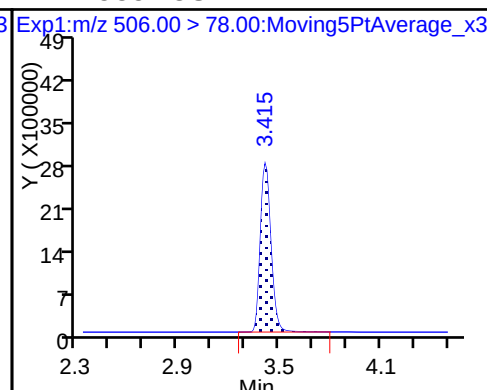
17 Perfluorooctane sulfonic acid



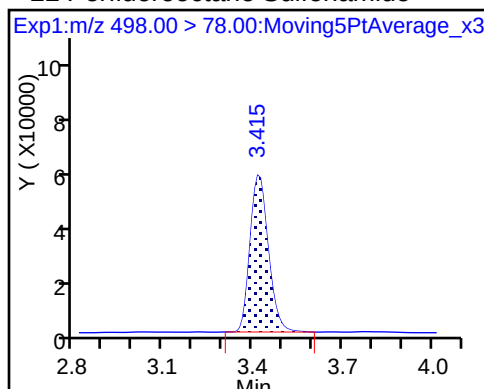
17 Perfluorooctane sulfonic acid



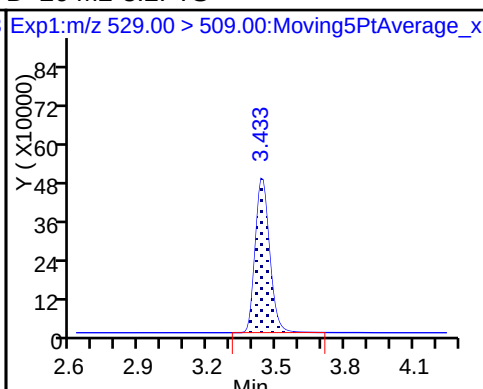
D 21 13C8 FOSA



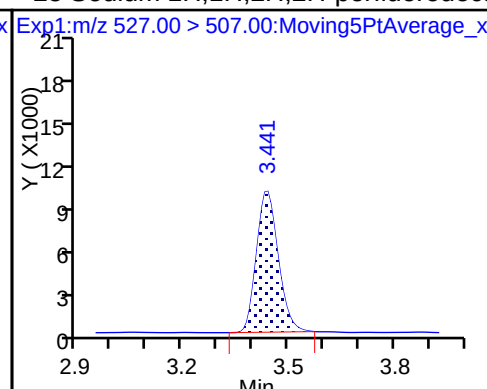
22 Perfluorooctane Sulfonamide



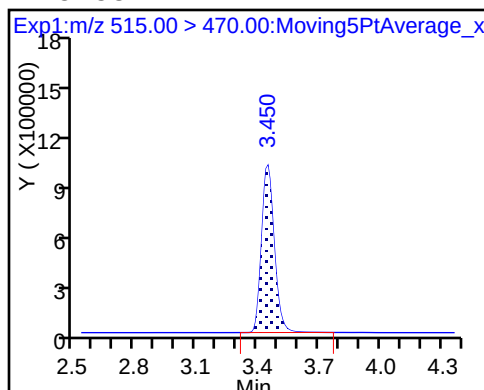
D 26 M2-8:2FTS



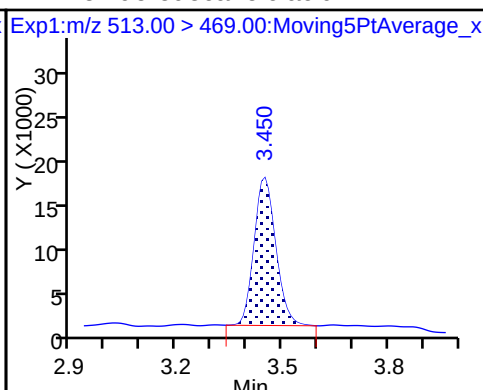
25 Sodium 1H,1H,2H,2H-perfluorodecane



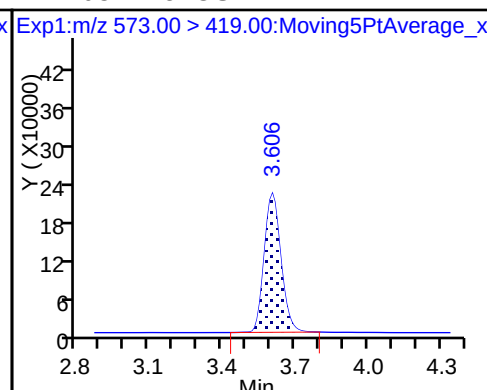
D 23 13C2 PFDA



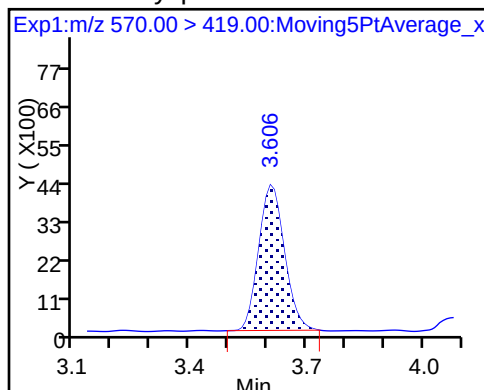
24 Perfluorodecanoic acid



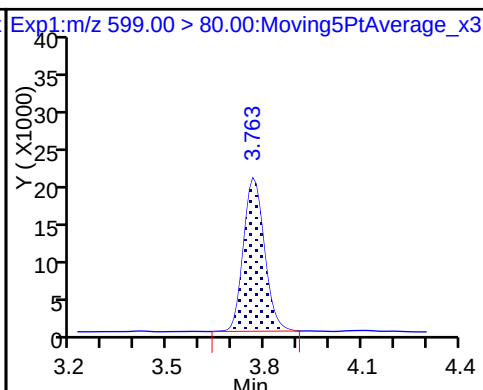
D 27 d3-NMeFOSAA



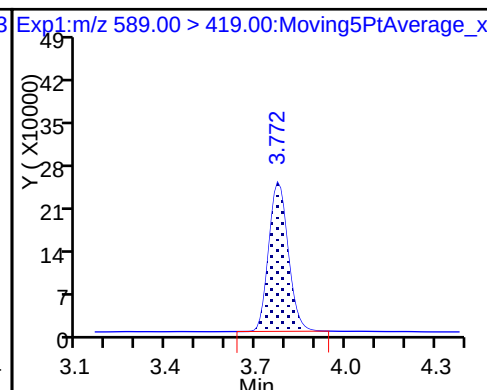
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid

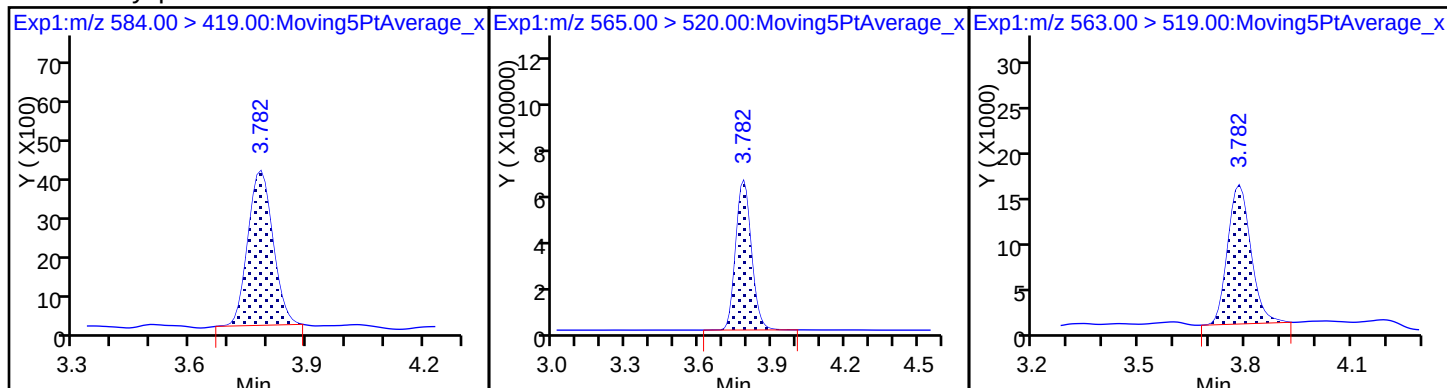


D 32 d5-NEtFOSAA



33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA

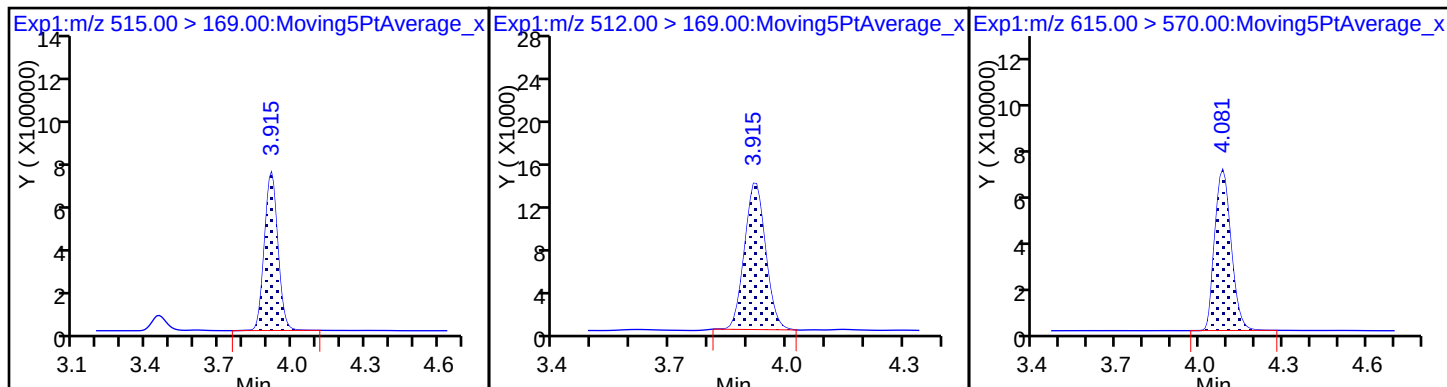
31 Perfluoroundecanoic acid



D 34 d-N-MeFOSA-M

35 MeFOSA

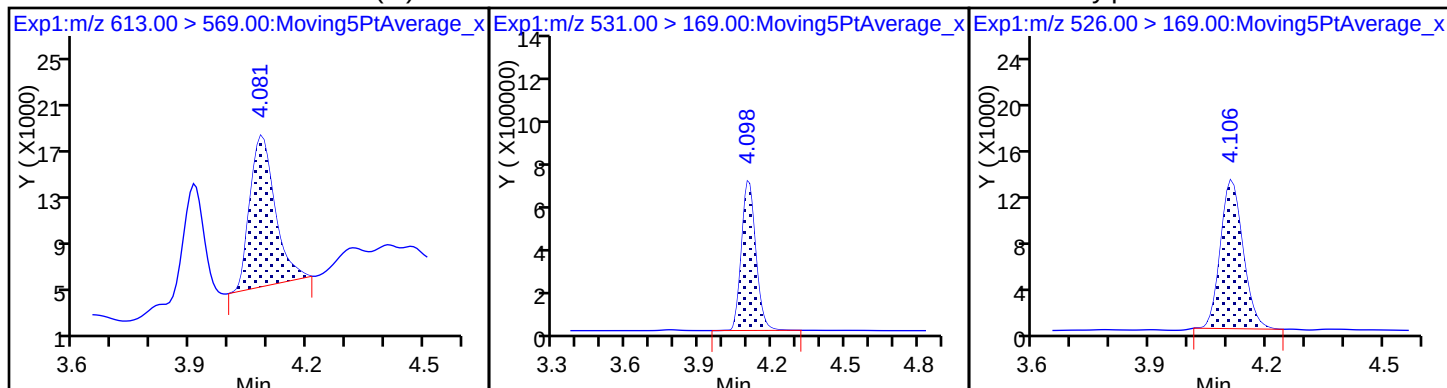
D 36 13C2 PFDaA



37 Perfluorododecanoic acid (M)

D 38 d-N-EtFOSA-M

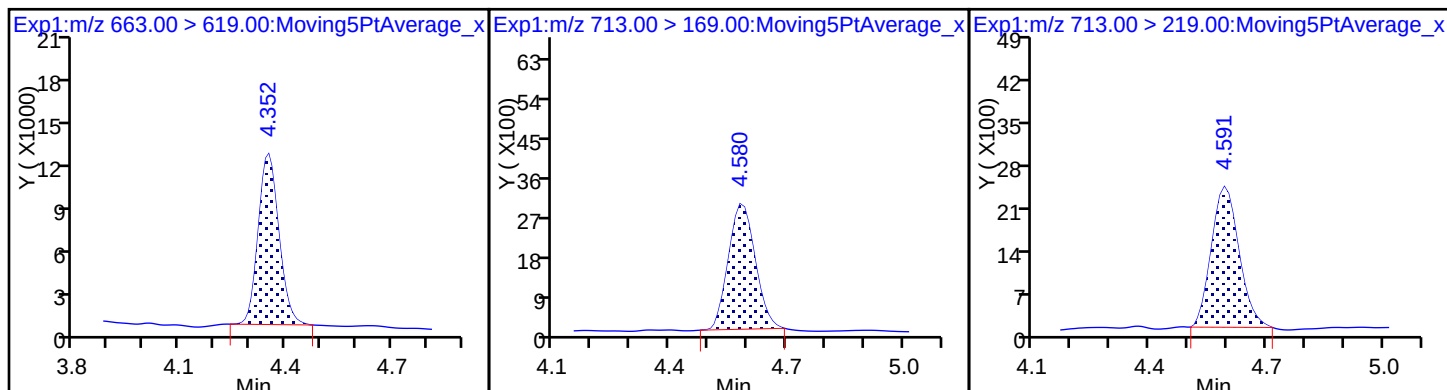
39 N-ethylperfluoro-1-octanesulfonami



41 Perfluorotridecanoic acid

42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

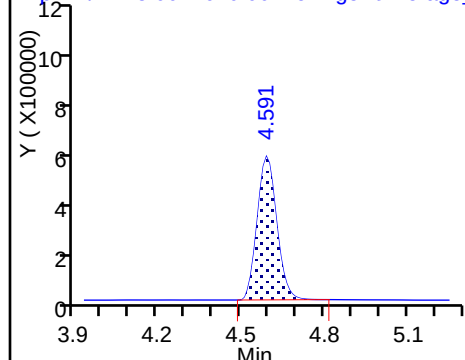


D 43 13C2-PFTeDA

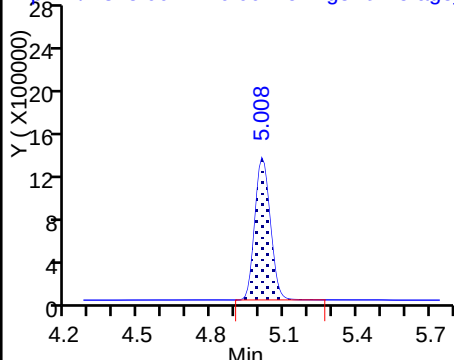
D 44 13C2-PFHxDA

45 Perfluorohexadecanoic acid

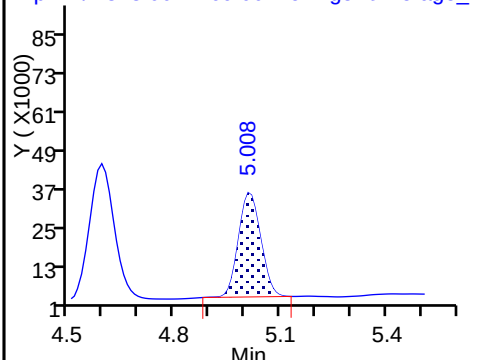
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Exp1:m/z 815.00 > 770.00:Moving5PtAverage_x

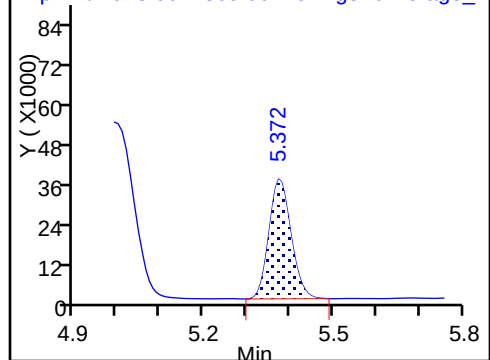


Exp1:m/z 813.00 > 769.00:Moving5PtAverage_x



46 Perfluorooctadecanoic acid

Exp1:m/z 913.00 > 869.00:Moving5PtAverage_x



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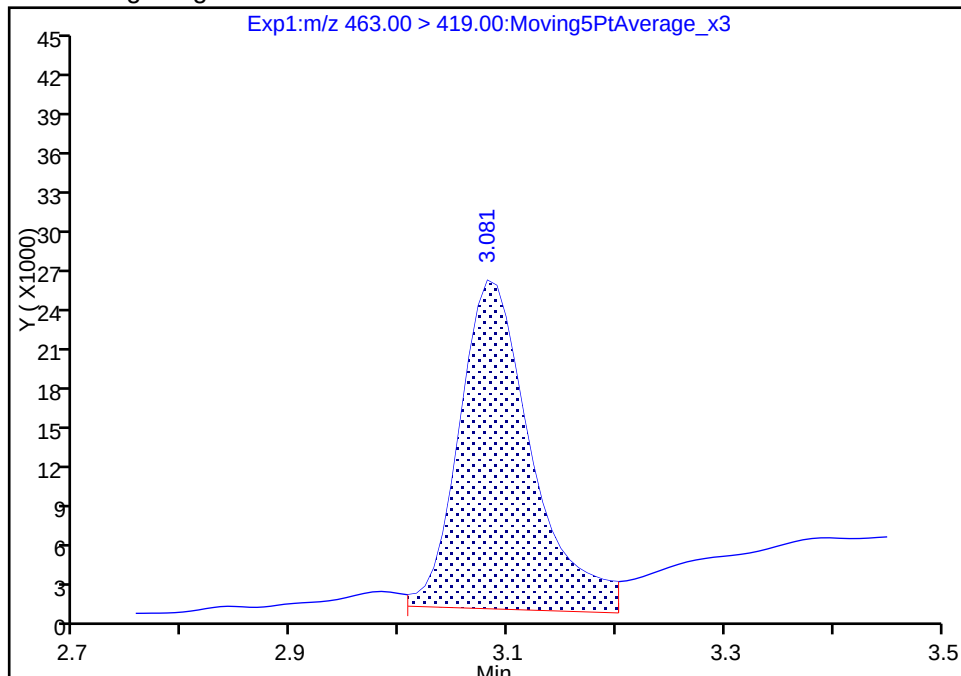
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_004.d
Injection Date: 24-Aug-2017 10:16:10 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 29 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

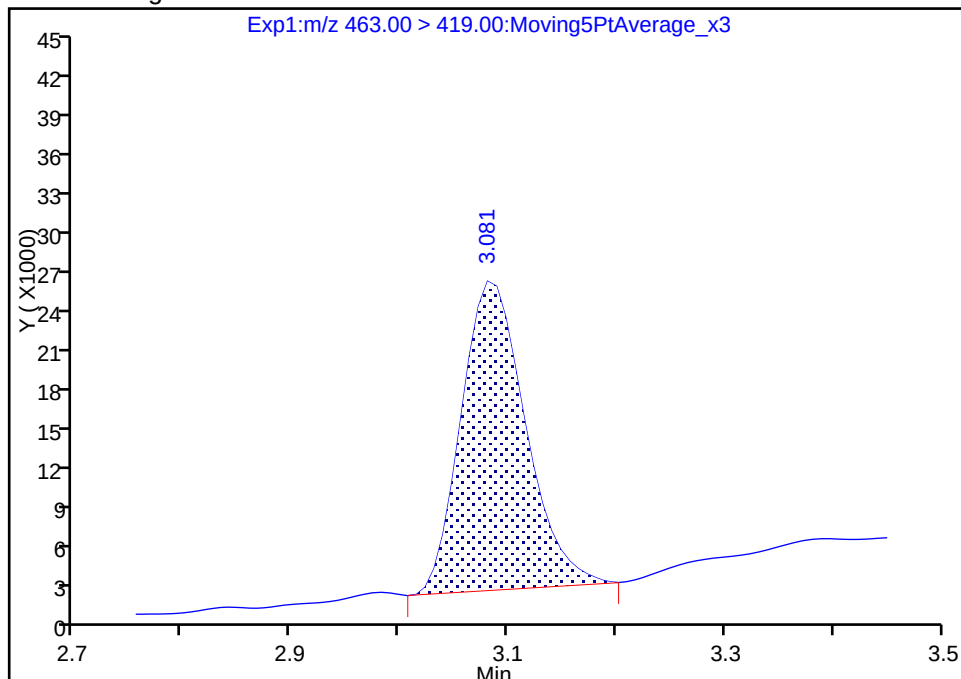
RT: 3.08
Area: 114043
Amount: 1.109338
Amount Units: ng/ml

Processing Integration Results



RT: 3.08
Area: 95318
Amount: 1.028987
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Aug-2017 10:47:47

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento

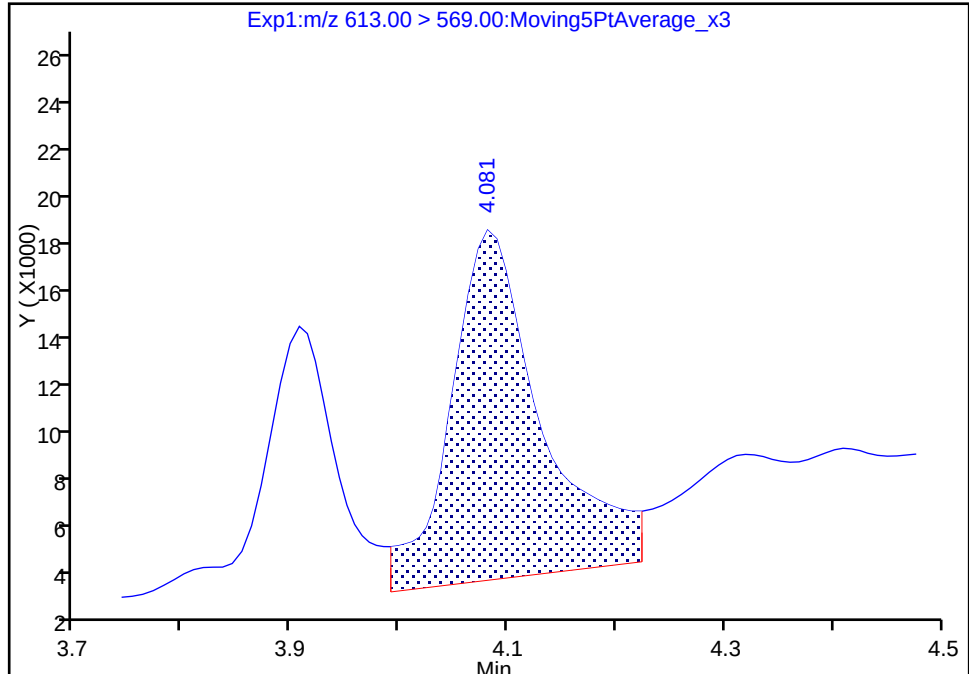
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Injection Date: 24-Aug-2017 10:16:10 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 29 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

37 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

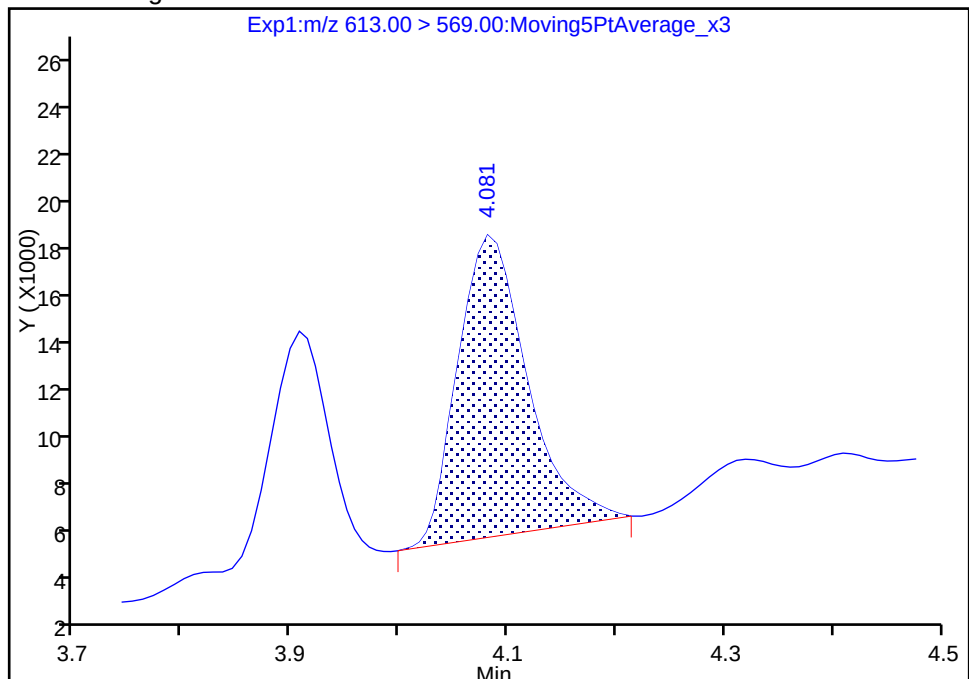
RT: 4.08
Area: 86858
Amount: 1.350787
Amount Units: ng/ml

Processing Integration Results



RT: 4.08
Area: 57927
Amount: 1.106221
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Aug-2017 10:48:17

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_005.d
 Lims ID: IC L3 Full
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 24-Aug-2017 10:23:04 ALS Bottle#: 30 Worklist Smp#: 5
 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*sub19
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:54:03 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

First Level Reviewer: phomsophat

Date: 24-Aug-2017 10:50:02

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	1.545	1.542	0.003		10876782	52.5		105	18848	
2 Perfluorobutyric acid										
212.90 > 169.00	1.545	1.545	0.0	1.000	1059118	5.36		107	237	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.747	0.008		6937983	52.8		106	68571	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.751	0.004	1.000	728652	5.03		101	530	
D 47 13C3-PFBS										
301.90 > 83.00	1.773	1.771	0.002		190849	48.9		105	4587	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.773	1.773	0.0	1.000	1420884	4.73		107	8358	
298.90 > 99.00	1.773	1.773	0.0	1.000	530597		2.68(0.00-0.00)	107	3290	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.983	1.979	0.004	1.000	234667	4.98		107	5855	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.017	2.016	0.001	1.000	672792	4.88		97.6	968	
D 7 13C2 PFHxA										
315.00 > 270.00	2.017	2.016	0.001		7401088	54.0		108	38247	
D 9 13C4-PFHpA										
367.00 > 322.00	2.357	2.349	0.008		6604614	52.1		104	12390	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.357	2.351	0.006	1.000	638851	5.02		100	1092	
D 11 18O2 PFHxS										
403.00 > 84.00	2.365	2.363	0.002		10610397	48.6		103	48262	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.365	2.365	0.0	1.000	1123503	4.81		106	2640	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.687	2.681	0.006	1.000	214542	4.78	101	3633	
D 12 M2-6:2FTS	429.00 > 409.00	2.687	2.681	0.006		2446122	46.2	97.3	12515	
* 62 13C2-PFOA	415.00 > 370.00	2.708	2.703	0.005		5959300	50.0		30512	
15 Perfluorooctanoic acid	413.00 > 369.00	2.716	2.709	0.007	1.000	651185	5.01	100	141	
	413.00 > 169.00	2.716	2.709	0.007	1.000	345684	1.88(0.90-1.10)	100	2456	
D 14 13C4 PFOA	417.00 > 372.00	2.716	2.709	0.007		5945452	51.1	102	35809	
16 Perfluoroheptanesulfonic Acid	449.00 > 80.00	2.723	2.718	0.005	1.000	939172	4.87	102	3607	
D 18 13C4 PFOS	503.00 > 80.00	3.087	3.084	0.003		7694138	50.7	106	33265	
17 Perfluorooctane sulfonic acid	499.00 > 80.00	3.096	3.087	0.009	1.000	765520	4.49	96.7	1097	
	499.00 > 99.00	3.096	3.087	0.009	1.000	169218	4.52(0.90-1.10)	96.7	794	
20 Perfluorononanoic acid	463.00 > 419.00	3.096	3.087	0.009	1.000	452982	4.78	95.5	224	M
D 19 13C5 PFNA	468.00 > 423.00	3.096	3.087	0.009		4811966	54.0	108	33236	M
D 21 13C8 FOSA	506.00 > 78.00	3.425	3.419	0.006		12152773	52.9	106	23922	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.425	3.421	0.004	1.000	1164104	5.18	104	6665	
D 26 M2-8:2FTS	529.00 > 509.00	3.441	3.438	0.003		2164816	50.8	106	13649	
25 Sodium 1H,1H,2H,2H-perfluorodecane	527.00 > 507.00	3.441	3.439	0.002	1.000	204683	4.88	102	7855	
24 Perfluorodecanoic acid	513.00 > 469.00	3.459	3.449	0.010	1.000	341258	4.70	94.0	734	
D 23 13C2 PFDA	515.00 > 470.00	3.459	3.449	0.010		4019397	52.1	104	29121	
D 27 d3-NMeFOSAA	573.00 > 419.00	3.617	3.607	0.010		1007638	48.9	97.7	6811	
28 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.617	3.611	0.006	1.000	101323	5.10	102	1936	
29 Perfluorodecane Sulfonic acid	599.00 > 80.00	3.773	3.763	0.010	1.000	478925	4.93	102	5171	
D 32 d5-NEtFOSAA	589.00 > 419.00	3.783	3.774	0.009		1106164	51.3	103	3471	
D 30 13C2 PFUnA	565.00 > 520.00	3.793	3.781	0.012		2792006	53.4	107	9962	
33 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	3.793	3.781	0.012	1.003	93348	4.92	98.3	1397	
31 Perfluoroundecanoic acid	563.00 > 519.00	3.793	3.783	0.010	1.000	296955	4.72	94.5	572	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M	515.00 > 169.00	3.923	3.917	0.006	2783263	50.4		101	735	
35 MeFOSA	512.00 > 169.00	3.931	3.923	0.008	1.000	259795	5.10	102	3456	
37 Perfluorododecanoic acid	613.00 > 569.00	4.087	4.082	0.005	1.000	246949	4.69	93.8	69.9	
D 36 13C2 PFDaA	615.00 > 570.00	4.087	4.082	0.005	2723439	53.2		106	9965	
D 38 d-N-EtFOSA-M	531.00 > 169.00	4.112	4.107	0.005	2764185	52.1		104	4853	
39 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.121	4.113	0.008	1.000	246476	4.80	96.0	2891	
41 Perfluorotridecanoic acid	663.00 > 619.00	4.359	4.350	0.009	1.000	252078	4.85	97.1	96.7	
42 Perfluorotetradecanoic acid	713.00 > 169.00	4.590	4.585	0.005	1.000	71000	4.88	97.7	1208	
713.00 > 219.00	4.602	4.585	0.017	1.002	50223		1.41(0.00-0.00)	97.7	644	
D 43 13C2-PFTeDA	715.00 > 670.00	4.602	4.591	0.011	2875053	53.2		106	10897	
45 Perfluorohexadecanoic acid	813.00 > 769.00	5.018	5.010	0.008	1.000	552335	5.22	104	103	
D 44 13C2-PFHxDA	815.00 > 770.00	5.018	5.010	0.008	5575388	50.6		101	4623	
46 Perfluorooctadecanoic acid	913.00 > 869.00	5.381	5.373	0.008	1.000	601033	5.02	100	135	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC_FULL-L3_00005

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_005.d

Injection Date: 24-Aug-2017 10:23:04

Instrument ID: A8_N

Lims ID: IC L3 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 30

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

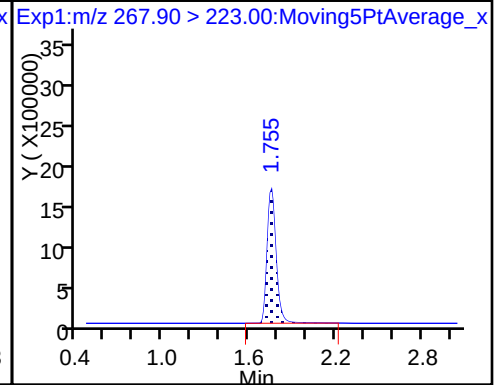
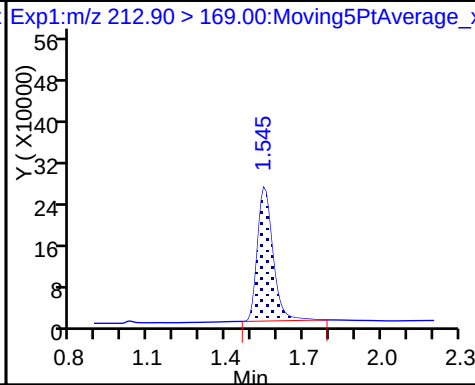
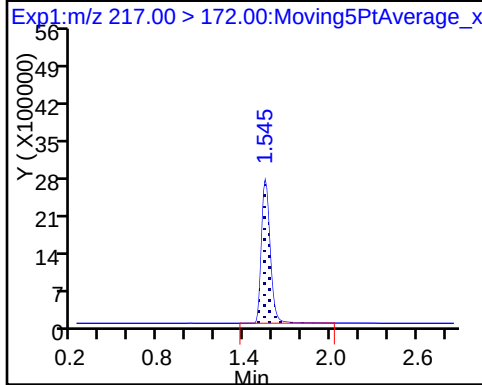
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

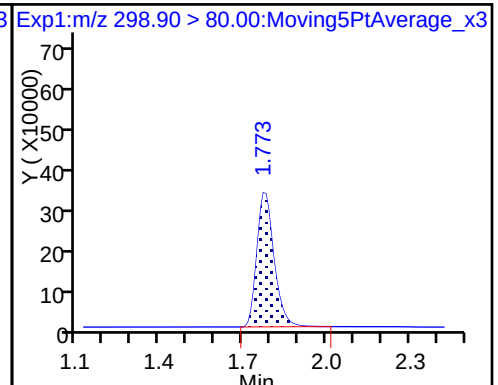
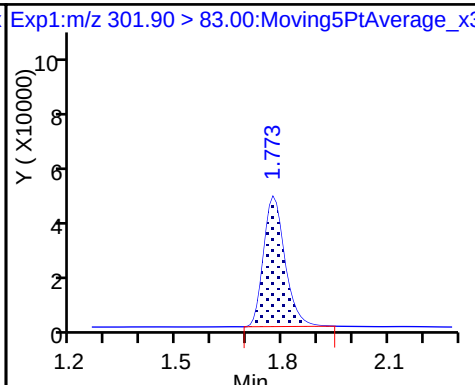
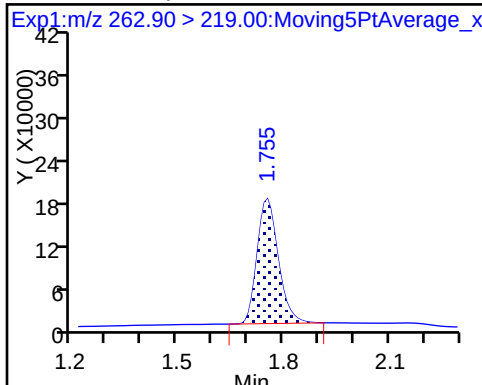
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

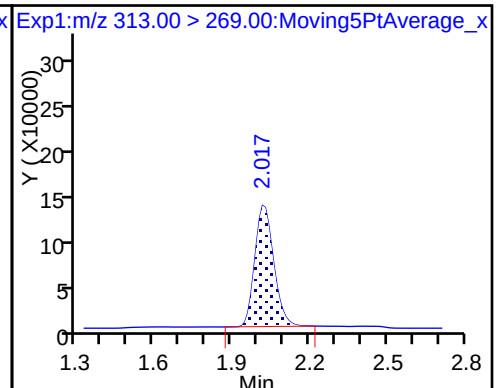
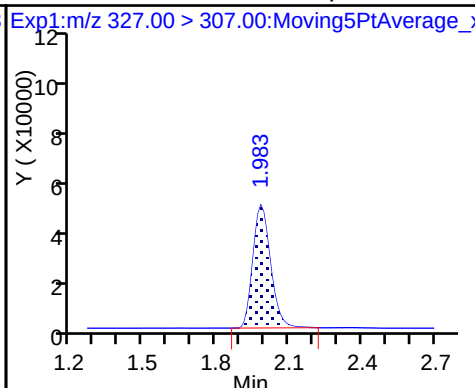
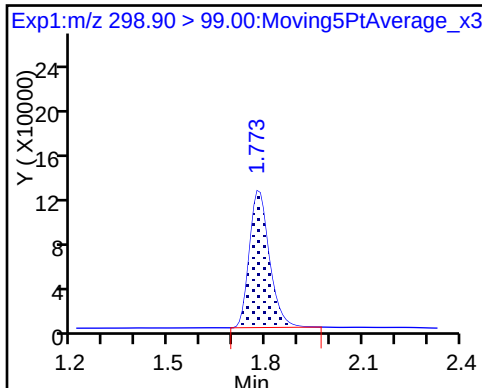
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexanoic acid

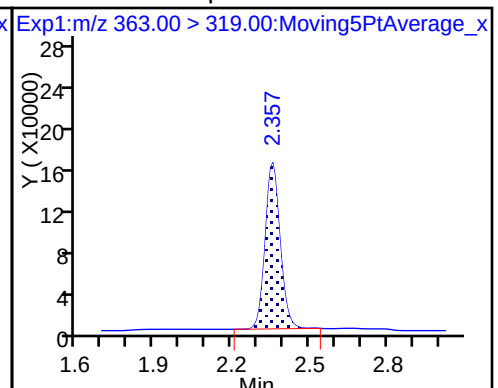
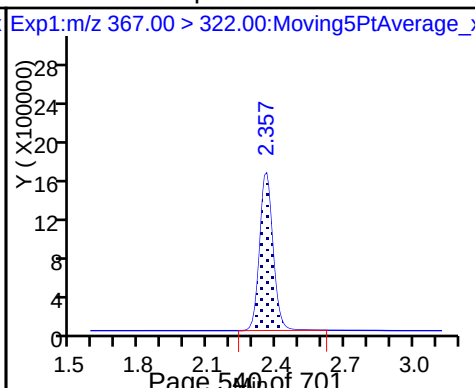
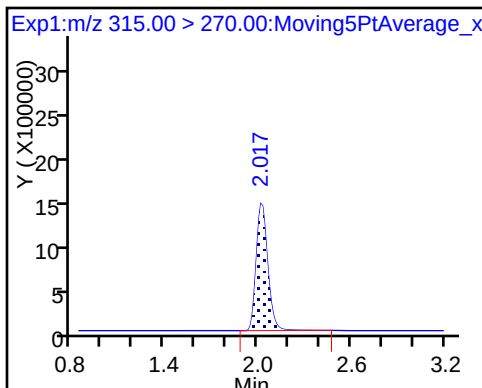
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

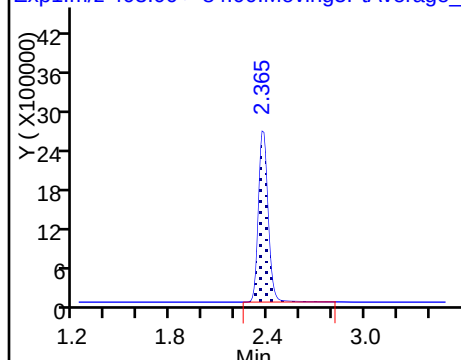


D 11 18O2 PFHxS

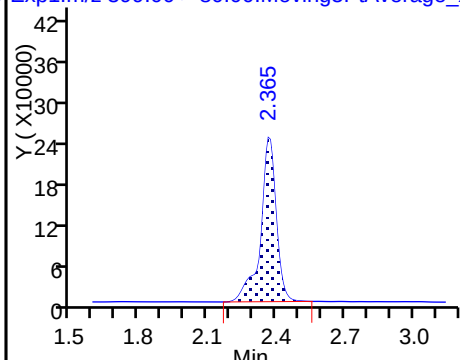
8 Perfluorohexanesulfonic acid

13 Sodium 1H,1H,2H,2H-perfluorooctane

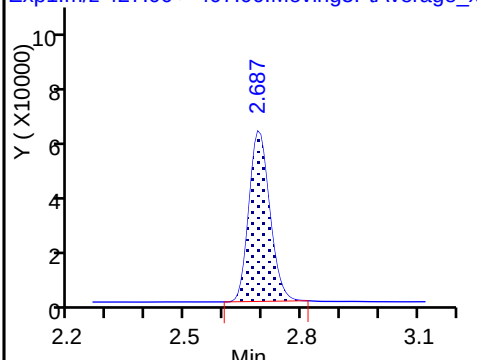
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Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3

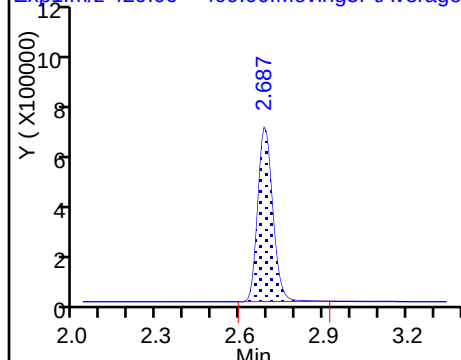


D 12 M2-6:2FTS

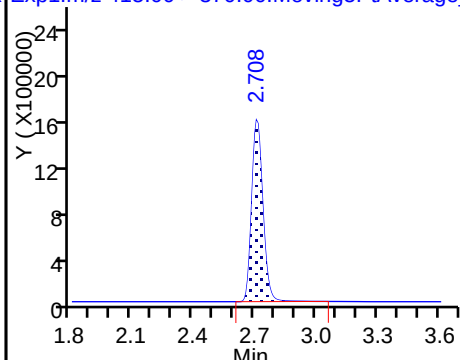
* 62 13C2-PFOA

15 Perfluorooctanoic acid

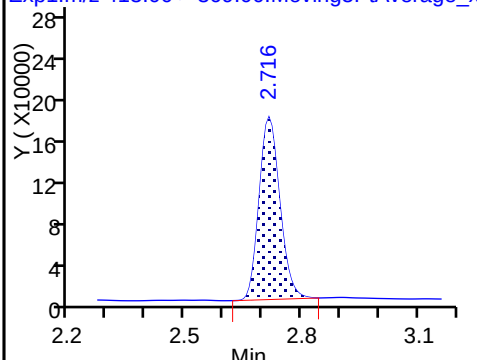
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Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3

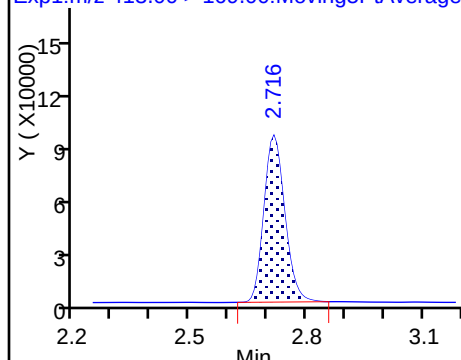


15 Perfluorooctanoic acid

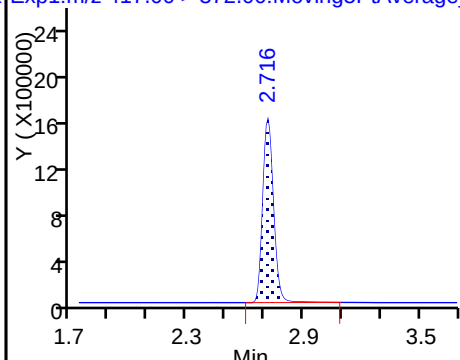
D 14 13C4 PFOA

16 Perfluoroheptanesulfonic Acid

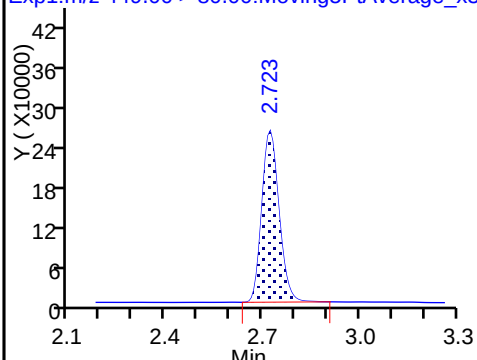
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Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

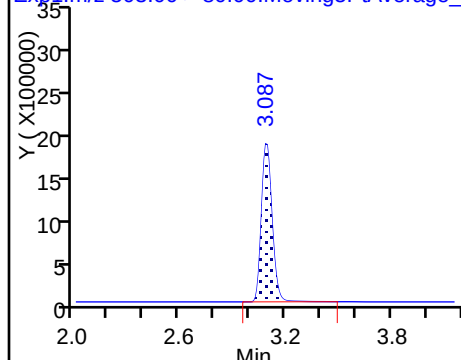


D 18 13C4 PFOS

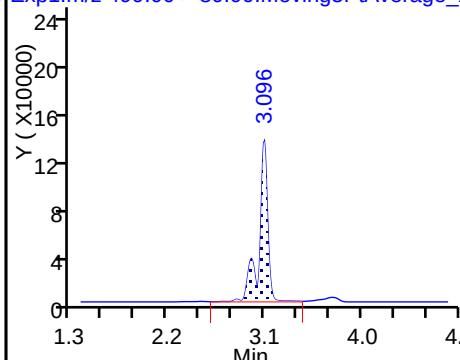
17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

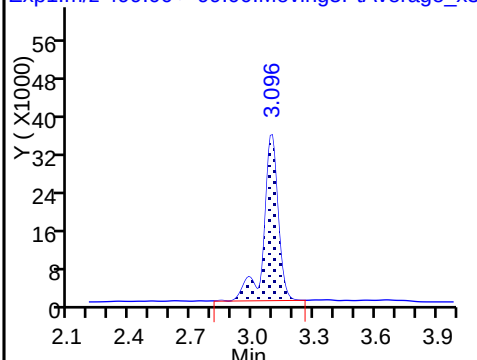
Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3



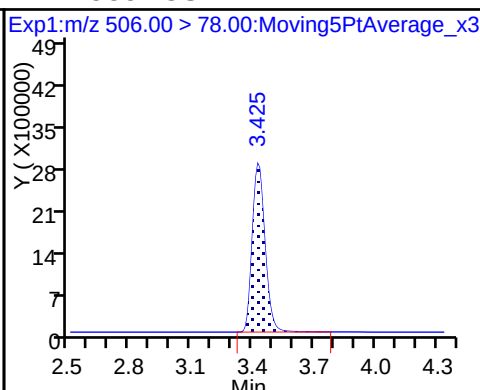
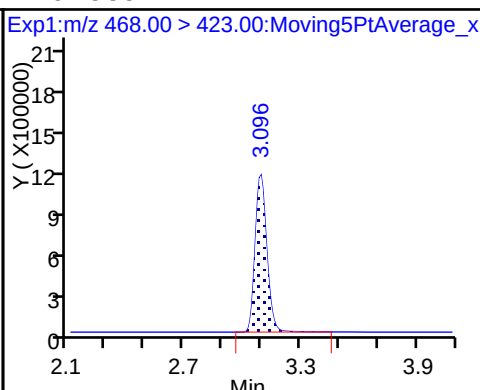
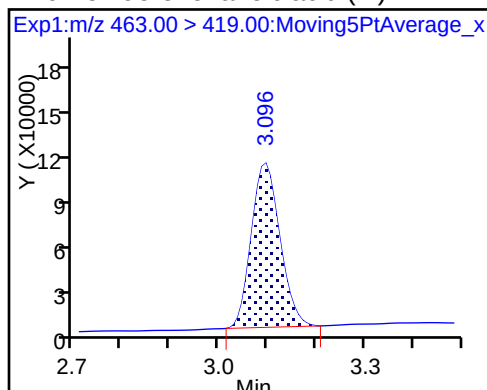
Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3



20 Perfluorononanoic acid (M)

D 19 13C5 PFNA

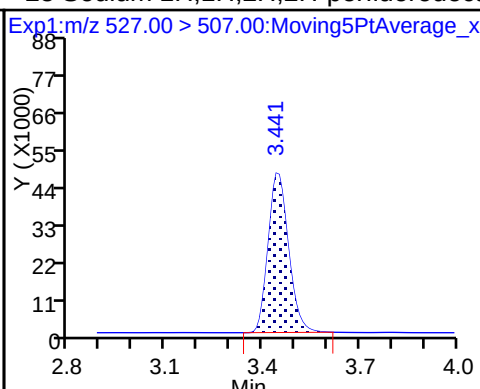
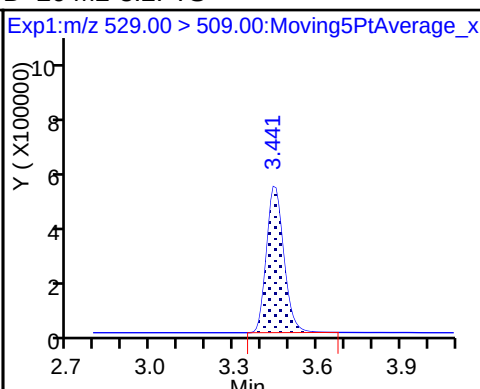
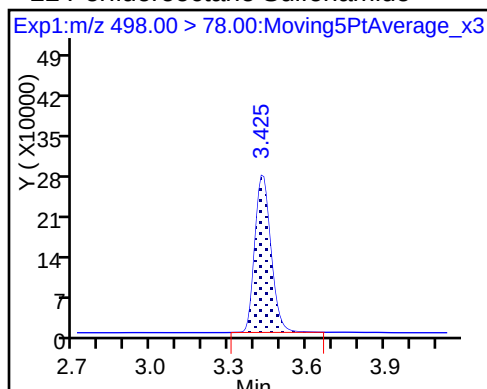
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

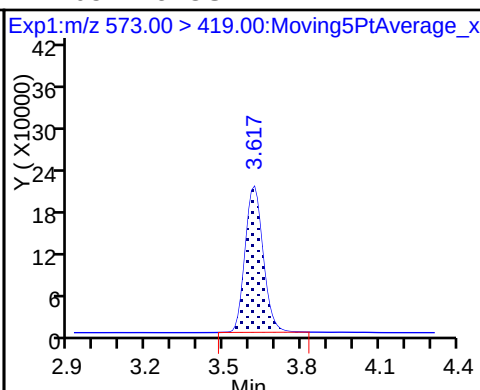
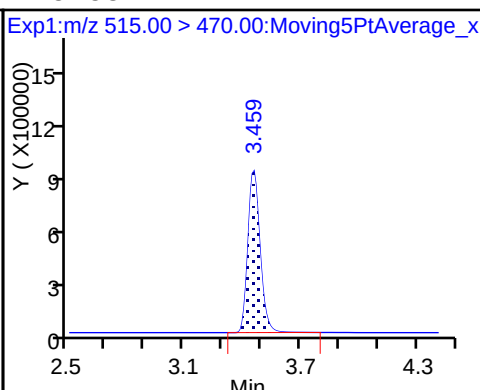
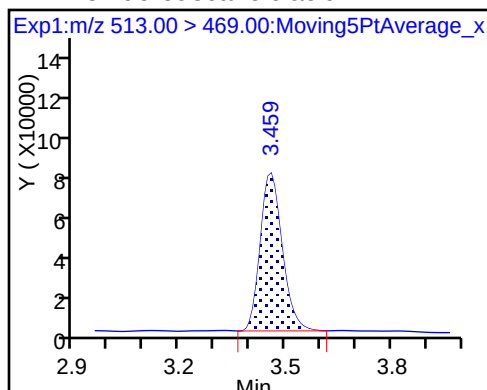
25 Sodium 1H,1H,2H,2H-perfluorodecane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

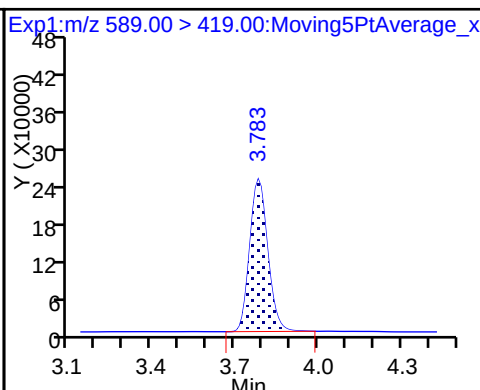
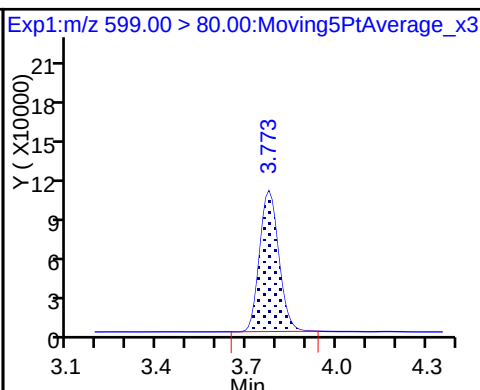
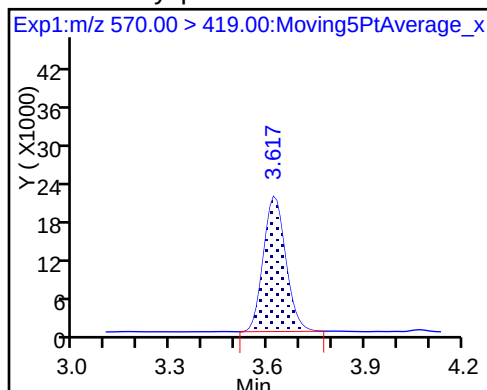
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

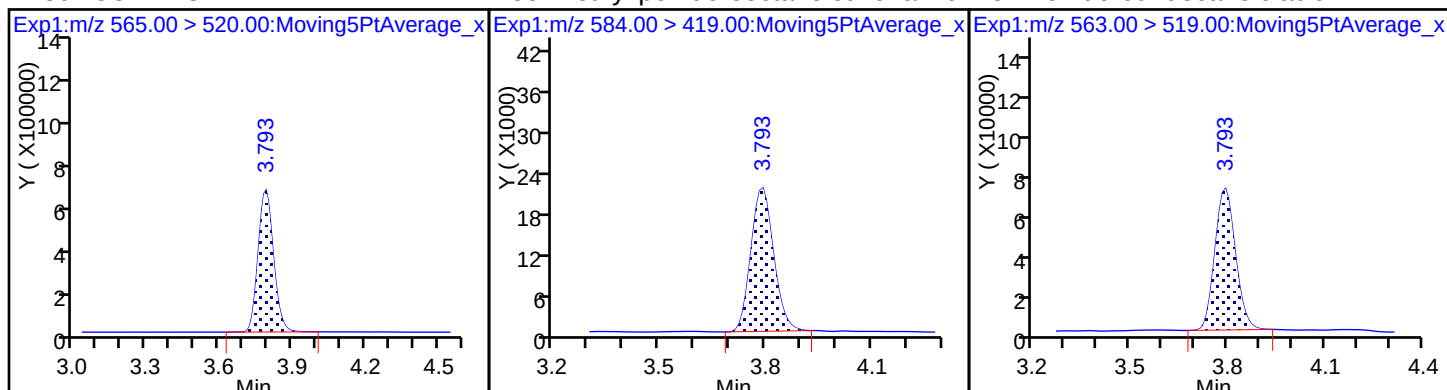
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA

33 N-ethyl perfluorooctane sulfonamid

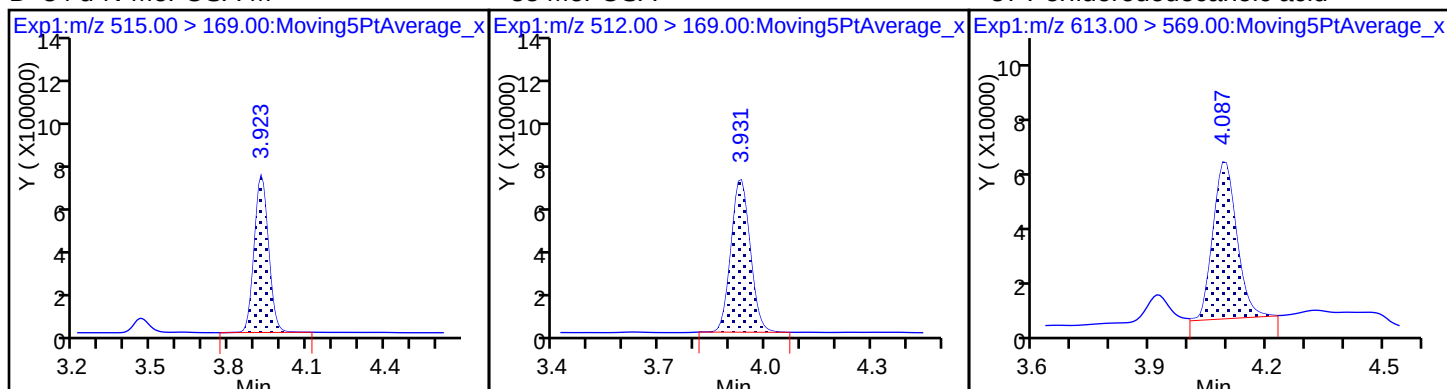
31 Perfluoroundecanoic acid



D 34 d-N-MeFOSA-M

35 MeFOSA

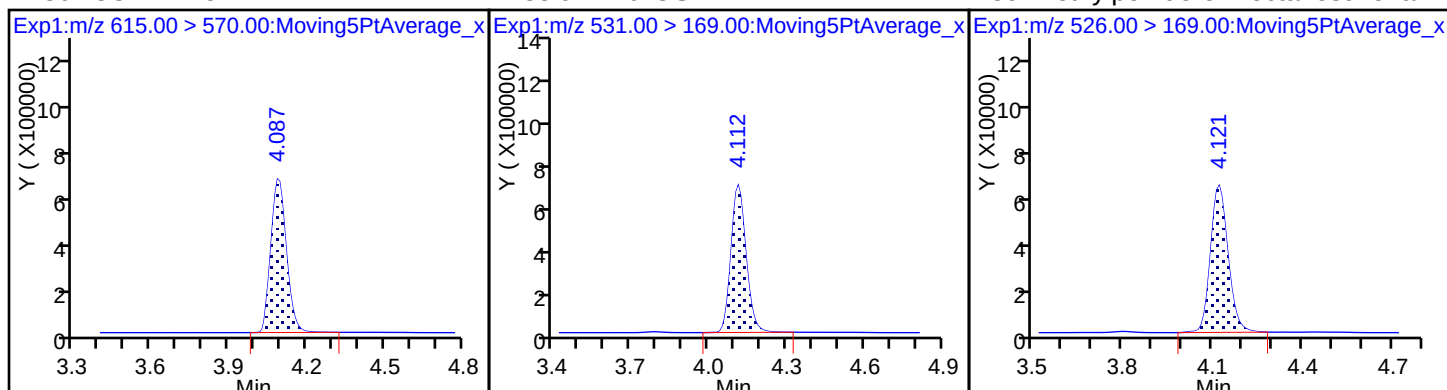
37 Perfluorododecanoic acid



D 36 13C2 PFDaA

D 38 d-N-EtFOSA-M

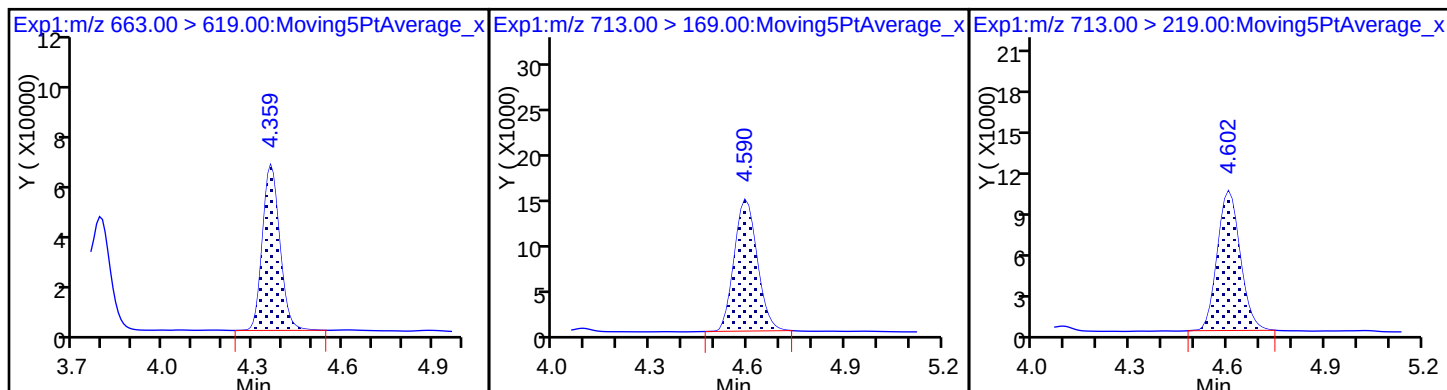
39 N-ethylperfluoro-1-octanesulfonami



41 Perfluorotridecanoic acid

42 Perfluorotetradecanoic acid

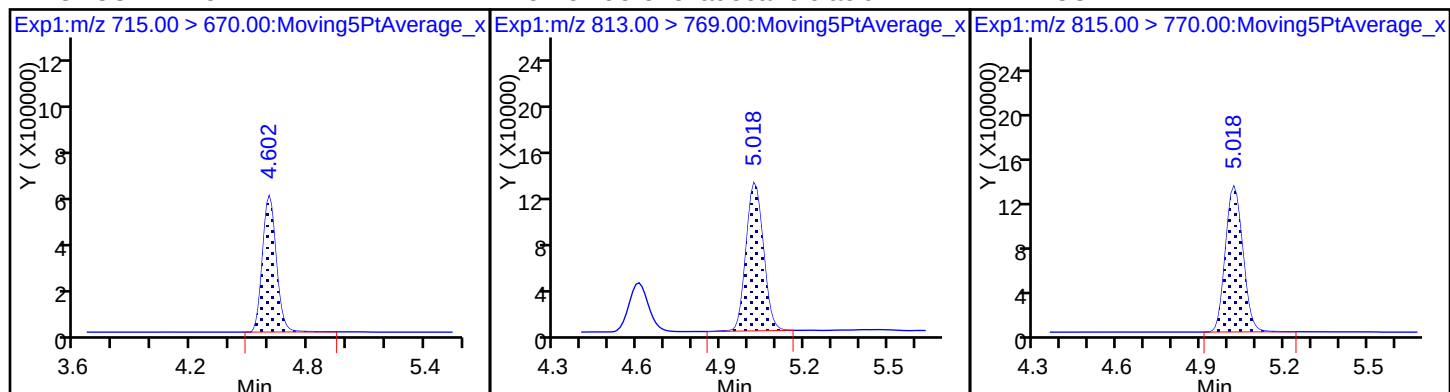
42 Perfluorotetradecanoic acid



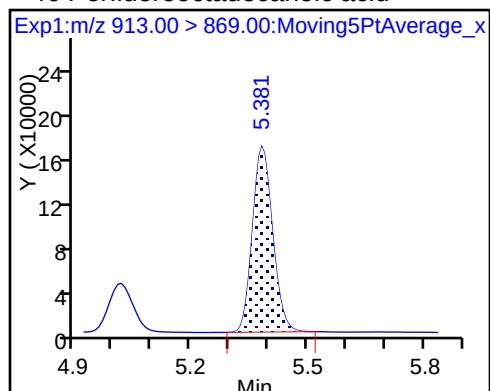
D 43 13C2-PFTeDA

45 Perfluorohexadecanoic acid

D 44 13C2-PFHxDA



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

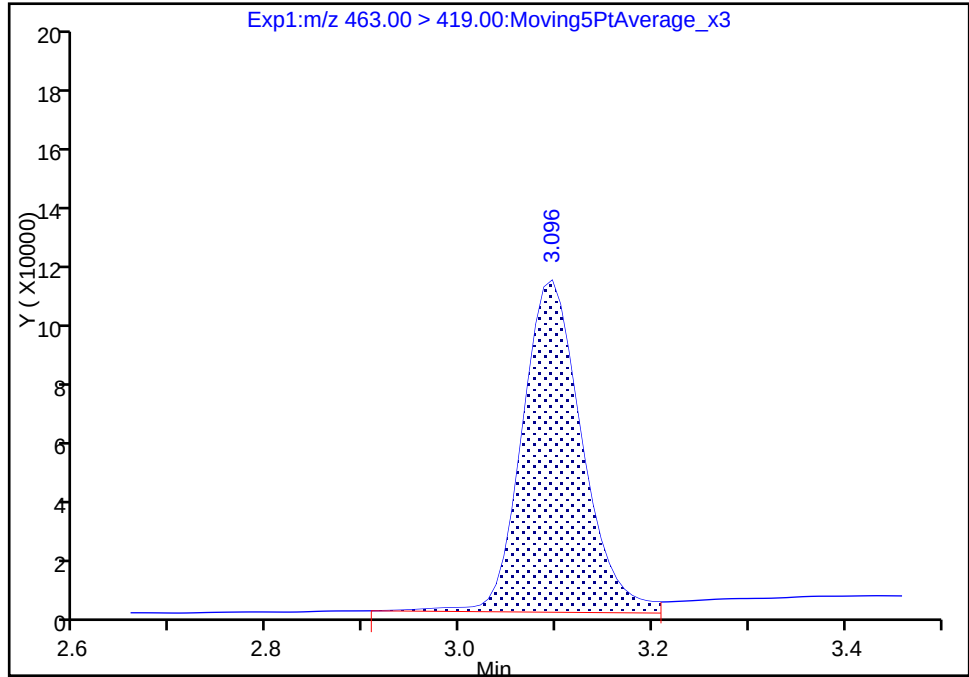
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Injection Date: 24-Aug-2017 10:23:04 Instrument ID: A8_N
Lims ID: IC L3 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 30 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

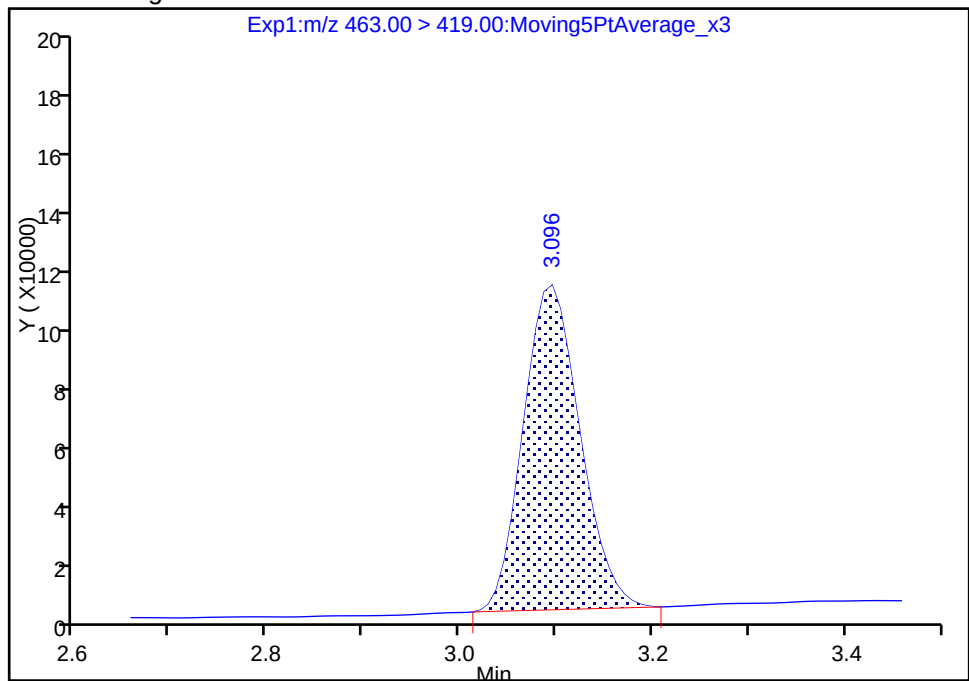
RT: 3.10
Area: 488768
Amount: 4.944070
Amount Units: ng/ml

Processing Integration Results



RT: 3.10
Area: 452982
Amount: 4.776392
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Aug-2017 10:49:22

Audit Action: Manually Integrated

Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_006.d
 Lims ID: IC L4 Full
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 24-Aug-2017 10:29:59 ALS Bottle#: 31 Worklist Smp#: 6
 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*sub19
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:54:06 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

First Level Reviewer: phomsophat

Date: 24-Aug-2017 13:06:12

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	1.545	1.542	0.003		10347324	49.9		99.9	23305	
2 Perfluorobutyric acid										
212.90 > 169.00	1.545	1.545	0.0	1.000	3971942	21.1		106	796	
D 3 13C5-PFPeA										
267.90 > 223.00	1.754	1.747	0.007		6538056	49.7		99.5	62477	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.754	1.751	0.003	1.000	2819891	20.7		103	2024	
D 47 13C3-PFBS										
301.90 > 83.00	1.772	1.771	0.001		178511	45.7		98.3	3519	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.781	1.773	0.008	1.000	5210859	18.6		105	22210	
298.90 > 99.00	1.781	1.773	0.008	1.000	2151241		2.42(0.00-0.00)	105	11753	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.982	1.979	0.003	1.000	905815	18.8		101	12974	
D 7 13C2 PFHxA										
315.00 > 270.00	2.028	2.016	0.012		6903339	50.4		101	18265	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.028	2.016	0.012	1.000	2648018	20.6		103	4045	
D 9 13C4-PFHpA										
367.00 > 322.00	2.354	2.349	0.005		6337598	50.0		100	14325	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.354	2.351	0.003	1.000	2446435	20.0		100	2972	
D 11 18O2 PFHxS										
403.00 > 84.00	2.370	2.363	0.007		10183997	46.7		98.7	19331	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.370	2.365	0.005	1.000	4107370	18.3		101	5811	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 M2-6:2FTS										
429.00 > 409.00	2.686	2.681	0.005		2496473	47.2		99.3	12539	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.686	2.681	0.005	1.000	860157	18.8		99.1	7654	
* 62 13C2-PFOA										
415.00 > 370.00	2.715	2.703	0.012		5784256	50.0			18293	
D 14 13C4 PFOA										
417.00 > 372.00	2.715	2.709	0.006		5999299	51.6		103	41751	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.715	2.709	0.006	1.000	2506742	19.1		95.5	559	
413.00 > 169.00	2.715	2.709	0.006	1.000	1361540		1.84(0.90-1.10)	95.5	4673	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.722	2.718	0.004	1.000	3630197	20.3		107	9266	
D 18 13C4 PFOS										
503.00 > 80.00	3.091	3.084	0.007		7133141	47.0		98.4	29600	
D 19 13C5 PFNA										
468.00 > 423.00	3.091	3.087	0.004		4492139	50.4		101	30194	
20 Perfluorononanoic acid										
463.00 > 419.00	3.091	3.087	0.004	1.000	1701549	19.2		96.1	860	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.091	3.087	0.004	1.000	2835600	17.9		96.6	3133	
499.00 > 99.00	3.091	3.087	0.004	1.000	608540		4.66(0.90-1.10)	96.6	2780	
D 21 13C8 FOSA										
506.00 > 78.00	3.426	3.419	0.007		11738110	51.1		102	37065	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.426	3.421	0.005	1.000	4380116	20.2		101	10830	
D 26 M2-8:2FTS										
529.00 > 509.00	3.443	3.438	0.005		1965341	46.1		96.3	17341	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.443	3.439	0.004	1.000	733921	19.3		101	16724	
D 23 13C2 PFDA										
515.00 > 470.00	3.453	3.449	0.004		3720180	48.2		96.4	19192	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.453	3.449	0.004	1.000	1316957	19.6		98.0	2899	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.610	3.607	0.003		1012747	49.1		98.2	6865	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.620	3.611	0.009	1.003	377640	18.9		94.6	4696	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.767	3.763	0.004	1.000	1792368	19.9		103	8896	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.786	3.774	0.012		1062485	49.3		98.5	3301	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.786	3.781	0.005	1.000	352558	19.3		96.7	2920	
D 30 13C2 PFUnA										
565.00 > 520.00	3.786	3.781	0.005		2574856	49.3		98.5	8993	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.786	3.783	0.003	1.000	1071917	18.5		92.4	2037	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.926	3.917	0.009		2707124	49.0		98.0	698	
35 MeFOSA										
512.00 > 169.00	3.926	3.923	0.003	1.000	968964	19.6		97.8	5539	
D 36 13C2 PFDaA										
615.00 > 570.00	4.088	4.082	0.006		2519889	49.2		98.4	9581	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.088	4.082	0.006	1.000	934770	19.2		95.9	265	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.114	4.107	0.007		2568463	48.4		96.9	4204	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.114	4.113	0.001	1.000	951552	19.9		99.7	4176	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.351	4.350	0.001	1.000	943819	19.6		98.2	338	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.591	4.585	0.006	1.000	256477	18.1		90.6	3056	
713.00 > 219.00	4.602	4.585	0.017	1.002	184842		1.39(0.00-0.00)	90.6	1630	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.591	4.591	0.0		2798407	51.8		104	11742	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.018	5.010	0.008		5668084	51.4		103	5888	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.018	5.010	0.008	1.000	1955799	19.4		97.1	319	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.380	5.373	0.007	1.000	2397368	19.7		98.4	471	

Reagents:

LCPFC_FULL-L4_00008

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_006.d

Injection Date: 24-Aug-2017 10:29:59

Instrument ID: A8_N

Lims ID: IC L4 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 31

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

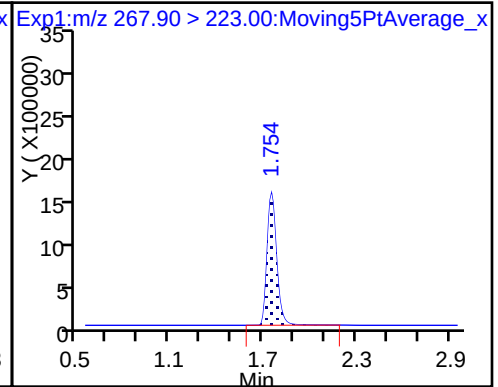
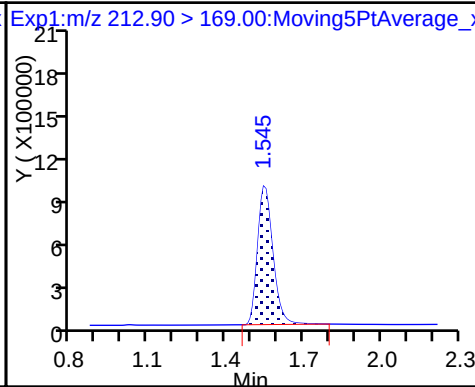
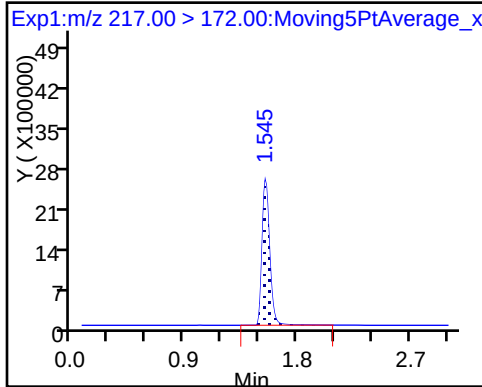
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

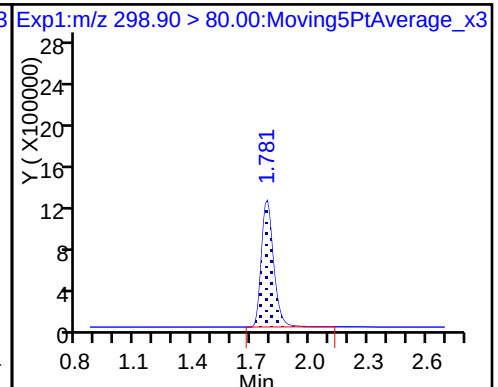
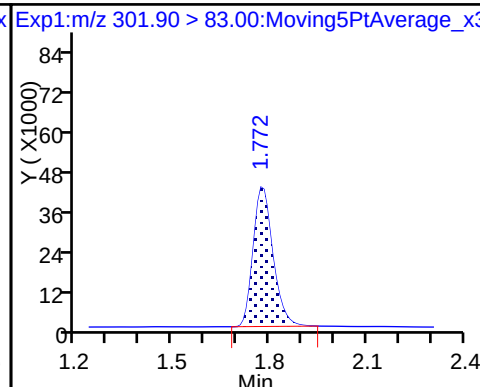
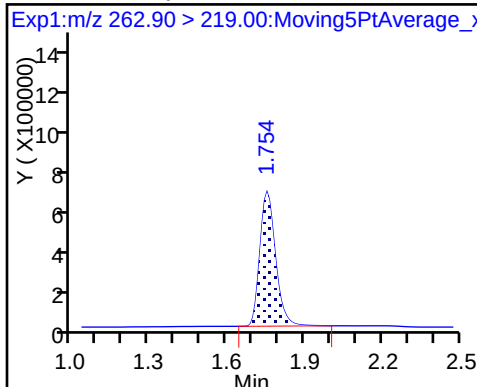
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

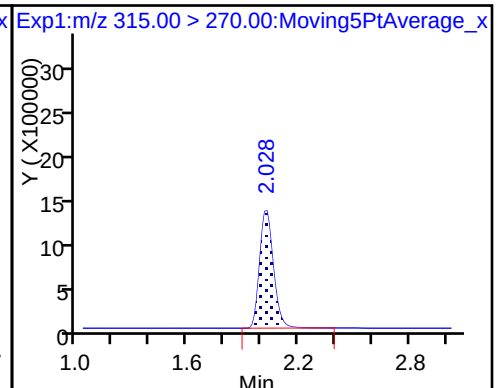
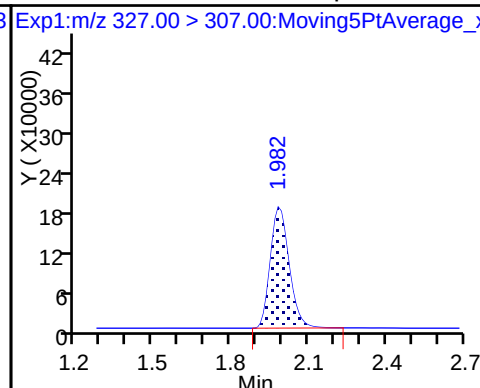
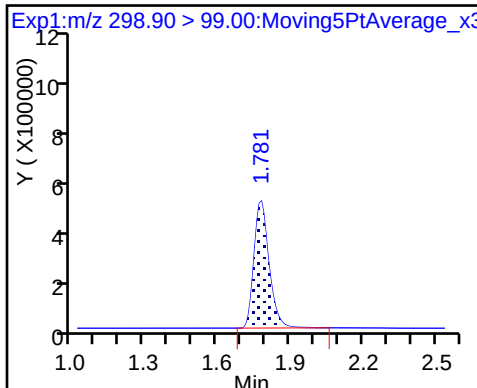
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa

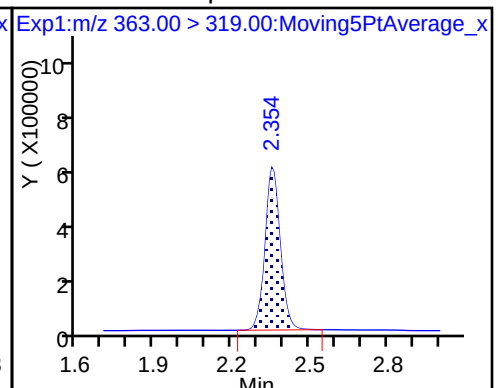
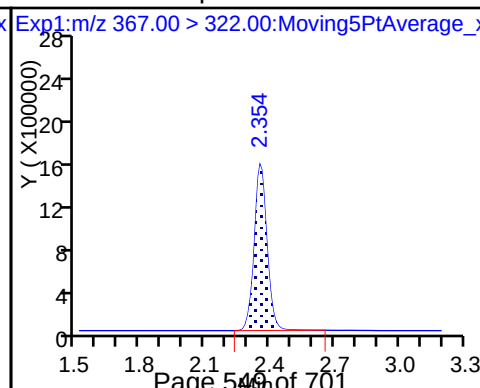
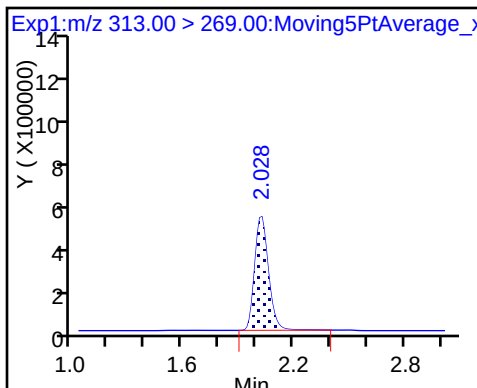
De 7 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

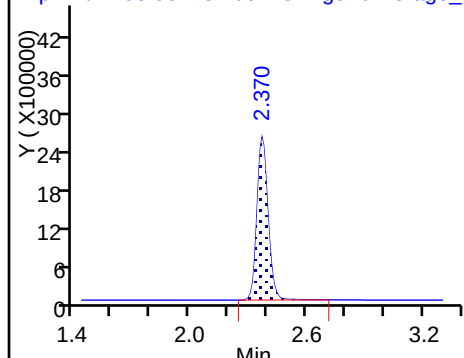


D 11 18O2 PFHxS

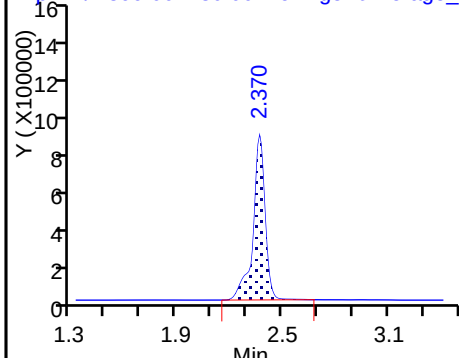
8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

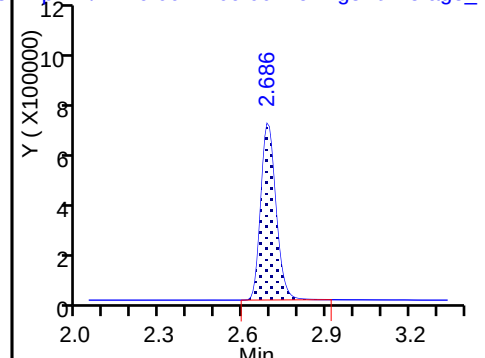
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Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



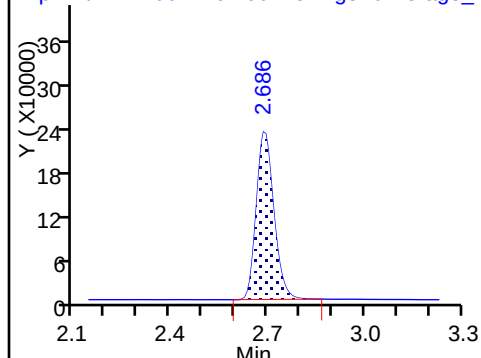
Exp1:m/z 429.00 > 409.00:Moving5PtAverage_x3



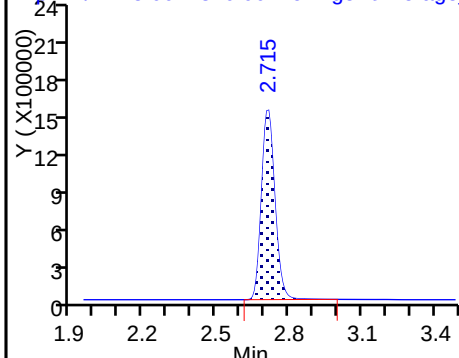
13 Sodium 1H,1H,2H,2H-perfluorooctanoate

D 14 13C4 PFOA

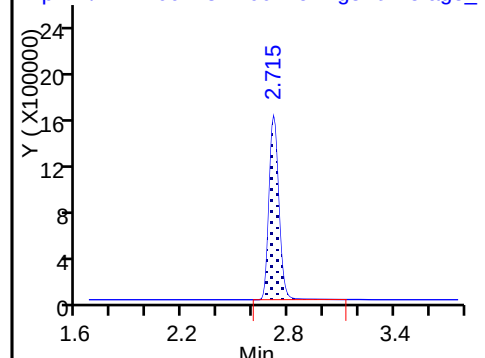
Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3



Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x3



Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3

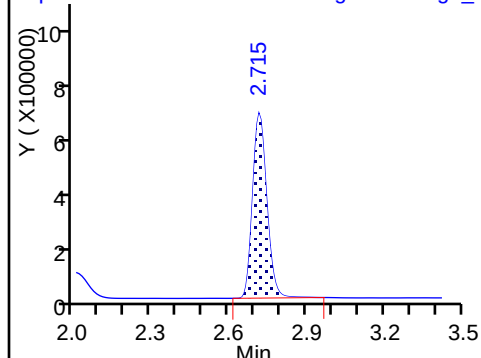


15 Perfluorooctanoic acid

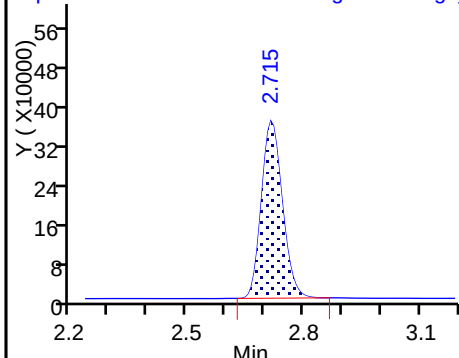
15 Perfluorooctanoic acid

16 Perfluoroheptanesulfonic Acid

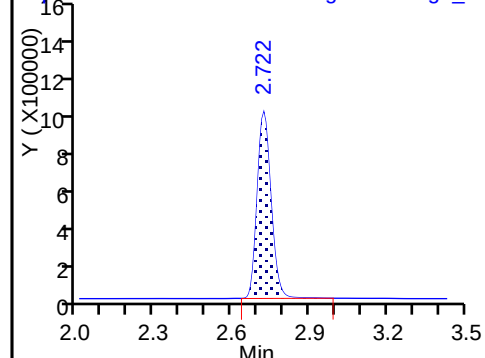
Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

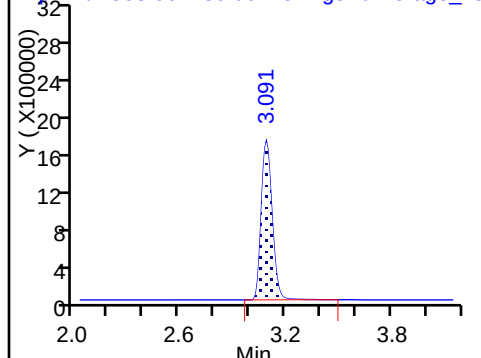


D 18 13C4 PFOS

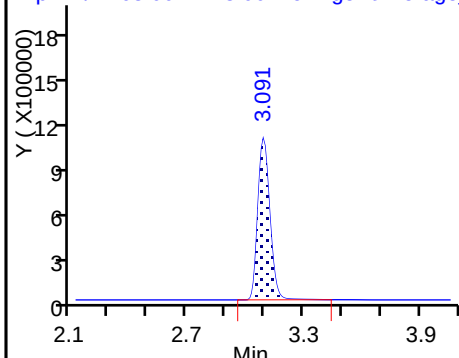
D 19 13C5 PFNA

20 Perfluorononanoic acid

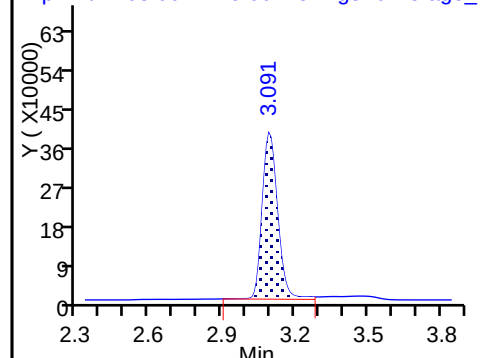
Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3



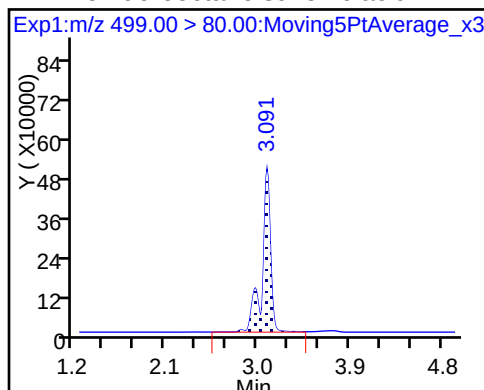
Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x3



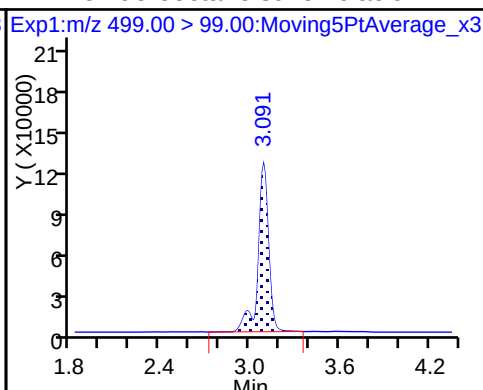
Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x3



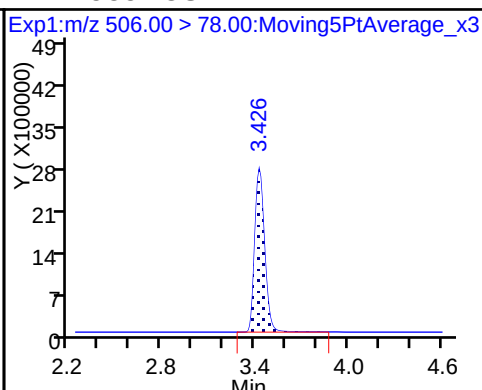
17 Perfluorooctane sulfonic acid



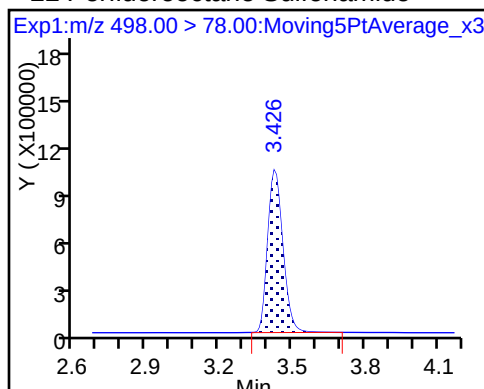
17 Perfluorooctane sulfonic acid



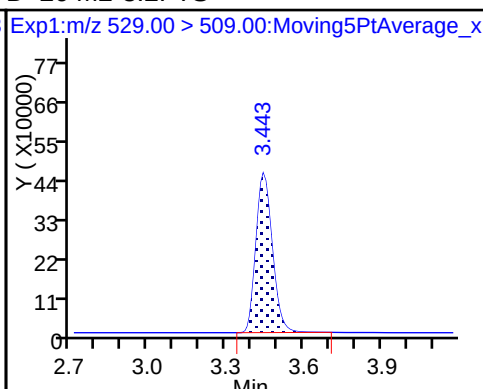
D 21 13C8 FOSA



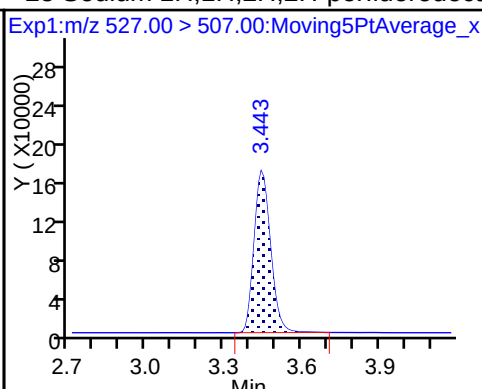
22 Perfluorooctane Sulfonamide



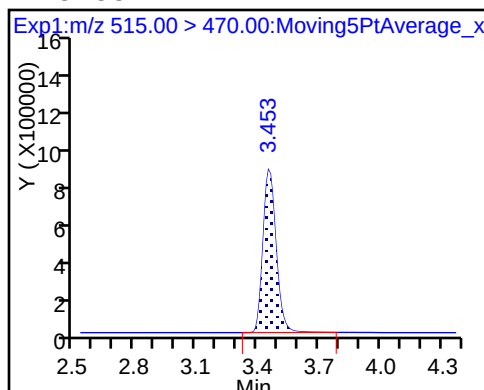
D 26 M2-8:2FTS



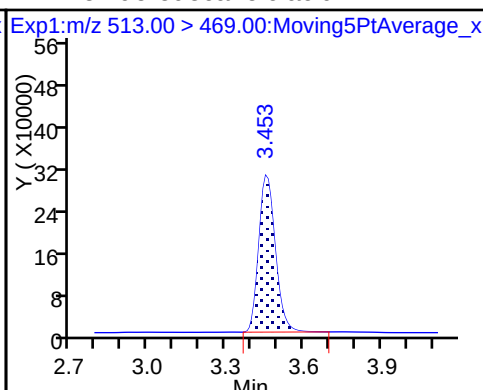
25 Sodium 1H,1H,2H,2H-perfluorodecane



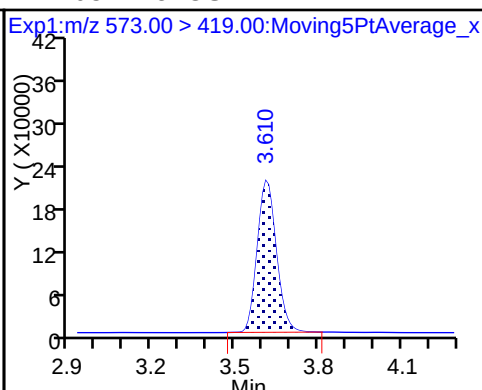
D 23 13C2 PFDA



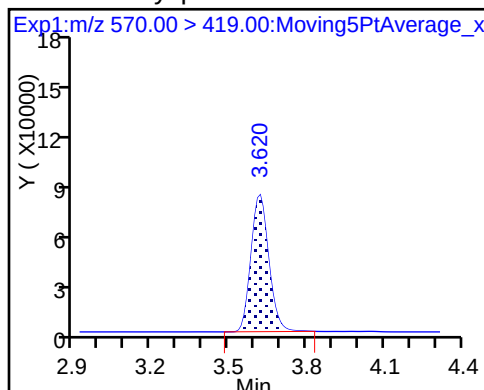
24 Perfluorodecanoic acid



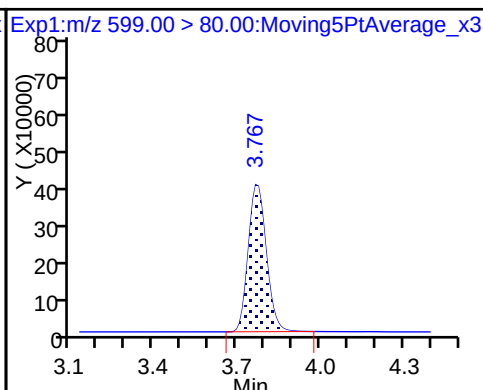
D 27 d3-NMeFOSAA



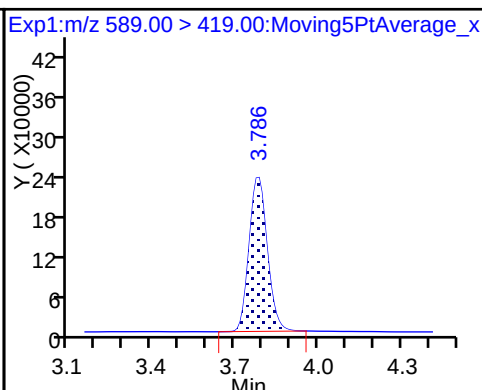
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid

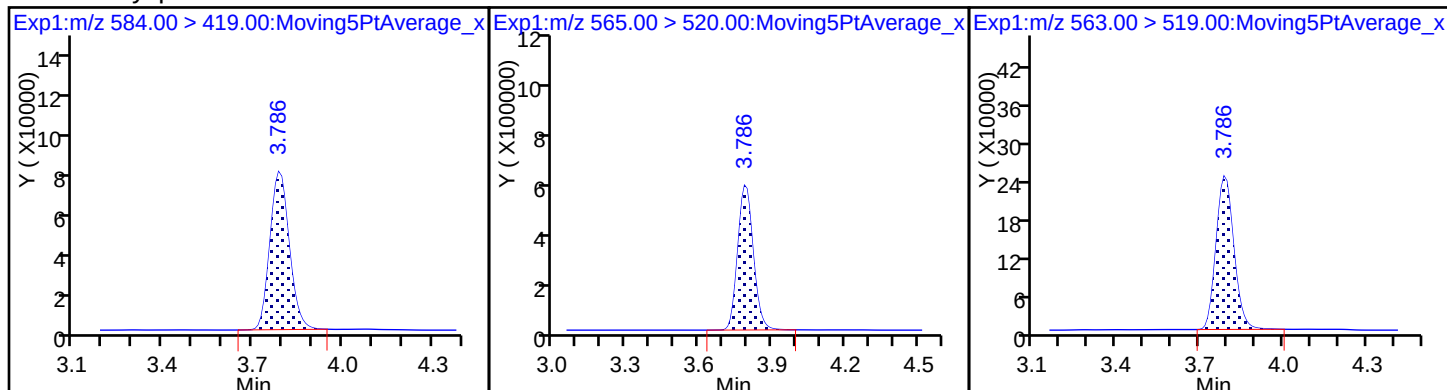


D 32 d5-NEtFOSAA



33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA

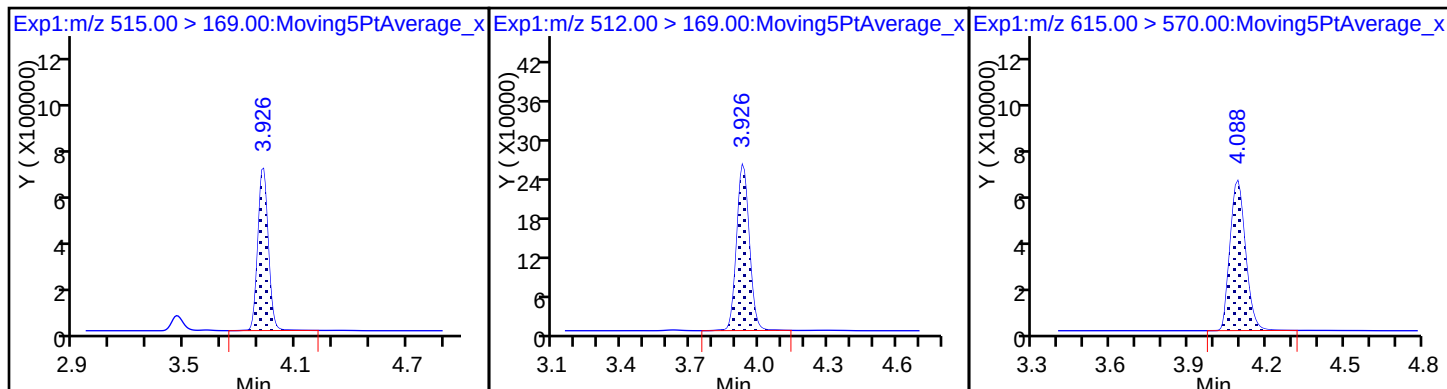
31 Perfluoroundecanoic acid



D 34 d-N-MeFOSA-M

35 MeFOSA

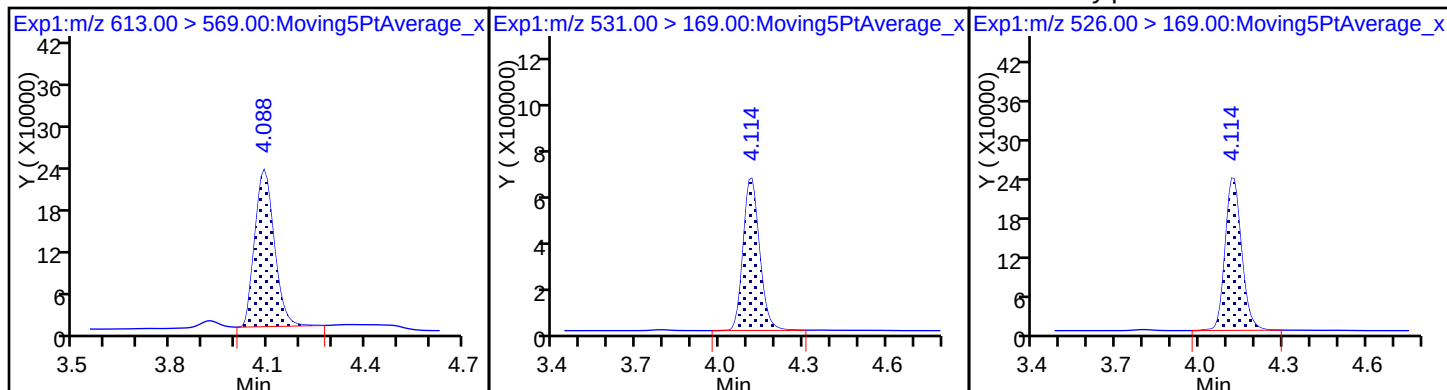
D 36 13C2 PFDaA



37 Perfluorododecanoic acid

D 38 d-N-EtFOSA-M

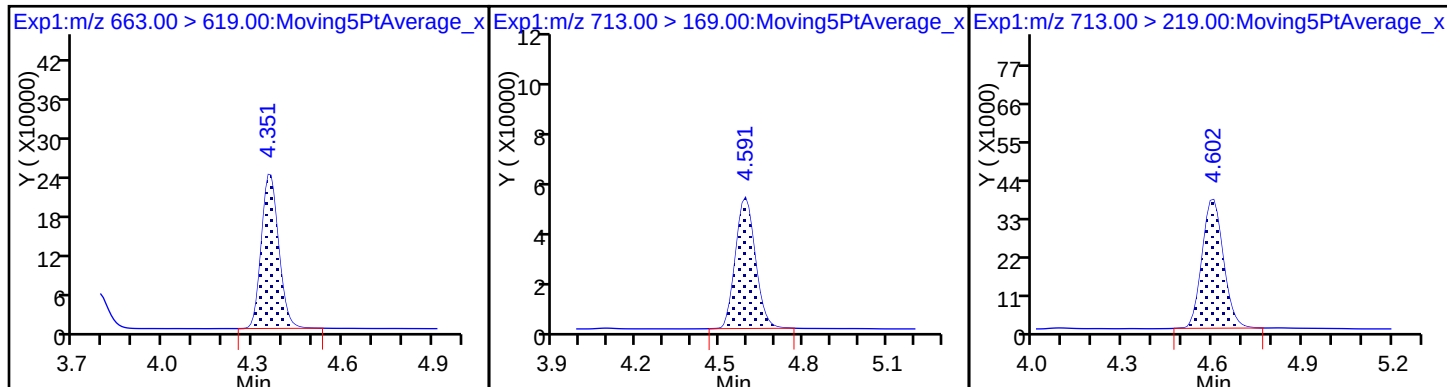
39 N-ethylperfluoro-1-octanesulfonami



41 Perfluorotridecanoic acid

42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

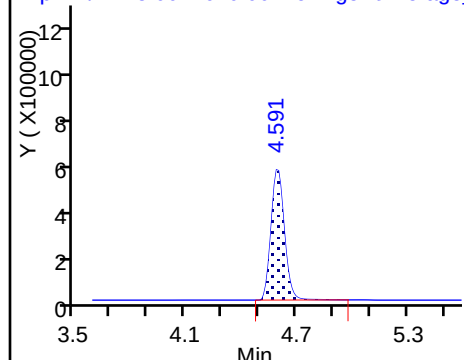


D 43 13C2-PFTeDA

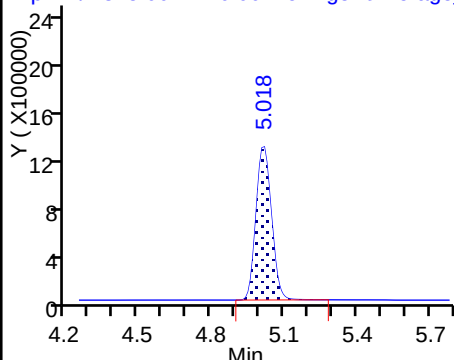
D 44 13C2-PFHxDA

45 Perfluorohexadecanoic acid

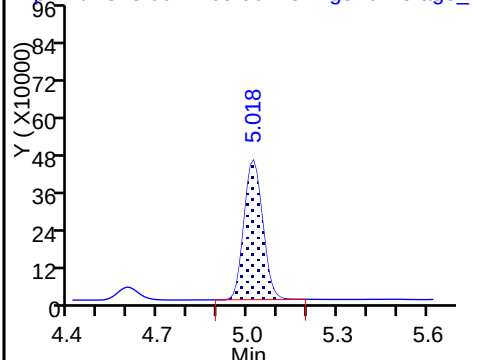
Exp1:m/z 715.00 > 670.00:Moving5PtAverage_x



Exp1:m/z 815.00 > 770.00:Moving5PtAverage_x

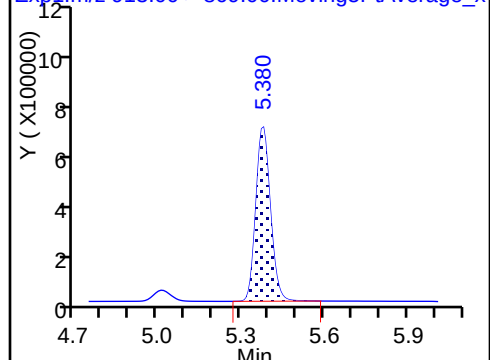


Exp1:m/z 813.00 > 769.00:Moving5PtAverage_x



46 Perfluorooctadecanoic acid

Exp1:m/z 913.00 > 869.00:Moving5PtAverage_x



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_007.d
 Lims ID: IC L5 Full
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 24-Aug-2017 10:36:53 ALS Bottle#: 32 Worklist Smp#: 7
 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*sub19
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:54:09 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

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	1.545	1.542	0.003		10436988	50.4		101	30467	
2 Perfluorobutyric acid										
212.90 > 169.00	1.553	1.545	0.008	1.000	9462743	49.9		99.9	2965	
D 3 13C5-PFPeA										
267.90 > 223.00	1.754	1.747	0.007		6437663	49.0		97.9	80831	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.754	1.751	0.003	1.000	6902883	51.4		103	4904	
D 47 13C3-PFBS										
301.90 > 83.00	1.773	1.771	0.002		178049	45.6		98.1	4223	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.782	1.773	0.009	1.000	12184780	43.5		98.4	233410	
298.90 > 99.00	1.782	1.773	0.009	1.000	5298875		2.30(0.00-0.00)	98.4	26761	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.983	1.979	0.004	1.000	2266455	47.4		102	30351	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.017	2.016	0.001	1.000	6539935	51.6		103	8903	
D 7 13C2 PFHxA										
315.00 > 270.00	2.017	2.016	0.001		6797501	49.6		99.2	38278	
D 9 13C4-PFHpA										
367.00 > 322.00	2.355	2.349	0.006		6330218	49.9		99.9	24735	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.355	2.351	0.004	1.000	6185854	50.7		101	7544	
D 11 18O2 PFHxS										
403.00 > 84.00	2.363	2.363	0.0		10221910	46.8		99.0	35800	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.371	2.365	0.006	1.000	10177783	45.2		99.4	16191	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.685	2.681	0.004	1.000	2133847	46.8		98.8	16972	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 M2-6:2FTS										
429.00 > 409.00	2.685	2.681	0.004		2483936	46.9		98.8	20949	
* 62 13C2-PFOA										
415.00 > 370.00	2.707	2.703	0.003		5922123	50.0			34923	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.714	2.709	0.005	1.000	6263198	47.6		95.3	1300	
413.00 > 169.00	2.714	2.709	0.005	1.000	3417002		1.83(0.90-1.10)	95.3	10639	
D 14 13C4 PFOA										
417.00 > 372.00	2.714	2.709	0.005		6008077	51.7		103	37656	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.721	2.718	0.003	1.000	8774426	49.3		104	24674	
D 18 13C4 PFOS										
503.00 > 80.00	3.081	3.084	-0.003		7101056	46.8		98.0	15620	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.090	3.087	0.003	1.000	7179346	45.6		98.3	4383	
499.00 > 99.00	3.081	3.087	-0.006	0.997	1519033		4.73(0.90-1.10)	98.3	4895	
20 Perfluorononanoic acid										
463.00 > 419.00	3.090	3.087	0.003	1.000	4341599	51.9		104	1817	
D 19 13C5 PFNA										
468.00 > 423.00	3.090	3.087	0.003		4242319	47.6		95.3	20656	
D 21 13C8 FOSA										
506.00 > 78.00	3.419	3.419	0.0		11360864	49.4		98.8	12172	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.428	3.421	0.007	1.000	10626285	50.5		101	11560	
D 26 M2-8:2FTS										
529.00 > 509.00	3.437	3.438	-0.001		2018998	47.4		98.9	15182	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.437	3.439	-0.002	1.000	1835859	46.9		97.9	18723	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.446	3.449	-0.003	1.000	3465795	49.7		99.4	5167	
D 23 13C2 PFDA										
515.00 > 470.00	3.446	3.449	-0.003		3859230	50.0		100	11297	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.609	3.607	0.001		1057639	51.3		103	6873	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.609	3.611	-0.003	1.000	975071	46.8		93.6	5771	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.765	3.763	0.002	1.000	4408935	49.2		102	4928	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.774	3.774	0.0		1051560	48.8		97.5	2720	
D 30 13C2 PFUnA										
565.00 > 520.00	3.784	3.781	0.003		2625256	50.2		100	5029	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.784	3.781	0.003	1.003	920624	51.0		102	4758	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.784	3.783	0.001	1.000	2660804	45.0		90.0	2695	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.920	3.917	0.003		2635799	47.7		95.5	636	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
35 MeFOSA										
512.00 > 169.00	3.928	3.923	0.005	1.000	2357081	48.9		97.7	3583	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.083	4.082	0.001	1.000	2292605	48.2		96.4	543	
D 36 13C2 PFDaA										
615.00 > 570.00	4.083	4.082	0.001		2458372	48.0		96.0	4262	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.109	4.107	0.002		2579921	48.6		97.3	2666	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.117	4.113	0.004	1.000	2417225	50.4		101	3834	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.352	4.350	0.002	1.000	2359196	50.3		101	722	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.586	4.585	0.001	1.000	650916	48.1		96.1	2293	
713.00 > 219.00	4.597	4.585	0.012	1.002	457769		1.42(0.00-0.00)	96.1	1843	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.597	4.591	0.006		2679519	49.6		99.1	3974	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.009	5.010	-0.001	1.000	4822029	51.7		103	508	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.009	5.010	-0.001		5332849	48.4		96.8	1893	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.372	5.373	-0.001	1.000	5785021	50.5		101	880	

Reagents:

LCPFC_FULL-L5_00008

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_007.d

Injection Date: 24-Aug-2017 10:36:53

Instrument ID: A8_N

Lims ID: IC L5 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 32

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

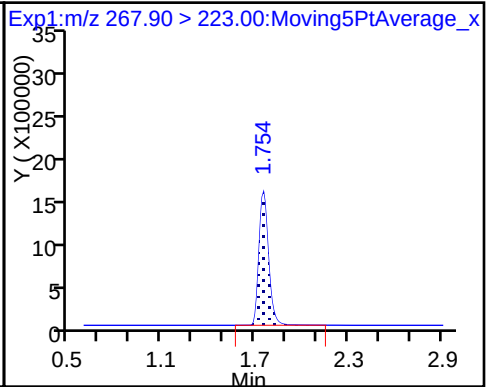
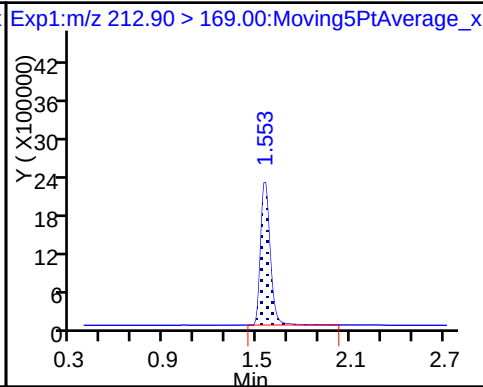
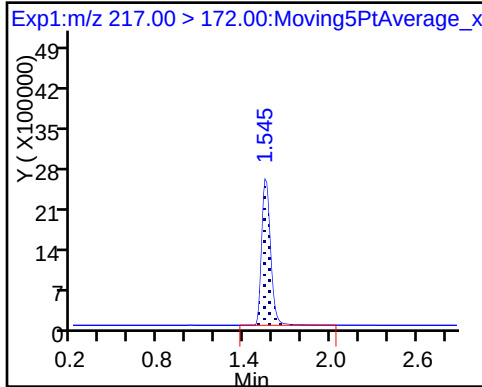
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

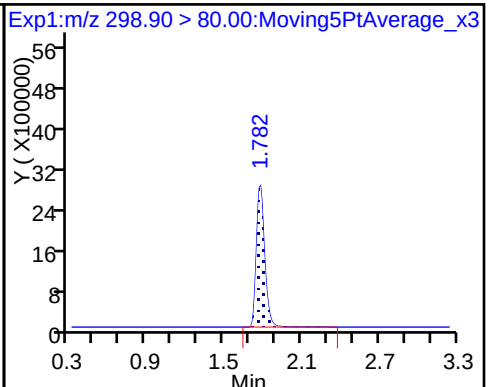
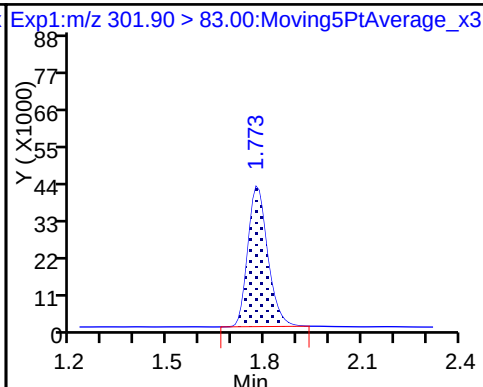
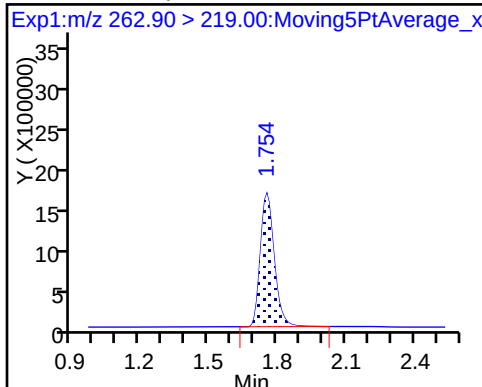
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

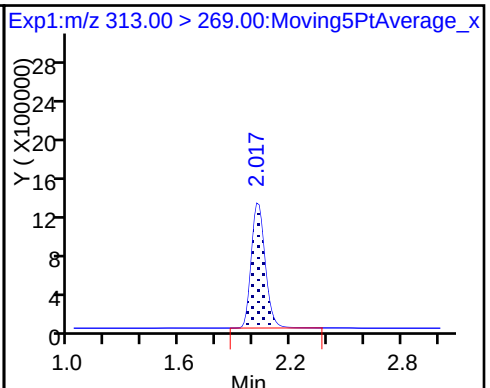
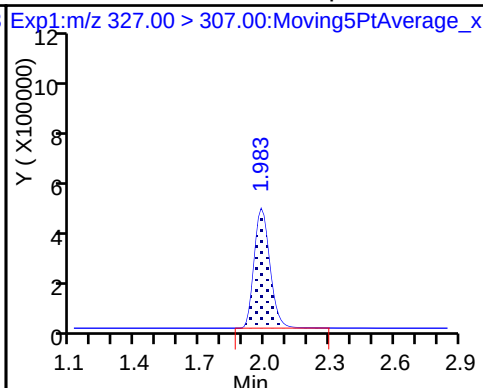
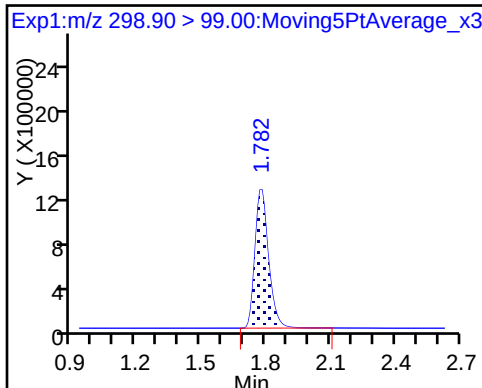
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexanoate

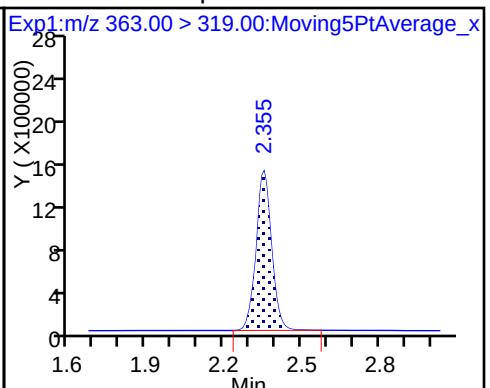
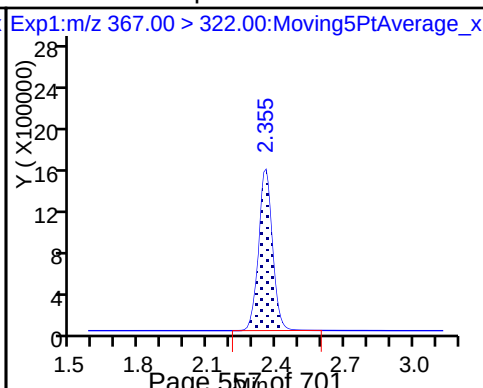
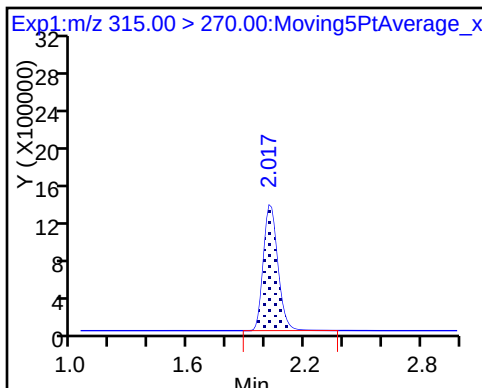
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

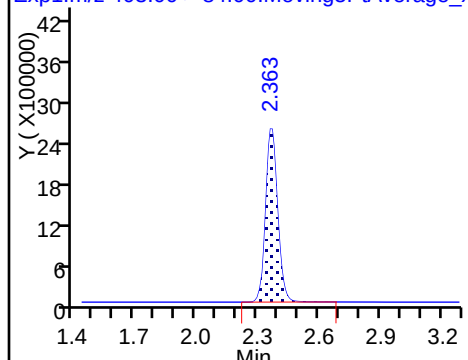


D 11 18O2 PFHxS

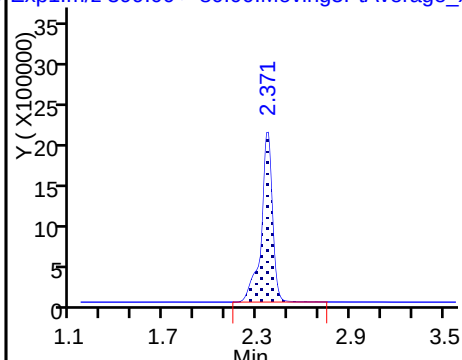
8 Perfluorohexanesulfonic acid

13 Sodium 1H,1H,2H,2H-perfluorooctane

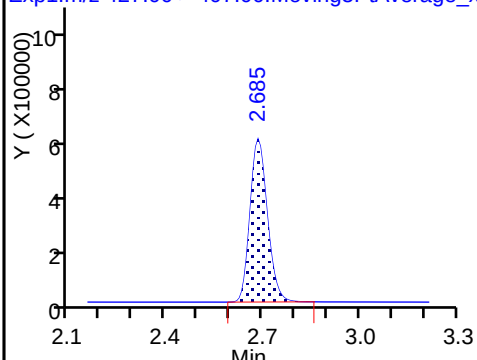
Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3



Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3

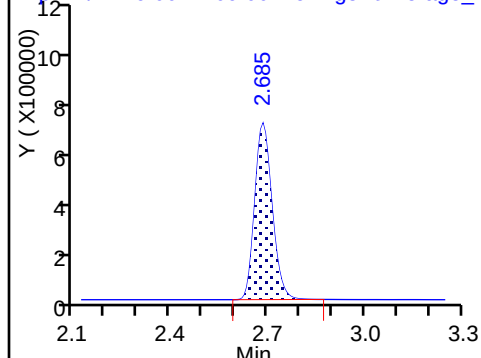


D 12 M2-6:2FTS

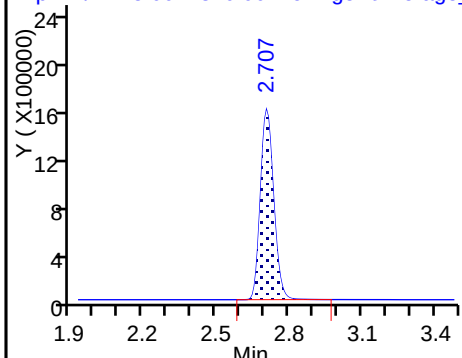
* 62 13C2-PFOA

15 Perfluorooctanoic acid

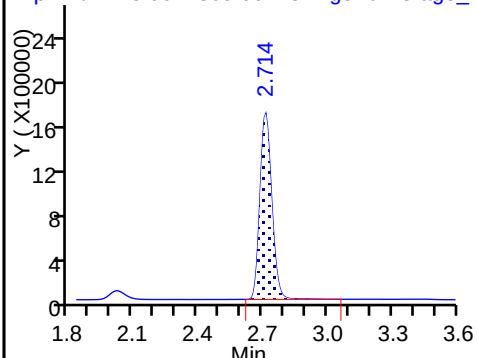
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Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3

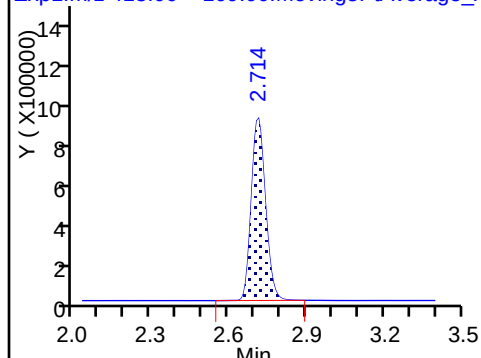


15 Perfluorooctanoic acid

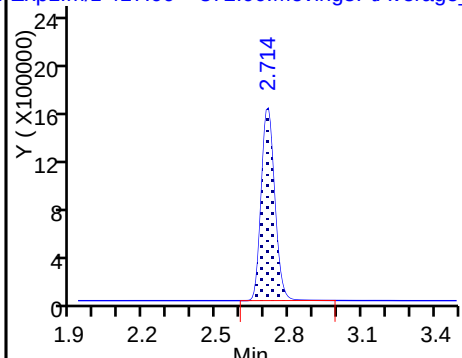
D 14 13C4 PFOA

16 Perfluoroheptanesulfonic Acid

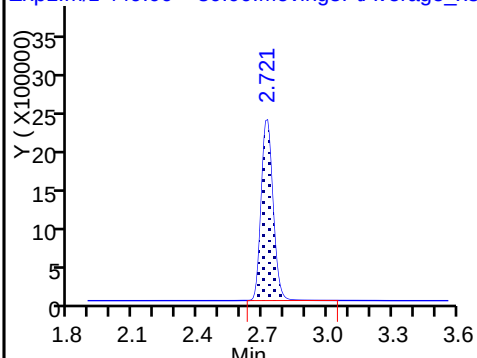
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Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

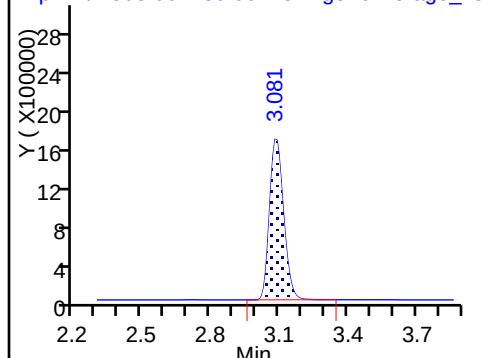


D 18 13C4 PFOS

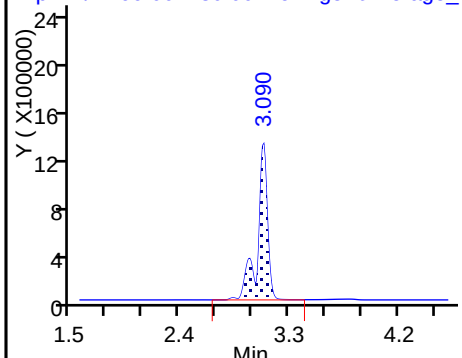
17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

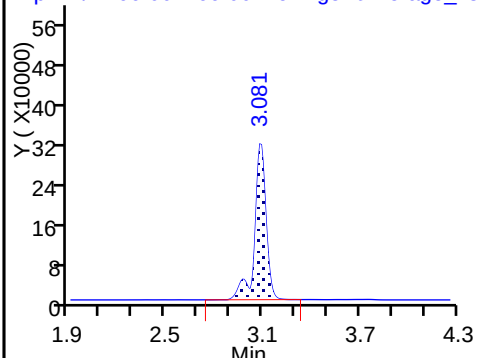
Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3



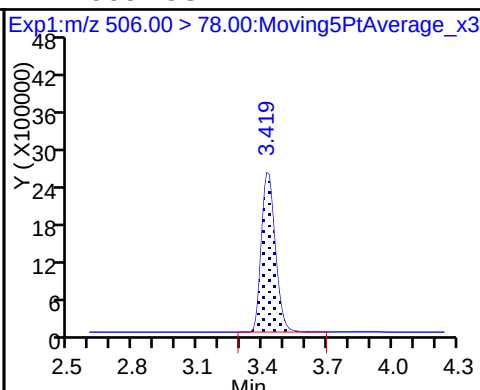
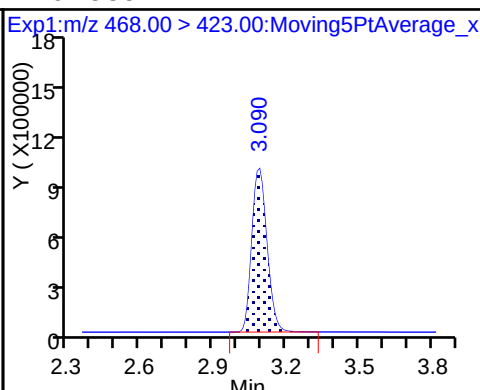
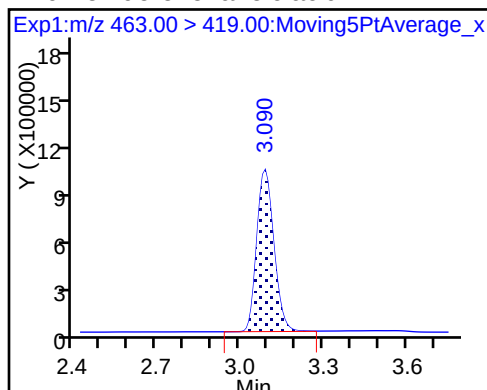
Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3



20 Perfluorononanoic acid

D 19 13C5 PFNA

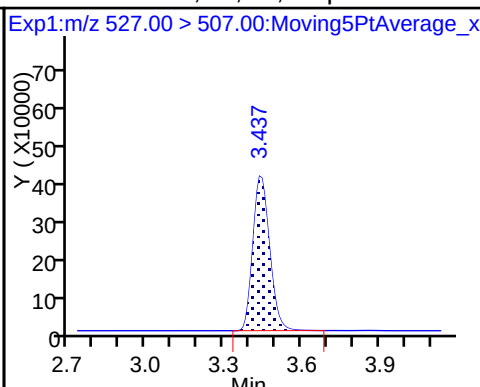
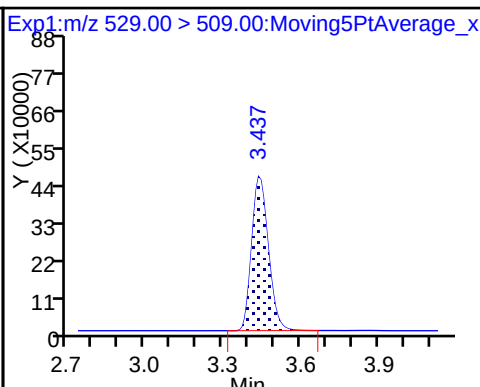
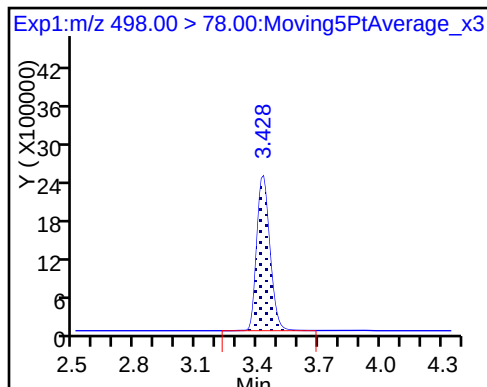
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

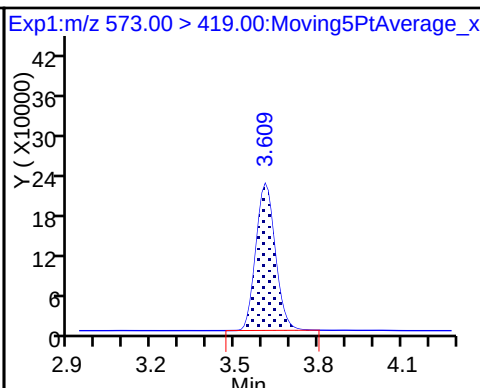
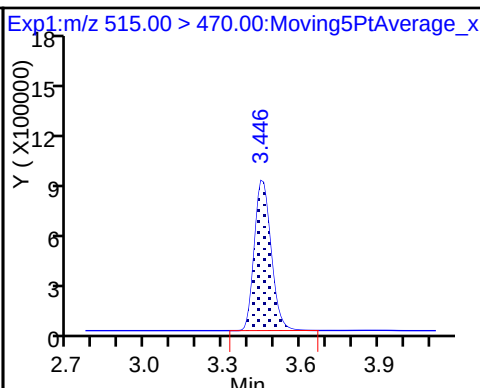
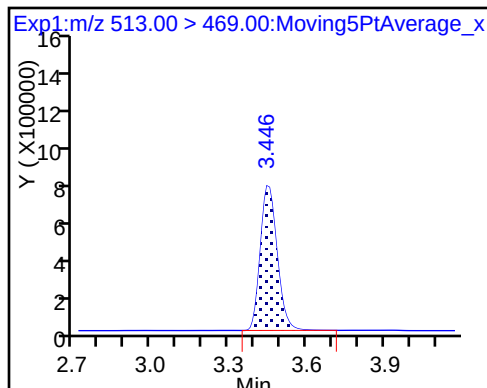
25 Sodium 1H,1H,2H,2H-perfluorodecane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

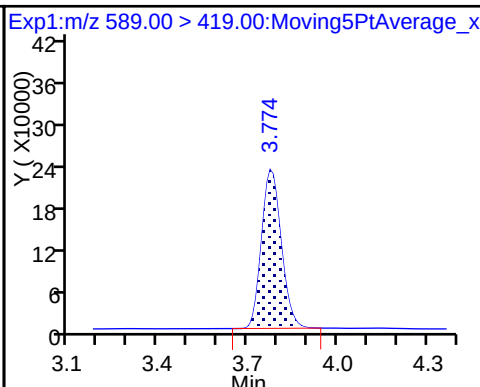
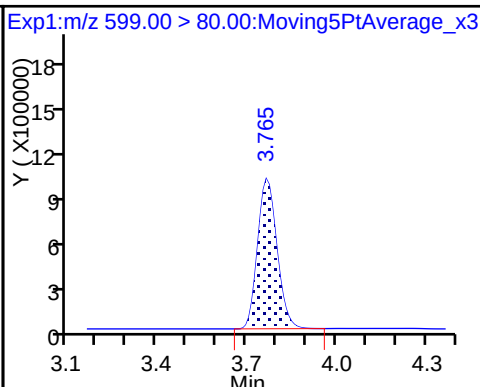
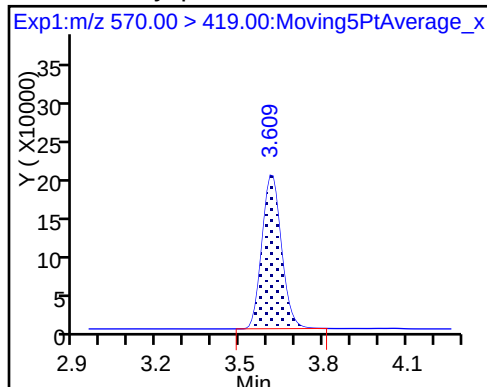
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

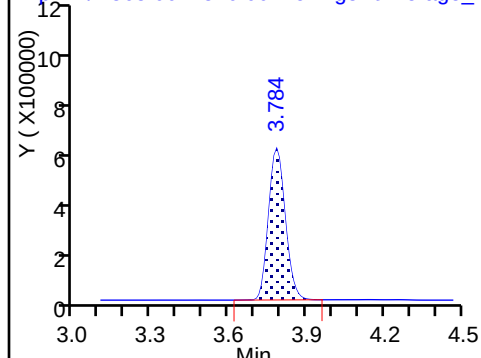


D 30 13C2 PFUnA

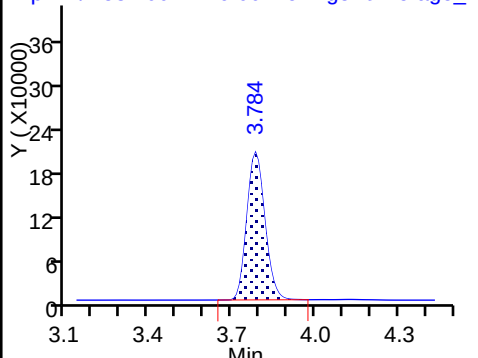
33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

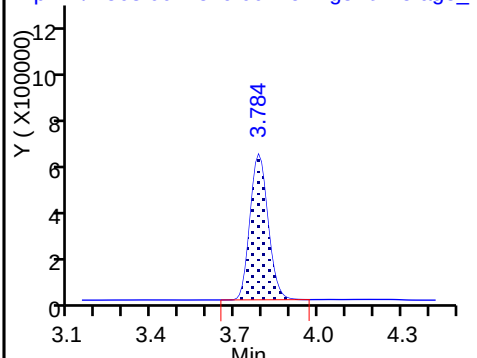
Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x



Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x



Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x

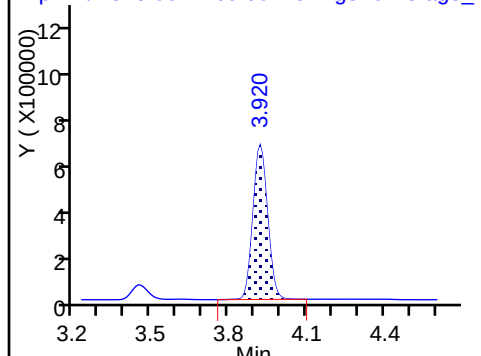


D 34 d-N-MeFOSA-M

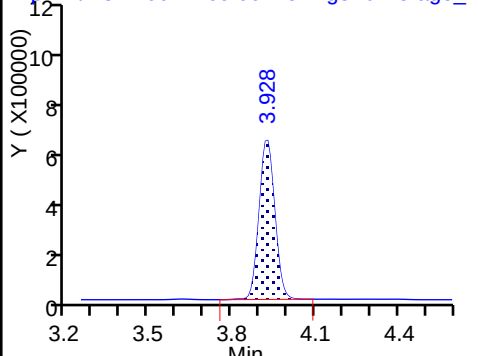
35 MeFOSA

37 Perfluorododecanoic acid

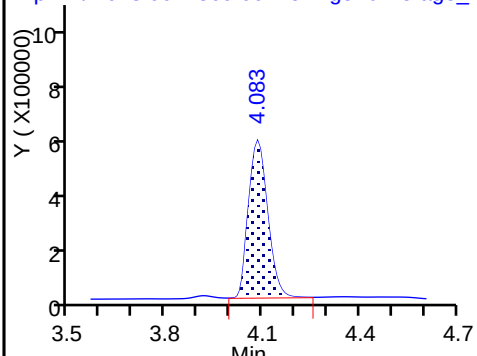
Exp1:m/z 515.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 512.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x

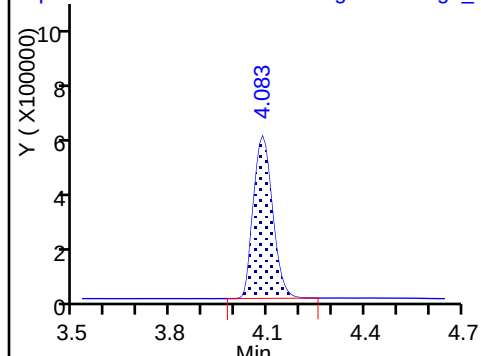


D 36 13C2 PFDaA

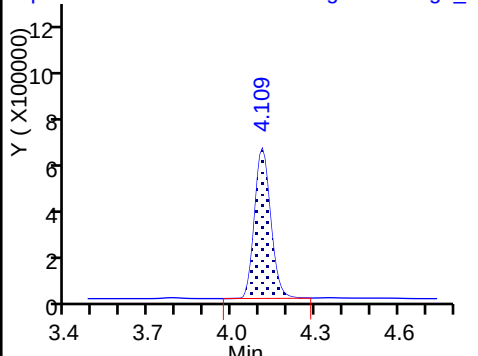
D 38 d-N-EtFOSA-M

39 N-ethylperfluoro-1-octanesulfonami

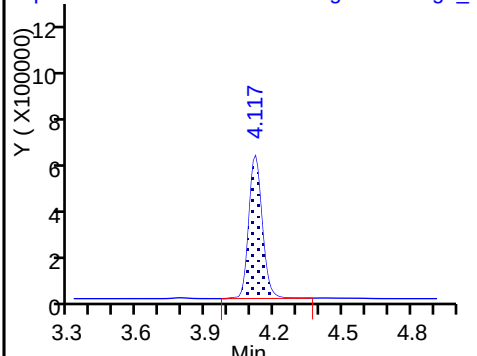
Exp1:m/z 615.00 > 570.00:Moving5PtAverage_x



Exp1:m/z 531.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 526.00 > 169.00:Moving5PtAverage_x

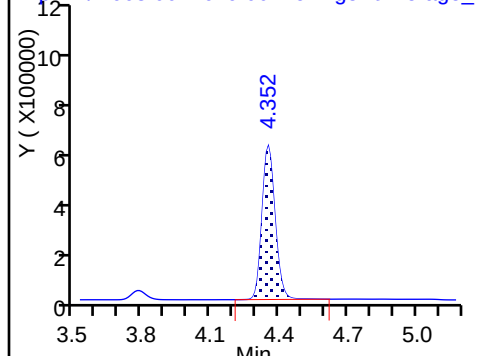


41 Perfluorotridecanoic acid

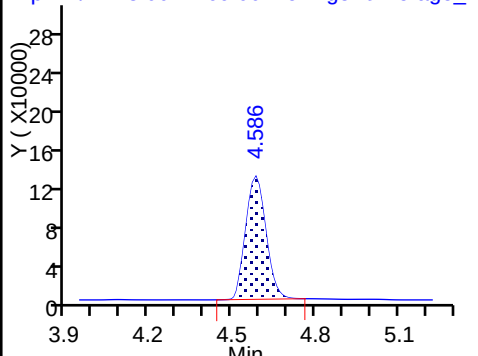
42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

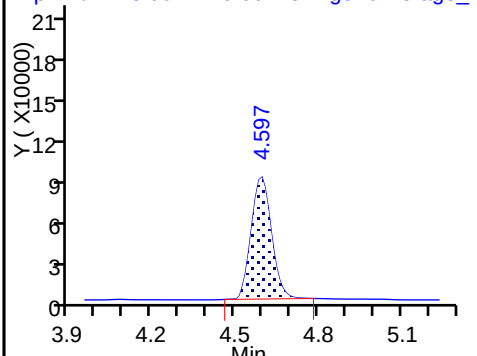
Exp1:m/z 663.00 > 619.00:Moving5PtAverage_x



Exp1:m/z 713.00 > 169.00:Moving5PtAverage_x



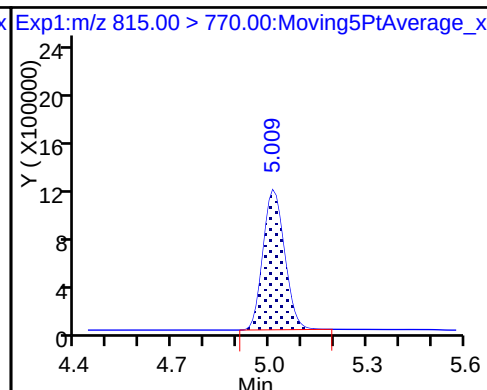
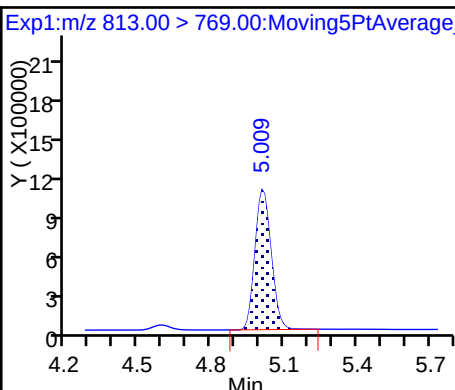
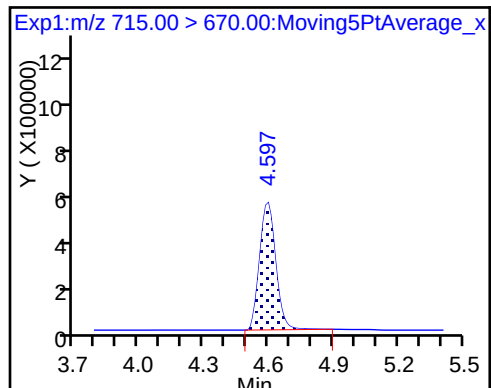
Exp1:m/z 713.00 > 219.00:Moving5PtAverage_x



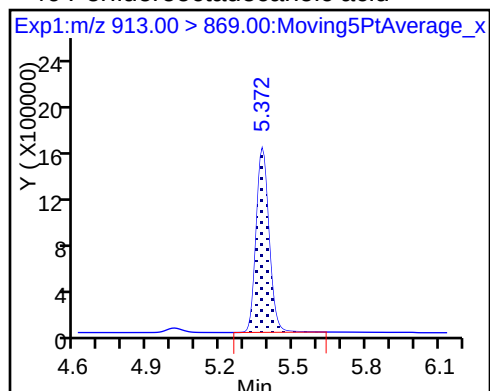
D 43 13C2-PFTeDA

45 Perfluorohexadecanoic acid

D 44 13C2-PFHxDA



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_008.d
 Lims ID: IC L6 Full
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 24-Aug-2017 10:43:47 ALS Bottle#: 33 Worklist Smp#: 8
 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*sub19
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:54:11 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

First Level Reviewer: phomsophat

Date: 24-Aug-2017 13:06:36

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	1.546	1.542	0.004		10354348	50.0		100.0	19188	
2 Perfluorobutyric acid										
212.90 > 169.00	1.546	1.545	0.001	1.000	16898535	89.9		89.9	3676	
D 3 13C5-PFPeA										
267.90 > 223.00	1.746	1.747	-0.001		6335044	48.2		96.4	34582	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.751	0.004	1.000	12887272	97.4		97.4	8097	
D 47 13C3-PFBS										
301.90 > 83.00	1.773	1.771	0.002		190930	48.9		105	4096	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.773	1.773	0.0	1.000	21103793	70.3		79.5	364643	
298.90 > 99.00	1.773	1.773	0.0	1.000	10400553		2.03(0.00-0.00)	79.5	35064	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.983	1.979	0.004	1.000	4893877	98.1		105	60645	
D 7 13C2 PFHxA										
315.00 > 270.00	2.018	2.016	0.002		6862788	50.1		100	36589	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.018	2.016	0.002	1.000	12601744	98.6		98.6	11939	
D 9 13C4-PFHpA										
367.00 > 322.00	2.349	2.349	0.0		6394742	50.5		101	21514	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.349	2.351	-0.002	1.000	12192211	98.9		98.9	9986	
D 11 18O2 PFHxS										
403.00 > 84.00	2.365	2.363	0.002		10777172	49.4		104	26276	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.365	2.365	0.0	1.000	20296054	85.5		94.0	11437	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 M2-6:2FTS										
429.00 > 409.00	2.679	2.681	-0.002		2592305	49.0		103	18557	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.679	2.681	-0.002	1.000	4518882	95.0		100	26325	
* 62 13C2-PFOA										
415.00 > 370.00	2.701	2.703	-0.002		5568099	50.0			22227	
D 14 13C4 PFOA										
417.00 > 372.00	2.708	2.709	-0.001		5654159	48.6		97.3	22129	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.708	2.709	-0.001	1.000	11858254	95.8		95.8	2369	
413.00 > 169.00	2.708	2.709	-0.001	1.000	6446930		1.84(0.90-1.10)	95.8	12184	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.716	2.718	-0.002	1.000	16419172	88.8		93.2	22642	
D 18 13C4 PFOS										
503.00 > 80.00	3.082	3.084	-0.002		7379875	48.7		102	11514	
D 19 13C5 PFNA										
468.00 > 423.00	3.082	3.087	-0.005		4431296	49.7		99.5	23998	
20 Perfluorononanoic acid										
463.00 > 419.00	3.082	3.087	-0.005	1.000	8732868	100.0		100	2870	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.082	3.087	-0.005	1.000	14658325	89.6		96.5	6887	
499.00 > 99.00	3.082	3.087	-0.005	1.000	3281811		4.47(0.90-1.10)	96.5	7129	
D 21 13C8 FOSA										
506.00 > 78.00	3.420	3.419	0.001		11311686	49.2		98.4	19280	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.420	3.421	-0.001	1.000	19841398	94.8		94.8	17449	
D 26 M2-8:2FTS										
529.00 > 509.00	3.438	3.438	0.0		2122759	49.8		104	12833	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.438	3.439	-0.001	1.000	3743384	90.9		94.9	13513	
D 23 13C2 PFDA										
515.00 > 470.00	3.447	3.449	-0.002		3800550	49.3		98.5	14808	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.447	3.449	-0.002	1.000	7355422	107.1		107	11319	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.599	3.607	-0.008		1065395	51.7		103	6388	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.610	3.611	-0.001	1.003	2026219	96.5		96.5	7890	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.756	3.763	-0.007	1.000	8857990	95.1		98.7	11005	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.766	3.774	-0.008		1125647	52.2		104	3186	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.776	3.781	-0.005	1.003	1961485	101.5		102	7120	
D 30 13C2 PFUnA										
565.00 > 520.00	3.776	3.781	-0.005		2664298	51.0		102	7806	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.776	3.783	-0.007	1.000	5770588	96.2		96.2	4327	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.916	3.917	-0.001		2892509	52.4		105	676	
35 MeFOSA										
512.00 > 169.00	3.924	3.923	0.001	1.000	5281342	99.8		99.8	5621	
D 36 13C2 PFDaA										
615.00 > 570.00	4.081	4.082	-0.001		2535746	49.5		99.0	6706	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.081	4.082	-0.001	1.000	4916676	100.2		100	1116	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.106	4.107	-0.001		2806547	52.9		106	3328	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.115	4.113	0.002	1.000	5343269	102.5		103	4507	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.341	4.350	-0.009	1.000	5060197	104.6		105	1493	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.581	4.585	-0.004	1.000	1278556	94.3		94.3	3495	
713.00 > 219.00	4.593	4.585	0.008	1.003	949082		1.35(0.00-0.00)	94.3	2934	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.581	4.591	-0.010		2681670	49.6		99.2	4693	
D 44 13C2-PFHxDA										
815.00 > 770.00	5.006	5.010	-0.004		5476760	49.7		99.4	3423	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	5.006	5.010	-0.004	1.000	9935406	104.2		104	1084	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.372	5.373	-0.001	1.000	12047785	102.4		102	1636	

Reagents:

LCPFC_FULL-L6_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_008.d

Injection Date: 24-Aug-2017 10:43:47

Instrument ID: A8_N

Lims ID: IC L6 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 33

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

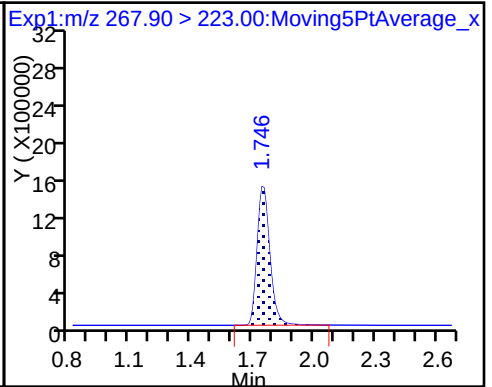
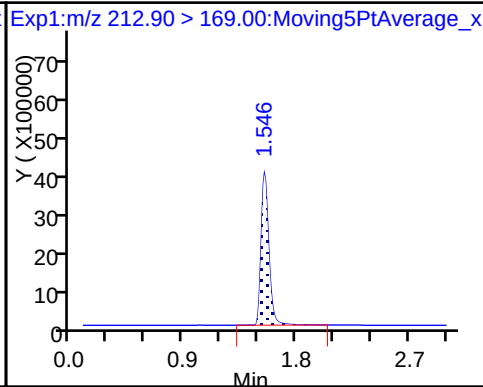
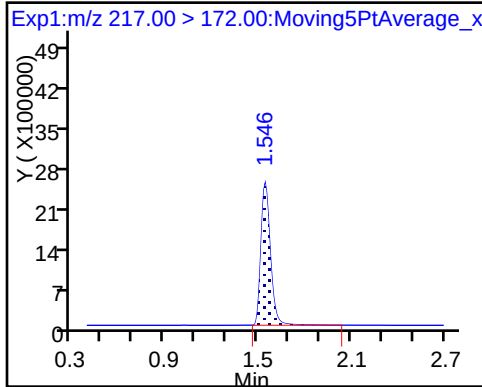
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

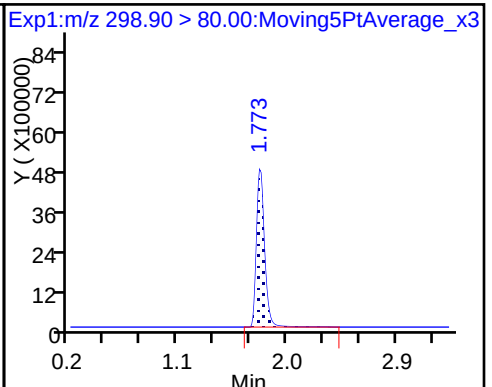
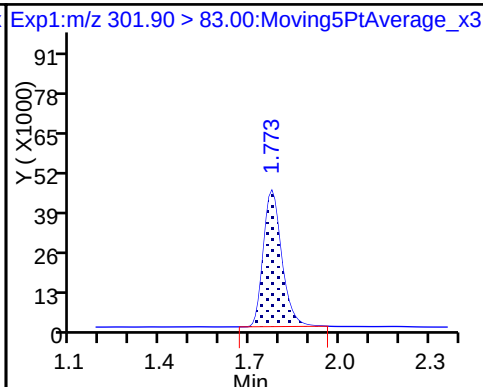
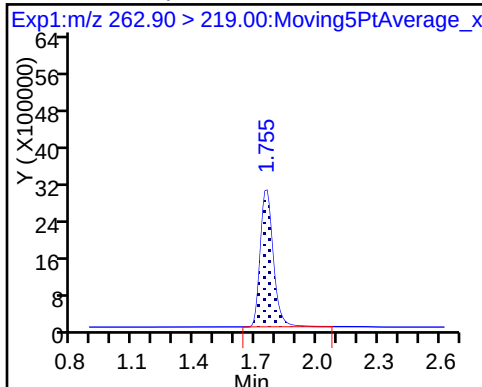
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

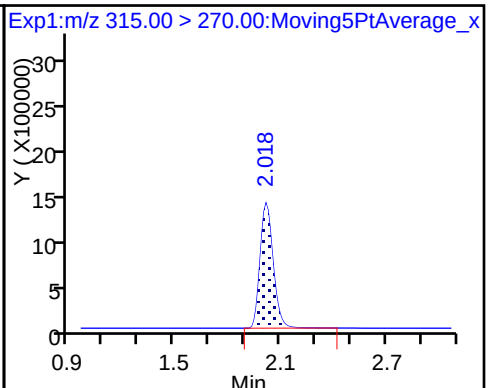
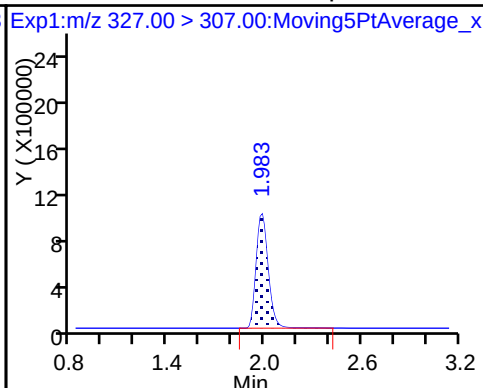
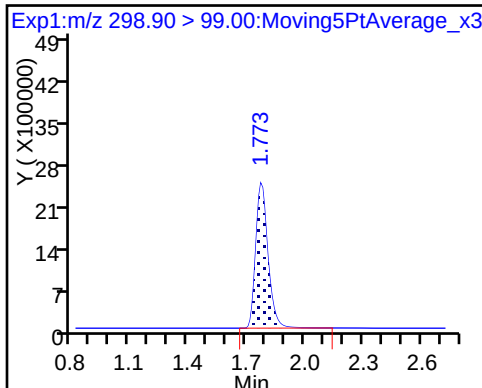
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa

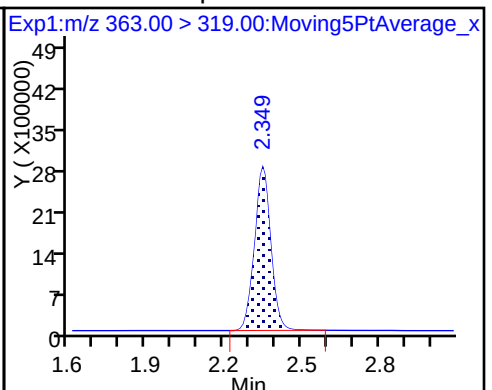
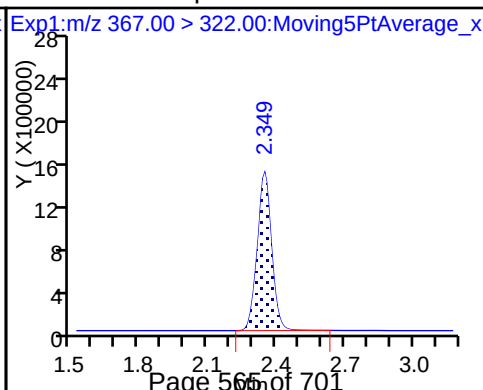
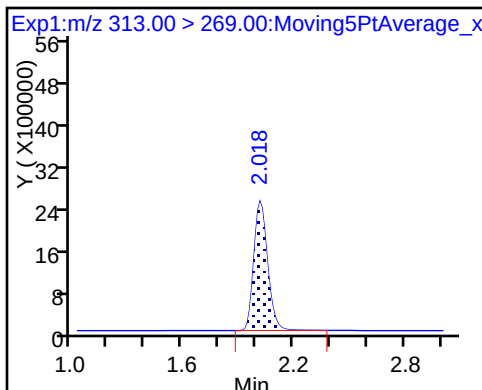
De 7 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

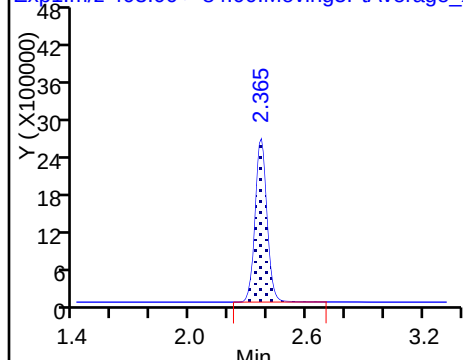


D 11 18O2 PFHxS

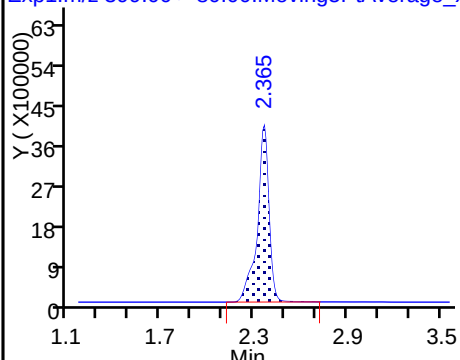
8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

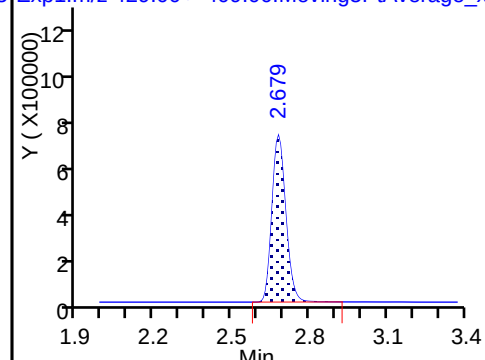
Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3



Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



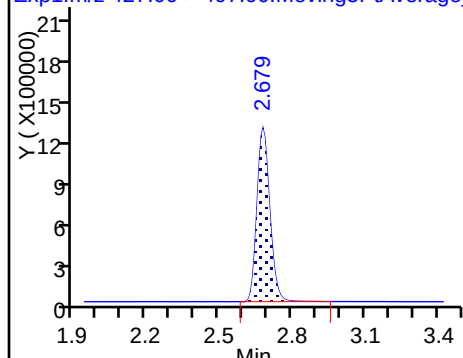
Exp1:m/z 429.00 > 409.00:Moving5PtAverage_x3



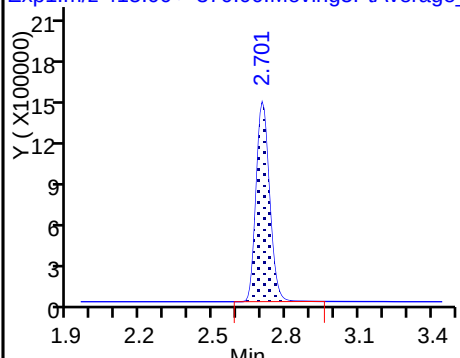
13 Sodium 1H,1H,2H,2H-perfluorooctanoate

D 14 13C4 PFOA

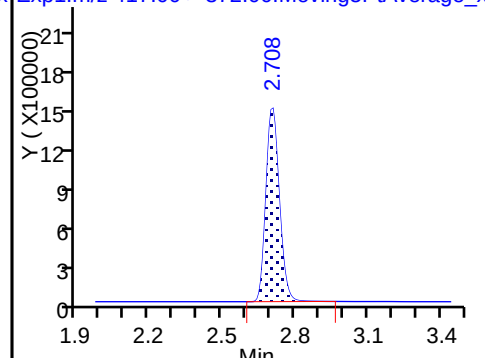
Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3



Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x3



Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3

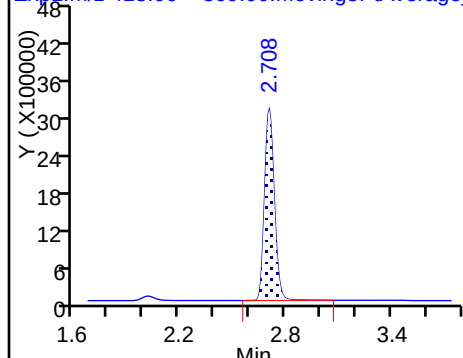


15 Perfluorooctanoic acid

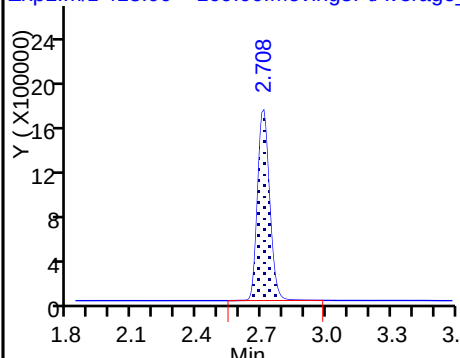
15 Perfluorooctanoic acid

16 Perfluoroheptanesulfonic Acid

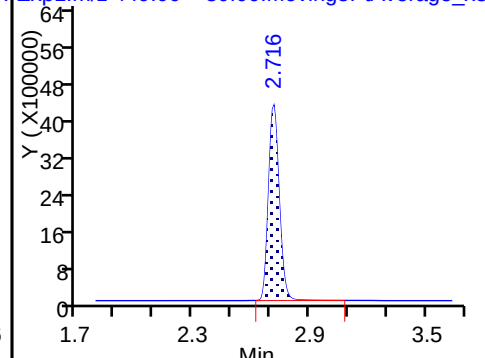
Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

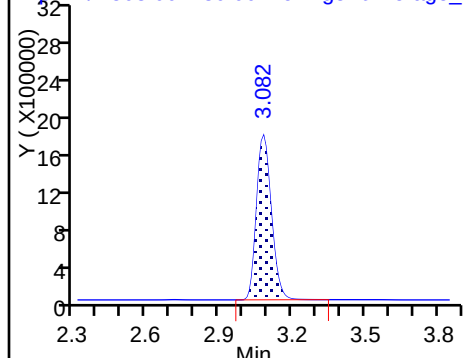


D 18 13C4 PFOS

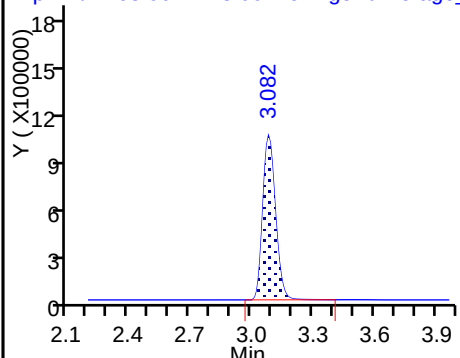
D 19 13C5 PFNA

20 Perfluorononanoic acid

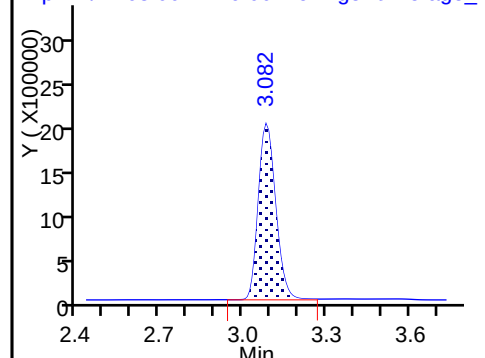
Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3



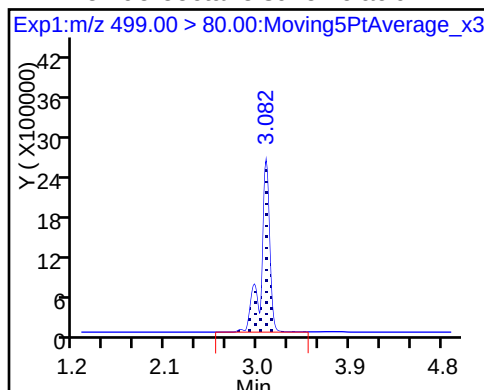
Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x3



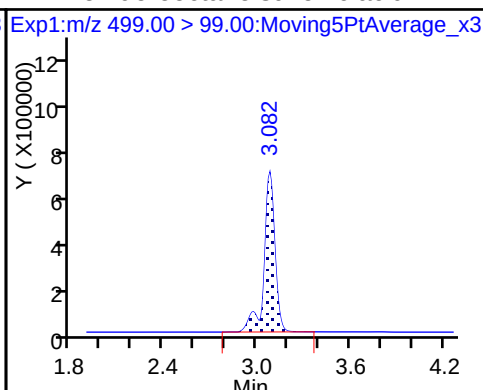
Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x3



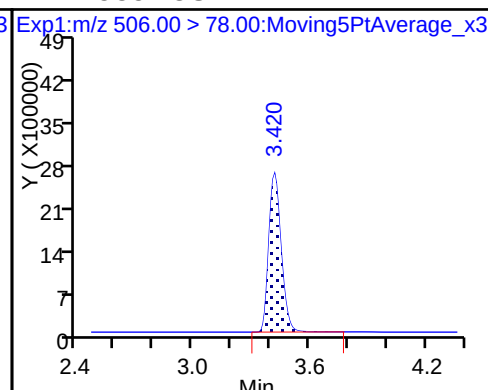
17 Perfluorooctane sulfonic acid



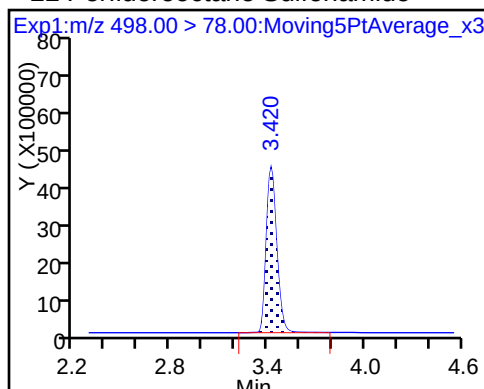
17 Perfluorooctane sulfonic acid



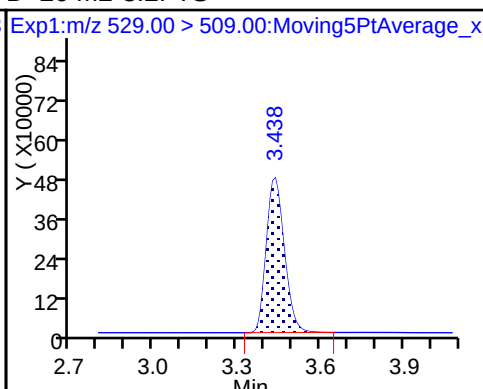
D 21 13C8 FOSA



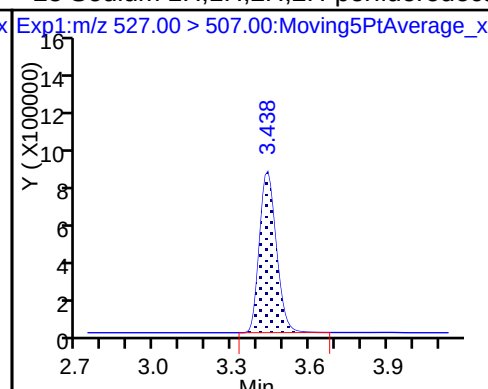
22 Perfluorooctane Sulfonamide



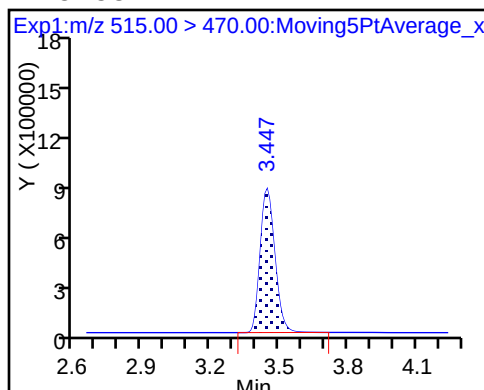
D 26 M2-8:2FTS



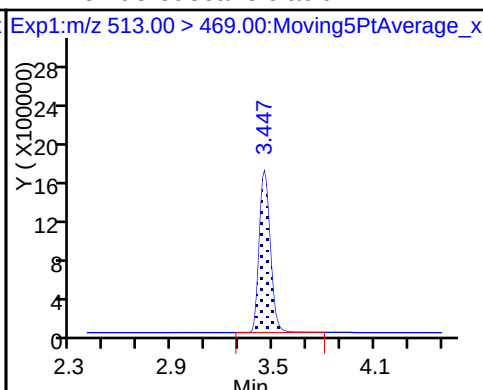
25 Sodium 1H,1H,2H,2H-perfluorodecane



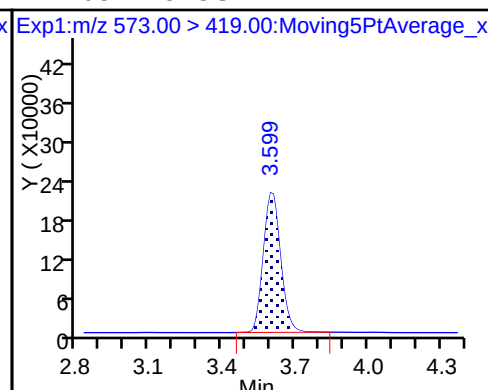
D 23 13C2 PFDA



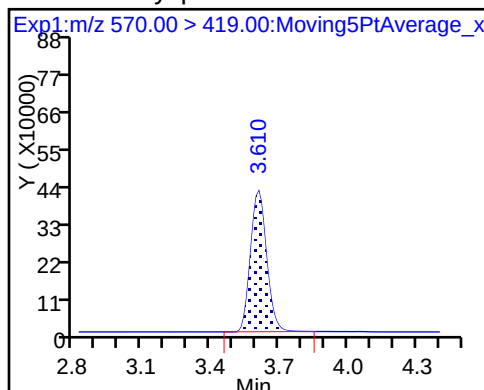
24 Perfluorodecanoic acid



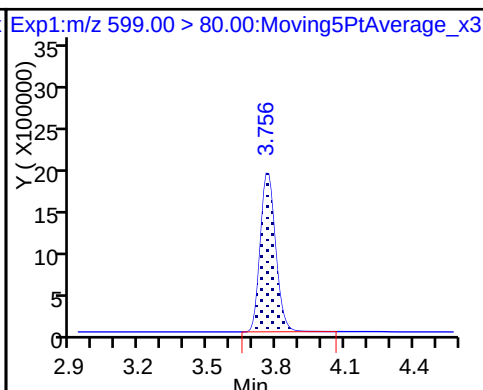
D 27 d3-NMeFOSAA



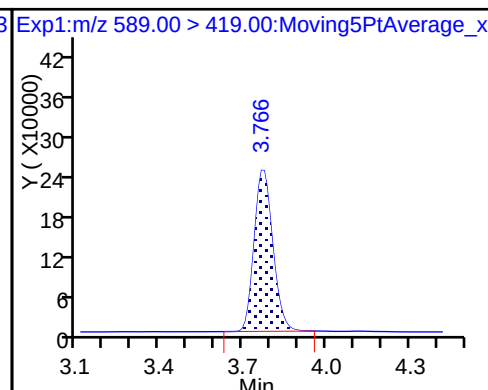
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid

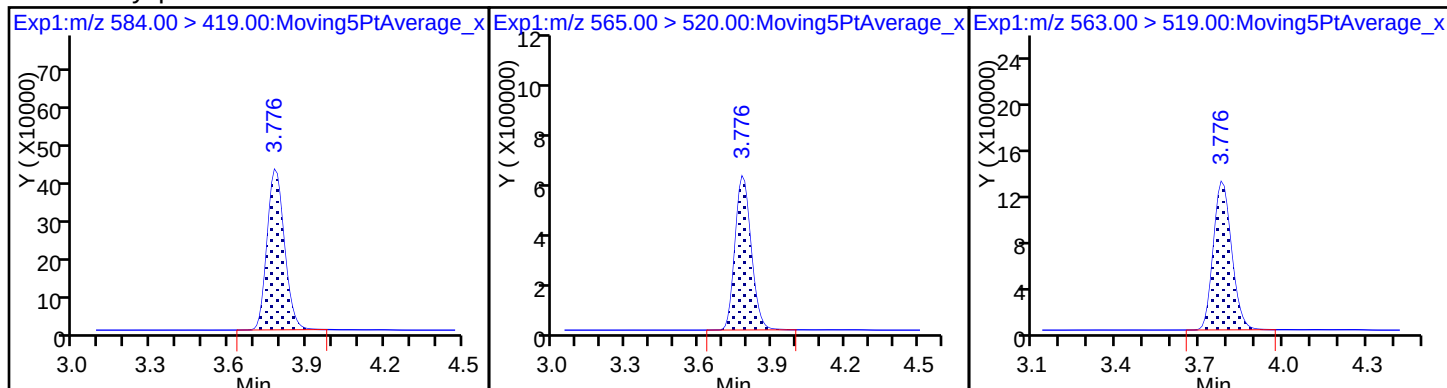


D 32 d5-NEtFOSAA



33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA

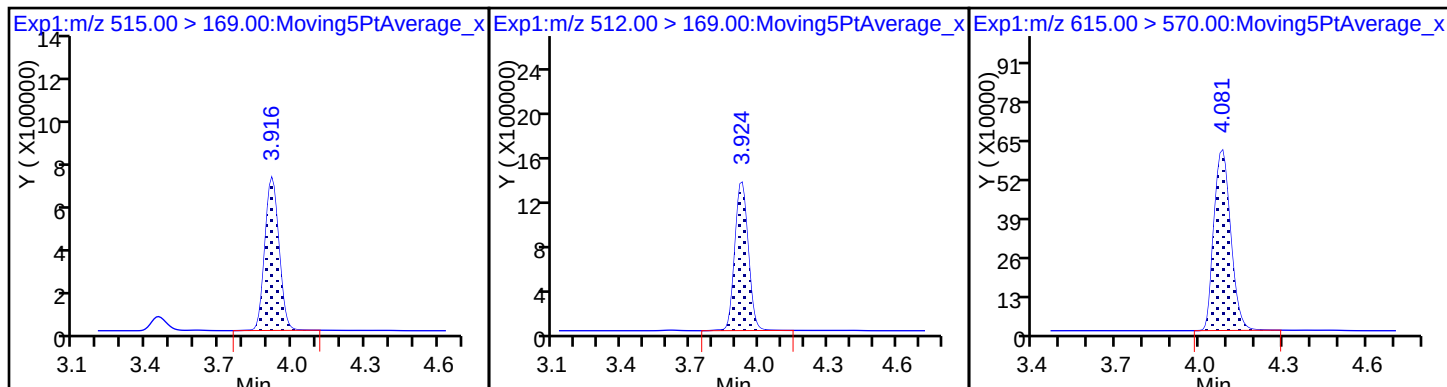
31 Perfluoroundecanoic acid



D 34 d-N-MeFOSA-M

35 MeFOSA

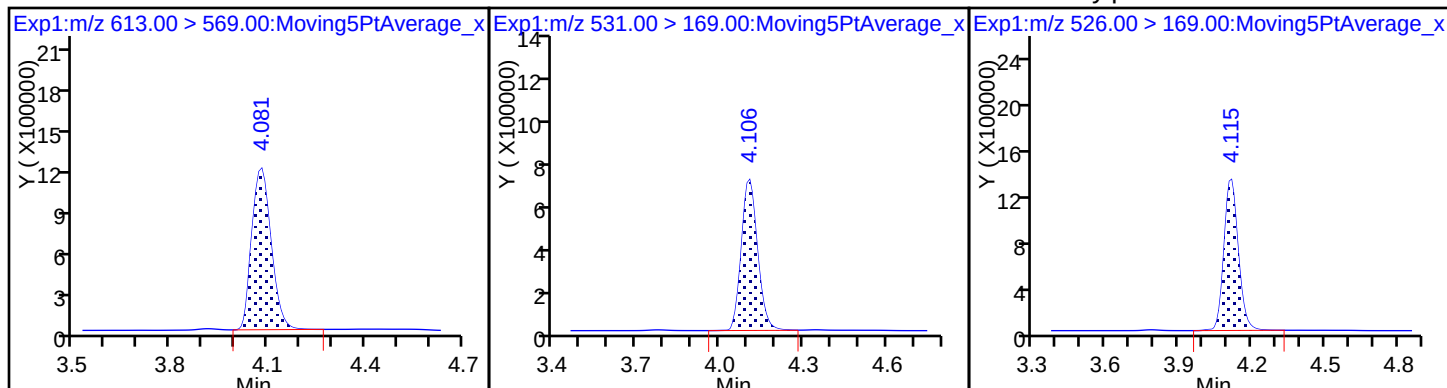
D 36 13C2 PFDaA



37 Perfluorododecanoic acid

D 38 d-N-EtFOSA-M

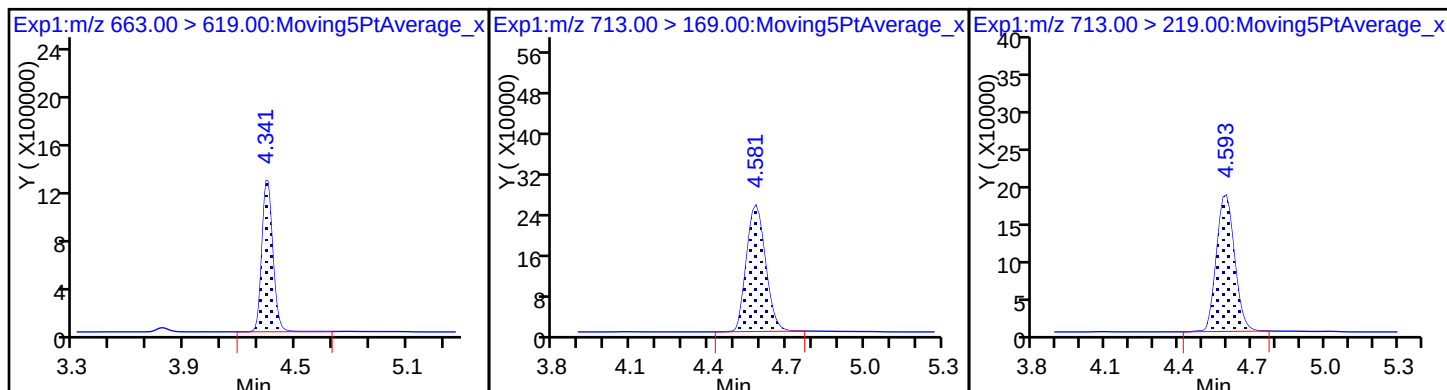
39 N-ethylperfluoro-1-octanesulfonami



41 Perfluorotridecanoic acid

42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

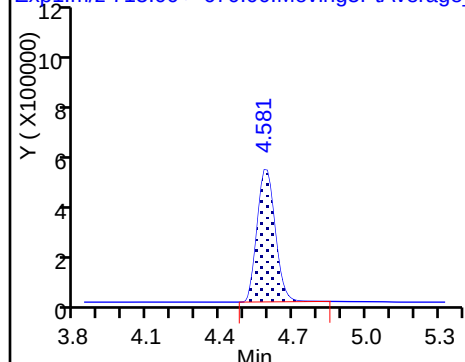


D 43 13C2-PFTeDA

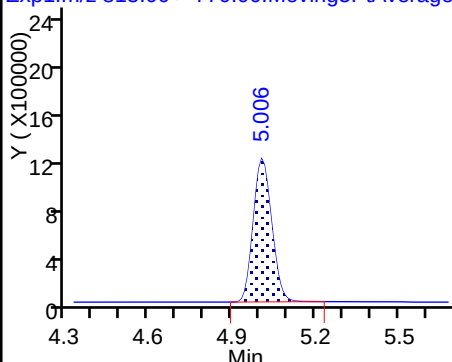
D 44 13C2-PFHxDA

45 Perfluorohexadecanoic acid

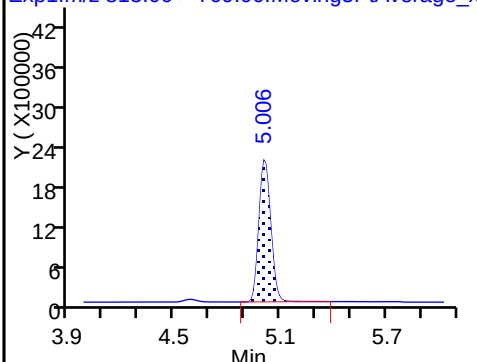
Exp1:m/z 715.00 > 670.00:Moving5PtAverage_x



Exp1:m/z 815.00 > 770.00:Moving5PtAverage_x

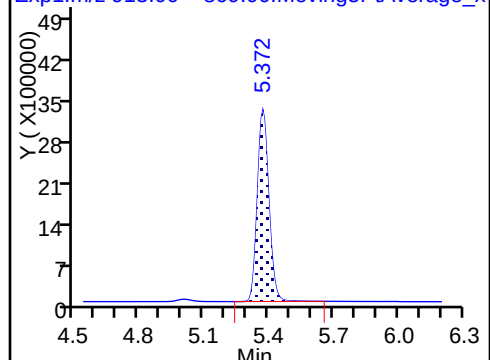


Exp1:m/z 813.00 > 769.00:Moving5PtAverage_x



46 Perfluorooctadecanoic acid

Exp1:m/z 913.00 > 869.00:Moving5PtAverage_x



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_009.d
 Lims ID: IC L7 Full
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 24-Aug-2017 10:50:41 ALS Bottle#: 34 Worklist Smp#: 9
 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*sub19
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:54:15 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

First Level Reviewer: phomsophat

Date: 24-Aug-2017 13:07:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.537	1.542	-0.005		9223990	44.5		89.0	40289	
2 Perfluorobutyric acid										
212.90 > 169.00	1.546	1.545	0.001	1.000	25456573	152.0		76.0	3738	
D 3 13C5-PFPeA										
267.90 > 223.00	1.746	1.747	-0.001		5832509	44.4		88.7	171575	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.746	1.751	-0.005	1.000	20195604	165.8		82.9	13315	
D 47 13C3-PFBS										
301.90 > 83.00	1.773	1.771	0.002		167298	42.9		92.2	3569	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.773	1.773	0.0	1.000	31989485	121.5		68.7	306488	
298.90 > 99.00	1.773	1.773	0.0	1.000	17217578		1.86(0.00-0.00)	68.7	231328	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.972	1.979	-0.007	1.000	8235277	162.8		87.2	33013	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.018	2.016	0.002	1.000	20459197	177.1		88.5	12752	
D 7 13C2 PFHxA										
315.00 > 270.00	2.018	2.016	0.002		6202360	45.3		90.5	23259	
D 9 13C4-PFHpA										
367.00 > 322.00	2.344	2.349	-0.005		5783566	45.6		91.3	21503	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.344	2.351	-0.007	1.000	20084980	180.2		90.1	18872	
D 11 18O2 PFHxS										
403.00 > 84.00	2.361	2.363	-0.002		9722992	44.6		94.2	42685	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.361	2.365	-0.004	1.000	33109344	154.7		85.0	13466	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Sodium 1H,1H,2H,2H-perfluorooctane	427.00	> 407.00	2.677	2.681	-0.004	1.000	7787108	161.6	85.2	57700
D 12 M2-6:2FTS	429.00	> 409.00	2.677	2.681	-0.004		2627540	49.6	104	18895
* 62 13C2-PFOA	415.00	> 370.00	2.699	2.703	-0.004		4842712	50.0		30725
15 Perfluorooctanoic acid	413.00	> 369.00	2.699	2.709	-0.010	1.000	19520592	178.1	89.1	4143
	413.00	> 169.00	2.699	2.709	-0.010	1.000	11079037	1.76(0.90-1.10)	89.1	18436
D 14 13C4 PFOA	417.00	> 372.00	2.699	2.709	-0.010		5007806	43.1	86.2	44826
16 Perfluoroheptanesulfonic Acid	449.00	> 80.00	2.714	2.718	-0.004	1.000	26021550	152.2	79.9	36097
D 18 13C4 PFOS	503.00	> 80.00	3.081	3.084	-0.003		6820592	45.0	94.1	11802
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.081	3.087	-0.006	1.000	25930106	171.4	92.4	9850
	499.00	> 99.00	3.081	3.087	-0.006	1.000	5388064	4.81(0.90-1.10)	92.4	609
20 Perfluorononanoic acid	463.00	> 419.00	3.081	3.087	-0.006	1.000	14858303	189.8	94.9	5347
D 19 13C5 PFNA	468.00	> 423.00	3.081	3.087	-0.006		3972715	44.6	89.2	18723
D 21 13C8 FOSA	506.00	> 78.00	3.417	3.419	-0.002		10785319	46.9	93.8	23388
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.417	3.421	-0.004	1.000	31120054	155.9	78.0	16917
D 26 M2-8:2FTS	529.00	> 509.00	3.435	3.438	-0.003		2024111	47.5	99.2	15038
25 Sodium 1H,1H,2H,2H-perfluorodecane	527.00	> 507.00	3.435	3.439	-0.004	1.000	6508345	165.8	86.5	26192
24 Perfluorodecanoic acid	513.00	> 469.00	3.445	3.449	-0.004	1.000	12357119	195.0	97.5	12543
D 23 13C2 PFDA	515.00	> 470.00	3.445	3.449	-0.004		3508960	45.5	91.0	20581
D 27 d3-NMeFOSAA	573.00	> 419.00	3.596	3.607	-0.011		1045585	50.7	101	6918
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.607	3.611	-0.004	1.003	4102157	199.1	99.5	9378
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.754	3.763	-0.009	1.000	15616303	181.4	94.1	10490
D 32 d5-NEtFOSAA	589.00	> 419.00	3.764	3.774	-0.010		1031294	47.8	95.6	3471
D 30 13C2 PFUnA	565.00	> 520.00	3.773	3.781	-0.008		2273290	43.5	87.0	8182
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.773	3.781	-0.008	1.003	3669288	207.3	104	11717
31 Perfluoroundecanoic acid	563.00	> 519.00	3.773	3.783	-0.010	1.000	9854871	192.5	96.3	5954

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M	515.00 > 169.00	3.914	3.917	-0.003		2809251	50.9	102	757	
35 MeFOSA	512.00 > 169.00	3.922	3.923	-0.001	1.000	9880406	192.1	96.1	8138	
37 Perfluorododecanoic acid	613.00 > 569.00	4.071	4.082	-0.011	1.000	9049141	188.6	94.3	2131	
D 36 13C2 PFDaA	615.00 > 570.00	4.071	4.082	-0.011		2480598	48.4	96.8	8420	
D 38 d-N-EtFOSA-M	531.00 > 169.00	4.107	4.107	0.0		2641185	49.8	99.6	2871	
39 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.107	4.113	-0.006	1.000	9949207	202.8	101	7249	
41 Perfluorotridecanoic acid	663.00 > 619.00	4.344	4.350	-0.006	1.000	9361633	197.9	98.9	2795	
42 Perfluorotetradecanoic acid	713.00 > 169.00	4.573	4.585	-0.012	1.000	2485860	206.4	103	6360	
713.00 > 219.00	4.585	4.585	0.0	1.003	1828606		1.36(0.00-0.00)	103	5268	
D 43 13C2-PFTeDA	715.00 > 670.00	4.585	4.591	-0.006		2382081	44.1	88.1	6950	
45 Perfluorohexadecanoic acid	813.00 > 769.00	5.000	5.010	-0.010	1.000	17163735	187.5	93.7	1434	
D 44 13C2-PFHxDA	815.00 > 770.00	5.000	5.010	-0.010		5268626	47.8	95.6	4262	
46 Perfluorooctadecanoic acid	913.00 > 869.00	5.362	5.373	-0.011	1.000	21569638	190.5	95.3	2659	

Reagents:

LCPFC_FULL-L7_00004

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_009.d

Injection Date: 24-Aug-2017 10:50:41

Instrument ID: A8_N

Lims ID: IC L7 Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 34

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

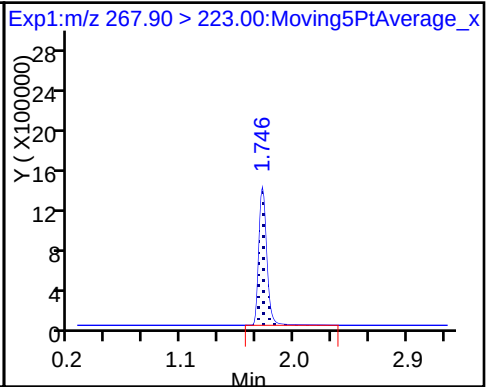
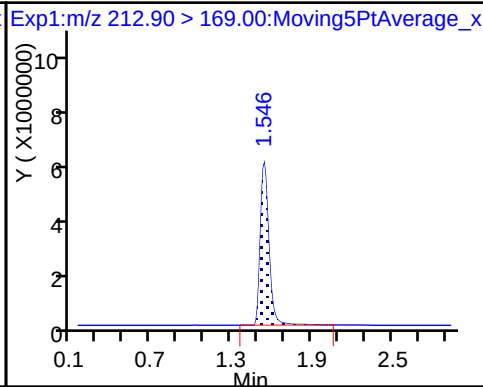
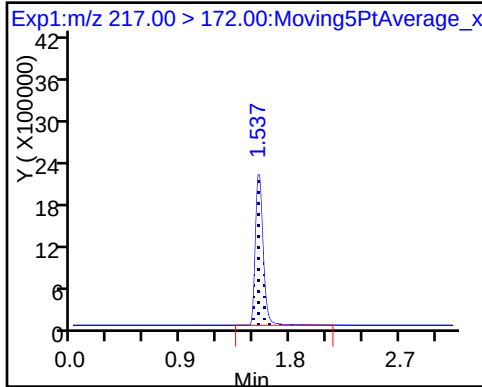
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

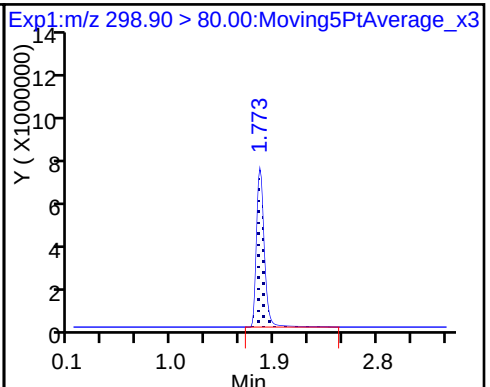
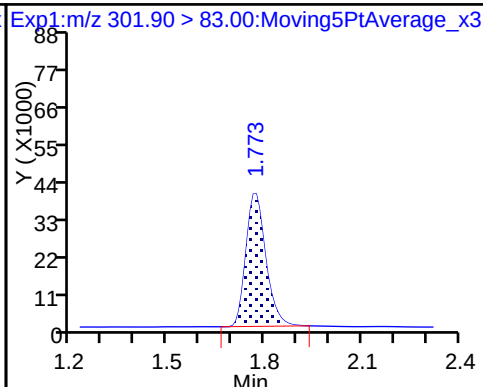
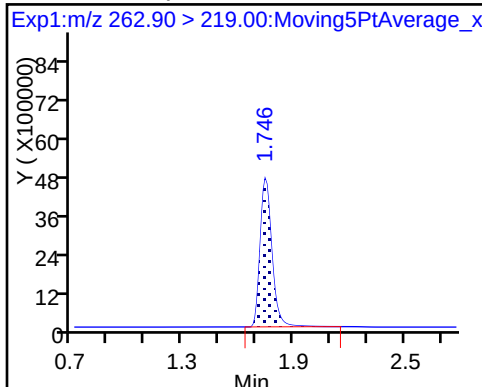
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

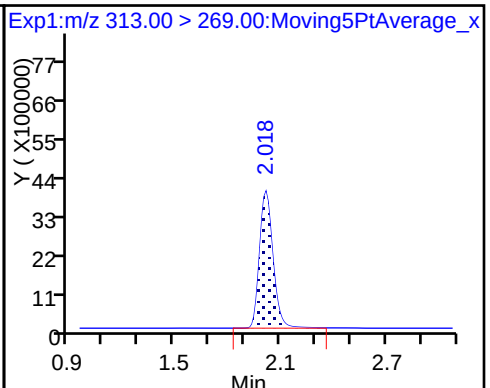
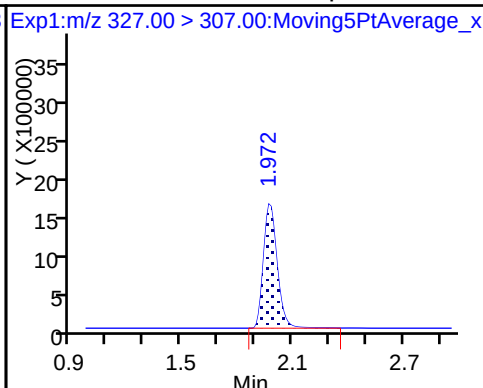
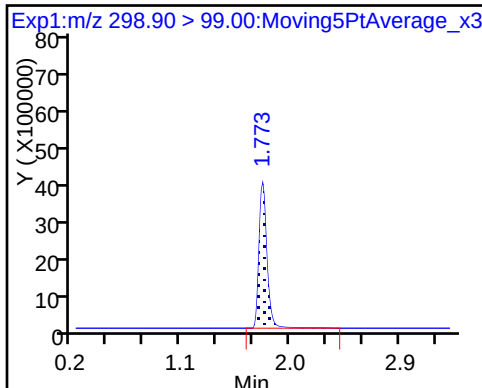
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexanoate

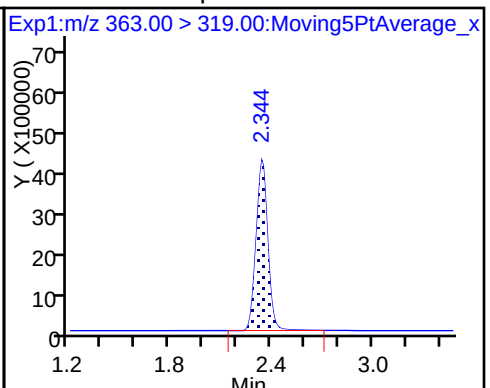
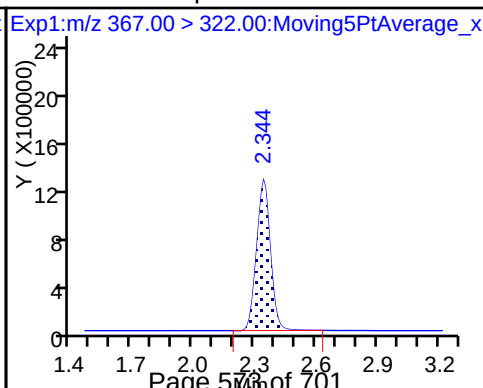
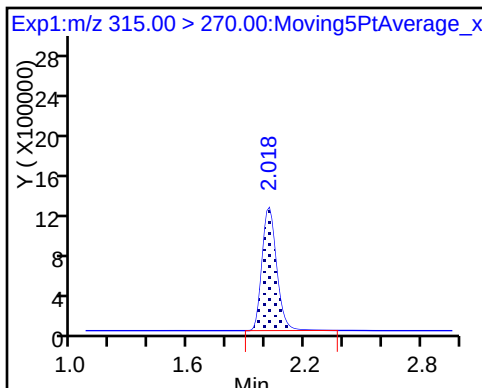
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

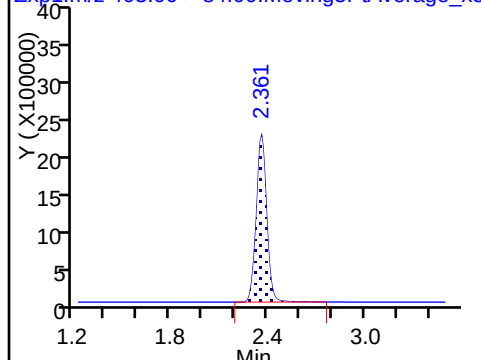


D 11 18O2 PFHxS

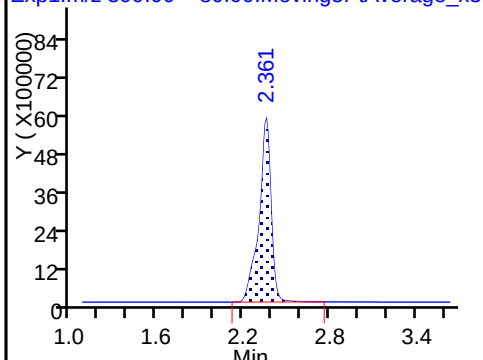
8 Perfluorohexanesulfonic acid

13 Sodium 1H,1H,2H,2H-perfluorooctane

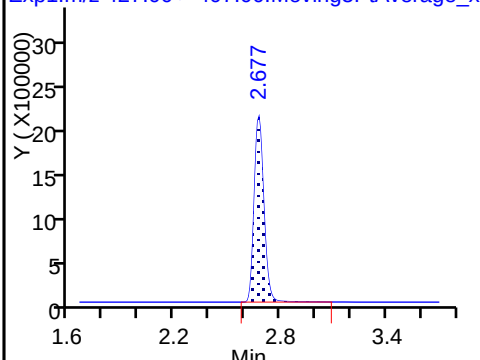
Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3



Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3

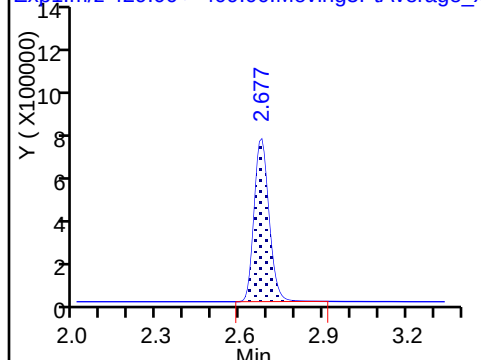


D 12 M2-6:2FTS

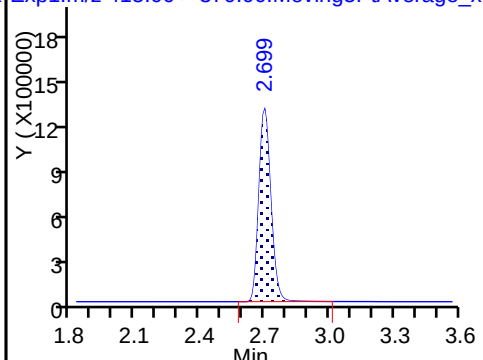
* 62 13C2-PFOA

15 Perfluorooctanoic acid

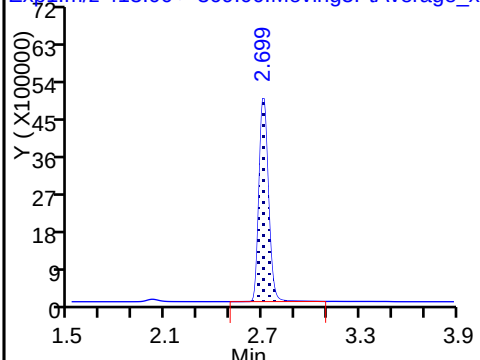
Exp1:m/z 429.00 > 409.00:Moving5PtAverage_x3



Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3

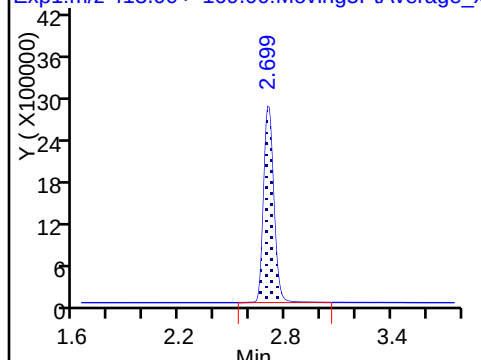


15 Perfluorooctanoic acid

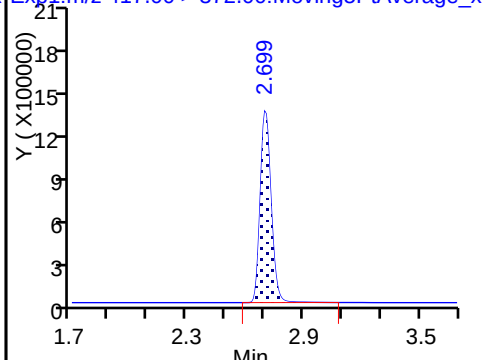
D 14 13C4 PFOA

16 Perfluoroheptanesulfonic Acid

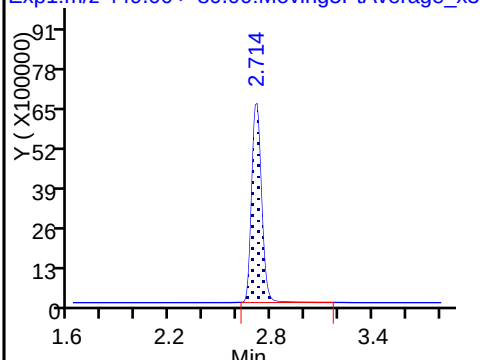
Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x3



Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

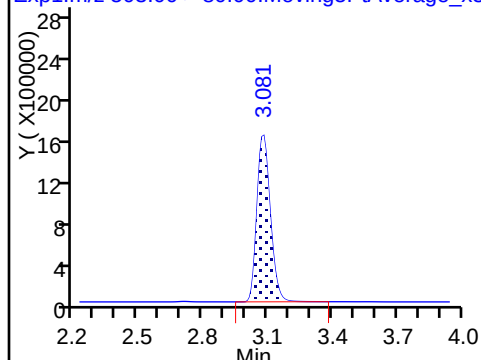


D 18 13C4 PFOS

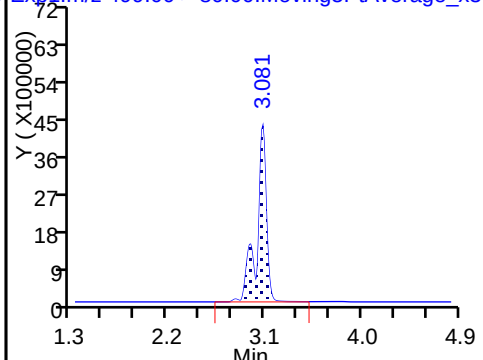
17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

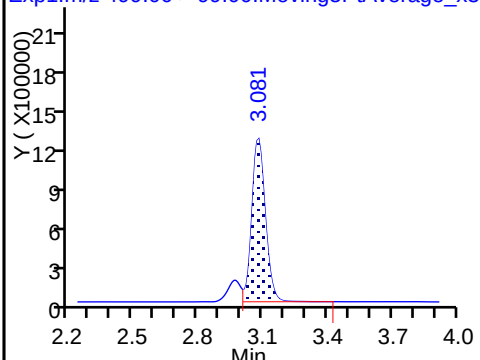
Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3



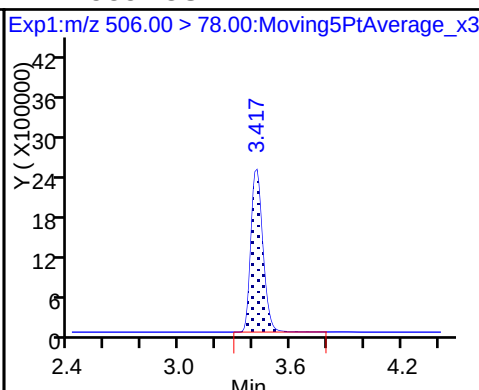
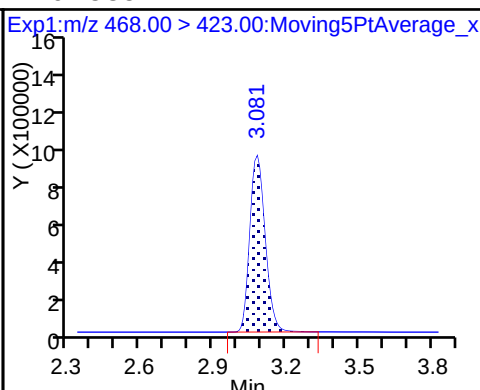
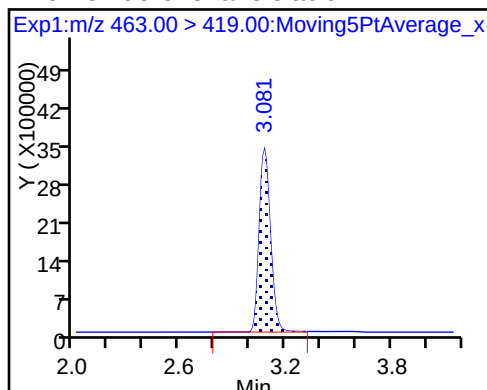
Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3



20 Perfluorononanoic acid

D 19 13C5 PFNA

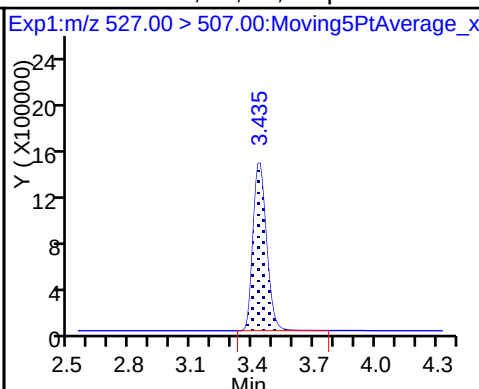
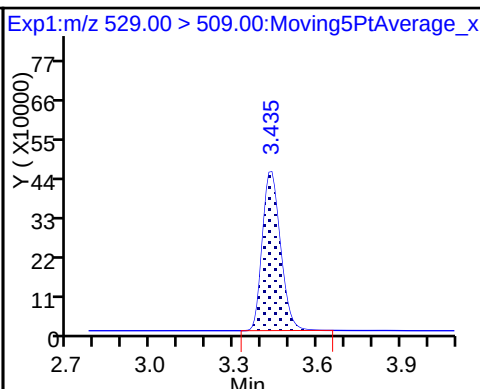
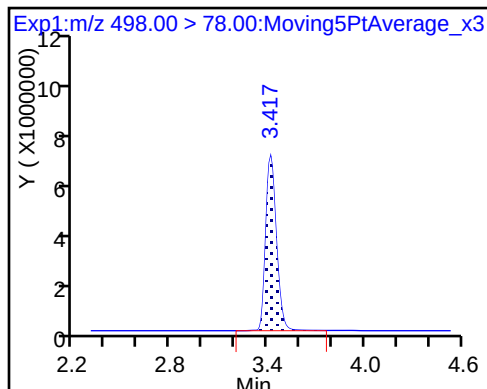
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

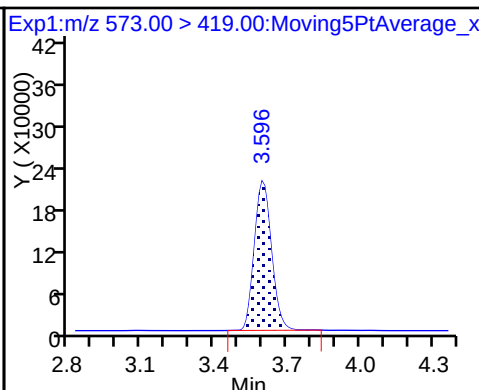
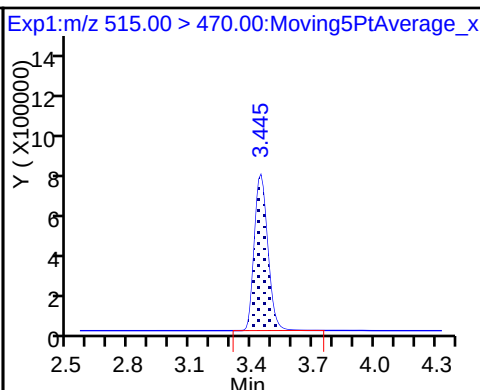
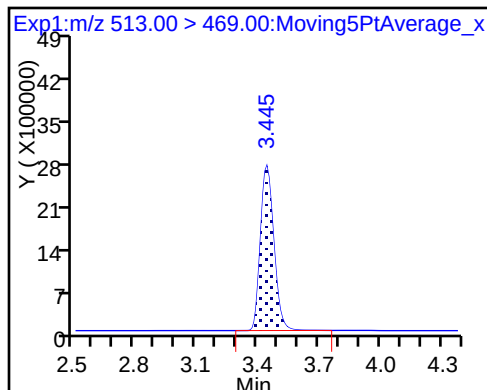
25 Sodium 1H,1H,2H,2H-perfluorodecane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

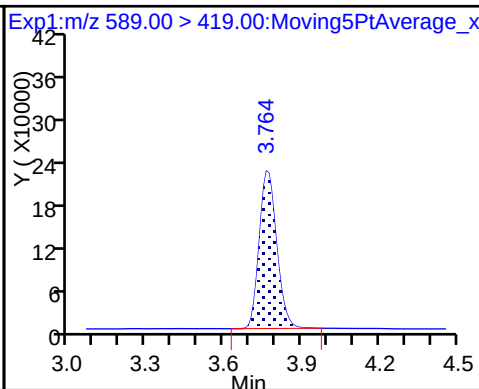
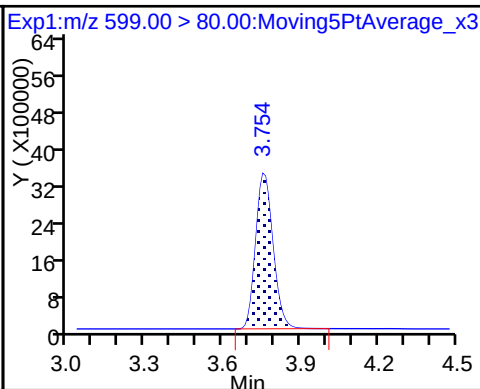
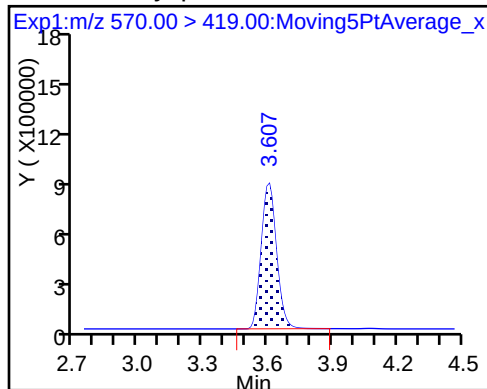
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

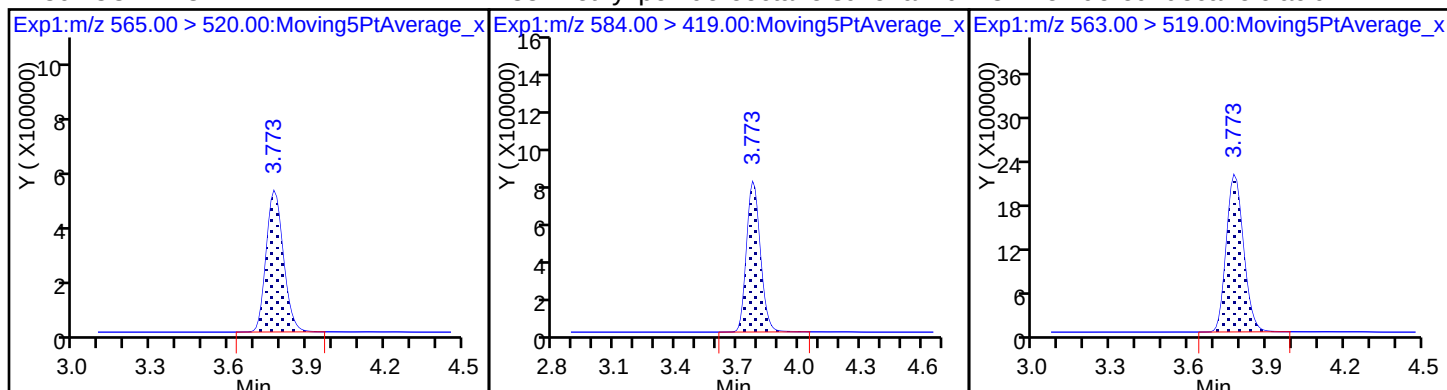
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA

33 N-ethyl perfluorooctane sulfonamid

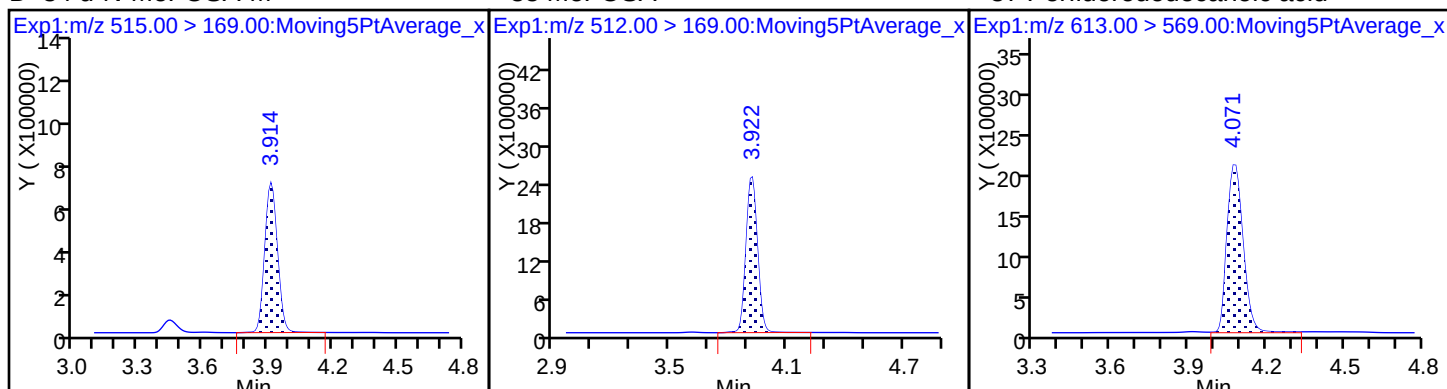
31 Perfluoroundecanoic acid



D 34 d-N-MeFOSA-M

35 MeFOSA

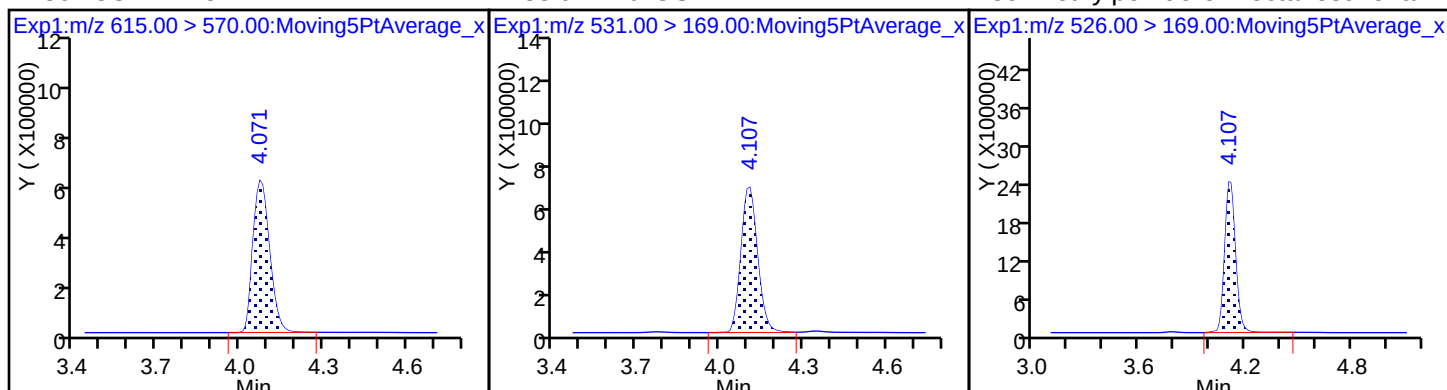
37 Perfluorododecanoic acid



D 36 13C2 PFDaA

D 38 d-N-EtFOSA-M

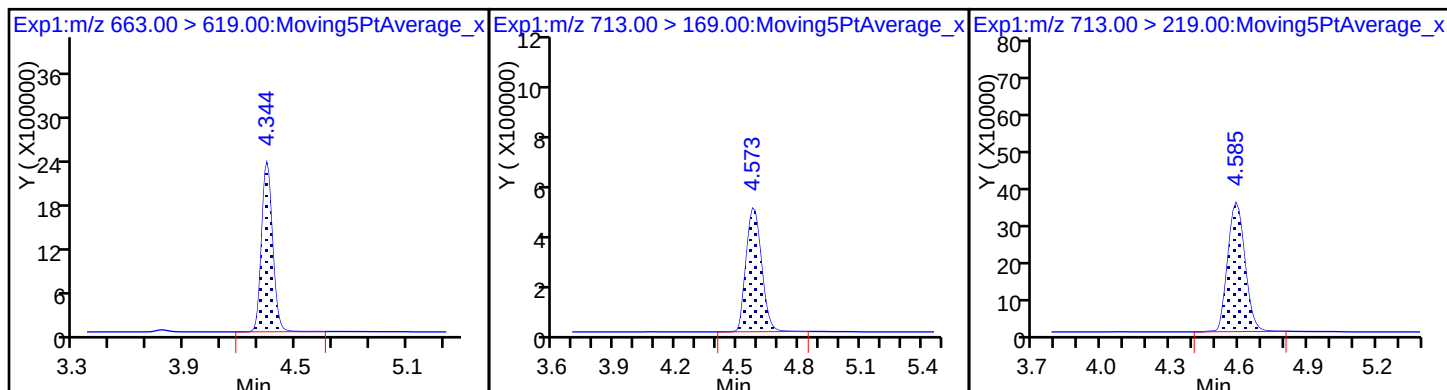
39 N-ethylperfluoro-1-octanesulfonami



41 Perfluorotridecanoic acid

42 Perfluorotetradecanoic acid

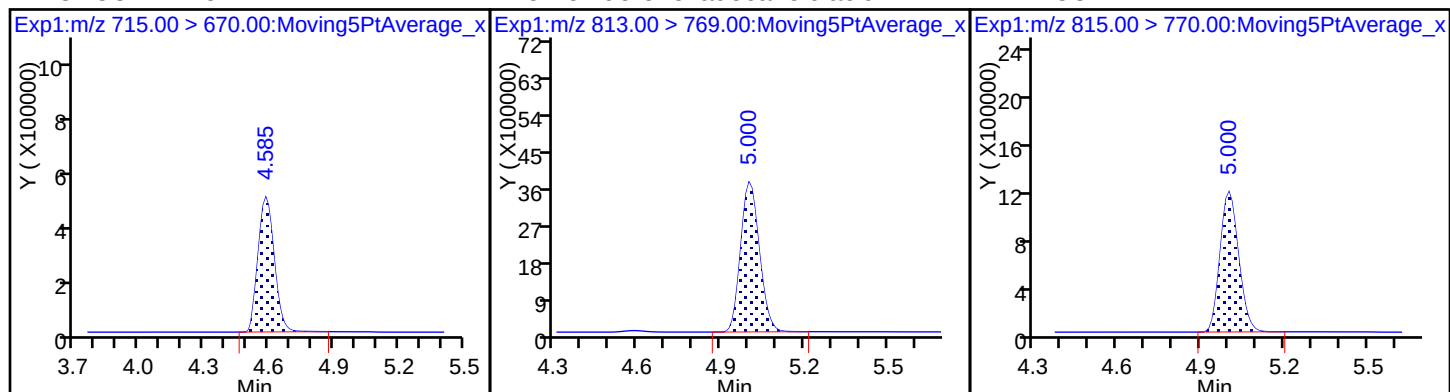
42 Perfluorotetradecanoic acid



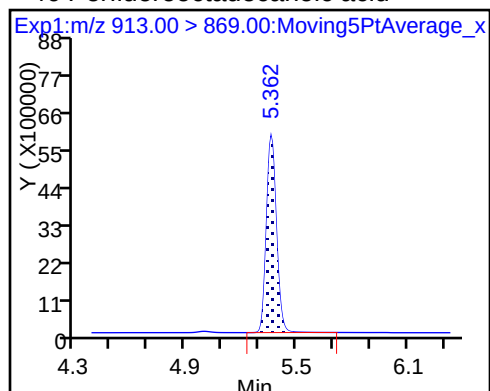
D 43 13C2-PFTeDA

45 Perfluorohexadecanoic acid

D 44 13C2-PFHxDA



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d
 Lims ID: IC M2-4:2FTS
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 24-Aug-2017 10:57:35 ALS Bottle#: 37 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: M2:4-2FTS Calibration Std
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub19
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:56:18 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

D 60 M2-4:2FTS

329.00 > 309.00 1.983 1.983 0.0 2360856 NC 18647

* 62 13C2-PFOA

415.00 > 370.00 2.694 2.703 -0.009 6314263 50.0 31648

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCM2-4:2FTSIC_00003

Amount Added: 1.00

Units: mL

Report Date: 24-Aug-2017 14:56:19

Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Injection Date: 24-Aug-2017 10:57:35

Instrument ID: A8_N

Lims ID: IC M2-4:2FTS

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 37 Worklist Smp#: 10

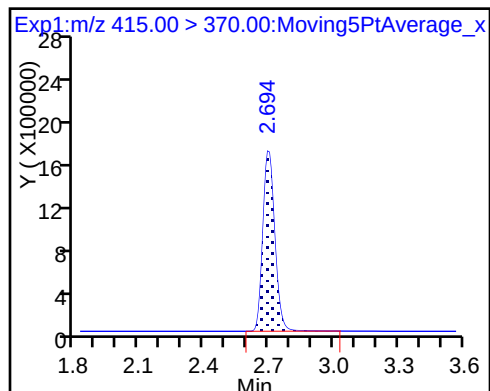
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

* 62 13C2-PFOA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: ICV 320-180980/12 Calibration Date: 08/24/2017 11:11

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.24A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.9315		50.8	49.5	2.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.106		52.5	49.5	6.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	71.73		43.0	43.8	-2.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	1.049		55.7	49.5	12.6	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	1.071		55.0	49.5	11.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.104		49.6	46.8	6.0	25.0
6:2FTS	AveID	0.8714	0.9332		50.3	46.9	7.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.140		51.6	49.5	4.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.254		49.3	47.1	4.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	1.044		52.4	49.5	5.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.009		45.0	47.3	-4.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	0.9929		53.1	49.5	7.3	25.0
8:2FTS	AveID	0.9289	1.021		52.1	47.4	9.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	1.019		55.9	49.5	12.8	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	1.088		54.6	49.5	10.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6845		54.2	47.8	13.5	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.9547		55.1	49.5	11.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	1.129		49.6	49.5	0.3	25.0
MeFOSA	AveID	0.9152	0.9443		51.1	49.5	3.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	1.036		53.0	49.5	7.1	25.0
N-EtFOSA-M	AveID	0.9286	1.038		55.3	49.5	11.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	1.040		54.0	49.5	9.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2451		48.0	49.5	-3.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9731		55.1	49.5	11.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	1.155		53.2	49.5	7.5	25.0
13C4 PFBA	Ave	207167	202746		48.4	49.5	-2.1	50.0
13C5 PFPeA	Ave	131459	129393		48.7	49.5	-1.6	50.0
13C3-PFBS	Ave	3904	4008		47.3	46.0	2.7	50.0
13C2 PFHxA	Ave	137038	135138		48.8	49.5	-1.4	50.0
13C4-PFHpA	Ave	126738	134269		52.4	49.5	5.9	50.0
18O2 PFHxS	Ave	218205	215006		46.1	46.8	-1.5	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: ICV 320-180980/12 Calibration Date: 08/24/2017 11:11
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.24A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	53062		47.1	47.0	0.2	50.0
13C4 PFOA	Ave	116250	118258		50.4	49.5	1.7	50.0
13C4 PFOS	Ave	151622	148264		46.3	47.3	-2.2	50.0
13C5 PFNA	Ave	89077	93876		52.2	49.5	5.4	50.0
13C8 FOSA	Ave	229921	218609		47.1	49.5	-4.9	50.0
M2-8:2FTS	Ave	42602	41743		46.5	47.4	-2.0	50.0
13C2 PFDA	Ave	77150	77478		49.7	49.5	0.4	50.0
d3-NMeFOSAA	Ave	20617	18792		45.1	49.5	-8.9	50.0
d5-NEtFOSAA	Ave	21565	20946		48.1	49.5	-2.9	50.0
13C2 PFUnA	Ave	52276	54058		51.2	49.5	3.4	50.0
d-N-MeFOSA-M	Ave	55225	56358		50.5	49.5	2.1	50.0
13C2 PFDoA	Ave	51239	51785		50.0	49.5	1.1	50.0
d-N-EtFOSA-M	Ave	53035	53100		49.6	49.5	0.1	50.0
13C2-PFTeDA	Ave	54053	54698		50.1	49.5	1.2	50.0
13C2-PFHxDA	Ave	110226	109631		49.2	49.5	-0.5	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_012.d
 Lims ID: ICV Full
 Client ID:
 Sample Type: ICV
 Inject. Date: 24-Aug-2017 11:11:23 ALS Bottle#: 36 Worklist Smp#: 12
 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\20170824-47047.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 24-Aug-2017 14:56:22 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK004

First Level Reviewer: phomsophat

Date: 24-Aug-2017 13:18:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.545	1.542	0.003		10036948	48.4		97.9	20339	
2 Perfluorobutyric acid										
212.90 > 169.00	1.545	1.545	0.0	1.000	9349741	50.8			2234	
D 3 13C5-PFPeA										
267.90 > 223.00	1.745	1.747	-0.002		6405588	48.7		98.4	37273	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.745	1.751	-0.006	1.000	7085398	52.5			5001	
D 47 13C3-PFBS										
301.90 > 83.00	1.763	1.771	-0.008		184512	47.3		103	3959	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.772	1.773	-0.001	1.000	12594289	43.0			265132	
298.90 > 99.00	1.772	1.773	-0.001	1.000	5523214		2.28(0.00-0.00)		36088	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.971	1.979	-0.008	1.000	2397262	49.4			23766	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.017	2.016	0.001	1.000	7017432	55.7			8215	
D 7 13C2 PFHxA										
315.00 > 270.00	2.017	2.016	0.001		6689995	48.8		98.6	16392	
D 9 13C4-PFHpA										
367.00 > 322.00	2.338	2.349	-0.011		6646985	52.4		106	10796	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.346	2.351	-0.005	1.000	7121128	55.0			11422	
D 11 18O2 PFHxS										
403.00 > 84.00	2.354	2.363	-0.009		10069086	46.1		98.5	30487	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.354	2.365	-0.011	1.000	11108474	49.6			8290	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Sodium 1H,1H,2H,2H-perfluorooctane	427.00	> 407.00	2.673	2.681	-0.008	1.000	2323768	50.3		12184
D 12 M2-6:2FTS	429.00	> 409.00	2.673	2.681	-0.008		2495488	47.1	100	10585
* 62 13C2-PFOA	415.00	> 370.00	2.695	2.703	-0.008		6009654	49.5		13796
15 Perfluorooctanoic acid	413.00	> 369.00	2.695	2.709	-0.014	1.000	6671355	51.6		1551
	413.00	> 169.00	2.695	2.709	-0.014	1.000	3457138		1.93(0.90-1.10)	8948
D 14 13C4 PFOA	417.00	> 372.00	2.695	2.709	-0.014		5854332	50.4	102	17033
16 Perfluoroheptanesulfonic Acid	449.00	> 80.00	2.702	2.718	-0.016	1.000	8762370	49.3		22446
D 18 13C4 PFOS	503.00	> 80.00	3.074	3.084	-0.010		7016835	46.3	97.8	12713
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.074	3.087	-0.013	1.000	7072055	45.0		7360
	499.00	> 99.00	3.074	3.087	-0.013	1.000	1700461		4.16(0.90-1.10)	6621
20 Perfluorononanoic acid	463.00	> 419.00	3.074	3.087	-0.013	1.000	4850809	52.4		1707
D 19 13C5 PFNA	468.00	> 423.00	3.074	3.087	-0.013		4647344	52.2	105	13251
D 21 13C8 FOSA	506.00	> 78.00	3.406	3.419	-0.013		10822217	47.1	95.1	33783
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.416	3.421	-0.005	1.000	10744806	53.1		28232
D 26 M2-8:2FTS	529.00	> 509.00	3.425	3.438	-0.013		1979691	46.5	98.0	15478
25 Sodium 1H,1H,2H,2H-perfluorodecane	527.00	> 507.00	3.425	3.439	-0.014	1.000	2021781	52.1		20815
24 Perfluorodecanoic acid	513.00	> 469.00	3.434	3.449	-0.015	1.000	3908634	55.9		7092
D 23 13C2 PFDA	515.00	> 470.00	3.434	3.449	-0.015		3835539	49.7	100	20115
D 27 d3-NMeFOSAA	573.00	> 419.00	3.592	3.607	-0.015		930304	45.1	91.1	5751
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.603	3.611	-0.008	1.003	1011826	54.6		4964
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.749	3.763	-0.014	1.000	4848479	54.2		11782
D 32 d5-NEtFOSAA	589.00	> 419.00	3.759	3.774	-0.015		1036906	48.1	97.1	2523
D 30 13C2 PFUnA	565.00	> 520.00	3.768	3.781	-0.013		2676137	51.2	103	9389
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.768	3.781	-0.013	1.003	989961	55.1		6570
31 Perfluoroundecanoic acid	563.00	> 519.00	3.768	3.783	-0.015	1.000	3021172	49.6		4612

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M	515.00 > 169.00	3.915	3.917	-0.002	2790002	50.5		102	690	
35 MeFOSA	512.00 > 169.00	3.915	3.923	-0.008	1.000	2634621	51.1		5896	
37 Perfluorododecanoic acid	613.00 > 569.00	4.066	4.082	-0.016	1.000	2655267	53.0		678	
D 36 13C2 PFDaA	615.00 > 570.00	4.066	4.082	-0.016	2563633	50.0		101	10684	
D 38 d-N-EtFOSA-M	531.00 > 169.00	4.101	4.107	-0.007	2628696	49.6		100	4037	
39 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.109	4.113	-0.004	1.000	2728848	55.3		6311	
41 Perfluorotridecanoic acid	663.00 > 619.00	4.333	4.350	-0.017	1.000	2665967	54.0		917	
42 Perfluorotetradecanoic acid	713.00 > 169.00	4.570	4.585	-0.015	1.000	663657	48.0		4603	
713.00 > 219.00	4.582	4.585	-0.003	1.003	512942		1.29(0.00-0.00)		3288	
D 43 13C2-PFTeDA	715.00 > 670.00	4.582	4.591	-0.009	2707811	50.1		101	7911	
45 Perfluorohexadecanoic acid	813.00 > 769.00	4.996	5.010	-0.014	1.000	5281127	55.1		671	
D 44 13C2-PFHxDA	815.00 > 770.00	4.996	5.010	-0.014	5427301	49.2		99.5	4103	
46 Perfluorooctadecanoic acid	913.00 > 869.00	5.355	5.373	-0.018	1.000	6266108	53.2		1136	

Reagents:

LCPFCIC_FULL_00003

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_012.d

Injection Date: 24-Aug-2017 11:11:23

Instrument ID: A8_N

Lims ID: ICV Full

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 36

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

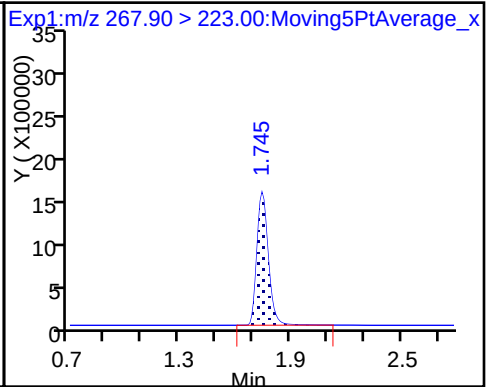
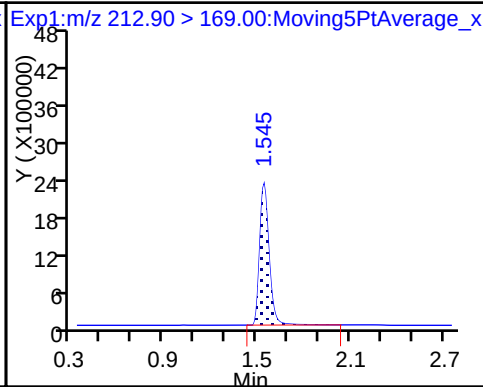
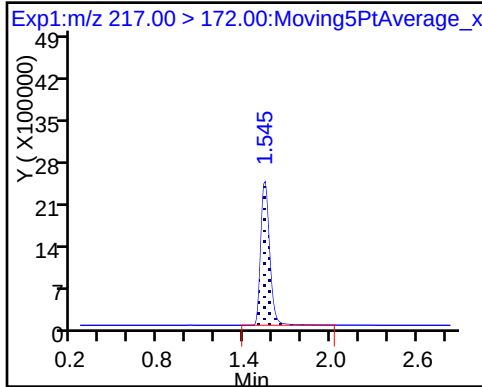
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

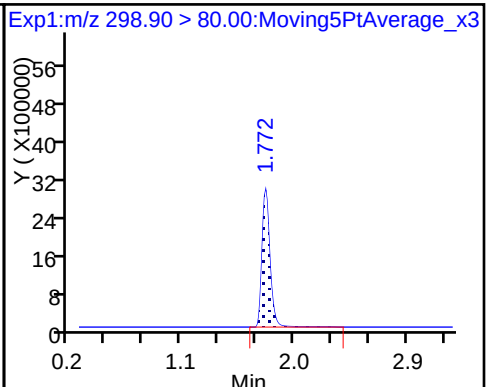
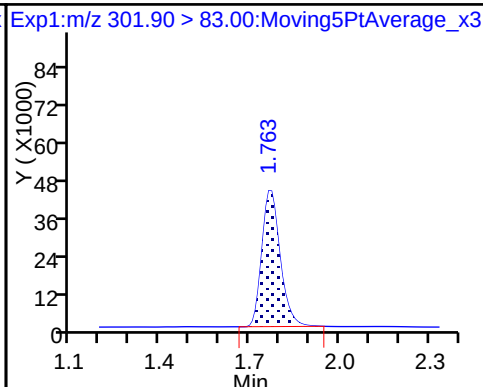
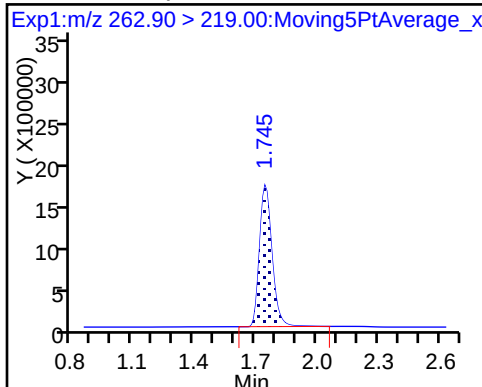
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

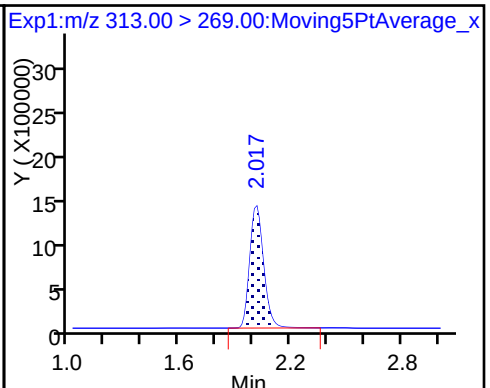
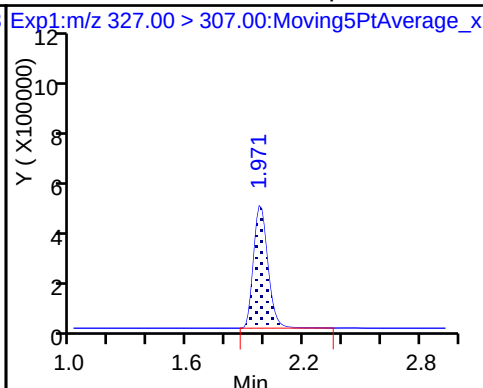
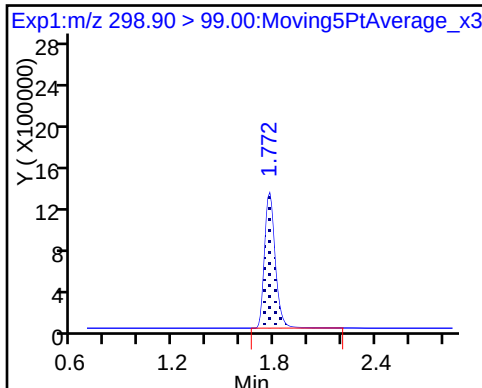
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexanoate

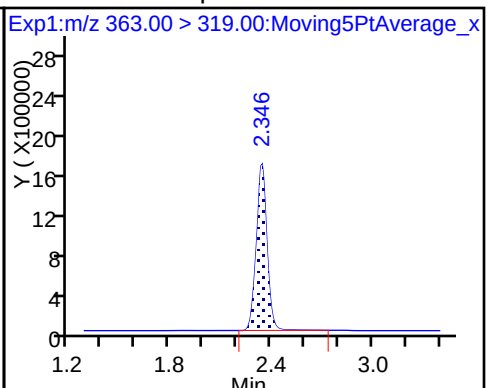
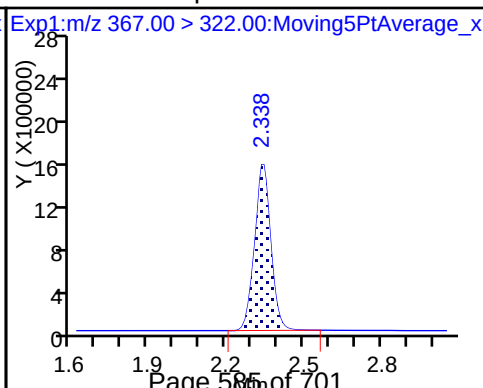
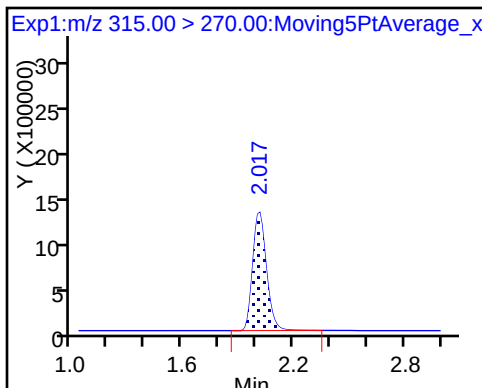
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

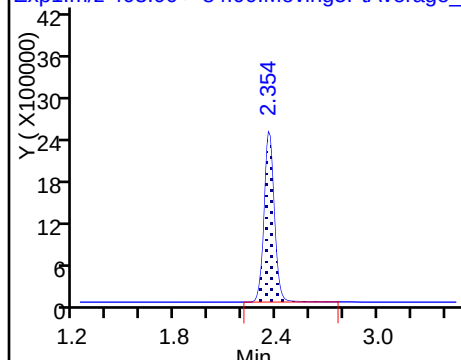


D 11 18O2 PFHxS

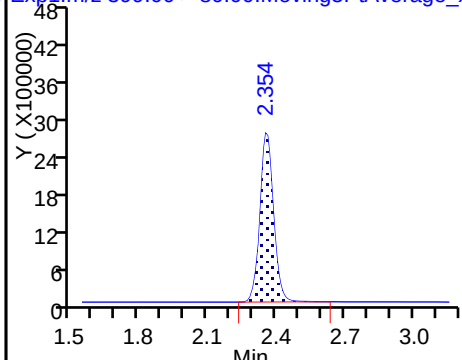
8 Perfluorohexanesulfonic acid

13 Sodium 1H,1H,2H,2H-perfluorooctane

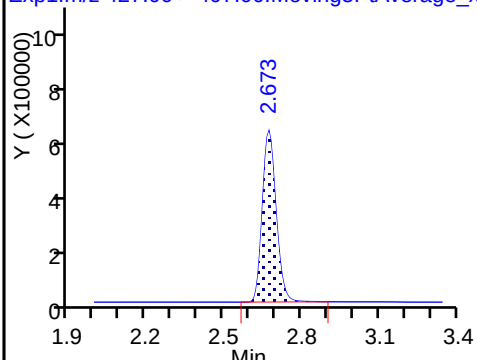
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Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3

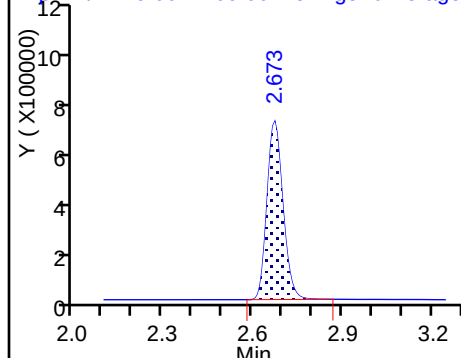


D 12 M2-6:2FTS

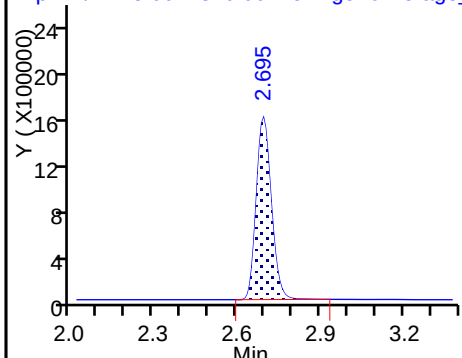
* 62 13C2-PFOA

15 Perfluorooctanoic acid

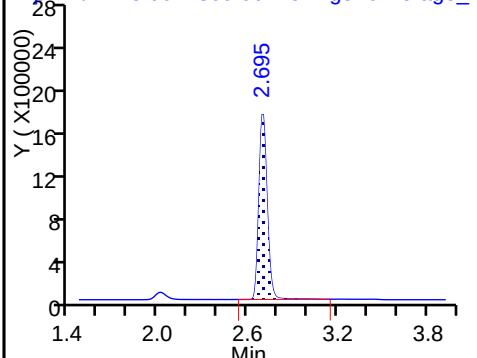
Exp1:m/z 429.00 > 409.00:Moving5PtAverage_x3



Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3

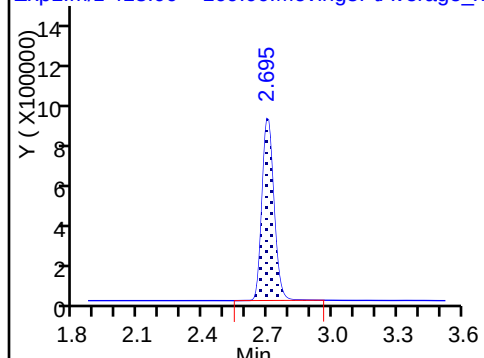


15 Perfluorooctanoic acid

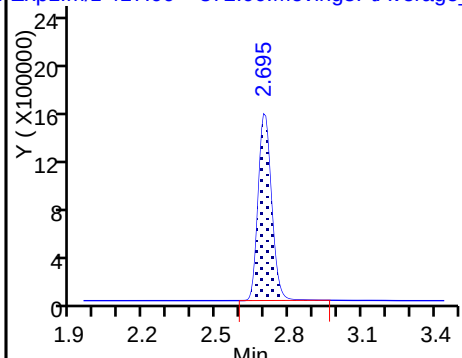
D 14 13C4 PFOA

16 Perfluoroheptanesulfonic Acid

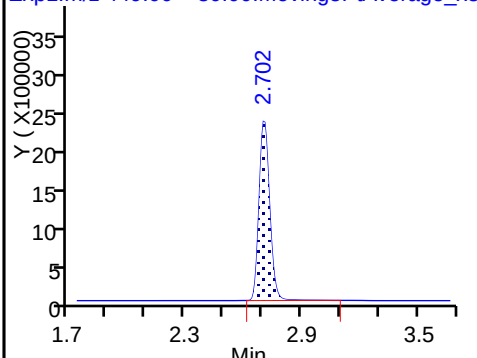
Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x3



Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

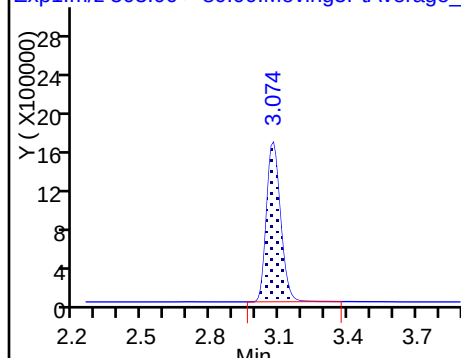


D 18 13C4 PFOS

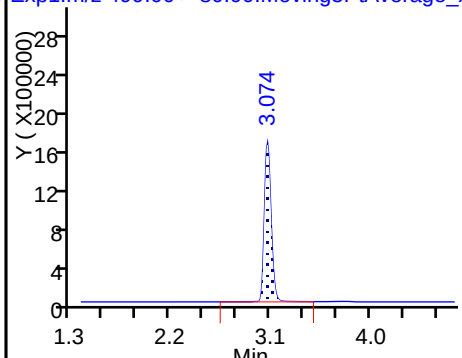
17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

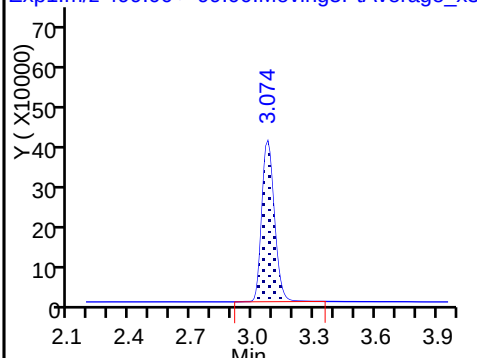
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Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3



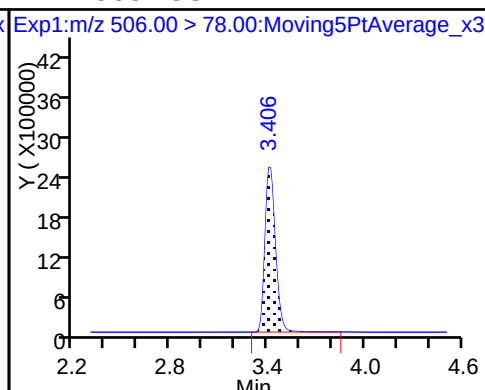
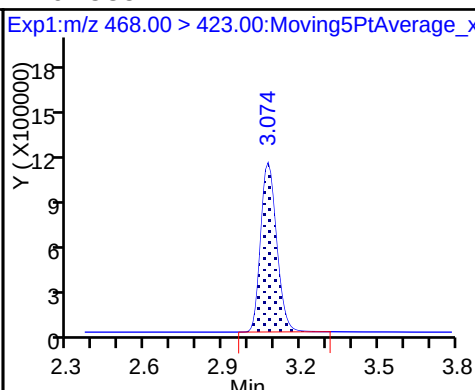
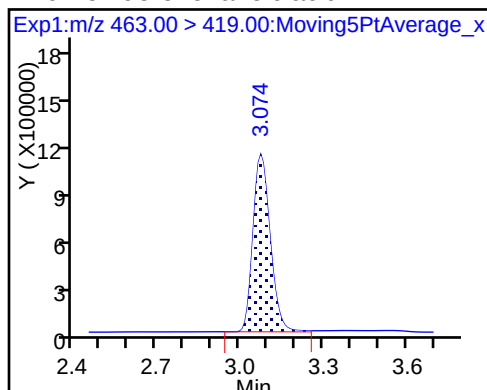
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20 Perfluorononanoic acid

D 19 13C5 PFNA

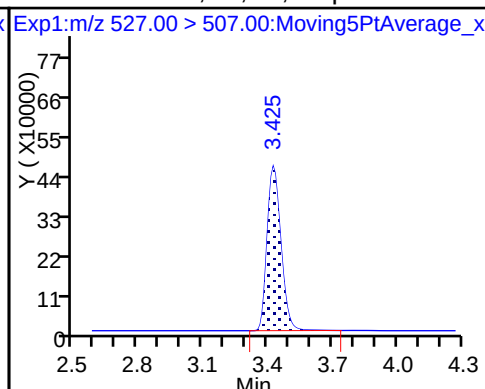
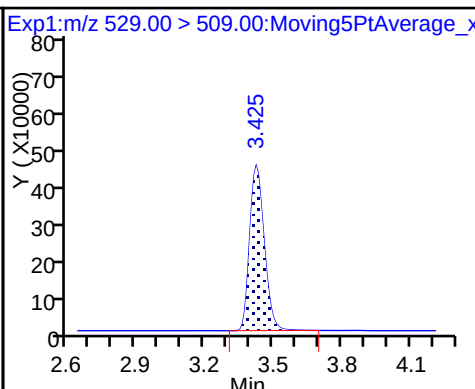
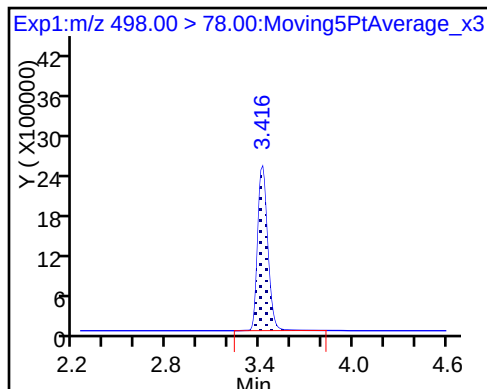
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

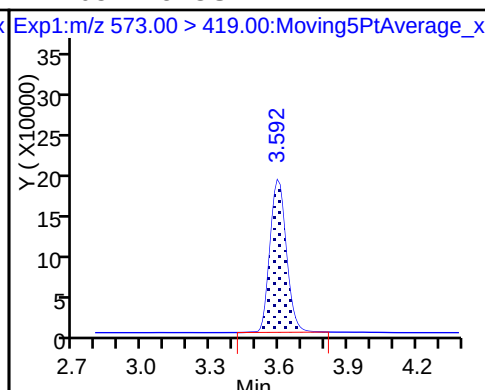
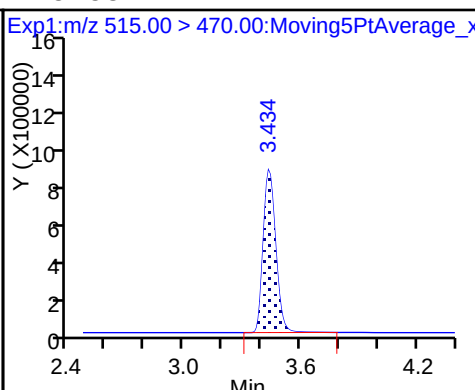
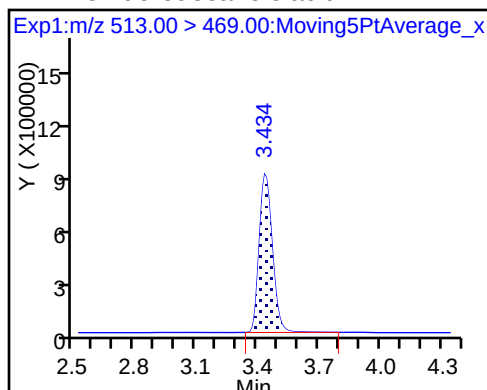
25 Sodium 1H,1H,2H,2H-perfluorodecane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

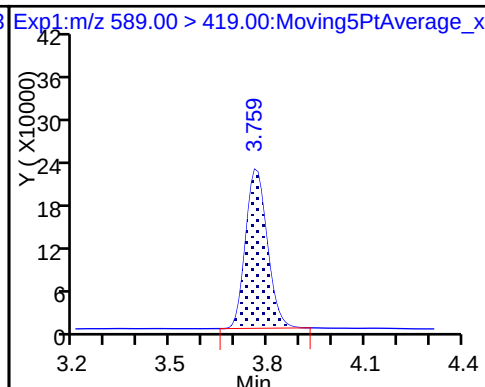
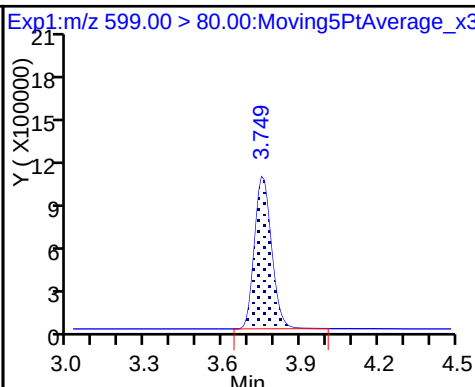
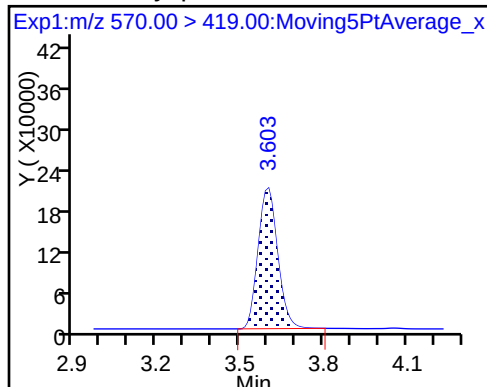
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

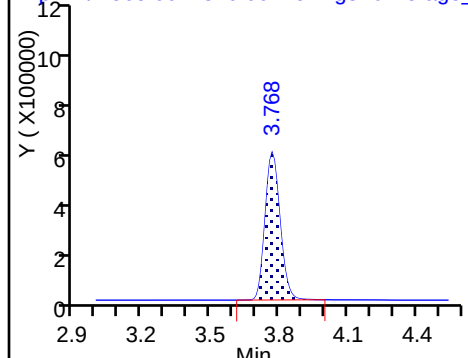


D 30 13C2 PFUnA

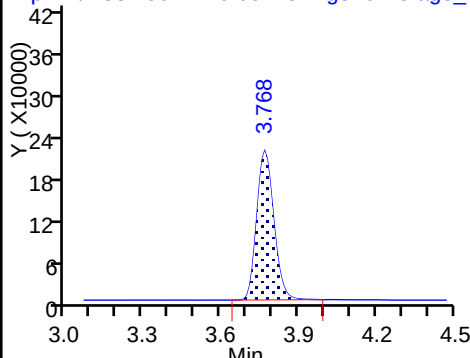
33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

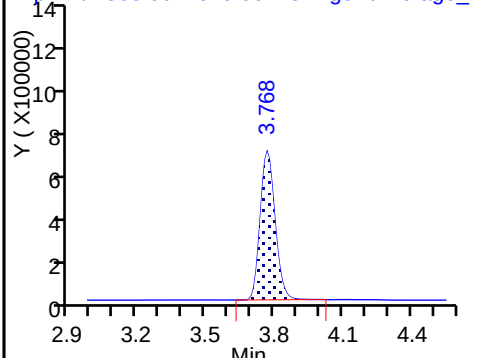
Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x



Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x



Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x

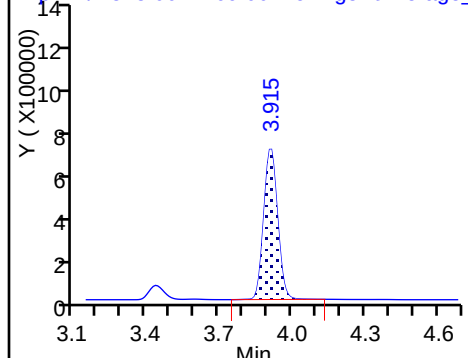


D 34 d-N-MeFOSA-M

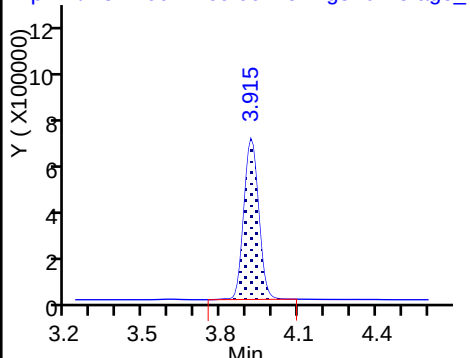
35 MeFOSA

37 Perfluorododecanoic acid

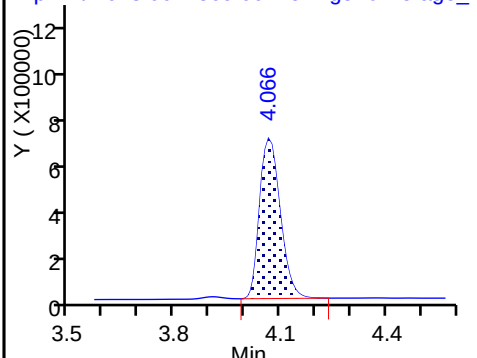
Exp1:m/z 515.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 512.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x

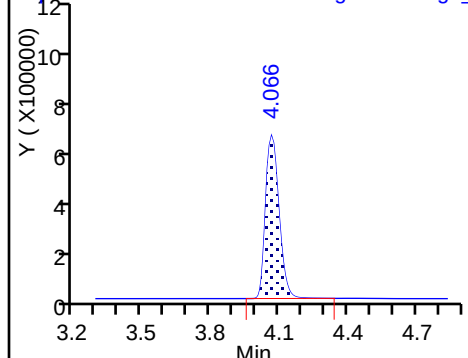


D 36 13C2 PFDaA

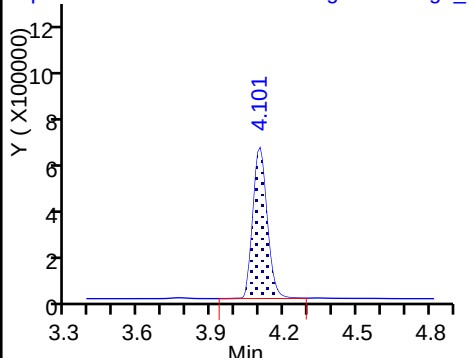
D 38 d-N-EtFOSA-M

39 N-ethylperfluoro-1-octanesulfonami

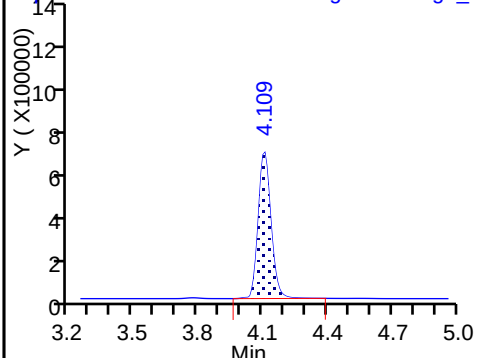
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Exp1:m/z 531.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 526.00 > 169.00:Moving5PtAverage_x

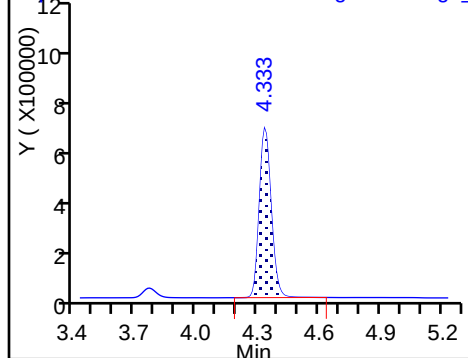


41 Perfluorotridecanoic acid

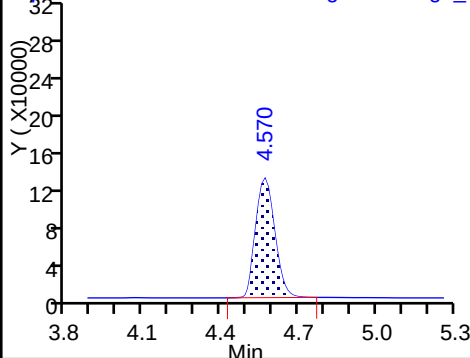
42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

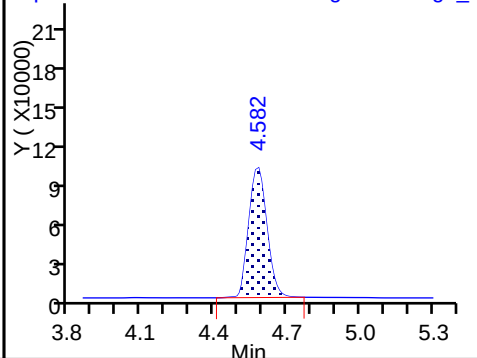
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Exp1:m/z 713.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 713.00 > 219.00:Moving5PtAverage_x

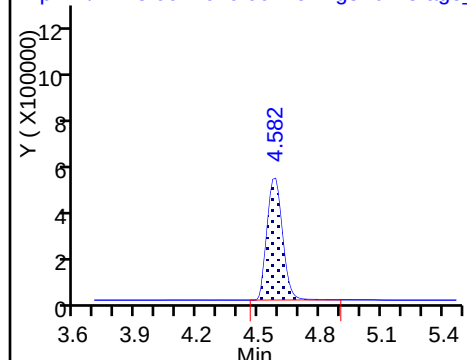


D 43 13C2-PFTeDA

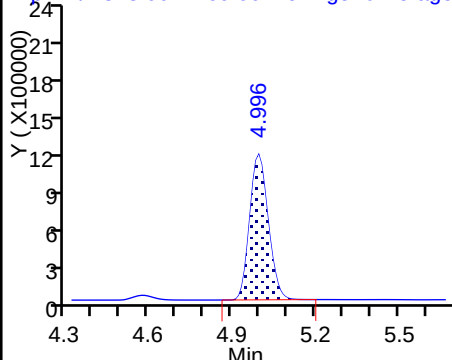
45 Perfluorohexadecanoic acid

D 44 13C2-PFHxDA

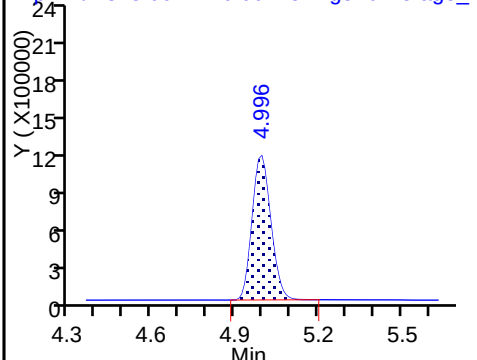
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Exp1:m/z 813.00 > 769.00:Moving5PtAverage_x

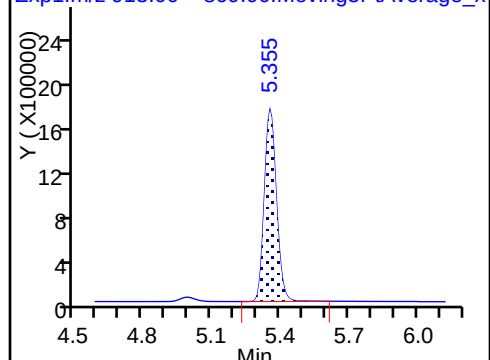


Exp1:m/z 815.00 > 770.00:Moving5PtAverage_x



46 Perfluorooctadecanoic acid

Exp1:m/z 913.00 > 869.00:Moving5PtAverage_x



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: CCVL 320-181763/4 Calibration Date: 08/29/2017 04:17

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.28B_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.9524		1.05	1.00	4.9	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.163		1.11	1.00	11.4	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	75.20		0.909	0.884	2.8	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	0.9517		1.02	1.00	2.2	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	0.9306		0.966	1.00	-3.4	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.185		1.04	0.910	13.8	50.0
6:2FTS	AveID	0.8714	0.9796		1.07	0.948	12.4	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.167		1.07	1.00	6.6	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.257		0.998	0.952	4.9	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	0.9456		0.960	1.00	-4.0	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.101		0.964	0.928	3.8	50.0
8:2FTS	AveID	0.9289	1.021		1.05	0.958	9.9	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	0.9523		1.05	1.00	5.4	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	1.025		1.11	1.00	10.8	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	0.8719		0.885	1.00	-11.5	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6576		1.05	0.964	9.0	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.9369		1.09	1.00	9.2	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	1.143		1.02	1.00	1.5	50.0
MeFOSA	AveID	0.9152	0.8692		0.950	1.00	-5.0	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	0.9687		1.00	1.00	0.2	50.0
N-EtFOSA-M	AveID	0.9286	0.8928		0.961	1.00	-3.9	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	0.7959		0.835	1.00	-16.5	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2216		0.877	1.00	-12.3	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.337		1.05	1.00	4.7	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	0.9339		0.869	1.00	-13.1	50.0
13C4 PFBA	Ave	207167	213529		51.5	50.0	3.1	50.0
13C5 PFPeA	Ave	131459	151863		57.8	50.0	15.5	50.0
13C3-PFBS	Ave	3904	4088		48.7	46.5	4.7	50.0
13C2 PFHxA	Ave	137038	163409		59.6	50.0	19.2	50.0
13C4-PFHpA	Ave	126738	155816		61.5	50.0	22.9	50.0
18O2 PFHxS	Ave	218205	232390		50.4	47.3	6.5	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-181763/4 Calibration Date: 08/29/2017 04:17
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.28B_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	67944		61.0	47.5	28.4	50.0
13C4 PFOA	Ave	116250	141617		60.9	50.0	21.8	50.0
13C4 PFOS	Ave	151622	162773		51.3	47.8	7.4	50.0
13C5 PFNA	Ave	89077	111906		62.8	50.0	25.6	50.0
M2-8:2FTS	Ave	42602	48131		54.1	47.9	13.0	50.0
13C2 PFDA	Ave	77150	90789		58.8	50.0	17.7	50.0
13C8 FOSA	Ave	229921	246488		53.6	50.0	7.2	50.0
d3-NMeFOSAA	Ave	20617	23379		56.7	50.0	13.4	50.0
d5-NEtFOSAA	Ave	21565	23231		53.9	50.0	7.7	50.0
13C2 PFUnA	Ave	52276	57557		55.1	50.0	10.1	50.0
d-N-MeFOSA-M	Ave	55225	59573		53.9	50.0	7.9	50.0
13C2 PFDoA	Ave	51239	61080		59.6	50.0	19.2	50.0
d-N-EtFOSA-M	Ave	53035	56101		52.9	50.0	5.8	50.0
13C2-PFTeDA	Ave	54053	62422		57.7	50.0	15.5	50.0
13C2-PFHxDA	Ave	110226	89010		40.4	50.0	-19.2	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47241.b\2017.08.28B_004.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 29-Aug-2017 04:17:39 ALS Bottle#: 29 Worklist Smp#: 4
 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*sub18
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47241.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 11:38:52 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 11:38:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.554	1.542	0.012		10676447	51.5		103	23621	
2 Perfluorobutyric acid										
212.90 > 169.00	1.554	1.545	0.009	1.000	203368	1.05		105	30.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.755	1.747	0.008		7593169	57.8		116	51587	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.755	1.751	0.004	1.000	176610	1.11		111	77.3	
D 47 13C3-PFBS										
301.90 > 83.00	1.782	1.771	0.011		190083	48.7		105	5631	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.782	1.773	0.009	1.000	271728	0.9086		103	3559	
298.90 > 99.00	1.782	1.773	0.009	1.000	113454		2.40(0.00-0.00)		1675	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.983	1.979	0.004	1.000	64863	1.04		112	3272	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.018	2.016	0.002	1.000	155518	1.02		102	252	
D 7 13C2 PFHxA										
315.00 > 270.00	2.018	2.016	0.002		8170452	59.6		119	28780	
D 9 13C4-PFHpA										
367.00 > 322.00	2.348	2.349	-0.001		7790817	61.5		123	18540	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.348	2.351	-0.003	1.000	145002	0.9658		96.6	214	
D 11 18O2 PFHxS										
403.00 > 84.00	2.364	2.363	0.001		10992045	50.4		107	24055	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.364	2.365	-0.001	1.000	250680	1.04		114	1731	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
13 Sodium 1H,1H,2H,2H-perfluorooctane	427.00	> 407.00	2.671	2.681	-0.010	1.000	63094	1.07	112	2129	
D 12 M2-6:2FTS	429.00	> 409.00	2.671	2.681	-0.010		3227353	61.0	128	13730	
* 62 13C2-PFOA	415.00	> 370.00	2.685	2.703	-0.018		6837332	50.0	100	14112	
15 Perfluorooctanoic acid	413.00	> 369.00	2.692	2.709	-0.017	1.000	165206	1.07	107	22.8	
	413.00	> 169.00	2.692	2.709	-0.017	1.000	85807	1.93(0.90-1.10)		781	
D 14 13C4 PFOA	417.00	> 372.00	2.692	2.709	-0.017		7080867	60.9	122	23560	
16 Perfluoroheptanesulfonic Acid	449.00	> 80.00	2.700	2.718	-0.018	1.000	194735	1.00	105	2431	
D 18 13C4 PFOS	503.00	> 80.00	3.059	3.084	-0.025		7780539	51.3	107	11239	
17 Perfluorooctane sulfonic acid	499.00	> 80.00	3.059	3.087	-0.028	1.000	166250	0.9635	104	871	M
	499.00	> 99.00	3.059	3.087	-0.028	1.000	35690	4.66(0.90-1.10)		222	M
20 Perfluorononanoic acid	463.00	> 419.00	3.059	3.087	-0.028	1.000	105815	0.9595	96.0	74.4	
D 19 13C5 PFNA	468.00	> 423.00	3.059	3.087	-0.028		5595295	62.8	126	10027	
D 21 13C8 FOSA	506.00	> 78.00	3.416	3.419	-0.003		12324378	53.6	107	37464	
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.425	3.421	0.004	1.000	252615	1.11	111	3139	
D 26 M2-8:2FTS	529.00	> 509.00	3.398	3.438	-0.040		2305455	54.1	113	10162	
25 Sodium 1H,1H,2H,2H-perfluorodecane	527.00	> 507.00	3.398	3.439	-0.041	1.000	47075	1.05	110	1598	
24 Perfluorodecanoic acid	513.00	> 469.00	3.416	3.449	-0.033	1.000	86456	1.05	105	186	
D 23 13C2 PFDA	515.00	> 470.00	3.416	3.449	-0.033		4539460	58.8	118	10375	
D 27 d3-NMeFOSAA	573.00	> 419.00	3.565	3.607	-0.042		1168929	56.7	113	6221	
28 N-methyl perfluorooctane sulfonami	570.00	> 419.00	3.575	3.611	-0.036	1.003	20383	0.8848	88.5	159	
29 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.722	3.763	-0.041	1.000	103181	1.05	109	2305	
D 32 d5-NEtFOSAA	589.00	> 419.00	3.732	3.774	-0.042		1161550	53.9	108	1540	
D 30 13C2 PFUnA	565.00	> 520.00	3.742	3.781	-0.039		2877832	55.1	110	12293	
33 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.742	3.781	-0.039	1.003	21764	1.09	109	316	
31 Perfluoroundecanoic acid	563.00	> 519.00	3.742	3.783	-0.041	1.000	65788	1.02	102	83.1	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M	515.00 > 169.00	3.921	3.917	0.004	2978672	53.9		108	925	
35 MeFOSA	512.00 > 169.00	3.928	3.923	0.005	1.000	51782	0.9497	95.0	1583	
37 Perfluorododecanoic acid	613.00 > 569.00	4.029	4.082	-0.053	1.000	59167	1.00	100	30.0	
D 36 13C2 PFDaA	615.00 > 570.00	4.029	4.082	-0.053	3053993	59.6		119	10764	
D 38 d-N-EtFOSA-M	531.00 > 169.00	4.113	4.107	0.006	2805059	52.9		106	5781	
39 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.121	4.113	0.008	1.000	50085	0.9614	96.1	1376	
41 Perfluorotridecanoic acid	663.00 > 619.00	4.298	4.350	-0.052	1.000	48616	0.8346	83.5	10.9	
42 Perfluorotetradecanoic acid	713.00 > 169.00	4.525	4.585	-0.060	1.000	13833	0.8767	87.7	514	
	713.00 > 219.00	4.525	4.585	-0.060	1.000	10698	1.29(0.00-0.00)		127	
D 43 13C2-PFTeDA	715.00 > 670.00	4.525	4.591	-0.066	3121112	57.7		115	19506	
45 Perfluorohexadecanoic acid	813.00 > 769.00	4.942	5.010	-0.068	1.000	119034	1.05	105	10.2	
D 44 13C2-PFHxDA	815.00 > 770.00	4.942	5.010	-0.068	4450502	40.4		80.8	11664	
46 Perfluorooctadecanoic acid	913.00 > 869.00	5.286	5.373	-0.087	1.000	83129	0.8693	86.9	15.4	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC_FULL-L2_00009

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47241.b\2017.08.28B_004.d

Injection Date: 29-Aug-2017 04:17:39

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 29

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

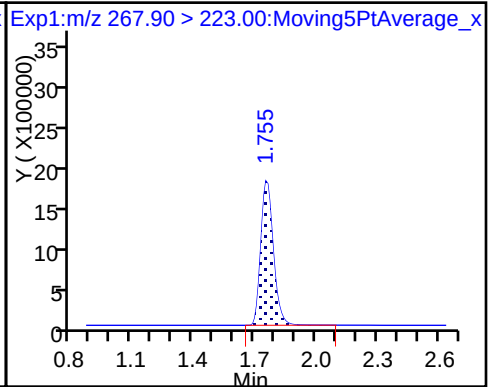
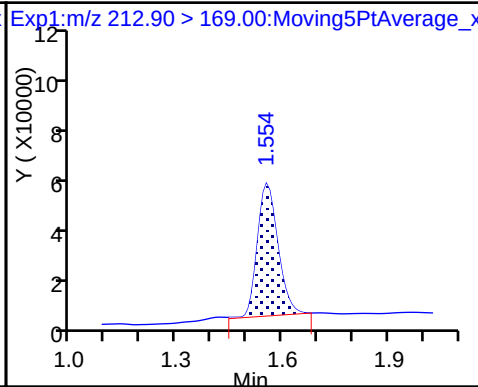
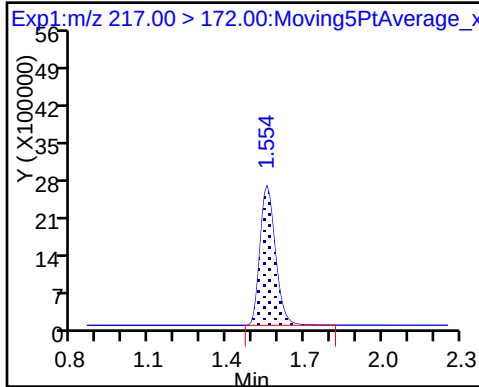
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

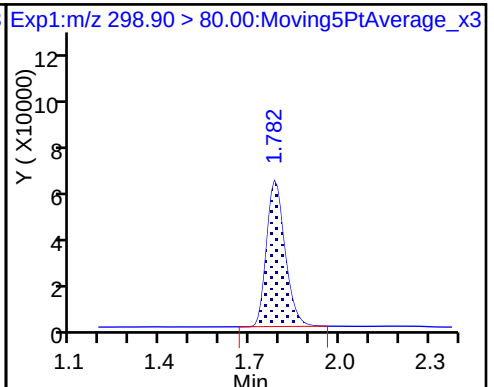
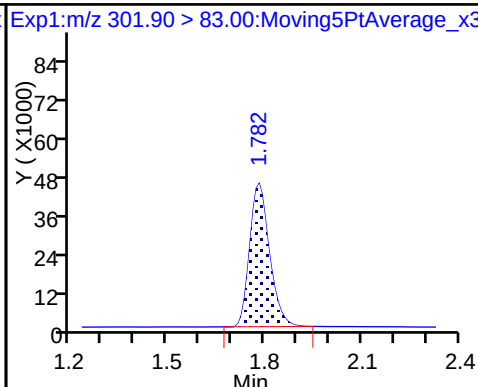
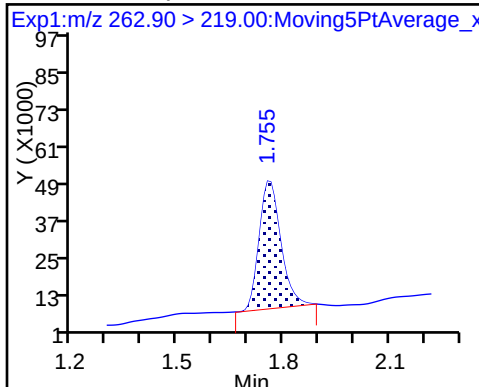
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

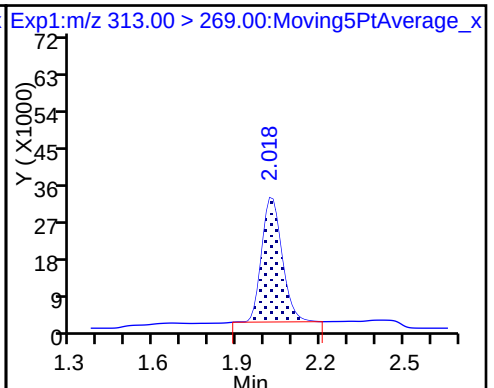
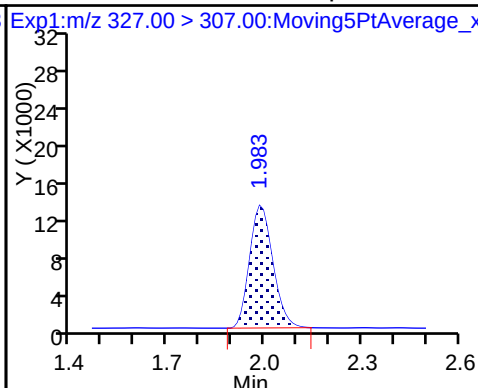
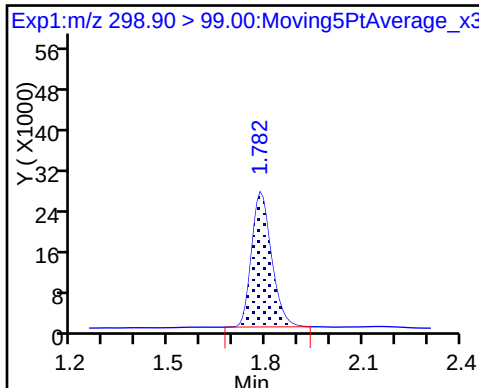
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexanoic acid

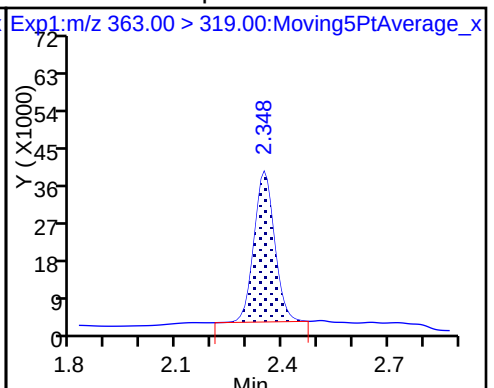
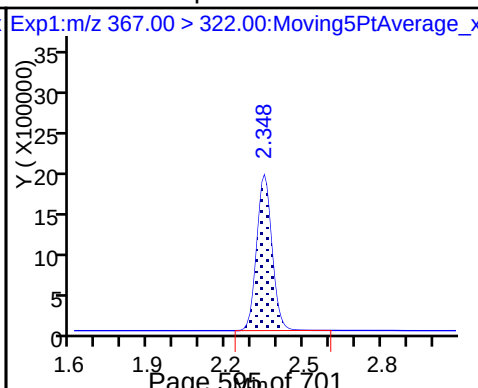
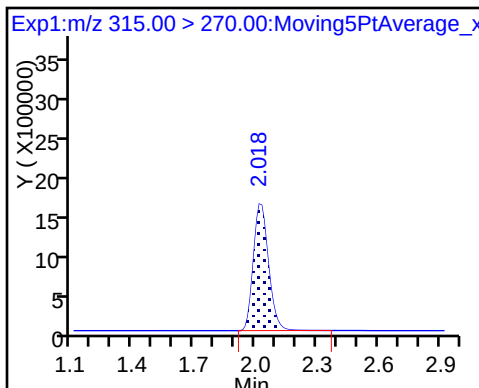
6 Perfluorohexanoic acid



D 7 13C2 PFHxA

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

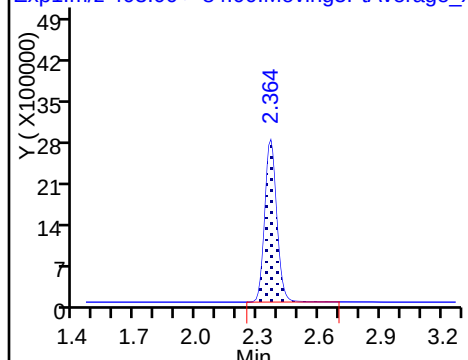


D 11 18O2 PFHxS

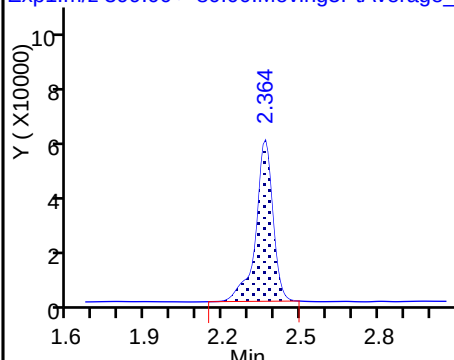
8 Perfluorohexanesulfonic acid

13 Sodium 1H,1H,2H,2H-perfluorooctane

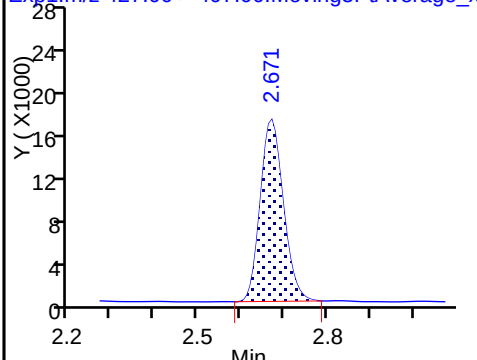
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Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3

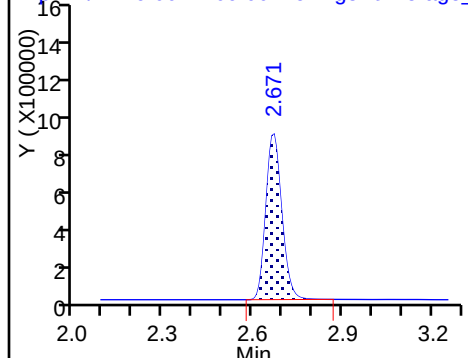


D 12 M2-6:2FTS

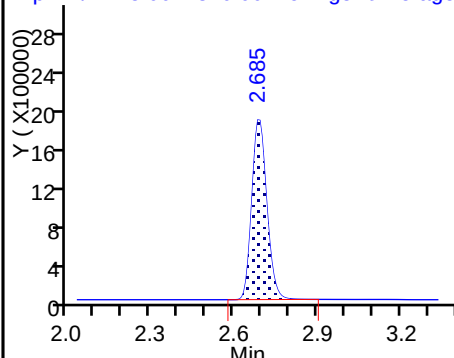
* 62 13C2-PFOA

15 Perfluorooctanoic acid

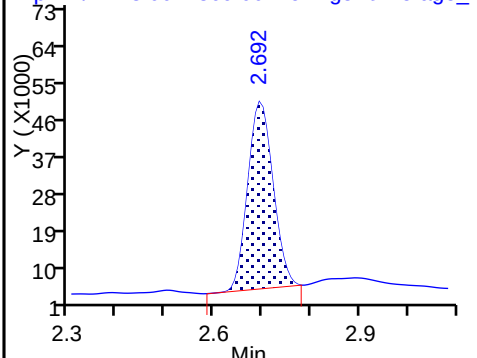
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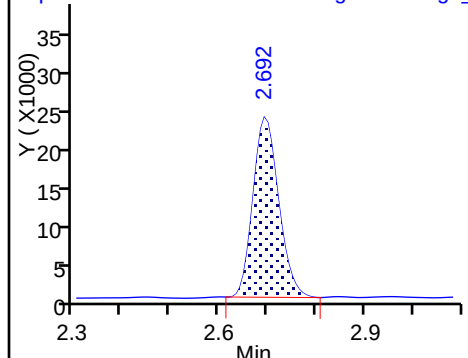


15 Perfluorooctanoic acid

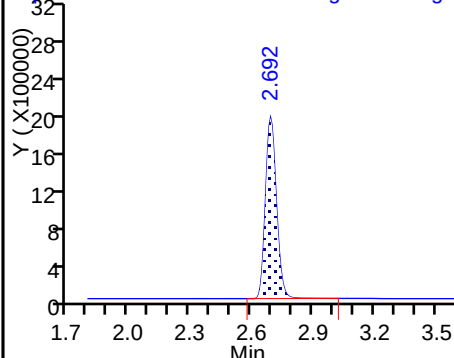
D 14 13C4 PFOA

16 Perfluoroheptanesulfonic Acid

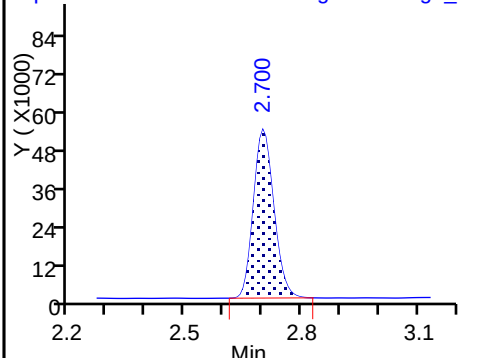
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Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

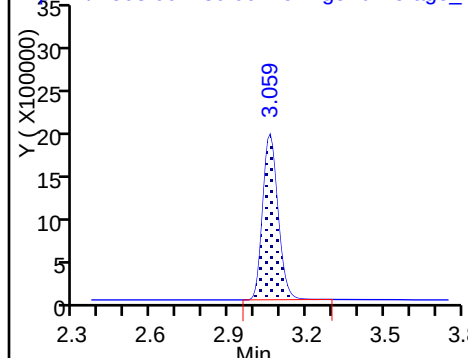


D 18 13C4 PFOS

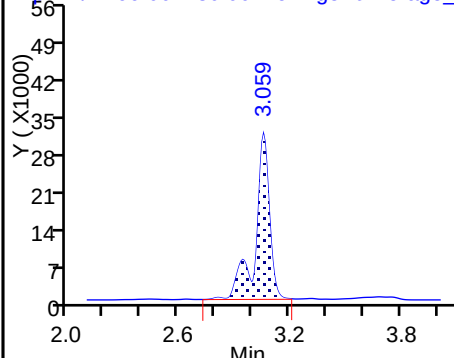
17 Perfluorooctane sulfonic acid (M)

17 Perfluorooctane sulfonic acid

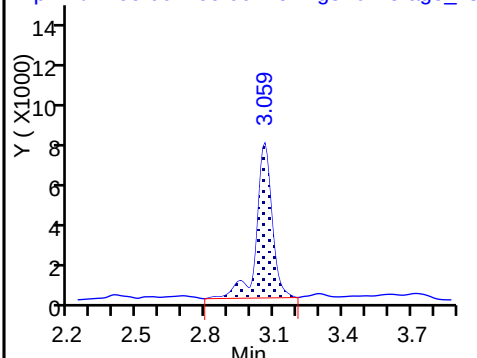
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Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3



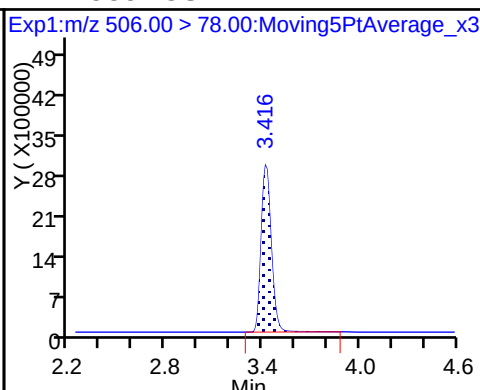
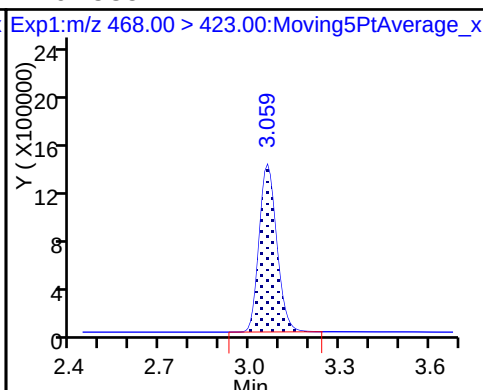
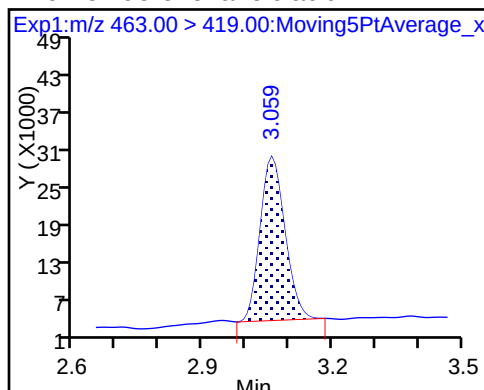
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20 Perfluorononanoic acid

D 19 13C5 PFNA

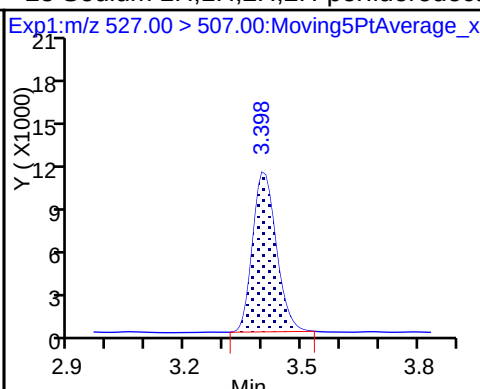
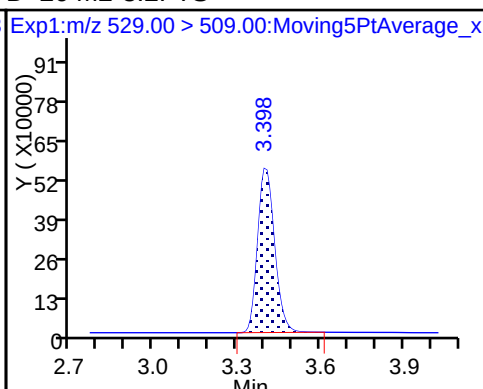
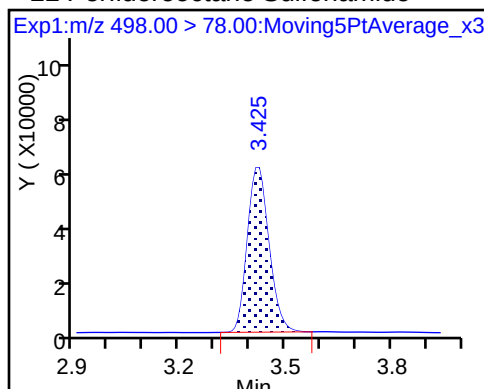
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

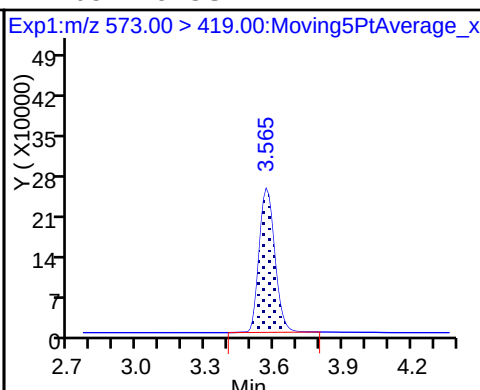
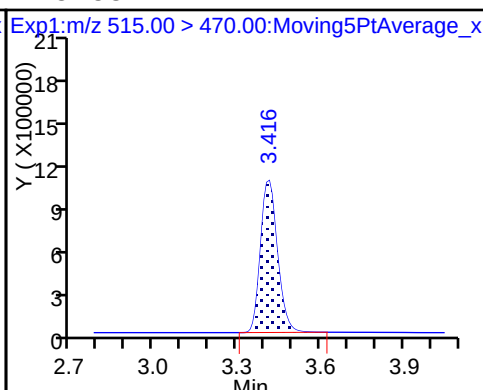
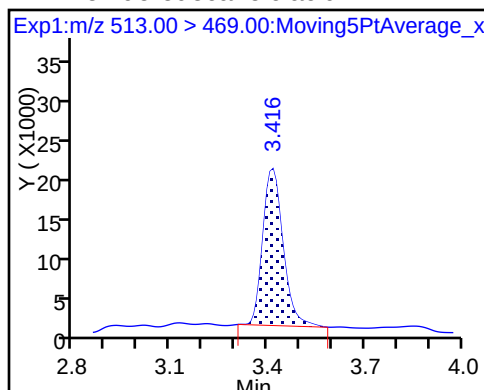
25 Sodium 1H,1H,2H,2H-perfluorodecane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

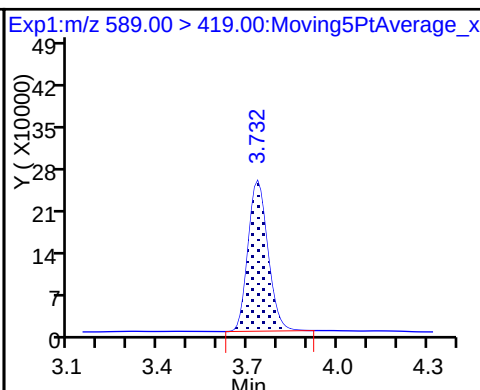
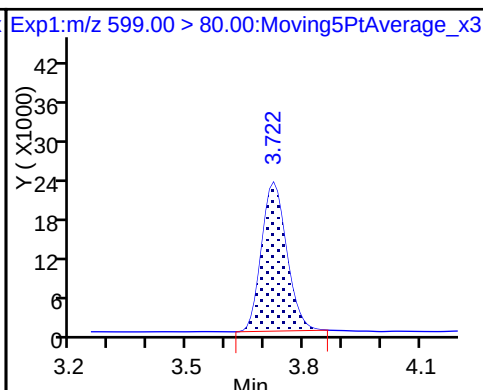
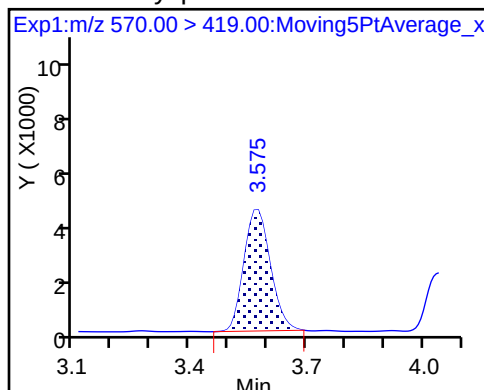
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

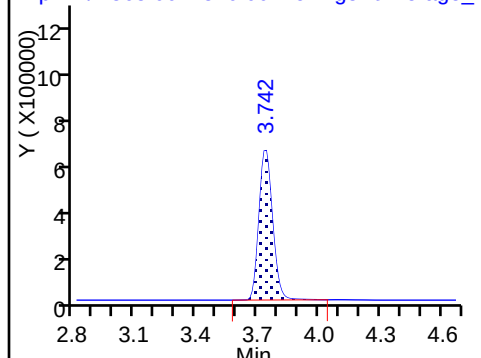


D 30 13C2 PFUnA

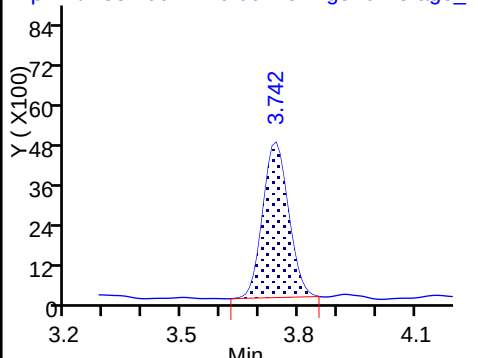
33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

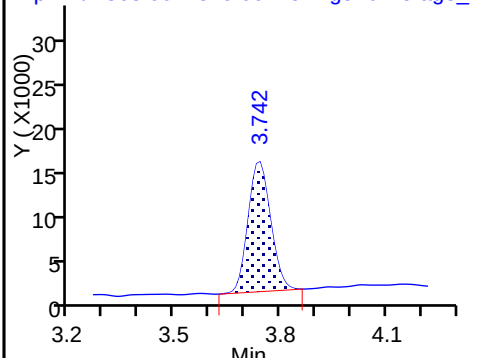
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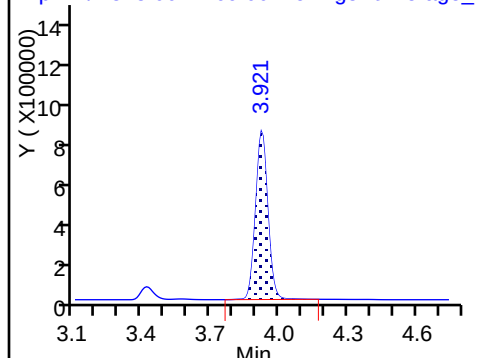


D 34 d-N-MeFOSA-M

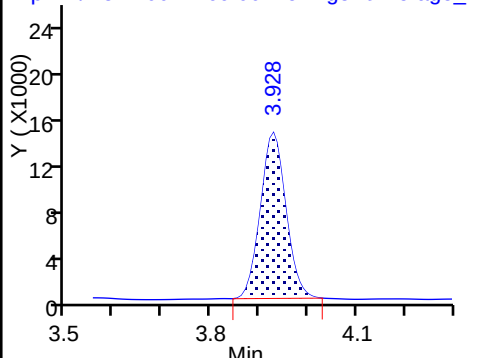
35 MeFOSA

37 Perfluorododecanoic acid

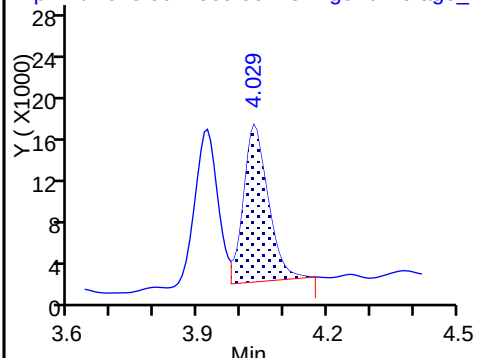
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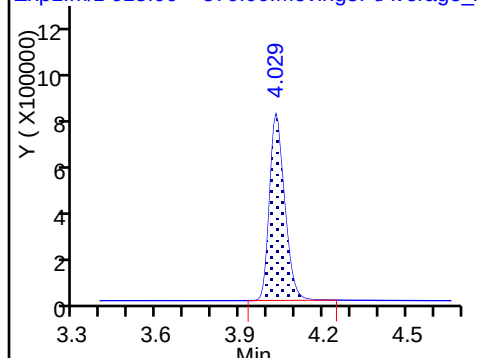


D 36 13C2 PFDaA

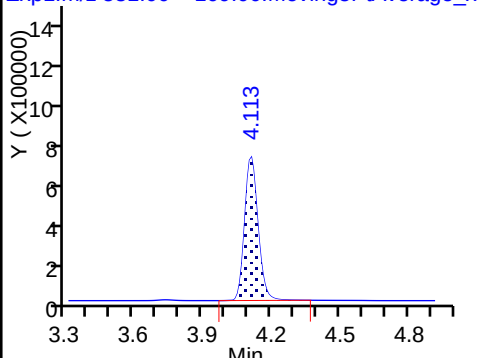
D 38 d-N-EtFOSA-M

39 N-ethylperfluoro-1-octanesulfonami

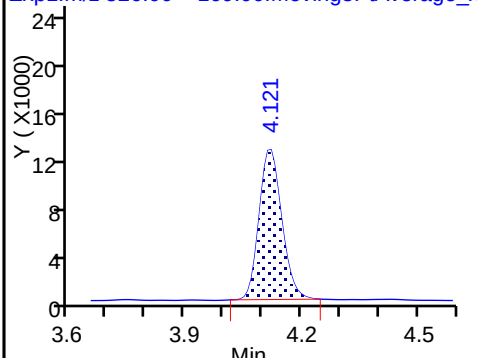
Exp1:m/z 615.00 > 570.00:Moving5PtAverage_x



Exp1:m/z 531.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 526.00 > 169.00:Moving5PtAverage_x

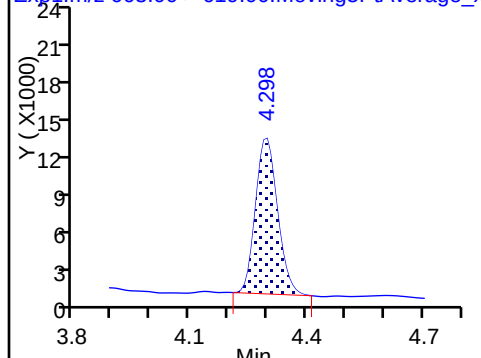


41 Perfluorotridecanoic acid

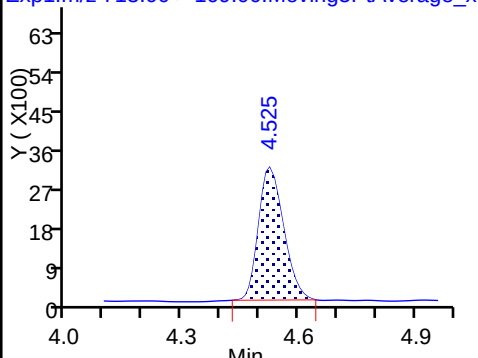
42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

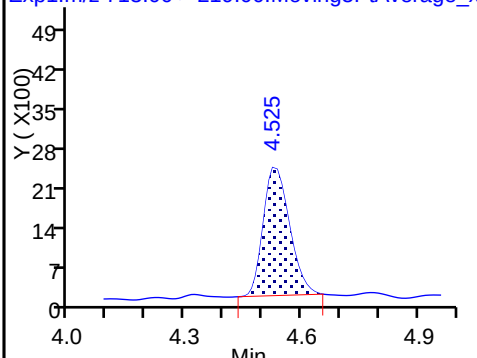
Exp1:m/z 663.00 > 619.00:Moving5PtAverage_x



Exp1:m/z 713.00 > 169.00:Moving5PtAverage_x



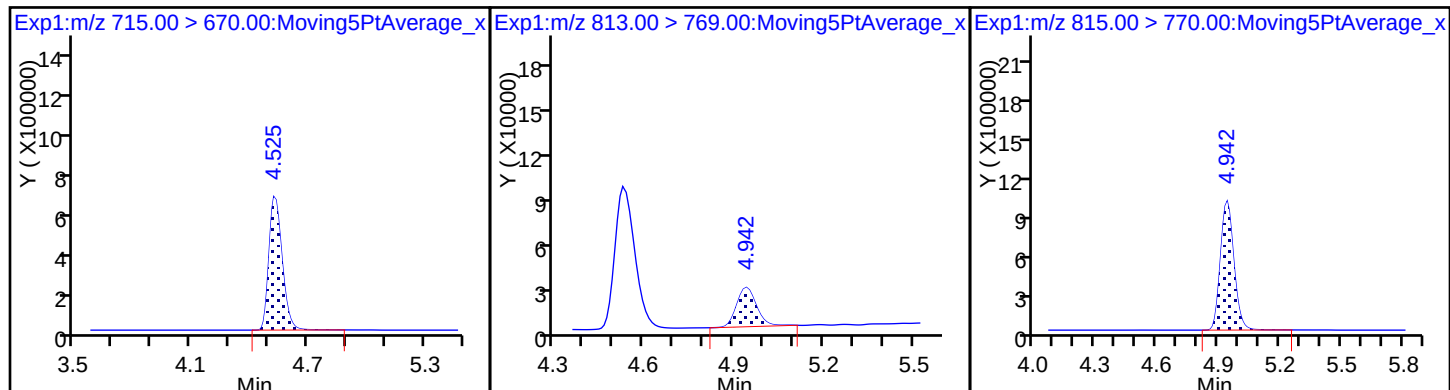
Exp1:m/z 713.00 > 219.00:Moving5PtAverage_x



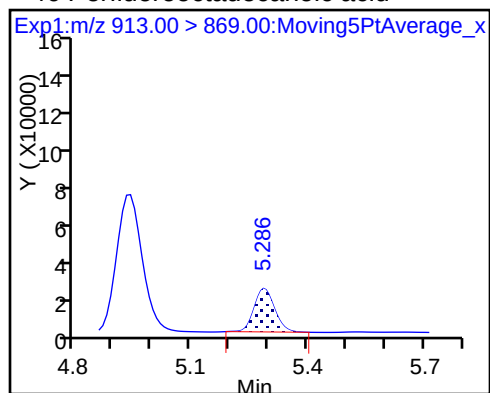
D 43 13C2-PFTeDA

45 Perfluorohexadecanoic acid

D 44 13C2-PFHxDA



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

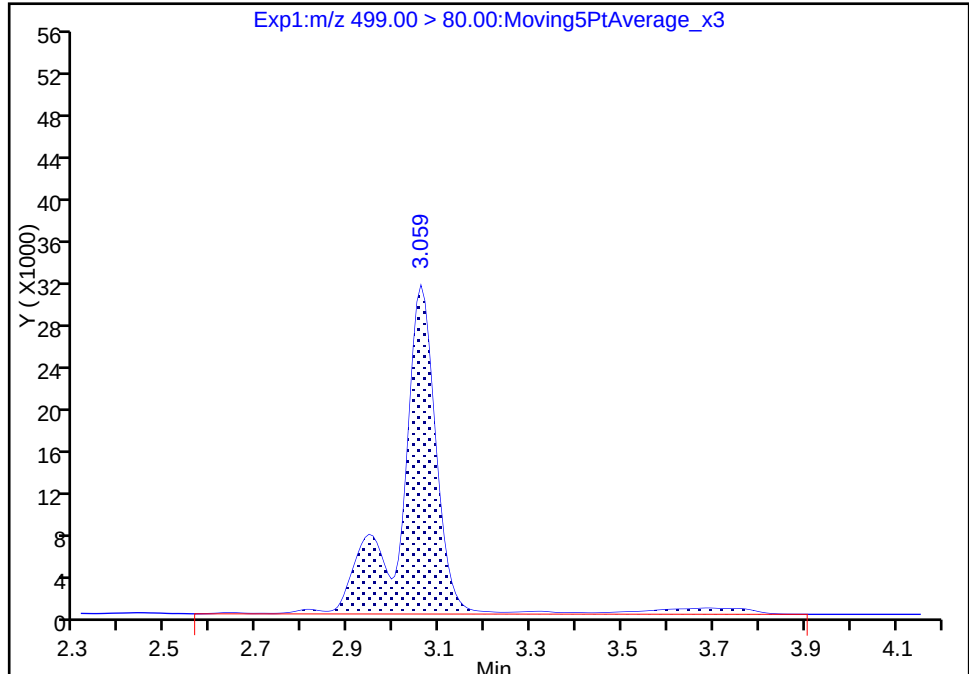
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47241.b\2017.08.28B_004.d
Injection Date: 29-Aug-2017 04:17:39 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 29 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

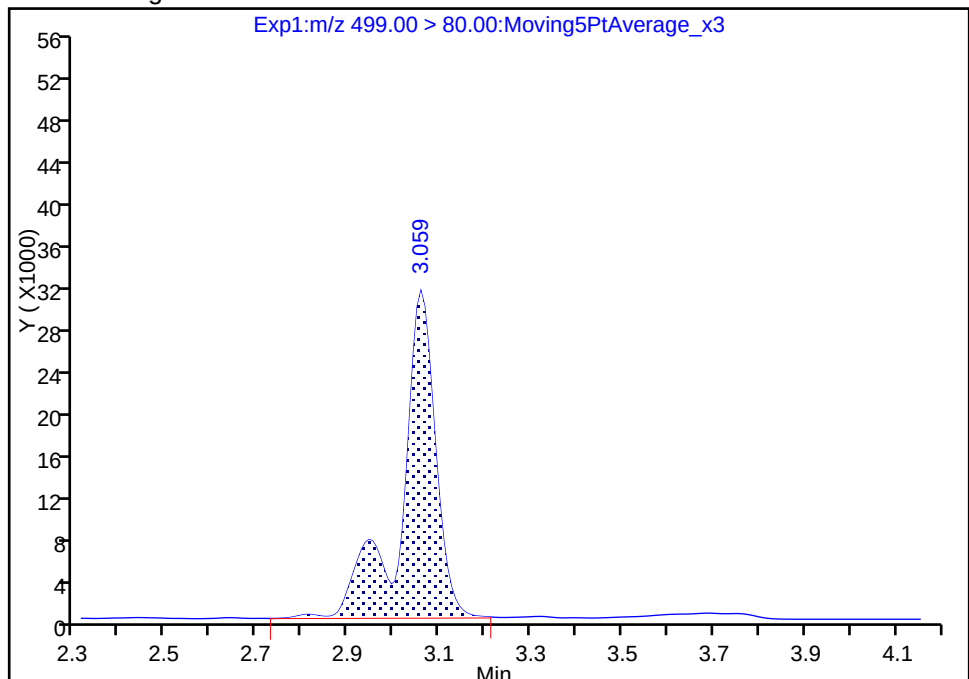
RT: 3.06
Area: 178837
Amount: 1.036492
Amount Units: ng/ml

Processing Integration Results



RT: 3.06
Area: 166250
Amount: 0.963541
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 11:36:57

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: CCV 320-181833/1 Calibration Date: 08/29/2017 09:07

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.28B_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.9536		21.0	20.0	5.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.113		21.3	20.0	6.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	75.23		18.2	17.7	2.8	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	1.010		21.7	20.0	8.5	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	0.995		20.7	20.0	3.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.082		18.9	18.2	3.9	25.0
6:2FTS	AveID	0.8714	0.8205		17.9	19.0	-5.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.072		19.6	20.0	-2.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.329		21.1	19.0	10.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.073		18.8	18.6	1.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	0.9434		19.1	20.0	-4.3	25.0
8:2FTS	AveID	0.9289	0.9199		19.0	19.2	-1.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	0.9079		20.1	20.0	0.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	0.9600		20.7	20.0	3.7	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	0.9103		18.5	20.0	-7.6	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6556		21.0	19.3	8.7	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.8544		19.9	20.0	-0.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	1.062		18.9	20.0	-5.7	25.0
MeFOSA	AveID	0.9152	0.8711		19.0	20.0	-4.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	0.8724		18.0	20.0	-9.8	25.0
N-EtFOSA-M	AveID	0.9286	0.9282		20.0	20.0	-0.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	0.8854		18.6	20.0	-7.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2183		17.3	20.0	-13.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8791		19.8	20.0	-1.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	0.8705		16.2	20.0	-19.0	25.0
13C4 PFBA	Ave	207167	209892		50.7	50.0	1.3	50.0
13C5 PFPeA	Ave	131459	151632		57.7	50.0	15.3	50.0
13C3-PFBS	Ave	3904	4130		49.2	46.5	5.8	50.0
13C2 PFHxA	Ave	137038	161944		59.1	50.0	18.2	50.0
13C4-PFHpA	Ave	126738	161898		63.9	50.0	27.7	50.0
18O2 PFHxS	Ave	218205	238197		51.6	47.3	9.2	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: CCV 320-181833/1 Calibration Date: 08/29/2017 09:07
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.28B_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	72349		64.9	47.5	36.7	50.0
13C4 PFOA	Ave	116250	142757		61.4	50.0	22.8	50.0
13C4 PFOS	Ave	151622	162610		51.3	47.8	7.2	50.0
13C5 PFNA	Ave	89077	116071		65.2	50.0	30.3	50.0
M2-8:2FTS	Ave	42602	50991		57.3	47.9	19.7	50.0
13C2 PFDA	Ave	77150	91186		59.1	50.0	18.2	50.0
13C8 FOSA	Ave	229921	244485		53.2	50.0	6.3	50.0
d3-NMeFOSAA	Ave	20617	23738		57.6	50.0	15.1	50.0
d5-NEtFOSAA	Ave	21565	24331		56.4	50.0	12.8	50.0
13C2 PFUnA	Ave	52276	62151		59.4	50.0	18.9	50.0
d-N-MeFOSA-M	Ave	55225	58348		52.8	50.0	5.7	50.0
13C2 PFDoA	Ave	51239	62254		60.7	50.0	21.5	50.0
d-N-EtFOSA-M	Ave	53035	54941		51.8	50.0	3.6	50.0
13C2-PFTeDA	Ave	54053	56690		52.4	50.0	4.9	50.0
13C2-PFHxDA	Ave	110226	93086		42.2	50.0	-15.5	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_046.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 29-Aug-2017 09:07:27 ALS Bottle#: 31 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub18
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:30:02 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:12:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.554	1.564	-0.010		10494581	50.7		101	22295	
2 Perfluorobutyric acid										
212.90 > 169.00	1.554	1.564	-0.010	1.000	4002840	21.0		105	618	
D 3 13C5-PFPeA										
267.90 > 223.00	1.754	1.773	-0.019		7581589	57.7		115	36223	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.754	1.773	-0.019	1.000	3374907	21.3		107	1429	
D 47 13C3-PFBS										
301.90 > 83.00	1.782	1.792	-0.010		192067	49.2		106	5011	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.782	1.801	-0.019	1.000	5494083	18.2		103	29283	
298.90 > 99.00	1.782	1.801	-0.019	1.000	2260390		2.43(0.00-0.00)		17802	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.983	2.006	-0.023	1.000	1288527	19.5		104	21579	
D 7 13C2 PFHxA										
315.00 > 270.00	2.028	2.041	-0.013		8097224	59.1		118	22760	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.028	2.041	-0.013	1.000	3272203	21.7		108	4705	
D 9 13C4-PFHpA										
367.00 > 322.00	2.347	2.365	-0.018		8094905	63.9		128	17877	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.347	2.365	-0.018	1.000	3222404	20.7		103	3819	
D 11 18O2 PFHxS										
403.00 > 84.00	2.363	2.381	-0.018		11266717	51.6		109	38429	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.363	2.381	-0.018	1.000	4691177	18.9		104	8041	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 M2-6:2FTS										
429.00 > 409.00	2.674	2.698	-0.024		3436598	64.9		137	16079	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.674	2.698	-0.024	1.000	1125539	17.9		94.2	12294	
D 14 13C4 PFOA										
417.00 > 372.00	2.703	2.720	-0.017		7137833	61.4		123	18714	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.703	2.720	-0.017	1.000	3061831	19.6		98.0	431	
413.00 > 169.00	2.703	2.720	-0.017	1.000	1575408		1.94(0.90-1.10)		5330	
* 62 13C2-PFOA										
415.00 > 370.00	2.696	2.720	-0.024		7100978	50.0		100	16752	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.710	2.727	-0.017	1.000	4113903	21.1		111	17698	
D 18 13C4 PFOS										
503.00 > 80.00	3.066	3.093	-0.027		7772746	51.3		107	16175	
D 19 13C5 PFNA										
468.00 > 423.00	3.066	3.093	-0.027		5803525	65.2		130	16752	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.066	3.093	-0.027	1.000	3239341	18.8		101	7630	
499.00 > 99.00	3.066	3.093	-0.027	1.000	668017		4.85(0.90-1.10)		2910	
20 Perfluorononanoic acid										
463.00 > 419.00	3.075	3.093	-0.018	1.000	2189927	19.1		95.7	1543	
D 26 M2-8:2FTS										
529.00 > 509.00	3.416	3.444	-0.028		2442477	57.3		120	17264	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.416	3.444	-0.028	1.000	898691	19.0		99.0	8679	
D 23 13C2 PFDA										
515.00 > 470.00	3.425	3.453	-0.028		4559299	59.1		118	16169	
D 21 13C8 FOSA										
506.00 > 78.00	3.425	3.453	-0.028		12224263	53.2		106	36173	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.433	3.453	-0.020	1.000	1655836	20.1		101	3153	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.433	3.453	-0.020	1.000	4693924	20.7		104	19311	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.587	3.605	-0.018		1186915	57.6		115	5761	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.587	3.616	-0.029	1.000	432181	18.5		92.4	2250	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.734	3.763	-0.029	1.000	2055272	21.0		109	9679	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.744	3.772	-0.028		1216554	56.4		113	1844	
D 30 13C2 PFUnA										
565.00 > 520.00	3.754	3.782	-0.028		3107535	59.4		119	8941	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.754	3.782	-0.028	1.003	415766	19.9		99.6	3670	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.754	3.782	-0.028	1.000	1319869	18.9		94.3	1818	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M	515.00 > 169.00	3.933	3.953	-0.020	2917384	52.8		106	673	
35 MeFOSA	512.00 > 169.00	3.933	3.961	-0.028	1.000	1016472	19.0	95.2	6269	
D 36 13C2 PFDaA	615.00 > 570.00	4.043	4.072	-0.029	3112679	60.7		121	9670	
37 Perfluorododecanoic acid	613.00 > 569.00	4.043	4.072	-0.029	1.000	1086189	18.0	90.2	546	
D 38 d-N-EtFOSA-M	531.00 > 169.00	4.113	4.140	-0.027	2747042	51.8		104	5661	
39 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.121	4.148	-0.027	1.000	1019905	20.0	100.0	4360	
41 Perfluorotridecanoic acid	663.00 > 619.00	4.308	4.333	-0.025	1.000	1102357	18.6	92.8	217	
42 Perfluorotetradecanoic acid	713.00 > 169.00	4.539	4.561	-0.022	1.000	247540	17.3	86.4	2894	
	713.00 > 219.00	4.551	4.561	-0.010	1.003	197211	1.26(0.00-0.00)		1644	
D 43 13C2-PFTeDA	715.00 > 670.00	4.551	4.574	-0.023	2834521	52.4		105	11873	
D 44 13C2-PFHxDA	815.00 > 770.00	4.955	4.972	-0.017	4654300	42.2		84.5	10998	
45 Perfluorohexadecanoic acid	813.00 > 769.00	4.955	4.982	-0.027	1.000	1636603	19.8	99.0	147	
46 Perfluorooctadecanoic acid	913.00 > 869.00	5.315	5.330	-0.015	1.000	1620664	16.2	81.0	247	

Reagents:

LCPFC_FULL-L4_00008

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_046.d

Injection Date: 29-Aug-2017 09:07:27

Instrument ID: A8_N

Lims ID: CCV L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 31

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

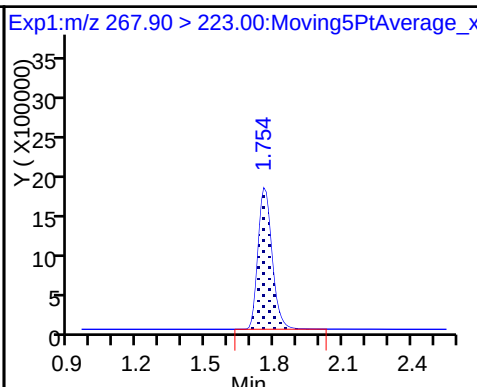
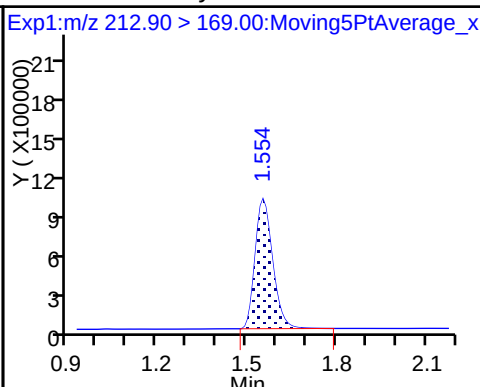
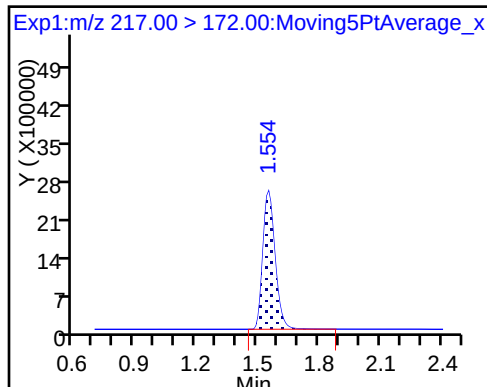
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

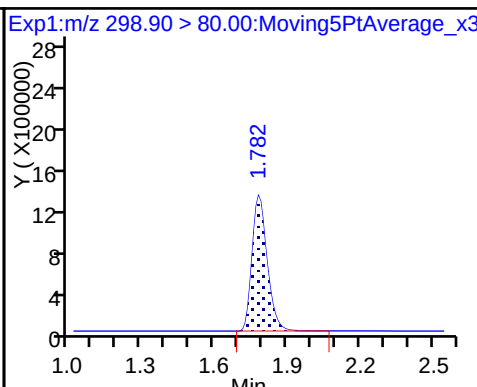
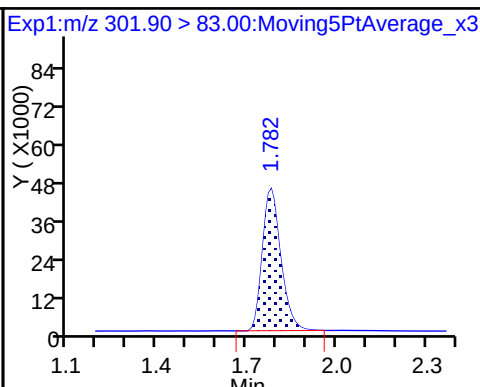
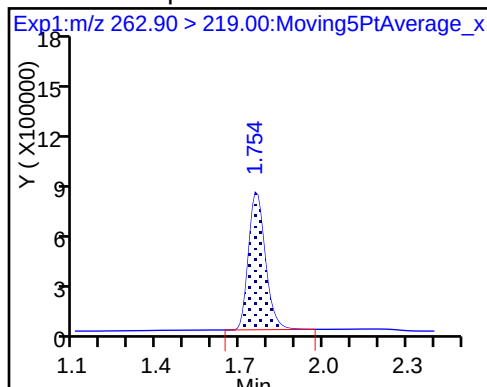
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

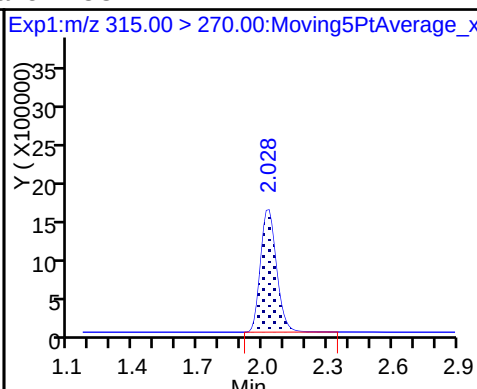
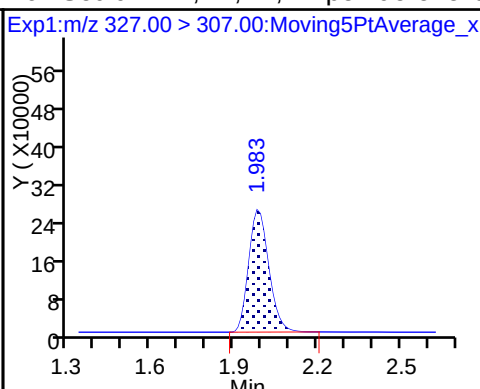
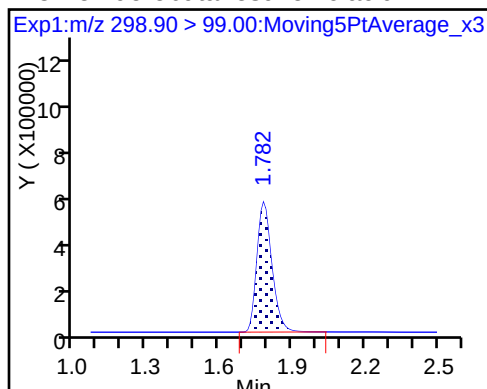
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa

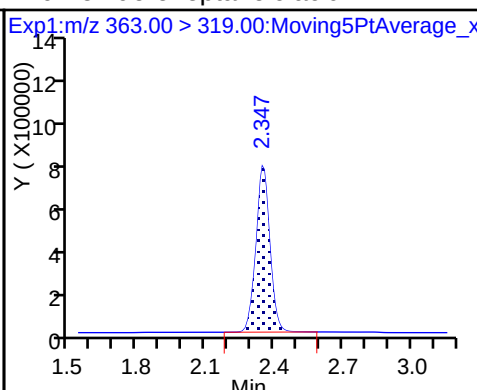
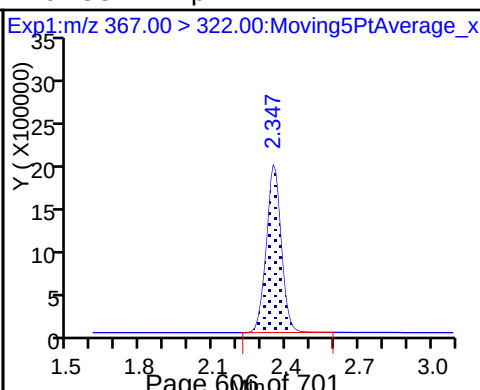
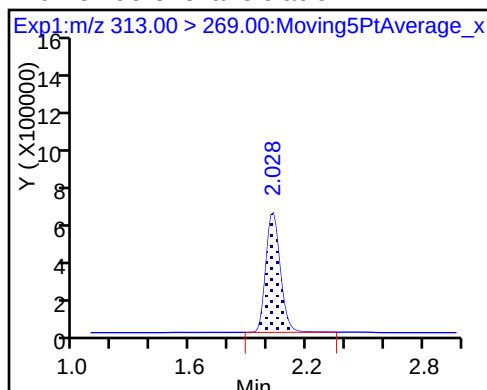
De 7 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

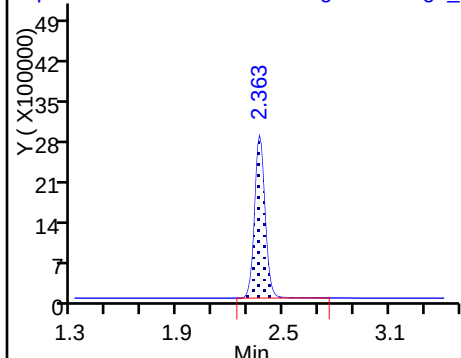


D 11 18O2 PFHxS

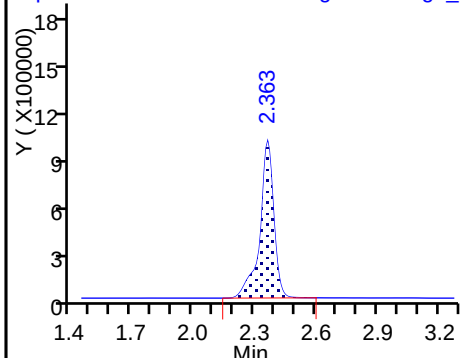
8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

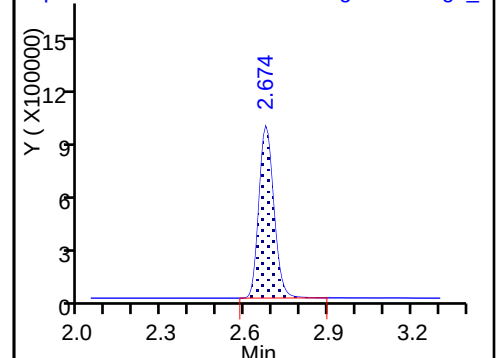
Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3



Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 429.00 > 409.00:Moving5PtAverage_x3

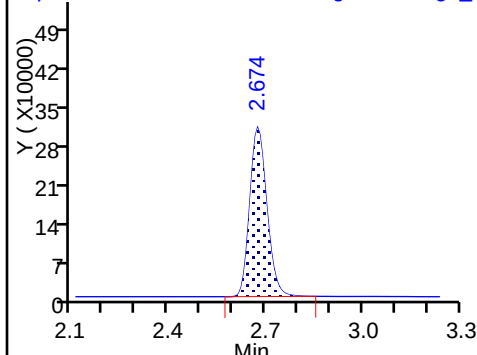


13 Sodium 1H,1H,2H,2H-perfluorooctadecanoate

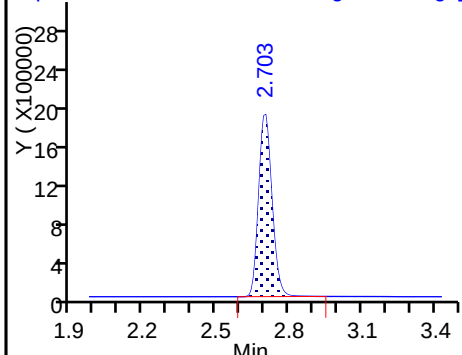
De 14 13C4 PFOA

15 Perfluorooctanoic acid

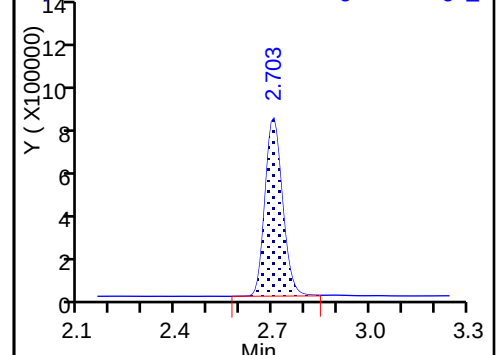
Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3



Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3

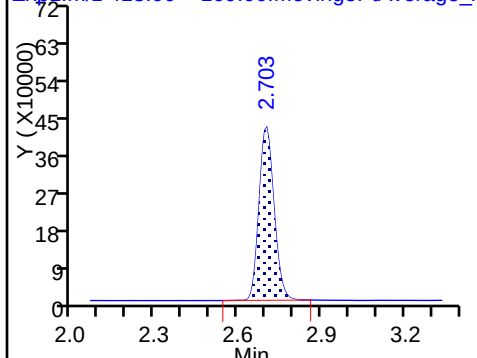


15 Perfluorooctanoic acid

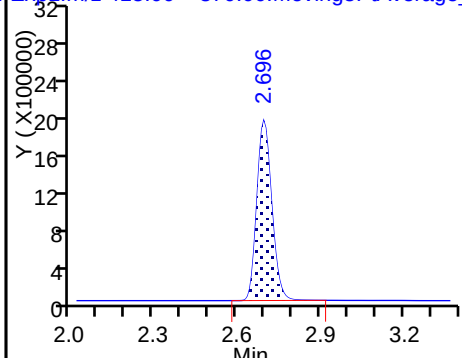
* 62 13C2-PFOA

16 Perfluoroheptanesulfonic Acid

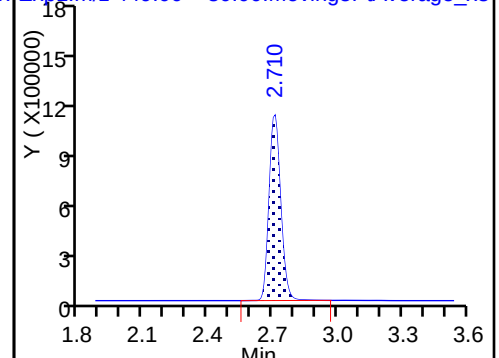
Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x3



Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3

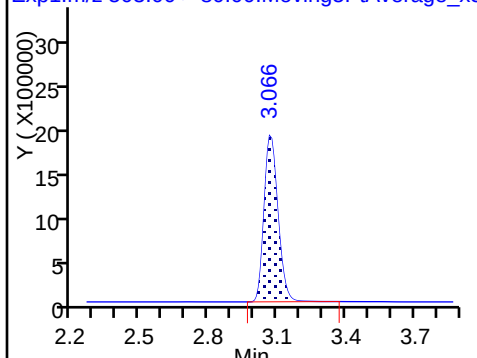


D 18 13C4 PFOS

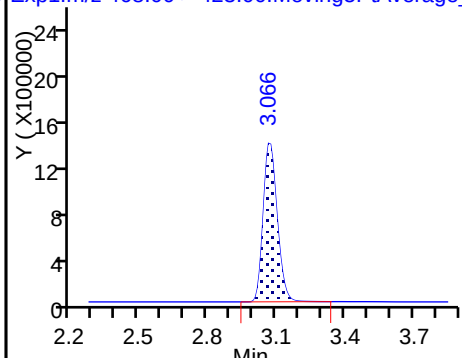
D 19 13C5 PFNA

17 Perfluorooctane sulfonic acid

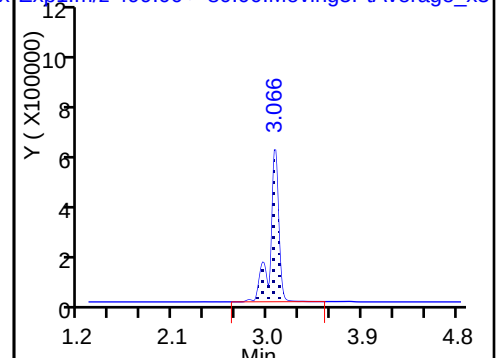
Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3



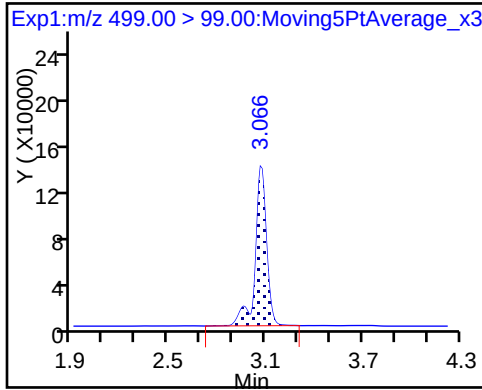
Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x3



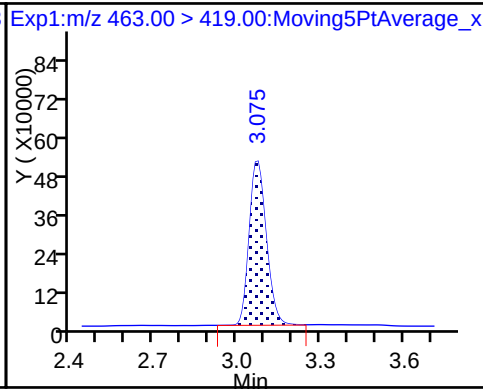
Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3



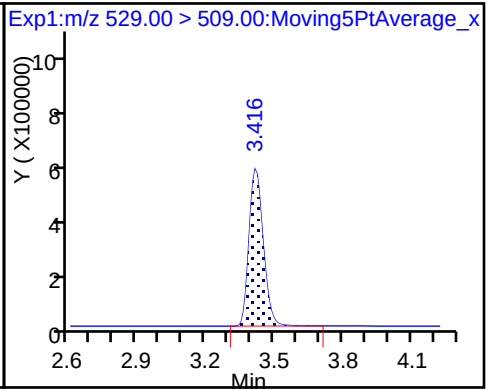
17 Perfluorooctane sulfonic acid



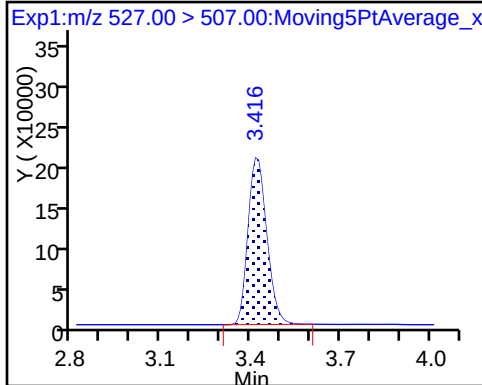
20 Perfluorononanoic acid



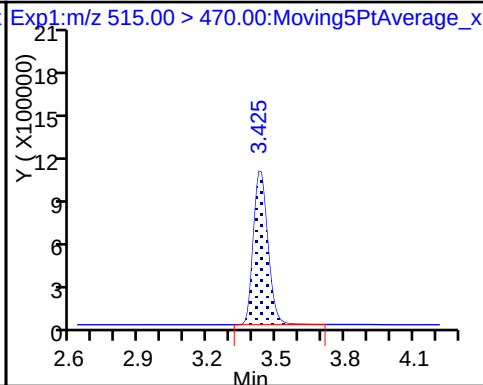
D 26 M2-8:2FTS



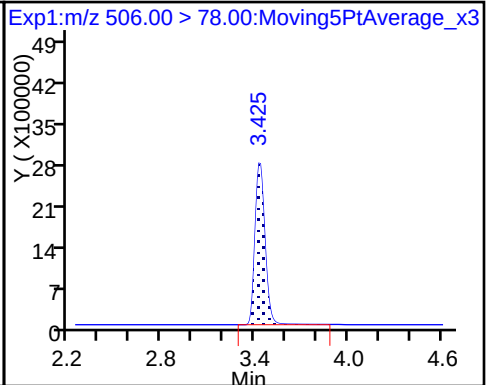
25 Sodium 1H,1H,2H,2H-perfluorodecanoate



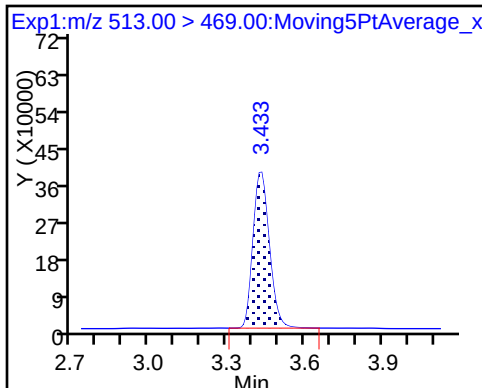
De23 13C2 PFDA



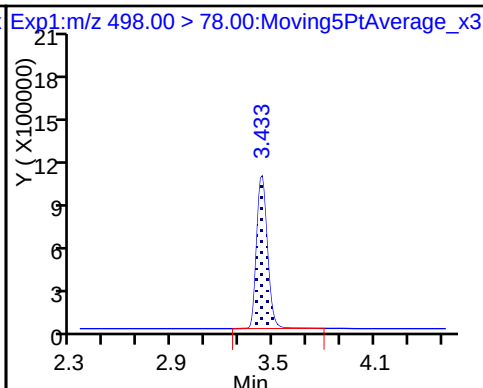
D 21 13C8 FOSA



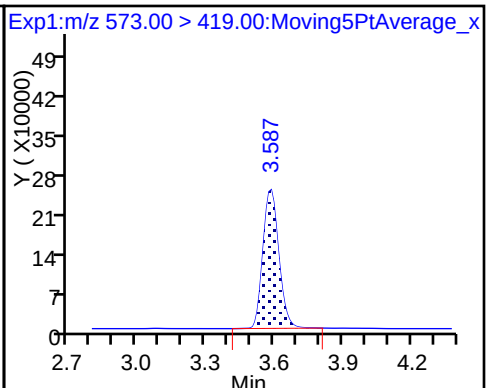
24 Perfluorodecanoic acid



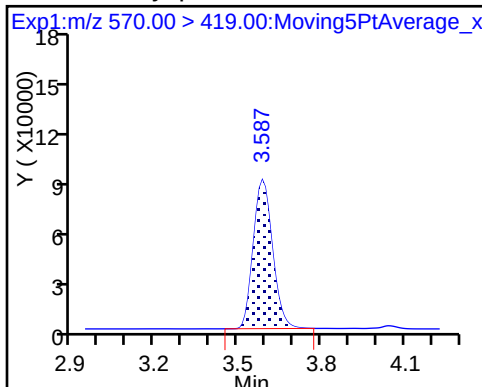
22 Perfluorooctane Sulfonamide



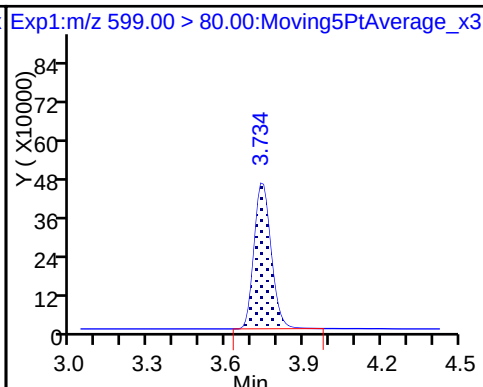
D 27 d3-NMeFOSAA



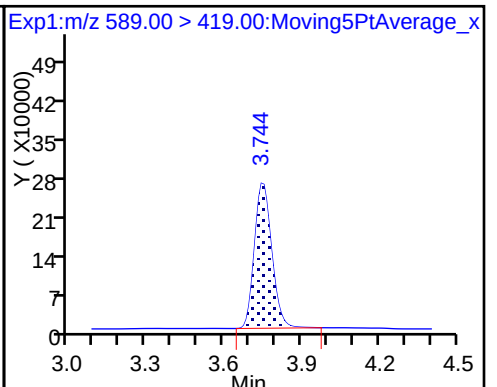
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid



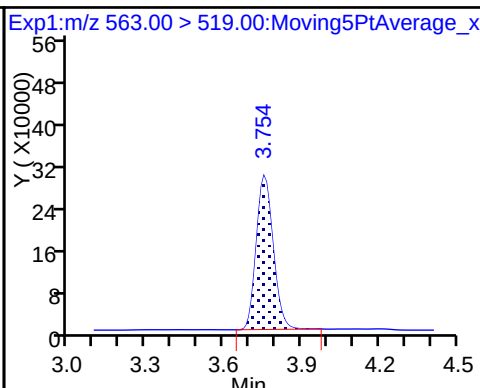
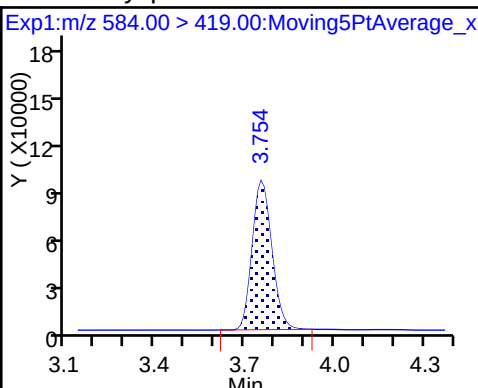
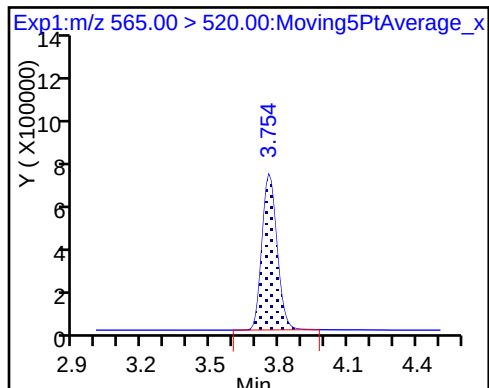
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA

33 N-ethyl perfluorooctane sulfonamid

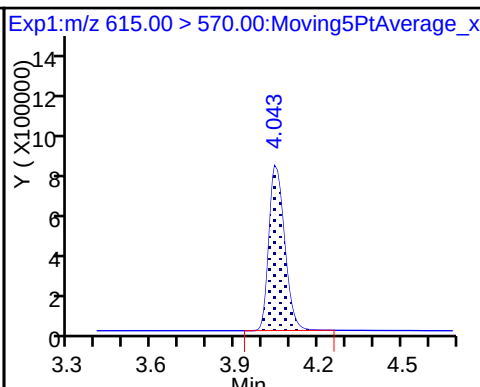
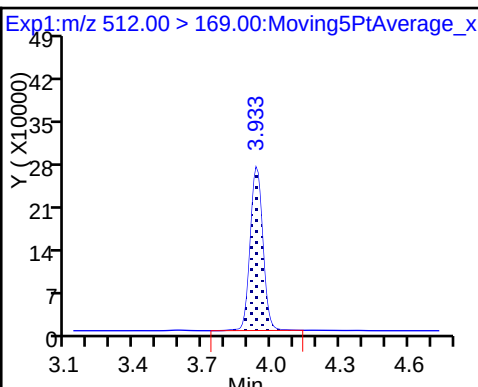
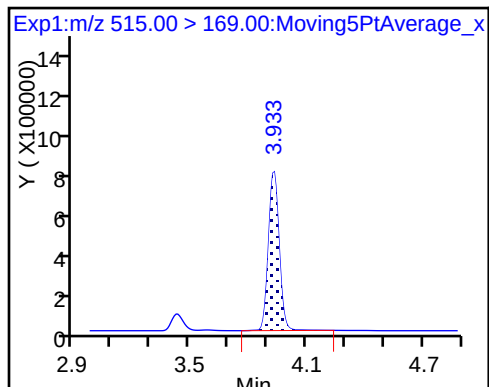
31 Perfluoroundecanoic acid



D 34 d-N-MeFOSA-M

35 MeFOSA

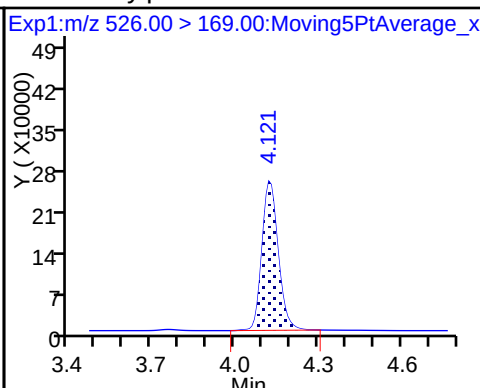
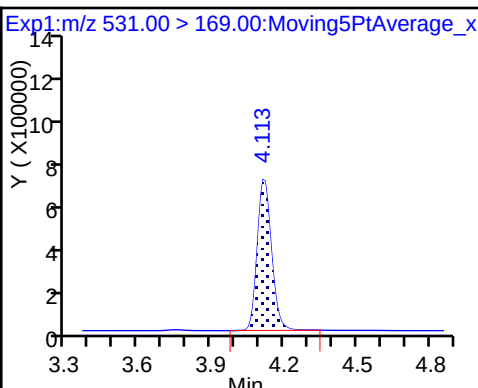
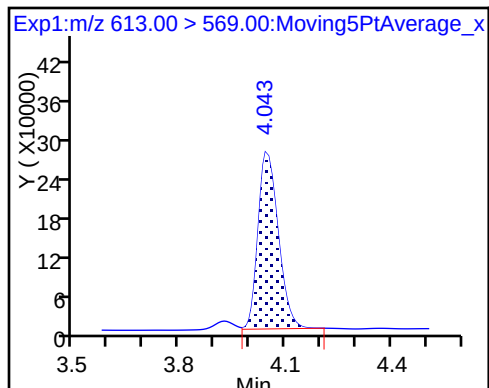
D 36 13C2 PFDaA



37 Perfluorododecanoic acid

D 38 d-N-EtFOSA-M

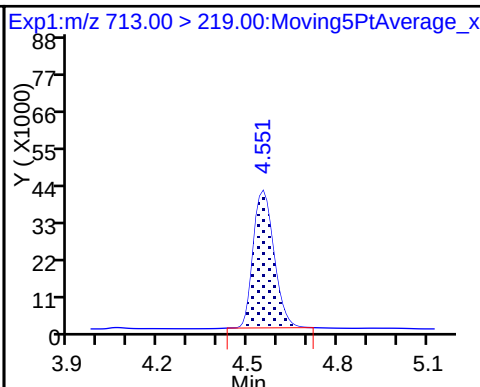
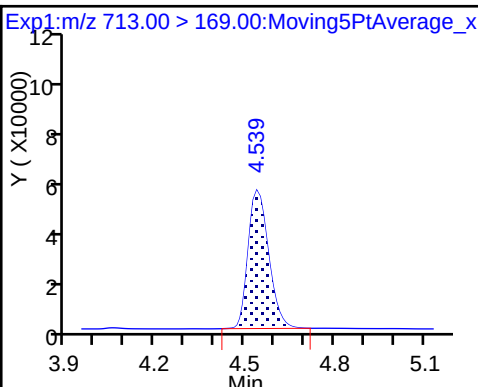
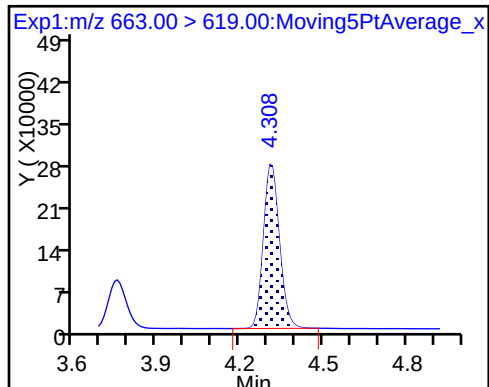
39 N-ethylperfluoro-1-octanesulfonami



41 Perfluorotridecanoic acid

42 Perfluorotetradecanoic acid

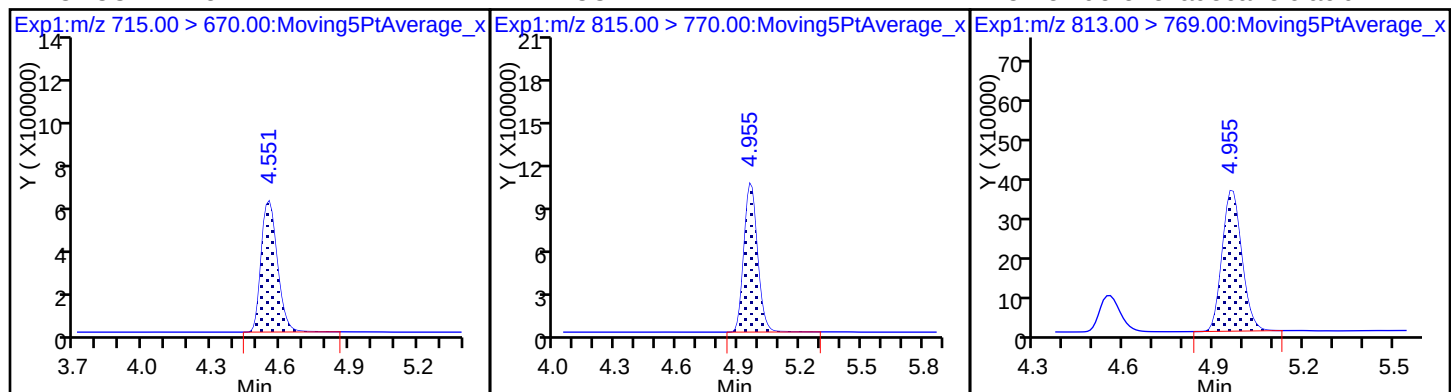
42 Perfluorotetradecanoic acid



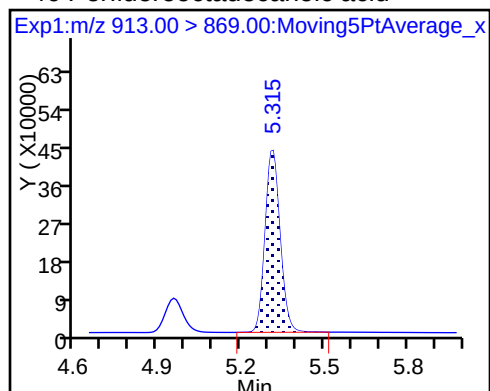
D 43 13C2-PFTeDA

D 44 13C2-PFHxDA

45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: CCV 320-181833/12 Calibration Date: 08/29/2017 10:23

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.28B_057.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.8915		49.1	50.0	-1.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.068		51.2	50.0	2.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	68.99		41.7	44.2	-5.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	0.9792		52.6	50.0	5.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	0.9727		50.5	50.0	0.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.003		43.8	45.5	-3.7	25.0
6:2FTS	AveID	0.8714	0.8210		44.7	47.4	-5.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.043		47.7	50.0	-4.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.214		48.2	47.6	1.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	0.9877		50.1	50.0	0.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.044		45.7	46.4	-1.5	25.0
8:2FTS	AveID	0.9289	0.9054		46.7	47.9	-2.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	0.9322		51.6	50.0	3.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	0.9432		51.0	50.0	1.9	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	0.9335		47.4	50.0	-5.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6459		51.6	48.2	7.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.8309		48.4	50.0	-3.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	1.048		46.5	50.0	-6.9	25.0
MeFOSA	AveID	0.9152	0.8908		48.7	50.0	-2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	0.9383		48.5	50.0	-3.0	25.0
N-EtFOSA-M	AveID	0.9286	0.9424		50.7	50.0	1.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	0.9728		51.0	50.0	2.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2151		42.6	50.0	-14.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8469		48.4	50.0	-3.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	0.9340		43.5	50.0	-13.1	25.0
13C4 PFBA	Ave	207167	215559		52.0	50.0	4.1	50.0
13C5 PFPeA	Ave	131459	152527		58.0	50.0	16.0	50.0
13C3-PFBS	Ave	3904	4145		49.4	46.5	6.2	50.0
13C2 PFHxA	Ave	137038	162262		59.2	50.0	18.4	50.0
13C4-PFHpA	Ave	126738	164875		65.0	50.0	30.1	50.0
18O2 PFHxS	Ave	218205	243709		52.8	47.3	11.7	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: CCV 320-181833/12 Calibration Date: 08/29/2017 10:23
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.28B_057.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	76513		68.7	47.5	44.5	50.0
13C4 PFOA	Ave	116250	145092		62.4	50.0	24.8	50.0
13C4 PFOS	Ave	151622	169067		53.3	47.8	11.5	50.0
13C5 PFNA	Ave	89077	112294		63.0	50.0	26.1	50.0
M2-8:2FTS	Ave	42602	52522		59.1	47.9	23.3	50.0
13C2 PFDA	Ave	77150	91299		59.2	50.0	18.3	50.0
13C8 FOSA	Ave	229921	244724		53.2	50.0	6.4	50.0
d3-NMeFOSAA	Ave	20617	24680		59.9	50.0	19.7	50.0
d5-NEtFOSAA	Ave	21565	25821		59.9	50.0	19.7	50.0
13C2 PFUnA	Ave	52276	61940		59.2	50.0	18.5	50.0
d-N-MeFOSA-M	Ave	55225	60199		54.5	50.0	9.0	50.0
13C2 PFDoA	Ave	51239	59068		57.6	50.0	15.3	50.0
d-N-EtFOSA-M	Ave	53035	59444		56.0	50.0	12.1	50.0
13C2-PFTeDA	Ave	54053	58870		54.5	50.0	8.9	50.0
13C2-PFHxDA	Ave	110226	90085		40.9	50.0	-18.3	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_057.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 29-Aug-2017 10:23:23 ALS Bottle#: 32 Worklist Smp#: 12
 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*sub18
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:31:01 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:20:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.564	1.564	0.0		10777962	52.0		104	22373	
2 Perfluorobutyric acid										
212.90 > 169.00	1.564	1.564	0.0	1.000	9608976	49.1		98.2	1198	
D 3 13C5-PFPeA										
267.90 > 223.00	1.773	1.773	0.0		7626330	58.0		116	36733	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.773	1.773	0.0	1.000	8148669	51.2		102	3265	
D 47 13C3-PFBS										
301.90 > 83.00	1.792	1.792	0.0		192751	49.4		106	5039	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.801	1.801	0.0	1.000	12639386	41.7		94.3	45493	
298.90 > 99.00	1.801	1.801	0.0	1.000	5782295		2.19(0.00-0.00)		33879	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	2.006	2.006	0.0	1.000	3046375	43.5		93.2	30426	
D 7 13C2 PFHxA										
315.00 > 270.00	2.041	2.041	0.0		8113120	59.2		118	30959	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.041	2.041	0.0	1.000	7943959	52.6		105	10496	
D 9 13C4-PFHpA										
367.00 > 322.00	2.365	2.365	0.0		8243738	65.0		130	24675	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.365	2.365	0.0	1.000	8018763	50.5		101	10455	
D 11 18O2 PFHxS										
403.00 > 84.00	2.381	2.381	0.0		11527455	52.8		112	32788	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.381	2.381	0.0	1.000	11122282	43.8		96.3	10890	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 M2-6:2FTS										
429.00 > 409.00	2.698	2.698	0.0		3634354	68.7		145	18639	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.698	2.698	0.0	1.000	2977375	44.7		94.2	27567	
D 14 13C4 PFOA										
417.00 > 372.00	2.720	2.720	0.0		7254584	62.4		125	28747	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.720	2.720	0.0	1.000	7568309	47.7		95.3	1137	
413.00 > 169.00	2.720	2.720	0.0	1.000	4004257		1.89(0.90-1.10)		11118	
* 62 13C2-PFOA										
415.00 > 370.00	2.720	2.720	0.0		6945554	50.0		100	18366	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.727	2.727	0.0	1.000	9770813	48.2		101	32260	
D 18 13C4 PFOS										
503.00 > 80.00	3.093	3.093	0.0		8081422	53.3		112	18721	
D 19 13C5 PFNA										
468.00 > 423.00	3.093	3.093	0.0		5614681	63.0		126	19952	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.093	3.093	0.0	1.000	8186689	45.7		98.5	159829	
499.00 > 99.00	3.093	3.093	0.0	1.000	1732464		4.73(0.90-1.10)		6670	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.093	3.093	0.0	1.000	5545351	50.1		100	3240	
D 26 M2-8:2FTS										
529.00 > 509.00	3.444	3.444	0.0		2515796	59.1		123	10755	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.444	3.444	0.0	1.000	2277714	46.7		97.5	14402	
D 23 13C2 PFDA										
515.00 > 470.00	3.453	3.453	0.0		4564964	59.2		118	21572	
D 21 13C8 FOSA										
506.00 > 78.00	3.453	3.453	0.0		12236175	53.2		106	24900	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.453	3.453	0.0	1.000	4255537	51.6		103	7111	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.453	3.453	0.0	1.000	11541231	51.0		102	283254	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.605	3.605	0.0		1234024	59.9		120	5068	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.616	3.616	0.0	1.003	1152002	47.4		94.7	8111	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.763	3.763	0.0	1.000	5263506	51.6		107	17584	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.772	3.772	0.0		1291034	59.9		120	1809	
D 30 13C2 PFUnA										
565.00 > 520.00	3.782	3.782	0.0		3097014	59.2		118	12257	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.782	3.782	0.0	1.003	1072716	48.4		96.8	7882	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.782	3.782	0.0	1.000	3244374	46.5		93.1	3065	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M	515.00 > 169.00	3.953	3.953	0.0	3009968	54.5		109	709	
35 MeFOSA	512.00 > 169.00	3.961	3.961	0.0	1.000	2681348	48.7	97.3	6639	
D 36 13C2 PFDaA	615.00 > 570.00	4.072	4.072	0.0	2953402	57.6		115	18938	
37 Perfluorododecanoic acid	613.00 > 569.00	4.072	4.072	0.0	1.000	2771018	48.5	97.0	1289	
D 38 d-N-EtFOSA-M	531.00 > 169.00	4.140	4.140	0.0	2972220	56.0		112	5633	
39 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.148	4.148	0.0	1.000	2800900	50.7	101	5876	
41 Perfluorotridecanoic acid	663.00 > 619.00	4.333	4.333	0.0	1.000	2872939	51.0	102	542	
42 Perfluorotetradecanoic acid	713.00 > 169.00	4.561	4.561	0.0	1.000	633196	42.6	85.1	4577	
	713.00 > 219.00	4.574	4.561	0.013	1.003	523055	1.21(0.00-0.00)		3082	
D 43 13C2-PFTeDA	715.00 > 670.00	4.574	4.574	0.0	2943482	54.5		109	11808	
D 44 13C2-PFHxDA	815.00 > 770.00	4.972	4.972	0.0	4504230	40.9		81.7	6996	
45 Perfluorohexadecanoic acid	813.00 > 769.00	4.982	4.982	0.0	1.000	3814623	48.4	96.7	305	
46 Perfluorooctadecanoic acid	913.00 > 869.00	5.330	5.330	0.0	1.000	4207078	43.5	86.9	577	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC_FULL-L5_00008

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_057.d

Injection Date: 29-Aug-2017 10:23:23

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 32

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

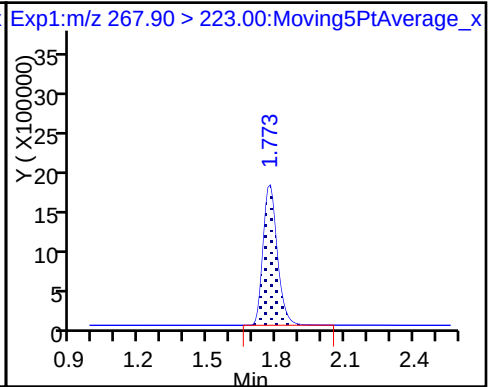
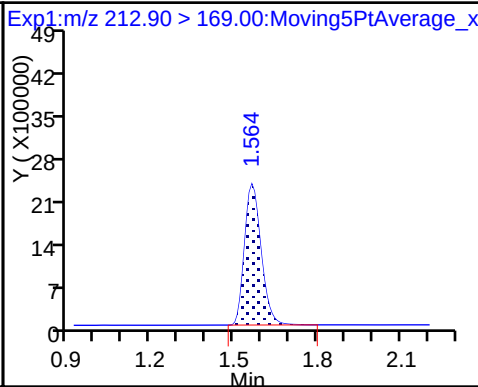
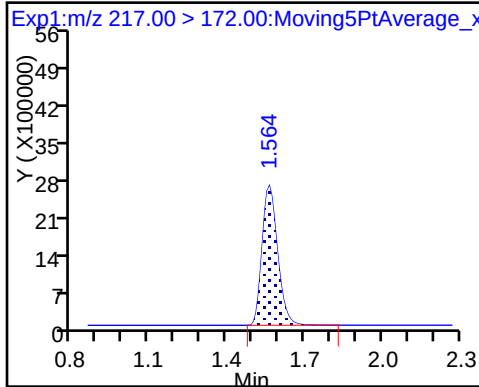
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

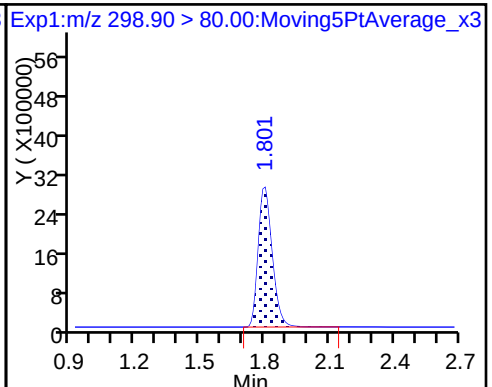
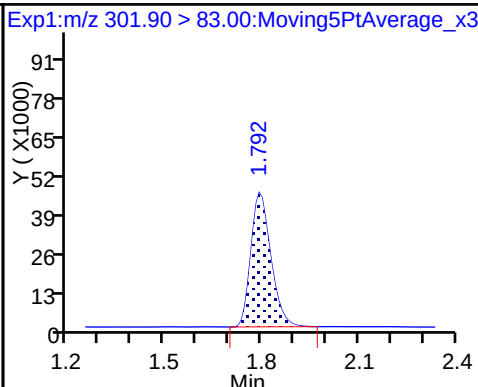
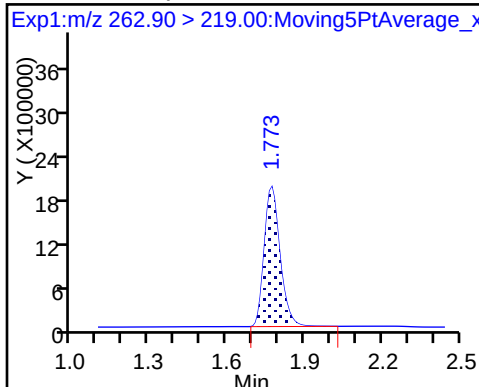
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

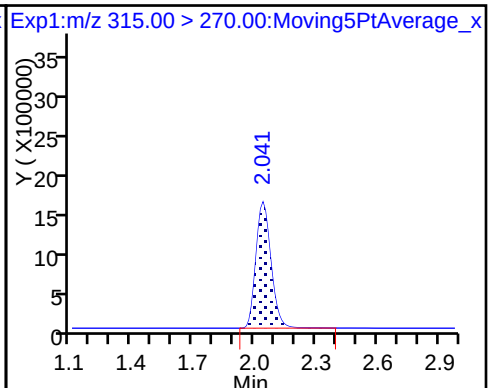
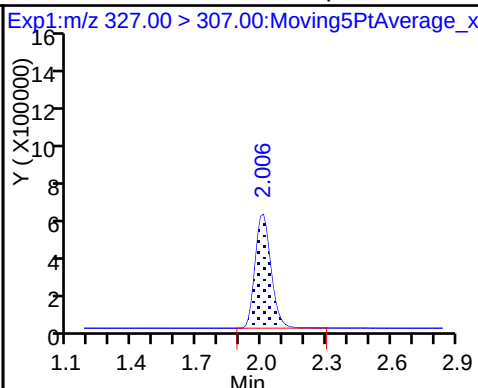
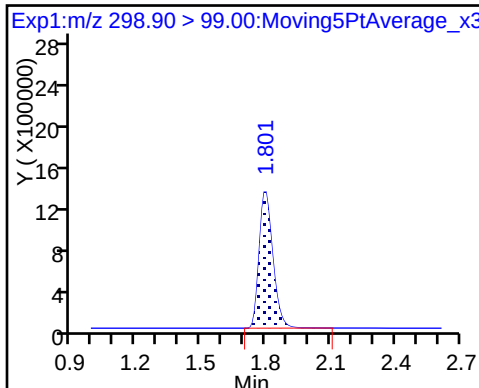
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa

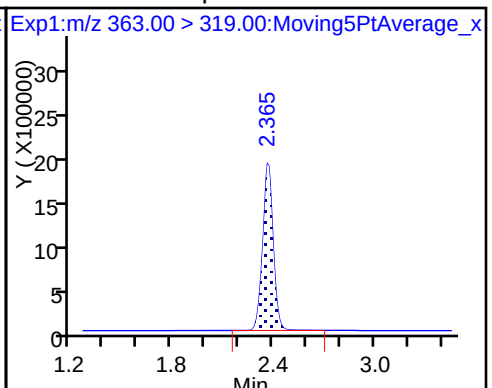
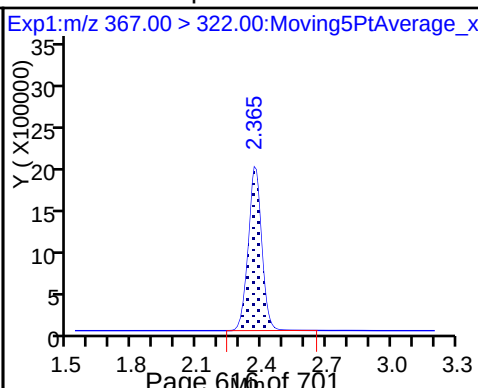
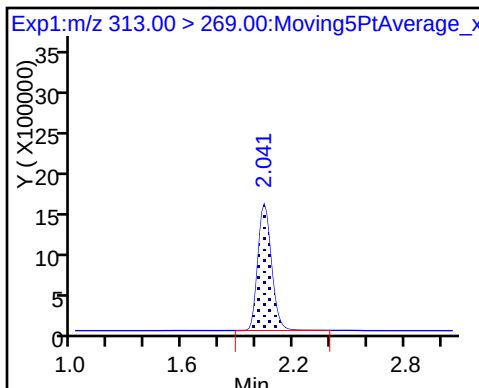
De 7 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

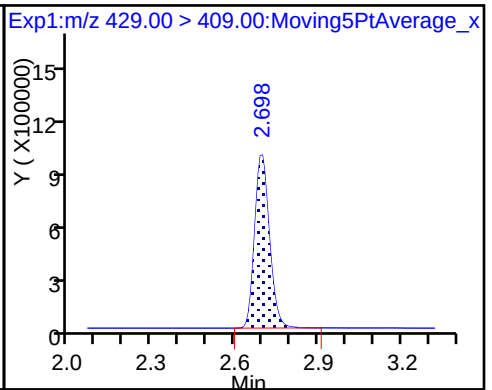
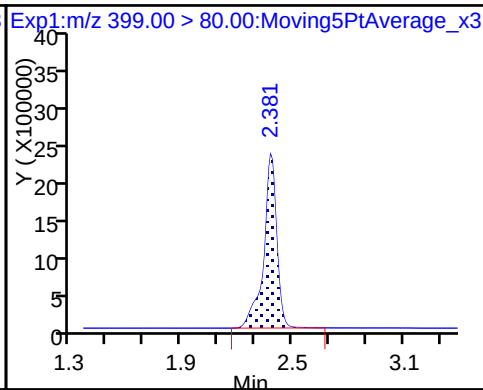
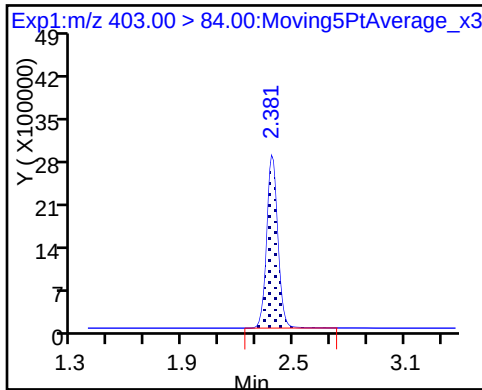
10 Perfluoroheptanoic acid



D 11 18O2 PFHxS

8 Perfluorohexanesulfonic acid

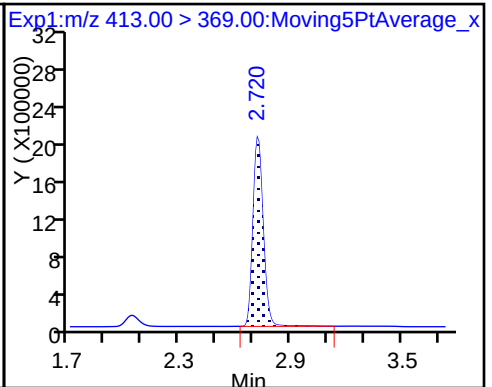
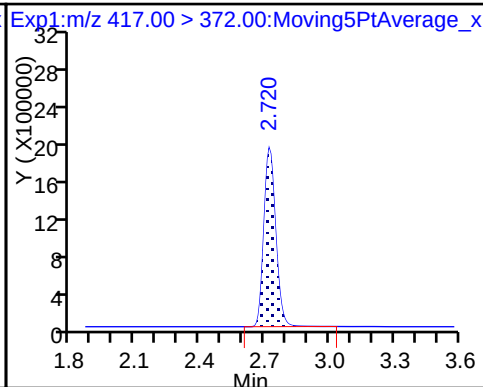
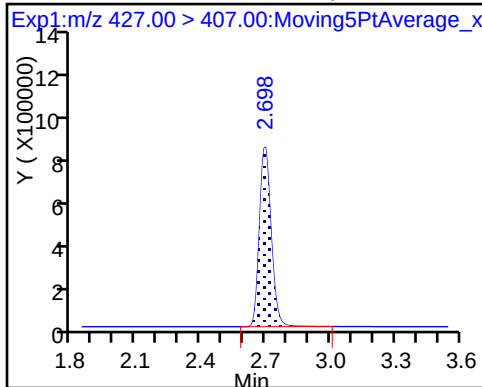
D 12 M2-6:2FTS



13 Sodium 1H,1H,2H,2H-perfluorooctadecanoate

De 14 13C4 PFOA

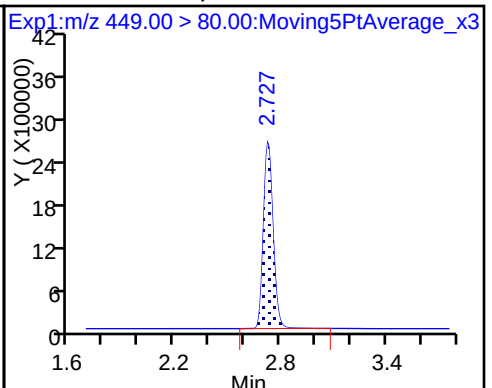
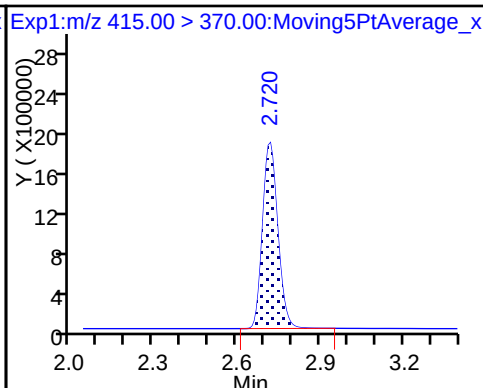
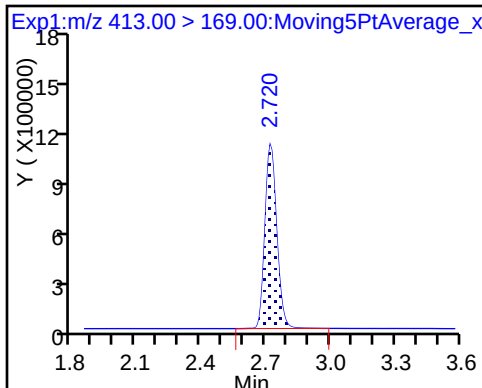
15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

* 62 13C2-PFOA

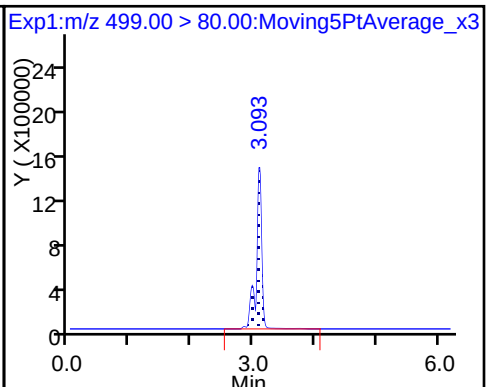
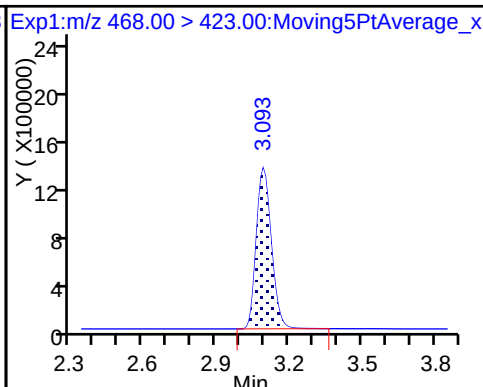
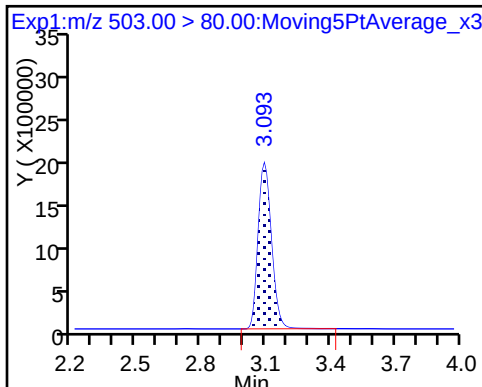
16 Perfluoroheptanesulfonic Acid



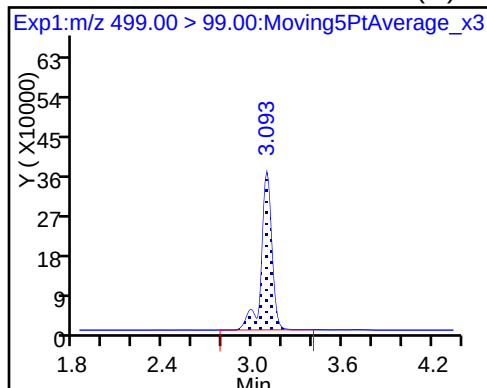
D 18 13C4 PFOS

D 19 13C5 PFNA

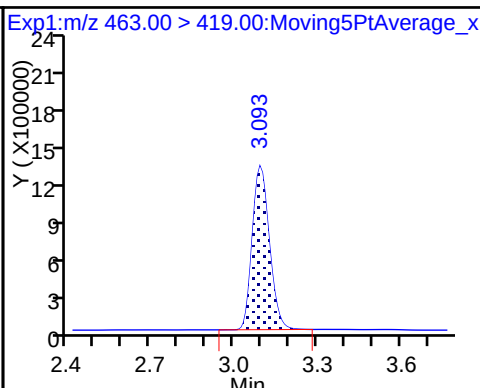
17 Perfluorooctane sulfonic acid



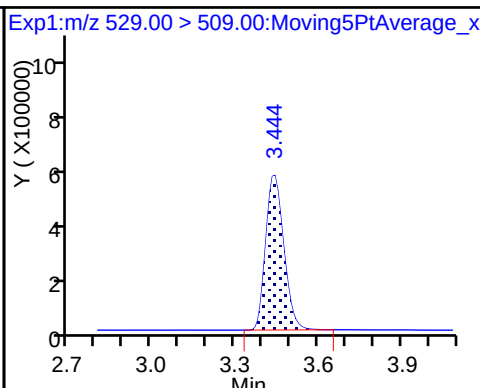
17 Perfluorooctane sulfonic acid (M)



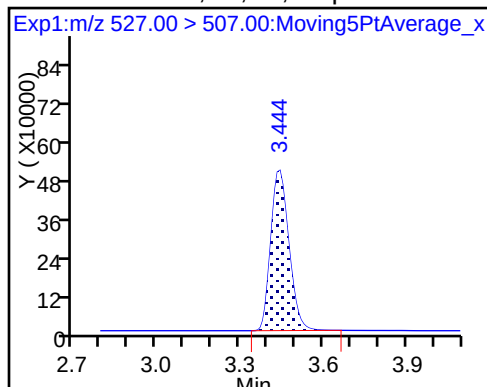
20 Perfluorononanoic acid



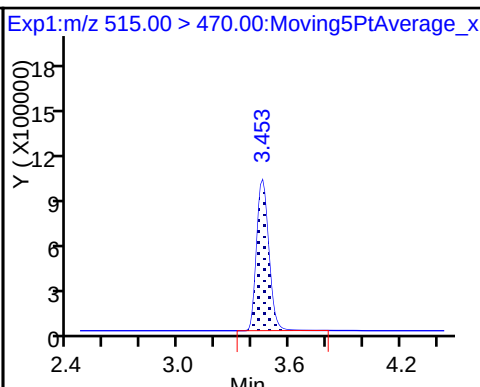
D 26 M2-8:2FTS



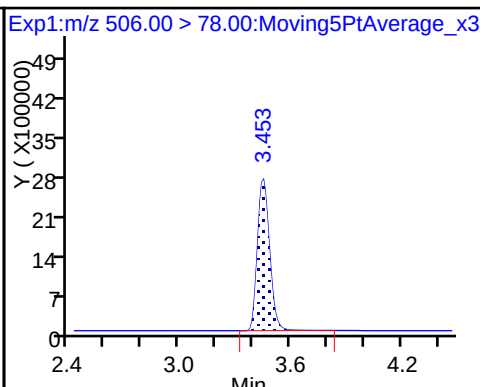
25 Sodium 1H,1H,2H,2H-perfluorodecanoate



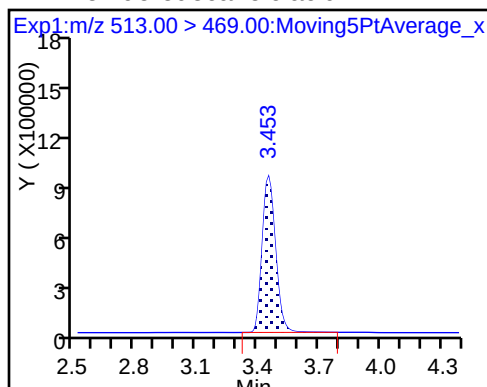
De23 13C2 PFDA



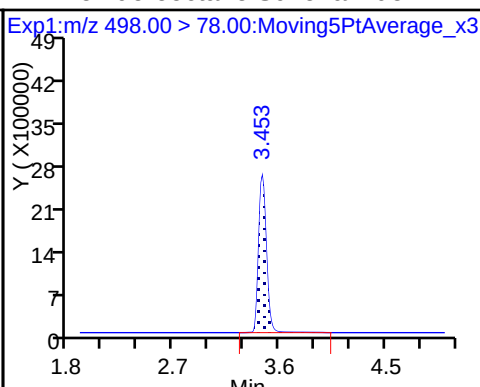
D 21 13C8 FOSA



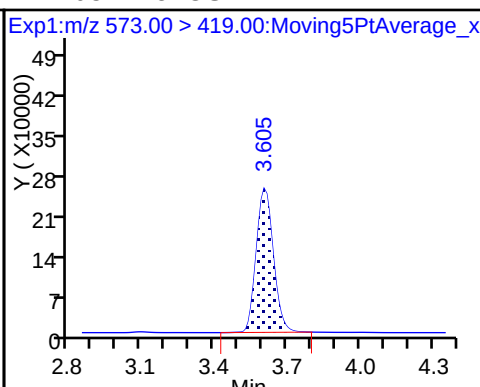
24 Perfluorodecanoic acid



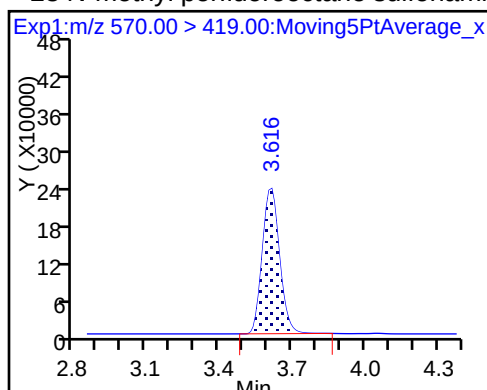
22 Perfluorooctane Sulfonamide



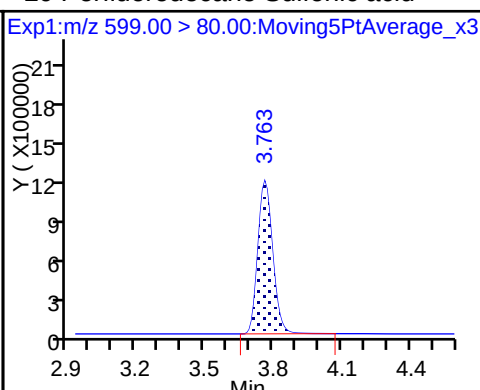
D 27 d3-NMeFOSAA



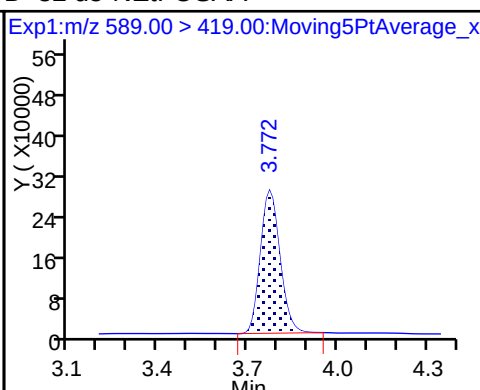
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid



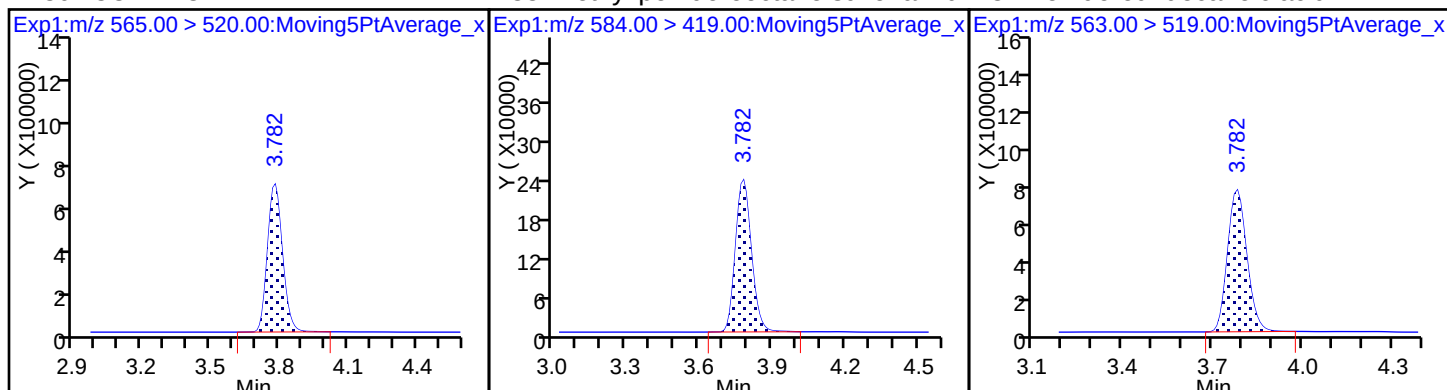
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA

33 N-ethyl perfluorooctane sulfonamid

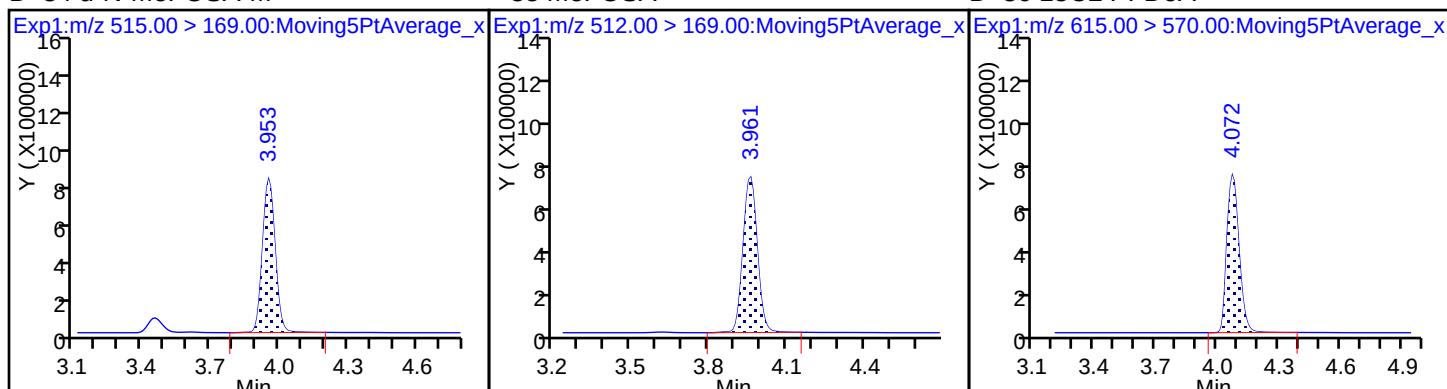
31 Perfluoroundecanoic acid



D 34 d-N-MeFOSA-M

35 MeFOSA

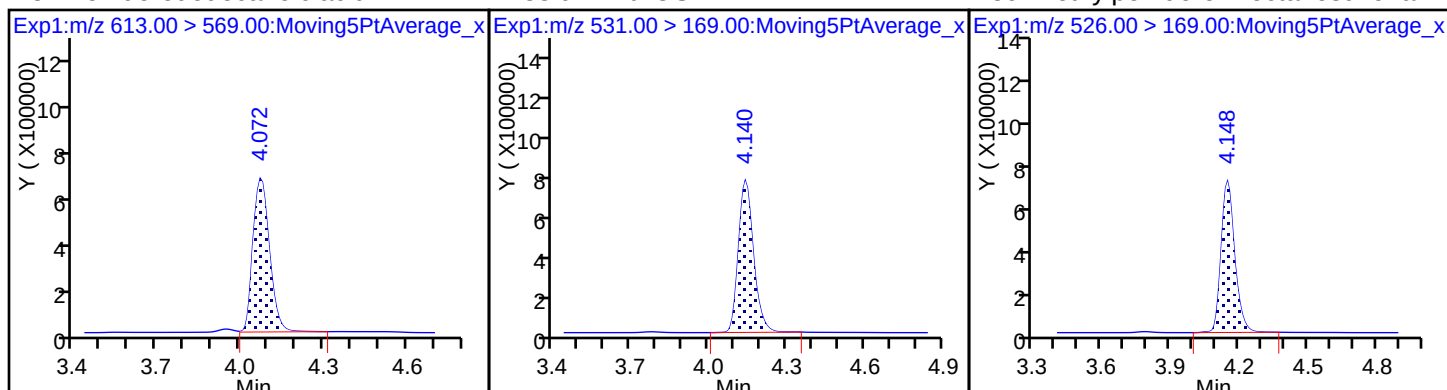
D 36 13C2 PFDaA



37 Perfluorododecanoic acid

D 38 d-N-EtFOSA-M

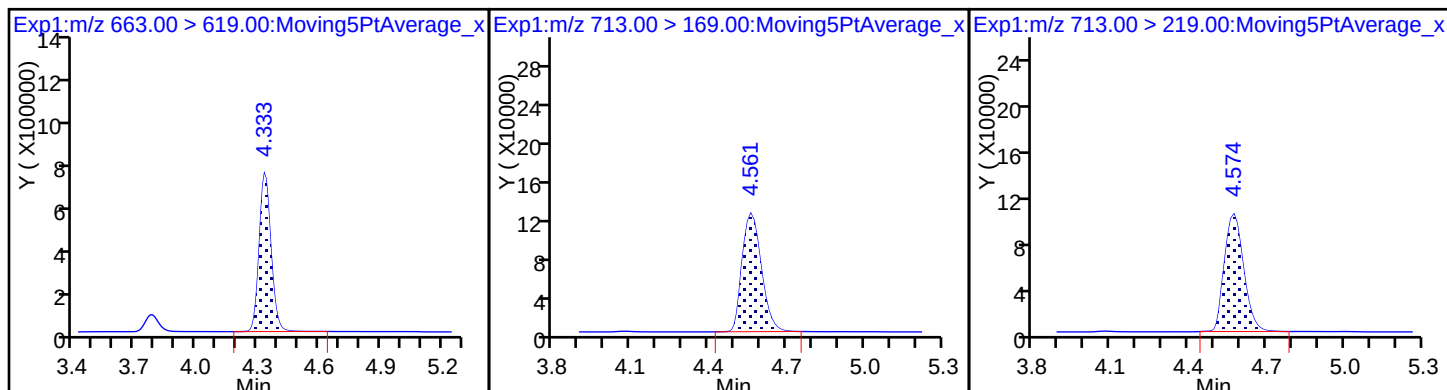
39 N-ethylperfluoro-1-octanesulfonami



41 Perfluorotridecanoic acid

42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

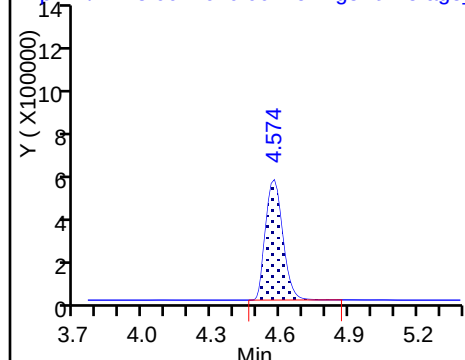


D 43 13C2-PFTeDA

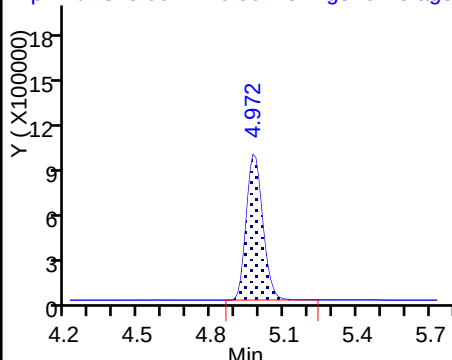
D 44 13C2-PFHxDA

45 Perfluorohexadecanoic acid

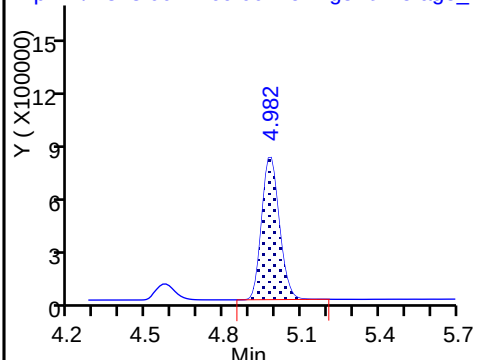
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Exp1:m/z 815.00 > 770.00:Moving5PtAverage_x

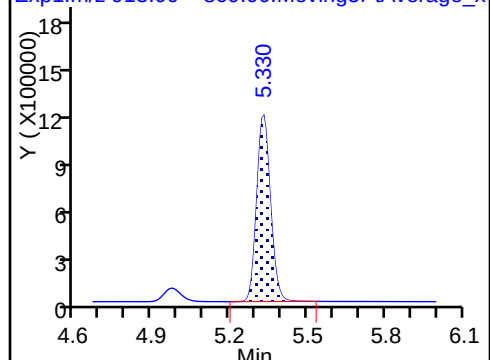


Exp1:m/z 813.00 > 769.00:Moving5PtAverage_x



46 Perfluorooctadecanoic acid

Exp1:m/z 913.00 > 869.00:Moving5PtAverage_x



TestAmerica Sacramento

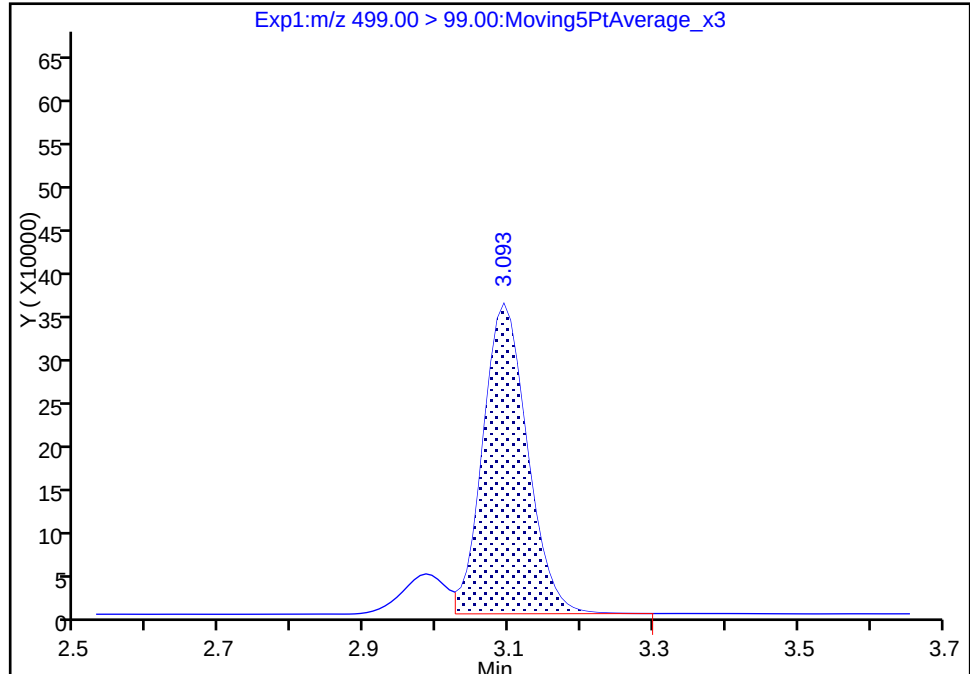
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Injection Date: 29-Aug-2017 10:23:23 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 32 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

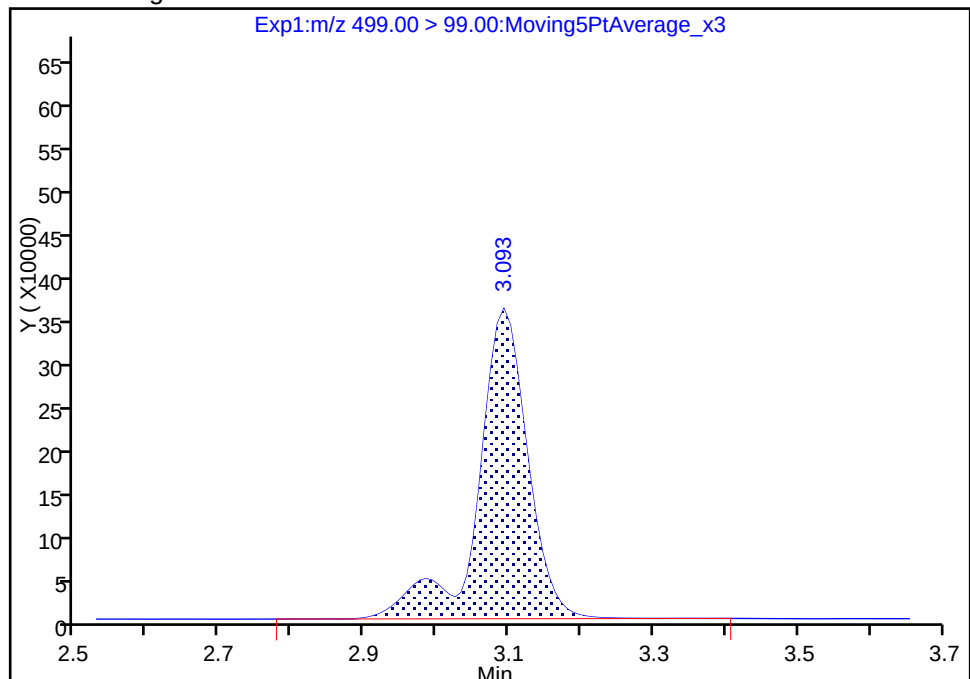
RT: 3.09
Area: 1533039
Amount: 45.681318
Amount Units: ng/ml

Processing Integration Results



RT: 3.09
Area: 1732464
Amount: 45.681318
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:20:12

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: CCV 320-181833/22 Calibration Date: 08/29/2017 11:32

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.28B_067.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.9416		20.7	20.0	3.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.078		20.7	20.0	3.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	76.73		18.5	17.7	4.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	0.9465		20.3	20.0	1.6	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	0.9580		19.9	20.0	-0.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.065		18.6	18.2	2.3	25.0
6:2FTS	AveID	0.8714	0.8527		18.6	19.0	-2.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.007		18.4	20.0	-8.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.332		21.2	19.0	11.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	0.9637		19.6	20.0	-2.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.050		18.4	18.6	-1.0	25.0
8:2FTS	AveID	0.9289	0.9613		19.8	19.2	3.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	0.9629		20.8	20.0	4.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	0.9077		20.1	20.0	0.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	0.8853		18.0	20.0	-10.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6446		20.6	19.3	6.9	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.8254		19.2	20.0	-3.8	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	0.9798		17.4	20.0	-13.0	25.0
MeFOSA	AveID	0.9152	0.8863		19.4	20.0	-3.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	0.8411		17.4	20.0	-13.0	25.0
N-EtFOSA-M	AveID	0.9286	0.8966		19.3	20.0	-3.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	0.8240		17.3	20.0	-13.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2053		16.2	20.0	-18.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8514		19.2	20.0	-4.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	0.8788		16.4	20.0	-18.2	25.0
13C4 PFBA	Ave	207167	215226		51.9	50.0	3.9	50.0
13C5 PFPeA	Ave	131459	158783		60.4	50.0	20.8	50.0
13C3-PFBS	Ave	3904	3990		47.5	46.5	2.2	50.0
13C2 PFHxA	Ave	137038	166021		60.6	50.0	21.1	50.0
13C4-PFHpA	Ave	126738	163424		64.5	50.0	28.9	50.0
18O2 PFHxS	Ave	218205	231311		50.1	47.3	6.0	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: CCV 320-181833/22 Calibration Date: 08/29/2017 11:32
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.28B_067.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	74587		66.9	47.5	40.9	50.0
13C4 PFOA	Ave	116250	151132		65.0	50.0	30.0	50.0
13C4 PFOS	Ave	151622	161307		50.9	47.8	6.4	50.0
13C5 PFNA	Ave	89077	114149		64.1	50.0	28.1	50.0
M2-8:2FTS	Ave	42602	50673		57.0	47.9	18.9	50.0
13C8 FOSA	Ave	229921	241987		52.6	50.0	5.2	50.0
13C2 PFDA	Ave	77150	94925		61.5	50.0	23.0	50.0
d3-NMeFOSAA	Ave	20617	25659		62.2	50.0	24.5	50.0
d5-NEtFOSAA	Ave	21565	24794		57.5	50.0	15.0	50.0
13C2 PFUnA	Ave	52276	66669		63.8	50.0	27.5	50.0
d-N-MeFOSA-M	Ave	55225	59090		53.5	50.0	7.0	50.0
13C2 PFDoA	Ave	51239	64168		62.6	50.0	25.2	50.0
d-N-EtFOSA-M	Ave	53035	59389		56.0	50.0	12.0	50.0
13C2-PFTeDA	Ave	54053	61735		57.1	50.0	14.2	50.0
13C2-PFHxDA	Ave	110226	99188		45.0	50.0	-10.0	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_067.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 29-Aug-2017 11:32:24 ALS Bottle#: 31 Worklist Smp#: 22
 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*sub18
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:31:26 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d

Column 1 : Det: EXP1

Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:29:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.565	1.564	0.001		10761298	51.9		104	26273	
2 Perfluorobutyric acid										
212.90 > 169.00	1.565	1.564	0.001	1.000	4052949	20.7		104	621	
D 3 13C5-PFPeA										
267.90 > 223.00	1.775	1.773	0.002		7939136	60.4		121	51853	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.775	1.773	0.002	1.000	3423018	20.7		103	1478	
D 47 13C3-PFBS										
301.90 > 83.00	1.802	1.792	0.010		185537	47.5		102	5282	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.802	1.801	0.001	1.000	5412580	18.5		105	32381	
298.90 > 99.00	1.802	1.801	0.001	1.000	2266706		2.39(0.00-0.00)		16679	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	2.009	2.006	0.003	1.000	1333333	19.6		105	26901	
D 7 13C2 PFHxA										
315.00 > 270.00	2.043	2.041	0.002		8301042	60.6		121	23023	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.055	2.041	0.014	1.000	3142819	20.3		102	4085	
D 9 13C4-PFHpA										
367.00 > 322.00	2.383	2.365	0.018		8171199	64.5		129	20467	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.383	2.365	0.018	1.000	3131283	19.9		99.4	3716	
D 11 18O2 PFHxS										
403.00 > 84.00	2.399	2.381	0.018		10941003	50.1		106	17068	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.399	2.381	0.018	1.000	4485044	18.6		102	7327	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 M2-6:2FTS										
429.00 > 409.00	2.710	2.698	0.012		3542879	66.9		141	18225	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.710	2.698	0.012	1.000	1205873	18.6		97.9	13162	
D 14 13C4 PFOA										
417.00 > 372.00	2.739	2.720	0.019		7556609	65.0		130	28688	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.739	2.720	0.019	1.000	3043390	18.4		92.0	428	
413.00 > 169.00	2.739	2.720	0.019	1.000	1602298		1.90(0.90-1.10)		6931	
* 62 13C2-PFOA										
415.00 > 370.00	2.732	2.720	0.012		7114088	50.0		100	22354	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.746	2.727	0.019	1.000	4092009	21.2		111	14417	
D 18 13C4 PFOS										
503.00 > 80.00	3.109	3.093	0.016		7710474	50.9		106	15225	
D 19 13C5 PFNA										
468.00 > 423.00	3.109	3.093	0.016		5707440	64.1		128	18090	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.109	3.093	0.016	1.000	3143019	18.4		99.0	6770	
499.00 > 99.00	3.109	3.093	0.016	1.000	637115		4.93(0.90-1.10)		3450	
20 Perfluorononanoic acid										
463.00 > 419.00	3.109	3.093	0.016	1.000	2200002	19.6		97.8	1748	
D 26 M2-8:2FTS										
529.00 > 509.00	3.451	3.444	0.007		2427259	57.0		119	13993	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.451	3.444	0.007	1.000	933282	19.8		103	12413	
D 23 13C2 PFDA										
515.00 > 470.00	3.469	3.453	0.016		4746234	61.5		123	21264	
D 21 13C8 FOSA										
506.00 > 78.00	3.460	3.453	0.007		12099364	52.6		105	46085	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.469	3.453	0.016	1.000	1723262	20.1		101	3704	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.460	3.453	0.007	1.000	4660159	20.8		104	24306	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.620	3.605	0.015		1282964	62.2		124	5874	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.620	3.616	0.004	1.000	454332	18.0		89.8	6333	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.777	3.763	0.014	1.000	2004633	20.6		107	10223	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.786	3.772	0.014		1239696	57.5		115	1763	
D 30 13C2 PFUnA										
565.00 > 520.00	3.796	3.782	0.014		3333434	63.8		128	22405	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.796	3.782	0.014	1.003	409280	19.2		96.2	5280	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.796	3.782	0.014	1.000	1306496	17.4		87.0	1849	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.968	3.953	0.015		2954476	53.5		107	739	
35 MeFOSA										
512.00 > 169.00	3.968	3.961	0.007	1.000	1047428	19.4		96.8	8314	
D 36 13C2 PFDaA										
615.00 > 570.00	4.088	4.072	0.016		3208404	62.6		125	23634	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.088	4.072	0.016	1.000	1079423	17.4		87.0	550	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.156	4.140	0.016		2969441	56.0		112	4749	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.156	4.148	0.008	1.000	1064925	19.3		96.6	4772	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.352	4.333	0.019	1.000	1057512	17.3		86.4	205	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.571	4.561	0.010	1.000	253427	16.2		81.2	2500	
713.00 > 219.00	4.582	4.561	0.021	1.002	197681		1.28(0.00-0.00)		1467	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.582	4.574	0.008		3086763	57.1		114	27958	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.985	4.972	0.013		4959417	45.0		90.0	14877	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.994	4.982	0.012	1.000	1688959	19.2		95.8	164	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.341	5.330	0.011	1.000	1743227	16.4		81.8	270	

Reagents:

LCPFC_FULL-L4_00008

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_067.d

Injection Date: 29-Aug-2017 11:32:24

Instrument ID: A8_N

Lims ID: CCV L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 31

Worklist Smp#: 22

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

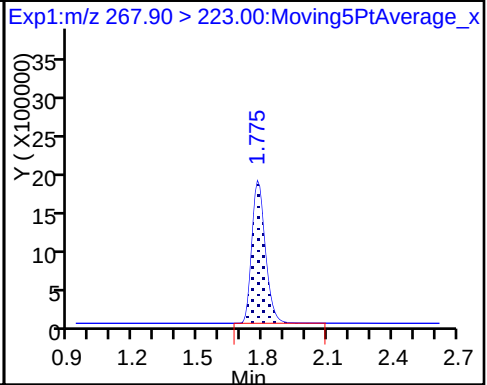
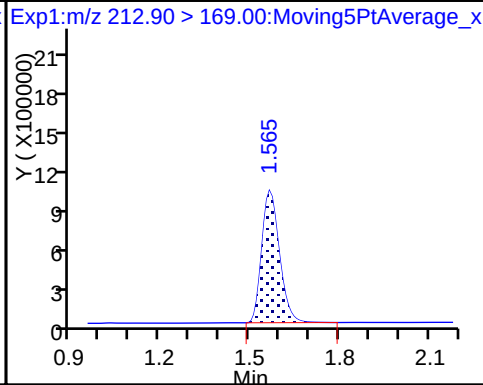
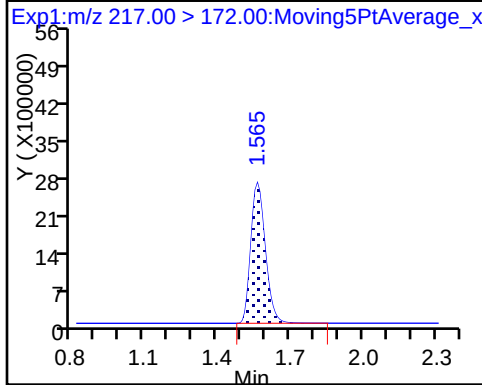
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

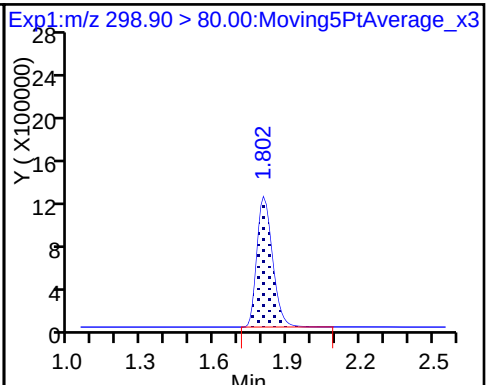
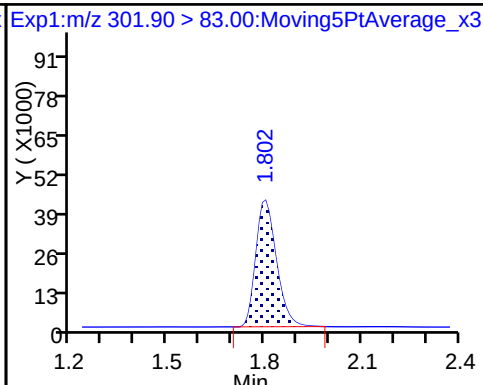
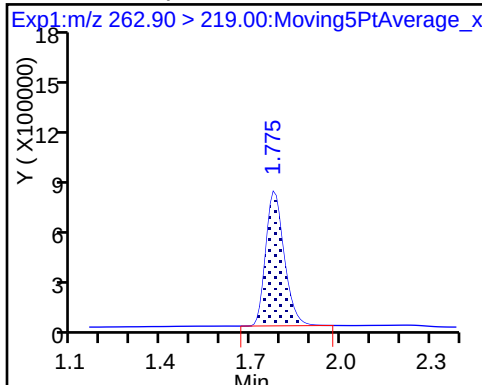
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

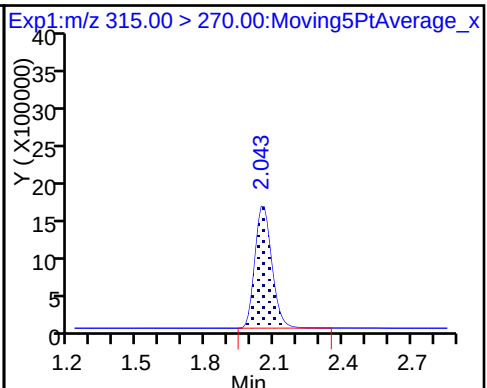
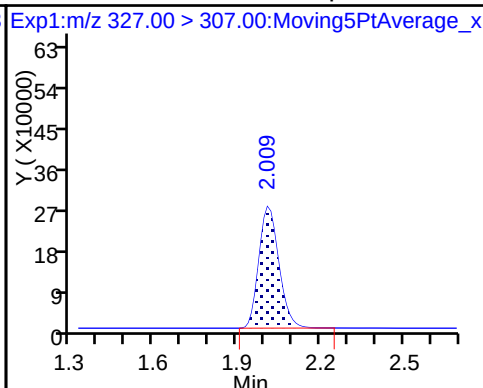
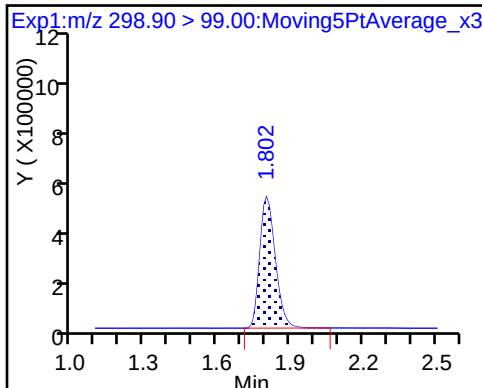
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa

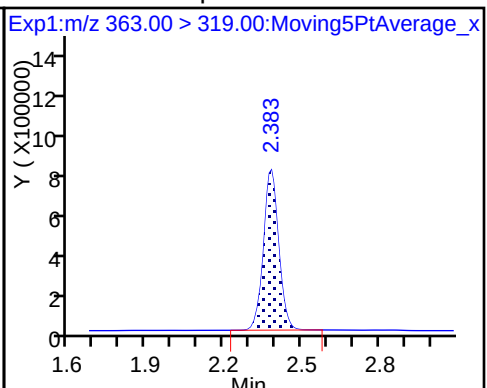
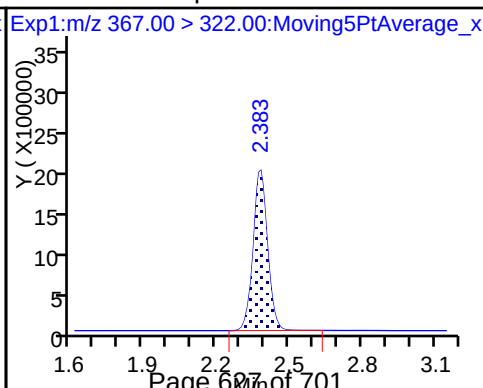
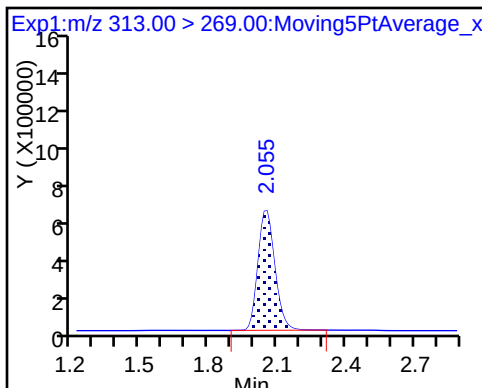
De 7 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

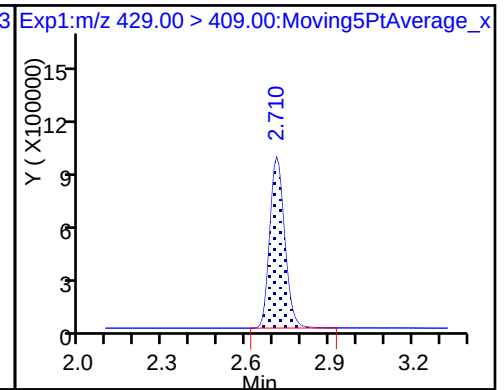
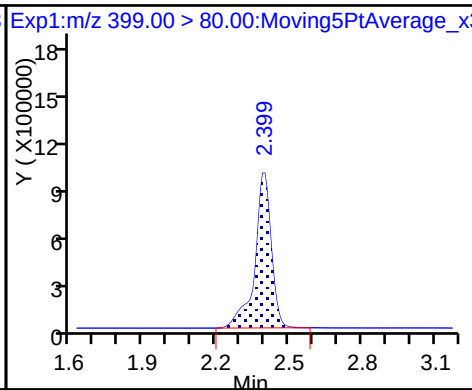
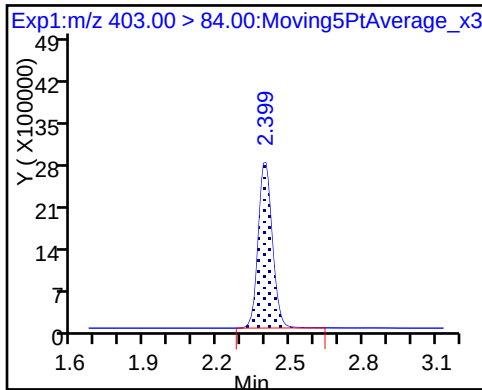
10 Perfluoroheptanoic acid



D 11 18O2 PFHxS

8 Perfluorohexanesulfonic acid

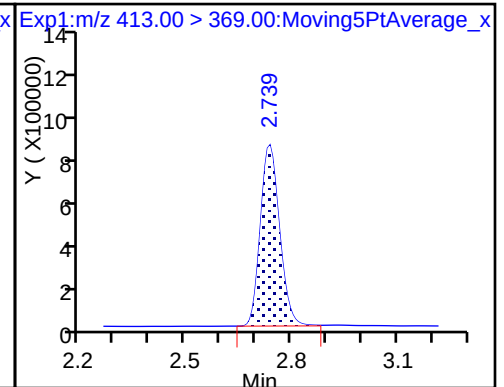
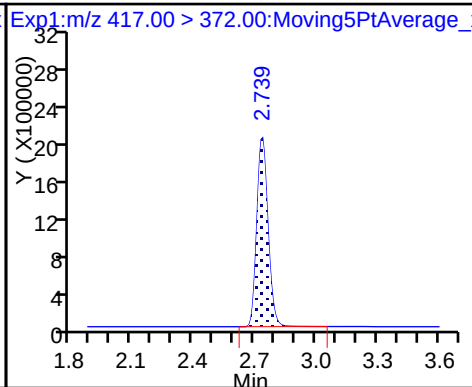
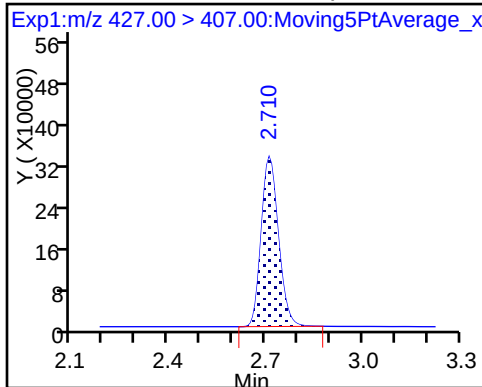
D 12 M2-6:2FTS



13 Sodium 1H,1H,2H,2H-perfluorooctane

De 14 13C4 PFOA

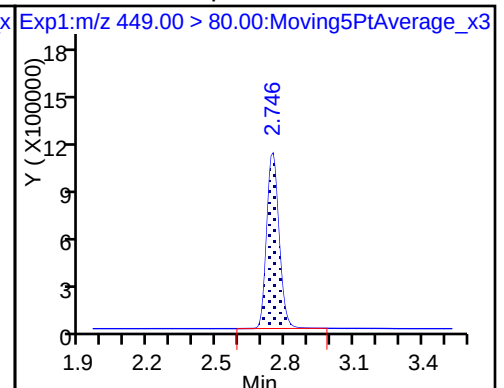
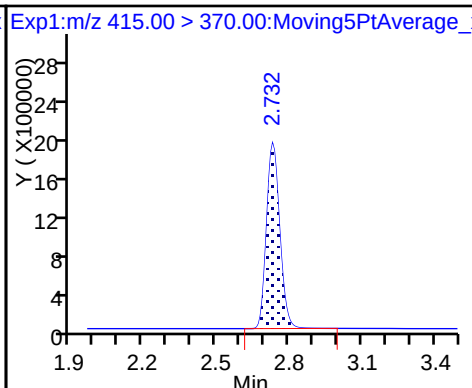
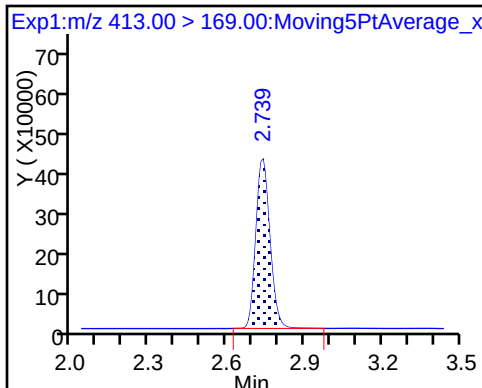
15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

* 62 13C2-PFOA

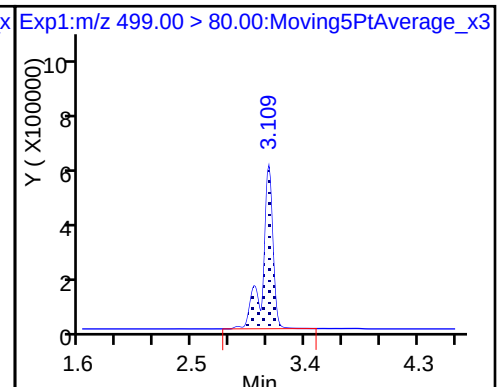
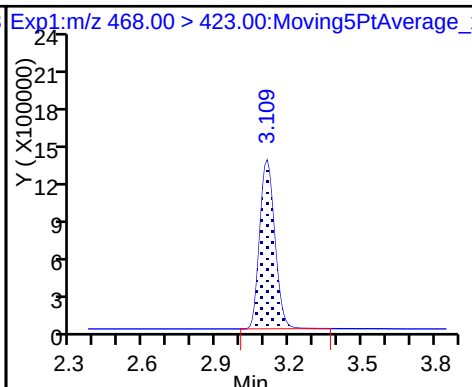
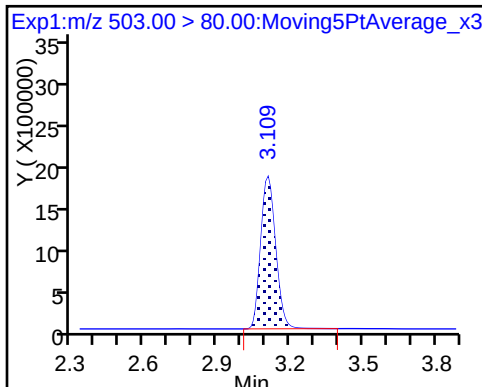
16 Perfluoroheptanesulfonic Acid



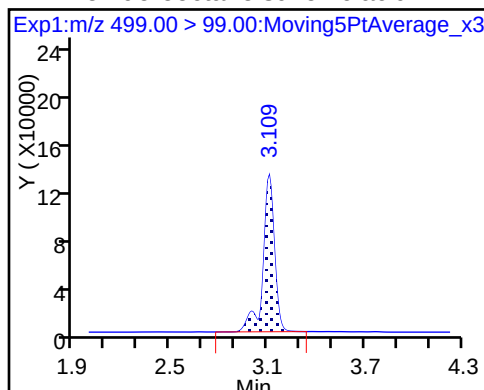
D 18 13C4 PFOS

D 19 13C5 PFNA

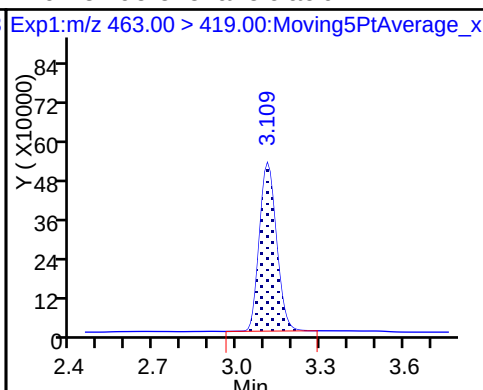
17 Perfluorooctane sulfonic acid



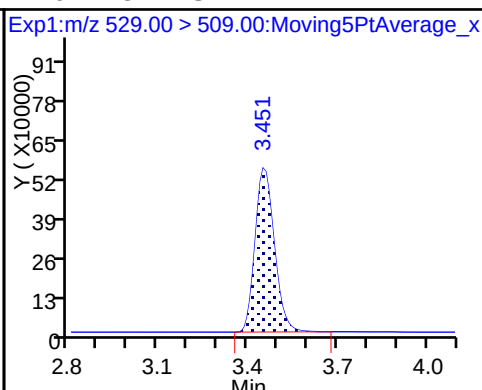
17 Perfluorooctane sulfonic acid



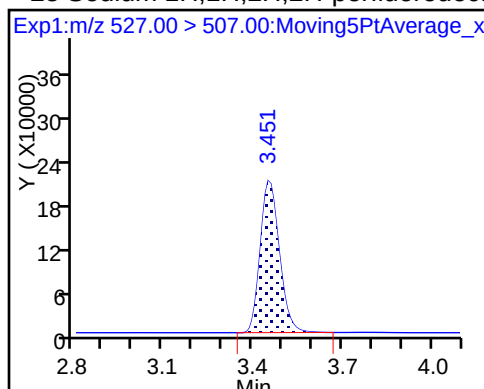
20 Perfluorononanoic acid



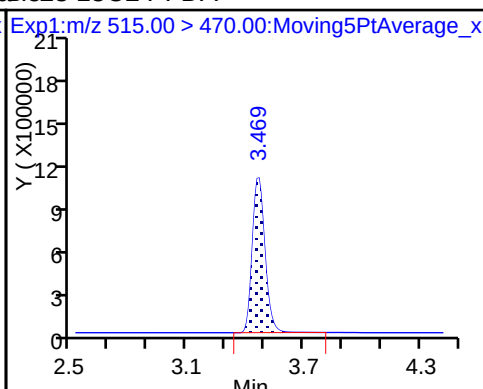
D 26 M2-8:2FTS



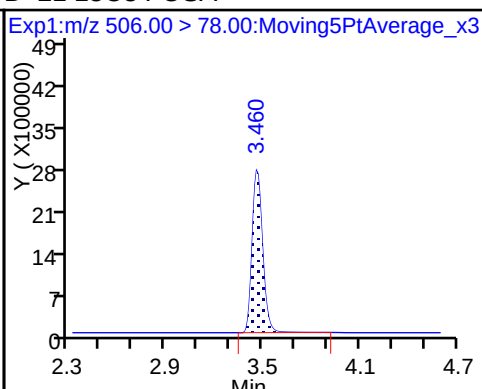
25 Sodium 1H,1H,2H,2H-perfluorodecanoate



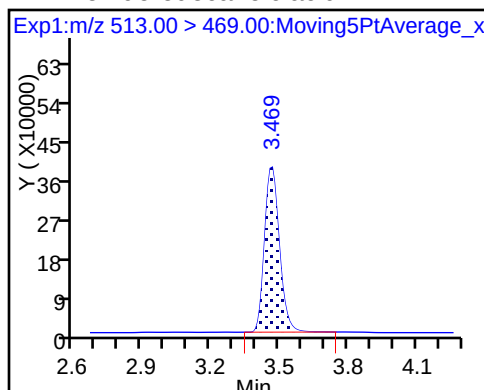
De23 13C2 PFDA



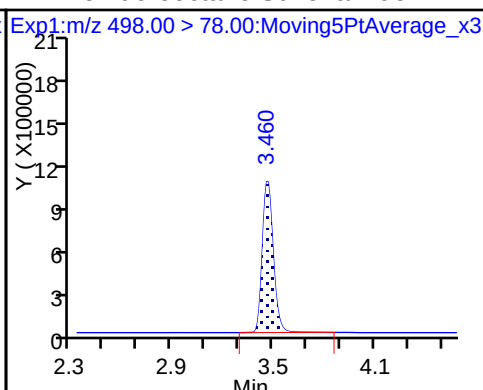
D 21 13C8 FOSA



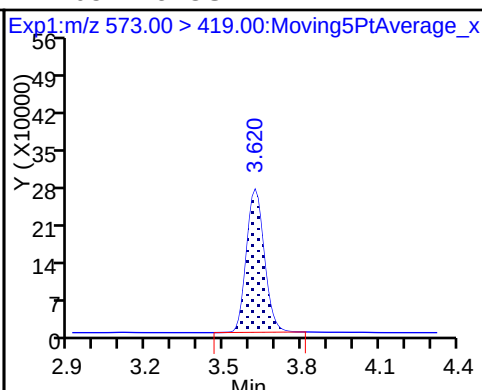
24 Perfluorodecanoic acid



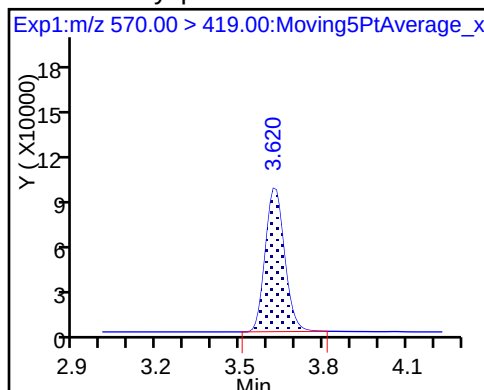
22 Perfluorooctane Sulfonamide



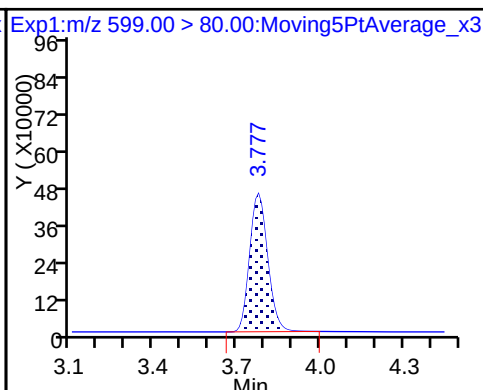
D 27 d3-NMeFOSAA



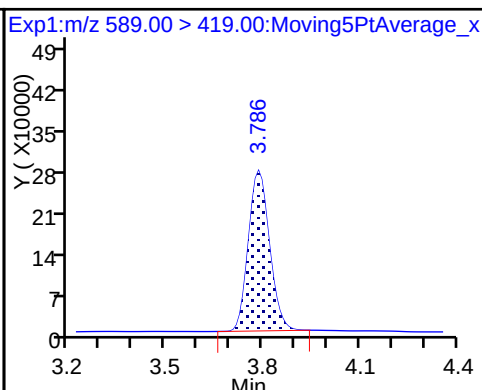
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid



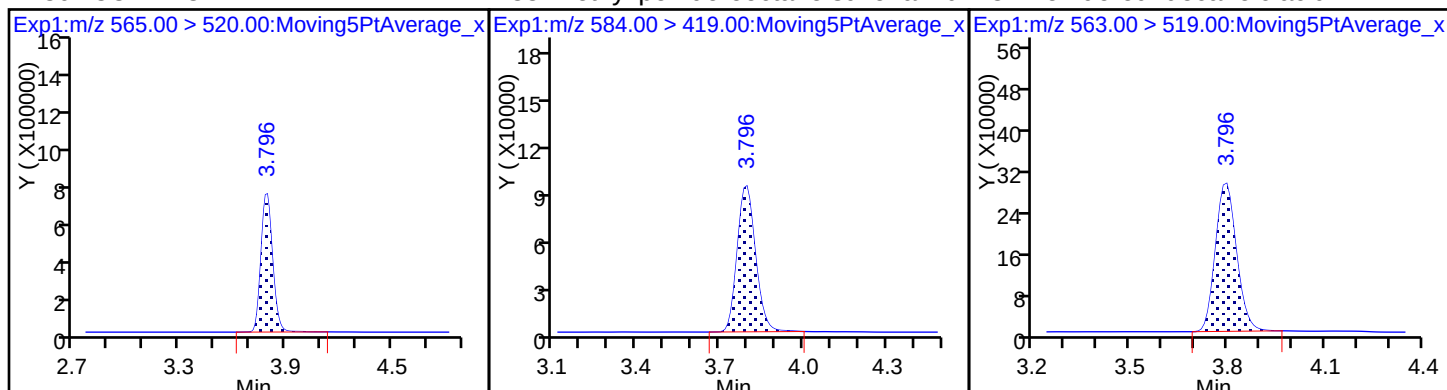
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA

33 N-ethyl perfluorooctane sulfonamid

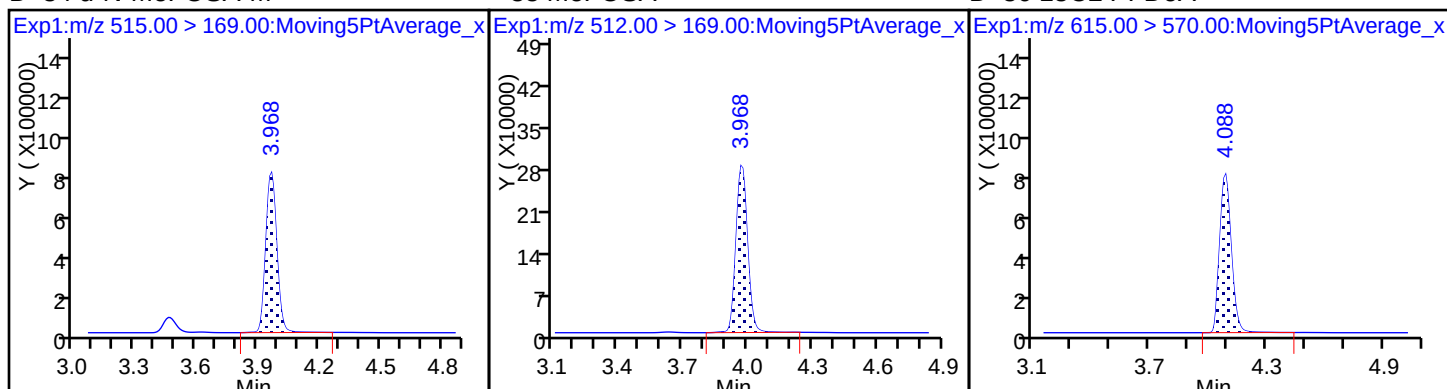
31 Perfluoroundecanoic acid



D 34 d-N-MeFOSA-M

35 MeFOSA

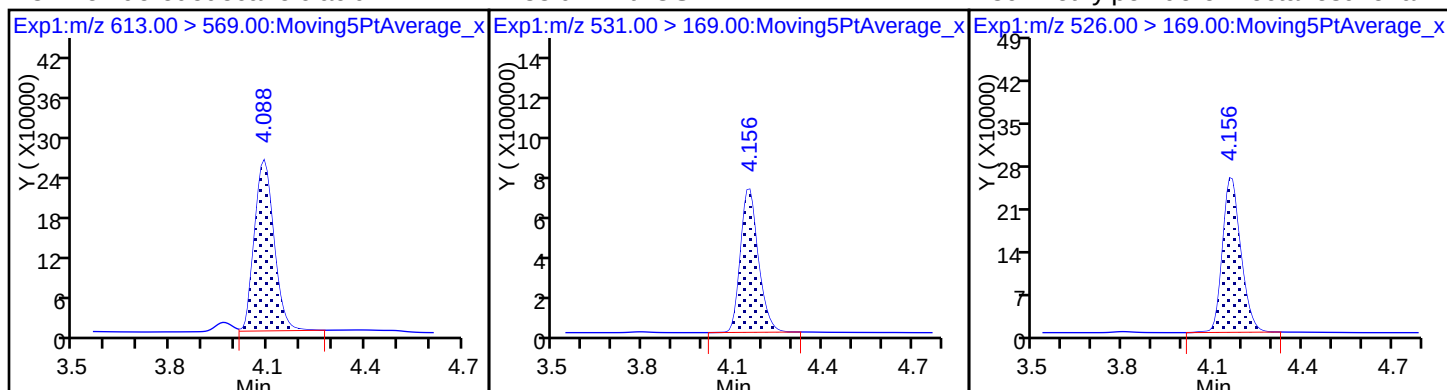
D 36 13C2 PFDaA



37 Perfluorododecanoic acid

D 38 d-N-EtFOSA-M

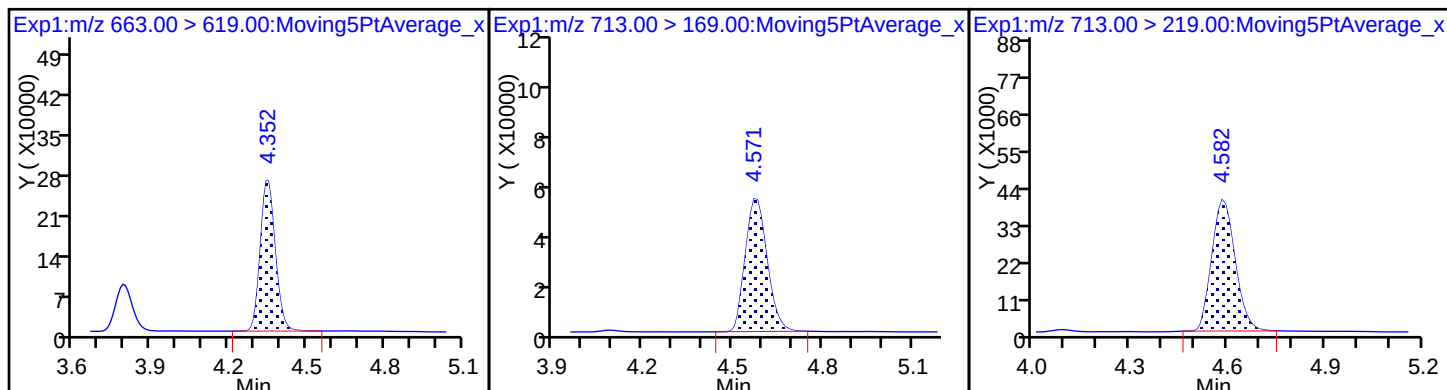
39 N-ethylperfluoro-1-octanesulfonami



41 Perfluorotridecanoic acid

42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

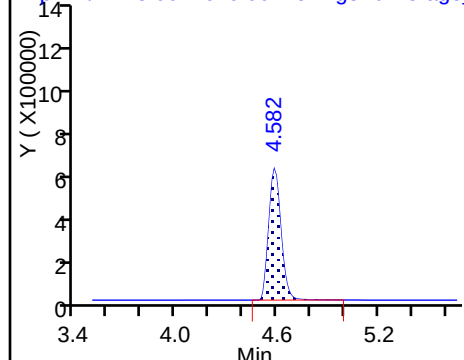


D 43 13C2-PFTeDA

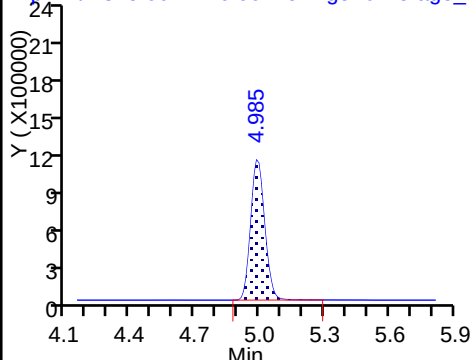
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45 Perfluorohexadecanoic acid

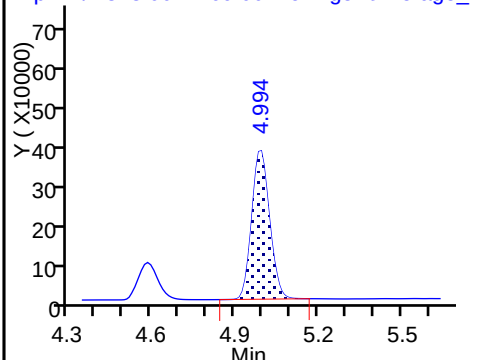
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Exp1:m/z 815.00 > 770.00:Moving5PtAverage_x

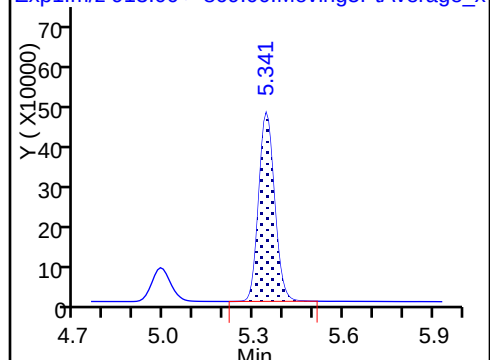


Exp1:m/z 813.00 > 769.00:Moving5PtAverage_x



46 Perfluorooctadecanoic acid

Exp1:m/z 913.00 > 869.00:Moving5PtAverage_x



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-179613/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_047.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>250.00 (mL)</u>	Date Analyzed: <u>08/29/2017 09:14</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.0	U	2.5	1.0	0.46
2706-90-3	Perfluoropentanoic acid (PFPeA)	2.0	U	2.5	2.0	0.99
307-24-4	Perfluorohexanoic acid (PFHxA)	2.0	U	2.5	2.0	0.79
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75
375-95-1	Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.5	1.0	0.44
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.0	U	2.5	2.0	0.75
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	2.5	2.0	0.58
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.0	U	2.5	2.0	0.55
376-06-7	Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.5	1.0	0.40
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	2.0	U	2.5	2.0	0.71
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U M	4.0	3.0	1.3
335-77-3	Perfluorodecanesulfonic acid (PFDS)	3.0	U	4.0	3.0	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.26	J	40	2.0	0.64

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-179613/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_047.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>250.00 (mL)</u>	Date Analyzed: <u>08/29/2017 09:14</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	66		25-150
STL00992	13C4 PFBA	111		25-150
STL00993	13C2 PFHxA	126		25-150
STL00990	13C4 PFOA	137		25-150
STL00995	13C5 PFNA	133		25-150
STL00996	13C2 PFDA	134		25-150
STL00997	13C2 PFUnA	124		25-150
STL00998	13C2 PFDoA	121		25-150
STL00994	18O2 PFHxS	106		25-150
STL00991	13C4 PFOS	106		25-150
STL01892	13C4-PFHpA	131		25-150
STL01893	13C5 PFPeA	117		25-150
STL02337	13C3-PFBS	106		25-150
STL02116	13C2-PFTeDA	121		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_047.d
 Lims ID: MB 320-179613/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 29-Aug-2017 09:14:21 ALS Bottle#: 36 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-179613/1-a
 Misc. Info.: Plate: 1 Rack: 5
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:30:02 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:13:00

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	1.553	1.564	-0.011		11482729	55.4		111	25134	
2 Perfluorobutyric acid										
212.90 > 169.00	1.553	1.564	-0.011	1.000	27046	0.1297			4.2	
D 3 13C5-PFPeA										
267.90 > 223.00	1.754	1.773	-0.019		7698079	58.6		117	57197	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.754	1.773	-0.019	1.000	13782	0.0857			4.8	
D 47 13C3-PFBS										
301.90 > 83.00	1.782	1.792	-0.010		192751	49.4		106	4582	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.782	1.801	-0.019	1.000	63077	0.2080			917	
298.90 > 99.00	1.782	1.801	-0.019	1.000	25158		2.51(0.00-0.00)		172	
D 7 13C2 PFHxA										
315.00 > 270.00	2.028	2.041	-0.013		8642252	63.1		126	27154	
6 Perfluorohexanoic acid										
313.00 > 269.00	2.017	2.041	-0.024	1.000	7738	0.0481			10.5	
D 9 13C4-PFHpA										
367.00 > 322.00	2.352	2.365	-0.013		8298363	65.5		131	15181	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.352	2.365	-0.013	1.000	5000	0.0313			6.7	
D 11 18O2 PFHxS										
403.00 > 84.00	2.369	2.381	-0.013		10955545	50.2		106	20985	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.369	2.381	-0.013	1.000	42915	0.1779			324	
D 12 M2-6:2FTS										
429.00 > 409.00	2.675	2.698	-0.023		3614531	68.3		144	19517	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.675	2.698	-0.023	1.000	12336	0.2011			457	

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	2.704	2.720	-0.016		7973365	68.6		137	27266	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.704	2.720	-0.016	1.000	22299	0.1278			3.6	
413.00 > 169.00	2.704	2.720	-0.016	1.000	12212		1.83(0.90-1.10)		109	
* 62 13C2-PFOA										
415.00 > 370.00	2.697	2.720	-0.023		9874	50.0			445	
16 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.704	2.727	-0.023	1.000	4043	0.0211			40.8	
D 18 13C4 PFOS										
503.00 > 80.00	3.073	3.093	-0.020		7657625	50.5		106	18431	
D 19 13C5 PFNA										
468.00 > 423.00	3.073	3.093	-0.020		5941360	66.7		133	17043	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.073	3.093	-0.020	1.000	28524	0.1680			138	M
499.00 > 99.00	3.073	3.093	-0.020	1.000	6559		4.35(0.90-1.10)		36.5	M
20 Perfluorononanoic acid										
463.00 > 419.00	3.073	3.093	-0.020	1.000	4811	0.0411			3.3	
D 26 M2-8:2FTS										
529.00 > 509.00	3.422	3.444	-0.022		2715189	63.7		133	22242	
D 23 13C2 PFDA										
515.00 > 470.00	3.430	3.453	-0.023		5174747	67.1		134	19163	
D 21 13C8 FOSA										
506.00 > 78.00	3.430	3.453	-0.023		7573024	32.9		65.9	32730	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.430	3.453	-0.023	1.000	5046	0.0540			11.0	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.430	3.453	-0.023	1.000	88354	0.6305			1509	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.580	3.605	-0.025		1096918	53.2		106	8145	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.580	3.616	-0.036	1.000	4095	0.1894			51.2	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.738	3.763	-0.025	1.000	9149	0.0947			203	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.748	3.772	-0.024		1126731	52.2		104	1728	
D 30 13C2 PFUnA										
565.00 > 520.00	3.758	3.782	-0.024		3242629	62.0		124	15100	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.758	3.782	-0.024	1.003	4183	0.2163			65.3	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.758	3.782	-0.024	1.000	10714	0.1467			16.7	
D 34 d-N-MeFOSA-M										
515.00 > 169.00	3.934	3.953	-0.019		6271	0.1136		0.2	1.5	
D 36 13C2 PFDoA										
615.00 > 570.00	4.042	4.072	-0.030		3101441	60.5		121	11795	
37 Perfluorododecanoic acid										
613.00 > 569.00	4.042	4.072	-0.030	1.000	9280	0.1547			4.9	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.121	4.140	-0.019		5190	0.0979		0.2	20.6	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.316	4.333	-0.017	1.000	7439	0.1258			1.6	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.549	4.561	-0.012	1.000	2063	0.1251			51.6	
713.00 > 219.00	4.549	4.561	-0.012	1.000	2077		0.99(0.00-0.00)		22.8	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.549	4.574	-0.025		3262102	60.4		121	14700	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.960	4.972	-0.012		4912876	44.6		89.1	9364	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.960	4.982	-0.022	1.000	50626	0.0986			5.0	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.312	5.330	-0.018	1.000	10284	0.0974			1.6	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_047.d

Injection Date: 29-Aug-2017 09:14:21

Instrument ID: A8_N

Lims ID: MB 320-179613/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 36

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

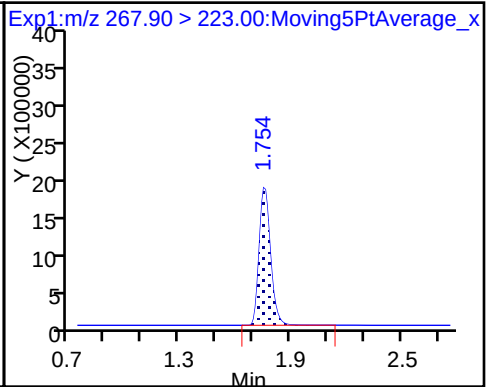
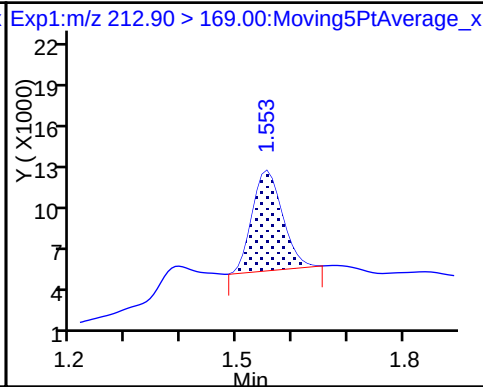
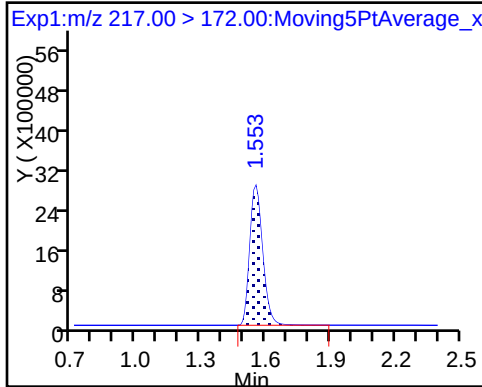
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

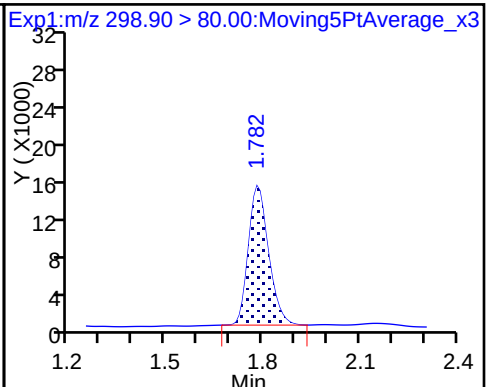
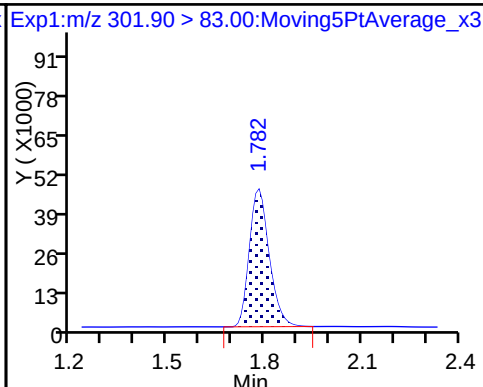
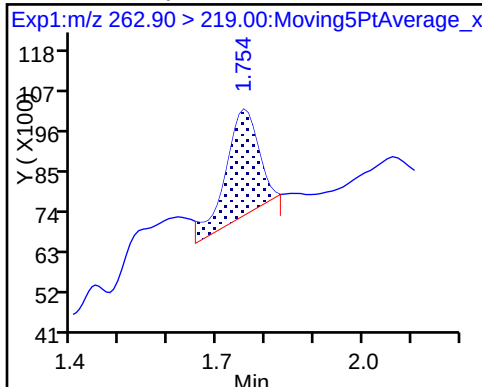
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

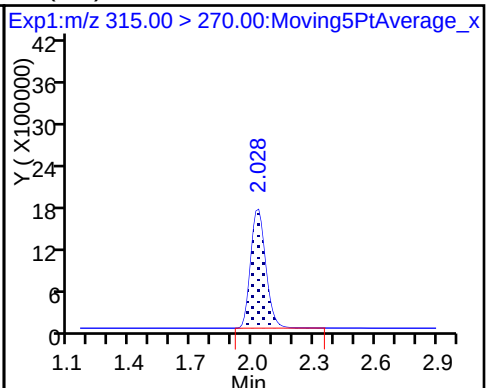
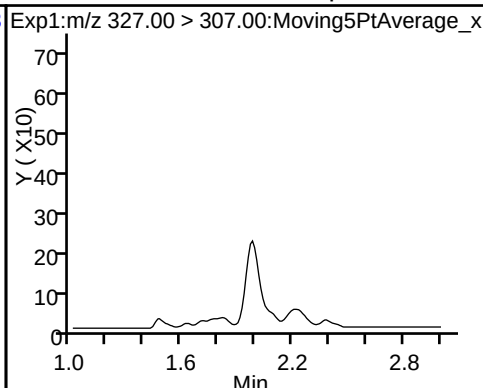
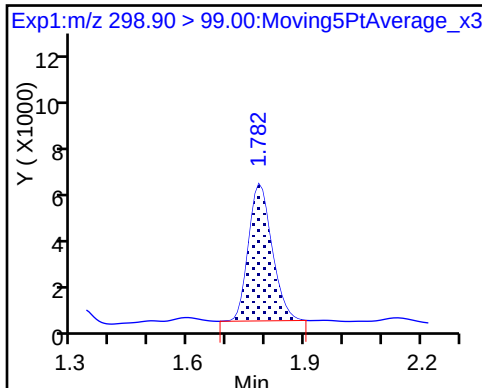
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa-2,3,5-tricarboxylate (PFHxS)

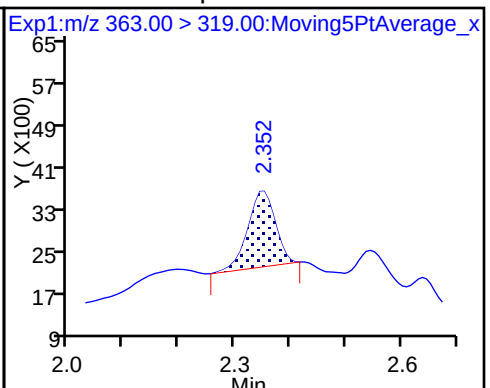
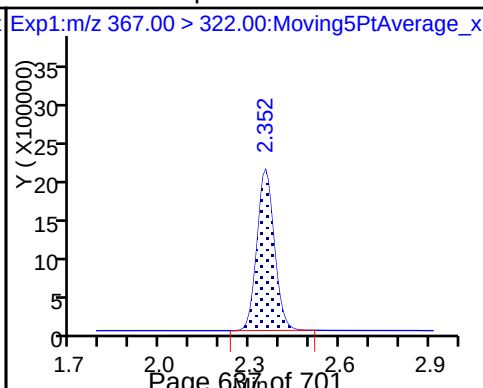
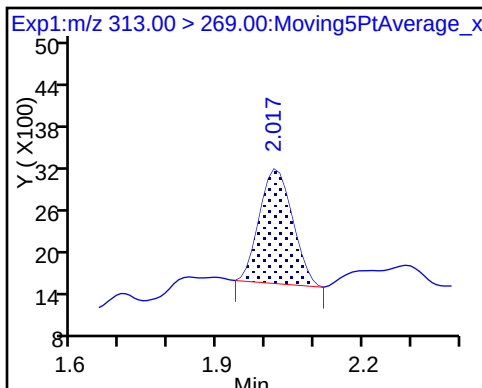
D 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

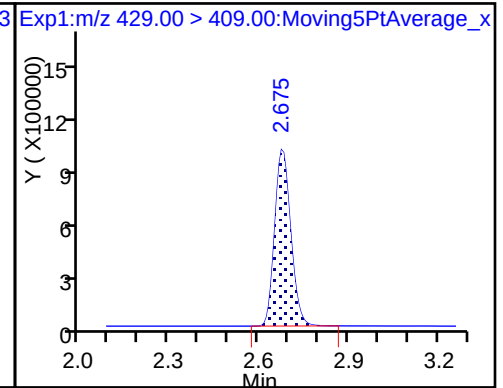
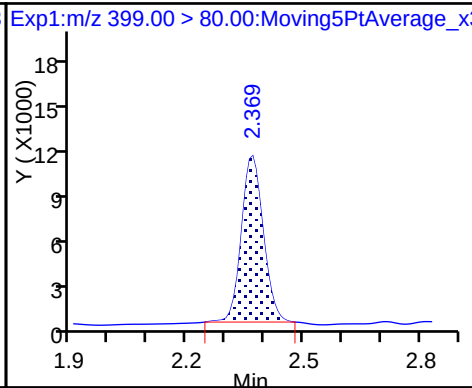
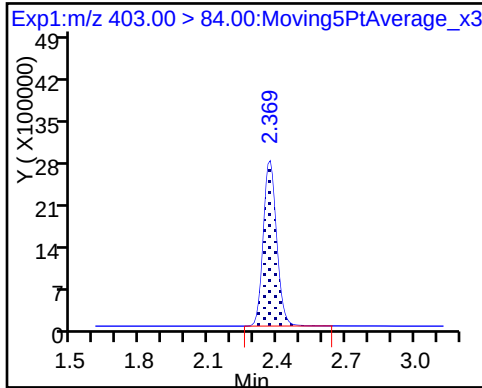
10 Perfluoroheptanoic acid



D 11 18O2 PFHxS

8 Perfluorohexanesulfonic acid

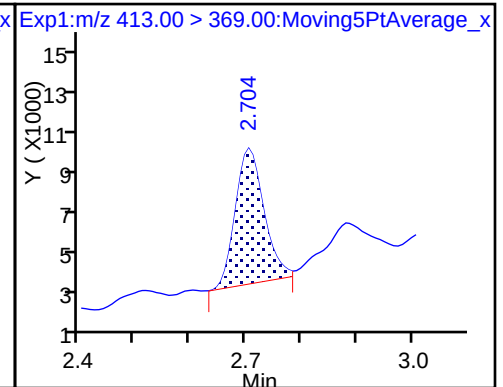
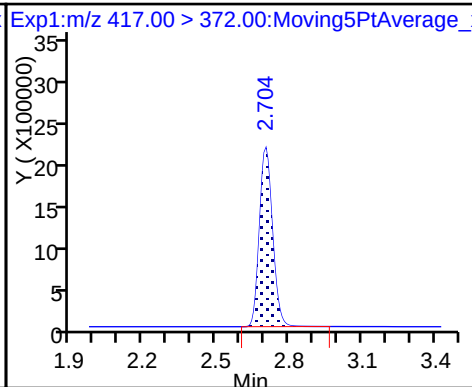
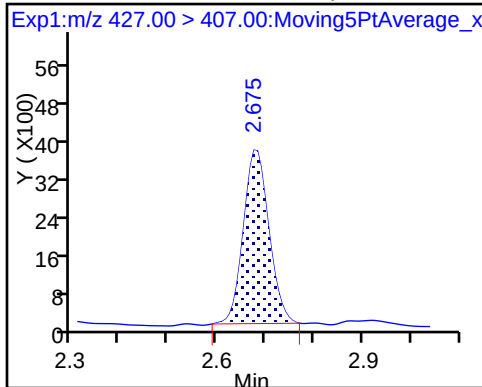
D 12 M2-6:2FTS



13 Sodium 1H,1H,2H,2H-perfluorooctanoate

De 14 13C4 PFOA

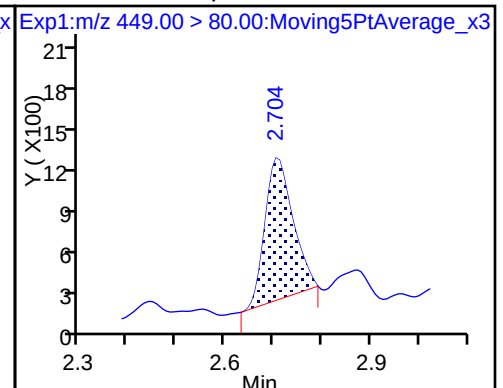
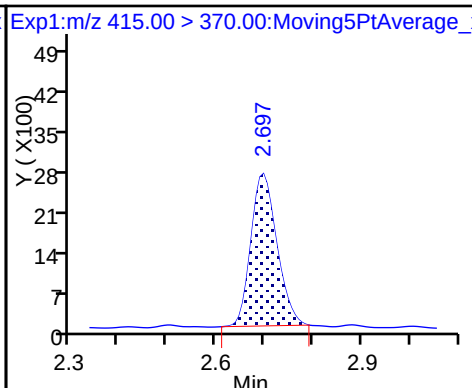
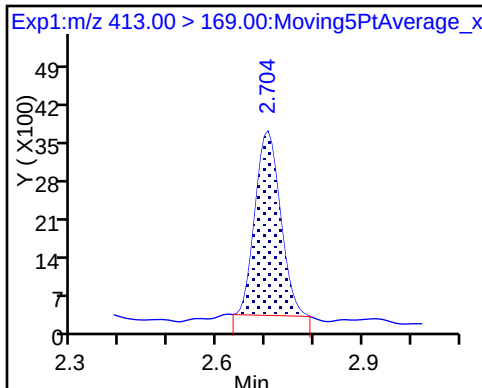
15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

* 62 13C2-PFOA

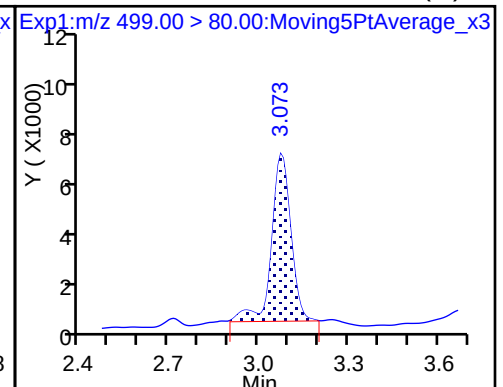
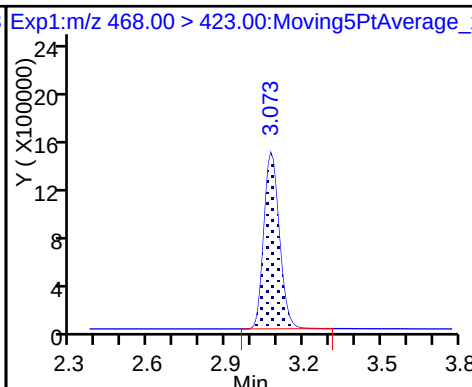
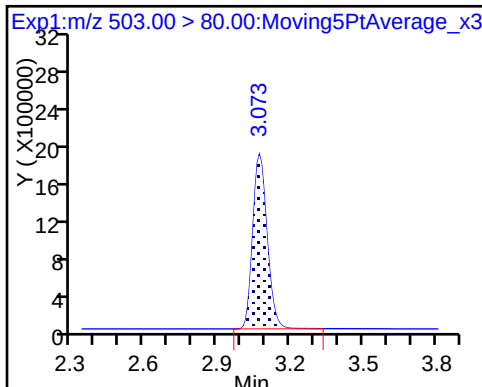
16 Perfluoroheptanesulfonic Acid



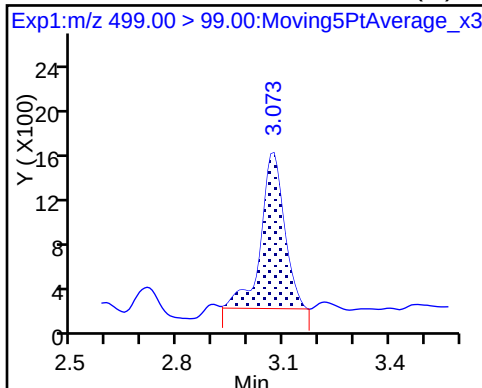
D 18 13C4 PFOS

D 19 13C5 PFNA

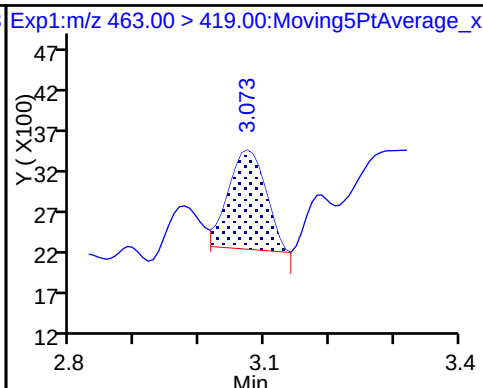
17 Perfluorooctane sulfonic acid (M)



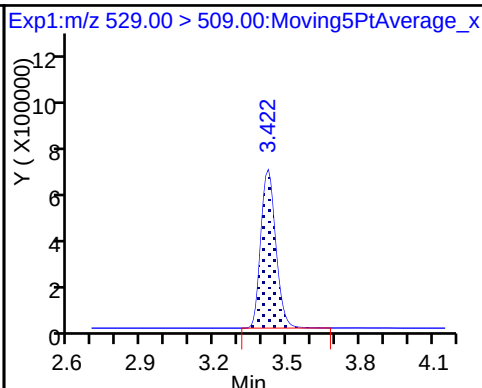
17 Perfluorooctane sulfonic acid (M)



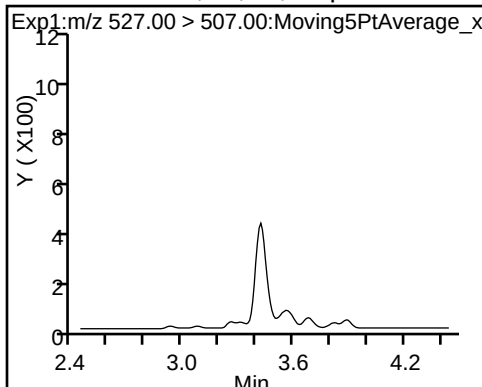
20 Perfluorononanoic acid



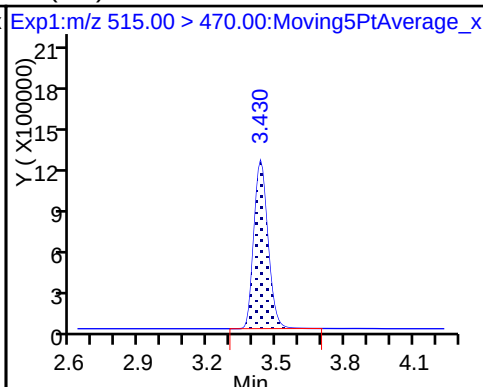
D 26 M2-8:2FTS



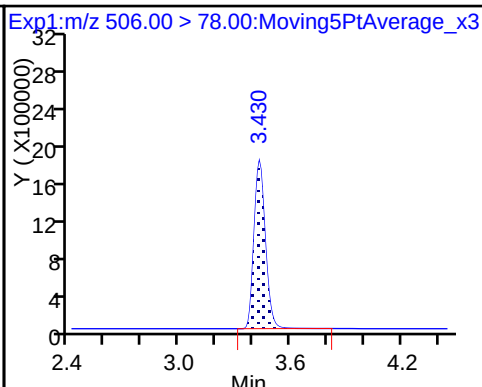
25 Sodium 1H,1H,2H,2H-perfluorodecanoate (M)



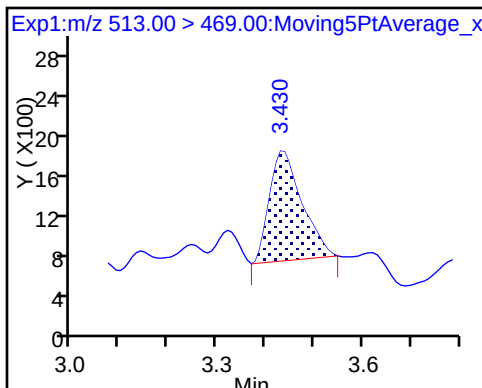
D 20 ND3 PFDA



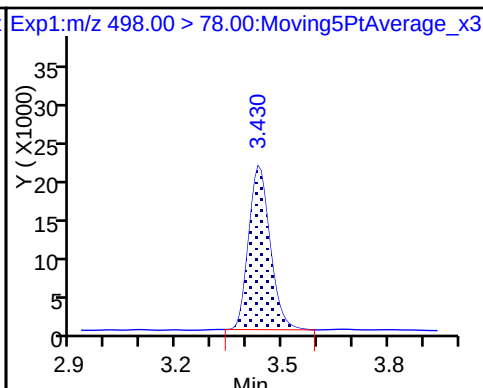
D 21 13C8 FOSA



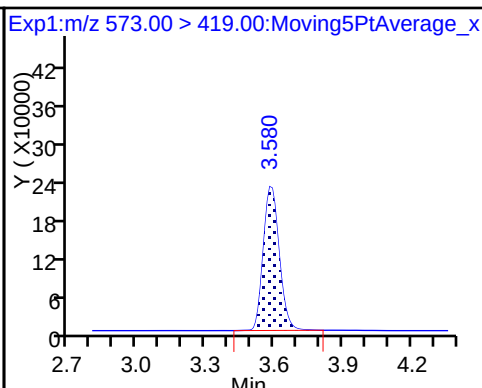
24 Perfluorodecanoic acid



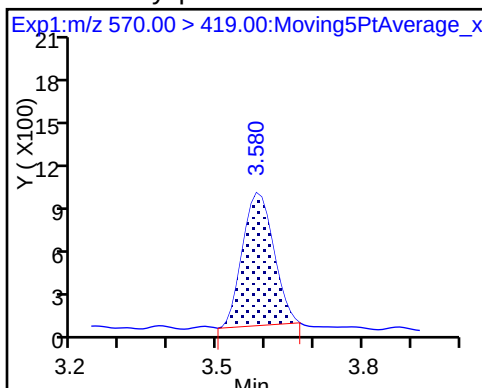
22 Perfluorooctane Sulfonamide



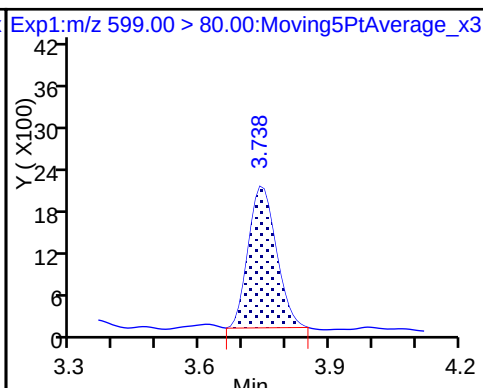
D 27 d3-NMeFOSAA



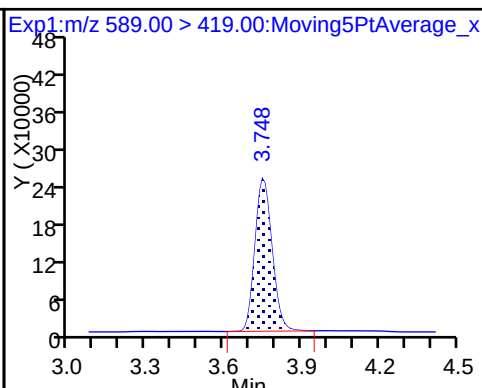
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid



D 32 d5-NEtFOSAA

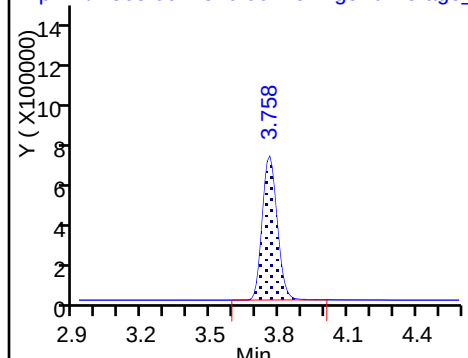


D 30 13C2 PFUnA

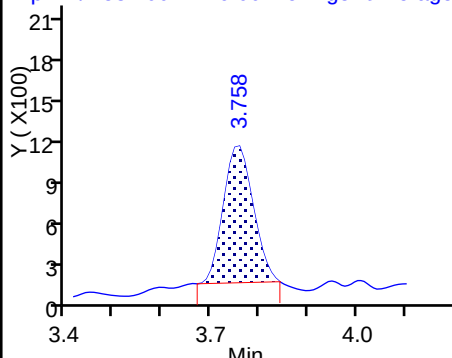
33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

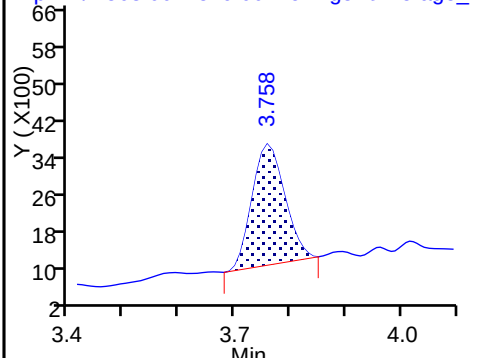
Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x



Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x



Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x

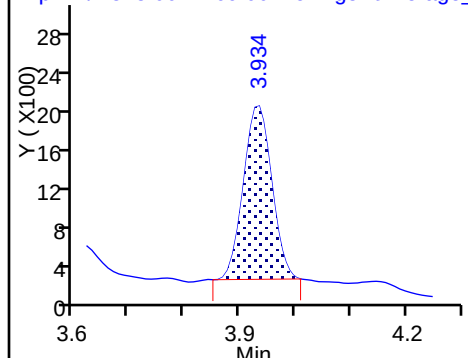


D 34 d-N-MeFOSA-M

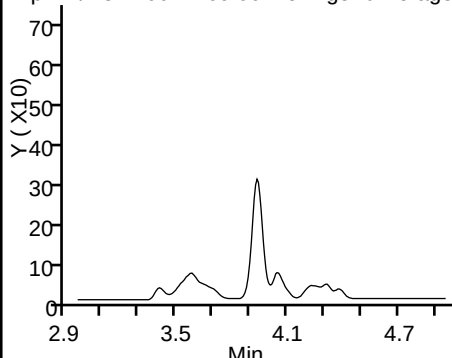
35 MeFOSA (ND)

D 36 13C2 PFDaA

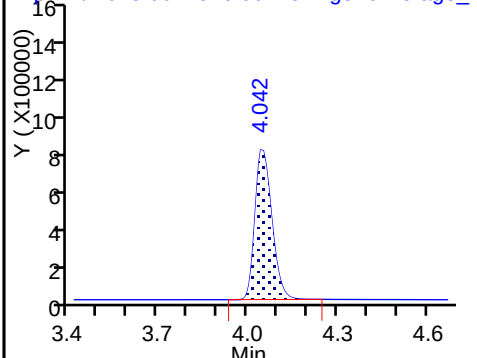
Exp1:m/z 515.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 512.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 615.00 > 570.00:Moving5PtAverage_x

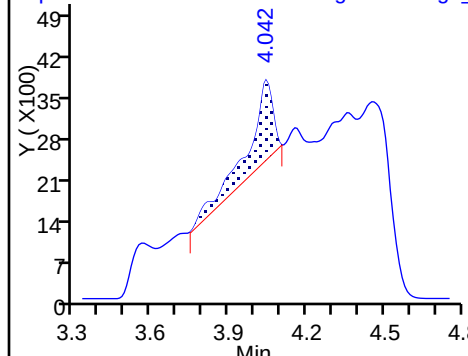


37 Perfluorododecanoic acid

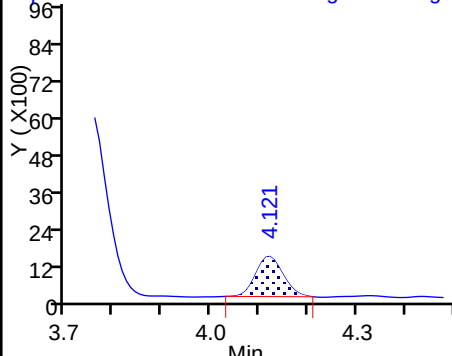
D 38 d-N-EtFOSA-M

39 N-ethylperfluoro-1-octanesulfonami (ND)

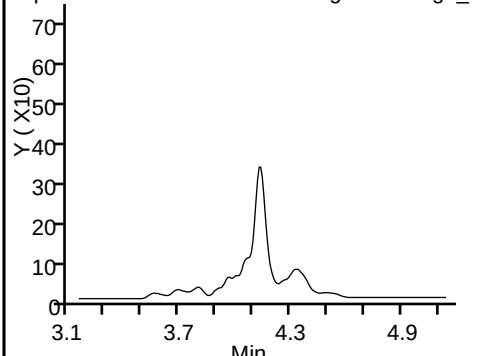
Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x



Exp1:m/z 531.00 > 169.00:Moving5PtAverage_x



Exp1:m/z 526.00 > 169.00:Moving5PtAverage_x

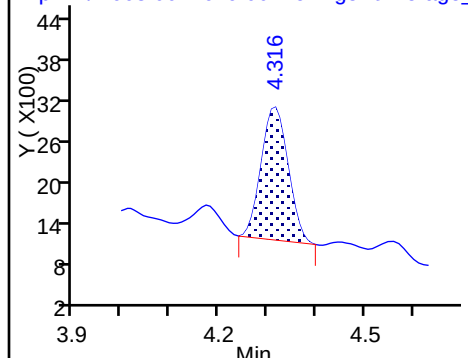


41 Perfluorotridecanoic acid

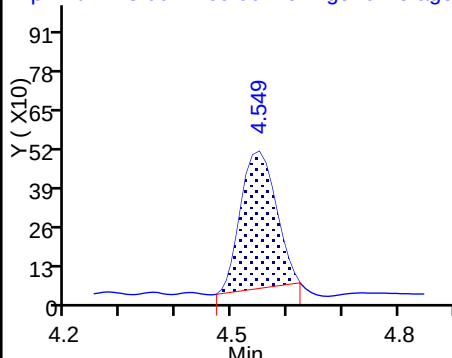
42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

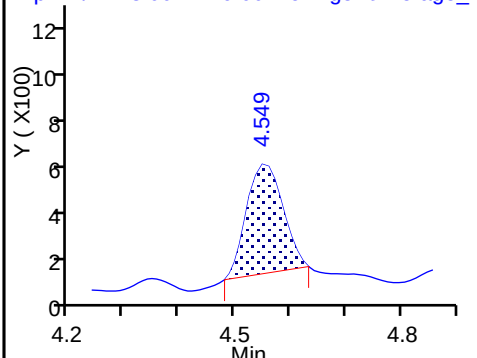
Exp1:m/z 663.00 > 619.00:Moving5PtAverage_x



Exp1:m/z 713.00 > 169.00:Moving5PtAverage_x



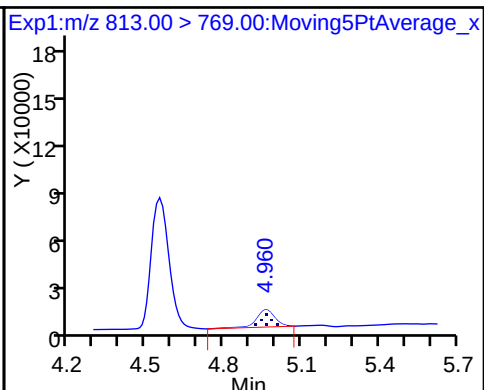
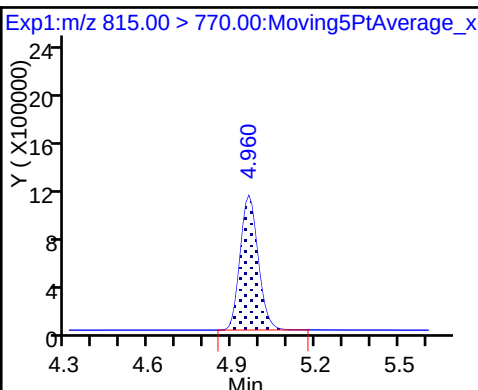
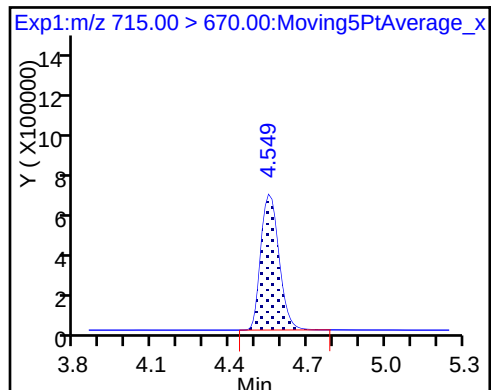
Exp1:m/z 713.00 > 219.00:Moving5PtAverage_x



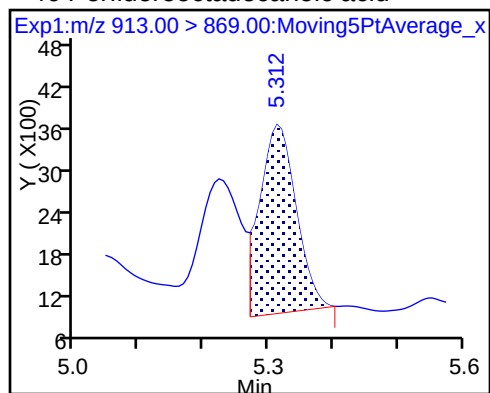
D 43 13C2-PFTeDA

D 44 13C2-PFHxDA

45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



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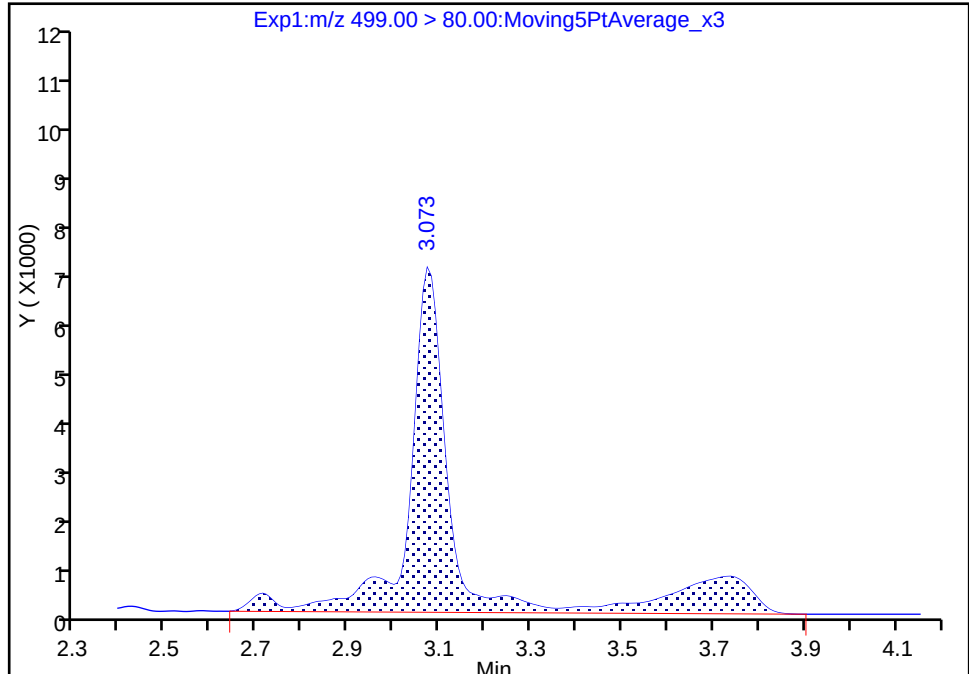
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_047.d
Injection Date: 29-Aug-2017 09:14:21 Instrument ID: A8_N
Lims ID: MB 320-179613/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

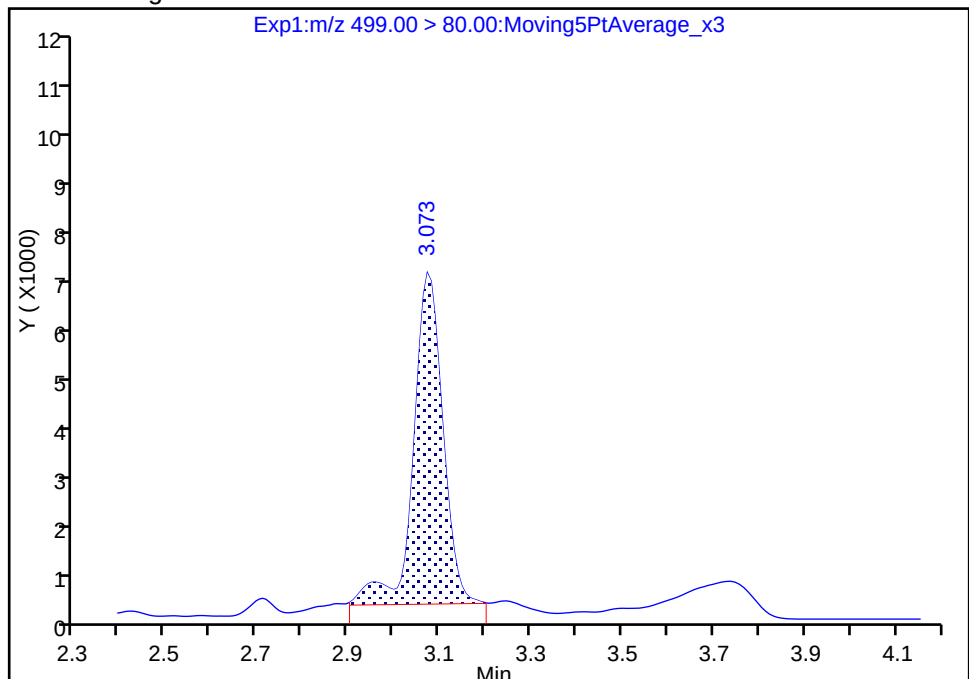
RT: 3.07
Area: 47215
Amount: 0.278038
Amount Units: ng/ml

Processing Integration Results



RT: 3.07
Area: 28524
Amount: 0.167971
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:12:39

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

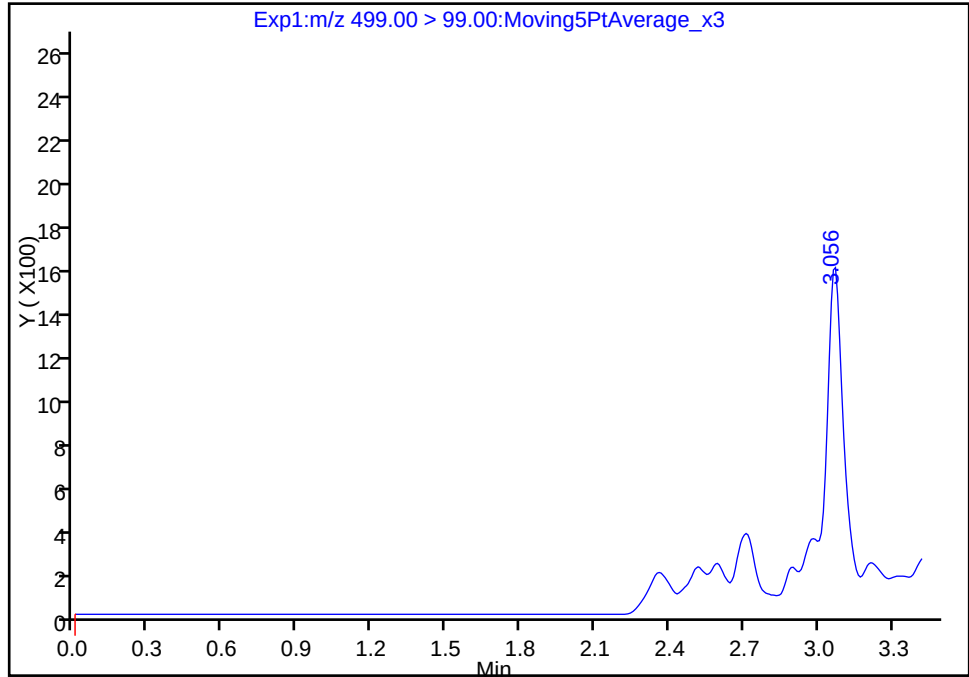
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_047.d
Injection Date: 29-Aug-2017 09:14:21 Instrument ID: A8_N
Lims ID: MB 320-179613/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 36 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

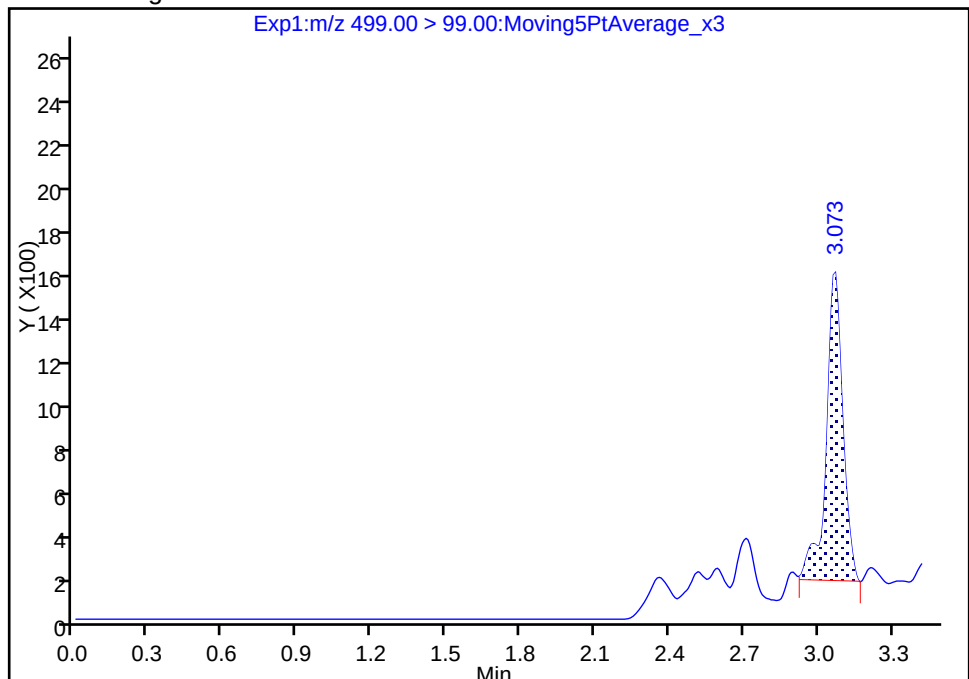
RT: 3.06
Area: 0
Amount: 0.278038
Amount Units: ng/ml

Processing Integration Results



RT: 3.07
Area: 6559
Amount: 0.167971
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 29-Aug-2017 14:12:45

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCS 320-179613/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_048.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>250.00 (mL)</u>	Date Analyzed: <u>08/29/2017 09:21</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	44.4		2.5	1.0	0.46
2706-90-3	Perfluoropentanoic acid (PFPeA)	42.6		2.5	2.0	0.99
307-24-4	Perfluorohexanoic acid (PFHxA)	42.4		2.5	2.0	0.79
375-85-9	Perfluoroheptanoic acid (PFHpA)	41.0		2.5	2.0	0.80
335-67-1	Perfluorooctanoic acid (PFOA)	39.5		2.5	2.0	0.75
375-95-1	Perfluorononanoic acid (PFNA)	40.5		2.5	2.0	0.65
335-76-2	Perfluorodecanoic acid (PFDA)	41.3		2.5	1.0	0.44
2058-94-8	Perfluoroundecanoic acid (PFUnA)	36.1		2.5	2.0	0.75
307-55-1	Perfluorododecanoic acid (PFDoA)	39.2		2.5	2.0	0.58
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	40.1		2.5	2.0	0.55
376-06-7	Perfluorotetradecanoic acid (PFTeA)	36.4		2.5	1.0	0.40
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36.5		2.5	2.0	0.92
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	37.7		2.5	2.0	0.87
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	43.7		2.5	2.0	0.71
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	39.7		4.0	3.0	1.3
335-77-3	Perfluorodecanesulfonic acid (PFDS)	42.0		4.0	3.0	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	43.6		40	2.0	0.64

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCS 320-179613/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_048.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>250.00 (mL)</u>	Date Analyzed: <u>08/29/2017 09:21</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	54		25-150
STL00992	13C4 PFBA	108		25-150
STL00993	13C2 PFHxA	123		25-150
STL00990	13C4 PFOA	136		25-150
STL00995	13C5 PFNA	131		25-150
STL00996	13C2 PFDA	141		25-150
STL00997	13C2 PFUnA	131		25-150
STL00998	13C2 PFDoA	121		25-150
STL00994	18O2 PFHxS	109		25-150
STL00991	13C4 PFOS	105		25-150
STL01892	13C4-PFHpA	139		25-150
STL01893	13C5 PFPeA	113		25-150
STL02337	13C3-PFBS	110		25-150
STL02116	13C2-PFTeDA	119		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_048.d
 Lims ID: LCS 320-179613/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 29-Aug-2017 09:21:15 ALS Bottle#: 37 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-179613/2-a
 Misc. Info.: Plate: 1 Rack: 5
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:30:02 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:13:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA	217.00 > 172.00	1.556	1.564	-0.008	11190110	54.0		108	14422	
2 Perfluorobutyric acid	212.90 > 169.00	1.556	1.564	-0.008	1.000	4512179	22.2	111	635	
D 3 13C5-PFPeA	267.90 > 223.00	1.756	1.773	-0.017	7429846	56.5		113	18934	
4 Perfluoropentanoic acid	262.90 > 219.00	1.756	1.773	-0.017	1.000	3307264	21.3	107	1416	
D 47 13C3-PFBS	301.90 > 83.00	1.784	1.792	-0.008	199899	51.2		110	4291	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.784	1.801	-0.017	1.000	5737646	18.2	103	22271	
	298.90 > 99.00	1.784	1.801	-0.017	1.000	2348423	2.44(0.00-0.00)		10021	
61 Sodium 1H,1H,2H,2H-perfluorohexane	327.00 > 307.00	1.986	2.006	-0.020	1.000	1526857	20.9	112	17190	
D 7 13C2 PFHxA	315.00 > 270.00	2.020	2.041	-0.021	8436676	61.6		123	25946	
6 Perfluorohexanoic acid	313.00 > 269.00	2.020	2.041	-0.021	1.000	3330570	21.2	106	3298	
D 9 13C4-PFHpA	367.00 > 322.00	2.350	2.365	-0.015	8785733	69.3		139	17379	
10 Perfluoroheptanoic acid	363.00 > 319.00	2.350	2.365	-0.015	1.000	3467661	20.5	102	3153	
D 11 18O2 PFHxS	403.00 > 84.00	2.366	2.381	-0.015	11295532	51.8		109	85923	
8 Perfluorohexanesulfonic acid	399.00 > 80.00	2.366	2.381	-0.015	1.000	4693422	18.9	104	8648	
D 12 M2-6:2FTS	429.00 > 409.00	2.678	2.698	-0.020	3794424	71.7		151	22462	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.678	2.698	-0.020	1.000	1493720	21.5	113	18594	
D 14 13C4 PFOA	417.00 > 372.00	2.700	2.720	-0.020		7881710	67.8	136	91266	
15 Perfluorooctanoic acid	413.00 > 369.00	2.700	2.720	-0.020	1.000	3405723	19.7	98.7	532	
413.00 > 169.00	2.700	2.720	-0.020	1.000	1799805		1.89(0.90-1.10)		7467	
16 Perfluoroheptanesulfonic Acid	449.00 > 80.00	2.707	2.727	-0.020	1.000	4175581	21.8	115	16142	
D 18 13C4 PFOS	503.00 > 80.00	3.073	3.093	-0.020		7629490	50.3	105	18345	
D 19 13C5 PFNA	468.00 > 423.00	3.073	3.093	-0.020		5844334	65.6	131	20942	
17 Perfluorooctane sulfonic acid	499.00 > 80.00	3.073	3.093	-0.020	1.000	3359372	19.9	107	50211	
499.00 > 99.00	3.073	3.093	-0.020	1.000	702147		4.78(0.90-1.10)		3178	
20 Perfluorononanoic acid	463.00 > 419.00	3.073	3.093	-0.020	1.000	2331450	20.2	101	1683	
D 26 M2-8:2FTS	529.00 > 509.00	3.421	3.444	-0.023		2666578	62.6	131	21156	
25 Sodium 1H,1H,2H,2H-perfluorodecane	527.00 > 507.00	3.421	3.444	-0.023	1.000	1120596	21.7	113	15214	
D 23 13C2 PFDA	515.00 > 470.00	3.430	3.453	-0.023		5435301	70.5	141	25798	
D 21 13C8 FOSA	506.00 > 78.00	3.430	3.453	-0.023		6160031	26.8	53.6	20837	
24 Perfluorodecanoic acid	513.00 > 469.00	3.430	3.453	-0.023	1.000	2029459	20.7	103	5231	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.430	3.453	-0.023	1.000	2485542	21.8	109	11308	
D 27 d3-NMeFOSAA	573.00 > 419.00	3.585	3.605	-0.020		1117398	54.2	108	5680	
28 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.585	3.616	-0.031	1.000	459645	20.9	104	2650	
29 Perfluorodecane Sulfonic acid	599.00 > 80.00	3.742	3.763	-0.021	1.000	2021176	21.0	109	10742	
D 32 d5-NEtFOSAA	589.00 > 419.00	3.752	3.772	-0.020		1086815	50.4	101	1761	
D 30 13C2 PFUnA	565.00 > 520.00	3.761	3.782	-0.021		3422250	65.5	131	15043	
33 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	3.761	3.782	-0.021	1.003	419373	22.5	112	3413	
31 Perfluoroundecanoic acid	563.00 > 519.00	3.761	3.782	-0.021	1.000	1391039	18.1	90.3	1775	
D 34 d-N-MeFOSA-M	515.00 > 169.00	3.932	3.953	-0.021		1490	0.0270	0.1	0.4	
D 36 13C2 PFDaA	615.00 > 570.00	4.047	4.072	-0.025		3101863	60.5	121	15841	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
37 Perfluorododecanoic acid										
613.00 > 569.00	4.047	4.072	-0.025	1.000	1175505	19.6		98.0	1094	
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.312	4.140	0.172		3422	0.0645		0.1	13.3	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.312	4.333	-0.021	1.000	1186291	20.1		100	239	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.545	4.561	-0.016	1.000	295765	18.2		90.9	5211	
713.00 > 219.00	4.557	4.561	-0.004	1.003	220278		1.34(0.00-0.00)		1977	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.557	4.574	-0.017		3218128	59.5		119	14202	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.956	4.972	-0.016		4518362	41.0		82.0	14878	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.956	4.982	-0.026	1.000	1623893	20.2		101	165	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.310	5.330	-0.020	1.000	1651928	17.0		85.1	266	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_048.d

Injection Date: 29-Aug-2017 09:21:15

Instrument ID: A8_N

Lims ID: LCS 320-179613/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 37

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

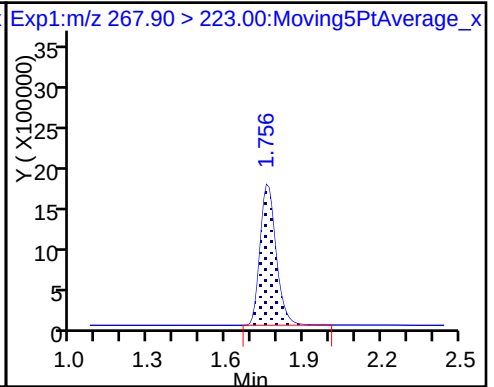
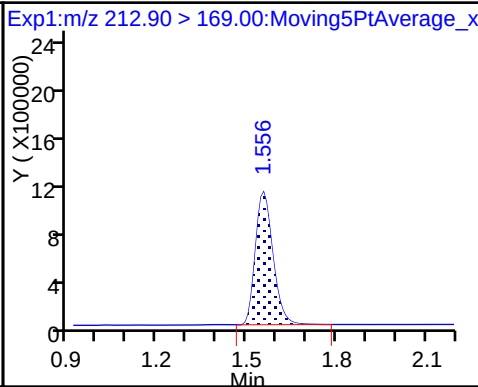
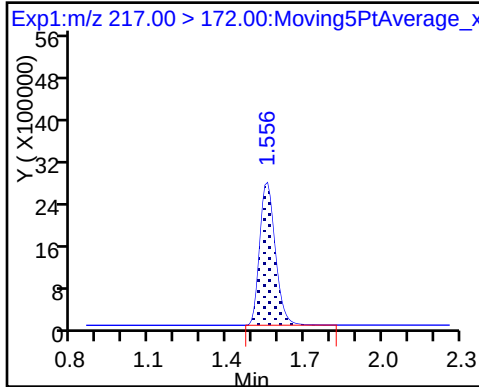
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

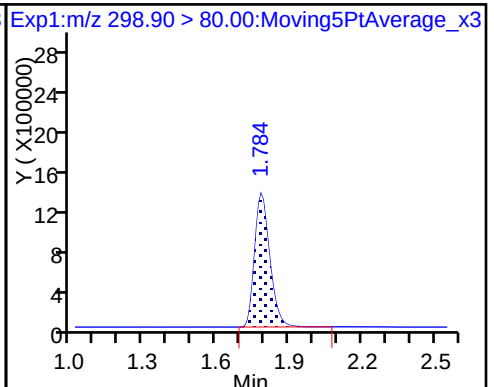
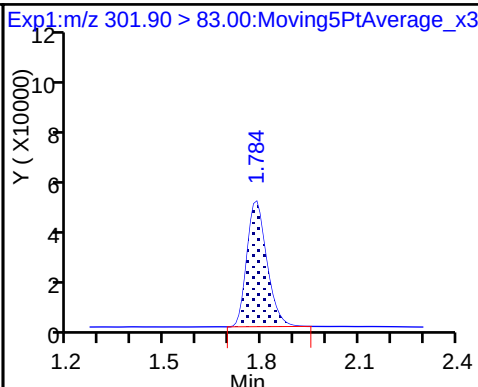
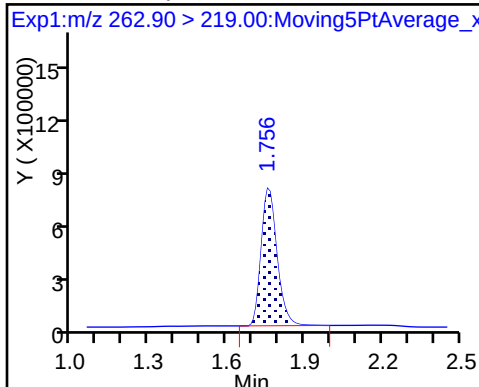
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

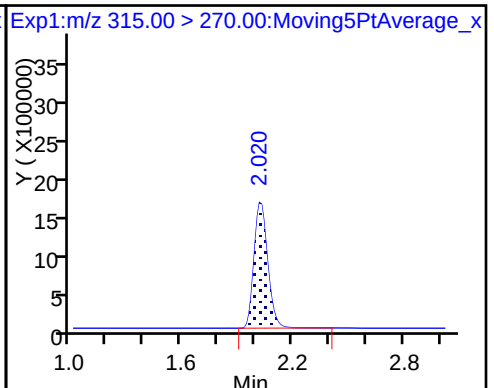
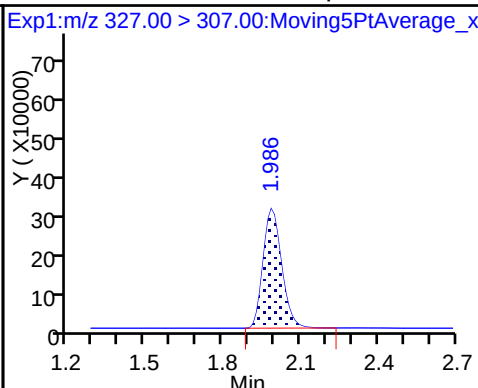
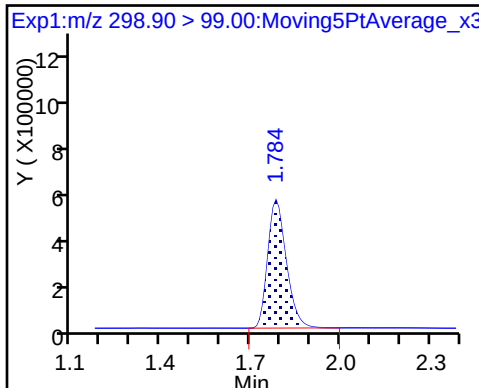
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa

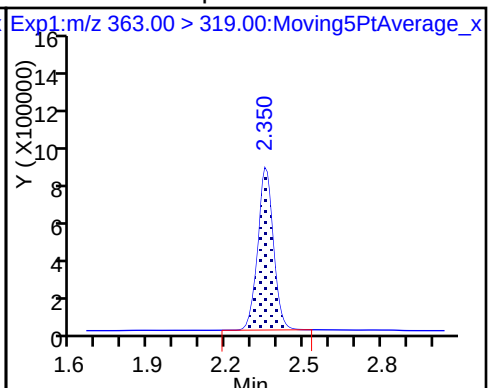
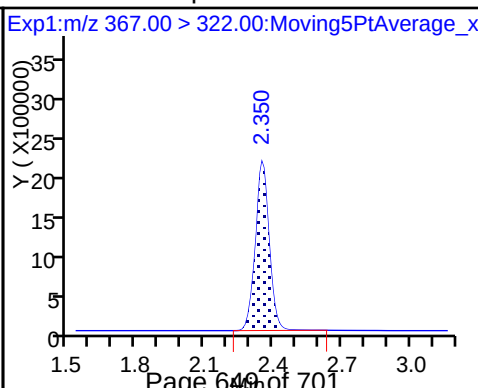
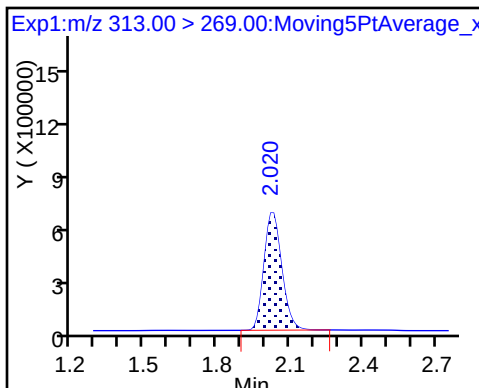
De 7 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

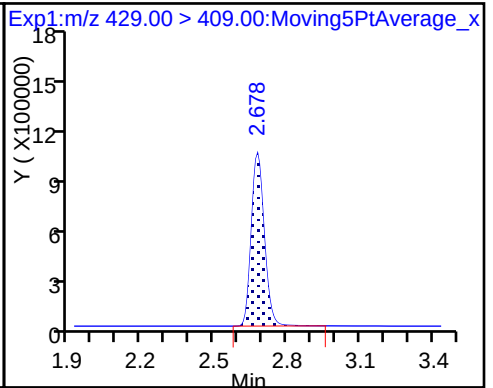
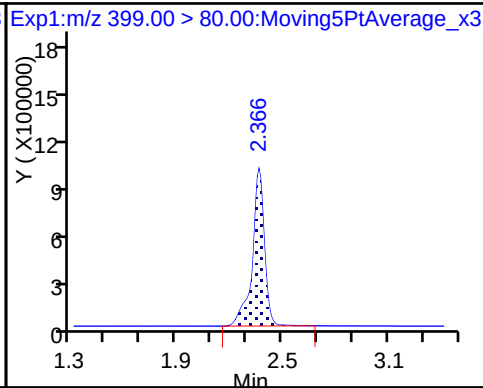
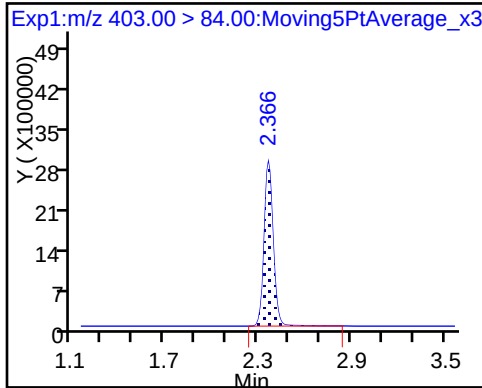
10 Perfluoroheptanoic acid



D 11 18O2 PFHxS

8 Perfluorohexanesulfonic acid

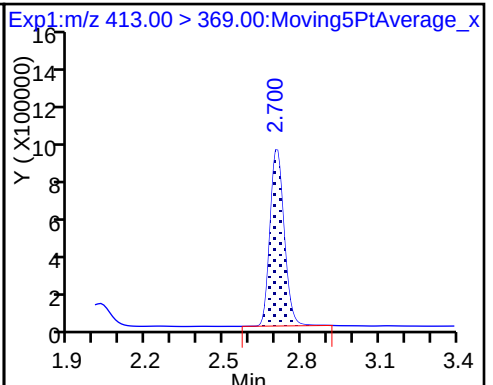
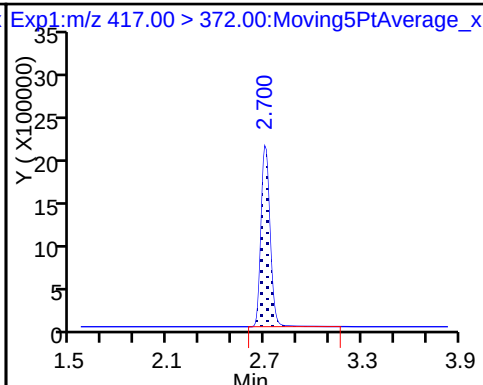
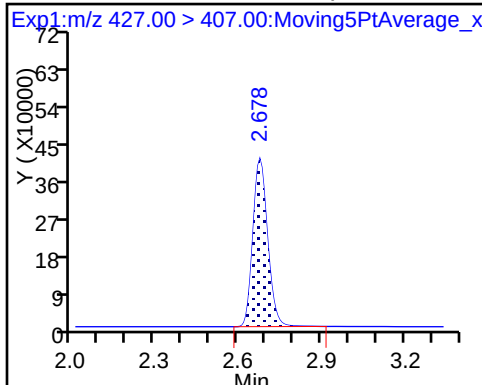
D 12 M2-6:2FTS



13 Sodium 1H,1H,2H,2H-perfluorooctanoate

De 14 13C4 PFOA

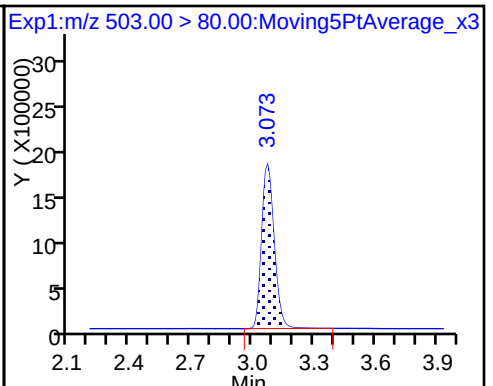
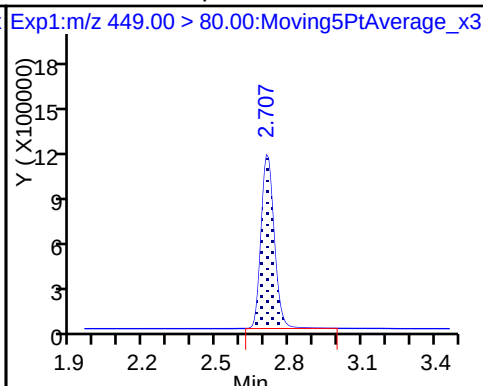
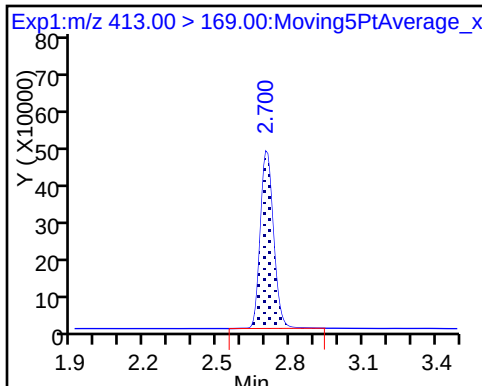
15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

16 Perfluoroheptanesulfonic Acid

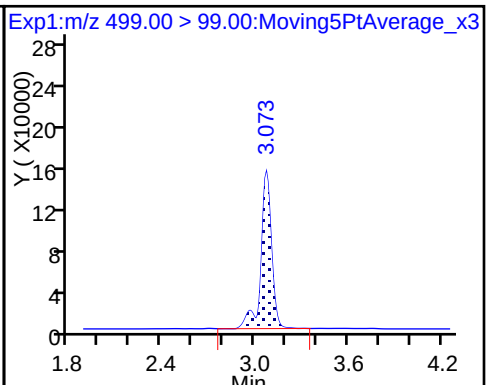
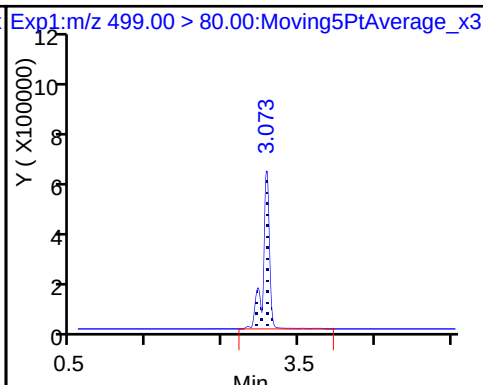
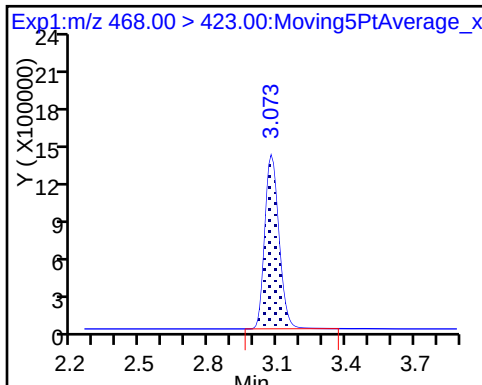
D 18 13C4 PFOS



D 19 13C5 PFNA

17 Perfluorooctane sulfonic acid

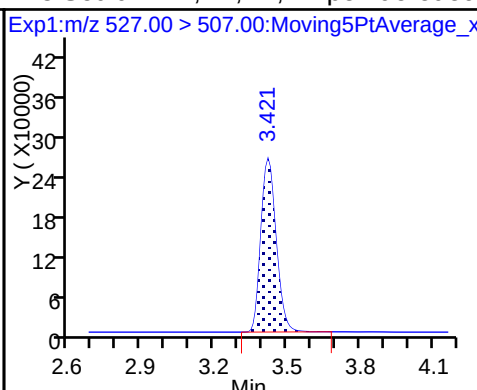
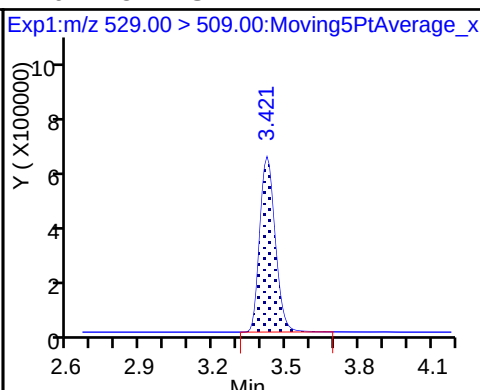
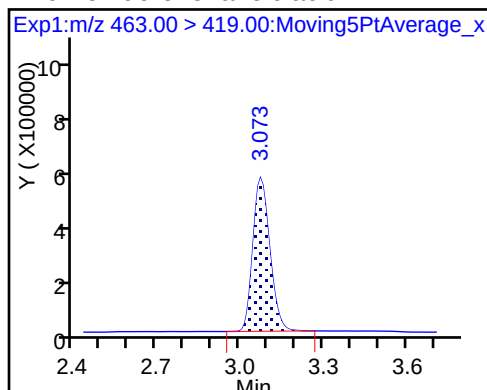
17 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid

D 26 M2-8:2FTS

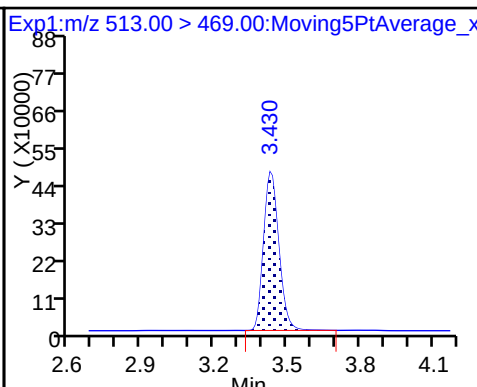
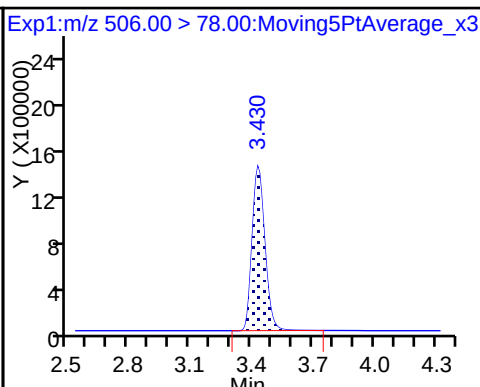
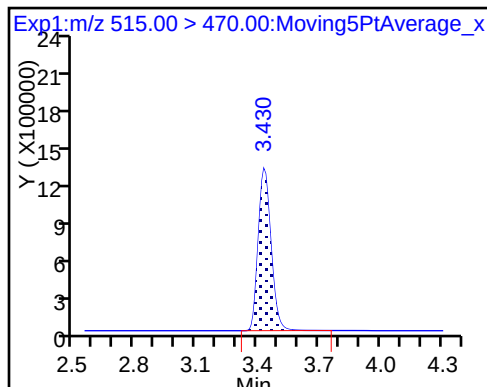
25 Sodium 1H,1H,2H,2H-perfluorodecane



D 23 13C2 PFDA

D 21 13C8 FOSA

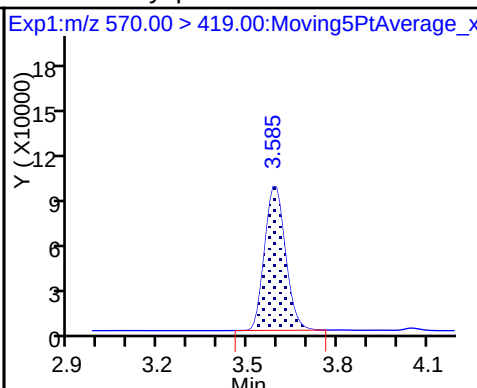
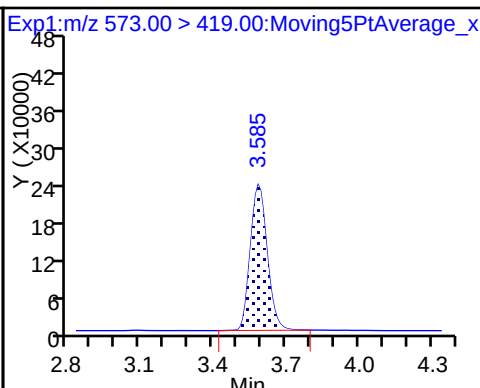
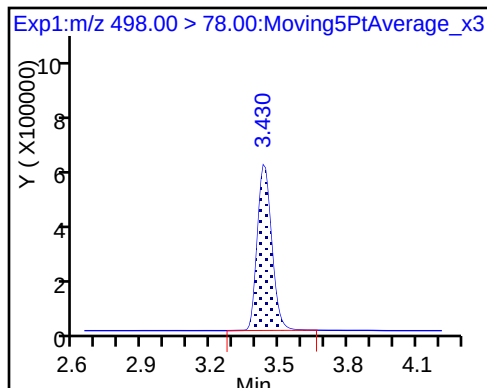
24 Perfluorodecanoic acid



22 Perfluorooctane Sulfonamide

D 27 d3-NMeFOSAA

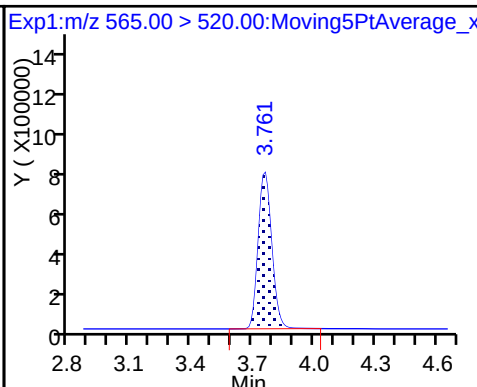
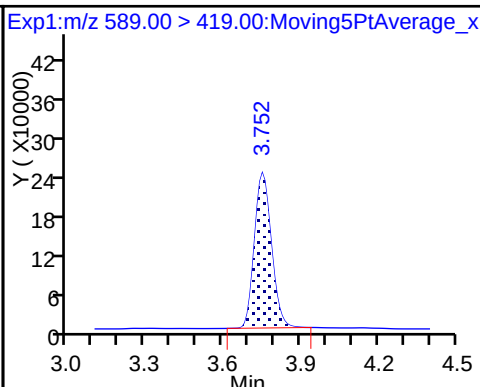
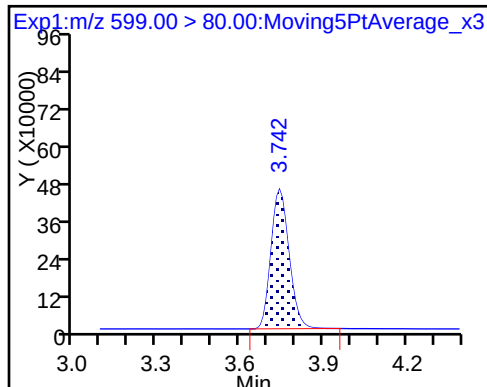
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

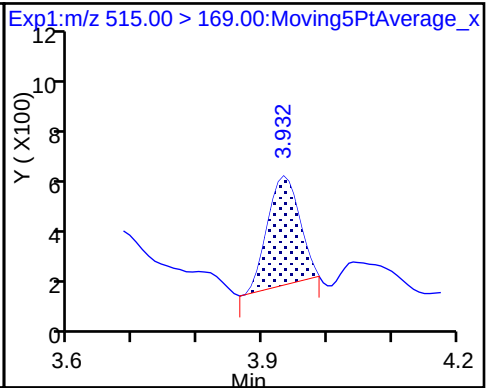
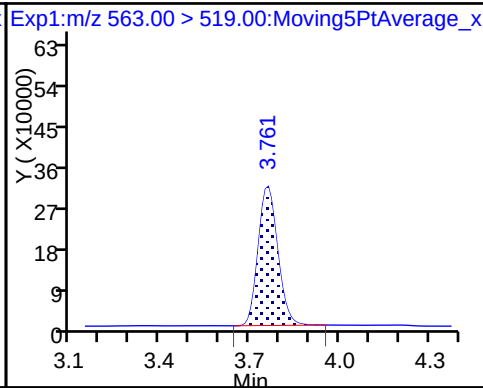
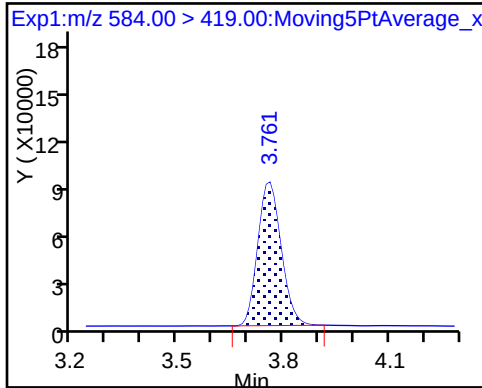
D 30 13C2 PFUnA



33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

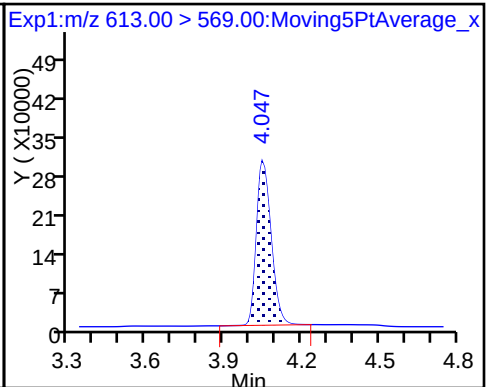
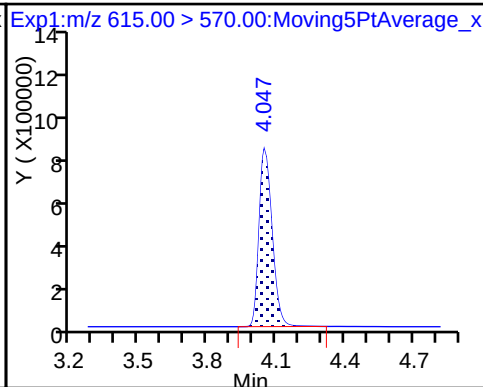
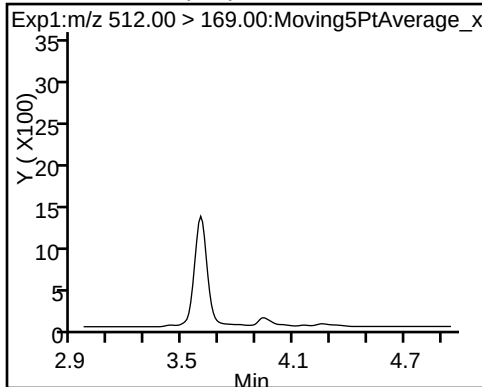
D 34 d-N-MeFOSA-M



35 MeFOSA (ND)

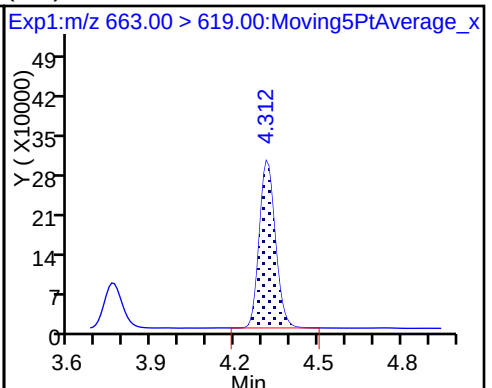
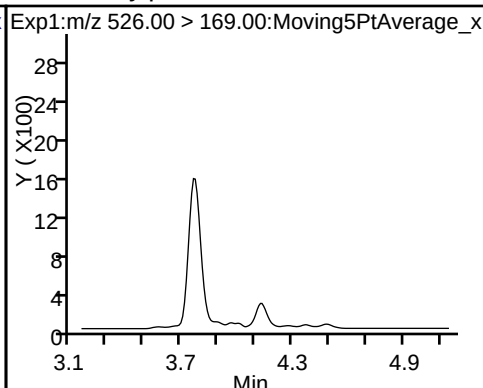
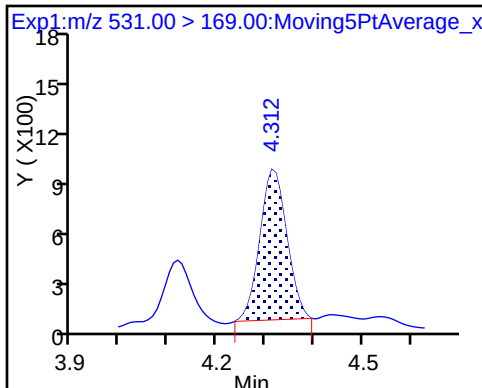
D 36 13C2 PFDaA

37 Perfluorododecanoic acid



D 38 d-N-EtFOSA-M

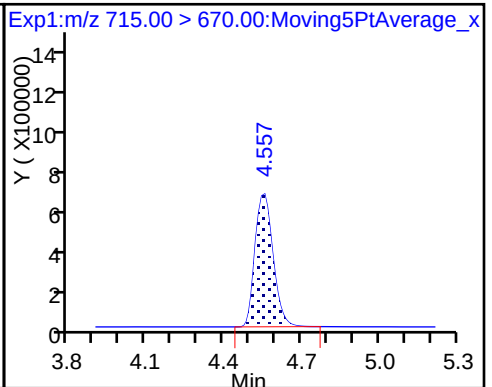
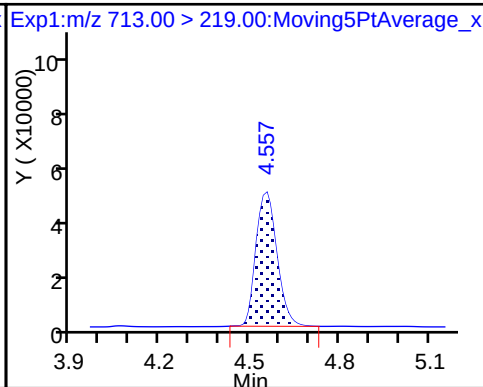
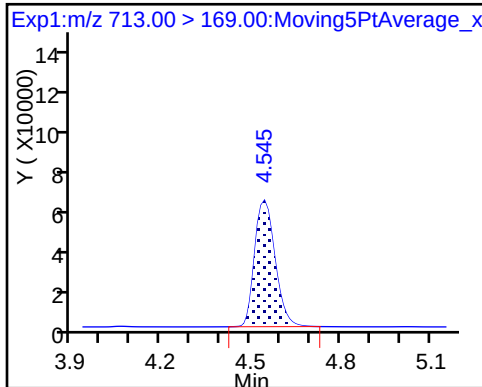
39 N-ethylperfluoro-1-octanesulfonami (ND) Perfluorotridecanoic acid



42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

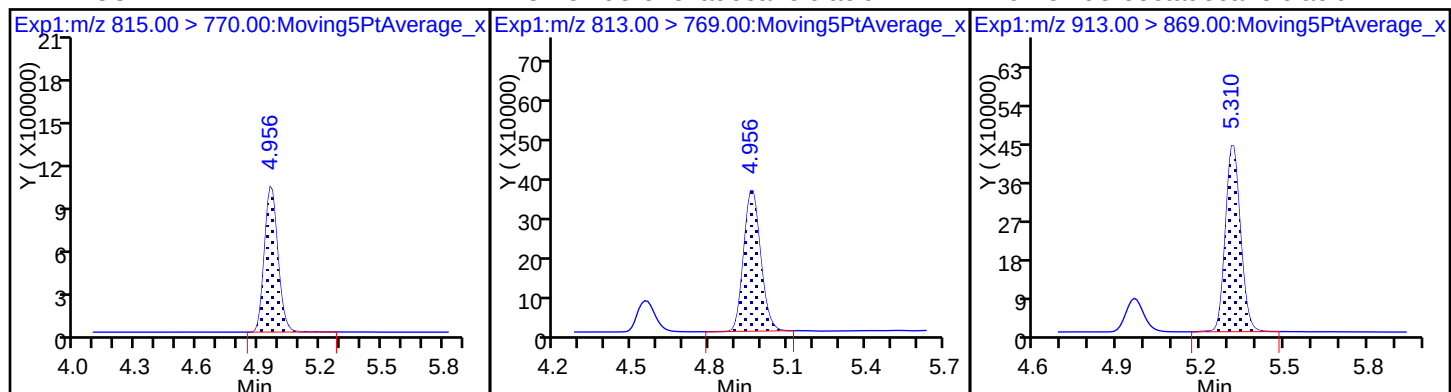
D 43 13C2-PFTeDA



D 44 13C2-PFHxDA

45 Perfluorohexadecanoic acid

46 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCSD 320-179613/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_049.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>250.00 (mL)</u>	Date Analyzed: <u>08/29/2017 09:28</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	44.7		2.5	1.0	0.46
2706-90-3	Perfluoropentanoic acid (PFPeA)	40.6		2.5	2.0	0.99
307-24-4	Perfluorohexanoic acid (PFHxA)	42.3		2.5	2.0	0.79
375-85-9	Perfluoroheptanoic acid (PFHpA)	43.6		2.5	2.0	0.80
335-67-1	Perfluorooctanoic acid (PFOA)	40.1		2.5	2.0	0.75
375-95-1	Perfluorononanoic acid (PFNA)	42.3		2.5	2.0	0.65
335-76-2	Perfluorodecanoic acid (PFDA)	42.8		2.5	1.0	0.44
2058-94-8	Perfluoroundecanoic acid (PFUnA)	37.4		2.5	2.0	0.75
307-55-1	Perfluorododecanoic acid (PFDoA)	41.4		2.5	2.0	0.58
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	43.5		2.5	2.0	0.55
376-06-7	Perfluorotetradecanoic acid (PFTeA)	38.0		2.5	1.0	0.40
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37.7		2.5	2.0	0.92
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	39.0		2.5	2.0	0.87
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	42.3		2.5	2.0	0.71
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	39.5		4.0	3.0	1.3
335-77-3	Perfluorodecanesulfonic acid (PFDS)	41.6		4.0	3.0	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	46.0		40	2.0	0.64

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-179613/3-A
 Matrix: Water Lab File ID: 2017.08.28B_049.d
 Analysis Method: 537 (modified) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 08/16/2017 09:20
 Sample wt/vol: 250.00 (mL) Date Analyzed: 08/29/2017 09:28
 Con. Extract Vol.: 0.50 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 181833 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	68		25-150
STL00992	13C4 PFBA	95		25-150
STL00993	13C2 PFHxA	110		25-150
STL00990	13C4 PFOA	121		25-150
STL00995	13C5 PFNA	113		25-150
STL00996	13C2 PFDA	114		25-150
STL00997	13C2 PFUnA	108		25-150
STL00998	13C2 PFDoA	105		25-150
STL00994	18O2 PFHxS	94		25-150
STL00991	13C4 PFOS	95		25-150
STL01892	13C4-PFHpA	117		25-150
STL01893	13C5 PFPeA	105		25-150
STL02337	13C3-PFBS	93		25-150
STL02116	13C2-PFTeDA	110		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_049.d
 Lims ID: LCSD 320-179613/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 29-Aug-2017 09:28:09 ALS Bottle#: 38 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-179613
 Misc. Info.: Plate: 1 Rack: 5
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 29-Aug-2017 14:30:02 Calib Date: 24-Aug-2017 10:57:35
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170824-47047.b\2017.08.24A_010.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 29-Aug-2017 14:13:33

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 1.553 1.564 -0.011 9841534 47.5 95.0 16624

2 Perfluorobutyric acid

212.90 > 169.00 1.553 1.564 -0.011 1.000 3993934 22.4 112 537

D 3 13C5-PFPeA

267.90 > 223.00 1.754 1.773 -0.019 6910271 52.6 105 31345

4 Perfluoropentanoic acid

262.90 > 219.00 1.754 1.773 -0.019 1.000 2925723 20.3 101 1130

D 47 13C3-PFBS

301.90 > 83.00 1.782 1.792 -0.010 169677 43.5 93.5 4452

5 Perfluorobutanesulfonic acid

298.90 > 80.00 1.782 1.801 -0.019 1.000 5035608 18.9 107 40882

298.90 > 99.00 1.782 1.801 -0.019 1.000 2059035 2.45(0.00-0.00) 11583

61 Sodium 1H,1H,2H,2H-perfluorohexane

327.00 > 307.00 1.983 2.006 -0.023 1.000 1385441 21.6 116 18592

D 7 13C2 PFHxA

315.00 > 270.00 2.028 2.041 -0.013 7548912 55.1 110 18187

6 Perfluorohexanoic acid

313.00 > 269.00 2.028 2.041 -0.013 1.000 2975129 21.2 106 3709

D 9 13C4-PFHpA

367.00 > 322.00 2.354 2.365 -0.011 7386022 58.3 117 12087

10 Perfluoroheptanoic acid

363.00 > 319.00 2.354 2.365 -0.011 1.000 3104837 21.8 109 3305

D 11 18O2 PFHxS

403.00 > 84.00 2.362 2.381 -0.019 9730817 44.6 94.3 24419

8 Perfluorohexanesulfonic acid

399.00 > 80.00 2.362 2.381 -0.019 1.000 4172996 19.5 107 5549

D 12 M2-6:2FTS

429.00 > 409.00 2.673 2.698 -0.025 3320892 62.9 132 19283

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Sodium 1H,1H,2H,2H-perfluorooctane	427.00	2.673	2.698	-0.025	1.000	1301914	21.3	112	9495	
D 14 13C4 PFOA	417.00	2.702	2.720	-0.018		7024807	60.4	121	43914	
15 Perfluorooctanoic acid	413.00	2.702	2.720	-0.018	1.000	3081921	20.0	100	499	
413.00 > 169.00	2.702	2.720	-0.018	1.000	1538966		2.00(0.90-1.10)		7039	
16 Perfluoroheptanesulfonic Acid	449.00	2.709	2.727	-0.018	1.000	3636977	21.2	111	14901	
D 18 13C4 PFOS	503.00	3.065	3.093	-0.028		6852176	45.2	94.5	22380	
D 19 13C5 PFNA	468.00	3.074	3.093	-0.019		5041109	56.6	113	19208	
17 Perfluorooctane sulfonic acid	499.00	3.074	3.093	-0.019	1.000	3004854	19.8	107	54001	
499.00 > 99.00	3.074	3.093	-0.019	1.000	626119		4.80(0.90-1.10)		2620	
20 Perfluorononanoic acid	463.00	3.074	3.093	-0.019	1.000	2100180	21.1	106	1633	
D 26 M2-8:2FTS	529.00	3.422	3.444	-0.022		2373713	55.7	116	26142	
25 Sodium 1H,1H,2H,2H-perfluorodecane	527.00	3.422	3.444	-0.022	1.000	997005	21.7	113	12900	
D 23 13C2 PFDA	515.00	3.430	3.453	-0.023		4415440	57.2	114	25025	
D 21 13C8 FOSA	506.00	3.430	3.453	-0.023		7862233	34.2	68.4	32775	
24 Perfluorodecanoic acid	513.00	3.430	3.453	-0.023	1.000	1707064	21.4	107	3974	
22 Perfluorooctane Sulfonamide	498.00	3.430	3.453	-0.023	1.000	3343171	23.0	115	16095	
D 27 d3-NMeFOSAA	573.00	3.584	3.605	-0.021		949946	46.1	92.2	7085	
28 N-methyl perfluorooctane sulfonami	570.00	3.584	3.616	-0.032	1.000	399994	21.4	107	2810	
29 Perfluorodecane Sulfonic acid	599.00	3.741	3.763	-0.022	1.000	1799765	20.8	108	12954	
D 32 d5-NEtFOSAA	589.00	3.750	3.772	-0.022		953248	44.2	88.4	1529	
D 30 13C2 PFUnA	565.00	3.750	3.782	-0.032		2835350	54.2	108	10341	
33 N-ethyl perfluorooctane sulfonamid	584.00	3.750	3.782	-0.032	1.000	367086	22.4	112	3979	
31 Perfluoroundecanoic acid	563.00	3.750	3.782	-0.032	1.000	1194125	18.7	93.5	1769	
D 36 13C2 PFDaA	615.00	4.045	4.072	-0.027		2677799	52.3	105	13253	
37 Perfluorododecanoic acid	613.00	4.045	4.072	-0.027	1.000	1072626	20.7	104	1007	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 38 d-N-EtFOSA-M										
531.00 > 169.00	4.318	4.140	0.178		2648	0.0499		0.1	14.9	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.310	4.333	-0.023	1.000	1109904	21.7		109	267	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.538	4.561	-0.023	1.000	286426	19.0		95.1	5097	
713.00 > 219.00	4.550	4.561	-0.011	1.003	217910		1.31(0.00-0.00)		2110	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.550	4.574	-0.024		2978585	55.1		110	21614	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.960	4.972	-0.012		3964271	36.0		71.9	8508	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.960	4.982	-0.022	1.000	1437909	20.4		102	156	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.313	5.330	-0.017	1.000	1468911	17.2		86.2	259	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b\2017.08.28B_049.d

Injection Date: 29-Aug-2017 09:28:09

Instrument ID: A8_N

Lims ID: LCSD 320-179613/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

38

Worklist Smp#:

4

Injection Vol: 2.0 ul

Dil. Factor:

1.0000

Method: A8_N

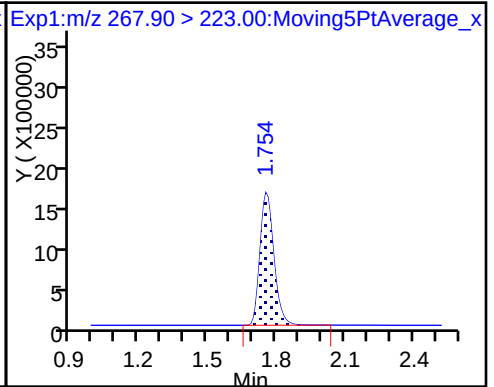
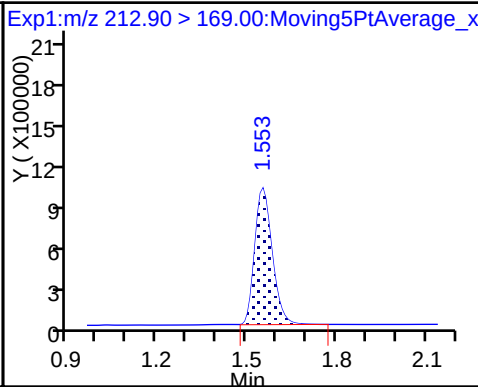
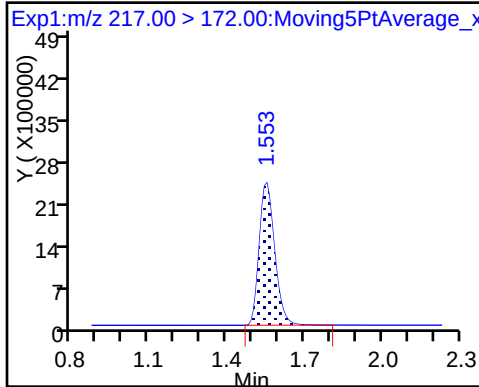
Limit Group:

LC PFC_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

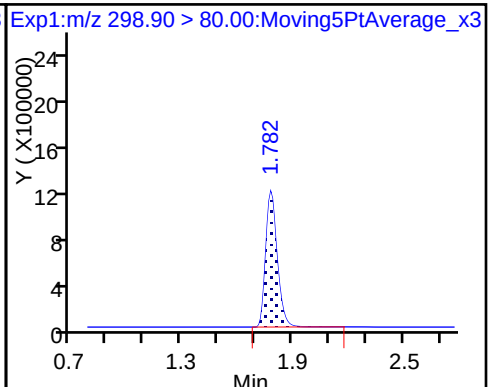
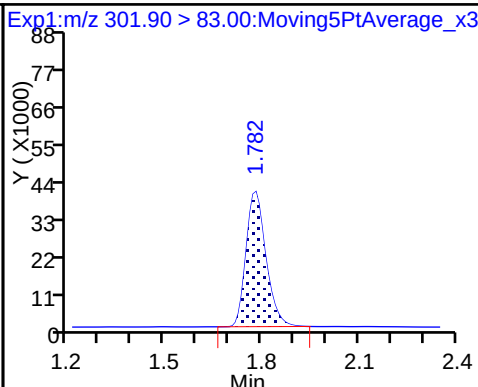
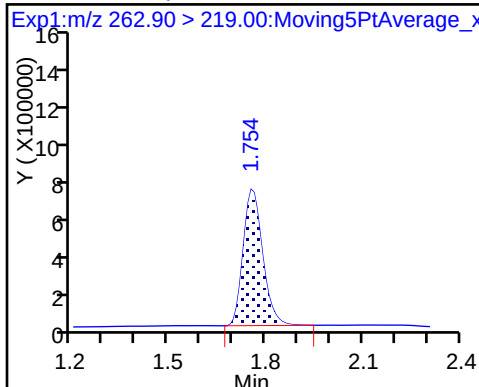
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

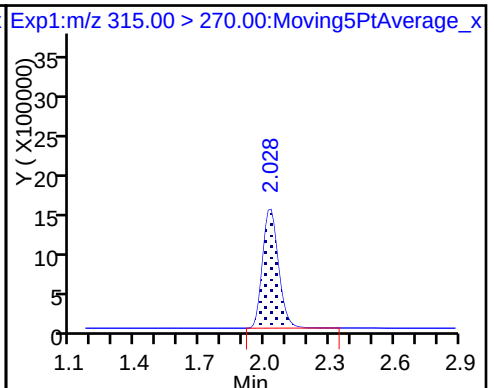
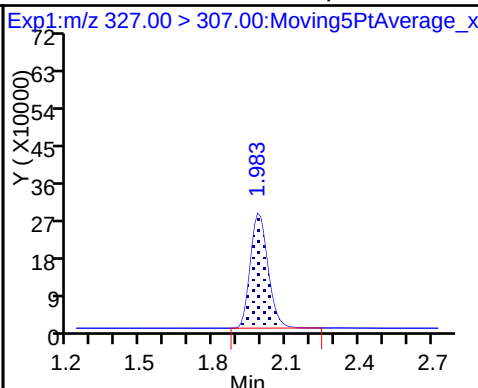
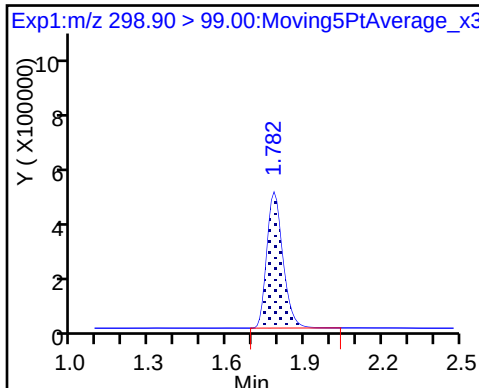
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 Sodium 1H,1H,2H,2H-perfluorohexa

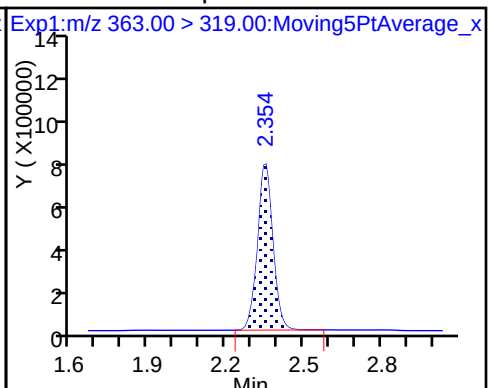
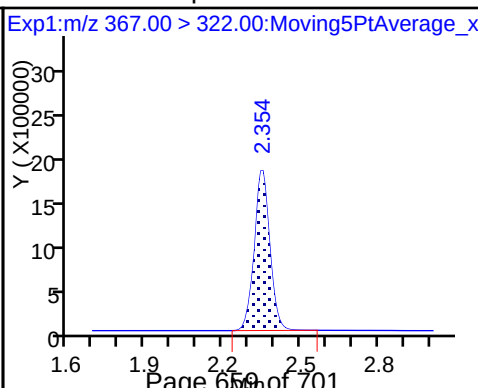
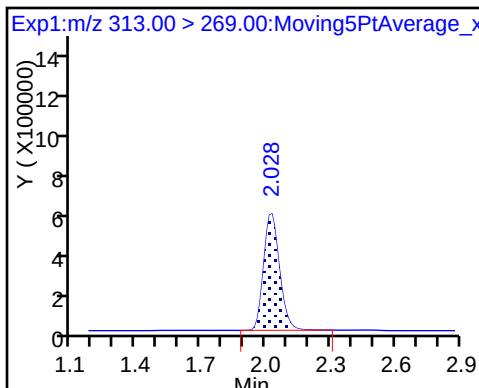
De 7 13C2 PFHxA



6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

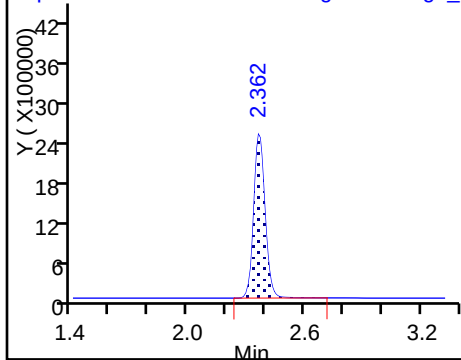


D 11 18O2 PFHxS

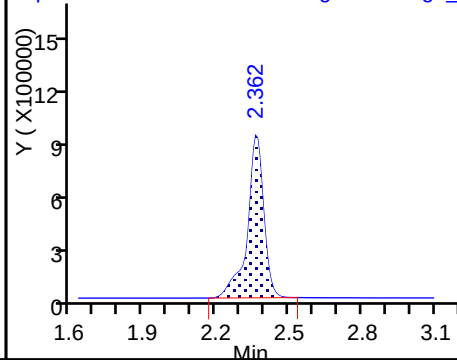
8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

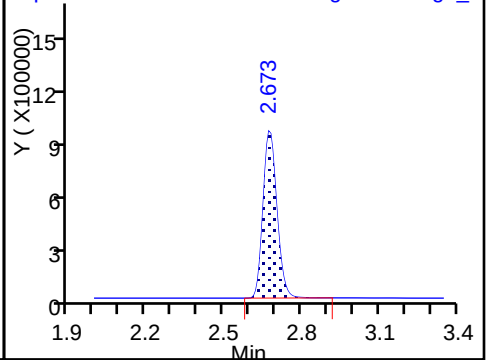
Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3



Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 429.00 > 409.00:Moving5PtAverage_x3

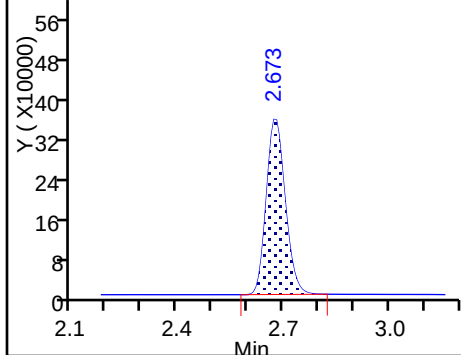


13 Sodium 1H,1H,2H,2H-perfluorooctadec

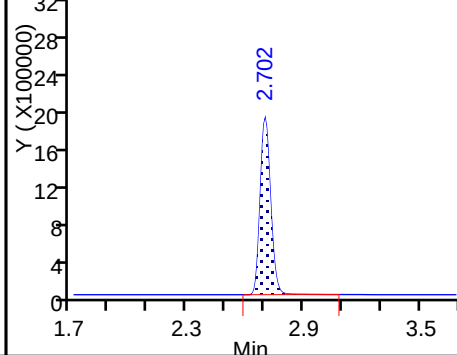
De 14 13C4 PFOA

15 Perfluorooctanoic acid

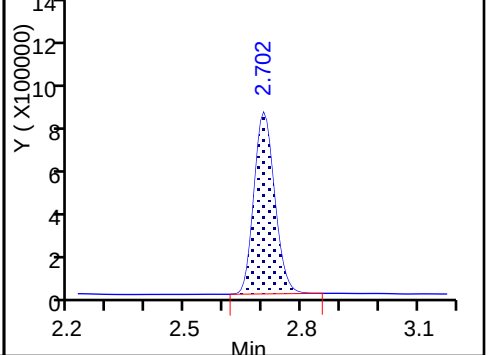
Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x3



Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x3



Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3

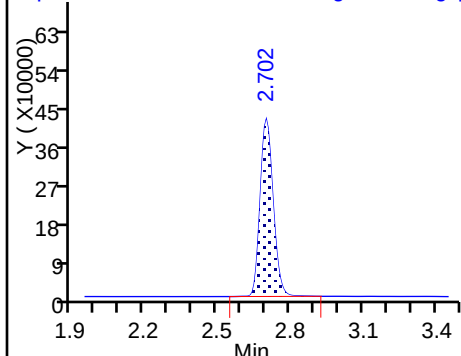


15 Perfluorooctanoic acid

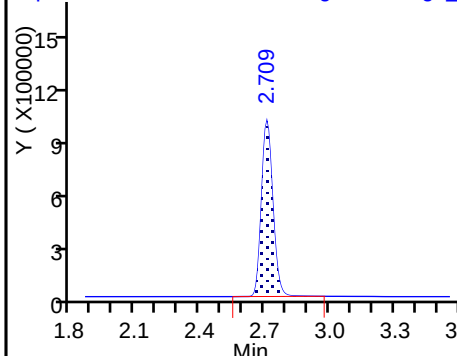
16 Perfluoroheptanesulfonic Acid

D 18 13C4 PFOS

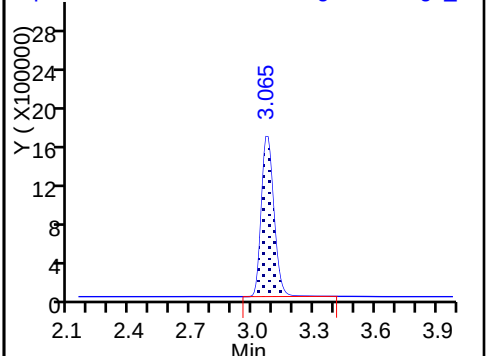
Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x3



Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3



Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3

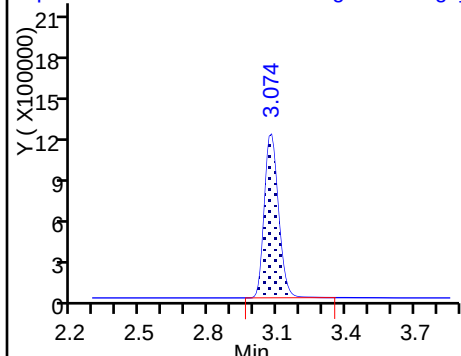


D 19 13C5 PFNA

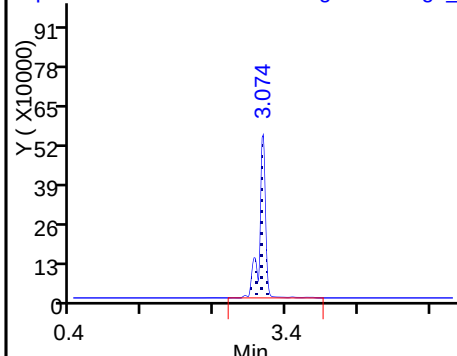
17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

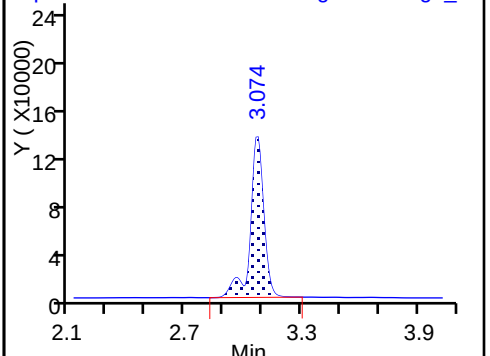
Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x3



Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3



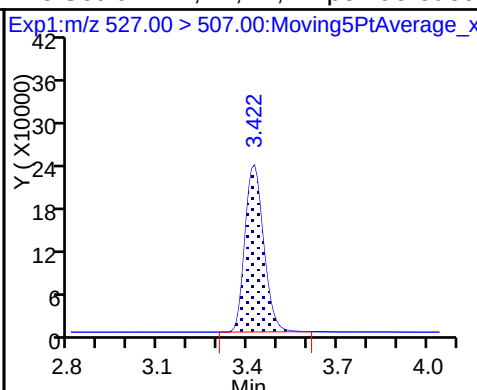
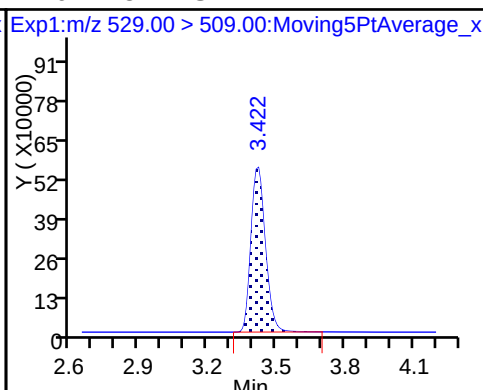
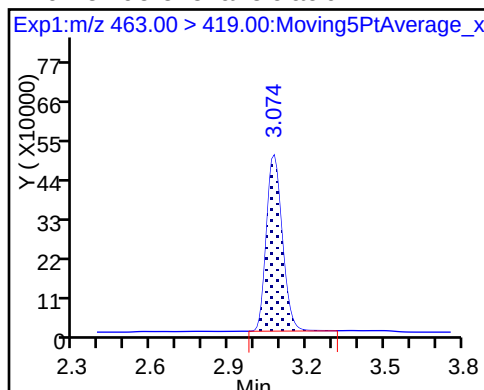
Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3



20 Perfluorononanoic acid

D 26 M2-8:2FTS

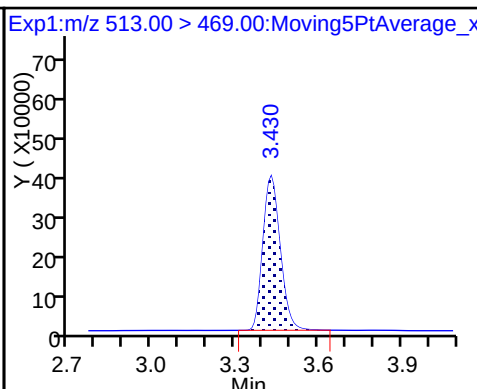
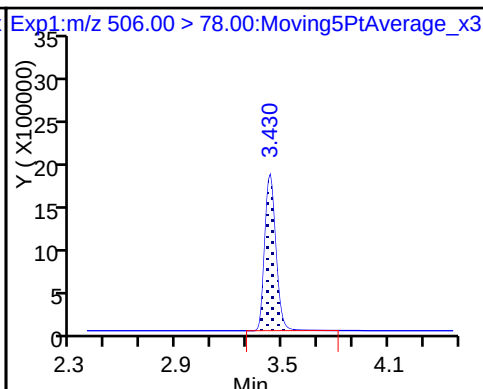
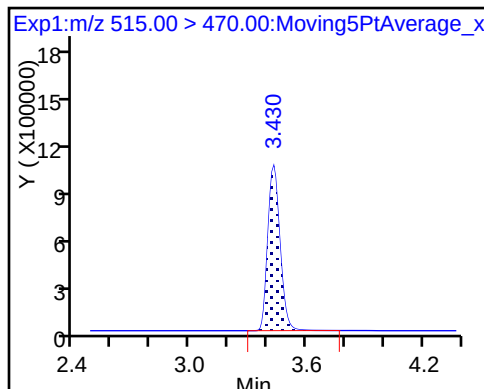
25 Sodium 1H,1H,2H,2H-perfluorodecane



D 23 13C2 PFDA

D 21 13C8 FOSA

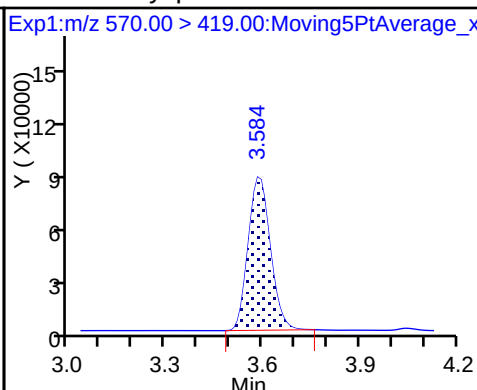
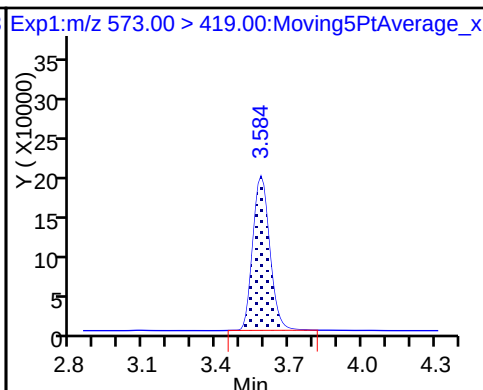
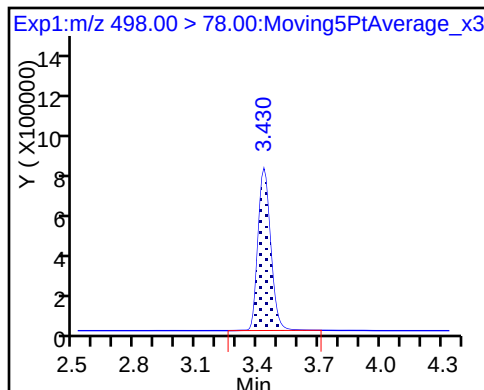
24 Perfluorodecanoic acid



22 Perfluorooctane Sulfonamide

D 27 d3-NMeFOSAA

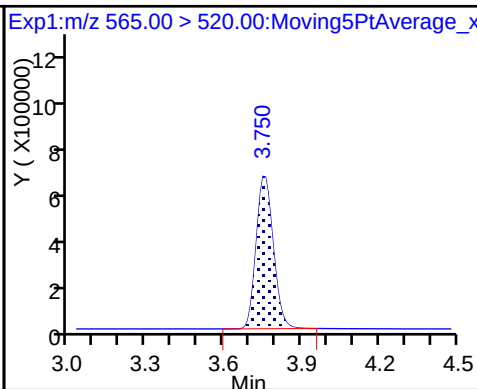
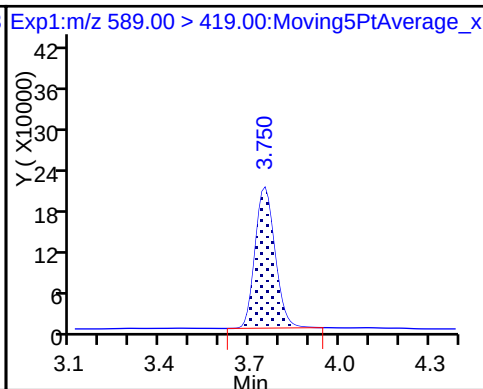
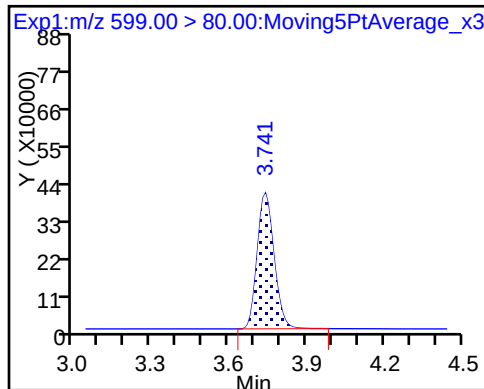
28 N-methyl perfluorooctane sulfonami



29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

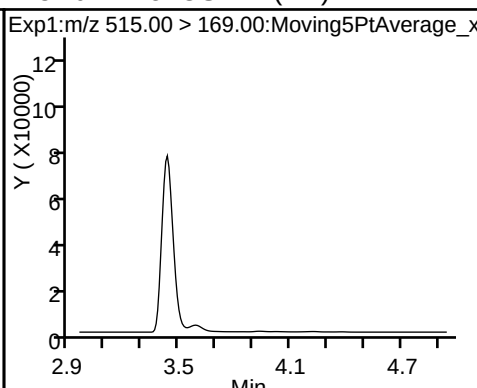
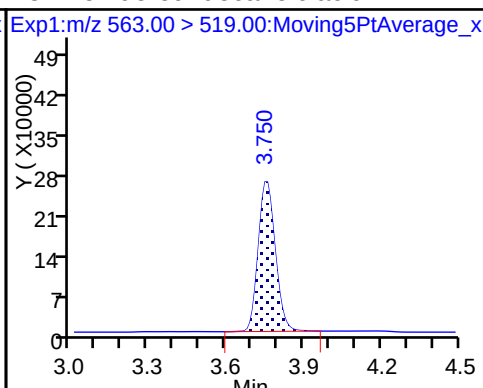
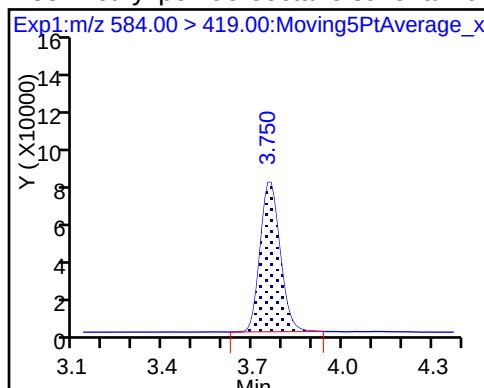
D 30 13C2 PFUnA



33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

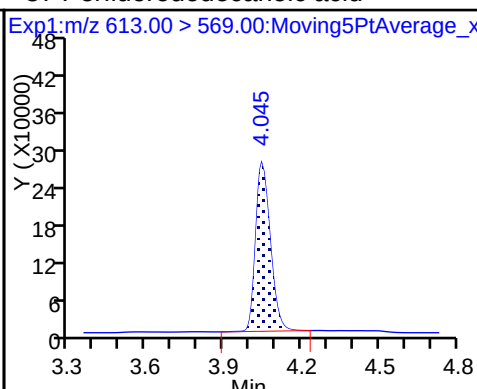
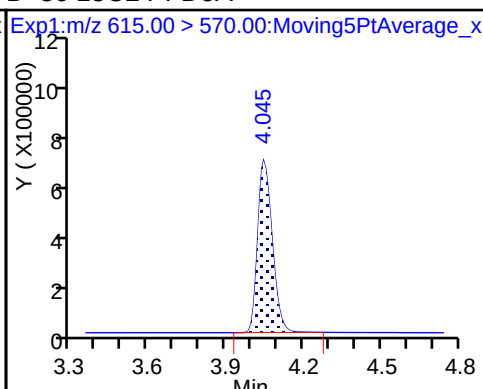
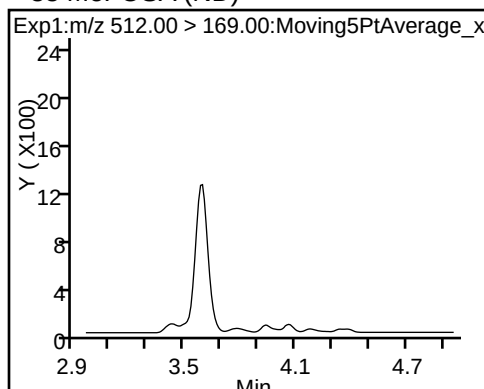
D 34 d-N-MeFOSA-M (ND)



35 MeFOSA (ND)

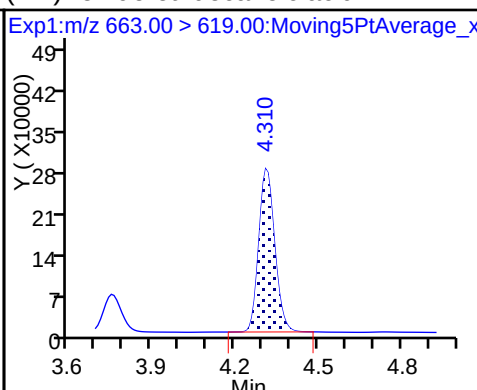
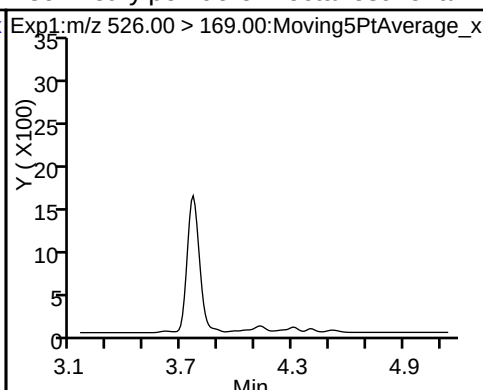
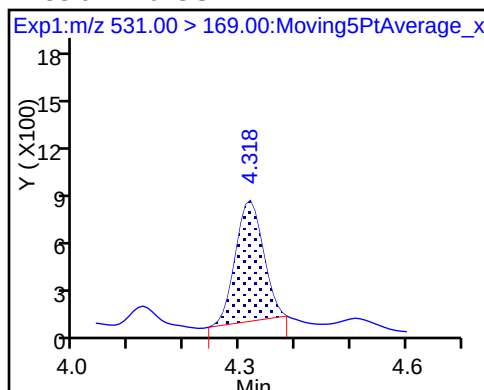
D 36 13C2 PFDaA

37 Perfluorododecanoic acid



D 38 d-N-EtFOSA-M

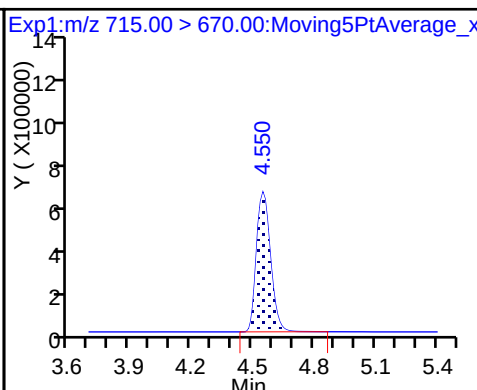
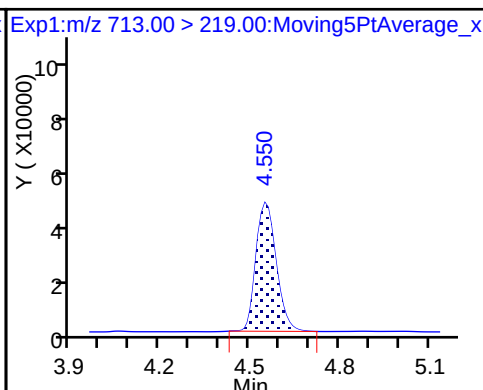
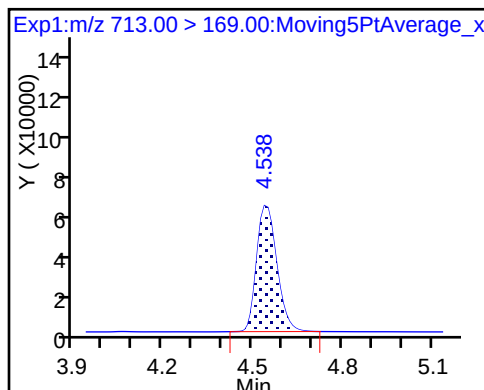
39 N-ethylperfluoro-1-octanesulfonami (ND)Perfluorotridecanoic acid



42 Perfluorotetradecanoic acid

42 Perfluorotetradecanoic acid

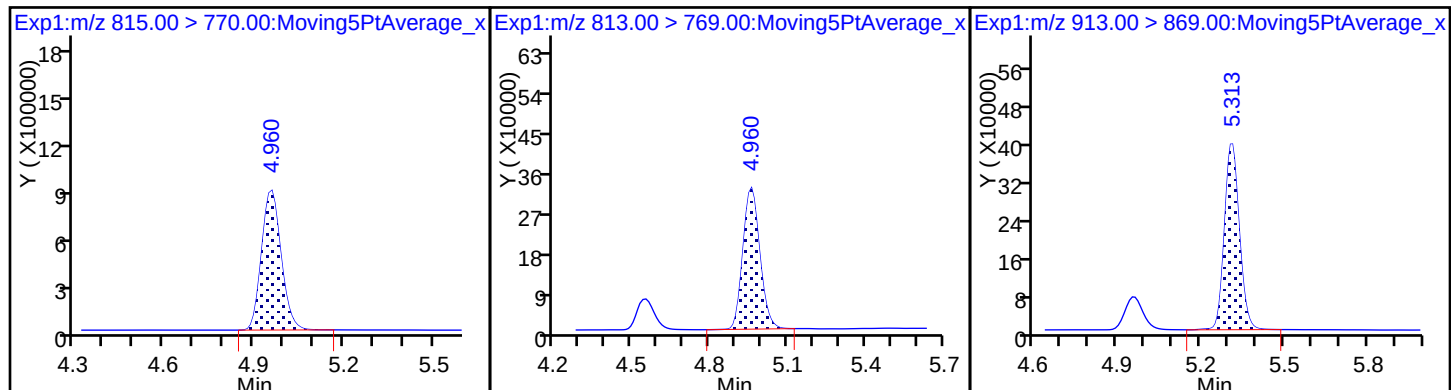
D 43 13C2-PFTeDA



D 44 13C2-PFHxDA

45 Perfluorohexadecanoic acid

46 Perfluorooctadecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/24/2017 10:09Analysis Batch Number: 180980 End Date: 08/24/2017 11:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-180980/3		08/24/2017 10:09	1	2017.08.24A_003 .d	GeminiC18 3x100 3(mm)
IC 320-180980/4		08/24/2017 10:16	1	2017.08.24A_004 .d	GeminiC18 3x100 3(mm)
IC 320-180980/5		08/24/2017 10:23	1	2017.08.24A_005 .d	GeminiC18 3x100 3(mm)
IC 320-180980/6		08/24/2017 10:29	1	2017.08.24A_006 .d	GeminiC18 3x100 3(mm)
IC 320-180980/7		08/24/2017 10:36	1	2017.08.24A_007 .d	GeminiC18 3x100 3(mm)
IC 320-180980/8		08/24/2017 10:43	1	2017.08.24A_008 .d	GeminiC18 3x100 3(mm)
IC 320-180980/9		08/24/2017 10:50	1	2017.08.24A_009 .d	GeminiC18 3x100 3(mm)
IC 320-180980/10		08/24/2017 10:57	1	2017.08.24A_010 .d	GeminiC18 3x100 3(mm)
ICB 320-180980/11		08/24/2017 11:04	1		GeminiC18 3x100 3(mm)
ICV 320-180980/12		08/24/2017 11:11	1	2017.08.24A_012 .d	GeminiC18 3x100 3(mm)
ZZZZZ		08/24/2017 11:18	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/29/2017 04:17Analysis Batch Number: 181763 End Date: 08/29/2017 04:52

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-181763/4		08/29/2017 04:17	1	2017.08.28B_004 .d	GeminiC18 3x100 3(mm)
CCV 320-181763/5		08/29/2017 04:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 04:31	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 04:38	100		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 04:45	50		GeminiC18 3x100 3(mm)
CCV 320-181763/9		08/29/2017 04:52	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/29/2017 09:07Analysis Batch Number: 181833End Date: 08/29/2017 11:32

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-181833/1		08/29/2017 09:07	1	2017.08.28B_046 .d	GeminiC18 3x100 3(mm)
MB 320-179613/1-A		08/29/2017 09:14	1	2017.08.28B_047 .d	GeminiC18 3x100 3(mm)
LCS 320-179613/2-A		08/29/2017 09:21	1	2017.08.28B_048 .d	GeminiC18 3x100 3(mm)
LCSD 320-179613/3-A		08/29/2017 09:28	1	2017.08.28B_049 .d	GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 09:35	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 09:41	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 09:48	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 09:55	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:02	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:09	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:16	1		GeminiC18 3x100 3(mm)
CCV 320-181833/12		08/29/2017 10:23	1	2017.08.28B_057 .d	GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:30	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:44	1		GeminiC18 3x100 3(mm)
320-30556-1 DL		08/29/2017 10:51	10	2017.08.28B_061 .d	GeminiC18 3x100 3(mm)
320-30556-2		08/29/2017 10:57	1	2017.08.28B_062 .d	GeminiC18 3x100 3(mm)
320-30556-3		08/29/2017 11:04	1	2017.08.28B_063 .d	GeminiC18 3x100 3(mm)
320-30556-4		08/29/2017 11:11	1	2017.08.28B_064 .d	GeminiC18 3x100 3(mm)
320-30556-1		08/29/2017 11:18	1	2017.08.28B_065 .d	GeminiC18 3x100 3(mm)
CCV 320-181833/22		08/29/2017 11:32	1	2017.08.28B_067 .d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Batch Number: 179613 Batch Start Date: 08/16/17 09:20 Batch Analyst: Santos, JonathanBatch Method: 3535 Batch End Date: 08/17/17 21:48

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC ALL_SU 00006	LCPFCS 00110
MB 320-179613/1		3535, 537 (modified)				250.00 mL	0.50 mL	500 uL	
LCS 320-179613/2		3535, 537 (modified)				250.00 mL	0.50 mL	500 uL	500 uL
LCSD 320-179613/3		3535, 537 (modified)				250.00 mL	0.50 mL	500 uL	500 uL
320-30556-A-1	TP-PFC-020-TPI	3535, 537 (modified)	T	287.82 g	27.01 g	260.8 mL	0.50 mL	500 uL	
320-30556-A-2	TP-PFC-020-MID-C ARBON	3535, 537 (modified)	T	286.46 g	27.66 g	258.8 mL	0.50 mL	500 uL	
320-30556-A-3	TP-PFC-020-TPE	3535, 537 (modified)	T	290.04 g	26.95 g	263.1 mL	0.50 mL	500 uL	
320-30556-A-4	TP-PFC-020-TPE-D	3535, 537 (modified)	T	287.99 g	26.92 g	261.1 mL	0.50 mL	500 uL	

Batch Notes	
Balance ID	QA-070
H2O ID	8/7/17
Hexane ID	981622
Manifold ID	8, 14
Methanol ID	1010872
Sodium Hydroxide ID	1010784
Pipette ID	I46370G
Analyst ID - Reagent Drop	CCB
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
Solvent Lot #	1010466
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003237040A

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.

537 (modified)

Page 1 of 2

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Batch Number: 179613 Batch Start Date: 08/16/17 09:20 Batch Analyst: Santos, JonathanBatch Method: 3535 Batch End Date: 08/17/17 21:48

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.

HPLC/LCMS Data Review Checklist

Job Number(s): 460-139000; 30317
30555; 30556; 460-139006; Work List ID(s): 47185; 47186; 47265; 47264
 Extraction Batch: 179613; 179714 Analysis Batch(es): 181485; 181487; 181488; 181833;
181762(CCVL); 181830;
 Delivery Rank: 4 Due Date: various 181831

	1 st Level	2 nd Level	N/A
A. Calibration/Instrument Run QC			
1. ICAL locked in Chrom and TALS? ICAL Batch# <u>180980; 180981</u>	✓	✓	
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?	✓	✓	
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			
1. Are all non-conformances documented/attached? NCM#	✓	✓	
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): [Signature] Date: 8/29/17
 2nd Level Reviewer: [Signature] Date: 8/30/17

NCMS: 99268; 99266; 99270; 99271; 99287; 99288; 99289; 99291;
99292; 99286; 99272; 99273; 99274; 99314; 99313; 99315;
99316

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 25AUG2017J_PFC

Worklist Number: 47185

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170828-47185.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 181484	LC PFC ICAL Raw Batch: 181485	LC PFAS ICAL Raw Batch: 181486
# 1 CCV L5	# 1 CCV L5 <i>PFDOA 10A</i>	# 1 CCV L5	
# 2 MB 320-179714/1-A	# 2 MB 320-179714/1-A <i>PI</i>	# 2 MB 320-179714/1-A	
# 3 LCS 320-179714/2-A	# 3 LCS 320-179714/2-A	# 3 LCS 320-179714/2-A	
# 4 320-30555-A-11-A	# 4 320-30555-A-11-A		
# 5 320-30555-A-12-A	# 5 320-30555-A-12-A		
# 6 320-30555-A-13-A	# 6 320-30555-A-13-A	<i>1st</i>	
# 7 320-30555-A-14-A	# 7 320-30555-A-14-A		
# 8 320-30555-A-15-A	# 8 320-30555-A-15-A		
# 9 320-30555-A-16-A	# 9 320-30555-A-16-A		
# 10 320-30555-A-17-A	# 10 320-30555-A-17-A		
# 11 320-30555-A-18-A	# 11 320-30555-A-18-A		
# 12 CCV L4	# 12 CCV L4	# 12 CCV L4	
# 13 320-30555-A-19-A	# 13 320-30555-A-19-A <i>RI</i>	<i>PFHpA 10A high 99271</i>	
# 14 320-30555-A-20-A	# 14 320-30555-A-20-A	<i>CCV 10A out 99270</i>	
# 15 320-30555-A-21-A	# 15 320-30555-A-21-A	<i>M/SD high targets 99266</i>	
# 16 320-30555-A-21-B MS	# 16 320-30555-A-21-B MS	<i>MS/MSD 1.R, RPD 99268</i>	
# 17 320-30555-A-21-C MSD	# 17 320-30555-A-21-C MSD		
# 18 320-30555-A-22-A	# 18 320-30555-A-22-A		
# 19 460-139000-F-1-A		# 19 460-139000-F-1-A	
# 20 460-139000-F-2-A		# 20 460-139000-F-2-A <i>20x</i>	
# 21 460-139000-F-2-B MS		# 21 460-139000-F-2-B MS <i>20x</i>	
# 22 460-139000-F-2-C MSD		# 22 460-139000-F-2-C MSD <i>20x</i>	
# 23 CCV L5	# 23 CCV L5	# 23 CCV L5 <i>PFDOA 10A</i>	
# 24 460-139000-F-3-A		# 24 460-139000-F-3-A	
# 25 460-139000-F-4-A		# 25 460-139000-F-4-A	
# 26 460-139000-F-5-A		# 26 460-139000-F-5-A	
# 27 CCV L4	# 27 CCV L4	# 27 CCV L4	

CCVL 181223

181222

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 25AUG2017K_PFC

Worklist Number: 47186

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170828-47186.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 181487	LC PFC ICAL Raw Batch: 181488	LC PFAS ICAL Raw Batch: 181489
# 1 CCV L4	# 1 CCV L4	# 1 CCV L4	
# 2 MB 320-179613/1-A	# 2 MB 320-179613/1-A	# 2 MB 320-179613/1-A	
# 3 LCS 320-179613/2-A	# 3 LCS 320-179613/2-A	# 3 LCS 320-179613/2-A	
# 4 LCSD 320-179613/3-A	# 4 LCSD 320-179613/3-A	# 4 LCSD 320-179613/3-A	
# 5 320-30555-A-1-A	# 5 320-30555-A-1-A RI IDA		
# 6 320-30555-A-2-A	# 6 320-30555-A-2-A		
# 7 320-30555-A-3-A	# 7 320-30555-A-3-A RI	1st	
# 8 320-30555-A-4-A	# 8 320-30555-A-4-A		
# 9 320-30555-A-5-A	# 9 320-30555-A-5-A RI		
#10 320-30555-A-6-A	#10 320-30555-A-6-A RI		
#11 320-30555-A-7-A	#11 320-30555-A-7-A RI		
#12 CCV L5	#12 CCV L5	#12 CCV L5	
#13 320-30555-A-8-A	#13 320-30555-A-8-A RI		
#14 320-30555-A-9-A	#14 320-30555-A-9-A RI		
#15 320-30555-A-10-A	#15 320-30555-A-10-A RI		
#16 320-30556-A-1-A	#16 320-30556-A-1-A IDX; RI		
#17 320-30556-A-2-A	#17 320-30556-A-2-A RI; i		
#18 320-30556-A-3-A	#18 320-30556-A-3-A RI		
#19 320-30556-A-4-A	#19 320-30556-A-4-A RI		
#20 460-139006-E-1-A		#20 460-139006-E-1-A	
#21 460-139006-E-2-A		#21 460-139006-E-2-A	
#22 460-139006-E-3-A		#22 460-139006-E-3-A	
#23 CCV L4	#23 CCV L4	#23 CCV L4 PFNA, DOA IDA out	
#24 460-139006-E-4-A		#24 460-139006-E-4-A	
#25 460-139006-E-5-A		#25 460-139006-E-5-A	
#26 CCV L5	#26 CCV L5	#26 CCV L5	

Link to 460-139000 MS/MSD
in 181485

LCVL 181223

181222

PFNA IDA out 99272
PFNA/DOA IDA high 99274
Several IDA out 99273

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 28AUG2017E_PFC

Worklist Number: 47265

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b

QC Batch: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 181833	LC PFC ICAL Raw Batch: 181834
# 1 CCV L4	# 1 CCV L4	# 1 CCV L4
# 2 MB 320-179613/1-A	# 2 MB 320-179613/1-A	
# 3 LCS 320-179613/2-A → confirmed	# 3 LCS 320-179613/2-A 6:2 FTS IDA high 99287	
# 4 LCSD 320-179613/3-A	# 4 LCSD 320-179613/3-A 6:2/8:2 IDA high 99288	
# 5 320-30555-A-1-A	# 5 320-30555-A-1-A	
# 6 320-30555-A-2-A -	# 6 320-30555-A-2-A → report original	PFTIDA IDA high 99289
# 7 320-30555-A-3-A	# 7 320-30555-A-3-A	PFTIDA IDA high 99291
# 8 320-30555-A-4-A → confirmed	# 8 320-30555-A-4-A	FOSTA IDA low 99292
# 9 320-30555-A-5-A → confirmed	# 9 320-30555-A-5-A	
#10 320-30555-A-6-A	#10 320-30555-A-6-A	
#11 320-30555-A-7-A	#11 320-30555-A-7-A	
#12 CCV L5	#12 CCV L5	#12 CCV L5
#13 320-30555-A-8-A	#13 320-30555-A-8-A	
#14 320-30555-A-9-A	#14 320-30555-A-9-A	
#15 320-30555-A-10-A	#15 320-30555-A-10-A	
#16 320-30556-A-1-A -	#16 320-30556-A-1-A RL, DL 99286	
#17 320-30556-A-2-A → c	#17 320-30556-A-2-A	
#18 320-30556-A-3-A → c	#18 320-30556-A-3-A	
#19 320-30556-A-4-A → c	#19 320-30556-A-4-A	
#20 320-30556-A-1-A → confirmed	#20 320-30556-A-1-A	
#21 RINSE	#21 RINSE	#21 RINSE
#22 CCV L4	#22 CCV L4	#22 CCV L4

CCVL 181763

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 28AUG2017D_PFC

Worklist Number: 47264

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47264.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 181830	LC PFC ICAL Raw Batch: 181831	LC PFAS ICAL Raw Batch: 181832
# 1 CCV L4	# 1 CCV L4	# 1 CCV L4	
# 2 MS 320-179714/1-A	# 2 MS 320-179714/1-A	PFBA 18A low 443 to 98c 8/29/17 99313	
# 3 LCS 320-179714/2-A	# 3 LCS 320-179714/2-A		
# 4 320-30555-A-11-A	# 4 320-30555-A-11-A		
# 5 320-30555-A-12-A	# 5 320-30555-A-12-A		
# 6 320-30555-A-13-A	# 6 320-30555-A-13-A		
# 7 320-30555-A-14-A	# 7 320-30555-A-14-A		
# 8 320-30555-A-15-A	# 8 320-30555-A-15-A		
# 9 320-30555-A-16-A	# 9 320-30555-A-16-A		
#10 320-30555-A-17-A	#10 320-30555-A-17-A		
#11 320-30555-A-18-A	#11 320-30555-A-18-A		
#12 CCV L5	#12 CCV L5	#12 CCV L5	
#13 320-30555-A-19-A	#13 320-30555-A-19-A		
#14 320-30555-A-20-A	#14 320-30555-A-20-A		
#15 320-30555-A-21-A	#15 320-30555-A-21-A		
#16 320-30555-A-21-B MS	#16 320-30555-A-21-B MS		
#17 320-30555-A-21-C MSD	#17 320-30555-A-21-C MSD		
#18 320-30555-A-22-A	#18 320-30555-A-22-A		
#19 460-139000-F-2-A		#19 460-139000-F-2-A	
#20 460-139000-F-2-B MS		#20 460-139000-F-2-B MS	
#21 460-139000-F-2-C MSD		#21 460-139000-F-2-C MSD	
#22 320-30317-A-5-A	#22 320-30317-A-5-A		
#23 CCV L4	#23 CCV L4	#23 CCV L4	

CCVL 181763

181762

MS/MSD high targets 99316

link to Job 139006 in 181488

RLDL 99311

RLDL 99315

92

Aqueous Extraction Analysis Sheet

AB 8/25/17

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End: 8/17/2017 9:48:00PM

Solid-Phase Extraction (SPE)

8/30

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-179613/1 N/A	N/A		250.00 mL				N/A	N/A	N/A	RI	MB 320-179613/1-A
			0.50 mL								
2 LCS-320-179613/2 N/A	N/A		250.00 mL				N/A	N/A	N/A	RI	LCS 320-179613/2-A
			0.50 mL								
3 LCSD-320-179613/3 N/A	N/A		250.00 mL				N/A	N/A	N/A	RI	LCSD 320-179613/3-A
			0.50 mL								
320-30555-A-1 (PFC_IDA_DOD5)	N/A (320-30555-1)	279.45 g	252.9 mL				8/25/17	16_Days	4	RI	320-30555-A-1-A
		26.51 g	0.50 mL								
320-30555-A-2 (PFC_IDA_DOD5)	N/A (320-30555-1)	285.43 g	258.9 mL				8/25/17	16_Days	4	RI	320-30555-A-2-A
		26.57 g	0.50 mL								
6 320-30555-A-3 (PFC_IDA_DOD5)	N/A (320-30555-1)	284.38 g	258.1 mL				8/25/17	16_Days	4	RI	320-30555-A-3-A
		26.30 g	0.50 mL								
7 320-30555-A-4 (PFC_IDA_DOD5)	N/A (320-30555-1)	287.96 g	260.5 mL				8/25/17	16_Days	4	RI	320-30555-A-4-A
		27.48 g	0.50 mL								
8 320-30555-A-5 (PFC_IDA_DOD5)	N/A (320-30555-1)	283.06 g	255.9 mL				8/25/17	16_Days	4	RI	320-30555-A-5-A
		27.21 g	0.50 mL								
9 320-30555-A-6 (PFC_IDA_DOD5)	N/A (320-30555-1)	278.88 g	251.6 mL				8/25/17	16_Days	4	RI	320-30555-A-6-A
		27.33 g	0.50 mL								
10 320-30555-A-7 (PFC_IDA_DOD5)	N/A (320-30555-1)	280.10 g	252.2 mL				8/25/17	16_Days	4	RI	320-30555-A-7-A
		27.89 g	0.50 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

11	320-30555-A-8 (PFC_IDA_DOD5)	N/A (320-30555-1)	287.44 g	259 mL				8/25/17	16_Days	4	RI	
			28.40 g	0.50 mL								
12	320-30555-A-9 (PFC_IDA_DOD5)	N/A (320-30555-1)	283.78 g	256.6 mL				8/25/17	16_Days	4	RI	
			27.22 g	0.50 mL								
13	320-30555-A-10 (PFC_IDA_DOD5)	N/A (320-30555-1)	281.50 g	253.4 mL				8/25/17	16_Days	4	RI	
			28.09 g	0.50 mL								
14	320-30556-A-1 (PFC_IDA_DOD5)	N/A (320-30556-1)	287.82 g	260.8 mL				8/25/17	16_Days	4	10x, RI	
			27.01 g	0.50 mL								
15	320-30556-A-2 (PFC_IDA_DOD5)	N/A (320-30556-1)	286.46 g	258.8 mL				8/25/17	16_Days	4	RI	
			27.66 g	0.50 mL								
16	320-30556-A-3 (PFC_IDA_DOD5)	N/A (320-30556-1)	290.04 g	263.1 mL				8/25/17	16_Days	4	RI	
			26.95 g	0.50 mL								
17	320-30556-A-4 (PFC_IDA_DOD5)	N/A (320-30556-1)	287.99 g	261.1 mL				8/25/17	16_Days	4	RI	
			26.92 g	0.50 mL								
18	460-139006-E-1 (PFC_IDA)	N/A (460-139006-1)	284.99 g	258.2 mL				8/22/17	20_Days	4		
			26.81 g	0.50 mL								
19	460-139006-E-2 (PFC_IDA)	N/A (460-139006-1)	284.07 g	257.3 mL				8/22/17	20_Days	4		
			26.74 g	0.50 mL								
20	460-139006-E-3 (PFC_IDA)	N/A (460-139006-1)	287.53 g	260.4 mL				8/22/17	20_Days	4		
			27.15 g	0.50 mL								
21	460-139006-E-4 (PFC_IDA)	N/A (460-139006-1)	288.39 g	261.7 mL				8/22/17	20_Days	4		
			26.66 g	0.50 mL								
22	460-139006-E-5 (PFC_IDA)	N/A (460-139006-1)	287.22 g	260.5 mL				8/22/17	20_Days	4		
			26.76 g	0.50 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

Batch Notes

Manifold ID 8, 14

Methanol ID 1010872

Hexane ID 981622

Sodium Hydroxide ID 1010784

First Start time NA

First End time NA

SPE Cartridge Type WAX 500mg

Solid Phase Extraction Disk ID 003237040A

Balance ID QA-070

H2O ID 8/7/17

Pipette ID I46370G

Solvent Name 0.3% NH4OH/MeOH

Solvent Lot # 1010466

Analyst ID - Reagent Drop

ceB

Analyst ID - SU Reagent Drop

ceB

Analyst ID - SU Reagent Drop JNS

Witness

Acid Name NA

Acid ID NA

Reagent ID NA

Reagent Lot Number NA

SOP Number WS-LC-0025

Page 6/6 of 701

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

Batch Comment NA

Comments

320-30555-A-1

Method Comments: include add on spikes

320-30555-A-2

Method Comments: include add on spikes

320-30555-A-3

Method Comments: include add on spikes

320-30555-A-4

Method Comments: include add on spikes

320-30555-A-5

Method Comments: include add on spikes

320-30555-A-6

Method Comments: include add on spikes

320-30555-A-7

Method Comments: include add on spikes

320-30555-A-8

Method Comments: include add on spikes

320-30555-A-9

Method Comments: include add on spikes

320-30555-A-10

Method Comments: include add on spikes

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-179613/1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL	JTS 8-16-17	JTS 8/16/17
LCS 320-179613/2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
LCS 320-179613/2	LCPFCSP_00110	500 uL	0.50 mL		
LCSD 320-179613/3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
LCSD 320-179613/3	LCPFCSP_00110	500 uL	0.50 mL		
320-30555-A-1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-4	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-5	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-6	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-7	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-8	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-9	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-10	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30556-A-1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30556-A-2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30556-A-3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

320-30556-A-4	LCMPFC_ALL_SU_00006	500 uL	0.50 mL	CES 8-16-17 ↓	JMS 8/16/17 ↓
460-139006-E-1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139006-E-2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139006-E-3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139006-E-4	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139006-E-5	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		

Other Reagents:

Reagent

Amount/Units

Lot#:

Page 679 of 701

Preparation Batch Number(s): 179673

Test: 3535_PFC

Earliest Holding Time: 8/21/17

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	N/A	nh
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 correctly in TALS	N/A	nh
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: TN

Date: 08/17/17

2nd Level Reviewer: JS

Date: 8/14/17

Comments: _____

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Method Code: 320-3535_PFC-320

Batch Open: 8/16/2017 2:22:00PM

Batch End: 8/17/2017 6:44:00PM

Solid-Phase Extraction (SPE)

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-179714/1 N/A	N/A		250 mL				N/A	N/A	N/A		MB-320-179714/1-A1
			0.50 mL								
2 LCS-320-179714/2 N/A	N/A		250 mL				N/A	N/A	N/A		LCS-320-179714/2-A1
			0.50 mL								
3 320-30555-A-11 (PFC_IDA_DOD5)	N/A (320-30555-1)	206.81 g	178.7 mL				8/25/17	16_Days	4		320-30555-A-11-A1
		28.09 g	0.50 mL								
320-30555-A-12 (PFC_IDA_DOD5)	N/A (320-30555-1)	255.82 g	228.1 mL				8/25/17	16_Days	4		320-30555-A-12-A1
		27.72 g	0.50 mL								
320-30555-A-13 (PFC_IDA_DOD5)	N/A (320-30555-1)	255.38 g	227.8 mL				8/25/17	16_Days	4		320-30555-A-13-A1
		27.58 g	0.50 mL								
6 320-30555-A-14 (PFC_IDA_DOD5)	N/A (320-30555-1)	239.90 g	212.8 mL				8/25/17	16_Days	4		320-30555-A-14-A1
		27.12 g	0.50 mL								
7 320-30555-A-15 (PFC_IDA_DOD5)	N/A (320-30555-1)	240.77 g	213.5 mL				8/25/17	16_Days	4		320-30555-A-15-A1
		27.24 g	0.50 mL								
8 320-30555-A-16 (PFC_IDA_DOD5)	N/A (320-30555-1)	247.43 g	220.1 mL				8/25/17	16_Days	4		320-30555-A-16-A1
		27.34 g	0.50 mL								
9 320-30555-A-17 (PFC_IDA_DOD5)	N/A (320-30555-1)	248.51 g	219.7 mL				8/25/17	16_Days	4		320-30555-A-17-A1
		28.86 g	0.50 mL								
10 320-30555-A-18 (PFC_IDA_DOD5)	N/A (320-30555-1)	253.77 g	225.3 mL				8/25/17	16_Days	4		320-30555-A-18-A1
		28.47 g	0.50 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Batch Open: 8/16/2017 2:22:00PM

Method Code: 320-3535_PFC-320

Batch End:

11	320-30555-A-19 (PFC_IDA_DOD5)	N/A (320-30555-1)	254.50 g	0.50 mL			8/25/17	16_Days	4	RI	
12	320-30555-A-20 (PFC_IDA_DOD5)	N/A (320-30555-1)	242.78 g	0.50 mL			8/25/17	16_Days	4	RI	
13	320-30555-A-21 (PFC_IDA_DOD5)	N/A (320-30555-1)	243.47 g	0.50 mL			8/25/17	16_Days	4	RI	
14	320-30555-A-21-MS (PFC_IDA_DOD5)	N/A (320-30555-1)	242.87 g	0.50 mL			8/25/17	16_Days	4	RI	
15	320-30555-A-21-MSD (PFC_IDA_DOD5)	N/A (320-30555-1)	240.83 g	0.50 mL			8/25/17	16_Days	4	RI	
16	320-30555-A-22 (PFC_IDA_DOD5)	N/A (320-30555-1)	239.62 g	0.50 mL			8/25/17	16_Days	4	RI	
17	460-139000-F-1 (PFC_IDA)	N/A (460-139000-1)	213.84 g	0.50 mL			8/22/17	18_Days	4	same analytical batch	
18	460-139000-F-2 (PFC_IDA)	N/A (460-139000-1)	236.54 g	0.50 mL			8/22/17	18_Days	4	as 20x	
19	460-139000-F-2-MS (PFC_IDA)	N/A (460-139000-1)	234.13 g	0.50 mL			8/22/17	18_Days	4	20x	
20	460-139000-F-2-MSD (PFC_IDA)	N/A (460-139000-1)	242.07 g	0.50 mL			8/22/17	18_Days	4	20x	
21	460-139000-F-3 (PFC_IDA)	N/A (460-139000-1)	226.71 g	0.50 mL			8/22/17	18_Days	4		
22	460-139000-F-4 (PFC_IDA)	N/A (460-139000-1)	244.99 g	0.50 mL			8/22/17	18_Days	4		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Batch Open: 8/16/2017 2:22:00PM

Method Code: 320-3535_PFC-320

Batch End:

23

460-139000-F-5 (PFC_IDA)	N/A (460-139000-1)	256.19 g					8/22/17	18_Days	4	
			0.50 mL							

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Batch Open: 8/16/2017 2:22:00PM

Method Code: 320-3535_PFC-320

Batch End:

Batch Notes

Manifold ID	8,14
Methanol ID	1010872
Hexane ID	958900
Sodium Hydroxide ID	1010784
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500 mg
Solid Phase Extraction Disk ID	003237040A
Balance ID	QA-070
H2O ID	8/15/17
Pipette ID	N32761F
Solvent Name	3% NH4OH/MeOH
Solvent Lot #	1010466
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop	TWL
Witness	
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
SOP Number	WS-SC-0025

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Batch Open: 8/16/2017 2:22:00PM

Method Code: 320-3535_PFC-320

Batch End:

Batch Comment NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Batch Open: 8/16/2017 2:22:00PM

Method Code: 320-3535_PFC-320

Batch End:

Comments

320-30555-A-11
Method Comments: include add on spikes

320-30555-A-12
Method Comments: include add on spikes

320-30555-A-13
Method Comments: include add on spikes

320-30555-A-14
Method Comments: include add on spikes

320-30555-A-15
Method Comments: include add on spikes

320-30555-A-16
Method Comments: include add on spikes

320-30555-A-17
Method Comments: include add on spikes

320-30555-A-18
Method Comments: include add on spikes

320-30555-A-19
Method Comments: include add on spikes

320-30555-A-20
Method Comments: include add on spikes

320-30555-A-21
Method Comments: include add on spikes

320-30555-A-21~MS
Method Comments: include add on spikes

320-30555-A-21~MSD
Method Comments: include add on spikes

320-30555-A-22
Method Comments: include add on spikes

460-139000-F-1
Method Comments: Client Notification Required Prior to 5X Dilution

460-139000-F-2
Method Comments: Client Notification Required Prior to 5X Dilution

460-139000-F-2~MS
Method Comments: Client Notification Required Prior to 5X Dilution

460-139000-F-2~MSD
Method Comments: Client Notification Required Prior to 5X Dilution

460-139000-F-3
Method Comments: Client Notification Required Prior to 5X Dilution

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Batch Open: 8/16/2017 2:22:00PM

Method Code: 320-3535_PFC-320

Batch End:

460-139000-F-4	Method Comments: Client Notification Required Prior to 5X Dilution
460-139000-F-5	Method Comments: Client Notification Required Prior to 5X Dilution
	Method Comments: Client Notification Required Prior to 5X Dilution

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Batch Open: 8/16/2017 2:22:00PM

Method Code: 320-3535_PFC-320

Batch End:

Reagent Additions Worksheet

Lab ID <i>MB 320 8/30/17</i>	Reagent Code	Amount Added	Final Amount	By	Witness
~~MS~~ 320-179714/1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL	<i>[Signature]</i> 8/16/17	<i>[Signature]</i> 8/16/17
LCS 320-179714/2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
LCS 320-179714/2	LCPFCSP_00110	500 uL	0.50 mL		
320-30555-A-11	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-12	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-13	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-14	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-15	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-16	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-17	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-18	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-19	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-20	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-21	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-21 MS	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-21 MS	LCPFCSP_00110	500 uL	0.50 mL		
320-30555-A-21 MSD	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-21 MSD	LCPFCSP_00110	500 uL	0.50 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179714

Analyst: Long, Tyrel W

Batch Open: 8/16/2017 2:22:00PM

Method Code: 320-3535_PFC-320

Batch End:

320-30555-A-22	LCMPFC_ALL_SU_00006	500 uL	0.50 mL	<i>[Signature]</i> 8/16/17	<i>Tea</i> 8/16/17
460-139000-F-1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139000-F-2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139000-F-2 MS	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139000-F-2 MS	LCPFCSP_00110	500 uL	0.50 mL		
460-139000-F-2 MSD	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139000-F-2 MSD	LCPFCSP_00110	500 uL	0.50 mL		
460-139000-F-3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139000-F-4	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139000-F-5	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		

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Other Reagents:		
Reagent	Amount/Units	Lot#:

Preparation Batch Number(s): 320-179714 Test: 3835 - PFL

Earliest Holding Time: 8/22/17

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	NA	N/A
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 correctly in TALS	NA	N/A
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: ABH

Date: 8/17/17

2nd Level Reviewer: TQN

Date: 08/17/17

Comments: _____

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Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-177777

Analyst: Sharifi, Nooshin

Batch Open: 8/4/2017 11:38:00AM

Method Code: 320-Shake_Bath_14D-320

Batch End: 8/9/2017 5:39:00PM

AB 8/24/17
RIAE 8/25/17

8/30

Shake Extraction with Ultrasonic Bath Extraction

Input Sample Lab ID (Analytical Method)	SDG (Job #)	Initial Amount	Final Amount	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-177777/1 N/A	N/A	5.00 g	1.0 mL	N/A	N/A	N/A		MB-320-177777/1-A
2 LCS-320-177777/2 N/A	N/A	5.00 g	1.0 mL	N/A	N/A	N/A		LCS-320-177777/2-A
3 320-30317-A-1 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.01 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-1-A
4 320-30317-A-2 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.02 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-2-A
5 320-30317-A-3 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.07 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-3-A
6 320-30317-A-4 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.03 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-4-A
7 320-30317-A-5 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.04 g	1.0 mL	8/6/17	23_Days	4	5X 10X	320-30317-A-5-A
8 320-30317-A-6 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.00 g	1.0 mL	8/6/17	23_Days	4	20X	320-30317-A-6-A
9 320-30317-A-7 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.02 g	1.0 mL	8/6/17	23_Days	4	2X 5X 8/25/17	320-30317-A-7-A
10 320-30317-A-8 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.04 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-8-A
11 320-30317-A-10 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.00 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-10-A
12 320-30317-A-10-MS (PFC_IDA_DOD5)	N/A (320-30317-1)	5.00 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-10-B-MS
13 320-30317-A-10-MSD (PFC_IDA_DOD5)	N/A (320-30317-1)	5.05 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-10-C-MSD
14 320-30317-A-11 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.02 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-11-A
15 320-30317-A-12 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.02 g	1.0 mL	8/6/17	23_Days	4	5X	320-30317-A-12-A

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Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

DOD - Screen - Caution

Batch Number: 320-177777

Analyst: Long, Tyrel W

Batch Open: 8/4/2017 11:38:00AM

Method Code: 320-Shake_Bath_14D-320

Batch End: 8/9/2017 5:39pm

Shake Extraction with Ultrasonic Bath Extraction

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	Initial Amount	Final Amount	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1	MB-320-177777/1 N/A	N/A	5.02 g <i>5.00</i>	1.0 mL <i>1.0</i>	N/A	N/A	N/A		MB 320-177777/1-A
2	LCS-320-177777/2 N/A	N/A	5.00 g	1.0 mL	N/A	N/A	N/A		LCS 320-177777/2-A
3	320-30317-A-1 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.01 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-1-A
4	320-30317-A-2 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.02 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-2-A
5	320-30317-A-3 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.07 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-3-A
6	320-30317-A-4 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.03 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-4-A
7	320-30317-A-5 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.04 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-5-A
8	320-30317-A-6 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.00 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-6-A
9	320-30317-A-7 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.02 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-7-A
10	320-30317-A-8 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.04 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-8-A
11	320-30317-A-10 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.00 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-10-A
12	320-30317-A-10-MS (PFC_IDA_DOD5)	N/A (320-30317-1)	5.00 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-10-B-MS
13	320-30317-A-10-MSD (PFC_IDA_DOD5)	N/A (320-30317-1)	5.05 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-10-C-MSD
14	320-30317-A-11 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.02 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-11-A
15	320-30317-A-12 (PFC_IDA_DOD5)	N/A (320-30317-1)	5.02 g	1.0 mL	8/6/17	23_Days	4		320-30317-A-12-A

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-177777

Analyst: Long, Tyrel W

Batch Open: 8/4/2017 11:38:00AM

Method Code: 320-Shake_Bath_14D-320

Batch End:

Batch Notes

Balance ID QA-070

Blank Sand Lot # Lot 162639

Filter ID NA

Millipore Water Dispense Date 8/02/17

Analyst ID - Reagent Drop Witness

TL

SPE Cartridge ID 017137109C

SPE Cartridge Type Wax 150 mL

Hexane ID 981620

Methanol ID 995762

Ammonium Hydroxide/MeOH ID 998776

Sodium Hydroxide ID 996469

Methanolic Potassium Hydroxide ID 998884

Manifold ID 12,13

Interference check solution ID NA

Acetic Acid ID 985731

Batch Comment NA

Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-177777

Analyst: Long, Tyrel W

Batch Open: 8/4/2017 11:38:00AM

Method Code: 320-Shake_Bath_14D-320

Batch End:

Comments

320-30317-A-1	Method Comments: DOD site, Screen-caution
320-30317-A-2	Method Comments: DOD site, Screen-caution
320-30317-A-3	Method Comments: DOD site, Screen-caution
320-30317-A-4	Method Comments: DOD site, Screen-caution
320-30317-A-5	Method Comments: DOD site, Screen-caution
320-30317-A-6	Method Comments: DOD site, Screen-caution
320-30317-A-7	Method Comments: DOD site, Screen-caution
320-30317-A-8	Method Comments: DOD site, Screen-caution
320-30317-A-10	Method Comments: DOD site, Screen-caution
320-30317-A-10-MS	Method Comments: DOD site, Screen-caution
320-30317-A-10-MSD	Method Comments: DOD site, Screen-caution
320-30317-A-11	Method Comments: DOD site, Screen-caution
320-30317-A-12	Method Comments: DOD site, Screen-caution

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Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-177777

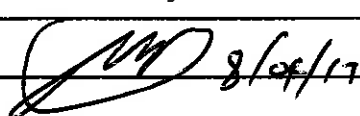
Analyst: Long, Tyrel W

Batch Open: 8/4/2017 11:38:00AM

Method Code: 320-Shake_Bath_14D-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-177777/1	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL	 8/4/17	Tyr E 8/4/17
LCS 320-177777/2	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
LCS 320-177777/2	LCPFCSP_00110	1.00 mL	1.0 mL		
320-30317-A-1	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-2	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-3	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-4	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-5	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-6	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-7	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-8	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-10	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-10 MS	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-10 MS	LCPFCSP_00110	1.00 mL	1.0 mL		
320-30317-A-10 MSD	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-10 MSD	LCPFCSP_00110	1.00 mL	1.0 mL		
320-30317-A-11	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		
320-30317-A-12	LCMPFC_ALL_SU_00004	1.00 mL	1.0 mL		

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Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-177777

Analyst: Long, Tyrel W

Batch Open: 8/4/2017 11:38:00AM

Method Code: 320-Shake_Bath_14D-320

Batch End:

Other Reagents:

Reagent

Amount/Units

Lot#:

Preparation Batch Number(s): 177777 Test: Shake Bath

Earliest Holding Time: 8/13/17

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	NA	NA
All necessary NCMs filed (including holding time)	NA	NA
Method/sample/login/QAS checked and correct	NA	NA
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	NA	NA
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	NA	NA
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	NA	NA
Comments are transcribed correctly in TALS	NA	NA
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	NA	NA
All spike amounts correct and added to necessary samples and QC	NA	NA
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	NA	NA
All necessary 'batch information' complete and entered into TALS correctly	NA	NA

1st Level Reviewer: ABH

Date: 8/9/17

2nd Level Reviewer: VPM

Date: 8/9/17

Comments: _____

Job # See Below

Analyst Initials GBC

Date 8/28/17

[illegible]

Comments:

Shipping and Receiving Documents

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact		Project Manager: Jeff Orient		Site Contact: Kevin Lantry		Date: 8/8/2017		COC No:		
Company Name: Tetra Tech		Tel/Fax: 1(412) 921-8778		Lab Contact: Daniel Alltucker		Carrier: Fed Ex		1 of 1 COCs		
Address: 661 Anderson Dr.		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS / MSD (Y/N) PFLC Full List - LC/MS/MS		Walk-in Client: Lab Sampling:		Sampler: Kevin Lantry For Lab Use Only: Job / SDG No.:		
☒ CALENDAR DAYS ☐ WORKING DAYS TAT if different from Below _____										
☒ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day										
Project Name: Site: Former NAS Brunswick GWEP P O #										
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:			
TP-PFC-020-TPI		8/8/17	0900	G	W	4	kpl			
TP-PFC-020-MID-CARBON		8/8/17	0905	G	W	4				
TP-PFC-020-TPE		8/8/17	0910	G	W	4				
TP-PFC-020-TPE-D		8/8/17	0000	G	W	4				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other		Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months						
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown		Special Instructions/QC Requirements & Comments:								
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 1.6 Cor'd: —		Therm ID No.: AK-1				
Relinquished by: <i>[Signature]</i>		Company: Tetra Tech		Date/Time: 8/8/17 1400		Received by: <i>[Signature]</i>		Company: TACS		
Relinquished by:		Company:		Date/Time:		Received by:		Company:		
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:		
Date/Time:		Date/Time:		Date/Time:		Date/Time:		Date/Time:		



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Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-30556-1

Login Number: 30556

List Source: TestAmerica Sacramento

List Number: 1

Creator: Turpen, Troy

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	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 $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"TP-PFC-020-TPI","537 (modified)","DL","320-30556-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1700","ng/L","D M","7.2","DL","","TRG","","","24","LOQ","YES","-99","","260.8","0.50","19","","
"TP-PFC-020-TPI","537 (modified)","DL","320-30556-1","TALSAC","STL00990","13C4
PFOA","100","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","95.9","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","330","ng/L","","1.2","DL","","TRG","","","3.8","LOQ","YES","-99","","260.8","0.50","2.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.9","ng/L","U","0.72","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","200","ng/L","","0.95","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","350","ng/L","","0.75","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","1.9","ng/L","U M","0.56","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","1.0","ng/L","J","0.42","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","0.96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","2.9","ng/L","U","1.2","DL","","TRG","","","3.8","LOQ","YES","-99","","260.8","0.50","2.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","330","ng/L","","0.83","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","75","ng/L","M","0.44","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","0.96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","56","ng/L","","0.88","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","75","ng/L","","0.77","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","9.0","ng/L","","0.68","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","2.3","ng/L","J","0.63","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","0.96","ng/L","U","0.38","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","0.96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","1.9","ng/L","U","0.53","DL","","TRG","","","2.4","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.2","ng/L","J M","0.61","DL","","TRG","","","38","LOQ","YES","-99","","260.8","0.50","1.9","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL00991","13C4
PFOS","80","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","91.6","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL00992","13C4
PFBA","72","ng/L","","-99","DL","","TRG","75","","-99","LOQ","YES","95.9","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL00993","13C2
PFHxA","78","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","95.9","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL00994","18O2
PFHxS","76","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","90.7","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL00995","13C5
PFNA","91","ng/L","","-99","DL","","TRG","95","","-99","LOQ","YES","95.9","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","95.9","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL00997","13C2
PFUnA","92","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","95.9","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL00998","13C2
PFDoA","85","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","95.9","","260.8","0.50","96","","
"TP-PFC-020-TPI","537 (modified)","RES","320-30556-1","TALSAC","STL01056","13C8

FOSA", "1.4", "ng/L", "Q", "-99", "DL", "", "TRG", "1", "", "-99", "LOQ", "YES", "95.9", "", "260.8", "0.50", "96", ""
"TP-PFC-020-TPI", "537 (modified)", "RES", "320-30556-1", "TALSAC", "STL01892", "13C4-
PFHpA", "94", "ng/L", "", "-99", "DL", "", "TRG", "99", "", "-99", "LOQ", "YES", "95.9", "", "260.8", "0.50", "96", ""
"TP-PFC-020-TPI", "537 (modified)", "RES", "320-30556-1", "TALSAC", "STL01893", "13C5
PFPeA", "80", "ng/L", "", "-99", "DL", "", "TRG", "83", "", "-99", "LOQ", "YES", "95.9", "", "260.8", "0.50", "96", ""
"TP-PFC-020-TPI", "537 (modified)", "RES", "320-30556-1", "TALSAC", "STL02116", "13C2-
PFTeDA", "85", "ng/L", "", "-99", "DL", "", "TRG", "88", "", "-99", "LOQ", "YES", "95.9", "", "260.8", "0.50", "96", ""
"TP-PFC-020-TPI", "537 (modified)", "RES", "320-30556-1", "TALSAC", "STL02337", "13C3-
PFBS", "74", "ng/L", "", "-99", "DL", "", "TRG", "83", "", "-99", "LOQ", "YES", "89.1", "", "260.8", "0.50", "0", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "1763-23-
1", "Perfluorooctanesulfonic acid (PFOS)", "2.9", "ng/L", "U
M", "1.2", "DL", "", "TRG", "", "", "3.9", "LOQ", "YES", "-99", "", "258.8", "0.50", "2.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "2058-94-8", "Perfluoroundecanoic
acid (PFUnA)", "1.9", "ng/L", "U", "0.72", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "2706-90-3", "Perfluoropentanoic
acid (PFPeA)", "29", "ng/L", "", "0.96", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "307-24-4", "Perfluorohexanoic
acid (PFHxA)", "1.8", "ng/L", "J", "0.76", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "307-55-1", "Perfluorododecanoic
acid (PFDoA)", "1.9", "ng/L", "U", "0.56", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "335-67-1", "Perfluorooctanoic
acid (PFOA)", "1.9", "ng/L", "U M", "0.72", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "335-76-2", "Perfluorodecanoic
acid (PFDA)", "0.97", "ng/L", "U", "0.43", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "0.97", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "335-77-
3", "Perfluorodecanesulfonic acid
(PFDS)", "2.9", "ng/L", "U", "1.2", "DL", "", "TRG", "", "", "3.9", "LOQ", "YES", "-99", "", "258.8", "0.50", "2.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "355-46-
4", "Perfluorohexanesulfonic acid
(PFHxS)", "1.9", "ng/L", "U", "0.84", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "375-22-4", "Perfluorobutanoic
acid (PFBA)", "120", "ng/L", "", "0.44", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "0.97", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "375-73-
5", "Perfluorobutanesulfonic acid
(PFBS)", "1.6", "ng/L", "J", "0.89", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "375-85-9", "Perfluoroheptanoic
acid (PFHpA)", "1.9", "ng/L", "U M", "0.77", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "375-92-
8", "Perfluoroheptanesulfonic Acid
(PFHpS)", "1.9", "ng/L", "U", "0.69", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "375-95-1", "Perfluorononanoic
acid (PFNA)", "1.9", "ng/L", "U", "0.63", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "376-06-
7", "Perfluorotetradecanoic acid
(PFTeA)", "0.97", "ng/L", "U", "0.39", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "0.97", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "72629-94-
8", "Perfluorotridecanoic Acid
(PFTriA)", "1.9", "ng/L", "U", "0.53", "DL", "", "TRG", "", "", "2.4", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "754-91-6", "Perfluorooctane
Sulfonamide
(FOSA)", "1.1", "ng/L", "J", "0.62", "DL", "", "TRG", "", "", "39", "LOQ", "YES", "-99", "", "258.8", "0.50", "1.9", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "STL00990", "13C4
PFOA", "140", "ng/L", "", "-99", "DL", "", "TRG", "140", "", "-99", "LOQ", "YES", "96.6", "", "258.8", "0.50", "97", ""
"TP-PFC-020-MID-CARBON", "537 (modified)", "RES", "320-30556-2", "TALSAC", "STL00991", "13C4

PFOS","120","ng/L","",-99","DL","","TRG","126","",-99","LOQ","YES","92.3","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL00992","13C4
PFBA","110","ng/L","",-99","DL","","TRG","112","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL00993","13C2
PFHxA","120","ng/L","",-99","DL","","TRG","127","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL00994","18O2
PFHxS","110","ng/L","",-99","DL","","TRG","126","",-99","LOQ","YES","91.4","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL00995","13C5
PFNA","120","ng/L","",-99","DL","","TRG","120","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL00996","13C2
PFDA","110","ng/L","",-99","DL","","TRG","110","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL00997","13C2
PFUnA","90","ng/L","",-99","DL","","TRG","93","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL00998","13C2
PFDaA","98","ng/L","",-99","DL","","TRG","101","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL01056","13C8
FOSA","1.5","ng/L","Q","-99","DL","","TRG","2","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL01892","13C4-
PFHpA","150","ng/L","Q","-99","DL","","TRG","151","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL01893","13C5
PFPeA","120","ng/L","",-99","DL","","TRG","128","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL02116","13C2-
PFTeDA","140","ng/L","",-99","DL","","TRG","143","",-99","LOQ","YES","96.6","","258.8","0.50","97",""
"TP-PFC-020-MID-CARBON","537 (modified)","RES","320-30556-2","TALSAC","STL02337","13C3-
PFBS","120","ng/L","",-99","DL","","TRG","129","",-99","LOQ","YES","89.8","","258.8","0.50","0",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.9","ng/L","U M","1.2","DL","","TRG","","","3.8","LOQ","YES","-99","","263.1","0.50","2.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","1.9","ng/L","U","0.71","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","31","ng/L","","0.94","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","6.7","ng/L","","0.75","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDaA)","1.9","ng/L","U","0.55","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1.9","ng/L","U M","0.71","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.95","ng/L","U","0.42","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","0.95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","2.9","ng/L","U","1.1","DL","","TRG","","","3.8","LOQ","YES","-99","","263.1","0.50","2.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","1.9","ng/L","U","0.83","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","100","ng/L","","0.44","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","0.95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","1.9","ng/L","U","0.87","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","1.9","ng/L","U M","0.76","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","1.9","ng/L","U","0.68","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.9","ng/L","U","0.62","DL","","TRG","","","2.4","LOQ","YES","-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","376-06-7","Perfluorotetradecanoic acid

(PFTeA),"0.95","ng/L","U","0.38","DL","","","TRG","","","2.4","LOQ","YES",-99","","263.1","0.50","0.95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA),"1.9","ng/L","U","0.52","DL","","","TRG","","","2.4","LOQ","YES",-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA),"0.73","ng/L","J","0.61","DL","","","TRG","","","38","LOQ","YES",-99","","263.1","0.50","1.9",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00990","13C4
PFOA","91","ng/L","","-99","DL","","","TRG","96","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00991","13C4
PFOS","110","ng/L","","-99","DL","","","TRG","118","","-99","LOQ","YES","90.8","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00992","13C4
PFBA","76","ng/L","","-99","DL","","","TRG","80","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00993","13C2
PFHxA","91","ng/L","","-99","DL","","","TRG","95","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00994","18O2
PFHxS","100","ng/L","","-99","DL","","","TRG","115","","-99","LOQ","YES","89.9","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00995","13C5
PFNA","80","ng/L","","-99","DL","","","TRG","84","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00996","13C2
PFDA","84","ng/L","","-99","DL","","","TRG","89","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00997","13C2
PFUnA","94","ng/L","","-99","DL","","","TRG","99","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL00998","13C2
PFDaA","100","ng/L","","-99","DL","","","TRG","107","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL01056","13C8
FOSA","5.0","ng/L","Q",-99,"DL","","","TRG","5","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL01892","13C4-
PFHpA","100","ng/L","","-99","DL","","","TRG","108","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL01893","13C5
PFPeA","86","ng/L","","-99","DL","","","TRG","90","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL02116","13C2-
PFTeDA","130","ng/L","","-99","DL","","","TRG","141","","-99","LOQ","YES","95.0","","263.1","0.50","95",""
"TP-PFC-020-TPE","537 (modified)","RES","320-30556-3","TALSAC","STL02337","13C3-
PFBS","100","ng/L","","-99","DL","","","TRG","118","","-99","LOQ","YES","88.4","","263.1","0.50","0",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"4.2","ng/L","","1.2","DL","","","TRG","","","3.8","LOQ","YES",-99","","261.1","0.50","2.9",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA),"1.9","ng/L","U","0.72","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA),"30","ng/L","","0.95","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA),"7.0","ng/L","","0.75","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDaA),"1.9","ng/L","U","0.56","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"0.82","ng/L","J M","0.72","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA),"0.96","ng/L","U","0.42","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","0.96",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS),"2.9","ng/L","U","1.2","DL","","","TRG","","","3.8","LOQ","YES",-99","","261.1","0.50","2.9",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"1.9","ng/L","U","0.83","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA),"100","ng/L","","0.44","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","0.96",""
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","1.9","ng/L","U","0.88","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","1.9","ng/L","U M","0.77","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","1.9","ng/L","U","0.68","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.9","ng/L","U","0.63","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.96","ng/L","U","0.38","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","0.96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","1.9","ng/L","U","0.53","DL","","","TRG","","","2.4","LOQ","YES",-99","","261.1","0.50","1.9","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","1.3","ng/L","J","0.61","DL","","","TRG","","","38","LOQ","YES",-99","","261.1","0.50","1.9","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00990","13C4
PFOA","110","ng/L","","","-99","DL","","","TRG","111","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00991","13C4
PFOS","91","ng/L","","","-99","DL","","","TRG","99","","","-99","LOQ","YES","91.5","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00992","13C4
PFBA","83","ng/L","","","-99","DL","","","TRG","87","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00993","13C2
PFHxA","98","ng/L","","","-99","DL","","","TRG","102","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00994","18O2
PFHxS","89","ng/L","","","-99","DL","","","TRG","98","","","-99","LOQ","YES","90.6","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00995","13C5
PFNA","97","ng/L","","","-99","DL","","","TRG","101","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00996","13C2
PFDA","99","ng/L","","","-99","DL","","","TRG","103","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00997","13C2
PFUnA","90","ng/L","","","-99","DL","","","TRG","94","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL00998","13C2
PFDaA","88","ng/L","","","-99","DL","","","TRG","92","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL01056","13C8
FOSA","2.8","ng/L","Q","-99","DL","","","TRG","3","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL01892","13C4-
PFHpA","110","ng/L","","","-99","DL","","","TRG","113","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL01893","13C5
PFPeA","94","ng/L","","","-99","DL","","","TRG","98","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL02116","13C2-
PFTeDA","110","ng/L","","","-99","DL","","","TRG","113","","","-99","LOQ","YES","95.7","","261.1","0.50","96","","
"TP-PFC-020-TPE-D","537 (modified)","RES","320-30556-4","TALSAC","STL02337","13C3-
PFBS","84","ng/L","","","-99","DL","","","TRG","94","","","-99","LOQ","YES","89.0","","261.1","0.50","0","","
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","39.7","ng/L","","","1.3","DL","","","SPK","107","","","4.0","LOQ","YES","37.1","","250.00","0.50","3.0","","
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","2058-94-
8","Perfluoroundecanoic acid
(PFUnA)","36.1","ng/L","","","0.75","DL","","","SPK","90","","","2.5","LOQ","YES","40.0","","250.00","0.50","2.0","","
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","42.6","ng/L","","","0.99","DL","","","SPK","107","","","2.5","LOQ","YES","40.0","","250.00","0.50","2.0","","
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","42.4","ng/L","","","0.79","DL","","","SPK","106","","","2.5","LOQ","YES","40.0","","250.00","0.50","2.0","","
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDaA)","39.2","ng/L","","","0.58","DL","","","SPK","98","","","2.5","LOQ","YES","40.0","","250.00","0.50","2.0","","
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","335-67-1","Perfluorooctanoic

acid (PFOA)","39.5","ng/L","","0.75","DL","","SPK","99","","2.5","LOQ","YES","40.0","","250.00","0.50","2.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","41.3","ng/L","","0.44","DL","","SPK","103","","2.5","LOQ","YES","40.0","","250.00","0.50","1.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","42.0","ng/L","","1.2","DL","","SPK","109","","4.0","LOQ","YES","38.6","","250.00","0.50","3.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","37.7","ng/L","","0.87","DL","","SPK","104","","2.5","LOQ","YES","36.4","","250.00","0.50","2.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","44.4","ng/L","","0.46","DL","","SPK","111","","2.5","LOQ","YES","40.0","","250.00","0.50","1.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","36.5","ng/L","","0.92","DL","","SPK","103","","2.5","LOQ","YES","35.4","","250.00","0.50","2.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","41.0","ng/L","","0.80","DL","","SPK","102","","2.5","LOQ","YES","40.0","","250.00","0.50","2.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","43.7","ng/L","","0.71","DL","","SPK","115","","2.5","LOQ","YES","38.1","","250.00","0.50","2.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","40.5","ng/L","","0.65","DL","","SPK","101","","2.5","LOQ","YES","40.0","","250.00","0.50","2.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","36.4","ng/L","","0.40","DL","","SPK","91","","2.5","LOQ","YES","40.0","","250.00","0.50","1.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","72629-94-
8","Perfluorotridecanoic Acid
(PFTriA)","40.1","ng/L","","0.55","DL","","SPK","100","","2.5","LOQ","YES","40.0","","250.00","0.50","2.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","43.6","ng/L","","0.64","DL","","SPK","109","","40","LOQ","YES","40.0","","250.00","0.50","2.0",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00990","13C4
PFOA","136","ng/L","","-99","DL","","SPK","136","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00991","13C4
PFOS","101","ng/L","","-99","DL","","SPK","105","","-99","LOQ","YES","95.6","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00992","13C4
PFBA","108","ng/L","","-99","DL","","SPK","108","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00993","13C2
PFHxA","123","ng/L","","-99","DL","","SPK","123","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00994","18O2
PFHxS","104","ng/L","","-99","DL","","SPK","109","","-99","LOQ","YES","94.6","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00995","13C5
PFNA","131","ng/L","","-99","DL","","SPK","131","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00996","13C2
PFDA","141","ng/L","","-99","DL","","SPK","141","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00997","13C2
PFUnA","131","ng/L","","-99","DL","","SPK","131","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL00998","13C2
PFDaA","121","ng/L","","-99","DL","","SPK","121","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL01056","13C8
FOSA","53.6","ng/L","","-99","DL","","SPK","54","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL01892","13C4-
PFHpA","139","ng/L","","-99","DL","","SPK","139","","-99","LOQ","YES","100","","250.00","0.50","100",""
"LCS 320-179613/2-A","537 (modified)","RES","LCS 320-179613/2-A","TALSAC","STL01893","13C5
PFPeA","113","ng/L","","-99","DL","","SPK","113","","-99","LOQ","YES","100","","250.00","0.50","100",""

"LCS 320-179613/2-A", "537 (modified)", "RES", "LCS 320-179613/2-A", "TALSAC", "STL02116", "13C2-PFTeDA", "119", "ng/L", "", "-99", "DL", "", "SPK", "119", "", "-99", "LOQ", "YES", "100", "", "250.00", "0.50", "100", ""
"LCS 320-179613/2-A", "537 (modified)", "RES", "LCS 320-179613/2-A", "TALSAC", "STL02337", "13C3-PFBS", "102", "ng/L", "", "-99", "DL", "", "SPK", "110", "", "-99", "LOQ", "YES", "93.0", "", "250.00", "0.50", "0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)", "39.5", "ng/L", "", "1.3", "DL", "", "SPK", "107", "0", "4.0", "LOQ", "YES", "37.1", "LCS 320-179613/2-A", "250.00", "0.50", "3.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)", "37.4", "ng/L", "", "0.75", "DL", "", "SPK", "94", "4", "2.5", "LOQ", "YES", "40.0", "LCS 320-179613/2-A", "250.00", "0.50", "2.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)", "40.6", "ng/L", "", "0.99", "DL", "", "SPK", "101", "5", "2.5", "LOQ", "YES", "40.0", "LCS 320-179613/2-A", "250.00", "0.50", "2.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)", "42.3", "ng/L", "", "0.79", "DL", "", "SPK", "106", "0", "2.5", "LOQ", "YES", "40.0", "LCS 320-179613/2-A", "250.00", "0.50", "2.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)", "41.4", "ng/L", "", "0.58", "DL", "", "SPK", "104", "6", "2.5", "LOQ", "YES", "40.0", "LCS 320-179613/2-A", "250.00", "0.50", "2.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "40.1", "ng/L", "", "0.75", "DL", "", "SPK", "100", "2", "2.5", "LOQ", "YES", "40.0", "LCS 320-179613/2-A", "250.00", "0.50", "2.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)", "42.8", "ng/L", "", "0.44", "DL", "", "SPK", "107", "3", "2.5", "LOQ", "YES", "40.0", "LCS 320-179613/2-A", "250.00", "0.50", "1.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)", "41.6", "ng/L", "", "1.2", "DL", "", "SPK", "108", "1", "4.0", "LOQ", "YES", "38.6", "LCS 320-179613/2-A", "250.00", "0.50", "3.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)", "39.0", "ng/L", "", "0.87", "DL", "", "SPK", "107", "3", "2.5", "LOQ", "YES", "36.4", "LCS 320-179613/2-A", "250.00", "0.50", "2.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)", "44.7", "ng/L", "", "0.46", "DL", "", "SPK", "112", "1", "2.5", "LOQ", "YES", "40.0", "LCS 320-179613/2-A", "250.00", "0.50", "1.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "37.7", "ng/L", "", "0.92", "DL", "", "SPK", "107", "3", "2.5", "LOQ", "YES", "35.4", "LCS 320-179613/2-A", "250.00", "0.50", "2.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "43.6", "ng/L", "", "0.80", "DL", "", "SPK", "109", "6", "2.5", "LOQ", "YES", "40.0", "LCS 320-179613/2-A", "250.00", "0.50", "2.0", ""
"LCSD 320-179613/3-A", "537 (modified)", "RES", "LCSD 320-179613/3-A", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid

(PFHpS),"42.3","ng/L",,"0.71","DL",,"SPK","111","3","2.5","LOQ","YES","38.1","LCS 320-179613/2-A","250.00","0.50","2.0",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"42.3","ng/L",,"0.65","DL",,"SPK","106","4","2.5","LOQ","YES","40.0","LCS 320-179613/2-A","250.00","0.50","2.0",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA),"38.0","ng/L",,"0.40","DL",,"SPK","95","5","2.5","LOQ","YES","40.0","LCS 320-179613/2-A","250.00","0.50","1.0",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA),"43.5","ng/L",,"0.55","DL",,"SPK","109","8","2.5","LOQ","YES","40.0","LCS 320-179613/2-A","250.00","0.50","2.0",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA),"46.0","ng/L",,"0.64","DL",,"SPK","115","5","40","LOQ","YES","40.0","LCS 320-179613/2-A","250.00","0.50","2.0",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00990","13C4 PFOA","121","ng/L",,"-99","DL",,"SPK","121",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00991","13C4 PFOS","90.4","ng/L",,"-99","DL",,"SPK","95",,"-99","LOQ","YES","95.6","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00992","13C4 PFBA","95.0","ng/L",,"-99","DL",,"SPK","95",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00993","13C2 PFHxA","110","ng/L",,"-99","DL",,"SPK","110",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00994","18O2 PFHxS","89.2","ng/L",,"-99","DL",,"SPK","94",,"-99","LOQ","YES","94.6","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00995","13C5 PFNA","113","ng/L",,"-99","DL",,"SPK","113",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00996","13C2 PFDA","114","ng/L",,"-99","DL",,"SPK","114",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00997","13C2 PFUnA","108","ng/L",,"-99","DL",,"SPK","108",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL00998","13C2 PFDaA","105","ng/L",,"-99","DL",,"SPK","105",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL01056","13C8 FOSA","68.4","ng/L",,"-99","DL",,"SPK","68",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL01892","13C4-PFHpA","117","ng/L",,"-99","DL",,"SPK","117",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL01893","13C5 PFPeA","105","ng/L",,"-99","DL",,"SPK","105",,"-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",,"
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL02116","13C2-

PFTeDA","110","ng/L","",-99","DL","","SPK","110","",-99","LOQ","YES","100","LCS 320-179613/2-A","250.00","0.50","100",""
"LCSD 320-179613/3-A","537 (modified)","RES","LCSD 320-179613/3-A","TALSAC","STL02337","13C3-PFBS","86.9","ng/L","",-99","DL","","SPK","93","",-99","LOQ","YES","93.0","LCS 320-179613/2-A","250.00","0.50","0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","3.0","ng/L","U
M","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","0.50","3.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","2.0","ng/L","U","0.75","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","2.0","ng/L","U","0.99","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","2.0","ng/L","U","0.79","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","2.0","ng/L","U","0.58","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","2.0","ng/L","U","0.75","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","1.0","ng/L","U","0.44","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","1.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","3.0","ng/L","U","1.2","DL","","TRG","","","4.0","LOQ","YES","-99","","250.00","0.50","3.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","2.0","ng/L","U","0.87","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","1.0","ng/L","U","0.46","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","1.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","2.0","ng/L","U","0.92","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","2.0","ng/L","U","0.80","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","2.0","ng/L","U","0.71","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","2.0","ng/L","U","0.65","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","1.0","ng/L","U","0.40","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","1.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.0","ng/L","U","0.55","DL","","TRG","","","2.5","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","1.26","ng/L","J","0.64","DL","","TRG","","","40","LOQ","YES","-99","","250.00","0.50","2.0",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00990","13C4 PFOA","137","ng/L","",-99","DL","","TRG","137","",-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00991","13C4 PFOS","101","ng/L","",-99","DL","","TRG","106","",-99","LOQ","YES","95.6","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00992","13C4 PFBA","111","ng/L","",-99","DL","","TRG","111","",-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00993","13C2 PFHxA","126","ng/L","",-99","DL","","TRG","126","",-99","LOQ","YES","100","","250.00","0.50","100",""

"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00994","18O2
PFHxS","100","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","94.6","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00995","13C5
PFNA","133","ng/L","","-99","DL","","TRG","133","","-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00996","13C2
PFDA","134","ng/L","","-99","DL","","TRG","134","","-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00997","13C2
PFUnA","124","ng/L","","-99","DL","","TRG","124","","-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL00998","13C2
PFDaA","121","ng/L","","-99","DL","","TRG","121","","-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL01056","13C8
FOSA","65.9","ng/L","","-99","DL","","TRG","66","","-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL01892","13C4-
PFHpA","131","ng/L","","-99","DL","","TRG","131","","-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL01893","13C5
PFPeA","117","ng/L","","-99","DL","","TRG","117","","-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL02116","13C2-
PFTeDA","121","ng/L","","-99","DL","","TRG","121","","-99","LOQ","YES","100","","250.00","0.50","100",""
"MB 320-179613/1-A","537 (modified)","RES","MB 320-179613/1-A","TALSAC","STL02337","13C3-
PFBS","98.8","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","93.0","","250.00","0.50","0",""
"Unknown","Unknown","TP-PFC-020-TPI","08/08/2017 09:00","AQ","320-30556-1","NM","","1.60","537
(modified)","3535","DL","08/16/2017 09:20","08/29/2017
10:51","TALSAC","COA","WET","NA","10","NA","NA","","100","320-179613","320-179613","NA","320-
181833","320-30556-1","08/09/2017 09:45","08/15/2017 09:50",""
"Unknown","Unknown","TP-PFC-020-TPI","08/08/2017 09:00","AQ","320-30556-1","NM","","1.60","537
(modified)","3535","RES","08/16/2017 09:20","08/29/2017
11:18","TALSAC","COA","WET","NA","1","NA","NA","","100","320-179613","320-179613","NA","320-
181833","320-30556-1","08/09/2017 09:45","08/15/2017 09:50",""
"Unknown","Unknown","TP-PFC-020-MID-CARBON","08/08/2017 09:05","AQ","320-30556-
2","NM","","1.60","537 (modified)","3535","RES","08/16/2017 09:20","08/29/2017
10:57","TALSAC","COA","WET","NA","1","NA","NA","","100","320-179613","320-179613","NA","320-
181833","320-30556-1","08/09/2017 09:45","08/15/2017 09:50",""
"Unknown","Unknown","TP-PFC-020-TPE","08/08/2017 09:10","AQ","320-30556-3","NM","","1.60","537
(modified)","3535","RES","08/16/2017 09:20","08/29/2017
11:04","TALSAC","COA","WET","NA","1","NA","NA","","100","320-179613","320-179613","NA","320-
181833","320-30556-1","08/09/2017 09:45","08/15/2017 09:50",""
"Unknown","Unknown","TP-PFC-020-TPE-D","08/08/2017 00:00","AQ","320-30556-4","FD","","1.60","537
(modified)","3535","RES","08/16/2017 09:20","08/29/2017
11:11","TALSAC","COA","WET","NA","1","NA","NA","","100","320-179613","320-179613","NA","320-
181833","320-30556-1","08/09/2017 09:45","08/15/2017 09:50",""
"Unknown","Unknown","LCS 320-179613/2-A","","AQ","LCS 320-179613/2-A","LCS","","-99","537
(modified)","3535","RES","08/16/2017 09:20","08/29/2017
09:21","TALSAC","COA","WET","NA","1","NA","NA","","100","320-179613","320-179613","NA","320-
181833","320-30556-1","08/16/2017 09:20","08/15/2017 09:50",""
"Unknown","Unknown","LCSD 320-179613/3-A","","AQ","LCSD 320-179613/3-A","LCSD","","-99","537
(modified)","3535","RES","08/16/2017 09:20","08/29/2017
09:28","TALSAC","COA","WET","NA","1","NA","NA","","100","320-179613","320-179613","NA","320-
181833","320-30556-1","08/16/2017 09:20","08/15/2017 09:50",""
"Unknown","Unknown","MB 320-179613/1-A","","AQ","MB 320-179613/1-A","MB","","-99","537
(modified)","3535","RES","08/16/2017 09:20","08/29/2017
09:14","TALSAC","COA","WET","NA","1","NA","NA","","100","320-179613","320-179613","NA","320-
181833","320-30556-1","08/16/2017 09:20","08/15/2017 09:50",""



TO: JEFF ORIENT **DATE:** OCTOBER 5, 2017

FROM: MEGAN RITCHIE **COPIES:** DV FILE/

SUBJECT: ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)
CTO WE21 - FORMER NAS BRUNSWICK
SDG 320-30556-1

SAMPLES: 4 / Groundwater / PFAS

TP-PFC-020-TPI TP-PFC-020-TPE
TP-PFC-020-MID-CARBON TP-PFC-020-TPE-D

Overview

The sample set for the former NAS Brunswick, SDG 320-30556-1 consists of four (4) groundwater environmental samples. One (1) field duplicate pair was included in this SDG: TP-PFC-020-TPE and TP-PFC-020-TPE-D. The samples were analyzed for per- and polyfluoroalkyl substances (PFAS).

The samples were collected by Tetra Tech on August 8, 2017 and analyzed by Test America of West Sacramento, California. The analysis was conducted in accordance with modified EPA Method 537 Rev. 1.1 analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters:

- * Data Completeness
- * Holding Times/Sample Preservation
- * LC/MS/MS Instrument Tuning and System Performance
- * Initial and Continuing Calibration Verification Results
- * Laboratory Method/Preparation Blank Analyses
- * Isotope Dilution Analyte Recoveries
- * Laboratory Control Sample (LCS) Results
- * Matrix Spike/Matrix Spike Duplicate Results
- * Laboratory Duplicate Sample Results
- * Internal Standard Results
- * Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Issues affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

PFAS

The following contaminant was detected in the method blank at the following maximum concentrations:

Analyte	Maximum Concentration	Reporting Limit (RL) (< or >)
Perfluorooctane sulfonamide (FOSA)	1.26 J ng/L	< RL

Maximum concentration detected in the method blank MB 320-179613/1-A from 8/29/17 @09:14 affecting samples TP-PFC-020-TPI, TP-PFC-020-MID-CARBON, TP-PFC-020-TPE, and TP-PFC-020-TPE-D. FOSA was qualified as not detected (U) in these samples because the FOSA results in the blank and the sample were less than the RL.

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The Isotope Dilution Analyte (IDA) recoveries associated with the following samples were below the QC limit for $^{13}\text{C}_8$ FOSA: TP-PFC-020-TPI, TP-PFC-020-MID-CARBON, TP-PFC-020-TPE, and TP-PFC-020-TPE-D. The positive results for FOSA in all samples were qualified as estimated (J) but were superseded by the qualifier for blank contamination (U).

Detected results reported below the Limit of Quantitation (LOQ) but above the Detection Limit (DL) were qualified as estimated (J).

Notes

Sample TP-PFC-020-TPI was diluted to bring the concentration of perfluorooctanoic acid (PFOA) within the calibration range.

The IDA recovery exceeded the QC limit for $^{13}\text{C}_4$ -PFHpA in sample TP-PFC-020-MID-CARBON. The associated target analyte perfluoroheptanoic acid (PFHpA) was not detected in the sample. No action was taken.

All analyses were conducted within the hold times specified by the site specific Sampling and Analysis Plan (SAP) and the analytical method.

Non-detected results were reported to the Limit of Detection (LOD).

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Executive Summary

Laboratory Performance: FOSA was detected in a method blank. IDA recoveries exceeded QC limits.

Other Factors Affecting Data Quality: Positive results below the LOQ were qualified as estimated.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Superfund Organic Methods Data Review" (January 2017) and the EPA New England Environmental Data Review Supplement (April 2013). The text of this report has been formulated to address only those areas affecting data quality.



Tetra Tech, Inc.
Megan Ritchie
Chemist/Data Validator



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

Appendix A

Qualified Analytical Results

PROJ_NO: 08005-WE21 SDG: 320-30556-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	TP-PFC-020-MID-CARBON			TP-PFC-020-TPE			TP-PFC-020-TPE-D			TP-PFC-020-TPI		
	LAB_ID	320-30556-2			320-30556-3			320-30556-4			320-30556-1		
	SAMP_DATE	8/8/2017			8/8/2017			8/8/2017			8/8/2017		
	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-020-TPE					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCCTANOIC ACID		1.9	U		1.9	U		0.82	J	P	1700		
PERFLUOROBUTANESULFONIC ACID		1.6	J	P	1.9	U		1.9	U		56		
PERFLUOROBUTANOIC ACID		120			100			100			75		
PERFLUORODECANE SULFONIC ACID		2.9	U		2.9	U		2.9	U		2.9	U	
PERFLUORODECANOIC ACID		0.97	U		0.95	U		0.96	U		1	J	P
PERFLUORODODECANOIC ACID		1.9	U		1.9	U		1.9	U		1.9	U	
PERFLUOROHEPTANESULFONIC ACID		1.9	U		1.9	U		1.9	U		9		
PERFLUOROHEPTANOIC ACID		1.9	U		1.9	U		1.9	U		75		
PERFLUOROHEXANESULFONIC ACID		1.9	U		1.9	U		1.9	U		330		
PERFLUOROHEXANOIC ACID		1.8	J	P	6.7			7			350		
PERFLUORONONANOIC ACID		1.9	U		1.9	U		1.9	U		2.3	J	P
PERFLUOROOCTANE SULFONAMIDE		1.1	U	A	0.73	U	A	1.3	U	A	2.2	U	A
PERFLUOROOCTANE SULFONIC ACID		2.9	U		2.9	U		4.2			330		
PERFLUOROPENTANOIC ACID		29			31			30			200		
PERFLUOROTETRADECANOIC ACID		0.97	U		0.95	U		0.96	U		0.96	U	
PERFLUOROTRIDECANOIC ACID		1.9	U		1.9	U		1.9	U		1.9	U	
PERFLUOROUNDECANOIC ACID		1.9	U		1.9	U		1.9	U		1.9	U	

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.

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $< \text{CRQL}$ 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

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPI</u>	Lab Sample ID: <u>320-30556-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_065.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>260.8 (mL)</u>	Date Analyzed: <u>08/29/2017 11:18</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	75	M	2.4	0.96	0.44
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		2.4	1.9	0.95
307-24-4	Perfluorohexanoic acid (PFHxA)	350		2.4	1.9	0.75
375-85-9	Perfluoroheptanoic acid (PFHpA)	75		2.4	1.9	0.77
375-95-1	Perfluorononanoic acid (PFNA)	2.3	J	2.4	1.9	0.63
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	J	2.4	0.96	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	1.9	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U M	2.4	1.9	0.56
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	1.9	0.53
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.96	U	2.4	0.96	0.38
375-73-5	Perfluorobutanesulfonic acid (PFBS)	56		2.4	1.9	0.88
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	330		2.4	1.9	0.83
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	9.0		2.4	1.9	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330		3.8	2.9	1.2
335-77-3	Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	2.9	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.2	J M	38	1.9	0.61

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPI</u>	Lab Sample ID: <u>320-30556-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_065.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>260.8 (mL)</u>	Date Analyzed: <u>08/29/2017 11:18</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	1	Q	25-150
STL00992	13C4 PFBA	75		25-150
STL00993	13C2 PFHxA	81		25-150
STL00995	13C5 PFNA	95		25-150
STL00996	13C2 PFDA	106		25-150
STL00997	13C2 PFUnA	96		25-150
STL00998	13C2 PFDoA	89		25-150
STL00994	18O2 PFHxS	84		25-150
STL00991	13C4 PFOS	88		25-150
STL01892	13C4-PFHpA	99		25-150
STL01893	13C5 PFPeA	83		25-150
STL02337	13C3-PFBS	83		25-150
STL02116	13C2-PFTeDA	88		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Client Sample ID: TP-PFC-020-TPI DL Lab Sample ID: 320-30556-1 DL
 Matrix: Water Lab File ID: 2017.08.28B_061.d
 Analysis Method: 537 (modified) Date Collected: 08/08/2017 09:00
 Extraction Method: 3535 Date Extracted: 08/16/2017 09:20
 Sample wt/vol: 260.8 (mL) Date Analyzed: 08/29/2017 10:51
 Con. Extract Vol.: 0.50 (mL) Dilution Factor: 10
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 181833 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1700	D M	24	19	7.2

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	109		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-MID-CARBON</u>	Lab Sample ID: <u>320-30556-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_062.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>258.8 (mL)</u>	Date Analyzed: <u>08/29/2017 10:57</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		2.4	0.97	0.44
2706-90-3	Perfluoropentanoic acid (PFPeA)	29		2.4	1.9	0.96
307-24-4	Perfluorohexanoic acid (PFHxA)	1.8	J	2.4	1.9	0.76
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	1.9	0.77
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U M	2.4	1.9	0.72
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.63
335-76-2	Perfluorodecanoic acid (PFDA)	0.97	U	2.4	0.97	0.43
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	1.9	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	1.9	0.56
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	1.9	0.53
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.97	U	2.4	0.97	0.39
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.4	1.9	0.89
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.84
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	1.9	0.69
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.9	2.9	1.2
335-77-3	Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.9	2.9	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.1	J	39	1.9	0.62

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-MID-CARBON</u>	Lab Sample ID: <u>320-30556-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_062.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>258.8 (mL)</u>	Date Analyzed: <u>08/29/2017 10:57</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	2	Q	25-150
STL00992	13C4 PFBA	112		25-150
STL00993	13C2 PFHxA	127		25-150
STL00990	13C4 PFOA	140		25-150
STL00995	13C5 PFNA	120		25-150
STL00996	13C2 PFDA	110		25-150
STL00997	13C2 PFUnA	93		25-150
STL00998	13C2 PFDoA	101		25-150
STL00994	18O2 PFHxS	126		25-150
STL00991	13C4 PFOS	126		25-150
STL01892	13C4-PFHpA	151	Q	25-150
STL01893	13C5 PFPeA	128		25-150
STL02337	13C3-PFBS	129		25-150
STL02116	13C2-PFTeDA	143		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPE</u>	Lab Sample ID: <u>320-30556-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_063.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:10</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>263.1 (mL)</u>	Date Analyzed: <u>08/29/2017 11:04</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	100		2.4	0.95	0.44
2706-90-3	Perfluoropentanoic acid (PFPeA)	31		2.4	1.9	0.94
307-24-4	Perfluorohexanoic acid (PFHxA)	6.7		2.4	1.9	0.75
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	1.9	0.76
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U M	2.4	1.9	0.71
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62
335-76-2	Perfluorodecanoic acid (PFDA)	0.95	U	2.4	0.95	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	1.9	0.71
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	1.9	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	1.9	0.52
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.95	U	2.4	0.95	0.38
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.87
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.83
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	1.9	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.9	U M	3.8	2.9	1.2
335-77-3	Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	2.9	1.1
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.73	J	38	1.9	0.61

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPE</u>	Lab Sample ID: <u>320-30556-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_063.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 09:10</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>263.1 (mL)</u>	Date Analyzed: <u>08/29/2017 11:04</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	5	Q	25-150
STL00992	13C4 PFBA	80		25-150
STL00993	13C2 PFHxA	95		25-150
STL00990	13C4 PFOA	96		25-150
STL00995	13C5 PFNA	84		25-150
STL00996	13C2 PFDA	89		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	107		25-150
STL00994	18O2 PFHxS	115		25-150
STL00991	13C4 PFOS	118		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	90		25-150
STL02337	13C3-PFBS	118		25-150
STL02116	13C2-PFTeDA	141		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPE-D</u>	Lab Sample ID: <u>320-30556-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_064.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 00:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>261.1 (mL)</u>	Date Analyzed: <u>08/29/2017 11:11</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	100		2.4	0.96	0.44
2706-90-3	Perfluoropentanoic acid (PFPeA)	30		2.4	1.9	0.95
307-24-4	Perfluorohexanoic acid (PFHxA)	7.0		2.4	1.9	0.75
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U M	2.4	1.9	0.77
335-67-1	Perfluorooctanoic acid (PFOA)	0.82	J M	2.4	1.9	0.72
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.63
335-76-2	Perfluorodecanoic acid (PFDA)	0.96	U	2.4	0.96	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.9	U	2.4	1.9	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	2.4	1.9	0.56
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	1.9	U	2.4	1.9	0.53
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.96	U	2.4	0.96	0.38
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.88
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.83
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	2.4	1.9	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	4.2		3.8	2.9	1.2
335-77-3	Perfluorodecanesulfonic acid (PFDS)	2.9	U	3.8	2.9	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.3	J	38	1.9	0.61

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-020-TPE-D</u>	Lab Sample ID: <u>320-30556-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_064.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>08/08/2017 00:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>261.1 (mL)</u>	Date Analyzed: <u>08/29/2017 11:11</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	3	Q	25-150
STL00992	13C4 PFBA	87		25-150
STL00993	13C2 PFHxA	102		25-150
STL00990	13C4 PFOA	111		25-150
STL00995	13C5 PFNA	101		25-150
STL00996	13C2 PFDA	103		25-150
STL00997	13C2 PFUnA	94		25-150
STL00998	13C2 PFDoA	92		25-150
STL00994	18O2 PFHxS	98		25-150
STL00991	13C4 PFOS	99		25-150
STL01892	13C4-PFHpA	113		25-150
STL01893	13C5 PFPeA	98		25-150
STL02337	13C3-PFBS	94		25-150
STL02116	13C2-PFTeDA	113		25-150

Appendix C

Support Documentation

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:[illegible]

Job Narrative
320-30556-1

Receipt

The samples were received on 8/9/2017 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

LCMS

Method(s) 537 (modified): 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) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) within the calibration range: TP-PFC-020-TPI (320-30556-1). Elevated reporting limits (RLs) are provided.

Method(s) 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for 13C4-PFHpA in the following sample: TP-PFC-020-MID-CARBON (320-30556-2). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. Reanalysis confirmed this result.

Method(s) 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples are below the method recommended limit for 13C8 FOSA: TP-PFC-020-TPI (320-30556-1), TP-PFC-020-MID-CARBON (320-30556-2), TP-PFC-020-TPE (320-30556-3) and TP-PFC-020-TPE-D (320-30556-4). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. Reanalysis confirmed these results.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-179613.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FORMER NAWC TRENTON
320-30556-1

SAMPLE IDENTIFICATION

TP-PFC-020-TPI DL

COMPOUND

PFOA

COMPOUND AREA 12506196

INTERNAL STANDARD AMOUNT (ng/ml) 50

DILUTION FACTOR 0.4

INTERNAL STANDARD AREA 8466

AVERAGE RRF 1.0942

SAMPLE VOLUME (ml) 260.8

VOLUME EXTRACT (ml) 0.4

VOLUME INJECTED (μl) 0.04

ml to L 1000

CONCENTRATION = 1656.50 ng/L
rounds to 1700

Calculation:

$(12506196 * 50 \text{ ng/ml} * 0.4 * 0.4 \text{ mL} * 0.04 \text{ uL} * 1000) / (8466 * 1.0942 * 260.8)$

FIELD DUPLICATE PRECISION
SDG 320-30566-1

ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >RL
PERFLUOROBUTANESULFONIC ACID	100	100	1.9	0	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEXANOIC ACID	6.7	7	1.9	4	FALSE	TRUE	TRUE	FALSE
PERFLUOROPENTANOIC ACID	31	30	1.9	3	FALSE	TRUE	TRUE	FALSE

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Matrix: Water Level: Low
 GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	3C3-PFB:#	PFHxA #	PFHpA #	PFHxS #	PFNA #	PFOS #
TP-PFC-020-TPI	320-30556-1	75	83	83	81	99	84	95	88

	<u>QC LIMITS</u>
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
13C3-PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFNA = 13C5 PFNA	25-150
PFOS = 13C4 PFOS	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Matrix: Water Level: Low
 GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFDA #	PFOSA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-020-TPI	320-30556-1	106	1 Q	96	89	88

	<u>QC LIMITS</u>
PFDA = 13C2 PFDA	25-150
PFOSA = 13C8 FOSA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	3C3-PFB:#	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-020-MID-CAR BON	320-30556-2	112	128	129	127	151 Q	126	140	120
TP-PFC-020-TPE	320-30556-3	80	90	118	95	108	115	96	84
TP-PFC-020-TPE-D	320-30556-4	87	98	94	102	113	98	111	101
	MB 320-179613/1-A	111	117	106	126	131	106	137	133
	LCS 320-179613/2-A	108	113	110	123	139	109	136	131
	LCSD 320-179613/3-A	95	105	93	110	117	94	121	113

	<u>QC LIMITS</u>
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
13C3-PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 1802 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFDA #	PFOSA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-020-MID-CAR BON	320-30556-2	126	110	2 Q	93	101	143
TP-PFC-020-TPE	320-30556-3	118	89	5 Q	99	107	141
TP-PFC-020-TPE-D	320-30556-4	99	103	3 Q	94	92	113
	MB 320-179613/1-A	106	134	66	124	121	121
	LCS 320-179613/2-A	105	141	54	131	121	119
	LCSD 320-179613/3-A	95	114	68	108	105	110

	<u>QC LIMITS</u>
PFOS = 13C4 PFOS	25-150
PFOSA = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-30556-1

SDG No.: _____

Matrix: Water

Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOA #
TP-PFC-020-TPI DL	320-30556-1 DL	109

PFOA = 13C4 PFOA

QC LIMITS
25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.28B_048.d
 Lab ID: LCS 320-179613/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	44.4	111	60-140	
Perfluoropentanoic acid (PFPeA)	40.0	42.6	107	60-140	
Perfluorohexanoic acid (PFHxA)	40.0	42.4	106	60-140	
Perfluoroheptanoic acid (PFHpA)	40.0	41.0	102	60-140	
Perfluorooctanoic acid (PFOA)	40.0	39.5	99	60-140	
Perfluorononanoic acid (PFNA)	40.0	40.5	101	60-140	
Perfluorodecanoic acid (PFDA)	40.0	41.3	103	60-140	
Perfluoroundecanoic acid (PFUnA)	40.0	36.1	90	60-140	
Perfluorododecanoic acid (PFDoA)	40.0	39.2	98	60-140	
Perfluorotridecanoic Acid (PFTriA)	40.0	40.1	100	50-150	
Perfluorotetradecanoic acid (PFTeA)	40.0	36.4	91	50-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	36.5	103	50-150	
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.7	104	60-140	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	43.7	115	50-150	
Perfluorooctanesulfonic acid (PFOS)	37.1	39.7	107	60-140	
Perfluorodecanesulfonic acid (PFDS)	38.6	42.0	109	50-150	
Perfluorooctane Sulfonamide (FOSA)	40.0	43.6	109	60-140	
13C8 FOSA	100	53.6	54	25-150	
13C4 PFBA	100	108	108	25-150	
13C2 PFHxA	100	123	123	25-150	
13C4 PFOA	100	136	136	25-150	
13C5 PFNA	100	131	131	25-150	
13C2 PFDA	100	141	141	25-150	
13C2 PFUnA	100	131	131	25-150	
13C2 PFDoA	100	121	121	25-150	
18O2 PFHxS	94.6	104	109	25-150	
13C4 PFOS	95.6	101	105	25-150	
13C4-PFHpA	100	139	139	25-150	
13C5 PFPeA	100	113	113	25-150	
13C3-PFBS	93.0	102	110	25-150	
13C2-PFTeDA	100	119	119	25-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.28B_049.d
 Lab ID: LCSD 320-179613/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorobutanoic acid (PFBA)	40.0	44.7	112	1	30	60-140	
Perfluoropentanoic acid (PFPeA)	40.0	40.6	101	5	30	60-140	
Perfluorohexanoic acid (PFHxA)	40.0	42.3	106	0	30	60-140	
Perfluoroheptanoic acid (PFHpA)	40.0	43.6	109	6	30	60-140	
Perfluorooctanoic acid (PFOA)	40.0	40.1	100	2	30	60-140	
Perfluorononanoic acid (PFNA)	40.0	42.3	106	4	30	60-140	
Perfluorodecanoic acid (PFDA)	40.0	42.8	107	3	30	60-140	
Perfluoroundecanoic acid (PFUnA)	40.0	37.4	94	4	30	60-140	
Perfluorododecanoic acid (PFDoA)	40.0	41.4	104	6	30	60-140	
Perfluorotridecanoic Acid (PFTriA)	40.0	43.5	109	8	30	50-150	
Perfluorotetradecanoic acid (PFTeA)	40.0	38.0	95	5	30	50-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	37.7	107	3	30	50-150	
Perfluorohexanesulfonic acid (PFHxS)	36.4	39.0	107	3	30	60-140	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	42.3	111	3	30	50-150	
Perfluorooctanesulfonic acid (PFOS)	37.1	39.5	107	0	30	60-140	
Perfluorodecanesulfonic acid (PFDS)	38.6	41.6	108	1	30	50-150	
Perfluorooctane Sulfonamide (FOSA)	40.0	46.0	115	5	30	60-140	
13C8 FOSA	100	68.4	68			25-150	
13C4 PFBA	100	95.0	95			25-150	
13C2 PFHxA	100	110	110			25-150	
13C4 PFOA	100	121	121			25-150	
13C5 PFNA	100	113	113			25-150	
13C2 PFDA	100	114	114			25-150	
13C2 PFUnA	100	108	108			25-150	
13C2 PFDoA	100	105	105			25-150	
18O2 PFHxS	94.6	89.2	94			25-150	
13C4 PFOS	95.6	90.4	95			25-150	
13C4-PFHpA	100	117	117			25-150	
13C5 PFPeA	100	105	105			25-150	
13C3-PFBS	93.0	86.9	93			25-150	
13C2-PFTeDA	100	110	110			25-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab File ID: 2017.08.28B_047.d Lab Sample ID: MB 320-179613/1-A
 Matrix: Water Date Extracted: 08/16/2017 09:20
 Instrument ID: A8_N Date Analyzed: 08/29/2017 09:14
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-179613/2-A	2017.08.28B 048.d	08/29/2017 09:21
	LCSD 320-179613/3-A	2017.08.28B 049.d	08/29/2017 09:28
TP-PFC-020-TPI DL	320-30556-1 DL	2017.08.28B 061.d	08/29/2017 10:51
TP-PFC-020-MID-CARBON	320-30556-2	2017.08.28B 062.d	08/29/2017 10:57
TP-PFC-020-TPE	320-30556-3	2017.08.28B 063.d	08/29/2017 11:04
TP-PFC-020-TPE-D	320-30556-4	2017.08.28B 064.d	08/29/2017 11:11
TP-PFC-020-TPI	320-30556-1	2017.08.28B 065.d	08/29/2017 11:18

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180980/3	2017.08.24A_003.d
Level 2	IC 320-180980/4	2017.08.24A_004.d
Level 3	IC 320-180980/5	2017.08.24A_005.d
Level 4	IC 320-180980/6	2017.08.24A_006.d
Level 5	IC 320-180980/7	2017.08.24A_007.d
Level 6	IC 320-180980/8	2017.08.24A_008.d
Level 7	IC 320-180980/9	2017.08.24A_009.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.539	1.538	1.545	1.545	1.553	1.546	1.546				1.295 - 1.795	1.545
Perfluoropentanoic acid (PFPeA)	1.747	1.747	1.755	1.754	1.754	1.755	1.746				1.501 - 2.001	1.751
Perfluorobutanesulfonic acid (PFBS)	1.766	1.766	1.773	1.781	1.782	1.773	++++				1.593 - 1.953	1.774
4:2 FTS	1.975	1.975	1.983	1.982	1.983	1.983	1.972				1.729 - 2.229	1.979
Perfluorohexanoic acid (PFHxA)	2.009	2.009	2.017	2.028	2.017	2.018	2.018				1.766 - 2.266	2.017
Perfluoroheptanoic acid (PFHpA)	2.350	2.346	2.357	2.354	2.355	2.349	2.344				2.101 - 2.601	2.351
Perfluorohexanesulfonic acid (PFHxS)	++++	2.362	2.365	2.370	2.371	2.365	2.361				2.115 - 2.615	2.366
6:2 FTS	2.679	2.677	2.687	2.686	2.685	2.679	2.677				2.431 - 2.931	2.681
Perfluorooctanoic acid (PFOA)	2.708	2.705	2.716	2.715	2.714	2.708	2.699				2.459 - 2.959	2.709
Perfluoroheptanesulfonic Acid (PFHpS)	2.715	2.713	2.723	2.722	2.721	2.716	2.714				2.468 - 2.968	2.718
Perfluorononanoic acid (PFNA)	3.084	3.081	3.096	3.091	3.090	3.082	3.081				2.837 - 3.337	3.086
Perfluorooctanesulfonic acid (PFOS)	3.084	3.081	3.096	3.091	3.090	3.082	3.081				2.837 - 3.337	3.086
Perfluorooctane Sulfonamide (FOSA)	3.419	3.415	3.425	3.426	3.428	3.420	3.417				3.171 - 3.671	3.421
8:2 FTS	3.436	3.441	3.441	3.443	3.437	3.438	3.435				3.189 - 3.689	3.439
Perfluorodecanoic acid (PFDA)	3.445	3.450	3.459	3.453	3.446	3.447	3.445				3.199 - 3.699	3.449
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.610	3.606	3.617	3.620	3.609	3.610	3.607				3.361 - 3.861	3.611
Perfluorodecanesulfonic acid (PFDS)	3.766	3.763	3.773	3.767	3.765	3.756	3.754				3.513 - 4.013	3.763
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.776	3.782	3.793	3.786	3.784	3.776	3.773				3.531 - 4.031	3.781
Perfluoroundecanoic acid (PFUnA)	3.786	3.782	3.793	3.786	3.784	3.776	3.773				3.533 - 4.033	3.783
MeFOSA	3.917	3.915	3.931	3.926	3.928	3.924	3.922				3.673 - 4.173	3.923
Perfluorododecanoic acid (PFDoA)	4.083	4.081	4.087	4.088	4.083	4.081	4.071				3.832 - 4.332	4.082
N-EtFOSA-M	4.108	4.106	4.121	4.114	4.117	4.115	4.107				3.863 - 4.363	4.113
Perfluorotridecanoic Acid (PFTriA)	4.354	4.352	4.359	4.351	4.352	4.341	4.344				4.100 - 4.600	4.350
Perfluorotetradecanoic acid (PFTeA)	4.592	4.580	4.590	4.591	4.586	4.581	4.573				4.335 - 4.835	4.585
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.009	5.008	5.018	5.018	5.009	5.006	5.000				4.760 - 5.260	5.010
Perfluoro-n-octadecanoic acid (PFODA)	5.374	5.372	5.381	5.380	5.372	5.372	5.362				5.123 - 5.623	5.373
13C4 PFBA	1.539	1.538	1.545	1.545	1.545	1.546	1.537				1.292 - 1.792	1.542
13C5 PFPeA	1.738	1.738	1.755	1.754	1.754	1.746	1.746				1.497 - 1.997	1.747
13C3-PFBS	1.766	1.766	1.773	1.772	1.773	1.773	1.773				1.671 - 1.871	1.771
13C2 PFHxA	2.009	2.009	2.017	2.028	2.017	2.018	2.018				1.766 - 2.266	2.017
13C4-PFHpA	2.342	2.346	2.357	2.354	2.355	2.349	2.344				2.099 - 2.599	2.350
18O2 PFHxS	2.358	2.362	2.365	2.370	2.363	2.365	2.361				2.113 - 2.613	2.363

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
M2-6:2FTS	2.679	2.677	2.687	2.686	2.685	2.679	2.677				2.431 - 2.931	2.681
13C4 PFOA	2.708	2.705	2.716	2.715	2.714	2.708	2.699				2.459 - 2.959	2.709
13C4 PFOS	3.084	3.081	3.087	3.091	3.081	3.082	3.081				2.834 - 3.334	3.084
13C5 PFNA	3.084	3.081	3.096	3.091	3.090	3.082	3.081				2.837 - 3.337	3.086
13C8 FOSA	3.410	3.415	3.425	3.426	3.419	3.420	3.417				3.169 - 3.669	3.419
M2-8:2FTS	3.436	3.433	3.441	3.443	3.437	3.438	3.435				3.188 - 3.688	3.438
13C2 PFDA	3.445	3.450	3.459	3.453	3.446	3.447	3.445				3.199 - 3.699	3.449
d3-NMeFOSAA	3.610	3.606	3.617	3.610	3.609	3.599	3.596				3.357 - 3.857	3.607
d5-NEtFOSAA	3.776	3.772	3.783	3.786	3.774	3.766	3.764				3.524 - 4.024	3.774
13C2 PFUnA	3.776	3.782	3.793	3.786	3.784	3.776	3.773				3.531 - 4.031	3.781
d-N-MeFOSA-M	3.909	3.915	3.923	3.926	3.920	3.916	3.914				3.667 - 4.167	3.918
13C2 PFDoA	4.083	4.081	4.087	4.088	4.083	4.081	4.071				3.832 - 4.332	4.082
d-N-EtFOSA-M	4.100	4.098	4.112	4.114	4.109	4.106	4.107				3.857 - 4.357	4.107
13C2-PFTeDA	4.592	4.591	4.602	4.591	4.597	4.581	4.585				4.341 - 4.841	4.591
13C2-PFHxDA	5.009	5.008	5.018	5.018	5.009	5.006	5.000				4.760 - 5.260	5.010

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180980/3	2017.08.24A_003.d
Level 2	IC 320-180980/4	2017.08.24A_004.d
Level 3	IC 320-180980/5	2017.08.24A_005.d
Level 4	IC 320-180980/6	2017.08.24A_006.d
Level 5	IC 320-180980/7	2017.08.24A_007.d
Level 6	IC 320-180980/8	2017.08.24A_008.d
Level 7	IC 320-180980/9	2017.08.24A_009.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4		B	M1	M2								
13C4 PFBA	205953 208740	219428 207087	217536 184480	206946	Ave		207167.071				5.5		50.0			
13C5 PFPeA	135234 128753	143355 126701	138760 116650	130761	Ave		131459.140				6.7		50.0			
13C3-PFBS	3869.3 3829.0	3980.8 4106.0	4104.3 3597.8	3838.9	Ave		3903.74501				4.6		50.0			
13C2 PFHxA	132530 135950	143392 137256	148022 124047	138067	Ave		137037.649				5.6		50.0			
13C4-PFHpA	122195 126604	135956 127895	132092 115671	126752	Ave		126738.003				5.2		50.0			
18O2 PFHxS	211958 216108	226335 227847	224321 205560	215306	Ave		218205.098				3.8		50.0			
M2-6:2FTS	50392 52293	53914 54575	51497 55317	52557	Ave		52935.0827				3.3		50.0			
13C4 PFOA	115096 120162	126360 113083	118909 100156	119986	Ave		116250.197				7.1		50.0			
13C4 PFOS	149406 148558	156113 154391	160965 142690	149229	Ave		151621.563				3.9		50.0			
13C5 PFNA	90530 84846	94002 88626	96239 79454	89843	Ave		89077.2114				6.3		50.0			
13C8 FOSA	225785 227217	236688 226234	243055 215706	234762	Ave		229921.060				3.9		50.0			
M2-8:2FTS	39773 42150	43494 44316	45194 42257	41030	Ave		42602.1742				4.4		50.0			
13C2 PFDA	78033 77185	83854 76011	80388 70179	74404	Ave		77150.4857				5.6		50.0			
d3-NMeFOSAA	19903 21153	20636 21308	20153 20912	20255	Ave		20617.0343				2.6		50.0			

Note: The M1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4		B	M1	M2								
d5-NEtFOSAA	21325 21031	22088 22513	22123 20626	21250	Ave		21565.1543				3.2		50.0			
13C2 PFUnA	51366 52505	55969 53286	55840 45466	51497	Ave		52275.5971				6.8		50.0			
d-N-MeFOSA-M	53267 52716	56751 57850	55665 56185	54142	Ave		55225.2086				3.4		50.0			
13C2 PFDoA	50170 49167	54145 50715	54469 49612	50398	Ave		51239.3571				4.2		50.0			
d-N-EtFOSA-M	50587 51598	53455 56131	55284 52824	51369	Ave		53035.3829				3.9		50.0			
13C2-PFTeDA	54074 53590	55961 53633	57501 47642	55968	Ave		54052.8200				5.9		50.0			
13C2-PFHxDA	111825 106657	113322 109535	111508 105373	113362	Ave		110225.903				2.9		50.0			

Note: The M1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

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)	1.1098 0.8160	0.8979 0.6900	0.9737	0.9597	0.9067	AveID		0.9077				14.5		35.0			
Perfluoropentanoic acid (PFPeA)	1.1797 1.0171	1.0442 0.8656	1.0502	1.0783	1.0723	AveID		1.0439				9.0		35.0			
Perfluorobutanesulfonic acid (PFBS)	78.096 58.142	75.637 ++++	78.325	76.774	71.996	AveID		73.162				10.5		50.0			
4:2 FTS	0.8769 0.9601	0.9397 0.7970	0.9758	0.9226	0.9281	AveID		0.9143				6.6		35.0			
Perfluorohexanoic acid (PFHxA)	1.0236 0.9181	0.9236 0.8247	0.9090	0.9590	0.9621	AveID		0.9315				6.6		35.0			
Perfluoroheptanoic acid (PFHpA)	1.0458 0.9533	0.9683 0.8682	0.9673	0.9650	0.9772	AveID		0.9636				5.4		35.0			
Perfluorohexanesulfonic acid (PFHxS)	++++ 0.9789	1.2009 0.8850	1.1008	1.0482	1.0351	AveID		1.0415				10.3		35.0			
6:2FTS	1.0099 0.8734	0.8708 0.7425	0.8789	0.8632	0.8609	AveID		0.8714				8.9		35.0			
Perfluorooctanoic acid (PFOA)	1.3035 1.0486	1.1501 0.9745	1.0953	1.0446	1.0425	AveID		1.0942				9.8		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2720 1.1171	1.2961 0.9578	1.2258	1.2776	1.2408	AveID		1.1982				10.1		50.0			
Perfluorononanoic acid (PFNA)	1.0519 0.9854	1.0140 0.9350	0.9414	0.9470	1.0234	AveID		0.9854				4.7		35.0			
Perfluorooctanesulfonic acid (PFOS)	1.1839 1.0231	1.1437 0.9791	1.0250	1.0238	1.0415	AveID		1.0600				7.0		35.0			
Perfluorooctane Sulfonamide (FOSA)	1.0529 0.8770	0.9994 0.7214	0.9579	0.9329	0.9353	AveID		0.9253				11.4		35.0			
8:2FTS	1.0344 0.8817	0.9940 0.8039	0.9455	0.9336	0.9093	AveID		0.9289				8.1		35.0			
Perfluorodecanoic acid (PFDA)	0.9890 0.9677	0.8530 0.8804	0.8490	0.8850	0.8981	AveID		0.9032				6.0		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.1690 0.9509	0.9374 0.9808	1.0055	0.9322	0.9219	AveID		0.9854				8.7		35.0			
Perfluorodecanesulfonic acid (PFDS)	0.5922 0.5952	0.6114 0.5676	0.6173	0.6230	0.6157	AveID		0.6032				3.2		50.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.8912 0.8713	0.8066 0.8895	0.8439	0.8296	0.8755	AveID		0.8582				3.8		35.0			
Perfluoroundecanoic acid (PFUnA)	1.3469 1.0829	1.2490 1.0838	1.0636	1.0408	1.0135	AveID		1.1258				11.0		35.0			

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.: 320-30556-1 Analy Batch No.: 180980
 SDG No.: _____
 Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
 Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

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								
MeFOSA	0.9740 0.9129	0.9178 0.8793	0.9334	0.8948	0.8943	AveID		0.9152				3.4		35.0			
Perfluorododecanoic acid (PFDoA)	1.0518 0.9695	1.0699 0.9120	0.9068	0.9274	0.9326	AveID		0.9671				7.0		35.0			
N-EtFOSA-M	0.9024 0.9519	0.9493 0.9417	0.8917	0.9262	0.9369	AveID		0.9286				2.5		35.0			
Perfluorotridecanoic Acid (PFTriA)	1.0207 0.9978	0.8921 0.9435	0.9256	0.9364	0.9597	AveID		0.9537				4.6		50.0			
Perfluorotetradecanoic acid (PFTeA)	0.3069 0.2384	0.2443 0.2609	0.2470	0.2291	0.2429	AveID		0.2528				10.2		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.7431 0.9071	1.2553 0.8144	0.9907	0.8626	0.9042	L2ID	0.4298	0.8665							0.9970		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	1.0570 1.0999	1.1198 1.0235	1.0780	1.0574	1.0848	AveID		1.0743				2.9		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180980/3	2017.08.24A_003.d
Level 2	IC 320-180980/4	2017.08.24A_004.d
Level 3	IC 320-180980/5	2017.08.24A_005.d
Level 4	IC 320-180980/6	2017.08.24A_006.d
Level 5	IC 320-180980/7	2017.08.24A_007.d
Level 6	IC 320-180980/8	2017.08.24A_008.d
Level 7	IC 320-180980/9	2017.08.24A_009.d

ANALYTE	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
13C4 PFBA	Ave	10297625 10354348	10971418 9223990	10876782	10347324	10436988	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5 PFPeA	Ave	6761694 6335044	7167750 5832509	6937983	6538056	6437663	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C3-PFBS	Ave	179923 190930	185109 167298	190849	178511	178049	46.5 46.5	46.5 46.5	46.5	46.5	46.5
13C2 PFHxA	Ave	6626513 6862788	7169588 6202360	7401088	6903339	6797501	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	6109752 6394742	6797811 5783566	6604614	6337598	6330218	50.0 50.0	50.0 50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	10025604 10777172	10705636 9722992	10610397	10183997	10221910	47.3 47.3	47.3 47.3	47.3	47.3	47.3
M2-6:2FTS	Ave	2393614 2592305	2560925 2627540	2446122	2496473	2483936	47.5 47.5	47.5 47.5	47.5	47.5	47.5
13C4 PFOA	Ave	5754782 5654159	6317994 5007806	5945452	5999299	6008077	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4 PFOS	Ave	7141590 7379875	7462183 6820592	7694138	7133141	7101056	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	4526493 4431296	4700096 3972715	4811966	4492139	4242319	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C8 FOSA	Ave	11289231 11311686	11834388 10785319	12152773	11738110	11360864	50.0 50.0	50.0 50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	1905112 2122759	2083372 2024111	2164816	1965341	2018998	47.9 47.9	47.9 47.9	47.9	47.9	47.9
13C2 PFDA	Ave	3901642 3800550	4192711 3508960	4019397	3720180	3859230	50.0 50.0	50.0 50.0	50.0	50.0	50.0
d3-NMeFOSAA	Ave	995137 1065395	1031821 1045585	1007638	1012747	1057639	50.0 50.0	50.0 50.0	50.0	50.0	50.0
d5-NETfOSAA	Ave	1066270 1125647	1104384 1031294	1106164	1062485	1051560	50.0 50.0	50.0 50.0	50.0	50.0	50.0

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

ANALYTE	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 PFUnA	Ave	2568317 2664298	2798436 2273290	2792006	2574856	2625256	50.0 50.0	50.0 50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	2663351 2892509	2837526 2809251	2783263	2707124	2635799	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	2508487 2535746	2707244 2480598	2723439	2519889	2458372	50.0 50.0	50.0 50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	2529344 2806547	2672739 2641185	2764185	2568463	2579921	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	2703706 2681670	2798051 2382081	2875053	2798407	2679519	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	5591246 5476760	5666113 5268626	5575388	5668084	5332849	50.0 50.0	50.0 50.0	50.0	50.0	50.0

Curve Type Legend:

Ave = Average

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-180980/3	2017.08.24A_003.d
Level 2	IC 320-180980/4	2017.08.24A_004.d
Level 3	IC 320-180980/5	2017.08.24A_005.d
Level 4	IC 320-180980/6	2017.08.24A_006.d
Level 5	IC 320-180980/7	2017.08.24A_007.d
Level 6	IC 320-180980/8	2017.08.24A_008.d
Level 7	IC 320-180980/9	2017.08.24A_009.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	114286 16898535	197020 25456573	1059118	3971942	9462743	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	79771 12887272	149697 20195604	728652	2819891	6902883	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		AveID	133562 21103793	266173 +++++	1420884	5210859	12184780	0.442 88.4	0.884 +++++	4.42	17.7	44.2
4:2 FTS		AveID	20637 4893877	47321 8235277	234667	905815	2266455	0.467 93.4	0.934 187	4.67	18.7	46.7
Perfluorohexanoic acid (PFHxA)		AveID	67831 12601744	132443 20459197	672792	2648018	6539935	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		AveID	63893 12192211	131647 20084980	638851	2446435	6185854	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 20296054	247334 33109344	1123503	4107370	10177783	+++++ 91.0	0.910 182	4.55	18.2	45.5
6:2FTS		AveID	24123 4518882	44506 7787108	214542	860157	2133847	0.474 94.8	0.948 190	4.74	19.0	47.4
Perfluorooctanoic acid (PFOA)		AveID	75012 11858254	145328 19520592	651185	2506742	6263198	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	90463 16419172	165687 26021550	939172	3630197	8774426	0.476 95.2	0.952 190	4.76	19.0	47.6
Perfluorononanoic acid (PFNA)		AveID	47616 8732868	95318 14858303	452982	1701549	4341599	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorooctanesulfonic acid (PFOS)		AveID	82073 14658325	165687 25930106	765520	2835600	7179346	0.464 92.8	0.928 186	4.64	18.6	46.4
Perfluorooctane Sulfonamide (FOSA)		AveID	118866 19841398	236554 31120054	1164104	4380116	10626285	0.500 100	1.00 200	5.00	20.0	50.0
8:2FTS		AveID	19707 3743384	41419 6508345	204683	733921	1835859	0.479 95.8	0.958 192	4.79	19.2	47.9
Perfluorodecanoic acid (PFDA)		AveID	38586 7355422	71527 12357119	341258	1316957	3465795	0.500 100	1.00 200	5.00	20.0	50.0

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1 Analy Batch No.: 180980

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/24/2017 10:09 Calibration End Date: 08/24/2017 10:57 Calibration ID: 33712

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
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	11633 2026219	19344 4102157	101323	377640	975071	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	42650 8857990	92017 15616303	478925	1792368	4408935	0.482 96.4	0.964 193	4.82	19.3	48.2
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	9503 1961485	17815 3669288	93348	352558	920624	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoroundecanoic acid (PFUnA)		AveID	34593 5770588	69903 9854871	296955	1071917	2660804	0.500 100	1.00 200	5.00	20.0	50.0
MeFOSA		AveID	25941 5281342	52085 9880406	259795	968964	2357081	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	26385 4916676	57927 9049141	246949	934770	2292605	0.500 100	1.00 200	5.00	20.0	50.0
N-EtFOSA-M		AveID	22824 5343269	50746 9949207	246476	951552	2417225	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorotridecanoic Acid (PFTriA)		AveID	25604 5060197	48303 9361633	252078	943819	2359196	0.500 100	1.00 200	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		AveID	8297 1278556	13670 2485860	71000	256477	650916	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	97460 9935406	142257 17163735	552335	1955799	4822029	0.500 100	1.00 200	5.00	20.0	50.0
Perfluoro-n-octadecanoic acid (PFODA)		AveID	59100 12047785	126897 21569638	601033	2397368	5785021	0.500 100	1.00 200	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: ICV 320-180980/12 Calibration Date: 08/24/2017 11:11

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.24A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.9315		50.8	49.5	2.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.106		52.5	49.5	6.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	71.73		43.0	43.8	-2.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	1.049		55.7	49.5	12.6	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	1.071		55.0	49.5	11.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.104		49.6	46.8	6.0	25.0
6:2FTS	AveID	0.8714	0.9332		50.3	46.9	7.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.140		51.6	49.5	4.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.254		49.3	47.1	4.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	1.044		52.4	49.5	5.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.009		45.0	47.3	-4.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	0.9929		53.1	49.5	7.3	25.0
8:2FTS	AveID	0.9289	1.021		52.1	47.4	9.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	1.019		55.9	49.5	12.8	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	1.088		54.6	49.5	10.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6845		54.2	47.8	13.5	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.9547		55.1	49.5	11.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	1.129		49.6	49.5	0.3	25.0
MeFOSA	AveID	0.9152	0.9443		51.1	49.5	3.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	1.036		53.0	49.5	7.1	25.0
N-EtFOSA-M	AveID	0.9286	1.038		55.3	49.5	11.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	1.040		54.0	49.5	9.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2451		48.0	49.5	-3.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9731		55.1	49.5	11.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	1.155		53.2	49.5	7.5	25.0
13C4 PFBA	Ave	207167	202746		48.4	49.5	-2.1	50.0
13C5 PFPeA	Ave	131459	129393		48.7	49.5	-1.6	50.0
13C3-PFBS	Ave	3904	4008		47.3	46.0	2.7	50.0
13C2 PFHxA	Ave	137038	135138		48.8	49.5	-1.4	50.0
13C4-PFHpA	Ave	126738	134269		52.4	49.5	5.9	50.0
18O2 PFHxS	Ave	218205	215006		46.1	46.8	-1.5	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: ICV 320-180980/12 Calibration Date: 08/24/2017 11:11
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.24A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	53062		47.1	47.0	0.2	50.0
13C4 PFOA	Ave	116250	118258		50.4	49.5	1.7	50.0
13C4 PFOS	Ave	151622	148264		46.3	47.3	-2.2	50.0
13C5 PFNA	Ave	89077	93876		52.2	49.5	5.4	50.0
13C8 FOSA	Ave	229921	218609		47.1	49.5	-4.9	50.0
M2-8:2FTS	Ave	42602	41743		46.5	47.4	-2.0	50.0
13C2 PFDA	Ave	77150	77478		49.7	49.5	0.4	50.0
d3-NMeFOSAA	Ave	20617	18792		45.1	49.5	-8.9	50.0
d5-NEtFOSAA	Ave	21565	20946		48.1	49.5	-2.9	50.0
13C2 PFUnA	Ave	52276	54058		51.2	49.5	3.4	50.0
d-N-MeFOSA-M	Ave	55225	56358		50.5	49.5	2.1	50.0
13C2 PFDoA	Ave	51239	51785		50.0	49.5	1.1	50.0
d-N-EtFOSA-M	Ave	53035	53100		49.6	49.5	0.1	50.0
13C2-PFTeDA	Ave	54053	54698		50.1	49.5	1.2	50.0
13C2-PFHxDA	Ave	110226	109631		49.2	49.5	-0.5	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: CCVL 320-181763/4 Calibration Date: 08/29/2017 04:17

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.28B_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.9524		1.05	1.00	4.9	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.163		1.11	1.00	11.4	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	75.20		0.909	0.884	2.8	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	0.9517		1.02	1.00	2.2	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	0.9306		0.966	1.00	-3.4	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.185		1.04	0.910	13.8	50.0
6:2FTS	AveID	0.8714	0.9796		1.07	0.948	12.4	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.167		1.07	1.00	6.6	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.257		0.998	0.952	4.9	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	0.9456		0.960	1.00	-4.0	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.101		0.964	0.928	3.8	50.0
8:2FTS	AveID	0.9289	1.021		1.05	0.958	9.9	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	0.9523		1.05	1.00	5.4	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	1.025		1.11	1.00	10.8	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	0.8719		0.885	1.00	-11.5	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6576		1.05	0.964	9.0	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.9369		1.09	1.00	9.2	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	1.143		1.02	1.00	1.5	50.0
MeFOSA	AveID	0.9152	0.8692		0.950	1.00	-5.0	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	0.9687		1.00	1.00	0.2	50.0
N-EtFOSA-M	AveID	0.9286	0.8928		0.961	1.00	-3.9	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	0.7959		0.835	1.00	-16.5	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2216		0.877	1.00	-12.3	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.337		1.05	1.00	4.7	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	0.9339		0.869	1.00	-13.1	50.0
13C4 PFBA	Ave	207167	213529		51.5	50.0	3.1	50.0
13C5 PFPeA	Ave	131459	151863		57.8	50.0	15.5	50.0
13C3-PFBS	Ave	3904	4088		48.7	46.5	4.7	50.0
13C2 PFHxA	Ave	137038	163409		59.6	50.0	19.2	50.0
13C4-PFHpA	Ave	126738	155816		61.5	50.0	22.9	50.0
18O2 PFHxS	Ave	218205	232390		50.4	47.3	6.5	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-181763/4 Calibration Date: 08/29/2017 04:17
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.28B_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	67944		61.0	47.5	28.4	50.0
13C4 PFOA	Ave	116250	141617		60.9	50.0	21.8	50.0
13C4 PFOS	Ave	151622	162773		51.3	47.8	7.4	50.0
13C5 PFNA	Ave	89077	111906		62.8	50.0	25.6	50.0
M2-8:2FTS	Ave	42602	48131		54.1	47.9	13.0	50.0
13C2 PFDA	Ave	77150	90789		58.8	50.0	17.7	50.0
13C8 FOSA	Ave	229921	246488		53.6	50.0	7.2	50.0
d3-NMeFOSAA	Ave	20617	23379		56.7	50.0	13.4	50.0
d5-NEtFOSAA	Ave	21565	23231		53.9	50.0	7.7	50.0
13C2 PFUnA	Ave	52276	57557		55.1	50.0	10.1	50.0
d-N-MeFOSA-M	Ave	55225	59573		53.9	50.0	7.9	50.0
13C2 PFDoA	Ave	51239	61080		59.6	50.0	19.2	50.0
d-N-EtFOSA-M	Ave	53035	56101		52.9	50.0	5.8	50.0
13C2-PFTeDA	Ave	54053	62422		57.7	50.0	15.5	50.0
13C2-PFHxDA	Ave	110226	89010		40.4	50.0	-19.2	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: CCV 320-181833/1 Calibration Date: 08/29/2017 09:07

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.28B_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.9536		21.0	20.0	5.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.113		21.3	20.0	6.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	75.23		18.2	17.7	2.8	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	1.010		21.7	20.0	8.5	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	0.995		20.7	20.0	3.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.082		18.9	18.2	3.9	25.0
6:2FTS	AveID	0.8714	0.8205		17.9	19.0	-5.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.072		19.6	20.0	-2.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.329		21.1	19.0	10.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.073		18.8	18.6	1.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	0.9434		19.1	20.0	-4.3	25.0
8:2FTS	AveID	0.9289	0.9199		19.0	19.2	-1.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	0.9079		20.1	20.0	0.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	0.9600		20.7	20.0	3.7	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	0.9103		18.5	20.0	-7.6	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6556		21.0	19.3	8.7	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.8544		19.9	20.0	-0.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	1.062		18.9	20.0	-5.7	25.0
MeFOSA	AveID	0.9152	0.8711		19.0	20.0	-4.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	0.8724		18.0	20.0	-9.8	25.0
N-EtFOSA-M	AveID	0.9286	0.9282		20.0	20.0	-0.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	0.8854		18.6	20.0	-7.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2183		17.3	20.0	-13.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8791		19.8	20.0	-1.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	0.8705		16.2	20.0	-19.0	25.0
13C4 PFBA	Ave	207167	209892		50.7	50.0	1.3	50.0
13C5 PFPeA	Ave	131459	151632		57.7	50.0	15.3	50.0
13C3-PFBS	Ave	3904	4130		49.2	46.5	5.8	50.0
13C2 PFHxA	Ave	137038	161944		59.1	50.0	18.2	50.0
13C4-PFHpA	Ave	126738	161898		63.9	50.0	27.7	50.0
18O2 PFHxS	Ave	218205	238197		51.6	47.3	9.2	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: CCV 320-181833/1 Calibration Date: 08/29/2017 09:07
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.28B_046.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	72349		64.9	47.5	36.7	50.0
13C4 PFOA	Ave	116250	142757		61.4	50.0	22.8	50.0
13C4 PFOS	Ave	151622	162610		51.3	47.8	7.2	50.0
13C5 PFNA	Ave	89077	116071		65.2	50.0	30.3	50.0
M2-8:2FTS	Ave	42602	50991		57.3	47.9	19.7	50.0
13C2 PFDA	Ave	77150	91186		59.1	50.0	18.2	50.0
13C8 FOSA	Ave	229921	244485		53.2	50.0	6.3	50.0
d3-NMeFOSAA	Ave	20617	23738		57.6	50.0	15.1	50.0
d5-NEtFOSAA	Ave	21565	24331		56.4	50.0	12.8	50.0
13C2 PFUnA	Ave	52276	62151		59.4	50.0	18.9	50.0
d-N-MeFOSA-M	Ave	55225	58348		52.8	50.0	5.7	50.0
13C2 PFDoA	Ave	51239	62254		60.7	50.0	21.5	50.0
d-N-EtFOSA-M	Ave	53035	54941		51.8	50.0	3.6	50.0
13C2-PFTeDA	Ave	54053	56690		52.4	50.0	4.9	50.0
13C2-PFHxDA	Ave	110226	93086		42.2	50.0	-15.5	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: CCV 320-181833/12 Calibration Date: 08/29/2017 10:23

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.28B_057.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.8915		49.1	50.0	-1.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.068		51.2	50.0	2.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	68.99		41.7	44.2	-5.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	0.9792		52.6	50.0	5.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	0.9727		50.5	50.0	0.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.003		43.8	45.5	-3.7	25.0
6:2FTS	AveID	0.8714	0.8210		44.7	47.4	-5.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.043		47.7	50.0	-4.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.214		48.2	47.6	1.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	0.9877		50.1	50.0	0.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.044		45.7	46.4	-1.5	25.0
8:2FTS	AveID	0.9289	0.9054		46.7	47.9	-2.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	0.9322		51.6	50.0	3.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	0.9432		51.0	50.0	1.9	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	0.9335		47.4	50.0	-5.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6459		51.6	48.2	7.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.8309		48.4	50.0	-3.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	1.048		46.5	50.0	-6.9	25.0
MeFOSA	AveID	0.9152	0.8908		48.7	50.0	-2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	0.9383		48.5	50.0	-3.0	25.0
N-EtFOSA-M	AveID	0.9286	0.9424		50.7	50.0	1.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	0.9728		51.0	50.0	2.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2151		42.6	50.0	-14.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8469		48.4	50.0	-3.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	0.9340		43.5	50.0	-13.1	25.0
13C4 PFBA	Ave	207167	215559		52.0	50.0	4.1	50.0
13C5 PFPeA	Ave	131459	152527		58.0	50.0	16.0	50.0
13C3-PFBS	Ave	3904	4145		49.4	46.5	6.2	50.0
13C2 PFHxA	Ave	137038	162262		59.2	50.0	18.4	50.0
13C4-PFHpA	Ave	126738	164875		65.0	50.0	30.1	50.0
18O2 PFHxS	Ave	218205	243709		52.8	47.3	11.7	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: CCV 320-181833/12 Calibration Date: 08/29/2017 10:23
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.28B_057.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	76513		68.7	47.5	44.5	50.0
13C4 PFOA	Ave	116250	145092		62.4	50.0	24.8	50.0
13C4 PFOS	Ave	151622	169067		53.3	47.8	11.5	50.0
13C5 PFNA	Ave	89077	112294		63.0	50.0	26.1	50.0
M2-8:2FTS	Ave	42602	52522		59.1	47.9	23.3	50.0
13C2 PFDA	Ave	77150	91299		59.2	50.0	18.3	50.0
13C8 FOSA	Ave	229921	244724		53.2	50.0	6.4	50.0
d3-NMeFOSAA	Ave	20617	24680		59.9	50.0	19.7	50.0
d5-NEtFOSAA	Ave	21565	25821		59.9	50.0	19.7	50.0
13C2 PFUnA	Ave	52276	61940		59.2	50.0	18.5	50.0
d-N-MeFOSA-M	Ave	55225	60199		54.5	50.0	9.0	50.0
13C2 PFDoA	Ave	51239	59068		57.6	50.0	15.3	50.0
d-N-EtFOSA-M	Ave	53035	59444		56.0	50.0	12.1	50.0
13C2-PFTeDA	Ave	54053	58870		54.5	50.0	8.9	50.0
13C2-PFHxDA	Ave	110226	90085		40.9	50.0	-18.3	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Lab Sample ID: CCV 320-181833/22 Calibration Date: 08/29/2017 11:32

Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57

Lab File ID: 2017.08.28B_067.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9077	0.9416		20.7	20.0	3.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.044	1.078		20.7	20.0	3.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	73.16	76.73		18.5	17.7	4.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9315	0.9465		20.3	20.0	1.6	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9636	0.9580		19.9	20.0	-0.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.041	1.065		18.6	18.2	2.3	25.0
6:2FTS	AveID	0.8714	0.8527		18.6	19.0	-2.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.094	1.007		18.4	20.0	-8.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.198	1.332		21.2	19.0	11.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9854	0.9637		19.6	20.0	-2.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.060	1.050		18.4	18.6	-1.0	25.0
8:2FTS	AveID	0.9289	0.9613		19.8	19.2	3.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9253	0.9629		20.8	20.0	4.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9032	0.9077		20.1	20.0	0.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9854	0.8853		18.0	20.0	-10.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6032	0.6446		20.6	19.3	6.9	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8582	0.8254		19.2	20.0	-3.8	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.126	0.9798		17.4	20.0	-13.0	25.0
MeFOSA	AveID	0.9152	0.8863		19.4	20.0	-3.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9671	0.8411		17.4	20.0	-13.0	25.0
N-EtFOSA-M	AveID	0.9286	0.8966		19.3	20.0	-3.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9537	0.8240		17.3	20.0	-13.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2528	0.2053		16.2	20.0	-18.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8514		19.2	20.0	-4.2	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.074	0.8788		16.4	20.0	-18.2	25.0
13C4 PFBA	Ave	207167	215226		51.9	50.0	3.9	50.0
13C5 PFPeA	Ave	131459	158783		60.4	50.0	20.8	50.0
13C3-PFBS	Ave	3904	3990		47.5	46.5	2.2	50.0
13C2 PFHxA	Ave	137038	166021		60.6	50.0	21.1	50.0
13C4-PFHpA	Ave	126738	163424		64.5	50.0	28.9	50.0
18O2 PFHxS	Ave	218205	231311		50.1	47.3	6.0	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1
 SDG No.: _____
 Lab Sample ID: CCV 320-181833/22 Calibration Date: 08/29/2017 11:32
 Instrument ID: A8_N Calib Start Date: 08/24/2017 10:09
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/24/2017 10:57
 Lab File ID: 2017.08.28B_067.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
M2-6:2FTS	Ave	52935	74587		66.9	47.5	40.9	50.0
13C4 PFOA	Ave	116250	151132		65.0	50.0	30.0	50.0
13C4 PFOS	Ave	151622	161307		50.9	47.8	6.4	50.0
13C5 PFNA	Ave	89077	114149		64.1	50.0	28.1	50.0
M2-8:2FTS	Ave	42602	50673		57.0	47.9	18.9	50.0
13C8 FOSA	Ave	229921	241987		52.6	50.0	5.2	50.0
13C2 PFDA	Ave	77150	94925		61.5	50.0	23.0	50.0
d3-NMeFOSAA	Ave	20617	25659		62.2	50.0	24.5	50.0
d5-NEtFOSAA	Ave	21565	24794		57.5	50.0	15.0	50.0
13C2 PFUnA	Ave	52276	66669		63.8	50.0	27.5	50.0
d-N-MeFOSA-M	Ave	55225	59090		53.5	50.0	7.0	50.0
13C2 PFDoA	Ave	51239	64168		62.6	50.0	25.2	50.0
d-N-EtFOSA-M	Ave	53035	59389		56.0	50.0	12.0	50.0
13C2-PFTeDA	Ave	54053	61735		57.1	50.0	14.2	50.0
13C2-PFHxDA	Ave	110226	99188		45.0	50.0	-10.0	50.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-179613/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_047.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>250.00 (mL)</u>	Date Analyzed: <u>08/29/2017 09:14</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.0	U	2.5	1.0	0.46
2706-90-3	Perfluoropentanoic acid (PFPeA)	2.0	U	2.5	2.0	0.99
307-24-4	Perfluorohexanoic acid (PFHxA)	2.0	U	2.5	2.0	0.79
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75
375-95-1	Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.5	1.0	0.44
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.0	U	2.5	2.0	0.75
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	2.5	2.0	0.58
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.0	U	2.5	2.0	0.55
376-06-7	Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.5	1.0	0.40
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	2.0	U	2.5	2.0	0.71
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U M	4.0	3.0	1.3
335-77-3	Perfluorodecanesulfonic acid (PFDS)	3.0	U	4.0	3.0	1.2
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.26	J	40	2.0	0.64

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-30556-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-179613/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.08.28B_047.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/16/2017 09:20</u>
Sample wt/vol: <u>250.00 (mL)</u>	Date Analyzed: <u>08/29/2017 09:14</u>
Con. Extract Vol.: <u>0.50 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>181833</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	66		25-150
STL00992	13C4 PFBA	111		25-150
STL00993	13C2 PFHxA	126		25-150
STL00990	13C4 PFOA	137		25-150
STL00995	13C5 PFNA	133		25-150
STL00996	13C2 PFDA	134		25-150
STL00997	13C2 PFUnA	124		25-150
STL00998	13C2 PFDoA	121		25-150
STL00994	18O2 PFHxS	106		25-150
STL00991	13C4 PFOS	106		25-150
STL01892	13C4-PFHpA	131		25-150
STL01893	13C5 PFPeA	117		25-150
STL02337	13C3-PFBS	106		25-150
STL02116	13C2-PFTeDA	121		25-150

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/24/2017 10:09

Analysis Batch Number: 180980 End Date: 08/24/2017 11:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-180980/3		08/24/2017 10:09	1	2017.08.24A_003 .d	GeminiC18 3x100 3(mm)
IC 320-180980/4		08/24/2017 10:16	1	2017.08.24A_004 .d	GeminiC18 3x100 3(mm)
IC 320-180980/5		08/24/2017 10:23	1	2017.08.24A_005 .d	GeminiC18 3x100 3(mm)
IC 320-180980/6		08/24/2017 10:29	1	2017.08.24A_006 .d	GeminiC18 3x100 3(mm)
IC 320-180980/7		08/24/2017 10:36	1	2017.08.24A_007 .d	GeminiC18 3x100 3(mm)
IC 320-180980/8		08/24/2017 10:43	1	2017.08.24A_008 .d	GeminiC18 3x100 3(mm)
IC 320-180980/9		08/24/2017 10:50	1	2017.08.24A_009 .d	GeminiC18 3x100 3(mm)
IC 320-180980/10		08/24/2017 10:57	1	2017.08.24A_010 .d	GeminiC18 3x100 3(mm)
ICB 320-180980/11		08/24/2017 11:04	1		GeminiC18 3x100 3(mm)
ICV 320-180980/12		08/24/2017 11:11	1	2017.08.24A_012 .d	GeminiC18 3x100 3(mm)
ZZZZZ		08/24/2017 11:18	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/29/2017 04:17Analysis Batch Number: 181763 End Date: 08/29/2017 04:52

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-181763/4		08/29/2017 04:17	1	2017.08.28B_004 .d	GeminiC18 3x100 3(mm)
CCV 320-181763/5		08/29/2017 04:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 04:31	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 04:38	100		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 04:45	50		GeminiC18 3x100 3(mm)
CCV 320-181763/9		08/29/2017 04:52	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-30556-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/29/2017 09:07Analysis Batch Number: 181833End Date: 08/29/2017 11:32

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-181833/1		08/29/2017 09:07	1	2017.08.28B_046 .d	GeminiC18 3x100 3(mm)
MB 320-179613/1-A		08/29/2017 09:14	1	2017.08.28B_047 .d	GeminiC18 3x100 3(mm)
LCS 320-179613/2-A		08/29/2017 09:21	1	2017.08.28B_048 .d	GeminiC18 3x100 3(mm)
LCSD 320-179613/3-A		08/29/2017 09:28	1	2017.08.28B_049 .d	GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 09:35	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 09:41	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 09:48	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 09:55	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:02	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:09	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:16	1		GeminiC18 3x100 3(mm)
CCV 320-181833/12		08/29/2017 10:23	1	2017.08.28B_057 .d	GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:30	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/29/2017 10:44	1		GeminiC18 3x100 3(mm)
320-30556-1 DL		08/29/2017 10:51	10	2017.08.28B_061 .d	GeminiC18 3x100 3(mm)
320-30556-2		08/29/2017 10:57	1	2017.08.28B_062 .d	GeminiC18 3x100 3(mm)
320-30556-3		08/29/2017 11:04	1	2017.08.28B_063 .d	GeminiC18 3x100 3(mm)
320-30556-4		08/29/2017 11:11	1	2017.08.28B_064 .d	GeminiC18 3x100 3(mm)
320-30556-1		08/29/2017 11:18	1	2017.08.28B_065 .d	GeminiC18 3x100 3(mm)
CCV 320-181833/22		08/29/2017 11:32	1	2017.08.28B_067 .d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Batch Number: 179613 Batch Start Date: 08/16/17 09:20 Batch Analyst: Santos, JonathanBatch Method: 3535 Batch End Date: 08/17/17 21:48

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC ALL_SU 00006	LCPFCS 00110
MB 320-179613/1		3535, 537 (modified)				250.00 mL	0.50 mL	500 uL	
LCS 320-179613/2		3535, 537 (modified)				250.00 mL	0.50 mL	500 uL	500 uL
LCSD 320-179613/3		3535, 537 (modified)				250.00 mL	0.50 mL	500 uL	500 uL
320-30556-A-1	TP-PFC-020-TPI	3535, 537 (modified)	T	287.82 g	27.01 g	260.8 mL	0.50 mL	500 uL	
320-30556-A-2	TP-PFC-020-MID-C ARBON	3535, 537 (modified)	T	286.46 g	27.66 g	258.8 mL	0.50 mL	500 uL	
320-30556-A-3	TP-PFC-020-TPE	3535, 537 (modified)	T	290.04 g	26.95 g	263.1 mL	0.50 mL	500 uL	
320-30556-A-4	TP-PFC-020-TPE-D	3535, 537 (modified)	T	287.99 g	26.92 g	261.1 mL	0.50 mL	500 uL	

Batch Notes	
Balance ID	QA-070
H2O ID	8/7/17
Hexane ID	981622
Manifold ID	8, 14
Methanol ID	1010872
Sodium Hydroxide ID	1010784
Pipette ID	I46370G
Analyst ID - Reagent Drop	CCB
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
Solvent Lot #	1010466
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003237040A

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.

537 (modified)

Page 1 of 2

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30556-1

SDG No.: _____

Batch Number: 179613 Batch Start Date: 08/16/17 09:20 Batch Analyst: Santos, JonathanBatch Method: 3535 Batch End Date: 08/17/17 21:48

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.

HPLC/LCMS Data Review Checklist

Job Number(s): 460-139000; 30317
30555; 30556; 460-139006; Work List ID(s): 47185; 47186; 47265; 47264
 Extraction Batch: 179613; 179714 Analysis Batch(es): 181485; 181487; 181488; 181833;
181762(CCVL); 181830;
 Delivery Rank: 4 Due Date: various 181831

	1 st Level	2 nd Level	N/A
A. Calibration/Instrument Run QC			
1. ICAL locked in Chrom and TALS? ICAL Batch# <u>180980; 180981</u>	✓	✓	
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?	✓	✓	
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			
1. Are all non-conformances documented/attached? NCM#	✓	✓	
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): [Signature] Date: 8/29/17
 2nd Level Reviewer: [Signature] Date: 8/30/17

NCMS: 99268; 99266; 99270; 99271; 99287; 99288; 99289; 99291;
99292; 99286; 99272; 99273; 99274; 99314; 99313; 99315;
99316

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 25AUG2017J_PFC

Worklist Number: 47185

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170828-47185.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 181484	LC PFC ICAL Raw Batch: 181485	LC PFAS ICAL Raw Batch: 181486
# 1 CCV L5	# 1 CCV L5 <i>PFDOA 10A</i>	# 1 CCV L5	
# 2 MB 320-179714/1-A	# 2 MB 320-179714/1-A <i>PI</i>	# 2 MB 320-179714/1-A	
# 3 LCS 320-179714/2-A	# 3 LCS 320-179714/2-A	# 3 LCS 320-179714/2-A	
# 4 320-30555-A-11-A	# 4 320-30555-A-11-A		
# 5 320-30555-A-12-A	# 5 320-30555-A-12-A		
# 6 320-30555-A-13-A	# 6 320-30555-A-13-A	<i>1st</i>	
# 7 320-30555-A-14-A	# 7 320-30555-A-14-A		
# 8 320-30555-A-15-A	# 8 320-30555-A-15-A		
# 9 320-30555-A-16-A	# 9 320-30555-A-16-A		
# 10 320-30555-A-17-A	# 10 320-30555-A-17-A		
# 11 320-30555-A-18-A	# 11 320-30555-A-18-A		
# 12 CCV L4	# 12 CCV L4	# 12 CCV L4	
# 13 320-30555-A-19-A	# 13 320-30555-A-19-A <i>RI</i>	<i>PFHpA 10A high 99271</i>	
# 14 320-30555-A-20-A	# 14 320-30555-A-20-A	<i>CCV 10A out 99270</i>	
# 15 320-30555-A-21-A	# 15 320-30555-A-21-A	<i>M/SD high targets 99266</i>	
# 16 320-30555-A-21-B MS	# 16 320-30555-A-21-B MS	<i>MS/MSD 1.R, RPD 99268</i>	
# 17 320-30555-A-21-C MSD	# 17 320-30555-A-21-C MSD		
# 18 320-30555-A-22-A	# 18 320-30555-A-22-A		
# 19 460-139000-F-1-A		# 19 460-139000-F-1-A	
# 20 460-139000-F-2-A		# 20 460-139000-F-2-A <i>20x</i>	
# 21 460-139000-F-2-B MS		# 21 460-139000-F-2-B MS <i>20x</i>	
# 22 460-139000-F-2-C MSD		# 22 460-139000-F-2-C MSD <i>20x</i>	
# 23 CCV L5	# 23 CCV L5	# 23 CCV L5 <i>PFDOA 10A</i>	
# 24 460-139000-F-3-A		# 24 460-139000-F-3-A	
# 25 460-139000-F-4-A		# 25 460-139000-F-4-A	
# 26 460-139000-F-5-A		# 26 460-139000-F-5-A	
# 27 CCV L4	# 27 CCV L4	# 27 CCV L4	

CCVL 181223

181222

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 25AUG2017K_PFC

Worklist Number: 47186

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170828-47186.b

QC Batching: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 181487	LC PFC ICAL Raw Batch: 181488	LC PFAS ICAL Raw Batch: 181489
# 1 CCV L4	# 1 CCV L4	# 1 CCV L4	
# 2 MB 320-179613/1-A	# 2 MB 320-179613/1-A	# 2 MB 320-179613/1-A	
# 3 LCS 320-179613/2-A	# 3 LCS 320-179613/2-A	# 3 LCS 320-179613/2-A	
# 4 LCSD 320-179613/3-A	# 4 LCSD 320-179613/3-A	# 4 LCSD 320-179613/3-A	
# 5 320-30555-A-1-A	# 5 320-30555-A-1-A RI IDA		
# 6 320-30555-A-2-A	# 6 320-30555-A-2-A		
# 7 320-30555-A-3-A	# 7 320-30555-A-3-A RI	1st	
# 8 320-30555-A-4-A	# 8 320-30555-A-4-A		
# 9 320-30555-A-5-A	# 9 320-30555-A-5-A RI		
#10 320-30555-A-6-A	#10 320-30555-A-6-A RI		
#11 320-30555-A-7-A	#11 320-30555-A-7-A RI		
#12 CCV L5	#12 CCV L5	#12 CCV L5	
#13 320-30555-A-8-A	#13 320-30555-A-8-A RI		
#14 320-30555-A-9-A	#14 320-30555-A-9-A RI		
#15 320-30555-A-10-A	#15 320-30555-A-10-A RI		
#16 320-30556-A-1-A	#16 320-30556-A-1-A IDX; RI		
#17 320-30556-A-2-A	#17 320-30556-A-2-A RI; i		
#18 320-30556-A-3-A	#18 320-30556-A-3-A RI		
#19 320-30556-A-4-A	#19 320-30556-A-4-A RI		
#20 460-139006-E-1-A		#20 460-139006-E-1-A	
#21 460-139006-E-2-A		#21 460-139006-E-2-A	
#22 460-139006-E-3-A		#22 460-139006-E-3-A	
#23 CCV L4	#23 CCV L4	#23 CCV L4 PFNA, DOA IDA out	
#24 460-139006-E-4-A		#24 460-139006-E-4-A	
#25 460-139006-E-5-A		#25 460-139006-E-5-A	
#26 CCV L5	#26 CCV L5	#26 CCV L5	

Link to 460-139000 MS/MSD
in 181485

LCVL 181223

181222

PFNA IDA out 99272
PFNA/DOA IDA high 99274
Several IDA out 99273

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 28AUG2017E_PFC

Worklist Number: 47265

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170829-47265.b

QC Batch: Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 181833	LC PFC ICAL Raw Batch: 181834
# 1 CCV L4	# 1 CCV L4	# 1 CCV L4
# 2 MB 320-179613/1-A	# 2 MB 320-179613/1-A	
# 3 LCS 320-179613/2-A → confirmed	# 3 LCS 320-179613/2-A 6:2 FTS IDA high 99287	
# 4 LCSD 320-179613/3-A	# 4 LCSD 320-179613/3-A 6:2/8:2 IDA high 99288	
# 5 320-30555-A-1-A	# 5 320-30555-A-1-A	
# 6 320-30555-A-2-A	# 6 320-30555-A-2-A → report original	PFTIDA IDA high 99289
# 7 320-30555-A-3-A	# 7 320-30555-A-3-A	PFTIDA IDA high 99291
# 8 320-30555-A-4-A → confirmed	# 8 320-30555-A-4-A	FOSTA IDA low 99292
# 9 320-30555-A-5-A → confirmed	# 9 320-30555-A-5-A	
# 10 320-30555-A-6-A	# 10 320-30555-A-6-A	
# 11 320-30555-A-7-A	# 11 320-30555-A-7-A	
# 12 CCV L5	# 12 CCV L5	# 12 CCV L5
# 13 320-30555-A-8-A	# 13 320-30555-A-8-A	
# 14 320-30555-A-9-A	# 14 320-30555-A-9-A	
# 15 320-30555-A-10-A	# 15 320-30555-A-10-A	
# 16 320-30556-A-1-A	# 16 320-30556-A-1-A RL, DL 99286	
# 17 320-30556-A-2-A → c	# 17 320-30556-A-2-A	
# 18 320-30556-A-3-A → c	# 18 320-30556-A-3-A	
# 19 320-30556-A-4-A → c	# 19 320-30556-A-4-A	
# 20 320-30556-A-1-A → confirmed	# 20 320-30556-A-1-A	
# 21 RINSE	# 21 RINSE	# 21 RINSE
# 22 CCV L4	# 22 CCV L4	# 22 CCV L4

CCVL 181763

92

Aqueous Extraction Analysis Sheet

AB 8/25/17

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End: 8/17/2017 9:48:00PM

Solid-Phase Extraction (SPE)

8/30

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-179613/1 N/A	N/A		250.00 mL				N/A	N/A	N/A	RI	MB-320-179613/1-A1
			0.50 mL								
2 LCS-320-179613/2 N/A	N/A		250.00 mL				N/A	N/A	N/A	RI	LCS-320-179613/2-A1
			0.50 mL								
3 LCSD-320-179613/3 N/A	N/A		250.00 mL				N/A	N/A	N/A	RI	LCSD-320-179613/3-A1
			0.50 mL								
320-30555-A-1 (PFC_IDA_DOD5)	N/A (320-30555-1)	279.45 g	252.9 mL				8/25/17	16_Days	4	RI	320-30555-A-1-A1
		26.51 g	0.50 mL								
320-30555-A-2 (PFC_IDA_DOD5)	N/A (320-30555-1)	285.43 g	258.9 mL				8/25/17	16_Days	4	RI	320-30555-A-2-A1
		26.57 g	0.50 mL								
6 320-30555-A-3 (PFC_IDA_DOD5)	N/A (320-30555-1)	284.38 g	258.1 mL				8/25/17	16_Days	4	RI	320-30555-A-3-A1
		26.30 g	0.50 mL								
7 320-30555-A-4 (PFC_IDA_DOD5)	N/A (320-30555-1)	287.96 g	260.5 mL				8/25/17	16_Days	4	RI	320-30555-A-4-A1
		27.48 g	0.50 mL								
8 320-30555-A-5 (PFC_IDA_DOD5)	N/A (320-30555-1)	283.06 g	255.9 mL				8/25/17	16_Days	4	RI	320-30555-A-5-A1
		27.21 g	0.50 mL								
9 320-30555-A-6 (PFC_IDA_DOD5)	N/A (320-30555-1)	278.88 g	251.6 mL				8/25/17	16_Days	4	RI	320-30555-A-6-A1
		27.33 g	0.50 mL								
10 320-30555-A-7 (PFC_IDA_DOD5)	N/A (320-30555-1)	280.10 g	252.2 mL				8/25/17	16_Days	4	RI	320-30555-A-7-A1
		27.89 g	0.50 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

11	320-30555-A-8 (PFC_IDA_DOD5)	N/A (320-30555-1)	287.44 g	259 mL				8/25/17	16_Days	4	RI	
			28.40 g	0.50 mL								
12	320-30555-A-9 (PFC_IDA_DOD5)	N/A (320-30555-1)	283.78 g	256.6 mL				8/25/17	16_Days	4	RI	
			27.22 g	0.50 mL								
13	320-30555-A-10 (PFC_IDA_DOD5)	N/A (320-30555-1)	281.50 g	253.4 mL				8/25/17	16_Days	4	RI	
			28.09 g	0.50 mL								
14	320-30556-A-1 (PFC_IDA_DOD5)	N/A (320-30556-1)	287.82 g	260.8 mL				8/25/17	16_Days	4	10x, RI	
			27.01 g	0.50 mL								
15	320-30556-A-2 (PFC_IDA_DOD5)	N/A (320-30556-1)	286.46 g	258.8 mL				8/25/17	16_Days	4	RI	
			27.66 g	0.50 mL								
16	320-30556-A-3 (PFC_IDA_DOD5)	N/A (320-30556-1)	290.04 g	263.1 mL				8/25/17	16_Days	4	RI	
			26.95 g	0.50 mL								
17	320-30556-A-4 (PFC_IDA_DOD5)	N/A (320-30556-1)	287.99 g	261.1 mL				8/25/17	16_Days	4	RI	
			26.92 g	0.50 mL								
18	460-139006-E-1 (PFC_IDA)	N/A (460-139006-1)	284.99 g	258.2 mL				8/22/17	20_Days	4		
			26.81 g	0.50 mL								
19	460-139006-E-2 (PFC_IDA)	N/A (460-139006-1)	284.07 g	257.3 mL				8/22/17	20_Days	4		
			26.74 g	0.50 mL								
20	460-139006-E-3 (PFC_IDA)	N/A (460-139006-1)	287.53 g	260.4 mL				8/22/17	20_Days	4		
			27.15 g	0.50 mL								
21	460-139006-E-4 (PFC_IDA)	N/A (460-139006-1)	288.39 g	261.7 mL				8/22/17	20_Days	4		
			26.66 g	0.50 mL								
22	460-139006-E-5 (PFC_IDA)	N/A (460-139006-1)	287.22 g	260.5 mL				8/22/17	20_Days	4		
			26.76 g	0.50 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

Batch Notes

Manifold ID 8, 14

Methanol ID 1010872

Hexane ID 981622

Sodium Hydroxide ID 1010784

First Start time NA

First End time NA

SPE Cartridge Type WAX 500mg

Solid Phase Extraction Disk ID 003237040A

Balance ID QA-070

H2O ID 8/7/17

Pipette ID I46370G

Solvent Name 0.3% NH4OH/MeOH

Solvent Lot # 1010466

Analyst ID - Reagent Drop

cab

Analyst ID - SU Reagent Drop

cab

Analyst ID - SU Reagent Drop JNS

Witness

Acid Name NA

Acid ID NA

Reagent ID NA

Reagent Lot Number NA

SOP Number WS-LC-0025

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-179613/1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL	JTS 8-16-17	JTS 8/16/17
LCS 320-179613/2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
LCS 320-179613/2	LCPFCSP_00110	500 uL	0.50 mL		
LCSD 320-179613/3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
LCSD 320-179613/3	LCPFCSP_00110	500 uL	0.50 mL		
320-30555-A-1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-4	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-5	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-6	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-7	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-8	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-9	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30555-A-10	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30556-A-1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30556-A-2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
320-30556-A-3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-179613

Analyst: Santos, Jonathan

Batch Open: 8/16/2017 9:20:00AM

Method Code: 320-3535_PFC-320

Batch End:

320-30556-A-4	LCMPFC_ALL_SU_00006	500 uL	0.50 mL	CES 8-16-17 ↓	JMS 8/16/17 ↓
460-139006-E-1	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139006-E-2	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139006-E-3	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139006-E-4	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		
460-139006-E-5	LCMPFC_ALL_SU_00006	500 uL	0.50 mL		

Other Reagents:		
Reagent	Amount/Units	Lot#:

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Preparation Batch Number(s): 177777 Test: Shake Bath

Earliest Holding Time: 8/13/17

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	NA	NA
All necessary NCMs filed (including holding time)	NA	NA
Method/sample/login/QAS checked and correct	NA	NA
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	NA	NA
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	NA	NA
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	NA	NA
Comments are transcribed correctly in TALS	NA	NA
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	NA	NA
All spike amounts correct and added to necessary samples and QC	NA	NA
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	NA	NA
All necessary 'batch information' complete and entered into TALS correctly	NA	NA

1st Level Reviewer: ABH

Date: 8/9/17

2nd Level Reviewer: VPM

Date: 8/9/17

Comments: _____

Sample Dilution Record

Method ID PFC-ID# / DOD 5

Job # See Below

Analyst (Print Name) Shyama Chandrasekhar

Analyst Initials GBC

Date 8/28/17

[illegible]

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	320-30556-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-020-TPE	Ground water	Normal (Regular)	8-Aug-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-30556-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-020-MID-CARBON	Ground water	Normal (Regular)	8-Aug-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-30556-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-020-TPE-D	Ground water	Field duplicate	8-Aug-17	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-30556-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-020-TPI	Ground water	Normal (Regular)	8-Aug-17	537	Perfluoroalkyl Compounds